
28039 Fri May 30 18:31:07 2014
 new/exception_lists/packaging
 4853 illumos-gate is not lint-clean when built with openssl 1.0

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26 #
27 #
28 #
29 # Exception List for validate_pkg
30 #
31 #
32 #
33 # The following entries are built in the /proto area
34 # but not included in any packages - this is intentional.
35 #
36 usr/include/auth_list.h
37 usr/include/bsm/audit_door_infc.h
38 usr/include/bsm/audit_private.h
39 usr/include/bsm/devalloc.h
40 usr/include/getxby_door.h
41 usr/include/passwdutil.h
42 usr/include/priv_utils.h
43 usr/include/rpcsvc/daemon_utils.h
44 usr/include/rpcsvc/svc_dg_priv.h
45 usr/include/security/pam_impl.h
46 usr/include/sys/clock_impl.h
47 usr/include/sys/ieeefp.h
48 usr/include/sys/winlockio.h
49 usr/include/scsi/plugins/ses/vendor/sun_impl.h
50 #
51 # Private/Internal libraries of the Cryptographic Framework.
52 #
53 lib/libkcf.so
54 lib/lib-lelfsign
55 lib/lib-lelfsign.ln
56 lib/lib-lkcf
57 lib/lib-lkcf.ln
58 usr/include/libelfsign.h
59 usr/lib/lib-lsoftcrypto
60 usr/lib/lib-lsoftcrypto.ln
61 usr/lib/amd64/lib-lsoftcrypto.ln      i386

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62 usr/lib/sparcv9/lib-lsoftcrypto.ln      sparc
63 #
64 #
65 # The following files are used by the DHCP service, the
66 # standalone's DHCP implementation, and the kernel (nfs_dlboot).
67 # They contain interfaces which are currently private.
68 #
69 usr/include/dhcp_svc_confkey.h
70 usr/include/dhcp_svc_confopt.h
71 usr/include/dhcp_svc_private.h
72 usr/include/dhcp_symbol.h
73 usr/include/sys/sunos_dhcp_class.h
74 usr/lib/libdhcpsvc.so
75 usr/lib/lib-ldhcpsvc
76 usr/lib/lib-ldhcpsvc.ln
77 #
78 # Private MAC driver header files
79 #
80 usr/include/inet/iptun.h
81 usr/include/sys/aggr_impl.h
82 usr/include/sys/aggr.h
83 usr/include/sys/dld_impl.h
84 usr/include/sys/dld_ioc.h
85 usr/include/sys/dls_impl.h
86 usr/include/sys/dls.h
87 usr/include/sys/mac_client_impl.h
88 usr/include/sys/mac_client.h
89 usr/include/sys/mac_flow_impl.h
90 usr/include/sys/mac_impl.h
91 usr/include/sys/mac_soft_ring.h
92 usr/include/sys/mac_stat.h
93 #
94 # Private GLDv3 userland libraries and headers
95 #
96 usr/include/libdladm_impl.h
97 usr/include/libdlaggr.h
98 usr/include/libdlether.h
99 usr/include/libdlflow_impl.h
100 usr/include/libdlflow.h
101 usr/include/libdliptun.h
102 usr/include/libdlmgmt.h
103 usr/include/libdlsim.h
104 usr/include/libdlstat.h
105 usr/include/libdlvnic.h
106 usr/include/libdlwlan_impl.h
107 usr/include/libdlwlan.h
108 #
109 # Virtual Network Interface Card (VNIC)
110 #
111 usr/include/sys/vnic.h
112 usr/include/sys/vnic_impl.h
113 #
114 # Private libipadm lint library and header files
115 #
116 usr/include/ipadm_ipmgmt.h
117 usr/include/ipadm_ndpd.h
118 usr/include/libipadm.h
119 lib/lib-lipadm
120 lib/lib-lipadm.ln
121 lib/libipadm.so
122 #
123 # Private libsocket header file
124 #
125 usr/include/libsocket_priv.h
126 #
127 # IKE and IPsec support library exceptions. The IKE support

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128 # library contains exclusively private interfaces, as does
129 # libipsecutil. My apologies for the glut of header files here.
130 #
131 usr/include/errfp.h
132 usr/include/ikedoor.h
133 usr/include/ipsec_util.h
134 usr/lib/libike.so
135 usr/lib/amd64/libike.so i386
136 usr/lib/sparcv9/libike.so sparc
137 usr/lib/libipsecutil.so
138 usr/lib/amd64/libipsecutil.so i386
139 usr/lib/sparcv9/libipsecutil.so sparc
140 usr/lib/llib-like
141 usr/lib/llib-like.ln
142 usr/lib/amd64/llib-like.ln i386
143 usr/lib/sparcv9/llib-like.ln sparc
144 usr/lib/llib-lipsecutil
145 usr/lib/llib-lipsecutil.ln
146 usr/lib/amd64/llib-lipsecutil.ln i386
147 usr/lib/sparcv9/llib-lipsecutil.ln sparc
148 #
149 usr/include/inet/ip_impl.h
150 usr/include/inet/ip_ndp.h
151 usr/include/inet/ip2mac_impl.h
152 usr/include/inet/ip2mac.h
153 usr/include/inet/rawip_impl.h
154 usr/include/inet/tcp_impl.h
155 usr/include/inet/udp_impl.h
156 usr/include/libmail.h
157 usr/include/libnwm_priv.h
158 usr/include/protocols/ripngd.h
159 usr/include/s_string.h
160 usr/include/sys/logindmux_impl.h
161 usr/include/sys/vgareg.h
162 #
163 # Some IPsec headers can't be shipped lest we hit export controls...
164 #
165 usr/include/inet/ipsec_impl.h
166 usr/include/inet/ipsec_info.h
167 usr/include/inet/ipsec.h
168 usr/include/inet/ipsec.h
169 usr/include/inet/keysock.h
170 usr/include/inet/sadb.h
171 usr/include/sys/sha1_consts.h
172 usr/include/sys/sha2_consts.h
173 #
174 #
175 # Filtering out directories not shipped
176 #
177 usr/4lib i386
178 #
179 # These files contain definitions shared privately between the kernel
180 # and libc. There is no reason for them to be part of a package that
181 # a customer should ever see. They are installed in the proto area by
182 # the uts build because libc and other components, like truss, are
183 # dependent upon their contents and should not have their own copies.
184 #
185 usr/include/sys/libc_kernel.h
186 usr/include/sys/synch32.h
187 #
188 # These files are installed in the proto area by the build of libproc for
189 # the benefit of the builds of cmd/truss, cmd/gcore and cmd/ptools, which
190 # use libproc as their common process-control library. These are not
191 # interfaces for customer use, so the files are excluded from packaging.
192 #
193 lib/llib-lproc

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194 lib/llib-lproc.ln
195 lib/amd64/llib-lproc.ln i386
196 lib/sparcv9/llib-lproc.ln sparc
197 usr/include/libproc.h
198 #
199 # Private interfaces for libdisasm
200 #
201 usr/include/libdisasm.h
202 usr/lib/llib-libdisasm
203 usr/lib/llib-libdisasm.ln
204 usr/lib/amd64/llib-libdisasm.ln i386
205 usr/lib/sparcv9/llib-libdisasm.ln sparc
206 #
207 # Private interfaces for libraidcfg
208 #
209 usr/include/raidcfg_spi.h
210 usr/include/raidcfg.h
211 usr/lib/libraidcfg.so
212 usr/lib/amd64/libraidcfg.so i386
213 usr/lib/sparcv9/libraidcfg.so sparc
214 usr/lib/llib-libraidcfg
215 usr/lib/llib-libraidcfg.ln
216 usr/lib/amd64/llib-libraidcfg.ln i386
217 usr/lib/sparcv9/llib-libraidcfg.ln sparc
218 #
219 # This file is used for private communication between mdb, drv/kmdb, and
220 # misc/kmdb. The interfaces described herein are not intended for customer
221 # use, and are thus excluded from packaging.
222 #
223 usr/include/sys/kmdb.h
224 #
225 # These files are installed in the proto area by the build of libdhcpgent
226 # and libdhcputil for the benefit of DHCP-related networking commands such
227 # as dhcpgent, dhcputil, ifconfig, and netstat. These are not interfaces
228 # for customer use, so the files are excluded from packaging.
229 #
230 lib/libdhcpgent.so
231 lib/libdhcputil.so
232 lib/amd64/libdhcputil.so i386
233 lib/sparcv9/libdhcputil.so sparc
234 lib/llib-libdhcpgent
235 lib/llib-libdhcpgent.ln
236 lib/llib-libdhcputil
237 lib/llib-libdhcputil.ln
238 lib/amd64/llib-libdhcputil.ln i386
239 lib/sparcv9/llib-libdhcputil.ln sparc
240 usr/include/dhcp_hostconf.h
241 usr/include/dhcp_impl.h
242 usr/include/dhcp_inittab.h
243 usr/include/dhcp_stable.h
244 usr/include/dhcp_symbol_common.h
245 usr/include/dhcpagent_ipc.h
246 usr/include/dhcpagent_util.h
247 usr/include/dhcpmsg.h
248 usr/lib/libdhcpgent.so
249 usr/lib/libdhcputil.so
250 usr/lib/amd64/libdhcputil.so i386
251 usr/lib/sparcv9/libdhcputil.so sparc
252 usr/lib/llib-libdhcpgent
253 usr/lib/llib-libdhcpgent.ln
254 usr/lib/llib-libdhcputil
255 usr/lib/llib-libdhcputil.ln
256 usr/lib/amd64/llib-libdhcputil.ln i386
257 usr/lib/sparcv9/llib-libdhcputil.ln sparc
258 #
259 # These files are installed in the proto area by the build of libinstzones

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260 # and libpkg
261 #
262 usr/lib/llib-linstzones
263 usr/lib/llib-linstzones.ln
264 usr/lib/amd64/llib-linstzones.ln      i386
265 usr/lib/sparcv9/llib-linstzones.ln    sparc
266 usr/lib/llib-lpkg
267 usr/lib/llib-lpkg.ln
268 #
269 # Don't ship header files private to libipmp and in.mpathd
270 #
271 usr/include/ipmp_query_impl.h
272 #
273 # These files are installed in the proto area by the build of libinetsvc,
274 # an inetd-specific library shared by inetd, inetadm and inetconv. Only
275 # the shared object is shipped.
276 #
277 usr/include/inetsvc.h
278 usr/lib/libinetsvc.so
279 usr/lib/llib-linetsvc
280 usr/lib/llib-linetsvc.ln
281 #
282 # These files are installed in the proto area by the build of libinetutil,
283 # a general purpose library for the benefit of internet utilities. Only
284 # the shared object is shipped.
285 #
286 lib/libinetutil.so
287 lib/amd64/libinetutil.so      i386
288 lib/sparcv9/libinetutil.so    sparc
289 lib/llib-linetutil
290 lib/llib-linetutil.ln
291 lib/amd64/llib-linetutil.ln  i386
292 lib/sparcv9/llib-linetutil.ln sparc
293 usr/include/libinetutil.h
294 usr/include/netinet/inetutil.h
295 usr/include/ofmt.h
296 usr/lib/libinetutil.so
297 usr/lib/amd64/libinetutil.so  i386
298 usr/lib/sparcv9/libinetutil.so sparc
299 usr/lib/llib-linetutil
300 usr/lib/llib-linetutil.ln
301 usr/lib/amd64/llib-linetutil.ln i386
302 usr/lib/sparcv9/llib-linetutil.ln sparc
303 #
304 # Miscellaneous kernel interfaces or kernel<->user interfaces that are
305 # consolidation private and we do not want to export at this time.
306 #
307 usr/include/sys/cryptmod.h
308 usr/include/sys/dumpadm.h
309 usr/include/sys/ontrap.h
310 usr/include/sys/sysmsg_impl.h
311 usr/include/sys/vlan.h
312 #
313 # These files are installed in the proto area so lvm can use
314 # them during the build process.
315 #
316 lib/llib-lmeta
317 lib/llib-lmeta.ln
318 usr/include/sdssc.h
319 usr/lib/llib-lmeta
320 usr/lib/llib-lmeta.ln
321 #
322 # non-public pci header
323 #
324 usr/include/sys/pci_impl.h
325 usr/include/sys/pci_tools.h

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326 #
327 # Exception list for RCM project, included by librcm and rcm_daemon
328 #
329 usr/include/librcm_event.h
330 usr/include/librcm_impl.h
331 #
332 # MDB deliverables that are not yet public
333 #
334 usr/lib/mdb/proc/mdb_test.so
335 usr/lib/mdb/proc/sparcv9/mdb_test.so    sparc
336 #
337 # SNCA project exception list
338 #
339 usr/include/inet/kssl/kssl.h
340 usr/include/inet/kssl/ksslimpl.h
341 usr/include/inet/kssl/ksslproto.h
342 usr/include/inet/nca
343 #
344 # these are "removed" from the source product build because the only
345 # packages that currently deliver them are removed.
346 # they really should't be in here.
347 #
348 etc/sfw
349 #
350 # Entries for the libmech_krb5 symlink, which has been included
351 # for build purposes only, not delivered to customers.
352 #
353 usr/lib/gss/libmech_krb5.so
354 usr/lib/amd64/gss/libmech_krb5.so      i386
355 usr/lib/sparcv9/gss/libmech_krb5.so    sparc
356 usr/lib/libmech_krb5.so
357 usr/lib/amd64/libmech_krb5.so          i386
358 usr/lib/sparcv9/libmech_krb5.so        sparc
359 #
360 # Entries for headers from efcode project which user does not need to see
361 #
362 usr/platform/sun4u/include/sys/fc_plat.h      sparc
363 usr/platform/sun4u/include/sys/fcode.h        sparc
364 #
365 # Private net80211 headers
366 #
367 usr/include/sys/net80211_crypto.h
368 usr/include/sys/net80211_ht.h
369 usr/include/sys/net80211_proto.h
370 usr/include/sys/net80211.h
371 #
372 usr/include/net/wpa.h
373 #
374 # PPPoE files not delivered to customers.
375 #
376 usr/include/net/pppoe.h
377 usr/include/net/spptun.h
378 #
379 # Simnet
380 #
381 usr/include/net/simnet.h
382 #
383 # Bridging internal data structures
384 #
385 usr/include/net/bridge_impl.h
386 #
387 # User<->kernel interface used by cfgadm/USB only
388 #
389 usr/include/sys/usb/hubd/hubd_impl.h
390 #
391 # User<->kernel interface used by cfgadm/SATA only

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392 #
393 usr/include/sys/sata/sata_cfgadm.h          i386
394 #
395 # Private ucred kernel header
396 #
397 usr/include/sys/ucred.h
398 #
399 # Private and/or platform-specific smf(5) files
400 #
401 lib/librestart.so
402 lib/llib-lrestart
403 lib/llib-lrestart.ln
404 lib/amd64/llib-lrestart.ln
405 lib/sparcv9/llib-lrestart.ln
406 usr/include/libcontract_priv.h
407 usr/include/librestart_priv.h
408 usr/include/librestart.h
409 usr/lib/librestart.so
410 usr/lib/sparcv9/librestart.so
411 lib/svc/manifest/platform/sun4u
412 lib/svc/manifest/platform/sun4v
413 var/svc/manifest/platform/sun4u
414 var/svc/manifest/platform/sun4v
415 etc/svc/profile/platform_sun4v.xml
416 etc/svc/profile/platform_SUNW,SPARC-Enterprise.xml
417 etc/svc/profile/platform_SUNW,Sun-Fire-15000.xml
418 etc/svc/profile/platform_SUNW,Sun-Fire-880.xml
419 etc/svc/profile/platform_SUNW,Sun-Fire-V890.xml
420 etc/svc/profile/platform_SUNW,Sun-Fire.xml
421 etc/svc/profile/platform_SUNW,Ultra-Enterprise-10000.xml
422 etc/svc/profile/platform_SUNW,UltraSPARC-IIe-NetraCT-40.xml
423 etc/svc/profile/platform_SUNW,UltraSPARC-IIe-NetraCT-60.xml
424 etc/svc/profile/platform_SUNW,UltraSPARC-IIi-NetraCT.xml
425 #
426 # Private libuutil files
427 #
428 lib/libuutil.so
429 lib/llib-luutil
430 lib/llib-luutil.ln
431 lib/sparcv9/llib-luutil.ln
432 usr/include/libuutil_impl.h
433 usr/lib/libuutil.so
434 usr/lib/sparcv9/libuutil.so
435 #
436 # Private Multidata file.
437 #
438 usr/include/sys/multidata_impl.h
439 #
440 # The following files are used by wanboot.
441 # They contain interfaces which are currently private.
442 #
443 usr/include/sys/wanboot_impl.h
444 usr/include/wanboot
445 usr/include/wanbootutil.h
446 #
447 # Even though all the objects built under usr/src/stand are later glommed
448 # together into a couple of second-stage boot loaders, we dump the static
449 # archives and lint libraries into $(ROOT)/stand for intermediate use
450 # (e.g., for lint, linking the second-stage boot loaders, ...). Since
451 # these are merely intermediate objects, they do not need to be packaged.
452 #
453 stand
454 #
455 # Private KCF header files
456 #
457 usr/include/sys/crypto/elfsign.h

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458 usr/include/sys/crypto/impl.h
459 usr/include/sys/crypto/ops_impl.h
460 usr/include/sys/crypto/sched_impl.h
461 #
462 # The following files are installed in the proto area
463 # by the build of libavl (AVL Tree Interface Library).
464 # libavl contains interfaces which are all private interfaces.
465 #
466 lib/libavl.so
467 lib/amd64/libavl.so
468 lib/sparcv9/libavl.so
469 lib/llib-lavl
470 lib/llib-lavl.ln
471 lib/amd64/llib-lavl.ln
472 lib/sparcv9/llib-lavl.ln
473 usr/lib/libavl.so
474 usr/lib/amd64/libavl.so
475 usr/lib/sparcv9/libavl.so
476 usr/lib/llib-lavl
477 usr/lib/llib-lavl.ln
478 usr/lib/amd64/llib-lavl.ln
479 usr/lib/sparcv9/llib-lavl.ln
480 #
481 # The following files are installed in the proto area
482 # by the build of libcmdutils (Command Utilities Library).
483 # libcmdutils contains interfaces which are all private interfaces.
484 #
485 lib/libcmdutils.so
486 lib/amd64/libcmdutils.so
487 lib/sparcv9/libcmdutils.so
488 lib/llib-lcmdutils
489 lib/llib-lcmdutils.ln
490 lib/amd64/llib-lcmdutils.ln
491 lib/sparcv9/llib-lcmdutils.ln
492 usr/include/libcmdutils.h
493 usr/lib/libcmdutils.so
494 usr/lib/amd64/libcmdutils.so
495 usr/lib/sparcv9/libcmdutils.so
496 usr/lib/llib-lcmdutils
497 usr/lib/llib-lcmdutils.ln
498 usr/lib/amd64/llib-lcmdutils.ln
499 usr/lib/sparcv9/llib-lcmdutils.ln
500 #
501 # Private interfaces in libsec
502 #
503 usr/include/aclutils.h
504 #
505 # USB skeleton driver stays in sync with the rest of USB but doesn't ship.
506 #
507 kernel/drv/usbskel
508 kernel/drv/amd64/usbskel
509 kernel/drv/sparcv9/usbskel
510 kernel/drv/usbskel.conf
511 #
512 # Consolidation and Sun private libdevid interfaces
513 # Public libdevid interfaces provided by devid.h
514 #
515 usr/include/sys/libdevid.h
516 #
517 # The following files are installed in the proto area by the build of
518 # libprtdiag. libprtdiag contains interfaces which are all private.
519 # Only the shared object is shipped.
520 #
521 usr/platform/sun4u/lib/llib-lprtdiag
522 usr/platform/sun4u/lib/llib-lprtdiag.ln
523 usr/platform/sun4v/lib/llib-lprtdiag.ln

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```

524 #
525 # The following files are installed in the proto area by the build of
526 # mdesc driver in sun4v. These header files are used on in the build
527 # and do not need to be shipped to customers.
528 #
529 usr/include/sys/mdesc.h                sparc
530 usr/include/sys/mdesc_impl.h           sparc
531 usr/platform/sun4v/include/sys/mach_descrip.h sparc
532 #
533 # The following files are installed in the proto area by the build of
534 # libpcp. libpcp contains interfaces which are all private.
535 # Only the shared object is shipped.
536 #
537 usr/platform/sun4v/lib/llib-lpcp.ln    sparc
538 usr/platform/SUNW,Netra-CP3060/lib/llib-lpcp.ln sparc
539 usr/platform/SUNW,Netra-CP3260/lib/llib-lpcp.ln sparc
540 usr/platform/SUNW,Netra-T5220/lib/llib-lpcp.ln sparc
541 usr/platform/SUNW,Netra-T5440/lib/llib-lpcp.ln sparc
542 usr/platform/SUNW,SPARC-Enterprise-T5120/lib/llib-lpcp.ln sparc
543 usr/platform/SUNW,Sun-Blade-T6300/lib/llib-lpcp.ln sparc
544 usr/platform/SUNW,Sun-Blade-T6320/lib/llib-lpcp.ln sparc
545 usr/platform/SUNW,Sun-Fire-T200/lib/llib-lpcp.ln sparc
546 usr/platform/SUNW,T5140/lib/llib-lpcp.ln sparc
547 usr/platform/SUNW,USBRDT-5240/lib/llib-lpcp.ln sparc
548 #
549 # ZFS internal tools and lint libraries
550 #
551 usr/lib/llib-lzfs_jni
552 usr/lib/llib-lzfs_jni.ln
553 usr/lib/amd64/llib-lzfs_jni.ln    i386
554 usr/lib/sparcv9/llib-lzfs_jni.ln  sparc
555 usr/lib/llib-lzpool
556 usr/lib/llib-lzpool.ln           i386
557 usr/lib/amd64/llib-lzpool.ln      i386
558 usr/lib/sparcv9/llib-lzpool.ln    sparc
559 #
560 # ZFS JNI headers
561 #
562 usr/include/libzfs_jni_dataset.h
563 usr/include/libzfs_jni_disk.h
564 usr/include/libzfs_jni_diskmgt.h
565 usr/include/libzfs_jni_ipool.h
566 usr/include/libzfs_jni_main.h
567 usr/include/libzfs_jni_pool.h
568 usr/include/libzfs_jni_property.h
569 usr/include/libzfs_jni_util.h
570 #
571 # These files are installed in the proto area for Solaris scsi_vhci driver
572 # (for MPAPI support) and should not be shipped
573 #
574 usr/include/sys/scsi/adapters/mpapi_impl.h
575 usr/include/sys/scsi/adapters/mpapi_scsi_vhci.h
576 #
577 # This library is installed in the proto area by the build of libdisasm, and is
578 # only used when building the KMDB disasm module.
579 #
580 usr/lib/libstanddisasm.so
581 usr/lib/amd64/libstanddisasm.so    i386
582 usr/lib/sparcv9/libstanddisasm.so  sparc
583 #
584 # TSol: tsol doesn't ship lint source, and tsnet isn't for customers at all.
585 #
586 lib/libtsnet.so
587 usr/lib/llib-ltsnet
588 usr/lib/llib-ltsol
589 #

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590 # nss interfaces shared between libnsl and other ON libraries.
591 #
592 usr/include/nss.h
593 #
594 # AT&T AST (ksh93) files which are currently needed only to build OS/Net
595 # (msgcc&co.)
596 # libast
597 usr/lib/libast.so
598 usr/lib/amd64/libast.so            i386
599 usr/lib/sparcv9/libast.so          sparc
600 usr/lib/llib-last
601 usr/lib/llib-last.ln
602 usr/lib/amd64/llib-last.ln        i386
603 usr/lib/sparcv9/llib-last.ln      sparc
604 # libcmd
605 usr/lib/llib-lcmd
606 usr/lib/llib-lcmd.ln
607 usr/lib/amd64/llib-lcmd.ln        i386
608 usr/lib/sparcv9/llib-lcmd.ln      sparc
609 # libdll
610 usr/lib/libdll.so
611 usr/lib/amd64/libdll.so            i386
612 usr/lib/sparcv9/libdll.so          sparc
613 usr/lib/llib-ldll
614 usr/lib/llib-ldll.ln
615 usr/lib/amd64/llib-ldll.ln        i386
616 usr/lib/sparcv9/llib-ldll.ln      sparc
617 # libpp (a helper library needed by AST's msgcc)
618 usr/lib/libpp.so
619 usr/lib/llib-lpp
620 usr/lib/llib-lpp.ln
621 usr/lib/locale/C/LC_MESSAGES/libpp
622 # libshell
623 usr/lib/libshell.so
624 usr/lib/amd64/libshell.so          i386
625 usr/lib/sparcv9/libshell.so        sparc
626 usr/lib/llib-lshell
627 usr/lib/llib-lshell.ln
628 usr/lib/amd64/llib-lshell.ln      i386
629 usr/lib/sparcv9/llib-lshell.ln    sparc
630 # libsum
631 usr/lib/libsum.so
632 usr/lib/amd64/libsum.so            i386
633 usr/lib/sparcv9/libsum.so          sparc
634 usr/lib/llib-lsum
635 usr/lib/llib-lsum.ln
636 usr/lib/amd64/llib-lsum.ln        i386
637 usr/lib/sparcv9/llib-lsum.ln      sparc
638 #
639 # This file is used in ON to build DSCP clients. It is not for customers.
640 #
641 usr/include/libdscp.h              sparc
642 #
643 # These files are used by the iSCSI Target and the iSCSI Initiator
644 #
645 usr/include/sys/iscsi_protocol.h
646 usr/include/sys/iscsi_authclient.h
647 usr/include/sys/iscsi_authclientglue.h
648 #
649 # These files are used by the COMSTAR iSCSI target port provider
650 #
651 usr/include/sys/idm
652 usr/include/sys/iscsit/chap.h
653 usr/include/sys/iscsit/iscsi_if.h
654 usr/include/sys/iscsit/isns_protocol.h
655 usr/include/sys/iscsit/radius_packet.h

```

```

656 usr/include/sys/iscsit/radius_protocol.h
657 #
658 # libshare is private and the 64-bit sharemgr is not delivered.
659 #
660 usr/lib/libshare.so
661 usr/lib/amd64/libshare.so          i386
662 usr/lib/sparcv9/libshare.so       sparc
663 usr/lib/fs/autofs/libshare_autofs.so
664 usr/lib/fs/autofs/amd64/libshare_autofs.so    i386
665 usr/lib/fs/autofs/sparcv9/libshare_autofs.so  sparc
666 usr/lib/fs/nfs/libshare_nfs.so
667 usr/lib/fs/nfs/amd64/libshare_nfs.so          i386
668 usr/lib/fs/nfs/sparcv9/libshare_nfs.so       sparc
669 usr/lib/fs/smb/libshare_smb.so
670 usr/lib/fs/smb/amd64/libshare_smb.so          i386
671 usr/lib/fs/smb/sparcv9/libshare_smb.so       sparc
672 usr/lib/fs/smbfs/libshare_smbfs.so
673 usr/lib/fs/smbfs/amd64/libshare_smbfs.so      i386
674 usr/lib/fs/smbfs/sparcv9/libshare_smbfs.so   sparc
675 usr/include/libshare_impl.h
676 usr/include/scfutil.h
677 #
678 # These files are installed in the proto area by the build of libpri for
679 # the benefit of the builds of FMA libldom, Zeus, picld plugins, and/or
680 # other libpri consumers. However, the libpri interfaces are private to
681 # Sun (Consolidation Private) and not intended for customer use. So these
682 # files (the symlink and the lint library) are excluded from packaging.
683 #
684 usr/lib/libpri.so                sparc
685 usr/lib/llib-lpri               sparc
686 usr/lib/llib-lpri.ln            sparc
687 usr/lib/sparcv9/libpri.so        sparc
688 usr/lib/sparcv9/llib-lpri.ln    sparc
689 #
690 # These files are installed in the proto area by the build of libds for
691 # the benefit of the builds of sun4v IO FMA and/or other libds
692 # consumers. However, the libds interfaces are private to Sun
693 # (Consolidation Private) and not intended for customer use. So these
694 # files (the symlink and the lint library) are excluded from packaging.
695 #
696 usr/lib/libds.so                sparc
697 usr/lib/sparcv9/libds.so        sparc
698 usr/lib/llib-lds               sparc
699 usr/lib/llib-lds.ln            sparc
700 usr/lib/sparcv9/llib-lds.ln    sparc
701 usr/lib/libdscfg.so
702 usr/lib/llib-ldscfg.ln
703 usr/platform/sun4v/include/sys/libds.h    sparc
704 usr/platform/sun4v/include/sys/vlds.h     sparc
705 #
706 # Private/Internal u8_textprep header file. Do not ship.
707 #
708 usr/include/sys/u8_textprep_data.h
709 #
710 # SQLite is private, used by SMF (svc.configd), idmapd and libsmb.
711 #
712 usr/include/sqlite
713 usr/lib/libsqlite-native.o
714 usr/lib/libsqlite.o
715 usr/lib/llib-lsqlite.ln
716 usr/lib/smbdrv/libsqlite.so
717 #
718 # Private/Internal kiconv header files. Do not ship.
719 #
720 usr/include/sys/kiconv_big5_utf8.h
721 usr/include/sys/kiconv_ckk_common.h

```

```

722 usr/include/sys/kiconv_cp950hkscs_utf8.h
723 usr/include/sys/kiconv_emea1.h
724 usr/include/sys/kiconv_emea2.h
725 usr/include/sys/kiconv_euckr_utf8.h
726 usr/include/sys/kiconv_euctw_utf8.h
727 usr/include/sys/kiconv_gb18030_utf8.h
728 usr/include/sys/kiconv_gb2312_utf8.h
729 usr/include/sys/kiconv_hkscs_utf8.h
730 usr/include/sys/kiconv_ja_jis_to_unicode.h
731 usr/include/sys/kiconv_ja_unicode_to_jis.h
732 usr/include/sys/kiconv_ja.h
733 usr/include/sys/kiconv_ko.h
734 usr/include/sys/kiconv_latin1.h
735 usr/include/sys/kiconv_sc.h
736 usr/include/sys/kiconv_tc.h
737 usr/include/sys/kiconv_uhc_utf8.h
738 usr/include/sys/kiconv_utf8_big5.h
739 usr/include/sys/kiconv_utf8_cp950hkscs.h
740 usr/include/sys/kiconv_utf8_euckr.h
741 usr/include/sys/kiconv_utf8_euctw.h
742 usr/include/sys/kiconv_utf8_gb18030.h
743 usr/include/sys/kiconv_utf8_gb2312.h
744 usr/include/sys/kiconv_utf8_hkscs.h
745 usr/include/sys/kiconv_utf8_uhc.h
746 #
747 # At this time, the ttydefs.cleanup file is only useful on sun4u systems
748 #
749 etc/flash/postdeployment/ttydefs.cleanup    i386
750 #
751 # This header file is shared only between the power commands and
752 # ppm/srn modules # and should not be in any package
753 #
754 usr/include/sys/srn.h
755 #
756 # Private/Internal header files of smbdrv. Do not ship.
757 #
758 usr/include/smb
759 usr/include/smbdrv
760 #
761 # Private/Internal dtrace scripts of smbdrv. Do not ship.
762 #
763 usr/lib/smbdrv/dtrace
764 #
765 # Private/Internal (lint) libraries of smbdrv. Do not ship.
766 #
767 usr/lib/reparse/llib-lreparse_smb
768 usr/lib/reparse/llib-lreparse_smb.ln
769 usr/lib/smbdrv/llib-lmlrpc
770 usr/lib/smbdrv/llib-lmlrpc.ln
771 usr/lib/smbdrv/llib-lmlsvc
772 usr/lib/smbdrv/llib-lmlsvc.ln
773 usr/lib/smbdrv/llib-lsmb
774 usr/lib/smbdrv/llib-lsmb.ln
775 usr/lib/smbdrv/llib-lsmbns
776 usr/lib/smbdrv/llib-lsmbns.ln
777 #
778 #
779 # Private/Internal 64-bit libraries of smbdrv. Do not ship.
780 #
781 usr/lib/smbdrv/amd64          i386
782 usr/lib/smbdrv/sparcv9       sparc
783 #
784 usr/lib/reparse/amd64/libreparse_smb.so    i386
785 usr/lib/reparse/amd64/libreparse_smb.so.1  i386
786 usr/lib/reparse/amd64/llib-lreparse_smb.ln i386
787 usr/lib/reparse/sparcv9/libreparse_smb.so  sparc

```

```

788 usr/lib/reparse/sparcv9/libreparse_smb.so.1      sparc
789 usr/lib/reparse/sparcv9/llib-lreparse_smb.ln     sparc
790 #
791 # Private dirent, extended to include flags, for use by SMB server
792 #
793 usr/include/sys/extdirent.h
794 #
795 # Private header files for vscan service
796 #
797 usr/include/libvscan.h
798 usr/include/sys/vscan.h
799 #
800 # libvscan is private
801 #
802 usr/lib/vscan/llib-lvscan
803 usr/lib/vscan/llib-lvscan.ln
804 #
805 # i86hvm is not a full platform. It is just a home for paravirtualized
806 # drivers. There is no usr/ component to this sub-platform, but the
807 # directory is created in the proto area to keep other tools happy.
808 #
809 usr/platform/i86hvm                                i386
810 #
811 # Private sdcard framework headers
812 #
813 usr/include/sys/sdcard
814 #
815 # libsmbfs is private
816 #
817 usr/include/netsmb
818 usr/lib/libsmbfs.so
819 usr/lib/amd64/libsmbfs.so                          i386
820 usr/lib/sparcv9/libsmbfs.so                        sparc
821 usr/lib/llib-lsmbfs
822 usr/lib/llib-lsmbfs.ln
823 usr/lib/amd64/llib-lsmbfs.ln                      i386
824 usr/lib/sparcv9/llib-lsmbfs.ln                    sparc
825 #
826 # demo & test program for smbfs (private) ACL support
827 #
828 usr/lib/fs/smbfs/chacl
829 usr/lib/fs/smbfs/lsacl
830 usr/lib/fs/smbfs/testnp
831 #
832 # FC related files
833 kernel/kmdb/fcip                                  i386
834 kernel/kmdb/amd64/fcip                            i386
835 kernel/kmdb/sparcv9/fcip                          sparc
836 kernel/kmdb/fcp                                   i386
837 kernel/kmdb/amd64/fcp                             i386
838 kernel/kmdb/sparcv9/fcp                          sparc
839 kernel/kmdb/fctl                                  i386
840 kernel/kmdb/amd64/fctl                            i386
841 kernel/kmdb/sparcv9/fctl                          sparc
842 kernel/kmdb/qlc                                   i386
843 kernel/kmdb/amd64/qlc                             i386
844 kernel/kmdb/sparcv9/qlc                          sparc
845 lib/llib-la5k                                    sparc
846 lib/llib-la5k.ln                                 sparc
847 lib/sparcv9/llib-la5k.ln                         sparc
848 lib/llib-lg_fc                                    sparc
849 lib/llib-lg_fc.ln                                sparc
850 lib/sparcv9/llib-lg_fc.ln                        sparc
851 usr/include/a_state.h                             sparc
852 usr/include/a5k.h                                 sparc
853 usr/include/exec.h                                sparc

```

```

854 usr/include/g_scsi.h                             sparc
855 usr/include/g_state.h                             sparc
856 usr/include/gfc.h                                 sparc
857 usr/include/l_common.h                            sparc
858 usr/include/l_error.h                             sparc
859 usr/include/rom.h                                 sparc
860 usr/include/stgcom.h                              sparc
861 usr/include/sys/fibre-channel
862 usr/lib/llib-LHBAAPI
863 usr/lib/llib-LHBAAPI.ln
864 usr/lib/amd64/llib-LHBAAPI.ln                    i386
865 usr/lib/sparcv9/llib-LHBAAPI.ln                  sparc
866 #
867 usr/bin/dscfgcli
868 usr/bin/sd_diag
869 usr/bin/sd_stats
870 usr/include/nsctl.h
871 usr/include/sys/ncall
872 usr/include/sys/nsc_ddi.h
873 usr/include/sys/nsc_thread.h
874 usr/include/sys/nsctl
875 usr/include/sys/nskernd.h
876 usr/include/sys/unistat
877 usr/lib/libnsctl.so
878 usr/lib/librdc.so
879 usr/lib/libunistat.so
880 usr/lib/llib-lnsctl.ln
881 usr/lib/llib-lrdc.ln
882 usr/lib/llib-lunistat.ln
883 #
884 # These files are used by the iSCSI initiator only.
885 # No reason to ship them.
886 #
887 usr/include/sys/scsi/adapters/iscsi_door.h
888 usr/include/sys/scsi/adapters/iscsi_if.h
889 #
890 # sbd ioctl hdr
891 #
892 usr/include/sys/stmf_sbd_ioctl.h
893 #
894 # proxy port provider interface
895 #
896 usr/include/sys/pppt_ic_if.h
897 usr/include/sys/pppt_ioctl.h
898 #
899 # proxy daemon lint library
900 #
901 usr/lib/llib-lstmfproxy
902 usr/lib/llib-lstmfproxy.ln
903 usr/lib/amd64/llib-lstmfproxy.ln                  i386
904 usr/lib/sparcv9/llib-lstmfproxy.ln                sparc
905 #
906 # portable object file and dictionary used by libfmd_msg test
907 #
908 usr/lib/fm/dict/TEST.dict
909 usr/lib/locale/C/LC_MESSAGES/TEST.mo
910 usr/lib/locale/C/LC_MESSAGES/TEST.po
911 #
912 # Private idmap RPC protocol
913 #
914 usr/include/rpcsvc/idmap_prot.h
915 usr/include/rpcsvc/idmap_prot.x
916 #
917 # Private idmap directory API
918 #
919 usr/include/directory.h

```

```

920 #
921 # librstp is private for bridging
922 #
923 usr/include/stp_bpdu.h
924 usr/include/stp_in.h
925 usr/include/stp_vectors.h
926 usr/lib/librstp.so
927 usr/lib/llib-lrstp
928 usr/lib/llib-lrstp.ln
929 #
930 # Private nvfru API
931 #
932 usr/include/nvfru.h
933 #
934 # vrrp
935 #
936 usr/include/libvrrpadm.h
937 usr/lib/libvrrpadm.so
938 usr/lib/amd64/libvrrpadm.so          i386
939 usr/lib/sparcv9/libvrrpadm.so       sparc
940 usr/lib/llib-lvrrpadm
941 usr/lib/llib-lvrrpadm.ln
942 usr/lib/amd64/llib-lvrrpadm.ln     i386
943 usr/lib/sparcv9/llib-lvrrpadm.ln   sparc
944 #
945 # This is only used during the -t tools build
946 #
947 opt/onbld/bin/i386/elfsign          i386
948 opt/onbld/bin/sparc/elfsign         sparc

950 #
951 # Private libdwarf
952 #
953 opt/onbld/lib/i386/libdwarf.so      i386
954 opt/onbld/lib/sparc/libdwarf.so     sparc

956 #
957 # Private socket filter API
958 #
959 usr/include/sys/sockfilter.h
960 #
961 # We don't actually validate license action payloads, and the license
962 # staging area is provided as a separate basedir for package
963 # publication. The net result is that everything therein should be
964 # ignored for packaging validation.
965 #
966 licenses
967 #
968 # Libbe is private
969 #
970 usr/include/libbe_priv.h
971 #
972 # ipmi is at present only useful on i386, but for historical reasons is
973 # delivered on SPARC and used by the build.
974 #
975 usr/include/sys/ipmi.h             sparc

977 #
978 # libsaveargs is private
979 #
980 usr/include/saveargs.h              i386
981 usr/lib/amd64/libsaveargs.so         i386
982 usr/lib/amd64/libstandsaveargs.so   i386
983 usr/lib/amd64/llib-lsaveargs.ln     i386

985 #

```

```

986 # libpcidb is private
987 #
988 usr/include/pcidb.h
989 usr/lib/amd64/libpcidb.so           i386
990 usr/lib/amd64/llib-lpcidb.ln       i386
991 usr/lib/sparcv9/libpcidb.so         sparc
992 usr/lib/sparcv9/llib-lpcidb.ln     sparc
993 usr/lib/libpcidb.so
994 usr/lib/llib-lpcidb
995 usr/lib/llib-lpcidb.ln

997 #
998 # Private OpenSSL library
999 #
1000 usr/include/openssl
1001 usr/lib/amd64/libsunw_crypto.so     i386
1002 usr/lib/amd64/libsunw_ssl.so        i386
1003 usr/lib/libsunw_crypto.so
1004 usr/lib/libsunw_ssl.so

```

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/p12split/Makefile

1

1273 Fri May 30 18:31:08 2014

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/p12split/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #

25 include ../Makefile.com

27 PROG=      p12split
28 LDLIBS +=  -lwboot -linetutil -lwbootutil
29 CPPFLAGS += -I$(CMNCRYPTDIR)

31 # libcrypto has no lint library, so we can only include this while building
32 $(PROG) := LDLIBS += -lsunw_crypto

34 LINTFLAGS += -erroff=E_NAME_USED_NOT_DEF2

36 all:      $(PROG)

38 install:  all $(ROOTCMD)

40 clean:

42 lint:     lint_PROG

44 include ../../../../Makefile.targ
```

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/p12split/p12split.c

1

```
*****
15471 Fri May 30 18:31:08 2014
new/usr/src/cmd/cmd-inet/usr.lib/wanboot/p12split/p12split.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * CDDL HEADER START
3  *
4  * The contents of this file are subject to the terms of the
5  * Common Development and Distribution License, Version 1.0 only
6  * (the "License"). You may not use this file except in compliance
7  * with the License.
8  *
9  * You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
10  * or http://www.opensolaris.org/os/licensing.
11  * See the License for the specific language governing permissions
12  * and limitations under the License.
13  *
14  * When distributing Covered Code, include this CDDL HEADER in each
15  * file and include the License file at usr/src/OPENSOLARIS.LICENSE.
16  * If applicable, add the following below this CDDL HEADER, with the
17  * fields enclosed by brackets "[]" replaced with your own identifying
18  * information: Portions Copyright [yyyy] [name of copyright owner]
19  *
20  * CDDL HEADER END
21  */
22 /*
23  * Copyright 2002-2003 Sun Microsystems, Inc. All rights reserved.
24  * Use is subject to license terms.
25  */

27 #include <stdio.h>
28 #include <libintl.h>
29 #include <locale.h>
30 #include <sys/types.h>
31 #include <sys/stat.h>
32 #include <sys/wanboot_impl.h>
33 #include <unistd.h>
34 #include <string.h>
35 #include <libnetutil.h>
36 #include <wanbootutil.h>

38 #include <openssl/crypto.h>
39 #include <openssl/buffer.h>
40 #include <openssl/bio.h>
41 #include <openssl/err.h>
42 #include <openssl/x509.h>
43 #include <openssl/x509v3.h>
44 #include <openssl/pkcs12.h>
45 #include <openssl/evp.h>
46 #include <p12aux.h>

48 static boolean_t verbose = B_FALSE; /* When nonzero, do in verbose mode */

50 /* The following match/cert values require PKCS12 */
51 static int matchty; /* Type of matching do to on input */
52 static char *k_matchval; /* localkeyid value to match */
53 static uint_t k_len; /* length of k_matchval */

55 #define IO_KEYFILE 1 /* Have a separate key file or data */
56 #define IO_CERTFILE 2 /* Have a separate cert file or data */
57 #define IO_TRUSTFILE 4 /* Have a separate trustanchor file */

59 static char *input = NULL; /* Consolidated input file */
60 static char *key_out = NULL; /* Key file to be output */
61 static char *cert_out = NULL; /* Cert file to be output */
```

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/p12split/p12split.c

2

```
62 static char *trust_out = NULL; /* Trust anchor file to be output */
63 static uint_t outfiles; /* What files are there for output */
64 static char *progname;

66 /* Returns from time_check */
67 typedef enum {
68     CHK_TIME_OK = 0, /* Cert in effect and not expired */
69     CHK_TIME_BEFORE_BAD, /* not_before field is invalid */
70     CHK_TIME_AFTER_BAD, /* not_after field is invalid */
71     CHK_TIME_IS_BEFORE, /* Cert not yet in force */
72     CHK_TIME_HAS_EXPIRED /* Cert has expired */
73 } time_errs_t;

75 static int parse_keyid(const char *);
76 static int do_certs(void);
77 static int read_files(STACK_OF(X509) **, X509 **, EVP_PKEY **);
78 static void check_certs(STACK_OF(X509) *, X509 **);
79 static time_errs_t time_check_print(X509 *);
80 static time_errs_t time_check(X509 *);
81 static int write_files(STACK_OF(X509) *, X509 **, EVP_PKEY **);
82 static int get_ifile(char *, char *, EVP_PKEY **, X509 **, STACK_OF(X509) **);
83 static int do_ofile(char *, EVP_PKEY *, X509 *, STACK_OF(X509) **);
84 static void usage(void);
85 static const char *cryptoerr(void);

87 int
88 main(int argc, char **argv)
89 {
90     int i;

92     /*
93      * Do the necessary magic for localization support.
94      */
95     (void) setlocale(LC_ALL, "");
96     #if !defined(TEXT_DOMAIN)
97     #define TEXT_DOMAIN "SYS_TEST"
98     #endif
99     (void) textdomain(TEXT_DOMAIN);

101     progname = strrchr(argv[0], '/');
102     if (progname != NULL)
103         progname++;
104     else
105         progname = argv[0];

107     wbku_errinit(progname);

109     matchty = DO_FIRST_PAIR;
110     while ((i = getopt(argc, argv, "vc:i:k:l:t:")) != -1) {
111         switch (i) {
112             case 'v':
113                 verbose = B_TRUE;
114                 break;

116             case 'l':
117                 if (parse_keyid(optarg) < 0)
118                     return (EXIT_FAILURE);
119                 matchty = DO_FIND_KEYID;
120                 break;

122             case 'c':
123                 cert_out = optarg;
124                 outfiles |= IO_CERTFILE;
125                 break;

127             case 'k':
```

```

128         key_out = optarg;
129         outfiles |= IO_KEYFILE;
130         break;

132     case 't':
133         trust_out = optarg;
134         outfiles |= IO_TRUSTFILE;
135         break;

137     case 'i':
138         input = optarg;
139         break;

141     default:
142         usage();
143     }
144 }

146 if (input == NULL) {
147     wbku_printerr("no input file specified\n");
148     usage();
149 }

151 /*
152  * Need output files.
153  */
154 if (outfiles == 0) {
155     wbku_printerr("at least one output file must be specified\n");
156     usage();
157 }

159 if (do_certs() < 0)
160     return (EXIT_FAILURE);

162 return (EXIT_SUCCESS);
163 }

165 static int
166 parse_keyid(const char *keystr)
167 {
168     const char    *rp;
169     char          *wp;
170     char          *nkeystr;
171     uint_t        nkeystrlen;

173     /*
174      * In the worst case, we'll need one additional character in our
175      * output string -- e.g. "A\0" -> "0A\0"
176      */
177     nkeystrlen = strlen(keystr) + 2;
178     k_len = (nkeystrlen + 1) / 2;
179     nkeystr = malloc(nkeystrlen);
180     k_matchval = malloc(k_len);
181     if (nkeystr == NULL || k_matchval == NULL) {
182         free(nkeystr);
183         free(k_matchval);
184         wbku_printerr("cannot allocate keyid");
185         return (-1);
186     }

188     /*
189      * For convenience, we allow the user to put spaces between each digit
190      * when entering it on the command line. As a result, we need to
191      * process it into a format that hexascii_to_octet() can handle. Note
192      * that we're careful to map strings like "AA B CC D" to "AA0BCC0D".
193      */

```

```

194     for (rp = keystr, wp = nkeystr; *rp != '\0'; rp++) {
195         if (*rp == ' ')
196             continue;

198         if (rp[1] == ' ' || rp[1] == '\0') {
199             *wp++ = '0'; /* one character sequence; prepend 0 */
200             *wp++ = *rp;
201         } else {
202             *wp++ = *rp++;
203             *wp++ = *rp;
204         }
205     }
206     *wp = '\0';

208     if (hexascii_to_octet(nkeystr, wp - nkeystr, k_matchval, &k_len) != 0) {
209         free(nkeystr);
210         free(k_matchval);
211         wbku_printerr("invalid keyid '%s'\n", keystr);
212         return (-1);
213     }

215     free(nkeystr);
216     return (0);
217 }

219 static int
220 do_certs(void)
221 {
222     char *bufp;
223     STACK_OF(X509) *ta_in = NULL;
224     EVP_PKEY *pkey_in = NULL;
225     X509 *xcert_in = NULL;

227     sunw_crypto_init();

229     if (read_files(&ta_in, &xcert_in, &pkey_in) < 0)
230         return (-1);

232     if (verbose) {
233         if (xcert_in != NULL) {
234             (void) printf(gettext("\nMain cert:\n"));

236             /*
237              * sunw_subject_attrs() returns a pointer to
238              * memory allocated on our behalf. The same
239              * behavior is exhibited by sunw_issuer_attrs().
240              */
241             bufp = sunw_subject_attrs(xcert_in, NULL, 0);
242             if (bufp != NULL) {
243                 (void) printf(gettext(" Subject: %s\n"),
244                     bufp);
245                 OPENSSL_free(bufp);
246             }

248             bufp = sunw_issuer_attrs(xcert_in, NULL, 0);
249             if (bufp != NULL) {
250                 (void) printf(gettext(" Issuer: %s\n"), bufp);
251                 OPENSSL_free(bufp);
252             }

254             (void) sunw_print_times(stdout, PRNT_BOTH, NULL,
255                 xcert_in);
256         }

258         if (ta_in != NULL) {
259             X509 *x;

```

```

260         int i;

262         for (i = 0; i < sk_X509_num(ta_in); i++) {
263             x = sk_X509_value(ta_in, i);
264             (void) printf(
265                 gettext("\nTrust Anchor cert %d:\n"), i);

267             /*
268              * sunw_subject_attrs() returns a pointer to
269              * memory allocated on our behalf. We get the
270              * same behavior from sunw_issuer_attrs().
271              */
272             bufp = sunw_subject_attrs(x, NULL, 0);
273             if (bufp != NULL) {
274                 (void) printf(
275                     gettext(" Subject: %s\n"), bufp);
276                 OPENSSL_free(bufp);
277             }

279             bufp = sunw_issuer_attrs(x, NULL, 0);
280             if (bufp != NULL) {
281                 (void) printf(
282                     gettext(" Issuer: %s\n"), bufp);
283                 OPENSSL_free(bufp);
284             }

286             (void) sunw_print_times(stdout, PRNT_BOTH,
287                                     NULL, x);
288         }
289     }
290 }

292 check_certs(ta_in, &xcert_in);
293 if (xcert_in != NULL && pkey_in != NULL) {
294     if (sunw_check_keys(xcert_in, pkey_in) == 0) {
295         wbku_printerr("warning: key and certificate do "
296                     "not match\n");
297     }
298 }

300 return (write_files(ta_in, xcert_in, pkey_in));
301 }

303 static int
304 read_files(STACK_OF(X509) **t_in, X509 **c_in, EVP_PKEY **k_in)
305 {
306     char *i_pass;

308     i_pass = getpassphrase(gettext("Enter key password: "));

310     if (get_ifile(input, i_pass, k_in, c_in, t_in) < 0)
311         return (-1);

312     /*
313      * If we are only interested in getting a trust anchor, and if there
314      * is no trust anchor but is a regular cert, use it instead. Do this
315      * to handle the insanity with openssl, which requires a matching cert
316      * and key in order to write a PKCS12 file.
317      */
318     if (outfiles == IO_TRUSTFILE) {
319         if (c_in != NULL && *c_in != NULL && t_in != NULL) {
320             if (*t_in == NULL) {
321                 if ((*t_in = sk_X509_new_null()) == NULL) {
322                     wbku_printerr("out of memory\n");
323                     return (-1);
324                 }
325             }

```

```

326         }

328         if (sk_X509_num(*t_in) == 0) {
329             if (sk_X509_push(*t_in, *c_in) == 0) {
330                 wbku_printerr("out of memory\n");
331                 return (-1);
332             }
333             *c_in = NULL;
334         }
335     }
336 }

338 if ((outfiles & IO_KEYFILE) && *k_in == NULL) {
339     wbku_printerr("no matching key found\n");
340     return (-1);
341 }
342 if ((outfiles & IO_CERTFILE) && *c_in == NULL) {
343     wbku_printerr("no matching certificate found\n");
344     return (-1);
345 }
346 if ((outfiles & IO_TRUSTFILE) && *t_in == NULL) {
347     wbku_printerr("no matching trust anchor found\n");
348     return (-1);
349 }

351 return (0);
352 }

354 static void
355 check_certs(STACK_OF(X509) *ta_in, X509 **c_in)
356 {
357     X509 *curr;
358     time_errs_t ret;
359     int i;
360     int del_expired = (outfiles != 0);

362     if (c_in != NULL && *c_in != NULL) {
363         ret = time_check_print(*c_in);
364         if ((ret != CHK_TIME_OK && ret != CHK_TIME_IS_BEFORE) &&
365             del_expired) {
366             (void) fprintf(stderr, gettext(" Removing cert\n"));
367             X509_free(*c_in);
368             *c_in = NULL;
369         }
370     }

372     if (ta_in == NULL)
373         return;

375     for (i = 0; i < sk_X509_num(ta_in); ) {
376         curr = sk_X509_value(ta_in, i);
377         ret = time_check_print(curr);
378         if ((ret != CHK_TIME_OK && ret != CHK_TIME_IS_BEFORE) &&
379             del_expired) {
380             (void) fprintf(stderr, gettext(" Removing cert\n"));
381             curr = sk_X509_delete(ta_in, i);
382             X509_free(curr);
383             continue;
384         }
385         i++;
386     }
387 }

389 static time_errs_t
390 time_check_print(X509 *cert)
391 {

```



```

392     char buf[256];
393     int ret;

395     ret = time_check(cert);
396     if (ret == CHK_TIME_OK)
397         return (CHK_TIME_OK);

399     (void) fprintf(stderr, gettext(" Subject: %s"),
400         sunw_subject_attrs(cert, buf, sizeof (buf)));
401     (void) fprintf(stderr, gettext(" Issuer: %s"),
402         sunw_issuer_attrs(cert, buf, sizeof (buf)));

404     switch (ret) {
405     case CHK_TIME_BEFORE_BAD:
406         (void) fprintf(stderr,
407             gettext("\n Invalid cert 'not before' field\n"));
408         break;

410     case CHK_TIME_AFTER_BAD:
411         (void) fprintf(stderr,
412             gettext("\n Invalid cert 'not after' field\n"));
413         break;

415     case CHK_TIME_HAS_EXPIRED:
416         (void) sunw_print_times(stderr, PRNT_NOT_AFTER,
417             gettext("\n Cert has expired\n"), cert);
418         break;

420     case CHK_TIME_IS_BEFORE:
421         (void) sunw_print_times(stderr, PRNT_NOT_BEFORE,
422             gettext("\n Warning: cert not yet valid\n"), cert);
423         break;

425     default:
426         break;
427     }

429     return (ret);
430 }

432 static time_errs_t
433 time_check(X509 *cert)
434 {
435     int i;

437     i = X509_cmp_time(X509_get_notBefore(cert), NULL);
438     if (i == 0)
439         return (CHK_TIME_BEFORE_BAD);
440     if (i > 0)
441         return (CHK_TIME_IS_BEFORE);
442     /* After 'not before' time */

444     i = X509_cmp_time(X509_get_notAfter(cert), NULL);
445     if (i == 0)
446         return (CHK_TIME_AFTER_BAD);
447     if (i < 0)
448         return (CHK_TIME_HAS_EXPIRED);
449     return (CHK_TIME_OK);
450 }

452 static int
453 write_files(STACK_OF(X509) *t_out, X509 *c_out, EVP_PKEY *k_out)
454 {
455     if (key_out != NULL) {
456         if (verbose)
457             (void) printf(gettext("%s: writing key\n"), progname);

```

```

458         if (do_ofile(key_out, k_out, NULL, NULL) < 0)
459             return (-1);
460     }

462     if (cert_out != NULL) {
463         if (verbose)
464             (void) printf(gettext("%s: writing cert\n"), progname);
465         if (do_ofile(cert_out, NULL, c_out, NULL) < 0)
466             return (-1);
467     }

469     if (trust_out != NULL) {
470         if (verbose)
471             (void) printf(gettext("%s: writing trust\n"),
472                 progname);
473         if (do_ofile(trust_out, NULL, NULL, t_out) < 0)
474             return (-1);
475     }

477     return (0);
478 }

480 static int
481 get_ifile(char *name, char *pass, EVP_PKEY **tmp_k, X509 **tmp_c,
482     STACK_OF(X509) **tmp_t)
483 {
484     PKCS12 *p12;
485     FILE *fp;
486     int ret;
487     struct stat sbuf;

489     if (stat(name, &sbuf) == 0 && !S_ISREG(sbuf.st_mode)) {
490         wbku_printrerr("%s is not a regular file\n", name);
491         return (-1);
492     }

494     if ((fp = fopen(name, "r")) == NULL) {
495         wbku_printrerr("cannot open input file %s", name);
496         return (-1);
497     }

499     p12 = d2i_PKCS12_fp(fp, NULL);
500     if (p12 == NULL) {
501         wbku_printrerr("cannot read file %s: %s\n", name, cryptoerr());
502         (void) fclose(fp);
503         return (-1);
504     }
505     (void) fclose(fp);

507     ret = sunw_PKCS12_parse(p12, pass, matchty, k_matchval, k_len,
508         NULL, tmp_k, tmp_c, tmp_t);
509     if (ret <= 0) {
510         if (ret == 0)
511             wbku_printrerr("cannot find matching cert and key\n");
512         else
513             wbku_printrerr("cannot parse %s: %s\n", name,
514                 cryptoerr());
515         PKCS12_free(p12);
516         return (-1);
517     }
518     return (0);
519 }

521 static int
522 do_ofile(char *name, EVP_PKEY *pkey, X509 *cert, STACK_OF(X509) *ta)
523 {

```

```

524     STACK_OF(EVP_PKEY) *klist = NULL;
525     STACK_OF(X509) *clist = NULL;
526     PKCS12 *p12 = NULL;
527     int ret = 0;
528     FILE *fp;
529     struct stat sbuf;

531     if (stat(name, &sbuf) == 0 && !S_ISREG(sbuf.st_mode)) {
532         wbku_printerr("%s is not a regular file\n", name);
533         return (-1);
534     }

536     if ((fp = fopen(name, "w")) == NULL) {
537         wbku_printerr("cannot open output file %s", name);
538         return (-1);
539     }

541     if ((clist = sk_X509_new_null()) == NULL ||
542         (klist = sk_EVP_PKEY_new_null()) == NULL) {
543         wbku_printerr("out of memory\n");
544         ret = -1;
545         goto cleanup;
546     }

548     if (cert != NULL && sk_X509_push(clist, cert) == 0) {
549         wbku_printerr("out of memory\n");
550         ret = -1;
551         goto cleanup;
552     }

554     if (pkey != NULL && sk_EVP_PKEY_push(klist, pkey) == 0) {
555         wbku_printerr("out of memory\n");
556         ret = -1;
557         goto cleanup;
558     }

560     p12 = sunw_PKCS12_create(WANBOOT_PASSPHRASE, klist, clist, ta);
561     if (p12 == NULL) {
562         wbku_printerr("cannot create %s: %s\n", name, cryptoerr());
563         ret = -1;
564         goto cleanup;
565     }

567     if (i2d_PKCS12_fp(fp, p12) == 0) {
568         wbku_printerr("cannot write %s: %s\n", name, cryptoerr());
569         ret = -1;
570         goto cleanup;
571     }

573 cleanup:
574     (void) fclose(fp);
575     if (p12 != NULL)
576         PKCS12_free(p12);
577     /*
578      * Put the cert and pkey off of the stack so that they won't
579      * be freed two times. (If they get left in the stack then
580      * they will be freed with the stack.)
581      */
582     if (clist != NULL) {
583         if (cert != NULL && sk_X509_num(clist) == 1) {
584             (void) sk_X509_delete(clist, 0);
585         }
586         sk_X509_pop_free(clist, X509_free);
587     }
588     if (klist != NULL) {
589         if (pkey != NULL && sk_EVP_PKEY_num(klist) == 1) {

```

```

590         (void) sk_EVP_PKEY_delete(klist, 0);
591     }
592     sk_EVP_PKEY_pop_free(klist, sunw_evp_pkey_free);
593 }

595     return (ret);
596 }

598 static void
599 usage(void)
600 {
601     (void) fprintf(stderr,
602         gettext("usage:\n"
603             "%s -i <file> -c <file> -k <file> -t <file> [-l <keyid> -v]\n"
604             "\n"),
605         progname);
606     (void) fprintf(stderr,
607         gettext(" where:\n"
608             "-i - input file to be split into component parts and put in\n"
609             "    files given by -c, -k and -t\n"
610             "-c - output file for the client certificate\n"
611             "-k - output file for the client private key\n"
612             "-t - output file for the remaining certificates (assumed\n"
613             "    to be trust anchors)\n"
614             "\n Files are assumed to be pkcs12-format files.\n\n"
615             "-v - verbose\n"
616             "-l - value of 'localkeyid' attribute in client cert and\n"
617             "    private key to be selected from the input file.\n\n"));
618     exit(EXIT_FAILURE);
619 }

621 /*
622  * Return a pointer to a static buffer that contains a listing of crypto
623  * errors. We presume that the user doesn't want more than 8KB of error
624  * messages :-).
625  */
626 static const char *
627 cryptoerr(void)
628 {
629     static char errbuf[8192];
630     unsigned long_t err;
631     const char *pfile;
632     int line;
633     unsigned int nerr = 0;

635     errbuf[0] = '\0';
636     while ((err = ERR_get_error_line(&pfile, &line)) != 0) {
637         if (++nerr > 1)
638             (void) strlcat(errbuf, "\n\t", sizeof(errbuf));

640         if (err == (unsigned long_t)-1) {
641             (void) strlcat(errbuf, strerror(errno),
642                 sizeof(errbuf));
643             break;
644         }
645         (void) strlcat(errbuf, ERR_reason_error_string(err),
646             sizeof(errbuf));
647     }

649     return (errbuf);
650 }

```

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/wanboot-cgi/Makefile

1

1284 Fri May 30 18:31:08 2014

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/wanboot-cgi/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #

25 include ../Makefile.com

27 PROG = wanboot-cgi
28 LDLIBS += -lgen -lnsl -lwanbootutil -lnvpair -lwanboot
29 CPPFLAGS += -I$(CMNCRYPTDIR)

31 # libcrypto has no lint library, so we can only include this while building
32 $(PROG) := LDLIBS += -lsunw_crypto

34 LINTFLAGS += -erroff=E_NAME_USED_NOT_DEF2

36 all: $(PROG)

38 install: all $(ROOTCMD)

40 clean:

42 lint: lint_PROG

44 include ../../../../Makefile.targ
```

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/wanboot-cgi/wanboot-cgi.c

1

45017 Fri May 30 18:31:08 2014
new/usr/src/cmd/cmd-inet/usr.lib/wanboot/wanboot-cgi/wanboot-cgi.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /*
2  * CDDL HEADER START
3  *
4  * The contents of this file are subject to the terms of the
5  * Common Development and Distribution License (the "License").
6  * You may not use this file except in compliance with the License.
7  *
8  * You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9  * or http://www.opensolaris.org/os/licensing.
10 * See the License for the specific language governing permissions
11 * and limitations under the License.
12 *
13 * When distributing Covered Code, include this CDDL HEADER in each
14 * file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 * If applicable, add the following below this CDDL HEADER, with the
16 * fields enclosed by brackets "[]" replaced with your own identifying
17 * information: Portions Copyright [yyyy] [name of copyright owner]
18 *
19 * CDDL HEADER END
20 */
21 /*
22 * Copyright (c) 2003, 2010, Oracle and/or its affiliates. All rights reserved.
23 * Copyright 2012 Milan Jurik. All rights reserved.
24 */

26 #include <stdio.h>
27 #include <stdlib.h>
28 #include <strings.h>
29 #include <string.h>
30 #include <libgen.h>
31 #include <unistd.h>
32 #include <fcntl.h>
33 #include <errno.h>
34 #include <netdb.h>
35 #include <libnvpair.h>
36 #include <sys/types.h>
37 #include <sys/wait.h>
38 #include <sys/stat.h>
39 #include <sys/param.h>
40 #include <sys/sysmacros.h>
41 #include <sys/mman.h>
42 #include <sys/socket.h>
43 #include <sys/utsname.h>
44 #include <sys/wanboot_impl.h>
45 #include <netinet/in.h>
46 #include <arpa/inet.h>

48 #include <openssl/crypto.h>
49 #include <openssl/x509.h>
50 #include <openssl/x509v3.h>
51 #include <openssl/pem.h>
52 #include <openssl/pkcs12.h>
53 #include <openssl/evp.h>
54 #include <openssl/err.h>

56 #include <p12aux.h>

58 #include <parseURL.h>
59 /*
60 * These can be replaced with wanbootutil.h once the openssl interfaces
61 * are moved to libwanboot.
```

new/usr/src/cmd/cmd-inet/usr.lib/wanboot/wanboot-cgi/wanboot-cgi.c

2

```
62 */
63 #include <wanboot/key_util.h>
64 #include <wanboot/key_xdr.h>
65 #include <hmac_sha1.h>

67 #include <netboot_paths.h>
68 #include <wanboot_conf.h>

70 /*
71 * Exit status:
72 */
73 #define WBCGI_STATUS_OK      0
74 #define WBCGI_STATUS_ERR    1

76 #define WBCGI_FILE_EXISTS(file, statbuf) \
77     (stat(file, &statbuf) == 0 && S_ISREG(statbuf.st_mode))

79 #define WBCGI_DIR_EXISTS(dir, statbuf) \
80     (stat(dir, &statbuf) == 0 && S_ISDIR(statbuf.st_mode))

82 #define WBCGI_HMAC_PATH      "/usr/lib/inet/wanboot/hmac"
83 #define WBCGI_ENCR_PATH      "/usr/lib/inet/wanboot/encr"
84 #define WBCGI_KEYMGMT_PATH   "/usr/lib/inet/wanboot/keymgmt"
85 #define WBCGI_MKISOFS_PATH   "/bin/mkisofs"

87 #define WBCGI_DEV_URANDOM     "/dev/urandom"

89 #define WBCGI_CONTENT_TYPE    "Content-Type: "
90 #define WBCGI_CONTENT_LENGTH "Content-Length: "
91 #define WBCGI_WANBOOT_BNDTXT  "WANBoot_Part_Boundary"
92 #define WBCGI_CRNL            "\r\n"

94 #define WBCGI_CNSTR            "CN="
95 #define WBCGI_CNSTR_LEN       (sizeof(WBCGI_CNSTR) - 1)
96 #define WBCGI_NAMESEP         ",/\n\r"

98 #define WBCGI_MAXBUF          256

100 /*
101 * Possible return values from netboot_ftw():
102 */
103 #define WBCGI_FTW_CBOK        2      /* CB terminated walk OK */
104 #define WBCGI_FTW_CBCONT      1      /* CB wants walk should continue */
105 #define WBCGI_FTW_DONE        0      /* Walk terminated without CBERR/CBOK */
106 #define WBCGI_FTW_CBERR      -1      /* CB terminated walk with err */

108 /*
109 * getsubopt() is used to map one of the contents[] keywords
110 * to one of these types
111 */
112 #define WBCGI_CONTENT_ERROR    -1
113 #define WBCGI_CONTENT_BOOTFILE 0
114 #define WBCGI_CONTENT_BOOTFS   1
115 #define WBCGI_CONTENT_ROOTFS    2

117 static char *contents[] =
118     { "bootfile", "bootfs", "rootfs", NULL };

120 /*
121 * getsubopt() is used to parse the query string for
122 * the keywords defined by queryopts[]
123 */
124 #define WBCGI_QUERYOPT_CONTENT 0
125 #define WBCGI_QUERYOPT_NET     1
126 #define WBCGI_QUERYOPT_CID     2
127 #define WBCGI_QUERYOPT_NONCE   3
```

```

129 static char *queryopts[] =
130     { "CONTENT", "IP", "CID", "NONCE", NULL };

132 static bc_handle_t      bc_handle;

135 static char *
136 status_msg(int status)
137 {
138     char      *msg;

140     switch (status) {
141     case 400:
142         msg = "Bad Request";
143         break;
144     case 403:
145         msg = "Forbidden";
146         break;
147     case 500:
148         msg = "Internal Server Error";
149         break;
150     default:
151         msg = "Unknown status";
152         break;
153     }

155     return (msg);
156 }

158 static void
159 print_status(int status, const char *spec_msg)
160 {
161     if (spec_msg == NULL) {
162         spec_msg = "";
163     }

165     (void) fprintf(stdout, "Status: %d %s %s%s", status,
166         status_msg(status), spec_msg, WBCGI_CRNL);
167 }

169 static char *
170 make_path(const char *root, const char *suffix)
171 {
172     char      path[MAXPATHLEN];
173     char      *ptr = NULL;
174     int        chars;

176     if ((chars = snprintf(path, sizeof (path),
177         "%s/%s", root, suffix)) < 0 || chars > sizeof (path) ||
178         (ptr = strdup(path)) == NULL) {
179         print_status(500, "(error making path)");
180     }

182     return (ptr);
183 }

185 static void
186 free_path(char **pathp)
187 {
188     if (*pathp != NULL) {
189         free(*pathp);
190         *pathp = NULL;
191     }
192 }

```

```

194 static char *
195 gen_tmppath(const char *prefix, const char *net, const char *cid)
196 {
197     pid_t      pid;
198     time_t     secs;
199     int        chars;
200     char        path[MAXPATHLEN];
201     char        *ptr = NULL;

203     if ((pid = getpid()) < 0 || (secs = time(NULL)) < 0 ||
204         (chars = snprintf(path, sizeof (path), "/tmp/%s_%s_%s_%ld_%ld",
205             prefix, net, cid, pid, secs)) < 0 || chars > sizeof (path) ||
206         (ptr = strdup(path)) == NULL) {
207         print_status(500, "(error creating temporary filename)");
208     }

210     return (ptr);
211 }

213 /*
214  * File I/O stuff:
215  */
216 static boolean_t
217 write_buffer(int fd, const void *buffer, size_t buflen)
218 {
219     size_t      nwritten;
220     ssize_t     nbytes;
221     const char  *buf = buffer;

223     for (nwritten = 0; nwritten < buflen; nwritten += nbytes) {
224         nbytes = write(fd, &buf[nwritten], buflen - nwritten);
225         if (nbytes <= 0) {
226             return (B_FALSE);
227         }
228     }

230     return (B_TRUE);
231 }

233 static boolean_t
234 write_file(int ofd, const char *filename, size_t size)
235 {
236     boolean_t   ret = B_TRUE;
237     int         ifd;
238     char        buf[1024];
239     size_t      rlen;
240     ssize_t     wlen;

242     if ((ifd = open(filename, O_RDONLY)) < 0) {
243         return (B_FALSE);
244     }

246     for (; size != 0; size -= wlen) {
247         rlen = (size < sizeof (buf)) ? size : sizeof (buf);

249         if ((wlen = read(ifd, buf, rlen)) < 0 ||
250             !write_buffer(ofd, buf, wlen)) {
251             ret = B_FALSE;
252             break;
253         }
254     }
255     (void) close(ifd);

257     return (ret);
258 }

```

```

260 static boolean_t
261 copy_file(const char *src, const char *dest)
262 {
263     boolean_t    ret = B_FALSE;
264     char          message[WBCGI_MAXBUF];
265     const size_t  chunksize = 16 * PAGE_SIZE;
266     size_t        validsize;
267     size_t        nwritten = 0;
268     size_t        nbytes = 0;
269     off_t         roff;
270     int           mflags = MAP_PRIVATE;
271     char          *buf = NULL;
272     struct stat    st;
273     int           rfd = -1;
274     int           wfd = -1;
275     int           chars;
276
277     if ((rfd = open(src, O_RDONLY)) < 0 ||
278         (wfd = open(dest, O_CREAT|O_EXCL|O_RDWR, S_IRUSR|S_IWUSR)) < 0 ||
279         fstat(rfd, &st) == -1) {
280         goto cleanup;
281     }
282
283     for (nbytes = st.st_size, roff = 0; nwritten < nbytes;
284          nwritten += validsize, roff += validsize) {
285         buf = mmap(buf, chunksize, PROT_READ, mflags, rfd, roff);
286         if (buf == MAP_FAILED) {
287             goto cleanup;
288         }
289         mflags |= MAP_FIXED;
290
291         validsize = MIN(chunksize, nbytes - nwritten);
292         if (!write_buffer(wfd, buf, validsize)) {
293             (void) munmap(buf, chunksize);
294             goto cleanup;
295         }
296     }
297
298     if (buf != NULL) {
299         (void) munmap(buf, chunksize);
300     }
301
302     ret = B_TRUE;
303 cleanup:
304     if (ret == B_FALSE) {
305         if ((chars = snprintf(message, sizeof (message),
306                                "error copying %s to %s", src, dest)) > 0 &&
307             chars <= sizeof (message)) {
308             print_status(500, message);
309         } else {
310             print_status(500, NULL);
311         }
312     }
313     if (rfd != -1) {
314         (void) close(rfd);
315     }
316     if (wfd != -1) {
317         (void) close(wfd);
318     }
319
320     return (ret);
321 }
322
323 static boolean_t
324 create_nonce(const char *noncepath, const char *nonce)
325 {

```

```

326     boolean_t    ret = B_TRUE;
327     int           fd;
328
329     if ((fd = open(noncepath,
330                   O_WRONLY|O_CREAT|O_EXCL, S_IRUSR|S_IWUSR)) == -1 ||
331         !write_buffer(fd, nonce, strlen(nonce))) {
332         print_status(500, "(error creating nonce file)");
333         ret = B_FALSE;
334     }
335     if (fd != -1) {
336         (void) close(fd);
337     }
338
339     return (ret);
340 }
341
342 static boolean_t
343 create_timestamp(const char *timestamppath, const char *timestamp)
344 {
345     boolean_t    ret = B_TRUE;
346     int           fd;
347
348     if ((fd = open(timestamppath,
349                   O_WRONLY|O_CREAT|O_EXCL, S_IRUSR|S_IWUSR)) == -1 ||
350         !write_buffer(fd, timestamp, strlen(timestamp))) {
351         print_status(500, "(error creating timestamp file)");
352         ret = B_FALSE;
353     }
354     if (fd != -1) {
355         (void) close(fd);
356     }
357
358     return (ret);
359 }
360
361 static boolean_t
362 create_urandom(const char *urandompath)
363 {
364     boolean_t    ret = B_TRUE;
365     int           fd;
366
367     if ((fd = open(urandompath,
368                   O_WRONLY|O_CREAT|O_EXCL, S_IRUSR|S_IWUSR)) == -1 ||
369         !write_file(fd, WBCGI_DEV_URANDOM, 32 * 1024)) {
370         print_status(500, "(error creating urandom file)");
371         ret = B_FALSE;
372     }
373     if (fd != -1) {
374         (void) close(fd);
375     }
376
377     return (ret);
378 }
379
380 static boolean_t
381 create_null_hash(const char *hashpath)
382 {
383     boolean_t    ret = B_TRUE;
384     int           fd;
385     static char   null_hash[HMAC_DIGEST_LEN];
386
387     if ((fd = open(hashpath,
388                   O_WRONLY|O_CREAT|O_EXCL, S_IRUSR|S_IWUSR)) == -1 ||
389         !write_buffer(fd, null_hash, sizeof (null_hash))) {
390         print_status(500, "(error creating null hash)");
391         ret = B_FALSE;

```

```

392     }
393     if (fd != -1) {
394         (void) close(fd);
395     }
396
397     return (ret);
398 }

```

```

401 static char *
402 determine_doc_root(void)
403 {
404     char    *doc_root;
405
406     /*
407      * If DOCUMENT_ROOT is valid, use that.
408      */
409     if ((doc_root = getenv("DOCUMENT_ROOT")) == NULL ||
410         strlen(doc_root) == 0) {
411         /*
412          * No DOCUMENT_ROOT - try PATH_TRANSLATED.
413          */
414         if ((doc_root = getenv("PATH_TRANSLATED")) == NULL ||
415             strlen(doc_root) == 0) {
416             /*
417              * Can't determine the document root.
418              */
419             return (NULL);
420         }
421     }
422
423     return (doc_root);
424 }

```

```

426 static boolean_t
427 get_request_info(int *contentp, char **netp, char **cidp, char **noncep,
428                 char **docrootp)
429 {
430     char    *method;
431     char    *query_string;
432     char    *value;
433     char    *junk;
434     int     i;
435
436     if ((method = getenv("REQUEST_METHOD")) == NULL ||
437         strncasecmp(method, "GET", strlen("GET") != 0)) {
438         print_status(403, "(GET method expected)");
439         return (B_FALSE);
440     }
441
442     if ((query_string = getenv("QUERY_STRING")) == NULL) {
443         print_status(400, "(empty query string)");
444         return (B_FALSE);
445     }
446
447     for (i = 0; i < strlen(query_string); i++) {
448         if (query_string[i] == '&') {
449             query_string[i] = ',';
450         }
451     }
452
453     *contentp = WBCGI_CONTENT_ERROR;
454     *netp = *cidp = *noncep = NULL;
455
456     if ((*docrootp = determine_doc_root()) == NULL) {
457         print_status(400, "(unable to determine document root)");

```

```

458         return (B_FALSE);
459     }
460
461     while (*query_string != '\0') {
462         switch (getsubopt(&query_string, queryopts, &value)) {
463             case WBCGI_QUERYOPT_CONTENT:
464                 *contentp = getsubopt(&value, contents, &junk);
465                 break;
466             case WBCGI_QUERYOPT_NET:
467                 *netp = value;
468                 break;
469             case WBCGI_QUERYOPT_CID:
470                 *cidp = value;
471                 break;
472             case WBCGI_QUERYOPT_NONCE:
473                 *noncep = value;
474                 break;
475             default:
476                 print_status(400, "(illegal query string)");
477                 return (B_FALSE);
478         }
479     }
480
481     switch (*contentp) {
482     default:
483         print_status(400, "(missing or illegal CONTENT)");
484         return (B_FALSE);
485
486     case WBCGI_CONTENT_BOOTFS:
487         if (*netp == NULL || *cidp == NULL || *noncep == NULL) {
488             print_status(400,
489                 "(CONTENT, IP, CID and NONCE required)");
490             return (B_FALSE);
491         }
492         break;
493
494     case WBCGI_CONTENT_BOOTFILE:
495     case WBCGI_CONTENT_ROOTFS:
496         if (*netp == NULL || *cidp == NULL || *docrootp == NULL) {
497             print_status(400,
498                 "(CONTENT, IP, CID and DOCUMENT_ROOT required)");
499             return (B_FALSE);
500         }
501         break;
502     }
503
504     return (B_TRUE);
505 }

```

```

507 static boolean_t
508 encrypt_payload(const char *payload, const char *encr_payload,
509                const char *keyfile, const char *encryption_type)
510 {
511     struct stat    sbuf;
512     int            chars;
513     char            cmd[MAXPATHLEN];
514     FILE            *fp;
515     int            status;
516     char            msg[WBCGI_MAXBUF];
517
518     if (!WBCGI_FILE_EXISTS(payload, sbuf)) {
519         print_status(500, "(encrypt_payload: missing payload)");
520         return (B_FALSE);
521     }
522
523     if ((chars = snprintf(cmd, sizeof (cmd),

```

```

524     "%s -o type=%s -k %s < %s > %s", WBCGI_ENCR_PATH,
525     encryption_type, keyfile, payload, encr_payload)) < 0 ||
526     chars > sizeof (cmd)) {
527     print_status(500, "(encrypt_payload: buffer overflow)");
528     return (B_FALSE);
529 }
531 if ((fp = popen(cmd, "w")) == NULL) {
532     print_status(500, "(encrypt_payload: missing/file error)");
533     return (B_FALSE);
534 }
535 if ((status = WEXITSTATUS(pclose(fp))) != 0) {
536     (void) snprintf(msg, sizeof (msg),
537     "(encrypt_payload: failed, status=%d)", status);
538     print_status(500, msg);
539     return (B_FALSE);
540 }
542 if (!WBCGI_FILE_EXISTS(encr_payload, sbuf)) {
543     print_status(500, "(encrypt_payload: bad encrypted file)");
544     return (B_FALSE);
545 }
547 return (B_TRUE);
548 }
550 static boolean_t
551 hash_payload(const char *payload, const char *payload_hash,
552     const char *keyfile)
553 {
554     struct stat sbuf;
555     int chars;
556     char cmd[MAXPATHLEN];
557     FILE *fp;
558     int status;
559     char msg[WBCGI_MAXBUF];
561     if (!WBCGI_FILE_EXISTS(payload, sbuf)) {
562         print_status(500, "(hash_payload: missing payload)");
563         return (B_FALSE);
564     }
566     if ((chars = snprintf(cmd, sizeof (cmd), "%s -i %s -k %s > %s",
567     WBCGI_HMAC_PATH, payload, keyfile, payload_hash)) < 0 ||
568     chars > sizeof (cmd)) {
569         print_status(500, "(hash_payload: buffer overflow)");
570         return (B_FALSE);
571     }
573     if ((fp = popen(cmd, "w")) == NULL) {
574         print_status(500, "(hash_payload: missing/file error)");
575         return (B_FALSE);
576     }
577     if ((status = WEXITSTATUS(pclose(fp))) != 0) {
578         (void) snprintf(msg, sizeof (msg),
579         "(hash_payload: failed, status=%d)", status);
580         print_status(500, msg);
581         return (B_FALSE);
582     }
584     if (!WBCGI_FILE_EXISTS(payload_hash, sbuf) ||
585     sbuf.st_size < HMAC_DIGEST_LEN) {
586         print_status(500, "(hash_payload: bad signature file)");
587         return (B_FALSE);
588     }

```

```

590     return (B_TRUE);
591 }
593 static boolean_t
594 extract_keystore(const char *path, const char *keystorepath)
595 {
596     struct stat sbuf;
597     int chars;
598     char cmd[MAXPATHLEN];
599     FILE *fp;
600     int status;
601     char msg[WBCGI_MAXBUF];
603     if (!WBCGI_FILE_EXISTS(path, sbuf)) {
604         print_status(500, "(extract_keystore: missing keystore)");
605         return (B_FALSE);
606     }
608     if ((chars = snprintf(cmd, sizeof (cmd),
609     "%s -x -f %s -s %s -o type=rsa",
610     WBCGI_KEYMGMT_PATH, keystorepath, path)) < 0 ||
611     chars > sizeof (cmd)) {
612         print_status(500, "(extract_keystore: buffer overflow)");
613         return (B_FALSE);
614     }
616     if ((fp = popen(cmd, "w")) == NULL) {
617         print_status(500, "(extract_keystore: missing/file error)");
618         return (B_FALSE);
619     }
620     if ((status = WEXITSTATUS(pclose(fp))) != 0) {
621         (void) snprintf(msg, sizeof (msg),
622         "(extract_keystore: failed, status=%d)", status);
623         print_status(500, msg);
624         return (B_FALSE);
625     }
627     if (!WBCGI_FILE_EXISTS(keystorepath, sbuf)) {
628         print_status(500, "(extract_keystore: failed to create)");
629         return (B_FALSE);
630     }
632     return (B_TRUE);
633 }
635 static boolean_t
636 mkisofs(const char *image_dir, const char *image)
637 {
638     struct stat sbuf;
639     int chars;
640     char cmd[MAXPATHLEN];
641     FILE *fp;
642     int status;
643     char msg[WBCGI_MAXBUF];
645     if (!WBCGI_DIR_EXISTS(image_dir, sbuf)) {
646         print_status(500, "(mkisofs: missing image_dir)");
647         return (B_FALSE);
648     }
650     if ((chars = snprintf(cmd, sizeof (cmd), "%s -quiet -o %s -r %s",
651     WBCGI_MKISOFS_PATH, image, image_dir)) < 0 ||
652     chars > sizeof (cmd)) {
653         print_status(500, "(mkisofs: buffer overflow)");
654         return (B_FALSE);
655     }

```



```

657     if ((fp = popen(cmd, "w")) == NULL) {
658         print_status(500, "(mkisofs: missing/file error)");
659         return (B_FALSE);
660     }
661     if ((status = WEXITSTATUS(pclose(fp))) != 0) {
662         (void) snprintf(msg, sizeof (msg),
663             "(mkisofs: failed, status=%d)", status);
664         print_status(500, msg);
665         return (B_FALSE);
666     }
668     if (!WBCGI_FILE_EXISTS(image, sbuf)) {
669         print_status(500, "(mkisofs: failed to create image)");
670         return (B_FALSE);
671     }
673     return (B_TRUE);
674 }

676 /*
677  * This function, when invoked with a file name, optional network and
678  * client ID strings, and callback function will search for the file
679  * in the following locations:
680  *
681  * NB_NETBOOT_ROOT/<network>/<client id>/<file>
682  * NB_NETBOOT_ROOT/<client id>/<file>
683  * NB_NETBOOT_ROOT/<network>/<file>
684  * NB_NETBOOT_ROOT/<file>
685  *
686  * The callback function is invoked each time the file is found until
687  * we have searched all of the above locations or the callback function
688  * returns a value other than WBCGI_FTW_CBCONT.
689  *
690  * Arguments:
691  *     filename - Name of file to search for.
692  *     net      - Optional network number to include in search hierarchy.
693  *     cid      - Optional client ID to include in search hierarchy.
694  *     cb       - Callback function to be called when file is found.
695  *     arg      - Argument to be supplied to the callback funtion.
696  *
697  * Returns:
698  *     WBCGI_FTW_DONE, WBCGI_FTW_CBOK or WBCGI_FTW_CBERR.
699  */
700 static int
701 netboot_ftw(const char *filename, const char *net, const char *cid,
702     int (*cb)(const char *, void *arg), void *arg)
703 {
704     char          ckpath[4][MAXPATHLEN];
705     int           ret;
706     struct stat   stat buf;
707     int           i = 0;
709     if (snprintf(ckpath[i++], MAXPATHLEN, "%s%s", NB_NETBOOT_ROOT, filename)
710         >= MAXPATHLEN)
711         return (WBCGI_FTW_CBERR);
713     if (net != NULL && snprintf(ckpath[i++], MAXPATHLEN, "%s%s/%s",
714         NB_NETBOOT_ROOT, net, filename) >= MAXPATHLEN)
715         return (WBCGI_FTW_CBERR);
717     if (cid != NULL) {
718         if (snprintf(ckpath[i++], MAXPATHLEN, "%s%s/%s",
719             NB_NETBOOT_ROOT, cid, filename) >= MAXPATHLEN)
720             return (WBCGI_FTW_CBERR);

```

```

722         if (net != NULL && snprintf(ckpath[i++], MAXPATHLEN,
723             "%s%s/%s/%s", NB_NETBOOT_ROOT, net, cid, filename) >=
724             MAXPATHLEN)
725             return (WBCGI_FTW_CBERR);
726     }
728     /*
729     * Loop through hierarchy and check for file existence.
730     */
731     while (i > 0) {
732         --i;
733         if (WBCGI_FILE_EXISTS(ckpath[i], buf)) {
734             if ((ret = cb(ckpath[i], arg)) != WBCGI_FTW_CBCONT)
735                 return (ret);
736         }
737     }
738     return (WBCGI_FTW_DONE);
739 }

741 /*ARGSUSED*/
742 static int
743 noact_cb(const char *path, void *arg)
744 {
745     return (WBCGI_FTW_CBOK);
746 }

748 static int
749 set_pathname(const char *path, void *pathname)
750 {
751     *(char **)pathname = strdup((char *)path);
752     return (WBCGI_FTW_CBOK);
753 }

755 static int
756 create_keystore(const char *path, void *keystorepath)
757 {
758     if (!extract_keystore(path, (char *)keystorepath)) {
759         return (WBCGI_FTW_CBERR);
760     }
761     return (WBCGI_FTW_CBOK);
762 }

764 static int
765 copy_certstore(const char *path, void *certstorepath)
766 {
767     if (!copy_file(path, (char *)certstorepath)) {
768         return (WBCGI_FTW_CBERR);
769     }
770     return (WBCGI_FTW_CBOK);
771 }

773 /*
774  * Add the certs found in the trustfile found in path (a trust store) to
775  * the file found at bootfs_dir/truststore. If necessary, create the
776  * output file.
777  */
778 static int
779 build_trustfile(const char *path, void *truststorepath)
780 {
781     int           ret = WBCGI_FTW_CBERR;
782     STACK_OF(X509) *i_anchors = NULL;
783     STACK_OF(X509) *o_anchors = NULL;
784     char          message[WBCGI_MAXBUF];
785     PKCS12        *p12 = NULL;
786     FILE          *rfp = NULL;
787     FILE          *wfp = NULL;

```

```

788     struct stat    i_st;
789     struct stat    o_st;
790     X509           *x = NULL;
791     int            errtype = 0;
792     int            wfd = -1;
793     int            chars;
794     int            i;

796     if (!WBCGI_FILE_EXISTS(path, i_st)) {
797         goto cleanup;
798     }

800     if (WBCGI_FILE_EXISTS((char *)truststorepath, o_st)) {
801         /*
802          * If we are inadvertently writing to the input file.
803          * return success.
804          * XXX Pete: how can this happen, and why success?
805          */
806         if (i_st.st_ino == o_st.st_ino) {
807             ret = WBCGI_FTW_CBCONT;
808             goto cleanup;
809         }
810         if ((wfp = fopen((char *)truststorepath, "r+")) == NULL) {
811             goto cleanup;
812         }
813         /*
814          * Read what's already there, so that new information
815          * can be added.
816          */
817         if ((p12 = d2i_PKCS12_fp(wfp, NULL)) == NULL) {
818             errtype = 1;
819             goto cleanup;
820         }
821         i = sunw_PKCS12_parse(p12, WANBOOT_PASSPHRASE, DO_NONE, NULL,
822                               0, NULL, NULL, &o_anchors);
823         if (i <= 0) {
824             errtype = 1;
825             goto cleanup;
826         }

828         PKCS12_free(p12);
829         p12 = NULL;
830     } else {
831         if (errno != ENOENT) {
832             chars = snprintf(message, sizeof (message),
833                              "(error accessing file %s, error %s)",
834                              path, strerror(errno));
835             if (chars > 0 && chars < sizeof (message))
836                 print_status(500, message);
837             else
838                 print_status(500, NULL);
839             return (WBCGI_FTW_CBERR);
840         }

842         /*
843          * Note: We could copy the file to the new trustfile, but
844          * we can't verify the password that way. Therefore, copy
845          * it by reading it.
846          */
847         if ((wfd = open((char *)truststorepath,
848                        O_CREAT|O_EXCL|O_RDWR, 0700)) < 0) {
849             goto cleanup;
850         }
851         if ((wfp = fdopen(wfd, "w+")) == NULL) {
852             goto cleanup;
853         }

```

```

854         o_anchors = sk_X509_new_null();
855         if (o_anchors == NULL) {
856             goto cleanup;
857         }
858     }

860     if ((rfp = fopen(path, "r")) == NULL) {
861         goto cleanup;
862     }
863     if ((p12 = d2i_PKCS12_fp(rfp, NULL)) == NULL) {
864         errtype = 1;
865         goto cleanup;
866     }
867     i = sunw_PKCS12_parse(p12, WANBOOT_PASSPHRASE, DO_NONE, NULL, 0, NULL,
868                           NULL, NULL, &i_anchors);
869     if (i <= 0) {
870         errtype = 1;
871         goto cleanup;
872     }
873     PKCS12_free(p12);
874     p12 = NULL;

876     /*
877      * Merge the two stacks of pkcs12 certs.
878      */
879     for (i = 0; i < sk_X509_num(i_anchors); i++) {
880         x = sk_X509_delete(i_anchors, i);
881         (void) sk_X509_push(o_anchors, x);
882     }

884     /*
885      * Create the pkcs12 structure from the modified input stack and
886      * then write out that structure.
887      */
888     p12 = sunw_PKCS12_create((const char *)WANBOOT_PASSPHRASE, NULL, NULL,
889                              o_anchors);
890     if (p12 == NULL) {
891         goto cleanup;
892     }
893     rewind(wfp);
894     if (i2d_PKCS12_fp(wfp, p12) == 0) {
895         goto cleanup;
896     }

898     ret = WBCGI_FTW_CBCONT;
899 cleanup:
900     if (ret == WBCGI_FTW_CBERR) {
901         if (errtype == 1) {
902             chars = snprintf(message, sizeof (message),
903                              "(internal PKCS12 error while copying %s to %s)",
904                              path, (char *)truststorepath);
905             if (chars > 0 && chars <= sizeof (message)) {
906                 print_status(500, message);
907             } else {
908                 print_status(500, NULL);
909             }
910         } else {
911             if (chars > 0 && chars <= sizeof (message)) {
912                 print_status(500, message);
913             } else {
914                 print_status(500, NULL);
915             }
916         }
917         if (rfp != NULL) {
918             (void) fclose(rfp);
919         }
920         if (wfp != NULL) {

```

```

920      /* Will also close wfd */
921      (void) fclose(wfp);
922  }
923  if (p12 != NULL) {
924      PKCS12_free(p12);
925  }
926  if (i_anchors != NULL) {
927      sk_X509_pop_free(i_anchors, X509_free);
928  }
929  if (o_anchors != NULL) {
930      sk_X509_pop_free(o_anchors, X509_free);
931  }
933  return (ret);
934 }

936 static boolean_t
937 check_key_type(const char *keyfile, const char *keytype, int flag)
938 {
939     boolean_t    ret = B_FALSE;
940     FILE         *key_fp = NULL;
941     wbku_key_attr_t ka;

943     /*
944      * Map keytype into the ka structure
945      */
946     if (wbku_str_to_keyattr(keytype, &ka, flag) != WBKU_SUCCESS) {
947         goto cleanup;
948     }

950     /*
951      * Open the key file for reading.
952      */
953     if ((key_fp = fopen(keyfile, "r")) == NULL) {
954         goto cleanup;
955     }

957     /*
958      * Find the valid client key, if it exists.
959      */
960     if (wbku_find_key(key_fp, NULL, &ka, NULL, B_FALSE) != WBKU_SUCCESS) {
961         goto cleanup;
962     }

964     ret = B_TRUE;
965 cleanup:
966     if (key_fp != NULL) {
967         (void) fclose(key_fp);
968     }

970     return (ret);
971 }

973 static boolean_t
974 resolve_hostname(const char *hostname, nvlist_t *nvl, boolean_t may_be_crap)
975 {
976     struct sockaddr_in    sin;
977     struct hostent        *hp;
978     struct utsname         un;
979     static char            myname[SYS_NMLN] = { '\0' };
980     char                  *cp = NULL;
981     char                  msg[WB CGI_MAXBUF];

983     /*
984      * Initialize cached nodename
985      */

```

```

986     if (strlen(myname) == 0) {
987         if (uname(&un) == -1) {
988             (void) snprintf(msg, sizeof (msg),
989                 "(unable to retrieve uname, errno %d)", errno);
990             print_status(500, msg);
991             return (B_FALSE);
992         }
993         (void) strcpy(myname, un.nodename);
994     }

996     /*
997      * If hostname is local node name, return the address this
998      * request came in on, which is supplied as SERVER_ADDR in the
999      * cgi environment. This ensures we don't send back a possible
1000      * alternate address that may be unreachable from the client's
1001      * network. Otherwise, just resolve with nameservice.
1002      */
1003     if ((strcmp(hostname, myname) != 0) ||
1004         ((cp = getenv("SERVER_ADDR")) == NULL)) {
1005         if (((hp = gethostbyname(hostname)) == NULL) ||
1006             (hp->h_addrtype != AF_INET) ||
1007             (hp->h_length != sizeof (struct in_addr))) {
1008             if (!may_be_crap) {
1009                 print_status(500, "(error resolving hostname)");
1010             }
1011             return (may_be_crap);
1012         }
1013         (void) memcpy(&sin.sin_addr, hp->h_addr, hp->h_length);
1014         cp = inet_ntoa(sin.sin_addr);
1015     }

1017     if (nvlist_add_string(nvl, (char *)hostname, cp) != 0) {
1018         print_status(500, "(error adding hostname to nvlist)");
1019         return (B_FALSE);
1020     }

1022     return (B_TRUE);
1023 }

1025 /*
1026  * one_name() is called for each certificate found and is passed the string
1027  * that X509_NAME_oneline() returns. Its job is to find the common name and
1028  * determine whether it is a host name; if it is then a line suitable for
1029  * inclusion in /etc/inet/hosts is written to that file.
1030  */
1031 static boolean_t
1032 one_name(const char *namestr, nvlist_t *nvl)
1033 {
1034     boolean_t    ret = B_TRUE;
1035     char         *p;
1036     char         *q;
1037     char         c;

1039     if (namestr != NULL &&
1040         (p = strstr(namestr, WB CGI_CNSTR)) != NULL) {
1041         p += WB CGI_CNSTR_LEN;

1043         if ((q = strpbrk(p, WB CGI_NAMESEP)) != NULL) {
1044             c = *q;
1045             *q = '\0';
1046             ret = resolve_hostname(p, nvl, B_TRUE);
1047             *q = c;
1048         } else {
1049             ret = resolve_hostname(p, nvl, B_TRUE);
1050         }
1051     }

```

```

1053     return (ret);
1054 }

1056 /*
1057  * Loop through the certificates in a file
1058  */
1059 static int
1060 get_hostnames(const char *path, void *nvl)
1061 {
1062     int             ret = WBCGI_FTW_CBERR;
1063     STACK_OF(X509) *certs = NULL;
1064     PKCS12          *p12 = NULL;
1065     char            message[WBCGI_MAXBUF];
1066     char            buf[WBCGI_MAXBUF + 1];
1067     FILE            *rfp = NULL;
1068     X509            *x = NULL;
1069     int             errtype = 0;
1070     int             chars;
1071     int             i;

1073     if ((rfp = fopen(path, "r")) == NULL) {
1074         goto cleanup;
1075     }

1077     if ((p12 = d2i_PKCS12_fp(rfp, NULL)) == NULL) {
1078         errtype = 1;
1079         goto cleanup;
1080     }
1081     i = sunw_PKCS12_parse(p12, WANBOOT_PASSPHRASE, DO_NONE, NULL, 0, NULL,
1082         NULL, NULL, &certs);
1083     if (i <= 0) {
1084         errtype = 1;
1085         goto cleanup;
1086     }

1088     PKCS12_free(p12);
1089     p12 = NULL;

1091     for (i = 0; i < sk_X509_num(certificates); i++) {
1092         x = sk_X509_value(certificates, i);
1093         if (!one_name(sunw_issuer_attrs(x, buf, sizeof (buf) - 1),
1094             nvl)) {
1095             goto cleanup;
1096         }
1097     }

1099     ret = WBCGI_FTW_CBCONT;
1100 cleanup:
1101     if (ret == WBCGI_FTW_CBERR) {
1102         if (errtype == 1) {
1103             chars = snprintf(message, sizeof (message),
1104                 "(internal PKCS12 error reading %s)", path);
1105         } else {
1106             chars = snprintf(message, sizeof (message),
1107                 "error reading %s", path);
1108         }
1109         if (chars > 0 && chars <= sizeof (message)) {
1110             print_status(500, message);
1111         } else {
1112             print_status(500, NULL);
1113         }
1114     }
1115     if (rfp != NULL) {
1116         (void) fclose(rfp);
1117     }

```

```

1118     if (p12 != NULL) {
1119         PKCS12_free(p12);
1120     }
1121     if (certs != NULL) {
1122         sk_X509_pop_free(certificates, X509_free);
1123     }

1125     return (ret);
1126 }

1128 /*
1129  * Create a hosts file by extracting hosts from client and truststore
1130  * files. Use the CN. Then we should copy that file to the inet dir.
1131  */
1132 static boolean_t
1133 create_hostsfile(const char *hostsfile, const char *net, const char *cid)
1134 {
1135     boolean_t       ret = B_FALSE;
1136     nvlist_t        *nvl;
1137     nvpair_t        *nvp;
1138     FILE            *hostfp = NULL;
1139     int             hostfd = -1;
1140     int             i;
1141     char            *hostslist;
1142     const char      *bc_urls[] = { BC_ROOT_SERVER, BC_BOOT_LOGGER, NULL };

1144     /*
1145      * Allocate nvlist handle to store our hostname/IP pairs.
1146      */
1147     if (nvlist_alloc(&nvl, NV_UNIQUE_NAME, 0) != 0) {
1148         print_status(500, "(error allocating hostname nvlist)");
1149         goto cleanup;
1150     }

1152     /*
1153      * Extract and resolve hostnames from CNs.
1154      */
1155     if (netboot_ftw(NB_CLIENT_CERT, net, cid,
1156         get_hostnames, nvl) == WBCGI_FTW_CBERR ||
1157         netboot_ftw(NB_CA_CERT, net, cid,
1158         get_hostnames, nvl) == WBCGI_FTW_CBERR) {
1159         goto cleanup;
1160     }

1162     /*
1163      * Extract and resolve hostnames from any URLs in bootconf.
1164      */
1165     for (i = 0; bc_urls[i] != NULL; ++i) {
1166         char        *urlstr;
1167         url_t        url;

1169         if ((urlstr = bootconf_get(&bc_handle, bc_urls[i])) != NULL &&
1170             url_parse(urlstr, &url) == URL_PARSE_SUCCESS) {
1171             if (!resolve_hostname(url.hport.hostname,
1172                 nvl, B_FALSE)) {
1173                 goto cleanup;
1174             }
1175         }
1176     }

1178     /*
1179      * If there is a resolve-hosts list in bootconf, resolve those
1180      * hostnames too.
1181      */
1182     if ((hostslist = bootconf_get(&bc_handle, BC_RESOLVE_HOSTS)) != NULL) {
1183         char        *hostname;

```

```

1185         for (hostname = strtok(hostslist, ","); hostname != NULL;
1186              hostname = strtok(NULL, ",")) {
1187             if (!resolve_hostname(hostname, nvl, B_FALSE)) {
1188                 goto cleanup;
1189             }
1190         }
1191     }
1192
1193     /*
1194     * Now write the hostname/IP pairs gathered to the hosts file.
1195     */
1196     if ((hostfd = open(hostsfile,
1197         O_RDWR|O_CREAT|O_EXCL, S_IRUSR|S_IWUSR)) == -1 ||
1198         (hostfp = fdopen(hostfd, "w+")) == NULL) {
1199         print_status(500, "(error creating hosts file)");
1200         goto cleanup;
1201     }
1202     for (nvp = nvlist_next_nvpair(nvl, NULL); nvp != NULL;
1203          nvp = nvlist_next_nvpair(nvl, nvp)) {
1204         char *hostname;
1205         char *ipstr;
1206
1207         hostname = nvpair_name(nvp);
1208         if (nvpair_value_string(nvp, &ipstr) != 0) {
1209             print_status(500, "(nvl error writing hosts file)");
1210             goto cleanup;
1211         }
1212
1213         if (fprintf(hostfp, "%s\t%s\n", ipstr, hostname) < 0) {
1214             print_status(500, "(error writing hosts file)");
1215             goto cleanup;
1216         }
1217     }
1218
1219     ret = B_TRUE;
1220 cleanup:
1221     if (nvl != NULL) {
1222         nvlist_free(nvl);
1223     }
1224     if (hostfp != NULL) {
1225         /*
1226         * hostfd is automatically closed as well.
1227         */
1228         (void) fclose(hostfp);
1229     }
1230
1231     return (ret);
1232 }
1233
1234 static boolean_t
1235 bootfile_payload(const char *docroot, char **bootpath)
1236 {
1237     boolean_t ret = B_FALSE;
1238     char *boot_file;
1239     struct stat sbuf;
1240
1241     if ((boot_file = bootconf_get(&bc_handle, BC_BOOT_FILE)) == NULL) {
1242         print_status(500, "(boot_file must be specified)");
1243         goto cleanup;
1244     }
1245     if ((*bootpath = make_path(docroot, boot_file)) == NULL) {
1246         goto cleanup;
1247     }
1248     if (!WBCGI_FILE_EXISTS(*bootpath, sbuf)) {
1249         print_status(500, "(boot_file missing)");

```

```

1250         goto cleanup;
1251     }
1252
1253     ret = B_TRUE;
1254 cleanup:
1255     return (ret);
1256 }
1257
1258 /*
1259 * Create the wanboot file system whose contents are determined by the
1260 * security configuration specified in bootconf.
1261 */
1262 static boolean_t
1263 wanbootfs_payload(const char *net, const char *cid, const char *nonce,
1264                  const char *bootconf, char **wanbootfs_imagep)
1265 {
1266     int ret = B_FALSE;
1267
1268     char *server_authentication;
1269     char *client_authentication;
1270     char *scf;
1271
1272     char *bootfs_dir = NULL;
1273     char *bootfs_etc_dir = NULL;
1274     char *bootfs_etc_inet_dir = NULL;
1275     char *bootfs_dev_dir = NULL;
1276
1277     char *systemconf = NULL;
1278     char *keystorepath = NULL;
1279     char *certstorepath = NULL;
1280     char *truststorepath = NULL;
1281     char *bootconfpath = NULL;
1282     char *systemconffpath = NULL;
1283     char *urandompath = NULL;
1284     char *noncepath = NULL;
1285     char *hostspath = NULL;
1286     char *etc_hostspath = NULL;
1287     char *timestamppath = NULL;
1288
1289     boolean_t authenticate_client;
1290     boolean_t authenticate_server;
1291
1292     struct stat sbuf;
1293
1294     /*
1295     * Initialize SSL stuff.
1296     */
1297     sunw_crypto_init();
1298
1299     /*
1300     * Get the security strategy values.
1301     */
1302     client_authentication = bootconf_get(&bc_handle,
1303         BC_CLIENT_AUTHENTICATION);
1304     authenticate_client = (client_authentication != NULL &&
1305         strcmp(client_authentication, "yes") == 0);
1306     server_authentication = bootconf_get(&bc_handle,
1307         BC_SERVER_AUTHENTICATION);
1308     authenticate_server = (server_authentication != NULL &&
1309         strcmp(server_authentication, "yes") == 0);
1310
1311     /*
1312     * Make a temporary directory structure for the wanboot file system.
1313     */
1314     if ((bootfs_dir = gen_tmppath("bootfs_dir", net, cid)) == NULL ||
1315         (bootfs_etc_dir = make_path(bootfs_dir, "etc")) == NULL ||

```

```

1316     (bootfs_etc_inet_dir = make_path(bootfs_etc_dir, "inet")) == NULL ||
1317     (bootfs_dev_dir = make_path(bootfs_dir, "dev")) == NULL) {
1318         goto cleanup;
1319     }
1320     if (mkdirp(bootfs_dir, 0700) ||
1321         mkdirp(bootfs_etc_dir, 0700) ||
1322         mkdirp(bootfs_etc_inet_dir, 0700) ||
1323         mkdirp(bootfs_dev_dir, 0700)) {
1324         print_status(500, "(error creating wanbootfs dir structure)");
1325         goto cleanup;
1326     }
1327
1328     if (authenticate_client) {
1329         /*
1330          * Add the client private key.
1331          */
1332         if ((keystorepath = make_path(bootfs_dir,
1333             NB_CLIENT_KEY)) == NULL ||
1334             netboot_ftw(NB_CLIENT_KEY, net, cid,
1335                 create_keystore, keystorepath) != WBCGI_FTW_CBOK) {
1336             goto cleanup;
1337         }
1338
1339         /*
1340          * Add the client certificate.
1341          */
1342         if ((certstorepath = make_path(bootfs_dir,
1343             NB_CLIENT_CERT)) == NULL ||
1344             netboot_ftw(NB_CLIENT_CERT, net, cid,
1345                 copy_certstore, certstorepath) != WBCGI_FTW_CBOK) {
1346             goto cleanup;
1347         }
1348     }
1349
1350     if (authenticate_client || authenticate_server) {
1351         /*
1352          * Add the trustfile; at least one truststore must exist.
1353          */
1354         if ((truststorepath = make_path(bootfs_dir,
1355             NB_CA_CERT)) == NULL) {
1356             goto cleanup;
1357         }
1358         if (netboot_ftw(NB_CA_CERT, net, cid,
1359             noact_cb, NULL) != WBCGI_FTW_CBOK) {
1360             print_status(500, "(truststore not found)");
1361         }
1362         if (netboot_ftw(NB_CA_CERT, net, cid,
1363             build_trustfile, truststorepath) == WBCGI_FTW_CBERR) {
1364             goto cleanup;
1365         }
1366
1367         /*
1368          * Create the /dev/urandom file.
1369          */
1370         if ((urandompath = make_path(bootfs_dev_dir,
1371             "urandom")) == NULL ||
1372             !create_urandom(urandompath)) {
1373             goto cleanup;
1374         }
1375     }
1376
1377     /*
1378      * Add the wanboot.conf(4) file.
1379      */
1380     if ((bootconfpath = make_path(bootfs_dir, NB_WANBOOT_CONF)) == NULL ||
1381         !copy_file(bootconf, bootconfpath)) {

```

```

1382         goto cleanup;
1383     }
1384
1385     /*
1386      * Add the system_conf file if present.
1387      */
1388     if ((scf = bootconf_get(&bc_handle, BC_SYSTEM_CONF)) != NULL) {
1389         if (netboot_ftw(scf, net, cid,
1390             set_pathname, &systemconf) != WBCGI_FTW_CBOK) {
1391             print_status(500, "(system_conf file not found)");
1392             goto cleanup;
1393         }
1394         if ((systemconfpath = make_path(bootfs_dir,
1395             NB_SYSTEM_CONF)) == NULL ||
1396             !copy_file(systemconf, systemconfpath)) {
1397             goto cleanup;
1398         }
1399     }
1400
1401     /*
1402      * Create the /nonce file.
1403      */
1404     if ((noncepath = make_path(bootfs_dir, "nonce")) == NULL ||
1405         !create_nonce(noncepath, nonce)) {
1406         goto cleanup;
1407     }
1408
1409     /*
1410      * Create an /etc/inet/hosts file by extracting hostnames from CN,
1411      * URLs in bootconf and resolve-hosts in bootconf.
1412      */
1413     if ((hostspath = make_path(bootfs_etc_inet_dir, "hosts")) == NULL ||
1414         !create_hostsfile(hostspath, net, cid)) {
1415         goto cleanup;
1416     }
1417
1418     /*
1419      * We would like to create a symbolic link etc/hosts -> etc/inet/hosts,
1420      * but unfortunately the HSFS support in the standalone doesn't handle
1421      * symlinks.
1422      */
1423     if ((etc_hostspath = make_path(bootfs_etc_dir, "hosts")) == NULL ||
1424         !copy_file(hostspath, etc_hostspath)) {
1425         goto cleanup;
1426     }
1427
1428     /*
1429      * Create the /timestamp file.
1430      */
1431     if ((timestamppath = make_path(bootfs_dir, "timestamp")) == NULL ||
1432         !create_timestamp(timestamppath, "timestamp")) {
1433         goto cleanup;
1434     }
1435
1436     /*
1437      * Create an HSFS file system for the directory.
1438      */
1439     if ((*wanbootfs_imagep = gen_tmppath("wanbootfs", net, cid)) == NULL ||
1440         !mkisofs(bootfs_dir, *wanbootfs_imagep)) {
1441         goto cleanup;
1442     }
1443
1444     ret = B_TRUE;
1445 cleanup:
1446     /*
1447      * Clean up temporary files and directories.

```

```

1448 */
1449 if (keystorepath != NULL &&
1450     WBCGI_FILE_EXISTS(keystorepath, sbuf)) {
1451     (void) unlink(keystorepath);
1452 }
1453 if (certstorepath != NULL &&
1454     WBCGI_FILE_EXISTS(certstorepath, sbuf)) {
1455     (void) unlink(certstorepath);
1456 }
1457 if (truststorepath != NULL &&
1458     WBCGI_FILE_EXISTS(truststorepath, sbuf)) {
1459     (void) unlink(truststorepath);
1460 }
1461 if (bootconfpath != NULL &&
1462     WBCGI_FILE_EXISTS(bootconfpath, sbuf)) {
1463     (void) unlink(bootconfpath);
1464 }
1465 if (systemconfpath != NULL &&
1466     WBCGI_FILE_EXISTS(systemconfpath, sbuf)) {
1467     (void) unlink(systemconfpath);
1468 }
1469 if (urandompath != NULL &&
1470     WBCGI_FILE_EXISTS(urandompath, sbuf)) {
1471     (void) unlink(urandompath);
1472 }
1473 if (noncepath != NULL &&
1474     WBCGI_FILE_EXISTS(noncepath, sbuf)) {
1475     (void) unlink(noncepath);
1476 }
1477 if (hostspath != NULL &&
1478     WBCGI_FILE_EXISTS(hostspath, sbuf)) {
1479     (void) unlink(hostspath);
1480 }
1481 if (etc_hostspath != NULL &&
1482     WBCGI_FILE_EXISTS(etc_hostspath, sbuf)) {
1483     (void) unlink(etc_hostspath);
1484 }
1485 if (timestamppath != NULL &&
1486     WBCGI_FILE_EXISTS(timestamppath, sbuf)) {
1487     (void) unlink(timestamppath);
1488 }
1490 if (bootfs_etc_inet_dir != NULL &&
1491     WBCGI_DIR_EXISTS(bootfs_etc_inet_dir, sbuf)) {
1492     (void) rmdir(bootfs_etc_inet_dir);
1493 }
1494 if (bootfs_etc_dir != NULL &&
1495     WBCGI_DIR_EXISTS(bootfs_etc_dir, sbuf)) {
1496     (void) rmdir(bootfs_etc_dir);
1497 }
1498 if (bootfs_dev_dir != NULL &&
1499     WBCGI_DIR_EXISTS(bootfs_dev_dir, sbuf)) {
1500     (void) rmdir(bootfs_dev_dir);
1501 }
1502 if (bootfs_dir != NULL &&
1503     WBCGI_DIR_EXISTS(bootfs_dir, sbuf)) {
1504     (void) rmdir(bootfs_dir);
1505 }
1507 /*
1508  * Free allocated memory.
1509  */
1510 free_path(&bootfs_dir);
1511 free_path(&bootfs_etc_dir);
1512 free_path(&bootfs_etc_inet_dir);
1513 free_path(&bootfs_dev_dir);

```

```

1515 free_path(&systemconf);
1516 free_path(&keystorepath);
1517 free_path(&certstorepath);
1518 free_path(&truststorepath);
1519 free_path(&bootconfpath);
1520 free_path(&systemconfpath);
1521 free_path(&urandompath);
1522 free_path(&noncepath);
1523 free_path(&hostspath);
1524 free_path(&etc_hostspath);
1525 free_path(&timestamppath);
1527 return (ret);
1528 }
1530 static boolean_t
1531 miniroot_payload(const char *net, const char *cid, const char *docroot,
1532                 char **rootpathp, char **rootinfo, boolean_t *https_rootserverp)
1533 {
1534     boolean_t    ret = B_FALSE;
1535     char          *root_server;
1536     char          *root_file;
1537     url_t         url;
1538     struct stat   sbuf;
1539     char          sizebuf[WBCGI_MAXBUF];
1540     int           chars;
1541     int           fd = -1;
1543     if ((root_server = bootconf_get(&bc_handle, BC_ROOT_SERVER)) == NULL) {
1544         print_status(500, "(root_server must be specified)");
1545         goto cleanup;
1546     }
1547     if (url_parse(root_server, &url) != URL_PARSE_SUCCESS) {
1548         print_status(500, "(root_server URL is invalid)");
1549     }
1550     *https_rootserverp = url.https;
1552     if ((root_file = bootconf_get(&bc_handle, BC_ROOT_FILE)) == NULL) {
1553         print_status(500, "(rootfile must be specified)");
1554         goto cleanup;
1555     }
1556     if ((*rootpathp = make_path(docroot, root_file)) == NULL) {
1557         goto cleanup;
1558     }
1559     if (!WBCGI_FILE_EXISTS(*rootpathp, sbuf)) {
1560         print_status(500, "(root filesystem image missing)");
1561         goto cleanup;
1562     }
1564     if ((*rootinfo = gen_tmppath("mrinfo", net, cid)) == NULL) {
1565         goto cleanup;
1566     }
1567     if ((chars = snprintf(sizebuf, sizeof(sizebuf), "%ld",
1568                          sbuf.st_size)) < 0 || chars > sizeof(sizebuf) ||
1569         (fd = open(*rootinfo,
1570                  O_RDWR|O_CREAT|O_EXCL, S_IRUSR|S_IWUSR)) == -1 ||
1571         !write_buffer(fd, sizebuf, strlen(sizebuf))) {
1572         print_status(500, "(error creating miniroot info file)");
1573         goto cleanup;
1574     }
1576     ret = B_TRUE;
1577 cleanup:
1578     if (fd != -1) {
1579         (void) close(fd);

```

```

1580     }
1581
1582     return (ret);
1583 }
1584
1585 static boolean_t
1586 deliver_payload(const char *payload, const char *payload_hash)
1587 {
1588     int            fd = fileno(stdout);
1589     struct stat    payload_buf, hash_buf;
1590     int            chars;
1591     char           main_header[WBCGI_MAXBUF];
1592     char           multi_header[WBCGI_MAXBUF];
1593     char           multi_header1[WBCGI_MAXBUF];
1594     char           multi_header2[WBCGI_MAXBUF];
1595     char           multi_end[WBCGI_MAXBUF];
1596     size_t         msglen;
1597
1598     if (!WBCGI_FILE_EXISTS(payload, payload_buf) ||
1599         !WBCGI_FILE_EXISTS(payload_hash, hash_buf)) {
1600         print_status(500, "(payload/hash file(s) missing)");
1601         return (B_FALSE);
1602     }
1603
1604     /*
1605      * Multi-part header.
1606      */
1607     if ((chars = snprintf(multi_header, sizeof (multi_header),
1608         "%s--%s%sapplication/octet-stream%s%s", WBCGI_CRNL,
1609         WBCGI_WANBOOT_BNDTXT, WBCGI_CRNL, WBCGI_CONTENT_TYPE, WBCGI_CRNL,
1610         WBCGI_CONTENT_LENGTH)) < 0 || chars > sizeof (multi_header)) {
1611         print_status(500, "(error creating multi_header)");
1612         return (B_FALSE);
1613     }
1614
1615     /*
1616      * Multi-part header for part one.
1617      */
1618     if ((chars = snprintf(multi_header1, sizeof (multi_header1),
1619         "%s%ld%s%s", multi_header, payload_buf.st_size, WBCGI_CRNL,
1620         WBCGI_CRNL)) < 0 || chars > sizeof (multi_header1)) {
1621         print_status(500, "(error creating multi_header1)");
1622         return (B_FALSE);
1623     }
1624
1625     /*
1626      * Multi-part header for part two.
1627      */
1628     if ((chars = snprintf(multi_header2, sizeof (multi_header2),
1629         "%s%ld%s%s", multi_header, hash_buf.st_size, WBCGI_CRNL,
1630         WBCGI_CRNL)) < 0 || chars > sizeof (multi_header2)) {
1631         print_status(500, "(error creating multi_header2)");
1632         return (B_FALSE);
1633     }
1634
1635     /*
1636      * End-of-parts Trailer.
1637      */
1638     if ((chars = snprintf(multi_end, sizeof (multi_end),
1639         "%s--%s--%s", WBCGI_CRNL, WBCGI_WANBOOT_BNDTXT,
1640         WBCGI_CRNL)) < 0 || chars > sizeof (multi_end)) {
1641         print_status(500, "(error creating multi_end)");
1642         return (B_FALSE);
1643     }
1644
1645     /*

```

```

1646      * Message header.
1647      */
1648     msglen = payload_buf.st_size + hash_buf.st_size +
1649         strlen(multi_header1) + strlen(multi_header2) + strlen(multi_end);
1650
1651     if ((chars = snprintf(main_header, sizeof (main_header),
1652         "%s%s%smultipart/mixed; boundary=%s%s%s", WBCGI_CONTENT_LENGTH,
1653         msglen, WBCGI_CRNL, WBCGI_CONTENT_TYPE, WBCGI_WANBOOT_BNDTXT,
1654         WBCGI_CRNL, WBCGI_CRNL)) < 0 || chars > sizeof (main_header)) {
1655         print_status(500, "(error creating main_header)");
1656         return (B_FALSE);
1657     }
1658
1659     /*
1660      * Write the message out. If things fall apart during this then
1661      * there's no way to report the error back to the client.
1662      */
1663     if (!write_buffer(fd, main_header, strlen(main_header)) ||
1664         !write_buffer(fd, multi_header1, strlen(multi_header1)) ||
1665         !write_file(fd, payload, payload_buf.st_size) ||
1666         !write_buffer(fd, multi_header2, strlen(multi_header2)) ||
1667         !write_file(fd, payload_hash, hash_buf.st_size) ||
1668         !write_buffer(fileno(stdout), multi_end, strlen(multi_end))) {
1669         return (B_FALSE);
1670     }
1671
1672     return (B_TRUE);
1673 }
1674
1675 /*ARGSUSED*/
1676 int
1677 main(int argc, char **argv)
1678 {
1679     int            ret = WBCGI_STATUS_ERR;
1680     struct stat    sbuf;
1681     int            content;
1682     char           *net;
1683     char           *cid;
1684     char           *nonce;
1685     char           *docroot;
1686     char           *payload;
1687     char           *signature_type;
1688     char           *encryption_type;
1689     char           *bootconf = NULL;
1690     char           *keyfile = NULL;
1691     char           *bootpath = NULL;
1692     char           *wanbootfs_image = NULL;
1693     char           *rootpath = NULL;
1694     char           *miniroot_info = NULL;
1695     char           *encr_payload = NULL;
1696     char           *payload_hash = NULL;
1697     boolean_t      https_rootserver;
1698
1699     /*
1700      * Process the query string.
1701      */
1702     if (!get_request_info(&content, &net, &cid, &nonce, &docroot)) {
1703         goto cleanup;
1704     }
1705
1706     /*
1707      * Sanity check that the netboot directory exists.
1708      */
1709     if (!WBCGI_DIR_EXISTS(NB_NETBOOT_ROOT, sbuf)) {
1710         print_status(500, "(NB_NETBOOT_ROOT does not exist)");
1711     }

```



```

1712         goto cleanup;
1713     }

1715     /*
1716     * Get absolute bootconf pathname.
1717     */
1718     if (netboot_ftw(NB_WANBOOT_CONF, net, cid,
1719         set_pathname, &bootconf) != WBCGI_FTW_CBOK) {
1720         print_status(500, "(wanboot.conf not found)");
1721         goto cleanup;
1722     }

1724     /*
1725     * Initialize bc_handle from the given wanboot.conf file.
1726     */
1727     if (bootconf_init(&bc_handle, bootconf) != BC_SUCCESS) {
1728         char    message[WBCGI_MAXBUF];
1729         int      chars;

1731         chars = snprintf(message, sizeof(message),
1732             "(wanboot.conf error: %s)", bootconf_errmsg(&bc_handle));
1733         if (chars > 0 && chars < sizeof(message))
1734             print_status(500, message);
1735         else
1736             print_status(500, "(wanboot.conf error)");
1737         goto cleanup;
1738     }

1740     /*
1741     * Get and check signature and encryption types,
1742     * presence of helper utilities, keystore, etc.
1743     */
1744     if ((signature_type = bootconf_get(&bc_handle,
1745         BC_SIGNATURE_TYPE)) != NULL) {
1746         if (!WBCGI_FILE_EXISTS(WBCGI_HMAC_PATH, sbuf)) {
1747             print_status(500, "(hmac utility not found)");
1748             goto cleanup;
1749         }
1750         if (keyfile == NULL && netboot_ftw(NB_CLIENT_KEY, net, cid,
1751             set_pathname, &keyfile) != WBCGI_FTW_CBOK) {
1752             print_status(500, "(keystore not found)");
1753             goto cleanup;
1754         }
1755         if (!check_key_type(keyfile, signature_type, WBKU_HASH_KEY)) {
1756             print_status(500, "(hash key not found)");
1757             goto cleanup;
1758         }
1759     }
1760     if ((encryption_type = bootconf_get(&bc_handle,
1761         BC_ENCRYPTION_TYPE)) != NULL) {
1762         if (signature_type == NULL) {
1763             print_status(500, "(encrypted but not signed)");
1764             goto cleanup;
1765         }
1766         if (!WBCGI_FILE_EXISTS(WBCGI_ENCR_PATH, sbuf)) {
1767             print_status(500, "(encr utility not found)");
1768             goto cleanup;
1769         }
1770         if (keyfile == NULL && netboot_ftw(NB_CLIENT_KEY, net, cid,
1771             set_pathname, &keyfile) != WBCGI_FTW_CBOK) {
1772             print_status(500, "(keystore not found)");
1773             goto cleanup;
1774         }
1775         if (!check_key_type(keyfile, encryption_type, WBKU_ENCR_KEY)) {
1776             print_status(500, "(encr key not found)");
1777             goto cleanup;

```

```

1778     }
1779 }

1781 /*
1782 * Determine/create our payload.
1783 */
1784 switch (content) {
1785 case WBCGI_CONTENT_BOOTFILE:
1786     if (!bootfile_payload(docroot, &bootpath)) {
1787         goto cleanup;
1788     }
1789     payload = bootpath;

1791     break;

1793 case WBCGI_CONTENT_BOOTFS:
1794     if (!wanbootfs_payload(net, cid, nonce,
1795         bootconf, &wanbootfs_image)) {
1796         goto cleanup;
1797     }
1798     payload = wanbootfs_image;

1800     break;

1802 case WBCGI_CONTENT_ROOTFS:
1803     if (!miniroot_payload(net, cid, docroot,
1804         &rootpath, &miniroot_info, &https_rootserver)) {
1805         goto cleanup;
1806     }
1807     payload = rootpath;

1809     break;
1810 }

1812 /*
1813 * Encrypt the payload if necessary.
1814 */
1815 if (content != WBCGI_CONTENT_BOOTFILE &&
1816     content != WBCGI_CONTENT_ROOTFS &&
1817     encryption_type != NULL) {
1818     if ((encr_payload = gen_tmppath("encr", net, cid)) == NULL) {
1819         goto cleanup;
1820     }

1822     if (!encrypt_payload(payload, encr_payload, keyfile,
1823         encryption_type)) {
1824         goto cleanup;
1825     }

1827     payload = encr_payload;
1828 }

1830 /*
1831 * Compute the hash (actual or null).
1832 */
1833 if ((payload_hash = gen_tmppath("hash", net, cid)) == NULL) {
1834     goto cleanup;
1835 }

1837 if (signature_type != NULL &&
1838     (content != WBCGI_CONTENT_ROOTFS || !https_rootserver)) {
1839     if (!hash_payload(payload, payload_hash, keyfile)) {
1840         goto cleanup;
1841     }
1842 } else {
1843     if (!create_null_hash(payload_hash)) {

```

```
1844         goto cleanup;
1845     }
1846 }
1847
1848 /*
1849  * For the rootfs the actual payload transmitted is the file
1850  * containing the size of the rootfs (as a string of ascii digits);
1851  * point payload at this instead.
1852  */
1853 if (content == WBCGI_CONTENT_ROOTFS) {
1854     payload = miniroot_info;
1855 }
1856
1857 /*
1858  * Finally, deliver the payload and hash as a multipart message.
1859  */
1860 if (!deliver_payload(payload, payload_hash)) {
1861     goto cleanup;
1862 }
1863
1864 ret = WBCGI_STATUS_OK;
1865 cleanup:
1866 /*
1867  * Clean up temporary files.
1868  */
1869 if (wanbootfs_image != NULL &&
1870     WBCGI_FILE_EXISTS(wanbootfs_image, sbuf)) {
1871     (void) unlink(wanbootfs_image);
1872 }
1873 if (miniroot_info != NULL &&
1874     WBCGI_FILE_EXISTS(miniroot_info, sbuf)) {
1875     (void) unlink(miniroot_info);
1876 }
1877 if (encr_payload != NULL &&
1878     WBCGI_FILE_EXISTS(encr_payload, sbuf)) {
1879     (void) unlink(encr_payload);
1880 }
1881 if (payload_hash != NULL &&
1882     WBCGI_FILE_EXISTS(payload_hash, sbuf)) {
1883     (void) unlink(payload_hash);
1884 }
1885
1886 /*
1887  * Free up any allocated strings.
1888  */
1889 free_path(&bootconf);
1890 free_path(&keyfile);
1891 free_path(&bootpath);
1892 free_path(&wanbootfs_image);
1893 free_path(&rootpath);
1894 free_path(&miniroot_info);
1895 free_path(&encr_payload);
1896 free_path(&payload_hash);
1897
1898 bootconf_end(&bc_handle);
1899
1900 return (ret);
1901 }
```

new/usr/src/cmd/cmd-inet/usr.lib/wpad/Makefile

1

1463 Fri May 30 18:31:08 2014
new/usr/src/cmd/cmd-inet/usr.lib/wpad/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2008 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #

25 PROG =      wpad
26 MANIFEST =   wpa.xml
27 OBJJS =      wpa_suppllicant.o wpa.o wpa_enc.o eloop.o \
28             driver_wifi.o l2_packet.o
29 SRCS =       $(OBJJS:%.o=%.c)

31 include ../../../../Makefile.cmd

33 ROOTMANIFESTDIR = $(ROOTSVCNETWORK)

35 LDLIBS +=    -ldladm -ldlpi
36 all install := LDLIBS += -lsunw_crypto

38 LINTFLAGS += -u

40 .KEEP_STATE:

42 all:         $(PROG)

44 $(PROG):     $(OBJJS)
45             $(LINK.c) $(OBJJS) -o $@ $(LDLIBS)
46             $(POST_PROCESS)

48 include ../Makefile.lib

50 install:     all $(ROOTLIBINETPROG) $(ROOTMANIFEST)

52 check:       $(CHKMANIFEST)

54 clean:       $(RM) $(OBJJS)
55

57 lint:        lint_SRCS

59 include ../../../../Makefile.targ
```

new/usr/src/cmd/sendmail/src/Makefile

1

2418 Fri May 30 18:31:08 2014
new/usr/src/cmd/sendmail/src/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 # Copyright (c) 2011 Gary Mills
23 #
24 #
25 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
26 # Use is subject to license terms.
27 #
28 # cmd/sendmail/src/Makefile
29 #
30 #
31 PROG=    sendmail
32 #
33 include  ../../Makefile.cmd
34 include  ../Makefile.cmd
35 #
36 OBJS= alias.o arpadate.o bf.o collect.o conf.o control.o convtime.o daemon.o \
37       deliver.o domain.o envelope.o err.o headers.o macro.o main.o map.o \
38       mci.o milter.o mime.o parseaddr.o queue.o ratectrl.o readcf.o \
39       recipient.o sasl.o savemail.o sfsasl.o sm_resolve.o srvsmtp.o stab.o \
40       stats.o sysexits.o tls.o trace.o udb.o usersmtp.o util.o version.o
41 #
42 SRCS=    $(OBJS:%.o=%.c)
43 #
44 MAPFILES = $(MAPFILE.INT) $(MAPFILE.NGB)
45 LDFLAGS += $(MAPFILES:%=-M%)
46 #
47 LDLIBS += ../libsmutil/libsmutil.a ../libsm/libsm.a -lresolv -lsocket \
48           -lnsl ../db/libdb.a -lldap -lsldap -lwrap -lumem \
49           -lsunw_ssl -lsunw_crypto -lsasl
50 #
51 INCPATH= -I. -I../include -I../db
52 #
53 ENVDEF= -DNETINET6 -DTCPPWRAPPERS -DSTARTTLS -DSASL=20115
54 SUNENVDEF= -DSUN_EXTENSIONS -DVENDOR_DEFAULT=VENDOR_SUN \
55           -DSUN_INIT_DOMAIN -DSUN_SIMPLIFIED_LDAP -D_FFR_LOCAL_DAEMON \
56           -D_FFR_MAIL_MACRO
57 #
58 CPPFLAGS = $(INCPATH) $(ENVDEF) $(SUNENVDEF) $(DBMDEF) $(CPPFLAGS.sm)
59 #
60 FILEMODE= 2555
```

new/usr/src/cmd/sendmail/src/Makefile

2

```
62 ROOTSYMLINKS= $(ROOTUSRSBIN)/newaliases $(ROOTUSRSBIN)/sendmail
63 #
64 # build rule
65 #
66 #
67 .KEEP_STATE:
68 all: $(PROG)
69 #
70 .PARALLEL: $(OBJS)
71 #
72 $(PROG): $(OBJS) $(MAPFILES) \
73         ../libsmutil/libsmutil.a ../libsm/libsm.a ../db/libdb.a
74         $(LINK.c) -o $@ $(OBJS) $(LDLIBS)
75         $(POST_PROCESS)
76 #
77 install: $(ROOTLIBPROG) $(ROOTSYMLINKS)
78 #
79 $(ROOTSYMLINKS):
80     $(RM) $@; $(SYMLINK) ../lib/sendmail $@
81 #
82 clean:
83     $(RM) $(PROG) $(OBJS)
84 #
85 lint: lint_SRCS
86 #
87 include ../../Makefile.targ
```

new/usr/src/cmd/ssh/include/engine.h

1

1226 Fri May 30 18:31:08 2014

new/usr/src/cmd/ssh/include/engine.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /*
2  * CDDL HEADER START
3  *
4  * The contents of this file are subject to the terms of the
5  * Common Development and Distribution License (the "License").
6  * You may not use this file except in compliance with the License.
7  *
8  * You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9  * or http://www.opensolaris.org/os/licensing.
10 * See the License for the specific language governing permissions
11 * and limitations under the License.
12 *
13 * When distributing Covered Code, include this CDDL HEADER in each
14 * file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 * If applicable, add the following below this CDDL HEADER, with the
16 * fields enclosed by brackets "[]" replaced with your own identifying
17 * information: Portions Copyright [yyyy] [name of copyright owner]
18 *
19 * CDDL HEADER END
20 */
21 /*
22 * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
23 * Use is subject to license terms.
24 */

26 #ifndef _ENGINE_H
27 #define _ENGINE_H

29 #ifdef __cplusplus
30 extern "C" {
31 #endif

33 #include "includes.h"
34 #include <openssl/opensslconf.h>
35 #include <openssl/engine.h>

37 ENGINE *pkcs11_engine_load(int use_engine);
38 void pkcs11_engine_finish(void *engine);

40 #ifdef __cplusplus
41 }
42 #endif

44 #endif /* _ENGINE_H */
```

new/usr/src/cmd/ssh/libopenbsd-compat/common/bsd-arc4random.c

1

```
*****
2526 Fri May 30 18:31:08 2014
new/usr/src/cmd/ssh/libopenbsd-compat/common/bsd-arc4random.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Copyright 2004 Sun Microsystems, Inc. All rights reserved.
3  * Use is subject to license terms.
4  */
5 /*
6  * Copyright (c) 1999-2000 Damien Miller. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 * 1. Redistributions of source code must retain the above copyright
12 * notice, this list of conditions and the following disclaimer.
13 * 2. Redistributions in binary form must reproduce the above copyright
14 * notice, this list of conditions and the following disclaimer in the
15 * documentation and/or other materials provided with the distribution.
16 *
17 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR
18 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
19 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
20 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
21 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
22 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
23 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
24 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
25 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
26 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
27 */

29 #include "includes.h"
30 #include "log.h"

32 RCSID("$Id: bsd-arc4random.c,v 1.5 2002/05/08 22:57:18 tim Exp $");

34 #pragma ident "%Z%M% %I% %E% SMI"

36 #ifndef HAVE_ARC4RANDOM

38 #include <openssl/opensslconf.h>
39 #include <openssl/rand.h>
40 #include <openssl/rc4.h>
41 #include <openssl/err.h>

43 /* Size of key to use */
44 #define SEED_SIZE 20

46 /* Number of bytes to reseed after */
47 #define REKEY_BYTES (1 << 24)

49 static int rc4_ready = 0;
50 static RC4_KEY rc4;

52 unsigned int arc4random(void)
53 {
54     unsigned int r = 0;
55     static int first_time = 1;

57     if (rc4_ready <= 0) {
58         if (first_time)
59             seed_rng();
60         first_time = 0;
61         arc4random_stir();

```

new/usr/src/cmd/ssh/libopenbsd-compat/common/bsd-arc4random.c

2

```
62     }

64     RC4(&rc4, sizeof(r), (unsigned char *)&r, (unsigned char *)&r);

66     rc4_ready -= sizeof(r);
67
68     return(r);
69 }

71 void arc4random_stir(void)
72 {
73     unsigned char rand_buf[SEED_SIZE];

75     memset(&rc4, 0, sizeof(rc4));
76     if (!RAND_bytes(rand_buf, sizeof(rand_buf)))
77         fatal("Couldn't obtain random bytes (error %ld)",
78             ERR_get_error());
79     RC4_set_key(&rc4, sizeof(rand_buf), rand_buf);
80     memset(rand_buf, 0, sizeof(rand_buf));

82     rc4_ready = REKEY_BYTES;
83 }
84 #endif /* !HAVE_ARC4RANDOM */

```

new/usr/src/cmd/ssh/libssh/Makefile.com

1

```
*****
2444 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #
2 # CDDL HEADER START
3 #
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18 #
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23 #
```

```
25 LIBRARY =      libssh.a
26 VERS =        .1

28 OBJECTS =      \
29                addrmatch.o \
30                atomicio.o \
31                authfd.o \
32                authfile.o \
33                bufaux.o \
34                buffer.o \
35                canohost.o \
36                channels.o \
37                cipher.o \
38                cipher-ctr.o \
39                compat.o \
40                compress.o \
41                crc32.o \
42                deattack.o \
43                dh.o \
44                dispatch.o \
45                engine.o \
46                entropy.o \
47                fatal.o \
48                g11n.o \
49                hostfile.o \
50                key.o \
51                kex.o \
52                kexdh.o \
53                kexdhc.o \
54                kexdhs.o \
55                kexgex.o \
56                kexgexc.o \
57                kexgexs.o \
58                kexgssc.o \
59                kexgsss.o \
60                log.o \
61                mac.o \
```

new/usr/src/cmd/ssh/libssh/Makefile.com

2

```
62                match.o \
63                misc.o \
64                mpaux.o \
65                msg.o \
66                nchan.o \
67                packet.o \
68                progressmeter.o \
69                proxy-io.o \
70                radix.o \
71                readconf.o \
72                readpass.o \
73                rsa.o \
74                sftp-common.o \
75                ssh-dss.o \
76                ssh-gss.o \
77                ssh-rsa.o \
78                tildexpand.o \
79                ttymodes.o \
80                uidswap.o \
81                uuencode.o \
82                xlist.o \
83                xmalloc.o

85 include $(SRC)/lib/Makefile.lib

87 BUILD.AR =      $(RM) $@ ; $(AR) $(ARFLAGS) $@ $(AROBJS)

89 SRCDIR =         ../common
90 SRCS =           $(OBJECTS:%.o=../common/%.c)

92 LIBS =          $(LIBRARY) $(LINTLIB)

94 # Define LDLIBS conditionally for lintcheck, rather than in general, since
95 # we're building an archive library which itself links to nothing, we just
96 # want lint to know about these libraries.
97 lintcheck :=    LDLIBS += -lz -lsocket -lnsl -lc
98 $(LINTLIB) :=    SRCS = $(SRCDIR)/$(LINTSRC)

100 POFILE_DIR =    ../..

102 .KEEP_STATE:

104 all:            $(LIBS)

106 # lint requires the (not installed) lint library
107 lint:           $(LINTLIB) .WAIT lintcheck

109 include $(SRC)/lib/Makefile.targ

111 objs/%.o:       $(SRCDIR)/%.c
112                $(COMPILE.c) -o $@ $<
113                $(POST_PROCESS_O)

115 include ../../Makefile.ssh-common
116 include ../../Makefile.msg.targ
```

new/usr/src/cmd/ssh/libssh/common/authfd.c

1

```
*****
16005 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/authfd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Author: Tatu Ylonen <ylo@cs.hut.fi>
3  * Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
4  * All rights reserved
5  * Functions for connecting the local authentication agent.
6  *
7  * As far as I am concerned, the code I have written for this software
8  * can be used freely for any purpose. Any derived versions of this
9  * software must be clearly marked as such, and if the derived work is
10 * incompatible with the protocol description in the RFC file, it must be
11 * called by a name other than "ssh" or "Secure Shell".
12 *
13 * SSH2 implementation,
14 * Copyright (c) 2000 Markus Friedl. All rights reserved.
15 *
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18 * are met:
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31 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
32 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
33 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
34 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
35 */

37 #include "includes.h"
38 RCSID("$OpenBSD: authfd.c,v 1.57 2002/09/11 18:27:26 stevesk Exp $");

40 #include <openssl/opensslconf.h>
41 #include <openssl/evp.h>

43 #include "ssh.h"
44 #include "rsa.h"
45 #include "buffer.h"
46 #include "bufaux.h"
47 #include "xmalloc.h"
48 #include "getput.h"
49 #include "key.h"
50 #include "authfd.h"
51 #include "cipher.h"
52 #include "kex.h"
53 #include "compat.h"
54 #include "log.h"
55 #include "atomicio.h"

57 static int agent_present = 0;

59 /* helper */
60 int decode_reply(int type);
```

new/usr/src/cmd/ssh/libssh/common/authfd.c

2

```
62 /* macro to check for "agent failure" message */
63 #define agent_failed(x) \
64     ((x == SSH_AGENT_FAILURE) || (x == SSH_COM_AGENT2_FAILURE) || \
65      (x == SSH2_AGENT_FAILURE))

67 int
68 ssh_agent_present(void)
69 {
70     int authfd;

72     if (agent_present)
73         return 1;
74     if ((authfd = ssh_get_authentication_socket()) == -1)
75         return 0;
76     else {
77         ssh_close_authentication_socket(authfd);
78         return 1;
79     }
80 }

82 /* Returns the number of the authentication fd, or -1 if there is none. */

84 int
85 ssh_get_authentication_socket(void)
86 {
87     const char *authsocket;
88     int sock;
89     struct sockaddr_un sunaddr;

91     authsocket = getenv(SSH_AUTHSOCKET_ENV_NAME);
92     if (!authsocket)
93         return -1;

95     sunaddr.sun_family = AF_UNIX;
96     strncpy(sunaddr.sun_path, authsocket, sizeof(sunaddr.sun_path));

98     sock = socket(AF_UNIX, SOCK_STREAM, 0);
99     if (sock < 0)
100         return -1;

102     /* close on exec */
103     if (fcntl(sock, F_SETFD, FD_CLOEXEC) == -1) {
104         close(sock);
105         return -1;
106     }
107     if (connect(sock, (struct sockaddr *) &sunaddr, sizeof sunaddr) < 0) {
108         close(sock);
109         return -1;
110     }
111     agent_present = 1;
112     return sock;
113 }

115 static int
116 ssh_request_reply(AuthenticationConnection *auth, Buffer *request, Buffer *reply)
117 {
118     int l, len;
119     char buf[1024];

121     /* Get the length of the message, and format it in the buffer. */
122     len = buffer_len(request);
123     PUT_32BIT(buf, len);

125     /* Send the length and then the packet to the agent. */
126     if (atomicio(write, auth->fd, buf, 4) != 4 ||
127         atomicio(write, auth->fd, buffer_ptr(request),
```



```

128     buffer_len(request)) != buffer_len(request)) {
129         error("Error writing to authentication socket.");
130         return 0;
131     }
132     /*
133     * Wait for response from the agent. First read the length of the
134     * response packet.
135     */
136     len = 4;
137     while (len > 0) {
138         l = read(auth->fd, buf + 4 - len, len);
139         if (l == -1 && (errno == EAGAIN || errno == EINTR))
140             continue;
141         if (l <= 0) {
142             error("Error reading response length from authentication
143             return 0;
144         }
145         len -= l;
146     }

148     /* Extract the length, and check it for sanity. */
149     len = GET_32BIT(buf);
150     if (len > 256 * 1024)
151         fatal("Authentication response too long: %d", len);

153     /* Read the rest of the response in to the buffer. */
154     buffer_clear(reply);
155     while (len > 0) {
156         l = len;
157         if (l > sizeof(buf))
158             l = sizeof(buf);
159         l = read(auth->fd, buf, l);
160         if (l == -1 && (errno == EAGAIN || errno == EINTR))
161             continue;
162         if (l <= 0) {
163             error("Error reading response from authentication socket
164             return 0;
165         }
166         buffer_append(reply, buf, l);
167         len -= l;
168     }
169     return 1;
170 }

172 /*
173 * Closes the agent socket if it should be closed (depends on how it was
174 * obtained). The argument must have been returned by
175 * ssh_get_authentication_socket().
176 */

178 void
179 ssh_close_authentication_socket(int sock)
180 {
181     if (getenv(SSH_AUTHSOCKET_ENV_NAME))
182         close(sock);
183 }

185 /*
186 * Opens and connects a private socket for communication with the
187 * authentication agent. Returns the file descriptor (which must be
188 * shut down and closed by the caller when no longer needed).
189 * Returns NULL if an error occurred and the connection could not be
190 * opened.
191 */

```

```

193 AuthenticationConnection *

```

```

194 ssh_get_authentication_connection(void)
195 {
196     AuthenticationConnection *auth;
197     int sock;

199     sock = ssh_get_authentication_socket();

201     /*
202     * Fail if we couldn't obtain a connection. This happens if we
203     * exited due to a timeout.
204     */
205     if (sock < 0)
206         return NULL;

208     auth = xmalloc(sizeof(*auth));
209     auth->fd = sock;
210     buffer_init(&auth->identities);
211     auth->howmany = 0;

213     return auth;
214 }

216 /*
217 * Closes the connection to the authentication agent and frees any associated
218 * memory.
219 */

221 void
222 ssh_close_authentication_connection(AuthenticationConnection *auth)
223 {
224     buffer_free(&auth->identities);
225     close(auth->fd);
226     xfree(auth);
227 }

229 /* Lock/unlock agent */
230 int
231 ssh_lock_agent(AuthenticationConnection *auth, int lock, const char *password)
232 {
233     int type;
234     Buffer msg;

236     buffer_init(&msg);
237     buffer_put_char(&msg, lock ? SSH_AGENTC_LOCK : SSH_AGENTC_UNLOCK);
238     buffer_put_cstring(&msg, password);

240     if (ssh_request_reply(auth, &msg, &msg) == 0) {
241         buffer_free(&msg);
242         return 0;
243     }
244     type = buffer_get_char(&msg);
245     buffer_free(&msg);
246     return decode_reply(type);
247 }

249 /*
250 * Returns the first authentication identity held by the agent.
251 */

253 int
254 ssh_get_num_identities(AuthenticationConnection *auth, int version)
255 {
256     int type, code1 = 0, code2 = 0;
257     Buffer request;

259     switch (version) {

```

```

260     case 1:
261         code1 = SSH_AGENTC_REQUEST_RSA_IDENTITIES;
262         code2 = SSH_AGENT_RSA_IDENTITIES_ANSWER;
263         break;
264     case 2:
265         code1 = SSH2_AGENTC_REQUEST_IDENTITIES;
266         code2 = SSH2_AGENT_IDENTITIES_ANSWER;
267         break;
268     default:
269         return 0;
270 }
271
272 /*
273  * Send a message to the agent requesting for a list of the
274  * identities it can represent.
275  */
276 buffer_init(&request);
277 buffer_put_char(&request, code1);
278
279 buffer_clear(&auth->identities);
280 if (ssh_request_reply(auth, &request, &auth->identities) == 0) {
281     buffer_free(&request);
282     return 0;
283 }
284 buffer_free(&request);
285
286 /* Get message type, and verify that we got a proper answer. */
287 type = buffer_get_char(&auth->identities);
288 if (agent_failed(type)) {
289     return 0;
290 } else if (type != code2) {
291     fatal("Bad authentication reply message type: %d", type);
292 }
293
294 /* Get the number of entries in the response and check it for sanity. */
295 auth->howmany = buffer_get_int(&auth->identities);
296 if (auth->howmany > 1024)
297     fatal("Too many identities in authentication reply: %d",
298         auth->howmany);
299
300 return auth->howmany;
301 }
302
303 Key *
304 ssh_get_first_identity(AuthenticationConnection *auth, char **comment, int versi
305 {
306     /* get number of identities and return the first entry (if any). */
307     if (ssh_get_num_identities(auth, version) > 0)
308         return ssh_get_next_identity(auth, comment, version);
309     return NULL;
310 }
311
312 Key *
313 ssh_get_next_identity(AuthenticationConnection *auth, char **comment, int versio
314 {
315     u_int bits;
316     u_char *blob;
317     u_int blen;
318     Key *key = NULL;
319
320     /* Return failure if no more entries. */
321     if (auth->howmany <= 0)
322         return NULL;
323
324     /*
325      * Get the next entry from the packet. These will abort with a fatal

```

```

326     * error if the packet is too short or contains corrupt data.
327     */
328     switch (version) {
329     case 1:
330         key = key_new(KEY_RSA1);
331         bits = buffer_get_int(&auth->identities);
332         buffer_get_bignum(&auth->identities, key->rsa->e);
333         buffer_get_bignum(&auth->identities, key->rsa->n);
334         *comment = buffer_get_string(&auth->identities, NULL);
335         if (bits != BN_num_bits(key->rsa->n))
336             log("Warning: identity keysize mismatch: actual %d, anno
337                 BN_num_bits(key->rsa->n), bits);
338         break;
339     case 2:
340         blob = buffer_get_string(&auth->identities, &blen);
341         *comment = buffer_get_string(&auth->identities, NULL);
342         key = key_from_blob(blob, blen);
343         xfree(blob);
344         break;
345     default:
346         return NULL;
347         break;
348     }
349     /* Decrement the number of remaining entries. */
350     auth->howmany--;
351     return key;
352 }
353
354 /*
355  * Generates a random challenge, sends it to the agent, and waits for
356  * response from the agent. Returns true (non-zero) if the agent gave the
357  * correct answer, zero otherwise. Response type selects the style of
358  * response desired, with 0 corresponding to protocol version 1.0 (no longer
359  * supported) and 1 corresponding to protocol version 1.1.
360  */
361
362 int
363 ssh_decrypt_challenge(AuthenticationConnection *auth,
364     Key* key, BIGNUM *challenge,
365     u_char session_id[16],
366     u_int response_type,
367     u_char response[16])
368 {
369     Buffer buffer;
370     int success = 0;
371     int i;
372     int type;
373
374     if (key->type != KEY_RSA1)
375         return 0;
376     if (response_type == 0) {
377         log("Compatibility with ssh protocol version 1.0 no longer suppo
378         return 0;
379     }
380     buffer_init(&buffer);
381     buffer_put_char(&buffer, SSH_AGENTC_RSA_CHALLENGE);
382     buffer_put_int(&buffer, BN_num_bits(key->rsa->n));
383     buffer_put_bignum(&buffer, key->rsa->e);
384     buffer_put_bignum(&buffer, key->rsa->n);
385     buffer_put_bignum(&buffer, challenge);
386     buffer_append(&buffer, session_id, 16);
387     buffer_put_int(&buffer, response_type);
388
389     if (ssh_request_reply(auth, &buffer, &buffer) == 0) {
390         buffer_free(&buffer);
391         return 0;

```

```

392     }
393     type = buffer_get_char(&buffer);

395     if (agent_failed(type)) {
396         log("Agent admitted failure to authenticate using the key.");
397     } else if (type != SSH_AGENT_RSA_RESPONSE) {
398         fatal("Bad authentication response: %d", type);
399     } else {
400         success = 1;
401         /*
402          * Get the response from the packet. This will abort with a
403          * fatal error if the packet is corrupt.
404          */
405         for (i = 0; i < 16; i++)
406             response[i] = buffer_get_char(&buffer);
407     }
408     buffer_free(&buffer);
409     return success;
410 }

412 /* ask agent to sign data, returns -1 on error, 0 on success */
413 int
414 ssh_agent_sign(AuthenticationConnection *auth,
415     Key *key,
416     u_char **sigp, u_int *lenp,
417     u_char *data, u_int datalen)
418 {
419     Buffer msg;
420     u_char *blob;
421     u_int blen;
422     int type, flags = 0;
423     int ret = -1;

425     if (key_to_blob(key, &blob, &blen) == 0)
426         return -1;

428     if (datafellows & SSH_BUG_SIGBLOB)
429         flags = SSH_AGENT_OLD_SIGNATURE;

431     buffer_init(&msg);
432     buffer_put_char(&msg, SSH2_AGENTC_SIGN_REQUEST);
433     buffer_put_string(&msg, blob, blen);
434     buffer_put_string(&msg, data, datalen);
435     buffer_put_int(&msg, flags);
436     xfree(blob);

438     if (ssh_request_reply(auth, &msg, &msg) == 0) {
439         buffer_free(&msg);
440         return -1;
441     }
442     type = buffer_get_char(&msg);
443     if (agent_failed(type)) {
444         log("Agent admitted failure to sign using the key.");
445     } else if (type != SSH2_AGENT_SIGN_RESPONSE) {
446         fatal("Bad authentication response: %d", type);
447     } else {
448         ret = 0;
449         *sigp = buffer_get_string(&msg, lenp);
450     }
451     buffer_free(&msg);
452     return ret;
453 }

455 /* Encode key for a message to the agent. */
457 static void

```

```

458 ssh_encode_identity_rsa1(Buffer *b, RSA *key, const char *comment)
459 {
460     buffer_put_int(b, BN_num_bits(key->n));
461     buffer_put_bignum(b, key->n);
462     buffer_put_bignum(b, key->e);
463     buffer_put_bignum(b, key->d);
464     /* To keep within the protocol: p < q for ssh. in SSL p > q */
465     buffer_put_bignum(b, key->iqmp); /* ssh key->u */
466     buffer_put_bignum(b, key->q); /* ssh key->p, SSL key->q */
467     buffer_put_bignum(b, key->p); /* ssh key->q, SSL key->p */
468     buffer_put_cstring(b, comment);
469 }

471 static void
472 ssh_encode_identity_ssh2(Buffer *b, Key *key, const char *comment)
473 {
474     buffer_put_cstring(b, key_ssh_name(key));
475     switch (key->type) {
476     case KEY_RSA:
477         buffer_put_bignum2(b, key->rsa->n);
478         buffer_put_bignum2(b, key->rsa->e);
479         buffer_put_bignum2(b, key->rsa->d);
480         buffer_put_bignum2(b, key->rsa->iqmp);
481         buffer_put_bignum2(b, key->rsa->p);
482         buffer_put_bignum2(b, key->rsa->q);
483         break;
484     case KEY_DSA:
485         buffer_put_bignum2(b, key->dsa->p);
486         buffer_put_bignum2(b, key->dsa->q);
487         buffer_put_bignum2(b, key->dsa->g);
488         buffer_put_bignum2(b, key->dsa->pub_key);
489         buffer_put_bignum2(b, key->dsa->priv_key);
490         break;
491     }
492     buffer_put_cstring(b, comment);
493 }

495 /*
496  * Adds an identity to the authentication server. This call is not meant to
497  * be used by normal applications.
498  */

500 int
501 ssh_add_identity_constrained(AuthenticationConnection *auth, Key *key,
502     const char *comment, u_int life)
503 {
504     Buffer msg;
505     int type, constrained = (life != 0);

507     buffer_init(&msg);

509     switch (key->type) {
510     case KEY_RSA1:
511         type = constrained ?
512             SSH_AGENTC_ADD_RSA_ID_CONSTRAINED :
513             SSH_AGENTC_ADD_RSA_IDENTITY;
514         buffer_put_char(&msg, type);
515         ssh_encode_identity_rsa1(&msg, key->rsa, comment);
516         break;
517     case KEY_RSA:
518     case KEY_DSA:
519         type = constrained ?
520             SSH2_AGENTC_ADD_ID_CONSTRAINED :
521             SSH2_AGENTC_ADD_IDENTITY;
522         buffer_put_char(&msg, type);
523         ssh_encode_identity_ssh2(&msg, key, comment);

```

```

524         break;
525     default:
526         buffer_free(&msg);
527         return 0;
528         break;
529     }
530     if (constrained) {
531         if (life != 0) {
532             buffer_put_char(&msg, SSH_AGENT_CONSTRAIN_LIFETIME);
533             buffer_put_int(&msg, life);
534         }
535     }
536     if (ssh_request_reply(auth, &msg, &msg) == 0) {
537         buffer_free(&msg);
538         return 0;
539     }
540     type = buffer_get_char(&msg);
541     buffer_free(&msg);
542     return decode_reply(type);
543 }

545 int
546 ssh_add_identity(AuthenticationConnection *auth, Key *key, const char *comment)
547 {
548     return ssh_add_identity_constrained(auth, key, comment, 0);
549 }

551 /*
552  * Removes an identity from the authentication server. This call is not
553  * meant to be used by normal applications.
554  */

556 int
557 ssh_remove_identity(AuthenticationConnection *auth, Key *key)
558 {
559     Buffer msg;
560     int type;
561     u_char *blob;
562     u_int blen;

564     buffer_init(&msg);

566     if (key->type == KEY_RSA1) {
567         buffer_put_char(&msg, SSH_AGENTC_REMOVE_RSA_IDENTITY);
568         buffer_put_int(&msg, BN_num_bits(key->rsa->n));
569         buffer_put_bignum(&msg, key->rsa->e);
570         buffer_put_bignum(&msg, key->rsa->n);
571     } else if (key->type == KEY_DSA || key->type == KEY_RSA) {
572         key_to_blob(key, &blob, &blen);
573         buffer_put_char(&msg, SSH2_AGENTC_REMOVE_IDENTITY);
574         buffer_put_string(&msg, blob, blen);
575         xfree(blob);
576     } else {
577         buffer_free(&msg);
578         return 0;
579     }
580     if (ssh_request_reply(auth, &msg, &msg) == 0) {
581         buffer_free(&msg);
582         return 0;
583     }
584     type = buffer_get_char(&msg);
585     buffer_free(&msg);
586     return decode_reply(type);
587 }

```

```

590 /*
591  * Removes all identities from the agent. This call is not meant to be used
592  * by normal applications.
593  */

595 int
596 ssh_remove_all_identities(AuthenticationConnection *auth, int version)
597 {
598     Buffer msg;
599     int type;
600     int code = (version==1) ?
601         SSH_AGENTC_REMOVE_ALL_RSA_IDENTITIES :
602         SSH2_AGENTC_REMOVE_ALL_IDENTITIES;

604     buffer_init(&msg);
605     buffer_put_char(&msg, code);

607     if (ssh_request_reply(auth, &msg, &msg) == 0) {
608         buffer_free(&msg);
609         return 0;
610     }
611     type = buffer_get_char(&msg);
612     buffer_free(&msg);
613     return decode_reply(type);
614 }

616 int
617 decode_reply(int type)
618 {
619     switch (type) {
620     case SSH_AGENT_FAILURE:
621     case SSH_COM_AGENT2_FAILURE:
622     case SSH2_AGENT_FAILURE:
623         log("SSH_AGENT_FAILURE");
624         return 0;
625     case SSH_AGENT_SUCCESS:
626         return 1;
627     default:
628         fatal("Bad response from authentication agent: %d", type);
629     }
630     /* NOTREACHED */
631     return 0;
632 }

```

```

*****
17293 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/authfile.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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1 /*
2  * Author: Tatu Ylonen <ylo@cs.hut.fi>
3  * Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
4  * All rights reserved
5  * This file contains functions for reading and writing identity files, and
6  * for reading the passphrase from the user.
7  *
8  * As far as I am concerned, the code I have written for this software
9  * can be used freely for any purpose. Any derived versions of this
10 * software must be clearly marked as such, and if the derived work is
11 * incompatible with the protocol description in the RFC file, it must be
12 * called by a name other than "ssh" or "Secure Shell".
13 *
14 *
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34 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
35 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
36 */

38 #include "includes.h"
39 RCSID("$OpenBSD: authfile.c,v 1.50 2002/06/24 14:55:38 markus Exp $");

41 #pragma ident "%Z%M% %I% %E% SMI"

43 #include <openssl/opensslconf.h>
44 #include <openssl/err.h>
45 #include <openssl/evp.h>
46 #include <openssl/pem.h>

48 #include "cipher.h"
49 #include "xmalloc.h"
50 #include "buffer.h"
51 #include "bufaux.h"
52 #include "key.h"
53 #include "ssh.h"
54 #include "log.h"
55 #include "authfile.h"
56 #include "rsa.h"

58 /* Version identification string for SSH v1 identity files. */
59 static const char authfile_id_string[] =
60     "SSH PRIVATE KEY FILE FORMAT 1.1\n";

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62 /*
63  * Saves the authentication (private) key in a file, encrypting it with
64  * passphrase. The identification of the file (lowest 64 bits of n) will
65  * precede the key to provide identification of the key without needing a
66  * passphrase.
67  */

69 static int
70 key_save_private_rsa1(Key *key, const char *filename, const char *passphrase,
71     const char *comment)
72 {
73     Buffer buffer, encrypted;
74     u_char buf[100], *cp;
75     int fd, i, cipher_num;
76     CipherContext ciphercontext;
77     Cipher *cipher;
78     u_int32_t rand;

80     /*
81      * If the passphrase is empty, use SSH_CIPHER_NONE to ease converting
82      * to another cipher; otherwise use SSH_AUTHFILE_CIPHER.
83      */
84     cipher_num = (strcmp(passphrase, "") == 0) ?
85         SSH_CIPHER_NONE : SSH_AUTHFILE_CIPHER;
86     if ((cipher = cipher_by_number(cipher_num)) == NULL)
87         fatal("save_private_key_rsa: bad cipher");

89     /* This buffer is used to built the secret part of the private key. */
90     buffer_init(&buffer);

92     /* Put checkbytes for checking passphrase validity. */
93     rand = arc4random();
94     buf[0] = rand & 0xff;
95     buf[1] = (rand >> 8) & 0xff;
96     buf[2] = buf[0];
97     buf[3] = buf[1];
98     buffer_append(&buffer, buf, 4);

100     /*
101      * Store the private key (n and e will not be stored because they
102      * will be stored in plain text, and storing them also in encrypted
103      * format would just give known plaintext).
104      */
105     buffer_put_bignum(&buffer, key->rsa->d);
106     buffer_put_bignum(&buffer, key->rsa->iqmp);
107     buffer_put_bignum(&buffer, key->rsa->q); /* reverse from SSL p */
108     buffer_put_bignum(&buffer, key->rsa->p); /* reverse from SSL q */

110     /* Pad the part to be encrypted until its size is a multiple of 8. */
111     while (buffer_len(&buffer) % 8 != 0)
112         buffer_put_char(&buffer, 0);

114     /* This buffer will be used to contain the data in the file. */
115     buffer_init(&encrypted);

117     /* First store keyfile id string. */
118     for (i = 0; authfile_id_string[i]; i++)
119         buffer_put_char(&encrypted, authfile_id_string[i]);
120     buffer_put_char(&encrypted, 0);

122     /* Store cipher type. */
123     buffer_put_char(&encrypted, cipher_num);
124     buffer_put_int(&encrypted, 0); /* For future extension */

126     /* Store public key. This will be in plain text. */
127     buffer_put_int(&encrypted, BN_num_bits(key->rsa->n));

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128     buffer_put_bignum(&encrypted, key->rsa->n);
129     buffer_put_bignum(&encrypted, key->rsa->e);
130     buffer_put_cstring(&encrypted, comment);

132     /* Allocate space for the private part of the key in the buffer. */
133     cp = buffer_append_space(&encrypted, buffer_len(&buffer));

135     cipher_set_key_string(&ciphercontext, cipher, passphrase,
136                           CIPHER_ENCRYPT);
137     cipher_crypt(&ciphercontext, cp,
138                 buffer_ptr(&buffer), buffer_len(&buffer));
139     cipher_cleanup(&ciphercontext);
140     memset(&ciphercontext, 0, sizeof(ciphercontext));

142     /* Destroy temporary data. */
143     memset(buf, 0, sizeof(buf));
144     buffer_free(&buffer);

146     fd = open(filename, O_WRONLY | O_CREAT | O_TRUNC, 0600);
147     if (fd < 0) {
148         error("open %s failed: %s.", filename, strerror(errno));
149         return 0;
150     }
151     if (write(fd, buffer_ptr(&encrypted), buffer_len(&encrypted)) !=
152         buffer_len(&encrypted)) {
153         error("write to key file %s failed: %s", filename,
154             strerror(errno));
155         buffer_free(&encrypted);
156         close(fd);
157         unlink(filename);
158         return 0;
159     }
160     close(fd);
161     buffer_free(&encrypted);
162     return 1;
163 }

165 /* save SSH v2 key in OpenSSL PEM format */
166 static int
167 key_save_private_pem(Key *key, const char *filename, const char *_passphrase,
168                     const char *comment)
169 {
170     FILE *fp;
171     int fd;
172     int success = 0;
173     int len = strlen(_passphrase);
174     u_char *passphrase = (len > 0) ? (u_char *)_passphrase : NULL;
175     const EVP_CIPHER *cipher = (len > 0) ? EVP_des_ede3_cbc() : NULL;

177     if (len > 0 && len <= 4) {
178         error("passphrase too short: have %d bytes, need > 4", len);
179         return 0;
180     }
181     fd = open(filename, O_WRONLY | O_CREAT | O_TRUNC, 0600);
182     if (fd < 0) {
183         error("open %s failed: %s.", filename, strerror(errno));
184         return 0;
185     }
186     fp = fdopen(fd, "w");
187     if (fp == NULL) {
188         error("fdopen %s failed: %s.", filename, strerror(errno));
189         close(fd);
190         return 0;
191     }
192     switch (key->type) {
193         case KEY_DSA:

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194         success = PEM_write_DSAPrivateKey(fp, key->dsa,
195                                           cipher, passphrase, len, NULL, NULL);
196         break;
197     case KEY_RSA:
198         success = PEM_write_RSAPrivateKey(fp, key->rsa,
199                                           cipher, passphrase, len, NULL, NULL);
200         break;
201     }
202     fclose(fp);
203     return success;
204 }

206 int
207 key_save_private(Key *key, const char *filename, const char *passphrase,
208                 const char *comment)
209 {
210     switch (key->type) {
211     case KEY_RSA1:
212         return key_save_private_rsa1(key, filename, passphrase,
213                                     comment);
214         break;
215     case KEY_DSA:
216     case KEY_RSA:
217         return key_save_private_pem(key, filename, passphrase,
218                                     comment);
219         break;
220     default:
221         break;
222     }
223     error("key_save_private: cannot save key type %d", key->type);
224     return 0;
225 }

227 /*
228  * Loads the public part of the ssh v1 key file. Returns NULL if an error was
229  * encountered (the file does not exist or is not readable), and the key
230  * otherwise.
231  */

233 static Key *
234 key_load_public_rsa1(int fd, const char *filename, char **commentp)
235 {
236     Buffer buffer;
237     Key *pub;
238     char *cp;
239     int i;
240     off_t len;

242     len = lseek(fd, (off_t) 0, SEEK_END);
243     lseek(fd, (off_t) 0, SEEK_SET);

245     buffer_init(&buffer);
246     cp = buffer_append_space(&buffer, len);

248     if (read(fd, cp, (size_t) len) != (size_t) len) {
249         debug("Read from key file %.200s failed: %.100s", filename,
250             strerror(errno));
251         buffer_free(&buffer);
252         return NULL;
253     }

255     /* Check that it is at least big enough to contain the ID string. */
256     if (len < sizeof(authfile_id_string)) {
257         debug3("Not a RSA1 key file %.200s.", filename);
258         buffer_free(&buffer);
259         return NULL;

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260     }
261     /*
262      * Make sure it begins with the id string. Consume the id string
263      * from the buffer.
264      */
265     for (i = 0; i < sizeof(authfile_id_string); i++)
266         if (buffer_get_char(&buffer) != authfile_id_string[i]) {
267             debug3("Not a RSA1 key file %.200s.", filename);
268             buffer_free(&buffer);
269             return NULL;
270         }
271     /* Skip cipher type and reserved data. */
272     (void) buffer_get_char(&buffer); /* cipher type */
273     (void) buffer_get_int(&buffer); /* reserved */
274
275     /* Read the public key from the buffer. */
276     (void) buffer_get_int(&buffer);
277     pub = key_new(KEY_RSA1);
278     buffer_get_bignum(&buffer, pub->rsa->n);
279     buffer_get_bignum(&buffer, pub->rsa->e);
280     if (commentp)
281         *commentp = buffer_get_string(&buffer, NULL);
282     /* The encrypted private part is not parsed by this function. */
283
284     buffer_free(&buffer);
285     return pub;
286 }
287
288 /* load public key from private-key file, works only for SSH v1 */
289 Key *
290 key_load_public_type(int type, const char *filename, char **commentp)
291 {
292     Key *pub;
293     int fd;
294
295     if (type == KEY_RSA1) {
296         fd = open(filename, O_RDONLY);
297         if (fd < 0)
298             return NULL;
299         pub = key_load_public_rsa1(fd, filename, commentp);
300         close(fd);
301         return pub;
302     }
303     return NULL;
304 }
305
306 /*
307  * Loads the private key from the file. Returns 0 if an error is encountered
308  * (file does not exist or is not readable, or passphrase is bad). This
309  * initializes the private key.
310  * Assumes we are called under uid of the owner of the file.
311  */
312
313 static Key *
314 key_load_private_rsa1(int fd, const char *filename, const char *passphrase,
315                      char **commentp)
316 {
317     int i, check1, check2, cipher_type;
318     off_t len;
319     Buffer buffer, decrypted;
320     u_char *cp;
321     CipherContext ciphercontext;
322     Cipher *cipher;
323     Key *prv = NULL;
324
325     len = lseek(fd, (off_t) 0, SEEK_END);

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326     lseek(fd, (off_t) 0, SEEK_SET);
327
328     buffer_init(&buffer);
329     cp = buffer_append_space(&buffer, len);
330
331     if (read(fd, cp, (size_t) len) != (size_t) len) {
332         debug("Read from key file %.200s failed: %.100s", filename,
333             strerror(errno));
334         buffer_free(&buffer);
335         close(fd);
336         return NULL;
337     }
338
339     /* Check that it is at least big enough to contain the ID string. */
340     if (len < sizeof(authfile_id_string)) {
341         debug3("Not a RSA1 key file %.200s.", filename);
342         buffer_free(&buffer);
343         close(fd);
344         return NULL;
345     }
346     /*
347      * Make sure it begins with the id string. Consume the id string
348      * from the buffer.
349      */
350     for (i = 0; i < sizeof(authfile_id_string); i++)
351         if (buffer_get_char(&buffer) != authfile_id_string[i]) {
352             debug3("Not a RSA1 key file %.200s.", filename);
353             buffer_free(&buffer);
354             close(fd);
355             return NULL;
356         }
357
358     /* Read cipher type. */
359     cipher_type = buffer_get_char(&buffer);
360     (void) buffer_get_int(&buffer); /* Reserved data. */
361
362     /* Read the public key from the buffer. */
363     (void) buffer_get_int(&buffer);
364     prv = key_new_private(KEY_RSA1);
365
366     buffer_get_bignum(&buffer, prv->rsa->n);
367     buffer_get_bignum(&buffer, prv->rsa->e);
368     if (commentp)
369         *commentp = buffer_get_string(&buffer, NULL);
370     else
371         xfree(buffer_get_string(&buffer, NULL));
372
373     /* Check that it is a supported cipher. */
374     cipher = cipher_by_number(cipher_type);
375     if (cipher == NULL) {
376         debug("Unsupported cipher %d used in key file %.200s.",
377             cipher_type, filename);
378         buffer_free(&buffer);
379         goto fail;
380     }
381     /* Initialize space for decrypted data. */
382     buffer_init(&decrypted);
383     cp = buffer_append_space(&decrypted, buffer_len(&buffer));
384
385     /* Rest of the buffer is encrypted. Decrypt it using the passphrase. */
386     cipher_set_key_string(&ciphercontext, cipher, passphrase,
387         CIPHER_DECRYPT);
388     cipher_crypt(&ciphercontext, cp,
389         buffer_ptr(&buffer), buffer_len(&buffer));
390     cipher_cleanup(&ciphercontext);
391     memset(&ciphercontext, 0, sizeof(ciphercontext));

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392     buffer_free(&buffer);

394     check1 = buffer_get_char(&decrypted);
395     check2 = buffer_get_char(&decrypted);
396     if (check1 != buffer_get_char(&decrypted) ||
397         check2 != buffer_get_char(&decrypted)) {
398         if (strcmp(passphrase, "") != 0)
399             debug("Bad passphrase supplied for key file %.200s.",
400                 filename);
401         /* Bad passphrase. */
402         buffer_free(&decrypted);
403         goto fail;
404     }
405     /* Read the rest of the private key. */
406     buffer_get_bignum(&decrypted, prv->rsa->d);
407     buffer_get_bignum(&decrypted, prv->rsa->iqmp);          /* u */
408     /* in SSL and SSH v1 p and q are exchanged */
409     buffer_get_bignum(&decrypted, prv->rsa->q);             /* p */
410     buffer_get_bignum(&decrypted, prv->rsa->p);             /* q */

412     /* calculate p-1 and q-1 */
413     rsa_generate_additional_parameters(prv->rsa);

415     buffer_free(&decrypted);
416     close(fd);
417     return prv;

419 fail:
420     if (commentp)
421         xfree(*commentp);
422     close(fd);
423     key_free(prv);
424     return NULL;
425 }

427 Key *
428 key_load_private_pem(int fd, int type, const char *passphrase,
429     char **commentp)
430 {
431     FILE *fp;
432     EVP_PKEY *pk = NULL;
433     Key *prv = NULL;
434     char *name = "<no key>";

436     fp = fdopen(fd, "r");
437     if (fp == NULL) {
438         error("fdopen failed: %s", strerror(errno));
439         close(fd);
440         return NULL;
441     }
442     pk = PEM_read_PrivateKey(fp, NULL, NULL, (char *)passphrase);
443     if (pk == NULL) {
444         debug("PEM_read_PrivateKey failed");
445         (void)ERR_get_error();
446     } else if (pk->type == EVP_PKEY_RSA &&
447         (type == KEY_UNSPEC || type == KEY_RSA)) {
448         prv = key_new(KEY_UNSPEC);
449         prv->rsa = EVP_PKEY_get1_RSA(pk);
450         prv->type = KEY_RSA;
451         name = "rsa w/o comment";
452 #ifdef DEBUG_PK
453         RSA_print_fp(stderr, prv->rsa, 8);
454 #endif
455     } else if (pk->type == EVP_PKEY_DSA &&
456         (type == KEY_UNSPEC || type == KEY_DSA)) {
457         prv = key_new(KEY_UNSPEC);

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458         prv->dsa = EVP_PKEY_get1_DSA(pk);
459         prv->type = KEY_DSA;
460         name = "dsa w/o comment";
461 #ifdef DEBUG_PK
462         DSA_print_fp(stderr, prv->dsa, 8);
463 #endif
464     } else {
465         error("PEM_read_PrivateKey: mismatch or "
466             "unknown EVP_PKEY save_type %d", pk->save_type);
467     }
468     fclose(fp);
469     if (pk != NULL)
470         EVP_PKEY_free(pk);
471     if (prv != NULL && commentp)
472         *commentp = xstrdup(name);
473     debug("read PEM private key done: type %s",
474         prv ? key_type(prv) : "<unknown>");
475     return prv;
476 }

478 static int
479 key_perm_ok(int fd, const char *filename)
480 {
481     struct stat st;

483     if (fstat(fd, &st) < 0)
484         return 0;
485     /*
486      * if a key owned by the user is accessed, then we check the
487      * permissions of the file. if the key owned by a different user,
488      * then we don't care.
489      */
490 #ifdef HAVE_CYGWIN
491     if (check_ntsec(filename))
492 #endif
493     if ((st.st_uid == getuid()) && (st.st_mode & 077) != 0) {
494         error("Warning: UNPROTECTED PRIVATE KEY FILE!");
495         error("Permissions 0%3.3o for '%s' are too open.",
496             (int)(st.st_mode & 0777), filename);
497         error("It is recommended that your private key files are NOT acc
498             error("This private key will be ignored.");
499         return 0;
500     }
501     return 1;
502 }

503 }

504 }

506 Key *
507 key_load_private_type(int type, const char *filename, const char *passphrase,
508     char **commentp)
509 {
510     int fd;

512     fd = open(filename, O_RDONLY);
513     if (fd < 0)
514         return NULL;
515     if (!key_perm_ok(fd, filename)) {
516         error("bad permissions: ignore key: %s", filename);
517         close(fd);
518         return NULL;
519     }
520     switch (type) {
521     case KEY_RSA1:
522         return key_load_private_rsa1(fd, filename, passphrase,
523             commentp);

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524         /* closes fd */
525         break;
526     case KEY_DSA:
527     case KEY_RSA:
528     case KEY_UNSPEC:
529         return key_load_private_pem(fd, type, passphrase, commentp);
530         /* closes fd */
531         break;
532     default:
533         close(fd);
534         break;
535     }
536     return NULL;
537 }

539 Key *
540 key_load_private(const char *filename, const char *passphrase,
541                 char **commentp)
542 {
543     Key *pub, *prv;
544     int fd;

546     fd = open(filename, O_RDONLY);
547     if (fd < 0)
548         return NULL;
549     if (!key_perm_ok(fd, filename)) {
550         error("bad permissions: ignore key: %s", filename);
551         close(fd);
552         return NULL;
553     }
554     pub = key_load_public_rsa1(fd, filename, commentp);
555     lseek(fd, (off_t) 0, SEEK_SET); /* rewind */
556     if (pub == NULL) {
557         /* closes fd */
558         prv = key_load_private_pem(fd, KEY_UNSPEC, passphrase, NULL);
559         /* use the filename as a comment for PEM */
560         if (commentp && prv)
561             *commentp = xstrdup(filename);
562     } else {
563         /* it's a SSH v1 key if the public key part is readable */
564         key_free(pub);
565         /* closes fd */
566         prv = key_load_private_rsa1(fd, filename, passphrase, NULL);
567     }
568     return prv;
569 }

571 static int
572 key_try_load_public(Key *k, const char *filename, char **commentp)
573 {
574     FILE *f;
575     char line[4096];
576     char *cp;

578     f = fopen(filename, "r");
579     if (f != NULL) {
580         while (fgets(line, sizeof(line), f)) {
581             line[sizeof(line)-1] = '\0';
582             cp = line;
583             switch (*cp) {
584             case '#':
585             case '\n':
586             case '\0':
587                 continue;
588             }
589             /* Skip leading whitespace. */

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590         for (; *cp && (*cp == ' ' || *cp == '\t'); cp++)
591             ;
592         if (*cp) {
593             if (key_read(k, &cp) == 1) {
594                 if (commentp)
595                     *commentp = xstrdup(filename);
596                 fclose(f);
597                 return 1;
598             }
599         }
600     }
601     fclose(f);
602     return 0;
603 }
604 }

606 /* load public key from ssh v1 private or any pubkey file */
607 Key *
608 key_load_public(const char *filename, char **commentp)
609 {
610     Key *pub;
611     char file[MAXPATHLEN];

613     pub = key_load_public_type(KEY_RSA1, filename, commentp);
614     if (pub != NULL)
615         return pub;
616     pub = key_new(KEY_UNSPEC);
617     if (key_try_load_public(pub, filename, commentp) == 1)
618         return pub;
619     if ((strncpy(file, filename, sizeof(file)) < sizeof(file)) &&
620         (strcat(file, ".pub", sizeof(file)) < sizeof(file)) &&
621         (key_try_load_public(pub, file, commentp) == 1))
622         return pub;
623     key_free(pub);
624     return NULL;
625 }

```

10887 Fri May 30 18:31:09 2014
 new/usr/src/cmd/ssh/libssh/common/bufaux.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /*
2  * Copyright 2009 Sun Microsystems, Inc. All rights reserved.
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4  */
5 /*
6  * Author: Tatu Ylonen <ylo@cs.hut.fi>
7  * Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
8  * All rights reserved
9  * Auxiliary functions for storing and retrieving various data types to/from
10 * Buffers.
11 *
12 * As far as I am concerned, the code I have written for this software
13 * can be used freely for any purpose. Any derived versions of this
14 * software must be clearly marked as such, and if the derived work is
15 * incompatible with the protocol description in the RFC file, it must be
16 * called by a name other than "ssh" or "Secure Shell".
17 *
18 *
19 * SSH2 packet format added by Markus Friedl
20 * Copyright (c) 2000 Markus Friedl. All rights reserved.
21 *
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38 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
39 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
40 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
41 */

43 #include "includes.h"
44 RCSID("$OpenBSD: bufaux.c,v 1.27 2002/06/26 08:53:12 markus Exp $");

46 #include <openssl/opensslconf.h>
47 #include <langinfo.h>
48 #include <openssl/bn.h>
49 #include "bufaux.h"
50 #include "xmalloc.h"
51 #include "getput.h"
52 #include "log.h"
53 #include "g11n.h"

55 /*
56  * Stores an BIGNUM in the buffer with a 2-byte msb first bit count, followed
57  * by (bits+7)/8 bytes of binary data, msb first.
58  */
59 int
60 buffer_put_bignum_ret(Buffer *buffer, const BIGNUM *value)
61 {

```

```

62     int bits = BN_num_bits(value);
63     int bin_size = (bits + 7) / 8;
64     u_char *buf = xmalloc(bin_size);
65     int oi;
66     char msg[2];

68     /* Get the value of in binary */
69     oi = BN_bn2bin(value, buf);
70     if (oi != bin_size) {
71         error("buffer_put_bignum_ret: BN_bn2bin() failed: oi %d != bin_s
72             oi, bin_size);
73         xfree(buf);
74         return (-1);
75     }

77     /* Store the number of bits in the buffer in two bytes, msb first. */
78     PUT_16BIT(msg, bits);
79     buffer_append(buffer, msg, 2);
80     /* Store the binary data. */
81     buffer_append(buffer, (char *)buf, oi);

83     memset(buf, 0, bin_size);
84     xfree(buf);

86     return (0);
87 }

89 void
90 buffer_put_bignum(Buffer *buffer, const BIGNUM *value)
91 {
92     if (buffer_put_bignum_ret(buffer, value) == -1)
93         fatal("buffer_put_bignum: buffer error");
94 }

96 /*
97  * Retrieves an BIGNUM from the buffer.
98  */
99 int
100 buffer_get_bignum_ret(Buffer *buffer, BIGNUM *value)
101 {
102     u_int bits, bytes;
103     u_char buf[2], *bin;

105     /* Get the number for bits. */
106     if (buffer_get_ret(buffer, (char *) buf, 2) == -1) {
107         error("buffer_get_bignum_ret: invalid length");
108         return (-1);
109     }
110     bits = GET_16BIT(buf);
111     /* Compute the number of binary bytes that follow. */
112     bytes = (bits + 7) / 8;
113     if (bytes > 8 * 1024) {
114         error("buffer_get_bignum_ret: cannot handle BN of size %d", byte
115             return (-1);
116     }
117     if (buffer_len(buffer) < bytes) {
118         error("buffer_get_bignum_ret: input buffer too small");
119         return (-1);
120     }
121     bin = buffer_ptr(buffer);
122     BN_bin2bn(bin, bytes, value);
123     if (buffer_consume_ret(buffer, bytes) == -1) {
124         error("buffer_get_bignum_ret: buffer_consume failed");
125         return (-1);
126     }
127     return (0);

```

```

128 }

130 void
131 buffer_get_bignum(Buffer *buffer, BIGNUM *value)
132 {
133     if (buffer_get_bignum_ret(buffer, value) == -1)
134         fatal("buffer_get_bignum: buffer error");
135 }

137 /*
138  * Stores an BIGNUM in the buffer in SSH2 format.
139  */
140 int
141 buffer_put_bignum2_ret(Buffer *buffer, const BIGNUM *value)
142 {
143     u_int bytes;
144     u_char *buf;
145     int oi;
146     u_int hasnohigh = 0;

148     if (BN_is_zero(value)) {
149         buffer_put_int(buffer, 0);
150         return 0;
151     }
152     if (value->neg) {
153         error("buffer_put_bignum2_ret: negative numbers not supported");
154         return (-1);
155     }
156     bytes = BN_num_bytes(value) + 1; /* extra padding byte */
157     if (bytes < 2) {
158         error("buffer_put_bignum2_ret: BN too small");
159         return (-1);
160     }
161     buf = xmalloc(bytes);
162     buf[0] = 0x00;
163     /* Get the value of in binary */
164     oi = BN_bn2bin(value, buf+1);
165     if (oi < 0 || (u_int)oi != bytes - 1) {
166         error("buffer_put_bignum2_ret: BN_bn2bin() failed: "
167             "oi %d != bin_size %d", oi, bytes);
168         xfree(buf);
169         return (-1);
170     }
171     hasnohigh = (buf[1] & 0x80) ? 0 : 1;
172     buffer_put_string(buffer, buf+hasnohigh, bytes-hasnohigh);
173     memset(buf, 0, bytes);
174     xfree(buf);
175     return (0);
176 }

178 void
179 buffer_put_bignum2(Buffer *buffer, const BIGNUM *value)
180 {
181     if (buffer_put_bignum2_ret(buffer, value) == -1)
182         fatal("buffer_put_bignum2: buffer error");
183 }

185 /* XXX does not handle negative BNs */
186 int
187 buffer_get_bignum2_ret(Buffer *buffer, BIGNUM *value)
188 {
189     u_int len;
190     u_char *bin;

192     if ((bin = buffer_get_string_ret(buffer, &len)) == NULL) {
193         error("buffer_get_bignum2_ret: invalid bignum");

```

```

194         return (-1);
195     }

197     if (len > 0 && (bin[0] & 0x80)) {
198         error("buffer_get_bignum2_ret: negative numbers not supported");
199         xfree(bin);
200         return (-1);
201     }
202     if (len > 8 * 1024) {
203         error("buffer_get_bignum2_ret: cannot handle BN of size %d", len);
204         xfree(bin);
205         return (-1);
206     }
207     BN_bin2bn(bin, len, value);
208     xfree(bin);
209     return (0);
210 }

212 void
213 buffer_get_bignum2(Buffer *buffer, BIGNUM *value)
214 {
215     if (buffer_get_bignum2_ret(buffer, value) == -1)
216         fatal("buffer_get_bignum2: buffer error");
217 }

219 /*
220  * Returns integers from the buffer (msb first).
221  */

223 int
224 buffer_get_short_ret(u_short *ret, Buffer *buffer)
225 {
226     u_char buf[2];

228     if (buffer_get_ret(buffer, (char *) buf, 2) == -1)
229         return (-1);
230     *ret = GET_16BIT(buf);
231     return (0);
232 }

234 u_short
235 buffer_get_short(Buffer *buffer)
236 {
237     u_short ret;

239     if (buffer_get_short_ret(&ret, buffer) == -1)
240         fatal("buffer_get_short: buffer error");

242     return (ret);
243 }

245 int
246 buffer_get_int_ret(u_int *ret, Buffer *buffer)
247 {
248     u_char buf[4];

250     if (buffer_get_ret(buffer, (char *) buf, 4) == -1)
251         return (-1);
252     *ret = GET_32BIT(buf);
253     return (0);
254 }

256 u_int
257 buffer_get_int(Buffer *buffer)
258 {
259     u_int ret;

```

```

261     if (buffer_get_int_ret(&ret, buffer) == -1)
262         fatal("buffer_get_int: buffer error");

264     return (ret);
265 }

267 #ifdef HAVE_U_INT64_T
268 int
269 buffer_get_int64_ret(u_int64_t *ret, Buffer *buffer)
270 {
271     u_char buf[8];

273     if (buffer_get_ret(buffer, (char *) buf, 8) == -1)
274         return (-1);
275     *ret = GET_64BIT(buf);
276     return (0);
277 }

279 u_int64_t
280 buffer_get_int64(Buffer *buffer)
281 {
282     u_int64_t ret;

284     if (buffer_get_int64_ret(&ret, buffer) == -1)
285         fatal("buffer_get_int: buffer error");

287     return (ret);
288 }
289 #endif

291 /*
292  * Stores integers in the buffer, msb first.
293  */
294 void
295 buffer_put_short(Buffer *buffer, u_short value)
296 {
297     char buf[2];

299     PUT_16BIT(buf, value);
300     buffer_append(buffer, buf, 2);
301 }

303 void
304 buffer_put_int(Buffer *buffer, u_int value)
305 {
306     char buf[4];

308     PUT_32BIT(buf, value);
309     buffer_append(buffer, buf, 4);
310 }

312 #ifdef HAVE_U_INT64_T
313 void
314 buffer_put_int64(Buffer *buffer, u_int64_t value)
315 {
316     char buf[8];

318     PUT_64BIT(buf, value);
319     buffer_append(buffer, buf, 8);
320 }
321 #endif

323 /*
324  * Returns an arbitrary binary string from the buffer. The string cannot
325  * be longer than 256k. The returned value points to memory allocated

```

```

326  * with xmalloc; it is the responsibility of the calling function to free
327  * the data. If length_ptr is non-NULL, the length of the returned data
328  * will be stored there. A null character will be automatically appended
329  * to the returned string, and is not counted in length.
330  */
331 void *
332 buffer_get_string_ret(Buffer *buffer, u_int *length_ptr)
333 {
334     u_char *value;
335     u_int len;

337     /* Get the length. */
338     len = buffer_get_int(buffer);
339     if (len > 256 * 1024) {
340         error("buffer_get_string_ret: bad string length %u", len);
341         return (NULL);
342     }
343     /* Allocate space for the string. Add one byte for a null character. */
344     value = xmalloc(len + 1);
345     /* Get the string. */
346     if (buffer_get_ret(buffer, value, len) == -1) {
347         error("buffer_get_string_ret: buffer_get failed");
348         xfree(value);
349         return (NULL);
350     }
351     /* Append a null character to make processing easier. */
352     value[len] = 0;
353     /* Optionally return the length of the string. */
354     if (length_ptr)
355         *length_ptr = len;
356     return (value);
357 }

359 void *
360 buffer_get_string(Buffer *buffer, u_int *length_ptr)
361 {
362     void *ret;

364     if ((ret = buffer_get_string_ret(buffer, length_ptr)) == NULL)
365         fatal("buffer_get_string: buffer error");
366     return (ret);
367 }

369 char *
370 buffer_get_utf8_string(Buffer *buffer, u_int *length_ptr)
371 {
372     char *value, *converted, *estr;
373     u_int len;

375     if ((value = buffer_get_string(buffer, &len)) == NULL)
376         return (value);

378     converted = g11n_convert_from_utf8(value, &len, &estr);
379     if (converted == NULL) {
380         if (estr != NULL)
381             error("invalid UTF-8 sequence: %s", estr);
382         converted = value;
383     } else {
384         xfree(value);
385     }

387     if (length_ptr != NULL)
388         *length_ptr = len;

390     return (converted);
391 }

```

```

393 /*
394  * Stores and arbitrary binary string in the buffer.
395  */
396 void
397 buffer_put_string(Buffer *buffer, const void *buf, u_int len)
398 {
399     buffer_put_int(buffer, len);
400     buffer_append(buffer, buf, len);
401 }
402 void
403 buffer_put_cstring(Buffer *buffer, const char *s)
404 {
405     if (s == NULL)
406         fatal("buffer_put_cstring: s == NULL");
407     buffer_put_string(buffer, s, strlen(s));
408 }
409
410 /*
411  * UTF-8 versions of the above.
412  */
413 void
414 buffer_put_utf8_string(Buffer *buffer, const char *s, uint_t len)
415 {
416     char *converted, *estr;
417     uint_t nlen = len;
418
419     converted = g11n_convert_to_utf8(s, &nlen, 0, &estr);
420     if (converted == NULL) {
421         if (estr != NULL)
422             error("Can't convert to UTF-8: %s", estr);
423         converted = (char *)s;
424     }
425
426     buffer_put_string(buffer, converted, nlen);
427
428     if (converted != s)
429         xfree(converted);
430 }
431
432 void
433 buffer_put_utf8_cstring(Buffer *buffer, const char *s)
434 {
435     buffer_put_utf8_string(buffer, s, strlen(s));
436 }
437
438 /*
439  * Returns a character from the buffer (0 - 255).
440  */
441 int
442 buffer_get_char_ret(char *ret, Buffer *buffer)
443 {
444     if (buffer_get_ret(buffer, ret, 1) == -1) {
445         error("buffer_get_char_ret: buffer_get_ret failed");
446         return (-1);
447     }
448     return (0);
449 }
450
451 int
452 buffer_get_char(Buffer *buffer)
453 {
454     char ch;
455
456     if (buffer_get_char_ret(&ch, buffer) == -1)
457         fatal("buffer_get_char: buffer error");

```

```

458     return (u_char) ch;
459 }
460
461 /*
462  * Stores a character in the buffer.
463  */
464 void
465 buffer_put_char(Buffer *buffer, int value)
466 {
467     char ch = value;
468
469     buffer_append(buffer, &ch, 1);
470 }

```

```

*****
4360 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/cipher-ctr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Copyright (c) 2003 Markus Friedl <markus@openbsd.org>
3  *
4  * Permission to use, copy, modify, and distribute this software for any
5  * purpose with or without fee is hereby granted, provided that the above
6  * copyright notice and this permission notice appear in all copies.
7  *
8  * THE SOFTWARE IS PROVIDED "AS IS" AND THE AUTHOR DISCLAIMS ALL WARRANTIES
9  * WITH REGARD TO THIS SOFTWARE INCLUDING ALL IMPLIED WARRANTIES OF
10 * MERCHANTABILITY AND FITNESS. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR
11 * ANY SPECIAL, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES
12 * WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN
13 * ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF
14 * OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.
15 */
16 /*
17  * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
18  * Use is subject to license terms.
19 */

21 #include "includes.h"
22 RCSID("$OpenBSD: cipher-ctr.c,v 1.4 2004/02/06 23:41:13 dtucker Exp $");

24 #include <openssl/opensslconf.h>
25 #include <openssl/evp.h>

27 #include "log.h"
28 #include "xmalloc.h"
29 #include <openssl/aes.h>

31 const EVP_CIPHER *evp_aes_128_ctr(void);
32 void ssh_aes_ctr_iv(EVP_CIPHER_CTX *, int, u_char *, u_int);

34 struct ssh_aes_ctr_ctx
35 {
36     AES_KEY      aes_ctx;
37     u_char       aes_counter[AES_BLOCK_SIZE];
38 };

40 /*
41  * increment counter 'ctr',
42  * the counter is of size 'len' bytes and stored in network-byte-order.
43  * (LSB at ctr[len-1], MSB at ctr[0])
44  */
45 static void
46 ssh_ctr_inc(u_char *ctr, u_int len)
47 {
48     int i;

49     for (i = len - 1; i >= 0; i--)
50         if (++ctr[i]) /* continue on overflow */
51             return;
52 }

53 }

55 static int
56 ssh_aes_ctr(EVP_CIPHER_CTX *ctx, u_char *dest, const u_char *src,
57             u_int len)
58 {
59     struct ssh_aes_ctr_ctx *c;
60     u_int n = 0;
61     u_char buf[AES_BLOCK_SIZE];

```

```

63     if (len == 0)
64         return (1);
65     if ((c = EVP_CIPHER_CTX_get_app_data(ctx)) == NULL)
66         return (0);

68     while ((len--) > 0) {
69         if (n == 0) {
70             AES_encrypt(c->aes_counter, buf, &c->aes_ctx);
71             ssh_ctr_inc(c->aes_counter, AES_BLOCK_SIZE);
72         }
73         *(dest++) = *(src++) ^ buf[n];
74         n = (n + 1) % AES_BLOCK_SIZE;
75     }
76     return (1);
77 }

79 static int
80 ssh_aes_ctr_init(EVP_CIPHER_CTX *ctx, const u_char *key, const u_char *iv,
81                 int enc)
82 {
83     struct ssh_aes_ctr_ctx *c;

85     if ((c = EVP_CIPHER_CTX_get_app_data(ctx)) == NULL) {
86         c = xmalloc(sizeof(*c));
87         EVP_CIPHER_CTX_set_app_data(ctx, c);
88     }
89     if (key != NULL)
90         AES_set_encrypt_key(key, EVP_CIPHER_CTX_key_length(ctx) * 8,
91                             &c->aes_ctx);
92     if (iv != NULL)
93         memcpy(c->aes_counter, iv, AES_BLOCK_SIZE);
94     return (1);
95 }

97 static int
98 ssh_aes_ctr_cleanup(EVP_CIPHER_CTX *ctx)
99 {
100     struct ssh_aes_ctr_ctx *c;

102     if ((c = EVP_CIPHER_CTX_get_app_data(ctx)) != NULL) {
103         memset(c, 0, sizeof(*c));
104         xfree(c);
105         EVP_CIPHER_CTX_set_app_data(ctx, NULL);
106     }
107     return (1);
108 }

110 void
111 ssh_aes_ctr_iv(EVP_CIPHER_CTX *evp, int doset, u_char *iv, u_int len)
112 {
113     struct ssh_aes_ctr_ctx *c;

115     if ((c = EVP_CIPHER_CTX_get_app_data(evp)) == NULL)
116         fatal("ssh_aes_ctr_iv: no context");
117     if (doset)
118         memcpy(c->aes_counter, iv, len);
119     else
120         memcpy(iv, c->aes_counter, len);
121 }

123 /*
124  * Function fills an EVP_CIPHER structure for AES CTR functions based on the NID
125  * and the key length.
126  */
127 static const EVP_CIPHER *

```

```
128 evp_aes_ctr(const char *nid, int key_len, EVP_CIPHER *aes_ctr)
129 {
130     memset(aes_ctr, 0, sizeof(EVP_CIPHER));
131     /*
132      * If the PKCS#11 engine is used the AES CTR NIDs were dynamically
133      * created during the engine initialization. If the engine is not used
134      * we work with NID_undef's which is OK since in that case OpenSSL
135      * doesn't use NIDs at all.
136      */
137     if ((aes_ctr->nid = OBJ_ln2nid(nid)) != NID_undef)
138         debug3("%s NID found", nid);
139
140     aes_ctr->block_size = AES_BLOCK_SIZE;
141     aes_ctr->iv_len = AES_BLOCK_SIZE;
142     aes_ctr->key_len = key_len;
143     aes_ctr->init = ssh_aes_ctr_init;
144     aes_ctr->cleanup = ssh_aes_ctr_cleanup;
145     aes_ctr->do_cipher = ssh_aes_ctr;
146     aes_ctr->flags = EVP_CIPH_CBC_MODE | EVP_CIPH_VARIABLE_LENGTH |
147         EVP_CIPH_ALWAYS_CALL_INIT | EVP_CIPH_CUSTOM_IV;
148     return (aes_ctr);
149 }
150
151 const EVP_CIPHER *
152 evp_aes_128_ctr(void)
153 {
154     static EVP_CIPHER aes_ctr;
155
156     return (evp_aes_ctr("aes-128-ctr", 16, &aes_ctr));
157 }
158
159 const EVP_CIPHER *
160 evp_aes_192_ctr(void)
161 {
162     static EVP_CIPHER aes_ctr;
163
164     return (evp_aes_ctr("aes-192-ctr", 24, &aes_ctr));
165 }
166
167 const EVP_CIPHER *
168 evp_aes_256_ctr(void)
169 {
170     static EVP_CIPHER aes_ctr;
171
172     return (evp_aes_ctr("aes-256-ctr", 32, &aes_ctr));
173 }
```

```

*****
15100 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/cipher.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Author: Tatu Ylonen <ylo@cs.hut.fi>
3  * Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
4  * All rights reserved
5  *
6  * As far as I am concerned, the code I have written for this software
7  * can be used freely for any purpose. Any derived versions of this
8  * software must be clearly marked as such, and if the derived work is
9  * incompatible with the protocol description in the RFC file, it must be
10 * called by a name other than "ssh" or "Secure Shell".
11 *
12 *
13 * Copyright (c) 1999 Niels Provos. All rights reserved.
14 * Copyright (c) 1999, 2000 Markus Friedl. All rights reserved.
15 *
16 * Redistribution and use in source and binary forms, with or without
17 * modification, are permitted provided that the following conditions
18 * are met:
19 * 1. Redistributions of source code must retain the above copyright
20 * notice, this list of conditions and the following disclaimer.
21 * 2. Redistributions in binary form must reproduce the above copyright
22 * notice, this list of conditions and the following disclaimer in the
23 * documentation and/or other materials provided with the distribution.
24 *
25 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR
26 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
27 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
28 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
29 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
30 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
31 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
32 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
33 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
34 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
35 */

37 /*
38  * Copyright 2009 Sun Microsystems, Inc. All rights reserved.
39  * Use is subject to license terms.
40 */

42 #include "includes.h"
43 RCSID("$OpenBSD: cipher.c,v 1.61 2002/07/12 15:50:17 markus Exp $");

45 #include "xmalloc.h"
46 #include "log.h"
47 #include "cipher.h"

49 #include <openssl/opensslconf.h>
50 #include <openssl/md5.h>

52 /*
53  * Symmetric ciphers can be offloaded to any engine through the EVP API only.
54  * However, OpenSSL doesn't offer AES in counter mode through EVP. So, we must
55  * define our own EVP functions.
56 */
57 extern const EVP_CIPHER *evp_aes_128_ctr(void);
58 extern const EVP_CIPHER *evp_aes_192_ctr(void);
59 extern const EVP_CIPHER *evp_aes_256_ctr(void);
60 extern void ssh_aes_ctr_iv(EVP_CIPHER_CTX *, int, u_char *, u_int);

```

```

62 static const EVP_CIPHER *evp_ssh1_3des(void);
63 static const EVP_CIPHER *evp_ssh1_bf(void);

65 struct Cipher {
66     char    *name;
67     int     number;           /* for ssh1 only */
68     u_int   block_size;
69     u_int   key_len;
70     u_int   discard_len;
71     const EVP_CIPHER    *(*evptype)(void);
72 } ciphers[] = {
73     { "none",          SSH_CIPHER_NONE,      8,  0,    0, EVP_enc_null },
74     { "des",           SSH_CIPHER_DES,       8,  8,    0, EVP_des_cbc },
75     { "3des",          SSH_CIPHER_3DES,      8, 16,    0, evp_ssh1_3des },
76     { "blowfish",      SSH_CIPHER_BLOWFISH,  8, 32,    0, evp_ssh1_bf },
77     { "3des-cbc",      SSH_CIPHER_SSH2,      8, 24,    0, EVP_des_ede3_cbc },
78     { "blowfish-cbc",  SSH_CIPHER_SSH2,      8, 16,    0, EVP_bf_cbc },
79 #ifdef SOLARIS_SSH_ENABLE_CAST5_128
80     { "cast128-cbc",   SSH_CIPHER_SSH2,      8, 16,    0, EVP_cast5_cbc },
81 #endif /* SOLARIS_SSH_ENABLE_CAST5_128 */
82     { "arcfour",       SSH_CIPHER_SSH2,      8, 16,    0, EVP_rc4 },
83     { "arcfour128",    SSH_CIPHER_SSH2,      8, 16, 1536, EVP_rc4 },
84     { "arcfour256",    SSH_CIPHER_SSH2,      8, 32, 1536, EVP_rc4 },
85     { "aes128-cbc",    SSH_CIPHER_SSH2,     16, 16,    0, EVP_aes_128_cbc },
86     { "aes192-cbc",    SSH_CIPHER_SSH2,     16, 24,    0, EVP_aes_192_cbc },
87     { "aes256-cbc",    SSH_CIPHER_SSH2,     16, 32,    0, EVP_aes_256_cbc },
88     { "aes128-ctr",    SSH_CIPHER_SSH2,     16, 16,    0, evp_aes_128_ctr },
89     { "aes192-ctr",    SSH_CIPHER_SSH2,     16, 24,    0, evp_aes_192_ctr },
90     { "aes256-ctr",    SSH_CIPHER_SSH2,     16, 32,    0, evp_aes_256_ctr },
91     { NULL,            SSH_CIPHER_ILLEGAL,    0,  0,    0, NULL },
92 };

94 /*--*/

96 u_int
97 cipher_blocksize(Cipher *c)
98 {
99     return (c->block_size);
100 }

102 u_int
103 cipher_keylen(Cipher *c)
104 {
105     return (c->key_len);
106 }

108 u_int
109 cipher_get_number(Cipher *c)
110 {
111     return (c->number);
112 }

114 u_int
115 cipher_mask_ssh1(int client)
116 {
117     u_int mask = 0;
118     mask |= 1 << SSH_CIPHER_3DES;           /* Mandatory */
119     mask |= 1 << SSH_CIPHER_BLOWFISH;
120     if (client) {
121         mask |= 1 << SSH_CIPHER_DES;
122     }
123     return mask;
124 }

126 Cipher *
127 cipher_by_name(const char *name)

```



```

128 {
129     Cipher *c;
130     for (c = ciphers; c->name != NULL; c++)
131         if (strcasecmp(c->name, name) == 0)
132             return c;
133     return NULL;
134 }

136 Cipher *
137 cipher_by_number(int id)
138 {
139     Cipher *c;
140     for (c = ciphers; c->name != NULL; c++)
141         if (c->number == id)
142             return c;
143     return NULL;
144 }

146 #define CIPHER_SEP    ","
147 int
148 ciphers_valid(const char *names)
149 {
150     Cipher *c;
151     char *ciphers, *cp;
152     char *p;

154     if (names == NULL || strcmp(names, "") == 0)
155         return 0;
156     ciphers = cp = xstrdup(names);
157     for ((p = strsep(&cp, CIPHER_SEP)); p && *p != '\0';
158          (p = strsep(&cp, CIPHER_SEP))) {
159         c = cipher_by_name(p);
160         if (c == NULL || c->number != SSH_CIPHER_SSH2) {
161             debug("bad cipher %s [%s]", p, names);
162             xfree(ciphers);
163             return 0;
164         } else {
165             debug3("cipher ok: %s [%s]", p, names);
166         }
167     }
168     debug3("ciphers ok: [%s]", names);
169     xfree(ciphers);
170     return 1;
171 }

173 /*
174  * Parses the name of the cipher. Returns the number of the corresponding
175  * cipher, or -1 on error.
176  */

178 int
179 cipher_number(const char *name)
180 {
181     Cipher *c;
182     if (name == NULL)
183         return -1;
184     c = cipher_by_name(name);
185     return (c==NULL) ? -1 : c->number;
186 }

188 char *
189 cipher_name(int id)
190 {
191     Cipher *c = cipher_by_number(id);
192     return (c==NULL) ? "<unknown>" : c->name;
193 }

```

```

195 void
196 cipher_init(CipherContext *cc, Cipher *cipher,
197             const u_char *key, u_int keylen, const u_char *iv, u_int ivlen,
198             int encrypt)
199 {
200     static int dowarn = 1;
201     const EVP_CIPHER *type;
202     int klen;
203     u_char *junk, *discard;

205     if (cipher->number == SSH_CIPHER_DES) {
206         if (dowarn) {
207             error("Warning: use of DES is strongly discouraged "
208                  "due to cryptographic weaknesses");
209             dowarn = 0;
210         }
211         if (keylen > 8)
212             keylen = 8;
213     }
214     cc->plaintext = (cipher->number == SSH_CIPHER_NONE);

216     if (keylen < cipher->key_len)
217         fatal("cipher_init: key length %d is insufficient for %s.",
218              keylen, cipher->name);
219     if (iv != NULL && ivlen < cipher->block_size)
220         fatal("cipher_init: iv length %d is insufficient for %s.",
221              ivlen, cipher->name);
222     cc->cipher = cipher;

224     type = (*cipher->evptype)();

226     EVP_CIPHER_CTX_init(&cc->evp);
227     /*
228      * cc->evp is of type EVP_CIPHER_CTX and its key_len will be set to the
229      * default value here for the cipher type. If the requested key length
230      * is different from the default value we will call EVP_CipherInit()
231      * again, see below.
232      */
233     if (EVP_CipherInit(&cc->evp, type, NULL, (u_char *)iv,
234                       (encrypt == CIPHER_ENCRYPT) ? 1 : 0) == 0)
235         fatal("cipher_init: EVP_CipherInit failed for %s",
236              cipher->name);
237     klen = EVP_CIPHER_CTX_key_length(&cc->evp);
238     if (klen > 0 && keylen != klen) {
239         debug("cipher_init: set keylen (%d -> %d)", klen, keylen);
240         if (EVP_CIPHER_CTX_set_key_length(&cc->evp, keylen) == 0)
241             fatal("cipher_init: set keylen failed (%d -> %d)",
242                  klen, keylen);
243     }
244     if (EVP_CipherInit(&cc->evp, NULL, (u_char *)key, NULL, -1) == 0)
245         fatal("cipher_init: EVP_CipherInit: set key failed for %s",
246              cipher->name);

248     if (cipher->discard_len > 0) {
249         junk = xmalloc(cipher->discard_len);
250         discard = xmalloc(cipher->discard_len);
251         if (EVP_Cipher(&cc->evp, discard, junk,
252                       cipher->discard_len) == 0)
253             fatal("cipher_init: EVP_Cipher failed during discard");
254         memset(discard, 0, cipher->discard_len);
255         xfree(junk);
256         xfree(discard);
257     }
258 }

```

```

260 void
261 cipher_crypt(CipherContext *cc, u_char *dest, const u_char *src, u_int len)
262 {
263     if (len % cc->cipher->block_size)
264         fatal("cipher_encrypt: bad plaintext length %d", len);
265     if (EVP_Cipher(&cc->evp, dest, (u_char *)src, len) == 0)
266         fatal("evp_crypt: EVP_Cipher failed");
267 }

269 void
270 cipher_cleanup(CipherContext *cc)
271 {
272     if (EVP_CIPHER_CTX_cleanup(&cc->evp) == 0)
273         error("cipher_cleanup: EVP_CIPHER_CTX_cleanup failed");
274 }

276 /*
277  * Selects the cipher, and keys if by computing the MD5 checksum of the
278  * passphrase and using the resulting 16 bytes as the key.
279  */

281 void
282 cipher_set_key_string(CipherContext *cc, Cipher *cipher,
283     const char *passphrase, int encrypt)
284 {
285     MD5_CTX md;
286     u_char digest[16];

288     MD5_Init(&md);
289     MD5_Update(&md, (const u_char *)passphrase, strlen(passphrase));
290     MD5_Final(digest, &md);

292     cipher_init(cc, cipher, digest, 16, NULL, 0, encrypt);

294     memset(digest, 0, sizeof(digest));
295     memset(&md, 0, sizeof(md));
296 }

298 /* Implementations for other non-EVP ciphers */

300 /*
301  * This is used by SSH1:
302  *
303  * What kind of triple DES are these 2 routines?
304  *
305  * Why is there a redundant initialization vector?
306  *
307  * If only iv3 was used, then, this would till effect have been
308  * outer-cbc. However, there is also a private iv1 == iv2 which
309  * perhaps makes differential analysis easier. On the other hand, the
310  * private iv1 probably makes the CRC-32 attack ineffective. This is a
311  * result of that there is no longer any known iv1 to use when
312  * choosing the X block.
313  */
314 struct ssh1_3des_ctx
315 {
316     EVP_CIPHER_CTX k1, k2, k3;
317 };

319 static int
320 ssh1_3des_init(EVP_CIPHER_CTX *ctx, const u_char *key, const u_char *iv,
321     int enc)
322 {
323     struct ssh1_3des_ctx *c;
324     u_char *k1, *k2, *k3;

```

```

326     if ((c = EVP_CIPHER_CTX_get_app_data(ctx)) == NULL) {
327         c = xmalloc(sizeof(*c));
328         EVP_CIPHER_CTX_set_app_data(ctx, c);
329     }
330     if (key == NULL)
331         return (1);
332     if (enc == -1)
333         enc = ctx->encrypt;
334     k1 = k2 = k3 = (u_char *) key;
335     k2 += 8;
336     if (EVP_CIPHER_CTX_key_length(ctx) >= 16+8) {
337         if (enc)
338             k3 += 16;
339         else
340             k1 += 16;
341     }
342     EVP_CIPHER_CTX_init(&c->k1);
343     EVP_CIPHER_CTX_init(&c->k2);
344     EVP_CIPHER_CTX_init(&c->k3);
345     if (EVP_CipherInit(&c->k1, EVP_des_cbc(), k1, NULL, enc) == 0 ||
346         EVP_CipherInit(&c->k2, EVP_des_cbc(), k2, NULL, !enc) == 0 ||
347         EVP_CipherInit(&c->k3, EVP_des_cbc(), k3, NULL, enc) == 0) {
348         memset(c, 0, sizeof(*c));
349         xfree(c);
350         EVP_CIPHER_CTX_set_app_data(ctx, NULL);
351         return (0);
352     }
353     return (1);
354 }

356 static int
357 ssh1_3des_cbc(EVP_CIPHER_CTX *ctx, u_char *dest, const u_char *src, u_int len)
358 {
359     struct ssh1_3des_ctx *c;

361     if ((c = EVP_CIPHER_CTX_get_app_data(ctx)) == NULL) {
362         error("ssh1_3des_cbc: no context");
363         return (0);
364     }
365     if (EVP_Cipher(&c->k1, dest, (u_char *)src, len) == 0 ||
366         EVP_Cipher(&c->k2, dest, dest, len) == 0 ||
367         EVP_Cipher(&c->k3, dest, dest, len) == 0)
368         return (0);
369     return (1);
370 }

372 static int
373 ssh1_3des_cleanup(EVP_CIPHER_CTX *ctx)
374 {
375     struct ssh1_3des_ctx *c;

377     if ((c = EVP_CIPHER_CTX_get_app_data(ctx)) != NULL) {
378         memset(c, 0, sizeof(*c));
379         xfree(c);
380         EVP_CIPHER_CTX_set_app_data(ctx, NULL);
381     }
382     return (1);
383 }

385 static const EVP_CIPHER *
386 evp_ssh1_3des(void)
387 {
388     static EVP_CIPHER ssh1_3des;

390     memset(&ssh1_3des, 0, sizeof(EVP_CIPHER));
391     ssh1_3des.nid = NID_undef;

```

```

392     ssh1_3des.block_size = 8;
393     ssh1_3des.iv_len = 0;
394     ssh1_3des.key_len = 16;
395     ssh1_3des.init = ssh1_3des_init;
396     ssh1_3des.cleanup = ssh1_3des_cleanup;
397     ssh1_3des.do_cipher = ssh1_3des_cbc;
398     ssh1_3des.flags = EVP_CIPHER_CBC_MODE | EVP_CIPHER_VARIABLE_LENGTH;
399     return (&ssh1_3des);
400 }

402 /*
403  * SSH1 uses a variation on Blowfish, all bytes must be swapped before
404  * and after encryption/decryption. Thus the swap_bytes stuff (yuk).
405  */
406 static void
407 swap_bytes(const u_char *src, u_char *dst, int n)
408 {
409     u_char c[4];

411     /* Process 4 bytes every lap. */
412     for (n = n / 4; n > 0; n--) {
413         c[3] = *src++;
414         c[2] = *src++;
415         c[1] = *src++;
416         c[0] = *src++;

418         *dst++ = c[0];
419         *dst++ = c[1];
420         *dst++ = c[2];
421         *dst++ = c[3];
422     }
423 }

425 static int (*orig_bf)(EVP_CIPHER_CTX *, u_char *, const u_char *, u_int) = NULL;

427 static int
428 bf_ssh1_cipher(EVP_CIPHER_CTX *ctx, u_char *out, const u_char *in, u_int len)
429 {
430     int ret;

432     swap_bytes(in, out, len);
433     ret = (*orig_bf)(ctx, out, out, len);
434     swap_bytes(out, out, len);
435     return (ret);
436 }

438 static const EVP_CIPHER *
439 evp_ssh1_bf(void)
440 {
441     static EVP_CIPHER ssh1_bf;

443     memcpy(&ssh1_bf, EVP_bf_cbc(), sizeof(EVP_CIPHER));
444     orig_bf = ssh1_bf.do_cipher;
445     ssh1_bf.nid = NID_undef;
446     ssh1_bf.do_cipher = bf_ssh1_cipher;
447     ssh1_bf.key_len = 32;
448     return (&ssh1_bf);
449 }

451 /*
452  * Exports an IV from the CipherContext required to export the key
453  * state back from the unprivileged child to the privileged parent
454  * process.
455  */
457 int

```

```

458 cipher_get_keyiv_len(CipherContext *cc)
459 {
460     Cipher *c = cc->cipher;
461     int ivlen;

463     if (c->number == SSH_CIPHER_3DES)
464         ivlen = 24;
465     else
466         ivlen = EVP_CIPHER_CTX_iv_length(&cc->evp);
467     return (ivlen);
468 }

470 void
471 cipher_get_keyiv(CipherContext *cc, u_char *iv, u_int len)
472 {
473     Cipher *c = cc->cipher;
474     u_char *civ = NULL;
475     int evplen;

477     switch (c->number) {
478     case SSH_CIPHER_SSH2:
479     case SSH_CIPHER_DES:
480     case SSH_CIPHER_BLOWFISH:
481         evplen = EVP_CIPHER_CTX_iv_length(&cc->evp);
482         if (evplen == 0)
483             return;
484         if (evplen != len)
485             fatal("%s: wrong iv length %d != %d", __func__,
486                 evplen, len);

488         if (c->evptype == evp_aes_128_ctr) {
489             ssh_aes_ctr_iv(&cc->evp, 0, iv, len);
490             return;
491         } else {
492             civ = cc->evp.iv;
493         }
494         break;
495     case SSH_CIPHER_3DES: {
496         struct ssh1_3des_ctx *desc;
497         if (len != 24)
498             fatal("%s: bad 3des iv length: %d", __func__, len);
499         desc = EVP_CIPHER_CTX_get_app_data(&cc->evp);
500         if (desc == NULL)
501             fatal("%s: no 3des context", __func__);
502         debug3("%s: Copying 3DES IV", __func__);
503         memcpy(iv, desc->k1.iv, 8);
504         memcpy(iv + 8, desc->k2.iv, 8);
505         memcpy(iv + 16, desc->k3.iv, 8);
506         return;
507     }
508     default:
509         fatal("%s: bad cipher %d", __func__, c->number);
510     }
511     memcpy(iv, civ, len);
512 }

514 void
515 cipher_set_keyiv(CipherContext *cc, u_char *iv)
516 {
517     Cipher *c = cc->cipher;
518     u_char *div = NULL;
519     int evplen = 0;

521     switch (c->number) {
522     case SSH_CIPHER_SSH2:
523     case SSH_CIPHER_DES:

```

```
524     case SSH_CIPHER_BLOWFISH:
525         evplen = EVP_CIPHER_CTX_iv_length(&cc->evp);
526         if (evplen == 0)
527             return;
528
529         if (c->evptype == evp_aes_128_ctr) {
530             ssh_aes_ctr_iv(&cc->evp, 1, iv, evplen);
531             return;
532         } else {
533             div = cc->evp.iv;
534         }
535         break;
536     case SSH_CIPHER_3DES: {
537         struct ssh1_3des_ctx *desc;
538         desc = EVP_CIPHER_CTX_get_app_data(&cc->evp);
539         if (desc == NULL)
540             fatal("%s: no 3des context", __func__);
541         debug3("%s: Installed 3DES IV", __func__);
542         memcpy(desc->k1.iv, iv, 8);
543         memcpy(desc->k2.iv, iv + 8, 8);
544         memcpy(desc->k3.iv, iv + 16, 8);
545         return;
546     }
547     default:
548         fatal("%s: bad cipher %d", __func__, c->number);
549 }
550 memcpy(div, iv, evplen);
551 }
552
553 #if OPENSSL_VERSION_NUMBER < 0x00907000L
554 #define EVP_X_STATE(evp)      &(evp).c
555 #define EVP_X_STATE_LEN(evp) sizeof((evp).c)
556 #else
557 #define EVP_X_STATE(evp)      (evp).cipher_data
558 #define EVP_X_STATE_LEN(evp) (evp).cipher->ctx_size
559 #endif
560
561 int
562 cipher_get_keycontext(CipherContext *cc, u_char *dat)
563 {
564     int plen = 0;
565     Cipher *c = cc->cipher;
566
567     if (c->evptype == EVP_rc4) {
568         plen = EVP_X_STATE_LEN(cc->evp);
569         if (dat == NULL)
570             return (plen);
571         memcpy(dat, EVP_X_STATE(cc->evp), plen);
572     }
573     return (plen);
574 }
575
576 void
577 cipher_set_keycontext(CipherContext *cc, u_char *dat)
578 {
579     Cipher *c = cc->cipher;
580     int plen;
581
582     if (c->evptype == EVP_rc4) {
583         plen = EVP_X_STATE_LEN(cc->evp);
584         memcpy(EVP_X_STATE(cc->evp), dat, plen);
585     }
586 }
```

```

*****
7408 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/dh.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /*
2  * Copyright (c) 2000 Niels Provos. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  * 1. Redistributions of source code must retain the above copyright
8  * notice, this list of conditions and the following disclaimer.
9  * 2. Redistributions in binary form must reproduce the above copyright
10 * notice, this list of conditions and the following disclaimer in the
11 * documentation and/or other materials provided with the distribution.
12 *
13 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR 'AS IS' AND ANY EXPRESS OR
14 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
15 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
16 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
17 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
18 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */
24
25 #include "includes.h"
26 RCSID("$OpenBSD: dh.c,v 1.22 2002/06/27 08:49:44 markus Exp $");
27
28 #include "xmalloc.h"
29
30 #include <openssl/opensslconf.h>
31 #include <openssl/bn.h>
32 #include <openssl/dh.h>
33 #include <openssl/evp.h>
34
35 #include "buffer.h"
36 #include "cipher.h"
37 #include "kex.h"
38 #include "dh.h"
39 #include "pathnames.h"
40 #include "log.h"
41 #include "misc.h"
42
43 static int
44 parse_prime(int linenum, char *line, struct dhgroup *dhg)
45 {
46     char *cp, *arg;
47     char *strsize, *gen, *prime;
48
49     cp = line;
50     arg = strdelim(&cp);
51     /* Ignore leading whitespace */
52     if (*arg == '\0')
53         arg = strdelim(&cp);
54     if (!arg || !*arg || *arg == '#')
55         return 0;
56
57     /* time */
58     if (cp == NULL || *arg == '\0')
59         goto fail;
60     arg = strsep(&cp, " "); /* type */
61     if (cp == NULL || *arg == '\0')

```

```

62         goto fail;
63     arg = strsep(&cp, " "); /* tests */
64     if (cp == NULL || *arg == '\0')
65         goto fail;
66     arg = strsep(&cp, " "); /* tries */
67     if (cp == NULL || *arg == '\0')
68         goto fail;
69     strsize = strsep(&cp, " "); /* size */
70     if (cp == NULL || *strsize == '\0' ||
71         (dhg->size = atoi(strsize)) == 0)
72         goto fail;
73     /* The whole group is one bit larger */
74     dhg->size++;
75     gen = strsep(&cp, " "); /* gen */
76     if (cp == NULL || *gen == '\0')
77         goto fail;
78     prime = strsep(&cp, " "); /* prime */
79     if (cp != NULL || *prime == '\0')
80         goto fail;
81
82     if ((dhg->g = BN_new()) == NULL)
83         fatal("parse_prime: BN_new failed");
84     if ((dhg->p = BN_new()) == NULL)
85         fatal("parse_prime: BN_new failed");
86     if (BN_hex2bn(&dhg->g, gen) == 0)
87         goto failclean;
88
89     if (BN_hex2bn(&dhg->p, prime) == 0)
90         goto failclean;
91
92     if (BN_num_bits(dhg->p) != dhg->size)
93         goto failclean;
94
95     return (1);
96
97 failclean:
98     BN_clear_free(dhg->g);
99     BN_clear_free(dhg->p);
100 fail:
101     error("Bad prime description in line %d", linenum);
102     return (0);
103 }
104
105 DH *
106 choose_dh(int min, int wantbits, int max)
107 {
108     FILE *f;
109     char line[2048];
110     int best, bestcount, which;
111     int linenum;
112     struct dhgroup dhg;
113
114     if ((f = fopen(_PATH_DH_MODULI, "r")) == NULL &&
115         (f = fopen(_PATH_DH_PRIMES, "r")) == NULL) {
116         log("WARNING: %s does not exist, using old modulus", _PATH_DH_MO
117         return (dh_new_group1());
118     }
119
120     linenum = 0;
121     best = bestcount = 0;
122     while (fgets(line, sizeof(line), f)) {
123         linenum++;
124         if (!parse_prime(linenum, line, &dhg))
125             continue;
126         BN_clear_free(dhg.g);
127         BN_clear_free(dhg.p);

```

```

129         if (dhg.size > max || dhg.size < min)
130             continue;

132         if ((dhg.size > wantbits && dhg.size < best) ||
133             (dhg.size > best && best < wantbits)) {
134             best = dhg.size;
135             bestcount = 0;
136         }
137         if (dhg.size == best)
138             bestcount++;
139     }
140     rewind(f);

142     if (bestcount == 0) {
143         fclose(f);
144         log("WARNING: no suitable primes in %s", _PATH_DH_PRIMES);
145         return (NULL);
146     }

148     linenum = 0;
149     which = arc4random() % bestcount;
150     while (fgets(line, sizeof(line), f)) {
151         if (!parse_prime(linenum, line, &dhg))
152             continue;
153         if ((dhg.size > max || dhg.size < min) ||
154             dhg.size != best ||
155             linenum++ != which) {
156             BN_clear_free(dhg.g);
157             BN_clear_free(dhg.p);
158             continue;
159         }
160         break;
161     }
162     fclose(f);
163     if (linenum != which+1)
164         fatal("WARNING: line %d disappeared in %s, giving up",
165             which, _PATH_DH_PRIMES);

167     return (dh_new_group(dhg.g, dhg.p));
168 }

170 /* diffie-hellman-group1-sha1 */

172 int
173 dh_pub_is_valid(DH *dh, BIGNUM *dh_pub)
174 {
175     int i;
176     int n = BN_num_bits(dh_pub);
177     int bits_set = 0;

179     if (dh_pub->neg) {
180         log("invalid public DH value: negativ");
181         return 0;
182     }
183     for (i = 0; i <= n; i++)
184         if (BN_is_bit_set(dh_pub, i))
185             bits_set++;
186     debug("bits set: %d/%d", bits_set, BN_num_bits(dh->p));

188     /* if g==2 and bits_set==1 then computing log_g(dh_pub) is trivial */
189     if (bits_set > 1 && (BN_cmp(dh_pub, dh->p) == -1))
190         return 1;
191     log("invalid public DH value (%d/%d)", bits_set, BN_num_bits(dh->p));
192     return 0;
193 }

```

```

195 void
196 dh_gen_key(DH *dh, int need)
197 {
198     int i, bits_set = 0, tries = 0;

200     if (dh->p == NULL)
201         fatal("dh_gen_key: dh->p == NULL");
202     if (2*need >= BN_num_bits(dh->p))
203         fatal("dh_gen_key: group too small: %d (2*need %d)",
204             BN_num_bits(dh->p), 2*need);
205     do {
206         if (dh->priv_key != NULL)
207             BN_clear_free(dh->priv_key);
208         if ((dh->priv_key = BN_new()) == NULL)
209             fatal("dh_gen_key: BN_new failed");
210         /* generate a 2*need bits random private exponent */
211         if (!BN_rand(dh->priv_key, 2*need, 0, 0))
212             fatal("dh_gen_key: BN_rand failed");
213         if (DH_generate_key(dh) == 0)
214             fatal("dh_gen_key: DH_generate_key() failed");
215         for (i = 0; i <= BN_num_bits(dh->priv_key); i++)
216             if (BN_is_bit_set(dh->priv_key, i))
217                 bits_set++;
218         debug("dh_gen_key: priv key bits set: %d/%d",
219             bits_set, BN_num_bits(dh->priv_key));
220         if (tries++ > 10)
221             fatal("dh_gen_key: too many bad keys: giving up");
222     } while (!dh_pub_is_valid(dh, dh->pub_key));
223 }

225 DH *
226 dh_new_group_asc(const char *gen, const char *modulus)
227 {
228     DH *dh;

230     if ((dh = DH_new()) == NULL)
231         fatal("dh_new_group_asc: DH_new");

233     if (BN_hex2bn(&dh->p, modulus) == 0)
234         fatal("BN_hex2bn p");
235     if (BN_hex2bn(&dh->g, gen) == 0)
236         fatal("BN_hex2bn g");

238     return (dh);
239 }

241 /*
242  * This just returns the group, we still need to generate the exchange
243  * value.
244  */

246 DH *
247 dh_new_group(BIGNUM *gen, BIGNUM *modulus)
248 {
249     DH *dh;

251     if ((dh = DH_new()) == NULL)
252         fatal("dh_new_group: DH_new");
253     dh->p = modulus;
254     dh->g = gen;

256     return (dh);
257 }

259 DH *

```

```
260 dh_new_group1(void)
261 {
262     static char *gen = "2", *group1 =
263         "FFFFFFFF" "FFFFFFFF" "C90FDAA2" "2168C234" "C4C6628B" "80DC1CD1"
264         "29024E08" "8A67CC74" "020BBEA6" "3B139B22" "514A0879" "8E3404DD"
265         "EF9519B3" "CD3A431B" "302B0A6D" "F25F1437" "4FE1356D" "6D51C245"
266         "E485B576" "625E7EC6" "F44C42E9" "A637ED6B" "0BFF5CB6" "F406B7ED"
267         "EE386BFB" "5A899FA5" "AE9F2411" "7C4B1FE6" "49286651" "ECE65381"
268         "FFFFFFFF" "FFFFFFFF";
269
270     return (dh_new_group_asc(gen, group1));
271 }
272
273 /*
274  * Estimates the group order for a Diffie-Hellman group that has an
275  * attack complexity approximately the same as  $O(2^{bits})$ . Estimate
276  * with:  $O(\exp(1.9223 * (\ln q)^{1/3} (\ln \ln q)^{2/3}))$ 
277  */
278
279 int
280 dh_estimate(int bits)
281 {
282     if (bits < 64)
283         return (512); /*  $O(2^{63})$  */
284     if (bits < 128)
285         return (1024); /*  $O(2^{86})$  */
286     if (bits < 192)
287         return (2048); /*  $O(2^{116})$  */
288     return (4096); /*  $O(2^{156})$  */
289 }
290 }
```

```

*****
4742 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/entropy.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Copyright (c) 2001 Damien Miller. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  * 1. Redistributions of source code must retain the above copyright
8  * notice, this list of conditions and the following disclaimer.
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10 * notice, this list of conditions and the following disclaimer in the
11 * documentation and/or other materials provided with the distribution.
12 *
13 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR 'AS IS' AND ANY EXPRESS OR
14 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
15 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
16 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
17 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
18 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */

25 #include "includes.h"

27 #include <openssl/opensslconf.h>
28 #include <openssl/rand.h>
29 #include <openssl/crypto.h>

31 #include "ssh.h"
32 #include "misc.h"
33 #include "xmalloc.h"
34 #include "atomicio.h"
35 #include "pathnames.h"
36 #include "log.h"

38 /*
39  * Portable OpenSSH PRNG seeding:
40  * If OpenSSL has not "internally seeded" itself (e.g. pulled data from
41  * /dev/random), then we execute a "ssh-rand-helper" program which
42  * collects entropy and writes it to stdout. The child program must
43  * write at least RANDOM_SEED_SIZE bytes. The child is run with stderr
44  * attached, so error/debugging output should be visible.
45  *
46  * XXX: we should tell the child how many bytes we need.
47  */

49 RCSID("$Id: entropy.c,v 1.44 2002/06/09 19:41:48 mouring Exp $");

51 #pragma ident "%Z%M% %I% %E% SMI"

53 #ifndef OPENSSSL_PRNG_ONLY
54 #define RANDOM_SEED_SIZE 48
55 static uid_t original_uid, original_euid;
56 #endif

58 void
59 seed_rng(void)
60 {
61 #ifndef OPENSSSL_PRNG_ONLY

```

```

62 int devnull;
63 int p[2];
64 pid_t pid;
65 int ret;
66 unsigned char buf[RANDOM_SEED_SIZE];
67 mysig_t old_sigchld;

69 if (RAND_status() == 1) {
70     debug3("RNG is ready, skipping seeding");
71     return;
72 }

74 debug3("Seeding PRNG from %s", SSH_RAND_HELPER);

76 if ((devnull = open("/dev/null", O_RDWR)) == -1)
77     fatal("Couldn't open /dev/null: %s", strerror(errno));
78 if (pipe(p) == -1)
79     fatal("pipe: %s", strerror(errno));

81 old_sigchld = mysignal(SIGCHLD, SIG_DFL);
82 if ((pid = fork()) == -1)
83     fatal("Couldn't fork: %s", strerror(errno));
84 if (pid == 0) {
85     dup2(devnull, STDIN_FILENO);
86     dup2(p[1], STDOUT_FILENO);
87     /* Keep stderr open for errors */
88     close(p[0]);
89     close(p[1]);
90     close(devnull);

92     if (original_uid != original_euid &&
93         (setuid(getuid()) == -1 ||
94          setuid(original_uid) == -1)) {
95         fprintf(stderr, "(rand child) setuid(%d): %s\n",
96                 original_uid, strerror(errno));
97         _exit(1);
98     }
99
100     execl(SSH_RAND_HELPER, "ssh-rand-helper", NULL);
101     fprintf(stderr, "(rand child) Couldn't exec '%s': %s\n",
102             SSH_RAND_HELPER, strerror(errno));
103     _exit(1);
104 }

106 close(devnull);
107 close(p[1]);

109 memset(buf, '\0', sizeof(buf));
110 ret = atomicio(read, p[0], buf, sizeof(buf));
111 if (ret == -1)
112     fatal("Couldn't read from ssh-rand-helper: %s",
113           strerror(errno));
114 if (ret != sizeof(buf))
115     fatal("ssh-rand-helper child produced insufficient data");

117 close(p[0]);

119 if (waitpid(pid, &ret, 0) == -1)
120     fatal("Couldn't wait for ssh-rand-helper completion: %s",
121           strerror(errno));
122 mysignal(SIGCHLD, old_sigchld);

124 /* We don't mind if the child exits upon a SIGPIPE */
125 if (!WIFEXITED(ret) &&
126     (!WIFSIGNALED(ret) || WTERMSIG(ret) != SIGPIPE))
127     fatal("ssh-rand-helper terminated abnormally");

```



```
128     if (WEXITSTATUS(ret) != 0)
129         fatal("ssh-rand-helper exit with exit status %d", ret);

131     RAND_add(buf, sizeof(buf), sizeof(buf));
132     memset(buf, '\0', sizeof(buf));

134 #endif /* OPENSSEL_PRNG_ONLY */
135     if (RAND_status() != 1)
136         fatal("PRNG is not seeded");
137 }

139 void
140 init_rng(void)
141 {
142     /*
143      * OpenSSL version numbers: MNFFPPS: major minor fix patch status
144      * We match major, minor, fix and status (not patch)
145      */
146     if ((SSLeay() ^ OPENSSEL_VERSION_NUMBER) & ~0xff0L)
147         fatal("OpenSSL version mismatch. Built against %lx, you "
148             "have %lx", OPENSSEL_VERSION_NUMBER, SSLeay());

150 #ifndef OPENSSEL_PRNG_ONLY
151     if ((original_uid = getuid()) == -1)
152         fatal("getuid: %s", strerror(errno));
153     if ((original_euid = geteuid()) == -1)
154         fatal("geteuid: %s", strerror(errno));
155 #endif
156 }
```

```

*****
9930 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/hostfile.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Author: Tatu Ylonen <ylo@cs.hut.fi>
3  * Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
4  * All rights reserved
5  * Functions for manipulating the known hosts files.
6  *
7  * As far as I am concerned, the code I have written for this software
8  * can be used freely for any purpose. Any derived versions of this
9  * software must be clearly marked as such, and if the derived work is
10 * incompatible with the protocol description in the RFC file, it must be
11 * called by a name other than "ssh" or "Secure Shell".
12 *
13 *
14 * Copyright (c) 1999, 2000 Markus Friedl. All rights reserved.
15 * Copyright (c) 1999 Niels Provos. All rights reserved.
16 *
17 * Redistribution and use in source and binary forms, with or without
18 * modification, are permitted provided that the following conditions
19 * are met:
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22 * 2. Redistributions in binary form must reproduce the above copyright
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25 *
26 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR "AS IS" AND ANY EXPRESS OR
27 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
28 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
29 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
30 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
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32 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
33 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
34 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
35 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
36 */
38 /* $OpenBSD: hostfile.c,v 1.45 2006/08/03 03:34:42 deraadt Exp $ */
40 #pragma ident "%Z%M% %I% %E% SMI"
42 #include "includes.h"
44 #include <openssl/opensslconf.h>
45 #include <openssl/hmac.h>
46 #include <openssl/sha.h>
48 #include "packet.h"
49 #include "xmalloc.h"
50 #include "match.h"
51 #include "key.h"
52 #include "hostfile.h"
53 #include "log.h"
55 /*
56  * Format of a hashed hostname is <MAGIC><SALT>|<HASHED_HOSTNAME>. <MAGIC> is
57  * "|1". As in non-hashed hostnames this whole string is then followed by a
58  * space, a key type and the key (which is out of scope of this function).
59  *
60  * Example what can be in 's':
61  */

```

```

62  * |1|t17NtsuXSLwP0H0eYdd8vJeNakM=|9XFVPh3jZUrfY6YCwn8Ua5eGZtA=
63  */
64 static int
65 extract_salt(const char *s, u_int l, char *salt, size_t salt_len)
66 {
67     char *p;
68     u_char *b64salt;
69     u_int b64len;
70     int ret;
72     if (l < sizeof(HASH_MAGIC) - 1) {
73         debug2("extract_salt: string too short");
74         return (-1);
75     }
76     if (strncmp(s, HASH_MAGIC, sizeof(HASH_MAGIC) - 1) != 0) {
77         debug2("extract_salt: invalid magic identifier");
78         return (-1);
79     }
80     s += sizeof(HASH_MAGIC) - 1;
81     l -= sizeof(HASH_MAGIC) - 1;
82     if ((p = memchr(s, HASH_DELIM, l)) == NULL) {
83         debug2("extract_salt: missing salt termination character");
84         return (-1);
85     }
87     b64len = p - s;
88     /* Sanity check */
89     if (b64len == 0 || b64len > 1024) {
90         debug2("extract_salt: bad encoded salt length %u", b64len);
91         return (-1);
92     }
93     b64salt = xmalloc(1 + b64len);
94     memcpy(b64salt, s, b64len);
95     b64salt[b64len] = '\0';
97     ret = __b64_pton(b64salt, (u_char *) salt, salt_len);
98     xfree(b64salt);
99     if (ret == -1) {
100         debug2("extract_salt: salt decode error");
101         return (-1);
102     }
103     if (ret != SHA_DIGEST_LENGTH) {
104         debug2("extract_salt: expected salt len %d, got %d",
105             SHA_DIGEST_LENGTH, ret);
106         return (-1);
107     }
109     return (0);
110 }
112 char *
113 host_hash(const char *host, const char *name_from_hostfile, u_int src_len)
114 {
115     const EVP_MD *md = EVP_sha1();
116     HMAC_CTX mac_ctx;
117     char salt[256], result[256], uu_salt[512], uu_result[512];
118     static char encoded[1024];
119     u_int i, len;
121     len = EVP_MD_size(md);
123     if (name_from_hostfile == NULL) {
124         /* Create new salt */
125         for (i = 0; i < len; i++)
126             salt[i] = arc4random();
127     } else {

```

```

128     /* Extract salt from known host entry */
129     if (extract_salt(name_from_hostfile, src_len, salt,
130                     sizeof(salt)) == -1)
131         return (NULL);
132 }
133
134 HMAC_Init(&mac_ctx, salt, len, md);
135 HMAC_Update(&mac_ctx, (u_char *) host, strlen(host));
136 HMAC_Final(&mac_ctx, (u_char *) result, NULL);
137 HMAC_cleanup(&mac_ctx);
138
139 if (__b64_ntop((u_char *) salt, len, uu_salt, sizeof(uu_salt)) == -1 ||
140     __b64_ntop((u_char *) result, len, uu_result, sizeof(uu_result)) ==
141     fatal("host_hash: __b64_ntop failed");
142
143 snprintf(encoded, sizeof(encoded), "%s%s%c%s", HASH_MAGIC, uu_salt,
144          HASH_DELIM, uu_result);
145
146 return (encoded);
147 }
148
149 /*
150  * Parses an RSA (number of bits, e, n) or DSA key from a string. Moves the
151  * pointer over the key. Skips any whitespace at the beginning and at end.
152  */
153
154 int
155 hostfile_read_key(char **cpp, u_int *bitsp, Key *ret)
156 {
157     char *cp;
158
159     /* Skip leading whitespace. */
160     for (cp = *cpp; *cp == ' ' || *cp == '\t'; cp++)
161         ;
162
163     if (key_read(ret, &cp) != 1)
164         return 0;
165
166     /* Skip trailing whitespace. */
167     for (; *cp == ' ' || *cp == '\t'; cp++)
168         ;
169
170     /* Return results. */
171     *cpp = cp;
172     *bitsp = key_size(ret);
173     return 1;
174 }
175
176 static int
177 hostfile_check_key(int bits, const Key *key, const char *host, const char *filen
178 {
179     if (key == NULL || key->type != KEY_RSA1 || key->rsa == NULL)
180         return 1;
181     if (bits != BN_num_bits(key->rsa->n)) {
182         log("Warning: %s, line %d: keysize mismatch for host %s: "
183             "actual %d vs. announced %d.",
184             filename, linenum, host, BN_num_bits(key->rsa->n), bits);
185         log("Warning: replace %d with %d in %s, line %d.",
186             bits, BN_num_bits(key->rsa->n), filename, linenum);
187     }
188     return 1;
189 }
190
191 /*
192  * Checks whether the given host (which must be in all lowercase) is already
193  * in the list of our known hosts. Returns HOST_OK if the host is known and

```

```

194  * has the specified key, HOST_NEW if the host is not known, and HOST_CHANGED
195  * if the host is known but used to have a different host key.
196  *
197  * If no 'key' has been specified and a key of type 'keytype' is known
198  * for the specified host, then HOST_FOUND is returned.
199  */
200
201 static HostStatus
202 check_host_in_hostfile_by_key_or_type(const char *filename,
203     const char *host, const Key *key, int keytype, Key *found, int *numret)
204 {
205     FILE *f;
206     char line[8192];
207     int linenum = 0;
208     u_int kbits;
209     char *cp, *cp2, *hashed_host;
210     HostStatus end_return;
211
212     debug3("check_host_in_hostfile: filename %s", filename);
213
214     /* Open the file containing the list of known hosts. */
215     f = fopen(filename, "r");
216     if (!f)
217         return HOST_NEW;
218
219     /*
220      * Return value when the loop terminates. This is set to
221      * HOST_CHANGED if we have seen a different key for the host and have
222      * not found the proper one.
223      */
224     end_return = HOST_NEW;
225
226     /* Go through the file. */
227     while (fgets(line, sizeof(line), f)) {
228         cp = line;
229         linenum++;
230
231         /* Skip any leading whitespace, comments and empty lines. */
232         for (; *cp == ' ' || *cp == '\t'; cp++)
233             ;
234         if (!*cp || *cp == '#' || *cp == '\n')
235             continue;
236
237         /* Find the end of the host name portion. */
238         for (cp2 = cp; *cp2 && *cp2 != ' ' && *cp2 != '\t'; cp2++)
239             ;
240
241         /* Check if the host name matches. */
242         if (match_hostname(host, cp, (u_int) (cp2 - cp)) != 1) {
243             if (*cp != HASH_DELIM)
244                 continue;
245             hashed_host = host_hash(host, cp, (u_int) (cp2 - cp));
246             if (hashed_host == NULL) {
247                 debug("Invalid hashed host line %d of %s",
248                     linenum, filename);
249                 continue;
250             }
251             if (strncmp(hashed_host, cp, (u_int) (cp2 - cp)) != 0)
252                 continue;
253         }
254
255         /* Got a match. Skip host name. */
256         cp = cp2;
257
258         /*
259          * Extract the key from the line. This will skip any leading

```

```

260     * whitespace. Ignore badly formatted lines.
261     */
262     if (!hostfile_read_key(&cp, &kbits, found))
263         continue;
264
265     if (numret != NULL)
266         *numret = linenum;
267
268     if (key == NULL) {
269         /* we found a key of the requested type */
270         if (found->type == keytype) {
271             fclose(f);
272             return HOST_FOUND;
273         }
274         continue;
275     }
276
277     if (!hostfile_check_key(kbits, found, host, filename, linenum))
278         continue;
279
280     /* Check if the current key is the same as the given key. */
281     if (key_equal(key, found)) {
282         /* Ok, they match. */
283         debug3("check_host_in_hostfile: match line %d", linenum)
284         fclose(f);
285         return HOST_OK;
286     }
287     /*
288      * They do not match. We will continue to go through the
289      * file; however, we note that we will not return that it is
290      * new.
291      */
292     end_return = HOST_CHANGED;
293 }
294 /* Clear variables and close the file. */
295 fclose(f);
296
297 /*
298  * Return either HOST_NEW or HOST_CHANGED, depending on whether we
299  * saw a different key for the host.
300  */
301 return end_return;
302 }
303
304 HostStatus
305 check_host_in_hostfile(const char *filename, const char *host, const Key *key,
306                       Key *found, int *numret)
307 {
308     if (key == NULL)
309         fatal("no key to look up");
310     return (check_host_in_hostfile_by_key_or_type(filename, host, key, 0,
311                                                  found, numret));
312 }
313
314 int
315 lookup_key_in_hostfile_by_type(const char *filename, const char *host,
316                               int keytype, Key *found, int *numret)
317 {
318     return (check_host_in_hostfile_by_key_or_type(filename, host, NULL,
319                                                  keytype, found, numret) == HOST_FOUND);
320 }
321
322 /*
323  * Appends an entry to the host file. Returns false if the entry could not
324  * be appended.
325  */

```

```

327 int
328 add_host_to_hostfile(const char *filename, const char *host, const Key *key,
329                     int store_hash)
330 {
331     FILE *f;
332     int success = 0;
333     char *hashed_host = NULL;
334
335     if (key == NULL)
336         return 1; /* XXX ? */
337     f = fopen(filename, "a");
338     if (!f)
339         return 0;
340
341     if (store_hash) {
342         if ((hashed_host = host_hash(host, NULL, 0)) == NULL) {
343             error("add_host_to_hostfile: host_hash failed");
344             fclose(f);
345             return 0;
346         }
347     }
348     fprintf(f, "%s ", store_hash ? hashed_host : host);
349
350     if (key_write(key, f)) {
351         success = 1;
352     } else {
353         error("add_host_to_hostfile: saving key in %s failed", filename)
354     }
355     fprintf(f, "\n");
356     fclose(f);
357     return success;
358 }

```

new/usr/src/cmd/ssh/libssh/common/kex.c

1

19073 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/kex.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /*
2  * Copyright (c) 2000, 2001 Markus Friedl. All rights reserved.
3  *
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5  * modification, are permitted provided that the following conditions
6  * are met:
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13 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR
14 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
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16 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
17 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
18 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 *
24 * Copyright 2009 Sun Microsystems, Inc. All rights reserved.
25 * Use is subject to license terms.
26 */

28 #include "includes.h"
29 RCSID("$OpenBSD: kex.c,v 1.51 2002/06/24 14:55:38 markus Exp $");

31 #include <locale.h>

33 #include <openssl/opensslconf.h>
34 #include <openssl/crypto.h>

36 #include "ssh2.h"
37 #include "xmalloc.h"
38 #include "buffer.h"
39 #include "bufaux.h"
40 #include "packet.h"
41 #include "compat.h"
42 #include "cipher.h"
43 #include "kex.h"
44 #include "key.h"
45 #include "log.h"
46 #include "mac.h"
47 #include "match.h"
48 #include "dispatch.h"
49 #include "g11n.h"

51 #ifdef GSSAPI
52 #include "ssh-gss.h"
53 #endif

55 #define KEX_COOKIE_LEN 16

57 char *session_lang = NULL;

60 /* prototype */
61 static void kex_do_hook(Kex *kex);
```

new/usr/src/cmd/ssh/libssh/common/kex.c

2

```
62 static void kex_kexinit_finish(Kex *);
63 static void kex_choose_conf(Kex *);

65 /* put algorithm proposal into buffer */
66 static
67 void
68 kex_prop2buf(Buffer *b, char *proposal[PROPOSAL_MAX])
69 {
70     int i;

72     buffer_clear(b);
73     /*
74      * add a dummy cookie, the cookie will be overwritten by
75      * kex_send_kexinit(), each time a kexinit is set
76      */
77     for (i = 0; i < KEX_COOKIE_LEN; i++)
78         buffer_put_char(b, 0);
79     for (i = 0; i < PROPOSAL_MAX; i++)
80         buffer_put_cstring(b, proposal[i]);
81     buffer_put_char(b, 0); /* first_kex_packet_follows */
82     buffer_put_int(b, 0); /* uint32 reserved */
83 }

85 /* parse buffer and return algorithm proposal */
86 static
87 char **
88 kex_buf2prop(Buffer *raw, int *first_kex_follows)
89 {
90     Buffer b;
91     int i;
92     char **proposal;

94     proposal = xmalloc(PROPOSAL_MAX * sizeof(char *));

96     buffer_init(&b);
97     buffer_append(&b, buffer_ptr(raw), buffer_len(raw));
98     /* skip cookie */
99     for (i = 0; i < KEX_COOKIE_LEN; i++)
100         buffer_get_char(&b);
101     /* extract kex init proposal strings */
102     for (i = 0; i < PROPOSAL_MAX; i++) {
103         proposal[i] = buffer_get_string(&b, NULL);
104         debug2("kex_parse_kexinit: %s", proposal[i]);
105     }
106     /* first kex follows / reserved */
107     i = buffer_get_char(&b);
108     if (first_kex_follows != NULL)
109         *first_kex_follows = i;
110     debug2("kex_parse_kexinit: first_kex_follows %d ", i);
111     i = buffer_get_int(&b);
112     debug2("kex_parse_kexinit: reserved %d ", i);
113     buffer_free(&b);
114     return proposal;
115 }

117 static
118 void
119 kex_prop_free(char **proposal)
120 {
121     int i;

123     for (i = 0; i < PROPOSAL_MAX; i++)
124         xfree(proposal[i]);
125     xfree(proposal);
126 }
```

```

128 static void
129 kex_protocol_error(int type, u_int32_t seq, void *ctxt)
130 {
131     error("Hm, kex protocol error: type %d seq %u", type, seq);
132 }

134 static void
135 kex_reset_dispatch(void)
136 {
137 #ifdef ALTPRIVSEP
138     /* unprivileged sshd has a kex packet handler that must not be reset */
139     debug3("kex_reset_dispatch -- should we dispatch_set(KEXINIT) here? %d &
140         packet_is_server(), packet_is_monitor());
141     if (packet_is_server() && !packet_is_monitor()) {
142         debug3("kex_reset_dispatch -- skipping dispatch_set(KEXINIT) in
143             return;
144     }
145 #endif /* ALTPRIVSEP */

147     dispatch_range(SSH2_MSG_TRANSPORT_MIN,
148         SSH2_MSG_TRANSPORT_MAX, &kex_protocol_error);
149     dispatch_set(SSH2_MSG_KEXINIT, &kex_input_kexinit);
150 }

152 void
153 kex_finish(Kex *kex)
154 {
155     kex_reset_dispatch();

157     packet_start(SSH2_MSG_NEWKEYS);
158     packet_send();
159     /* packet_write_wait(); */
160     debug("SSH2_MSG_NEWKEYS sent");

162 #ifdef ALTPRIVSEP
163     if (packet_is_monitor())
164         goto skip_newkeys;
165 #endif /* ALTPRIVSEP */
166     debug("expecting SSH2_MSG_NEWKEYS");
167     packet_read_expect(SSH2_MSG_NEWKEYS);
168     packet_check_eom();
169     debug("SSH2_MSG_NEWKEYS received");
170 #ifdef ALTPRIVSEP
171     skip_newkeys;
172 #endif /* ALTPRIVSEP */

174     kex->done = 1;
175     kex->initial_kex_done = 1; /* never to be cleared once set */
176     buffer_clear(&kex->peer);
177     /* buffer_clear(&kex->my); */
178     kex->flags &= ~KEX_INIT_SENT;
179     xfree(kex->name);
180     kex->name = NULL;
181 }

183 void
184 kex_send_kexinit(Kex *kex)
185 {
186     u_int32_t rand = 0;
187     u_char *cookie;
188     int i;

190     if (kex == NULL) {
191         error("kex_send_kexinit: no kex, cannot rekey");
192         return;
193     }

```

```

194     if (kex->flags & KEX_INIT_SENT) {
195         debug("KEX_INIT_SENT");
196         return;
197     }
198     kex->done = 0;

200     /* update my proposal -- e.g., add/remove GSS kexalgs */
201     kex_do_hook(kex);

203     /* generate a random cookie */
204     if (buffer_len(&kex->my) < KEX_COOKIE_LEN)
205         fatal("kex_send_kexinit: kex proposal too short");
206     cookie = buffer_ptr(&kex->my);
207     for (i = 0; i < KEX_COOKIE_LEN; i++) {
208         if (i % 4 == 0)
209             rand = arc4random();
210         cookie[i] = rand;
211         rand >= 8;
212     }
213     packet_start(SSH2_MSG_KEXINIT);
214     packet_put_raw(buffer_ptr(&kex->my), buffer_len(&kex->my));
215     packet_send();
216     debug("SSH2_MSG_KEXINIT sent");
217     kex->flags |= KEX_INIT_SENT;
218 }

220 void
221 kex_input_kexinit(int type, u_int32_t seq, void *ctxt)
222 {
223     char *ptr;
224     u_int dlen;
225     int i;
226     Kex *kex = (Kex *)ctxt;

228     debug("SSH2_MSG_KEXINIT received");
229     if (kex == NULL)
230         fatal("kex_input_kexinit: no kex, cannot rekey");

232     ptr = packet_get_raw(&dlen);
233     buffer_append(&kex->peer, ptr, dlen);

235     /* discard packet */
236     for (i = 0; i < KEX_COOKIE_LEN; i++)
237         packet_get_char();
238     for (i = 0; i < PROPOSAL_MAX; i++)
239         xfree(packet_get_string(NULL));
240     (void) packet_get_char();
241     (void) packet_get_int();
242     packet_check_eom();

244     kex_kexinit_finish(kex);
245 }

247 /*
248  * This is for GSS keyex, where actual KEX offer can change at rekey
249  * time due to credential expiration/renewal...
250  */
251 static
252 void
253 kex_do_hook(Kex *kex)
254 {
255     char **prop;

257     if (kex->kex_hook == NULL)
258         return;

```

```

260 /* Unmarshall my proposal, let the hook modify it, remarshal it */
261 prop = kex_buf2prop(&kex->my, NULL);
262 buffer_clear(&kex->my);
263 (kex->kex_hook)(kex, prop);
264 kex_prop2buf(&kex->my, prop);
265 kex_prop_free(prop);
266 }

268 /* Initiate the key exchange by sending the SSH2_MSG_KEXINIT message. */
269 void
270 kex_start(Kex *kex)
271 {
272     kex_send_kexinit(kex);
273     kex_reset_dispatch();
274 }

276 /*
277  * Allocate a key exchange structure and populate it with a proposal we are
278  * going to use. This function does not start the actual key exchange.
279  */
280 Kex *
281 kex_setup(const char *host, char *proposal[PROPOSAL_MAX], Kex_hook_func hook)
282 {
283     Kex *kex;

285     kex = xmalloc(sizeof(*kex));
286     memset(kex, 0, sizeof(*kex));
287     buffer_init(&kex->peer);
288     buffer_init(&kex->my);

290     kex->kex_hook = hook; /* called by kex_send_kexinit() */

292     if (host != NULL && *host != '\0')
293         kex->serverhost = xstrdup(host);
294     else
295         kex->server = 1;

297     kex_prop2buf(&kex->my, proposal);

299     return kex;
300 }

302 static void
303 kex_kexinit_finish(Kex *kex)
304 {
305     if (!(kex->flags & KEX_INIT_SENT))
306         kex_send_kexinit(kex);

308     kex_choose_conf(kex);

310     if (kex->kex_type >= 0 && kex->kex_type < KEX_MAX &&
311         kex->kex[kex->kex_type] != NULL)
312         (kex->kex[kex->kex_type])(kex);
313     else
314         fatal("Unsupported key exchange %d", kex->kex_type);
315 }

317 static void
318 choose_lang(char **lang, char *client, char *server)
319 {
320     if (datafellows & SSH_BUG_LOCALES_NOT_LANGTAGS)
321         *lang = match_list(client, server, NULL);
322     else
323         *lang = g11n_srvr_locale_negotiate(client, NULL);
324 }

```

```

326 /*
327  * Make the message clear enough so that if this happens the user can figure out
328  * the workaround of changing the Ciphers option.
329  */
330 #define CLIENT_ERR_MSG
331 "Client and server could not agree on a common cipher:\n"
332 " client: %s\n"
333 " server: %s\n"
334 "\n"
335 "The client cipher list can be controlled using the \"Ciphers\" option, \n"
336 "see ssh_config(4) for more information. The \"-o Ciphers=<cipher-list>\" \n"
337 "option may be used to temporarily override the ciphers the client\n"
338 "offers."

340 /*
341  * The server side message goes to syslogd and we do not want to send multiline
342  * messages there. What's more, the server side notification may be shorter
343  * since we expect that an administrator will deal with that, not the user.
344  */
345 #define SERVER_ERR_MSG
346 "Client and server could not agree on a common cipher: client \"%s\", "
347 "server \"%s\". The server cipher list can be controlled using the "
348 "\"Ciphers\" option, see sshd_config(4) for more information."

350 static void
351 choose_enc(int is_server, Enc *enc, char *client, char *server)
352 {
353     char *name = match_list(client, server, NULL);

355     if (name == NULL) {
356         if (is_server == 1)
357             fatal(SERVER_ERR_MSG, client, server);
358         else
359             fatal(CLIENT_ERR_MSG, client, server);
360     }

362     if ((enc->cipher = cipher_by_name(name)) == NULL)
363         fatal("matching cipher is not supported: %s", name);

365     enc->name = name;
366     enc->enabled = 0;
367     enc->iv = NULL;
368     enc->key = NULL;
369     enc->key_len = cipher_keylen(enc->cipher);
370     enc->block_size = cipher_blocksize(enc->cipher);
371 }

373 static void
374 choose_mac(Mac *mac, char *client, char *server)
375 {
376     char *name = match_list(client, server, NULL);
377     if (name == NULL)
378         fatal("no matching mac found: client %s server %s",
379             client, server);
380     if (mac_setup(mac, name) < 0)
381         fatal("unsupported mac %s", name);
382     /* truncate the key */
383     if (datafellows & SSH_BUG_HMAC)
384         mac->key_len = 16;
385     mac->name = name;
386     mac->key = NULL;
387     mac->enabled = 0;
388 }

390 static void
391 choose_comp(Comp *comp, char *client, char *server)

```

```

392 {
393     char *name = match_list(client, server, NULL);
394     if (name == NULL)
395         fatal("no matching comp found: client %s server %s", client, ser
396     if (strcmp(name, "zlib") == 0) {
397         comp->type = 1;
398     } else if (strcmp(name, "none") == 0) {
399         comp->type = 0;
400     } else {
401         fatal("unsupported comp %s", name);
402     }
403     comp->name = name;
404 }

406 static void
407 choose_kex(Kex *k, char *client, char *server)
408 {
409     k->name = match_list(client, server, NULL);
410     if (k->name == NULL)
411         fatal("no common kex alg: client '%s', server '%s'", client,
412             server);
413     /* XXX Finish 3.6/7 merge of kex stuff -- choose_kex() done */
414     if (strcmp(k->name, KEX_DH1) == 0) {
415         k->kex_type = KEX_DH_GRP1_SHA1;
416     } else if (strcmp(k->name, KEX_DHGEX) == 0) {
417         k->kex_type = KEX_DH_GEX_SHA1;
418 #ifdef GSSAPI
419     } else if (strcmp(k->name, KEX_GSS_SHA1, sizeof(KEX_GSS_SHA1)-1) == 0)
420     {
421         k->kex_type = KEX_GSS_GRP1_SHA1;
422 #endif
423     } else
424         fatal("bad kex alg %s", k->name);
425 }

426 static void
427 choose_hostkeyalg(Kex *k, char *client, char *server)
428 {
429     char *hostkeyalg = match_list(client, server, NULL);
430     if (hostkeyalg == NULL)
431         fatal("no hostkey alg");
432     k->hostkey_type = key_type_from_name(hostkeyalg);
433     if (k->hostkey_type == KEY_UNSPEC)
434         fatal("bad hostkey alg '%s'", hostkeyalg);
435     xfree(hostkeyalg);
436 }

438 static int
439 proposals_match(char *my[PROPOSAL_MAX], char *peer[PROPOSAL_MAX])
440 {
441     static int check[] = {
442         PROPOSAL_KEX_ALGS, PROPOSAL_SERVER_HOST_KEY_ALGS, -1
443     };
444     int *idx;
445     char *p;

447     for (idx = &check[0]; *idx != -1; idx++) {
448         if ((p = strchr(my[*idx], ',')) != NULL)
449             *p = '\0';
450         if ((p = strchr(peer[*idx], ',')) != NULL)
451             *p = '\0';
452         if (strcmp(my[*idx], peer[*idx]) != 0) {
453             debug2("proposal mismatch: my %s peer %s",
454                 my[*idx], peer[*idx]);
455             return (0);
456         }
457     }

```

```

458     debug2("proposals match");
459     return (1);
460 }

462 static void
463 kex_choose_conf(Kex *kex)
464 {
465     Newkeys *newkeys;
466     char **my, **peer;
467     char **cprop, **sprop;
468     char *p_langs_c2s, *p_langs_s2c; /* peer's langs */
469     char *p_langs = NULL; /* peer's langs */
470     char *m_langs = NULL; /* my langs */
471     int nenc, nmac, ncomp;
472     int mode;
473     int ctos; /* direction: if true client-to-
474     int need;
475     int first_kex_follows, type;

477     my = kex_buf2prop(&kex->my, NULL);
478     peer = kex_buf2prop(&kex->peer, &first_kex_follows);

480     if (kex->server) {
481         cprop=peer;
482         sprop=my;
483     } else {
484         cprop=my;
485         sprop=peer;
486     }

488     /* Algorithm Negotiation */
489     for (mode = 0; mode < MODE_MAX; mode++) {
490         newkeys = xmalloc(sizeof(*newkeys));
491         memset(newkeys, 0, sizeof(*newkeys));
492         kex->newkeys[mode] = newkeys;
493         ctos = (!kex->server && mode == MODE_OUT) || (kex->server && mod
494         nenc = ctos ? PROPOSAL_ENC_ALGS_CTOS : PROPOSAL_ENC_ALGS_STOC;
495         nmac = ctos ? PROPOSAL_MAC_ALGS_CTOS : PROPOSAL_MAC_ALGS_STOC;
496         ncomp = ctos ? PROPOSAL_COMP_ALGS_CTOS : PROPOSAL_COMP_ALGS_STOC
497         choose_enc(kex->server, &newkeys->enc, cprop[nenc], sprop[nenc]
498         choose_mac(&newkeys->mac, cprop[nmac], sprop[nmac]);
499         choose_comp(&newkeys->comp, cprop[ncomp], sprop[ncomp]);
500         debug("kex: %s %s %s %s",
501             ctos ? "client->server" : "server->client",
502             newkeys->enc.name,
503             newkeys->mac.name,
504             newkeys->comp.name);
505     }
506     choose_kex(kex, cprop[PROPOSAL_KEX_ALGS], sprop[PROPOSAL_KEX_ALGS]);
507     choose_hostkeyalg(kex, cprop[PROPOSAL_SERVER_HOST_KEY_ALGS],
508         sprop[PROPOSAL_SERVER_HOST_KEY_ALGS]);
509     need = 0;
510     for (mode = 0; mode < MODE_MAX; mode++) {
511         newkeys = kex->newkeys[mode];
512         if (need < newkeys->enc.key_len)
513             need = newkeys->enc.key_len;
514         if (need < newkeys->enc.block_size)
515             need = newkeys->enc.block_size;
516         if (need < newkeys->mac.key_len)
517             need = newkeys->mac.key_len;
518     }
519     /* XXX need runden? */
520     kex->we_need = need;

522     /* ignore the next message if the proposals do not match */
523     if (first_kex_follows && !proposals_match(my, peer) &&

```



```

524     !(datafellows & SSH_BUG_FIRSTKEX)) {
525         type = packet_read();
526         debug2("skipping next packet (type %u)", type);
527     }

529     /* Language/locale negotiation -- not worth doing on re-key */

531     if (!kex->initial_kex_done) {
532         p_langs_c2s = peer[PROPOSAL_LANG_CTOS];
533         p_langs_s2c = peer[PROPOSAL_LANG_STOC];
534         debug("Peer sent proposed langtags, ctos: %s", p_langs_c2s);
535         debug("Peer sent proposed langtags, stoc: %s", p_langs_s2c);
536         plangs = NULL;

538         /* We propose the same langs for each protocol direction */
539         mlangs = my[PROPOSAL_LANG_STOC];
540         debug("We proposed langtags, ctos: %s", my[PROPOSAL_LANG_CTOS]);
541         debug("We proposed langtags, stoc: %s", mlangs);

543         /*
544          * Why oh why did they bother with negotiating langs for
545          * each protocol direction?!
546          *
547          * The semantics of this are vaguely specified, but one can
548          * imagine using one language (locale) for the whole session and
549          * a different one for message localization (e.g., 'en_US.UTF-8'
550          * overall and 'fr' for messages). Weird? Maybe. But lang
551          * tags don't include codeset info, like locales do...
552          *
553          * So, server-side we want:
554          * - setlocale(LC_ALL, c2s_locale);
555          * and
556          * - setlocale(LC_MESSAGES, s2c_locale);
557          *
558          * Client-side we don't really care. But we could do:
559          *
560          * - when very verbose, tell the use what lang the server's
561          *   messages are in, if left out in the protocol
562          * - when sending messages to the server, and if applicable, we
563          *   can localize them according to the language negotiated for
564          *   that direction.
565          *
566          * But for now we do nothing on the client side.
567          */
568         if ((p_langs_c2s && *p_langs_c2s) && !(p_langs_s2c && *p_langs_s2c))
569             plangs = p_langs_c2s;
570         else if ((p_langs_s2c && *p_langs_s2c) && !(p_langs_c2s && *p_langs_c2s))
571             plangs = p_langs_s2c;
572         else
573             plangs = p_langs_c2s;

575         if (kex->server) {
576             if (plangs && mlangs && *plangs && *mlangs) {
577                 char *locale;

579                 g11n_test_langtag(plangs, 1);

581                 choose_lang(&locale, plangs, mlangs);
582                 if (locale) {
583                     g11n_setlocale(LC_ALL, locale);
584                     debug("Negotiated main locale: %s", locale);
585                     packet_send_debug("Negotiated main locale: %s", locale);
586                     xfree(locale);
587                 }
588                 if (plangs != p_langs_s2c &&
589                     p_langs_s2c && *p_langs_s2c) {

```

```

590         choose_lang(&locale, p_langs_s2c, mlangs);
591         if (locale) {
592             g11n_setlocale(LC_MESSAGES, locale);
593             debug("Negotiated messages locale: %s", locale);
594             packet_send_debug("Negotiated messages locale: %s", locale);
595             xfree(locale);
596         }
597     }
598 }
599
600     }
601     else {
602         if (plangs && mlangs && *plangs && *mlangs &&
603             !(datafellows & SSH_BUG_LOCALES_NOT_LANGTAGS)) {
604             char *lang;
605             lang = g11n_clnt_langtag_negotiate(mlangs, plangs);
606             if (lang) {
607                 session_lang = lang;
608                 debug("Negotiated lang: %s", lang);
609                 g11n_test_langtag(lang, 0);
610             }
611         }
612     }
613 }

615     kex_prop_free(my);
616     kex_prop_free(peer);
617 }

619 static u_char *
620 derive_key(Kex *kex, int id, int need, u_char *hash, BIGNUM *shared_secret)
621 {
622     Buffer b;
623     const EVP_MD *evp_md = EVP_sha1();
624     EVP_MD_CTX md;
625     char c = id;
626     int have;
627     int mdsz = EVP_MD_size(evp_md);
628     u_char *digest = xmalloc(roundup(need, mdsz));

630     buffer_init(&b);
631     buffer_put_bignum2(&b, shared_secret);

633     /* K1 = HASH(K || H || "A" || session_id) */
634     EVP_DigestInit(&md, evp_md);
635     if (!(datafellows & SSH_BUG_DERIVEKEY))
636         EVP_DigestUpdate(&md, buffer_ptr(&b), buffer_len(&b));
637     EVP_DigestUpdate(&md, hash, mdsz);
638     EVP_DigestUpdate(&md, &c, 1);
639     EVP_DigestUpdate(&md, kex->session_id, kex->session_id_len);
640     EVP_DigestFinal(&md, digest, NULL);

642     /*
643      * expand key:
644      * Kn = HASH(K || H || K1 || K2 || ... || Kn-1)
645      * Key = K1 || K2 || ... || Kn
646      */
647     for (have = mdsz; need > have; have += mdsz) {
648         EVP_DigestInit(&md, evp_md);
649         if (!(datafellows & SSH_BUG_DERIVEKEY))
650             EVP_DigestUpdate(&md, buffer_ptr(&b), buffer_len(&b));
651         EVP_DigestUpdate(&md, hash, mdsz);
652         EVP_DigestUpdate(&md, digest, have);
653         EVP_DigestFinal(&md, digest + have, NULL);
654     }
655     buffer_free(&b);

```

```

656 #ifdef DEBUG_KEX
657     fprintf(stderr, "key '%c'== ", c);
658     dump_digest("key", digest, need);
659 #endif
660     return digest;
661 }

663 Newkeys *current_keys[MODE_MAX];

665 #define NKEYS    6
666 void
667 kex_derive_keys(Kex *kex, u_char *hash, BIGNUM *shared_secret)
668 {
669     u_char *keys[NKEYS];
670     int i, mode, ctos;

672     for (i = 0; i < NKEYS; i++)
673         keys[i] = derive_key(kex, 'A'+i, kex->we_need, hash, shared_secret);

675     debug2("kex_derive_keys");
676     for (mode = 0; mode < MODE_MAX; mode++) {
677         current_keys[mode] = kex->newkeys[mode];
678         kex->newkeys[mode] = NULL;
679         ctos = (!kex->server && mode == MODE_OUT) || (kex->server && mode == MODE_IN);
680         current_keys[mode]->enc.iv = keys[ctos ? 0 : 1];
681         current_keys[mode]->enc.key = keys[ctos ? 2 : 3];
682         current_keys[mode]->mac.key = keys[ctos ? 4 : 5];
683     }
684 }

686 Newkeys *
687 kex_get_newkeys(int mode)
688 {
689     Newkeys *ret;

691     ret = current_keys[mode];
692     current_keys[mode] = NULL;
693     return ret;
694 }

696 #if defined(DEBUG_KEX) || defined(DEBUG_KEXDH)
697 void
698 dump_digest(char *msg, u_char *digest, int len)
699 {
700     int i;

702     fprintf(stderr, "%s\n", msg);
703     for (i = 0; i < len; i++) {
704         fprintf(stderr, "%02x", digest[i]);
705         if (i%32 == 31)
706             fprintf(stderr, "\n");
707         else if (i%8 == 7)
708             fprintf(stderr, " ");
709     }
710     fprintf(stderr, "\n");
711 }
712 #endif

```

```

*****
2956 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/kexdh.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
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3  *
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6  * are met:
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20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */

25 #include "includes.h"
26 RCSID("$OpenBSD: kexdh.c,v 1.18 2002/03/18 17:50:31 provos Exp $");

28 #pragma ident "%Z%M% %I% %E% SMI"

30 #include <openssl/opensslconf.h>
31 #include <openssl/crypto.h>
32 #include <openssl/bn.h>

34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "key.h"
38 #include "kex.h"
39 #include "log.h"
40 #include "packet.h"
41 #include "dh.h"
42 #include "ssh2.h"

44 u_char *
45 kex_dh_hash(
46     char *client_version_string,
47     char *server_version_string,
48     char *ckexinit, int ckexinitlen,
49     char *skexinit, int skexinitlen,
50     u_char *serverhostkeyblob, int sbloblen,
51     BIGNUM *client_dh_pub,
52     BIGNUM *server_dh_pub,
53     BIGNUM *shared_secret)
54 {
55     Buffer b;
56     static u_char digest[EVP_MAX_MD_SIZE];
57     const EVP_MD *evp_md = EVP_sha1();
58     EVP_MD_CTX md;

60     buffer_init(&b);
61     buffer_put_cstring(&b, client_version_string);

```

```

62     buffer_put_cstring(&b, server_version_string);

64     /* kexinit messages: fake header: len+SSH2_MSG_KEXINIT */
65     buffer_put_int(&b, ckexinitlen+1);
66     buffer_put_char(&b, SSH2_MSG_KEXINIT);
67     buffer_append(&b, ckexinit, ckexinitlen);
68     buffer_put_int(&b, skexinitlen+1);
69     buffer_put_char(&b, SSH2_MSG_KEXINIT);
70     buffer_append(&b, skexinit, skexinitlen);

72     buffer_put_string(&b, serverhostkeyblob, sbloblen);
73     buffer_put_bignum2(&b, client_dh_pub);
74     buffer_put_bignum2(&b, server_dh_pub);
75     buffer_put_bignum2(&b, shared_secret);

77 #ifdef DEBUG_KEX
78     buffer_dump(&b);
79 #endif
80     EVP_DigestInit(&md, evp_md);
81     EVP_DigestUpdate(&md, buffer_ptr(&b), buffer_len(&b));
82     EVP_DigestFinal(&md, digest, NULL);

84     buffer_free(&b);

86 #ifdef DEBUG_KEX
87     dump_digest("hash", digest, EVP_MD_size(evp_md));
88 #endif
89     return digest;
90 }

```

```

*****
4549 Fri May 30 18:31:09 2014
new/usr/src/cmd/ssh/libssh/common/kexdh.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

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19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */
24
25 #include "includes.h"
26 RCSID("$OpenBSD: kexdh.c,v 1.18 2002/03/18 17:50:31 provos Exp $");
27
28 #pragma ident "%Z%M% %I% %E% SMI"
29
30 #include <openssl/opensslconf.h>
31 #include <openssl/crypto.h>
32 #include <openssl/bn.h>
33
34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "key.h"
38 #include "kex.h"
39 #include "log.h"
40 #include "packet.h"
41 #include "dh.h"
42 #include "ssh2.h"
43
44 void
45 kexdh_client(Kex *kex)
46 {
47     BIGNUM *dh_server_pub = NULL, *shared_secret = NULL;
48     DH *dh;
49     Key *server_host_key;
50     u_char *server_host_key_blob = NULL, *signature = NULL;
51     u_char *kbuf, *hash;
52     u_int klen, kout, slen, sbloblen;
53
54     /* generate and send 'e', client DH public key */
55     dh = dh_new_group1();
56     dh_gen_key(dh, kex->we_need * 8);
57     packet_start(SSH2_MSG_KEXDH_INIT);
58     packet_put_bignum2(dh->pub_key);
59     packet_send();
60
61     debug("sending SSH2_MSG_KEXDH_INIT");

```

```

62 #ifdef DEBUG_KEXDH
63     DHparams_print_fp(stderr, dh);
64     fprintf(stderr, "pub= ");
65     BN_print_fp(stderr, dh->pub_key);
66     fprintf(stderr, "\n");
67 #endif
68
69     debug("expecting SSH2_MSG_KEXDH_REPLY");
70     packet_read_expect(SSH2_MSG_KEXDH_REPLY);
71
72     /* key, cert */
73     server_host_key_blob = packet_get_string(&sbloblen);
74     server_host_key = key_from_blob(server_host_key_blob, sbloblen);
75     if (server_host_key == NULL)
76         fatal("cannot decode server_host_key_blob");
77     if (server_host_key->type != kex->hostkey_type)
78         fatal("type mismatch for decoded server_host_key_blob");
79     if (kex->verify_host_key == NULL)
80         fatal("cannot verify server_host_key");
81     if (kex->verify_host_key(server_host_key) == -1)
82         fatal("server_host_key verification failed");
83
84     /* DH paramter f, server public DH key */
85     if ((dh_server_pub = BN_new()) == NULL)
86         fatal("dh_server_pub == NULL");
87     packet_get_bignum2(dh_server_pub);
88
89 #ifdef DEBUG_KEXDH
90     fprintf(stderr, "dh_server_pub= ");
91     BN_print_fp(stderr, dh_server_pub);
92     fprintf(stderr, "\n");
93     debug("bits %d", BN_num_bits(dh_server_pub));
94 #endif
95
96     /* signed H */
97     signature = packet_get_string(&slen);
98     packet_check_eom();
99
100     if (!dh_pub_is_valid(dh, dh_server_pub))
101         packet_disconnect("bad server public DH value");
102
103     klen = DH_size(dh);
104     kbuf = xmalloc(klen);
105     kout = DH_compute_key(kbuf, dh_server_pub, dh);
106 #ifdef DEBUG_KEXDH
107     dump_digest("shared secret", kbuf, kout);
108 #endif
109     if ((shared_secret = BN_new()) == NULL)
110         fatal("kexdh_client: BN_new failed");
111     BN_bin2bn(kbuf, kout, shared_secret);
112     memset(kbuf, 0, klen);
113     xfree(kbuf);
114
115     /* calc and verify H */
116     hash = kex_dh_hash(
117         kex->client_version_string,
118         kex->server_version_string,
119         buffer_ptr(&kex->my), buffer_len(&kex->my),
120         buffer_ptr(&kex->peer), buffer_len(&kex->peer),
121         server_host_key_blob, sbloblen,
122         dh->pub_key,
123         dh_server_pub,
124         shared_secret
125     );
126     xfree(server_host_key_blob);
127     BN_clear_free(dh_server_pub);

```

```
128     DH_free(dh);
130     if (key_verify(server_host_key, signature, slen, hash, 20) != 1)
131         fatal("key_verify failed for server_host_key");
132     key_free(server_host_key);
133     xfree(signature);
135     /* save session id */
136     if (kex->session_id == NULL) {
137         kex->session_id_len = 20;
138         kex->session_id = xmalloc(kex->session_id_len);
139         memcpy(kex->session_id, hash, kex->session_id_len);
140     }
142     kex_derive_keys(kex, hash, shared_secret);
143     BN_clear_free(shared_secret);
144     kex_finish(kex);
145 }
```

```

*****
4395 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/kexdhs.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
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19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */

25 #include "includes.h"
26 RCSID("$OpenBSD: kexdh.c,v 1.18 2002/03/18 17:50:31 provos Exp $");

28 #pragma ident "%Z%M% %I% %E% SMI"

30 #include <openssl/opensslconf.h>
31 #include <openssl/crypto.h>
32 #include <openssl/bn.h>

34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "key.h"
38 #include "kex.h"
39 #include "log.h"
40 #include "packet.h"
41 #include "dh.h"
42 #include "ssh2.h"

44 void
45 kexdh_server(Kex *kex)
46 {
47     BIGNUM *shared_secret = NULL, *dh_client_pub = NULL;
48     DH *dh;
49     Key *server_host_key;
50     u_char *kbuf, *hash, *signature = NULL, *server_host_key_blob = NULL;
51     u_int sbloblen, klen, kout;
52     u_int slen;

54     /* generate server DH public key */
55     dh = dh_new_group1();
56     dh_gen_key(dh, kex->we_need * 8);

58     debug("expecting SSH2_MSG_KEXDH_INIT");
59     packet_read_expect(SSH2_MSG_KEXDH_INIT);

61     if (kex->load_host_key == NULL)

```

```

62         fatal("Cannot load hostkey");
63     server_host_key = kex->load_host_key(kex->hostkey_type);
64     if (server_host_key == NULL)
65         fatal("Unsupported hostkey type %d", kex->hostkey_type);

67     /* key, cert */
68     if ((dh_client_pub = BN_new()) == NULL)
69         fatal("dh_client_pub == NULL");
70     packet_get_bignum2(dh_client_pub);
71     packet_check_eom();

73 #ifdef DEBUG_KEXDH
74     fprintf(stderr, "dh_client_pub= ");
75     BN_print_fp(stderr, dh_client_pub);
76     fprintf(stderr, "\n");
77     debug("bits %d", BN_num_bits(dh_client_pub));
78 #endif

80 #ifdef DEBUG_KEXDH
81     DHparams_print_fp(stderr, dh);
82     fprintf(stderr, "pub= ");
83     BN_print_fp(stderr, dh->pub_key);
84     fprintf(stderr, "\n");
85 #endif
86     if (!dh_pub_is_valid(dh, dh_client_pub))
87         packet_disconnect("bad client public DH value");

89     klen = DH_size(dh);
90     kbuf = xmalloc(klen);
91     kout = DH_compute_key(kbuf, dh_client_pub, dh);
92 #ifdef DEBUG_KEXDH
93     dump_digest("shared secret", kbuf, kout);
94 #endif
95     if ((shared_secret = BN_new()) == NULL)
96         fatal("kexdh_server: BN_new failed");
97     BN_bin2bn(kbuf, kout, shared_secret);
98     memset(kbuf, 0, klen);
99     xfree(kbuf);

101     key_to_blob(server_host_key, &server_host_key_blob, &sbloblen);

103     /* calc H */
104     hash = kex_dh_hash(
105         kex->client_version_string,
106         kex->server_version_string,
107         buffer_ptr(&kex->peer), buffer_len(&kex->peer),
108         buffer_ptr(&kex->my), buffer_len(&kex->my),
109         server_host_key_blob, sbloblen,
110         dh_client_pub,
111         dh->pub_key,
112         shared_secret
113     );
114     BN_clear_free(dh_client_pub);

116     /* save session id := H */
117     /* XXX hashlen depends on KEX */
118     if (kex->session_id == NULL) {
119         kex->session_id_len = 20;
120         kex->session_id = xmalloc(kex->session_id_len);
121         memcpy(kex->session_id, hash, kex->session_id_len);
122     }

124     /* sign H */
125     /* XXX hashlen depends on KEX */
126     key_sign(server_host_key, &signature, &slen, hash, 20);

```

```
128     /* destroy_sensitive_data(); */
130     /* send server hostkey, DH pubkey 'f' and signed H */
131     packet_start(SSH2_MSG_KEXDH_REPLY);
132     packet_put_string(server_host_key_blob, sbloblen);
133     packet_put_bignum2(dh->pub_key); /* f */
134     packet_put_string(signature, slen);
135     packet_send();

137     xfree(signature);
138     xfree(server_host_key_blob);
139     /* have keys, free DH */
140     DH_free(dh);

142     kex_derive_keys(kex, hash, shared_secret);
143     BN_clear_free(shared_secret);
144     kex_finish(kex);
145 }
```

```

*****
3296 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/kexgex.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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21 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
22 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
23 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
24 */

26 #include "includes.h"
27 RCSID("$OpenBSD: kexgex.c,v 1.22 2002/03/24 17:27:03 stevesk Exp $");

29 #pragma ident "%Z%M% %I% %E% SMI"

31 #include <openssl/opensslconf.h>
32 #include <openssl/bn.h>

34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "key.h"
38 #include "kex.h"
39 #include "log.h"
40 #include "packet.h"
41 #include "dh.h"
42 #include "ssh2.h"
43 #include "compat.h"

45 u_char *
46 kexgex_hash(
47     char *client_version_string,
48     char *server_version_string,
49     char *ckexinit, int ckexinitlen,
50     char *skexinit, int skexinitlen,
51     u_char *serverhostkeyblob, int sbloblen,
52     int min, int wantbits, int max, BIGNUM *prime, BIGNUM *gen,
53     BIGNUM *client_dh_pub,
54     BIGNUM *server_dh_pub,
55     BIGNUM *shared_secret)
56 {
57     Buffer b;
58     static u_char digest[EVP_MAX_MD_SIZE];
59     const EVP_MD *evp_md = EVP_sha1();
60     EVP_MD_CTX md;

```

```

62     buffer_init(&b);
63     buffer_put_cstring(&b, client_version_string);
64     buffer_put_cstring(&b, server_version_string);

66     /* kexinit messages: fake header: len+SSH2_MSG_KEXINIT */
67     buffer_put_int(&b, ckexinitlen+1);
68     buffer_put_char(&b, SSH2_MSG_KEXINIT);
69     buffer_append(&b, ckexinit, ckexinitlen);
70     buffer_put_int(&b, skexinitlen+1);
71     buffer_put_char(&b, SSH2_MSG_KEXINIT);
72     buffer_append(&b, skexinit, skexinitlen);

74     buffer_put_string(&b, serverhostkeyblob, sbloblen);
75     if (min == -1 || max == -1)
76         buffer_put_int(&b, wantbits);
77     else {
78         buffer_put_int(&b, min);
79         buffer_put_int(&b, wantbits);
80         buffer_put_int(&b, max);
81     }
82     buffer_put_bignum2(&b, prime);
83     buffer_put_bignum2(&b, gen);
84     buffer_put_bignum2(&b, client_dh_pub);
85     buffer_put_bignum2(&b, server_dh_pub);
86     buffer_put_bignum2(&b, shared_secret);

88 #ifdef DEBUG_KEXDH
89     buffer_dump(&b);
90 #endif
91     EVP_DigestInit(&md, evp_md);
92     EVP_DigestUpdate(&md, buffer_ptr(&b), buffer_len(&b));
93     EVP_DigestFinal(&md, digest, NULL);

95     buffer_free(&b);

97 #ifdef DEBUG_KEXDH
98     dump_digest("hash", digest, EVP_MD_size(evp_md));
99 #endif
100     return digest;
101 }

```



```

*****
5813 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/kexgexc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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16 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
17 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
18 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
19 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
20 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
21 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
22 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
23 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
24 */

26 #include "includes.h"
27 RCSID("$OpenBSD: kexgexc.c,v 1.22 2002/03/24 17:27:03 stevesk Exp $");

29 #pragma ident "%Z%M% %I% %E% SMI"

31 #include <openssl/opensslconf.h>
32 #include <openssl/bn.h>

34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "key.h"
38 #include "kex.h"
39 #include "log.h"
40 #include "packet.h"
41 #include "dh.h"
42 #include "ssh2.h"
43 #include "compat.h"

45 void
46 kexgexc_client(Kex *kex)
47 {
48     BIGNUM *dh_server_pub = NULL, *shared_secret = NULL;
49     BIGNUM *p = NULL, *g = NULL;
50     Key *server_host_key;
51     u_char *kbuf, *hash, *signature = NULL, *server_host_key_blob = NULL;
52     u_int klen, kout, slen, sbloblen;
53     int min, max, nbits;
54     DH *dh;

56     nbits = dh_estimate(kex->we_need * 8);

58     if (datafellows & SSH_OLD_DHGX) {
59         debug("SSH2_MSG_KEX_DH_GEX_REQUEST_OLD sent");
61         /* Old GEX request */

```

```

62         packet_start(SSH2_MSG_KEX_DH_GEX_REQUEST_OLD);
63         packet_put_int(nbits);
64         min = DH_GRP_MIN;
65         max = DH_GRP_MAX;
66     } else {
67         debug("SSH2_MSG_KEX_DH_GEX_REQUEST sent");

69         /* New GEX request */
70         min = DH_GRP_MIN;
71         max = DH_GRP_MAX;
72         packet_start(SSH2_MSG_KEX_DH_GEX_REQUEST);
73         packet_put_int(min);
74         packet_put_int(nbits);
75         packet_put_int(max);
76     }
77 #ifdef DEBUG_KEXDH
78     fprintf(stderr, "\nmin = %d, nbits = %d, max = %d\n",
79             min, nbits, max);
80 #endif
81     packet_send();

83     debug("expecting SSH2_MSG_KEX_DH_GEX_GROUP");
84     packet_read_expect(SSH2_MSG_KEX_DH_GEX_GROUP);

86     if ((p = BN_new()) == NULL)
87         fatal("BN_new");
88     packet_get_bignum2(p);
89     if ((g = BN_new()) == NULL)
90         fatal("BN_new");
91     packet_get_bignum2(g);
92     packet_check_eom();

94     if (BN_num_bits(p) < min || BN_num_bits(p) > max)
95         fatal("DH_GEX group out of range: %d !< %d !< %d",
96             min, BN_num_bits(p), max);

98     dh = dh_new_group(g, p);
99     dh_gen_key(dh, kex->we_need * 8);

101 #ifdef DEBUG_KEXDH
102     DHparams_print_fp(stderr, dh);
103     fprintf(stderr, "pub= ");
104     BN_print_fp(stderr, dh->pub_key);
105     fprintf(stderr, "\n");
106 #endif

108     debug("SSH2_MSG_KEX_DH_GEX_INIT sent");
109     /* generate and send 'e', client DH public key */
110     packet_start(SSH2_MSG_KEX_DH_GEX_INIT);
111     packet_put_bignum2(dh->pub_key);
112     packet_send();

114     debug("expecting SSH2_MSG_KEX_DH_GEX_REPLY");
115     packet_read_expect(SSH2_MSG_KEX_DH_GEX_REPLY);

117     /* key, cert */
118     server_host_key_blob = packet_get_string(&sbloblen);
119     server_host_key = key_from_blob(server_host_key_blob, sbloblen);
120     if (server_host_key == NULL)
121         fatal("cannot decode server_host_key_blob");
122     if (server_host_key->type != kex->hostkey_type)
123         fatal("type mismatch for decoded server_host_key_blob");
124     if (kex->verify_host_key == NULL)
125         fatal("cannot verify server_host_key");
126     if (kex->verify_host_key(server_host_key) == -1)
127         fatal("server_host_key verification failed");

```

```

129     /* DH paramter f, server public DH key */
130     if ((dh_server_pub = BN_new()) == NULL)
131         fatal("dh_server_pub == NULL");
132     packet_get_bignum2(dh_server_pub);

134 #ifdef DEBUG_KEXDH
135     fprintf(stderr, "dh_server_pub= ");
136     BN_print_fp(stderr, dh_server_pub);
137     fprintf(stderr, "\n");
138     debug("bits %d", BN_num_bits(dh_server_pub));
139 #endif

141     /* signed H */
142     signature = packet_get_string(&slen);
143     packet_check_eom();

145     if (!dh_pub_is_valid(dh, dh_server_pub))
146         packet_disconnect("bad server public DH value");

148     klen = DH_size(dh);
149     kbuf = xmalloc(klen);
150     kout = DH_compute_key(kbuf, dh_server_pub, dh);
151 #ifdef DEBUG_KEXDH
152     dump_digest("shared secret", kbuf, kout);
153 #endif
154     if ((shared_secret = BN_new()) == NULL)
155         fatal("kexgexc_client: BN_new failed");
156     BN_bin2bn(kbuf, kout, shared_secret);
157     memset(kbuf, 0, klen);
158     xfree(kbuf);

160     if (datafellows & SSH_OLD_DHGX)
161         min = max = -1;

163     /* calc and verify H */
164     hash = kexgexc_hash(
165         kex->client_version_string,
166         kex->server_version_string,
167         buffer_ptr(&kex->my), buffer_len(&kex->my),
168         buffer_ptr(&kex->peer), buffer_len(&kex->peer),
169         server_host_key_blob, sbloblen,
170         min, nbits, max,
171         dh->p, dh->g,
172         dh->pub_key,
173         dh_server_pub,
174         shared_secret
175     );
176     /* have keys, free DH */
177     DH_free(dh);
178     xfree(server_host_key_blob);
179     BN_clear_free(dh_server_pub);

181     if (key_verify(server_host_key, signature, slen, hash, 20) != 1)
182         fatal("key_verify failed for server_host_key");
183     key_free(server_host_key);
184     xfree(signature);

186     /* save session id */
187     if (kex->session_id == NULL) {
188         kex->session_id_len = 20;
189         kex->session_id = xmalloc(kex->session_id_len);
190         memcpy(kex->session_id, hash, kex->session_id_len);
191     }
192     kex_derive_keys(kex, hash, shared_secret);
193     BN_clear_free(shared_secret);

```

```

195     kex_finish(kex);
196 }

```

```

*****
5723 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/kexgexs.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
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3  * Copyright (c) 2001 Markus Friedl. All rights reserved.
4  *
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6  * modification, are permitted provided that the following conditions
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20 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
21 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
22 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
23 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
24 */

26 #include "includes.h"
27 RCSID("$OpenBSD: kexgex.c,v 1.22 2002/03/24 17:27:03 stevesk Exp $");

29 #pragma ident "%Z%M% %I% %E% SMI"

31 #include <openssl/opensslconf.h>
32 #include <openssl/bn.h>

34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "key.h"
38 #include "kex.h"
39 #include "log.h"
40 #include "packet.h"
41 #include "dh.h"
42 #include "ssh2.h"
43 #include "compat.h"

45 void
46 kexgex_server(Kex *kex)
47 {
48     BIGNUM *shared_secret = NULL, *dh_client_pub = NULL;
49     Key *server_host_key;
50     DH *dh;
51     u_char *kbuf, *hash, *signature = NULL, *server_host_key_blob = NULL;
52     u_int sbloblen, klen, kout, slen;
53     int min = -1, max = -1, nbits = -1, type;

55     if (kex->load_host_key == NULL)
56         fatal("Cannot load hostkey");
57     server_host_key = kex->load_host_key(kex->hostkey_type);
58     if (server_host_key == NULL)
59         fatal("Unsupported hostkey type %d", kex->hostkey_type);

61     type = packet_read();

```

```

62     switch (type) {
63     case SSH2_MSG_KEX_DH_GEX_REQUEST:
64         debug("SSH2_MSG_KEX_DH_GEX_REQUEST received");
65         min = packet_get_int();
66         nbits = packet_get_int();
67         max = packet_get_int();
68         min = MAX(DH_GRP_MIN, min);
69         max = MIN(DH_GRP_MAX, max);
70         break;
71     case SSH2_MSG_KEX_DH_GEX_REQUEST_OLD:
72         debug("SSH2_MSG_KEX_DH_GEX_REQUEST_OLD received");
73         nbits = packet_get_int();
74         min = DH_GRP_MIN;
75         max = DH_GRP_MAX;
76         /* unused for old GEX */
77         break;
78     default:
79         fatal("protocol error during kex, no DH_GEX_REQUEST: %d", type);
80     }
81     packet_check_eom();

83     if (max < min || nbits < min || max < nbits)
84         fatal("DH_GEX_REQUEST, bad parameters: %d !< %d !< %d",
85             min, nbits, max);

87     /* Contact privileged parent */
88     dh = choose_dh(min, nbits, max);
89     if (dh == NULL)
90         packet_disconnect("Protocol error: no matching DH grp found");

92     debug("SSH2_MSG_KEX_DH_GEX_GROUP sent");
93     packet_start(SSH2_MSG_KEX_DH_GEX_GROUP);
94     packet_put_bignum2(dh->p);
95     packet_put_bignum2(dh->g);
96     packet_send();

98     /* flush */
99     packet_write_wait();

101     /* Compute our exchange value in parallel with the client */
102     dh_gen_key(dh, kex->we_need * 8);

104     debug("expecting SSH2_MSG_KEX_DH_GEX_INIT");
105     packet_read_expect(SSH2_MSG_KEX_DH_GEX_INIT);

107     /* key, cert */
108     if ((dh_client_pub = BN_new()) == NULL)
109         fatal("dh_client_pub == NULL");
110     packet_get_bignum2(dh_client_pub);
111     packet_check_eom();

113 #ifdef DEBUG_KEXDH
114     fprintf(stderr, "dh_client_pub= ");
115     BN_print_fp(stderr, dh_client_pub);
116     fprintf(stderr, "\n");
117     debug("bits %d", BN_num_bits(dh_client_pub));
118 #endif

120 #ifdef DEBUG_KEXDH
121     DHparams_print_fp(stderr, dh);
122     fprintf(stderr, "pub= ");
123     BN_print_fp(stderr, dh->pub_key);
124     fprintf(stderr, "\n");
125 #endif
126     if (!dh_pub_is_valid(dh, dh_client_pub))
127         packet_disconnect("bad client public DH value");

```

```

129     klen = DH_size(dh);
130     kbuf = xmalloc(klen);
131     kout = DH_compute_key(kbuf, dh_client_pub, dh);
132 #ifdef DEBUG_KEXDH
133     dump_digest("shared secret", kbuf, kout);
134 #endif
135     if ((shared_secret = BN_new()) == NULL)
136         fatal("kexgex_server: BN_new failed");
137     BN_bin2bn(kbuf, kout, shared_secret);
138     memset(kbuf, 0, klen);
139     xfree(kbuf);

141     key_to_blob(server_host_key, &server_host_key_blob, &sbloblen);

143     if (type == SSH2_MSG_KEX_DH_GEX_REQUEST_OLD)
144         min = max = -1;

146     /* calc H */
147     hash = kexgex_hash(
148         kex->client_version_string,
149         kex->server_version_string,
150         buffer_ptr(&kex->peer), buffer_len(&kex->peer),
151         buffer_ptr(&kex->my), buffer_len(&kex->my),
152         server_host_key_blob, sbloblen,
153         min, nbits, max,
154         dh->p, dh->g,
155         dh_client_pub,
156         dh->pub_key,
157         shared_secret
158     );
159     BN_clear_free(dh_client_pub);

161     /* save session id := H */
162     /* XXX hashlen depends on KEX */
163     if (kex->session_id == NULL) {
164         kex->session_id_len = 20;
165         kex->session_id = xmalloc(kex->session_id_len);
166         memcpy(kex->session_id, hash, kex->session_id_len);
167     }

169     /* sign H */
170     /* XXX hashlen depends on KEX */
171     key_sign(server_host_key, &signature, &slen, hash, 20);

173     /* destroy_sensitive_data(); */

175     /* send server hostkey, DH pubkey 'f' and signed H */
176     debug("SSH2_MSG_KEX_DH_GEX_REPLY sent");
177     packet_start(SSH2_MSG_KEX_DH_GEX_REPLY);
178     packet_put_string(server_host_key_blob, sbloblen);
179     packet_put_bignum2(dh->pub_key); /* f */
180     packet_put_string(signature, slen);
181     packet_send();

183     xfree(signature);
184     xfree(server_host_key_blob);
185     /* have keys, free DH */
186     DH_free(dh);

188     kex_derive_keys(kex, hash, shared_secret);
189     BN_clear_free(shared_secret);

191     kex_finish(kex);
192 }

```

9633 Fri May 30 18:31:10 2014
 new/usr/src/cmd/ssh/libssh/common/kexgssc.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /*
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5  * modification, are permitted provided that the following conditions
6  * are met:
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19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */
24 /*
25  * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
26  * Use is subject to license terms.
27  */
28
29 #pragma ident      "%Z%M% %I%      %E% SMI"
30
31
32 #include "includes.h"
33
34 #ifdef GSSAPI
35
36 #include <openssl/opensslconf.h>
37 #include <openssl/crypto.h>
38 #include <openssl/bn.h>
39
40 #include "xmalloc.h"
41 #include "buffer.h"
42 #include "bufaux.h"
43 #include "kex.h"
44 #include "log.h"
45 #include "packet.h"
46 #include "dh.h"
47 #include "canohost.h"
48 #include "ssh2.h"
49 #include "ssh-gss.h"
50
51 extern char *xxx_host;
52
53 Gssctxt *xxx_gssctxt;
54
55 static void kexgss_verbose_cleanup(void *arg);
56
57 void
58 kexgss_client(Kex *kex)
59 {
60     gss_buffer_desc gssbuf, send_tok, recv_tok, msg_tok;
61     gss_buffer_t token_ptr;

```

```

62     gss_OID mech = GSS_C_NULL_OID;
63     Gssctxt *ctxt = NULL;
64     OM_uint32 maj_status, min_status, smaj_status, smin_status;
65     unsigned int klen, kout;
66     DH *dh;
67     BIGNUM *dh_server_pub = 0;
68     BIGNUM *shared_secret = 0;
69     Key *server_host_key = NULL;
70     unsigned char *kbuf;
71     unsigned char *hash;
72     unsigned char *server_host_key_blob = NULL;
73     char *msg, *lang;
74     int type = 0;
75     int first = 1;
76     uint_t sbloblen = 0;
77     uint_t strlen;
78
79     /* Map the negotiated kex name to a mech OID */
80     ssh_gssapi_oid_of_kexname(kex->name, &mech);
81     if (mech == GSS_C_NULL_OID)
82         fatal("Couldn't match the negotiated GSS key exchange");
83
84     ssh_gssapi_build_ctx(&ctxt, 1, mech);
85
86     /* This code should match that in ssh_dh1_client */
87
88     /* Step 1 - e is dh->pub_key */
89     dh = dh_new_group1();
90     dh_gen_key(dh, kex->we_need * 8);
91
92     /* This is f, we initialise it now to make life easier */
93     dh_server_pub = BN_new();
94     if (dh_server_pub == NULL) {
95         fatal("dh_server_pub == NULL");
96     }
97
98     token_ptr = GSS_C_NO_BUFFER;
99
100     recv_tok.value = NULL;
101     recv_tok.length = 0;
102
103     do {
104         debug("Calling gss_init_sec_context");
105
106         maj_status = ssh_gssapi_init_ctx(ctxt, xxx_host,
107             kex->options.gss_deleg_creds, token_ptr, &send_tok);
108
109         if (GSS_ERROR(maj_status)) {
110             ssh_gssapi_error(ctxt, "performing GSS-API protected "
111                 "SSHv2 key exchange");
112             (void) gss_release_buffer(&min_status, &send_tok);
113             packet_disconnect("A GSS-API error occurred during "
114                 "GSS-API protected SSHv2 key exchange\n");
115         }
116
117         /* If we've got an old receive buffer get rid of it */
118         if (token_ptr != GSS_C_NO_BUFFER) {
119             /* We allocated recv_tok */
120             xfree(recv_tok.value);
121             recv_tok.value = NULL;
122             recv_tok.length = 0;
123             token_ptr = GSS_C_NO_BUFFER;
124         }
125
126         if (maj_status == GSS_S_COMPLETE) {
127             /* If mutual state flag is not true, kex fails */

```

```

128         if (!(ctxt->flags & GSS_C_MUTUAL_FLAG)) {
129             fatal("Mutual authentication failed");
130         }
131         /* If integ avail flag is not true kex fails */
132         if (!(ctxt->flags & GSS_C_INTEG_FLAG)) {
133             fatal("Integrity check failed");
134         }
135     }
136 }
137
138 /*
139  * If we have data to send, then the last message that we
140  * received cannot have been a 'complete'.
141  */
142 if (send_tok.length != 0) {
143     if (first) {
144         packet_start(SSH2_MSG_KEXGSS_INIT);
145         packet_put_string(send_tok.value,
146             send_tok.length);
147         packet_put_bignum2(dh->pub_key);
148         first = 0;
149     } else {
150         packet_start(SSH2_MSG_KEXGSS_CONTINUE);
151         packet_put_string(send_tok.value,
152             send_tok.length);
153     }
154     (void) gss_release_buffer(&min_status, &send_tok);
155     packet_send();
156     packet_write_wait();
157 }
158
159 /*
160  * If we've sent them data, they'd better be polite and
161  * reply.
162 */
163
164 next_packet:
165
166 /*
167  * We need to catch connection closing w/o error
168  * tokens or messages so we can tell the user
169  * _something_ more useful than "Connection
170  * closed by ..."
171  *
172  * We use a fatal cleanup function as that's
173  * all, really, that we can do for now.
174  */
175 fatal_add_cleanup(kexgss_verbose_cleanup, NULL);
176 type = packet_read();
177 fatal_remove_cleanup(kexgss_verbose_cleanup, NULL);
178 switch (type) {
179     case SSH2_MSG_KEXGSS_HOSTKEY:
180         debug("Received KEXGSS_HOSTKEY");
181         server_host_key_blob =
182             packet_get_string(&sbloblen);
183         server_host_key =
184             key_from_blob(server_host_key_blob,
185                 sbloblen);
186         goto next_packet; /* there MUST be another */
187     case SSH2_MSG_KEXGSS_CONTINUE:
188         debug("Received GSSAPI_CONTINUE");
189         if (maj_status == GSS_S_COMPLETE)
190             packet_disconnect("Protocol error: "
191                 "received GSS-API context token "
192                 "though the context was already "
193                 "established");
194         rcv_tok.value = packet_get_string(&strlen);

```

```

194         rcv_tok.length = strlen; /* u_int vs. size_t */
195         break;
196     case SSH2_MSG_KEXGSS_COMPLETE:
197         debug("Received GSSAPI_COMPLETE");
198         packet_get_bignum2(dh_server_pub);
199         msg_tok.value = packet_get_string(&strlen);
200         msg_tok.length = strlen; /* u_int vs. size_t */
201
202         /* Is there a token included? */
203         if (packet_get_char()) {
204             rcv_tok.value =
205                 packet_get_string(&strlen);
206             /* u_int/size_t */
207             rcv_tok.length = strlen;
208         }
209         if (rcv_tok.length > 0 &&
210             maj_status == GSS_S_COMPLETE) {
211             packet_disconnect("Protocol error: "
212                 "received GSS-API context token "
213                 "though the context was already "
214                 "established");
215         } else if (rcv_tok.length == 0 &&
216             maj_status == GSS_S_CONTINUE_NEEDED) {
217             /* No token included */
218             packet_disconnect("Protocol error: "
219                 "did not receive expected "
220                 "GSS-API context token");
221         }
222         break;
223     case SSH2_MSG_KEXGSS_ERROR:
224         smaj_status = packet_get_int();
225         smin_status = packet_get_int();
226         msg = packet_get_string(NULL);
227         lang = packet_get_string(NULL);
228         xfree(lang);
229         error("Server had a GSS-API error; the "
230             "connection will close (%d/%d):\n%s",
231             smaj_status, smin_status, msg);
232         error("Use the GssKeyEx option to disable "
233             "GSS-API key exchange and try again.");
234         packet_disconnect("The server had a GSS-API "
235             "error during GSS-API protected SSHv2 "
236             "key exchange\n");
237         break;
238     default:
239         packet_disconnect("Protocol error: "
240             "didn't expect packet type %d", type);
241     }
242     if (rcv_tok.value)
243         token_ptr = &rcv_tok;
244 } else {
245     /* No data, and not complete */
246     if (maj_status != GSS_S_COMPLETE) {
247         fatal("Not complete, and no token output");
248     }
249 }
250 } while (maj_status == GSS_S_CONTINUE_NEEDED);
251
252 /*
253  * We _must_ have received a COMPLETE message in reply from the
254  * server, which will have set dh_server_pub and msg_tok.
255  */
256 if (type != SSH2_MSG_KEXGSS_COMPLETE)
257     fatal("Expected SSH2_MSG_KEXGSS_COMPLETE never arrived");
258 if (maj_status != GSS_S_COMPLETE)
259     fatal("Internal error in GSS-API protected SSHv2 key exchange");

```

```

261     /* Check f in range [1, p-1] */
262     if (!dh_pub_is_valid(dh, dh_server_pub))
263         packet_disconnect("bad server public DH value");

265     /* compute K=f^x mod p */
266     klen = DH_size(dh);
267     kbuf = xmalloc(klen);
268     kout = DH_compute_key(kbuf, dh_server_pub, dh);

270     shared_secret = BN_new();
271     BN_bin2bn(kbuf, kout, shared_secret);
272     (void) memset(kbuf, 0, klen);
273     xfree(kbuf);

275     /* The GSS hash is identical to the DH one */
276     hash = kex_dh_hash(
277         kex->client_version_string,
278         kex->server_version_string,
279         buffer_ptr(&kex->my), buffer_len(&kex->my),
280         buffer_ptr(&kex->peer), buffer_len(&kex->peer),
281         server_host_key_blob, sbloblen, /* server host key */
282         dh->pub_key, /* e */
283         dh_server_pub, /* f */
284         shared_secret); /* K */

286     gssbuf.value = hash;
287     gssbuf.length = 20;

289     /* Verify that H matches the token we just got. */
290     if ((maj_status = gss_verify_mic(&min_status, ctxt->context, &gssbuf,
291         &msg_tok, NULL))) {
292         packet_disconnect("Hash's MIC didn't verify");
293     }

295     if (server_host_key && kex->accept_host_key != NULL)
296         (void) kex->accept_host_key(server_host_key);

298     DH_free(dh);

300     xxx_gssctxt = ctxt; /* for gss keyex w/ mic userauth */

302     /* save session id */
303     if (kex->session_id == NULL) {
304         kex->session_id_len = 20;
305         kex->session_id = xmalloc(kex->session_id_len);
306         (void) memcpy(kex->session_id, hash, kex->session_id_len);
307     }

309     kex_derive_keys(kex, hash, shared_secret);
310     BN_clear_free(shared_secret);
311     kex_finish(kex);
312 }

314 /* ARGSUSED */
315 static
316 void
317 kexgss_verbose_cleanup(void *arg)
318 {
319     error("The GSS-API protected key exchange has failed without "
320         "indication\nfrom the server, possibly due to misconfiguration "
321         "of the server.");
322     error("Use the GssKeyEx option to disable GSS-API key exchange "
323         "and try again.");
324 }

```

```

326 #endif /* GSSAPI */

```

7226 Fri May 30 18:31:10 2014
 new/usr/src/cmd/ssh/libssh/common/kexgsss.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

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22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */
24
25 * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
26 * Use is subject to license terms.
27 */
28
29 #pragma ident      "%Z%M% %I%      %E% SMI"
30
31 #include "includes.h"
32
33 #ifdef GSSAPI
34
35 #include <openssl/opensslconf.h>
36 #include <openssl/crypto.h>
37 #include <openssl/bn.h>
38
39 #include "xmalloc.h"
40 #include "buffer.h"
41 #include "bufaux.h"
42 #include "compat.h"
43 #include "kex.h"
44 #include "log.h"
45 #include "packet.h"
46 #include "dh.h"
47 #include "ssh2.h"
48 #include "ssh-gss.h"
49 #include "auth.h"
50
51 Gssctxt *xxx_gssctxt;
52 extern Authctxt *x_authctxt;
53
54 static void kex_gss_send_error(Gssctxt *ctxt);
55
56 void
57 kexgss_server(Kex *kex)
58 {
59     OM_uint32 maj_status, min_status;
60     gss_buffer_desc gssbuf, send_tok, recv_tok, msg_tok;
61     Gssctxt *ctxt = NULL;

```

```

62     unsigned int klen, kout;
63     unsigned int sbloblen = 0;
64     unsigned char *kbuf, *hash;
65     unsigned char *server_host_key_blob = NULL;
66     DH *dh;
67     Key *server_host_key = NULL;
68     BIGNUM *shared_secret = NULL;
69     BIGNUM *dh_client_pub = NULL;
70     int type = 0;
71     uint_t slen;
72     gss_OID oid;
73
74     /*
75      * Load host key to advertise in a SSH_MSG_KEXGSS_HOSTKEY packet
76      * -- unlike KEX_DH/KEX_GEX no host key, no problem since it's
77      * the GSS-API that provides for server host authentication.
78      */
79     if (kex->load_host_key != NULL &&
80         !(datafellows & SSH_BUG_GSSKEX_HOSTKEY))
81         server_host_key = kex->load_host_key(kex->hostkey_type);
82     if (server_host_key != NULL)
83         key_to_blob(server_host_key, &server_host_key_blob, &sbloblen);
84
85     /* Initialise GSSAPI */
86
87     ssh_gssapi_oid_of_kexname(kex->name, &oid);
88     if (oid == GSS_C_NULL_OID) {
89         fatal("Couldn't match the negotiated GSS key exchange");
90     }
91
92     ssh_gssapi_build_ctx(&xxx_gssctxt, 0, oid);
93
94     ctxt = xxx_gssctxt;
95
96     do {
97         debug("Wait SSH2_MSG_GSSAPI_INIT");
98         type = packet_read();
99         switch (type) {
100             case SSH2_MSG_KEXGSS_INIT:
101                 if (dh_client_pub != NULL)
102                     fatal("Received KEXGSS_INIT after "
103                         "initialising");
104                 recv_tok.value = packet_get_string(&slen);
105                 recv_tok.length = slen; /* int vs. size_t */
106
107                 dh_client_pub = BN_new();
108
109                 if (dh_client_pub == NULL)
110                     fatal("dh_client_pub == NULL");
111                 packet_get_bignum2(dh_client_pub);
112
113                 /* Send SSH_MSG_KEXGSS_HOSTKEY here, if we want */
114                 if (sbloblen) {
115                     packet_start(SSH2_MSG_KEXGSS_HOSTKEY);
116                     packet_put_string(server_host_key_blob,
117                                     sbloblen);
118                     packet_send();
119                     packet_write_wait();
120                 }
121                 break;
122             case SSH2_MSG_KEXGSS_CONTINUE:
123                 recv_tok.value = packet_get_string(&slen);
124                 recv_tok.length = slen; /* int vs. size_t */
125                 break;
126             default:

```



```

128         packet_disconnect("Protocol error: didn't expect "
129             "packet type %d", type);
130     }
131
132     maj_status = ssh_gssapi_accept_ctx(ctxt, &recv_tok, &send_tok);
133
134     xfree(recv_tok.value); /* We allocated this, not gss */
135
136     if (dh_client_pub == NULL)
137         fatal("No client public key");
138
139     if (maj_status == GSS_S_CONTINUE_NEEDED) {
140         debug("Sending GSSAPI_CONTINUE");
141         packet_start(SSH2_MSG_KEXGSS_CONTINUE);
142         packet_put_string(send_tok.value, send_tok.length);
143         packet_send();
144         packet_write_wait();
145         (void) gss_release_buffer(&min_status, &send_tok);
146     }
147 } while (maj_status == GSS_S_CONTINUE_NEEDED);
148
149 if (GSS_ERROR(maj_status)) {
150     kex_gss_send_error(ctxt);
151     if (send_tok.length > 0) {
152         packet_start(SSH2_MSG_KEXGSS_CONTINUE);
153         packet_put_string(send_tok.value, send_tok.length);
154         packet_send();
155         packet_write_wait();
156         (void) gss_release_buffer(&min_status, &send_tok);
157     }
158     fatal("accept_ctx died");
159 }
160
161 debug("gss_complete");
162 if (!(ctxt->flags & GSS_C_MUTUAL_FLAG))
163     fatal("Mutual authentication flag wasn't set");
164
165 if (!(ctxt->flags & GSS_C_INTEG_FLAG))
166     fatal("Integrity flag wasn't set");
167
168 dh = dh_new_group1();
169 dh_gen_key(dh, kex->we_need * 8);
170
171 if (!dh_pub_is_valid(dh, dh_client_pub))
172     packet_disconnect("bad client public DH value");
173
174 klen = DH_size(dh);
175 kbuf = xmalloc(klen);
176 kout = DH_compute_key(kbuf, dh_client_pub, dh);
177
178 shared_secret = BN_new();
179 BN_bin2bn(kbuf, kout, shared_secret);
180 (void) memset(kbuf, 0, klen);
181 xfree(kbuf);
182
183 /* The GSSAPI hash is identical to the Diffie Helman one */
184 hash = kex_dh_hash(
185     kex->client_version_string,
186     kex->server_version_string,
187     buffer_ptr(&kex->peer), buffer_len(&kex->peer),
188     buffer_ptr(&kex->my), buffer_len(&kex->my),
189     server_host_key_blob, sbloblen,
190     dh_client_pub,
191     dh->pub_key,
192     shared_secret);

```

```

194     BN_free(dh_client_pub);
195
196     if (kex->session_id == NULL) {
197         kex->session_id_len = 20;
198         kex->session_id = xmalloc(kex->session_id_len);
199         (void) memcpy(kex->session_id, hash, kex->session_id_len);
200     } else if (x_authctxt != NULL && x_authctxt->success) {
201         ssh_gssapi_storecreds(ctxt, x_authctxt);
202     }
203
204     /* Should fix kex_dh_hash to output hash length */
205     gssbuf.length = 20; /* yes, it's always 20 (SHA-1) */
206     gssbuf.value = hash; /* and it's static constant storage */
207
208     if (GSS_ERROR(ssh_gssapi_get_mic(ctxt, &gssbuf, &msg_tok))) {
209         kex_gss_send_error(ctxt);
210         fatal("Couldn't get MIC");
211     }
212
213     packet_start(SSH2_MSG_KEXGSS_COMPLETE);
214     packet_put_bignum2(dh->pub_key);
215     packet_put_string((char *)msg_tok.value, msg_tok.length);
216     (void) gss_release_buffer(&min_status, &msg_tok);
217
218     if (send_tok.length != 0) {
219         packet_put_char(1); /* true */
220         packet_put_string((char *)send_tok.value, send_tok.length);
221         (void) gss_release_buffer(&min_status, &send_tok);
222     } else {
223         packet_put_char(0); /* false */
224     }
225     packet_send();
226     packet_write_wait();
227
228     DH_free(dh);
229
230     kex_derive_keys(kex, hash, shared_secret);
231     BN_clear_free(shared_secret);
232     kex_finish(kex);
233 }
234
235 static void
236 kex_gss_send_error(Gssctxt *ctxt) {
237     char *errstr;
238     OM_uint32 maj, min;
239
240     errstr = ssh_gssapi_last_error(ctxt, &maj, &min);
241     if (errstr) {
242         packet_start(SSH2_MSG_KEXGSS_ERROR);
243         packet_put_int(maj);
244         packet_put_int(min);
245         packet_put_cstring(errstr);
246         packet_put_cstring("");
247         packet_send();
248         packet_write_wait();
249         /* XXX - We should probably log the error locally here */
250         xfree(errstr);
251     }
252 }
253 #endif /* GSSAPI */

```

```

*****
19862 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /*
2  * read_bignum():
3  * Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
4  *
5  * As far as I am concerned, the code I have written for this software
6  * can be used freely for any purpose. Any derived versions of this
7  * software must be clearly marked as such, and if the derived work is
8  * incompatible with the protocol description in the RFC file, it must be
9  * called by a name other than "ssh" or "Secure Shell".
10 *
11 *
12 * Copyright (c) 2000, 2001 Markus Friedl. All rights reserved.
13 *
14 * Redistribution and use in source and binary forms, with or without
15 * modification, are permitted provided that the following conditions
16 * are met:
17 * 1. Redistributions of source code must retain the above copyright
18 * notice, this list of conditions and the following disclaimer.
19 * 2. Redistributions in binary form must reproduce the above copyright
20 * notice, this list of conditions and the following disclaimer in the
21 * documentation and/or other materials provided with the distribution.
22 *
23 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR 'AS IS' AND ANY EXPRESS OR
24 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
25 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
26 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
27 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
28 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
29 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
30 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
31 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
32 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
33 */
34 #include "includes.h"
35 RCSID("$OpenBSD: key.c,v 1.49 2002/09/09 14:54:14 markus Exp $");
36
37 #pragma ident "%Z%M% %I% %E% SMI"
38
39 #include <openssl/opensslconf.h>
40 #include <openssl/evp.h>
41
42 #include "xmalloc.h"
43 #include "key.h"
44 #include "rsa.h"
45 #include "ssh-dss.h"
46 #include "ssh-rsa.h"
47 #include "uuencode.h"
48 #include "buffer.h"
49 #include "bufaux.h"
50 #include "log.h"
51
52 Key *
53 key_new(int type)
54 {
55     Key *k;
56     RSA *rsa;
57     DSA *dsa;
58     k = xmalloc(sizeof(*k));
59     k->type = type;
60     k->flags = 0;
61     k->dsa = NULL;

```

```

62     k->rsa = NULL;
63     switch (k->type) {
64     case KEY_RSA1:
65     case KEY_RSA:
66         if ((rsa = RSA_new()) == NULL)
67             fatal("key_new: RSA_new failed");
68         if ((rsa->n = BN_new()) == NULL)
69             fatal("key_new: BN_new failed");
70         if ((rsa->e = BN_new()) == NULL)
71             fatal("key_new: BN_new failed");
72         k->rsa = rsa;
73         break;
74     case KEY_DSA:
75         if ((dsa = DSA_new()) == NULL)
76             fatal("key_new: DSA_new failed");
77         if ((dsa->p = BN_new()) == NULL)
78             fatal("key_new: BN_new failed");
79         if ((dsa->q = BN_new()) == NULL)
80             fatal("key_new: BN_new failed");
81         if ((dsa->g = BN_new()) == NULL)
82             fatal("key_new: BN_new failed");
83         if ((dsa->pub_key = BN_new()) == NULL)
84             fatal("key_new: BN_new failed");
85         k->dsa = dsa;
86         break;
87     case KEY_UNSPEC:
88         break;
89     default:
90         fatal("key_new: bad key type %d", k->type);
91         break;
92     }
93     return k;
94 }
95
96 Key *
97 key_new_private(int type)
98 {
99     Key *k = key_new(type);
100     switch (k->type) {
101     case KEY_RSA1:
102     case KEY_RSA:
103         if ((k->rsa->d = BN_new()) == NULL)
104             fatal("key_new_private: BN_new failed");
105         if ((k->rsa->iqmp = BN_new()) == NULL)
106             fatal("key_new_private: BN_new failed");
107         if ((k->rsa->q = BN_new()) == NULL)
108             fatal("key_new_private: BN_new failed");
109         if ((k->rsa->p = BN_new()) == NULL)
110             fatal("key_new_private: BN_new failed");
111         if ((k->rsa->dmq1 = BN_new()) == NULL)
112             fatal("key_new_private: BN_new failed");
113         if ((k->rsa->dmp1 = BN_new()) == NULL)
114             fatal("key_new_private: BN_new failed");
115         break;
116     case KEY_DSA:
117         if ((k->dsa->priv_key = BN_new()) == NULL)
118             fatal("key_new_private: BN_new failed");
119         break;
120     case KEY_UNSPEC:
121         break;
122     default:
123         break;
124     }
125     return k;
126 }

```

```

128 void
129 key_free(Key *k)
130 {
131     switch (k->type) {
132     case KEY_RSA1:
133     case KEY_RSA:
134         if (k->rsa != NULL)
135             RSA_free(k->rsa);
136         k->rsa = NULL;
137         break;
138     case KEY_DSA:
139         if (k->dsa != NULL)
140             DSA_free(k->dsa);
141         k->dsa = NULL;
142         break;
143     case KEY_UNSPEC:
144         break;
145     default:
146         fatal("key_free: bad key type %d", k->type);
147         break;
148     }
149     xfree(k);
150 }
151 int
152 key_equal(const Key *a, const Key *b)
153 {
154     if (a == NULL || b == NULL || a->type != b->type)
155         return 0;
156     switch (a->type) {
157     case KEY_RSA1:
158     case KEY_RSA:
159         return a->rsa != NULL && b->rsa != NULL &&
160             BN_cmp(a->rsa->e, b->rsa->e) == 0 &&
161             BN_cmp(a->rsa->n, b->rsa->n) == 0;
162         break;
163     case KEY_DSA:
164         return a->dsa != NULL && b->dsa != NULL &&
165             BN_cmp(a->dsa->p, b->dsa->p) == 0 &&
166             BN_cmp(a->dsa->q, b->dsa->q) == 0 &&
167             BN_cmp(a->dsa->g, b->dsa->g) == 0 &&
168             BN_cmp(a->dsa->pub_key, b->dsa->pub_key) == 0;
169         break;
170     default:
171         fatal("key_equal: bad key type %d", a->type);
172         break;
173     }
174     return 0;
175 }
176
177 static u_char *
178 key_fingerprint_raw(Key *k, enum fp_type dgst_type, u_int *dgst_raw_length)
179 {
180     const EVP_MD *md = NULL;
181     EVP_MD_CTX ctx;
182     u_char *blob = NULL;
183     u_char *retval = NULL;
184     u_int len = 0;
185     int nlen, elen;
186
187     *dgst_raw_length = 0;
188
189     switch (dgst_type) {
190     case SSH_FP_MD5:
191         md = EVP_md5();
192         break;
193     case SSH_FP_SHA1:

```

```

194         md = EVP_sha1();
195         break;
196     default:
197         fatal("key_fingerprint_raw: bad digest type %d",
198             dgst_type);
199     }
200     switch (k->type) {
201     case KEY_RSA1:
202         nlen = BN_num_bytes(k->rsa->n);
203         elen = BN_num_bytes(k->rsa->e);
204         len = nlen + elen;
205         blob = xmalloc(len);
206         BN_bn2bin(k->rsa->n, blob);
207         BN_bn2bin(k->rsa->e, blob + nlen);
208         break;
209     case KEY_DSA:
210     case KEY_RSA:
211         key_to_blob(k, &blob, &len);
212         break;
213     case KEY_UNSPEC:
214         return retval;
215         break;
216     default:
217         fatal("key_fingerprint_raw: bad key type %d", k->type);
218         break;
219     }
220     if (blob != NULL) {
221         retval = xmalloc(EVP_MAX_MD_SIZE);
222         EVP_DigestInit(&ctx, md);
223         EVP_DigestUpdate(&ctx, blob, len);
224         EVP_DigestFinal(&ctx, retval, &dgst_raw_length);
225         memset(blob, 0, len);
226         xfree(blob);
227     } else {
228         fatal("key_fingerprint_raw: blob is null");
229     }
230     return retval;
231 }
232
233 static char *
234 key_fingerprint_hex(u_char *dgst_raw, u_int dgst_raw_len)
235 {
236     char *retval;
237     int i;
238
239     retval = xmalloc(dgst_raw_len * 3 + 1);
240     retval[0] = '\0';
241     for (i = 0; i < dgst_raw_len; i++) {
242         char hex[4];
243         snprintf(hex, sizeof(hex), "%02x:", dgst_raw[i]);
244         strlcat(retval, hex, dgst_raw_len * 3);
245     }
246     retval[(dgst_raw_len * 3) - 1] = '\0';
247     return retval;
248 }
249
250 static char *
251 key_fingerprint_bubblebabble(u_char *dgst_raw, u_int dgst_raw_len)
252 {
253     char vowels[] = { 'a', 'e', 'i', 'o', 'u', 'y' };
254     char consonants[] = { 'b', 'c', 'd', 'f', 'g', 'h', 'k', 'l', 'm',
255         'n', 'p', 'r', 's', 't', 'v', 'z', 'x' };
256     u_int i, j = 0, rounds, seed = 1;
257     char *retval;
258
259     rounds = (dgst_raw_len / 2) + 1;

```

```

260     retval = xmalloc(sizeof(char) * (rounds*6));
261     retval[j++] = 'x';
262     for (i = 0; i < rounds; i++) {
263         u_int idx0, idx1, idx2, idx3, idx4;
264         if ((i + 1 < rounds) || (dgst_raw_len % 2 != 0)) {
265             idx0 = (((u_int)(dgst_raw[2 * i])) >> 6) & 3) +
266                 seed % 6;
267             idx1 = (((u_int)(dgst_raw[2 * i])) >> 2) & 15;
268             idx2 = (((u_int)(dgst_raw[2 * i])) & 3) +
269                 (seed / 6) % 6;
270             retval[j++] = vowels[idx0];
271             retval[j++] = consonants[idx1];
272             retval[j++] = vowels[idx2];
273             if ((i + 1) < rounds) {
274                 idx3 = (((u_int)(dgst_raw[(2 * i) + 1])) >> 4) &
275                     (((u_int)(dgst_raw[(2 * i) + 1])) & 15);
276                 retval[j++] = consonants[idx3];
277                 retval[j++] = '-';
278                 idx4 = (((u_int)(dgst_raw[(2 * i) + 1])) & 3) +
279                     (seed * 5) +
280                     (((u_int)(dgst_raw[2 * i])) * 7) +
281                     (((u_int)(dgst_raw[(2 * i) + 1])))) % 36;
282             }
283         } else {
284             idx0 = seed % 6;
285             idx1 = 16;
286             idx2 = seed / 6;
287             retval[j++] = vowels[idx0];
288             retval[j++] = consonants[idx1];
289             retval[j++] = vowels[idx2];
290         }
291     }
292     retval[j++] = 'x';
293     retval[j++] = '\0';
294     return retval;
295 }

297 char *
298 key_fingerprint(Key *k, enum fp_type dgst_type, enum fp_rep dgst_rep)
299 {
300     char *retval = NULL;
301     u_char *dgst_raw;
302     u_int dgst_raw_len;

304     dgst_raw = key_fingerprint_raw(k, dgst_type, &dgst_raw_len);
305     if (!dgst_raw)
306         fatal("key_fingerprint: null from key_fingerprint_raw()");
307     switch (dgst_rep) {
308     case SSH_FP_HEX:
309         retval = key_fingerprint_hex(dgst_raw, dgst_raw_len);
310         break;
311     case SSH_FP_BUBBLEBABBLE:
312         retval = key_fingerprint_bubblebabble(dgst_raw, dgst_raw_len);
313         break;
314     default:
315         fatal("key_fingerprint_ex: bad digest representation %d",
316             dgst_rep);
317         break;
318     }
319     memset(dgst_raw, 0, dgst_raw_len);
320     xfree(dgst_raw);
321     return retval;
322 }

324 /*
325  * Reads a multiple-precision integer in decimal from the buffer, and advances

```

```

326  * the pointer. The integer must already be initialized. This function is
327  * permitted to modify the buffer. This leaves *cpp to point just beyond the
328  * last processed (and maybe modified) character. Note that this may modify
329  * the buffer containing the number.
330  */
331 static int
332 read_bignum(char **cpp, BIGNUM * value)
333 {
334     char *cp = *cpp;
335     int old;

337     /* Skip any leading whitespace. */
338     for (; *cp == ' ' || *cp == '\t'; cp++)
339         ;

341     /* Check that it begins with a decimal digit. */
342     if (*cp < '0' || *cp > '9')
343         return 0;

345     /* Save starting position. */
346     *cpp = cp;

348     /* Move forward until all decimal digits skipped. */
349     for (; *cp >= '0' && *cp <= '9'; cp++)
350         ;

352     /* Save the old terminating character, and replace it by \0. */
353     old = *cp;
354     *cp = 0;

356     /* Parse the number. */
357     if (BN_dec2bn(&value, *cpp) == 0)
358         return 0;

360     /* Restore old terminating character. */
361     *cp = old;

363     /* Move beyond the number and return success. */
364     *cpp = cp;
365     return 1;
366 }

368 static int
369 write_bignum(FILE *f, BIGNUM *num)
370 {
371     char *buf = BN_bn2dec(num);
372     if (buf == NULL) {
373         error("write_bignum: BN_bn2dec() failed");
374         return 0;
375     }
376     fprintf(f, "%s", buf);
377     OPENSSL_free(buf);
378     return 1;
379 }

381 /* returns 1 ok, -1 error */
382 int
383 key_read(Key *ret, char **cpp)
384 {
385     Key *k;
386     int success = -1;
387     char *cp, *space;
388     int len, n, type;
389     u_int bits;
390     u_char *blob;

```

```

392     cp = *cpp;
393
394     switch (ret->type) {
395     case KEY_RSA1:
396         /* Get number of bits. */
397         if (*cp < '0' || *cp > '9')
398             return -1;
399         /* Bad bit count... */
400         for (bits = 0; *cp >= '0' && *cp <= '9'; cp++)
401             bits = 10 * bits + *cp - '0';
402         if (bits == 0)
403             return -1;
404         *cpp = cp;
405         /* Get public exponent, public modulus. */
406         if (!read_bignum(cpp, ret->rsa->e))
407             return -1;
408         if (!read_bignum(cpp, ret->rsa->n))
409             return -1;
410         success = 1;
411         break;
412     case KEY_UNSPEC:
413     case KEY_RSA:
414     case KEY_DSA:
415         space = strchr(cp, ' ');
416         if (space == NULL) {
417             debug3("key_read: no space");
418             return -1;
419         }
420         *space = '\0';
421         type = key_type_from_name(cp);
422         *space = ' ';
423         if (type == KEY_UNSPEC) {
424             debug3("key_read: no key found");
425             return -1;
426         }
427         cp = space+1;
428         if (*cp == '\0') {
429             debug3("key_read: short string");
430             return -1;
431         }
432         if (ret->type == KEY_UNSPEC) {
433             ret->type = type;
434         } else if (ret->type != type) {
435             /* is a key, but different type */
436             debug3("key_read: type mismatch");
437             return -1;
438         }
439         len = 2*strlen(cp);
440         blob = xmalloc(len);
441         n = uudecode(cp, blob, len);
442         if (n < 0) {
443             error("key_read: uudecode %s failed", cp);
444             xfree(blob);
445             return -1;
446         }
447         k = key_from_blob(blob, n);
448         xfree(blob);
449         if (k == NULL) {
450             error("key_read: key_from_blob %s failed", cp);
451             return -1;
452         }
453         if (k->type != type) {
454             error("key_read: type mismatch: encoding error");
455             key_free(k);
456             return -1;
457         }
458     }
459     /*XXXX*/

```

```

458         if (ret->type == KEY_RSA) {
459             if (ret->rsa != NULL)
460                 RSA_free(ret->rsa);
461             ret->rsa = k->rsa;
462             k->rsa = NULL;
463             success = 1;
464         #ifdef DEBUG_PK
465             RSA_print_fp(stderr, ret->rsa, 8);
466         #endif
467         } else {
468             if (ret->dsa != NULL)
469                 DSA_free(ret->dsa);
470             ret->dsa = k->dsa;
471             k->dsa = NULL;
472             success = 1;
473         #ifdef DEBUG_PK
474             DSA_print_fp(stderr, ret->dsa, 8);
475         #endif
476         }
477     /*XXXX*/
478     key_free(k);
479     if (success != 1)
480         break;
481     /* advance cp: skip whitespace and data */
482     while (*cp == ' ' || *cp == '\t')
483         cp++;
484     while (*cp != '\0' && *cp != ' ' && *cp != '\t')
485         cp++;
486     *cpp = cp;
487     break;
488 default:
489     fatal("key_read: bad key type: %d", ret->type);
490     break;
491 }
492 return success;
493 }
494
495 int
496 key_write(const Key *key, FILE *f)
497 {
498     int n, success = 0;
499     u_int len, bits = 0;
500     u_char *blob;
501     char *uu;
502
503     if (key->type == KEY_RSA1 && key->rsa != NULL) {
504         /* size of modulus 'n' */
505         bits = BN_num_bits(key->rsa->n);
506         fprintf(f, "%u", bits);
507         if (write_bignum(f, key->rsa->e) &&
508             write_bignum(f, key->rsa->n)) {
509             success = 1;
510         } else {
511             error("key_write: failed for RSA key");
512         }
513     } else if ((key->type == KEY_DSA && key->dsa != NULL) ||
514                (key->type == KEY_RSA && key->rsa != NULL)) {
515         key_to_blob(key, &blob, &len);
516         uu = xmalloc(2*len);
517         n = uuencode(blob, len, uu, 2*len);
518         if (n > 0) {
519             fprintf(f, "%s %s", key_ssh_name(key), uu);
520             success = 1;
521         }
522         xfree(blob);
523         xfree(uu);

```

```

524     }
525     return success;
526 }

528 char *
529 key_type(Key *k)
530 {
531     switch (k->type) {
532     case KEY_RSA1:
533         return "RSA1";
534         break;
535     case KEY_RSA:
536         return "RSA";
537         break;
538     case KEY_DSA:
539         return "DSA";
540         break;
541     }
542     return "unknown";
543 }

545 char *
546 key_ssh_name(const Key *k)
547 {
548     switch (k->type) {
549     case KEY_RSA:
550         return "ssh-rsa";
551         break;
552     case KEY_DSA:
553         return "ssh-dss";
554         break;
555     }
556     return "ssh-unknown";
557 }

559 u_int
560 key_size(Key *k)
561 {
562     switch (k->type) {
563     case KEY_RSA1:
564     case KEY_RSA:
565         return BN_num_bits(k->rsa->n);
566         break;
567     case KEY_DSA:
568         return BN_num_bits(k->dsa->p);
569         break;
570     }
571     return 0;
572 }

574 static RSA *
575 rsa_generate_private_key(u_int bits)
576 {
577     RSA *private;
578     private = RSA_generate_key(bits, 35, NULL, NULL);
579     if (private == NULL)
580         fatal("rsa_generate_private_key: key generation failed.");
581     return private;
582 }

584 static DSA *
585 dsa_generate_private_key(u_int bits)
586 {
587     DSA *private = DSA_generate_parameters(bits, NULL, 0, NULL, NULL, NULL,
588     if (private == NULL)
589         fatal("dsa_generate_private_key: DSA_generate_parameters failed")

```

```

590     if (!DSA_generate_key(private))
591         fatal("dsa_generate_private_key: DSA_generate_key failed.");
592     if (private == NULL)
593         fatal("dsa_generate_private_key: NULL.");
594     return private;
595 }

597 Key *
598 key_generate(int type, u_int bits)
599 {
600     Key *k = key_new(KEY_UNSPEC);
601     switch (type) {
602     case KEY_DSA:
603         k->dsa = dsa_generate_private_key(bits);
604         break;
605     case KEY_RSA:
606     case KEY_RSA1:
607         k->rsa = rsa_generate_private_key(bits);
608         break;
609     default:
610         fatal("key_generate: unknown type %d", type);
611     }
612     k->type = type;
613     return k;
614 }

616 Key *
617 key_from_private(Key *k)
618 {
619     Key *n = NULL;
620     switch (k->type) {
621     case KEY_DSA:
622         n = key_new(k->type);
623         BN_copy(n->dsa->p, k->dsa->p);
624         BN_copy(n->dsa->q, k->dsa->q);
625         BN_copy(n->dsa->g, k->dsa->g);
626         BN_copy(n->dsa->pub_key, k->dsa->pub_key);
627         break;
628     case KEY_RSA:
629     case KEY_RSA1:
630         n = key_new(k->type);
631         BN_copy(n->rsa->n, k->rsa->n);
632         BN_copy(n->rsa->e, k->rsa->e);
633         break;
634     default:
635         fatal("key_from_private: unknown type %d", k->type);
636         break;
637     }
638     return n;
639 }

641 int
642 key_type_from_name(char *name)
643 {
644     if (strcmp(name, "rsa1") == 0) {
645         return KEY_RSA1;
646     } else if (strcmp(name, "rsa") == 0) {
647         return KEY_RSA;
648     } else if (strcmp(name, "dsa") == 0) {
649         return KEY_DSA;
650     } else if (strcmp(name, "ssh-rsa") == 0) {
651         return KEY_RSA;
652     } else if (strcmp(name, "ssh-dss") == 0) {
653         return KEY_DSA;
654     } else if (strcmp(name, "null") == 0) {
655         return KEY_NULL;

```

```

656     }
657     debug2("key_type_from_name: unknown key type '%s'", name);
658     return KEY_UNSPEC;
659 }

661 int
662 key_names_valid2(const char *names)
663 {
664     char *s, *cp, *p;

666     if (names == NULL || strcmp(names, "") == 0)
667         return 0;
668     s = cp = xstrdup(names);
669     for ((p = strsep(&cp, ",")); p && *p != '\0';
670          (p = strsep(&cp, ","))) {
671         switch (key_type_from_name(p)) {
672             case KEY_RSA1:
673             case KEY_UNSPEC:
674                 xfree(s);
675                 return 0;
676             }
677     }
678     debug3("key names ok: [%s]", names);
679     xfree(s);
680     return 1;
681 }

683 Key *
684 key_from_blob(u_char *blob, int blen)
685 {
686     Buffer b;
687     char *ktype;
688     int rlen, type;
689     Key *key = NULL;

691 #ifdef DEBUG_PK
692     dump_base64(stderr, blob, blen);
693 #endif
694     buffer_init(&b);
695     buffer_append(&b, blob, blen);
696     if ((ktype = buffer_get_string_ret(&b, NULL)) == NULL) {
697         error("key_from_blob: can't read key type");
698         goto out;
699     }

701     type = key_type_from_name(ktype);

703     switch (type) {
704     case KEY_RSA:
705         key = key_new(type);
706         if (buffer_get_bignum2_ret(&b, key->rsa->e) == -1 ||
707             buffer_get_bignum2_ret(&b, key->rsa->n) == -1) {
708             error("key_from_blob: can't read rsa key");
709             key_free(key);
710             key = NULL;
711             goto out;
712         }
713 #ifdef DEBUG_PK
714         RSA_print_fp(stderr, key->rsa, 8);
715 #endif
716         break;
717     case KEY_DSA:
718         key = key_new(type);
719         if (buffer_get_bignum2_ret(&b, key->dsa->p) == -1 ||
720             buffer_get_bignum2_ret(&b, key->dsa->q) == -1 ||
721             buffer_get_bignum2_ret(&b, key->dsa->g) == -1 ||

```

```

722         buffer_get_bignum2_ret(&b, key->dsa->pub_key) == -1) {
723             error("key_from_blob: can't read dsa key");
724             key_free(key);
725             key = NULL;
726             goto out;
727         }
728 #ifdef DEBUG_PK
729         DSA_print_fp(stderr, key->dsa, 8);
730 #endif
731         break;
732     case KEY_UNSPEC:
733         key = key_new(type);
734         break;
735     default:
736         error("key_from_blob: cannot handle type %s", ktype);
737         goto out;
738     }
739     rlen = buffer_len(&b);
740     if (key != NULL && rlen != 0)
741         error("key_from_blob: remaining bytes in key blob %d", rlen);
742 out:
743     if (ktype != NULL)
744         xfree(ktype);
745     buffer_free(&b);
746     return key;
747 }

749 int
750 key_to_blob(const Key *key, u_char **blobp, u_int *lenp)
751 {
752     Buffer b;
753     int len;

755     if (key == NULL) {
756         error("key_to_blob: key == NULL");
757         return 0;
758     }
759     buffer_init(&b);
760     switch (key->type) {
761     case KEY_DSA:
762         buffer_put_cstring(&b, key_ssh_name(key));
763         buffer_put_bignum2(&b, key->dsa->p);
764         buffer_put_bignum2(&b, key->dsa->q);
765         buffer_put_bignum2(&b, key->dsa->g);
766         buffer_put_bignum2(&b, key->dsa->pub_key);
767         break;
768     case KEY_RSA:
769         buffer_put_cstring(&b, key_ssh_name(key));
770         buffer_put_bignum2(&b, key->rsa->e);
771         buffer_put_bignum2(&b, key->rsa->n);
772         break;
773     default:
774         error("key_to_blob: unsupported key type %d", key->type);
775         buffer_free(&b);
776         return 0;
777     }
778     len = buffer_len(&b);
779     if (lenp != NULL)
780         *lenp = len;
781     if (blobp != NULL) {
782         *blobp = xmalloc(len);
783         memcpy(*blobp, buffer_ptr(&b), len);
784     }
785     memset(buffer_ptr(&b), 0, len);
786     buffer_free(&b);
787     return len;

```

```

788 }

790 int
791 key_sign(
792     Key *key,
793     u_char **sigp, u_int *lenp,
794     u_char *data, u_int datalen)
795 {
796     switch (key->type) {
797     case KEY_DSA:
798         return ssh_dss_sign(key, sigp, lenp, data, datalen);
799         break;
800     case KEY_RSA:
801         return ssh_rsa_sign(key, sigp, lenp, data, datalen);
802         break;
803     default:
804         error("key_sign: illegal key type %d", key->type);
805         return -1;
806         break;
807     }
808 }

810 /*
811  * key_verify returns 1 for a correct signature, 0 for an incorrect signature
812  * and -1 on error.
813  */
814 int
815 key_verify(
816     Key *key,
817     u_char *signature, u_int signaturelen,
818     u_char *data, u_int datalen)
819 {
820     if (signaturelen == 0)
821         return -1;

823     switch (key->type) {
824     case KEY_DSA:
825         return ssh_dss_verify(key, signature, signaturelen, data, datalen);
826         break;
827     case KEY_RSA:
828         return ssh_rsa_verify(key, signature, signaturelen, data, datalen);
829         break;
830     default:
831         error("key_verify: illegal key type %d", key->type);
832         return -1;
833         break;
834     }
835 }

837 /* Converts a private to a public key */
838 Key *
839 key_demote(Key *k)
840 {
841     Key *pk;

843     pk = xmalloc(sizeof(*pk));
844     pk->type = k->type;
845     pk->flags = k->flags;
846     pk->dsa = NULL;
847     pk->rsa = NULL;

849     switch (k->type) {
850     case KEY_RSA1:
851     case KEY_RSA:
852         if ((pk->rsa = RSA_new()) == NULL)
853             fatal("key_demote: RSA_new failed");

```

```

854         if ((pk->rsa->e = BN_dup(k->rsa->e)) == NULL)
855             fatal("key_demote: BN_dup failed");
856         if ((pk->rsa->n = BN_dup(k->rsa->n)) == NULL)
857             fatal("key_demote: BN_dup failed");
858         break;
859     case KEY_DSA:
860         if ((pk->dsa = DSA_new()) == NULL)
861             fatal("key_demote: DSA_new failed");
862         if ((pk->dsa->p = BN_dup(k->dsa->p)) == NULL)
863             fatal("key_demote: BN_dup failed");
864         if ((pk->dsa->q = BN_dup(k->dsa->q)) == NULL)
865             fatal("key_demote: BN_dup failed");
866         if ((pk->dsa->g = BN_dup(k->dsa->g)) == NULL)
867             fatal("key_demote: BN_dup failed");
868         if ((pk->dsa->pub_key = BN_dup(k->dsa->pub_key)) == NULL)
869             fatal("key_demote: BN_dup failed");
870         break;
871     default:
872         fatal("key_free: bad key type %d", k->type);
873         break;
874     }

876     return (pk);
877 }

```



```

*****
4458 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/mac.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Copyright (c) 2001 Markus Friedl. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  * 1. Redistributions of source code must retain the above copyright
8  * notice, this list of conditions and the following disclaimer.
9  * 2. Redistributions in binary form must reproduce the above copyright
10 * notice, this list of conditions and the following disclaimer in the
11 * documentation and/or other materials provided with the distribution.
12 *
13 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR
14 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
15 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
16 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
17 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
18 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */

25 #include "includes.h"
26 RCSID("$OpenBSD: mac.c,v 1.5 2002/05/16 22:02:50 markus Exp $");

28 #include <openssl/opensslconf.h>
29 #include <openssl/hmac.h>

31 #include "xmalloc.h"
32 #include "getput.h"
33 #include "log.h"
34 #include "cipher.h"
35 #include "kex.h"
36 #include "mac.h"
37 #include "misc.h"

39 #define SSH_EVP 1 /* OpenSSL EVP-based MAC */

41 struct {
42     char *name;
43     int type;
44     const EVP_MD *mdfunc(void);
45     int truncatebits; /* truncate digest if != 0 */
46     int key_len; /* will be used if we have UMAC */
47 } macs[] = {
48     { "hmac-sha1", SSH_EVP, EVP_sha1, 0, -1 },
49     { "hmac-sha1-96", SSH_EVP, EVP_sha1, 96, -1 },
50     { "hmac-md5", SSH_EVP, EVP_md5, 0, -1 },
51     { "hmac-md5-96", SSH_EVP, EVP_md5, 96, -1 },
52 #ifdef SOLARIS_SSH_ENABLE_RIPEMD160
53     { "hmac-ripemd160", SSH_EVP, EVP_ripemd160, 0, -1 },
54     { "hmac-ripemd160@openssh.com", SSH_EVP, EVP_ripemd160, 0, -1 },
55 #endif /* SOLARIS_SSH_ENABLE_RIPEMD160 */
56     { NULL, 0, NULL, 0, -1 }
57 };

59 static void
60 mac_setup_by_id(Mac *mac, int which)
61 {

```

```

62     int evp_len;
63     mac->type = macs[which].type;
64     if (mac->type == SSH_EVP) {
65         mac->evp_md = (*macs[which].mdfunc)();
66         if ((evp_len = EVP_MD_size(mac->evp_md)) <= 0)
67             fatal("mac %s len %d", mac->name, evp_len);
68         mac->key_len = mac->mac_len = (u_int)evp_len;
69     } else
70         fatal("wrong MAC type (%d)", mac->type);
71     if (macs[which].truncatebits != 0)
72         mac->mac_len = macs[which].truncatebits / 8;
73 }

75 int
76 mac_setup(Mac *mac, char *name)
77 {
78     int i;

80     for (i = 0; macs[i].name; i++) {
81         if (strcmp(name, macs[i].name) == 0) {
82             if (mac != NULL)
83                 mac_setup_by_id(mac, i);
84             debug2("mac_setup: found %s", name);
85             return (0);
86         }
87     }
88     debug2("mac_setup: unknown %s", name);
89     return (-1);
90 }

92 int
93 mac_init(Mac *mac)
94 {
95     if (mac->key == NULL)
96         fatal("mac_init: no key");
97     switch (mac->type) {
98     case SSH_EVP:
99         if (mac->evp_md == NULL)
100             return -1;
101         HMAC_Init(&mac->evp_ctx, mac->key, mac->key_len, mac->evp_md);
102         return 0;
103     default:
104         return -1;
105     }
106 }

108 u_char *
109 mac_compute(Mac *mac, u_int32_t seqno, u_char *data, int datalen)
110 {
111     static u_char m[EVP_MAX_MD_SIZE];
112     u_char b[4];

114     if (mac->mac_len > sizeof(m))
115         fatal("mac_compute: mac too long %u %lu",
116             mac->mac_len, (u_long)sizeof(m));

118     switch (mac->type) {
119     case SSH_EVP:
120         put_u32(b, seqno);
121         /* reset HMAC context */
122         HMAC_Init(&mac->evp_ctx, NULL, 0, NULL);
123         HMAC_Update(&mac->evp_ctx, b, sizeof(b));
124         HMAC_Update(&mac->evp_ctx, data, datalen);
125         HMAC_Final(&mac->evp_ctx, m, NULL);
126         break;
127     default:

```

```
128         fatal("mac_compute: unknown MAC type");
129     }
131     return (m);
132 }
134 void
135 mac_clear(Mac *mac)
136 {
137     if (mac->evp_md != NULL)
138         HMAC_cleanup(&mac->evp_ctx);
139     mac->evp_md = NULL;
140 }
142 /* XXX copied from ciphers_valid */
143 #define MAC_SEP " "
144 int
145 mac_valid(const char *names)
146 {
147     char *maclist, *cp, *p;
149     if (names == NULL || strcmp(names, "") == 0)
150         return (0);
151     maclist = cp = xstrdup(names);
152     for ((p = strsep(&cp, MAC_SEP)); p && *p != '\0';
153          (p = strsep(&cp, MAC_SEP))) {
154         if (mac_setup(NULL, p) < 0) {
155             debug("bad mac %s [%s]", p, names);
156             xfree(maclist);
157             return (0);
158         } else {
159             debug3("mac ok: %s [%s]", p, names);
160         }
161     }
162     debug3("macs ok: [%s]", names);
163     xfree(maclist);
164     return (1);
165 }
```

new/usr/src/cmd/ssh/libssh/common/mpaux.c

1

1409 Fri May 30 18:31:10 2014

new/usr/src/cmd/ssh/libssh/common/mpaux.c

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /*
2  * Author: Tatu Ylonen <ylo@cs.hut.fi>
3  * Copyright (c) 1995 Tatu Ylonen <ylo@cs.hut.fi>, Espoo, Finland
4  * All rights reserved
5  * This file contains various auxiliary functions related to multiple
6  * precision integers.
7  *
8  * As far as I am concerned, the code I have written for this software
9  * can be used freely for any purpose. Any derived versions of this
10 * software must be clearly marked as such, and if the derived work is
11 * incompatible with the protocol description in the RFC file, it must be
12 * called by a name other than "ssh" or "Secure Shell".
13 */

15 #include "includes.h"
16 RCSID("$OpenBSD: mpaux.c,v 1.16 2001/02/08 19:30:52 itojun Exp $");

18 #pragma ident "%Z%M% %I% %E% SMI"

20 #include <openssl/opensslconf.h>
21 #include <openssl/bn.h>
22 #include "getput.h"
23 #include "xmalloc.h"

25 #include <openssl/md5.h>

27 #include "mpaux.h"

29 void
30 compute_session_id(u_char session_id[16],
31 u_char cookie[8],
32 BIGNUM* host_key_n,
33 BIGNUM* session_key_n)
34 {
35     u_int host_key_bytes = BN_num_bytes(host_key_n);
36     u_int session_key_bytes = BN_num_bytes(session_key_n);
37     u_int bytes = host_key_bytes + session_key_bytes;
38     u_char *buf = xmalloc(bytes);
39     MD5_CTX md;

41     BN_bn2bin(host_key_n, buf);
42     BN_bn2bin(session_key_n, buf + host_key_bytes);
43     MD5_Init(&md);
44     MD5_Update(&md, buf, bytes);
45     MD5_Update(&md, cookie, 8);
46     MD5_Final(session_id, &md);
47     memset(buf, 0, bytes);
48     xfree(buf);
49 }
```

```

*****
5126 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/ssh-dss.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Copyright (c) 2000 Markus Friedl. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  * 1. Redistributions of source code must retain the above copyright
8  * notice, this list of conditions and the following disclaimer.
9  * 2. Redistributions in binary form must reproduce the above copyright
10 * notice, this list of conditions and the following disclaimer in the
11 * documentation and/or other materials provided with the distribution.
12 *
13 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR
14 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
15 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
16 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
17 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
18 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */

25 #include "includes.h"
26 RCSID("$OpenBSD: ssh-dss.c,v 1.17 2002/07/04 10:41:47 markus Exp $");

28 #pragma ident      "%Z%M% %I%      %E% SMI"

30 #include <openssl/opensslconf.h>
31 #include <openssl/bn.h>
32 #include <openssl/evp.h>

34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "compat.h"
38 #include "log.h"
39 #include "key.h"
40 #include "ssh-dss.h"

42 #define INTBLOB_LEN      20
43 #define SIGBLOB_LEN      (2*INTBLOB_LEN)

45 int
46 ssh_dss_sign(Key *key, u_char **sigp, u_int *lenp,
47             u_char *data, u_int datalen)
48 {
49     DSA_SIG *sig;
50     const EVP_MD *evp_md = EVP_sha1();
51     EVP_MD_CTX md;
52     u_char digest[EVP_MAX_MD_SIZE], sigblob[SIGBLOB_LEN];
53     u_int rlen, slen, len, dlen;
54     Buffer b;

56     if (key == NULL || key->type != KEY_DSA || key->dsa == NULL) {
57         error("ssh_dss_sign: no DSA key");
58         return -1;
59     }
60     EVP_DigestInit(&md, evp_md);
61     EVP_DigestUpdate(&md, data, datalen);

```

```

62     EVP_DigestFinal(&md, digest, &dlen);

64     sig = DSA_do_sign(digest, dlen, key->dsa);
65     memset(digest, 'd', sizeof(digest));

67     if (sig == NULL) {
68         error("ssh_dss_sign: sign failed");
69         return -1;
70     }

72     rlen = BN_num_bytes(sig->r);
73     slen = BN_num_bytes(sig->s);
74     if (rlen > INTBLOB_LEN || slen > INTBLOB_LEN) {
75         error("bad sig size %u %u", rlen, slen);
76         DSA_SIG_free(sig);
77         return -1;
78     }
79     memset(sigblob, 0, SIGBLOB_LEN);
80     BN_bn2bin(sig->r, sigblob+ SIGBLOB_LEN - INTBLOB_LEN - rlen);
81     BN_bn2bin(sig->s, sigblob+ SIGBLOB_LEN - slen);
82     DSA_SIG_free(sig);

84     if (datafellows & SSH_BUG_SIGBLOB) {
85         if (lenp != NULL)
86             *lenp = SIGBLOB_LEN;
87         if (sigp != NULL) {
88             *sigp = xmalloc(SIGBLOB_LEN);
89             memcpy(*sigp, sigblob, SIGBLOB_LEN);
90         }
91     } else {
92         /* ietf-drafts */
93         buffer_init(&b);
94         buffer_put_cstring(&b, "ssh-dss");
95         buffer_put_string(&b, sigblob, SIGBLOB_LEN);
96         len = buffer_len(&b);
97         if (lenp != NULL)
98             *lenp = len;
99         if (sigp != NULL) {
100             *sigp = xmalloc(len);
101             memcpy(*sigp, buffer_ptr(&b), len);
102         }
103         buffer_free(&b);
104     }
105     return 0;
106 }

107 int
108 ssh_dss_verify(Key *key, u_char *signature, u_int signaturelen,
109               u_char *data, u_int datalen)
110 {
111     DSA_SIG *sig;
112     const EVP_MD *evp_md = EVP_sha1();
113     EVP_MD_CTX md;
114     u_char digest[EVP_MAX_MD_SIZE], *sigblob;
115     u_int len, dlen;
116     int rlen, ret;
117     Buffer b;

119     if (key == NULL || key->type != KEY_DSA || key->dsa == NULL) {
120         error("ssh_dss_verify: no DSA key");
121         return -1;
122     }

124     /* fetch signature */
125     if (datafellows & SSH_BUG_SIGBLOB) {
126         sigblob = signature;
127         len = signaturelen;

```

```
128     } else {
129         /* ietf-drafts */
130         char *ktype;
131         buffer_init(&b);
132         buffer_append(&b, signature, signaturelen);
133         ktype = buffer_get_string(&b, NULL);
134         if (strcmp("ssh-dss", ktype) != 0) {
135             error("ssh_dss_verify: cannot handle type %s", ktype);
136             buffer_free(&b);
137             xfree(ktype);
138             return -1;
139         }
140         xfree(ktype);
141         sigblob = buffer_get_string(&b, &len);
142         rlen = buffer_len(&b);
143         buffer_free(&b);
144         if (rlen != 0) {
145             error("ssh_dss_verify: "
146                  "remaining bytes in signature %d", rlen);
147             xfree(sigblob);
148             return -1;
149         }
150     }

152     if (len != SIGBLOB_LEN) {
153         fatal("bad sigbloblen %u != SIGBLOB_LEN", len);
154     }

156     /* parse signature */
157     if ((sig = DSA_SIG_new()) == NULL)
158         fatal("ssh_dss_verify: DSA_SIG_new failed");
159     if ((sig->r = BN_new()) == NULL)
160         fatal("ssh_dss_verify: BN_new failed");
161     if ((sig->s = BN_new()) == NULL)
162         fatal("ssh_dss_verify: BN_new failed");
163     BN_bin2bn(sigblob, INTBLOB_LEN, sig->r);
164     BN_bin2bn(sigblob+ INTBLOB_LEN, INTBLOB_LEN, sig->s);

166     if (!(datafellows & SSH_BUG_SIGBLOB)) {
167         memset(sigblob, 0, len);
168         xfree(sigblob);
169     }

171     /* sha1 the data */
172     EVP_DigestInit(&md, evp_md);
173     EVP_DigestUpdate(&md, data, datalen);
174     EVP_DigestFinal(&md, digest, &dlen);

176     ret = DSA_do_verify(digest, dlen, sig, key->dsa);
177     memset(digest, 'd', sizeof(digest));

179     DSA_SIG_free(sig);

181     debug("ssh_dss_verify: signature %s",
182          ret == 1 ? "correct" : ret == 0 ? "incorrect" : "error");
183     return ret;
184 }
```

```

*****
20125 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/ssh-gss.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /*
2  * Copyright (c) 2001-2003 Simon Wilkinson. All rights reserved. *
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4  * modification, are permitted provided that the following conditions
5  * are met:
6  * 1. Redistributions of source code must retain the above copyright
7  * notice, this list of conditions and the following disclaimer.
8  * 2. Redistributions in binary form must reproduce the above copyright
9  * notice, this list of conditions and the following disclaimer in the
10 * documentation and/or other materials provided with the distribution.
11 *
12 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR 'AS IS' AND ANY EXPRESS OR
13 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
14 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
15 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
16 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
17 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
18 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
19 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
20 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
21 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
22 */
23 /*
24 * Copyright 2009 Sun Microsystems, Inc. All rights reserved.
25 * Use is subject to license terms.
26 */
28 #include "includes.h"
30 #ifdef GSSAPI
32 #include "ssh.h"
33 #include "ssh2.h"
34 #include "xmalloc.h"
35 #include "buffer.h"
36 #include "bufaux.h"
37 #include "packet.h"
38 #include "compat.h"
39 #include <openssl/opensslconf.h>
40 #include <openssl/evp.h>
41 #include "cipher.h"
42 #include "kex.h"
43 #include "log.h"
44 #include "compat.h"
45 #include "xlist.h"
47 #include <netdb.h>
49 #include "ssh-gss.h"
51 #ifdef HAVE_GSS_OID_TO_MECH
52 #include <gssapi/gssapi_ext.h>
53 #endif /* HAVE_GSS_OID_TO_MECH */
55 typedef struct {
56     char *encoded;
57     gss_OID oid;
58 } ssh_gss_kex_mapping;
60 static ssh_gss_kex_mapping **gss_enc2oid = NULL;

```

```

62 static void ssh_gssapi_encode_oid_for_kex(const gss_OID oid, char **enc_name);
63 static char *ssh_gssapi_make_kexalgs_list(gss_OID_set mechs,
64     const char *old_kexalgs);
66 /*
67  * Populate gss_enc2oid table and return list of kexnames.
68  *
69  * If called with both mechs == GSS_C_NULL_OID_SET and kexname_list == NULL
70  * then cached gss_enc2oid table is cleaned up.
71  */
72 void
73 ssh_gssapi_mech_oids_to_kexnames(const gss_OID_set mechs, char **kexname_list)
74 {
75     ssh_gss_kex_mapping **new_gss_enc2oid, **p;
76     Buffer buf;
77     char *enc_name;
78     int i;
80     if (kexname_list != NULL)
81         *kexname_list = NULL; /* default to failed */
83     if (mechs != GSS_C_NULL_OID_SET || kexname_list == NULL) {
84         /* Cleanup gss_enc2oid table */
85         for (p = gss_enc2oid; p != NULL && *p != NULL; p++) {
86             if ((*p)->encoded)
87                 xfree((*p)->encoded);
88             ssh_gssapi_release_oid(&(*p)->oid);
89             xfree(*p);
90         }
91         if (gss_enc2oid)
92             xfree(gss_enc2oid);
93     }
95     if (mechs == GSS_C_NULL_OID_SET && kexname_list == NULL)
96         return; /* nothing left to do */
98     if (mechs) {
99         gss_OID mech;
100         /* Populate gss_enc2oid table */
101         new_gss_enc2oid = xmalloc(sizeof (ssh_gss_kex_mapping *) *
102             (mechs->count + 1));
103         memset(new_gss_enc2oid, 0,
104             sizeof (ssh_gss_kex_mapping *) * (mechs->count + 1));
106         for (i = 0; i < mechs->count; i++) {
107             mech = &mechs->elements[i];
108             ssh_gssapi_encode_oid_for_kex((const gss_OID)mech,
109                 &enc_name);
111             if (!enc_name)
112                 continue;
114             new_gss_enc2oid[i] =
115                 xmalloc(sizeof (ssh_gss_kex_mapping));
116             (new_gss_enc2oid[i])->encoded = enc_name;
117             (new_gss_enc2oid[i])->oid =
118                 ssh_gssapi_dup_oid(&mechs->elements[i]);
119         }
121         /* Do this last to avoid run-ins with fatal_cleanups */
122         gss_enc2oid = new_gss_enc2oid;
123     }
125     if (!kexname_list)
126         return; /* nothing left to do */

```

```

128 /* Make kex name list */
129 buffer_init(&buf);
130 for (p = gss_enc2oid; p && *p; p++) {
131     buffer_put_char(&buf, ',');
132     buffer_append(&buf, (*p)->encoded, strlen((*p)->encoded));
133 }
134
135 if (buffer_len(&buf) == 0) {
136     buffer_free(&buf);
137     return;
138 }
139
140 buffer_consume(&buf, 1); /* consume leading ',' */
141 buffer_put_char(&buf, '\0');
142
143 *kexname_list = xstrdup(buffer_ptr(&buf));
144 buffer_free(&buf);
145 }
146
147 void
148 ssh_gssapi_mech_oid_to_kexname(const gss_OID mech, char **kexname)
149 {
150     ssh_gss_kex_mapping **p;
151
152     if (mech == GSS_C_NULL_OID || !kexname)
153         return;
154
155     *kexname = NULL; /* default to not found */
156     if (gss_enc2oid) {
157         for (p = gss_enc2oid; p && *p; p++) {
158             if (mech->length == (*p)->oid->length &&
159                 memcmp(mech->elements, (*p)->oid->elements,
160                     mech->length) == 0)
161                 *kexname = xstrdup((*p)->encoded);
162         }
163     }
164
165     if (*kexname)
166         return; /* found */
167
168     ssh_gssapi_encode_oid_for_kex(mech, kexname);
169 }
170
171 void
172 ssh_gssapi_oid_of_kexname(const char *kexname, gss_OID *mech)
173 {
174     ssh_gss_kex_mapping **p;
175
176     if (!mech || !kexname || !*kexname)
177         return;
178
179     *mech = GSS_C_NULL_OID; /* default to not found */
180
181     if (!gss_enc2oid)
182         return;
183
184     for (p = gss_enc2oid; p && *p; p++) {
185         if (strcmp(kexname, (*p)->encoded) == 0) {
186             *mech = (*p)->oid;
187             return;
188         }
189     }
190 }
191
192 static
193 void

```

```

194 ssh_gssapi_encode_oid_for_kex(const gss_OID oid, char **enc_name)
195 {
196     Buffer buf;
197     OM_uint32 oidlen;
198     uint_t encrlen;
199     const EVP_MD *evp_md = EVP_md5();
200     EVP_MD_CTX md;
201     uchar_t digest[EVP_MAX_MD_SIZE];
202     char *encoded;
203
204     if (oid == GSS_C_NULL_OID || !enc_name)
205         return;
206
207     *enc_name = NULL;
208
209     oidlen = oid->length;
210
211     /* No GSS mechs have OIDs as long as 128 -- simplify DER encoding */
212     if (oidlen > 128)
213         return; /* fail gracefully */
214
215     /*
216      * NOTE: If we need to support SSH_BUG_GSSAPI_BER this is where
217      * we'd do it.
218      * That means using "Se3H81ismm0C30E+FwYCiQ==" for the Kerberos
219      * V mech and "N3+k7/4wGxHyuP8Yxi4RhA==" for the GSI mech. Ick.
220      */
221
222     buffer_init(&buf);
223
224     /* UNIVERSAL class tag for OBJECT IDENTIFIER */
225     buffer_put_char(&buf, 0x06);
226     buffer_put_char(&buf, oidlen); /* one octet DER length -- see above */
227
228     /* OID elements */
229     buffer_append(&buf, oid->elements, oidlen);
230
231     /* Make digest */
232     EVP_DigestInit(&md, evp_md);
233     EVP_DigestUpdate(&md, buffer_ptr(&buf), buffer_len(&buf));
234     EVP_DigestFinal(&md, digest, NULL);
235     buffer_free(&buf);
236
237     /* Base 64 encoding */
238     encoded = xmalloc(EVP_MD_size(evp_md)*2);
239     encrlen = __b64_ntop(digest, EVP_MD_size(evp_md),
240         encoded, EVP_MD_size(evp_md) * 2);
241     buffer_init(&buf);
242     buffer_append(&buf, KEX_GSS_SHA1, sizeof (KEX_GSS_SHA1) - 1);
243     buffer_append(&buf, encoded, encrlen);
244     buffer_put_char(&buf, '\0');
245
246     debug2("GSS-API Mechanism encoded as %s", encoded);
247     xfree(encoded);
248
249     *enc_name = xstrdup(buffer_ptr(&buf));
250     buffer_free(&buf);
251 }
252
253 static char *
254 ssh_gssapi_make_kexalgs_list(gss_OID_set mechs, const char *old_kexalgs)
255 {
256     char *gss_kexalgs, *new_kexalgs;
257     int len;

```

```

260     if (mechs == GSS_C_NULL_OID_SET)
261         return (xstrdup(old_kexalgs)); /* never null */

263     ssh_gssapi_mech_oids_to_kexnames(mechs, &gss_kexalgs);

265     if (gss_kexalgs == NULL || *gss_kexalgs == '\0')
266         return (xstrdup(old_kexalgs)); /* never null */

268     if (old_kexalgs == NULL || *old_kexalgs == '\0')
269         return (gss_kexalgs);

271     len = strlen(old_kexalgs) + strlen(gss_kexalgs) + 2;
272     new_kexalgs = xmalloc(len);
273     (void) snprintf(new_kexalgs, len, "%s,%s", gss_kexalgs, old_kexalgs);
274     xfree(gss_kexalgs);

276     return (new_kexalgs);
277 }

279 void
280 ssh_gssapi_modify_kex(Kex *kex, gss_OID_set mechs, char **proposal)
281 {
282     char *kexalgs, *orig_kexalgs, *p;
283     char **hostalg, *orig_hostalgs, *new_hostalgs;
284     char **hostalgs;
285     gss_OID_set dup_mechs;
286     OM_uint32 maj, min;
287     int i;

289     if (kex == NULL || proposal == NULL ||
290         proposal[PROPOSAL_KEX_ALGS] == NULL) {
291         fatal("INTERNAL ERROR (%s)", __func__);
292     }

294     orig_hostalgs = proposal[PROPOSAL_SERVER_HOST_KEY_ALGS];

296     if (kex->mechs == GSS_C_NULL_OID_SET && mechs == GSS_C_NULL_OID_SET)
297         return; /* didn't offer GSS last time, not offering now */

299     if (kex->mechs == GSS_C_NULL_OID_SET || mechs == GSS_C_NULL_OID_SET)
300         goto mod_offer; /* didn't offer last time or not offering now */

302     /* Check if mechs is congruent to kex->mechs (last offered) */
303     if (kex->mechs->count == mechs->count) {
304         int present, matches = 0;

306         for (i = 0; i < mechs->count; i++) {
307             maj = gss_test_oid_set_member(&min,
308                 &kex->mechs->elements[i], mechs, &present);

310             if (GSS_ERROR(maj)) {
311                 mechs = GSS_C_NULL_OID_SET;
312                 break;
313             }

315             matches += (present) ? 1 : 0;
316         }

318         if (matches == kex->mechs->count)
319             return; /* no change in offer from last time */
320     }

322 mod_offer:
323     /*
324      * Remove previously offered mechs from PROPOSAL_KEX_ALGS proposal
325      */

```

```

326     * ASSUMPTION: GSS-API kex algs always go in front, so removing
327     * them is a matter of skipping them.
328     */
329     p = kexalgs = orig_kexalgs = proposal[PROPOSAL_KEX_ALGS];
330     while (p != NULL && *p != '\0' &&
331         strcmp(p, KEX_GSS_SHA1, strlen(KEX_GSS_SHA1)) == 0) {
333         if ((p = strchr(p, ',')) == NULL)
334             break;
335         p++;
336         kexalgs = p;
338     }
339     kexalgs = proposal[PROPOSAL_KEX_ALGS] = xstrdup(kexalgs);
340     xfree(orig_kexalgs);

342     (void) gss_release_oid_set(&min, &kex->mechs); /* ok if !kex->mechs */

344     /* Not offering GSS kex algorithms now -> all done */
345     if (mechs == GSS_C_NULL_OID_SET)
346         return;

348     /* Remember mechs we're offering */
349     maj = gss_create_empty_oid_set(&min, &dup_mechs);
350     if (GSS_ERROR(maj))
351         return;
352     for (i = 0; i < mechs->count; i++) {
353         maj = gss_add_oid_set_member(&min, &mechs->elements[i],
354             &dup_mechs);

356         if (GSS_ERROR(maj)) {
357             (void) gss_release_oid_set(&min, &dup_mechs);
358             return;
359         }
360     }

362     /* Add mechs to kex algorithms ... */
363     proposal[PROPOSAL_KEX_ALGS] = ssh_gssapi_make_kexalgs_list(mechs,
364         kexalgs);
365     xfree(kexalgs);
366     kex->mechs = dup_mechs; /* remember what we offer now */

368     /*
369      * ... and add null host key alg, if it wasn't there before, but
370      * not if we're the server and we have other host key algs to
371      * offer.
372      * NOTE: Never remove "null" host key alg once added.
373      */
374     if (orig_hostalgs == NULL || *orig_hostalgs == '\0') {
375         proposal[PROPOSAL_SERVER_HOST_KEY_ALGS] = xstrdup("null");
376     } else if (!kex->server) {
377         hostalgs = xsplit(orig_hostalgs, ',');
378         for (hostalg = hostalgs; *hostalg != NULL; hostalg++) {
379             if (strcmp(*hostalg, "null") == 0) {
380                 xfree_split_list(hostalgs);
381                 return;
382             }
383         }
384     }
385     xfree_split_list(hostalgs);

387     if (kex->mechs != GSS_C_NULL_OID_SET) {
388         int len;

390         len = strlen(orig_hostalgs) + sizeof ("null");
391         new_hostalgs = xmalloc(len);

```



```

392         (void) snprintf(new_hostalgs, len, "%s,null",
393                          orig_hostalgs);
394         proposal[PROPOSAL_SERVER_HOST_KEY_ALGS] = new_hostalgs;
395     }
396
397     xfree(orig_hostalgs);
398 }
399 }
400
401 /*
402  * Yes, we harcode OIDs for some things, for now it's all we can do.
403  *
404  * We have to reference particular mechanisms due to lack of generality
405  * in the GSS-API in several areas: authorization, mapping principal
406  * names to usernames, "storing" delegated credentials, and discovering
407  * whether a mechanism is a pseudo-mechanism that negotiates mechanisms.
408  *
409  * Even if they were in some header file or if __gss_mech_to_oid()
410  * and/or __gss_oid_to_mech() were standard we'd still have to hardcode
411  * the mechanism names, and since the mechanisms have no standard names
412  * other than their OIDs it's actually worse [less portable] to hardcode
413  * names than OIDs, so we hardcode OIDs.
414  *
415  * SPNEGO is a difficult problem though -- it MUST NOT be used in SSHv2,
416  * but that's true of all possible pseudo-mechanisms that can perform
417  * mechanism negotiation, and SPNEGO could have new OIDs in the future.
418  * Ideally we could query each mechanism for its feature set and then
419  * ignore any mechanisms that negotiate mechanisms, but, alas, there's
420  * no interface to do that.
421  *
422  * In the future, if the necessary generic GSS interfaces for the issues
423  * listed above are made available (even if they differ by platform, as
424  * we can expect authorization interfaces will), then we can stop
425  * referencing specific mechanism OIDs here.
426  */
427 int
428 ssh_gssapi_is_spnego(gss_OID oid)
429 {
430     return (oid->length == 6 &&
431             memcmp("\053\006\001\005\005\002", oid->elements, 6) == 0);
432 }
433
434 int
435 ssh_gssapi_is_krb5(gss_OID oid)
436 {
437     return (oid->length == 9 &&
438             memcmp("\x2A\x86\x48\x86\xF7\x12\x01\x02\x02",
439                    oid->elements, 9) == 0);
440 }
441
442 int
443 ssh_gssapi_is_dh(gss_OID oid)
444 {
445     return (oid->length == 9 &&
446             memcmp("\053\006\004\001\052\002\032\002\005",
447                    oid->elements, 9) == 0);
448 }
449
450 int
451 ssh_gssapi_is_gsi(gss_OID oid)
452 {
453     return (oid->length == 9 &&
454             memcmp("\x2B\x06\x01\x04\x01\x9B\x50\x01\x01",
455                    oid->elements, 9) == 0);
456 }

```

```

458 const char *
459 ssh_gssapi_oid_to_name(gss_OID oid)
460 {
461     #ifdef HAVE_GSS_OID_TO_MECH
462         return (__gss_oid_to_mech(oid));
463     #else
464         if (ssh_gssapi_is_krb5(oid))
465             return ("Kerberos");
466         if (ssh_gssapi_is_gsi(oid))
467             return ("GSI");
468         return ("unknown");
469     #endif /* HAVE_GSS_OID_TO_MECH */
470 }
471
472 char *
473 ssh_gssapi_oid_to_str(gss_OID oid)
474 {
475     #ifdef HAVE_GSS_OID_TO_STR
476         gss_buffer_desc str_buf;
477         char *str;
478         OM_uint32 maj, min;
479
480         maj = gss_oid_to_str(&min, oid, &str_buf);
481
482         if (GSS_ERROR(maj))
483             return (xstrdup("<gss_oid_to_str() failed>"));
484
485         str = xmalloc(str_buf.length + 1);
486         memset(str, 0, str_buf.length + 1);
487         strlcpy(str, str_buf.value, str_buf.length + 1);
488         (void) gss_release_buffer(&min, &str_buf);
489
490         return (str);
491     #else
492         return (xstrdup("<gss_oid_to_str() unsupported>"));
493     #endif /* HAVE_GSS_OID_TO_STR */
494 }
495
496 /* Check that the OID in a data stream matches that in the context */
497 int
498 ssh_gssapi_check_mech_oid(Gssctxt *ctx, void *data, size_t len)
499 {
500     return (ctx != NULL && ctx->desired_mech != GSS_C_NULL_OID &&
501             ctx->desired_mech->length == len &&
502             memcmp(ctx->desired_mech->elements, data, len) == 0);
503 }
504
505 /* Set the contexts OID from a data stream */
506 void
507 ssh_gssapi_set_oid_data(Gssctxt *ctx, void *data, size_t len)
508 {
509     if (ctx->actual_mech != GSS_C_NULL_OID) {
510         xfree(ctx->actual_mech->elements);
511         xfree(ctx->actual_mech);
512     }
513     ctx->actual_mech = xmalloc(sizeof (gss_OID_desc));
514     ctx->actual_mech->length = len;
515     ctx->actual_mech->elements = xmalloc(len);
516     memcpy(ctx->actual_mech->elements, data, len);
517 }
518
519 /* Set the contexts OID */
520 void
521 ssh_gssapi_set_oid(Gssctxt *ctx, gss_OID oid)
522 {
523 }

```

```

524     ssh_gssapi_set_oid_data(ctx, oid->elements, oid->length);
525 }

527 /* All this effort to report an error ... */

529 void
530 ssh_gssapi_error(Gssctx *ctx, const char *where)
531 {
532     char *errmsg = ssh_gssapi_last_error(ctx, NULL, NULL);

534     if (where != NULL)
535         debug("GSS-API error while %s: %s", where, errmsg);
536     else
537         debug("GSS-API error: %s", errmsg);

539     /* ssh_gssapi_last_error() can't return NULL */
540     xfree(errmsg);
541 }

543 char *
544 ssh_gssapi_last_error(Gssctx *ctx, OM_uint32 *major_status,
545                      OM_uint32 *minor_status)
546 {
547     OM_uint32 lmin, more;
548     OM_uint32 maj, min;
549     gss_OID mech = GSS_C_NULL_OID;
550     gss_buffer_desc msg;
551     Buffer b;
552     char *ret;

554     buffer_init(&b);

556     if (ctx) {
557         /* Get status codes from the Gssctx */
558         maj = ctx->major;
559         min = ctx->minor;
560         /* Output them if desired */
561         if (major_status)
562             *major_status = maj;
563         if (minor_status)
564             *minor_status = min;
565         /* Get mechanism for minor status display */
566         mech = (ctx->actual_mech != GSS_C_NULL_OID) ?
567             ctx->actual_mech : ctx->desired_mech;
568     } else if (major_status && minor_status) {
569         maj = *major_status;
570         min = *minor_status;
571     } else {
572         maj = GSS_S_COMPLETE;
573         min = 0;
574     }

576     more = 0;
577     /* The GSSAPI error */
578     do {
579         gss_display_status(&lmin, maj, GSS_C_GSS_CODE,
580                          GSS_C_NULL_OID, &more, &msg);

582         buffer_append(&b, msg.value, msg.length);
583         buffer_put_char(&b, '\n');
584         gss_release_buffer(&lmin, &msg);
585     } while (more != 0);

587     /* The mechanism specific error */
588     do {
589         /*

```

```

590         * If mech == GSS_C_NULL_OID we may get the default
591         * mechanism, whatever that is, and that may not be
592         * useful.
593         */
594         gss_display_status(&lmin, min, GSS_C_MECH_CODE, mech, &more,
595                          &msg);

597         buffer_append(&b, msg.value, msg.length);
598         buffer_put_char(&b, '\n');

600         gss_release_buffer(&lmin, &msg);
601     } while (more != 0);

603     buffer_put_char(&b, '\0');
604     ret = xstrdup(buffer_ptr(&b));
605     buffer_free(&b);

607     return (ret);
608 }

610 /*
611  * Initialise our GSSAPI context. We use this opaque structure to contain all
612  * of the data which both the client and server need to persist across
613  * {accept,init}_sec_context calls, so that when we do it from the userauth
614  * stuff life is a little easier
615  */
616 void
617 ssh_gssapi_build_ctx(Gssctx **ctx, int client, gss_OID mech)
618 {
619     Gssctx *newctx;

622     newctx = (Gssctx*)xmalloc(sizeof (Gssctx));
623     memset(newctx, 0, sizeof (Gssctx));

626     newctx->local = client;
627     newctx->desired_mech = ssh_gssapi_dup_oid(mech);

629     /* This happens to be redundant given the memset() above */
630     newctx->major = GSS_S_COMPLETE;
631     newctx->context = GSS_C_NO_CONTEXT;
632     newctx->actual_mech = GSS_C_NULL_OID;
633     newctx->desired_name = GSS_C_NO_NAME;
634     newctx->src_name = GSS_C_NO_NAME;
635     newctx->dst_name = GSS_C_NO_NAME;
636     newctx->creds = GSS_C_NO_CREDENTIAL;
637     newctx->deleg_creds = GSS_C_NO_CREDENTIAL;

639     newctx->default_creds = (*ctx != NULL) ? (*ctx)->default_creds : 0;

641     ssh_gssapi_delete_ctx(ctx);

643     *ctx = newctx;
644 }

646 gss_OID
647 ssh_gssapi_dup_oid(gss_OID oid)
648 {
649     gss_OID new_oid;

651     new_oid = xmalloc(sizeof (gss_OID_desc));

653     new_oid->elements = xmalloc(oid->length);
654     new_oid->length = oid->length;
655     memcpy(new_oid->elements, oid->elements, oid->length);

```

```

657     return (new_oid);
658 }

660 gss_OID
661 ssh_gssapi_make_oid(size_t length, void *elements)
662 {
663     gss_OID_desc oid;

665     oid.length = length;
666     oid.elements = elements;

668     return (ssh_gssapi_dup_oid(&oid));
669 }

671 void
672 ssh_gssapi_release_oid(gss_OID *oid)
673 {
674     OM_uint32 min;

676     if (oid && *oid == GSS_C_NULL_OID)
677         return;
678     (void) gss_release_oid(&min, oid);

680     if (*oid == GSS_C_NULL_OID)
681         return; /* libgss did own this gss_OID and released it */

683     xfree((*oid)->elements);
684     xfree(*oid);
685     *oid = GSS_C_NULL_OID;
686 }

688 struct gss_name {
689     gss_OID      name_type;
690     gss_buffer_t external_name;
691     gss_OID      mech_type;
692     void         *mech_name;
693 };

695 /* Delete our context, providing it has been built correctly */
696 void
697 ssh_gssapi_delete_ctx(Gssctxt **ctx)
698 {
699     OM_uint32 ms;

701     if ((*ctx) == NULL)
702         return;

704     if ((*ctx)->context != GSS_C_NO_CONTEXT)
705         gss_delete_sec_context(&ms, &(*ctx)->context, GSS_C_NO_BUFFER);
706 #if 0
707     /* XXX */
708     if ((*ctx)->desired_mech != GSS_C_NULL_OID)
709         ssh_gssapi_release_oid(&(*ctx)->desired_mech);
710 #endif
711     if ((*ctx)->actual_mech != GSS_C_NULL_OID)
712         (void) ssh_gssapi_release_oid(&(*ctx)->actual_mech);
713     if ((*ctx)->desired_name != GSS_C_NO_NAME)
714         gss_release_name(&ms, &(*ctx)->desired_name);
715 #if 0
716     if ((*ctx)->src_name != GSS_C_NO_NAME)
717         gss_release_name(&ms, &(*ctx)->src_name);
718 #endif
719     if ((*ctx)->dst_name != GSS_C_NO_NAME)
720         gss_release_name(&ms, &(*ctx)->dst_name);
721     if ((*ctx)->creds != GSS_C_NO_CREDENTIAL)

```

```

722         gss_release_cred(&ms, &(*ctx)->creds);
723     if ((*ctx)->deleg_creds != GSS_C_NO_CREDENTIAL)
724         gss_release_cred(&ms, &(*ctx)->deleg_creds);

726     xfree(*ctx);
727     *ctx = NULL;
728 }

730 /* Create a GSS hostbased service principal name for a given server hostname */
731 int
732 ssh_gssapi_import_name(Gssctxt *ctx, const char *server_host)
733 {
734     gss_buffer_desc name_buf;
735     int ret;

737     /* Build target principal */
738     name_buf.length = strlen(SSH_GSS_HOSTBASED_SERVICE) +
739         strlen(server_host) + 1; /* +1 for '@' */
740     name_buf.value = xmalloc(name_buf.length + 1); /* +1 for NUL */
741     ret = snprintf(name_buf.value, name_buf.length + 1, "%s@%s",
742         SSH_GSS_HOSTBASED_SERVICE, server_host);

744     debug3("ss: snprintf() returned %d, expected %d", __func__, ret,
745         name_buf.length);

747     ctx->major = gss_import_name(&ctx->minor, &name_buf,
748         GSS_C_NT_HOSTBASED_SERVICE, &ctx->desired_name);

750     if (GSS_ERROR(ctx->major)) {
751         ssh_gssapi_error(ctx, "calling GSS_Import_name()");
752         return (0);
753     }

755     xfree(name_buf.value);

757     return (1);
758 }

760 OM_uint32
761 ssh_gssapi_get_mic(Gssctxt *ctx, gss_buffer_desc *buffer, gss_buffer_desc *hash)
762 {
764     ctx->major = gss_get_mic(&ctx->minor, ctx->context,
765         GSS_C_QOP_DEFAULT, buffer, hash);
766     if (GSS_ERROR(ctx->major))
767         ssh_gssapi_error(ctx, "while getting MIC");
768     return (ctx->major);
769 }

771 OM_uint32
772 ssh_gssapi_verify_mic(Gssctxt *ctx, gss_buffer_desc *buffer,
773     gss_buffer_desc *hash)
774 {
775     gss_qop_t qop;

777     ctx->major = gss_verify_mic(&ctx->minor, ctx->context, buffer,
778         hash, &qop);
779     if (GSS_ERROR(ctx->major))
780         ssh_gssapi_error(ctx, "while verifying MIC");
781     return (ctx->major);
782 }
783 #endif /* GSSAPI */

```

```

*****
7621 Fri May 30 18:31:10 2014
new/usr/src/cmd/ssh/libssh/common/ssh-rsa.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Copyright (c) 2000 Markus Friedl. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  * 1. Redistributions of source code must retain the above copyright
8  * notice, this list of conditions and the following disclaimer.
9  * 2. Redistributions in binary form must reproduce the above copyright
10 * notice, this list of conditions and the following disclaimer in the
11 * documentation and/or other materials provided with the distribution.
12 *
13 * THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR
14 * IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES
15 * OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.
16 * IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT,
17 * INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
18 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
19 * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
20 * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
21 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
22 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
23 */

25 #include "includes.h"
26 RCSID("$OpenBSD: ssh-rsa.c,v 1.26 2002/08/27 17:13:56 stevesk Exp $");

28 #pragma ident "%Z%M% %I% %E% SMI"

30 #include <openssl/opensslconf.h>
31 #include <openssl/evp.h>
32 #include <openssl/err.h>

34 #include "xmalloc.h"
35 #include "log.h"
36 #include "buffer.h"
37 #include "bufaux.h"
38 #include "key.h"
39 #include "ssh-rsa.h"
40 #include "compat.h"
41 #include "ssh.h"

43 static int openssl_rsa_verify(int, u_char *, u_int, u_char *, u_int, RSA *);

45 /* RSASSA-PKCS1-v1_5 (PKCS #1 v2.0 signature) with SHA1 */
46 int
47 ssh_rsa_sign(Key *key, u_char **sigp, u_int *lenp,
48             u_char *data, u_int datalen)
49 {
50     const EVP_MD *evp_md;
51     EVP_MD_CTX md;
52     u_char digest[EVP_MAX_MD_SIZE], *sig;
53     u_int slen, dlen, len;
54     int ok, nid;
55     Buffer b;

57     if (key == NULL || key->type != KEY_RSA || key->rsa == NULL) {
58         error("ssh_rsa_sign: no RSA key");
59         return -1;
60     }
61     nid = (datafellows & SSH_BUG_RSASIGMD5) ? NID_md5 : NID_sha1;

```

```

62     if ((evp_md = EVP_get_digestbynid(nid)) == NULL) {
63         error("ssh_rsa_sign: EVP_get_digestbynid %d failed", nid);
64         return -1;
65     }
66     EVP_DigestInit(&md, evp_md);
67     EVP_DigestUpdate(&md, data, datalen);
68     EVP_DigestFinal(&md, digest, &dlen);

70     slen = RSA_size(key->rsa);
71     sig = xmalloc(slen);

73     ok = RSA_sign(nid, digest, dlen, sig, &len, key->rsa);
74     memset(digest, 'd', sizeof(digest));

76     if (ok != 1) {
77         int ecode = ERR_get_error();
78         error("ssh_rsa_sign: RSA sign failed: %s",
79             ERR_error_string(ecode, NULL));
80         xfree(sig);
81         return -1;
82     }
83     if (len < slen) {
84         u_int diff = slen - len;
85         debug("slen %u > len %u", slen, len);
86         memmove(sig + diff, sig, len);
87         memset(sig, 0, diff);
88     } else if (len > slen) {
89         error("ssh_rsa_sign: slen %u slen2 %u", slen, len);
90         xfree(sig);
91         return -1;
92     }
93     /* encode signature */
94     buffer_init(&b);
95     buffer_put_cstring(&b, "ssh-rsa");
96     buffer_put_string(&b, sig, slen);
97     len = buffer_len(&b);
98     if (lenp != NULL)
99         *lenp = len;
100     if (sigp != NULL) {
101         *sigp = xmalloc(len);
102         memcpy(*sigp, buffer_ptr(&b), len);
103     }
104     buffer_free(&b);
105     memset(sig, 's', slen);
106     xfree(sig);

108     return 0;
109 }

111 int
112 ssh_rsa_verify(Key *key, u_char *signature, u_int signaturelen,
113               u_char *data, u_int datalen)
114 {
115     Buffer b;
116     const EVP_MD *evp_md;
117     EVP_MD_CTX md;
118     char *ktype;
119     u_char digest[EVP_MAX_MD_SIZE], *sigblob;
120     u_int len, dlen, modlen;
121     int rlen, ret, nid;

123     if (key == NULL || key->type != KEY_RSA || key->rsa == NULL) {
124         error("ssh_rsa_verify: no RSA key");
125         return -1;
126     }
127     if (BN_num_bits(key->rsa->n) < SSH_RSA_MINIMUM_MODULUS_SIZE) {

```

```

128         error("ssh_rsa_verify: RSA modulus too small: %d < minimum %d bi
129             BN_num_bits(key->rsa->n), SSH_RSA_MINIMUM_MODULUS_SIZE);
130         return -1;
131     }
132     buffer_init(&b);
133     buffer_append(&b, signature, signaturelen);
134     ktype = buffer_get_string(&b, NULL);
135     if (strcmp("ssh-rsa", ktype) != 0) {
136         error("ssh_rsa_verify: cannot handle type %s", ktype);
137         buffer_free(&b);
138         xfree(ktype);
139         return -1;
140     }
141     xfree(ktype);
142     sigblob = buffer_get_string(&b, &rlen);
143     rlen = buffer_len(&b);
144     buffer_free(&b);
145     if (rlen != 0) {
146         error("ssh_rsa_verify: remaining bytes in signature %d", rlen);
147         xfree(sigblob);
148         return -1;
149     }
150     /* RSA_verify expects a signature of RSA_size */
151     modlen = RSA_size(key->rsa);
152     if (len > modlen) {
153         error("ssh_rsa_verify: len %u > modlen %u", len, modlen);
154         xfree(sigblob);
155         return -1;
156     } else if (len < modlen) {
157         u_int diff = modlen - len;
158         debug("ssh_rsa_verify: add padding: modlen %u > len %u",
159             modlen, len);
160         sigblob = xrealloc(sigblob, modlen);
161         memmove(sigblob + diff, sigblob, len);
162         memset(sigblob, 0, diff);
163         len = modlen;
164     }
165     nid = (datafellows & SSH_BUG_RSASIGMD5) ? NID_md5 : NID_sha1;
166     if ((evp_md = EVP_get_digestbynid(nid)) == NULL) {
167         error("ssh_rsa_verify: EVP_get_digestbynid %d failed", nid);
168         xfree(sigblob);
169         return -1;
170     }
171     EVP_DigestInit(&md, evp_md);
172     EVP_DigestUpdate(&md, data, datalen);
173     EVP_DigestFinal(&md, digest, &dlen);
174
175     ret = openssh_RSA_verify(nid, digest, dlen, sigblob, len, key->rsa);
176     memset(digest, 'd', sizeof(digest));
177     memset(sigblob, 's', len);
178     xfree(sigblob);
179     debug("ssh_rsa_verify: signature %scorrect", (ret==0) ? "in" : "");
180     return ret;
181 }
182
183 /*
184  * See:
185  * http://www.rsasecurity.com/rsalabs/pkcs/pkcs-1/
186  * ftp://ftp.rsasecurity.com/pub/pkcs/pkcs-1/pkcs-1v2-1.asn
187  */
188 /*
189  * id-sha1 OBJECT IDENTIFIER ::= { iso(1) identified-organization(3)
190  *     oiw(14) secsig(3) algorithms(2) 26 }
191  */
192 static const u_char id_sha1[] = {
193     0x30, 0x21, /* type Sequence, length 0x21 (33) */

```

```

194     0x30, 0x09, /* type Sequence, length 0x09 */
195     0x06, 0x05, /* type OID, length 0x05 */
196     0x2b, 0x0e, 0x03, 0x02, 0x1a, /* id-sha1 OID */
197     0x05, 0x00, /* NULL */
198     0x04, 0x14 /* Octet string, length 0x14 (20), followed by sha1 hash */
199 };
200 /*
201  * id-md5 OBJECT IDENTIFIER ::= { iso(1) member-body(2) us(840)
202  *     rsadsi(113549) digestAlgorithm(2) 5 }
203  */
204 static const u_char id_md5[] = {
205     0x30, 0x20, /* type Sequence, length 0x20 (32) */
206     0x30, 0x0c, /* type Sequence, length 0x09 */
207     0x06, 0x08, /* type OID, length 0x05 */
208     0x2a, 0x86, 0x48, 0x86, 0xf7, 0x0d, 0x02, 0x05, /* id-md5 */
209     0x05, 0x00, /* NULL */
210     0x04, 0x10 /* Octet string, length 0x10 (16), followed by md5 hash */
211 };
212
213 static int
214 openssh_RSA_verify(int type, u_char *hash, u_int hashlen,
215     u_char *sigbuf, u_int siglen, RSA *rsa)
216 {
217     u_int ret, rsize, oidlen = 0, hlen = 0;
218     int len;
219     const u_char *oid = NULL;
220     u_char *decrypted = NULL;
221
222     ret = 0;
223     switch (type) {
224     case NID_sha1:
225         oid = id_sha1;
226         oidlen = sizeof(id_sha1);
227         hlen = 20;
228         break;
229     case NID_md5:
230         oid = id_md5;
231         oidlen = sizeof(id_md5);
232         hlen = 16;
233         break;
234     default:
235         goto done;
236     }
237     if (hashlen != hlen) {
238         error("bad hashlen");
239         goto done;
240     }
241     rsize = RSA_size(rsa);
242     if (siglen == 0 || siglen > rsize) {
243         error("bad siglen");
244         goto done;
245     }
246     decrypted = xmalloc(rsize);
247     if ((len = RSA_public_decrypt(siglen, sigbuf, decrypted, rsa,
248         RSA_PKCS1_PADDING)) < 0) {
249         error("RSA_public_decrypt failed: %s",
250             ERR_error_string(ERR_get_error(), NULL));
251         goto done;
252     }
253     if (len != hlen + oidlen) {
254         error("bad decrypted len: %d != %d + %d", len, hlen, oidlen);
255         goto done;
256     }
257     if (memcmp(decrypted, oid, oidlen) != 0) {
258         error("oid mismatch");
259     }

```

```
260         goto done;
261     }
262     if (memcmp(decrypted + oidlen, hash, hlen) != 0) {
263         error("hash mismatch");
264         goto done;
265     }
266     ret = 1;
267 done:
268     if (decrypted)
269         xfree(decrypted);
270     return ret;
271 }
```

new/usr/src/cmd/ssh/sftp-server/Makefile

1

1599 Fri May 30 18:31:11 2014

new/usr/src/cmd/ssh/sftp-server/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #
24 # cmd/ssh/sftp-server/Makefile

26 PROG =          sftp-server

28 OBJS =          sftp-server.o sftp-server-main.o
29 SRCS =          $(OBJS:.o=.c)

31 include ../../Makefile.cmd
32 include ../Makefile.ssh-common

34 LDLIBS +=       $(SSH_COMMON_LDLIBS) -lsocket

36 # libcrypto has no lint library, so we can only use it when building
37 $(PROG) := LDLIBS += -lsunw_crypto

39 POFILE_DIR =    ..

41 .KEEP_STATE:

43 .PARALLEL:      $(OBJS)

45 all:            $(PROG)

47 $(PROG):        $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/
48                 $(LINK.c) $(OBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
49                 $(POST_PROCESS)

51 install:        all $(ROOTLIBSSHPRG) $(ROOTLIBSSH)

53 clean:
54                 $(RM) -f $(OBJS) $(PROG)

56 lint:           lint_SRCS

58 include ../Makefile.msg.targ
59 include ../../Makefile.targ
```

new/usr/src/cmd/ssh/sftp/Makefile

1

1585 Fri May 30 18:31:11 2014
new/usr/src/cmd/ssh/sftp/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #
24 # cmd/ssh/sftp/Makefile

26 PROG =          sftp

28 OBJS =          \
29                sftp.o \
30                sftp-client.o \
31                sftp-glob.o

33 SRCS =          $(OBJS:.o=.c)

35 include ../../Makefile.cmd
36 include ../Makefile.ssh-common

38 LDLIBS +=       $(SSH_COMMON_LDLIBS) -lsocket -ltecla

40 # libcrypto has no lint library, so we can only use it when building
41 $(PROG) := LDLIBS += -lsunw_crypto

43 POFILE_DIR =    ..

45 .KEEP_STATE:

47 .PARALLEL:      $(OBJS)

49 all: $(PROG)

51 $(PROG):        $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/
52                $(LINK.c) $(OBJS) -o $$@ $(LDLIBS) $(DYNFLAGS)
53                $(POST_PROCESS)

55 install:        all $(ROOTPROG)

57 clean:
58                $(RM) -f $(OBJS) $(PROG)

60 lint:           lint_SRCS
```

new/usr/src/cmd/ssh/sftp/Makefile

2

```
62 include ../Makefile.msg.targ
63 include ../../Makefile.targ
```


new/usr/src/cmd/ssh/ssh-add/Makefile

1

1547 Fri May 30 18:31:11 2014

new/usr/src/cmd/ssh/ssh-add/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

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23 #
24 # cmd/ssh/ssh-add/Makefile

26 PROG= ssh-add

28 OBJS   =      \
29      ssh-add.o
30 SRCS   = $(OBJS:.o=.c)

32 include ../../Makefile.cmd
33 include ../Makefile.ssh-common

35 LDLIBS += $(SSH_COMMON_LDLIBS) -lsocket

37 # libcrypto has no lint library, so we can only use it when building
38 $(PROG) := LDLIBS += -lsunw_crypto

40 POFILE_DIR= ..

42 .KEEP_STATE:

44 .PARALLEL: $(OBJS)

46 all: $(PROG)

48 $(PROG): $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/libopen
49      $(LINK.c) $(OBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
50      $(POST_PROCESS)

52 install: all $(ROOTPROG)

54 clean:
55      $(RM) -f $(OBJS) $(PROG)

57 lint:  lint_SRCS

59 include ../Makefile.msg.targ
60 include ../../Makefile.targ
```

new/usr/src/cmd/ssh/ssh-agent/Makefile

1

1553 Fri May 30 18:31:11 2014
new/usr/src/cmd/ssh/ssh-agent/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

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23 #
24 # cmd/ssh/ssh-agent/Makefile

26 PROG= ssh-agent

28 OBJS   = \
29     ssh-agent.o
30 SRCS   = $(OBJS:.o=.c)

32 include ../Makefile.cmd
33 include ../Makefile.ssh-common

35 LDLIBS += $(SSH_COMMON_LDLIBS) -lsocket

37 # libcrypto has no lint library, so we can only use it when building
38 $(PROG) := LDLIBS += -lsunw_crypto

40 POFILE_DIR= ..

42 .KEEP_STATE:

44 .PARALLEL: $(OBJS)

46 all: $(PROG)

48 $(PROG): $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/libopen
49     $(LINK.c) $(OBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
50     $(POST_PROCESS)

52 install: all $(ROOTPROG)

54 clean:
55     $(RM) -f $(OBJS) $(PROG)

57 lint: lint_SRCS

59 include ../Makefile.msg.targ
60 include ../Makefile.targ
```

new/usr/src/cmd/ssh/ssh-keygen/Makefile

1

1556 Fri May 30 18:31:11 2014

new/usr/src/cmd/ssh/ssh-keygen/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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23 #
24 # cmd/ssh/ssh-keygen/Makefile

26 PROG= ssh-keygen

28 OBJS   = \
29     ssh-keygen.o
30 SRCS   = $(OBJS:.o=.c)

32 include ../Makefile.cmd
33 include ../Makefile.ssh-common

35 LDLIBS += $(SSH_COMMON_LDLIBS) -lsocket

37 # libcrypto has no lint library, so we can only use it when building
38 $(PROG) := LDLIBS += -lsunw_crypto

40 POFILE_DIR= ..

42 .KEEP_STATE:

44 .PARALLEL: $(OBJS)

46 all: $(PROG)

48 $(PROG): $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/libopen
49     $(LINK.c) $(OBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
50     $(POST_PROCESS)

52 install: all $(ROOTPROG)

54 clean:
55     $(RM) -f $(OBJS) $(PROG)

57 lint: lint_SRCS

59 include ../Makefile.msg.targ
60 include ../Makefile.targ
```

new/usr/src/cmd/ssh/ssh-keyscan/Makefile

1

1569 Fri May 30 18:31:11 2014

new/usr/src/cmd/ssh/ssh-keyscan/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

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23 #
24 # cmd/ssh/ssh-keyscan/Makefile

26 PROG= ssh-keyscan

28 OBJS   = \
29     ssh-keyscan.o
30 SRCS   = $(OBJS:.o=.c)

32 include ../Makefile.cmd
33 include ../Makefile.ssh-common

35 LDLIBS += $(SSH_COMMON_LDLIBS) -lsocket -lnsl -lz

37 # libcrypto has no lint library, so we can only use it when building
38 $(PROG) := LDLIBS += -lsunw_crypto

40 POFILE_DIR= ..

42 .KEEP_STATE:

44 .PARALLEL: $(OBJS)

46 all: $(PROG)

48 $(PROG): $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/libopen
49     $(LINK.c) $(OBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
50     $(POST_PROCESS)

52 clean:
53     $(RM) -f $(OBJS) $(PROG)

55 lint: lint_SRCS

57 include ../Makefile.msg.targ
58 include ../Makefile.targ

60 install: all $(ROOTPROG)
```

new/usr/src/cmd/ssh/ssh-keysign/Makefile

1

1690 Fri May 30 18:31:11 2014
new/usr/src/cmd/ssh/ssh-keysign/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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23 #
24 # cmd/ssh/ssh-keysign/Makefile

26 PROG= ssh-keysign

28 DIRS= $(ROOTLIBSSH)

31 OBJS   = ssh-keysign.o
32 SRCS   = $(OBJS:.o=.c)

34 include ../Makefile.cmd
35 include ../Makefile.ssh-common

37 FILEMODE= 04555

39 LDLIBS += $(SSH_COMMON_LDLIBS) -lsocket -lnsl -lz

41 # libcrypto has no lint library, so we can only use it when building
42 $(PROG) := LDLIBS += -lsunw_crypto

44 POFILE_DIR= ..

46 .KEEP_STATE:

48 .PARALLEL: $(OBJS)

50 all: $(PROG)

52 $(PROG): $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/libopen
53          $(LINK.c) $(OBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
54          $(POST_PROCESS)

56 clean:
57          $(RM) -f $(OBJS) $(PROG)

59 lint:  lint_SRCS

61 include ../Makefile.msg.targ
```

new/usr/src/cmd/ssh/ssh-keysign/Makefile

2

```
62 include ../Makefile.targ

64 install: all $(DIRS) $(ROOTLIBSSHPROG) $(ROOTLIBSSH)

67 $(ROOTLIBSSHPROG)/%: %
68     $(INS.file)

70 $(DIRS):
71     $(INS.dir)
```

new/usr/src/cmd/ssh/ssh/Makefile

1

1686 Fri May 30 18:31:11 2014
new/usr/src/cmd/ssh/ssh/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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23 #
24 # cmd/ssh/ssh/Makefile

26 PROG= ssh

28 OBJS   = ssh.o \
29         sshconnect.o \
30         sshconnect1.o \
31         sshconnect2.o \
32         sstty.o \
33         clientloop.o \
34         gss-clnt.o
35 SRCS   = $(OBJS:.o=.c)

37 include ../../Makefile.cmd
38 include ../../Makefile.ssh-common

40 LDLIBS += $(SSH_COMMON_LDLIBS) -lsocket \
41         -lnsl \
42         -lz \
43         -lgss

45 # libcrypto has no lint library, so we can only use it when building
46 $(PROG) := LDLIBS += -lsunw_crypto

48 POFILE_DIR= ..

50 .KEEP_STATE:

52 .PARALLEL: $(OBJS)

54 all: $(PROG)

56 $(PROG): $(OBJS) ../libssh/$(MACH)/libssh.a ../libopenbsd-compat/$(MACH)/libopen
57         $(LINK.c) $(OBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
58         $(POST_PROCESS)

60 install: all $(ROOTPROG)
```

new/usr/src/cmd/ssh/ssh/Makefile

2

```
62 clean:
63         $(RM) -f $(OBJS) $(PROG)

65 lint:    lint_SRCS

67 include ../Makefile.msg.targ

69 XGETFLAGS += --keyword=log
70 include ../../Makefile.targ
```

new/usr/src/cmd/ssh/sshd/Makefile

1

```
*****
2508 Fri May 30 18:31:11 2014
new/usr/src/cmd/ssh/sshd/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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24 # cmd/ssh/sshd/Makefile

26 PROG= sshd

28 DIRS= $(ROOTLIBSSH)

30 OBJS = sshd.o \
31       altprivsep.o \
32       auth.o \
33       auth1.o \
34       auth2.o \
35       auth-options.o \
36       auth2-chall.o \
37       auth2-gss.o \
38       auth2-hostbased.o \
39       auth2-kbdint.o \
40       auth2-none.o \
41       auth2-passwd.o \
42       auth2-pam.o \
43       auth2-pubkey.o \
44       auth-bsdauth.o \
45       auth-chall.o \
46       auth-rhosts.o \
47       auth-krb4.o \
48       auth-krb5.o \
49       auth-pam.o \
50       auth-passwd.o \
51       auth-rsa.o \
52       auth-rh-rsa.o \
53       auth-sia.o \
54       auth-skey.o \
55       bsmaudit.o \
56       groupaccess.o \
57       gss-serv.o \
58       loginrec.o \
59       servconf.o \
60       serverloop.o \
61       session.o \
```

new/usr/src/cmd/ssh/sshd/Makefile

2

```
62         sshlogin.o \
63         sshpty.o

65 EXTOBJS = sftp-server.o

67 SRCS = $(OBJS:.o=.c) ../sftp-server/sftp-server.c

69 include ../../Makefile.cmd
70 include ../Makefile.ssh-common

72 LDLIBS += $(SSH_COMMON_LDLIBS) -lsocket \
73           -lnsl \
74           -lz \
75           -lpam \
76           -lbsd \
77           -lwrap \
78           -lgss \
79           -lcontract
80 MAPFILES = $(MAPFILE.INT) $(MAPFILE.NGB)
81 LDFLAGS += $(MAPFILES:%=-M%)

83 # libcrypto has no lint library, so we can only use it when building
84 $(PROG) := LDLIBS += -lsunw_crypto

86 POFILE_DIR= ..

88 .KEEP_STATE:

90 .PARALLEL: $(OBJS)

92 all: $(PROG)

94 $(PROG): $(OBJS) $(EXTOBJS) $(MAPFILES) ../libssh/$(MACH)/libssh.a \
95         ../libopenbsd-compat/$(MACH)/libopenbsd-compat.a
96         $(LINK.c) $(OBJS) $(EXTOBJS) -o $@ $(LDLIBS) $(DYNFLAGS)
97         $(POST_PROCESS)

99 %.o : ../sftp-server/%.c
100         $(COMPILE.c) -o $@ $<
101         $(POST_PROCESS_0)

103 install: all $(DIRS) $(ROOTLIBSSHPROG) $(ROOTLIBSSH)

106 $(ROOTLIBSSHPROG)/%: %
107         $(INS.file)

109 $(DIRS):
110         $(INS.dir)

112 clean:
113         $(RM) $(OBJS) $(EXTOBJS)

115 lint: lint_SRCS

117 include ../Makefile.msg.targ
118 include ../../Makefile.targ
```

new/usr/src/cmd/svr4pkg/pkgadd/Makefile

1

1303 Fri May 30 18:31:11 2014
new/usr/src/cmd/svr4pkg/pkgadd/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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21 #
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25 #
26 #
27 PROG=          pkgadd
28 #
29 OBJS=          check.o      \
30                main.o       \
31                quit.o
32 #
33 ROOTLINKS=     $(ROOTUSRSBIN)/pkgask
34 #
35 include $(SRC)/cmd/svr4pkg/Makefile.svr4pkg
36 #
37 LDLIBS +=      -lpkg -linstzones -ladm
38 LDLIBS +=      -lsunw_crypto -lwanboot
39 #
40 .KEEP_STATE:
41 #
42 all: $(PROG)
43 #
44 install: all $(ROOTUSRSBINPROG) $(ROOTLINKS)
45 #
46 $(ROOTLINKS): $(ROOTUSRSBINPROG)
47                $(RM) $@
48                $(LN) $(ROOTUSRSBINPROG) $@
49 #
50 include $(SRC)/cmd/svr4pkg/Makefile.svr4pkg.targ
```


new/usr/src/cmd/svr4pkg/pkgadm/Makefile

1

1223 Fri May 30 18:31:12 2014

new/usr/src/cmd/svr4pkg/pkgadm/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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25 #
26 #
27 PROG=          pkgadm
28 #
29 OBJS=          addcert.o      \
30                certs.o        \
31                listcert.o     \
32                lock.o          \
33                main.o          \
34                removecert.o
35 #
36 include $(SRC)/cmd/svr4pkg/Makefile.svr4pkg
37 #
38 LDLIBS +=      -lpkg -ladm -lsunw_crypto -lgen
39 #
40 .KEEP_STATE:
41 all:           $(PROG)
42 #
43 install:       all $(ROOTPROG)
44 #
45 include $(SRC)/cmd/svr4pkg/Makefile.svr4pkg.targ
```

new/usr/src/common/net/wanboot/boot_http.c

1

```
*****
72083 Fri May 30 18:31:12 2014
new/usr/src/common/net/wanboot/boot_http.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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20 */

22 /*
23  * Copyright (c) 2003, 2010, Oracle and/or its affiliates. All rights reserved.
24  * Copyright (c) 2012, OmniTI Computer Consulting, Inc. All rights reserved.
25  */

27 #include <errno.h>
28 #include <sys/types.h>
29 #include <sys/socket.h>
30 #include <netinet/in.h>
31 #include <arpa/inet.h>
32 #include <ctype.h>
33 #include <stdio.h>
34 #include <strings.h>
35 #include <stdlib.h>
36 #include <netdb.h>

38 #include <openssl/ssl.h>
39 #include <openssl/err.h>
40 #include <openssl/rand.h>
41 #include <openssl/pkcs12.h>

43 /* this must be included after ssl.h to avoid re-defining 'offsetof' */
44 #include <sys/sysmacros.h>

46 #include <boot_http.h>
47 #include <socket_inet.h>
48 #include <p12access.h>

50 #include "bootlog.h"

52 #define BOOT_HTTP_MAJOR_VERSION 1
53 #define BOOT_HTTP_MINOR_VERSION 0
54 #define BOOT_HTTP_MICRO_VERSION 0

56 static boot_http_ver_t boot_http_ver = {
57     BOOT_HTTP_MAJOR_VERSION,
58     BOOT_HTTP_MINOR_VERSION,
59     BOOT_HTTP_MICRO_VERSION
60 };
```

new/usr/src/common/net/wanboot/boot_http.c

2

```
62 static int      early_err;      /* Error from before error occurred */

64 static boolean_t verbose_mode = B_FALSE;
65 static char      *cipher_list = NULL; /* Ciphers supported (if not default) */

67 typedef struct {
68     int      i;          /* current position in buffer */
69     int      n;          /* number of bytes in buffer */
70     char      buf[512];   /* buffer */
71 } buf_struct_t;

73 typedef struct {
74     uint_t    errsrc;     /* Source of this error */
75     ulong_t    error;     /* Which error? */
76 } errrent_t;

79 typedef enum {
80     HTTP_REQ_TYPE_HEAD = 1,
81     HTTP_REQ_TYPE_GET
82 } http_req_t;

84 #define FAILSAFE 20      /* Max # empty lines to accept */
85 #define DEFAULT_TIMEOUT 10 /* Default socket read timeout value */
86 #define HTTP_CONN_INFO 0x90919293 /* Identifies a http_conn_t struct */
87 #define ESTACK_SIZE 20   /* Size of the stack */

89 typedef struct http_conn_t {
90     uint_t    signature;   /* Cookie indicating this is a handle */
91     int      fd;          /* Connection's fd... */
92     SSL_CTX    *ctx;       /* Handle to ssl data structure */
93     void      *ssl;        /* Timeout to use on read requests in sec */
94     int      read_timeout; /* Basic authentication user ID */
95     char      *basic_auth_userid; /* Basic authentication user ID */
96     char      *basic_auth_password; /* and password */
97     char      is_multipart; /* B_TRUE if doing multipart/mixed download */
98     char      is_firstpart; /* B_TRUE if first part in a multipart xfer */
99     char      is_firstchunk; /* B_TRUE if first chunk in chunked xfer */
100    char      is_chunked; /* B_TRUE if message body is chunked */
101    boolean_t    keepalive;
102    struct sockadr_in host_addr; /* Address of host */
103    url_t      uri;            /* The current URI */
104    url_hport_t proxy;        /* The proxy info */
105    boolean_t    proxied;      /* Connection is proxied */
106    char      *random_file; /* File with seed info for pseudo random */
107    char      *client_cert_file; /* File holding client's certificate */
108    char      *private_key_file; /* File with the private key */
109    char      *file_password; /* file with password to key or pkcs12 file. */
110    http_respinfo_t resp; /* Response summary info */
111    char      **resphdr; /* Array of header response lines */
112    buf_struct_t inbuf;
113    char      *boundary; /* Boundary text (multipart downloads only) */
114    uint_t    boundary_len; /* Length of boundary string */
115    uint_t    numerrs;
116    uint_t    nexterr; /* Next error to return */
117    ssize_t    body_size; /* Size of message body or chunk */
118    ssize_t    body_read; /* # of bytes of body_size processed */
119    ssize_t    body_size_tot; /* Total message body size */
120    ssize_t    body_read_tot; /* # of bytes of body_size_tot processed */
121    errrent_t    errs[ESTACK_SIZE]; /* stack of errors on the last request */
122    /* (libssl can return multiple errors on one */
123    /* operation) */
124 } http_conn_t;

127 /*
```

```

128 * Convenient macros for accessing fields in connection structure.
129 */
130 #define CONN_HOSTNAME      c_id->uri.hport.hostname
131 #define CONN_PORT          c_id->uri.hport.port
132 #define CONN_ABSPATH       c_id->uri.abspath
133 #define CONN_HTTPS         c_id->uri.https
134 #define CONN_PROXY_HOSTNAME c_id->proxy.hostname
135 #define CONN_PROXY_PORT    c_id->proxy.port

137 #define RESET_ERR(c_id) (c_id->numerrs = 0, (c_id->nexterr = 0)
138 #define SET_ERR(c_id, src, err) if ((c_id->numerrs < ESTACK_SIZE) \
139     (c_id->errs[(c_id->numerrs)].errsrc = (src), \
140     (c_id->errs[(c_id->numerrs++)].error = (err))

142 #define GET_ERR(c_id, e_src, e_code) \
143     if ((c_id->nexterr < (c_id->numerrs) \
144         (e_src) = (c_id->errs[(c_id->nexterr)].errsrc, \
145         (e_code) = (c_id->errs[(c_id->nexterr++)].error; \
146     else \
147         (e_src) = 0, (e_code) = 0

149 /*
150 * Macro used to increment message body read counters
151 */
152 #define INC_BREAD_CNT(bool, bcnt) \
153     if (bool) { \
154         bcnt--; \
155         c_id->body_read++; \
156         c_id->body_read_tot++; \
157     }

159 static int      ssl_init = 0;          /* 1 when ssl has been initialized */
160 static char      *ca_verify_file;      /* List of trusted CA's */
161 static int       verify_depth = 16;    /* Certificate chain depth to verify */
162 static int       p12_format = 0;       /* Default to PEM format */

165 /* prototypes for local functions */
166 static int      http_req(http_handle_t, const char *, http_req_t, offset_t,
167     offset_t);
168 static boolean_t http_check_conn(http_conn_t *);
169 static SSL_CTX *initialize_ctx(http_conn_t *);
170 static int      tcp_connect(http_conn_t *, const char *, uint16_t);
171 static int      readline(http_conn_t *, int, char *, int);
172 static int      proxy_connect(http_conn_t *);
173 static int      check_cert_chain(http_conn_t *, char *);
174 static void     print_ciphers(SSL *);
175 static int      read_headerlines(http_conn_t *, boolean_t);
176 static void     free_response(http_conn_t *, int);
177 static int      free_ctx_ssl(http_conn_t *);
178 static int      get_chunk_header(http_conn_t *);
179 static int      init_bread(http_conn_t *);
180 static int      get_msgcnt(http_conn_t *, ssize_t *);
181 static int      getaline(http_conn_t *, char *, int, boolean_t);
182 static int      getbytes(http_conn_t *, char *, int);
183 static int      http_srv_send(http_conn_t *, const void *, size_t);
184 static int      http_srv_rcv(http_conn_t *, void *, size_t);
185 static void     handle_ssl_error(http_conn_t *, int);
186 static int      count_digits(int);
187 static int      hexdigit(char);
188 static char      *eat_ws(const char *);
189 static boolean_t startswith(const char **strp, const char *starts);

191 /* ----- public functions ----- */
193 */

```

```

194 * http_set_p12_format - Set flag indicating that certs & keys will be in
195 *                        pkcs12 format.
196 *
197 * Default is PEM certs.  When this is called, the default can be changed to
198 * pcs12 format.
199 */
200 void
201 http_set_p12_format(int on_off)
202 {
203     p12_format = on_off;
204 }

206 /*
207 * http_get_version - Get current boot http support version
208 *
209 * pVer = http_get_version();
210 *
211 * Arguments:
212 *     None.
213 *
214 * Returns:
215 *     Pointer to struct with version information.
216 *
217 * Returns the version of the http support in the current library.  This
218 * is a struct with unsigned integers for <major>, <minor> and
219 * <micro> version numbers.  <major> changes when an incompatible change
220 * is made.  <minor> changes when an upwardly-compatible API change is
221 * made.  <micro> consists of bug fixes, etc.
222 */
223 boot_http_ver_t const *
224 http_get_version(void)
225 {
226     return (&boot_http_ver);
227 }

229 /*
230 * http_set_verbose - Turn verbose on/off
231 *
232 * http_set_verbose(on_off);
233 *
234 * Arguments:
235 *     on_off - When TRUE, turn verbose mode on.  When FALSE, turn
236 *             verbose off.
237 *
238 * Returns:
239 *     None.
240 *
241 * When enabled, information is logged to bootlog (or the Solaris equivalent).
242 */
243 void
244 http_set_verbose(boolean_t on_off)
245 {
246     verbosemode = on_off;
247 }

249 /*
250 * http_set_cipher_list - Change the list of ciphers that can be used.
251 *
252 * ret = http_set_cipher_list(handle, list);
253 *
254 * Arguments:
255 *     list - List of ciphers that can be used.
256 *
257 * Returns:
258 *     0 - Success
259 *     -1 - An error occurred.  Check http_get_lasterr().

```

```

260 */
261 int
262 http_set_cipher_list(const char *list)
263 {
264     early_err = 0;
265
266     if (list != NULL) {
267         list = strdup(list);
268         if (list == NULL) {
269             early_err = EHTTP_NOMEM;
270             return (-1);
271         }
272     }
273
274     free(cipher_list);
275     cipher_list = (char *)list;
276     return (0);
277 }
278
279 /*
280 * http_srv_init - Set up a structure for a connection.
281 *
282 * handle = http_srv_init(url);
283 *
284 * Arguments:
285 * url - the structure that contains the URI.
286 *
287 * Returns:
288 * != NULL - A handle for referring to this connection.
289 * == NULL - An error occurred. Get the exact error from
290 * http_get_lasterr().
291 */
292 http_handle_t
293 http_srv_init(const url_t *url)
294 {
295     http_conn_t *c_id;
296
297     early_err = 0;
298     if (url == NULL) {
299         early_err = EHTTP_BADARG;
300         return (NULL);
301     }
302
303     if ((c_id = malloc(sizeof (*c_id))) == NULL) {
304         early_err = EHTTP_NOMEM;
305         return (NULL);
306     }
307
308     bzero(c_id, sizeof (*c_id));
309     c_id->uri = *url;
310     c_id->proxied = B_FALSE;
311     c_id->read_timeout = DEFAULT_TIMEOUT;
312     c_id->keepalive = B_TRUE;
313     c_id->fd = -1;
314
315     /* Do this at the end, just in case.... */
316     c_id->signature = HTTP_CONN_INFO;
317
318     return (c_id);
319 }
320
321 /*
322 * http_conn_is_https - Determine whether the scheme is http or https.
323 *
324 * B_TRUE - Connection is an SSL connection.
325 * B_FALSE - Connection isn't SSL.

```

```

326 *
327 * ret = http_conn_is_https(handle, boolean_t *bool);
328 *
329 * Arguments:
330 * handle - Handle associated with the desired connection
331 * bool - Ptr to boolean in which to place result
332 *
333 * Returns:
334 * 0 - Success
335 * -1 - Some error occurred.
336 */
337 int
338 http_conn_is_https(http_handle_t handle, boolean_t *bool)
339 {
340     http_conn_t *c_id = handle;
341
342     if (!http_check_conn(c_id))
343         return (-1);
344
345     *bool = CONN_HTTPS;
346     return (0);
347 }
348
349 /*
350 * http_set_proxy - Establish the proxy name/port.
351 *
352 * ret = http_set_proxy(handle, proxy);
353 *
354 * Arguments:
355 * handle - Handle associated with the desired connection
356 * proxy - The hostport definition for the proxy. If NULL,
357 * The next connect will not use a proxy.
358 *
359 * Returns:
360 * 0 - Success
361 * -1 - An error occurred. Check http_get_lasterr().
362 */
363 int
364 http_set_proxy(http_handle_t handle, const url_hport_t *proxy)
365 {
366     http_conn_t *c_id = handle;
367
368     if (!http_check_conn(c_id))
369         return (-1);
370
371     if (proxy != NULL) {
372         c_id->proxy = *proxy;
373         c_id->proxied = B_TRUE;
374     } else {
375         CONN_PROXY_HOSTNAME[0] = '\0';
376         c_id->proxied = B_FALSE;
377     }
378
379     return (0);
380 }
381
382 /*
383 * http_set_keepalive - Set keepalive for this connection.
384 *
385 * http_set_keepalive(handle, on_off);
386 *
387 * Arguments:
388 * handle - Handle associated with the desired connection
389 * on_off - Boolean turning keepalive on (TRUE) or off (FALSE)
390 *
391 * Returns:

```

```

392 *      0      - Success.
393 *      -1     - An error occurred. Check http_get_lasterr().
394 *
395 * This setting takes effect next time a connection is opened using this
396 * handle.
397 */
398 int
399 http_set_keepalive(http_handle_t handle, boolean_t on_off)
400 {
401     http_conn_t *c_id = handle;
402
403     if (!http_check_conn(c_id))
404         return (-1);
405
406     c_id->keepalive = on_off;
407     return (0);
408 }
409
410 /*
411 * http_set_socket_read_timeout - Set the timeout reads
412 *
413 * http_set_socket_read_timeout(handle, timeout);
414 *
415 * Arguments:
416 *     handle - Handle associated with the desired connection
417 *     timeout - Timeout, in seconds. Zero will default to 10 second
418 *              timeouts.
419 *
420 * Returns:
421 *     0      - Success.
422 *     -1     - An error occurred. Check http_get_lasterr().
423 *
424 * This setting takes effect beginning with the next read operation on this
425 * connection.
426 */
427 int
428 http_set_socket_read_timeout(http_handle_t handle, uint_t timeout)
429 {
430     http_conn_t *c_id = handle;
431
432     if (!http_check_conn(c_id))
433         return (-1);
434
435     c_id->read_timeout = (timeout) ? timeout : DEFAULT_TIMEOUT;
436     return (0);
437 }
438
439 /*
440 * http_set_basic_auth - Set the basic authorization user ID and password
441 *
442 * ret = http_set_basic_auth(handle, userid, password);
443 *
444 * Arguments:
445 *     handle - Handle associated with the desired connection
446 *     userid - ID to pass as part of http/https request
447 *     password- Password which goes with the user ID
448 *
449 * Returns:
450 *     0      - Success
451 *     -1     - An error occurred. Check http_get_lasterr().
452 *
453 * This must be set before a https connection is made.
454 */
455 int
456 http_set_basic_auth(http_handle_t handle, const char *userid,
457     const char *password)

```

```

458 {
459     http_conn_t *c_id = handle;
460
461     if (!http_check_conn(c_id))
462         return (-1);
463
464     if (password == NULL || userid == NULL || userid[0] == '\0') {
465         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
466         return (-1);
467     }
468
469     userid = strdup(userid);
470     password = strdup(password);
471     if (userid == NULL || password == NULL) {
472         free((void *)userid);
473         free((void *)password);
474         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
475         return (-1);
476     }
477
478     free(c_id->basic_auth_userid);
479     c_id->basic_auth_userid = (char *)userid;
480     free(c_id->basic_auth_password);
481     c_id->basic_auth_password = (char *)password;
482     return (0);
483 }
484
485 /*
486 * http_set_random_file - See the pseudo random number generator with file data
487 *
488 * ret = http_set_random_file(handle, filename);
489 *
490 * Arguments:
491 *     handle - Handle associated with the desired connection
492 *     filename - filename (including path) with random number seed.
493 *
494 * Returns:
495 *     0      - Success
496 *     -1     - An error occurred. Check http_get_lasterr().
497 *
498 * This must be set before a https connection is made.
499 */
500 int
501 http_set_random_file(http_handle_t handle, const char *fname)
502 {
503     http_conn_t *c_id = handle;
504
505     if (!http_check_conn(c_id))
506         return (-1);
507
508     if (fname != NULL) {
509         fname = strdup(fname);
510         if (fname == NULL) {
511             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
512             return (-1);
513         }
514     }
515
516     free(c_id->random_file);
517     c_id->random_file = (char *)fname;
518     return (0);
519 }
520
521 /*
522 * http_set_certificate_authority_file - Set the CA file.

```

```

524 *
525 *   ret = http_set_certificate_authority_file(filename);
526 *
527 * Arguments:
528 *   filename- File with the certificate authority certs
529 *
530 * Returns:
531 *   0          - Success
532 *   -1         - An error occurred. Check http_get_lasterr().
533 *
534 * This must be set before https connections to the servers is done.
535 */
536 int
537 http_set_certificate_authority_file(const char *fname)
538 {
539     early_err = 0;
540
541     if (fname != NULL) {
542         fname = strdup(fname);
543         if (fname == NULL) {
544             early_err = EHTTP_NOMEM;
545             return (-1);
546         }
547     }
548
549     free(ca_verify_file);
550     ca_verify_file = (char *)fname;
551     return (0);
552 }
553
554 /*
555 * http_set_client_certificate_file - Set the file containing the PKCS#12
556 * client certificate and optionally its certificate chain.
557 *
558 *   ret = http_set_client_certificate_file(handle, filename);
559 *
560 * Arguments:
561 *   handle - Handle associated with the desired connection
562 *   filename- File (including path) containing certificate, etc.
563 *
564 * Returns:
565 *   0          - Success
566 *   -1         - An error occurred. Check http_get_lasterr().
567 *
568 * This must be set before the handle is used to make a https connection
569 * which will require a client certificate.
570 */
571 int
572 http_set_client_certificate_file(http_handle_t handle, const char *fname)
573 {
574     http_conn_t *c_id = handle;
575
576     if (!http_check_conn(c_id))
577         return (-1);
578
579     if (fname != NULL) {
580         fname = strdup(fname);
581         if (fname == NULL) {
582             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
583             return (-1);
584         }
585     }
586
587     free(c_id->client_cert_file);
588     c_id->client_cert_file = (char *)fname;
589     return (0);

```

```

590 }
591
592 /*
593 * http_set_password - Set the password for the private key or pkcs12 file.
594 *
595 *   ret = http_set_password(handle, password);
596 *
597 * Arguments:
598 *   handle - Handle associated with the desired connection
599 *   password- Password for the client's private key file or pkcs12 file.
600 *
601 * Returns:
602 *   0          - Success
603 *   -1         - An error occurred. Check http_get_lasterr().
604 *
605 * This must be set before the handle is used to make a https connection.
606 */
607 int
608 http_set_password(http_handle_t handle, const char *password)
609 {
610     http_conn_t *c_id = handle;
611
612     if (!http_check_conn(c_id))
613         return (-1);
614
615     if (password != NULL) {
616         password = strdup(password);
617         if (password == NULL) {
618             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
619             return (-1);
620         }
621     }
622
623     free(c_id->file_password);
624     c_id->file_password = (char *)password;
625     return (0);
626 }
627
628 /*
629 * http_set_key_file_password - Set the password for the private key
630 * file.
631 *
632 *   ret = http_set_key_file_password(handle, password);
633 *
634 * Arguments:
635 *   handle - Handle associated with the desired connection
636 *   password- Password for the client's private key file.
637 *
638 * Returns:
639 *   0          - Success
640 *   -1         - An error occurred. Check http_get_lasterr().
641 *
642 * This must be set before the handle is used to make a https connection.
643 */
644 int
645 http_set_key_file_password(http_handle_t handle, const char *password)
646 {
647     return (http_set_password(handle, password));
648 }
649
650 /*
651 * http_set_private_key_file - Set the file containing the PKCS#12
652 * private key for this client.
653 *
654 *   ret = http_set_private_key_file(handle, filename);
655 *

```

```

656 * Arguments:
657 *   handle - Handle associated with the desired connection
658 *   filename- File (including path) containing the private key.
659 *
660 * Returns:
661 *   0 - Success
662 *   -1 - An error occurred. Check http_get_lasterr().
663 *
664 * This must be set before the handle is used to make a https connection.
665 */
666 int
667 http_set_private_key_file(http_handle_t handle, const char *fname)
668 {
669     http_conn_t *c_id = handle;
670
671     if (!http_check_conn(c_id))
672         return (-1);
673
674     if (fname != NULL) {
675         fname = strdup(fname);
676         if (fname == NULL) {
677             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
678             return (-1);
679         }
680     }
681
682     free(c_id->private_key_file);
683     c_id->private_key_file = (char *)fname;
684     return (0);
685 }
686
687 /*
688 * http_srv_connect - Establish a connection to the server
689 *
690 * ret = http_srv_connect(handle);
691 *
692 * Arguments:
693 *   handle - Handle associated with the desired connection
694 *
695 * Returns:
696 *   0 - Success
697 *   -1 - An error occurred. Check http_get_lasterr() for specifics.
698 */
699 int
700 http_srv_connect(http_handle_t handle)
701 {
702     http_conn_t *c_id = handle;
703     SSL_CTX *ctx = NULL;
704     int retval;
705
706     ERR_clear_error();
707     if (!http_check_conn(c_id))
708         return (-1);
709
710     if (CONN_HTTPS) {
711         /* Build our SSL context (this function sets any errors) */
712         ctx = initialize_ctx(c_id);
713         if (ctx == NULL) {
714             libbootlog(BOOTLOG_CRIT,
715                 "http_srv_connect: initialize_ctx returned NULL");
716             return (-1);
717         }
718     }
719
720     /* Connect the TCP socket */
721     if (c_id->proxied) {

```

```

722         c_id->fd = proxy_connect(c_id);
723     } else {
724         c_id->fd = tcp_connect(c_id, CONN_HOSTNAME, CONN_PORT);
725     }
726
727     if (c_id->fd < 0) {
728         if (ctx != NULL)
729             SSL_CTX_free(ctx);
730         libbootlog(BOOTLOG_CRIT,
731             "http_srv_connect: %s returned %d",
732             (c_id->proxied) ? "proxy_connect" : "tcp_connect",
733             c_id->fd);
734         return (-1);
735     }
736
737     if (CONN_HTTPS) {
738         /* Connect the SSL socket */
739         if ((c_id->ssl = SSL_new(ctx)) == NULL) {
740             ulong_t err;
741             while ((err = ERR_get_error()) != 0)
742                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
743             libbootlog(BOOTLOG_CRIT,
744                 "http_srv_connect: SSL_new returned "
745                 "NULL");
746             (void) free_ctx_ssl(c_id);
747             return (-1);
748         }
749         if (verbosemode)
750             print_ciphers(c_id->ssl);
751
752         /* Ensure automatic negotiations will do things right */
753         SSL_set_connect_state(c_id->ssl);
754
755         if (SSL_set_fd(c_id->ssl, c_id->fd) == 0) {
756             ulong_t err;
757             while ((err = ERR_get_error()) != 0)
758                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
759             libbootlog(BOOTLOG_CRIT,
760                 "http_srv_connect: SSL_set_fd returned 0");
761             (void) free_ctx_ssl(c_id);
762             return (-1);
763         }
764
765         if ((retval = SSL_connect(c_id->ssl)) <= 0) {
766             handle_ssl_error(c_id, retval);
767             libbootlog(BOOTLOG_CRIT,
768                 "http_srv_connect: SSL_connect");
769             (void) free_ctx_ssl(c_id);
770             return (-1);
771         }
772
773         if (check_cert_chain(c_id, CONN_HOSTNAME) != 0) {
774             (void) free_ctx_ssl(c_id);
775             return (-1);
776         }
777
778         if (verbosemode)
779             print_ciphers(c_id->ssl);
780     }
781
782     return (0);
783 }
784
785 /*
786 * http_head_request - Issue http HEAD request
787 */

```

```

788 *     ret = http_head_request(handle, abs_path);
789 *
790 * Arguments:
791 *     handle - Handle associated with the desired connection
792 *     abs_path- File name portion of the URI, beginning with a /. Query,
793 *               segment, etc are allowed.
794 *
795 * Returns:
796 *     0 - Success
797 *    -1 - An error occurred. Check http_get_lasterr().
798 */
799 int
800 http_head_request(http_handle_t handle, const char *abs_path)
801 {
802     return (http_req(handle, abs_path, HTTP_REQ_TYPE_HEAD, 0, 0));
803 }
804
805 /*
806 * http_get_request - Issue http GET request without a range.
807 *
808 *     ret = http_get_request(handle, abs_path);
809 *
810 * Arguments:
811 *     handle - Handle associated with the desired connection
812 *     abs_path- File name portion of the URI, beginning with a /. Query,
813 *               segment, etc are allowed.
814 *
815 * Returns:
816 *     0 - Success
817 *    -1 - An error occurred. Check http_get_lasterr().
818 */
819 int
820 http_get_request(http_handle_t handle, const char *abs_path)
821 {
822     return (http_req(handle, abs_path, HTTP_REQ_TYPE_GET, -1, 0));
823 }
824
825 /*
826 * http_get_range_request - Issue http GET request using a range.
827 *
828 *     ret = http_get_range_request(handle, abs_path, curpos, len);
829 *
830 * Arguments:
831 *     handle - Handle associated with the desired connection
832 *     abs_path- File name portion of the URI, beginning with a /. Query,
833 *               segment, etc are allowed.
834 *     curpos - >=0 - Beginning of range
835 *     len    - = 0 - Range ends at the end of the file
836 *             > 0 - Length of range.
837 *
838 * Returns:
839 *     0 - Success
840 *    -1 - An error occurred. Check http_get_lasterr().
841 */
842 int
843 http_get_range_request(http_handle_t handle, const char *abs_path,
844                       offset_t curpos, offset_t len)
845 {
846     http_conn_t *c_id = handle;
847
848     if (!http_check_conn(c_id))
849         return (-1);
850
851     if (curpos < 0) {
852         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
853         return (-1);

```

```

854     }
855
856     return (http_req(handle, abs_path, HTTP_REQ_TYPE_GET, curpos, len));
857 }
858
859 /*
860 * http_free_respinfo - Free a respinfo structure
861 *
862 *     ret = http_free_respinfo(resp);
863 *
864 * Arguments:
865 *     resp - respinfo structure presumably allocated by
866 *            http_process_headers() or http_process_part_headers()
867 *
868 * Note that if resp is NULL, then this results in a NOOP.
869 */
870 void
871 http_free_respinfo(http_respinfo_t *resp)
872 {
873     if (resp == NULL) {
874         return;
875     }
876
877     if (resp->statusmsg != NULL) {
878         free(resp->statusmsg);
879     }
880     free(resp);
881 }
882
883 /*
884 * http_process_headers - Read in the header lines from the response
885 *
886 *     ret = http_process_headers(handle, resp);
887 *
888 * Arguments:
889 *     handle - Handle associated with the connection where the request
890 *               was made.
891 *     resp - Summary information about the response.
892 *
893 * Returns:
894 *     0 - Success
895 *    < 0 - An error occurred. Specifics of the error can
896 *          be gotten using http_get_lasterr().
897 *
898 * Process the HTTP headers in the response. Check for a valid response
899 * status line. Allocate and return response information via the 'resp'
900 * argument. Header lines are stored locally, are returned using calls
901 * to http_get_response_header() and http_get_header_value().
902 *
903 * Note that the errors will be set in the http_conn_t struct before the
904 * function which detected the error returns.
905 *
906 * Note that if resp is non-NULL, then upon a successful return, information
907 * about the status line, the code in the status line and the number of
908 * header lines are returned in the http_respinfo_t structure. The caller is
909 * responsible for freeing the resources allocated to this structure via
910 * http_free_respinfo().
911 *
912 * Note that the counters used to read message bodies are initialized here.
913 *
914 * Calling this function replaces the header information which is
915 * queried using http_get_response_header() and http_get_header_value().
916 * Once this function is called, headers read by the previous call
917 * to http_process_headers() or http_process_part_headers() is lost.
918 */
919

```



```

920 int
921 http_process_headers(http_handle_t handle, http_respinfo_t **resp)
922 {
923     http_conn_t *c_id = handle;
924     http_respinfo_t *lresp;
925     char line[MAXHOSTNAMELEN];
926     char *ptr;
927     int i;

929     ERR_clear_error();
930     if (!http_check_conn(c_id))
931         return (-1);

933     if (resp != NULL) {
934         if ((lresp = malloc(sizeof (http_respinfo_t))) == NULL) {
935             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
936             return (-1);
937         }

939         bzero(lresp, sizeof (http_respinfo_t));
940     }

942     /*
943      * check the response status line, expecting
944      * HTTP/1.1 200 OK
945      */
946     i = getaline(c_id, line, sizeof (line), B_FALSE);
947     if (i == 0) {
948         if (resp != NULL) {
949             *resp = lresp;
950         }
951         return (0);
952     }

954     if (i < 0) {
955         /*
956          * Cause of I/O error was already put into
957          * error stack. This is an additional error.
958          */
959         http_free_respinfo(lresp);
960         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NODATA);
961         return (-1);
962     }

964     free_response(c_id, B_TRUE);

966     if (verbosemode)
967         libbootlog(BOOTLOG_VERBOSE, "http_process_headers: %s", line);

969     ptr = line;
970     if (strncmp(ptr, "HTTP/1.1", 8) != 0) {
971         http_free_respinfo(lresp);
972         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOT_1_1);
973         return (-1);
974     }

976     /* skip to the code */
977     ptr += 8;
978     while (isspace(*ptr))
979         ptr++;

981     /* make sure it's three digits */
982     i = 0;
983     while (isdigit(ptr[i]))
984         i++;
985     if (i != 3) {

```

```

986         http_free_respinfo(lresp);
987         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADHDR);
988         return (-1);
989     }
990     c_id->resp.code = strtol(ptr, NULL, 10);

992     /* skip to the message */
993     ptr += 3;
994     while (isspace(*ptr))
995         ptr++;

997     /* save the message */
998     c_id->resp.statusmsg = malloc(strlen(ptr) + 1);
999     if (c_id->resp.statusmsg == NULL) {
1000         http_free_respinfo(lresp);
1001         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1002         return (-1);
1003     }
1004     (void) strcpy(c_id->resp.statusmsg, ptr);

1006     if ((i = read_headerlines(c_id, B_FALSE)) < 0) {
1007         /*
1008          * Error stack was already set at a lower level.
1009          * 'statusmsg' will be cleaned up next time
1010          * headers are read.
1011          */
1012         http_free_respinfo(lresp);
1013         return (-1);
1014     }

1016     /*
1017      * See if there is a 'content-type: multipart/mixed' line in the
1018      * headers. If so, get the additional string.
1019      */
1020     ptr = http_get_header_value(handle, "Content-Type");
1021     if (ptr != NULL) {
1022         char *ptr2;

1024         ptr2 = ptr;
1025         while (isspace(*ptr2))
1026             ptr2++;
1027         if (startswith((const char **)&ptr2, "Multipart/Mixed;")) {
1028             while (isspace(*ptr2))
1029                 ptr2++;
1030             if (startswith((const char **)&ptr2, "Boundary=")) {
1031                 if (ptr2[0] == '"') {
1032                     ptr2++;
1033                     if (ptr2[strlen(ptr2) - 1] == '"')
1034                         ptr2[strlen(ptr2) - 1] = '\0';
1035                 }
1036                 c_id->boundary = strdup(ptr2);
1037                 if (c_id->boundary == NULL) {
1038                     free(ptr);
1039                     http_free_respinfo(lresp);
1040                     SET_ERR(c_id, ERRSRC_LIBHTTP,
1041                             EHTTP_NOMEM);
1042                     return (-1);
1043                 }
1044                 c_id->boundary_len = strlen(c_id->boundary);
1045                 c_id->is_multipart = B_TRUE;
1046                 c_id->is_firstpart = B_TRUE;
1047             }
1048             free(ptr);
1049         }
1050     }

```

```

1052 /*
1053  * Initialize the counters used to process message bodies.
1054  */
1055 if (init_bread(c_id) != 0) {
1056     /*
1057      * Error stack was already set at a lower level.
1058      */
1059     http_free_respinfo(lresp);
1060     return (-1);
1061 }

1063 /* Copy fields to the caller's structure */
1064 if (resp != NULL) {
1065     lresp->code = c_id->resp.code;
1066     lresp->nresphdrs = c_id->resp.nresphdrs;
1067     lresp->statusmsg = strdup(c_id->resp.statusmsg);
1068     if (lresp->statusmsg == NULL) {
1069         http_free_respinfo(lresp);
1070         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1071         return (-1);
1072     }
1073     *resp = lresp;
1074 }

1076 return (0);
1077 }

1079 /*
1080  * http_process_part_headers - Read in part boundary and header lines for the
1081  *                             next part of a multipart message.
1082  *
1083  *     ret = http_process_part_headers(handle, resp);
1084  *
1085  * Arguments:
1086  *     handle    - Handle associated with the connection where the request
1087  *                 was made.
1088  *     resp      - Return address for summary information about the
1089  *                 header block.
1090  *
1091  * Returns:
1092  *     = 1        - The end part was found.
1093  *     = 0        - Success, with header info returned in 'resp'
1094  *     = -1       - An error occurred. Specifics of the error can
1095  *                 be gotten using http_get_lasterr().
1096  *
1097  * This function reads any \r\n sequences (empty lines) and expects to get
1098  * a boundary line as the next non-empty line. It then reads header lines
1099  * (content-length, etc) until it gets another empty lines, which ends the
1100  * header section.
1101  *
1102  * Note that if resp is non-NULL, then upon a successful return, information
1103  * about the the number of header lines is returned in the http_respinfo_t
1104  * structure. The caller is responsible for freeing the resources allocated
1105  * to this structure via http_free_respinfo().
1106  *
1107  * Headers values can be returned using http_get_response_header() and
1108  * http_get_header_value().
1109  *
1110  * Calling this function replaces the header information which is
1111  * queried using http_get_response_header() and http_get_header_value().
1112  * Once this function is called, information returned by the previous call
1113  * to http_process_headers() or http_process_part_headers() is gone.
1114  */
1115 int
1116 http_process_part_headers(http_handle_t handle, http_respinfo_t **resp)
1117 {

```

```

1118 http_conn_t *c_id = handle;
1119 char line[MAXHOSTNAMELEN];
1120 int count;
1121 int limit;
1122 int i;

1124 ERR_clear_error();
1125 if (!http_check_conn(c_id))
1126     return (-1);

1128 if (c_id->is_multipart == 0) {
1129     SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOTMULTI);
1130     return (-1);
1131 }

1133 /*
1134  * Figure out how many empty lines to allow. Before the first
1135  * boundary of the transmission, there can be any number of
1136  * empty lines (from 0 up). Limit these to some reasonable
1137  * failsafe.
1138  *
1139  * For the 2nd and later boundaries, there is supposed to be
1140  * one crlf pair. However, many implementations don't require
1141  * it. So don't require it.
1142  */
1143 if (c_id->is_firstpart) {
1144     limit = FAILSAFE;
1145     c_id->is_firstpart = B_FALSE;
1146 } else
1147     limit = 1;

1149 /* Look for the boundary line. */
1150 count = 0;
1151 while ((i = getaline(c_id, line, sizeof (line), B_TRUE)) == 0 &&
1152        count < FAILSAFE)
1153     count++;
1154 if (i < 0 || count > limit) {
1155     /*
1156      * If I/O error, cause was already put into
1157      * error stack. This is an additional error.
1158      */
1159     SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOBOUNDARY);
1160     return (-1);
1161 }

1163 free_response(c_id, B_FALSE);

1165 if (verbosemode)
1166     libbootlog(BOOTLOG_VERBOSE,
1167                "http_process_part_headers: %s", line);

1169 /* Look for boundary line - '--<boundary text> */
1170 if (line[0] != '-' || line[1] != '-' ||
1171     strncmp(&line[2], c_id->boundary, c_id->boundary_len) != 0) {
1172     /* No boundary line.... */
1173     SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOBOUNDARY);
1174     return (-1);
1175 }

1177 /* Is this the end-of-parts boundary (ends with a trailing '--') */
1178 if (strncmp(&line[c_id->boundary_len + 2], "--") == 0) {
1179     return (1);
1180 }

1182 free_response(c_id, B_FALSE);
1183 if (read_headerlines(c_id, B_TRUE) < 0) {

```

```

1184     /* Error stack was already set at a lower level. */
1185     return (-1);
1186 }
1187
1188 /* Copy fields to the caller's structure */
1189 if (resp != NULL) {
1190     if ((*resp = malloc(sizeof (http_respinf_t))) == NULL) {
1191         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1192         return (-1);
1193     }
1194     bzero(*resp, sizeof (http_respinf_t));
1195     (*resp)->code = ' ';
1196     (*resp)->nresphdrs = c_id->resp.nresphdrs;
1197 }
1198
1199 return (0);
1200 }
1201
1202 /*
1203  * http_get_response_header - Get a line from the response header
1204  *
1205  * ret = http_get_response_header(handle, whichline);
1206  *
1207  * Arguments:
1208  *   handle - Handle associated with the desired connection
1209  *   whichline - Which line of the header to return. This must be between
1210  *             zero and resp.nresphdrs which was returned by the call to
1211  *             http_process_headers().
1212  *
1213  * Returns:
1214  *   ptr - Points to a copy of the header line.
1215  *   NULL - An error occurred. Check http_get_lasterr().
1216  */
1217 char *
1218 http_get_response_header(http_handle_t handle, uint_t which)
1219 {
1220     http_conn_t *c_id = handle;
1221     char *res;
1222
1223     if (!http_check_conn(c_id))
1224         return (NULL);
1225
1226     if (which >= c_id->resp.nresphdrs) {
1227         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_OORANGE);
1228         return (NULL);
1229     }
1230
1231     res = strdup(c_id->resphdr[which]);
1232     if (res == NULL) {
1233         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1234         return (NULL);
1235     }
1236     return (res);
1237 }
1238
1239 /*
1240  * http_get_header_value - Get the value of a header line.
1241  *
1242  * ret = http_get_header_value(handle, what);
1243  *
1244  * Arguments:
1245  *   handle - Handle associated with the desired connection
1246  *   what - The field name to look up.
1247  *
1248  * Returns:
1249  *   ptr - Points to a copy of the header value.

```

```

1250     NULL - An error occurred. Check http_get_lasterr().
1251 */
1252 char *
1253 http_get_header_value(http_handle_t handle, const char *field_name)
1254 {
1255     http_conn_t *c_id = handle;
1256     char *ptr;
1257     char *res;
1258     int i;
1259     int n;
1260
1261     if (!http_check_conn(c_id))
1262         return (NULL);
1263
1264     if (field_name == NULL || field_name[0] == '\0') {
1265         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
1266         return (NULL);
1267     }
1268
1269     for (i = 0; i < c_id->resp.nresphdrs; i++) {
1270         ptr = c_id->resphdr[i];
1271         n = strlen(field_name);
1272         if (strncasecmp(field_name, ptr, n) == 0 && ptr[n] == ':') {
1273             ptr += n + 1;
1274
1275             while (isspace(*ptr))
1276                 ptr++;
1277
1278             res = strdup(ptr);
1279             if (res == NULL) {
1280                 SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1281                 return (NULL);
1282             }
1283             return (res);
1284         }
1285     }
1286     SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMATCH);
1287     return (NULL);
1288 }
1289
1290 /*
1291  * http_read_body - Read the HTTP response body.
1292  *
1293  * ret = http_read_body(handle, recv_buf_ptr, recv_buf_size);
1294  *
1295  * Arguments:
1296  *   handle - Handle associated with the relevant connection
1297  *   recv_buf_ptr - Points to buffer to receive buffer
1298  *   recv_buf_size - Length in bytes of buffer.
1299  *
1300  * Returns:
1301  *   n - Number of bytes read..
1302  *   < 0 - An error occurred. This is (the number of bytes gotten + 1),
1303  *         negated. In other words, if 'n' bytes were read and then an
1304  *         error occurred, this will return -(n+1). So zero bytes
1305  *         were read and then an error occurs, this will return -1. If
1306  *         1 byte was read, it will return -2, etc. Specifics of the
1307  *         error can be gotten using http_get_lasterr().
1308  *
1309  * Note that the errors will be set in the http_conn_t struct before the
1310  * function which detected the error returns.
1311  */
1312 int
1313 http_read_body(http_handle_t handle, char *recv_buf_ptr, size_t recv_buf_size)
1314 {
1315     http_conn_t *c_id = handle;

```

```

1317     ERR_clear_error();
1318     if (!http_check_conn(c_id))
1319         return (-1);

1321     if (recv_buf_ptr == NULL || recv_buf_size == 0) {
1322         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
1323         return (-1);
1324     }

1326     return (getbytes(c_id, recv_buf_ptr, recv_buf_size));
1327 }

1329 /*
1330  * http_srv_disconnect - Get rid of the connection to the server without
1331  *                       freeing the http_conn_t structure.
1332  *
1333  *   ret = http_srv_disconnect(handle);
1334  *
1335  * Arguments:
1336  *   handle   - Handle associated with the connection
1337  *
1338  * Returns:
1339  *   0        - Success
1340  *   -1       - An error occurred. Specifics of the error can
1341  *             be gotten using http_get_lasterr().
1342  */
1343 int
1344 http_srv_disconnect(http_handle_t handle)
1345 {
1346     http_conn_t *c_id = handle;
1347     int err_ret;

1349     ERR_clear_error();
1350     if (!http_check_conn(c_id))
1351         return (-1);

1353     err_ret = free_ctx_ssl(c_id);
1354     bzero(&c_id->inbuf, sizeof (c_id->inbuf));
1355     free_response(c_id, B_TRUE);

1357     return (err_ret);
1358 }

1360 /*
1361  * http_srv_close - Close the connection and clean up the http_conn_t
1362  *                 structure.
1363  *
1364  *   http_srv_close(handle);
1365  *
1366  * Arguments:
1367  *   handle   - Handle associated with the desired connection
1368  *
1369  * Returns:
1370  *   0        - Success
1371  *   -1       - An error occurred. Specifics of the error can
1372  *             be gotten using http_get_lasterr().
1373  */
1374 int
1375 http_srv_close(http_handle_t handle)
1376 {
1377     http_conn_t *c_id = handle;
1378     int err_ret = 0;

1380     if (!http_check_conn(c_id))
1381         return (-1);

```

```

1383     if (c_id->ctx != NULL || c_id->ssl != NULL || c_id->fd != -1)
1384         err_ret = http_srv_disconnect(handle);

1386     free(c_id->basic_auth_userid);
1387     free(c_id->basic_auth_password);
1388     free(c_id->resp.statusmsg);
1389     free(c_id->client_cert_file);
1390     free(c_id->private_key_file);
1391     free(c_id->random_file);
1392     free(c_id->file_password);
1393     c_id->signature = 0;

1395     free(c_id);
1396     return (err_ret);
1397 }

1399 /*
1400  * http_get_conn_info - Return current information about the connection
1401  *
1402  *   err = http_get_conn_info(handle);
1403  *
1404  * Arguments:
1405  *   handle   - Handle associated with the connection in question
1406  *
1407  * Returns:
1408  *   non_NULL - Points to structure
1409  *   NULL     - An error exists. Check http_get_lasterr().
1410  */
1411 http_conninfo_t *
1412 http_get_conn_info(http_handle_t handle)
1413 {
1414     http_conn_t *c_id = handle;
1415     http_conninfo_t *info;

1417     if (!http_check_conn(c_id))
1418         return (NULL);

1420     info = malloc(sizeof (*info));
1421     if (info == NULL) {
1422         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1423         return (NULL);
1424     }

1426     bzero(info, sizeof (*info));

1428     info->uri = c_id->uri;
1429     info->proxy = c_id->proxy;
1430     info->keepalive = c_id->keepalive;
1431     info->read_timeout = c_id->read_timeout;

1433     return (info);
1434 }

1436 /*
1437  * http_get_lasterr - Return the next error on the last operation
1438  *
1439  *   err = http_get_lasterr(handle, errsrc);
1440  *
1441  * Arguments:
1442  *   handle   - Handle associated with the connection in question
1443  *             If no valid handle exists yet, this can be NULL.
1444  *             However, it must be checked with the very next call.
1445  *   errsrc   - Returns the Sources of errors (ERRSRC_* values).
1446  *
1447  * Returns:

```

```

1448 *      0      - No error exists
1449 *      <> 0    - The error.
1450 */
1451 ulong_t
1452 http_get_lasterr(http_handle_t handle, uint_t *errsrc)
1453 {
1454     http_conn_t *c_id = handle;
1455     ulong_t src;
1456     ulong_t err;

1458     if (c_id == NULL || c_id->signature != HTTP_CONN_INFO) {
1459         if (errsrc)
1460             *errsrc = ERRSRC_LIBHTTP;
1461         err = early_err;
1462         early_err = 0;
1463         return (err);
1464     }

1466     GET_ERR(c_id, src, err);
1467     if (src == 0 && err == 0) {
1468         if (errsrc)
1469             *errsrc = ERRSRC_LIBHTTP;
1470         err = early_err;
1471         early_err = 0;
1472         return (err);
1473     }
1474     if (errsrc)
1475         *errsrc = src;
1476     return (err);
1477 }

1479 /*
1480 * http_decode_err - Decode a libssl error
1481 *
1482 * err = http_decode_err(err, errlib, errfunc, errcode);
1483 *
1484 * Arguments:
1485 * err      - libssl/libcrypto error returned.
1486 * errlib   - returns libssl/libcrypto sublibrary that caused the error
1487 * errfunc  - returns function in that library
1488 * errcode  - returns error code
1489 *
1490 * Returns:
1491 * None other than the above.
1492 */
1493 void
1494 http_decode_err(ulong_t err, int *errlib, int *errfunc, int *errcode)
1495 {
1496     if (errlib)
1497         *errlib = ERR_GET_LIB(err);
1498     if (errfunc)
1499         *errfunc = ERR_GET_FUNC(err);
1500     if (errcode)
1501         *errcode = ERR_GET_REASON(err);
1502 }

1504 /* ----- private functions ----- */

1506 /*
1507 * http_req - Issue http request (either HEAD or GET)
1508 *
1509 * ret = http_req(handle, abs_path, reqtype, curpos, len);
1510 *
1511 * Arguments:
1512 * handle   - Handle associated with the desired connection
1513 * abs_path- File name portion of the URI, beginning with a /. Query,

```

```

1514 *      segment, etc are allowed.
1515 *      type    - HTTP_REQ_TYPE_HEAD or HTTP_REQ_TYPE_GET
1516 *
1517 *      In the case of GET requests,
1518 *      curpos- -1 - Range not used
1519 *              >=0 - Beginning of range
1520 *      len     - 0 - Range ends at the end of the file
1521 *              >0 - Length of range.
1522 *
1523 * Returns:
1524 *      0      - Success
1525 *      -1     - An error occurred. Check http_get_lasterr().
1526 */
1527 static int
1528 http_req(http_handle_t handle, const char *abs_path, http_req_t type,
1529         offset_t curpos, offset_t len)
1530 {
1531     http_conn_t *c_id = handle;
1532     char *request;
1533     char *reqtypename;
1534     char *newreq;
1535     int requestlen;
1536     int retval;
1537     int j;

1539     ERR_clear_error();
1540     if (!http_check_conn(c_id))
1541         return (-1);

1543     if (abs_path == NULL || abs_path[0] == '\0') {
1544         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
1545         return (-1);
1546     }

1548     /* Determine the name for the request type */
1549     switch (type) {
1550     case HTTP_REQ_TYPE_GET:
1551         reqtypename = "GET";
1552         if (curpos < 0 && curpos != -1) {
1553             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
1554             return (-1);
1555         }
1556         break;

1558     case HTTP_REQ_TYPE_HEAD:
1559         reqtypename = "HEAD";
1560         break;

1562     default:
1563         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
1564         return (-1);
1565     }

1567     /* Do rudimentary checks on the absolute path */
1568     if (abs_path == NULL || *abs_path != '/') {
1569         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADARG);
1570         libbootlog(BOOTLOG_CRIT, "http_req: invalid file path");
1571         if (abs_path != NULL)
1572             libbootlog(BOOTLOG_CRIT, " %s", abs_path);
1573         return (-1);
1574     }
1575     (void) strncpy(CONN_ABSPATH, abs_path, MAXHOSTNAMELEN);

1577     /*
1578     * Size the request.
1579     */

```

```

1580     * With proxy:
1581     *   reqtypename + " http://" + host + ":" + port + path +
1582     *   " HTTP/1.1\r\n" +
1583     * Without proxy:
1584     *   reqtypename + " " + path + " HTTP/1.1\r\n" +
1585     */
1586     requestlen = strlen(reqtypename) + 8 + strlen(CONN_HOSTNAME) + 1 +
1587         count_digits(CONN_PORT) + strlen(CONN_ABSPATH) + 11;

1589     /*
1590     * Plus the rest:
1591     *   "Host: " + targethost + ":" + count_digits(port) + "\r\n" +
1592     *   "Connection: Keep-Alive\r\n" plus trailing "\r\n\0"
1593     */
1594     requestlen += 6 + strlen(CONN_HOSTNAME) + 1 +
1595         count_digits(CONN_PORT) + 2 + 24 + 3;
1596     if ((request = malloc(requestlen)) == NULL) {
1597         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1598         return (-1);
1599     }

1601     /* The request line */
1602     if (c_id->proxied && c_id->ssl == NULL) {
1603         j = snprintf(request, requestlen,
1604             "%s http://%s:%d%s HTTP/1.1\r\n",
1605             reqtypename, CONN_HOSTNAME, CONN_PORT,
1606             CONN_ABSPATH);
1607     } else {
1608         j = snprintf(request, requestlen, "%s %s HTTP/1.1\r\n",
1609             reqtypename, CONN_ABSPATH);
1610     }

1612     /* Ancillary headers */
1613     j += snprintf(&request[j], requestlen - j, "Host: %s:%d\r\n",
1614         CONN_HOSTNAME, CONN_PORT);
1615     if (!c_id->keepalive)
1616         j += snprintf(&request[j], requestlen - j,
1617             "Connection: close\r\n");
1618     else
1619         j += snprintf(&request[j], requestlen - j,
1620             "Connection: Keep-Alive\r\n");
1621     /*
1622     * We only send the range header on GET requests
1623     *
1624     * "Range: bytes=" + from + "-" + end + "\r\n" or
1625     * "Range: bytes=" + from + "-" "\r\n"
1626     */
1627     if (type == HTTP_REQ_TYPE_GET && curpos >= 0) {
1628         offset_t endpos;

1630         requestlen += 13 + count_digits(curpos) + 1 + 2;
1631         if (len > 0) {
1632             endpos = curpos + len - 1;
1633             requestlen += count_digits(endpos);
1634         }

1636         if ((newreq = realloc(request, requestlen)) == NULL) {
1637             free(request);
1638             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1639             return (-1);
1640         }
1641         request = newreq;

1643         j += sprintf(&request[j], "Range: bytes=%lld-", curpos);
1644         if (len > 0)
1645             j += sprintf(&request[j], "%lld", endpos);

```

```

1646         j += sprintf(&request[j], "\r\n");
1647     }

1649     /*
1650     * Authorization is added only if provided (RFC 2617, Section 2)
1651     *
1652     * "Authorization: Basic " + authncstr + "\r\n"
1653     */
1654     if (c_id->basic_auth_userid && c_id->basic_auth_password) {
1655         char *authstr;
1656         char *authncstr;
1657         int authlen;

1659         /*
1660         * Allow for concat(basic_auth_userid ":" basic_auth_password)
1661         */
1662         authlen = strlen(c_id->basic_auth_userid) + 2 +
1663             strlen(c_id->basic_auth_password);
1664         if ((authstr = malloc(authlen + 1)) == NULL) {
1665             free(request);
1666             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1667             return (-1);
1668         }
1669         (void) snprintf(authstr, authlen + 1, "%s:%s",
1670             c_id->basic_auth_userid, c_id->basic_auth_password);

1672         /* 3 bytes encoded as 4 (round up) with null termination */
1673         if ((authncstr = malloc((authlen + 2) / 3 * 4 + 1)) == NULL) {
1674             free(authstr);
1675             free(request);
1676             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1677             return (-1);
1678         }

1680         (void) EVP_EncodeBlock((unsigned char *)authncstr,
1681             (unsigned char *)authstr, authlen);

1683         /*
1684         * Finally do concat(Authorization: Basic " authncstr "\r\n")
1685         */
1686         requestlen += 21 + strlen(authncstr) + 2;
1687         if ((newreq = realloc(request, requestlen)) == NULL) {
1688             free(authncstr);
1689             free(authstr);
1690             free(request);
1691             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
1692             return (-1);
1693         }
1694         request = newreq;

1696         j += snprintf(&request[j], requestlen - j,
1697             "Authorization: Basic %s\r\n", authncstr);

1699         free(authncstr);
1700         free(authstr);
1701     }

1703     j += sprintf(&request[j], "\r\n");

1705     if (verbosemode)
1706         libbootlog(BOOTLOG_VERBOSE, "%s", request);

1708     /* send the HTTP request */
1709     retval = http_srv_send(c_id, request, j);

1711     free(request);

```

```

1712     if (retval != j) {
1713         /* Assume error in was set by send request. */
1714         return (-1);
1715     }
1717     return (0);
1718 }

1720 /*
1721  * password_cb - Callback to get private key password and return it
1722  *               to SSL. (Used for PEM certificates only.)
1723  *
1724  *     len = passwd_cb(buf, buflen, rwflag, userdata);
1725  *
1726  * Arguments:
1727  *     buf       - Buffer for the password
1728  *     buflen    - Length of 'buf'
1729  *     rwflag    - password will be used for reading/decryption (== 0)
1730  *                 or writing/encryption (== 1).
1731  *     userdata  - Points to connection-specific information.
1732  *
1733  * Returns:
1734  *     > 0       - Length of password that was put into 'buf'.
1735  *     0         - No password was returned (usually error occurred)
1736  *
1737  * NOTE: The password code is not thread safe
1738  */
1739 /* ARGSUSED */
1740 static int
1741 password_cb(char *buf, int buflen, int rwflag, void *userdata)
1742 {
1743     http_conn_t *c_id = userdata;

1745     if (c_id == NULL || c_id->signature != HTTP_CONN_INFO)
1746         return (0);

1748     if (c_id->file_password == NULL ||
1749         buflen < strlen(c_id->file_password) + 1)
1750         return (0);

1752     return (strcpy(buf, c_id->file_password, buflen));
1753 }

1755 /*
1756  * initialize_ctx - Initialize the context for a connection.
1757  *
1758  *     ctx = initialize_ctx(c_id);
1759  *
1760  * Arguments:
1761  *     None.
1762  *
1763  * Returns:
1764  *     non-NULL - Points to ctx structure.
1765  *     NULL     - An error occurred. Any cleanup is done and error
1766  *                 information is in the error stack.
1767  */
1768 static SSL_CTX *
1769 initialize_ctx(http_conn_t *c_id)
1770 {
1771     #if OPENSSSL_VERSION_NUMBER < 0x10000000L
1772         SSL_METHOD *meth;
1773     #else
1774         const SSL_METHOD *meth;
1775     #endif
1776     SSL_CTX *ctx;

```

```

1778     ERR_clear_error();

1780     /* Global system initialization */
1781     if (ssl_init == 0) {
1782         sunw_crypto_init();
1783         SSL_load_error_strings();
1784         ssl_init = 1;
1785     }

1787     /* Create our context */
1788     meth = SSLv3_client_method();
1789     if ((ctx = SSL_CTX_new(meth)) == NULL) {
1790         ulong_t err;
1791         while ((err = ERR_get_error()) != 0)
1792             SET_ERR(c_id, ERRSRC_LIBSSL, err);
1793         libbootlog(BOOTLOG_CRIT,
1794             "initialize_ctx: SSL_CTX_new returned NULL");
1795         return (NULL);
1796     }

1798     /*
1799     * Ensure that any renegotiations for blocking connections will
1800     * be done automatically. (The alternative is to return partial
1801     * reads to the caller and let it oversee the renegotiations.)
1802     */
1803     if (SSL_CTX_set_mode(ctx, SSL_MODE_AUTO_RETRY) == 0) {
1804         ulong_t err;
1805         while ((err = ERR_get_error()) != 0)
1806             SET_ERR(c_id, ERRSRC_LIBSSL, err);
1807         libbootlog(BOOTLOG_CRIT,
1808             "initialize_ctx: SSL_CTX_set_mode returned 0");
1809         (void) SSL_CTX_free(ctx);
1810         return (NULL);
1811     }

1813     /* set cipher list if provided */
1814     if (cipher_list != NULL) {
1815         if (!SSL_CTX_set_cipher_list(ctx, cipher_list)) {
1816             ulong_t err;
1817             while ((err = ERR_get_error()) != 0)
1818                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
1819             libbootlog(BOOTLOG_CRIT,
1820                 "initialize_ctx: Error in cipher list");
1821             SSL_CTX_free(ctx);
1822             return (NULL);
1823         }
1824     }

1826     /*
1827     * We attempt to use the client_certificate_file for the private
1828     * key input scheme *only* in the absence of private_key_file. In
1829     * this instance the scheme will be the same as that used for the
1830     * certificate input.
1831     */

1833     /* Load our certificates */
1834     if (c_id->client_cert_file != NULL) {
1835         if (p12_format) {
1836             /* Load pkcs12-formatted files */
1837             if (sunw_p12_use_certfile(ctx, c_id->client_cert_file,
1838                 c_id->file_password)
1839                 <= 0) {
1840                 ulong_t err;
1841                 while ((err = ERR_get_error()) != 0)
1842                     SET_ERR(c_id, ERRSRC_LIBSSL, err);
1843                 libbootlog(BOOTLOG_CRIT,

```

```

1844         "initialize_ctx: Couldn't read "
1845         "PKCS12 certificate file");
1846         SSL_CTX_free(ctx);
1847         return (NULL);
1848     }
1849     } else {
1850         /* Load PEM-formatted files */
1851         if (SSL_CTX_use_certificate_file(ctx,
1852             c_id->client_cert_file, SSL_FILETYPE_PEM) <= 0) {
1853             ulong_t err;
1854             while ((err = ERR_get_error()) != 0)
1855                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
1856             libbootlog(BOOTLOG_CRIT,
1857                 "initialize_ctx: Couldn't read "
1858                 "PEM certificate file");
1859             SSL_CTX_free(ctx);
1860             return (NULL);
1861         }
1862     }
1863     if (c_id->private_key_file == NULL)
1864         c_id->private_key_file = c_id->client_cert_file;
1865 }

1867 /* Load our keys */
1868 if (p12_format) {
1869     /* Load pkcs12-formatted files */
1870     if (c_id->private_key_file != NULL) {
1871         if (sunw_p12_use_keyfile(ctx, c_id->private_key_file,
1872             c_id->file_password)
1873             <= 0) {
1874             ulong_t err;
1875             while ((err = ERR_get_error()) != 0)
1876                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
1877             libbootlog(BOOTLOG_CRIT,
1878                 "initialize_ctx: Couldn't read "
1879                 "PKCS12 key file");
1880             SSL_CTX_free(ctx);
1881             return (NULL);
1882         }
1883     }
1884 } else {
1885     /* Load PEM-formatted files */
1886     SSL_CTX_set_default_passwd_cb(ctx, password_cb);
1887     SSL_CTX_set_default_passwd_cb_userdata(ctx, c_id);
1888     if (c_id->private_key_file != NULL) {
1889         if (SSL_CTX_use_PrivateKey_file(ctx,
1890             c_id->private_key_file, SSL_FILETYPE_PEM) <= 0) {
1891             ulong_t err;
1892             while ((err = ERR_get_error()) != 0)
1893                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
1894             libbootlog(BOOTLOG_CRIT,
1895                 "initialize_ctx: Couldn't read "
1896                 "PEM key file");
1897             SSL_CTX_free(ctx);
1898             return (NULL);
1899         }
1900     }
1901 }

1903 /* Load the CAs we trust */
1904 if (ca_verify_file != NULL) {
1905     if (p12_format) {
1906         if (sunw_p12_use_trustfile(ctx, ca_verify_file,
1907             c_id->file_password)
1908             <= 0) {
1909             ulong_t err;

```

```

1910         while ((err = ERR_get_error()) != 0)
1911             SET_ERR(c_id, ERRSRC_LIBSSL, err);
1912         libbootlog(BOOTLOG_CRIT,
1913             "initialize_ctx: Couldn't read "
1914             "PKCS12 CA list file");
1915         SSL_CTX_free(ctx);
1916         return (NULL);
1917     }
1918     } else {
1919         if (SSL_CTX_load_verify_locations(ctx, ca_verify_file,
1920             NULL) == 0) {
1921             ulong_t err;
1922             while ((err = ERR_get_error()) != 0)
1923                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
1924             libbootlog(BOOTLOG_CRIT,
1925                 "initialize_ctx: Couldn't read PEM"
1926                 " CA list file");
1927             SSL_CTX_free(ctx);
1928             return (NULL);
1929         }
1930     }
1931 }

1933 SSL_CTX_set_verify_depth(ctx, verify_depth);

1935 /* Load randomness */
1936 if (c_id->random_file != NULL &&
1937     RAND_load_file(c_id->random_file, 1024 * 1024) <= 0) {
1938     ulong_t err;
1939     while ((err = ERR_get_error()) != 0)
1940         SET_ERR(c_id, ERRSRC_LIBSSL, err);
1941     libbootlog(BOOTLOG_CRIT,
1942         "initialize_ctx: Couldn't load random file");
1943     SSL_CTX_free(ctx);
1944     return (NULL);
1945 }
1946 if (RAND_status() <= 0) {
1947     ulong_t err;
1948     while ((err = ERR_get_error()) != 0)
1949         SET_ERR(c_id, ERRSRC_LIBSSL, err);
1950     libbootlog(BOOTLOG_CRIT,
1951         "initialize_ctx: PRNG not seeded");
1952     SSL_CTX_free(ctx);
1953     return (NULL);
1954 }

1956 return (ctx);
1957 }

1959 /*
1960  * tcp_connect - Set up a TCP connection.
1961  *
1962  * sock = tcp_connect(c_id, hostname, port);
1963  *
1964  * Arguments:
1965  *   c_id      - Structure associated with the desired connection
1966  *   hostname  - the host to connect to
1967  *   port      - the port to connect to
1968  *
1969  * Returns:
1970  *   >= 0      - Socket number.
1971  *   -1        - Error occurred. Error information is set in the
1972  *               error stack. Any cleanup is done.
1973  *
1974  * This function established a connection to the target host. When
1975  * it returns, the connection is ready for a HEAD or GET request.

```



```

1976 */
1977 static int
1978 tcp_connect(http_conn_t *c_id, const char *hostname, uint16_t port)
1979 {
1980     struct hostent *hp;
1981     struct sockaddr_in addr;
1982     int sock;
1983     int status;
1984
1985     if ((hp = gethostbyname(hostname)) == NULL) {
1986         SET_ERR(c_id, ERRSRC_RESOLVE, h_errno);
1987         return (-1);
1988     }
1989
1990     bzero(&addr, sizeof (addr));
1991     /* LINTED */
1992     addr.sin_addr = *(struct in_addr *)hp->h_addr;
1993     addr.sin_family = AF_INET;
1994     addr.sin_port = htons(port);
1995
1996     if ((sock = socket(AF_INET, SOCK_STREAM, IPPROTO_TCP)) < 0) {
1997         SET_ERR(c_id, ERRSRC_SYSTEM, errno);
1998         return (-1);
1999     }
2000
2001     status = connect(sock, (struct sockaddr *)&addr, sizeof (addr));
2002     if (status < 0) {
2003         SET_ERR(c_id, ERRSRC_SYSTEM, errno);
2004         (void) socket_close(sock);
2005         return (-1);
2006     }
2007
2008     c_id->host_addr = addr; /* save for future sendto calls */
2009     c_id->fd = sock;
2010
2011     return (sock);
2012 }
2013
2014 /*
2015 * readline - Get a line from the socket. Discard the end-of-line
2016 * (CR or CR/LF or LF).
2017 *
2018 * ret = readline(c_id, sock, buf, len);
2019 *
2020 * Arguments:
2021 * c_id - Structure associated with the desired connection
2022 * sock - Socket to read
2023 * buf - Buffer for the line
2024 * len - Length of the buffer
2025 *
2026 * Returns:
2027 * 0 - Success. 'buf' contains the line.
2028 * -1 - Error occurred. Error information is set in the
2029 * error stack.
2030 */
2031 static int
2032 readline(http_conn_t *c_id, int sock, char *buf, int len)
2033 {
2034     int n, r;
2035     char *ptr = buf;
2036
2037     for (n = 0; n < len; n++) {
2038         r = socket_read(sock, ptr, 1, c_id->read_timeout);
2039
2040         if (r < 0) {
2041             SET_ERR(c_id, ERRSRC_SYSTEM, errno);

```

```

2042         return (-1);
2043     } else if (r == 0) {
2044         libbootlog(BOOTLOG_WARNING, "Readline: no data");
2045         return (0);
2046     }
2047
2048     if (*ptr == '\n') {
2049         *ptr = '\0';
2050
2051         /* Strip off the CR if it's there */
2052         if (buf[n-1] == '\r') {
2053             buf[n-1] = '\0';
2054             n--;
2055         }
2056
2057         return (n);
2058     }
2059
2060     ptr++;
2061 }
2062
2063 libbootlog(BOOTLOG_WARNING, "readline: Buffer too short\n");
2064 return (0);
2065 }
2066
2067 /*
2068 * proxy_connect - Set up a proxied TCP connection to the target host.
2069 *
2070 * sock = proxy_connect(c_id);
2071 *
2072 * Arguments:
2073 * c_id - Structure associated with the desired connection
2074 *
2075 * Returns:
2076 * >= 0 - Socket number.
2077 * -1 - Error occurred. Error information is set in the
2078 * error stack. Any cleanup is done.
2079 *
2080 * This function established a connection to the proxy and then sends
2081 * the request to connect to the target host. It reads the response
2082 * (the status line and any headers). When it returns, the connection
2083 * is ready for a HEAD or GET request.
2084 */
2085 static int
2086 proxy_connect(http_conn_t *c_id)
2087 {
2088     struct sockaddr_in addr;
2089     int sock;
2090     char buf[1024];
2091     char *ptr;
2092     int i;
2093
2094     if ((sock = tcp_connect(c_id, CONN_PROXY_HOSTNAME,
2095                             CONN_PROXY_PORT)) < 0) {
2096         return (-1);
2097     }
2098
2099     if (!CONN_HTTPS) {
2100         return (sock);
2101     }
2102
2103     /* Now that we're connected, do the proxy request */
2104     (void) snprintf(buf, sizeof (buf),
2105                    "CONNECT %s:%d HTTP/1.0\r\n\r\n", CONN_HOSTNAME, CONN_PORT);
2106
2107     /* socket_write sets the errors */

```

```

2108     if (socket_write(sock, buf, strlen(buf), &addr) <= 0) {
2109         SET_ERR(c_id, ERRSRC_SYSTEM, errno);
2110         (void) socket_close(sock);
2111         return (-1);
2112     }
2113
2114     /* And read the response */
2115     i = readline(c_id, sock, buf, sizeof (buf));
2116     if (i <= 0) {
2117         if (i == 0)
2118             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NORESP);
2119         libbootlog(BOOTLOG_CRIT,
2120             "proxy_connect: Empty response from proxy");
2121         (void) socket_close(sock);
2122         return (-1);
2123     }
2124
2125     ptr = buf;
2126     if (strncmp(ptr, "HTTP", 4) != 0) {
2127         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOT_1_1);
2128         libbootlog(BOOTLOG_CRIT,
2129             "proxy_connect: Unrecognized protocol");
2130         (void) socket_close(sock);
2131         return (-1);
2132     }
2133
2134     /* skip to the code */
2135     ptr += 4;
2136     while (*ptr != ' ' && *ptr != '\0')
2137         ptr++;
2138     while (*ptr == ' ' && *ptr != '\0')
2139         ptr++;
2140
2141     /* make sure it's three digits */
2142     if (strncmp(ptr, "200", 3) != 0) {
2143         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADRESP);
2144         libbootlog(BOOTLOG_CRIT,
2145             "proxy_connect: Received error from proxy server");
2146         (void) socket_close(sock);
2147         return (-1);
2148     }
2149     ptr += 3;
2150     if (isdigit(*ptr)) {
2151         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADRESP);
2152         (void) socket_close(sock);
2153         return (-1);
2154     }
2155
2156     /* Look for the blank line that signals end of proxy header */
2157     while ((i = readline(c_id, sock, buf, sizeof (buf))) > 0)
2158         ;
2159
2160     if (i < 0) {
2161         (void) socket_close(sock);
2162         return (-1);
2163     }
2164
2165     return (sock);
2166 }
2167
2168 /*
2169  * check_cert_chain - Check if we have a valid certificate chain.
2170  *
2171  * ret = check_cert_chain(c_id, host);
2172  *
2173  * Arguments:

```

```

2174  *   c_id      - Connection info.
2175  *   host      - Name to compare with the common name in the certificate.
2176  *
2177  * Returns:
2178  *   0         - Certificate chain and common name are both OK.
2179  *  -1         - Certificate chain and/or common name is not valid.
2180  */
2181 static int
2182 check_cert_chain(http_conn_t *c_id, char *host)
2183 {
2184     X509 *peer;
2185     char peer_CN[256];
2186     long verify_err;
2187
2188     if ((verify_err = SSL_get_verify_result(c_id->ssl)) != X509_V_OK) {
2189         SET_ERR(c_id, ERRSRC_VERIFERR, verify_err);
2190         libbootlog(BOOTLOG_CRIT,
2191             "check_cert_chain: Certificate doesn't verify");
2192         return (-1);
2193     }
2194
2195     /*
2196      * Check the cert chain. The chain length
2197      * is automatically checked by OpenSSL when we
2198      * set the verify depth in the ctx
2199      *
2200      * All we need to do here is check that the CN
2201      * matches
2202      */
2203
2204     /* Check the common name */
2205     if ((peer = SSL_get_peer_certificate(c_id->ssl)) == NULL) {
2206         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOCERT);
2207         libbootlog(BOOTLOG_CRIT,
2208             "check_cert_chain: Peer did not present a certificate");
2209         return (-1);
2210     }
2211     (void) X509_NAME_get_text_by_NID(X509_get_subject_name(peer),
2212         NID_commonName, peer_CN, 256);
2213
2214     if (verbosemode)
2215         libbootlog(BOOTLOG_VERBOSE,
2216             "server cert's peer_CN is %s, host is %s", peer_CN, host);
2217
2218     if (strcasemp(peer_CN, host)) {
2219         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMATCH);
2220         libbootlog(BOOTLOG_CRIT,
2221             "check_cert_chain: Common name doesn't match host name");
2222         libbootlog(BOOTLOG_CRIT,
2223             "peer_CN = %s, host = %s", peer_CN, host);
2224         return (-1);
2225     }
2226
2227     return (0);
2228 }
2229
2230 /*
2231  * print_ciphers - Print the list of ciphers for debugging.
2232  *
2233  * print_ciphers(ssl);
2234  *
2235  * Arguments:
2236  *   ssl      - SSL connection.
2237  *
2238  * Returns:
2239  *   none

```

```

2240 */
2241 static void
2242 print_ciphers(SSL *ssl)
2243 {
2244     SSL_CIPHER *c;
2245     STACK_OF(SSL_CIPHER) *sk;
2246     int i;
2247     const char *name;
2248
2249     if (ssl == NULL)
2250         return;
2251
2252     sk = SSL_get_ciphers(ssl);
2253     if (sk == NULL)
2254         return;
2255
2256     for (i = 0; i < sk_SSL_CIPHER_num(sk); i++) {
2257         c = sk_SSL_CIPHER_value(sk, i);
2258         libbootlog(BOOTLOG_VERBOSE, "%08lx %s", c->id, c->name);
2259     }
2260     name = SSL_get_cipher_name(ssl);
2261     if (name == NULL)
2262         name = "";
2263     libbootlog(BOOTLOG_VERBOSE, "Current cipher = %s", name);
2264 }
2265
2266 /*
2267 * read_headerlines - Get the header lines from the server. This reads
2268 * lines until it gets a empty line indicating end of headers.
2269 *
2270 * ret = read_headerlines(c_id);
2271 *
2272 * Arguments:
2273 * c_id - Info about the connection being read.
2274 * bread - TRUE if the headerlines are part of the message body.
2275 *
2276 * Returns:
2277 * 0 - Header lines were read.
2278 * -1 - Error occurred. The errors information is already in
2279 * the error stack.
2280 *
2281 * Read the lines. If the current line begins with a space or tab, it is
2282 * a continuation. Take the new line and append it to the end of the
2283 * previous line rather than making an entry for another line in
2284 * c_id->resphdr.
2285 *
2286 * Note that I/O errors are put into the error stack by http_srv_rcv(),
2287 * which is called by getaline().
2288 */
2289 static int
2290 read_headerlines(http_conn_t *c_id, boolean_t bread)
2291 {
2292     char line[MAXHOSTNAMELEN];
2293     char **new_buf;
2294     char *ptr;
2295     int next;
2296     int cur;
2297     int n;
2298
2299     /* process headers, stop when we get to an empty line */
2300     cur = 0;
2301     next = 0;
2302     while ((n = getaline(c_id, line, sizeof (line), bread)) > 0) {
2303
2304         if (verbosemode)
2305             libbootlog(BOOTLOG_VERBOSE,

```

```

2306         "read_headerlines: %s", line);
2307     /*
2308     * See if this is a continuation line (first col is a
2309     * space or a tab)
2310     */
2311     if (line[0] != ' ' && line[0] != '\t') {
2312         cur = next;
2313         next++;
2314         new_buf =
2315             realloc(c_id->resphdr, (cur + 1) * sizeof (void *));
2316         if (new_buf == NULL) {
2317             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
2318             return (-1);
2319         }
2320         c_id->resphdr = new_buf;
2321
2322         c_id->resphdr[cur] = strdup(line);
2323         if (c_id->resphdr[cur] == NULL) {
2324             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
2325             return (-1);
2326         }
2327     } else {
2328         ptr = line;
2329         while (isspace(*ptr))
2330             ptr++;
2331         c_id->resphdr[cur] = realloc(c_id->resphdr[cur],
2332             strlen(c_id->resphdr[cur]) + strlen(ptr) + 1);
2333         if (c_id->resphdr[cur] == NULL) {
2334             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOMEM);
2335             return (-1);
2336         }
2337         (void) strcat(c_id->resphdr[cur], ptr);
2338     }
2339     ptr = &(c_id->resphdr[cur][strlen(c_id->resphdr[cur]) - 1]);
2340     while (ptr > c_id->resphdr[cur] && isspace(*ptr))
2341         ptr--;
2342     c_id->resp.nresphdrs = next;
2343
2344     /* Cause of any I/O error was already put into error stack. */
2345     return (n >= 0 ? 0 : -1);
2346 }
2347
2348 static void
2349 free_response(http_conn_t *c_id, int free_boundary)
2350 {
2351     int i;
2352
2353     /* free memory from previous calls */
2354     if (c_id->resp.statusmsg != NULL) {
2355         free(c_id->resp.statusmsg);
2356         c_id->resp.statusmsg = NULL;
2357     }
2358     for (i = 0; i < c_id->resp.nresphdrs; i++) {
2359         free(c_id->resphdr[i]);
2360         c_id->resphdr[i] = NULL;
2361     }
2362     c_id->resp.nresphdrs = 0;
2363     if (c_id->resphdr != NULL) {
2364         free(c_id->resphdr);
2365         c_id->resphdr = NULL;
2366     }
2367
2368     if (free_boundary && c_id->boundary) {
2369         free(c_id->boundary);
2370         c_id->boundary = NULL;
2371     }

```

```

2372         c_id->is_multipart = B_FALSE;
2373     }
2374 }

2376 static int
2377 free_ctx_ssl(http_conn_t *c_id)
2378 {
2379     int err_ret = 0;

2381     if (c_id->ssl != NULL) {
2382         if (SSL_shutdown(c_id->ssl) <= 0) {
2383             ulong_t err;
2384             while ((err = ERR_get_error()) != 0)
2385                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
2386             err_ret = -1;
2387         }
2388         SSL_free(c_id->ssl);
2389         c_id->ssl = NULL;
2390     }

2392     if (c_id->fd != -1 && socket_close(c_id->fd) < 0) {
2393         SET_ERR(c_id, ERRSRC_SYSTEM, errno);
2394         err_ret = -1;
2395     }
2396     c_id->fd = -1;

2398     if (c_id->ctx != NULL) {
2399         SSL_CTX_free(c_id->ctx);
2400         c_id->ctx = NULL;
2401     }

2403     return (err_ret);
2404 }

2406 /*
2407  * get_chunk_header - Get a chunk header line
2408  *
2409  * Arguments:
2410  *   c_id - Structure describing the connection in question.
2411  *
2412  * Returns:
2413  *   >=0 - Length of next chunk
2414  *   -1 - Error occurred. The error information is in the error stack.
2415  */
2416 static int
2417 get_chunk_header(http_conn_t *c_id)
2418 {
2419     char    line[MAXHOSTNAMELEN];
2420     char    *ptr;
2421     int     value;
2422     int     ok;
2423     int     i;

2425     /*
2426      * Determine whether an extra crlf pair will precede the
2427      * chunk header. For the first one, there is no preceding
2428      * crlf. For later chunks, there is one crlf.
2429      */
2430     if (c_id->is_firstchunk) {
2431         ok = 1;
2432         c_id->is_firstchunk = B_FALSE;
2433     } else {
2434         ok = ((i = getaline(c_id, line, sizeof (line), B_FALSE)) == 0);
2435     }

2437     if (ok)

```

```

2438         i = getaline(c_id, line, sizeof (line), B_FALSE);
2439         if (!ok || i < 0) {
2440             /*
2441              * If I/O error, the Cause was already put into
2442              * error stack. This is an additional error.
2443              */
2444             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_NOHEADER);
2445             return (-1);
2446         }

2448         if (verbosemode)
2449             libbootlog(BOOTLOG_VERBOSE, "get_chunk_header: <%s>", line);

2452         /*
2453          * The first (and probably only) field in the line is the hex
2454          * length of the chunk.
2455          */
2456         ptr = line;
2457         value = 0;
2458         while (*ptr != '\0' && (i = hexdigit(*ptr)) >= 0) {
2459             value = (value << 4) + i;
2460             ptr++;
2461         }

2463         return (value);
2464     }

2466 /*
2467  * init_bread - Initialize the counters used to read message bodies.
2468  *
2469  * Arguments:
2470  *   c_id - Structure describing the connection in question.
2471  *
2472  * Returns:
2473  *   0 - Success
2474  *   -1 - Error occurred. The error information is in the error stack.
2475  *
2476  * This routine will determine whether the message body being received is
2477  * chunked or non-chunked. Once determined, the counters used to read
2478  * message bodies will be initialized.
2479  */
2480 static int
2481 init_bread(http_conn_t *c_id)
2482 {
2483     char    *hdr;
2484     char    *ptr;
2485     boolean_t sized = B_FALSE;

2487     /*
2488      * Assume non-chunked reads until proven otherwise.
2489      */
2490     c_id->is_chunked = B_FALSE;
2491     c_id->is_firstchunk = B_FALSE;
2492     hdr = http_get_header_value(c_id, "Content-Length");
2493     if (hdr != NULL) {
2494         c_id->body_size = strtol(hdr, NULL, 10);
2495         if (c_id->body_size == 0 && errno != 0) {
2496             free(hdr);
2497             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADSIZE);
2498             return (-1);
2499         }
2500         free(hdr);
2501         sized = B_TRUE;
2502     }

```

```

2504 /*
2505  * If size was not determined above, then see if this is a
2506  * chunked message. Keep in mind that the first chunk size is
2507  * "special".
2508  */
2509 if (!sized) {
2510     hdr = http_get_header_value(c_id, "Transfer-Encoding");
2511     if (hdr != NULL) {
2512         ptr = eat_ws(hdr);
2513         if (startswith((const char **)&ptr, "chunked;") ||
2514             strcasecmp(ptr, "chunked") == 0) {
2515             c_id->is_firstchunk = B_TRUE;
2516             c_id->is_chunked = B_TRUE;
2517         }
2518         free(hdr);
2519         if (c_id->is_chunked) {
2520             c_id->body_size = get_chunk_header(c_id);
2521             if (c_id->body_size == -1) {
2522                 /*
2523                  * Error stack was already set at a
2524                  * lower level.
2525                  */
2526                 return (-1);
2527             }
2528             sized = B_TRUE;
2529         }
2530     }
2531 }

2533 /*
2534  * Well, isn't this a fine predicament? It wasn't chunked or
2535  * non-chunked as far as we can tell.
2536  */
2537 if (!sized) {
2538     SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_BADSIZE);
2539     return (-1);
2540 }

2542 c_id->body_read = 0;
2543 c_id->body_size_tot = c_id->body_size;
2544 c_id->body_read_tot = 0;

2546 return (0);
2547 }

2549 /*
2550  * get_msgcnt - Get the number of bytes left in the message body or chunk.
2551  *
2552  * Arguments:
2553  *   c_id - Structure describing the connection in question.
2554  *   msgcnt - Where to store the message count.
2555  *
2556  * Returns:
2557  *   0 - Success
2558  *   -1 - Error occurred. The error information is in the error stack.
2559  *
2560  * Note that if the message being read is not chunked, then the byte count
2561  * is simply the message size minus the bytes read thus far. In the case of
2562  * chunked messages, the byte count returned will be the number of bytes
2563  * left in the chunk. If the current chunk has been exhausted, then this
2564  * routine will determine the size of the next chunk. When the next chunk
2565  * size is zero, the message has been read in its entirety.
2566  */
2567 static int
2568 get_msgcnt(http_conn_t *c_id, ssize_t *msgcnt)
2569 {

```

```

2570 /*
2571  * If there are more bytes in the message, then return.
2572  */
2573 *msgcnt = c_id->body_size - c_id->body_read;
2574 if (*msgcnt != 0) {
2575     return (0);
2576 }
2577 /*
2578  * If this is not a chunked message and the body has been
2579  * read, then we're done.
2580  */
2581 if (!c_id->is_chunked) {
2582     return (0);
2583 }

2585 /*
2586  * We're looking at a chunked message whose immediate
2587  * chunk has been totally processed. See if there is
2588  * another chunk.
2589  */
2590 c_id->body_size = get_chunk_header(c_id);
2591 if (c_id->body_size == -1) {
2592     /*
2593      * Error stack was already set at a
2594      * lower level.
2595      */
2596     return (-1);
2597 }

2599 /*
2600  * No bytes of this chunk have been processed yet.
2601  */
2602 c_id->body_read = 0;

2604 /*
2605  * A zero length chunk signals the end of the
2606  * message body and chunking.
2607  */
2608 if (c_id->body_size == 0) {
2609     c_id->is_chunked = B_FALSE;
2610     return (0);
2611 }

2613 /*
2614  * There is another chunk.
2615  */
2616 c_id->body_size_tot += c_id->body_size;
2617 *msgcnt = c_id->body_size - c_id->body_read;

2619 return (0);
2620 }

2622 /*
2623  * getaline - Get lines of data from the HTTP response, up to 'len' bytes.
2624  * NOTE: the line will not end with a NULL if all 'len' bytes
2625  * were read.
2626  *
2627  * Arguments:
2628  *   c_id - Structure describing the connection in question.
2629  *   line - Where to store the data.
2630  *   len - Maximum number of bytes in the line.
2631  *   bread - TRUE if the lines are part of the message body.
2632  *
2633  * Returns:
2634  *   >=0 - The number of bytes successfully read.
2635  *   <0 - An error occurred. This is (the number of bytes gotten + 1),

```

```

2636 *          negated. In other words, if 'n' bytes were read and then an
2637 *          error occurred, this will return -(n+1)). So zero bytes read
2638 *          and then an error occurs, this will return -1. If 1 bytes
2639 *          was read, it will return -2, etc.
2640 *
2641 *          Specifics of the error can be gotten using http_get_lasterr();
2642 *
2643 * Note that I/O errors are put into the error stack by http_srv_rcv().1
2644 */
2645 static int
2646 getaline(http_conn_t *c_id, char *line, int len, boolean_t bread)
2647 {
2648     int i = 0;
2649     ssize_t msgcnt = 0;
2650     ssize_t cnt;
2651
2652     while (i < len) {
2653         /*
2654          * Special processing required for message body reads.
2655          */
2656         if (bread) {
2657             /*
2658              * See if there is another chunk. Obviously, in the
2659              * case of non-chunked messages, there won't be.
2660              * But in either case, chunked or not, if msgcnt
2661              * is still zero after the call to get_msgcnt(),
2662              * then we're done.
2663              */
2664             if (msgcnt == 0) {
2665                 if (get_msgcnt(c_id, &msgcnt) == -1) {
2666                     return -(i+1);
2667                 }
2668                 if (msgcnt == 0) {
2669                     break;
2670                 }
2671             }
2672             cnt = MIN(msgcnt, sizeof (c_id->inbuf.buf));
2673         } else {
2674             cnt = sizeof (c_id->inbuf.buf);
2675         }
2676
2677         /* read more data if buffer empty */
2678         if (c_id->inbuf.i == c_id->inbuf.n) {
2679             c_id->inbuf.i = 0;
2680             c_id->inbuf.n = http_srv_rcv(c_id, c_id->inbuf.buf,
2681                 cnt);
2682             if (c_id->inbuf.n == 0) {
2683                 return (i);
2684             }
2685             if (c_id->inbuf.n < 0) {
2686                 return -(i+1);
2687             }
2688         }
2689         /* skip CR */
2690         if (c_id->inbuf.buf[c_id->inbuf.i] == '\r') {
2691             INC_BREAD_CNT(bread, msgcnt);
2692             c_id->inbuf.i++;
2693             continue;
2694         }
2695         if (c_id->inbuf.buf[c_id->inbuf.i] == '\n') {
2696             INC_BREAD_CNT(bread, msgcnt);
2697             c_id->inbuf.i++;
2698             line[i] = '\0';
2699             return (i);
2700         }
2701         /* copy buf from internal buffer */

```

```

2702             INC_BREAD_CNT(bread, msgcnt);
2703             line[i++] = c_id->inbuf.buf[c_id->inbuf.i++];
2704         }
2705         return (i);
2706     }
2707
2708 /*
2709 * getbytes - Get a block from the HTTP response. Used for the HTTP body.
2710 *
2711 * Arguments:
2712 *   c_id - Structure describing the connection in question.
2713 *   line - Where to store the data.
2714 *   len - Maximum number of bytes in the block.
2715 *
2716 * Returns:
2717 *   >=0 - The number of bytes successfully read.
2718 *   <0 - An error occurred. This is (the number of bytes gotten + 1),
2719 *       negated. In other words, if 'n' bytes were read and then an
2720 *       error occurred, this will return -(n+1)). So zero bytes read
2721 *       and then an error occurs, this will return -1. If 1 bytes
2722 *       was read, it will return -2, etc.
2723 *
2724 *          Specifics of the error can be gotten using http_get_lasterr();
2725 *
2726 * Note that all reads performed here assume that a message body is being
2727 * read. If this changes in the future, then the logic should more closely
2728 * resemble getaline().
2729 *
2730 * Note that I/O errors are put into the error stack by http_srv_rcv().
2731 */
2732 static int
2733 getbytes(http_conn_t *c_id, char *line, int len)
2734 {
2735     int i = 0;
2736     ssize_t msgcnt = 0;
2737     ssize_t cnt;
2738     int nbytes;
2739
2740     while (i < len) {
2741         /*
2742          * See if there is another chunk. Obviously, in the
2743          * case of non-chunked messages, there won't be.
2744          * But in either case, chunked or not, if msgcnt
2745          * is still zero after the call to get_msgcnt(), then
2746          * we're done.
2747          */
2748         if (msgcnt == 0) {
2749             if (get_msgcnt(c_id, &msgcnt) == -1) {
2750                 return -(i+1);
2751             }
2752             if (msgcnt == 0) {
2753                 break;
2754             }
2755         }
2756
2757         cnt = MIN(msgcnt, len - i);
2758
2759         if (c_id->inbuf.n != c_id->inbuf.i) {
2760             nbytes = (int)MIN(cnt, c_id->inbuf.n - c_id->inbuf.i);
2761             (void) memcpy(line, &c_id->inbuf.buf[c_id->inbuf.i],
2762                 nbytes);
2763             c_id->inbuf.i += nbytes;
2764         } else {
2765             nbytes = http_srv_rcv(c_id, line, cnt);
2766             if (nbytes == 0) {
2767                 return (i);

```

```

2768     }
2769     if (nbytes < 0) {
2770         return (-(i+1));
2771     }
2772 }
2773
2774 i += nbytes;
2775 line += nbytes;
2776 msgcnt -= nbytes;
2777 c_id->body_read += nbytes;
2778 c_id->body_read_tot += nbytes;
2779 }
2780
2781 return (i);
2782 }
2783
2784 static int
2785 http_srv_send(http_conn_t *c_id, const void *buf, size_t nbyte)
2786 {
2787     int     retval;
2788
2789     if (c_id->ssl != NULL) {
2790         if ((retval = SSL_write(c_id->ssl, buf, nbyte)) <= 0) {
2791             handle_ssl_error(c_id, retval);
2792         }
2793         return (retval);
2794     } else {
2795         retval = socket_write(c_id->fd, buf, nbyte, &c_id->host_addr);
2796         if (retval < 0) {
2797             SET_ERR(c_id, ERRSRC_SYSTEM, errno);
2798             return (-1);
2799         }
2800         return (retval);
2801     }
2802 }
2803
2804 static int
2805 http_srv_recv(http_conn_t *c_id, void *buf, size_t nbyte)
2806 {
2807     int     retval;
2808
2809     if (c_id->ssl != NULL) {
2810         if ((retval = SSL_read(c_id->ssl, buf, nbyte)) <= 0) {
2811             handle_ssl_error(c_id, retval);
2812         }
2813         return (retval);
2814     } else {
2815         retval = socket_read(c_id->fd, buf, nbyte, c_id->read_timeout);
2816         if (retval < 0) {
2817             SET_ERR(c_id, ERRSRC_SYSTEM, errno);
2818             return (-1);
2819         }
2820         return (retval);
2821     }
2822 }
2823
2824 static boolean_t
2825 http_check_conn(http_conn_t *c_id)
2826 {
2827     early_err = 0;
2828     if (c_id == NULL || c_id->signature != HTTP_CONN_INFO) {
2829         early_err = EHTTP_BADARG;
2830         return (B_FALSE);
2831     }
2832     RESET_ERR(c_id);
2833     return (B_TRUE);

```

```

2834 }
2835
2836 static void
2837 handle_ssl_error(http_conn_t *c_id, int retval)
2838 {
2839     ulong_t err;
2840
2841     err = SSL_get_error(c_id->ssl, retval);
2842
2843     switch (err) {
2844     case SSL_ERROR_NONE:
2845         return;
2846
2847     case SSL_ERROR_ZERO_RETURN:
2848         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_CONCLOSED);
2849         return;
2850
2851     case SSL_ERROR_WANT_READ:
2852     case SSL_ERROR_WANT_WRITE:
2853     case SSL_ERROR_WANT_CONNECT:
2854     case SSL_ERROR_WANT_X509_LOOKUP:
2855         SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_UNEXPECTED);
2856         return;
2857
2858     case SSL_ERROR_SYSCALL:
2859         err = ERR_get_error();
2860         if (err == 0)
2861             SET_ERR(c_id, ERRSRC_LIBHTTP, EHTTP_EOFERR);
2862         else if (err == (ulong_t)-1)
2863             SET_ERR(c_id, ERRSRC_SYSTEM, errno);
2864         else {
2865             SET_ERR(c_id, ERRSRC_LIBSSL, err);
2866             while ((err = ERR_get_error()) != 0)
2867                 SET_ERR(c_id, ERRSRC_LIBSSL, err);
2868         }
2869         return;
2870
2871     case SSL_ERROR_SSL:
2872         while ((err = ERR_get_error()) != 0) {
2873             SET_ERR(c_id, ERRSRC_LIBSSL, err);
2874         }
2875         return;
2876     }
2877 }
2878
2879 static int
2880 count_digits(int value)
2881 {
2882     int     count = 1;
2883
2884     if (value < 0) {
2885         count++;
2886         value = -value;
2887     }
2888
2889     while (value > 9) {
2890         value /= 10;
2891         count++;
2892     }
2893     return (count);
2894 }
2895
2896 static int
2897 hexdigit(char ch)
2898 {
2899     if (ch >= '0' && ch <= '9')

```

```
2900         return (ch - '0');
2901     if (ch >= 'A' && ch <= 'F')
2902         return (ch - 'A' + 10);
2903     if (ch >= 'a' && ch <= 'f')
2904         return (ch - 'a' + 10);
2905     return (-1);
2906 }

2908 static char *
2909 eat_ws(const char *buf)
2910 {
2911     char *ptr = (char *)buf;

2913     while (isspace(*ptr))
2914         ptr++;

2916     return (ptr);
2917 }

2919 static boolean_t
2920 startswith(const char **strp, const char *starts)
2921 {
2922     int len = strlen(starts);

2924     if (strncasecmp(*strp, starts, len) == 0) {
2925         *strp += len;
2926         return (B_TRUE);
2927     }
2928     return (B_FALSE);
2929 }
```



```

*****
13542 Fri May 30 18:31:12 2014
new/usr/src/lib/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
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14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #

22 # Copyright 2011 Nexenta Systems, Inc. All rights reserved.
23 # Copyright (c) 1989, 2010, Oracle and/or its affiliates. All rights reserved.
24 # Copyright (c) 2012 by Delphix. All rights reserved.
25 # Copyright (c) 2012, Joyent, Inc. All rights reserved.
26 # Copyright (c) 2013 Gary Mills

28 include ../Makefile.master

30 # Note that libcurses installs commands along with its library.
31 # This is a minor bug which probably should be fixed.
32 # Note also that a few extra libraries are kept in cmd source.
33 #
34 # Certain libraries are linked with, hence depend on, other libraries.
35 #
36 # Although we have historically used .WAIT to express dependencies, it
37 # reduces the amount of parallelism and thus lengthens the time it
38 # takes to build the libraries. Thus, we now require that any new
39 # libraries explicitly call out their dependencies. Eventually, all
40 # the library dependencies will be called out explicitly. See
41 # "Library interdependencies" near the end of this file.
42 #
43 # Aside from explicit dependencies (and legacy .WAITs), all libraries
44 # are built in parallel.
45 #
46 .PARALLEL:

48 SUBDIRS= \
49     common .WAIT \
50     ../cmd/sgs/libconv \
51     ../cmd/sgs/libdl .WAIT

53 SUBDIRS += \
54     libc .WAIT \
55     ../cmd/sgs/libelf .WAIT \
56     c_synonyms \
57     libmd \
58     libmd5 \
59     librsn \
60     libmp .WAIT \
61     libnsl \

```

```

62 libsecdb .WAIT \
63 librpcsvc \
64 libsocket .WAIT \
65 libsctp \
66 libsip \
67 libcommputil \
68 libresolv \
69 libresolv2 .WAIT \
70 libw .WAIT \
71 libintl .WAIT \
72 ../cmd/sgs/librtld_db \
73 libaio \
74 libast \
75 libdll \
76 libcmd \
77 libshell \
78 libsum \
79 librt \
80 libadm \
81 libctf \
82 libdtrace \
83 libdtrace_jni \
84 libcurses \
85 libtermcap \
86 libgen \
87 libgss \
88 libpam \
89 libuuid \
90 libthread \
91 libpthread .WAIT \
92 libslp \
93 libbsdmalloc \
94 libdoor \
95 libdevinfo \
96 libdladm \
97 libdlpi \
98 libeti \
99 libcrypt \
100 libdns_sd \
101 libefi \
102 libfstyp \
103 libwanboot \
104 libwanbootutil \
105 libcryptoutil \
106 libinetutil \
107 libipadm \
108 libipd \
109 libipmp \
110 libiscsit \
111 libkmf \
112 libkstat \
113 libkvm \
114 liblm \
115 libmalloc \
116 libmapmalloc \
117 libmtmalloc \
118 libnls \
119 libnwam \
120 libsbios \
121 libtecla \
122 libumem \
123 libnvpair .WAIT \
124 libexacct \
125 libsas1 \
126 libldap5 \
127 libslldap .WAIT \

```

```

128 libbsm \
129 libsys \
130 libsysevent \
131 libnisdb \
132 libpool \
133 libpp \
134 libproc \
135 libproject \
136 libsendfile \
137 nametoaddr \
138 ncad_addr \
139 hbaapi \
140 smhba \
141 sun_fc \
142 sun_sas \
143 gss_mechs/mech_krb5 .WAIT \
144 libkrb5 .WAIT \
145 krb5 .WAIT \
146 libsmbs \
147 libfcoe \
148 libsrpt \
149 libstmf \
150 libstmfproxy \
151 libnsctl \
152 libunistat \
153 libdscfg \
154 librdc \
155 libinstzones \
156 libpkg \
157 libpcidb \

159 SUBDIRS += \
160 passwdutil \
161 pam_modules \
162 crypt_modules \
163 libadt_jni \
164 abi \
165 auditd_plugins \
166 libvolmgt \
167 libdevice \
168 libdevide \
169 libdhcpsvc \
170 libc_db \
171 libndmp \
172 libsec \
173 libtnfprobe \
174 libtnf \
175 libtnfctl \
176 libdhcpagent \
177 libdhcpdu \
178 libdhcputil \
179 libxnet \
180 libipsecutil \
181 openssl \
182 nsswitch \
183 print \
184 libuutil \
185 libscf \
186 libinetsvc \
187 librestart \
188 libsched \
189 libelfsign \
190 pkcs11 .WAIT \
191 libpctx .WAIT \
192 libcpc \
193 getloginx \

```

```

194 watchmalloc \
195 extendedFILE \
196 madv \
197 mpss \
198 libdisasm \
199 libwrap \
200 libxcurses \
201 libxcurses2 \
202 libbrand .WAIT \
203 libzonecfg \
204 libzoneinfo \
205 libzonestat \
206 libtsnet \
207 libtsol \
208 gss_mechs/mech_spnego \
209 gss_mechs/mech_dummy \
210 gss_mechs/mech_dh \
211 rpcsec_gss \
212 libraidcfg .WAIT \
213 librcm .WAIT \
214 libcfgadm .WAIT \
215 libpicl .WAIT \
216 libpicltree .WAIT \
217 raidcfg_plugins \
218 cfgadm_plugins \
219 libmail \
220 lvm \
221 libsmmedia \
222 libipp \
223 libdiskmgt \
224 liblgrp \
225 libfsmgt \
226 fm \
227 libavl \
228 libcmdutils \
229 libcontract \
230 ../cmd/sendmail/libmilter \
231 sasl_plugins \
232 udapl \
233 libzpool \
234 libzfs_core \
235 libzfs \
236 libbe \
237 pylibbe \
238 libzfs_jni \
239 pyzfs \
240 pysolaris \
241 libmapid \
242 brand \
243 policykit \
244 hal \
245 libshare \
246 libsqlite \
247 libidmap \
248 libadutils \
249 libipmi \
250 libexacct/demo \
251 libvrrpadm \
252 libvscan \
253 libgrubmgt \
254 smbsrv \
255 libilb \
256 scsi \
257 libima \
258 libsun_ima \
259 mpapi \

```

```

260      librstp      \
261      libreparse   \
262      libhotplug   \
263      libfruutils  .WAIT  \
264      libfru       \
265      ${$(MACH)_SUBDIRS}

267 i386_SUBDIRS=    \
268      libntfs      \
269      libparted    \
270      libfdisk     \
271      libsaveargs

273 sparc_SUBDIRS= .WAIT \
274      efcode       \
275      libds        \
276      libdscp      \
277      libprtdiag   .WAIT  \
278      libprtdiag_psr \
279      libpri       \
280      librsc       \
281      storage      \
282      libpcp       \
283      libtsalarm   \
284      libv12n

286 FM_sparc_DEPLIBS= libpri

288 fm:      \
289      libexacct \
290      libipmi   \
291      libzfs    \
292      scsi      \
293      ${FM_${$(MACH)_DEPLIBS}}

295 #
296 # Create a special version of $(SUBDIRS) with no .WAIT's, for use with the
297 # clean and clobber targets (for more information, see those targets, below).
298 #
299 NOWAIT_SUBDIRS= ${SUBDIRS:.WAIT=}

301 DCSUBDIRS =      \
302      lvm

304 MSGSUBDIRS=      \
305      abi          \
306      auditd_plugins \
307      brand        \
308      cfgadm_plugins \
309      gss_mechs/mech_dh \
310      gss_mechs/mech_krb5 \
311      krb5         \
312      libast       \
313      libbsm       \
314      libbc        \
315      libcfgadm    \
316      libcmd       \
317      libcontract  \
318      libcurses    \
319      libdhcpcsvc  \
320      libdhcputil  \
321      libipsecutil \
322      libdiskmgmt  \
323      libdladm     \
324      libdll       \
325      libgrubmgmt  \

```

```

326      libgss      \
327      libidmap     \
328      libipmp      \
329      libilb       \
330      libinetutil  \
331      libinstzones \
332      libipadm     \
333      libnsl       \
334      libnwam      \
335      libpam       \
336      libpicl      \
337      libpool      \
338      libpkg       \
339      libpp        \
340      libscf       \
341      libsasl      \
342      libldap5     \
343      libsecdb     \
344      libshare     \
345      libshell     \
346      libslldap    \
347      libslp       \
348      libsmbf      \
349      libsmmedia   \
350      libsum       \
351      libtsol      \
352      libuutil     \
353      libvrrpadm   \
354      libvscan     \
355      libwanboot   \
356      libwanbootutil \
357      libzfs       \
358      libzonecfg   \
359      lvm          \
360      madv         \
361      mpss         \
362      pam_modules  \
363      pyzfs        \
364      pysolaris    \
365      rpcsec_gss   \
366      libreparse   \
367      MSGSUBDIRS += \
368      ${$(MACH)_MSGSUBDIRS}

370 sparc_MSGSUBDIRS=      \
371      libprtdiag        \
372      libprtdiag_psr

374 i386_MSGSUBDIRS= libfdisk

376 HDRSUBDIRS=      \
377      auditd_plugins \
378      libast         \
379      libbrand       \
380      libbsm         \
381      libbc          \
382      libcmd         \
383      libcmdutils    \
384      libcommputil   \
385      libcontract    \
386      libcpc         \
387      libctf         \
388      libcurses      \
389      libtermcap     \
390      libcryptoutil  \
391      libdevice      \

```

```

392 libdevid \
393 libdevinfo \
394 libdiskmgt \
395 libdladm \
396 libdll \
397 libdlpi \
398 libdhcpcagent \
399 libdhcpsvc \
400 libdhcputil \
401 libdisasm \
402 libdns_sd \
403 libdscfg \
404 libdtrace \
405 libdtrace_jni \
406 libelfsign \
407 libeti \
408 libfru \
409 libfstyp \
410 libgen \
411 libipadm \
412 libipd \
413 libipsecutil \
414 libinetsvc \
415 libinetutil \
416 libinstzones \
417 libipmi \
418 libipmp \
419 libipp \
420 libiscsit \
421 libkstat \
422 libkvm \
423 libmail \
424 libmd \
425 libmtmalloc \
426 libndmp \
427 libnvpair \
428 libnsctl \
429 libnsl \
430 libnwam \
431 libpam \
432 libpcidb \
433 libpctx \
434 libpicl \
435 libpicltree \
436 libpool \
437 libpp \
438 libproc \
439 libraidcfg \
440 librcm \
441 librdc \
442 libscf \
443 libsip \
444 libsbios \
445 librestart \
446 librpcsvc \
447 librsn \
448 librstp \
449 libsasl \
450 libsec \
451 libshell \
452 libslp \
453 libsmmedia \
454 libsocket \
455 libsqlite \
456 libfcoe \
457 libsrpt \

```

```

458 libstmf \
459 libstmfproxy \
460 libsum \
461 libsysevent \
462 libtecla \
463 libtnf \
464 libtnfctl \
465 libtnfprobe \
466 libtsnet \
467 libtsol \
468 libvrrpadm \
469 libvolmgt \
470 libumem \
471 libunistat \
472 libuutil \
473 libwanboot \
474 libwanbootutil \
475 libwrap \
476 libxcurses2 \
477 libzfs \
478 libzfs_core \
479 libzfs_jni \
480 libzoneinfo \
481 libzonestat \
482 hal \
483 policykit \
484 lvm \
485 pkcs11 \
486 passwdutil \
487 ../cmd/sendmail/libmilter \
488 fm \
489 udapl \
490 libmapid \
491 libkrb5 \
492 libmbfs \
493 libshare \
494 libidmap \
495 libvscan \
496 libgrubmgt \
497 smbsrv \
498 libilb \
499 scsi \
500 hbaapi \
501 smhba \
502 libima \
503 libsun_ima \
504 mpapi \
505 librepase \
506 ${$(MACH)_HDRSUBDIRS}

508 i386_HDRSUBDIRS= \
509 libparted \
510 libfdisk \
511 libsaveargs

513 sparc_HDRSUBDIRS= \
514 libds \
515 libdscp \
516 libpri \
517 libv12n \
518 storage

520 all := TARGET= all
521 check := TARGET= check
522 clean := TARGET= clean
523 clobber := TARGET= clobber

```

```

524 install :=      TARGET= install
525 install_h :=    TARGET= install_h
526 lint :=        TARGET= lint
527 _dc :=          TARGET= _dc
528 _msg :=          TARGET= _msg

530 .KEEP_STATE:

532 #
533 # For the all and install targets, we clearly must respect library
534 # dependencies so that the libraries link correctly. However, for
535 # the remaining targets (check, clean, clobber, install_h, lint, _dc
536 # and _msg), libraries do not have any dependencies on one another
537 # and thus respecting dependencies just slows down the build.
538 # As such, for these rules, we use pattern replacement to explicitly
539 # avoid triggering the dependency information. Note that for clean,
540 # clobber and lint, we must use $(NOWAIT_SUBDIRS) rather than
541 # $(SUBDIRS), to prevent '.WAIT' from expanding to '.WAIT-nodepend'.
542 #

544 all:              $(SUBDIRS)

546 install:           $(SUBDIRS) .WAIT install_extra

548 # extra libraries kept in other source areas
549 install_extra:
550     @cd ../cmd/sgs; pwd; $(MAKE) install_lib
551     @pwd

553 clean clobber lint: $(NOWAIT_SUBDIRS:%=-nodepend)

555 install_h check:   $(HDRSUBDIRS:%=-nodepend)

557 _msg:               $(MSGSUBDIRS:%=-nodepend) .WAIT _dc

559 _dc:                 $(DCSUBDIRS:%=-nodepend)

561 #
562 # Library interdependencies are called out explicitly here
563 #
564 auditd_plugins: libbsm libnsl libsecdb
565 gss_mechs/mech_krb5: libgss libnsl libsocket libresolv pkcs11
566 krb5: openssl
567 libadt_jni: libbsm
568 libast: libsocket
569 libadutils: libldap5 libresolv libsocket libnsl
570 nsswitch: libadutils libidmap
571 libbe: libzfs
572 libbsm: libtsol
573 libcmd: libsum libast libsocket libnsl
574 libcmdutils: libavl
575 libcontract: libnvpair
576 libdevinfo: libdevinfo
577 libdevinfo: libnvpair libsec
578 libdhcpcagent: libsocket libdhcputil libuuid libdplpi libcontract
579 libdhcpsvc: libinetutil
580 libdhcputil: libnsl libgen libinetutil libdplpi
581 libdladm: libdevinfo libinetutil libsocket libscf librcm libnvpair \
582     libexacct libnsl libkstat libcurses
583 libdll: libast
584 libdplpi: libinetutil libdladm
585 libds: libsysevent
586 libdscfg: libnscf libunistat libsocket libnsl
587 libdtrace: libproc libgen libctf
588 libdtrace_jni: libuutil libdtrace
589 libefi: libuuid

```

```

590 libfstyp: libnvpair
591 libelfsign: libcryptoutil libkmf
592 libidmap: libadutils libldap5 libavl libsldap libuutil
593 libipadm: libnsl libinetutil libsocket libdplpi libnvpair libdhcpcagent \
594     libdladm libsecdb
595 libiscsi: libc libnvpair libstmf libuuid libnsl
596 libkmf: libcryptoutil pkcs11 openssl
597 libnsl: libmd5
598 libmapid: libresolv
599 librdc: libsocket libnsl libnscf libunistat libdscfg
600 libuuid: libdplpi
601 libinetutil: libsocket
602 libipsecutil: libtecla libsocket
603 libinstzones: libzonecfg libcontract
604 libpkg: libwanboot libscf libadm openssl
605 libnwm: libscf
606 libsecdb: libnsl
607 libsas: libgss libsocket pkcs11 libmd
608 sas_plugins: pkcs11 libgss libsocket libsas
609 libscf: libsocket
610 libshell: libast libcmd libdll libsocket libsecdb
611 libsip: libmd5
612 libsbfs: libcmdutils libsocket libnsl libkrb5
613 libsocket: libnsl
614 libstmfproxy: libstmf libsocket libnsl libpthread
615 libsum: libast
616 libsysevent: libsecdb
617 libldap5: libsas libsocket libnsl libmd
618 libsldap: libldap5 libtsol libnsl libc libscf libresolv
619 libpool: libnvpair libexacct
620 libpp: libast
621 libzonecfg: libc libsocket libnsl libuuid libnvpair libsysevent libsec \
622     libbrand libpool libscf
623 libproc: ../cmd/sgs/librtld_db ../cmd/sgs/libelf libctf libsaveargs
624 libproject: libpool libproc libsecdb
625 libtermcap: libcurses
626 libtsnet: libnsl libtsol libsecdb
627 libwrap: libnsl libsocket
628 libwanboot: libnvpair libresolv libnsl libsocket libdevinfo libinetutil \
629     libdhcputil openssl
630 libwanbootutil: libnsl
631 pam_modules: libproject passwdutil smbsrv
632 libscf: libuutil libmd libgen libsbios libnsl
633 libinetsvc: libscf
634 librestart: libuutil libscf
635 libsaveargs: libdisasm
636 ../cmd/sgs/libdl: ../cmd/sgs/libconv
637 ../cmd/sgs/libelf: ../cmd/sgs/libconv
638 pkcs11: libcryptoutil openssl
639 print: libldap5
640 udapl/udapl_tavor: udapl/libdat
641 libzfs: libdevinfo libgen libnvpair libuutil \
642     libadm libavl libefi libidmap libmd libzfs_core
643 libzfs_core: libnvpair
644 libzfs_jni: libdiskmgt libnvpair libzfs
645 libzpool: libavl libumem libnvpair libcmdutils
646 libsec: libavl libidmap
647 brand: libc libsocket
648 libshare: libscf libzfs libuuid libfsmgt libsecdb libumem libsbios
649 libexacct/demo: libexacct libproject libsocket libnsl
650 libtsalarm: libpcp
651 smbsrv: libsocket libnsl libmd libxnet libpthread librt \
652     libshare libidmap pkcs11 libsqlite libcryptoutil \
653     libparse libcmdutils
654 libv12n: libds libuuid
655 libvrrpadm: libsocket libdladm libscf

```

```
656 libvscan:      libscf
657 libfru:         libfruutils
658 scsi:           libnvpair libfru
659 mpapi:          libpthread libdevinfo libsysevent libnvpair
660 sun_fc:         libdevinfo libsysevent libnvpair
661 libsun_ima:     libdevinfo libsysevent libnsl
662 sun_sas:        libdevinfo libsysevent libnvpair libkstat libdevid
663 libgrubmgmt:    libdevinfo libzfs libfstyp
664 pylibbe:       libbe libzfs
665 pyzfs:         libnvpair libzfs
666 pysolaris:     libsec libidmap
667 libreparse:    libnvpair
668 libhotplug:    libnvpair
669 cfgadm_plugins: libhotplug
670 libilb:        libsocket
671 openssl:       libnsl libc libsocket
672 $(INTEL_BUILD)libdiskmgmt:libfdisk

674 #
675 # The reason this rule checks for the existence of the
676 # Makefile is that some of the directories do not exist
677 # in certain situations (e.g., exportable source builds,
678 # OpenSolaris).
679 #
680 $(SUBDIRS): FRC
681     @if [ -f $@/Makefile ]; then \
682         cd $@; pwd; $(MAKE) $(TARGET); \
683     else \
684         true; \
685     fi
686
687 $(SUBDIRS:%=%-nodepend):
688     @if [ -f $(@:%-nodepend=)/Makefile ]; then \
689         cd $(@:%-nodepend=); pwd; $(MAKE) $(TARGET); \
690     else \
691         true; \
692     fi
693
694 FRC:
```

new/usr/src/lib/krb5/plugins/preauth/pkinit/Makefile.com

1

```
*****
2278 Fri May 30 18:31:12 2014
new/usr/src/lib/krb5/plugins/preauth/pkinit/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #
2 # CDDL HEADER START
3 #
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5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
23 # Use is subject to license terms.
24 #
25 #
```

```
27 LIBRARY= pkinit.a
28 VERS= .1
```

```
30 PKINIT_OBJS= \
31     pkinit_accessor.o \
32     pkinit_clnt.o \
33     pkinit_crypto_openssl.o \
34     pkinit_identity.o \
35     pkinit_lib.o \
36     pkinit_matching.o \
37     pkinit_profile.o \
38     pkinit_srv.o
```

```
41 OBJECTS= $(PKINIT_OBJS)
```

```
43 # include library definitions
44 include $(SRC)/lib/krb5/Makefile.lib
```

```
46 SRCS= $(PKINIT_OBJS:%.o=./%.c)
```

```
48 LIBS= $(DYNLIB)
```

```
50 include $(SRC)/lib/gss_mechs/mech_krb5/Makefile.mech_krb5
```

```
52 POFILE = $(LIBRARY:%.a=%.po)
53 POFILES = generic.po
```

```
55 #override liblink
56 INS.liblink= -$(RM) $@; $(SYMLINK) $(LIBLINKS)$(VERS) $@
```

```
59 CPPFLAGS += -I$(SRC)/lib/krb5 \
60             -I$(SRC)/lib/krb5/kdb \
61             -I$(SRC)/lib/gss_mechs/mech_krb5/include \
```

new/usr/src/lib/krb5/plugins/preauth/pkinit/Makefile.com

2

```
62 -I$(SRC)/lib/gss_mechs/mech_krb5/krb5/os \
63 -I$(SRC)/lib/gss_mechs/mech_krb5/include/krb5 \
64 -I$(SRC)/uts/common/gssapi/include/ \
65 -I$(SRC)/uts/common/gssapi/mechs/krb5/include \
66 -I$(SRC)
```

```
68 CERRWARN += -_gcc=-Wno-uninitialized
69 CERRWARN += -_gcc=-Wno-unused-function
```

```
71 CFLAGS += $(CCVERBOSE) -I.
72 DYNFLAGS += $(KRUNPATH) $(KMECHLIB) -znodelate
73 LDLIBS += -L $(ROOTLIBDIR) -lsunw_crypto -lc
```

```
75 ROOTLIBDIR= $(ROOT)/usr/lib/krb5/plugins/preauth
```

```
77 $(ROOTLIBDIR):
78     $(INS.dir)
```

```
80 .KEEP_STATE:
```

```
82 all: $(LIBS)
```

```
84 lint: lintcheck
```

```
86 # include library targets
87 include $(SRC)/lib/krb5/Makefile.targ
```

```
89 FRC:
```

```
91 generic.po: FRC
92     $(RM) messages.po
93     $(XGETTEXT) $(XGETFLAGS) '$(GREP) -l gettext ../*. [ch]'
94     $(SED) "/^domain/d" messages.po > $@
95     $(RM) messages.po
```

new/usr/src/lib/libkmf/plugins/kmf_openssl/Makefile.com

1

1949 Fri May 30 18:31:12 2014
new/usr/src/lib/libkmf/plugins/kmf_openssl/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #
24 # Makefile for KMF Plugins
25 #

27 LIBRARY=      kmf_openssl.a
28 VERS=         .1

30 OBJECTS=      openssl_spi.o

32 include $(SRC)/lib/Makefile.lib

34 LIBLINKS=     $(DYNLIB:.so.1=.so)
35 KMFINC=        -I../../include -I../../ber_der/inc

37 BERLIB=        -lkmf -lkmfberder
38 BERLIB64=      $(BERLIB)

40 OPENSLLIBS=    $(BERLIB) -lsunw_crypto -lcryptoutil -lc
41 OPENSLLIBS64=  $(BERLIB64) -lsunw_crypto -lcryptoutil -lc

43 LINTSLLIBS     = $(BERLIB) -lcryptoutil -lc
44 LINTSLLIBS64   = $(BERLIB64) -lcryptoutil -lc

46 SRCDIR=        ../common
47 INCDIR=         ../../include

49 CFLAGS         += $(CCVERBOSE)
50 CPPFLAGS        += -D_REENTRANT $(KMFINC) \
51                 -I$(INCDIR) -I$(ADJUNCT_PROTO)/usr/include/libxml2

53 CERRWARN        += -_gcc=-Wno-unused-label
54 CERRWARN        += -_gcc=-Wno-unused-value
55 CERRWARN        += -_gcc=-Wno-uninitialized

57 PICS=          $(OBJECTS:%=pics/%)

59 lint:= OPENSLLIBS= $(LINTSLLIBS)
60 lint:= OPENSLLIBS64= $(LINTSLLIBS64)
```

new/usr/src/lib/libkmf/plugins/kmf_openssl/Makefile.com

2

```
62 LDLIBS32      += $(OPENSLLIBS)

64 ROOTLIBDIR=    $(ROOTFS_LIBDIR)/crypto
65 ROOTLIBDIR64=  $(ROOTFS_LIBDIR)/crypto/$(MACH64)

67 .KEEP_STATE:

69 LIBS           = $(DYNLIB)
70 all:           $(DYNLIB) $(LINTLIB)

72 lint: lintcheck

74 FRC:

76 include $(SRC)/lib/Makefile.targ
```


new/usr/src/lib/libkmf/plugins/kmf_openssl/common/openssl_spi.c

1

```
*****
133380 Fri May 30 18:31:12 2014
new/usr/src/lib/libkmf/plugins/kmf_openssl/common/openssl_spi.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Copyright (c) 2006, 2010, Oracle and/or its affiliates. All rights reserved.
3  *
4  * Use is subject to license terms.
5  */
6 /*
7  * Copyright (c) 2012, OmniTI Computer Consulting, Inc. All rights reserved.
8  */
9 /*
10 * Written by Dr Stephen N Henson (shenson@bigfoot.com) for the OpenSSL
11 * project 2000.
12 */
13 /*
14  * =====
15  * Copyright (c) 2000-2004 The OpenSSL Project. All rights reserved.
16  *
17  * Redistribution and use in source and binary forms, with or without
18  * modification, are permitted provided that the following conditions
19  * are met:
20  *
21  * 1. Redistributions of source code must retain the above copyright
22  * notice, this list of conditions and the following disclaimer.
23  *
24  * 2. Redistributions in binary form must reproduce the above copyright
25  * notice, this list of conditions and the following disclaimer in
26  * the documentation and/or other materials provided with the
27  * distribution.
28  *
29  * 3. All advertising materials mentioning features or use of this
30  * software must display the following acknowledgment:
31  * "This product includes software developed by the OpenSSL Project
32  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
33  *
34  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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37  * licensing@OpenSSL.org.
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39  * 5. Products derived from this software may not be called "OpenSSL"
40  * nor may "OpenSSL" appear in their names without prior written
41  * permission of the OpenSSL Project.
42  *
43  * 6. Redistributions of any form whatsoever must retain the following
44  * acknowledgment:
45  * "This product includes software developed by the OpenSSL Project
46  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
47  *
48  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
49  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
50  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
51  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
52  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
53  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
54  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
55  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
56  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
57  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
58  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
59  * OF THE POSSIBILITY OF SUCH DAMAGE.
60  * =====
61  */
```

new/usr/src/lib/libkmf/plugins/kmf_openssl/common/openssl_spi.c

2

```
62 * This product includes cryptographic software written by Eric Young
63 * (eay@cryptsoft.com). This product includes software written by Tim
64 * Hudson (tjh@cryptsoft.com).
65 *
66 */

68 #include <stdlib.h>
69 #include <kmfapiP.h>
70 #include <ber_der.h>
71 #include <fcntl.h>
72 #include <sys/stat.h>
73 #include <dirent.h>
74 #include <cryptoutil.h>
75 #include <synch.h>
76 #include <thread.h>

78 /* OPENSSL related headers */
79 #include <openssl/bio.h>
80 #include <openssl/bn.h>
81 #include <openssl/asn1.h>
82 #include <openssl/err.h>
83 #include <openssl/bn.h>
84 #include <openssl/x509.h>
85 #include <openssl/rsa.h>
86 #include <openssl/dsa.h>
87 #include <openssl/x509v3.h>
88 #include <openssl/objects.h>
89 #include <openssl/pem.h>
90 #include <openssl/pkcs12.h>
91 #include <openssl/ocsp.h>
92 #include <openssl/des.h>
93 #include <openssl/rand.h>

95 #define PRINT_ANY_EXTENSION (\
96     KMF_X509_EXT_KEY_USAGE |\
97     KMF_X509_EXT_CERT_POLICIES |\
98     KMF_X509_EXT_SUBJECTNAME |\
99     KMF_X509_EXT_BASIC_CONSTRAINTS |\
100     KMF_X509_EXT_NAME_CONSTRAINTS |\
101     KMF_X509_EXT_POLICY_CONSTRAINTS |\
102     KMF_X509_EXT_EXT_KEY_USAGE |\
103     KMF_X509_EXT_INHIBIT_ANY_POLICY |\
104     KMF_X509_EXT_AUTH_KEY_ID |\
105     KMF_X509_EXT_SUBJECT_KEY_ID |\
106     KMF_X509_EXT_POLICY_MAPPING)

108 static uchar_t P[] = { 0x00, 0x8d, 0xf2, 0xa4, 0x94, 0x49, 0x22, 0x76,
109     0xaa, 0x3d, 0x25, 0x75, 0x9b, 0xb0, 0x68, 0x69,
110     0xcb, 0xea, 0xc0, 0xd8, 0x3a, 0xfb, 0x8d, 0x0c,
111     0xf7, 0xcb, 0xb8, 0x32, 0x4f, 0x0d, 0x78, 0x82,
112     0xe5, 0xd0, 0x76, 0x2f, 0xc5, 0xb7, 0x21, 0x0e,
113     0xaf, 0xc2, 0xe9, 0xad, 0xac, 0x32, 0xab, 0x7a,
114     0xac, 0x49, 0x69, 0x3d, 0xfb, 0xf8, 0x37, 0x24,
115     0xc2, 0xec, 0x07, 0x36, 0xee, 0x31, 0xc8, 0x02,
116     0x91 };

118 static uchar_t Q[] = { 0x00, 0xc7, 0x73, 0x21, 0x8c, 0x73, 0x7e, 0xc8,
119     0xee, 0x99, 0x3b, 0x4f, 0x2d, 0xed, 0x30, 0xf4,
120     0x8e, 0xda, 0xce, 0x91, 0x5f };

122 static uchar_t G[] = { 0x00, 0x62, 0x6d, 0x02, 0x78, 0x39, 0xea, 0x0a,
123     0x13, 0x41, 0x31, 0x63, 0xa5, 0x5b, 0x4c, 0xb5,
124     0x00, 0x29, 0x9d, 0x55, 0x22, 0x95, 0x6c, 0xef,
125     0xcb, 0x3b, 0xff, 0x10, 0xf3, 0x99, 0xce, 0x2c,
126     0x2e, 0x71, 0xcb, 0x9d, 0xe5, 0xfa, 0x24, 0xba,
127     0xbf, 0x58, 0xe5, 0xb7, 0x95, 0x21, 0x92, 0x5c,
```

```

128     0x9c, 0xc4, 0x2e, 0x9f, 0x6f, 0x46, 0x4b, 0x08,
129     0x8c, 0xc5, 0x72, 0xaf, 0x53, 0xe6, 0xd7, 0x88,
130     0x02 };

132 #define SET_ERROR(h, c) h->lasterr.kstype = KMF_KEYSTORE_OPENSSL; \
133     h->lasterr.errcode = c;

135 #define SET_SYS_ERROR(h, c) h->lasterr.kstype = -1; h->lasterr.errcode = c;

137 /*
138  * Declare some new macros for managing stacks of EVP_PKEYS, similar to
139  * what wanboot did.
140  */
141 DECLARE_STACK_OF(EVP_PKEY)

143 #define sk_EVP_PKEY_new_null() SKM_sk_new_null(EVP_PKEY)
144 #define sk_EVP_PKEY_free(st) SKM_sk_free(EVP_PKEY, (st))
145 #define sk_EVP_PKEY_num(st) SKM_sk_num(EVP_PKEY, (st))
146 #define sk_EVP_PKEY_value(st, i) SKM_sk_value(EVP_PKEY, (st), (i))
147 #define sk_EVP_PKEY_push(st, val) SKM_sk_push(EVP_PKEY, (st), (val))
148 #define sk_EVP_PKEY_pop_free(st, free_func) SKM_sk_pop_free(EVP_PKEY, (st), \
149     (free_func))

151 mutex_t init_lock = DEFAULTMUTEX;
152 static int ssl_initialized = 0;
153 static BIO *bio_err = NULL;

155 static int
156 test_for_file(char *, mode_t);
157 static KMF_RETURN
158 openssl_parse_bag(PKCS12_SAFEBAG *, char *, int,
159     STACK_OF(EVP_PKEY) *, STACK_OF(X509) *);

161 static KMF_RETURN
162 local_export_pk12(KMF_HANDLE_T, KMF_CREDENTIAL *, int, KMF_X509_DER_CERT *,
163     int, KMF_KEY_HANDLE *, char *);

165 static KMF_RETURN set_pkey_attr(EVP_PKEY *, ASN1_TYPE *, int);

167 static KMF_RETURN
168 extract_pem(KMF_HANDLE *, char *, char *, KMF_BIGNT *, char *,
169     CK_UTF8CHAR *, CK_ULONG, EVP_PKEY **, KMF_DATA **, int *);

171 static KMF_RETURN
172 kmf_load_cert(KMF_HANDLE *, char *, char *, KMF_BIGNT *, KMF_CERT_VALIDITY,
173     char *, KMF_DATA *);

175 static KMF_RETURN
176 load_certs(KMF_HANDLE *, char *, char *, KMF_BIGNT *, KMF_CERT_VALIDITY,
177     char *, KMF_DATA **, uint32_t *);

179 static KMF_RETURN
180 sslBN2KMFBN(BIGNUM *, KMF_BIGNT *);

182 static EVP_PKEY *
183 ImportRawRSAKey(KMF_RAW_RSA_KEY *);

185 static KMF_RETURN
186 convertToRawKey(EVP_PKEY *, KMF_RAW_KEY_DATA *);

188 KMF_RETURN
189 OpenSSL_FindCert(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

191 void
192 OpenSSL_FreeKMFcert(KMF_HANDLE_T, KMF_X509_DER_CERT *);

```

```

194 KMF_RETURN
195 OpenSSL_StoreCert(KMF_HANDLE_T handle, int, KMF_ATTRIBUTE *);

197 KMF_RETURN
198 OpenSSL_DeleteCert(KMF_HANDLE_T handle, int, KMF_ATTRIBUTE *);

200 KMF_RETURN
201 OpenSSL_CreateKeypair(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

203 KMF_RETURN
204 OpenSSL_StoreKey(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

206 KMF_RETURN
207 OpenSSL_EncodePubKeyData(KMF_HANDLE_T, KMF_KEY_HANDLE *, KMF_DATA *);

209 KMF_RETURN
210 OpenSSL_SignData(KMF_HANDLE_T, KMF_KEY_HANDLE *, KMF_OID *,
211     KMF_DATA *, KMF_DATA *);

213 KMF_RETURN
214 OpenSSL_DeleteKey(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

216 KMF_RETURN
217 OpenSSL_ImportCRL(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

219 KMF_RETURN
220 OpenSSL_DeleteCRL(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

222 KMF_RETURN
223 OpenSSL_ListCRL(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

225 KMF_RETURN
226 OpenSSL_FindCertInCRL(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

228 KMF_RETURN
229 OpenSSL_CertGetPrintable(KMF_HANDLE_T, const KMF_DATA *,
230     KMF_PRINTABLE_ITEM, char *);

232 KMF_RETURN
233 OpenSSL_GetErrorString(KMF_HANDLE_T, char **);

235 KMF_RETURN
236 OpenSSL_FindPrikeyByCert(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

238 KMF_RETURN
239 OpenSSL_DecryptData(KMF_HANDLE_T, KMF_KEY_HANDLE *, KMF_OID *,
240     KMF_DATA *, KMF_DATA *);

242 KMF_RETURN
243 OpenSSL_CreateOCSPRequest(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

245 KMF_RETURN
246 OpenSSL_GetOCSPStatusForCert(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

248 KMF_RETURN
249 OpenSSL_FindKey(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

251 KMF_RETURN
252 OpenSSL_ExportPK12(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

254 KMF_RETURN
255 OpenSSL_CreateSymKey(KMF_HANDLE_T, int, KMF_ATTRIBUTE *);

257 KMF_RETURN
258 OpenSSL_GetSymKeyValue(KMF_HANDLE_T, KMF_KEY_HANDLE *, KMF_RAW_SYM_KEY *);

```

```

260 KMF_RETURN
261 OpenSSL_VerifyCRLFile(KMF_HANDLE_T, char *, KMF_DATA *);

263 KMF_RETURN
264 OpenSSL_CheckCRLDate(KMF_HANDLE_T, char *);

266 static
267 KMF_PLUGIN_FUNCLIST openssl_plugin_table =
268 {
269     1, /* Version */
270     NULL, /* ConfigureKeystore */
271     OpenSSL_FindCert,
272     OpenSSL_FreeKMFcert,
273     OpenSSL_StoreCert,
274     NULL, /* ImportCert */
275     OpenSSL_ImportCRL,
276     OpenSSL_DeleteCert,
277     OpenSSL_DeleteCRL,
278     OpenSSL_CreateKeypair,
279     OpenSSL_FindKey,
280     OpenSSL_EncodePubKeyData,
281     OpenSSL_SignData,
282     OpenSSL_DeleteKey,
283     OpenSSL_ListCRL,
284     NULL, /* FindCRL */
285     OpenSSL_FindCertInCRL,
286     OpenSSL_GetErrorString,
287     OpenSSL_FindPrikeyByCert,
288     OpenSSL_DecryptData,
289     OpenSSL_ExportPK12,
290     OpenSSL_CreateSymKey,
291     OpenSSL_GetSymKeyValue,
292     NULL, /* SetTokenPin */
293     OpenSSL_StoreKey,
294     NULL /* Finalize */
295 };

297 static mutex_t *lock_cs;
298 static long *lock_count;

300 static void
301 /* ARGSUSED1 */
302 locking_cb(int mode, int type, char *file, int line)
303 {
304     if (mode & CRYPTO_LOCK) {
305         (void) mutex_lock(&(lock_cs[type]));
306         lock_count[type]++;
307     } else {
308         (void) mutex_unlock(&(lock_cs[type]));
309     }
310 }

312 static unsigned long
313 thread_id()
314 {
315     return ((unsigned long)thr_self());
316 }

318 KMF_PLUGIN_FUNCLIST *
319 KMF_Plugin_Initialize()
320 {
321     int i;

323     (void) mutex_lock(&init_lock);
324     if (!ssl_initialized) {
325         /*

```

```

326     * Add support for extension OIDs that are not yet in the
327     * openssl default set.
328     */
329     (void) OBJ_create("2.5.29.30", "nameConstraints",
330         "X509v3 Name Constraints");
331     (void) OBJ_create("2.5.29.33", "policyMappings",
332         "X509v3 Policy Mappings");
333     (void) OBJ_create("2.5.29.36", "policyConstraints",
334         "X509v3 Policy Constraints");
335     (void) OBJ_create("2.5.29.46", "freshestCRL",
336         "X509v3 Freshest CRL");
337     (void) OBJ_create("2.5.29.54", "inhibitAnyPolicy",
338         "X509v3 Inhibit Any-Policy");
339     /*
340     * Set up for thread-safe operation.
341     */
342     lock_cs = OPENSSL_malloc(CRYPTO_num_locks() * sizeof (mutex_t));
343     if (lock_cs == NULL) {
344         (void) mutex_unlock(&init_lock);
345         return (NULL);
346     }

348     lock_count = OPENSSL_malloc(CRYPTO_num_locks() * sizeof (long));
349     if (lock_count == NULL) {
350         OPENSSL_free(lock_cs);
351         (void) mutex_unlock(&init_lock);
352         return (NULL);
353     }

355     for (i = 0; i < CRYPTO_num_locks(); i++) {
356         lock_count[i] = 0;
357         (void) mutex_init(&lock_cs[i], USYNC_THREAD, NULL);
358     }

360     CRYPTO_set_id_callback((unsigned long (*)())thread_id);
361     if (CRYPTO_get_locking_callback() == NULL)
362         CRYPTO_set_locking_callback((void (*)())locking_cb);

364     OpenSSL_add_all_algorithms();

366     /* Enable error strings for reporting */
367     ERR_load_crypto_strings();

369     ssl_initialized = 1;
370 }
371 (void) mutex_unlock(&init_lock);

373 return (&openssl_plugin_table);
374 }
375 /*
376 * Convert an SSL DN to a KMF DN.
377 */
378 static KMF_RETURN
379 get_x509_dn(X509_NAME *ssLDN, KMF_X509_NAME *kmfDN)
380 {
381     KMF_DATA derdata;
382     KMF_RETURN rv = KMF_OK;
383     uchar_t *tmp;

385     /* Convert to raw DER format */
386     derdata.Length = i2d_X509_NAME(ssLDN, NULL);
387     if ((tmp = derdata.Data = (uchar_t *)OPENSSL_malloc(derdata.Length))
388         == NULL) {
389         return (KMF_ERR_MEMORY);
390     }
391     (void) i2d_X509_NAME(ssLDN, &tmp);

```

```

393     /* Decode to KMF format */
394     rv = DerDecodeName(&derdata, kmfDN);
395     if (rv != KMF_OK) {
396         rv = KMF_ERR_BAD_CERT_FORMAT;
397     }
398     OPENSSL_free(derdata.Data);

400     return (rv);
401 }

403 int
404 isdir(char *path)
405 {
406     struct stat s;

408     if (stat(path, &s) == -1)
409         return (0);

411     return ((s.st_mode & S_IFMT) == S_IFDIR);
412 }

414 static KMF_RETURN
415 ssl_cert2KMFDATA(KMF_HANDLE *kmfh, X509 *x509cert, KMF_DATA *cert)
416 {
417     KMF_RETURN rv = KMF_OK;
418     unsigned char *buf = NULL, *p;
419     int len;

421     /*
422      * Convert the X509 internal struct to DER encoded data
423      */
424     if ((len = i2d_X509(x509cert, NULL)) < 0) {
425         SET_ERROR(kmfh, ERR_get_error());
426         rv = KMF_ERR_BAD_CERT_FORMAT;
427         goto cleanup;
428     }
429     if ((buf = malloc(len)) == NULL) {
430         SET_SYS_ERROR(kmfh, errno);
431         rv = KMF_ERR_MEMORY;
432         goto cleanup;
433     }

435     /*
436      * i2d_X509 will increment the buf pointer so that we need to
437      * save it.
438      */
439     p = buf;
440     if ((len = i2d_X509(x509cert, &p)) < 0) {
441         SET_ERROR(kmfh, ERR_get_error());
442         free(buf);
443         rv = KMF_ERR_BAD_CERT_FORMAT;
444         goto cleanup;
445     }

447     /* caller's responsibility to free it */
448     cert->Data = buf;
449     cert->Length = len;

451 cleanup:
452     if (rv != KMF_OK) {
453         if (buf)
454             free(buf);
455         cert->Data = NULL;
456         cert->Length = 0;
457     }

```

```

459     return (rv);
460 }

463 static KMF_RETURN
464 check_cert(X509 *xcert, char *issuer, char *subject, KMF_BIGNT *serial,
465            boolean_t *match)
466 {
467     KMF_RETURN rv = KMF_OK;
468     boolean_t findIssuer = FALSE;
469     boolean_t findSubject = FALSE;
470     boolean_t findSerial = FALSE;
471     KMF_X509_NAME issuerDN, subjectDN;
472     KMF_X509_NAME certIssuerDN, certSubjectDN;

474     *match = FALSE;
475     if (xcert == NULL) {
476         return (KMF_ERR_BAD_PARAMETER);
477     }

479     (void) memset(&issuerDN, 0, sizeof (KMF_X509_NAME));
480     (void) memset(&subjectDN, 0, sizeof (KMF_X509_NAME));
481     (void) memset(&certIssuerDN, 0, sizeof (KMF_X509_NAME));
482     (void) memset(&certSubjectDN, 0, sizeof (KMF_X509_NAME));

484     if (issuer != NULL && strlen(issuer)) {
485         rv = kmf_dn_parser(issuer, &issuerDN);
486         if (rv != KMF_OK)
487             return (KMF_ERR_BAD_PARAMETER);

489         rv = get_x509_dn(xcert->cert_info->issuer, &certIssuerDN);
490         if (rv != KMF_OK) {
491             kmf_free_dn(&issuerDN);
492             return (KMF_ERR_BAD_PARAMETER);
493         }

495         findIssuer = TRUE;
496     }
497     if (subject != NULL && strlen(subject)) {
498         rv = kmf_dn_parser(subject, &subjectDN);
499         if (rv != KMF_OK) {
500             rv = KMF_ERR_BAD_PARAMETER;
501             goto cleanup;
502         }

504         rv = get_x509_dn(xcert->cert_info->subject, &certSubjectDN);
505         if (rv != KMF_OK) {
506             rv = KMF_ERR_BAD_PARAMETER;
507             goto cleanup;
508         }
509         findSubject = TRUE;
510     }
511     if (serial != NULL && serial->val != NULL)
512         findSerial = TRUE;

514     if (findSerial) {
515         BIGNUM *bn;

517         /* Comparing BIGNUMs is a pain! */
518         bn = ASN1_INTEGER_to_BN(xcert->cert_info->serialNumber, NULL);
519         if (bn != NULL) {
520             int bnlen = BN_num_bytes(bn);

522             if (bnlen == serial->len) {
523                 uchar_t *a = malloc(bnlen);

```

```

524         if (a == NULL) {
525             rv = KMF_ERR_MEMORY;
526             BN_free(bn);
527             goto cleanup;
528         }
529         bnlen = BN_bn2bin(bn, a);
530         *match = (memcmp(a, serial->val, serial->len) ==
531             0);
532         rv = KMF_OK;
533         free(a);
534     }
535     BN_free(bn);
536     if (!(*match))
537         goto cleanup;
538 } else {
539     rv = KMF_OK;
540     goto cleanup;
541 }
542 }
543 if (findIssuer) {
544     *match = (kmf_compare_rdns(&issuerDN, &certIssuerDN) == 0);
545     if ((*match) == B_FALSE) {
546         /* stop checking and bail */
547         rv = KMF_OK;
548         goto cleanup;
549     }
550 }
551 if (findSubject) {
552     *match = (kmf_compare_rdns(&subjectDN, &certSubjectDN) == 0);
553     if ((*match) == B_FALSE) {
554         /* stop checking and bail */
555         rv = KMF_OK;
556         goto cleanup;
557     }
558 }
559
560 *match = TRUE;
561 cleanup:
562 if (findIssuer) {
563     kmf_free_dn(&issuerDN);
564     kmf_free_dn(&certIssuerDN);
565 }
566 if (findSubject) {
567     kmf_free_dn(&subjectDN);
568     kmf_free_dn(&certSubjectDN);
569 }
570
571 return (rv);
572 }
573
574 /*
575 * This function loads a certificate file into an X509 data structure, and
576 * checks if its issuer, subject or the serial number matches with those
577 * values. If it matches, then return the X509 data structure.
578 */
579 static KMF_RETURN
580 load_X509cert(KMF_HANDLE *kmfh,
581     char *issuer, char *subject, KMF_BIGNT *serial,
582     char *pathname, X509 *outcert)
583 {
584     KMF_RETURN rv = KMF_OK;
585     X509 *xcert = NULL;
586     BIO *bcert = NULL;
587     boolean_t match = FALSE;
588     KMF_ENCODE_FORMAT format;

```

```

591     /*
592     * auto-detect the file format, regardless of what
593     * the 'format' parameters in the params say.
594     */
595     rv = kmf_get_file_format(pathname, &format);
596     if (rv != KMF_OK) {
597         if (rv == KMF_ERR_OPEN_FILE)
598             rv = KMF_ERR_CERT_NOT_FOUND;
599         return (rv);
600     }
601
602     /* Not ASN1(DER) format */
603     if ((bcert = BIO_new_file(pathname, "rb")) == NULL) {
604         SET_ERROR(kmfh, ERR_get_error());
605         rv = KMF_ERR_OPEN_FILE;
606         goto cleanup;
607     }
608
609     if (format == KMF_FORMAT_PEM)
610         xcert = PEM_read_bio_X509_AUX(bcert, NULL, NULL, NULL);
611     else if (format == KMF_FORMAT_ASN1)
612         xcert = d2i_X509_bio(bcert, NULL);
613     else if (format == KMF_FORMAT_PKCS12) {
614         PKCS12 *p12 = d2i_PKCS12_bio(bcert, NULL);
615         if (p12 != NULL) {
616             (void) PKCS12_parse(p12, NULL, NULL, &xcert, NULL);
617             PKCS12_free(p12);
618             p12 = NULL;
619         } else {
620             SET_ERROR(kmfh, ERR_get_error());
621             rv = KMF_ERR_BAD_CERT_FORMAT;
622         }
623     } else {
624         rv = KMF_ERR_BAD_PARAMETER;
625         goto cleanup;
626     }
627
628     if (xcert == NULL) {
629         SET_ERROR(kmfh, ERR_get_error());
630         rv = KMF_ERR_BAD_CERT_FORMAT;
631         goto cleanup;
632     }
633
634     if (check_cert(xcert, issuer, subject, serial, &match) != KMF_OK ||
635         match == FALSE) {
636         rv = KMF_ERR_CERT_NOT_FOUND;
637         goto cleanup;
638     }
639
640     if (outcert != NULL) {
641         *outcert = xcert;
642     }
643
644     cleanup:
645     if (bcert != NULL) (void) BIO_free(bcert);
646     if (rv != KMF_OK && xcert != NULL)
647         X509_free(xcert);
648
649     return (rv);
650 }
651
652 static int
653 datacmp(const void *a, const void *b)
654 {
655     KMF_DATA *adata = (KMF_DATA *)a;

```

```

656     KMF_DATA *bdata = (KMF_DATA *)b;
657     if (adata->Length > bdata->Length)
658         return (-1);
659     if (adata->Length < bdata->Length)
660         return (1);
661     return (0);
662 }

664 static KMF_RETURN
665 load_certs(KMF_HANDLE *kmfh, char *issuer, char *subject, KMF_BIGINT *serial,
666           KMF_CERT_VALIDITY validity, char *pathname,
667           KMF_DATA **certlist, uint32_t *numcerts)
668 {
669     KMF_RETURN rv = KMF_OK;
670     int i;
671     KMF_DATA *certs = NULL;
672     int nc = 0;
673     int hits = 0;
674     KMF_ENCODE_FORMAT format;

676     rv = kmf_get_file_format(pathname, &format);
677     if (rv != KMF_OK) {
678         if (rv == KMF_ERR_OPEN_FILE)
679             rv = KMF_ERR_CERT_NOT_FOUND;
680         return (rv);
681     }
682     if (format == KMF_FORMAT_ASN1) {
683         /* load a single certificate */
684         certs = (KMF_DATA *)malloc(sizeof (KMF_DATA));
685         if (certs == NULL)
686             return (KMF_ERR_MEMORY);
687         certs->Data = NULL;
688         certs->Length = 0;
689         rv = kmf_load_cert(kmfh, issuer, subject, serial, validity,
690                           pathname, certs);
691         if (rv == KMF_OK) {
692             *certlist = certs;
693             *numcerts = 1;
694         } else {
695             kmf_free_data(certs);
696             free(certs);
697             certs = NULL;
698         }
699         return (rv);
700     } else if (format == KMF_FORMAT_PKCS12) {
701         /* We need a credential to access a PKCS#12 file */
702         rv = KMF_ERR_BAD_CERT_FORMAT;
703     } else if (format == KMF_FORMAT_PEM ||
704               format == KMF_FORMAT_PEM_KEYPAIR) {
705         /* This function only works on PEM files */
706         rv = extract_pem(kmfh, issuer, subject, serial, pathname,
707                          (uchar_t *)NULL, 0, NULL, &certs, &nc);
708     } else {
709         return (KMF_ERR_ENCODING);
710     }

713     if (rv != KMF_OK)
714         return (rv);

716     for (i = 0; i < nc; i++) {
717         if (validity == KMF_NONEXPIRED_CERTS) {
718             rv = kmf_check_cert_date(kmfh, &certs[i]);
719         } else if (validity == KMF_EXPIRED_CERTS) {
720             rv = kmf_check_cert_date(kmfh, &certs[i]);
721             if (rv == KMF_OK)

```

```

722         rv = KMF_ERR_CERT_NOT_FOUND;
723         if (rv == KMF_ERR_VALIDITY_PERIOD)
724             rv = KMF_OK;
725     }
726     if (rv != KMF_OK) {
727         /* Remove this cert from the list by clearing it. */
728         kmf_free_data(&certs[i]);
729     } else {
730         hits++; /* count valid certs found */
731     }
732     rv = KMF_OK;
733 }
734 if (rv == KMF_OK && hits > 0) {
735     /*
736      * Sort the list of certs by length to put the cleared ones
737      * at the end so they don't get accessed by the caller.
738      */
739     qsort((void *)certs, nc, sizeof (KMF_DATA), datacmp);
740     *certlist = certs;

742     /* since we sorted the list, just return the number of hits */
743     *numcerts = hits;
744 } else {
745     if (rv == KMF_OK && hits == 0)
746         rv = KMF_ERR_CERT_NOT_FOUND;
747     if (certs != NULL) {
748         free(certs);
749         certs = NULL;
750     }
751 }
752 return (rv);
753 }

755 static KMF_RETURN
756 kmf_load_cert(KMF_HANDLE *kmfh,
757               char *issuer, char *subject, KMF_BIGINT *serial,
758               KMF_CERT_VALIDITY validity,
759               char *pathname,
760               KMF_DATA *cert)
761 {
762     KMF_RETURN rv = KMF_OK;
763     X509 *x509cert = NULL;

765     rv = load_X509cert(kmfh, issuer, subject, serial, pathname, &x509cert);
766     if (rv == KMF_OK && x509cert != NULL && cert != NULL) {
767         rv = ssl_cert2KMFDATA(kmfh, x509cert, cert);
768         if (rv != KMF_OK) {
769             goto cleanup;
770         }
771         if (validity == KMF_NONEXPIRED_CERTS) {
772             rv = kmf_check_cert_date(kmfh, cert);
773         } else if (validity == KMF_EXPIRED_CERTS) {
774             rv = kmf_check_cert_date(kmfh, cert);
775             if (rv == KMF_OK) {
776                 /*
777                  * This is a valid cert so skip it.
778                  */
779                 rv = KMF_ERR_CERT_NOT_FOUND;
780             }
781             if (rv == KMF_ERR_VALIDITY_PERIOD) {
782                 /*
783                  * We want to return success when we
784                  * find an invalid cert.
785                  */
786                 rv = KMF_OK;
787                 goto cleanup;

```

```

788     }
789 }
790 cleanup:
791 if (x509cert != NULL)
792     X509_free(x509cert);
793
794 return (rv);
795 }
796
797 static KMF_RETURN
798 readAltFormatPrivateKey(KMF_DATA *filedata, EVP_PKEY **pkey)
799 {
800     KMF_RETURN ret = KMF_OK;
801     KMF_RAW_RSA_KEY rsa;
802     BerElement *asn1 = NULL;
803     BerValue filebuf;
804     BerValue OID = { NULL, 0 };
805     BerValue *Mod = NULL, *PubExp = NULL;
806     BerValue *PriExp = NULL, *Prime1 = NULL, *Prime2 = NULL;
807     BerValue *Coef = NULL;
808     BIGNUM *D = NULL, *P = NULL, *Q = NULL, *COEF = NULL;
809     BIGNUM *Exp1 = NULL, *Exp2 = NULL, *pminus1 = NULL;
810     BIGNUM *qminus1 = NULL;
811     BN_CTX *ctx = NULL;
812
813     *pkey = NULL;
814
815     filebuf.bv_val = (char *)filedata->Data;
816     filebuf.bv_len = filedata->Length;
817
818     asn1 = kmfder_init(&filebuf);
819     if (asn1 == NULL) {
820         ret = KMF_ERR_MEMORY;
821         goto out;
822     }
823
824     if (kmfber_scanf(asn1, "{{Dn{IIIIII}}}",
825         &OID, &Mod, &PubExp, &PriExp, &Prime1,
826         &Prime2, &Coef) == -1) {
827         ret = KMF_ERR_ENCODING;
828         goto out;
829     }
830
831     /*
832     * We have to derive the 2 Exponents using Bignumber math.
833     * Exp1 = PriExp mod (Prime1 - 1)
834     * Exp2 = PriExp mod (Prime2 - 1)
835     */
836
837     /* D = PrivateExponent */
838     D = BN_bin2bn((const uchar_t *)PriExp->bv_val, PriExp->bv_len, D);
839     if (D == NULL) {
840         ret = KMF_ERR_MEMORY;
841         goto out;
842     }
843
844     /* P = Prime1 (first prime factor of Modulus) */
845     P = BN_bin2bn((const uchar_t *)Prime1->bv_val, Prime1->bv_len, P);
846     if (D == NULL) {
847         ret = KMF_ERR_MEMORY;
848         goto out;
849     }
850
851     /* Q = Prime2 (second prime factor of Modulus) */
852     Q = BN_bin2bn((const uchar_t *)Prime2->bv_val, Prime2->bv_len, Q);

```

```

855     if ((ctx = BN_CTX_new()) == NULL) {
856         ret = KMF_ERR_MEMORY;
857         goto out;
858     }
859
860     /* Compute (P - 1) */
861     pminus1 = BN_new();
862     (void) BN_sub(pminus1, P, BN_value_one());
863
864     /* Exponent1 = D mod (P - 1) */
865     Exp1 = BN_new();
866     (void) BN_mod(Exp1, D, pminus1, ctx);
867
868     /* Compute (Q - 1) */
869     qminus1 = BN_new();
870     (void) BN_sub(qminus1, Q, BN_value_one());
871
872     /* Exponent2 = D mod (Q - 1) */
873     Exp2 = BN_new();
874     (void) BN_mod(Exp2, D, qminus1, ctx);
875
876     /* Coef = (Inverse Q) mod P */
877     COEF = BN_new();
878     (void) BN_mod_inverse(COEF, Q, P, ctx);
879
880     /* Convert back to KMF format */
881     (void) memset(&rsa, 0, sizeof (rsa));
882
883     if ((ret = sslBN2KMFBN(Exp1, &rsa.exp1)) != KMF_OK)
884         goto out;
885     if ((ret = sslBN2KMFBN(Exp2, &rsa.exp2)) != KMF_OK)
886         goto out;
887     if ((ret = sslBN2KMFBN(COEF, &rsa.coef)) != KMF_OK)
888         goto out;
889
890     rsa.mod.val = (uchar_t *)Mod->bv_val;
891     rsa.mod.len = Mod->bv_len;
892
893     rsa.pubexp.val = (uchar_t *)PubExp->bv_val;
894     rsa.pubexp.len = PubExp->bv_len;
895
896     rsa.priexp.val = (uchar_t *)PriExp->bv_val;
897     rsa.priexp.len = PriExp->bv_len;
898
899     rsa.prime1.val = (uchar_t *)Prime1->bv_val;
900     rsa.prime1.len = Prime1->bv_len;
901
902     rsa.prime2.val = (uchar_t *)Prime2->bv_val;
903     rsa.prime2.len = Prime2->bv_len;
904
905     *pkey = ImportRawRSAKey(&rsa);
906 out:
907     if (asn1 != NULL)
908         kmfber_free(asn1, 1);
909
910     if (OID.bv_val) {
911         free(OID.bv_val);
912     }
913     if (PriExp)
914         free(PriExp);
915
916     if (Mod)
917         free(Mod);
918
919     if (PubExp)

```

```

920         free(PubExp);
922     if (Coef) {
923         (void) memset(Coef->bv_val, 0, Coef->bv_len);
924         free(Coef->bv_val);
925         free(Coef);
926     }
927     if (Prime1)
928         free(Prime1);
929     if (Prime2)
930         free(Prime2);
932     if (ctx != NULL)
933         BN_CTX_free(ctx);
935     if (D)
936         BN_clear_free(D);
937     if (P)
938         BN_clear_free(P);
939     if (Q)
940         BN_clear_free(Q);
941     if (pminus1)
942         BN_clear_free(pminus1);
943     if (qminus1)
944         BN_clear_free(qminus1);
945     if (Exp1)
946         BN_clear_free(Exp1);
947     if (Exp2)
948         BN_clear_free(Exp2);
950     return (ret);
952 }
954 static EVP_PKEY *
955 openssl_load_key(KMF_HANDLE_T handle, const char *file)
956 {
957     BIO *keyfile = NULL;
958     EVP_PKEY *pkey = NULL;
959     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
960     KMF_ENCODE_FORMAT format;
961     KMF_RETURN rv;
962     KMF_DATA filedata;
964     if (file == NULL) {
965         return (NULL);
966     }
968     if (kmf_get_file_format((char *)file, &format) != KMF_OK)
969         return (NULL);
971     keyfile = BIO_new_file(file, "rb");
972     if (keyfile == NULL) {
973         goto end;
974     }
976     if (format == KMF_FORMAT_ASN1) {
977         pkey = d2i_PrivateKey_bio(keyfile, NULL);
978         if (pkey == NULL) {
980             (void) BIO_free(keyfile);
981             keyfile = NULL;
982             /* Try odd ASN.1 variations */
983             rv = kmf_read_input_file(kmfh, (char *)file,
984                                     &filedata);
985             if (rv == KMF_OK) {

```

```

986         (void) readAltFormatPrivateKey(&filedata,
987                                         &pkey);
988         kmf_free_data(&filedata);
989     }
990 } else if (format == KMF_FORMAT_PEM ||
991            format == KMF_FORMAT_PEM_KEYPAIR) {
992     pkey = PEM_read_bio_PrivateKey(keyfile, NULL, NULL, NULL);
993     if (pkey == NULL) {
994         KMF_DATA derdata;
995         /*
996          * Check if this is the alt. format
997          * RSA private key file.
998          */
999         rv = kmf_read_input_file(kmfh, (char *)file,
1000                                 &filedata);
1001         if (rv == KMF_OK) {
1002             uchar_t *d = NULL;
1003             int len;
1004             rv = kmf_pem_to_der(filedata.Data,
1005                                &len);
1006             if (rv == KMF_OK && d != NULL) {
1007                 derdata.Data = d;
1008                 derdata.Length = (size_t)len;
1009                 (void) readAltFormatPrivateKey(
1010                     &derdata, &pkey);
1011                 free(d);
1012             }
1013             kmf_free_data(&filedata);
1014         }
1015     }
1016 }
1017 }
1019 end:
1020 if (pkey == NULL)
1021     SET_ERROR(kmfh, ERR_get_error());
1023 if (keyfile != NULL)
1024     (void) BIO_free(keyfile);
1026 return (pkey);
1027 }
1029 KMF_RETURN
1030 OpenSSL_FindCert(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
1031 {
1032     KMF_RETURN rv = KMF_OK;
1033     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
1034     int i, n;
1035     uint32_t maxcerts = 0;
1036     uint32_t *num_certs;
1037     KMF_X509_DER_CERT *kmf_cert = NULL;
1038     char *dirpath = NULL;
1039     char *filename = NULL;
1040     char *fullpath = NULL;
1041     char *issuer = NULL;
1042     char *subject = NULL;
1043     KMF_BIGINTEGER *serial = NULL;
1044     KMF_CERT_VALIDITY validity;
1046     num_certs = kmf_get_attr_ptr(KMF_COUNT_ATTR, attrlist, numattr);
1047     if (num_certs == NULL)
1048         return (KMF_ERR_BAD_PARAMETER);
1050     /* num_certs should reference the size of kmf_cert */
1051     maxcerts = *num_certs;

```



```

1052     if (maxcerts == 0)
1053         maxcerts = 0xFFFFFFFF;
1054     *num_certs = 0;

1056     /* Get the optional returned certificate list */
1057     kmf_cert = kmf_get_attr_ptr(KMF_X509_DER_CERT_ATTR, attrlist,
1058                                numattr);

1060     /*
1061      * The dirpath attribute and the filename attribute can not be NULL
1062      * at the same time.
1063      */
1064     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
1065     filename = kmf_get_attr_ptr(KMF_CERT_FILENAME_ATTR, attrlist,
1066                                numattr);

1068     fullpath = get_fullpath(dirpath, filename);
1069     if (fullpath == NULL)
1070         return (KMF_ERR_BAD_PARAMETER);

1072     /* Get optional search criteria attributes */
1073     issuer = kmf_get_attr_ptr(KMF_ISSUER_NAME_ATTR, attrlist, numattr);
1074     subject = kmf_get_attr_ptr(KMF_SUBJECT_NAME_ATTR, attrlist, numattr);
1075     serial = kmf_get_attr_ptr(KMF_BIGINT_ATTR, attrlist, numattr);
1076     rv = kmf_get_attr(KMF_CERT_VALIDITY_ATTR, attrlist, numattr,
1077                      &validity, NULL);
1078     if (rv != KMF_OK) {
1079         validity = KMF_ALL_CERTS;
1080         rv = KMF_OK;
1081     }

1083     if (isdir(fullpath)) {
1084         DIR *dirp;
1085         struct dirent *dp;

1087         n = 0;
1088         /* open all files in the directory and attempt to read them */
1089         if ((dirp = opendir(fullpath)) == NULL) {
1090             return (KMF_ERR_BAD_PARAMETER);
1091         }
1092         while ((dp = readdir(dirp)) != NULL) {
1093             char *fname;
1094             KMF_DATA *certlist = NULL;
1095             uint32_t loaded_certs = 0;

1097             if (strcmp(dp->d_name, ".") == 0 ||
1098                 strcmp(dp->d_name, "..") == 0)
1099                 continue;

1101             fname = get_fullpath(fullpath, (char *)dp->d_name);

1103             rv = load_certs(kmfh, issuer, subject, serial,
1104                             validity, fname, &certlist, &loaded_certs);

1106             if (rv != KMF_OK) {
1107                 free(fname);
1108                 if (certlist != NULL) {
1109                     for (i = 0; i < loaded_certs; i++)
1110                         kmf_free_data(&certlist[i]);
1111                     free(certlist);
1112                 }
1113                 continue;
1114             }

1116             /* If load succeeds, add certdata to the list */
1117             if (kmf_cert != NULL) {

```

```

1118         for (i = 0; i < loaded_certs &&
1119              n < maxcerts; i++) {
1120             kmf_cert[n].certificate.Data =
1121                 certlist[i].Data;
1122             kmf_cert[n].certificate.Length =
1123                 certlist[i].Length;

1125             kmf_cert[n].kmf_private.keystore_type =
1126                 KMF_KEYSTORE_OPENSSL;
1127             kmf_cert[n].kmf_private.flags =
1128                 KMF_FLAG_CERT_VALID;
1129             kmf_cert[n].kmf_private.label =
1130                 strdup(fname);
1131             n++;
1132         }
1133     /*
1134      * If maxcerts < loaded_certs, clean up the
1135      * certs that were not used.
1136      */
1137     for (; i < loaded_certs; i++)
1138         kmf_free_data(&certlist[i]);
1139     } else {
1140         for (i = 0; i < loaded_certs; i++)
1141             kmf_free_data(&certlist[i]);
1142         n += loaded_certs;
1143     }
1144     free(certlist);
1145     free(fname);
1146 }
1147 (*num_certs) = n;
1148 if (*num_certs == 0)
1149     rv = KMF_ERR_CERT_NOT_FOUND;
1150 if (*num_certs > 0)
1151     rv = KMF_OK;
1152 exit:
1153 (void) closedir(dirp);
1154 } else {
1155     KMF_DATA *certlist = NULL;
1156     uint32_t loaded_certs = 0;

1158     rv = load_certs(kmfh, issuer, subject, serial, validity,
1159                     fullpath, &certlist, &loaded_certs);
1160     if (rv != KMF_OK) {
1161         free(fullpath);
1162         return (rv);
1163     }

1165     n = 0;
1166     if (kmf_cert != NULL && certlist != NULL) {
1167         for (i = 0; i < loaded_certs && i < maxcerts; i++) {
1168             kmf_cert[n].certificate.Data =
1169                 certlist[i].Data;
1170             kmf_cert[n].certificate.Length =
1171                 certlist[i].Length;
1172             kmf_cert[n].kmf_private.keystore_type =
1173                 KMF_KEYSTORE_OPENSSL;
1174             kmf_cert[n].kmf_private.flags =
1175                 KMF_FLAG_CERT_VALID;
1176             kmf_cert[n].kmf_private.label =
1177                 strdup(fullpath);
1178             n++;
1179         }
1180         /* If maxcerts < loaded_certs, clean up */
1181         for (; i < loaded_certs; i++)
1182             kmf_free_data(&certlist[i]);
1183     } else if (certlist != NULL) {

```

```

1184         for (i = 0; i < loaded_certs; i++)
1185             kmf_free_data(&certlist[i]);
1186         n = loaded_certs;
1187     }
1188     if (certlist != NULL)
1189         free(certlist);
1190     *num_certs = n;
1191 }
1193 free(fullpath);
1195 return (rv);
1196 }
1198 void
1199 /*ARGSUSED*/
1200 OpenSSL_FreeKMFcert(KMF_HANDLE_T handle,
1201 KMF_X509_DER_CERT *kmf_cert)
1202 {
1203     if (kmf_cert != NULL) {
1204         if (kmf_cert->certificate.Data != NULL) {
1205             kmf_free_data(&kmf_cert->certificate);
1206         }
1207         if (kmf_cert->kmf_private.label)
1208             free(kmf_cert->kmf_private.label);
1209     }
1210 }
1212 /*ARGSUSED*/
1213 KMF_RETURN
1214 OpenSSL_StoreCert(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
1215 {
1216     KMF_RETURN ret = KMF_OK;
1217     KMF_DATA *cert = NULL;
1218     char *outfilename = NULL;
1219     char *dirpath = NULL;
1220     char *fullpath = NULL;
1221     KMF_ENCODE_FORMAT format;
1223     /* Get the cert data */
1224     cert = kmf_get_attr_ptr(KMF_CERT_DATA_ATTR, attrlist, numattr);
1225     if (cert == NULL || cert->Data == NULL)
1226         return (KMF_ERR_BAD_PARAMETER);
1228     /* Check the output filename and directory attributes. */
1229     outfile = kmf_get_attr_ptr(KMF_CERT_FILENAME_ATTR, attrlist,
1230 numattr);
1231     if (outfile == NULL)
1232         return (KMF_ERR_BAD_PARAMETER);
1234     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
1235     fullpath = get_fullpath(dirpath, outfile);
1236     if (fullpath == NULL)
1237         return (KMF_ERR_BAD_CERTFILE);
1239     /* Check the optional format attribute */
1240     ret = kmf_get_attr(KMF_ENCODE_FORMAT_ATTR, attrlist, numattr,
1241 &format, NULL);
1242     if (ret != KMF_OK) {
1243         /* If there is no format attribute, then default to PEM */
1244         format = KMF_FORMAT_PEM;
1245         ret = KMF_OK;
1246     } else if (format != KMF_FORMAT_ASN1 && format != KMF_FORMAT_PEM) {
1247         ret = KMF_ERR_BAD_CERT_FORMAT;
1248         goto out;
1249     }

```

```

1251     /* Store the certificate in the file with the specified format */
1252     ret = kmf_create_cert_file(cert, format, fullpath);
1254 out:
1255     if (fullpath != NULL)
1256         free(fullpath);
1258     return (ret);
1259 }
1262 KMF_RETURN
1263 OpenSSL_DeleteCert(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
1264 {
1265     KMF_RETURN rv;
1266     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
1267     KMF_DATA certdata = {NULL, 0};
1268     char *dirpath = NULL;
1269     char *filename = NULL;
1270     char *fullpath = NULL;
1271     char *issuer = NULL;
1272     char *subject = NULL;
1273     KMF_BIGINT *serial = NULL;
1274     KMF_CERT_VALIDITY validity;
1276     /*
1277      * Get the DIRPATH and CERT_FILENAME attributes. They can not be
1278      * NULL at the same time.
1279      */
1280     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
1281     filename = kmf_get_attr_ptr(KMF_CERT_FILENAME_ATTR, attrlist,
1282 numattr);
1283     fullpath = get_fullpath(dirpath, filename);
1284     if (fullpath == NULL)
1285         return (KMF_ERR_BAD_PARAMETER);
1287     /* Get optional search criteria attributes */
1288     issuer = kmf_get_attr_ptr(KMF_ISSUER_NAME_ATTR, attrlist, numattr);
1289     subject = kmf_get_attr_ptr(KMF_SUBJECT_NAME_ATTR, attrlist, numattr);
1290     serial = kmf_get_attr_ptr(KMF_BIGINT_ATTR, attrlist, numattr);
1291     rv = kmf_get_attr(KMF_CERT_VALIDITY_ATTR, attrlist, numattr,
1292 &validity, NULL);
1293     if (rv != KMF_OK) {
1294         validity = KMF_ALL_CERTS;
1295         rv = KMF_OK;
1296     }
1298     if (isdir(fullpath)) {
1299         DIR *dirp;
1300         struct dirent *dp;
1302         /* open all files in the directory and attempt to read them */
1303         if ((dirp = opendir(fullpath)) == NULL) {
1304             return (KMF_ERR_BAD_PARAMETER);
1305         }
1307         while ((dp = readdir(dirp)) != NULL) {
1308             if (strcmp(dp->d_name, ".") != 0 &&
1309                 strcmp(dp->d_name, "..") != 0) {
1310                 char *fname;
1312                 fname = get_fullpath(fullpath,
1313 (char *)&dp->d_name);
1315                 if (fname == NULL) {

```

```

1316         rv = KMF_ERR_MEMORY;
1317         break;
1318     }
1319
1320     rv = kmf_load_cert(kmfh, issuer, subject,
1321         serial, validity, fname, &certdata);
1322
1323     if (rv == KMF_ERR_CERT_NOT_FOUND) {
1324         free(fname);
1325         kmf_free_data(&certdata);
1326         rv = KMF_OK;
1327         continue;
1328     } else if (rv != KMF_OK) {
1329         free(fname);
1330         break;
1331     }
1332
1333     if (unlink(fname) != 0) {
1334         SET_SYS_ERROR(kmfh, errno);
1335         rv = KMF_ERR_INTERNAL;
1336         free(fname);
1337         break;
1338     }
1339     free(fname);
1340     kmf_free_data(&certdata);
1341 }
1342 }
1343 (void) closedir(dirp);
1344 } else {
1345     /* Just try to load a single certificate */
1346     rv = kmf_load_cert(kmfh, issuer, subject, serial, validity,
1347         fullpath, &certdata);
1348     if (rv == KMF_OK) {
1349         if (unlink(fullpath) != 0) {
1350             SET_SYS_ERROR(kmfh, errno);
1351             rv = KMF_ERR_INTERNAL;
1352         }
1353     }
1354 }
1355 }
1356
1357 out:
1358     if (fullpath != NULL)
1359         free(fullpath);
1360
1361     kmf_free_data(&certdata);
1362
1363     return (rv);
1364 }
1365
1366 KMF_RETURN
1367 OpenSSL_EncodePubKeyData(KMF_HANDLE_T handle, KMF_KEY_HANDLE *key,
1368     KMF_DATA *keydata)
1369 {
1370     KMF_RETURN rv = KMF_OK;
1371     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
1372     int n;
1373
1374     if (key == NULL || keydata == NULL ||
1375         key->keyp == NULL)
1376         return (KMF_ERR_BAD_PARAMETER);
1377
1378     if (key->keyalg == KMF_RSA) {
1379         RSA *pubkey = EVP_PKEY_get1_RSA(key->keyp);
1380
1381         if (!(n = i2d_RSA_PUBKEY(pubkey, &keydata->Data))) {
1382             SET_ERROR(kmfh, ERR_get_error());
1383             return (KMF_ERR_INTERNAL);
1384         }
1385     }
1386 }

```

```

1382         return (KMF_ERR_ENCODING);
1383     }
1384     RSA_free(pubkey);
1385 } else if (key->keyalg == KMF_DSA) {
1386     DSA *pubkey = EVP_PKEY_get1_DSA(key->keyp);
1387
1388     if (!(n = i2d_DSA_PUBKEY(pubkey, &keydata->Data))) {
1389         SET_ERROR(kmfh, ERR_get_error());
1390         return (KMF_ERR_ENCODING);
1391     }
1392     DSA_free(pubkey);
1393 } else {
1394     return (KMF_ERR_BAD_PARAMETER);
1395 }
1396 keydata->Length = n;
1397
1398 cleanup:
1399 if (rv != KMF_OK) {
1400     if (keydata->Data)
1401         free(keydata->Data);
1402     keydata->Data = NULL;
1403     keydata->Length = 0;
1404 }
1405
1406 return (rv);
1407 }
1408
1409 static KMF_RETURN
1410 ssl_write_key(KMF_HANDLE *kmfh, KMF_ENCODE_FORMAT format, BIO *out,
1411 KMF_CREDENTIAL *cred, EVP_PKEY *pkey, boolean_t private)
1412 {
1413     int rv = 0;
1414     RSA *rsa;
1415     DSA *dsa;
1416
1417     if (pkey == NULL || out == NULL)
1418         return (KMF_ERR_BAD_PARAMETER);
1419
1420     switch (format) {
1421     case KMF_FORMAT_RAWKEY:
1422         /* same as ASN.1 */
1423     case KMF_FORMAT_ASN1:
1424         if (pkey->type == EVP_PKEY_RSA) {
1425             rsa = EVP_PKEY_get1_RSA(pkey);
1426             if (private)
1427                 rv = i2d_RSAPrivateKey_bio(out, rsa);
1428             else
1429                 rv = i2d_RSAPublicKey_bio(out, rsa);
1430             RSA_free(rsa);
1431         } else if (pkey->type == EVP_PKEY_DSA) {
1432             dsa = EVP_PKEY_get1_DSA(pkey);
1433             rv = i2d_DSAPrivateKey_bio(out, dsa);
1434             DSA_free(dsa);
1435         }
1436         if (rv == 1) {
1437             rv = KMF_OK;
1438         } else {
1439             SET_ERROR(kmfh, rv);
1440         }
1441         break;
1442     case KMF_FORMAT_PEM:
1443         if (pkey->type == EVP_PKEY_RSA) {
1444             rsa = EVP_PKEY_get1_RSA(pkey);
1445             if (private)
1446                 rv = PEM_write_bio_RSAPrivateKey(out,
1447                 rsa, NULL, NULL, 0, NULL,

```

```

1448         (cred != NULL ? cred->cred : NULL));
1449     else
1450         rv = PEM_write_bio_RSAPublicKey(out,
1451             rsa);
1452     RSA_free(rsa);
1453 } else if (pkey->type == EVP_PKEY_DSA) {
1454     dsa = EVP_PKEY_get1_DSA(pkey);
1455     rv = PEM_write_bio_DSAPrivateKey(out,
1456         dsa, NULL, NULL, 0, NULL,
1457         (cred != NULL ? cred->cred : NULL));
1458     DSA_free(dsa);
1459 }
1461 if (rv == 1) {
1462     rv = KMF_OK;
1463 } else {
1464     SET_ERROR(kmfh, rv);
1465 }
1466 break;
1468 default:
1469     rv = KMF_ERR_BAD_PARAMETER;
1470 }
1472 return (rv);
1473 }
1475 KMF_RETURN
1476 OpenSSL_CreateKeypair(KMF_HANDLE_T handle, int numattr,
1477     KMF_ATTRIBUTE *attrlist)
1478 {
1479     KMF_RETURN rv = KMF_OK;
1480     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
1481     uint32_t eValue = 0x010001;
1482     RSA *sslPrivKey = NULL;
1483     DSA *sslDSAKey = NULL;
1484     EVP_PKEY *eprikey = NULL;
1485     EVP_PKEY *epubkey = NULL;
1486     BIO *out = NULL;
1487     KMF_KEY_HANDLE *pubkey = NULL, *privkey = NULL;
1488     uint32_t keylen = 1024;
1489     uint32_t keylen_size = sizeof (uint32_t);
1490     boolean_t storekey = TRUE;
1491     KMF_KEY_ALG keytype = KMF_RSA;
1493     rv = kmf_get_attr(KMF_STOREKEY_BOOL_ATTR, attrlist, numattr,
1494         &storekey, NULL);
1495     if (rv != KMF_OK) {
1496         /* "storekey" is optional. Default is TRUE */
1497         rv = KMF_OK;
1498     }
1500     rv = kmf_get_attr(KMF_KEYALG_ATTR, attrlist, numattr,
1501         (void *)&keytype, NULL);
1502     if (rv != KMF_OK)
1503         /* keytype is optional. KMF_RSA is default */
1504         rv = KMF_OK;
1506     pubkey = kmf_get_attr_ptr(KMF_PUBKEY_HANDLE_ATTR, attrlist, numattr);
1507     if (pubkey == NULL)
1508         return (KMF_ERR_BAD_PARAMETER);
1510     privkey = kmf_get_attr_ptr(KMF_PRIVKEY_HANDLE_ATTR, attrlist, numattr);
1511     if (privkey == NULL)
1512         return (KMF_ERR_BAD_PARAMETER);

```

```

1514     (void) memset(pubkey, 0, sizeof (KMF_KEY_HANDLE));
1515     (void) memset(privkey, 0, sizeof (KMF_KEY_HANDLE));
1517     eprikey = EVP_PKEY_new();
1518     if (eprikey == NULL) {
1519         SET_ERROR(kmfh, ERR_get_error());
1520         rv = KMF_ERR_KEYGEN_FAILED;
1521         goto cleanup;
1522     }
1523     epubkey = EVP_PKEY_new();
1524     if (epubkey == NULL) {
1525         SET_ERROR(kmfh, ERR_get_error());
1526         rv = KMF_ERR_KEYGEN_FAILED;
1527         goto cleanup;
1528     }
1529     if (keytype == KMF_RSA) {
1530         KMF_BIGNT *rsaexp = NULL;
1532         rsaexp = kmf_get_attr_ptr(KMF_RSAEXP_ATTR, attrlist, numattr);
1533         if (rsaexp != NULL) {
1534             if (rsaexp->len > 0 &&
1535                 rsaexp->len <= sizeof (eValue) &&
1536                 rsaexp->val != NULL) {
1537                 /* LINTED E_BAD_PTR_CAST_ALIGN */
1538                 eValue = *(uint32_t *)rsaexp->val;
1539             } else {
1540                 rv = KMF_ERR_BAD_PARAMETER;
1541                 goto cleanup;
1542             }
1543         } else {
1544             /* RSA Exponent is optional. Default is 0x10001 */
1545             rv = KMF_OK;
1546         }
1548         rv = kmf_get_attr(KMF_KEYLENGTH_ATTR, attrlist, numattr,
1549             &keylen, &keylen_size);
1550         if (rv == KMF_ERR_ATTR_NOT_FOUND)
1551             /* keylen is optional, default is 1024 */
1552             rv = KMF_OK;
1553         if (rv != KMF_OK) {
1554             rv = KMF_ERR_BAD_PARAMETER;
1555             goto cleanup;
1556         }
1558         sslPrivKey = RSA_generate_key(keylen, eValue, NULL, NULL);
1559         if (sslPrivKey == NULL) {
1560             SET_ERROR(kmfh, ERR_get_error());
1561             rv = KMF_ERR_KEYGEN_FAILED;
1562         } else {
1563             (void) EVP_PKEY_set1_RSA(eprikey, sslPrivKey);
1564             privkey->kstype = KMF_KEYSTORE_OPENSSL;
1565             privkey->keyalg = KMF_RSA;
1566             privkey->keyclass = KMF_ASYM_PRI;
1567             privkey->israw = FALSE;
1568             privkey->keyp = (void *)eprikey;
1570             /* OpenSSL derives the public key from the private */
1571             (void) EVP_PKEY_set1_RSA(epubkey, sslPrivKey);
1572             pubkey->kstype = KMF_KEYSTORE_OPENSSL;
1573             pubkey->keyalg = KMF_RSA;
1574             pubkey->israw = FALSE;
1575             pubkey->keyclass = KMF_ASYM_PUB;
1576             pubkey->keyp = (void *)epubkey;
1577         }
1578     } else if (keytype == KMF_DSA) {
1579         DSA *dp;

```

```

1580     sslDSAKey = DSA_new();
1581     if (sslDSAKey == NULL) {
1582         SET_ERROR(kmfh, ERR_get_error());
1583         return (KMF_ERR_MEMORY);
1584     }

1586     if ((sslDSAKey->p = BN_bin2bn(P, sizeof (P), sslDSAKey->p)) ==
1587         NULL) {
1588         SET_ERROR(kmfh, ERR_get_error());
1589         rv = KMF_ERR_KEYGEN_FAILED;
1590         goto cleanup;
1591     }
1592     if ((sslDSAKey->q = BN_bin2bn(Q, sizeof (Q), sslDSAKey->q)) ==
1593         NULL) {
1594         SET_ERROR(kmfh, ERR_get_error());
1595         rv = KMF_ERR_KEYGEN_FAILED;
1596         goto cleanup;
1597     }
1598     if ((sslDSAKey->g = BN_bin2bn(G, sizeof (G), sslDSAKey->g)) ==
1599         NULL) {
1600         SET_ERROR(kmfh, ERR_get_error());
1601         rv = KMF_ERR_KEYGEN_FAILED;
1602         goto cleanup;
1603     }

1605     if (!DSA_generate_key(sslDSAKey)) {
1606         SET_ERROR(kmfh, ERR_get_error());
1607         rv = KMF_ERR_KEYGEN_FAILED;
1608         goto cleanup;
1609     }

1611     privkey->kstype = KMF_KEYSTORE_OPENSSL;
1612     privkey->keyalg = KMF_DSA;
1613     privkey->keyclass = KMF_ASYM_PRI;
1614     privkey->israw = FALSE;
1615     if (EVP_PKEY_set1_DSA(eprikey, sslDSAKey)) {
1616         privkey->keyp = (void *)eprikey;
1617     } else {
1618         SET_ERROR(kmfh, ERR_get_error());
1619         rv = KMF_ERR_KEYGEN_FAILED;
1620         goto cleanup;
1621     }
1622     dp = DSA_new();
1623     /* Make a copy for the public key */
1624     if (dp != NULL) {
1625         if ((dp->p = BN_new()) == NULL) {
1626             SET_ERROR(kmfh, ERR_get_error());
1627             rv = KMF_ERR_MEMORY;
1628             DSA_free(dp);
1629             goto cleanup;
1630         }
1631         if ((dp->q = BN_new()) == NULL) {
1632             SET_ERROR(kmfh, ERR_get_error());
1633             rv = KMF_ERR_MEMORY;
1634             BN_free(dp->p);
1635             DSA_free(dp);
1636             goto cleanup;
1637         }
1638         if ((dp->g = BN_new()) == NULL) {
1639             SET_ERROR(kmfh, ERR_get_error());
1640             rv = KMF_ERR_MEMORY;
1641             BN_free(dp->q);
1642             BN_free(dp->p);
1643             DSA_free(dp);
1644             goto cleanup;
1645         }

```

```

1646         if ((dp->pub_key = BN_new()) == NULL) {
1647             SET_ERROR(kmfh, ERR_get_error());
1648             rv = KMF_ERR_MEMORY;
1649             BN_free(dp->q);
1650             BN_free(dp->p);
1651             BN_free(dp->g);
1652             DSA_free(dp);
1653             goto cleanup;
1654         }
1655         (void) BN_copy(dp->p, sslDSAKey->p);
1656         (void) BN_copy(dp->q, sslDSAKey->q);
1657         (void) BN_copy(dp->g, sslDSAKey->g);
1658         (void) BN_copy(dp->pub_key, sslDSAKey->pub_key);

1660         pubkey->kstype = KMF_KEYSTORE_OPENSSL;
1661         pubkey->keyalg = KMF_DSA;
1662         pubkey->keyclass = KMF_ASYM_PUB;
1663         pubkey->israw = FALSE;

1665         if (EVP_PKEY_set1_DSA(epubkey, sslDSAKey)) {
1666             pubkey->keyp = (void *)epubkey;
1667         } else {
1668             SET_ERROR(kmfh, ERR_get_error());
1669             rv = KMF_ERR_KEYGEN_FAILED;
1670             goto cleanup;
1671         }
1672     }
1673 }

1675 if (rv != KMF_OK) {
1676     goto cleanup;
1677 }

1679 if (storekey) {
1680     KMF_ATTRIBUTE storeattrs[4]; /* max. 4 attributes needed */
1681     int i = 0;
1682     char *keyfile = NULL, *dirpath = NULL;
1683     KMF_ENCODE_FORMAT format;
1684     /*
1685      * Construct a new attribute array and call openssl_store_key
1686      */
1687     kmf_set_attr_at_index(storeattrs, i, KMF_PRIVKEY_HANDLE_ATTR,
1688         privkey, sizeof (privkey));
1689     i++;

1691     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
1692     if (dirpath != NULL) {
1693         storeattrs[i].type = KMF_DIRPATH_ATTR;
1694         storeattrs[i].pValue = dirpath;
1695         storeattrs[i].valueLen = strlen(dirpath);
1696         i++;
1697     } else {
1698         rv = KMF_OK; /* DIRPATH is optional */
1699     }
1700     keyfile = kmf_get_attr_ptr(KMF_KEY_FILENAME_ATTR,
1701         attrlist, numattr);
1702     if (keyfile != NULL) {
1703         storeattrs[i].type = KMF_KEY_FILENAME_ATTR;
1704         storeattrs[i].pValue = keyfile;
1705         storeattrs[i].valueLen = strlen(keyfile);
1706         i++;
1707     } else {
1708         goto cleanup; /* KEYFILE is required */
1709     }
1710     rv = kmf_get_attr(KMF_ENCODE_FORMAT_ATTR, attrlist, numattr,
1711         (void *)&format, NULL);

```

```

1712         if (rv == KMF_OK) {
1713             storeattrs[i].type = KMF_ENCODE_FORMAT_ATTR;
1714             storeattrs[i].pValue = &format;
1715             storeattrs[i].valueLen = sizeof (format);
1716             i++;
1717         }
1719         rv = OpenSSL_StoreKey(handle, i, storeattrs);
1720     }
1722 cleanup:
1723     if (rv != KMF_OK) {
1724         if (eprikey != NULL)
1725             EVP_PKEY_free(eprikey);
1727         if (epubkey != NULL)
1728             EVP_PKEY_free(epubkey);
1730         if (pubkey->keylabel) {
1731             free(pubkey->keylabel);
1732             pubkey->keylabel = NULL;
1733         }
1735         if (privkey->keylabel) {
1736             free(privkey->keylabel);
1737             privkey->keylabel = NULL;
1738         }
1740         pubkey->keyp = NULL;
1741         privkey->keyp = NULL;
1742     }
1744     if (sslPrivKey)
1745         RSA_free(sslPrivKey);
1747     if (sslDSAkey)
1748         DSA_free(sslDSAkey);
1750     if (out != NULL)
1751         (void) BIO_free(out);
1753     return (rv);
1754 }
1756 /*
1757  * Make sure the BN conversion is properly padded with 0x00
1758  * bytes. If not, signature verification for DSA signatures
1759  * may fail in the case where the bignum value does not use
1760  * all of the bits.
1761  */
1762 static int
1763 fixbnlen(BIGNUM *bn, unsigned char *buf, int len) {
1764     int bytes = len - BN_num_bytes(bn);
1766     /* prepend with leading 0x00 if necessary */
1767     while (bytes-- > 0)
1768         *buf++ = 0;
1770     (void) BN_bn2bin(bn, buf);
1771     /*
1772      * Return the desired length since we prepended it
1773      * with the necessary 0x00 padding.
1774      */
1775     return (len);
1776 }

```

```

1778 KMF_RETURN
1779 OpenSSL_SignData(KMF_HANDLE_T handle, KMF_KEY_HANDLE *key,
1780                 KMF_OID *AlgOID, KMF_DATA *tobesigned, KMF_DATA *output)
1781 {
1782     KMF_RETURN ret = KMF_OK;
1783     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
1784     KMF_ALGORITHM_INDEX AlgId;
1785     EVP_MD_CTX ctx;
1786     const EVP_MD *md;
1788     if (key == NULL || AlgOID == NULL ||
1789         tobesigned == NULL || output == NULL ||
1790         tobesigned->Data == NULL ||
1791         output->Data == NULL)
1792         return (KMF_ERR_BAD_PARAMETER);
1794     /* Map the OID to an OpenSSL algorithm */
1795     AlgId = x509_algid_to_algid(AlgOID);
1796     if (AlgId == KMF_ALGID_NONE)
1797         return (KMF_ERR_BAD_ALGORITHM);
1799     if (key->keyalg == KMF_RSA) {
1800         EVP_PKEY *pkey = (EVP_PKEY *)key->keyp;
1801         uchar_t *p;
1802         int len;
1803         if (AlgId == KMF_ALGID_MD5WithRSA)
1804             md = EVP_md5();
1805         else if (AlgId == KMF_ALGID_MD2WithRSA)
1806             md = EVP_md2();
1807         else if (AlgId == KMF_ALGID_SHA1WithRSA)
1808             md = EVP_sha1();
1809         else if (AlgId == KMF_ALGID_SHA256WithRSA)
1810             md = EVP_sha256();
1811         else if (AlgId == KMF_ALGID_SHA384WithRSA)
1812             md = EVP_sha384();
1813         else if (AlgId == KMF_ALGID_SHA512WithRSA)
1814             md = EVP_sha512();
1815         else if (AlgId == KMF_ALGID_RSA)
1816             md = NULL;
1817         else
1818             return (KMF_ERR_BAD_ALGORITHM);
1820         if ((md == NULL) && (AlgId == KMF_ALGID_RSA)) {
1821             RSA *rsa = EVP_PKEY_get1_RSA((EVP_PKEY *)pkey);
1823             p = output->Data;
1824             if ((len = RSA_private_encrypt(tobesigned->Length,
1825                 tobesigned->Data, p, rsa,
1826                 RSA_PKCS1_PADDING)) <= 0) {
1827                 SET_ERROR(kmfh, ERR_get_error());
1828                 ret = KMF_ERR_INTERNAL;
1829             }
1830             output->Length = len;
1831         } else {
1832             (void) EVP_MD_CTX_init(&ctx);
1833             (void) EVP_SignInit_ex(&ctx, md, NULL);
1834             (void) EVP_SignUpdate(&ctx, tobesigned->Data,
1835                 (uint32_t)tobesigned->Length);
1836             len = (uint32_t)output->Length;
1837             p = output->Data;
1838             if (!EVP_SignFinal(&ctx, p, (uint32_t *)&len, pkey)) {
1839                 SET_ERROR(kmfh, ERR_get_error());
1840                 len = 0;
1841                 ret = KMF_ERR_INTERNAL;
1842             }
1843             output->Length = len;

```

```

1844         (void) EVP_MD_CTX_cleanup(&ctx);
1845     }
1846 } else if (key->keyalg == KMF_DSA) {
1847     DSA *dsa = EVP_PKEY_get1_DSA(key->keyp);
1848
1849     uchar_t hash[EVP_MAX_MD_SIZE];
1850     uint32_t hashlen;
1851     DSA_SIG *dsasig;
1852
1853     if (AlgId == KMF_ALGID_DSA ||
1854         AlgId == KMF_ALGID_SHA1WithDSA)
1855         md = EVP_sha1();
1856     else if (AlgId == KMF_ALGID_SHA256WithDSA)
1857         md = EVP_sha256();
1858     else /* Bad algorithm */
1859         return (KMF_ERR_BAD_ALGORITHM);
1860
1861     /*
1862     * OpenSSL EVP_Sign operation automatically converts to
1863     * ASN.1 output so we do the operations separately so we
1864     * are assured of NOT getting ASN.1 output returned.
1865     * KMF does not want ASN.1 encoded results because
1866     * not all mechanisms return ASN.1 encodings (PKCS#11
1867     * and NSS return raw signature data).
1868     */
1869     EVP_MD_CTX_init(&ctx);
1870     (void) EVP_DigestInit_ex(&ctx, md, NULL);
1871     (void) EVP_DigestUpdate(&ctx, tobesigned->Data,
1872         tobesigned->Length);
1873     (void) EVP_DigestFinal_ex(&ctx, hash, &hashlen);
1874
1875     /* Only sign first 20 bytes for SHA2 */
1876     if (AlgId == KMF_ALGID_SHA256WithDSA)
1877         hashlen = 20;
1878     dsasig = DSA_do_sign(hash, hashlen, dsa);
1879     if (dsasig != NULL) {
1880         int i;
1881         output->Length = i = fixbnlen(dsasig->r, output->Data,
1882             hashlen);
1883
1884         output->Length += fixbnlen(dsasig->s, &output->Data[i],
1885             hashlen);
1886
1887         DSA_SIG_free(dsasig);
1888     } else {
1889         SET_ERROR(kmfh, ERR_get_error());
1890     }
1891     (void) EVP_MD_CTX_cleanup(&ctx);
1892 } else {
1893     return (KMF_ERR_BAD_PARAMETER);
1894 }
1895 cleanup:
1896 return (ret);
1897 }
1898
1899 KMF_RETURN
1900 /*ARGSUSED*/
1901 OpenSSL_DeleteKey(KMF_HANDLE_T handle,
1902     int numattr, KMF_ATTRIBUTE *attrlist)
1903 {
1904     KMF_RETURN rv = KMF_OK;
1905     KMF_KEY_HANDLE *key;
1906     boolean_t destroy = B_TRUE;
1907
1908     key = kmf_get_attr_ptr(KMF_KEY_HANDLE_ATTR, attrlist, numattr);
1909     if (key == NULL || key->keyp == NULL)

```

```

1910         return (KMF_ERR_BAD_PARAMETER);
1911
1912     rv = kmf_get_attr(KMF_DESTROY_BOOL_ATTR, attrlist, numattr,
1913         (void *)&destroy, NULL);
1914     if (rv != KMF_OK) {
1915         /* "destroy" is optional. Default is TRUE */
1916         rv = KMF_OK;
1917     }
1918
1919     if (key->keyclass != KMF_ASYM_PUB &&
1920         key->keyclass != KMF_ASYM_PRI &&
1921         key->keyclass != KMF_SYMMETRIC)
1922         return (KMF_ERR_BAD_KEY_CLASS);
1923
1924     if (key->keyclass == KMF_SYMMETRIC) {
1925         kmf_free_raw_sym_key((KMF_RAW_SYM_KEY *)key->keyp);
1926         key->keyp = NULL;
1927     } else {
1928         if (key->keyp != NULL) {
1929             EVP_PKEY_free(key->keyp);
1930             key->keyp = NULL;
1931         }
1932     }
1933
1934     if (key->keylabel != NULL) {
1935         EVP_PKEY *pkey = NULL;
1936         /* If the file exists, make sure it is a proper key. */
1937         pkey = openssl_load_key(handle, key->keylabel);
1938         if (pkey == NULL) {
1939             if (key->keylabel != NULL) {
1940                 free(key->keylabel);
1941                 key->keylabel = NULL;
1942             }
1943             return (KMF_ERR_KEY_NOT_FOUND);
1944         }
1945         EVP_PKEY_free(pkey);
1946
1947         if (destroy) {
1948             if (unlink(key->keylabel) != 0) {
1949                 KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
1950                 SET_SYS_ERROR(kmfh, errno);
1951                 rv = KMF_ERR_INTERNAL;
1952             }
1953         }
1954         if (key->keylabel != NULL) {
1955             free(key->keylabel);
1956             key->keylabel = NULL;
1957         }
1958     }
1959     return (rv);
1960 }
1961
1962 KMF_RETURN
1963 OpenSSL_GetErrorString(KMF_HANDLE_T handle, char **msgstr)
1964 {
1965     KMF_RETURN ret = KMF_OK;
1966     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
1967     char str[256]; /* OpenSSL needs at least 120 byte buffer */
1968
1969     ERR_error_string_n(kmfh->lasterr.errcode, str, sizeof (str));
1970     if (strlen(str)) {
1971         *msgstr = (char *)strdup(str);
1972         if ((*msgstr) == NULL)
1973             ret = KMF_ERR_MEMORY;
1974     } else {
1975         *msgstr = NULL;
1976     }

```

```

1976     }
1978     return (ret);
1979 }

1981 static int
1982 ext2NID(int kmfext)
1983 {
1984     switch (kmfext) {
1985         case KMF_X509_EXT_KEY_USAGE:
1986             return (NID_key_usage);
1987         case KMF_X509_EXT_PRIV_KEY_USAGE_PERIOD:
1988             return (NID_private_key_usage_period);
1989         case KMF_X509_EXT_CERT_POLICIES:
1990             return (NID_certificate_policies);
1991         case KMF_X509_EXT_SUBJ_ALTNAME:
1992             return (NID_subject_alt_name);
1993         case KMF_X509_EXT_ISSUER_ALTNAME:
1994             return (NID_issuer_alt_name);
1995         case KMF_X509_EXT_BASIC_CONSTRAINTS:
1996             return (NID_basic_constraints);
1997         case KMF_X509_EXT_EXT_KEY_USAGE:
1998             return (NID_ext_key_usage);
1999         case KMF_X509_EXT_AUTH_KEY_ID:
2000             return (NID_authority_key_identifier);
2001         case KMF_X509_EXT_CRL_DIST_POINTS:
2002             return (NID_crl_distribution_points);
2003         case KMF_X509_EXT_SUBJ_KEY_ID:
2004             return (NID_subject_key_identifier);
2005         case KMF_X509_EXT_POLICY_MAPPINGS:
2006             return (OBJ_sn2nid("policyMappings"));
2007         case KMF_X509_EXT_NAME_CONSTRAINTS:
2008             return (OBJ_sn2nid("nameConstraints"));
2009         case KMF_X509_EXT_POLICY_CONSTRAINTS:
2010             return (OBJ_sn2nid("policyConstraints"));
2011         case KMF_X509_EXT_INHIBIT_ANY_POLICY:
2012             return (OBJ_sn2nid("inhibitAnyPolicy"));
2013         case KMF_X509_EXT_FRESHEST_CRL:
2014             return (OBJ_sn2nid("freshestCRL"));
2015         default:
2016             return (NID_undef);
2017     }
2018 }

2020 KMF_RETURN
2021 OpenSSL_CertGetPrintable(KMF_HANDLE_T handle, const KMF_DATA *pcert,
2022     KMF_PRINTABLE_ITEM flag, char *resultStr)
2023 {
2024     KMF_RETURN ret = KMF_OK;
2025     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
2026     X509 *xcert = NULL;
2027     unsigned char *outbuf = NULL;
2028     unsigned char *outbuf_p;
2029     char *tmpstr = NULL;
2030     int j;
2031     int ext_index, nid, len;
2032     BIO *mem = NULL;
2033     #if OPENSSSL_VERSION_NUMBER < 0x10000000L
2034     STACK *emlst = NULL;
2035     #else
2036     STACK_OF(OPENSSSL_STRING) *emlst = NULL;
2037     #endif
2038     X509_EXTENSION *ex;
2039     X509_CINF *ci;

2041     if (pcert == NULL || pcert->Data == NULL || pcert->Length == 0) {

```

```

2042         return (KMF_ERR_BAD_PARAMETER);
2043     }

2045     /* copy cert data to outbuf */
2046     outbuf = malloc(pcert->Length);
2047     if (outbuf == NULL) {
2048         return (KMF_ERR_MEMORY);
2049     }
2050     (void) memcpy(outbuf, pcert->Data, pcert->Length);

2052     outbuf_p = outbuf; /* use a temp pointer; required by openssl */
2053     xcert = d2i_X509(NULL, (const uchar_t **)&outbuf_p, pcert->Length);
2054     if (xcert == NULL) {
2055         SET_ERROR(kmfh, ERR_get_error());
2056         ret = KMF_ERR_ENCODING;
2057         goto out;
2058     }

2060     mem = BIO_new(BIO_s_mem());
2061     if (mem == NULL) {
2062         SET_ERROR(kmfh, ERR_get_error());
2063         ret = KMF_ERR_MEMORY;
2064         goto out;
2065     }

2067     switch (flag) {
2068     case KMF_CERT_ISSUER:
2069         (void) X509_NAME_print_ex(mem, X509_get_issuer_name(xcert), 0,
2070             XN_FLAG_SEP_CPLUS_SPC);
2071         len = BIO_gets(mem, resultStr, KMF_CERT_PRINTABLE_LEN);
2072         break;

2074     case KMF_CERT_SUBJECT:
2075         (void) X509_NAME_print_ex(mem, X509_get_subject_name(xcert), 0,
2076             XN_FLAG_SEP_CPLUS_SPC);
2077         len = BIO_gets(mem, resultStr, KMF_CERT_PRINTABLE_LEN);
2078         break;

2080     case KMF_CERT_VERSION:
2081         tmpstr = i2s_ASN1_INTEGER(NULL, xcert->cert_info->version);
2082         (void) strncpy(resultStr, tmpstr, KMF_CERT_PRINTABLE_LEN);
2083         OPENSSSL_free(tmpstr);
2084         len = strlen(resultStr);
2085         break;

2087     case KMF_CERT_SERIALIZED:
2088         if (i2a_ASN1_INTEGER(mem, X509_get_serialNumber(xcert)) > 0) {
2089             (void) strcpy(resultStr, "0x");
2090             len = BIO_gets(mem, &resultStr[2],
2091                 KMF_CERT_PRINTABLE_LEN - 2);
2092         }
2093         break;

2095     case KMF_CERT_NOTBEFORE:
2096         (void) ASN1_TIME_print(mem, X509_get_notBefore(xcert));
2097         len = BIO_gets(mem, resultStr, KMF_CERT_PRINTABLE_LEN);
2098         break;

2100     case KMF_CERT_NOTAFTER:
2101         (void) ASN1_TIME_print(mem, X509_get_notAfter(xcert));
2102         len = BIO_gets(mem, resultStr, KMF_CERT_PRINTABLE_LEN);
2103         break;

2105     case KMF_CERT_PUBKEY_DATA:
2106         {
2107             EVP_PKEY *pkey = X509_get_pubkey(xcert);

```



```

2108         if (pkey == NULL) {
2109             SET_ERROR(kmfh, ERR_get_error());
2110             ret = KMF_ERR_ENCODING;
2111             goto out;
2112         }
2113
2114         if (pkey->type == EVP_PKEY_RSA) {
2115             (void) BIO_printf(mem,
2116                 "RSA Public Key: (%d bit)\n",
2117                 BN_num_bits(pkey->pkey.rsa->n));
2118             (void) RSA_print(mem, pkey->pkey.rsa, 0);
2119         } else if (pkey->type == EVP_PKEY_DSA) {
2120             (void) BIO_printf(mem,
2121                 "%12sDSA Public Key:\n", "");
2122             (void) DSA_print(mem, pkey->pkey.dsa, 0);
2123         } else {
2124             (void) BIO_printf(mem,
2125                 "%12sUnknown Public Key:\n", "");
2126         }
2127         (void) BIO_printf(mem, "\n");
2128         EVP_PKEY_free(pkey);
2129     }
2130     len = BIO_read(mem, resultStr, KMF_CERT_PRINTABLE_LEN);
2131     break;
2132 case KMF_CERT_SIGNATURE_ALG:
2133 case KMF_CERT_PUBKEY_ALG:
2134     if (flag == KMF_CERT_SIGNATURE_ALG) {
2135         len = i2a_ASN1_OBJECT(mem,
2136             xcert->sig_alg->algorithm);
2137     } else {
2138         len = i2a_ASN1_OBJECT(mem,
2139             xcert->cert_info->key->algor->algorithm);
2140     }
2141
2142     if (len > 0) {
2143         len = BIO_read(mem, resultStr,
2144             KMF_CERT_PRINTABLE_LEN);
2145     }
2146     break;
2147
2148 case KMF_CERT_EMAIL:
2149     emlst = X509_get1_email(xcert);
2150 #if OPENSSL_VERSION_NUMBER < 0x10000000L
2151     for (j = 0; j < sk_num(emlst); j++)
2152         (void) BIO_printf(mem, "%s\n", sk_value(emlst, j));
2153 #else
2154     for (j = 0; j < sk_OPENSSL_STRING_num(emlst); j++)
2155         (void) BIO_printf(mem, "%s\n",
2156             sk_OPENSSL_STRING_value(emlst, j));
2157 #endif
2158
2159     len = BIO_gets(mem, resultStr, KMF_CERT_PRINTABLE_LEN);
2160     X509_email_free(emlst);
2161     break;
2162 case KMF_X509_EXT_ISSUER_ALTNAME:
2163 case KMF_X509_EXT_SUBJ_ALTNAME:
2164 case KMF_X509_EXT_KEY_USAGE:
2165 case KMF_X509_EXT_PRIV_KEY_USAGE_PERIOD:
2166 case KMF_X509_EXT_CERT_POLICIES:
2167 case KMF_X509_EXT_BASIC_CONSTRAINTS:
2168 case KMF_X509_EXT_NAME_CONSTRAINTS:
2169 case KMF_X509_EXT_POLICY_CONSTRAINTS:
2170 case KMF_X509_EXT_EXT_KEY_USAGE:
2171 case KMF_X509_EXT_INHIBIT_ANY_POLICY:
2172 case KMF_X509_EXT_AUTH_KEY_ID:
2173 case KMF_X509_EXT_SUBJ_KEY_ID:

```

```

2174 case KMF_X509_EXT_POLICY_MAPPINGS:
2175 case KMF_X509_EXT_CRL_DIST_POINTS:
2176 case KMF_X509_EXT_FRESHEST_CRL:
2177     nid = ext2NID(flag);
2178     if (nid == NID_undef) {
2179         ret = KMF_ERR_EXTENSION_NOT_FOUND;
2180         goto out;
2181     }
2182     ci = xcert->cert_info;
2183
2184     ext_index = X509v3_get_ext_by_NID(ci->extensions, nid, -1);
2185     if (ext_index == -1) {
2186         SET_ERROR(kmfh, ERR_get_error());
2187
2188         ret = KMF_ERR_EXTENSION_NOT_FOUND;
2189         goto out;
2190     }
2191     ex = X509v3_get_ext(ci->extensions, ext_index);
2192
2193     (void) i2a_ASN1_OBJECT(mem, X509_EXTENSION_get_object(ex));
2194
2195     if (BIO_printf(mem, ": %s\n",
2196         X509_EXTENSION_get_critical(ex) ? "critical" : "") <= 0) {
2197         SET_ERROR(kmfh, ERR_get_error());
2198         ret = KMF_ERR_ENCODING;
2199         goto out;
2200     }
2201     if (!X509V3_EXT_print(mem, ex, X509V3_EXT_DUMP_UNKNOWN, 4)) {
2202         (void) BIO_printf(mem, "%s", 4, "");
2203         (void) M_ASN1_OCTET_STRING_print(mem, ex->value);
2204     }
2205     if (BIO_write(mem, "\n", 1) <= 0) {
2206         SET_ERROR(kmfh, ERR_get_error());
2207         ret = KMF_ERR_ENCODING;
2208         goto out;
2209     }
2210     len = BIO_read(mem, resultStr, KMF_CERT_PRINTABLE_LEN);
2211 }
2212 if (len <= 0) {
2213     SET_ERROR(kmfh, ERR_get_error());
2214     ret = KMF_ERR_ENCODING;
2215 }
2216
2217 out:
2218 if (outbuf != NULL) {
2219     free(outbuf);
2220 }
2221
2222 if (xcert != NULL) {
2223     X509_free(xcert);
2224 }
2225
2226 if (mem != NULL) {
2227     (void) BIO_free(mem);
2228 }
2229
2230 return (ret);
2231 }
2232
2233 KMF_RETURN
2234 /*ARGSUSED*/
2235 OpenSSL_FindPrikeyByCert(KMF_HANDLE_T handle, int numattr,
2236     KMF_ATTRIBUTE *attrlist)
2237 {
2238     KMF_RETURN rv = KMF_OK;
2239     KMF_KEYSTORE_TYPE kstype = KMF_KEYSTORE_OPENSSL;

```

```

2240 KMF_KEY_CLASS keyclass = KMF_ASYM_PRI;
2241 KMF_KEY_HANDLE *key = NULL;
2242 uint32_t numkeys = 1; /* 1 key only */
2243 char *dirpath = NULL;
2244 char *keyfile = NULL;
2245 KMF_ATTRIBUTE new_attrlist[16];
2246 int i = 0;

2248 /*
2249  * This is really just a FindKey operation, reuse the
2250  * FindKey function.
2251  */
2252 kmf_set_attr_at_index(new_attrlist, i,
2253 KMF_KEYSTORE_TYPE_ATTR, &kstype, sizeof (kstype));
2254 i++;

2256 kmf_set_attr_at_index(new_attrlist, i,
2257 KMF_COUNT_ATTR, &numkeys, sizeof (uint32_t));
2258 i++;

2260 kmf_set_attr_at_index(new_attrlist, i,
2261 KMF_KEYCLASS_ATTR, &keyclass, sizeof (keyclass));
2262 i++;

2264 key = kmf_get_attr_ptr(KMF_KEY_HANDLE_ATTR, attrlist, numattr);
2265 if (key == NULL) {
2266     return (KMF_ERR_BAD_PARAMETER);
2267 } else {
2268     kmf_set_attr_at_index(new_attrlist, i,
2269 KMF_KEY_HANDLE_ATTR, key, sizeof (KMF_KEY_HANDLE));
2270 i++;
2271 }

2273 dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
2274 if (dirpath != NULL) {
2275     kmf_set_attr_at_index(new_attrlist, i,
2276 KMF_DIRPATH_ATTR, dirpath, strlen(dirpath));
2277 i++;
2278 }

2280 keyfile = kmf_get_attr_ptr(KMF_KEY_FILENAME_ATTR, attrlist, numattr);
2281 if (keyfile == NULL)
2282     return (KMF_ERR_BAD_PARAMETER);
2283 else {
2284     kmf_set_attr_at_index(new_attrlist, i,
2285 KMF_KEY_FILENAME_ATTR, keyfile, strlen(keyfile));
2286 i++;
2287 }

2289 rv = OpenSSL_FindKey(handle, i, new_attrlist);
2290 return (rv);
2291 }

2293 KMF_RETURN
2294 /*ARGSUSED*/
2295 OpenSSL_DecryptData(KMF_HANDLE_T handle, KMF_KEY_HANDLE *key,
2296 KMF_OID *AlgoID, KMF_DATA *ciphertext,
2297 KMF_DATA *output)
2298 {
2299     KMF_RETURN ret = KMF_OK;
2300     RSA *rsa = NULL;
2301     unsigned int in_len = 0, out_len = 0;
2302     unsigned int total_decrypted = 0, modulus_len = 0;
2303     uint8_t *in_data, *out_data;
2304     int i, blocks;

```

```

2306 if (key == NULL || AlgoID == NULL ||
2307     ciphertext == NULL || output == NULL ||
2308     ciphertext->Data == NULL ||
2309     output->Data == NULL)
2310     return (KMF_ERR_BAD_PARAMETER);

2312 if (key->keyalg == KMF_RSA) {
2313     rsa = EVP_PKEY_get1_RSA((EVP_PKEY *)key->keyp);
2314     modulus_len = RSA_size(rsa);
2315 } else {
2316     return (KMF_ERR_BAD_PARAMETER);
2317 }

2319 blocks = ciphertext->Length/modulus_len;
2320 out_data = output->Data;
2321 in_data = ciphertext->Data;
2322 out_len = modulus_len - 11;
2323 in_len = modulus_len;

2325 for (i = 0; i < blocks; i++) {
2326     out_len = RSA_private_decrypt(in_len,
2327 in_data, out_data, rsa, RSA_PKCS1_PADDING);

2329     if (out_len == 0) {
2330         ret = KMF_ERR_INTERNAL;
2331         goto cleanup;
2332     }

2334     out_data += out_len;
2335     total_decrypted += out_len;
2336     in_data += in_len;
2337 }

2339 output->Length = total_decrypted;

2341 cleanup:
2342     RSA_free(rsa);
2343     if (ret != KMF_OK)
2344         output->Length = 0;

2346     return (ret);

2348 }

2350 /*
2351  * This function will create a certid from issuer_cert and user_cert.
2352  * The caller should use OCSP_CERTID_free(OCSP_CERTID *) to deallocate
2353  * certid memory after use.
2354  */
2355 static KMF_RETURN
2356 create_certid(KMF_HANDLE_T handle, const KMF_DATA *issuer_cert,
2357 const KMF_DATA *user_cert, OCSP_CERTID **certid)
2358 {
2359     KMF_RETURN ret = KMF_OK;
2360     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
2361     X509 *issuer = NULL;
2362     X509 *cert = NULL;
2363     unsigned char *ptmp;

2365     if (issuer_cert == NULL || user_cert == NULL) {
2366         return (KMF_ERR_BAD_PARAMETER);
2367     }

2369     /* convert the DER-encoded issuer cert to an internal X509 */
2370     ptmp = issuer_cert->Data;
2371     issuer = d2i_X509(NULL, (const uchar_t **)&ptmp,

```

```

2372     issuer_cert->Length);
2373     if (issuer == NULL) {
2374         SET_ERROR(kmfh, ERR_get_error());
2375         ret = KMF_ERR_OCSP_BAD_ISSUER;
2376         goto end;
2377     }
2378
2379     /* convert the DER-encoded user cert to an internal X509 */
2380     ptmp = user_cert->Data;
2381     cert = d2i_X509(NULL, (const uchar_t **)&ptmp,
2382         user_cert->Length);
2383     if (cert == NULL) {
2384         SET_ERROR(kmfh, ERR_get_error());
2385
2386         ret = KMF_ERR_OCSP_BAD_CERT;
2387         goto end;
2388     }
2389
2390     /* create a CERTID */
2391     *certid = OCSP_cert_to_id(NULL, cert, issuer);
2392     if (*certid == NULL) {
2393         SET_ERROR(kmfh, ERR_get_error());
2394         ret = KMF_ERR_OCSP_CERTID;
2395         goto end;
2396     }
2397
2398 end:
2399     if (issuer != NULL) {
2400         X509_free(issuer);
2401     }
2402
2403     if (cert != NULL) {
2404         X509_free(cert);
2405     }
2406
2407     return (ret);
2408 }
2409
2410 KMF_RETURN
2411 OpenSSL_CreateOCSPRequest(KMF_HANDLE_T handle,
2412     int numattr, KMF_ATTRIBUTE *attrlist)
2413 {
2414     KMF_RETURN ret = KMF_OK;
2415     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
2416     OCSP_CERTID *id = NULL;
2417     OCSP_REQUEST *req = NULL;
2418     BIO *derbio = NULL;
2419     char *reqfile;
2420     KMF_DATA *issuer_cert;
2421     KMF_DATA *user_cert;
2422
2423     user_cert = kmf_get_attr_ptr(KMF_USER_CERT_DATA_ATTR,
2424         attrlist, numattr);
2425     if (user_cert == NULL)
2426         return (KMF_ERR_BAD_PARAMETER);
2427
2428     issuer_cert = kmf_get_attr_ptr(KMF_ISSUER_CERT_DATA_ATTR,
2429         attrlist, numattr);
2430     if (issuer_cert == NULL)
2431         return (KMF_ERR_BAD_PARAMETER);
2432
2433     reqfile = kmf_get_attr_ptr(KMF_OCSP_REQUEST_FILENAME_ATTR,
2434         attrlist, numattr);
2435     if (reqfile == NULL)
2436         return (KMF_ERR_BAD_PARAMETER);

```

```

2438     ret = create_certid(handle, issuer_cert, user_cert, &id);
2439     if (ret != KMF_OK) {
2440         return (ret);
2441     }
2442
2443     /* Create an OCSP request */
2444     req = OCSP_REQUEST_new();
2445     if (req == NULL) {
2446         SET_ERROR(kmfh, ERR_get_error());
2447         ret = KMF_ERR_OCSP_CREATE_REQUEST;
2448         goto end;
2449     }
2450
2451     if (!OCSP_request_add0_id(req, id)) {
2452         ret = KMF_ERR_OCSP_CREATE_REQUEST;
2453         goto end;
2454     }
2455
2456     /* Write the request to the output file with DER encoding */
2457     derbio = BIO_new_file(reqfile, "wb");
2458     if (!derbio) {
2459         SET_ERROR(kmfh, ERR_get_error());
2460         ret = KMF_ERR_OPEN_FILE;
2461         goto end;
2462     }
2463     if (i2d_OCSP_REQUEST_bio(derbio, req) <= 0) {
2464         ret = KMF_ERR_ENCODING;
2465     }
2466
2467 end:
2468     /*
2469     * We don't need to free "id" explicitly, because OCSP_REQUEST_free()
2470     * will also deallocate certid's space.
2471     */
2472     if (req != NULL) {
2473         OCSP_REQUEST_free(req);
2474     }
2475
2476     if (derbio != NULL) {
2477         (void) BIO_free(derbio);
2478     }
2479
2480     return (ret);
2481 }
2482
2483 /* ocsp_find_signer_sk() is copied from openssl source */
2484 static X509 *ocsp_find_signer_sk(STACK_OF(X509) *certs, OCSP_RESPID *id)
2485 {
2486     int i;
2487     unsigned char tmphash[SHA_DIGEST_LENGTH], *keyhash;
2488
2489     /* Easy if lookup by name */
2490     if (id->type == V_OCSP_RESPID_NAME)
2491         return (X509_find_by_subject(certs, id->value.byName));
2492
2493     /* Lookup by key hash */
2494
2495     /* If key hash isn't SHA1 length then forget it */
2496     if (id->value.byKey->length != SHA_DIGEST_LENGTH)
2497         return (NULL);
2498
2499     keyhash = id->value.byKey->data;
2500     /* Calculate hash of each key and compare */
2501     for (i = 0; i < sk_X509_num(certs); i++) {
2502         X509 *x = sk_X509_value(certs, i);
2503         /* Use pubkey_digest to get the key ID value */

```

```

2504         (void) X509_pubkey_digest(x, EVP_sha1(), tmphash, NULL);
2505         if (!memcmp(keyhash, tmphash, SHA_DIGEST_LENGTH))
2506             return (x);
2507     }
2508     return (NULL);
2509 }

2511 /* ocsig_find_signer() is copied from openssl source */
2512 /* ARGSUSED2 */
2513 static int
2514 ocsig_find_signer(X509 **psigner, OCSP_BASICRESP *bs, STACK_OF(X509) *certs,
2515                  X509_STORE *st, unsigned long flags)
2516 {
2517     X509 *signer;
2518     OCSP_RESPID *rid = bs->tbsResponseData->responderId;
2519     if ((signer = ocsig_find_signer_sk(certs, rid))) {
2520         *psigner = signer;
2521         return (2);
2522     }
2523     if (!(flags & OCSP_NOINTERN) &&
2524         (signer = ocsig_find_signer_sk(bs->certs, rid))) {
2525         *psigner = signer;
2526         return (1);
2527     }
2528     /* Maybe lookup from store if by subject name */

2530     *psigner = NULL;
2531     return (0);
2532 }

2534 /*
2535  * This function will verify the signature of a basic response, using
2536  * the public key from the OCSP responder certificate.
2537  */
2538 static KMF_RETURN
2539 check_response_signature(KMF_HANDLE_T handle, OCSP_BASICRESP *bs,
2540                         KMF_DATA *signer_cert, KMF_DATA *issuer_cert)
2541 {
2542     KMF_RETURN ret = KMF_OK;
2543     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
2544     STACK_OF(X509) *cert_stack = NULL;
2545     X509 *signer = NULL;
2546     X509 *issuer = NULL;
2547     EVP_PKEY *skey = NULL;
2548     unsigned char *ptmp;

2551     if (bs == NULL || issuer_cert == NULL)
2552         return (KMF_ERR_BAD_PARAMETER);

2554     /*
2555      * Find the certificate that signed the basic response.
2556      *
2557      * If signer_cert is not NULL, we will use that as the signer cert.
2558      * Otherwise, we will check if the issuer cert is actually the signer.
2559      * If we still do not find a signer, we will look for it from the
2560      * certificate list came with the response file.
2561      */
2562     if (signer_cert != NULL) {
2563         ptmp = signer_cert->Data;
2564         signer = d2i_X509(NULL, (const uchar_t **)&ptmp,
2565                          signer_cert->Length);
2566         if (signer == NULL) {
2567             SET_ERROR(kmfh, ERR_get_error());
2568             ret = KMF_ERR_OCSP_BAD_SIGNER;
2569             goto end;

```

```

2570     }
2571     } else {
2572         /*
2573          * Convert the issuer cert into X509 and push it into a
2574          * stack to be used by ocsig_find_signer().
2575          */
2576         ptmp = issuer_cert->Data;
2577         issuer = d2i_X509(NULL, (const uchar_t **)&ptmp,
2578                          issuer_cert->Length);
2579         if (issuer == NULL) {
2580             SET_ERROR(kmfh, ERR_get_error());
2581             ret = KMF_ERR_OCSP_BAD_ISSUER;
2582             goto end;
2583         }

2585         if ((cert_stack = sk_X509_new_null()) == NULL) {
2586             ret = KMF_ERR_INTERNAL;
2587             goto end;
2588         }

2590         if (sk_X509_push(cert_stack, issuer) == NULL) {
2591             ret = KMF_ERR_INTERNAL;
2592             goto end;
2593         }

2595         ret = ocsig_find_signer(&signer, bs, cert_stack, NULL, 0);
2596         if (!ret) {
2597             /* can not find the signer */
2598             ret = KMF_ERR_OCSP_BAD_SIGNER;
2599             goto end;
2600         }
2601     }

2603     /* Verify the signature of the response */
2604     skey = X509_get_pubkey(signer);
2605     if (skey == NULL) {
2606         ret = KMF_ERR_OCSP_BAD_SIGNER;
2607         goto end;
2608     }

2610     ret = OCSP_BASICRESP_verify(bs, skey, 0);
2611     if (ret == 0) {
2612         ret = KMF_ERR_OCSP_RESPONSE_SIGNATURE;
2613         goto end;
2614     }

2616 end:
2617     if (issuer != NULL) {
2618         X509_free(issuer);
2619     }

2621     if (signer != NULL) {
2622         X509_free(signer);
2623     }

2625     if (skey != NULL) {
2626         EVP_PKEY_free(skey);
2627     }

2629     if (cert_stack != NULL) {
2630         sk_X509_free(cert_stack);
2631     }

2633     return (ret);
2634 }

```

```

2638 KMF_RETURN
2639 OpenSSL_GetOCSPStatusForCert(KMF_HANDLE_T handle,
2640     int numattr, KMF_ATTRIBUTE *attrlist)
2641 {
2642     KMF_RETURN ret = KMF_OK;
2643     BIO *derbio = NULL;
2644     OCSP_RESPONSE *resp = NULL;
2645     OCSP_BASICRESP *bs = NULL;
2646     OCSP_CERTID *id = NULL;
2647     OCSP_SINGLERESP *single = NULL;
2648     ASN1_GENERALIZEDTIME *rev, *thisupd, *nextupd;
2649     int index, status, reason;
2650     KMF_DATA *issuer_cert;
2651     KMF_DATA *user_cert;
2652     KMF_DATA *signer_cert;
2653     KMF_DATA *response;
2654     int *response_reason, *response_status, *cert_status;
2655     boolean_t ignore_response_sign = B_FALSE; /* default is FALSE */
2656     uint32_t response_lifetime;

2658     issuer_cert = kmf_get_attr_ptr(KMF_ISSUER_CERT_DATA_ATTR,
2659         attrlist, numattr);
2660     if (issuer_cert == NULL)
2661         return (KMF_ERR_BAD_PARAMETER);

2663     user_cert = kmf_get_attr_ptr(KMF_USER_CERT_DATA_ATTR,
2664         attrlist, numattr);
2665     if (user_cert == NULL)
2666         return (KMF_ERR_BAD_PARAMETER);

2668     response = kmf_get_attr_ptr(KMF_OCSP_RESPONSE_DATA_ATTR,
2669         attrlist, numattr);
2670     if (response == NULL)
2671         return (KMF_ERR_BAD_PARAMETER);

2673     response_status = kmf_get_attr_ptr(KMF_OCSP_RESPONSE_STATUS_ATTR,
2674         attrlist, numattr);
2675     if (response_status == NULL)
2676         return (KMF_ERR_BAD_PARAMETER);

2678     response_reason = kmf_get_attr_ptr(KMF_OCSP_RESPONSE_REASON_ATTR,
2679         attrlist, numattr);
2680     if (response_reason == NULL)
2681         return (KMF_ERR_BAD_PARAMETER);

2683     cert_status = kmf_get_attr_ptr(KMF_OCSP_RESPONSE_CERT_STATUS_ATTR,
2684         attrlist, numattr);
2685     if (cert_status == NULL)
2686         return (KMF_ERR_BAD_PARAMETER);

2688     /* Read in the response */
2689     derbio = BIO_new_mem_buf(response->Data, response->Length);
2690     if (!derbio) {
2691         ret = KMF_ERR_MEMORY;
2692         return (ret);
2693     }

2695     resp = d2i_OCSP_RESPONSE_bio(derbio, NULL);
2696     if (resp == NULL) {
2697         ret = KMF_ERR_OCSP_MALFORMED_RESPONSE;
2698         goto end;
2699     }

2701     /* Check the response status */

```

```

2702     status = OCSP_response_status(resp);
2703     *response_status = status;
2704     if (status != OCSP_RESPONSE_STATUS_SUCCESSFUL) {
2705         ret = KMF_ERR_OCSP_RESPONSE_STATUS;
2706         goto end;
2707     }

2709 #ifdef DEBUG
2710     printf("Successfully checked the response file status.\n");
2711 #endif /* DEBUG */

2713     /* Extract basic response */
2714     bs = OCSP_response_get1_basic(resp);
2715     if (bs == NULL) {
2716         ret = KMF_ERR_OCSP_NO_BASIC_RESPONSE;
2717         goto end;
2718     }

2720 #ifdef DEBUG
2721     printf("Successfully retrieved the basic response.\n");
2722 #endif /* DEBUG */

2724     /* Check the basic response signature if required */
2725     ret = kmf_get_attr(KMF_IGNORE_RESPONSE_SIGN_ATTR, attrlist, numattr,
2726         (void *)&ignore_response_sign, NULL);
2727     if (ret != KMF_OK)
2728         ret = KMF_OK;

2730     signer_cert = kmf_get_attr_ptr(KMF_SIGNER_CERT_DATA_ATTR,
2731         attrlist, numattr);

2733     if (ignore_response_sign == B_FALSE) {
2734         ret = check_response_signature(handle, bs,
2735             signer_cert, issuer_cert);
2736         if (ret != KMF_OK)
2737             goto end;
2738     }

2740 #ifdef DEBUG
2741     printf("Successfully verified the response signature.\n");
2742 #endif /* DEBUG */

2744     /* Create a certid for the certificate in question */
2745     ret = create_certid(handle, issuer_cert, user_cert, &id);
2746     if (ret != KMF_OK) {
2747         ret = KMF_ERR_OCSP_CERTID;
2748         goto end;
2749     }

2751 #ifdef DEBUG
2752     printf("successfully created a certid for the cert.\n");
2753 #endif /* DEBUG */

2755     /* Find the index of the single response for the certid */
2756     index = OCSP_resp_find(bs, id, -1);
2757     if (index < 0) {
2758         /* could not find this certificate in the response */
2759         ret = KMF_ERR_OCSP_UNKNOWN_CERT;
2760         goto end;
2761     }

2763 #ifdef DEBUG
2764     printf("Successfully found the single response index for the cert.\n");
2765 #endif /* DEBUG */

2767     /* Retrieve the single response and get the cert status */

```

```

2768     single = OCSP_resp_get0(bs, index);
2769     status = OCSP_single_get0_status(single, &reason, &rev, &thisupd,
2770     &nextupd);
2771     if (status == V_OCSP_CERTSTATUS_GOOD) {
2772         *cert_status = OCSP_GOOD;
2773     } else if (status == V_OCSP_CERTSTATUS_UNKNOWN) {
2774         *cert_status = OCSP_UNKNOWN;
2775     } else { /* revoked */
2776         *cert_status = OCSP_REVOKED;
2777         *response_reason = reason;
2778     }
2779     ret = KMF_OK;

2781     /* resp. time is optional, so we don't care about the return code. */
2782     (void) kmf_get_attr(KMF_RESPONSE_LIFETIME_ATTR, attrlist, numattr,
2783     (void *)&response_lifetime, NULL);

2785     if (!OCSP_check_validity(thisupd, nextupd, 300,
2786     response_lifetime)) {
2787         ret = KMF_ERR_OCSP_STATUS_TIME_INVALID;
2788         goto end;
2789     }

2791 #ifdef DEBUG
2792     printf("Successfully verify the time.\n");
2793 #endif /* DEBUG */

2795 end:
2796     if (derbio != NULL)
2797         (void) BIO_free(derbio);

2799     if (resp != NULL)
2800         OCSP_RESPONSE_free(resp);

2802     if (bs != NULL)
2803         OCSP_BASICRESP_free(bs);

2805     if (id != NULL)
2806         OCSP_CERTID_free(id);

2808     return (ret);
2809 }

2811 static KMF_RETURN
2812 fetch_key(KMF_HANDLE_T handle, char *path,
2813 KMF_KEY_CLASS keyclass, KMF_KEY_HANDLE *key)
2814 {
2815     KMF_RETURN rv = KMF_OK;
2816     EVP_PKEY *pkey = NULL;
2817     KMF_RAW_SYM_KEY *rkey = NULL;

2819     if (keyclass == KMF_ASYM_PRI ||
2820     keyclass == KMF_ASYM_PUB) {
2821         pkey = openssl_load_key(handle, path);
2822         if (pkey == NULL) {
2823             return (KMF_ERR_KEY_NOT_FOUND);
2824         }
2825         if (key != NULL) {
2826             if (pkey->type == EVP_PKEY_RSA)
2827                 key->keyalg = KMF_RSA;
2828             else if (pkey->type == EVP_PKEY_DSA)
2829                 key->keyalg = KMF_DSA;

2831             key->kstype = KMF_KEYSTORE_OPENSSL;
2832             key->keyclass = keyclass;
2833             key->keyp = (void *)pkey;

```

```

2834         key->israw = FALSE;
2835         if (path != NULL &&
2836             ((key->keylabel = strdup(path)) == NULL)) {
2837             EVP_PKEY_free(pkey);
2838             return (KMF_ERR_MEMORY);
2839         }
2840     } else {
2841         EVP_PKEY_free(pkey);
2842         pkey = NULL;
2843     }
2844 } else if (keyclass == KMF_SYMMETRIC) {
2845     KMF_ENCODE_FORMAT fmt;
2846     /*
2847      * If the file is a recognized format,
2848      * then it is NOT a symmetric key.
2849      */
2850     rv = kmf_get_file_format(path, &fmt);
2851     if (rv == KMF_OK || fmt != 0) {
2852         return (KMF_ERR_KEY_NOT_FOUND);
2853     } else if (rv == KMF_ERR_ENCODING) {
2854         /*
2855          * If we don't know the encoding,
2856          * it is probably a symmetric key.
2857          */
2858         rv = KMF_OK;
2859     } else if (rv == KMF_ERR_OPEN_FILE) {
2860         return (KMF_ERR_KEY_NOT_FOUND);
2861     }

2863     if (key != NULL) {
2864         KMF_DATA keyvalue;
2865         rkey = malloc(sizeof (KMF_RAW_SYM_KEY));
2866         if (rkey == NULL) {
2867             rv = KMF_ERR_MEMORY;
2868             goto out;
2869         }

2871         (void) memset(rkey, 0, sizeof (KMF_RAW_SYM_KEY));
2872         rv = kmf_read_input_file(handle, path, &keyvalue);
2873         if (rv != KMF_OK)
2874             goto out;

2876         rkey->keydata.len = keyvalue.Length;
2877         rkey->keydata.val = keyvalue.Data;

2879         key->kstype = KMF_KEYSTORE_OPENSSL;
2880         key->keyclass = keyclass;
2881         key->israw = TRUE;
2882         key->keyp = (void *)rkey;
2883         if (path != NULL &&
2884             ((key->keylabel = strdup(path)) == NULL)) {
2885             rv = KMF_ERR_MEMORY;
2886         }
2887     }
2888 }

2889 out:
2890     if (rv != KMF_OK) {
2891         if (rkey != NULL) {
2892             kmf_free_raw_sym_key(rkey);
2893         }
2894         if (pkey != NULL)
2895             EVP_PKEY_free(pkey);

2897         if (key != NULL) {
2898             key->keyalg = KMF_KEYALG_NONE;
2899             key->keyclass = KMF_KEYCLASS_NONE;

```

```

2900         key->keyp = NULL;
2901     }
2902 }
2904     return (rv);
2905 }

2907 KMF_RETURN
2908 OpenSSL_FindKey(KMF_HANDLE_T handle,
2909               int numattr, KMF_ATTRIBUTE *attrlist)
2910 {
2911     KMF_RETURN rv = KMF_OK;
2912     char *fullpath = NULL;
2913     uint32_t maxkeys;
2914     KMF_KEY_HANDLE *key;
2915     uint32_t *numkeys;
2916     KMF_KEY_CLASS keyclass;
2917     KMF_RAW_KEY_DATA *rawkey;
2918     char *dirpath;
2919     char *keyfile;

2921     if (handle == NULL)
2922         return (KMF_ERR_BAD_PARAMETER);

2924     numkeys = kmf_get_attr_ptr(KMF_COUNT_ATTR, attrlist, numattr);
2925     if (numkeys == NULL)
2926         return (KMF_ERR_BAD_PARAMETER);

2928     rv = kmf_get_attr(KMF_KEYCLASS_ATTR, attrlist, numattr,
2929                     (void *)&keyclass, NULL);
2930     if (rv != KMF_OK)
2931         return (KMF_ERR_BAD_PARAMETER);

2933     if (keyclass != KMF_ASYM_PUB &&
2934         keyclass != KMF_ASYM_PRI &&
2935         keyclass != KMF_SYMMETRIC)
2936         return (KMF_ERR_BAD_KEY_CLASS);

2938     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
2939     keyfile = kmf_get_attr_ptr(KMF_KEY_FILENAME_ATTR, attrlist, numattr);

2941     fullpath = get_fullpath(dirpath, keyfile);

2943     if (fullpath == NULL)
2944         return (KMF_ERR_BAD_PARAMETER);

2946     maxkeys = *numkeys;
2947     if (maxkeys == 0)
2948         maxkeys = 0xFFFFFFFF;
2949     *numkeys = 0;

2951     key = kmf_get_attr_ptr(KMF_KEY_HANDLE_ATTR, attrlist, numattr);
2952     /* it is okay to have "keys" contains NULL */

2954     /*
2955      * The caller may want a list of the raw key data as well.
2956      * Useful for importing keys from a file into other keystores.
2957      */
2958     rawkey = kmf_get_attr_ptr(KMF_RAW_KEY_ATTR, attrlist, numattr);

2960     if (isdir(fullpath)) {
2961         DIR *dirp;
2962         struct dirent *dp;
2963         int n = 0;

2965         /* open all files in the directory and attempt to read them */

```

```

2966         if ((dirp = opendir(fullpath)) == NULL) {
2967             return (KMF_ERR_BAD_PARAMETER);
2968         }
2969         rewinddir(dirp);
2970         while ((dp = readdir(dirp)) != NULL && n < maxkeys) {
2971             if (strcmp(dp->d_name, ".") &&
2972                 strcmp(dp->d_name, "..")) {
2973                 char *fname;

2975                 fname = get_fullpath(fullpath,
2976                                     (char *)&dp->d_name);

2978                 rv = fetch_key(handle, fname,
2979                               keyclass, key ? &key[n] : NULL);

2981                 if (rv == KMF_OK) {
2982                     if (key != NULL && rawkey != NULL)
2983                         rv = convertToRawKey(
2984                             key[n].keyp, &rawkey[n]);
2985                     n++;
2986                 }

2988                 if (rv != KMF_OK || key == NULL)
2989                     free(fname);

2990             }
2991             (void) closedir(dirp);
2992             free(fullpath);
2993             (*numkeys) = n;
2994         } else {
2995             rv = fetch_key(handle, fullpath, keyclass, key);
2996             if (rv == KMF_OK)
2997                 (*numkeys) = 1;

3000             if (rv != KMF_OK || key == NULL)
3001                 free(fullpath);

3003             if (rv == KMF_OK && key != NULL && rawkey != NULL) {
3004                 rv = convertToRawKey(key->keyp, rawkey);
3005             }
3006         }

3008         if (rv == KMF_OK && (*numkeys) == 0)
3009             rv = KMF_ERR_KEY_NOT_FOUND;
3010         else if (rv == KMF_ERR_KEY_NOT_FOUND && (*numkeys) > 0)
3011             rv = KMF_OK;

3013         return (rv);
3014     }

3016 #define HANDLE_PK12_ERROR { \
3017     SET_ERROR(kmfh, ERR_get_error()); \
3018     rv = KMF_ERR_ENCODING; \
3019     goto out; \
3020 }

3022 static int
3023 add_alias_to_bag(PKCS12_SAFEBAG *bag, X509 *xcert)
3024 {
3025     if (xcert != NULL && xcert->aux != NULL &&
3026         xcert->aux->alias != NULL) {
3027         if (PKCS12_add_friendlyname_asc(bag,
3028                                         (const char *)xcert->aux->alias->data,
3029                                         xcert->aux->alias->length) == 0)
3030             return (0);
3031     }

```

```

3032     return (1);
3033 }

3035 static PKCS7 *
3036 add_cert_to_safe(X509 *sslcert, KMF_CREDENTIAL *cred,
3037     uchar_t *keyid, unsigned int keyidlen)
3038 {
3039     PKCS12_SAFEBAG *bag = NULL;
3040     PKCS7 *cert_authsafe = NULL;
3041     STACK_OF(PKCS12_SAFEBAG) *bag_stack;

3043     bag_stack = sk_PKCS12_SAFEBAG_new_null();
3044     if (bag_stack == NULL)
3045         return (NULL);

3047     /* Convert cert from X509 struct to PKCS#12 bag */
3048     bag = PKCS12_x5092certbag(sslcert);
3049     if (bag == NULL) {
3050         goto out;
3051     }

3053     /* Add the key id to the certificate bag. */
3054     if (keyidlen > 0 && !PKCS12_add_localkeyid(bag, keyid, keyidlen)) {
3055         goto out;
3056     }

3058     if (!add_alias_to_bag(bag, sslcert))
3059         goto out;

3061     /* Pile it on the bag_stack. */
3062     if (!sk_PKCS12_SAFEBAG_push(bag_stack, bag)) {
3063         goto out;
3064     }
3065     /* Turn bag_stack of certs into encrypted authsafe. */
3066     cert_authsafe = PKCS12_pack_p7encdata(
3067         NID_pbe_withSHA1and40BitRC2_CBC,
3068         cred->cred, cred->credlen, NULL, 0,
3069         PKCS12_DEFAULT_ITER, bag_stack);

3071 out:
3072     if (bag_stack != NULL)
3073         sk_PKCS12_SAFEBAG_pop_free(bag_stack, PKCS12_SAFEBAG_free);

3075     return (cert_authsafe);
3076 }

3078 static PKCS7 *
3079 add_key_to_safe(EVP_PKEY *pkey, KMF_CREDENTIAL *cred,
3080     uchar_t *keyid, unsigned int keyidlen,
3081     char *label, int label_len)
3082 {
3083     PKCS8_PRIV_KEY_INFO *p8 = NULL;
3084     STACK_OF(PKCS12_SAFEBAG) *bag_stack = NULL;
3085     PKCS12_SAFEBAG *bag = NULL;
3086     PKCS7 *key_authsafe = NULL;

3088     p8 = EVP_PKEY2PKCS8(pkey);
3089     if (p8 == NULL) {
3090         return (NULL);
3091     }
3092     /* Put the shrouded key into a PKCS#12 bag. */
3093     bag = PKCS12_MAKE_SHKEYBAG(
3094         NID_pbe_withSHA1and3_Key_TripleDES_CBC,
3095         cred->cred, cred->credlen,
3096         NULL, 0, PKCS12_DEFAULT_ITER, p8);

```

```

3098     /* Clean up the PKCS#8 shrouded key, don't need it now. */
3099     PKCS8_PRIV_KEY_INFO_free(p8);
3100     p8 = NULL;

3102     if (bag == NULL) {
3103         return (NULL);
3104     }
3105     if (keyidlen && !PKCS12_add_localkeyid(bag, keyid, keyidlen))
3106         goto out;
3107     if (label != NULL && !PKCS12_add_friendlyname(bag, label, label_len))
3108         goto out;

3110     /* Start a PKCS#12 safebag container for the private key. */
3111     bag_stack = sk_PKCS12_SAFEBAG_new_null();
3112     if (bag_stack == NULL)
3113         goto out;

3115     /* Pile on the private key on the bag_stack. */
3116     if (!sk_PKCS12_SAFEBAG_push(bag_stack, bag))
3117         goto out;

3119     key_authsafe = PKCS12_pack_p7data(bag_stack);

3121 out:
3122     if (bag_stack != NULL)
3123         sk_PKCS12_SAFEBAG_pop_free(bag_stack, PKCS12_SAFEBAG_free);
3124     bag_stack = NULL;
3125     return (key_authsafe);
3126 }

3128 static EVP_PKEY *
3129 ImportRawRSAKey(KMF_RAW_RSA_KEY *key)
3130 {
3131     RSA *rsa = NULL;
3132     EVP_PKEY *newkey = NULL;

3134     if ((rsa = RSA_new()) == NULL)
3135         return (NULL);

3137     if ((rsa->n = BN_bin2bn(key->mod.val, key->mod.len, rsa->n)) == NULL)
3138         return (NULL);

3140     if ((rsa->e = BN_bin2bn(key->pubexp.val, key->pubexp.len, rsa->e)) ==
3141         NULL)
3142         return (NULL);

3144     if (key->priexp.val != NULL)
3145         if ((rsa->d = BN_bin2bn(key->priexp.val, key->priexp.len,
3146             rsa->d)) == NULL)
3147             return (NULL);

3149     if (key->prime1.val != NULL)
3150         if ((rsa->p = BN_bin2bn(key->prime1.val, key->prime1.len,
3151             rsa->p)) == NULL)
3152             return (NULL);

3154     if (key->prime2.val != NULL)
3155         if ((rsa->q = BN_bin2bn(key->prime2.val, key->prime2.len,
3156             rsa->q)) == NULL)
3157             return (NULL);

3159     if (key->exp1.val != NULL)
3160         if ((rsa->dmp1 = BN_bin2bn(key->exp1.val, key->exp1.len,
3161             rsa->dmp1)) == NULL)
3162             return (NULL);

```



```

3164     if (key->exp2.val != NULL)
3165         if ((rsa->dmq1 = BN_bin2bn(key->exp2.val, key->exp2.len,
3166             rsa->dmq1)) == NULL)
3167             return (NULL);

3169     if (key->coef.val != NULL)
3170         if ((rsa->iqmp = BN_bin2bn(key->coef.val, key->coef.len,
3171             rsa->iqmp)) == NULL)
3172             return (NULL);

3174     if ((newkey = EVP_PKEY_new()) == NULL)
3175         return (NULL);

3177     (void) EVP_PKEY_set1_RSA(newkey, rsa);

3179     /* The original key must be freed once here or it leaks memory */
3180     RSA_free(rsa);

3182     return (newkey);
3183 }

3185 static EVP_PKEY *
3186 ImportRawDSAKey(KMF_RAW_DSA_KEY *key)
3187 {
3188     DSA *dsa = NULL;
3189     EVP_PKEY *newkey = NULL;

3191     if ((dsa = DSA_new()) == NULL)
3192         return (NULL);

3194     if ((dsa->p = BN_bin2bn(key->prime.val, key->prime.len,
3195         dsa->p)) == NULL)
3196         return (NULL);

3198     if ((dsa->q = BN_bin2bn(key->subprime.val, key->subprime.len,
3199         dsa->q)) == NULL)
3200         return (NULL);

3202     if ((dsa->g = BN_bin2bn(key->base.val, key->base.len,
3203         dsa->g)) == NULL)
3204         return (NULL);

3206     if ((dsa->priv_key = BN_bin2bn(key->value.val, key->value.len,
3207         dsa->priv_key)) == NULL)
3208         return (NULL);

3210     if (key->pubvalue.val != NULL) {
3211         if ((dsa->pub_key = BN_bin2bn(key->pubvalue.val,
3212             key->pubvalue.len, dsa->pub_key)) == NULL)
3213             return (NULL);
3214     }

3216     if ((newkey = EVP_PKEY_new()) == NULL)
3217         return (NULL);

3219     (void) EVP_PKEY_set1_DSA(newkey, dsa);

3221     /* The original key must be freed once here or it leaks memory */
3222     DSA_free(dsa);
3223     return (newkey);
3224 }

3226 static EVP_PKEY *
3227 raw_key_to_pkey(KMF_KEY_HANDLE *key)
3228 {
3229     EVP_PKEY *pkey = NULL;

```

```

3230     KMF_RAW_KEY_DATA *rawkey;
3231     ASN1_TYPE *attr = NULL;
3232     KMF_RETURN ret;

3234     if (key == NULL || !key->israw)
3235         return (NULL);

3237     rawkey = (KMF_RAW_KEY_DATA *)key->keyp;
3238     if (rawkey->keytype == KMF_RSA) {
3239         pkey = ImportRawRSAKey(&rawkey->rawdata.rsa);
3240     } else if (rawkey->keytype == KMF_DSA) {
3241         pkey = ImportRawDSAKey(&rawkey->rawdata.dsa);
3242     } else if (rawkey->keytype == KMF_ECDSA) {
3243         /*
3244          * OpenSSL in Solaris does not support EC for
3245          * legal reasons
3246          */
3247         return (NULL);
3248     } else {
3249         /* wrong kind of key */
3250         return (NULL);
3251     }

3253     if (rawkey->label != NULL) {
3254         if ((attr = ASN1_TYPE_new()) == NULL) {
3255             EVP_PKEY_free(pkey);
3256             return (NULL);
3257         }
3258         attr->value.bmpstring = ASN1_STRING_type_new(V_ASN1_BITMAPSTRING);
3259         (void) ASN1_STRING_set(attr->value.bmpstring, rawkey->label,
3260             strlen(rawkey->label));
3261         attr->type = V_ASN1_BITMAPSTRING;
3262         attr->value.ptr = (char *)attr->value.bmpstring;
3263         ret = set_pkey_attr(pkey, attr, NID_friendlyName);
3264         if (ret != KMF_OK) {
3265             EVP_PKEY_free(pkey);
3266             ASN1_TYPE_free(attr);
3267             return (NULL);
3268         }
3269     }
3270     if (rawkey->id.Data != NULL) {
3271         if ((attr = ASN1_TYPE_new()) == NULL) {
3272             EVP_PKEY_free(pkey);
3273             return (NULL);
3274         }
3275         attr->value.octet_string =
3276             ASN1_STRING_type_new(V_ASN1_OCTET_STRING);
3277         attr->type = V_ASN1_OCTET_STRING;
3278         (void) ASN1_STRING_set(attr->value.octet_string,
3279             rawkey->id.Data, rawkey->id.Length);
3280         attr->value.ptr = (char *)attr->value.octet_string;
3281         ret = set_pkey_attr(pkey, attr, NID_localKeyID);
3282         if (ret != KMF_OK) {
3283             EVP_PKEY_free(pkey);
3284             ASN1_TYPE_free(attr);
3285             return (NULL);
3286         }
3287     }
3288     return (pkey);
3289 }

3291 /*
3292  * Search a list of private keys to find one that goes with the certificate.
3293  */
3294 static EVP_PKEY *
3295 find_matching_key(X509 *xcert, int numkeys, KMF_KEY_HANDLE *keylist)

```

```

3296 {
3297     int i;
3298     EVP_PKEY *pkey = NULL;
3299
3300     if (numkeys == 0 || keylist == NULL || xcert == NULL)
3301         return (NULL);
3302     for (i = 0; i < numkeys; i++) {
3303         if (keylist[i].israw)
3304             pkey = raw_key_to_pkey(&keylist[i]);
3305         else
3306             pkey = (EVP_PKEY *)keylist[i].keyp;
3307         if (pkey != NULL) {
3308             if (X509_check_private_key(xcert, pkey)) {
3309                 return (pkey);
3310             } else {
3311                 EVP_PKEY_free(pkey);
3312                 pkey = NULL;
3313             }
3314         }
3315     }
3316     return (pkey);
3317 }
3318
3319 static KMF_RETURN
3320 local_export_pk12(KMF_HANDLE_T handle,
3321                  KMF_CREDENTIAL *cred,
3322                  int numcerts, KMF_X509_DER_CERT *certlist,
3323                  int numkeys, KMF_KEY_HANDLE *keylist,
3324                  char *filename)
3325 {
3326     KMF_RETURN rv = KMF_OK;
3327     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
3328     BIO *bio = NULL;
3329     PKCS7 *cert_authsafe = NULL;
3330     PKCS7 *key_authsafe = NULL;
3331     STACK_OF(PKCS7) *authsafe_stack = NULL;
3332     PKCS12 *p12_elem = NULL;
3333     int i;
3334
3335     if (numcerts == 0 && numkeys == 0)
3336         return (KMF_ERR_BAD_PARAMETER);
3337
3338     /*
3339      * Open the output file.
3340      */
3341     if ((bio = BIO_new_file(filename, "wb")) == NULL) {
3342         SET_ERROR(kmfh, ERR_get_error());
3343         rv = KMF_ERR_OPEN_FILE;
3344         goto cleanup;
3345     }
3346
3347     /* Start a PKCS#7 stack. */
3348     authsafe_stack = sk_PKCS7_new_null();
3349     if (authsafe_stack == NULL) {
3350         rv = KMF_ERR_MEMORY;
3351         goto cleanup;
3352     }
3353     if (numcerts > 0) {
3354         for (i = 0; rv == KMF_OK && i < numcerts; i++) {
3355             const uchar_t *p = certlist[i].certificate.Data;
3356             long len = certlist[i].certificate.Length;
3357             X509 *xcert = NULL;
3358             EVP_PKEY *pkey = NULL;
3359             unsigned char keyid[EVP_MAX_MD_SIZE];
3360             unsigned int keyidlen = 0;

```

```

3362         xcert = d2i_X509(NULL, &p, len);
3363         if (xcert == NULL) {
3364             SET_ERROR(kmfh, ERR_get_error());
3365             rv = KMF_ERR_ENCODING;
3366         }
3367         if (certlist[i].kmf_private.label != NULL) {
3368             /* Set alias attribute */
3369             (void) X509_alias_set1(xcert,
3370                                   (uchar_t *)certlist[i].kmf_private.label,
3371                                   strlen(certlist[i].kmf_private.label));
3372         }
3373         /* Check if there is a key corresponding to this cert */
3374         pkey = find_matching_key(xcert, numkeys, keylist);
3375
3376         /*
3377          * If key is found, get fingerprint and create a
3378          * safebag.
3379          */
3380         if (pkey != NULL) {
3381             (void) X509_digest(xcert, EVP_sha1(),
3382                               keyid, &keyidlen);
3383             key_authsafe = add_key_to_safe(pkey, cred,
3384                                           keyid, keyidlen,
3385                                           certlist[i].kmf_private.label,
3386                                           (certlist[i].kmf_private.label ?
3387                                            strlen(certlist[i].kmf_private.label) : 0));
3389             if (key_authsafe == NULL) {
3390                 X509_free(xcert);
3391                 EVP_PKEY_free(pkey);
3392                 goto cleanup;
3393             }
3394             /* Put the key safe into the Auth Safe */
3395             if (!sk_PKCS7_push(authsafe_stack,
3396                               key_authsafe)) {
3397                 X509_free(xcert);
3398                 EVP_PKEY_free(pkey);
3399                 goto cleanup;
3400             }
3401         }
3402
3403         /* create a certificate safebag */
3404         cert_authsafe = add_cert_to_safe(xcert, cred, keyid,
3405                                         keyidlen);
3406         if (cert_authsafe == NULL) {
3407             X509_free(xcert);
3408             EVP_PKEY_free(pkey);
3409             goto cleanup;
3410         }
3411         if (!sk_PKCS7_push(authsafe_stack, cert_authsafe)) {
3412             X509_free(xcert);
3413             EVP_PKEY_free(pkey);
3414             goto cleanup;
3415         }
3416
3417         X509_free(xcert);
3418         if (pkey)
3419             EVP_PKEY_free(pkey);
3420     }
3421 } else if (numcerts == 0 && numkeys > 0) {
3422     /*
3423      * If only adding keys to the file.
3424      */
3425     for (i = 0; i < numkeys; i++) {
3426         EVP_PKEY *pkey = NULL;

```

```

3428         if (keylist[i].israw)
3429             pkey = raw_key_to_pkey(&keylist[i]);
3430         else
3431             pkey = (EVP_PKEY *)keylist[i].keyp;
3432
3433         if (pkey == NULL)
3434             continue;
3435
3436         key_authsafe = add_key_to_safe(pkey, cred,
3437             NULL, 0, NULL, 0);
3438
3439         if (key_authsafe == NULL) {
3440             EVP_PKEY_free(pkey);
3441             goto cleanup;
3442         }
3443         if (!sk_PKCS7_push(authsafe_stack, key_authsafe)) {
3444             EVP_PKEY_free(pkey);
3445             goto cleanup;
3446         }
3447     }
3448 }
3449 p12_elem = PKCS12_init(NID_pkcs7_data);
3450 if (p12_elem == NULL) {
3451     goto cleanup;
3452 }
3453
3454 /* Put the PKCS#7 stack into the PKCS#12 element. */
3455 if (!PKCS12_pack_authsafes(p12_elem, authsafe_stack)) {
3456     goto cleanup;
3457 }
3458
3459 /* Set the integrity MAC on the PKCS#12 element. */
3460 if (!PKCS12_set_mac(p12_elem, cred->cred, cred->credlen,
3461     NULL, 0, PKCS12_DEFAULT_ITER, NULL)) {
3462     goto cleanup;
3463 }
3464
3465 /* Write the PKCS#12 element to the export file. */
3466 if (!i2d_PKCS12_bio(bio, p12_elem)) {
3467     goto cleanup;
3468 }
3469 PKCS12_free(p12_elem);
3470
3471 cleanup:
3472 /* Clear away the PKCS#7 stack, we're done with it. */
3473 if (authsafe_stack)
3474     sk_PKCS7_pop_free(authsafe_stack, PKCS7_free);
3475
3476 if (bio != NULL)
3477     (void) BIO_free_all(bio);
3478
3479 return (rv);
3480 }
3481
3482 KMF_RETURN
3483 openssl_build_pk12(KMF_HANDLE_T handle, int numcerts,
3484     KMF_X509_DER_CERT *certlist, int numkeys, KMF_KEY_HANDLE *keylist,
3485     KMF_CREDENTIAL *p12cred, char *filename)
3486 {
3487     KMF_RETURN rv;
3488
3489     if (certlist == NULL && keylist == NULL)
3490         return (KMF_ERR_BAD_PARAMETER);
3491
3492     rv = local_export_pk12(handle, p12cred, numcerts, certlist,
3493         numkeys, keylist, filename);

```

```

3495     return (rv);
3496 }
3497
3498 KMF_RETURN
3499 OpenSSL_ExportPK12(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
3500 {
3501     KMF_RETURN rv;
3502     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
3503     char *fullpath = NULL;
3504     char *dirpath = NULL;
3505     char *certfile = NULL;
3506     char *keyfile = NULL;
3507     char *filename = NULL;
3508     KMF_CREDENTIAL *p12cred = NULL;
3509     KMF_X509_DER_CERT certdata;
3510     KMF_KEY_HANDLE key;
3511     int gotkey = 0;
3512     int gotcert = 0;
3513
3514     if (handle == NULL)
3515         return (KMF_ERR_BAD_PARAMETER);
3516
3517     /*
3518      * First, find the certificate.
3519      */
3520     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
3521     certfile = kmf_get_attr_ptr(KMF_CERT_FILENAME_ATTR, attrlist, numattr);
3522     if (certfile != NULL) {
3523         fullpath = get_fullpath(dirpath, certfile);
3524         if (fullpath == NULL)
3525             return (KMF_ERR_BAD_PARAMETER);
3526
3527         if (isdir(fullpath)) {
3528             free(fullpath);
3529             return (KMF_ERR_AMBIGUOUS_PATHNAME);
3530         }
3531
3532         (void) memset(&certdata, 0, sizeof(certdata));
3533         rv = kmf_load_cert(kmfh, NULL, NULL, NULL, NULL,
3534             fullpath, &certdata.certificate);
3535         if (rv != KMF_OK)
3536             goto end;
3537
3538         gotcert++;
3539         certdata.kmf_private.keystore_type = KMF_KEYSTORE_OPENSSL;
3540         free(fullpath);
3541     }
3542
3543     /*
3544      * Now find the private key.
3545      */
3546     keyfile = kmf_get_attr_ptr(KMF_KEY_FILENAME_ATTR, attrlist, numattr);
3547     if (keyfile != NULL) {
3548         fullpath = get_fullpath(dirpath, keyfile);
3549         if (fullpath == NULL)
3550             return (KMF_ERR_BAD_PARAMETER);
3551
3552         if (isdir(fullpath)) {
3553             free(fullpath);
3554             return (KMF_ERR_AMBIGUOUS_PATHNAME);
3555         }
3556
3557         (void) memset(&key, 0, sizeof(KMF_KEY_HANDLE));
3558         rv = fetch_key(handle, fullpath, KMF_ASYM_PRI, &key);
3559         if (rv != KMF_OK)

```

```

3560         goto end;
3561     gotkey++;
3562 }
3564 /*
3565  * Open the output file.
3566  */
3567 filename = kmf_get_attr_ptr(KMF_OUTPUT_FILENAME_ATTR, attrlist,
3568     numattr);
3569 if (filename == NULL) {
3570     rv = KMF_ERR_BAD_PARAMETER;
3571     goto end;
3572 }
3574 /* Stick the key and the cert into a PKCS#12 file */
3575 p12cred = kmf_get_attr_ptr(KMF_PK12CRED_ATTR, attrlist, numattr);
3576 if (p12cred == NULL) {
3577     rv = KMF_ERR_BAD_PARAMETER;
3578     goto end;
3579 }
3581 rv = local_export_pk12(handle, p12cred, 1, &certdata,
3582     1, &key, filename);
3584 end:
3585 if (fullpath)
3586     free(fullpath);
3588 if (gotcert)
3589     kmf_free_kmf_cert(handle, &certdata);
3590 if (gotkey)
3591     kmf_free_kmf_key(handle, &key);
3592 return (rv);
3593 }
3595 /*
3596  * Helper function to extract keys and certificates from
3597  * a single PEM file. Typically the file should contain a
3598  * private key and an associated public key wrapped in an x509 cert.
3599  * However, the file may be just a list of X509 certs with no keys.
3600  */
3601 static KMF_RETURN
3602 extract_pem(KMF_HANDLE *kmfh,
3603     char *issuer, char *subject, KMF_BIGNT *serial,
3604     char *filename, CK_UTF8CHAR *pin,
3605     CK_ULONG pinlen, EVP_PKEY **priv_key, KMF_DATA **certs,
3606     int *numcerts)
3607 /* ARGSUSED6 */
3608 {
3609     KMF_RETURN rv = KMF_OK;
3610     FILE *fp;
3611     STACK_OF(X509_INFO) *x509_info_stack = NULL;
3612     int i, ncerts = 0, matchcerts = 0;
3613     EVP_PKEY *pkey = NULL;
3614     X509_INFO *info;
3615     X509 *x;
3616     X509_INFO **cert_infos = NULL;
3617     KMF_DATA *certlist = NULL;
3619     if (priv_key)
3620         *priv_key = NULL;
3621     if (certs)
3622         *certs = NULL;
3623     fp = fopen(filename, "r");
3624     if (fp == NULL)
3625         return (KMF_ERR_OPEN_FILE);

```

```

3627     x509_info_stack = PEM_X509_INFO_read(fp, NULL, NULL, pin);
3628     if (x509_info_stack == NULL) {
3629         (void) fclose(fp);
3630         return (KMF_ERR_ENCODING);
3631     }
3632     cert_infos = (X509_INFO **)malloc(sk_X509_INFO_num(x509_info_stack) *
3633         sizeof (X509_INFO *));
3634     if (cert_infos == NULL) {
3635         (void) fclose(fp);
3636         rv = KMF_ERR_MEMORY;
3637         goto err;
3638     }
3640     for (i = 0; i < sk_X509_INFO_num(x509_info_stack); i++) {
3641         cert_infos[ncerts] = sk_X509_INFO_value(x509_info_stack, i);
3642         ncerts++;
3643     }
3645     if (ncerts == 0) {
3646         (void) fclose(fp);
3647         rv = KMF_ERR_CERT_NOT_FOUND;
3648         goto err;
3649     }
3651     if (priv_key != NULL) {
3652         rewind(fp);
3653         pkey = PEM_read_PrivateKey(fp, NULL, NULL, pin);
3654     }
3655     (void) fclose(fp);
3657     x = cert_infos[ncerts - 1]->x509;
3658     /*
3659      * Make sure the private key matchs the last cert in the file.
3660      */
3661     if (pkey != NULL && !X509_check_private_key(x, pkey)) {
3662         EVP_PKEY_free(pkey);
3663         rv = KMF_ERR_KEY_MISMATCH;
3664         goto err;
3665     }
3667     certlist = (KMF_DATA *)calloc(ncerts, sizeof (KMF_DATA));
3668     if (certlist == NULL) {
3669         if (pkey != NULL)
3670             EVP_PKEY_free(pkey);
3671         rv = KMF_ERR_MEMORY;
3672         goto err;
3673     }
3675     /*
3676      * Convert all of the certs to DER format.
3677      */
3678     matchcerts = 0;
3679     for (i = 0; rv == KMF_OK && certs != NULL && i < ncerts; i++) {
3680         boolean_t match = FALSE;
3681         info = cert_infos[ncerts - 1 - i];
3683         rv = check_cert(info->x509, issuer, subject, serial, &match);
3684         if (rv != KMF_OK || match != TRUE) {
3685             rv = KMF_OK;
3686             continue;
3687         }
3689         rv = ssl_cert2KMFDATA(kmfh, info->x509,
3690             &certlist[matchcerts++]);

```

```

3692         if (rv != KMF_OK) {
3693             int j;
3694             for (j = 0; j < matchcerts; j++)
3695                 kmf_free_data(&certlist[j]);
3696             free(certlist);
3697             certlist = NULL;
3698             ncerts = matchcerts = 0;
3699         }
3700     }
3701
3702     if (numcerts != NULL)
3703         *numcerts = matchcerts;
3704
3705     if (certs != NULL)
3706         *certs = certlist;
3707     else if (certlist != NULL) {
3708         for (i = 0; i < ncerts; i++)
3709             kmf_free_data(&certlist[i]);
3710         free(certlist);
3711         certlist = NULL;
3712     }
3713
3714     if (priv_key == NULL && pkey != NULL)
3715         EVP_PKEY_free(pkey);
3716     else if (priv_key != NULL && pkey != NULL)
3717         *priv_key = pkey;
3718
3719 err:
3720     /* Cleanup the stack of X509 info records */
3721     for (i = 0; i < sk_X509_INFO_num(x509_info_stack); i++) {
3722         info = (X509_INFO *)sk_X509_INFO_value(x509_info_stack, i);
3723         X509_INFO_free(info);
3724     }
3725     if (x509_info_stack)
3726         sk_X509_INFO_free(x509_info_stack);
3727
3728     if (cert_infos != NULL)
3729         free(cert_infos);
3730
3731     return (rv);
3732 }
3733
3734 static KMF_RETURN
3735 openssl_parse_bags(STACK_OF(PKCS12_SAFEBAG) *bags, char *pin,
3736                   STACK_OF(EVP_PKEY) *keys, STACK_OF(X509) *certs)
3737 {
3738     KMF_RETURN ret;
3739     int i;
3740
3741     for (i = 0; i < sk_PKCS12_SAFEBAG_num(bags); i++) {
3742         PKCS12_SAFEBAG *bag = sk_PKCS12_SAFEBAG_value(bags, i);
3743         ret = openssl_parse_bag(bag, pin, (pin ? strlen(pin) : 0),
3744                                keys, certs);
3745
3746         if (ret != KMF_OK)
3747             return (ret);
3748     }
3749
3750     return (ret);
3751 }
3752
3753 static KMF_RETURN
3754 set_pkey_attr(EVP_PKEY *pkey, ASN1_TYPE *attrib, int nid)
3755 {
3756     X509_ATTRIBUTE *attr = NULL;

```

```

3758     if (pkey == NULL || attrib == NULL)
3759         return (KMF_ERR_BAD_PARAMETER);
3760
3761     if (pkey->attributes == NULL) {
3762         pkey->attributes = sk_X509_ATTRIBUTE_new_null();
3763         if (pkey->attributes == NULL)
3764             return (KMF_ERR_MEMORY);
3765     }
3766     attr = X509_ATTRIBUTE_create(nid, attrib->type, attrib->value.ptr);
3767     if (attr != NULL) {
3768         int i;
3769         X509_ATTRIBUTE *a;
3770         for (i = 0;
3771              i < sk_X509_ATTRIBUTE_num(pkey->attributes); i++) {
3772             a = sk_X509_ATTRIBUTE_value(pkey->attributes, i);
3773             if (OBJ_obj2nid(a->object) == nid) {
3774                 X509_ATTRIBUTE_free(a);
3775                 sk_X509_ATTRIBUTE_set(pkey->attributes,
3776                                       i, attr);
3777                 return (KMF_OK);
3778             }
3779         }
3780         if (sk_X509_ATTRIBUTE_push(pkey->attributes, attr) == NULL) {
3781             X509_ATTRIBUTE_free(attr);
3782             return (KMF_ERR_MEMORY);
3783         }
3784     } else {
3785         return (KMF_ERR_MEMORY);
3786     }
3787
3788     return (KMF_OK);
3789 }
3790
3791 static KMF_RETURN
3792 openssl_parse_bag(PKCS12_SAFEBAG *bag, char *pass, int passlen,
3793                  STACK_OF(EVP_PKEY) *keylist, STACK_OF(X509) *certlist)
3794 {
3795     KMF_RETURN ret = KMF_OK;
3796     PKCS8_PRIV_KEY_INFO *p8 = NULL;
3797     EVP_PKEY *pkey = NULL;
3798     X509 *xcert = NULL;
3799     ASN1_TYPE *keyid = NULL;
3800     ASN1_TYPE *fname = NULL;
3801     uchar_t *data = NULL;
3802
3803     keyid = PKCS12_get_attr(bag, NID_localKeyID);
3804     fname = PKCS12_get_attr(bag, NID_friendlyName);
3805
3806     switch (M_PKCS12_bag_type(bag)) {
3807     case NID_keyBag:
3808         if (keylist == NULL)
3809             goto end;
3810         pkey = EVP_PKCS82PKEY(bag->value.keybag);
3811         if (pkey == NULL)
3812             ret = KMF_ERR_PKCS12_FORMAT;
3813
3814         break;
3815     case NID_pkcs8ShroudedKeyBag:
3816         if (keylist == NULL)
3817             goto end;
3818         p8 = M_PKCS12_decrypt_key(bag, pass, passlen);
3819         if (p8 == NULL)
3820             return (KMF_ERR_AUTH_FAILED);
3821         pkey = EVP_PKCS82PKEY(p8);
3822         PKCS8_PRIV_KEY_INFO_free(p8);
3823         if (pkey == NULL)

```

```

3824         ret = KMF_ERR_PKCS12_FORMAT;
3825         break;
3826     case NID_certBag:
3827         if (certlist == NULL)
3828             goto end;
3829         if (M_PKCS12_cert_bag_type(bag) != NID_x509Certificate)
3830             return (KMF_ERR_PKCS12_FORMAT);
3831         xcert = M_PKCS12_certbag2x509(bag);
3832         if (xcert == NULL) {
3833             ret = KMF_ERR_PKCS12_FORMAT;
3834             goto end;
3835         }
3836         if (keyid != NULL) {
3837             if (X509_keyid_set1(xcert,
3838                 keyid->value.octet_string->data,
3839                 keyid->value.octet_string->length) == 0) {
3840                 ret = KMF_ERR_PKCS12_FORMAT;
3841                 goto end;
3842             }
3843         }
3844         if (fname != NULL) {
3845             int len, r;
3846             len = ASN1_STRING_to_UTF8(&data,
3847                 fname->value.asn1_string);
3848             if (len > 0 && data != NULL) {
3849                 r = X509_alias_set1(xcert, data, len);
3850                 if (r == NULL) {
3851                     ret = KMF_ERR_PKCS12_FORMAT;
3852                     goto end;
3853                 }
3854             } else {
3855                 ret = KMF_ERR_PKCS12_FORMAT;
3856                 goto end;
3857             }
3858         }
3859         if (sk_X509_push(certlist, xcert) == 0)
3860             ret = KMF_ERR_MEMORY;
3861         else
3862             xcert = NULL;
3863         break;
3864     case NID_safeContentsBag:
3865         return (openssl_parse_bags(bag->value.safes, pass,
3866             keylist, certlist));
3867     default:
3868         ret = KMF_ERR_PKCS12_FORMAT;
3869         break;
3870 }
3871
3872 /*
3873  * Set the ID and/or FriendlyName attributes on the key.
3874  * If converting to PKCS11 objects, these can translate to CKA_ID
3875  * and CKA_LABEL values.
3876  */
3877 if (pkey != NULL && ret == KMF_OK) {
3878     ASN1_TYPE *attr = NULL;
3879     if (keyid != NULL && keyid->type == V_ASN1_OCTET_STRING) {
3880         if ((attr = ASN1_TYPE_new()) == NULL)
3881             return (KMF_ERR_MEMORY);
3882         attr->value.octet_string =
3883             ASN1_STRING_dup(keyid->value.octet_string);
3884         attr->type = V_ASN1_OCTET_STRING;
3885         attr->value.ptr = (char *)attr->value.octet_string;
3886         ret = set_pkey_attr(pkey, attr, NID_localKeyID);
3887         OPENSSL_free(attr);
3888     }

```

```

3890         if (ret == KMF_OK && fname != NULL &&
3891             fname->type == V_ASN1_BMPSTRING) {
3892             if ((attr = ASN1_TYPE_new()) == NULL)
3893                 return (KMF_ERR_MEMORY);
3894             attr->value.bmpstring =
3895                 ASN1_STRING_dup(fname->value.bmpstring);
3896             attr->type = V_ASN1_BMPSTRING;
3897             attr->value.ptr = (char *)attr->value.bmpstring;
3898             ret = set_pkey_attr(pkey, attr, NID_friendlyName);
3899             OPENSSL_free(attr);
3900         }
3901
3902         if (ret == KMF_OK && keylist != NULL &&
3903             sk_EVP_PKEY_push(keylist, pkey) == 0)
3904             ret = KMF_ERR_MEMORY;
3905     }
3906     if (ret == KMF_OK && keylist != NULL)
3907         pkey = NULL;
3908 end:
3909     if (pkey != NULL)
3910         EVP_PKEY_free(pkey);
3911     if (xcert != NULL)
3912         X509_free(xcert);
3913     if (data != NULL)
3914         OPENSSL_free(data);
3915
3916     return (ret);
3917 }
3918
3919 static KMF_RETURN
3920 openssl_pkcs12_parse(PKCS12 *p12, char *pin,
3921     STACK_OF(EVP_PKEY) *keys,
3922     STACK_OF(X509) *certs,
3923     STACK_OF(X509) *ca)
3924 /* ARGSUSED3 */
3925 {
3926     KMF_RETURN ret = KMF_OK;
3927     STACK_OF(PKCS7) *asafes = NULL;
3928     STACK_OF(PKCS12_SAFEBAG) *bags = NULL;
3929     int i, bagnid;
3930     PKCS7 *p7;
3931
3932     if (p12 == NULL || (keys == NULL && certs == NULL))
3933         return (KMF_ERR_BAD_PARAMETER);
3934
3935     if (pin == NULL || *pin == NULL) {
3936         if (PKCS12_verify_mac(p12, NULL, 0)) {
3937             pin = NULL;
3938         } else if (PKCS12_verify_mac(p12, "", 0)) {
3939             pin = "";
3940         } else {
3941             return (KMF_ERR_AUTH_FAILED);
3942         }
3943     } else if (!PKCS12_verify_mac(p12, pin, -1)) {
3944         return (KMF_ERR_AUTH_FAILED);
3945     }
3946
3947     if ((asafes = PKCS12_unpack_authsafes(p12)) == NULL)
3948         return (KMF_ERR_PKCS12_FORMAT);
3949
3950     for (i = 0; ret == KMF_OK && i < sk_PKCS7_num(asafes); i++) {
3951         bags = NULL;
3952         p7 = sk_PKCS7_value(asafes, i);
3953         bagnid = OBJ_obj2nid(p7->type);
3954
3955         if (bagnid == NID_pkcs7_data) {

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3956         bags = PKCS12_unpack_p7data(p7);
3957     } else if (bagnid == NID_pkcs7_encrypted) {
3958         bags = PKCS12_unpack_p7encdata(p7, pin,
3959             (pin ? strlen(pin) : 0));
3960     } else {
3961         continue;
3962     }
3963     if (bags == NULL) {
3964         ret = KMF_ERR_PKCS12_FORMAT;
3965         goto out;
3966     }
3968     if (openssl_parse_bags(bags, pin, keys, certs) != KMF_OK)
3969         ret = KMF_ERR_PKCS12_FORMAT;
3971     sk_PKCS12_SAFE_BAG_pop_free(bags, PKCS12_SAFE_BAG_free);
3972 }
3973 out:
3974     if (asafes != NULL)
3975         sk_PKCS7_pop_free(asafes, PKCS7_free);
3977     return (ret);
3978 }
3980 /*
3981  * Helper function to decrypt and parse PKCS#12 import file.
3982  */
3983 static KMF_RETURN
3984 extract_pkcs12(BIO *fbio, CK_UTF8CHAR *pin, CK_ULONG pinlen,
3985     STACK_OF(EVP_PKEY) **priv_key, STACK_OF(X509) **certs,
3986     STACK_OF(X509) **ca)
3987 /* ARGSUSED2 */
3988 {
3989     PKCS12 *pk12, *pk12_tmp;
3990     STACK_OF(EVP_PKEY) *pkeylist = NULL;
3991     STACK_OF(X509) *xcertlist = NULL;
3992     STACK_OF(X509) *cacertlist = NULL;
3994     if ((pk12 = PKCS12_new()) == NULL) {
3995         return (KMF_ERR_MEMORY);
3996     }
3998     if ((pk12_tmp = d2i_PKCS12_bio(fbio, &pk12)) == NULL) {
3999         /* This is ok; it seems to mean there is no more to read. */
4000         if (ERR_GET_LIB(ERR_peek_error()) == ERR_LIB_ASN1 &&
4001             ERR_GET_REASON(ERR_peek_error()) == ASN1_R_HEADER_TOO_LONG)
4002             goto end_extract_pkcs12;
4004         PKCS12_free(pk12);
4005         return (KMF_ERR_PKCS12_FORMAT);
4006     }
4007     pk12 = pk12_tmp;
4009     xcertlist = sk_X509_new_null();
4010     if (xcertlist == NULL) {
4011         PKCS12_free(pk12);
4012         return (KMF_ERR_MEMORY);
4013     }
4014     pkeylist = sk_EVP_PKEY_new_null();
4015     if (pkeylist == NULL) {
4016         sk_X509_pop_free(xcertlist, X509_free);
4017         PKCS12_free(pk12);
4018         return (KMF_ERR_MEMORY);
4019     }
4021     if (openssl_pkcs12_parse(pk12, (char *)pin, pkeylist, xcertlist,

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```

4022     cacertlist) != KMF_OK) {
4023         sk_X509_pop_free(xcertlist, X509_free);
4024         sk_EVP_PKEY_pop_free(pkeylist, EVP_PKEY_free);
4025         PKCS12_free(pk12);
4026         return (KMF_ERR_PKCS12_FORMAT);
4027     }
4029     if (priv_key && pkeylist)
4030         *priv_key = pkeylist;
4031     else if (pkeylist)
4032         sk_EVP_PKEY_pop_free(pkeylist, EVP_PKEY_free);
4033     if (certs && xcertlist)
4034         *certs = xcertlist;
4035     else if (xcertlist)
4036         sk_X509_pop_free(xcertlist, X509_free);
4037     if (ca && cacertlist)
4038         *ca = cacertlist;
4039     else if (cacertlist)
4040         sk_X509_pop_free(cacertlist, X509_free);
4042 end_extract_pkcs12:
4044     PKCS12_free(pk12);
4045     return (KMF_OK);
4046 }
4048 static KMF_RETURN
4049 sslBN2KMFBN(BIGNUM *from, KMF_BIGNT *to)
4050 {
4051     KMF_RETURN rv = KMF_OK;
4052     uint32_t sz;
4054     sz = BN_num_bytes(from);
4055     to->val = (uchar_t *)malloc(sz);
4056     if (to->val == NULL)
4057         return (KMF_ERR_MEMORY);
4059     if ((to->len = BN_bn2bin(from, to->val)) != sz) {
4060         free(to->val);
4061         to->val = NULL;
4062         to->len = 0;
4063         rv = KMF_ERR_MEMORY;
4064     }
4066     return (rv);
4067 }
4069 static KMF_RETURN
4070 exportRawRSAKey(RSA *rsa, KMF_RAW_KEY_DATA *key)
4071 {
4072     KMF_RETURN rv;
4073     KMF_RAW_RSA_KEY *kmfkey = &key->rawdata.rsa;
4075     (void) memset(kmfkey, 0, sizeof (KMF_RAW_RSA_KEY));
4076     if ((rv = sslBN2KMFBN(rsa->n, &kmfkey->mod)) != KMF_OK)
4077         goto cleanup;
4079     if ((rv = sslBN2KMFBN(rsa->e, &kmfkey->pubexp)) != KMF_OK)
4080         goto cleanup;
4082     if (rsa->d != NULL)
4083         if ((rv = sslBN2KMFBN(rsa->d, &kmfkey->priexp)) != KMF_OK)
4084             goto cleanup;
4086     if (rsa->p != NULL)
4087         if ((rv = sslBN2KMFBN(rsa->p, &kmfkey->prime1)) != KMF_OK)

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```

4088         goto cleanup;
4090     if (rsa->q != NULL)
4091         if ((rv = sslBN2KMFBN(rsa->q, &kmfkey->prime2)) != KMF_OK)
4092             goto cleanup;
4094     if (rsa->dmp1 != NULL)
4095         if ((rv = sslBN2KMFBN(rsa->dmp1, &kmfkey->exp1)) != KMF_OK)
4096             goto cleanup;
4098     if (rsa->dmq1 != NULL)
4099         if ((rv = sslBN2KMFBN(rsa->dmq1, &kmfkey->exp2)) != KMF_OK)
4100             goto cleanup;
4102     if (rsa->iqmp != NULL)
4103         if ((rv = sslBN2KMFBN(rsa->iqmp, &kmfkey->coef)) != KMF_OK)
4104             goto cleanup;
4105 cleanup:
4106     if (rv != KMF_OK)
4107         kmf_free_raw_key(key);
4108     else
4109         key->keytype = KMF_RSA;
4111     /*
4112     * Free the reference to this key, SSL will not actually free
4113     * the memory until the refcount == 0, so this is safe.
4114     */
4115     RSA_free(rsa);
4117     return (rv);
4118 }
4120 static KMF_RETURN
4121 exportRawDSAKey(DSA *dsa, KMF_RAW_KEY_DATA *key)
4122 {
4123     KMF_RETURN rv;
4124     KMF_RAW_DSA_KEY *kmfkey = &key->rawdata.dsa;
4126     (void) memset(kmfkey, 0, sizeof (KMF_RAW_DSA_KEY));
4127     if ((rv = sslBN2KMFBN(dsa->p, &kmfkey->prime)) != KMF_OK)
4128         goto cleanup;
4130     if ((rv = sslBN2KMFBN(dsa->q, &kmfkey->subprime)) != KMF_OK)
4131         goto cleanup;
4133     if ((rv = sslBN2KMFBN(dsa->g, &kmfkey->base)) != KMF_OK)
4134         goto cleanup;
4136     if ((rv = sslBN2KMFBN(dsa->priv_key, &kmfkey->value)) != KMF_OK)
4137         goto cleanup;
4139 cleanup:
4140     if (rv != KMF_OK)
4141         kmf_free_raw_key(key);
4142     else
4143         key->keytype = KMF_DSA;
4145     /*
4146     * Free the reference to this key, SSL will not actually free
4147     * the memory until the refcount == 0, so this is safe.
4148     */
4149     DSA_free(dsa);
4151     return (rv);
4152 }

```

```

4154 static KMF_RETURN
4155 add_cert_to_list(KMF_HANDLE *kmfh, X509 *sslcert,
4156                 KMF_X509_DER_CERT **certlist, int *ncerts)
4157 {
4158     KMF_RETURN rv = KMF_OK;
4159     KMF_X509_DER_CERT *list = (*certlist);
4160     KMF_X509_DER_CERT cert;
4161     int n = (*ncerts);
4163     if (list == NULL) {
4164         list = (KMF_X509_DER_CERT *)malloc(sizeof (KMF_X509_DER_CERT));
4165     } else {
4166         list = (KMF_X509_DER_CERT *)realloc(list,
4167         sizeof (KMF_X509_DER_CERT) * (n + 1));
4168     }
4170     if (list == NULL)
4171         return (KMF_ERR_MEMORY);
4173     (void) memset(&cert, 0, sizeof (cert));
4174     rv = ssl_cert2KMFDATA(kmfh, sslcert, &cert.certificate);
4175     if (rv == KMF_OK) {
4176         int len = 0;
4177         /* Get the alias name for the cert if there is one */
4178         char *a = (char *)X509_alias_get0(sslcert, &len);
4179         if (a != NULL)
4180             cert.kmf_private.label = strdup(a);
4181         cert.kmf_private.keystore_type = KMF_KEYSTORE_OPENSSSL;
4183         list[n] = cert;
4184         (*ncerts) = n + 1;
4186         *certlist = list;
4187     } else {
4188         free(list);
4189     }
4191     return (rv);
4192 }
4194 static KMF_RETURN
4195 add_key_to_list(KMF_RAW_KEY_DATA **keylist,
4196                KMF_RAW_KEY_DATA *newkey, int *nkeys)
4197 {
4198     KMF_RAW_KEY_DATA *list = (*keylist);
4199     int n = (*nkeys);
4201     if (list == NULL) {
4202         list = (KMF_RAW_KEY_DATA *)malloc(sizeof (KMF_RAW_KEY_DATA));
4203     } else {
4204         list = (KMF_RAW_KEY_DATA *)realloc(list,
4205         sizeof (KMF_RAW_KEY_DATA) * (n + 1));
4206     }
4208     if (list == NULL)
4209         return (KMF_ERR_MEMORY);
4211     list[n] = *newkey;
4212     (*nkeys) = n + 1;
4214     *keylist = list;
4216     return (KMF_OK);
4217 }
4219 static X509_ATTRIBUTE *

```



```

4220 find_attr(STACK_OF(X509_ATTRIBUTE) *attrs, int nid)
4221 {
4222     X509_ATTRIBUTE *a;
4223     int i;
4224
4225     if (attrs == NULL)
4226         return (NULL);
4227
4228     for (i = 0; i < sk_X509_ATTRIBUTE_num(attrs); i++) {
4229         a = sk_X509_ATTRIBUTE_value(attrs, i);
4230         if (OBJ_obj2nid(a->object) == nid)
4231             return (a);
4232     }
4233     return (NULL);
4234 }
4235
4236 static KMF_RETURN
4237 convertToRawKey(EVP_PKEY *pkey, KMF_RAW_KEY_DATA *key)
4238 {
4239     KMF_RETURN rv = KMF_OK;
4240     X509_ATTRIBUTE *attr;
4241
4242     if (pkey == NULL || key == NULL)
4243         return (KMF_ERR_BAD_PARAMETER);
4244     /* Convert SSL key to raw key */
4245     switch (pkey->type) {
4246     case EVP_PKEY_RSA:
4247         rv = exportRawRSAKey(EVP_PKEY_get1_RSA(pkey),
4248                             key);
4249         if (rv != KMF_OK)
4250             return (rv);
4251         break;
4252     case EVP_PKEY_DSA:
4253         rv = exportRawDSAKey(EVP_PKEY_get1_DSA(pkey),
4254                             key);
4255         if (rv != KMF_OK)
4256             return (rv);
4257         break;
4258     default:
4259         return (KMF_ERR_BAD_PARAMETER);
4260     }
4261     /*
4262     * If friendlyName, add it to record.
4263     */
4264     attr = find_attr(pkey->attributes, NID_friendlyName);
4265     if (attr != NULL) {
4266         ASN1_TYPE *ty = NULL;
4267         int numattr = sk_ASN1_TYPE_num(attr->value.set);
4268         if (attr->single == 0 && numattr > 0) {
4269             ty = sk_ASN1_TYPE_value(attr->value.set, 0);
4270         }
4271         if (ty != NULL) {
4272             #if OPENSSL_VERSION_NUMBER < 0x10000000L
4273             key->label = uni2asc(ty->value.bmpstring->data,
4274                                ty->value.bmpstring->length);
4275             #else
4276             key->label = OPENSSL_uni2asc(ty->value.bmpstring->data,
4277                                         ty->value.bmpstring->length);
4278             #endif
4279         }
4280     } else {
4281         key->label = NULL;
4282     }
4283
4284     /*
4285     * If KeyID, add it to record as a KMF_DATA object.

```

```

4286     */
4287     attr = find_attr(pkey->attributes, NID_localKeyID);
4288     if (attr != NULL) {
4289         ASN1_TYPE *ty = NULL;
4290         int numattr = sk_ASN1_TYPE_num(attr->value.set);
4291         if (attr->single == 0 && numattr > 0) {
4292             ty = sk_ASN1_TYPE_value(attr->value.set, 0);
4293         }
4294         key->id.Data = (uchar_t *)malloc(
4295             ty->value.octet_string->length);
4296         if (key->id.Data == NULL)
4297             return (KMF_ERR_MEMORY);
4298         (void) memcpy(key->id.Data, ty->value.octet_string->data,
4299                     ty->value.octet_string->length);
4300         key->id.Length = ty->value.octet_string->length;
4301     } else {
4302         (void) memset(&key->id, 0, sizeof (KMF_DATA));
4303     }
4304
4305     return (rv);
4306 }
4307
4308 static KMF_RETURN
4309 convertPK12Objects(
4310     KMF_HANDLE *kmfh,
4311     STACK_OF(EVP_PKEY) *sslkeys,
4312     STACK_OF(X509) *sslcert,
4313     STACK_OF(X509) *sslcerts,
4314     KMF_RAW_KEY_DATA **keylist, int *nkeys,
4315     KMF_X509_DER_CERT **certlist, int *ncerts)
4316 {
4317     KMF_RETURN rv = KMF_OK;
4318     KMF_RAW_KEY_DATA key;
4319     int i;
4320
4321     for (i = 0; sslkeys != NULL && i < sk_EVP_PKEY_num(sslkeys); i++) {
4322         EVP_PKEY *pkey = sk_EVP_PKEY_value(sslkeys, i);
4323         rv = convertToRawKey(pkey, &key);
4324         if (rv == KMF_OK)
4325             rv = add_key_to_list(keylist, &key, nkeys);
4326
4327         if (rv != KMF_OK)
4328             return (rv);
4329     }
4330
4331     /* Now add the certificate to the certlist */
4332     for (i = 0; sslcert != NULL && i < sk_X509_num(sslcert); i++) {
4333         X509 *cert = sk_X509_value(sslcert, i);
4334         rv = add_cert_to_list(kmfh, cert, certlist, ncerts);
4335         if (rv != KMF_OK)
4336             return (rv);
4337     }
4338
4339     /* Also add any included CA certs to the list */
4340     for (i = 0; sslcerts != NULL && i < sk_X509_num(sslcerts); i++) {
4341         X509 *c;
4342         /*
4343          * sk_X509_value() is macro that embeds a cast to (X509 *).
4344          * Here it translates into ((X509 *)sk_value((ca), (i))).
4345          * Lint is complaining about the embedded casting, and
4346          * to fix it, you need to fix openssl header files.
4347          */
4348         c = sk_X509_value(sslcerts, i);
4349
4350         /* Now add the ca cert to the certlist */
4351         rv = add_cert_to_list(kmfh, c, certlist, ncerts);

```

```

4352         if (rv != KMF_OK)
4353             return (rv);
4354     }
4355     return (rv);
4356 }

4358 KMF_RETURN
4359 openssl_import_objects(KMF_HANDLE *kmfh,
4360     char *filename, KMF_CREDENTIAL *cred,
4361     KMF_X509_DER_CERT **certlist, int *ncerts,
4362     KMF_RAW_KEY_DATA **keylist, int *nkeys)
4363 {
4364     KMF_RETURN rv = KMF_OK;
4365     KMF_ENCODE_FORMAT format;
4366     BIO *bio = NULL;
4367     STACK_OF(EVP_PKEY) *privkeys = NULL;
4368     STACK_OF(X509) *certs = NULL;
4369     STACK_OF(X509) *cacerts = NULL;

4371     /*
4372      * auto-detect the file format, regardless of what
4373      * the 'format' parameters in the params say.
4374      */
4375     rv = kmf_get_file_format(filename, &format);
4376     if (rv != KMF_OK) {
4377         return (rv);
4378     }

4380     /* This function only works for PEM or PKCS#12 files */
4381     if (format != KMF_FORMAT_PEM &&
4382         format != KMF_FORMAT_PEM_KEYPAIR &&
4383         format != KMF_FORMAT_PKCS12)
4384         return (KMF_ERR_ENCODING);

4386     *certlist = NULL;
4387     *keylist = NULL;
4388     *ncerts = 0;
4389     *nkeys = 0;

4391     if (format == KMF_FORMAT_PKCS12) {
4392         bio = BIO_new_file(filename, "rb");
4393         if (bio == NULL) {
4394             SET_ERROR(kmfh, ERR_get_error());
4395             rv = KMF_ERR_OPEN_FILE;
4396             goto end;
4397         }

4399         rv = extract_pkcs12(bio, (uchar_t *)cred->cred,
4400             (uint32_t)cred->credlen, &privkeys, &certs, &cacerts);

4402         if (rv == KMF_OK)
4403             /* Convert keys and certs to exportable format */
4404             rv = convertPK12Objects(kmfh, privkeys, certs, cacerts,
4405                 keylist, nkeys, certlist, ncerts);
4406     } else {
4407         EVP_PKEY *pkey;
4408         KMF_DATA *certdata = NULL;
4409         KMF_X509_DER_CERT *kmfcerts = NULL;
4410         int i;
4411         rv = extract_pem(kmfh, NULL, NULL, NULL, filename,
4412             (uchar_t *)cred->cred, (uint32_t)cred->credlen,
4413             &pkey, &certdata, ncerts);

4415         /* Reached end of import file? */
4416         if (rv == KMF_OK && pkey != NULL) {
4417             privkeys = sk_EVP_PKEY_new_null();

```

```

4418         if (privkeys == NULL) {
4419             rv = KMF_ERR_MEMORY;
4420             goto end;
4421         }
4422         (void) sk_EVP_PKEY_push(privkeys, pkey);
4423         /* convert the certificate list here */
4424         if (*ncerts > 0 && certlist != NULL) {
4425             kmfcerts = (KMF_X509_DER_CERT *)calloc(*ncerts,
4426                 sizeof (KMF_X509_DER_CERT));
4427             if (kmfcerts == NULL) {
4428                 rv = KMF_ERR_MEMORY;
4429                 goto end;
4430             }
4431             for (i = 0; i < *ncerts; i++) {
4432                 kmfcerts[i].certificate = certdata[i];
4433                 kmfcerts[i].kmf_private.keystore_type =
4434                     KMF_KEystore_OPENSSL;
4435             }
4436             *certlist = kmfcerts;
4437         }
4438         /*
4439          * Convert keys to exportable format, the certs
4440          * are already OK.
4441          */
4442         rv = convertPK12Objects(kmfh, privkeys, NULL, NULL,
4443             keylist, nkeys, NULL, NULL);
4444     }
4445 }
4446 end:
4447     if (bio != NULL)
4448         (void) BIO_free(bio);

4450     if (privkeys)
4451         sk_EVP_PKEY_pop_free(privkeys, EVP_PKEY_free);
4452     if (certs)
4453         sk_X509_pop_free(certs, X509_free);
4454     if (cacerts)
4455         sk_X509_pop_free(cacerts, X509_free);

4457     return (rv);
4458 }

4460 static KMF_RETURN
4461 create_deskey(DES_cblock **deskey)
4462 {
4463     DES_cblock *key;

4465     key = (DES_cblock *) malloc(sizeof (DES_cblock));
4466     if (key == NULL) {
4467         return (KMF_ERR_MEMORY);
4468     }

4470     if (DES_random_key(key) == 0) {
4471         free(key);
4472         return (KMF_ERR_KEYGEN_FAILED);
4473     }

4475     *deskey = key;
4476     return (KMF_OK);
4477 }

4479 #define KEYGEN_RETRY 3
4480 #define DES3_KEY_SIZE 24

4482 static KMF_RETURN
4483 create_des3key(unsigned char **des3key)

```

```

4484 {
4485     KMF_RETURN ret = KMF_OK;
4486     DES_cblock *deskey1 = NULL;
4487     DES_cblock *deskey2 = NULL;
4488     DES_cblock *deskey3 = NULL;
4489     unsigned char *newkey = NULL;
4490     int retry;

4492     if ((newkey = malloc(DES3_KEY_SIZE)) == NULL) {
4493         return (KMF_ERR_MEMORY);
4494     }

4496     /* create the 1st DES key */
4497     if ((ret = create_deskey(&deskey1)) != KMF_OK) {
4498         goto out;
4499     }

4501     /*
4502      * Create the 2nd DES key and make sure its value is different
4503      * from the 1st DES key.
4504      */
4505     retry = 0;
4506     do {
4507         if (deskey2 != NULL) {
4508             free(deskey2);
4509             deskey2 = NULL;
4510         }

4512         if ((ret = create_deskey(&deskey2)) != KMF_OK) {
4513             goto out;
4514         }

4516         if (memcmp((const void *) deskey1, (const void *) deskey2, 8)
4517             == 0) {
4518             ret = KMF_ERR_KEYGEN_FAILED;
4519             retry++;
4520         }
4521     } while (ret == KMF_ERR_KEYGEN_FAILED && retry < KEYGEN_RETRY);

4523     if (ret != KMF_OK) {
4524         goto out;
4525     }

4527     /*
4528      * Create the 3rd DES key and make sure its value is different
4529      * from the 2nd DES key.
4530      */
4531     retry = 0;
4532     do {
4533         if (deskey3 != NULL) {
4534             free(deskey3);
4535             deskey3 = NULL;
4536         }

4538         if ((ret = create_deskey(&deskey3)) != KMF_OK) {
4539             goto out;
4540         }

4542         if (memcmp((const void *) deskey2, (const void *) deskey3, 8)
4543             == 0) {
4544             ret = KMF_ERR_KEYGEN_FAILED;
4545             retry++;
4546         }
4547     } while (ret == KMF_ERR_KEYGEN_FAILED && retry < KEYGEN_RETRY);

4549     if (ret != KMF_OK) {

```

```

4550         goto out;
4551     }

4553     /* Concatenate 3 DES keys into a DES3 key */
4554     (void) memcpy((void *) newkey, (const void *) deskey1, 8);
4555     (void) memcpy((void *) (newkey + 8), (const void *) deskey2, 8);
4556     (void) memcpy((void *) (newkey + 16), (const void *) deskey3, 8);
4557     *des3key = newkey;

4559 out:
4560     if (deskey1 != NULL)
4561         free(deskey1);

4563     if (deskey2 != NULL)
4564         free(deskey2);

4566     if (deskey3 != NULL)
4567         free(deskey3);

4569     if (ret != KMF_OK && newkey != NULL)
4570         free(newkey);

4572     return (ret);
4573 }

4575 KMF_RETURN
4576 OpenSSL_CreateSymKey(KMF_HANDLE_T handle,
4577     int numattr, KMF_ATTRIBUTE *attrlist)
4578 {
4579     KMF_RETURN ret = KMF_OK;
4580     KMF_HANDLE *kmfh = (KMF_HANDLE *) handle;
4581     char *fullpath = NULL;
4582     KMF_RAW_SYM_KEY *rkey = NULL;
4583     DES_cblock *deskey = NULL;
4584     unsigned char *des3key = NULL;
4585     unsigned char *random = NULL;
4586     int fd = -1;
4587     KMF_KEY_HANDLE *symkey;
4588     KMF_KEY_ALG keytype;
4589     uint32_t keylen;
4590     uint32_t keylen_size = sizeof (keylen);
4591     char *dirpath;
4592     char *keyfile;

4594     if (kmfh == NULL)
4595         return (KMF_ERR_UNINITIALIZED);

4597     symkey = kmf_get_attr_ptr(KMF_KEY_HANDLE_ATTR, attrlist, numattr);
4598     if (symkey == NULL)
4599         return (KMF_ERR_BAD_PARAMETER);

4601     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);

4603     keyfile = kmf_get_attr_ptr(KMF_KEY_FILENAME_ATTR, attrlist, numattr);
4604     if (keyfile == NULL)
4605         return (KMF_ERR_BAD_PARAMETER);

4607     ret = kmf_get_attr(KMF_KEYALG_ATTR, attrlist, numattr,
4608         (void *) &keytype, NULL);
4609     if (ret != KMF_OK)
4610         return (KMF_ERR_BAD_PARAMETER);

4612     ret = kmf_get_attr(KMF_KEYLENGTH_ATTR, attrlist, numattr,
4613         &keylen, &keylen_size);
4614     if (ret == KMF_ERR_ATTR_NOT_FOUND &&
4615         (keytype == KMF_DES || keytype == KMF_DES3))

```

```

4616         /* keylength is not required for DES and 3DES */
4617         ret = KMF_OK;
4618         if (ret != KMF_OK)
4619             return (KMF_ERR_BAD_PARAMETER);
4621         fullpath = get_fullpath(dirpath, keyfile);
4622         if (fullpath == NULL)
4623             return (KMF_ERR_BAD_PARAMETER);
4625         /* If the requested file exists, return an error */
4626         if (test_for_file(fullpath, 0400) == 1) {
4627             free(fullpath);
4628             return (KMF_ERR_DUPLICATE_KEYFILE);
4629         }
4631         fd = open(fullpath, O_CREAT|O_TRUNC|O_RDWR, 0400);
4632         if (fd == -1) {
4633             ret = KMF_ERR_OPEN_FILE;
4634             goto out;
4635         }
4637         rkey = malloc(sizeof (KMF_RAW_SYM_KEY));
4638         if (rkey == NULL) {
4639             ret = KMF_ERR_MEMORY;
4640             goto out;
4641         }
4642         (void) memset(rkey, 0, sizeof (KMF_RAW_SYM_KEY));
4644         if (keytype == KMF_DES) {
4645             if ((ret = create_deskey(&deskey)) != KMF_OK) {
4646                 goto out;
4647             }
4648             rkey->keydata.val = (uchar_t *)deskey;
4649             rkey->keydata.len = 8;
4651             symkey->keyalg = KMF_DES;
4653         } else if (keytype == KMF_DES3) {
4654             if ((ret = create_des3key(&des3key)) != KMF_OK) {
4655                 goto out;
4656             }
4657             rkey->keydata.val = (uchar_t *)des3key;
4658             rkey->keydata.len = DES3_KEY_SIZE;
4659             symkey->keyalg = KMF_DES3;
4661         } else if (keytype == KMF_AES || keytype == KMF_RC4 ||
4662             keytype == KMF_GENERIC_SECRET) {
4663             int bytes;
4665             if (keylen % 8 != 0) {
4666                 ret = KMF_ERR_BAD_KEY_SIZE;
4667                 goto out;
4668             }
4670             if (keytype == KMF_AES) {
4671                 if (keylen != 128 &&
4672                     keylen != 192 &&
4673                     keylen != 256) {
4674                     ret = KMF_ERR_BAD_KEY_SIZE;
4675                     goto out;
4676                 }
4677             }
4679             bytes = keylen/8;
4680             random = malloc(bytes);
4681             if (random == NULL) {

```

```

4682                 ret = KMF_ERR_MEMORY;
4683                 goto out;
4684             }
4685             if (RAND_bytes(random, bytes) != 1) {
4686                 ret = KMF_ERR_KEYGEN_FAILED;
4687                 goto out;
4688             }
4690             rkey->keydata.val = (uchar_t *)random;
4691             rkey->keydata.len = bytes;
4692             symkey->keyalg = keytype;
4694         } else {
4695             ret = KMF_ERR_BAD_KEY_TYPE;
4696             goto out;
4697         }
4699         (void) write(fd, (const void *) rkey->keydata.val, rkey->keydata.len);
4701         symkey->kstype = KMF_KEYSTORE_OPENSSL;
4702         symkey->keyclass = KMF_SYMMETRIC;
4703         symkey->keylabel = (char *)fullpath;
4704         symkey->israw = TRUE;
4705         symkey->keyp = rkey;
4707 out:
4708         if (fd != -1)
4709             (void) close(fd);
4711         if (ret != KMF_OK && fullpath != NULL) {
4712             free(fullpath);
4713         }
4714         if (ret != KMF_OK) {
4715             kmf_free_raw_sym_key(rkey);
4716             symkey->keyp = NULL;
4717             symkey->keyalg = KMF_KEYALG_NONE;
4718         }
4720         return (ret);
4721     }
4723     /*
4724     * Check a file to see if it is a CRL file with PEM or DER format.
4725     * If success, return its format in the "pformat" argument.
4726     */
4727     KMF_RETURN
4728     OpenSSL_IsCRLFile(KMF_HANDLE_T handle, char *filename, int *pformat)
4729     {
4730         KMF_RETURN         ret = KMF_OK;
4731         KMF_HANDLE         *kmfh = (KMF_HANDLE *)handle;
4732         BIO                 *bio = NULL;
4733         X509_CRL            *xcrl = NULL;
4735         if (filename == NULL) {
4736             return (KMF_ERR_BAD_PARAMETER);
4737         }
4739         bio = BIO_new_file(filename, "rb");
4740         if (bio == NULL) {
4741             SET_ERROR(kmfh, ERR_get_error());
4742             ret = KMF_ERR_OPEN_FILE;
4743             goto out;
4744         }
4746         if ((xcrl = PEM_read_bio_X509_CRL(bio, NULL, NULL, NULL)) != NULL) {
4747             *pformat = KMF_FORMAT_PEM;

```

```

4748         goto out;
4749     }
4750     (void) BIO_free(bio);

4752     /*
4753      * Now try to read it as raw DER data.
4754      */
4755     bio = BIO_new_file(filename, "rb");
4756     if (bio == NULL) {
4757         SET_ERROR(kmfh, ERR_get_error());
4758         ret = KMF_ERR_OPEN_FILE;
4759         goto out;
4760     }

4762     if ((xcrl = d2i_X509_CRL_bio(bio, NULL)) != NULL) {
4763         *pformat = KMF_FORMAT_ASN1;
4764     } else {
4765         ret = KMF_ERR_BAD_CRLFILE;
4766     }

4768 out:
4769     if (bio != NULL)
4770         (void) BIO_free(bio);

4772     if (xcrl != NULL)
4773         X509_CRL_free(xcrl);

4775     return (ret);
4776 }

4778 KMF_RETURN
4779 OpenSSL_GetSymKeyValue(KMF_HANDLE_T handle, KMF_KEY_HANDLE *symkey,
4780     KMF_RAW_SYM_KEY *rkey)
4781 {
4782     KMF_RETURN    rv = KMF_OK;
4783     KMF_HANDLE    *kmfh = (KMF_HANDLE *)handle;
4784     KMF_DATA      keyvalue;

4786     if (kmfh == NULL)
4787         return (KMF_ERR_UNINITIALIZED);

4789     if (symkey == NULL || rkey == NULL)
4790         return (KMF_ERR_BAD_PARAMETER);
4791     else if (symkey->keyclass != KMF_SYMMETRIC)
4792         return (KMF_ERR_BAD_KEY_CLASS);

4794     if (symkey->israw) {
4795         KMF_RAW_SYM_KEY *rawkey = (KMF_RAW_SYM_KEY *)symkey->keyp;

4797         if (rawkey == NULL ||
4798             rawkey->keydata.val == NULL ||
4799             rawkey->keydata.len == 0)
4800             return (KMF_ERR_BAD_KEYHANDLE);

4802         rkey->keydata.len = rawkey->keydata.len;
4803         if ((rkey->keydata.val = malloc(rkey->keydata.len)) == NULL)
4804             return (KMF_ERR_MEMORY);
4805         (void) memcpy(rkey->keydata.val, rawkey->keydata.val,
4806             rkey->keydata.len);
4807     } else {
4808         rv = kmf_read_input_file(handle, symkey->keylabel, &keyvalue);
4809         if (rv != KMF_OK)
4810             return (rv);
4811         rkey->keydata.len = keyvalue.Length;
4812         rkey->keydata.val = keyvalue.Data;
4813     }

```

```

4815         return (rv);
4816     }

4818     /*
4819      * substitute for the unsafe access(2) function.
4820      * If the file in question already exists, return 1.
4821      * else 0. If an error occurs during testing (other
4822      * than EEXIST), return -1.
4823      */
4824     static int
4825     test_for_file(char *filename, mode_t mode)
4826     {
4827         int fd;

4829         /*
4830          * Try to create the file with the EXCL flag.
4831          * The call should fail if the file exists.
4832          */
4833         fd = open(filename, O_WRONLY|O_CREAT|O_EXCL, mode);
4834         if (fd == -1 && errno == EEXIST)
4835             return (1);
4836         else if (fd == -1) /* some other error */
4837             return (-1);

4839         /* The file did NOT exist. Delete the testcase. */
4840         (void) close(fd);
4841         (void) unlink(filename);
4842         return (0);
4843     }

4845 KMF_RETURN
4846 OpenSSL_StoreKey(KMF_HANDLE_T handle, int numattr,
4847     KMF_ATTRIBUTE *attrlist)
4848 {
4849     KMF_RETURN rv = KMF_OK;
4850     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
4851     KMF_KEY_HANDLE *pubkey = NULL, *prikey = NULL;
4852     KMF_RAW_KEY_DATA *rawkey;
4853     EVP_PKEY *pkey = NULL;
4854     KMF_ENCODE_FORMAT format = KMF_FORMAT_PEM;
4855     KMF_CREDENTIAL cred = {NULL, 0};
4856     BIO *out = NULL;
4857     int keys = 0;
4858     char *fullpath = NULL;
4859     char *keyfile = NULL;
4860     char *dirpath = NULL;

4862     pubkey = kmf_get_attr_ptr(KMF_PUBKEY_HANDLE_ATTR, attrlist, numattr);
4863     if (pubkey != NULL)
4864         keys++;

4866     prikey = kmf_get_attr_ptr(KMF_PRIVKEY_HANDLE_ATTR, attrlist, numattr);
4867     if (prikey != NULL)
4868         keys++;

4870     rawkey = kmf_get_attr_ptr(KMF_RAW_KEY_ATTR, attrlist, numattr);
4871     if (rawkey != NULL)
4872         keys++;

4874     /*
4875      * Exactly 1 type of key must be passed to this function.
4876      */
4877     if (keys != 1)
4878         return (KMF_ERR_BAD_PARAMETER);

```

```

4880     keyfile = (char *)kmf_get_attr_ptr(KMF_KEY_FILENAME_ATTR, attrlist,
4881         numattr);
4882     if (keyfile == NULL)
4883         return (KMF_ERR_BAD_PARAMETER);

4885     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);

4887     fullpath = get_fullpath(dirpath, keyfile);

4889     /* Once we have the full path, we don't need the pieces */
4890     if (fullpath == NULL)
4891         return (KMF_ERR_BAD_PARAMETER);

4893     /* If the requested file exists, return an error */
4894     if (test_for_file(fullpath, 0400) == 1) {
4895         free(fullpath);
4896         return (KMF_ERR_DUPLICATE_KEYFILE);
4897     }

4899     rv = kmf_get_attr(KMF_ENCODE_FORMAT_ATTR, attrlist, numattr,
4900         &format, NULL);
4901     if (rv != KMF_OK)
4902         /* format is optional. */
4903         rv = KMF_OK;

4905     /* CRED is not required for OpenSSL files */
4906     (void) kmf_get_attr(KMF_CREDENTIAL_ATTR, attrlist, numattr,
4907         &cred, NULL);

4909     /* Store the private key to the keyfile */
4910     out = BIO_new_file(fullpath, "wb");
4911     if (out == NULL) {
4912         SET_ERROR(kmfh, ERR_get_error());
4913         rv = KMF_ERR_OPEN_FILE;
4914         goto end;
4915     }

4917     if (prikey != NULL && prikey->keyp != NULL) {
4918         if (prikey->keyalg == KMF_RSA ||
4919             prikey->keyalg == KMF_DSA) {
4920             pkey = (EVP_PKEY *)prikey->keyp;

4922             rv = ssl_write_key(kmfh, format,
4923                 out, &cred, pkey, TRUE);

4925             if (rv == KMF_OK && prikey->keylabel == NULL) {
4926                 prikey->keylabel = strdup(fullpath);
4927                 if (prikey->keylabel == NULL)
4928                     rv = KMF_ERR_MEMORY;
4929             }
4930         }
4931     } else if (pubkey != NULL && pubkey->keyp != NULL) {
4932         if (pubkey->keyalg == KMF_RSA ||
4933             pubkey->keyalg == KMF_DSA) {
4934             pkey = (EVP_PKEY *)pubkey->keyp;

4936             rv = ssl_write_key(kmfh, format,
4937                 out, &cred, pkey, FALSE);

4939             if (rv == KMF_OK && pubkey->keylabel == NULL) {
4940                 pubkey->keylabel = strdup(fullpath);
4941                 if (pubkey->keylabel == NULL)
4942                     rv = KMF_ERR_MEMORY;
4943             }
4944         }
4945     } else if (rawkey != NULL) {

```

```

4946         if (rawkey->keytype == KMF_RSA) {
4947             pkey = ImportRawRSAKey(&rawkey->rawdata.rsa);
4948         } else if (rawkey->keytype == KMF_DSA) {
4949             pkey = ImportRawDSAKey(&rawkey->rawdata.dsa);
4950         } else {
4951             rv = KMF_ERR_BAD_PARAMETER;
4952         }
4953         if (pkey != NULL) {
4954             KMF_KEY_CLASS kclass = KMF_ASYM_PRI;

4956             rv = kmf_get_attr(KMF_KEYCLASS_ATTR, attrlist, numattr,
4957                 (void *)&kclass, NULL);
4958             if (rv != KMF_OK)
4959                 rv = KMF_OK;
4960             rv = ssl_write_key(kmfh, format, out,
4961                 &cred, pkey, (kclass == KMF_ASYM_PRI));
4962             EVP_PKEY_free(pkey);
4963         }
4964     }

4966 end:

4968     if (out)
4969         (void) BIO_free(out);

4972     if (rv == KMF_OK)
4973         (void) chmod(fullpath, 0400);

4975     free(fullpath);
4976     return (rv);
4977 }

4979 KMF_RETURN
4980 OpenSSL_ImportCRL(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
4981 {
4982     KMF_RETURN ret = KMF_OK;
4983     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
4984     X509_CRL *xcrl = NULL;
4985     X509 *xcert = NULL;
4986     EVP_PKEY *pkey;
4987     KMF_ENCODE_FORMAT format;
4988     BIO *in = NULL, *out = NULL;
4989     int openssl_ret = 0;
4990     KMF_ENCODE_FORMAT outformat;
4991     boolean_t crlcheck = FALSE;
4992     char *certfile, *dirpath, *crlfile, *incrl, *outcrl, *outcrlfile;

4994     if (numattr == 0 || attrlist == NULL) {
4995         return (KMF_ERR_BAD_PARAMETER);
4996     }

4998     /* CRL check is optional */
4999     (void) kmf_get_attr(KMF_CRL_CHECK_ATTR, attrlist, numattr,
5000         &crlcheck, NULL);

5002     certfile = kmf_get_attr_ptr(KMF_CERT_FILENAME_ATTR, attrlist, numattr);
5003     if (crlcheck == B_TRUE && certfile == NULL) {
5004         return (KMF_ERR_BAD_CERTFILE);
5005     }

5007     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);
5008     incrl = kmf_get_attr_ptr(KMF_CRL_FILENAME_ATTR, attrlist, numattr);
5009     outcrl = kmf_get_attr_ptr(KMF_CRL_OUTFILE_ATTR, attrlist, numattr);

5011     crlfile = get_fullpath(dirpath, incrl);

```

```

5013     if (crlfile == NULL)
5014         return (KMF_ERR_BAD_CRLFILE);

5016     outcrlfile = get_fullpath(dirpath, outcrl);
5017     if (outcrlfile == NULL)
5018         return (KMF_ERR_BAD_CRLFILE);

5020     if (isdir(outcrlfile)) {
5021         free(outcrlfile);
5022         return (KMF_ERR_BAD_CRLFILE);
5023     }

5025     ret = kmf_is_crl_file(handle, crlfile, &format);
5026     if (ret != KMF_OK) {
5027         free(outcrlfile);
5028         return (ret);
5029     }

5031     in = BIO_new_file(crlfile, "rb");
5032     if (in == NULL) {
5033         SET_ERROR(kmfh, ERR_get_error());
5034         ret = KMF_ERR_OPEN_FILE;
5035         goto end;
5036     }

5038     if (format == KMF_FORMAT_ASN1) {
5039         xcrl = d2i_X509_CRL_bio(in, NULL);
5040     } else if (format == KMF_FORMAT_PEM) {
5041         xcrl = PEM_read_bio_X509_CRL(in, NULL, NULL, NULL);
5042     }

5044     if (xcrl == NULL) {
5045         SET_ERROR(kmfh, ERR_get_error());
5046         ret = KMF_ERR_BAD_CRLFILE;
5047         goto end;
5048     }

5050     /* If bypasscheck is specified, no need to verify. */
5051     if (crlcheck == B_FALSE)
5052         goto output;

5054     ret = kmf_is_cert_file(handle, certfile, &format);
5055     if (ret != KMF_OK)
5056         goto end;

5058     /* Read in the CA cert file and convert to X509 */
5059     if (BIO_read_filename(in, certfile) <= 0) {
5060         SET_ERROR(kmfh, ERR_get_error());
5061         ret = KMF_ERR_OPEN_FILE;
5062         goto end;
5063     }

5065     if (format == KMF_FORMAT_ASN1) {
5066         xcrt = d2i_X509_bio(in, NULL);
5067     } else if (format == KMF_FORMAT_PEM) {
5068         xcrt = PEM_read_bio_X509(in, NULL, NULL, NULL);
5069     } else {
5070         ret = KMF_ERR_BAD_CERT_FORMAT;
5071         goto end;
5072     }

5074     if (xcrt == NULL) {
5075         SET_ERROR(kmfh, ERR_get_error());
5076         ret = KMF_ERR_BAD_CERT_FORMAT;
5077         goto end;

```

```

5078     }
5079     /* Now get the public key from the CA cert */
5080     pkey = X509_get_pubkey(xcrt);
5081     if (pkey == NULL) {
5082         SET_ERROR(kmfh, ERR_get_error());
5083         ret = KMF_ERR_BAD_CERTFILE;
5084         goto end;
5085     }

5087     /* Verify the CRL with the CA's public key */
5088     openssl_ret = X509_CRL_verify(xcrl, pkey);
5089     EVP_PKEY_free(pkey);
5090     if (openssl_ret > 0) {
5091         ret = KMF_OK; /* verify succeed */
5092     } else {
5093         SET_ERROR(kmfh, openssl_ret);
5094         ret = KMF_ERR_BAD_CRLFILE;
5095     }

5097 output:
5098     ret = kmf_get_attr(KMF_ENCODE_FORMAT_ATTR, attrlist, numattr,
5099                      &outformat, NULL);
5100     if (ret != KMF_OK) {
5101         ret = KMF_OK;
5102         outformat = KMF_FORMAT_PEM;
5103     }

5105     out = BIO_new_file(outcrlfile, "wb");
5106     if (out == NULL) {
5107         SET_ERROR(kmfh, ERR_get_error());
5108         ret = KMF_ERR_OPEN_FILE;
5109         goto end;
5110     }

5112     if (outformat == KMF_FORMAT_ASN1) {
5113         openssl_ret = (int)i2d_X509_CRL_bio(out, xcrl);
5114     } else if (outformat == KMF_FORMAT_PEM) {
5115         openssl_ret = PEM_write_bio_X509_CRL(out, xcrl);
5116     } else {
5117         ret = KMF_ERR_BAD_PARAMETER;
5118         goto end;
5119     }

5121     if (openssl_ret <= 0) {
5122         SET_ERROR(kmfh, ERR_get_error());
5123         ret = KMF_ERR_WRITE_FILE;
5124     } else {
5125         ret = KMF_OK;
5126     }

5128 end:
5129     if (xcrl != NULL)
5130         X509_CRL_free(xcrl);

5132     if (xcrt != NULL)
5133         X509_free(xcrt);

5135     if (in != NULL)
5136         (void) BIO_free(in);

5138     if (out != NULL)
5139         (void) BIO_free(out);

5141     if (outcrlfile != NULL)
5142         free(outcrlfile);

```

```

5144     return (ret);
5145 }

5147 KMF_RETURN
5148 OpenSSL_ListCRL(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
5149 {
5150     KMF_RETURN ret = KMF_OK;
5151     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
5152     X509_CRL *x = NULL;
5153     KMF_ENCODE_FORMAT format;
5154     char *crlfile = NULL;
5155     BIO *in = NULL;
5156     BIO *mem = NULL;
5157     long len;
5158     char *memptr;
5159     char *data = NULL;
5160     char **crldata;
5161     char *crlfilename, *dirpath;

5163     if (numattr == 0 || attrlist == NULL) {
5164         return (KMF_ERR_BAD_PARAMETER);
5165     }
5166     crlfilename = kmf_get_attr_ptr(KMF_CRL_FILENAME_ATTR,
5167     attrlist, numattr);
5168     if (crlfilename == NULL)
5169         return (KMF_ERR_BAD_CRLFILE);

5171     crldata = (char **)kmf_get_attr_ptr(KMF_CRL_DATA_ATTR,
5172     attrlist, numattr);

5174     if (crldata == NULL)
5175         return (KMF_ERR_BAD_PARAMETER);

5177     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);

5179     crlfile = get_fullpath(dirpath, crlfilename);

5181     if (crlfile == NULL)
5182         return (KMF_ERR_BAD_CRLFILE);

5184     if (isdir(crlfile)) {
5185         free(crlfile);
5186         return (KMF_ERR_BAD_CRLFILE);
5187     }

5189     ret = kmf_is_crl_file(handle, crlfile, &format);
5190     if (ret != KMF_OK) {
5191         free(crlfile);
5192         return (ret);
5193     }

5195     if (bio_err == NULL)
5196         bio_err = BIO_new_fp(stderr, BIO_NOCLOSE);

5198     in = BIO_new_file(crlfile, "rb");
5199     if (in == NULL) {
5200         SET_ERROR(kmfh, ERR_get_error());
5201         ret = KMF_ERR_OPEN_FILE;
5202         goto end;
5203     }

5205     if (format == KMF_FORMAT_ASN1) {
5206         x = d2i_X509_CRL_bio(in, NULL);
5207     } else if (format == KMF_FORMAT_PEM) {
5208         x = PEM_read_bio_X509_CRL(in, NULL, NULL, NULL);
5209     }

```

```

5211     if (x == NULL) { /* should not happen */
5212         SET_ERROR(kmfh, ERR_get_error());
5213         ret = KMF_ERR_OPEN_FILE;
5214         goto end;
5215     }

5217     mem = BIO_new(BIO_s_mem());
5218     if (mem == NULL) {
5219         SET_ERROR(kmfh, ERR_get_error());
5220         ret = KMF_ERR_MEMORY;
5221         goto end;
5222     }

5224     (void) X509_CRL_print(mem, x);
5225     len = BIO_get_mem_data(mem, &memptr);
5226     if (len <= 0) {
5227         SET_ERROR(kmfh, ERR_get_error());
5228         ret = KMF_ERR_MEMORY;
5229         goto end;
5230     }

5232     data = malloc(len + 1);
5233     if (data == NULL) {
5234         ret = KMF_ERR_MEMORY;
5235         goto end;
5236     }

5238     (void) memcpy(data, memptr, len);
5239     data[len] = '\0';
5240     *crldata = data;

5242 end:
5243     if (x != NULL)
5244         X509_CRL_free(x);

5246     if (crlfile != NULL)
5247         free(crlfile);

5249     if (in != NULL)
5250         (void) BIO_free(in);

5252     if (mem != NULL)
5253         (void) BIO_free(mem);

5255     return (ret);
5256 }

5258 KMF_RETURN
5259 OpenSSL_DeleteCRL(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
5260 {
5261     KMF_RETURN ret = KMF_OK;
5262     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
5263     KMF_ENCODE_FORMAT format;
5264     char *crlfile = NULL;
5265     BIO *in = NULL;
5266     char *crlfilename, *dirpath;

5268     if (numattr == 0 || attrlist == NULL) {
5269         return (KMF_ERR_BAD_PARAMETER);
5270     }

5272     crlfilename = kmf_get_attr_ptr(KMF_CRL_FILENAME_ATTR,
5273     attrlist, numattr);

5275     if (crlfilename == NULL)

```



```

5276         return (KMF_ERR_BAD_CRLFILE);

5278         dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);

5280         crlfile = get_fullpath(dirpath, crlfilename);

5282         if (crlfile == NULL)
5283             return (KMF_ERR_BAD_CRLFILE);

5285         if (isdir(crlfile)) {
5286             ret = KMF_ERR_BAD_CRLFILE;
5287             goto end;
5288         }

5290         ret = kmf_is_crl_file(handle, crlfile, &format);
5291         if (ret != KMF_OK)
5292             goto end;

5294         if (unlink(crlfile) != 0) {
5295             SET_SYS_ERROR(kmfh, errno);
5296             ret = KMF_ERR_INTERNAL;
5297             goto end;
5298         }

5300 end:
5301         if (in != NULL)
5302             (void) BIO_free(in);
5303         if (crlfile != NULL)
5304             free(crlfile);

5306         return (ret);
5307     }

5309 KMF_RETURN
5310 OpenSSL_FindCertInCRL(KMF_HANDLE_T handle, int numattr, KMF_ATTRIBUTE *attrlist)
5311 {
5312     KMF_RETURN ret = KMF_OK;
5313     KMF_HANDLE *kmfh = (KMF_HANDLE *)handle;
5314     KMF_ENCODE_FORMAT format;
5315     BIO *in = NULL;
5316     X509 *xcert = NULL;
5317     X509_CRL *xcrl = NULL;
5318     STACK_OF(X509_REVOKED) *revoke_stack = NULL;
5319     X509_REVOKED *revoke;
5320     int i;
5321     char *crlfilename, *crlfile, *dirpath, *certfile;

5323     if (numattr == 0 || attrlist == NULL) {
5324         return (KMF_ERR_BAD_PARAMETER);
5325     }

5327     crlfilename = kmf_get_attr_ptr(KMF_CRL_FILENAME_ATTR,
5328                                     attrlist, numattr);

5330     if (crlfilename == NULL)
5331         return (KMF_ERR_BAD_CRLFILE);

5333     certfile = kmf_get_attr_ptr(KMF_CERT_FILENAME_ATTR, attrlist, numattr);
5334     if (certfile == NULL)
5335         return (KMF_ERR_BAD_CRLFILE);

5337     dirpath = kmf_get_attr_ptr(KMF_DIRPATH_ATTR, attrlist, numattr);

5339     crlfile = get_fullpath(dirpath, crlfilename);

5341     if (crlfile == NULL)

```

```

5342         return (KMF_ERR_BAD_CRLFILE);

5344         if (isdir(crlfile)) {
5345             ret = KMF_ERR_BAD_CRLFILE;
5346             goto end;
5347         }

5349         ret = kmf_is_crl_file(handle, crlfile, &format);
5350         if (ret != KMF_OK)
5351             goto end;

5353         /* Read the CRL file and load it into a X509_CRL structure */
5354         in = BIO_new_file(crlfilename, "rb");
5355         if (in == NULL) {
5356             SET_ERROR(kmfh, ERR_get_error());
5357             ret = KMF_ERR_OPEN_FILE;
5358             goto end;
5359         }

5361         if (format == KMF_FORMAT_ASN1) {
5362             xcrl = d2i_X509_CRL_bio(in, NULL);
5363         } else if (format == KMF_FORMAT_PEM) {
5364             xcrl = PEM_read_bio_X509_CRL(in, NULL, NULL, NULL);
5365         }

5367         if (xcrl == NULL) {
5368             SET_ERROR(kmfh, ERR_get_error());
5369             ret = KMF_ERR_BAD_CRLFILE;
5370             goto end;
5371         }
5372         (void) BIO_free(in);

5374         /* Read the Certificate file and load it into a X509 structure */
5375         ret = kmf_is_cert_file(handle, certfile, &format);
5376         if (ret != KMF_OK)
5377             goto end;

5379         in = BIO_new_file(certfile, "rb");
5380         if (in == NULL) {
5381             SET_ERROR(kmfh, ERR_get_error());
5382             ret = KMF_ERR_OPEN_FILE;
5383             goto end;
5384         }

5386         if (format == KMF_FORMAT_ASN1) {
5387             xcert = d2i_X509_bio(in, NULL);
5388         } else if (format == KMF_FORMAT_PEM) {
5389             xcert = PEM_read_bio_X509(in, NULL, NULL, NULL);
5390         }

5392         if (xcert == NULL) {
5393             SET_ERROR(kmfh, ERR_get_error());
5394             ret = KMF_ERR_BAD_CERTFILE;
5395             goto end;
5396         }

5398         /* Check if the certificate and the CRL have same issuer */
5399         if (X509_NAME_cmp(xcert->cert_info->issuer, xcrl->crl->issuer) != 0) {
5400             ret = KMF_ERR_ISSUER;
5401             goto end;
5402         }

5404         /* Check to see if the certificate serial number is revoked */
5405         revoke_stack = X509_CRL_get_REVOKED(xcrl);
5406         if (sk_X509_REVOKED_num(revoke_stack) <= 0) {
5407             /* No revoked certificates in the CRL file */

```

```

5408         SET_ERROR(kmfh, ERR_get_error());
5409         ret = KMF_ERR_EMPTY_CRL;
5410         goto end;
5411     }

5413     for (i = 0; i < sk_X509_REVOKED_num(revoke_stack); i++) {
5414         revoke = sk_X509_REVOKED_value(revoke_stack, i);
5415         if (ASN1_INTEGER_cmp(xcert->cert_info->serialNumber,
5416             revoke->serialNumber) == 0) {
5417             break;
5418         }
5419     }

5421     if (i < sk_X509_REVOKED_num(revoke_stack)) {
5422         ret = KMF_OK;
5423     } else {
5424         ret = KMF_ERR_NOT_REVOKED;
5425     }

5427 end:
5428     if (in != NULL)
5429         (void) BIO_free(in);
5430     if (xcrl != NULL)
5431         X509_CRL_free(xcrl);
5432     if (xcert != NULL)
5433         X509_free(xcert);

5435     return (ret);
5436 }

5438 KMF_RETURN
5439 OpenSSL_VerifyCRLFile(KMF_HANDLE_T handle, char *crlname, KMF_DATA *tacert)
5440 {
5441     KMF_RETURN     ret = KMF_OK;
5442     KMF_HANDLE     *kmfh = (KMF_HANDLE *)handle;
5443     BIO            *bcrl = NULL;
5444     X509_CRL       *xcrl = NULL;
5445     X509           *xcert = NULL;
5446     EVP_PKEY       *pkey;
5447     int            sslret;
5448     KMF_ENCODE_FORMAT crl_format;
5449     unsigned char  *p;
5450     long           len;

5452     if (handle == NULL || crlname == NULL || tacert == NULL) {
5453         return (KMF_ERR_BAD_PARAMETER);
5454     }

5456     ret = kmf_get_file_format(crlname, &crl_format);
5457     if (ret != KMF_OK)
5458         return (ret);

5460     bcrl = BIO_new_file(crlname, "rb");
5461     if (bcrl == NULL) {
5462         SET_ERROR(kmfh, ERR_get_error());
5463         ret = KMF_ERR_OPEN_FILE;
5464         goto cleanup;
5465     }

5467     if (crl_format == KMF_FORMAT_ASN1) {
5468         xcrl = d2i_X509_CRL_bio(bcrl, NULL);
5469     } else if (crl_format == KMF_FORMAT_PEM) {
5470         xcrl = PEM_read_bio_X509_CRL(bcrl, NULL, NULL, NULL);
5471     } else {
5472         ret = KMF_ERR_BAD_PARAMETER;
5473         goto cleanup;

```

```

5474     }

5476     if (xcrl == NULL) {
5477         SET_ERROR(kmfh, ERR_get_error());
5478         ret = KMF_ERR_BAD_CRLFILE;
5479         goto cleanup;
5480     }

5482     p = tacert->Data;
5483     len = tacert->Length;
5484     xcert = d2i_X509(NULL, (const uchar_t **)&p, len);

5486     if (xcert == NULL) {
5487         SET_ERROR(kmfh, ERR_get_error());
5488         ret = KMF_ERR_BAD_CERTFILE;
5489         goto cleanup;
5490     }

5492     /* Get issuer certificate public key */
5493     pkey = X509_get_pubkey(xcert);
5494     if (pkey == NULL) {
5495         SET_ERROR(kmfh, ERR_get_error());
5496         ret = KMF_ERR_BAD_CERT_FORMAT;
5497         goto cleanup;
5498     }

5500     /* Verify CRL signature */
5501     sslret = X509_CRL_verify(xcrl, pkey);
5502     EVP_PKEY_free(pkey);
5503     if (sslret > 0) {
5504         ret = KMF_OK;
5505     } else {
5506         SET_ERROR(kmfh, sslret);
5507         ret = KMF_ERR_BAD_CRLFILE;
5508     }

5510 cleanup:
5511     if (bcrl != NULL)
5512         (void) BIO_free(bcrl);

5514     if (xcrl != NULL)
5515         X509_CRL_free(xcrl);

5517     if (xcert != NULL)
5518         X509_free(xcert);

5520     return (ret);

5522 }

5524 KMF_RETURN
5525 OpenSSL_CheckCRLDate(KMF_HANDLE_T handle, char *crlname)
5526 {
5527     KMF_RETURN     ret = KMF_OK;
5528     KMF_HANDLE     *kmfh = (KMF_HANDLE *)handle;
5529     KMF_ENCODE_FORMAT crl_format;
5530     BIO            *bcrl = NULL;
5531     X509_CRL       *xcrl = NULL;
5532     int            i;

5534     if (handle == NULL || crlname == NULL) {
5535         return (KMF_ERR_BAD_PARAMETER);
5536     }

5538     ret = kmf_is_crl_file(handle, crlname, &crl_format);
5539     if (ret != KMF_OK)

```

```
5540         return (ret);

5542     bcr1 = BIO_new_file(crlname, "rb");
5543     if (bcr1 == NULL) {
5544         SET_ERROR(kmfh, ERR_get_error());
5545         ret = KMF_ERR_OPEN_FILE;
5546         goto cleanup;
5547     }

5549     if (crl_format == KMF_FORMAT_ASN1)
5550         xcrl = d2i_X509_CRL_bio(bcr1, NULL);
5551     else if (crl_format == KMF_FORMAT_PEM)
5552         xcrl = PEM_read_bio_X509_CRL(bcr1, NULL, NULL, NULL);

5554     if (xcrl == NULL) {
5555         SET_ERROR(kmfh, ERR_get_error());
5556         ret = KMF_ERR_BAD_CRLFILE;
5557         goto cleanup;
5558     }
5559     i = X509_cmp_time(X509_CRL_get_lastUpdate(xcrl), NULL);
5560     if (i >= 0) {
5561         ret = KMF_ERR_VALIDITY_PERIOD;
5562         goto cleanup;
5563     }
5564     if (X509_CRL_get_nextUpdate(xcrl)) {
5565         i = X509_cmp_time(X509_CRL_get_nextUpdate(xcrl), NULL);

5567         if (i <= 0) {
5568             ret = KMF_ERR_VALIDITY_PERIOD;
5569             goto cleanup;
5570         }
5571     }

5573     ret = KMF_OK;

5575 cleanup:
5576     if (bcr1 != NULL)
5577         (void) BIO_free(bcr1);

5579     if (xcrl != NULL)
5580         X509_CRL_free(xcrl);

5582     return (ret);
5583 }
```

new/usr/src/lib/libpkg/Makefile.com

1

```
*****
2551 Fri May 30 18:31:13 2014
new/usr/src/lib/libpkg/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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19 # CDDL HEADER END
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21 #
22 #
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25 #
26
27 LIBRARY= libpkg.a
28 VERS= .1
29
30 # include library definitions
31 OBJECTS= \
32     canonize.o  ckparam.o  ckvolseq.o \
33     devtype.o   dstream.o  gpgklist.o \
34     gpgkmap.o   isdir.o    logerr.o \
35     mappath.o   ncgrpw.o   nhash.o \
36     pkgexecl.o  pkgexecv.o  pkgmount.o \
37     pkgtrans.o  ppgkmap.o \
38     progerr.o   putcfile.o  rrmkdir.o \
39     runcmd.o    srchcfile.o  tputcfent.o \
40     verify.o    security.o  pkgweb.o \
41     pkgerr.o    keystore.o  p12lib.o \
42     vfpops.o    fmkdir.o   pkgstr.o \
43     handlelocalfs.o pkgserv.o
44
45 # include library definitions
46 include $(SRC)/lib/Makefile.lib
47
48
49 SRCDIR= ../common
50
51 POFILE = libpkg.po
52 MSGFILES = $(OBJECTS:%.o=../common/%.i)
53 CLEANFILES += $(MSGFILES)
54
55 # This library is NOT lint clean
56
57 # openssl forces us to ignore dubious pointer casts, thanks to its clever
58 # use of macros for stack management.
59 LINTFLAGS= -umx -errtags \
60            -erroff=E_BAD_PTR_CAST_ALIGN,E_BAD_PTR_CAST
61 $(LINTLIB):= SRCS = $(SRCDIR)/$(LINTSRC)
```

new/usr/src/lib/libpkg/Makefile.com

2

```
64 LIBS = $(DYNLIB) $(LINTLIB)
65
66 LDLIBS += -lc -lwanboot -lscf -ladm
67
68 # libcrypto and libssl have no lint library, and so can only be used when
69 # building
70 # building
71 $(DYNLIB) := LDLIBS += -lsunw_crypto -lsunw_ssl
72
73 CFLAGS += $(CVERBOSE)
74 CERRWARN += -_gcc=-Wno-unused-label
75 CERRWARN += -_gcc=-Wno-parentheses
76 CERRWARN += -_gcc=-Wno-uninitialized
77 CERRWARN += -_gcc=-Wno-clobbered
78 CERRWARN += -_gcc=-Wno-switch
79 CERRWARN += -_gcc=-Wno-unused-value
80 CPPFLAGS += -I$(SRCDIR) -D_FILE_OFFSET_BITS=64
81
82 .KEEP_STATE:
83
84 all: $(LIBS)
85
86 $(POFILE): $(MSGFILES)
87     $(BUILDPO.msgfiles)
88
89 _msg: $(MSGDOMAINPOFILE)
90
91 lint: lintcheck
92
93 # include library targets
94 include $(SRC)/lib/Makefile.targ
95 include $(SRC)/Makefile.msg.targ
```

new/usr/src/lib/libpkg/common/security.c

1

```
*****
6803 Fri May 30 18:31:13 2014
new/usr/src/lib/libpkg/common/security.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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18 *
19 * CDDL HEADER END
20 */

22 /*
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25 */

28 /*
29  * Module: security.c
30  * Description:
31  *   Module for handling certificates and various
32  *   utilities to access their data.
33 */

35 #include <stdio.h>
36 #include <string.h>
37 #include <errno.h>
38 #include <ctype.h>
39 #include <sys/types.h>
40 #include <sys/stat.h>
41 #include <limits.h>
42 #include <pkgstrct.h>
43 #include <pkginfo.h>
44 #include <locale.h>
45 #include <libintl.h>
46 #include <unistd.h>
47 #include <stdlib.h>

49 #include <openssl/bio.h>
50 #include <openssl/pkcs12.h>
51 #include <openssl/pkcs7.h>
52 #include <openssl/x509.h>
53 #include <openssl/err.h>
54 #include <openssl/ssl.h>
55 #include "pkgerr.h"
56 #include "pkglib.h"
57 #include "pkglibmsgs.h"
58 #include "pkglocale.h"
59 #include "p12lib.h"

61 /* length of allowable passwords */
```

new/usr/src/lib/libpkg/common/security.c

2

```
62 #define MAX_PASSLEN 128

64 /*
65  * Name:      init_security
66  * Description: Initializes structures, libraries, for security operations
67  * Arguments:  none
68  * Returns:   0 if we couldn't initialize, non-zero otherwise
69 */
70 void
71 sec_init(void)
72 {
73     OpenSSL_add_all_algorithms();
74     SSL_load_error_strings();
75     ERR_load_SUNW_strings();
76     (void) SSL_library_init();
77 }

79 /*
80  * get_cert_chain - Builds a chain of certificates, from a given
81  * user certificate to a trusted certificate.
82  *
83  * Arguments:
84  * err - Error object to add errors to
85  * cert - User cert to start with
86  * cas - Trusted certs to use as trust anchors
87  * chain - The resulting chain of certs (in the form of an
88  * ordered set) is placed here.
89  *
90  * Returns:
91  * 0 - Success - chain is stored in 'chain'.
92  * non-zero - Failure, errors recorded in err
93 */
94 int
95 get_cert_chain(PKG_ERR *err, X509 *cert, STACK_OF(X509) *clcerts,
96               STACK_OF(X509) *cas, STACK_OF(X509) **chain)
97 {
98     X509_STORE_CTX *store_ctx = NULL;
99     X509_STORE *ca_store = NULL;
100     X509 *ca_cert = NULL;
101     int i;
102     int ret = 0;

104     if ((ca_store = X509_STORE_new()) == NULL) {
105         pkgerr_add(err, PKGERR_NOMEM,
106                   gettext(ERR_MEM));
107         ret = 1;
108         goto cleanup;
109     }

111     /* add all ca certs into the store */
112     for (i = 0; i < sk_X509_num(cas); i++) {
113         ca_cert = sk_X509_value(cas, i);
114         if (X509_STORE_add_cert(ca_store, ca_cert) == 0) {
115             pkgerr_add(err, PKGERR_NOMEM, gettext(ERR_MEM));
116             ret = 1;
117             goto cleanup;
118         }
119     }

121     /* initialize context object used during the chain resolution */

123     if ((store_ctx = X509_STORE_CTX_new()) == NULL) {
124         pkgerr_add(err, PKGERR_NOMEM, gettext(ERR_MEM));
125         ret = 1;
126         goto cleanup;
127     }
```

```

129     (void) X509_STORE_CTX_init(store_ctx, ca_store, cert, clcerts);
130     /* attempt to verify the cert, which builds the cert chain */
131     if (X509_verify_cert(store_ctx) <= 0) {
132         pkgerr_add(err, PKGERR_CHAIN,
133             gettext(ERR_CERTCHAIN),
134             get_subject_display_name(cert),
135             X509_verify_cert_error_string(store_ctx->error));
136         ret = 1;
137         goto cleanup;
138     }
139     *chain = X509_STORE_CTX_get1_chain(store_ctx);

141 cleanup:
142     if (ca_store != NULL)
143         (void) X509_STORE_free(ca_store);
144     if (store_ctx != NULL) {
145         (void) X509_STORE_CTX_cleanup(store_ctx);
146         (void) X509_STORE_CTX_free(store_ctx);
147     }

149     return (ret);
150 }

152 /*
153  * Name:             get_subject_name
154  * Description: Retrieves a name used for identifying a certificate's subject.
155  *
156  * Arguments:  cert - The certificate to get the name from
157  *
158  * Returns :   A static buffer containing the common name (CN) of the
159  *             subject of the cert.
160  *
161  *             if the CN is not available, returns a string with the entire
162  *             X509 distinguished name.
163  */
164 char
165 *get_subject_display_name(X509 *cert)
166 {
168     X509_NAME      *xname;
169     static char      sname[ATTR_MAX];

171     xname = X509_get_subject_name(cert);
172     if (X509_NAME_get_text_by_NID(xname,
173         NID_commonName, sname,
174         ATTR_MAX) <= 0) {
175         (void) strncpy(sname,
176             X509_NAME_oneline(xname, NULL, 0), ATTR_MAX);
177         sname[ATTR_MAX - 1] = '\0';
178     }
179     return (sname);
180 }

182 /*
183  * Name:             get_display_name
184  * Description: Retrieves a name used for identifying a certificate's issuer.
185  *
186  * Arguments:  cert - The certificate to get the name from
187  *
188  * Returns :   A static buffer containing the common name (CN)
189  *             of the issuer of the cert.
190  *
191  *             if the CN is not available, returns a string with the entire
192  *             X509 distinguished name.
193  */

```

```

194 char
195 *get_issuer_display_name(X509 *cert)
196 {
198     X509_NAME      *xname;
199     static char      sname[ATTR_MAX];

201     xname = X509_get_issuer_name(cert);
202     if (X509_NAME_get_text_by_NID(xname,
203         NID_commonName, sname,
204         ATTR_MAX) <= 0) {
205         (void) strncpy(sname,
206             X509_NAME_oneline(xname, NULL, 0), ATTR_MAX);
207         sname[ATTR_MAX - 1] = '\0';
208     }
209     return (sname);
210 }

213 /*
214  * Name:             get_serial_num
215  * Description: Retrieves the serial number of an X509 cert
216  *
217  * Arguments:  cert - The certificate to get the data from
218  *
219  * Returns :   A static buffer containing the serial number
220  *             of the cert
221  *
222  *             if the SN is not available, returns NULL
223  */
224 char
225 *get_serial_num(X509 *cert)
226 {
227     static char      sn_str[ATTR_MAX];
228     ASN1_INTEGER      *sn;

230     if ((sn = X509_get_serialNumber(cert)) != 0) {
231         return (NULL);
232     } else {
233         (void) snprintf(sn_str, ATTR_MAX, "%ld",
234             ASN1_INTEGER_get(sn));
235     }

237     return (sn_str);
238 }

240 /*
241  * Name:             get_fingerprint
242  * Description: Generates a fingerprint string given
243  *             a digest algorithm with which to calculate
244  *             the fingerprint
245  *
246  * Arguments:  cert - The certificate to get the data from
247  *             alg - The algorithm to use to calculate the fingerprint
248  *
249  * Returns :   A static buffer containing the digest
250  *             NULL if cert is NULL, or digest cannot be calculated
251  */
252 char
253 *get_fingerprint(X509 *cert, const EVP_MD *alg)
254 {
255     static char      fp_str[ATTR_MAX];
256     char              tmp[ATTR_MAX] = "";
257     unsigned int n;
258     unsigned char md[EVP_MAX_MD_SIZE];
259     int i;

```

```
261     if (!X509_digest(cert, alg, md, &n)) {
262         return (NULL);
263     }
264
265     /* start with empty string */
266     fp_str[0] = '\0';
267
268     for (i = 0; i < (int)n; i++) {
269         /* form a byte of the fingerprint */
270         (void) snprintf(tmp, ATTR_MAX, "%02X:", md[i]);
271         /* cat it onto the end of the result */
272         (void) strlcat(fp_str, tmp, ATTR_MAX);
273     }
274
275     /* nuke trailing ':' */
276     fp_str[strlen(fp_str) - 1] = '\0';
277
278     return (fp_str);
279 }
```

new/usr/src/lib/libwanboot/Makefile.com

1

```
*****
2771 Fri May 30 18:31:13 2014
new/usr/src/lib/libwanboot/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

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25 #

27 LIBRARY =      libwanboot.a
28 VERS =        .1

30 # List of locally located modules.
31 LOC_DIR =      ../common
32 LOC_OBJS =      socket_inet.o bootinfo_aux.o
33 LOC_SRCS =      $(LOC_OBJS:%.o=$(LOC_DIR)/%.c)

35 # List of common wanboot objects.
36 COM_DIR =      ../../../common/net/wanboot
37 COM_OBJS =      auxutil.o \
38                 boot_http.o \
39                 bootconf.o \
40                 bootconf_errmsg.o \
41                 bootinfo.o \
42                 bootlog.o \
43                 http_errorstr.o \
44                 p12access.o \
45                 p12auxpars.o \
46                 p12auxutl.o \
47                 p12err.o \
48                 p12misc.o \
49                 parseURL.o
50 COM_SRCS =      $(COM_OBJS:%.o=$(COM_DIR)/%.c)

52 # List of common DHCP modules.
53 DHCP_DIR =      $(SRC)/common/net/dhcp
54 DHCP_OBJS =      dhcpinfo.o
55 DHCP_SRCS =      $(DHCP_OBJS:%.o=$(DHCP_DIR)/%.c)

57 OBJECTS =      $(LOC_OBJS) $(COM_OBJS) $(DHCP_OBJS)

59 include ../../Makefile.lib

61 LIBS +=        $(LINTLIB)
```

new/usr/src/lib/libwanboot/Makefile.com

2

```
62 LDLIBS +=      -lnvpair -lresolv -lnsl -lsocket -ldevinfo -ldhcuputil \
63                 -linetutil -lc

65 # libcrypto and libssl have no lint library, so we can only use it when
66 # building
67 $(DYNLIB) := LDLIBS += -lsunw_crypto -lsunw_ssl

69 CPPFLAGS =      -I$(SRC)/common/net/wanboot/crypt $(CPPFLAGS.master)
70 CERRWARN +=      -_gcc=-Wno-switch
71 CERRWARN +=      -_gcc=-Wno-parentheses
72 CERRWARN +=      -_gcc=-Wno-unused-value
73 CERRWARN +=      -_gcc=-Wno-uninitialized

75 # Must override SRCS from Makefile.lib since sources have
76 # multiple source directories.
77 SRCS =           $(LOC_SRCS) $(COM_SRCS) $(DHCP_SRCS)

79 # Must define location of lint library source.
80 SRCDIR =          $(LOC_DIR)
81 $(LINTLIB) :=     SRCS = $(SRCDIR)/$(LINTSRC)

83 # OpenSSL requires us to turn this off
84 LINTFLAGS +=      -erroff=E_BAD_PTR_CAST_ALIGN
85 LINTFLAGS64 +=    -erroff=E_BAD_PTR_CAST_ALIGN

87 CFLAGS +=        $(CCVERBOSE)
88 CPPFLAGS +=      -I$(LOC_DIR) -I$(COM_DIR) -I$(DHCP_DIR)

90 .KEEP_STATE:

92 all: $(LIBS)

94 lint: lintcheck

96 pics/%.o: $(COM_DIR)/%.c
97           $(COMPILE.c) -o $@ $<
98           $(POST_PROCESS_O)

100 pics/%.o: $(DHCP_DIR)/%.c
101           $(COMPILE.c) -o $@ $<
102           $(POST_PROCESS_O)

104 include ../../Makefile.targ
```


new/usr/src/lib/openssl/Makefile

1

```
*****
1746 Fri May 30 18:31:13 2014
new/usr/src/lib/openssl/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

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19 # CDDL HEADER END
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21 #
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24 #
25 # lib/openssl/Makefile
26 #

28 include $(SRC)/lib/Makefile.lib

30 SUBDIRS = libsunw_crypto .WAIT libsunw_ssl

32 # conditional assignments
33 all := TARGET= all
34 install := TARGET= install
35 clean := TARGET= clean
36 clobber := TARGET= clobber
37 lint := TARGET= lint
38 _msg := TARGET= _msg

40 .KEEP_STATE:

42 HDRS.cmd= ls include/openssl/
43 HDRS= $(HDRS.cmd:sh)

45 HDRDIR= include/openssl
46 ROOTHDRDIR= $(ROOT)/usr/include/openssl
47 ROOTHDRS= $(HDRS:%=$(ROOTHDRDIR)/%)
48 CHECKHDRS= $(HDRS:%.h=%.check)

51 all install clean clobber lint: $(SUBDIRS)

53 $(ROOTHDRS): $(ROOTHDRDIR)

55 $(ROOTHDRDIR):
56 $(INS.dir)

58 $(ROOTHDRDIR)/%: $(HDRDIR)/%
59 $(INS.file)

61 install install_h: $(ROOTHDRS)
```

new/usr/src/lib/openssl/Makefile

2

```
63 $(SUBDIRS): FRC
64 @cd $@; pwd; $(MAKE) $(TARGET)

66 check: $(CHECKHDRS)
67 @cd libsunw_ssl; pwd; $(MAKE) $@
68 @cd libsunw_crypto; pwd; $(MAKE) $@

70 FRC:
71
```

new/usr/src/lib/openssl/include/aes_locl.h

1

```
*****
3526 Fri May 30 18:31:13 2014
new/usr/src/lib/openssl/include/aes_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/aes/aes.h -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
3 * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
10 * notice, this list of conditions and the following disclaimer.
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14 * the documentation and/or other materials provided with the
15 * distribution.
16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
19 * "This product includes software developed by the OpenSSL Project
20 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 */
50
52 #ifndef HEADER_AES_LOCL_H
53 #define HEADER_AES_LOCL_H
54
55 #include <openssl/e_os2.h>
56
57 #ifdef OPENSSL_NO_AES
58 #error AES is disabled.
59 #endif
60
61 #include <stdio.h>
```

new/usr/src/lib/openssl/include/aes_locl.h

2

```
62 #include <stdlib.h>
63 #include <string.h>
64
65 #if defined(_MSC_VER) && (defined(_M_IX86) || defined(_M_AMD64) || defined(_M_X64))
66 # define SWAP(x) (_lrotl(x, 8) & 0x00ff00ff | _lrotr(x, 8) & 0xff00ff00)
67 # define GETU32(p) SWAP(*(u32 *) (p))
68 # define PUTU32(ct, st) { *(u32 *) (ct) = SWAP((st)); }
69 #else
70 # define GETU32(pt) (((u32)(pt)[0] << 24) ^ ((u32)(pt)[1] << 16) ^ ((u32)(pt)[2]
71 # define PUTU32(ct, st) { (ct)[0] = (u8)((st) >> 24); (ct)[1] = (u8)((st) >> 16)
72 #endif
73
74 #ifdef AES_LONG
75 typedef unsigned long u32;
76 #else
77 typedef unsigned int u32;
78 #endif
79 typedef unsigned short u16;
80 typedef unsigned char u8;
81
82 #define MAXKC (256/32)
83 #define MAXKB (256/8)
84 #define MAXNR 14
85
86 /* This controls loop-unrolling in aes_core.c */
87 #undef FULL_UNROLL
88
89 #endif /* !HEADER_AES_LOCL_H */
```

```

*****
5472 Fri May 30 18:31:13 2014
new/usr/src/lib/openssl/include/asn1_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* asn1.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 /* Internal ASN1 structures and functions: not for application use */
61 /* ASN1 print context structure */

```

```

63 struct asn1_pctx_st
64 {
65     unsigned long flags;
66     unsigned long nm_flags;
67     unsigned long cert_flags;
68     unsigned long oid_flags;
69     unsigned long str_flags;
70 } /* ASN1_PCTX */;

72 /* ASN1 public key method structure */

74 struct evp_pkey_asn1_method_st
75 {
76     int pkey_id;
77     int pkey_base_id;
78     unsigned long pkey_flags;

80     char *pem_str;
81     char *info;

83     int (*pub_decode)(EVP_PKEY *pk, X509_PUBKEY *pub);
84     int (*pub_encode)(X509_PUBKEY *pub, const EVP_PKEY *pk);
85     int (*pub_cmp)(const EVP_PKEY *a, const EVP_PKEY *b);
86     int (*pub_print)(BIO *out, const EVP_PKEY *pkey, int indent,
87                     ASN1_PCTX *pctx);

89     int (*priv_decode)(EVP_PKEY *pk, PKCS8_PRIV_KEY_INFO *p8inf);
90     int (*priv_encode)(PKCS8_PRIV_KEY_INFO *p8, const EVP_PKEY *pk);
91     int (*priv_print)(BIO *out, const EVP_PKEY *pkey, int indent,
92                      ASN1_PCTX *pctx);

94     int (*pkey_size)(const EVP_PKEY *pk);
95     int (*pkey_bits)(const EVP_PKEY *pk);

97     int (*param_decode)(EVP_PKEY *pkey,
98                        const unsigned char **pder, int derlen);
99     int (*param_encode)(const EVP_PKEY *pkey, unsigned char **pder);
100    int (*param_missing)(const EVP_PKEY *pk);
101    int (*param_copy)(EVP_PKEY *to, const EVP_PKEY *from);
102    int (*param_cmp)(const EVP_PKEY *a, const EVP_PKEY *b);
103    int (*param_print)(BIO *out, const EVP_PKEY *pkey, int indent,
104                      ASN1_PCTX *pctx);

105    int (*sig_print)(BIO *out,
106                    const X509_ALGOR *sigalg, const ASN1_STRING *sig,
107                    int indent, ASN1_PCTX *pctx);

110    void (*pkey_free)(EVP_PKEY *pkey);
111    int (*pkey_ctrl)(EVP_PKEY *pkey, int op, long arg1, void *arg2);

113    /* Legacy functions for old PEM */

115    int (*old_priv_decode)(EVP_PKEY *pkey,
116                          const unsigned char **pder, int derlen);
117    int (*old_priv_encode)(const EVP_PKEY *pkey, unsigned char **pder);
118    /* Custom ASN1 signature verification */
119    int (*item_verify)(EVP_MD_CTX *ctx, const ASN1_ITEM *it, void *asn,
120                      X509_ALGOR *a, ASN1_BIT_STRING *sig,
121                      EVP_PKEY *pkey);
122    int (*item_sign)(EVP_MD_CTX *ctx, const ASN1_ITEM *it, void *asn,
123                     X509_ALGOR *alg1, X509_ALGOR *alg2,
124                     ASN1_BIT_STRING *sig);

126 } /* EVP_PKEY_ASN1_METHOD */;

```

```
128 /* Method to handle CRL access.
129  * In general a CRL could be very large (several Mb) and can consume large
130  * amounts of resources if stored in memory by multiple processes.
131  * This method allows general CRL operations to be redirected to more
132  * efficient callbacks: for example a CRL entry database.
133  */

135 #define X509_CRL_METHOD_DYNAMIC      1

137 struct x509_crl_method_st
138 {
139     int flags;
140     int (*crl_init)(X509_CRL *crl);
141     int (*crl_free)(X509_CRL *crl);
142     int (*crl_lookup)(X509_CRL *crl, X509_REVOKED **ret,
143                       ASN1_INTEGER *ser, X509_NAME *issuer);
144     int (*crl_verify)(X509_CRL *crl, EVP_PKEY *pk);
145 };
```

```

*****
8795 Fri May 30 18:31:13 2014
new/usr/src/lib/openssl/include/bf_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bf/bf_locl.h */
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef HEADER_BF_LOCL_H
60 #define HEADER_BF_LOCL_H
61 #include <openssl/opensslconf.h> /* BF_PTR, BF_PTR2 */

```

```

63 #undef c2l
64 #define c2l(c,l)      (l=((unsigned long)((c)+)) \
65                        l|=((unsigned long)((c)+))<< 8L, \
66                        l|=((unsigned long)((c)+))<<16L, \
67                        l|=((unsigned long)((c)+))<<24L)
68
69 /* NOTE - c is not incremented as per c2l */
70 #undef c2ln
71 #define c2ln(c,l1,l2,n) { \
72     c+=n; \
73     l1=l2=0; \
74     switch (n) { \
75     case 8: l2=((unsigned long)((c)+))<<24L; \
76     case 7: l2|=((unsigned long)((c)+))<<16L; \
77     case 6: l2|=((unsigned long)((c)+))<< 8L; \
78     case 5: l2|=((unsigned long)((c)+)); \
79     case 4: l1|=((unsigned long)((c)+))<<24L; \
80     case 3: l1|=((unsigned long)((c)+))<<16L; \
81     case 2: l1|=((unsigned long)((c)+))<< 8L; \
82     case 1: l1|=((unsigned long)((c)+)); \
83     } \
84 }
85
86 #undef l2c
87 #define l2c(l,c)      ((c)+=(unsigned char)(((l) \
88                        >> 8L)&0xff), \
89                        (c)+=(unsigned char)(((l) \
90                        >>16L)&0xff), \
91                        (c)+=(unsigned char)(((l) \
92                        >>24L)&0xff))
93
94 /* NOTE - c is not incremented as per l2c */
95 #undef l2cn
96 #define l2cn(l1,l2,c,n) { \
97     c+=n; \
98     switch (n) { \
99     case 8: *--(c)=(unsigned char)(((l2)>>24L)&0xff); \
100    case 7: *--(c)=(unsigned char)(((l2)>>16L)&0xff); \
101    case 6: *--(c)=(unsigned char)(((l2)>> 8L)&0xff); \
102    case 5: *--(c)=(unsigned char)(((l2) \
103    >>0L)&0xff); \
104    case 4: *--(c)=(unsigned char)(((l1)>>24L)&0xff); \
105    case 3: *--(c)=(unsigned char)(((l1)>>16L)&0xff); \
106    case 2: *--(c)=(unsigned char)(((l1)>> 8L)&0xff); \
107    case 1: *--(c)=(unsigned char)(((l1) \
108    >>0L)&0xff); \
109    } \
110 }
111
112 /* NOTE - c is not incremented as per n2l */
113 #define n2ln(c,l1,l2,n) { \
114     c+=n; \
115     l1=l2=0; \
116     switch (n) { \
117     case 8: l2=((unsigned long)((c)+))<<24L; \
118     case 7: l2|=((unsigned long)((c)+))<<16L; \
119     case 6: l2|=((unsigned long)((c)+))<< 8L; \
120     case 5: l2|=((unsigned long)((c)+)); \
121     case 4: l1|=((unsigned long)((c)+))<<24L; \
122     case 3: l1|=((unsigned long)((c)+))<<16L; \
123     case 2: l1|=((unsigned long)((c)+))<< 8L; \
124     case 1: l1|=((unsigned long)((c)+)); \
125     } \
126 }
127
128 /* NOTE - c is not incremented as per l2n */
129 #define l2nn(l1,l2,c,n) { \
130     c+=n; \
131     switch (n) { \

```

```

128     case 8: *--(c)=(unsigned char)(((l2)>>8)&0xff); \
129     case 7: *--(c)=(unsigned char)(((l2)>>8)&0xff); \
130     case 6: *--(c)=(unsigned char)(((l2)>>16)&0xff); \
131     case 5: *--(c)=(unsigned char)(((l2)>>24)&0xff); \
132     case 4: *--(c)=(unsigned char)(((l1)>>8)&0xff); \
133     case 3: *--(c)=(unsigned char)(((l1)>>8)&0xff); \
134     case 2: *--(c)=(unsigned char)(((l1)>>16)&0xff); \
135     case 1: *--(c)=(unsigned char)(((l1)>>24)&0xff); \
136     } \
137 }

139 #undef n2l
140 #define n2l(c,l)    (l=((unsigned long)*((c++))<<24L, \
141                    l|=((unsigned long)*((c++))<<16L, \
142                    l|=((unsigned long)*((c++))<< 8L, \
143                    l|=((unsigned long)*((c++))

145 #undef l2n
146 #define l2n(l,c)    (*(c++)=(unsigned char)(((l)>>24L)&0xff), \
147                    *(c++)=(unsigned char)(((l)>>16L)&0xff), \
148                    *(c++)=(unsigned char)(((l)>> 8L)&0xff), \
149                    *(c++)=(unsigned char)(((l)>>0L)&0xff))

151 /* This is actually a big endian algorithm, the most significant byte
152  * is used to lookup array 0 */

154 #if defined(BF_PTR2)

156 /*
157  * This is basically a special Intel version. Point is that Intel
158  * doesn't have many registers, but offers a reach choice of addressing
159  * modes. So we spare some registers by directly traversing BF_KEY
160  * structure and hiring the most decorated addressing mode. The code
161  * generated by EGCS is *perfectly* competitive with assembler
162  * implementation!
163  */
164 #define BF_ENC(LL,R,KEY,Pi) ( \
165     LL^=KEY[Pi], \
166     t= KEY[BF_ROUNDS+2 + 0 + ((R>>24)&0xFF)], \
167     t+= KEY[BF_ROUNDS+2 + 256 + ((R>>16)&0xFF)], \
168     t^= KEY[BF_ROUNDS+2 + 512 + ((R>>8) &0xFF)], \
169     t+= KEY[BF_ROUNDS+2 + 768 + ((R) &0xFF)], \
170     LL^=t \
171 )

173 #elif defined(BF_PTR)

175 #ifndef BF_LONG_LOG2
176 #define BF_LONG_LOG2 2 /* default to BF_LONG being 32 bits */
177 #endif
178 #define BF_M (0xFF<<BF_LONG_LOG2)
179 #define BF_0 (24-BF_LONG_LOG2)
180 #define BF_1 (16-BF_LONG_LOG2)
181 #define BF_2 ( 8-BF_LONG_LOG2)
182 #define BF_3 BF_LONG_LOG2 /* left shift */

184 /*
185  * This is normally very good on RISC platforms where normally you
186  * have to explicitly "multiply" array index by sizeof(BF_LONG)
187  * in order to calculate the effective address. This implementation
188  * excuses CPU from this extra work. Power[PC] uses should have most
189  * fun as (R>>BF_i)&BF_M gets folded into a single instruction, namely
190  * rlwinnm. So let'em double-check if their compiler does it.
191  */

193 #define BF_ENC(LL,R,S,P) ( \

```

```

194     LL^=P, \
195     LL^= (((*(BF_LONG *)((unsigned char *)&S[ 0]))+((R>>BF_0)&BF_M))+ \
196           *(BF_LONG *)((unsigned char *)&S[256]))+((R>>BF_1)&BF_M))^ \
197           *(BF_LONG *)((unsigned char *)&S[512]))+((R>>BF_2)&BF_M))^ \
198           *(BF_LONG *)((unsigned char *)&S[768]))+((R<<BF_3)&BF_M))^ \
199     )
200 #else

202 /*
203  * This is a *generic* version. Seem to perform best on platforms that
204  * offer explicit support for extraction of 8-bit nibbles preferably
205  * complemented with "multiplying" of array index by sizeof(BF_LONG).
206  * For the moment of this writing the list comprises Alpha CPU featuring
207  * extbl and s[48]addq instructions.
208  */

210 #define BF_ENC(LL,R,S,P) ( \
211     LL^=P, \
212     LL^=((( S[ ((int)(R>>24)&0xff)] + \
213              S[0x0100+((int)(R>>16)&0xff)])^ \
214              S[0x0200+((int)(R>> 8)&0xff)])+ \
215              S[0x0300+((int)(R) &0xff)])&0xffffffffL \
216     )
217 #endif

219 #endif

```

new/usr/src/lib/openssl/include/bf_pi.h

1

17302 Fri May 30 18:31:13 2014
new/usr/src/lib/openssl/include/bf_pi.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bf/bf_pi.h */
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6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 static const BF_KEY bf_init= {
60     {
61         0x243f6a88L, 0x85a308d3L, 0x13198a2eL, 0x03707344L,
```

new/usr/src/lib/openssl/include/bf_pi.h

2

```
62     0xa4093822L, 0x299f31d0L, 0x082efa98L, 0xec4e6c89L,
63     0x452821e6L, 0x38d01377L, 0xbe5466cfL, 0x34e90c6cL,
64     0xc0ac29b7L, 0xc97c50ddL, 0x3f84d5b5L, 0xb5470917L,
65     0x9216d5d9L, 0x8979fb1b
66 }, {
67     0xd1310ba6L, 0x98dfb5acL, 0x2ffd72dbL, 0xd01adfb7L,
68     0xb8e1afedL, 0x6a267e96L, 0xba7c9045L, 0xf12c7f99L,
69     0x24a19947L, 0xb3916cf7L, 0x0801f2e2L, 0x858efc16L,
70     0x636920d8L, 0x71574e69L, 0xa458fea3L, 0xf4933d7eL,
71     0x0d95748fL, 0x728eb658L, 0x718bcd58L, 0x82154aeel,
72     0x7b54a41dL, 0xc25a59b5L, 0x9c30d539L, 0x2af26013L,
73     0xc5d1b023L, 0x286085f0L, 0xca417918L, 0xb8db38efL,
74     0x8e79dcb0L, 0x603a180eL, 0x6c9e0e8bL, 0xb01e8a3eL,
75     0xd15777c1L, 0xbd314b27L, 0x78af2fdaL, 0x560560c6L,
76     0xe65525f3L, 0xaa55ab94L, 0x57489862L, 0x63e81440L,
77     0x55ca396aL, 0x2aab10b6L, 0xb4cc5e34L, 0x1141e8ceL,
78     0xa15486afL, 0x7c72e993L, 0xb3ee1411L, 0x636fbc2aL,
79     0x2ba9c55dL, 0x741831f6L, 0xce5c3e16L, 0xb87931e1L,
80     0xafd6ba33L, 0x6c24cf5cL, 0x7a32581eL, 0x28958677L,
81     0x3b8f4898L, 0x6b4bb9afL, 0xc4bfe81bL, 0x66281293L,
82     0x61d809ccL, 0xfb21a991L, 0x487cac6bL, 0x5dec0321L,
83     0xef845d5dL, 0xe98575b1L, 0xdc262302L, 0xeb651888L,
84     0x23893e81L, 0xd396acc5L, 0xf6d6ff3L, 0x83f44239L,
85     0x2e0b4482L, 0xa4842004L, 0x69c8f04aL, 0xe1f9b59eL,
86     0x21c66842L, 0xf6e96c9aL, 0x670c9c61L, 0xabd388f0L,
87     0x6a51a0d2L, 0xd8542f68L, 0x960fa728L, 0xab5133a3L,
88     0x6eef0b6cL, 0x137a3be4L, 0xba3bf050L, 0x7efb2a98L,
89     0xa1f1651dL, 0x39af0176L, 0x66ca593eL, 0x82430888L,
90     0x8cee8619L, 0x456f9fb4L, 0x7d84a5c3L, 0x3b8b5ebeL,
91     0xe06f75d8L, 0x85c12073L, 0x401a449fL, 0x56c16aa6L,
92     0x4ed3aa62L, 0x363f7706L, 0x1bfedf72L, 0x429b023dL,
93     0x37d0d724L, 0xd00a1248L, 0xdb0fead3L, 0x49f1c09bL,
94     0x075372c9L, 0x80991b7bL, 0x25d479d8L, 0xf6e8def7L,
95     0x3fe501aL, 0xb6794c3bL, 0x976ce0bdL, 0x04c006baL,
96     0x1a94fb6L, 0x409f60c4L, 0x5e5c9ec2L, 0x196a2463L,
97     0x68fb6fafL, 0x3e6c53b5L, 0x1339b2ebL, 0x3b52ec6fL,
98     0x6dfc511fL, 0x9b30952cL, 0xcc814544L, 0xaf5ebd09L,
99     0xbec3d004L, 0xde334afdL, 0x660f2807L, 0x192e4bbbL,
100    0xc00ba857L, 0x45c8740fL, 0xd20b5f39L, 0xb9d3fbbdL,
101    0x5579c0bdL, 0x1a60320aL, 0xd6a100c6L, 0x402c7279L,
102    0x679f25feL, 0xfb1fa3ccL, 0x8ea5e9f8L, 0xdb3222f8L,
103    0x3c7516dfL, 0xfd616b15L, 0x2f501ec8L, 0xad0552abL,
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315 0xc9aa53fdL, 0x62a80f00L, 0xbb25bf2eL, 0x35bdd2f6L,
316 0x71126905L, 0xb2040222L, 0xb6cbcf7cL, 0xcd769c2bL,
317 0x53113ec0L, 0x1640e3d3L, 0x38abb60L, 0x2547adf0L,
318 0xba38209cL, 0xf746ce76L, 0x77afa1c5L, 0x0756060L,
319 0x85cbfe4eL, 0x8ae88dd8L, 0x7aaa9b0L, 0x4cf9aa7eL,
320 0x1948c25cL, 0x02fb8a8cL, 0x01c36ae4L, 0xd6ebe1f9L,
321 0x90d4f869L, 0xa65cdea0L, 0x3f09252dL, 0xc208e69fL,
322 0xb74e6132L, 0xce77e25bL, 0x578fdfe3L, 0x3ac372e6L,
323 }
324 };
```

new/usr/src/lib/openssl/include/bio_lcl.h

1

771 Fri May 30 18:31:13 2014

new/usr/src/lib/openssl/include/bio_lcl.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #include <openssl/bio.h>
```

```
3 #if BIO_FLAGS_UPLINK==0
```

```
4 /* Shortcut UPLINK calls on most platforms... */
```

```
5 #define UP_stdin      stdin
```

```
6 #define UP_stdout     stdout
```

```
7 #define UP_stderr     stderr
```

```
8 #define UP_fprintf    fprintf
```

```
9 #define UP_fgets      fgets
```

```
10 #define UP_fread      fread
```

```
11 #define UP_fwrite     fwrite
```

```
12 #undef UP_fsetmod
```

```
13 #define UP_feof       feof
```

```
14 #define UP_fclose     fclose
```

```
16 #define UP_fopen       fopen
```

```
17 #define UP_fseek       fseek
```

```
18 #define UP_ftell       ftell
```

```
19 #define UP_fflush      fflush
```

```
20 #define UP_ferror      ferror
```

```
21 #ifdef _WIN32
```

```
22 #define UP_fileno      _fileno
```

```
23 #define UP_open        _open
```

```
24 #define UP_read        _read
```

```
25 #define UP_write       _write
```

```
26 #define UP_lseek       _lseek
```

```
27 #define UP_close       _close
```

```
28 #else
```

```
29 #define UP_fileno      fileno
```

```
30 #define UP_open        open
```

```
31 #define UP_read        read
```

```
32 #define UP_write       write
```

```
33 #define UP_lseek       lseek
```

```
34 #define UP_close       close
```

```
35 #endif
```

```
36 #endif
```

new/usr/src/lib/openssl/include/blowfish.h

1

5143 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/blowfish.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bf/blowfish.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_BLOWFISH_H
60 #define HEADER_BLOWFISH_H
```

new/usr/src/lib/openssl/include/blowfish.h

2

62 #include <openssl/e_os2.h>

```
64 #ifdef __cplusplus
65 extern "C" {
66 #endif
```

```
68 #ifdef OPENSSL_NO_BF
69 #error BF is disabled.
70 #endif
```

```
72 #define BF_ENCRYPT      1
73 #define BF_DECRYPT      0
```

```
75 /*
76 * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
77 * ! BF_LONG has to be at least 32 bits wide. If it's wider, then !
78 * ! BF_LONG_LOG2 has to be defined along. !
79 * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
80 */
```

```
82 #if defined(__LP32__)
83 #define BF_LONG unsigned long
84 #elif defined(OPENSSL_SYS_CRAY) || defined(__ILP64__)
85 #define BF_LONG unsigned long
86 #define BF_LONG_LOG2 3
87 /*
88 * _CRAY note. I could declare short, but I have no idea what impact
89 * does it have on performance on none-T3E machines. I could declare
90 * int, but at least on C90 sizeof(int) can be chosen at compile time.
91 * So I've chosen long...
92 *
93 * <appro@fy.chalmers.se>
94 */
95 #define BF_LONG unsigned int
96 #endif
```

```
98 #define BF_ROUNDS      16
99 #define BF_BLOCK        8
```

```
101 typedef struct bf_key_st
102 {
103     BF_LONG P[BF_ROUNDS+2];
104     BF_LONG S[4*256];
105 } BF_KEY;
```

```
107 #ifdef OPENSSL_FIPS
108 void private_BF_set_key(BF_KEY *key, int len, const unsigned char *data);
109 #endif
110 void BF_set_key(BF_KEY *key, int len, const unsigned char *data);
```

```
112 void BF_encrypt(BF_LONG *data, const BF_KEY *key);
113 void BF_decrypt(BF_LONG *data, const BF_KEY *key);
```

```
115 void BF_ecb_encrypt(const unsigned char *in, unsigned char *out,
116                     const BF_KEY *key, int enc);
117 void BF_cbc_encrypt(const unsigned char *in, unsigned char *out, long length,
118                     const BF_KEY *schedule, unsigned char *ivec, int enc);
119 void BF_cfb64_encrypt(const unsigned char *in, unsigned char *out, long length,
120                       const BF_KEY *schedule, unsigned char *ivec, int *num, int enc);
121 void BF_ofb64_encrypt(const unsigned char *in, unsigned char *out, long length,
122                       const BF_KEY *schedule, unsigned char *ivec, int *num);
123 const char *BF_options(void);
```

```
125 #ifdef __cplusplus
126 }
127 #endif
```

129 #endif

new/usr/src/lib/openssl/include/bn_lcl.h

1

17183 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/bn_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bn/bn_lcl.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
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51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
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58 /* =====
59 * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without
```

new/usr/src/lib/openssl/include/bn_lcl.h

2

```
62 * modification, are permitted provided that the following conditions
63 * are met:
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67 *
68 * 2. Redistributions in binary form must reproduce the above copyright
69 * notice, this list of conditions and the following disclaimer in
70 * the documentation and/or other materials provided with the
71 * distribution.
72 *
73 * 3. All advertising materials mentioning features or use of this
74 * software must display the following acknowledgment:
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76 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
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83 * 5. Products derived from this software may not be called "OpenSSL"
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89 * "This product includes software developed by the OpenSSL Project
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103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #ifndef HEADER_BN_LCL_H
113 #define HEADER_BN_LCL_H
114
115 #include <openssl/bn.h>
116
117 #ifdef __cplusplus
118 extern "C" {
119 #endif
120
121
122 /*
123  * BN_window_bits_for_exponent_size -- macro for sliding window mod_exp function
124  *
125  * For window size 'w' (w >= 2) and a random 'b' bits exponent,
126  * the number of multiplications is a constant plus on average
```

```

128 *
129 *      2^(w-1) + (b-w)/(w+1);
130 *
131 * here 2^(w-1) is for precomputing the table (we actually need
132 * entries only for windows that have the lowest bit set), and
133 * (b-w)/(w+1) is an approximation for the expected number of
134 * w-bit windows, not counting the first one.
135 *
136 * Thus we should use
137 *
138 *      w >= 6 if      b > 671
139 *      w = 5 if 671 > b > 239
140 *      w = 4 if 239 > b > 79
141 *      w = 3 if 79 > b > 23
142 *      w <= 2 if 23 > b
143 *
144 * (with draws in between). Very small exponents are often selected
145 * with low Hamming weight, so we use w = 1 for b <= 23.
146 */
147 #if 1
148 #define BN_window_bits_for_exponent_size(b) \
149     ((b) > 671 ? 6 : \
150      (b) > 239 ? 5 : \
151      (b) > 79 ? 4 : \
152      (b) > 23 ? 3 : 1)
153 #else
154 /* Old SSLeay/OpenSSL table.
155 * Maximum window size was 5, so this table differs for b==1024;
156 * but it coincides for other interesting values (b==160, b==512).
157 */
158 #define BN_window_bits_for_exponent_size(b) \
159     ((b) > 255 ? 5 : \
160      (b) > 127 ? 4 : \
161      (b) > 17 ? 3 : 1)
162 #endif

166 /* BN_mod_exp_mont_consttime is based on the assumption that the
167 * L1 data cache line width of the target processor is at least
168 * the following value.
169 */
170 #define MOD_EXP_CTIME_MIN_CACHE_LINE_WIDTH ( 64 )
171 #define MOD_EXP_CTIME_MIN_CACHE_LINE_MASK (MOD_EXP_CTIME_MIN_CACHE_LINE_WI

173 /* Window sizes optimized for fixed window size modular exponentiation
174 * algorithm (BN_mod_exp_mont_consttime).
175 *
176 * To achieve the security goals of BN_mod_exp_mont_consttime, the
177 * maximum size of the window must not exceed
178 * log_2(MOD_EXP_CTIME_MIN_CACHE_LINE_WIDTH).
179 *
180 * Window size thresholds are defined for cache line sizes of 32 and 64,
181 * cache line sizes where log_2(32)=5 and log_2(64)=6 respectively. A
182 * window size of 7 should only be used on processors that have a 128
183 * byte or greater cache line size.
184 */
185 #if MOD_EXP_CTIME_MIN_CACHE_LINE_WIDTH == 64

187 # define BN_window_bits_for_ctime_exponent_size(b) \
188     ((b) > 937 ? 6 : \
189      (b) > 306 ? 5 : \
190      (b) > 89 ? 4 : \
191      (b) > 22 ? 3 : 1)
192 # define BN_MAX_WINDOW_BITS_FOR_CTIME_EXPONENT_SIZE (6)

```

```

194 #elif MOD_EXP_CTIME_MIN_CACHE_LINE_WIDTH == 32

196 # define BN_window_bits_for_ctime_exponent_size(b) \
197     ((b) > 306 ? 5 : \
198      (b) > 89 ? 4 : \
199      (b) > 22 ? 3 : 1)
200 # define BN_MAX_WINDOW_BITS_FOR_CTIME_EXPONENT_SIZE (5)

202 #endif

205 /* Pentium pro 16,16,16,32,64 */
206 /* Alpha 16,16,16,16,64 */
207 #define BN_MULL_SIZE_NORMAL (16) /* 32 */
208 #define BN_MUL_RECURSIVE_SIZE_NORMAL (16) /* 32 less than */
209 #define BN_SQR_RECURSIVE_SIZE_NORMAL (16) /* 32 */
210 #define BN_MUL_LOW_RECURSIVE_SIZE_NORMAL (32) /* 32 */
211 #define BN_MONT_CTX_SET_SIZE_WORD (64) /* 32 */

213 #if !defined(OPENSSSL_NO_ASM) && !defined(OPENSSSL_NO_INLINE_ASM) && !defined(PEDA
214 /*
215 * BN_UMULT_HIGH section.
216 *
217 * No, I'm not trying to overwhelm you when stating that the
218 * product of N-bit numbers is 2*N bits wide:-) No, I don't expect
219 * you to be impressed when I say that if the compiler doesn't
220 * support 2*N integer type, then you have to replace every N*N
221 * multiplication with 4 (N/2)*(N/2) accompanied by some shifts
222 * and additions which unavoidably results in severe performance
223 * penalties. Of course provided that the hardware is capable of
224 * producing 2*N result... That's when you normally start
225 * considering assembler implementation. However! It should be
226 * pointed out that some CPUs (most notably Alpha, PowerPC and
227 * upcoming IA-64 family:-) provide *separate* instruction
228 * calculating the upper half of the product placing the result
229 * into a general purpose register. Now *if* the compiler supports
230 * inline assembler, then it's not impossible to implement the
231 * "bignum" routines (and have the compiler optimize 'em)
232 * exhibiting "native" performance in C. That's what BN_UMULT_HIGH
233 * macro is about:-)
234 *
235 * <appro@fy.chalmers.se>
236 */
237 # if defined(__alpha) && (defined(SIXTY_FOUR_BIT_LONG) || defined(SIXTY_FOUR_BIT
238 # if defined(__DECC)
239 # include <c_asm.h>
240 # define BN_UMULT_HIGH(a,b) (BN_ULONG)__asm__("umulh %a0,%a1,%v0", (a), (b))
241 # elif defined(__GNUC__) && __GNUC__ >= 2
242 # define BN_UMULT_HIGH(a,b) ({ \
243     register BN_ULONG ret; \
244     __asm__("umulh %1,%2,%0" \
245            : "=r"(ret) \
246            : "r"(a), "r"(b)); \
247     ret; \
248 # endif /* compiler */
249 # elif defined(__ARCH_PPC) && defined(__64BIT__) && defined(SIXTY_FOUR_BIT_LONG)
250 # if defined(__GNUC__) && __GNUC__ >= 2
251 # define BN_UMULT_HIGH(a,b) ({ \
252     register BN_ULONG ret; \
253     __asm__("mulhdu %0,%1,%2" \
254            : "=r"(ret) \
255            : "r"(a), "r"(b)); \
256     ret; \
257 # endif /* compiler */
258 # elif (defined(__x86_64) || defined(__x86_64__)) && \
259     (defined(SIXTY_FOUR_BIT_LONG) || defined(SIXTY_FOUR_BIT))

```

```

260 # if defined(__GNUC__) && __GNUC__>=2
261 #   define BN_UMULT_HIGH(a,b) ({ \
262     register BN_ULONG ret,discard; \
263     __asm__ ("mulq %3" \
264         : "=a"(discard),"=d"(ret) \
265         : "a"(a), "g"(b) \
266         : "cc"); \
267     ret; \
268 #   define BN_UMULT_LOHI(low,high,a,b) \
269     __asm__ ("mulq %3" \
270         : "=a"(low),"=d"(high) \
271         : "a"(a),"g"(b) \
272         : "cc"); \
273 #   endif
274 # elif defined(_M_AMD64) || defined(_M_X64) && defined(SIXTY_FOUR_BIT)
275 #   if defined(_MSC_VER) && _MSC_VER>=1400
276     unsigned __int64 _umulh (unsigned __int64 a,unsigned __int64 b);
277     unsigned __int64 _umul128 (unsigned __int64 a,unsigned __int64 b,
278         unsigned __int64 *h);
279 #   pragma intrinsic(_umulh,_umul128)
280 #   define BN_UMULT_HIGH(a,b) _umulh((a),(b))
281 #   define BN_UMULT_LOHI(low,high,a,b) ((low)=_umul128((a),(b),&(high)))
282 #   endif
283 # elif defined(__mips) && (defined(SIXTY_FOUR_BIT) || defined(SIXTY_FOUR_BIT_LONG))
284 #   if defined(__GNUC__) && __GNUC__>=2
285 #       if __GNUC__>=4 && __GNUC_MINOR__>=4 /* "h" constraint is no more since 4.4 */
286 #           define BN_UMULT_HIGH(a,b) (((__uint128_t)(a)*(b))>>64)
287 #           define BN_UMULT_LOHI(low,high,a,b) ({ \
288             __uint128_t ret=(__uint128_t)(a)*(b); \
289             (high)=ret>>64; (low)=ret; \
290             })
291 #       else
292 #           define BN_UMULT_HIGH(a,b) ({ \
293             register BN_ULONG ret; \
294             __asm__ ("dmultu %1,%2" \
295                 : "=h"(ret) \
296                 : "r"(a), "r"(b) : "l"); \
297             ret; \
298             })
299 #           define BN_UMULT_LOHI(low,high,a,b) \
300             __asm__ ("dmultu %2,%3" \
301                 : "=l"(low),"=h"(high) \
302                 : "r"(a), "r"(b)); \
303 #       endif
304 #   endif
305 #   endif
306 #   endif
307 #   endif
308 #   endif
309 #   endif
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326     BN_ULONG t; \
327     t=(BN_ULONG)w * (a) + (r) + (c); \
328     (r)= Lw(t); \
329     (c)= Hw(t); \
330 }
331
332 #define mul(r,a,w,c) { \
333     BN_ULONG t; \
334     t=(BN_ULONG)w * (a) + (c); \
335     (r)= Lw(t); \
336     (c)= Hw(t); \
337 }
338
339 #define sqr(r0,r1,a) { \
340     BN_ULONG t; \
341     t=(BN_ULONG)(a)*(a); \
342     (r0)=Lw(t); \
343     (r1)=Hw(t); \
344 }
345
346 #elif defined(BN_UMULT_LOHI)
347 #define mul_add(r,a,w,c) { \
348     BN_ULONG high,low,ret,tmp=(a); \
349     ret = (r); \
350     BN_UMULT_LOHI(low,high,w,tmp); \
351     ret += (c); \
352     (c) = (ret<(c))?1:0; \
353     (c) += high; \
354     ret += low; \
355     (c) += (ret<low)?1:0; \
356     (r) = ret; \
357 }
358
359 #define mul(r,a,w,c) { \
360     BN_ULONG high,low,ret,ta=(a); \
361     BN_UMULT_LOHI(low,high,w,ta); \
362     ret = low + (c); \
363     (c) = high; \
364     (c) += (ret<low)?1:0; \
365     (r) = ret; \
366 }
367
368 #define sqr(r0,r1,a) { \
369     BN_ULONG tmp=(a); \
370     BN_UMULT_LOHI(r0,r1,tmp,tmp); \
371 }
372
373 #elif defined(BN_UMULT_HIGH)
374 #define mul_add(r,a,w,c) { \
375     BN_ULONG high,low,ret,tmp=(a); \
376     ret = (r); \
377     high= BN_UMULT_HIGH(w,tmp); \
378     ret += (c); \
379     low = (w) * tmp; \
380     (c) = (ret<(c))?1:0; \
381     (c) += high; \
382     ret += low; \
383     (c) += (ret<low)?1:0; \
384     (r) = ret; \
385 }
386
387 #define mul(r,a,w,c) { \
388     BN_ULONG high,low,ret,ta=(a); \
389     low = (w) * ta; \
390     high= BN_UMULT_HIGH(w,ta); \
391     ret = low + (c); \

```

```

392     (c) = high; \
393     (c) += (ret<low)?1:0; \
394     (r) = ret; \
395 }
397 #define sqr(r0,r1,a) { \
398     BN_ULONG tmp=(a); \
399     (r0) = tmp * tmp; \
400     (r1) = BN_UMULT_HIGH(tmp,tmp); \
401 }
403 #else
404 /*****
405  * No long long type
406  */
408 #define LBITS(a) ((a)&BN_MASK2l)
409 #define HBITS(a) (((a)>>BN_BITS4)&BN_MASK2l)
410 #define L2HBITS(a) (((a)<<BN_BITS4)&BN_MASK2)
412 #define LLBITS(a) ((a)&BN_MASKl)
413 #define LHBITS(a) (((a)>>BN_BITS2)&BN_MASKl)
414 #define LL2HBITS(a) ((BN_ULLONG)((a)&BN_MASKl)<<BN_BITS2)
416 #define mul64(l,h,b1,bh) \
417 { \
418     BN_ULONG m,m1,lt,ht; \
419 \
420     lt=l; \
421     ht=h; \
422     m=(bh)*(lt); \
423     lt=(b1)*(lt); \
424     m1=(b1)*(ht); \
425     ht=(bh)*(ht); \
426     m=(m+m1)&BN_MASK2; if (m < m1) ht+=L2HBITS((BN_ULONG)1); \
427     ht+=HBITS(m); \
428     m1=L2HBITS(m); \
429     lt=(lt+m1)&BN_MASK2; if (lt < m1) ht++; \
430     (l)=lt; \
431     (h)=ht; \
432 }
434 #define sqr64(lo,ho,in) \
435 { \
436     BN_ULONG l,h,m; \
437 \
438     h=(in); \
439     l=LBITS(h); \
440     h=HBITS(h); \
441     m=(l)*(h); \
442     l*=l; \
443     h*=h; \
444     h+=(m&BN_MASK2h1)>>(BN_BITS4-1); \
445     m=(m&BN_MASK2l)<<(BN_BITS4+1); \
446     l=(l+m)&BN_MASK2; if (l < m) h++; \
447     (lo)=l; \
448     (ho)=h; \
449 }
451 #define mul_add(r,a,b1,bh,c) { \
452     BN_ULONG l,h; \
453 \
454     h= (a); \
455     l=LBITS(h); \
456     h=HBITS(h); \
457     mul64(l,h,(b1),(bh)); \

```

```

458 \
459     /* non-multiply part */ \
460     l=(l+(c))&BN_MASK2; if (l < (c)) h++; \
461     (c)=(r); \
462     l=(l+(c))&BN_MASK2; if (l < (c)) h++; \
463     (c)=h&BN_MASK2; \
464     (r)=l; \
465 }
467 #define mul(r,a,b1,bh,c) { \
468     BN_ULONG l,h; \
469 \
470     h= (a); \
471     l=LBITS(h); \
472     h=HBITS(h); \
473     mul64(l,h,(b1),(bh)); \
474 \
475     /* non-multiply part */ \
476     l+=(c); if ((l&BN_MASK2) < (c)) h++; \
477     (c)=h&BN_MASK2; \
478     (r)=l&BN_MASK2; \
479 }
480 #endif /* !BN_LLONG */
482 #if defined(OPENSSL_DOING_MAKEDEPEND) && defined(OPENSSL_FIPS)
483 #undef bn_div_words
484 #endif
486 void bn_mul_normal(BN_ULONG *r,BN_ULONG *a,int na,BN_ULONG *b,int nb);
487 void bn_mul_comba8(BN_ULONG *r,BN_ULONG *a,BN_ULONG *b);
488 void bn_mul_comba4(BN_ULONG *r,BN_ULONG *a,BN_ULONG *b);
489 void bn_sqr_normal(BN_ULONG *r,const BN_ULONG *a,int n,BN_ULONG *tmp);
490 void bn_sqr_comba8(BN_ULONG *r,const BN_ULONG *a);
491 void bn_sqr_comba4(BN_ULONG *r,const BN_ULONG *a);
492 int bn_cmp_words(const BN_ULONG *a,const BN_ULONG *b,int n);
493 int bn_cmp_part_words(const BN_ULONG *a,const BN_ULONG *b,
494     int cl,int dl);
495 void bn_mul_recursive(BN_ULONG *r,BN_ULONG *a,BN_ULONG *b,int n2,
496     int dna,int دنب,BN_ULONG *t);
497 void bn_mul_part_recursive(BN_ULONG *r,BN_ULONG *a,BN_ULONG *b,
498     int n,int tna,int دنب,BN_ULONG *t);
499 void bn_sqr_recursive(BN_ULONG *r,const BN_ULONG *a,int n2,BN_ULONG *t);
500 void bn_mul_low_normal(BN_ULONG *r,BN_ULONG *a,BN_ULONG *b,int n);
501 void bn_mul_low_recursive(BN_ULONG *r,BN_ULONG *a,BN_ULONG *b,int n2,
502     BN_ULONG *t);
503 void bn_mul_high(BN_ULONG *r,BN_ULONG *a,BN_ULONG *b,BN_ULONG *l,int n2,
504     BN_ULONG *t);
505 BN_ULONG bn_add_part_words(BN_ULONG *r,const BN_ULONG *a,const BN_ULONG *b,
506     int cl,int dl);
507 BN_ULONG bn_sub_part_words(BN_ULONG *r,const BN_ULONG *a,const BN_ULONG *b,
508     int cl,int dl);
509 int bn_mul_mont(BN_ULONG *rp,const BN_ULONG *ap,const BN_ULONG *bp,const BN_U
511 #ifdef __cplusplus
512 }
513 #endif
515 #endif

```


new/usr/src/lib/openssl/include/bn_prime.h

1

14989 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/bn_prime.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* Auto generated by bn_prime.pl */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef EIGHT_BIT
60 #define NUMPRIMES 2048
61 typedef unsigned short prime_t;
```

new/usr/src/lib/openssl/include/bn_prime.h

2

```
62 #else
63 #define NUMPRIMES 54
64 typedef unsigned char prime_t;
65 #endif
66 static const prime_t primes[NUMPRIMES]=
67 {
68     2, 3, 5, 7, 11, 13, 17, 19,
69     23, 29, 31, 37, 41, 43, 47, 53,
70     59, 61, 67, 71, 73, 79, 83, 89,
71     97, 101, 103, 107, 109, 113, 127, 131,
72     137, 139, 149, 151, 157, 163, 167, 173,
73     179, 181, 191, 193, 197, 199, 211, 223,
74     227, 229, 233, 239, 241, 251,
75 #ifndef EIGHT_BIT
76     257, 263,
77     269, 271, 277, 281, 283, 293, 307, 311,
78     313, 317, 331, 337, 347, 349, 353, 359,
79     367, 373, 379, 383, 389, 397, 401, 409,
80     419, 421, 431, 433, 439, 443, 449, 457,
81     461, 463, 467, 479, 487, 491, 499, 503,
82     509, 521, 523, 541, 547, 557, 563, 569,
83     571, 577, 587, 593, 599, 601, 607, 613,
84     617, 619, 631, 641, 643, 647, 653, 659,
85     661, 673, 677, 683, 691, 701, 709, 719,
86     727, 733, 739, 743, 751, 757, 761, 769,
87     773, 787, 797, 809, 811, 821, 823, 827,
88     829, 839, 853, 857, 859, 863, 877, 881,
89     883, 887, 907, 911, 919, 929, 937, 941,
90     947, 953, 967, 971, 977, 983, 991, 997,
91     1009, 1013, 1019, 1021, 1031, 1033, 1039, 1049,
92     1051, 1061, 1063, 1069, 1087, 1091, 1093, 1097,
93     1103, 1109, 1117, 1123, 1129, 1151, 1153, 1163,
94     1171, 1181, 1187, 1193, 1201, 1213, 1217, 1223,
95     1229, 1231, 1237, 1249, 1259, 1277, 1279, 1283,
96     1289, 1291, 1297, 1301, 1303, 1307, 1319, 1321,
97     1327, 1361, 1367, 1373, 1381, 1399, 1409, 1423,
98     1427, 1429, 1433, 1439, 1447, 1451, 1453, 1459,
99     1471, 1481, 1483, 1487, 1489, 1493, 1499, 1511,
100    1523, 1531, 1543, 1549, 1553, 1559, 1567, 1571,
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102    1621, 1627, 1637, 1657, 1663, 1667, 1669, 1693,
103    1697, 1699, 1709, 1721, 1723, 1733, 1741, 1747,
104    1753, 1759, 1777, 1783, 1787, 1789, 1801, 1811,
105    1823, 1831, 1847, 1861, 1867, 1871, 1873, 1877,
106    1879, 1889, 1901, 1907, 1913, 1931, 1933, 1949,
107    1951, 1973, 1979, 1987, 1993, 1997, 1999, 2003,
108    2011, 2017, 2027, 2029, 2039, 2053, 2063, 2069,
109    2081, 2083, 2087, 2089, 2099, 2111, 2113, 2129,
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```
326 #endif
327     };
```

```
*****
8575 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/cast_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/cast/cast_lcl.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
```

```
60 #include "e_os.h"
```

```
62 #ifdef OPENSAL_SYS_WIN32
63 #include <stdlib.h>
64 #endif

67 #undef c2l
68 #define c2l(c,l)      (l=((unsigned long)((c)))<< 8L, \
69                       l|=((unsigned long)((c)))<< 16L, \
70                       l|=((unsigned long)((c)))<< 24L)

73 /* NOTE - c is not incremented as per c2l */
74 #undef c2ln
75 #define c2ln(c,l1,l2,n) { \
76     c+=n; \
77     l1=l2=0; \
78     switch (n) { \
79         case 8: l2=((unsigned long)((c)))<<24L; \
80         case 7: l2|=((unsigned long)((c)))<<16L; \
81         case 6: l2|=((unsigned long)((c)))<< 8L; \
82         case 5: l2|=((unsigned long)((c))); \
83         case 4: l1|=((unsigned long)((c)))<<24L; \
84         case 3: l1|=((unsigned long)((c)))<<16L; \
85         case 2: l1|=((unsigned long)((c)))<< 8L; \
86         case 1: l1|=((unsigned long)((c))); \
87     } \
88 }

90 #undef l2c
91 #define l2c(l,c)      ((*((c))=((unsigned char)((l)>>24L)&0xff), \
92                       *((c))=((unsigned char)((l)>>16L)&0xff), \
93                       *((c))=((unsigned char)((l)>> 8L)&0xff), \
94                       *((c))=((unsigned char)((l)>>0L)&0xff))

96 /* NOTE - c is not incremented as per l2c */
97 #undef l2cn
98 #define l2cn(l1,l2,c,n) { \
99     c+=n; \
100     switch (n) { \
101         case 8: *((c))=((unsigned char)((l2)>>24L)&0xff); \
102         case 7: *((c))=((unsigned char)((l2)>>16L)&0xff); \
103         case 6: *((c))=((unsigned char)((l2)>> 8L)&0xff); \
104         case 5: *((c))=((unsigned char)((l2)>>0L)&0xff); \
105         case 4: *((c))=((unsigned char)((l1)>>24L)&0xff); \
106         case 3: *((c))=((unsigned char)((l1)>>16L)&0xff); \
107         case 2: *((c))=((unsigned char)((l1)>> 8L)&0xff); \
108         case 1: *((c))=((unsigned char)((l1)>>0L)&0xff); \
109     } \
110 }

112 /* NOTE - c is not incremented as per n2l */
113 #define n2ln(c,l1,l2,n) { \
114     c+=n; \
115     l1=l2=0; \
116     switch (n) { \
117         case 8: l2=((unsigned long)((c)))<<24L; \
118         case 7: l2|=((unsigned long)((c)))<<16L; \
119         case 6: l2|=((unsigned long)((c)))<< 8L; \
120         case 5: l2|=((unsigned long)((c))); \
121         case 4: l1|=((unsigned long)((c)))<<24L; \
122         case 3: l1|=((unsigned long)((c)))<<16L; \
123         case 2: l1|=((unsigned long)((c)))<< 8L; \
124         case 1: l1|=((unsigned long)((c))); \
125     } \
126 }
```

```

128 /* NOTE - c is not incremented as per l2n */
129 #define l2nn(l1,l2,c,n) { \
130     c+=n; \
131     switch (n) { \
132     case 8: *((c))=(unsigned char)(((l2) )&0xff); \
133     case 7: *((c))=(unsigned char)(((l2)>> 8)&0xff); \
134     case 6: *((c))=(unsigned char)(((l2)>>16)&0xff); \
135     case 5: *((c))=(unsigned char)(((l2)>>24)&0xff); \
136     case 4: *((c))=(unsigned char)(((l1) )&0xff); \
137     case 3: *((c))=(unsigned char)(((l1)>> 8)&0xff); \
138     case 2: *((c))=(unsigned char)(((l1)>>16)&0xff); \
139     case 1: *((c))=(unsigned char)(((l1)>>24)&0xff); \
140     } \
141     }
142
143 #undef n2l
144 #define n2l(c,l) \
145     (l=((unsigned long)((c))<<24L, \
146     l|=((unsigned long)((c))<<16L, \
147     l|=((unsigned long)((c))<< 8L, \
148     l|=((unsigned long)((c))<< 0L))
149
150 #undef l2n
151 #define l2n(l,c) \
152     (*(c))=((unsigned char)(((l)>>24L)&0xff), \
153     *((c))=((unsigned char)(((l)>>16L)&0xff), \
154     *((c))=((unsigned char)(((l)>> 8L)&0xff), \
155     *((c))=((unsigned char)(((l)>> 0L)&0xff))
156
157 #if defined(OPENSSL_SYS_WIN32) && defined(_MSC_VER)
158 #define ROTL(a,n) (_lrotl(a,n))
159 #else
160 #define ROTL(a,n) (((a)<<(n))&0xffffffff|((a)>>(32-(n))))
161 #endif
162
163 #define C_M 0x3fc
164 #define C_0 22L
165 #define C_1 14L
166 #define C_2 6L
167 #define C_3 2L /* left shift */

```

```

168 /* The rotate has an extra 16 added to it to help the x86 asm */
169 #if defined(CAST_PTR)
170 #define E_CAST(n,key,L,R,OP1,OP2,OP3) \
171 { \
172     int i; \
173     t=(key[n*2] OP1 R)&0xffffffffL; \
174     i=key[n*2+1]; \
175     t=ROTL(t,i); \
176     L^= ((((*((CAST_LONG *)((unsigned char *) \
177     CAST_S_table0+((t>>C_2)&C_M)) OP2 \
178     *((CAST_LONG *)((unsigned char *) \
179     CAST_S_table1+((t<<C_3)&C_M)))&0xffffffffL) OP3 \
180     *((CAST_LONG *)((unsigned char *) \
181     CAST_S_table2+((t>>C_0)&C_M)))&0xffffffffL) OP1 \
182     *((CAST_LONG *)((unsigned char *) \
183     CAST_S_table3+((t>>C_1)&C_M)))&0xffffffffL; \
184 }
185 #elif defined(CAST_PTR2)
186 #define E_CAST(n,key,L,R,OP1,OP2,OP3) \
187 { \
188     int i; \
189     CAST_LONG u,v,w; \
190     w=(key[n*2] OP1 R)&0xffffffffL; \
191     i=key[n*2+1]; \
192     w=ROTL(w,i); \
193     u=w>>C_2; \
194     v=w<<C_3; \

```

```

194     u&=C_M; \
195     v&=C_M; \
196     t=*((CAST_LONG *)((unsigned char *)CAST_S_table0+u)); \
197     u=w>>C_0; \
198     t=(t OP2 *((CAST_LONG *)((unsigned char *)CAST_S_table1+v))&0xffffffffL; \
199     v=w>>C_1; \
200     u&=C_M; \
201     v&=C_M; \
202     t=(t OP3 *((CAST_LONG *)((unsigned char *)CAST_S_table2+u)&0xffffffffL); \
203     t=(t OP1 *((CAST_LONG *)((unsigned char *)CAST_S_table3+v)&0xffffffffL); \
204     L^=(t&0xffffffff); \
205 }
206 #else
207 #define E_CAST(n,key,L,R,OP1,OP2,OP3) \
208 { \
209     CAST_LONG a,b,c,d; \
210     t=(key[n*2] OP1 R)&0xffffffffL; \
211     t=ROTL(t,(key[n*2+1])); \
212     a=CAST_S_table0[(t>> 8)&0xff]; \
213     b=CAST_S_table1[(t )&0xff]; \
214     c=CAST_S_table2[(t>>24)&0xff]; \
215     d=CAST_S_table3[(t>>16)&0xff]; \
216     L^=((((a OP2 b)&0xffffffffL) OP3 c)&0xffffffffL) OP1 d)&0xffffffffL; \
217 }
218 #endif
219
220 extern const CAST_LONG CAST_S_table0[256];
221 extern const CAST_LONG CAST_S_table1[256];
222 extern const CAST_LONG CAST_S_table2[256];
223 extern const CAST_LONG CAST_S_table3[256];
224 extern const CAST_LONG CAST_S_table4[256];
225 extern const CAST_LONG CAST_S_table5[256];
226 extern const CAST_LONG CAST_S_table6[256];
227 extern const CAST_LONG CAST_S_table7[256];

```

```
*****
27196 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/cast_s.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cast/cast_s.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 OPENSSL_GLOBAL const CAST_LONG CAST_S_table0[256]={
59     0x30fb40d4,0x9fa0ff0b,0x6beccd2f,0x3f258c7a,
60     0x1e213f2f,0x9c004dd3,0x6003e540,0xcf9fc949,
61     0xbfd4af27,0x88bbbdb5,0xe2034090,0x98d09675,
```

```
62     0x6e63a0e0,0x15c361d2,0xc2e7661d,0x22d4ff8e,
63     0x28683b6f,0xc07fd059,0xff2379c8,0x775f50e2,
64     0x43c340d3,0xdf2f8656,0x887ca41a,0xa2d2bd2d,
65     0xa1c9e0d6,0x346c4819,0x61b76d87,0x22540f2f,
66     0x2abe32e1,0xaa54166b,0x22568e3a,0xa2d341d0,
67     0x66db40c8,0xa784392f,0x004dff2f,0x2db9d2de,
68     0x97943fac,0x4a97c1d8,0x527644b7,0xb5f437a7,
69     0xb82cbaef,0xd751d159,0x6ff7f0ed,0x5a097a1f,
70     0x827b68d0,0x90ecf52e,0x22b0c054,0xbc8e5935,
71     0x4b6d2f7f,0x50bb64a2,0xd2664910,0xbee5812d,
72     0xb7332290,0xe93b159f,0xb48ee411,0x4bfff345d,
73     0xfd45c240,0xad31973f,0xc4f6d02e,0x55fc8165,
74     0xd5b1caad,0xa1ac2dae,0xa2d4b76d,0xc19b0c50,
75     0x882240f2,0xc0c6e4f38,0xa4e4bfd7,0x4f5ba272,
76     0x564c1d2f,0xc59c5319,0xb949e354,0xb04669fe,
77     0xb1b6ab8a,0xc71358dd,0x6385c545,0x110f935d,
78     0x57538ad5,0x6a390493,0xe63d37e0,0x2a54f6b3,
79     0x3a787d5f,0x6276a0b5,0x19a6fcdf,0x7a42206a,
80     0x29f9d4d5,0xf61b1891,0xbb7275e,0xaa508167,
81     0x38901091,0xc6b505eb,0x84c7cb8c,0x2ad75a0f,
82     0x874a1427,0xa2d1936b,0x2ad286af,0xaa56d291,
83     0xd7894360,0x425c750d,0x93b39e26,0x187184c9,
84     0xc600b32d,0x73e2bb14,0xa0ebc3c,0x54623779,
85     0x64459eab,0x3f328b82,0x7718cf82,0x59a2cea6,
86     0x04ee002e,0x89fe78e6,0x3fab0950,0x325ff6c2,
87     0x81383f05,0x6963c5c8,0x76cb5ad6,0xd49974c9,
88     0xca180dcf,0x380782d5,0xc7fa5cfe,0x8ac31511,
89     0x35e79e13,0x47da91d0,0xf40f9086,0xe2419e,
90     0x31366241,0x051ef495,0xaa573b04,0x4a805d8d,
91     0x548300d0,0x00322a3c,0xbff64cddf,0xba57a68e,
92     0x75c6372b,0x50afd341,0xa7c13275,0x915a0bf5,
93     0x6b54bfab,0x2b0b1426,0xab4cc9d7,0x449cc82,
94     0xf7fbf265,0xab85c5f3,0x1b55db94,0xaad4e324,
95     0xcfa4bd3f,0x2dea3e2,0x9e204d02,0xc8bd25ac,
96     0xeadf55b3,0xd5bd9e98,0xe31231b2,0x2ad5ad6c,
97     0x954329de,0xadbe4528,0xd8710f69,0xaa51c90f,
98     0xaa786bf6,0x22513f1e,0xaa51a79b,0x2ad344cc,
99     0x7b5a41f0,0xd37cfbad,0x1b069505,0x41ece491,
100    0xb4c332e6,0x032268d4,0xc9600acc,0xc387e6d,
101    0xbff6bb16c,0x6a70fb78,0x0d03d9c9,0xd4df39de,
102    0xe01063da,0x4736f464,0x5ad328d8,0xb347cc96,
103    0x75bb0fc3,0x98511bfb,0x4ffbcc35,0xb58bcf6a,
104    0xe11f0abc,0xbfc5fe4a,0xa70aec10,0xac39570a,
105    0x3f04442f,0x6188b153,0xe0397a2e,0x5727cb79,
106    0x9ceb418f,0x1cacd68d,0x2ad37c96,0x0175cb9d,
107    0xc69dff09,0xc75b65f0,0xd9db40d8,0xec0e7779,
108    0x4744ead4,0xb11c3274,0xdd24cb9e,0x7e1c54bd,
109    0xf01144f9,0xd2240eb1,0x9675b3fd,0xa3ac3755,
110    0xd47c27af,0x51c85f4d,0x56907596,0xa5bb15e6,
111    0x580304f0,0xca042cf1,0x011a37ea,0x8dbfaadb,
112    0x35ba3e4a,0x3526ffa0,0xc37bd409,0xbcb306ed9,
113    0x98a52666,0x5648f725,0xff5e569d,0xc0cd63d0,
114    0x7c63b2cf,0x700b45e1,0xd5ea50f1,0x85a92872,
115    0xaf1fbda7,0xd4234870,0xa7870bf3,0x2d3b4d79,
116    0x42e04198,0x0cd0ede7,0x26470db8,0xf881814c,
117    0x474d6ad7,0x7c0c5e5c,0xd1231959,0x381b7298,
118    0xf5d2f4db,0xab838653,0x6e2f1e23,0x83719c9e,
119    0xbd91e046,0x9a56456e,0xdc39200c,0x20c8c571,
120    0x962bda1c,0xe1e696ff,0xb141ab08,0x7cca89b9,
121    0x1a69e783,0x02cc4843,0xa2f7c579,0x429ef47d,
122    0x427b169c,0x5ac9f049,0xdd8f0f00,0x5c8165bf,
123    };
124 OPENSSL_GLOBAL const CAST_LONG CAST_S_table1[256]={
125     0x1f201094,0xef0ba75b,0x69e3cf7e,0x393f4380,
126     0xfe61cf7a,0xeec5207a,0x55889c94,0x72fc0651,
127     0xada7ef79,0x4e1d7235,0xd55a63ce,0xde0436ba,
```

```
128 0x99c430ef,0x5f0c0794,0x18dcd7bd,0xa1d6eff3,
129 0xa0b52f7b,0x59e83605,0xee15b094,0xe9ff909,
130 0xdc440086,0xef944459,0xba83ccb3,0xe0c3cdfb,
131 0xd1da4181,0x3b092ab1,0xf997f1c1,0xa5e6cf7b,
132 0x01420ddb,0xe4e7ef5b,0x25a1ff41,0xe180f806,
133 0x1fc41080,0x179bee7a,0xd37ac6a9,0xfe5830a4,
134 0x98de8b7f,0x77e83f4e,0x79929269,0x24fa9f7b,
135 0xe113c85b,0xacc40083,0xd7503525,0xf7ea615f,
136 0x62143154,0x0d554b63,0x5d681121,0xc866c359,
137 0x3d63cf73,0xcee234c0,0xd4d87e87,0x5c672b21,
138 0x071f6181,0x39f7627f,0x361e3084,0xe4eb573b,
139 0x602f64a4,0xd63acd9c,0x1bbc4635,0x9e81032d,
140 0x2701f50c,0x99847ab4,0xa0e3df79,0xba6cf38c,
141 0x10843094,0x2537a95e,0xf46f6ffe,0xa1ff3b1f,
142 0x208cfb6a,0x8f458c74,0xd9e0a227,0x4ec73a34,
143 0xfc884f69,0x3e4de8df,0xef0e0088,0x3559648d,
144 0x8a45388c,0x1d804366,0x721d9bfd,0xa58684bb,
145 0xe8256333,0x844e8212,0x128d8098,0xfed33fb4,
146 0xce280ae1,0x27e19ba5,0xd5a6c252,0xe49754bd,
147 0xc5d655dd,0xeb667064,0x77840b4d,0xa1b6a801,
148 0x84db26a9,0xe0b56714,0x21f043b7,0xe5d05860,
149 0x54f03084,0x066fff472,0xa31aa153,0xdadc4755,
150 0xb5625dbf,0x68561be6,0x83ca6b94,0xd26ed23b,
151 0xeccc01db,0xa6d3d0ba,0xb6803d5c,0xaf77a709,
152 0x33b4a34c,0x397bc8d6,0x5ee22b95,0x5f0e5304,
153 0x81ed6f61,0x20e74364,0xb45e1378,0xde18639b,
154 0x881ca122,0xb96726d1,0x8049a7e8,0x22b7da7b,
155 0x5e552d25,0x5272d237,0x79d2951c,0xc60d894c,
156 0x488cb402,0x1ba4fe5b,0xa4b09f6b,0x1ca815cf,
157 0xa20c3005,0x8871df63,0xb9de2fcb,0x0cc6c9e9,
158 0x0beeff53,0xe3214517,0xb4542835,0x9f63293c,
159 0xee41e729,0x6e1d2d7c,0x50045286,0x1e6685f3,
160 0xf33401c6,0x30a22c95,0x31a70850,0x60930f13,
161 0x73f98417,0xa1269859,0xec645c44,0x52c877a9,
162 0xcdff33a6,0xa02b1741,0x7cbad9a2,0x2180036f,
163 0x50d99c08,0xcb3f4861,0xc26bd765,0x64a3f6ab,
164 0x80342676,0x25a75e7b,0xe4e6d1fc,0x20c710e6,
165 0xcdcf0b680,0x17844d3b,0x31ee84d,0x7e0824e4,
166 0x2ccb49eb,0x846a3bae,0x8ff77888,0xee5d60f6,
167 0x7af75673,0x2fdd5cbb,0xa11631c1,0x30f66f43,
168 0xb3faec54,0x157fd7fa,0xef8579cc,0xd152de58,
169 0xdb2ffde5,0x8f32ce19,0x306af97a,0x02f03ef8,
170 0x99319ad5,0xc242fa0f,0xa7e3ebb0,0xc68e4906,
171 0xb8da230c,0x80823028,0xdcdcf3c8,0xd35fb171,
172 0x088a1bc8,0xbec0c560,0x61a3c9e8,0xbca8f54d,
173 0xc72feffa,0x22822e99,0x82c570b4,0xd8d94e89,
174 0x8b1c34bc,0x301e16e6,0x273be979,0xb0ffea6,
175 0x61d9b8c6,0x00b24869,0xb7ffce3f,0x08dc283b,
176 0x43daf65a,0xf7e19798,0x7619b72f,0x8f1c9ba4,
177 0xdc8637a0,0x16a7d3b1,0x9fc393b7,0xa7136eeb,
178 0xc6bcc63e,0x1a513742,0xef6828bc,0x520365d6,
179 0x2d6a77ab,0x3527ed4b,0x821fd216,0x095c6e2e,
180 0xdb92f2fb,0x5eea29cb,0x145892f5,0x91584f7f,
181 0x5483697b,0x2667a8cc,0x85196048,0x8c4bacea,
182 0x833860d4,0x0d23e0f9,0xc6387e8a,0x0ae6d249,
183 0xb284600c,0xd835731d,0xdcb1c647,0xac4c56ea,
184 0x3ebd81b3,0x230eabb0,0x6438bc87,0xf0b5b1fa,
185 0x8f5ea2b3,0xfc184642,0x0a036b7a,0x4fb089bd,
186 0x649da589,0xa345415e,0x5c038323,0x3e5d3bb9,
187 0x43d79572,0x7e6dd07c,0x06ddf1e,0xc6cc4ef,
188 0x7160a539,0x73bfbe70,0x83877605,0x4523ecf1,
189 };
190 OPENSSL_GLOBAL const CAST_LONG CAST_S_table2[256]=[
191 0x8defc240,0x25fa5d9f,0xeb903dbf,0xe810c907,
192 0x47607fff,0x369fe44b,0x8c1fc644,0xaececa90,
193 0xb9b1f9bf,0xeefbcaea,0xe8cf1950,0x51df07ae,
```

```
194 0x920e8806,0xf0ad0548,0xe13c8d83,0x927010d5,
195 0x11107d9f,0x07647db9,0xb2e3e4d4,0x3d4f285e,
196 0xb9afa820,0xfade82e0,0xa067268b,0x8272792e,
197 0x553fb2c0,0x489ae22b,0xd4ef9794,0x125e3fbc,
198 0x21ffffee,0x825b1bfd,0x9255c5ed,0x1257a240,
199 0x4e1a8302,0xbae07fff,0x528246e7,0x8e57140e,
200 0x3373f7bf,0x8c9f8188,0xa6fc4ee8,0xc982b5a5,
201 0xa8c01db7,0x579fc264,0x67094f31,0xf2bd3f5f,
202 0x40fff7c1,0x1fb78dfc,0x8e6bd2c1,0x437be59b,
203 0x99b03dbf,0xb5dbc64b,0x638dc0e6,0x55819d99,
204 0xa197c81c,0x4a012d6e,0xc5884a28,0xc36f71,
205 0xb843c213,0x6c0743f1,0x8309893c,0xfeddd5f,
206 0x2f7fe850,0xd7c07f7e,0x02507fbf,0x5afb9a04,
207 0xa747d2d0,0x1651192e,0xaf70bf3e,0x58c31380,
208 0x5f98302e,0x727cc3c4,0x0a0fb402,0xf077fe82,
209 0x8c96fdad,0x5d2c2aae,0x8ee99a49,0x50da88b8,
210 0x8427f4a0,0x1eac5790,0x796fb449,0x8252dc15,
211 0xefbd7d9b,0xa672597d,0xada840d8,0x45f54504,
212 0xfa5d7403,0xe83ec305,0x4f91751a,0x925669c2,
213 0x23efe941,0xa903f12e,0x60270df2,0x0276e4b6,
214 0x94fd6574,0x927985b2,0x8276dbcb,0x02778176,
215 0xf8af918d,0x4e48f79e,0x8f616ddf,0xe29d840e,
216 0x842f7d83,0x340ce5c8,0x96bbb682,0x93b4b148,
217 0xef303cab,0x984faf28,0x779faf9b,0x92dc560d,
218 0x224d1e20,0x8437aa88,0x7d29dc96,0x2756d3dc,
219 0x8b907cee,0xb51fd240,0xe7c07ce3,0xe566b4a1,
220 0xc3e9615e,0x3cf8209d,0x6094d1e3,0xcd9ca341,
221 0x5c76460e,0x00ea983b,0xd4d67881,0xfdf4757c,
222 0xf76cedd9,0xbda8229c,0x127dadaa,0x438a074e,
223 0x1f97c090,0x081bdb8a,0x93a07ebe,0xb938ca15,
224 0x97b03cff,0x3dc2c0f8,0x8d1ab2ec,0x64380e51,
225 0x68cc7bfb,0xd90f2788,0x12490181,0x5de5fffd,
226 0xdd7ef86a,0x76a2e214,0xb9a40368,0x925d958f,
227 0x4b39fffa,0xba39aee9,0xa4ffd30b,0xfaf7933b,
228 0x6d498623,0x193cbcf4,0x27627545,0x825cf47a,
229 0x61bd8ba0,0xd11e42d1,0xceed04f4,0x127ea392,
230 0x10428db7,0x8272a972,0x9270c4a8,0x127de50b,
231 0x285ba1c8,0x3c62f44f,0x35c0eaa5,0xe805d231,
232 0x428929fb,0xb4fcdcf82,0x4fb66a53,0x0e7dc15b,
233 0x1f081fab,0x108618ae,0xfcfd086d,0xf9ff2889,
234 0x694bcc11,0x236a5cae,0x12deca4d,0x2c3f8cc5,
235 0xd2d02dfe,0xf8ef5896,0xe4cf52da,0x95155b67,
236 0x494a488c,0xb9b6a80c,0x5c8f82bc,0x89d36b45,
237 0x3a609437,0xec00c9a9,0x44715253,0x0a874b49,
238 0xd773bc40,0x7c34671c,0x02717ef6,0x4feb5536,
239 0xa2d02fff,0xd2bf60c4,0xd43f03c0,0x50b4ef6d,
240 0x07478cd1,0x006e1888,0xa2e53f55,0xb9e6d4bc,
241 0xa2048016,0x97573833,0xd7207d67,0xde0f8f3d,
242 0x72f87b33,0xabcc4f33,0x7688c55d,0x7b00a6b0,
243 0x947b0001,0x570075d2,0xf9bb88f8,0x8942019e,
244 0x4264a5ff,0x856302e0,0x72dbd92b,0xee971b69,
245 0x6ea22fde,0x5f08ae2b,0xaf7a616d,0xe5c98767,
246 0xcf1febd2,0x61efc8c2,0xf1ac2571,0xcc8239c2,
247 0x67214cb8,0xb1e583d1,0xb7dc3e62,0x7f10bdce,
248 0xf90a5c38,0x0ff0443d,0x606e6dc6,0x60543a49,
249 0x5727c148,0x2be98a1d,0x8ab41738,0x20e1be24,
250 0xaf96da0f,0x68458425,0x99833be5,0x600457d,
251 0x282f9350,0x8334b362,0xd91d1120,0x2b6d8da0,
252 0x642b1e31,0x9c305a00,0x52bce688,0x1b03588a,
253 0xf7baefd5,0x4142ed9c,0xa4315c11,0x8323ec5,
254 0xdfe4636,0xa133c501,0xe9d3531c,0xee353783,
255 };
256 OPENSSL_GLOBAL const CAST_LONG CAST_S_table3[256]=[
257 0x9db30420,0x1fb6e9de,0xa7be7bef,0xd273a298,
258 0x4a4f7bdb,0x64ad8c57,0x85510443,0xfa020ed1,
259 0x7e287aff,0xe60fb663,0x095f35a1,0x79ebf120,
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260 0xfd059d43,0x6497b7b1,0xf3641f63,0x241e4adf,
261 0x28147f5f,0x4fa2b8cd,0xc9430040,0x0cc32220,
262 0xfdd30b30,0xc0a5374f,0x1d2d00d9,0x24147b15,
263 0xee4d111a,0x0fca5167,0x71ff904c,0x2d195ffe,
264 0x1a05645f,0x0c13feff,0x081b08ca,0x05170121,
265 0x80530100,0xe83e5efe,0xac9af4f8,0x7fe72701,
266 0xd2b8ee5f,0x06df4261,0xbb9e9b8a,0x7293ea25,
267 0xce84ffdf,0xf5718801,0x3dd64b04,0xa26f263b,
268 0x7ed48400,0x547eebe6,0x446d4ca0,0x6cf3d6f5,
269 0x2649abdf,0xaea0c7f5,0x36338cc1,0x503f7e93,
270 0xd3772061,0x11b638e1,0x72500e03,0xf80eb2bb,
271 0xabe0502e,0xec8d77de,0x57971e81,0xe14f6746,
272 0xc9335400,0x6920318f,0x081dbb99,0xffc304a5,
273 0x4d351805,0x7f3d5ce3,0xa6c866c6,0x5d5bcc99,
274 0xdaec6fea,0x9f926f91,0x9f46222f,0x3991467d,
275 0xa5bf6d8e,0x1143c44f,0x43958302,0xd0214eeb,
276 0x022083b8,0x3fb6180c,0x18f8931e,0x281658e6,
277 0x26486e3e,0x8bd78a70,0x7477e4c1,0xb506e07c,
278 0xf32d0a25,0x79098b02,0xe4eabb81,0x28123b23,
279 0x69dead38,0x1574ca16,0xdf871b62,0x211c40b7,
280 0xa51a9ef9,0x0014377b,0x041e8ac8,0x09114003,
281 0xbd59e4d2,0xe3d156d5,0x4fe876d5,0x2f91a340,
282 0x557be8de,0x00eae4a7,0x0ce5c2ec,0xad4bba6,
283 0xe756bdf,0xdd3369ac,0xec17b035,0x06572327,
284 0x99af8b0,0x56c8c391,0x6b65811c,0x5e146119,
285 0x6e85cb75,0xbe07c002,0xc2325577,0x893ff4ec,
286 0x5bbfc92d,0xd0ec3b25,0xb7801ab7,0x8d6d3b24,
287 0x20c763ef,0xc366a5fc,0x9c32880,0xa0ace3205,
288 0xaac9548a,0xeca1d7c7,0x041afa32,0x1d16625a,
289 0x6701902c,0x9b757a54,0x31d477f7,0x9126b031,
290 0x36cc6fdb,0xc70b8b46,0xd9e66a48,0x56e55a79,
291 0x026a4ceb,0x52437eff,0x2f8f76b4,0x0df980a5,
292 0x8674cde3,0xedda04eb,0x17a9be04,0xc2c18f4df,
293 0xb7747f9d,0xab2af7b4,0xefc34d20,0x2e096b7c,
294 0x1741a254,0xe5b6a035,0x213d42f6,0xc2c1c7c26,
295 0x61c2f50f,0x6552daf9,0xd2c231f8,0x25130f69,
296 0xd8167fa2,0x0418f2c8,0x001a96a6,0x0d1526ab,
297 0x63315c21,0x5e0a72ec,0x49bafefd,0x187908d9,
298 0x8d0dbd86,0x311170a7,0x3e9b640c,0xcc3e10d7,
299 0xd5cad3b6,0x0caec388,0xf73001e1,0x6c728aff,
300 0x71eae2a1,0x1f9af36e,0xcfcdb12f,0xc1de8417,
301 0xac07be6b,0xcb44a1d8,0xb9b0f56,0x013988c3,
302 0xb1c52fca,0xb4be31cd,0xd8782806,0x12a3a4e2,
303 0x6f7de532,0x58fd7eb6,0xd01ee900,0x24adfffc2,
304 0xf4990fc5,0x9711aac5,0x001d7b95,0x82e5e7d2,
305 0x109873f6,0x00613096,0xc32d9521,0xada121ff,
306 0x29908415,0x7fbb977f,0xaf9eb3db,0x29c9ed2a,
307 0x5ce2a465,0xa730f32c,0xd0aa3fe8,0xa5c091,
308 0xd49e2ce7,0x0ce454a9,0xd60acd86,0x015f1919,
309 0x77079103,0xdea03af6,0x78a8565e,0xdee356df,
310 0x21f05cbe,0x8b75e387,0xb3c50651,0xb8a5c3ef,
311 0xd8eeb6d2,0xe523be77,0xc2154529,0x2f69efdf,
312 0xafe67afb,0xf470c4b2,0xf3e0eb5b,0xd6cc9876,
313 0x39e4460c,0x1fda8538,0x1987832f,0xca007367,
314 0xa99144f8,0x296b299e,0x492fc295,0x9266beab,
315 0xb5676e69,0x9bd3ddda,0xdf7e052f,0xdb25701c,
316 0x1b5e51ee,0xf65324e6,0x6afce36c,0x0316cc04,
317 0x8644213e,0xb7dc59d0,0x7965291f,0xccd6fd43,
318 0x41823979,0x932bcdff6,0xb657c34d,0x4edfd282,
319 0x7ae5290c,0x3cb9536b,0x851e20fe,0x9833557e,
320 0x13ecf0b0,0xd3ffbf372,0xf385c5c1,0xae7fed2,
321 };
322 OPENSSL_GLOBAL const CAST_LONG CAST_S_table4[256]=[
323 0x7ec90c04,0x2c6e74b9,0x9b0e66df,0xae337911,
324 0xb86a7fff,0x1dd358f5,0x44dd9d44,0x1731167f,
325 0x08fbf1fa,0xe7f511cc,0xd2051b00,0x735aba00,
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326 0x2ab722d8,0x386381cb,0xacf6243a,0x69befd7a,
327 0xe6a2e77f,0xf0c720cd,0xc4494816,0xccf5c180,
328 0x38851640,0x15b0a848,0xe68b18cb,0x4caadeff,
329 0x5f480a01,0x0412b2aa,0x259814fc,0x41d0efe2,
330 0x4e40b48d,0x248eb6fb,0x8dba1cfe,0x41a99b02,
331 0x1a550a04,0xba8f65cb,0x7251f4e7,0x95a51725,
332 0xc106ecd7,0x97a5980a,0xc539b9aa,0x4d79fe6a,
333 0xf2f3f763,0x68af8040,0xed0c9e56,0x11b4958b,
334 0xe1eb5a88,0x8709e6b0,0xd7e07156,0x4e29fea7,
335 0x6366e52d,0x02d1c000,0xc4ac8e05,0x9377f571,
336 0xc0c05372a,0x578535f2,0x2261be02,0xd642a0c9,
337 0xdf13a280,0x74b55bd2,0x682199c0,0xd421e5ec,
338 0x53fb3ce8,0xc8adedb3,0x28a87fc9,0x3d959981,
339 0x5c1ff900,0xfe38d399,0xc0c4eff0b,0x062407ea,
340 0xaa2f4fb1,0x4fb96976,0x90c79505,0xb0a8a774,
341 0xef55a1ff,0xe59ca2c2,0xa6b62d27,0xe66a4263,
342 0xdf65001f,0x0ec50966,0xfdd55bc,0x29de0655,
343 0x911e739a,0x17af8975,0x32c7911c,0x8f89468,
344 0x0d01e980,0x524755f4,0x03b63cc9,0x0cc844b2,
345 0xbcf3f0aa,0x87ac36e9,0xe53a7426,0x01b3d82b,
346 0x1a9e7449,0x64ee2d7e,0xcddbb1da,0x01c94910,
347 0xb868bf80,0x0d26f3fd,0x9342ede7,0x04a5c284,
348 0x636737b6,0x50f5b616,0xf24766e3,0x8eca36c1,
349 0x136e05db,0xfef18391,0xfb887a37,0xd6e7f7d4,
350 0xc7f7bdc9,0x3063fcdf,0xb6f589de,0xec2941da,
351 0x26e46695,0xb7566419,0xf654efc5,0x08d858b7,
352 0x48925401,0xc1bacb7f,0xe5ff550f,0xb6083049,
353 0x5bb5d0e8,0x87d72e5a,0xab6a6ee1,0x23a66ce,
354 0xc62bf3cd,0x9e0885f9,0x68cb3e47,0x086c010f,
355 0xa21de820,0xd18b69de,0xf3f65777,0xfa02c3f6,
356 0x407edac3,0xcbb3d550,0x1793084d,0xb0d70eba,
357 0x0ab378d5,0xd951fb0c,0xded7da56,0x4124bbe4,
358 0x94ca0b56,0x0f5755d1,0xe0e1e56e,0x6184b5be,
359 0x580a249f,0x94f74bc0,0xe327888e,0x9f7b5561,
360 0xc3dc0280,0x05687715,0x646c6bd7,0x44904db3,
361 0x66b4f0a3,0xc0f1648a,0x697ed5af,0x49e92ff6,
362 0x309e374f,0x2cb6356a,0x85808573,0x4991f840,
363 0x76f0ae02,0x083be84d,0x28421c9a,0x44489406,
364 0x736e4cb8,0xc1092910,0x8bc95fc6,0x7d869cf4,
365 0x134f616f,0x2e77118d,0xb31b2be1,0xaa90b472,
366 0x3ca5d717,0x7d161bba,0x9cad9010,0xaf462ba2,
367 0x9fe459d2,0x45d34559,0xd9f2da13,0xdbc65487,
368 0xf3e4f94e,0x176d486f,0x097c13ea,0x631da5c7,
369 0x445f7382,0x175683f4,0xcdc66a97,0x70be0288,
370 0xb3cdcf72,0x6e5dd2f3,0x20936079,0x459b80a5,
371 0xbe60e2db,0xa9c23101,0xeba5315c,0x224e42f2,
372 0x1c5c1572,0xf6721b2c,0x1ad2fff3,0x8c25404e,
373 0x324ed72f,0x4067b7fd,0x0523138e,0x5ca3bc78,
374 0xdc0fd66e,0x75922283,0x784d6b17,0x58ebb16e,
375 0x44094f85,0x3f481d87,0xfcfeae7b,0x7b5fff76,
376 0x8c2302bf,0xaaaf7456,0x5f46b02a,0x2b092801,
377 0x3d38f5f7,0x0ca81f36,0x52af4a8a,0x66d5e7c0,
378 0xdf3b0874,0x95055110,0x1b5ad7a8,0xf61ed5ad,
379 0x6cf6e479,0x20758184,0xd0cefa65,0x88f7be58,
380 0x4a046826,0x0ff6f8f3,0xa09c7f70,0x5346aba0,
381 0x5ce96c28,0xe176eda3,0x6bac307f,0xf36829d2,
382 0x85360fa9,0x17e3fe2a,0x24b79767,0xf5a96b20,
383 0xd6cd2595,0x68ff1ebf,0x7555442c,0xf19f06be,
384 0xf9e0659a,0xeeb9491d,0x34010718,0xbb30cab8,
385 0xe822fe15,0x88570983,0x750e6249,0xda627e55,
386 0x5e76ffa8,0xb1534546,0xd647de08,0xfef9e7d4,
387 };
388 OPENSSL_GLOBAL const CAST_LONG CAST_S_table5[256]=[
389 0xf6fa8f9d,0x2cac6ce1,0x4ca34867,0xe2337f7c,
390 0x95db08e7,0x016843b4,0xecd5cbb,0x325553ac,
391 0xb9f9f060,0xdfa1e2ed,0x83f0579d,0x63ed86b9,
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392 0x1ab6a6b8, 0xde5e39, 0xf38ff732, 0x8989b138,
393 0x33f14961, 0xc01937bd, 0xf506c6da, 0xe4625e7e,
394 0xa308ea99, 0x4e23e33c, 0x79cbd7cc, 0x48a14367,
395 0xa3149619, 0xfec94bd5, 0xa114174a, 0xeea01866,
396 0xa084db2d, 0x09a8486f, 0xa888614a, 0x2900af98,
397 0x01665991, 0xe1992863, 0xc8f30c60, 0x2e78ef3c,
398 0xd0d51932, 0xcf0fec14, 0xf7ca07d2, 0xd0a82072,
399 0xfd41197e, 0x9305a6b0, 0xe86be3da, 0x74bed3cd,
400 0x372da53c, 0x4c7f4448, 0xdab5d440, 0x6dba0ec3,
401 0x083919a7, 0x9fbaeed9, 0x49dbcfb0, 0xe670c53,
402 0x5c3d9c01, 0x64bdb941, 0x2c0e636a, 0xba7dd9cd,
403 0xea6f7388, 0xe70bc762, 0x35f29adb, 0x5c4cdd8d,
404 0xf0d48d8c, 0xb88153e2, 0x08a19866, 0x1ae2eac8,
405 0x284caf89, 0xaa928223, 0x9334be53, 0x3b3a21bf,
406 0x16434be3, 0x9aea3906, 0xef8c36e, 0xf890cdd9,
407 0x80226dae, 0xc340a4a3, 0xdf7e9c09, 0xa694a807,
408 0x5b7c5ecc, 0x221db3a6, 0x9a69a02f, 0x68818a54,
409 0xceb2296f, 0x53c0843a, 0xfe893655, 0x25bfe68a,
410 0xb4628abc, 0xcf222ebf, 0x25ac6f48, 0xa9a99387,
411 0x53bddb65, 0xe76ffbe7, 0xe967fd78, 0x0ba93563,
412 0x8e342bc1, 0xe8a11be9, 0x4980740d, 0xc8087dfc,
413 0x8de4bf99, 0xa11101a0, 0x7fd37975, 0xda5a26c0,
414 0xe81f994f, 0x9528cd89, 0xfd339fed, 0xb87834bf,
415 0x5f04456d, 0x2258698, 0xc9c4c83b, 0x2dc156be,
416 0x4f628daa, 0x57f55ec5, 0xe2220abe, 0xd2916ebf,
417 0x4ec75b95, 0x24f2c3c0, 0x42d15d99, 0xcd0d7fa0,
418 0x7b6e27ff, 0xa8dc8af0, 0x7345c106, 0xf41e232f,
419 0x35162386, 0xe6ea8926, 0x3333b094, 0x157ec6f2,
420 0x372b74af, 0x692573e4, 0xe9a9d848, 0xf3160289,
421 0x3a62ef1d, 0xa787e238, 0xf3a5f676, 0x74364853,
422 0x20951063, 0x4576698d, 0xb6fad407, 0x592af950,
423 0x36f73523, 0x4cfb6e87, 0x7da4ce0c, 0x6c152daa,
424 0xcbb0396a8, 0x50dfef5d, 0xfcd707ab, 0x0921c42f,
425 0x89dff0bb, 0x5fe2be78, 0x448f4f33, 0x754613c9,
426 0x2b05d08d, 0x48b9d585, 0xdc049441, 0xc8098f9b,
427 0x7dede786, 0xc39a3373, 0x42410005, 0x6a091751,
428 0x0ef3c8a6, 0x890072d6, 0x28207682, 0xa9a9f7be,
429 0xbfb32679d, 0xd45b5b75, 0xb353fd00, 0xcbb0e358,
430 0x830f220a, 0x1f8fb214, 0xd372cf08, 0xcc3c4a13,
431 0x8cf63166, 0x061c87be, 0x88c98f88, 0x6062e397,
432 0x47cf8e7a, 0xb6c85283, 0x3cc2acfb, 0x3fc06976,
433 0x4e8f0252, 0x64d8314d, 0xda3870e3, 0xe665459,
434 0xc10908f0, 0x513021a5, 0x6c5b68b7, 0x822f8aa0,
435 0x3007cd3e, 0x74719eef, 0xdc872681, 0x073340d4,
436 0x7e432fd9, 0x0c5ec241, 0x8809286c, 0xf592d891,
437 0x08a930f6, 0x957ef305, 0xb7fbffbd, 0xc266e96f,
438 0x6fe4ac98, 0xb173ecc0, 0xbc60b42a, 0x953498da,
439 0xfba1ae12, 0x2d4bd736, 0xf25faab, 0xa4f3fceb,
440 0xe2969123, 0x257f0c3d, 0x9348af49, 0x361400bc,
441 0xe8816f4a, 0x3814f200, 0xa3f94043, 0x9c7a54c2,
442 0xabc704f57, 0xda41e7f9, 0xc25ad33a, 0x54f4a084,
443 0xb17f5505, 0x59357cbe, 0xedbd15c8, 0xf797c5ab,
444 0xba5ac7b5, 0xb6f6deaf, 0x3a479c3a, 0x5302da25,
445 0x653d7e6a, 0x54268d49, 0x51a477ea, 0x5017d55b,
446 0xd7d25d88, 0x44136c76, 0x0404a8c8, 0xb8e5a121,
447 0xb81a928a, 0x60ed5869, 0x97c55b96, 0xeae991b,
448 0x29935913, 0x01fdb7f1, 0x088e8dfa, 0x9ab6f6f5,
449 0x3b4cbf9f, 0x4a5de3ab, 0xe6051d35, 0xa0e1d855,
450 0xd36b4cf1, 0xf544edeb, 0xb0e93524, 0xbabb8fbd,
451 0xa2d762cf, 0x49c92f54, 0x38b5f331, 0x7128a454,
452 0x48392905, 0xa65b1db8, 0x851c97bd, 0xd675cf2f,
453 };
454 OPENSSL_GLOBAL const CAST_LONG CAST_S_table6[256]=[
455 0x85e04019, 0x332bf567, 0x662dbfff, 0xcfc65693,
456 0x2a8d7f6f, 0xab9bc912, 0xde6008a1, 0x2028da1f,
457 0x0227bce7, 0x4d642916, 0x18fac300, 0x50f18b82,
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458 0x2cb2cb11, 0xb232e75c, 0x4b3695f2, 0xb28707de,
459 0xa05fbcf6, 0xcd4181e9, 0xe150210c, 0xe24ef1bd,
460 0xb168c381, 0xfde4e789, 0xc579b0d8, 0x1e8bfd43,
461 0x4d495001, 0x38be4341, 0x913cee1d, 0x92a79c3f,
462 0x089766be, 0xbaeeadf4, 0x1286becf, 0xb6eacb19,
463 0x2660c200, 0x7565bde4, 0x64241f7a, 0x8248dca9,
464 0xc3b3ad66, 0x28136086, 0xbdb8dfa8, 0x356d1cf2,
465 0x107789be, 0xb3b2e9ce, 0x0502aa8f, 0x0bc0351e,
466 0x166bf52a, 0xeb12ff82, 0xe3486911, 0xd34d7516,
467 0x4e7b3aff, 0x5f43671b, 0x9cf6e037, 0x4981ac83,
468 0x334266ce, 0x8c9341b7, 0xd0d854c0, 0xcb3a6c88,
469 0x47bc2829, 0x4725ba37, 0xa66ad22b, 0x7ad61f1e,
470 0x0c5cbafa, 0x4437f107, 0xb6e79962, 0x42d2d816,
471 0xa961288, 0xe1a5c06e, 0x13749e67, 0x72fc081a,
472 0xb1d139f7, 0xf9583745, 0xc19df58, 0xbec3f756,
473 0xc06eba30, 0x7211b24, 0x45c28829, 0xc95e317f,
474 0xb8ec511, 0x38bc46e9, 0xc6e6fa14, 0xbae8584a,
475 0xad4ebc46, 0x468f508b, 0x7829435f, 0xf124183b,
476 0x821dba9f, 0xff60ff4, 0xea2c4e6d, 0x16e39264,
477 0x92544a8b, 0x009b4fc3, 0xaba68ced, 0x9ac96f78,
478 0x06a5b79a, 0xb2856e6e, 0x1aec3ca9, 0xb838688,
479 0x0e0804e9, 0x55f1be56, 0xe7e5363b, 0xb3a1f25d,
480 0xf7debb85, 0x61fe033c, 0x16746233, 0xc034c28,
481 0xda6d0c74, 0x79aac56c, 0x3ce4e1ad, 0x51f0c802,
482 0x98f8f35a, 0x1626a49f, 0xeed82b29, 0xd382fe3,
483 0xc04fb99a, 0xbb325778, 0x3ec6d97b, 0xb677a6a9,
484 0xc658b5c, 0xd45230c7, 0x2bd1408b, 0x060c3eb7,
485 0xb906bd78, 0xa33754f4, 0xf430c87d, 0xc8a71302,
486 0xb96d8c32, 0xebd4e7be, 0xbe8b9d2d, 0x7979fb06,
487 0xe7225308, 0x8b75cf77, 0x11ef8da4, 0xe083c858,
488 0x8d6b786f, 0x5a6317a6, 0xfa5cf7a0, 0x5dda0033,
489 0xf28ebfb0, 0xf5b9c310, 0xa0eac280, 0x08b9767a,
490 0xa3d9d2b0, 0x79d34217, 0x021a718d, 0x9ac6336a,
491 0x2711fd60, 0x438050e3, 0x069908a8, 0x3d7fedc4,
492 0x826d2bef, 0x4eeb8476, 0x488dcf25, 0x36c9d566,
493 0x28e74e41, 0xc2610aca, 0x3d49a9cf, 0xbae3b9df,
494 0xb65f8de6, 0x92aea6f4, 0x3ac7d5e6, 0x9ea80509,
495 0xf22b017d, 0xa4173f70, 0xdd1e16c3, 0x15e0d7f9,
496 0x50b1b887, 0x2b9f4fd5, 0x625aba82, 0x6a017962,
497 0x2ec01b9c, 0x15488aa9, 0xd716e740, 0x40055a2c,
498 0x93d29a22, 0xe32dbf9a, 0x058745b9, 0x3453dc1e,
499 0xd699296e, 0x496cff6f, 0x1c9f4986, 0xdfc2ed07,
500 0xb87242d1, 0x19de7eae, 0x053e561a, 0x15ad6f8c,
501 0x66626c1c, 0x7154c24c, 0xea082b2a, 0x93eb2939,
502 0x17dcb0f0, 0x58d4f2ae, 0x9ea294fb, 0x52cf564c,
503 0x9883fe66, 0x2ec40581, 0x763953c3, 0x01d6692e,
504 0xd3a0c108, 0xa1e7160e, 0xe4f2dfa6, 0x693ed285,
505 0x74904698, 0x4c2b0edd, 0x4f757656, 0x5d393378,
506 0xa132234f, 0x3d321c5d, 0xc3f5e194, 0x4b269301,
507 0xc79f022f, 0x3c997e7e, 0x5e4f9504, 0x3ffaafbbd,
508 0x76f7ad0e, 0x296693f4, 0x3d1fce6f, 0xc61e45be,
509 0xd3b5ab34, 0xf72bf9b7, 0x1b0434c0, 0x4e72b567,
510 0x5592a33d, 0xb5229301, 0xcfd2a87f, 0x60aeb767,
511 0x1814386b, 0x30bcc33d, 0x38a0c07d, 0xfd1606f2,
512 0xc363519b, 0x589dd390, 0x5479f8e6, 0x1cb8d647,
513 0x97fd61a9, 0xea7759f4, 0x2d57539d, 0x569a58cf,
514 0xe84e63ad, 0x462e1b78, 0x6580f87e, 0xf3817914,
515 0x91da55f4, 0x40a230f3, 0xd1988f35, 0xb6e318d2,
516 0x3ffa50bc, 0x3d40f021, 0xc3c0bdae, 0x4958c24c,
517 0x518f36b2, 0x84b1d370, 0xfedce83, 0x78ddada,
518 0xf2a279c7, 0x94e01be8, 0x90716f4b, 0x954b8aa3,
519 };
520 OPENSSL_GLOBAL const CAST_LONG CAST_S_table7[256]=[
521 0xe216300d, 0xbddfffc, 0xa7ebdabd, 0x35648095,
522 0x7789f8b7, 0xe6c1121b, 0x0e241600, 0x052ce8b5,
523 0x11a9cfd0, 0xe5952f11, 0xece7990a, 0x9386d174,
```

```
524 0x2a42931c, 0x76e38111, 0xb12def3a, 0x37dddfc,  
525 0xde9adeb1, 0x0a0cc32c, 0xbe197029, 0x84a00940,  
526 0xbb243a0f, 0xb4d137cf, 0xb44e79f0, 0x049eedfd,  
527 0x0b15a15d, 0x480d3168, 0x8bbbde5a, 0x669ded42,  
528 0xc7ece831, 0x3f8f95e7, 0x72df191b, 0x7580330d,  
529 0x94074251, 0x5c7dcdfa, 0xabbe6d63, 0xaa402164,  
530 0xb301d40a, 0x02e7d1ca, 0x53571dae, 0x7a3182a2,  
531 0x12a8dddec, 0xfdaa335d, 0x176f43e8, 0x71fb46d4,  
532 0x38129022, 0xce949ad4, 0xb84769ad, 0x965bd862,  
533 0x82f3d055, 0x66fb9767, 0x15b80b4e, 0x1d5b47a0,  
534 0x4cfde06f, 0xc28ec4b8, 0x57e8726e, 0x647a78fc,  
535 0x99865d44, 0x608bd593, 0x6c200e03, 0x39dc5ff6,  
536 0x5d0b00a3, 0xae63aff2, 0x7e8bd632, 0x70108c0c,  
537 0xbbd35049, 0x2998df04, 0x980cf42a, 0x9b6df491,  
538 0x9e7edd53, 0x06918548, 0x58cb7e07, 0x3b74ef2e,  
539 0x522fffb1, 0xd24708cc, 0x1c7e27cd, 0xa4eb215b,  
540 0x3cf1d2e2, 0x19b47a38, 0x424f7618, 0x35856039,  
541 0x9d17dee7, 0x27eb35e6, 0xc9aff67b, 0x36baf5b8,  
542 0x09c467cd, 0xc18910b1, 0xe11dbf7b, 0x06cd1af8,  
543 0x7170c608, 0x2d5e3354, 0xd4de495a, 0x64c6d006,  
544 0xbcc0c62c, 0x3dd00db3, 0x708f8f34, 0x77d51b42,  
545 0x264f620f, 0x24b8d2bf, 0x15c1b79e, 0x46a52564,  
546 0xf8d7e54e, 0x3e378160, 0x7895cda5, 0x859c15a5,  
547 0xe6459788, 0xc37bc75f, 0xdb07ba0c, 0x0676a3ab,  
548 0x7f229b1e, 0x31842e7b, 0x24259fd7, 0xf8bef472,  
549 0x835ffcb8, 0x6df4c1f2, 0x96f5b195, 0xfd0af0fc,  
550 0xb0fe134c, 0xe2506d3d, 0x4f9b12ea, 0xf215f225,  
551 0xa223736f, 0x9fb4c428, 0x25d04979, 0x34c713f8,  
552 0xc4618187, 0xea7a6e98, 0x7cd16efc, 0x1436876c,  
553 0xf1544107, 0xbdeeee14, 0x56e9af27, 0xa04aa441,  
554 0x3cf7c899, 0x92ecbae6, 0xdd67016d, 0x151682eb,  
555 0xa842eedf, 0xfdba60b4, 0xf1907b75, 0x20e3030f,  
556 0x24d8c29e, 0xe139673b, 0xefa63fb8, 0x71873054,  
557 0xb6f2cf3b, 0x9f326442, 0xcb15a4cc, 0xb01a4504,  
558 0xf1e47d8d, 0x844a1be5, 0xbae7dfdc, 0x42cbda70,  
559 0xcd7dae0a, 0x57e85b7a, 0xd53f5af6, 0x20cf4d8c,  
560 0xcea4d428, 0x79d130aa, 0x3486ebfb, 0x33d3cddc,  
561 0x77853b53, 0x37effcb5, 0xc5068778, 0xe580b3e6,  
562 0x4e68b8f4, 0xc5c8b37e, 0xd809ea2, 0x398feb7c,  
563 0x132a4f94, 0x43b7950e, 0x2fee7d1c, 0x223613bd,  
564 0xdd06caa2, 0x37df932b, 0xc4248289, 0xacf3ebc3,  
565 0x5715f6b7, 0xef3478dd, 0xf267616f, 0xc148cbe4,  
566 0x9052815e, 0x5e410fab, 0xb48a2465, 0x2eda7fa4,  
567 0xe87b40e4, 0xe98ea084, 0x5889e9e1, 0xefd390fc,  
568 0xdd07d35b, 0xdb485694, 0x38d7e5b2, 0x57720101,  
569 0x730edebc, 0x5b643113, 0x94917e4f, 0x503c2fba,  
570 0x646f1282, 0x7523d24a, 0xe0779695, 0xf9c17a8f,  
571 0x7a5b2121, 0xd187b896, 0x29263a4d, 0xba510cdf,  
572 0x81f47c9f, 0xad1163ed, 0xea7b5965, 0x1a00726e,  
573 0x11403092, 0x00da6d77, 0x4a0cdd61, 0xad1f4603,  
574 0x605bdfb0, 0x9eedc364, 0x22ebe6a8, 0xcee7d28a,  
575 0xa0e736a0, 0x5564a6b9, 0x10853209, 0xc7eb8f37,  
576 0x2de705ca, 0x8951570f, 0xdf09822b, 0xbd691a6c,  
577 0xaa12e4f2, 0x87451c0f, 0xe0f6a27a, 0x3ada4819,  
578 0x4cf1764f, 0x0d771c2b, 0x67cdb156, 0x350d8384,  
579 0x5938fa0f, 0x42399ef3, 0x36997b07, 0xe0e84093d,  
580 0x4aa93e61, 0x8360d87b, 0x1fa98b0c, 0x1149382c,  
581 0xe97625a5, 0x0614d1b7, 0x0e25244b, 0xc768347,  
582 0x589e8d82, 0x0d2059d1, 0xa466bb1e, 0xf8da0a82,  
583 0x04f19130, 0xba6e4ec0, 0x99265164, 0x1ee7230d,  
584 0x50b2ad80, 0xeae6801, 0x8db2a283, 0xea8bf59e,  
585 };
```

new/usr/src/lib/openssl/include/charmap.h

1

527 Fri May 30 18:31:14 2014

new/usr/src/lib/openssl/include/charmap.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* Auto generated with chartype.pl script.
2  * Mask of various character properties
3  */
```

```
5 static const unsigned char char_type[] = {
6  2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
7  2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
8  120, 0, 1, 40, 0, 0, 0, 16, 16, 16, 0, 25, 25, 16, 16, 16,
9  16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 9, 9, 16, 9, 16,
10 0, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16,
11 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 0, 1, 0, 0, 0,
12 0, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16,
13 16, 16, 16, 16, 16, 16, 16, 16, 16, 16, 0, 0, 0, 0, 2
14 };
```

new/usr/src/lib/openssl/include/cml_l_locl.h

1

```
*****
4027 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/cml_l_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/camellia/camellia_locl.h -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
3 * Copyright 2006 NTT (Nippon Telegraph and Telephone Corporation) .
4 * ALL RIGHTS RESERVED.
5 *
6 * Intellectual Property information for Camellia:
7 *   http://info.isl.ntt.co.jp/crypt/eng/info/chiteki.html
8 *
9 * News Release for Announcement of Camellia open source:
10 *   http://www.ntt.co.jp/news/news06e/0604/060413a.html
11 *
12 * The Camellia Code included herein is developed by
13 * NTT (Nippon Telegraph and Telephone Corporation), and is contributed
14 * to the OpenSSL project.
15 *
16 * The Camellia Code is licensed pursuant to the OpenSSL open source
17 * license provided below.
18 */
19 /* =====
20 * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
21 *
22 * Redistribution and use in source and binary forms, with or without
23 * modification, are permitted provided that the following conditions
24 * are met:
25 *
26 * 1. Redistributions of source code must retain the above copyright
27 * notice, this list of conditions and the following disclaimer.
28 *
29 * 2. Redistributions in binary form must reproduce the above copyright
30 * notice, this list of conditions and the following disclaimer in
31 * the documentation and/or other materials provided with the
32 * distribution.
33 *
34 * 3. All advertising materials mentioning features or use of this
35 * software must display the following acknowledgment:
36 * "This product includes software developed by the OpenSSL Project
37 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
38 *
39 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
40 * endorse or promote products derived from this software without
41 * prior written permission. For written permission, please contact
42 * openssl-core@openssl.org.
43 *
44 * 5. Products derived from this software may not be called "OpenSSL"
45 * nor may "OpenSSL" appear in their names without prior written
46 * permission of the OpenSSL Project.
47 *
48 * 6. Redistributions of any form whatsoever must retain the following
49 * acknowledgment:
50 * "This product includes software developed by the OpenSSL Project
51 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
52 *
53 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
54 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
55 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
56 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
57 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
58 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
59 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
60 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
61 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
```

new/usr/src/lib/openssl/include/cml_l_locl.h

2

```
62 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
63 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
64 * OF THE POSSIBILITY OF SUCH DAMAGE.
65 * =====
66 */
67
68 #ifndef HEADER_CAMELLIA_LOCL_H
69 #define HEADER_CAMELLIA_LOCL_H
70
71 typedef unsigned int u32;
72 typedef unsigned char u8;
73
74 int Camellia_Ekeygen(int keyBitLength, const u8 *rawKey,
75                     KEY_TABLE_TYPE keyTable);
76 void Camellia_EncryptBlock_Rounds(int grandRounds, const u8 plaintext[],
77                                   const KEY_TABLE_TYPE keyTable, u8 ciphertext[]);
78 void Camellia_DecryptBlock_Rounds(int grandRounds, const u8 ciphertext[],
79                                   const KEY_TABLE_TYPE keyTable, u8 plaintext[]);
80 void Camellia_EncryptBlock(int keyBitLength, const u8 plaintext[],
81                             const KEY_TABLE_TYPE keyTable, u8 ciphertext[]);
82 void Camellia_DecryptBlock(int keyBitLength, const u8 ciphertext[],
83                             const KEY_TABLE_TYPE keyTable, u8 plaintext[]);
84 int private_Camellia_set_key(const unsigned char *userKey, const int bits,
85                              CAMELLIA_KEY *key);
86 #endif /* #ifndef HEADER_CAMELLIA_LOCL_H */
```

new/usr/src/lib/openssl/include/cms_lcl.h

1

```
*****
13394 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/cms_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_lcl.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
16 * notice, this list of conditions and the following disclaimer in
17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
23 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26 * endorse or promote products derived from this software without
27 * prior written permission. For written permission, please contact
28 * licensing@OpenSSL.org.
29 *
30 * 5. Products derived from this software may not be called "OpenSSL"
31 * nor may "OpenSSL" appear in their names without prior written
32 * permission of the OpenSSL Project.
33 *
34 * 6. Redistributions of any form whatsoever must retain the following
35 * acknowledgment:
36 * "This product includes software developed by the OpenSSL Project
37 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 */

54 #ifndef HEADER_CMS_LCL_H
55 #define HEADER_CMS_LCL_H

57 #ifdef __cplusplus
58 extern "C" {
59 #endif

61 #include <openssl/x509.h>
```

new/usr/src/lib/openssl/include/cms_lcl.h

2

```
63 /* Cryptographic message syntax (CMS) structures: taken
64  * from RFC3852
65  */

67 /* Forward references */

69 typedef struct CMS_IssuerAndSerialNumber_st CMS_IssuerAndSerialNumber;
70 typedef struct CMS_EncapsulatedContentInfo_st CMS_EncapsulatedContentInfo;
71 typedef struct CMS_SignerIdentifier_st CMS_SignerIdentifier;
72 typedef struct CMS_SignedData_st CMS_SignedData;
73 typedef struct CMS_OtherRevocationInfoFormat_st CMS_OtherRevocationInfoFormat;
74 typedef struct CMS_OriginatorInfo_st CMS_OriginatorInfo;
75 typedef struct CMS_EncryptedContentInfo_st CMS_EncryptedContentInfo;
76 typedef struct CMS_EnvelopedData_st CMS_EnvelopedData;
77 typedef struct CMS_DigestedData_st CMS_DigestedData;
78 typedef struct CMS_EncryptedData_st CMS_EncryptedData;
79 typedef struct CMS_AuthenticatedData_st CMS_AuthenticatedData;
80 typedef struct CMS_CompressedData_st CMS_CompressedData;
81 typedef struct CMS_OtherCertificateFormat_st CMS_OtherCertificateFormat;
82 typedef struct CMS_KeyTransRecipientInfo_st CMS_KeyTransRecipientInfo;
83 typedef struct CMS_OriginatorPublicKey_st CMS_OriginatorPublicKey;
84 typedef struct CMS_OriginatorIdentifierOrKey_st CMS_OriginatorIdentifierOrKey;
85 typedef struct CMS_KeyAgreeRecipientInfo_st CMS_KeyAgreeRecipientInfo;
86 typedef struct CMS_OtherKeyAttribute_st CMS_OtherKeyAttribute;
87 typedef struct CMS_RecipientKeyIdentifier_st CMS_RecipientKeyIdentifier;
88 typedef struct CMS_KeyAgreeRecipientIdentifier_st CMS_KeyAgreeRecipientIdentifier;
89 typedef struct CMS_RecipientEncryptedKey_st CMS_RecipientEncryptedKey;
90 typedef struct CMS_KEKIdentifier_st CMS_KEKIdentifier;
91 typedef struct CMS_KEKRecipientInfo_st CMS_KEKRecipientInfo;
92 typedef struct CMS_PasswordRecipientInfo_st CMS_PasswordRecipientInfo;
93 typedef struct CMS_OtherRecipientInfo_st CMS_OtherRecipientInfo;
94 typedef struct CMS_ReceiptsFrom_st CMS_ReceiptsFrom;

96 struct CMS_ContentInfo_st
97 {
98     ASN1_OBJECT *contentType;
99     union {
100         ASN1_OCTET_STRING *data;
101         CMS_SignedData *signedData;
102         CMS_EnvelopedData *envelopedData;
103         CMS_DigestedData *digestedData;
104         CMS_EncryptedData *encryptedData;
105         CMS_AuthenticatedData *authenticatedData;
106         CMS_CompressedData *compressedData;
107         ASN1_TYPE *other;
108         /* Other types ... */
109         void *otherData;
110     } d;
111 };

113 struct CMS_SignedData_st
114 {
115     long version;
116     STACK_OF(X509_ALGOR) *digestAlgorithms;
117     CMS_EncapsulatedContentInfo *encapContentInfo;
118     STACK_OF(CMS_CertificateChoices) *certificates;
119     STACK_OF(CMS_RevocationInfoChoice) *crls;
120     STACK_OF(CMS_SignerInfo) *signerInfos;
121 };

122 struct CMS_EncapsulatedContentInfo_st
123 {
124     ASN1_OBJECT *eContentType;
125     ASN1_OCTET_STRING *eContent;
126     /* Set to 1 if incomplete structure only part set up */
127 }
```

```

128     int partial;
129     };

131 struct CMS_SignerInfo_st
132 {
133     long version;
134     CMS_SignerIdentifier *sid;
135     X509_ALGOR *digestAlgorithm;
136     STACK_OF(X509_ATTRIBUTE) *signedAttrs;
137     X509_ALGOR *signatureAlgorithm;
138     ASN1_OCTET_STRING *signature;
139     STACK_OF(X509_ATTRIBUTE) *unsignedAttrs;
140     /* Signing certificate and key */
141     X509 *signer;
142     EVP_PKEY *pkey;
143 };

145 struct CMS_SignerIdentifier_st
146 {
147     int type;
148     union {
149         CMS_IssuerAndSerialNumber *issuerAndSerialNumber;
150         ASN1_OCTET_STRING *subjectKeyIdentifier;
151     } d;
152 };

154 struct CMS_EnvelopedData_st
155 {
156     long version;
157     CMS_OriginatorInfo *originatorInfo;
158     STACK_OF(CMS_RecipientInfo) *recipientInfos;
159     CMS_EncryptedContentInfo *encryptedContentInfo;
160     STACK_OF(X509_ATTRIBUTE) *unprotectedAttrs;
161 };

163 struct CMS_OriginatorInfo_st
164 {
165     STACK_OF(CMS_CertificateChoices) *certificates;
166     STACK_OF(CMS_RevocationInfoChoice) *crls;
167 };

169 struct CMS_EncryptedContentInfo_st
170 {
171     ASN1_OBJECT *contentType;
172     X509_ALGOR *contentEncryptionAlgorithm;
173     ASN1_OCTET_STRING *encryptedContent;
174     /* Content encryption algorithm and key */
175     const EVP_CIPHER *cipher;
176     unsigned char *key;
177     size_t keylen;
178     /* Set to 1 if we are debugging decrypt and don't fake keys for MMA */
179     int debug;
180 };

182 struct CMS_RecipientInfo_st
183 {
184     int type;
185     union {
186         CMS_KeyTransRecipientInfo *ktri;
187         CMS_KeyAgreeRecipientInfo *kari;
188         CMS_KEKRecipientInfo *kekri;
189         CMS_PasswordRecipientInfo *pwri;
190         CMS_OtherRecipientInfo *ori;
191     } d;
192 };

```

```

194 typedef CMS_SignerIdentifier CMS_RecipientIdentifier;

196 struct CMS_KeyTransRecipientInfo_st
197 {
198     long version;
199     CMS_RecipientIdentifier *rid;
200     X509_ALGOR *keyEncryptionAlgorithm;
201     ASN1_OCTET_STRING *encryptedKey;
202     /* Recipient Key and cert */
203     X509 *recip;
204     EVP_PKEY *pkey;
205 };

207 struct CMS_KeyAgreeRecipientInfo_st
208 {
209     long version;
210     CMS_OriginatorIdentifierOrKey *originator;
211     ASN1_OCTET_STRING *ukm;
212     X509_ALGOR *keyEncryptionAlgorithm;
213     STACK_OF(CMS_RecipientEncryptedKey) *recipientEncryptedKeys;
214 };

216 struct CMS_OriginatorIdentifierOrKey_st
217 {
218     int type;
219     union {
220         CMS_IssuerAndSerialNumber *issuerAndSerialNumber;
221         ASN1_OCTET_STRING *subjectKeyIdentifier;
222         CMS_OriginatorPublicKey *originatorKey;
223     } d;
224 };

226 struct CMS_OriginatorPublicKey_st
227 {
228     X509_ALGOR *algorithm;
229     ASN1_BIT_STRING *publicKey;
230 };

232 struct CMS_RecipientEncryptedKey_st
233 {
234     CMS_KeyAgreeRecipientIdentifier *rid;
235     ASN1_OCTET_STRING *encryptedKey;
236 };

238 struct CMS_KeyAgreeRecipientIdentifier_st
239 {
240     int type;
241     union {
242         CMS_IssuerAndSerialNumber *issuerAndSerialNumber;
243         CMS_RecipientKeyIdentifier *rKeyId;
244     } d;
245 };

247 struct CMS_RecipientKeyIdentifier_st
248 {
249     ASN1_OCTET_STRING *subjectKeyIdentifier;
250     ASN1_GENERALIZEDTIME *date;
251     CMS_OtherKeyAttribute *other;
252 };

254 struct CMS_KEKRecipientInfo_st
255 {
256     long version;
257     CMS_KEKIdentifier *kekId;
258     X509_ALGOR *keyEncryptionAlgorithm;
259     ASN1_OCTET_STRING *encryptedKey;

```

```

260     /* Extra info: symmetric key to use */
261     unsigned char *key;
262     size_t keylen;
263 };

265 struct CMS_KEKIdentifier_st
266 {
267     ASN1_OCTET_STRING *keyIdentifier;
268     ASN1_GENERALIZEDTIME *date;
269     CMS_OtherKeyAttribute *other;
270 };

272 struct CMS_PasswordRecipientInfo_st
273 {
274     long version;
275     X509_ALGOR *keyDerivationAlgorithm;
276     X509_ALGOR *keyEncryptionAlgorithm;
277     ASN1_OCTET_STRING *encryptedKey;
278     /* Extra info: password to use */
279     unsigned char *pass;
280     size_t passlen;
281 };

283 struct CMS_OtherRecipientInfo_st
284 {
285     ASN1_OBJECT *oriType;
286     ASN1_TYPE *oriValue;
287 };

289 struct CMS_DigestedData_st
290 {
291     long version;
292     X509_ALGOR *digestAlgorithm;
293     CMS_EncapsulatedContentInfo *encapContentInfo;
294     ASN1_OCTET_STRING *digest;
295 };

297 struct CMS_EncryptedData_st
298 {
299     long version;
300     CMS_EncryptedContentInfo *encryptedContentInfo;
301     STACK_OF(X509_ATTRIBUTE) *unprotectedAttrs;
302 };

304 struct CMS_AuthenticatedData_st
305 {
306     long version;
307     CMS_OriginatorInfo *originatorInfo;
308     STACK_OF(CMS_RecipientInfo) *recipientInfos;
309     X509_ALGOR *macAlgorithm;
310     X509_ALGOR *digestAlgorithm;
311     CMS_EncapsulatedContentInfo *encapContentInfo;
312     STACK_OF(X509_ATTRIBUTE) *authAttrs;
313     ASN1_OCTET_STRING *mac;
314     STACK_OF(X509_ATTRIBUTE) *unauthAttrs;
315 };

317 struct CMS_CompressedData_st
318 {
319     long version;
320     X509_ALGOR *compressionAlgorithm;
321     STACK_OF(CMS_RecipientInfo) *recipientInfos;
322     CMS_EncapsulatedContentInfo *encapContentInfo;
323 };

325 struct CMS_RevocationInfoChoice_st

```

```

326     {
327         int type;
328         union {
329             X509_CRL *crl;
330             CMS_OtherRevocationInfoFormat *other;
331         } d;
332     };

334 #define CMS_REVCHOICE_CRL 0
335 #define CMS_REVCHOICE_OTHER 1

337 struct CMS_OtherRevocationInfoFormat_st
338 {
339     ASN1_OBJECT *otherRevInfoFormat;
340     ASN1_TYPE *otherRevInfo;
341 };

343 struct CMS_CertificateChoices
344 {
345     int type;
346     union {
347         X509 *certificate;
348         ASN1_STRING *extendedCertificate;
349         ASN1_STRING *v1AttrCert; /* Left encoded for now */
350         ASN1_STRING *v2AttrCert; /* Left encoded for now */
351         CMS_OtherCertificateFormat *other;
352     } d;
353 };

355 #define CMS_CERTCHOICE_CERT 0
356 #define CMS_CERTCHOICE_EXCERT 1
357 #define CMS_CERTCHOICE_V1ACERT 2
358 #define CMS_CERTCHOICE_V2ACERT 3
359 #define CMS_CERTCHOICE_OTHER 4

361 struct CMS_OtherCertificateFormat_st
362 {
363     ASN1_OBJECT *otherCertFormat;
364     ASN1_TYPE *otherCert;
365 };

367 /* This is also defined in pkcs7.h but we duplicate it
368  * to allow the CMS code to be independent of PKCS#7
369  */

371 struct CMS_IssuerAndSerialNumber_st
372 {
373     X509_NAME *issuer;
374     ASN1_INTEGER *serialNumber;
375 };

377 struct CMS_OtherKeyAttribute_st
378 {
379     ASN1_OBJECT *keyAttrId;
380     ASN1_TYPE *keyAttr;
381 };

383 /* ESS structures */

385 #ifdef HEADER_X509V3_H

387 struct CMS_ReceiptRequest_st
388 {
389     ASN1_OCTET_STRING *signedContentIdentifier;
390     CMS_ReceiptsFrom *receiptsFrom;
391     STACK_OF(GENERAL_NAMES) *receiptsTo;

```

```

392     };

395 struct CMS_ReceiptsFrom_st
396 {
397     int type;
398     union
399     {
400         long allOrFirstTier;
401         STACK_OF(GENERAL_NAMES) *receiptList;
402     } d;
403 };
404 #endif

406 struct CMS_Receipt_st
407 {
408     long version;
409     ASN1_OBJECT *contentType;
410     ASN1_OCTET_STRING *signedContentIdentifier;
411     ASN1_OCTET_STRING *originatorSignatureValue;
412 };

414 DECLARE_ASN1_FUNCTIONS(CMS_ContentInfo)
415 DECLARE_ASN1_ITEM(CMS_SignerInfo)
416 DECLARE_ASN1_ITEM(CMS_IssuerAndSerialNumber)
417 DECLARE_ASN1_ITEM(CMS_Attributes_Sign)
418 DECLARE_ASN1_ITEM(CMS_Attributes_Verify)
419 DECLARE_ASN1_ITEM(CMS_RecipientInfo)
420 DECLARE_ASN1_ITEM(CMS_PasswordRecipientInfo)
421 DECLARE_ASN1_ALLOC_FUNCTIONS(CMS_IssuerAndSerialNumber)

423 #define CMS_SIGNERINFO_ISSUER_SERIAL    0
424 #define CMS_SIGNERINFO_KEYIDENTIFIER    1

426 #define CMS_RECIPINFO_ISSUER_SERIAL    0
427 #define CMS_RECIPINFO_KEYIDENTIFIER    1

429 BIO *cms_content_bio(CMS_ContentInfo *cms);

431 CMS_ContentInfo *cms_data_create(void);

433 CMS_ContentInfo *cms_DigestedData_create(const EVP_MD *md);
434 BIO *cms_DigestedData_init_bio(CMS_ContentInfo *cms);
435 int cms_DigestedData_do_final(CMS_ContentInfo *cms, BIO *chain, int verify);

437 BIO *cms_SignedData_init_bio(CMS_ContentInfo *cms);
438 int cms_SignedData_final(CMS_ContentInfo *cms, BIO *chain);
439 int cms_set1_SignerIdentifier(CMS_SignerIdentifier *sid, X509 *cert, int type);
440 int cms_SignerIdentifier_get0_signer_id(CMS_SignerIdentifier *sid,
441                                         ASN1_OCTET_STRING **keyid,
442                                         X509_NAME **issuer, ASN1_INTEGER **sno);
443 int cms_SignerIdentifier_cert_cmp(CMS_SignerIdentifier *sid, X509 *cert);

445 CMS_ContentInfo *cms_CompressedData_create(int comp_nid);
446 BIO *cms_CompressedData_init_bio(CMS_ContentInfo *cms);

448 void cms_DigestAlgorithm_set(X509_ALGOR *alg, const EVP_MD *md);
449 BIO *cms_DigestAlgorithm_init_bio(X509_ALGOR *digestAlgorithm);
450 int cms_DigestAlgorithm_find_ctx(EVP_MD_CTX *mctx, BIO *chain,
451                                  X509_ALGOR *mdalg);

453 BIO *cms_EncryptedContent_init_bio(CMS_EncryptedContentInfo *ec);
454 BIO *cms_EncryptedData_init_bio(CMS_ContentInfo *cms);
455 int cms_EncryptedContent_init(CMS_EncryptedContentInfo *ec,
456                               const EVP_CIPHER *cipher,
457                               const unsigned char *key, size_t keylen);

```

```

459 int cms_Receipt_verify(CMS_ContentInfo *cms, CMS_ContentInfo *req_cms);
460 int cms_msgSigDigest_add1(CMS_SignerInfo *dest, CMS_SignerInfo *src);
461 ASN1_OCTET_STRING *cms_encode_Receipt(CMS_SignerInfo *si);

463 BIO *cms_EnvelopedData_init_bio(CMS_ContentInfo *cms);
464 CMS_EnvelopedData *cms_get0_enveloped(CMS_ContentInfo *cms);

466 /* PWRI routines */
467 int cms_RecipientInfo_pwri_crypt(CMS_ContentInfo *cms, CMS_RecipientInfo *ri,
468                                   int en_de);
469
470 #ifdef __cplusplus
471 }
472 #endif
473 #endif

```



```

*****
9250 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/conf_def.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/conf/conf_def.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* THIS FILE WAS AUTOMATICALLY GENERATED!
60  * Please modify and use keysets.pl to regenerate it. */

```

```

62 #define CONF_NUMBER 1
63 #define CONF_UPPER 2
64 #define CONF_LOWER 4
65 #define CONF_UNDER 256
66 #define CONF_PUNCTUATION 512
67 #define CONF_WS 16
68 #define CONF_ESC 32
69 #define CONF_QUOTE 64
70 #define CONF_DQUOTE 1024
71 #define CONF_COMMENT 128
72 #define CONF_FCOMMENT 2048
73 #define CONF_EOF 8
74 #define CONF_HIGHBIT 4096
75 #define CONF_ALPHA (CONF_UPPER|CONF_LOWER)
76 #define CONF_ALPHA_NUMERIC (CONF_ALPHA|CONF_NUMBER|CONF_UNDER)
77 #define CONF_ALPHA_NUMERIC_PUNCT (CONF_ALPHA|CONF_NUMBER|CONF_UNDER| \
78 CONF_PUNCTUATION)
79
80 #define KEYTYPES(c) ((unsigned short *)((c)->meth_data))
81 #ifndef CHARSET_EBCDIC
82 #define IS_COMMENT(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_COMMENT)
83 #define IS_FCOMMENT(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_FCOMMENT)
84 #define IS_EOF(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_EOF)
85 #define IS_ESC(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_ESC)
86 #define IS_NUMBER(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_NUMBER)
87 #define IS_WS(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_WS)
88 #define IS_ALPHA_NUMERIC(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_ALPHA_NUMERIC)
89 #define IS_ALPHA_NUMERIC_PUNCT(c,a) \
90 (KEYTYPES(c)[(a)&0xff]&CONF_ALPHA_NUMERIC_PUNCT)
91 #define IS_QUOTE(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_QUOTE)
92 #define IS_DQUOTE(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_DQUOTE)
93 #define IS_HIGHBIT(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_HIGHBIT)
94
95 #else /*CHARSET_EBCDIC*/
96
97 #define IS_COMMENT(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_COMMENT)
98 #define IS_FCOMMENT(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_FCOMMENT)
99 #define IS_EOF(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_EOF)
100 #define IS_ESC(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_ESC)
101 #define IS_NUMBER(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_NUMBER)
102 #define IS_WS(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_WS)
103 #define IS_ALPHA_NUMERIC(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_ALPHA_NUME)
104 #define IS_ALPHA_NUMERIC_PUNCT(c,a) \
105 (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_ALPHA_NUME)
106 #define IS_QUOTE(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_QUOTE)
107 #define IS_DQUOTE(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_DQUOTE)
108 #define IS_HIGHBIT(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_HIGHBIT)
109 #endif /*CHARSET_EBCDIC*/
110
111 static unsigned short CONF_type_default[256]={
112 0x0008,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,
113 0x0000,0x0010,0x0010,0x0000,0x0000,0x0000,0x0000,0x0000,
114 0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,
115 0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,
116 0x0010,0x0200,0x0040,0x0080,0x0000,0x0200,0x0200,0x0040,
117 0x0000,0x0000,0x0200,0x0200,0x0200,0x0200,0x0200,0x0200,
118 0x0001,0x0001,0x0001,0x0001,0x0001,0x0001,0x0001,0x0001,
119 0x0001,0x0001,0x0000,0x0200,0x0000,0x0000,0x0000,0x0200,
120 0x0200,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,
121 0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,
122 0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,
123 0x0040,0x0004,0x0004,0x0000,0x0000,0x0000,0x0004,0x0004,
124 0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,
125 0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,
126 0x0004,0x0004,0x0004,0x0000,0x0200,0x0000,0x0200,0x0000,
127

```

```
128     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
129     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
130     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
131     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
132     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
133     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
134     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
135     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
136     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
137     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
138     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
139     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
140     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
141     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
142     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
143     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
144     };

146 static unsigned short CONF_type_win32[256]={
147     0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,
148     0x0000,0x0010,0x0010,0x0000,0x0000,0x0000,0x0010,0x0000,
149     0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,
150     0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,0x0000,
151     0x0010,0x0200,0x0400,0x0000,0x0000,0x0200,0x0200,0x0000,
152     0x0000,0x0000,0x0200,0x0200,0x0200,0x0200,0x0200,0x0200,
153     0x0001,0x0001,0x0001,0x0001,0x0001,0x0001,0x0001,0x0001,
154     0x0001,0x0001,0x0000,0x0A00,0x0000,0x0000,0x0000,0x0200,
155     0x0200,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,
156     0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,
157     0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,0x0002,
158     0x0002,0x0002,0x0002,0x0000,0x0000,0x0000,0x0200,0x0100,
159     0x0000,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,
160     0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,0x0004,
161     0x0004,0x0004,0x0004,0x0004,0x0000,0x0200,0x0000,0x0000,
162     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
163     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
164     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
165     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
166     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
167     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
168     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
169     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
170     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
171     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
172     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
173     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
174     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
175     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
176     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
177     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
178     0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,0x1000,
179     };
```

new/usr/src/lib/openssl/include/cryptlib.h

1

4440 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/cryptlib.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/cryptlib.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ''AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_CRYPTLIB_H
60 #define HEADER_CRYPTLIB_H
```

new/usr/src/lib/openssl/include/cryptlib.h

2

```
62 #include <stdlib.h>
63 #include <string.h>
64
65 #include "e_os.h"
66
67 #ifdef OPENSSL_USE_APPLINK
68 #define BIO_FLAGS_UPLINK 0x8000
69 #include "ms/uplink.h"
70 #endif
71
72 #include <openssl/crypto.h>
73 #include <openssl/buffer.h>
74 #include <openssl/bio.h>
75 #include <openssl/err.h>
76 #include <openssl/opensslconf.h>
77
78 #ifdef __cplusplus
79 extern "C" {
80 #endif
81
82 #ifndef OPENSSL_SYS_VMS
83 #define X509_CERT_AREA          OPENSSLDIR
84 #define X509_CERT_DIR          OPENSSLDIR "/certs"
85 #define X509_CERT_FILE         OPENSSLDIR "/cert.pem"
86 #define X509_PRIVATE_DIR       OPENSSLDIR "/private"
87 #else
88 #define X509_CERT_AREA          "SSLROOT:[000000]"
89 #define X509_CERT_DIR          "SSLCERTS:"
90 #define X509_CERT_FILE         "SSLCERTS:cert.pem"
91 #define X509_PRIVATE_DIR       "SSLPRIVATE:"
92 #endif
93
94 #define X509_CERT_DIR_EVP      "SSL_CERT_DIR"
95 #define X509_CERT_FILE_EVP    "SSL_CERT_FILE"
96
97 /* size of string representations */
98 #define DECIMAL_SIZE(type)      ((sizeof(type)*8+2)/3+1)
99 #define HEX_SIZE(type)          (sizeof(type)*2)
100
101 void OPENSSL_cpuid_setup(void);
102 extern unsigned int OPENSSL_ia32cap_P[];
103 void OPENSSL_showfatal(const char *fmta,...);
104 void *OPENSSL_stderr(void);
105 extern int OPENSSL_NONPIC_relocated;
106
107 void solaris_locking_setup();
108
109 #ifdef __cplusplus
110 }
111 #endif
112
113 #endif
```

new/usr/src/lib/openssl/include/cryptoki.h

1

```
*****
2579 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/cryptoki.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * CDDL HEADER START
3  *
4  * The contents of this file are subject to the terms of the
5  * Common Development and Distribution License, Version 1.0 only
6  * (the "License"). You may not use this file except in compliance
7  * with the License.
8  *
9  * You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
10 * or http://www.opensolaris.org/os/licensing.
11 * See the License for the specific language governing permissions
12 * and limitations under the License.
13 *
14 * When distributing Covered Code, include this CDDL HEADER in each
15 * file and include the License file at usr/src/OPENSOLARIS.LICENSE.
16 * If applicable, add the following below this CDDL HEADER, with the
17 * fields enclosed by brackets "[]" replaced with your own identifying
18 * information: Portions Copyright [yyyy] [name of copyright owner]
19 *
20 * CDDL HEADER END
21 */
22 /*
23  * Copyright 2003 Sun Microsystems, Inc. All rights reserved.
24  * Use is subject to license terms.
25 */

27 #ifndef _CRYPTOKI_H
28 #define _CRYPTOKI_H

30 #pragma ident    "@(#)cryptoki.h 1.2      05/06/08 SMI"

32 #ifdef __cplusplus
33 extern "C" {
34 #endif

36 #ifndef CK_PTR
37 #define CK_PTR *
38 #endif

40 #ifndef CK_DECLARE_FUNCTION
41 #define CK_DECLARE_FUNCTION(returnType, name) returnType name
42 #endif

44 #ifndef CK_DECLARE_FUNCTION_POINTER
45 #define CK_DECLARE_FUNCTION_POINTER(returnType, name) returnType name
46 #endif

48 #ifndef CK_DECLARE_FUNCTION_POINTER
49 #define CK_DECLARE_FUNCTION_POINTER(returnType, name) returnType (* name)
50 #endif

52 #ifndef CK_CALLBACK_FUNCTION
53 #define CK_CALLBACK_FUNCTION(returnType, name) returnType (* name)
54 #endif

56 #ifndef NULL_PTR
57 #include <unistd.h>      /* For NULL */
58 #define NULL_PTR NULL
59 #endif

61 /*
```

new/usr/src/lib/openssl/include/cryptoki.h

2

```
62  * pkcs11t.h defines TRUE and FALSE in a way that upsets lint
63  */
64 #ifndef CK_DISABLE_TRUE_FALSE
65 #define CK_DISABLE_TRUE_FALSE
66 #ifndef TRUE
67 #define TRUE 1
68 #endif /* TRUE */
69 #ifndef FALSE
70 #define FALSE 0
71 #endif /* FALSE */
72 #endif /* CK_DISABLE_TRUE_FALSE */

74 #undef CK_PKCS11_FUNCTION_INFO

76 #include "pkcs11.h"

78 /* Solaris specific functions */

80 #include <stdlib.h>

82 /*
83  * SUNW_C_GetMechSession will initialize the framework and do all
84  * the necessary PKCS#11 calls to create a session capable of
85  * providing operations on the requested mechanism
86  */
87 CK_RV SUNW_C_GetMechSession(CK_MECHANISM_TYPE mech,
88                             CK_SESSION_HANDLE_PTR hSession);

90 /*
91  * SUNW_C_KeyToObject will create a secret key object for the given
92  * mechanism from the rawkey data.
93  */
94 CK_RV SUNW_C_KeyToObject(CK_SESSION_HANDLE hSession,
95                          CK_MECHANISM_TYPE mech, const void *rawkey, size_t rawkey_len,
96                          CK_OBJECT_HANDLE_PTR obj);

99 #ifdef __cplusplus
100 }
101 #endif

103 #endif /* _CRYPTOKI_H */
```

new/usr/src/lib/openssl/include/des_locl.h

1

13706 Fri May 30 18:31:14 2014
new/usr/src/lib/openssl/include/des_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/des/des_locl.h */
2 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_DES_LOCL_H
60 #define HEADER_DES_LOCL_H
```

new/usr/src/lib/openssl/include/des_locl.h

2

```
62 #include <openssl/e_os2.h>
```

```
64 #if defined(OPENSSL_SYS_WIN32)
65 #ifndef OPENSSL_SYS_MSDOS
66 #define OPENSSL_SYS_MSDOS
67 #endif
68 #endif
```

```
70 #include <stdio.h>
71 #include <stdlib.h>
```

```
73 #ifndef OPENSSL_SYS_MSDOS
74 #if !defined(OPENSSL_SYS_VMS) || defined(__DECC)
75 #ifdef OPENSSL_UNISTD
76 #include OPENSSL_UNISTD
77 #else
78 #include <unistd.h>
79 #endif
80 #include <math.h>
81 #endif
82 #endif
83 #include <openssl/des.h>
```

```
85 #ifdef OPENSSL_SYS_MSDOS /* Visual C++ 2.1 (Windows NT/95) */
86 #include <stdlib.h>
87 #include <errno.h>
88 #include <time.h>
89 #include <io.h>
90 #endif
```

```
92 #if defined(__STDC__) || defined(OPENSSL_SYS_VMS) || defined(M_XENIX) || defined
93 #include <string.h>
94 #endif
```

```
96 #ifdef OPENSSL_BUILD_SHLIBCRYPTO
97 # undef OPENSSL_EXTERN
98 # define OPENSSL_EXTERN OPENSSL_EXPORT
99 #endif
```

```
101 #define ITERATIONS 16
102 #define HALF_ITERATIONS 8
```

```
104 /* used in des_read and des_write */
105 #define MAXWRITE (1024*16)
106 #define BSIZE (MAXWRITE+4)
```

```
108 #define c2l(c,l) (l=((DES_LONG)*((c++))) , \
109 l|=((DES_LONG)*((c++)))<< 8L, \
110 l|=((DES_LONG)*((c++)))<<16L, \
111 l|=((DES_LONG)*((c++)))<<24L)
```

```
113 /* NOTE - c is not incremented as per c2l */
```

```
114 #define c2ln(c,l1,l2,n) { \
115 c+=n; \
116 l1=l2=0; \
117 switch (n) { \
118 case 8: l2=((DES_LONG)*((--c)))<<24L; \
119 case 7: l2|=((DES_LONG)*((--c)))<<16L; \
120 case 6: l2|=((DES_LONG)*((--c)))<< 8L; \
121 case 5: l2|=((DES_LONG)*((--c))); \
122 case 4: l1|=((DES_LONG)*((--c)))<<24L; \
123 case 3: l1|=((DES_LONG)*((--c)))<<16L; \
124 case 2: l1|=((DES_LONG)*((--c)))<< 8L; \
125 case 1: l1|=((DES_LONG)*((--c))); \
126 } \
127 }
```

```

129 #define l2c(l,c)      (*(c++)=(unsigned char)(((l)      )&0xff), \
130                        *((c++)=(unsigned char)(((l)>> 8L)&0xff), \
131                        *((c++)=(unsigned char)(((l)>>16L)&0xff), \
132                        *((c++)=(unsigned char)(((l)>>24L)&0xff))

134 /* replacements for htonl and ntohl since I have no idea what to do
135  * when faced with machines with 8 byte longs. */
136 #define HDRSIZE 4

138 #define n2l(c,l)      (l=((DES_LONG)*((c++))<<24L, \
139                        l|=((DES_LONG)*((c++))<<16L, \
140                        l|=((DES_LONG)*((c++))<< 8L, \
141                        l|=((DES_LONG)*((c++))))

143 #define l2n(l,c)      (*(c++)=(unsigned char)(((l)>>24L)&0xff), \
144                        *((c++)=(unsigned char)(((l)>>16L)&0xff), \
145                        *((c++)=(unsigned char)(((l)>> 8L)&0xff), \
146                        *((c++)=(unsigned char)(((l)      )&0xff))

148 /* NOTE - c is not incremented as per l2c */
149 #define l2cn(l1,l2,c,n) { \
150     c+=n; \
151     switch (n) { \
152     case 8: *((c--)=((unsigned char)(((l2)>>24L)&0xff); \
153     case 7: *((c--)=((unsigned char)(((l2)>>16L)&0xff); \
154     case 6: *((c--)=((unsigned char)(((l2)>> 8L)&0xff); \
155     case 5: *((c--)=((unsigned char)(((l2)      )&0xff); \
156     case 4: *((c--)=((unsigned char)(((l1)>>24L)&0xff); \
157     case 3: *((c--)=((unsigned char)(((l1)>>16L)&0xff); \
158     case 2: *((c--)=((unsigned char)(((l1)>> 8L)&0xff); \
159     case 1: *((c--)=((unsigned char)(((l1)      )&0xff); \
160     } \
161     }

163 #if (defined(OPENSSL_SYS_WIN32) && defined(_MSC_VER)) || defined(__ICC)
164 #define ROTATE(a,n)    (_lrotr(a,n))
165 #elif defined(__GNUC__) && __GNUC__>=2 && !defined(__STRICT_ANSI__) && !defined(
166 # if defined(__i386) || defined(__i386__) || defined(__x86_64) || defined(__x86_
167 # define ROTATE(a,n)  ({ register unsigned int ret; \
168                        __asm__ ("rorl %1,%0" \
169                                : "=r"(ret) \
170                                : "I"(n), "0"(a) \
171                                : "cc"); \
172                        ret; \
173                        })
174 # endif
175 #endif
176 #ifndef ROTATE
177 #define ROTATE(a,n)    (((a)>>(n))+((a)<<(32-(n))))
178 #endif

180 /* Don't worry about the LOAD_DATA() stuff, that is used by
181  * fcrypt() to add it's little bit to the front */

183 #ifdef DES_FCRYPT

185 #define LOAD_DATA_tmp(R,S,u,t,E0,E1) \
186     { DES_LONG tmp; LOAD_DATA(R,S,u,t,E0,E1,tmp); }

188 #define LOAD_DATA(R,S,u,t,E0,E1,tmp) \
189     t=R^(R>>16L); \
190     u=t^E0; t=E1; \
191     tmp=(u<<16); u^=R^s[S]; u^=tmp; \
192     tmp=(t<<16); t^=R^s[S+1]; t^=tmp
193 #else

```

```

194 #define LOAD_DATA_tmp(a,b,c,d,e,f) LOAD_DATA(a,b,c,d,e,f,g)
195 #define LOAD_DATA(R,S,u,t,E0,E1,tmp) \
196     u=R^s[S]; \
197     t=R^s[S+1]
198 #endif

200 /* The changes to this macro may help or hinder, depending on the
201  * compiler and the architecture. gcc2 always seems to do well :-).
202  * Inspired by Dana How <how@isl.stanford.edu>
203  * DO NOT use the alternative version on machines with 8 byte longs.
204  * It does not seem to work on the Alpha, even when DES_LONG is 4
205  * bytes, probably an issue of accessing non-word aligned objects :-( */
206 #ifndef DES_PTR

208 /* It recently occurred to me that 0^0^0^0^0^0 == 0, so there
209  * is no reason to not xor all the sub items together. This potentially
210  * saves a register since things can be xored directly into L */

212 #if defined(DES_RISC1) || defined(DES_RISC2)
213 #ifdef DES_RISC1
214 #define D_ENCRYPT(LL,R,S) { \
215     unsigned int u1,u2,u3; \
216     LOAD_DATA(R,S,u,t,E0,E1,u1); \
217     u2=(int)u>>8L; \
218     u1=(int)u&0xfc; \
219     u2&=0xfc; \
220     t=ROTATE(t,4); \
221     u>>=16L; \
222     LL^= *(const DES_LONG *) (des_SP +u1); \
223     LL^= *(const DES_LONG *) (des_SP+0x200+u2); \
224     u3=(int)(u>>8L); \
225     u1=(int)u&0xfc; \
226     u3&=0xfc; \
227     LL^= *(const DES_LONG *) (des_SP+0x400+u1); \
228     LL^= *(const DES_LONG *) (des_SP+0x600+u3); \
229     u2=(int)t>>8L; \
230     u1=(int)t&0xfc; \
231     u2&=0xfc; \
232     t>>=16L; \
233     LL^= *(const DES_LONG *) (des_SP+0x100+u1); \
234     LL^= *(const DES_LONG *) (des_SP+0x300+u2); \
235     u3=(int)t>>8L; \
236     u1=(int)t&0xfc; \
237     u3&=0xfc; \
238     LL^= *(const DES_LONG *) (des_SP+0x500+u1); \
239     LL^= *(const DES_LONG *) (des_SP+0x700+u3); \
240 #endif
241 #ifdef DES_RISC2
242 #define D_ENCRYPT(LL,R,S) { \
243     unsigned int u1,u2,s1,s2; \
244     LOAD_DATA(R,S,u,t,E0,E1,u1); \
245     u2=(int)u>>8L; \
246     u1=(int)u&0xfc; \
247     u2&=0xfc; \
248     t=ROTATE(t,4); \
249     LL^= *(const DES_LONG *) (des_SP +u1); \
250     LL^= *(const DES_LONG *) (des_SP+0x200+u2); \
251     s1=(int)(u>>16L); \
252     s2=(int)(u>>24L); \
253     s1&=0xfc; \
254     s2&=0xfc; \
255     LL^= *(const DES_LONG *) (des_SP+0x400+s1); \
256     LL^= *(const DES_LONG *) (des_SP+0x600+s2); \
257     u2=(int)t>>8L; \
258     u1=(int)t&0xfc; \
259     u2&=0xfc; \

```

```

260     LL^= *(const DES_LONG *) (des_SP+0x100+u1); \
261     LL^= *(const DES_LONG *) (des_SP+0x300+u2); \
262     s1=(int)(t>>16L); \
263     s2=(int)(t>>24L); \
264     s1&=0xfc; \
265     s2&=0xfc; \
266     LL^= *(const DES_LONG *) (des_SP+0x500+s1); \
267     LL^= *(const DES_LONG *) (des_SP+0x700+s2); }
268 #endif
269 #else
270 #define D_ENCRYPT(LL,R,S) { \
271     LOAD_DATA_tmp(R,S,u,t,E0,E1); \
272     t=ROTATE(t,4); \
273     LL^= \
274     *(const DES_LONG *) (des_SP + ((u >> 8L) & 0xfc)) ^ \
275     *(const DES_LONG *) (des_SP+0x200+((u>> 8L) & 0xfc)) ^ \
276     *(const DES_LONG *) (des_SP+0x400+((u>>16L) & 0xfc)) ^ \
277     *(const DES_LONG *) (des_SP+0x600+((u>>24L) & 0xfc)) ^ \
278     *(const DES_LONG *) (des_SP+0x100+((t >> 8L) & 0xfc)) ^ \
279     *(const DES_LONG *) (des_SP+0x300+((t>> 8L) & 0xfc)) ^ \
280     *(const DES_LONG *) (des_SP+0x500+((t>>16L) & 0xfc)) ^ \
281     *(const DES_LONG *) (des_SP+0x700+((t>>24L) & 0xfc)); }
282 #endif

284 #else /* original version */

286 #if defined(DES_RISC1) || defined(DES_RISC2)
287 #ifdef DES_RISC1
288 #define D_ENCRYPT(LL,R,S) { \
289     unsigned int u1,u2,u3; \
290     LOAD_DATA(R,S,u,t,E0,E1,u1); \
291     u>>=2L; \
292     t=ROTATE(t,6); \
293     u2=(int)u>>8L; \
294     u1=(int)u&0x3f; \
295     u2&=0x3f; \
296     u>>=16L; \
297     LL^=DES_SPtrans[0][u1]; \
298     LL^=DES_SPtrans[2][u2]; \
299     u3=(int)u>>8L; \
300     u1=(int)u&0x3f; \
301     u3&=0x3f; \
302     LL^=DES_SPtrans[4][u1]; \
303     LL^=DES_SPtrans[6][u3]; \
304     u2=(int)t>>8L; \
305     u1=(int)t&0x3f; \
306     u2&=0x3f; \
307     t>>=16L; \
308     LL^=DES_SPtrans[1][u1]; \
309     LL^=DES_SPtrans[3][u2]; \
310     u3=(int)t>>8L; \
311     u1=(int)t&0x3f; \
312     u3&=0x3f; \
313     LL^=DES_SPtrans[5][u1]; \
314     LL^=DES_SPtrans[7][u3]; }
315 #endif
316 #ifdef DES_RISC2
317 #define D_ENCRYPT(LL,R,S) { \
318     unsigned int u1,u2,s1,s2; \
319     LOAD_DATA(R,S,u,t,E0,E1,u1); \
320     u>>=2L; \
321     t=ROTATE(t,6); \
322     u2=(int)u>>8L; \
323     u1=(int)u&0x3f; \
324     u2&=0x3f; \
325     LL^=DES_SPtrans[0][u1]; \

```

```

326     LL^=DES_SPtrans[2][u2]; \
327     s1=(int)u>>16L; \
328     s2=(int)u>>24L; \
329     s1&=0x3f; \
330     s2&=0x3f; \
331     LL^=DES_SPtrans[4][s1]; \
332     LL^=DES_SPtrans[6][s2]; \
333     u2=(int)t>>8L; \
334     u1=(int)t&0x3f; \
335     u2&=0x3f; \
336     LL^=DES_SPtrans[1][u1]; \
337     LL^=DES_SPtrans[3][u2]; \
338     s1=(int)t>>16L; \
339     s2=(int)t>>24L; \
340     s1&=0x3f; \
341     s2&=0x3f; \
342     LL^=DES_SPtrans[5][s1]; \
343     LL^=DES_SPtrans[7][s2]; }
344 #endif

346 #else

348 #define D_ENCRYPT(LL,R,S) { \
349     LOAD_DATA_tmp(R,S,u,t,E0,E1); \
350     t=ROTATE(t,4); \
351     LL^= \
352     DES_SPtrans[0][((u>> 2L) & 0x3f)] ^ \
353     DES_SPtrans[2][((u>>10L) & 0x3f)] ^ \
354     DES_SPtrans[4][((u>>18L) & 0x3f)] ^ \
355     DES_SPtrans[6][((u>>26L) & 0x3f)] ^ \
356     DES_SPtrans[1][((t>> 2L) & 0x3f)] ^ \
357     DES_SPtrans[3][((t>>10L) & 0x3f)] ^ \
358     DES_SPtrans[5][((t>>18L) & 0x3f)] ^ \
359     DES_SPtrans[7][((t>>26L) & 0x3f)]; }
360 #endif
361 #endif

363 /* IP and FP
364  * The problem is more of a geometric problem than random bit fiddling.
365  *
366  * 0 1 2 3 4 5 6 7      62 54 46 38 30 22 14 6
367  * 8 9 10 11 12 13 14 15    60 52 44 36 28 20 12 4
368  * 16 17 18 19 20 21 22 23    58 50 42 34 26 18 10 2
369  * 24 25 26 27 28 29 30 31    to 56 48 40 32 24 16 8 0

370  * 32 33 34 35 36 37 38 39    63 55 47 39 31 23 15 7
371  * 40 41 42 43 44 45 46 47    61 53 45 37 29 21 13 5
372  * 48 49 50 51 52 53 54 55    59 51 43 35 27 19 11 3
373  * 56 57 58 59 60 61 62 63    57 49 41 33 25 17 9 1

375  The output has been subject to swaps of the form
376  0 1 -> 3 1 but the odd and even bits have been put into
377  2 3 2 0
378  different words. The main trick is to remember that
379  t=((l>>size)^r)&(mask);
380  r^=t;
381  l^=(t<<size);
382  can be used to swap and move bits between words.

384  So l = 0 1 2 3 r = 16 17 18 19
385  4 5 6 7      20 21 22 23
386  8 9 10 11     24 25 26 27
387  12 13 14 15   28 29 30 31
388  becomes (for size == 2 and mask == 0x3333)
389  t = 2^16 3^17 -- -- l = 0 1 16 17 r = 2 3 18 19
390  6^20 7^21 -- --      4 5 20 21      6 7 22 23
391  10^24 11^25 -- --    8 9 24 25      10 11 24 25

```

```

392          14^28 15^29 -- --      12 13 28 29      14 15 28 29

394      Thanks for hints from Richard Outerbridge - he told me IP&FP
395      could be done in 15 xor, 10 shifts and 5 ands.
396      When I finally started to think of the problem in 2D
397      I first got ~42 operations without xors. When I remembered
398      how to use xors :-) I got it to its final state.
399      */
400 #define PERM_OP(a,b,t,n,m) ((t)=(((a)>>(n))^(b))&(m)),\
401      (b)^=(t),\
402      (a)^=((t)<<(n)))

404 #define IP(l,r) \
405 { \
406     register DES_LONG tt; \
407     PERM_OP(r,l,tt, 4,0xf0f0f0fL); \
408     PERM_OP(l,r,tt,16,0x000ffffL); \
409     PERM_OP(r,l,tt, 2,0x3333333L); \
410     PERM_OP(l,r,tt, 8,0x0ff0ffL); \
411     PERM_OP(r,l,tt, 1,0x5555555L); \
412 }

414 #define FP(l,r) \
415 { \
416     register DES_LONG tt; \
417     PERM_OP(l,r,tt, 1,0x5555555L); \
418     PERM_OP(r,l,tt, 8,0x0ff0ffL); \
419     PERM_OP(l,r,tt, 2,0x3333333L); \
420     PERM_OP(r,l,tt,16,0x000ffffL); \
421     PERM_OP(l,r,tt, 4,0xf0f0f0fL); \
422 }

424 extern const DES_LONG DES_SPtrans[8][64];

426 void fcrypt_body(DES_LONG *out,DES_key_schedule *ks,
427     DES_LONG Eswap0, DES_LONG Eswap1);

429 #ifdef OPENSSL_SMALL_FOOTPRINT
430 #undef DES_UNROLL
431 #endif
432 #endif

```


new/usr/src/lib/openssl/include/des_ver.h

1

3643 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/des_ver.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/des/des_ver.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
```

59 #include <openssl/e_os2.h>

61 #ifdef OPENSSL_BUILD_SHLIBCRYPTO

new/usr/src/lib/openssl/include/des_ver.h

2

```
62 # undef OPENSSL_EXTERN
63 # define OPENSSL_EXTERN OPENSSL_EXPORT
64 #endif
```

```
66 /* The following macros make sure the names are different from libdes names */
67 #define DES_version OSSL_DES_version
68 #define libdes_version OSSL_libdes_version
```

```
70 OPENSSL_EXTERN const char OSSL_DES_version[]; /* SSLeay version string */
71 OPENSSL_EXTERN const char OSSL_libdes_version[]; /* old libdes version st
```

new/usr/src/lib/openssl/include/dsa_locl.h

1

2869 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/dsa_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* =====
2  * Copyright (c) 2007 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
19 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
22 * endorse or promote products derived from this software without
23 * prior written permission. For written permission, please contact
24 * openssl-core@openssl.org.
25 *
26 * 5. Products derived from this software may not be called "OpenSSL"
27 * nor may "OpenSSL" appear in their names without prior written
28 * permission of the OpenSSL Project.
29 *
30 * 6. Redistributions of any form whatsoever must retain the following
31 * acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
34 *
35 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
37 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
38 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
39 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
40 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
41 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
42 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include <openssl/dsa.h>

57 int dsa_builtin_paramgen(DSA *ret, size_t bits, size_t qbits,
58     const EVP_MD *evpmd, const unsigned char *seed_in, size_t seed_len,
59     unsigned char *seed_out,
60     int *counter_ret, unsigned long *h_ret, BN_GENCB *cb);
```

```

*****
23524 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/e_os.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* e_os.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_E_OS_H
60 #define HEADER_E_OS_H

```

```

62 #include <openssl/opensslconf.h>

64 #include <openssl/e_os2.h>
65 /* <openssl/e_os2.h> contains what we can justify to make visible
66 * to the outside; this file e_os.h is not part of the exported
67 * interface. */

69 #ifdef __cplusplus
70 extern "C" {
71 #endif

73 /* Used to checking reference counts, most while doing perl5 stuff :-) */
74 #ifdef REF_PRINT
75 #undef REF_PRINT
76 #define REF_PRINT(a,b) fprintf(stderr,"%08X:%d:%s\n", (int)b,b->references,a)
77 #endif

79 #ifndef DEVRANDOM
80 /* set this to a comma-separated list of 'random' device files to try out.
81 * My default, we will try to read at least one of these files */
82 #define DEVRANDOM "/dev/urandom","/dev/random","/dev/srandom"
83 #endif
84 #ifndef DEVRANDOM_EGD
85 /* set this to a comma-seperated list of 'egd' sockets to try out. These
86 * sockets will be tried in the order listed in case accessing the device files
87 * listed in DEVRANDOM did not return enough entropy. */
88 #define DEVRANDOM_EGD "/var/run/egd-pool","/dev/egd-pool","/etc/egd-pool","/etc/"
89 #endif

91 #if defined(OPENSSL_SYS_VXWORKS)
92 # define NO_SYS_PARAM_H
93 # define NO_CHMOD
94 # define NO_SYSLOG
95 #endif
96
97 #if defined(OPENSSL_SYS_MACINTOSH_CLASSIC)
98 # if macintosh==1
99 #  ifdef MAC_OS_GUSI_SOURCE
100 #   define MAC_OS_pre_X
101 #   define NO_SYS_TYPES_H
102 #  endif
103 #  define NO_SYS_PARAM_H
104 #  define NO_CHMOD
105 #  define NO_SYSLOG
106 #  undef DEVRANDOM
107 #  define GETPID_IS_MEANINGLESS
108 #  endif
109 #endif

111 /*****
112 The Microsoft section
113 *****/
114 /* The following is used because of the small stack in some
115 * Microsoft operating systems */
116 #if defined(OPENSSL_SYS_MSDOS) && !defined(OPENSSL_SYSNAME_WIN32)
117 # define MS_STATIC static
118 #else
119 # define MS_STATIC
120 #endif

122 #if defined(OPENSSL_SYS_WIN32) && !defined(WIN32)
123 # define WIN32
124 #endif
125 #if defined(OPENSSL_SYS_WINDOWS) && !defined(WINDOWS)
126 # define WINDOWS
127 #endif

```

```

128 #if defined(OPENSSL_SYS_MSDOS) && !defined(MSDOS)
129 # define MSDOS
130 #endif

132 #if defined(MSDOS) && !defined(GETPID_IS_MEANINGLESS)
133 # define GETPID_IS_MEANINGLESS
134 #endif

136 #ifdef WIN32
137 #define get_last_sys_error() GetLastError()
138 #define clear_sys_error() SetLastError(0)
139 #if !defined(WINNT)
140 #define WIN_CONSOLE_BUG
141 #endif
142 #else
143 #define get_last_sys_error() errno
144 #define clear_sys_error() errno=0
145 #endif

147 #if defined(WINDOWS)
148 #define get_last_socket_error() WSAGetLastError()
149 #define clear_socket_error() WSAClearLastError(0)
150 #define readsocket(s,b,n) recv((s),(b),(n),0)
151 #define writesocket(s,b,n) send((s),(b),(n),0)
152 #elif defined(__DJGPP__)
153 #define WATT32
154 #define get_last_socket_error() errno
155 #define clear_socket_error() errno=0
156 #define closesocket(s) close_s(s)
157 #define readsocket(s,b,n) read_s(s,b,n)
158 #define writesocket(s,b,n) send(s,b,n,0)
159 #elif defined(MAC_OS_pre_X)
160 #define get_last_socket_error() errno
161 #define clear_socket_error() errno=0
162 #define closesocket(s) MacSocket_close(s)
163 #define readsocket(s,b,n) MacSocket_recv((s),(b),(n),true)
164 #define writesocket(s,b,n) MacSocket_send((s),(b),(n))
165 #elif defined(OPENSSL_SYS_VMS)
166 #define get_last_socket_error() errno
167 #define clear_socket_error() errno=0
168 #define ioctlsocket(a,b,c) ioctl(a,b,c)
169 #define closesocket(s) close(s)
170 #define readsocket(s,b,n) recv((s),(b),(n),0)
171 #define writesocket(s,b,n) send((s),(b),(n),0)
172 #elif defined(OPENSSL_SYS_VXWORKS)
173 #define get_last_socket_error() errno
174 #define clear_socket_error() errno=0
175 #define ioctlsocket(a,b,c) ioctl((a),(b),(int)(c))
176 #define closesocket(s) close(s)
177 #define readsocket(s,b,n) read((s),(b),(n))
178 #define writesocket(s,b,n) write((s),(char *) (b),(n))
179 #elif defined(OPENSSL_SYS_BEOS_R5)
180 #define get_last_socket_error() errno
181 #define clear_socket_error() errno=0
182 #define FIONBIO SO_NONBLOCK
183 #define ioctlsocket(a,b,c) setsockopt((a),SOL_SOCKET,(b),(c),size)
184 #define readsocket(s,b,n) recv((s),(b),(n),0)
185 #define writesocket(s,b,n) send((s),(b),(n),0)
186 #elif defined(OPENSSL_SYS_NETWARE)
187 #if defined(NETWARE_BSDSOCK)
188 #define get_last_socket_error() errno
189 #define clear_socket_error() errno=0
190 #define closesocket(s) close(s)
191 #define ioctlsocket(a,b,c) ioctl(a,b,c)
192 #if defined(NETWARE_LIBC)
193 #define readsocket(s,b,n) recv((s),(b),(n),0)

```

```

194 #define writesocket(s,b,n) send((s),(b),(n),0)
195 #else
196 #define readsocket(s,b,n) recv((s),(char *) (b),(n),0)
197 #define writesocket(s,b,n) send((s),(char *) (b),(n),0)
198 #endif
199 #else
200 #define get_last_socket_error() WSAGetLastError()
201 #define clear_socket_error() WSAClearLastError(0)
202 #define readsocket(s,b,n) recv((s),(b),(n),0)
203 #define writesocket(s,b,n) send((s),(b),(n),0)
204 #endif
205 #else
206 #define get_last_socket_error() errno
207 #define clear_socket_error() errno=0
208 #define ioctlsocket(a,b,c) ioctl(a,b,c)
209 #define closesocket(s) close(s)
210 #define readsocket(s,b,n) read((s),(b),(n))
211 #define writesocket(s,b,n) write((s),(b),(n))
212 #endif

214 #ifdef WIN16 /* never the case */
215 # define MS_CALLBACK _far _loadds
216 # define MS_FAR _far
217 #else
218 # define MS_CALLBACK
219 # define MS_FAR
220 #endif

222 #ifdef OPENSSL_NO_STDIO
223 # undef OPENSSL_NO_FP_API
224 # define OPENSSL_NO_FP_API
225 #endif

227 #if (defined(WINDOWS) || defined(MSDOS))

229 # ifdef __DJGPP__
230 # include <unistd.h>
231 # include <sys/stat.h>
232 # include <sys/socket.h>
233 # include <tcp.h>
234 # include <netdb.h>
235 # define setmode setmode
236 # define _O_TEXT _O_TEXT
237 # define _O_BINARY _O_BINARY
238 # undef DEVRANDOM
239 # define DEVRANDOM "/dev/urandom\x24"
240 # endif /* __DJGPP__ */

242 # ifndef S_IFDIR
243 # define S_IFDIR _S_IFDIR
244 # endif

246 # ifndef S_IFMT
247 # define S_IFMT _S_IFMT
248 # endif

250 # if !defined(WINNT) && !defined(__DJGPP__)
251 # define NO_SYSLOG
252 # endif
253 # define NO_DIRENT

255 # ifdef WINDOWS
256 # if !defined(_WIN32_WCE) && !defined(_WIN32_WINNT)
257 /*
258 * Defining _WIN32_WINNT here in e_os.h implies certain "discipline."
259 * Most notably we ought to check for availability of each specific

```

```

260  * routine with GetProcAddress() and/or guard NT-specific calls with
261  * GetVersion() < 0x80000000. One can argue that in latter "or" case
262  * we ought to /DELAYLOAD some .DLLs in order to protect ourselves
263  * against run-time link errors. This doesn't seem to be necessary,
264  * because it turned out that already Windows 95, first non-NT Win32
265  * implementation, is equipped with at least NT 3.51 stubs, dummy
266  * routines with same name, but which do nothing. Meaning that it's
267  * apparently sufficient to guard "vanilla" NT calls with GetVersion
268  * alone, while NT 4.0 and above interfaces ought to be linked with
269  * GetProcAddress at run-time.
270  */
271 # define _WIN32_WINNT 0x0400
272 # endif
273 # if !defined(OPENSSL_NO_SOCKET) && defined(_WIN32_WINNT)
274  /*
275   * Just like defining _WIN32_WINNT including winsock2.h implies
276   * certain "discipline" for maintaining [broad] binary compatibility.
277   * As long as structures are invariant among Winsock versions,
278   * it's sufficient to check for specific Winsock2 API availability
279   * at run-time [DSO global lookup is recommended]...
280   */
281 # include <winsock2.h>
282 # include <ws2tcpip.h>
283  /* yes, they have to be #included prior to <windows.h> */
284 # endif
285 # include <windows.h>
286 # include <stdio.h>
287 # include <stddef.h>
288 # include <errno.h>
289 # include <string.h>
290 # ifdef _WIN64
291  # define strlen(s) _strlen31(s)
292  /* cut strings to 2GB */
293  static unsigned int _strlen31(const char *str)
294  {
295      unsigned int len=0;
296      while (*str && len<0x80000000U) str++, len++;
297      return len&0x7FFFFFFF;
298  }
299 # endif
300 # include <malloc.h>
301 # if defined(_MSC_VER) && _MSC_VER<=1200 && defined(_MT) && defined(isspace)
302  /* compensate for bug in VC6 ctype.h */
303 # undef isspace
304 # undef isdigit
305 # undef isalnum
306 # undef isupper
307 # undef isxdigit
308 # endif
309 # if defined(_MSC_VER) && !defined(_DLL) && defined(stdin)
310  # if _MSC_VER>=1300
311      # undef stdin
312      # undef stdout
313      # undef stderr
314      FILE *_iob_func();
315      # define stdin (&_iob_func()[0])
316      # define stdout (&_iob_func()[1])
317      # define stderr (&_iob_func()[2])
318  # elif defined(I_CAN_LIVE_WITH_LNK4049)
319      # undef stdin
320      # undef stdout
321      # undef stderr
322      /* pre-1300 has _p_iob(), but it's available only in msvcr.lib,
323       * or in other words with /MD. Declaring implicit import, i.e.
324       * with _imp_prefix, works correctly with all compiler options,
325       * but without /MD results in LINK warning LNK4049:

```

```

326  * 'locally defined symbol "__iob" imported'.
327  */
328  extern FILE *_imp_iob;
329 # define stdin (&_imp_iob[0])
330 # define stdout (&_imp_iob[1])
331 # define stderr (&_imp_iob[2])
332 # endif
333 # endif
334 # endif
335 # include <io.h>
336 # include <fcntl.h>
337
338 # ifdef OPENSSL_SYS_WINCE
339 # define OPENSSL_NO_POSIX_IO
340 # endif
341
342 # if defined(_BORLANDC_)
343 # define _setmode setmode
344 # define _O_TEXT O_TEXT
345 # define _O_BINARY O_BINARY
346 # define _int64 __int64
347 # define _kbhit kbhit
348 # endif
349
350 # define EXIT(n) exit(n)
351 # define LIST_SEPARATOR_CHAR ';'
352 # ifndef X_OK
353 # define X_OK 0
354 # endif
355 # ifndef W_OK
356 # define W_OK 2
357 # endif
358 # ifndef R_OK
359 # define R_OK 4
360 # endif
361 # define OPENSSL_CONF "openssl.cnf"
362 # define SSLEAY_CONF OPENSSL_CONF
363 # define NUL_DEV "nul"
364 # define RFILE ".rnd"
365 # ifdef OPENSSL_SYS_WINCE
366 # define DEFAULT_HOME ""
367 # else
368 # define DEFAULT_HOME "C:"
369 # endif
370
371 /* Avoid Windows 8 SDK GetVersion deprecated problems */
372 #if defined(_MSC_VER) && _MSC_VER>=1800
373 # define check_winnt() (1)
374 #else
375 # define check_winnt() (GetVersion() < 0x80000000)
376 #endif
377
378 #else /* The non-microsoft world */
379
380 # ifdef OPENSSL_SYS_VMS
381 # define VMS 1
382  /* some programs don't include stdlib, so exit() and others give implicit
383   function warnings */
384 # include <stdlib.h>
385 # if defined(__DECC)
386 # include <unistd.h>
387 # else
388 # include <unixlib.h>
389 # endif
390 # define OPENSSL_CONF "openssl.cnf"
391 # define SSLEAY_CONF OPENSSL_CONF

```

```

392 # define RFILE "rnd"
393 # define LIST_SEPARATOR_CHAR ','
394 # define NUL_DEV "NLA0:"
395 /* We don't have any well-defined random devices on VMS, yet... */
396 # undef DEVRANDOM
397 /* We need to do this since VMS has the following coding on status codes:
398
399 Bits 0-2: status type: 0 = warning, 1 = success, 2 = error, 3 = info ...
400 The important thing to know is that odd numbers are considered
401 good, while even ones are considered errors.
402 Bits 3-15: actual status number
403 Bits 16-27: facility number. 0 is considered "unknown"
404 Bits 28-31: control bits. If bit 28 is set, the shell won't try to
405 output the message (which, for random codes, just looks ugly)
406
407 So, what we do here is to change 0 to 1 to get the default success status,
408 and everything else is shifted up to fit into the status number field, and
409 the status is tagged as an error, which I believe is what is wanted here.
410 -- Richard Levitte
411 */
412 # define EXIT(n) do { int __VMS_EXIT = n; \
413 if (__VMS_EXIT == 0) \
414 __VMS_EXIT = 1; \
415 else \
416 __VMS_EXIT = (n << 3) | 2; \
417 __VMS_EXIT |= 0x10000000; \
418 exit(__VMS_EXIT); } while(0)
419 # define NO_SYS_PARAM_H
420
421 # elif defined(OPENSSL_SYS_NETWARE)
422 # include <fcntl.h>
423 # include <unistd.h>
424 # define NO_SYS_TYPES_H
425 # undef DEVRANDOM
426 # ifdef NETWARE_CLIB
427 # define getpid GetThreadID
428 extern int GetThreadID(void);
429 /* # include <conio.h> */
430 extern int kbhit(void);
431 # else
432 # include <screen.h>
433 # endif
434 # define NO_SYSLOG
435 # define _setmode setmode
436 # define _kbhit kbhit
437 # define _O_TEXT O_TEXT
438 # define _O_BINARY O_BINARY
439 # define OPENSSL_CONF "openssl.cnf"
440 # define SSLEAY_CONF OPENSSL_CONF
441 # define RFILE "rnd"
442 # define LIST_SEPARATOR_CHAR ','
443 # define EXIT(n) { if (n) printf("ERROR: %d\n", (int)n); exit(n); }
444
445 # else
446 /* !defined VMS */
447 # ifdef OPENSSL_SYS_MPE
448 # define NO_SYS_PARAM_H
449 # endif
450 # ifdef OPENSSL_UNISTD
451 # include OPENSSL_UNISTD
452 # else
453 # include <unistd.h>
454 # endif
455 # ifndef NO_SYS_TYPES_H
456 # include <sys/types.h>
457 # endif

```

```

458 # if defined(NEXT) || defined(OPENSSL_SYS_NEWS4)
459 # define pid_t int /* pid_t is missing on NEXTSTEP/OPENSTEP
460 * (unless when compiling with -D_POSIX_SOURCE,
461 * which doesn't work for us) */
462 # endif
463 # ifdef OPENSSL_SYS_NEWS4 /* setvbuf is missing on mips-sony-bsd */
464 # define setvbuf(a, b, c, d) setbuffer((a), (b), (d))
465 # typedef unsigned long clock_t;
466 # endif
467 # ifdef OPENSSL_SYS_WIN32_CYGWIN
468 # include <io.h>
469 # include <fcntl.h>
470 # endif
471
472 # define OPENSSL_CONF "openssl.cnf"
473 # define SSLEAY_CONF OPENSSL_CONF
474 # define RFILE "rnd"
475 # define LIST_SEPARATOR_CHAR ','
476 # define NUL_DEV "/dev/null"
477 # define EXIT(n) exit(n)
478 # endif
479
480 # define SSLeay_getpid() getpid()
481
482 #endif
483
484 /***** */
485
486 #ifndef USE_SOCKETS
487 # if defined(WINDOWS) || defined(MSDOS)
488 /* windows world */
489
490 # ifdef OPENSSL_NO_SOCKET
491 # define SSLeay_Write(a,b,c) (-1)
492 # define SSLeay_Read(a,b,c) (-1)
493 # define SHUTDOWN(fd) close(fd)
494 # define SHUTDOWN2(fd) close(fd)
495 # elif !defined(_DJGPP_)
496 # if defined(_WIN32_WCE) && _WIN32_WCE<410
497 # define getservbyname _masked_declaration_getservbyname
498 # endif
499 # endif
500 # if !defined(IPPROTO_IP)
501 /* winsock[2].h was included already? */
502 # include <winsock.h>
503 # endif
504 # ifdef getservbyname
505 # undef getservbyname
506 /* this is used to be wcecompat/include/winsock_extras.h */
507 struct servent* PASCAL getservbyname(const char*, const char*);
508 # endif
509
510 # ifdef _WIN64
511 /*
512 * Even though sizeof(SOCKET) is 8, it's safe to cast it to int, because
513 * the value constitutes an index in per-process table of limited size
514 * and not a real pointer.
515 */
516 # define socket(d,t,p) ((int)socket(d,t,p))
517 # define accept(s,f,l) ((int)accept(s,f,l))
518 # endif
519 # define SSLeay_Write(a,b,c) send((a),(b),(c),0)
520 # define SSLeay_Read(a,b,c) recv((a),(b),(c),0)
521 # define SHUTDOWN(fd) { shutdown((fd),0); closesocket(fd); }
522 # define SHUTDOWN2(fd) { shutdown((fd),2); closesocket(fd); }
523 # else

```

```

524 #   define SSLeay_Write(a,b,c)      write_s(a,b,c,0)
525 #   define SSLeay_Read(a,b,c)       read_s(a,b,c)
526 #   define SHUTDOWN(fd)             close_s(fd)
527 #   define SHUTDOWN2(fd)            close_s(fd)
528 #   endif

530 #   elif defined(MAC_OS_pre_X)

532 #   include "MacSocket.h"
533 #   define SSLeay_Write(a,b,c)       MacSocket_send((a),(b),(c))
534 #   define SSLeay_Read(a,b,c)        MacSocket_recv((a),(b),(c),true)
535 #   define SHUTDOWN(fd)              MacSocket_close(fd)
536 #   define SHUTDOWN2(fd)             MacSocket_close(fd)

538 #   elif defined(OPENSSSL_SYS_NETWORK)
539 #       /* NetWare uses the WinSock2 interfaces by default, but can be configur
540 #       */
541 #       if defined(NETWARE_BSDSOCK)
542 #           include <sys/socket.h>
543 #           include <netinet/in.h>
544 #           include <sys/time.h>
545 #           if defined(NETWARE_CLIB)
546 #               include <sys/bsdskt.h>
547 #           else
548 #               include <sys/select.h>
549 #           endif
550 #           define INVALID_SOCKET (int)(~0)
551 #       else
552 #           include <novsock2.h>
553 #       endif
554 #       define SSLeay_Write(a,b,c)    send((a),(b),(c),0)
555 #       define SSLeay_Read(a,b,c)     recv((a),(b),(c),0)
556 #       define SHUTDOWN(fd)           { shutdown((fd),0); closesocket(fd); }
557 #       define SHUTDOWN2(fd)          { shutdown((fd),2); closesocket(fd); }

559 #   else

561 #       ifndef NO_SYS_PARAM_H
562 #           include <sys/param.h>
563 #       endif
564 #       ifdef OPENSSSL_SYS_VXWORKS
565 #           include <time.h>
566 #       elif !defined(OPENSSSL_SYS_MPE)
567 #           include <sys/time.h> /* Needed under linux for FD_XXX */
568 #       endif

570 #       include <netdb.h>
571 #       if defined(OPENSSSL_SYS_VMS_NODECC)
572 #           include <socket.h>
573 #           include <in.h>
574 #           include <inet.h>
575 #       else
576 #           include <sys/socket.h>
577 #           ifdef FILIO_H
578 #               include <sys/filio.h> /* Added for FIONBIO under unixware */
579 #           endif
580 #           include <netinet/in.h>
581 #           if !defined(OPENSSSL_SYS_BEOS_R5)
582 #               include <arpa/inet.h>
583 #           endif
584 #       endif

586 #       if defined(NEXT) || defined(_NEXT_SOURCE)
587 #           include <sys/fcntl.h>
588 #           include <sys/types.h>
589 #       endif

```

```

591 #   ifdef OPENSSSL_SYS_AIX
592 #       include <sys/select.h>
593 #   endif

595 #   ifdef __QNX__
596 #       include <sys/select.h>
597 #   endif

599 #   if defined(sun)
600 #       include <sys/filio.h>
601 #   else
602 #       ifndef VMS
603 #           include <sys/ioctl.h>
604 #       else
605 #           /* ioctl is only in VMS > 7.0 and when socketshr is not used */
606 #           if !defined(TCPIP_TYPE_SOCKETSHR) && defined(__VMS_VER) && (__VMS_VER >
607 #               include <sys/ioctl.h>
608 #           endif
609 #       endif
610 #   endif

612 #   ifdef VMS
613 #       include <unixio.h>
614 #       if defined(TCPIP_TYPE_SOCKETSHR)
615 #           include <socketshr.h>
616 #       endif
617 #   endif

619 #   define SSLeay_Read(a,b,c)         read((a),(b),(c))
620 #   define SSLeay_Write(a,b,c)        write((a),(b),(c))
621 #   define SHUTDOWN(fd)               { shutdown((fd),0); closesocket((fd)); }
622 #   define SHUTDOWN2(fd)              { shutdown((fd),2); closesocket((fd)); }
623 #   ifndef INVALID_SOCKET
624 #       define INVALID_SOCKET         (-1)
625 #   endif /* INVALID_SOCKET */
626 #   endif

628 /* Some IPv6 implementations are broken, disable them in known bad
629 * versions.
630 */
631 #   if !defined(OPENSSSL_USE_IPV6)
632 #       if defined(AF_INET6) && !defined(OPENSSSL_SYS_BEOS_BONE) && !defined(NETWARE
633 #           define OPENSSSL_USE_IPV6 1
634 #       else
635 #           define OPENSSSL_USE_IPV6 0
636 #       endif
637 #   endif

639 #endif

641 #if defined(sun) && !defined(__svr4__) && !defined(__SVR4)
642 /* include headers first, so our defines don't break it */
643 #include <stdlib.h>
644 #include <string.h>
645 /* bcopy can handle overlapping moves according to SunOS 4.1.4 manpage */
646 #define memmove(s1,s2,n) bcopy((s2),(s1),(n))
647 #define strtoul(s,e,b) ((unsigned long int)strtol((s),(e),(b)))
648 extern char *sys_errlist[]; extern int sys_nerr;
649 #define strerror(ernum) \
650     (((ernum)<0 || (ernum)>=sys_nerr) ? NULL : sys_errlist[ernum])
651 /* Being signed SunOS 4.x memcpy breaks ASN1_OBJECT table lookup */
652 #include "crypto/o_str.h"
653 #define define memcmp OPENSSSL_memcmp
654 #endif

```

```

656 #ifndef OPENSSL_EXIT
657 # if defined(MONOLITH) && !defined(OPENSSL_C)
658 #  define OPENSSL_EXIT(n) return(n)
659 # else
660 #  define OPENSSL_EXIT(n) do { EXIT(n); return(n); } while(0)
661 # endif
662 #endif

664 /*****

666 #define DG_GCC_BUG      /* gcc < 2.6.3 on DGUX */

668 #ifdef sgi
669 #define IRIX_CC_BUG      /* all version of IRIX I've tested (4.* 5.*) */
670 #endif
671 #ifdef OPENSSL_SYS_SNI
672 #define IRIX_CC_BUG      /* CDS++ up to V2.0B something suffered from the same bug
673 #endif

675 #if defined(OPENSSL_SYS_WINDOWS)
676 #  define strcasecmp _stricmp
677 #  define strncasecmp _strnicmp
678 #elif defined(OPENSSL_SYS_VMS)
679 /* VMS below version 7.0 doesn't have strcasecmp() */
680 #  include "o_str.h"
681 #  define strcasecmp OPENSSL_strcasecmp
682 #  define strncasecmp OPENSSL_strncasecmp
683 #  define OPENSSL_IMPLEMENTED strncasecmp
684 #elif defined(OPENSSL_SYS_OS2) && defined(__EMX__)
685 #  define strcasecmp stricmp
686 #  define strncasecmp strnicmp
687 #elif defined(OPENSSL_SYS_NETWARE)
688 #  include <string.h>
689 #  if defined(NETWARE_CLIB)
690 #    define strcasecmp stricmp
691 #    define strncasecmp strnicmp
692 #  endif /* NETWARE_CLIB */
693 #endif

695 #if defined(OPENSSL_SYS_OS2) && defined(__EMX__)
696 #  include <io.h>
697 #  include <fcntl.h>
698 #  define NO_SYSLOG
699 #endif

701 /* vxworks */
702 #if defined(OPENSSL_SYS_VXWORKS)
703 #include <ioLib.h>
704 #include <tickLib.h>
705 #include <sysLib.h>

707 #define TTY_STRUCT int

709 #define sleep(a) taskDelay((a) * sysClkRateGet())

711 #include <vxWorks.h>
712 #include <sockLib.h>
713 #include <taskLib.h>

715 #define getpid taskIdSelf

717 /* NOTE: these are implemented by helpers in database app!
718 * if the database is not linked, we need to implement them
719 * elsewhere */
720 struct hostent *gethostbyname(const char *name);
721 struct hostent *gethostbyaddr(const char *addr, int length, int type);

```

```

722 struct servent *getservbyname(const char *name, const char *proto);

724 #endif
725 /* end vxworks */

727 /* beos */
728 #if defined(OPENSSL_SYS_BEOS_R5)
729 #define SO_ERROR 0
730 #define NO_SYS_UN
731 #define IPPROTO_IP 0
732 #include <OS.h>
733 #endif

736 #ifdef __cplusplus
737 }
738 #endif

740 #endif

```


new/usr/src/lib/openssl/include/ec_lcl.h

1

```
*****
21911 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/ec_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ec/ec_lcl.h */
2 /*
3  * Originally written by Bodo Moeller for the OpenSSL project.
4  */
5 /* =====
6  * Copyright (c) 1998-2010 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
16  * notice, this list of conditions and the following disclaimer in
17  * the documentation and/or other materials provided with the
18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
23  * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
24  *
25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26  * endorse or promote products derived from this software without
27  * prior written permission. For written permission, please contact
28  * openssl-core@openssl.org.
29  *
30  * 5. Products derived from this software may not be called "OpenSSL"
31  * nor may "OpenSSL" appear in their names without prior written
32  * permission of the OpenSSL Project.
33  *
34  * 6. Redistributions of any form whatsoever must retain the following
35  * acknowledgment:
36  * "This product includes software developed by the OpenSSL Project
37  * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57 /* =====
58  * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
59  *
60  * Portions of the attached software ("Contribution") are developed by
```

new/usr/src/lib/openssl/include/ec_lcl.h

2

```
62  * SUN MICROSYSTEMS, INC., and are contributed to the OpenSSL project.
63  *
64  * The Contribution is licensed pursuant to the OpenSSL open source
65  * license provided above.
66  *
67  * The elliptic curve binary polynomial software is originally written by
68  * Sheueling Chang Shantz and Douglas Stebila of Sun Microsystems Laboratories.
69  *
70  */

73 #include <stdlib.h>

75 #include <openssl/obj_mac.h>
76 #include <openssl/ec.h>
77 #include <openssl/bn.h>

79 #if defined(__SUNPRO_C)
80 # if __SUNPRO_C >= 0x520
81 # pragma error_messages (off,E_ARRAY_OF_INCOMPLETE_NONAME,E_ARRAY_OF_INCOMPLETE)
82 # endif
83 #endif

85 /* Use default functions for poin2oct, oct2point and compressed coordinates */
86 #define EC_FLAGS_DEFAULT_OCT 0x1

88 /* Structure details are not part of the exported interface,
89  * so all this may change in future versions. */

91 struct ec_method_st {
92     /* Various method flags */
93     int flags;
94     /* used by EC_METHOD_get_field_type: */
95     int field_type; /* a NID */

97     /* used by EC_GROUP_new, EC_GROUP_free, EC_GROUP_clear_free, EC_GROUP_co
98     int (*group_init)(EC_GROUP *);
99     void (*group_finish)(EC_GROUP *);
100     void (*group_clear_finish)(EC_GROUP *);
101     int (*group_copy)(EC_GROUP *, const EC_GROUP *);

103     /* used by EC_GROUP_set_curve_GFp, EC_GROUP_get_curve_GFp, */
104     /* EC_GROUP_set_curve_GF2m, and EC_GROUP_get_curve_GF2m: */
105     int (*group_set_curve)(EC_GROUP *, const BIGNUM *p, const BIGNUM *a, con
106     int (*group_get_curve)(const EC_GROUP *, BIGNUM *p, BIGNUM *a, BIGNUM *b

108     /* used by EC_GROUP_get_degree: */
109     int (*group_get_degree)(const EC_GROUP *);

111     /* used by EC_GROUP_check: */
112     int (*group_check_discriminant)(const EC_GROUP *, BN_CTX *);

114     /* used by EC_POINT_new, EC_POINT_free, EC_POINT_clear_free, EC_POINT_co
115     int (*point_init)(EC_POINT *);
116     void (*point_finish)(EC_POINT *);
117     void (*point_clear_finish)(EC_POINT *);
118     int (*point_copy)(EC_POINT *, const EC_POINT *);

120     /* used by EC_POINT_set_to_infinity,
121     * EC_POINT_set_jprojective_coordinates_GFp,
122     * EC_POINT_get_jprojective_coordinates_GFp,
123     * EC_POINT_set_affine_coordinates_GFp, ..._GF2m,
124     * EC_POINT_get_affine_coordinates_GFp, ..._GF2m,
125     * EC_POINT_set_compressed_coordinates_GFp, ..._GF2m:
126     */
127     int (*point_set_to_infinity)(const EC_GROUP *, EC_POINT *);
```

```

128 int (*point_set_Jprojective_coordinates_Gfp)(const EC_GROUP *, EC_POINT
129 const BIGNUM *x, const BIGNUM *y, const BIGNUM *z, BN_CTX *);
130 int (*point_get_Jprojective_coordinates_Gfp)(const EC_GROUP *, const EC_
131 BIGNUM *x, BIGNUM *y, BIGNUM *z, BN_CTX *);
132 int (*point_set_affine_coordinates)(const EC_GROUP *, EC_POINT *,
133 const BIGNUM *x, const BIGNUM *y, BN_CTX *);
134 int (*point_get_affine_coordinates)(const EC_GROUP *, const EC_POINT *,
135 BIGNUM *x, BIGNUM *y, BN_CTX *);
136 int (*point_set_compressed_coordinates)(const EC_GROUP *, EC_POINT *,
137 const BIGNUM *x, int y_bit, BN_CTX *);

139 /* used by EC_POINT_point2oct, EC_POINT_oct2point: */
140 size_t (*point2oct)(const EC_GROUP *, const EC_POINT *, point_conversion
141 unsigned char *buf, size_t len, BN_CTX *);
142 int (*oct2point)(const EC_GROUP *, EC_POINT *,
143 const unsigned char *buf, size_t len, BN_CTX *);

145 /* used by EC_POINT_add, EC_POINT_dbl, ECP_POINT_invert: */
146 int (*add)(const EC_GROUP *, EC_POINT *r, const EC_POINT *a, const EC_PO
147 int (*dbl)(const EC_GROUP *, EC_POINT *r, const EC_POINT *a, BN_CTX *);
148 int (*invert)(const EC_GROUP *, EC_POINT *, BN_CTX *);

150 /* used by EC_POINT_is_at_infinity, EC_POINT_is_on_curve, EC_POINT_cmp:
151 int (*is_at_infinity)(const EC_GROUP *, const EC_POINT *);
152 int (*is_on_curve)(const EC_GROUP *, const EC_POINT *, BN_CTX *);
153 int (*point_cmp)(const EC_GROUP *, const EC_POINT *a, const EC_POINT *b,

155 /* used by EC_POINT_make_affine, EC_POINTS_make_affine: */
156 int (*make_affine)(const EC_GROUP *, EC_POINT *, BN_CTX *);
157 int (*points_make_affine)(const EC_GROUP *, size_t num, EC_POINT *[], BN

159 /* used by EC_POINTS_mul, EC_POINT_mul, EC_POINT_precompute_mult, EC_POI
160 * (default implementations are used if the 'mul' pointer is 0): */
161 int (*mul)(const EC_GROUP *group, EC_POINT *r, const BIGNUM *scalar,
162 size_t num, const EC_POINT *points[], const BIGNUM *scalars[], B
163 int (*precompute_mult)(EC_GROUP *group, BN_CTX *);
164 int (*have_precompute_mult)(const EC_GROUP *group);

167 /* internal functions */

169 /* 'field_mul', 'field_sqr', and 'field_div' can be used by 'add' and 'd
170 * the same implementations of point operations can be used with differe
171 * optimized implementations of expensive field operations: */
172 int (*field_mul)(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, const BIG
173 int (*field_sqr)(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CTX *)
174 int (*field_div)(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, const BIG

176 int (*field_encode)(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CTX
177 int (*field_decode)(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CTX
178 int (*field_set_to_one)(const EC_GROUP *, BIGNUM *r, BN_CTX *);
179 } /* EC_METHOD */;

181 typedef struct ec_extra_data_st {
182 struct ec_extra_data_st *next;
183 void *data;
184 void *(*dup_func)(void *);
185 void (*free_func)(void *);
186 void (*clear_free_func)(void *);
187 } EC_EXTRA_DATA; /* used in EC_GROUP */

189 struct ec_group_st {
190 const EC_METHOD *meth;

192 EC_POINT *generator; /* optional */
193 BIGNUM order, cofactor;

```

```

195 int curve_name; /* optional NID for named curve */
196 int asn1_flag; /* flag to control the asn1 encoding */
197 point_conversion_form_t asn1_form;

199 unsigned char *seed; /* optional seed for parameters (appears in ASN1) *
200 size_t seed_len;

202 EC_EXTRA_DATA *extra_data; /* linked list */

204 /* The following members are handled by the method functions,
205 * even if they appear generic */

206 BIGNUM field; /* Field specification.
207 * For curves over GF(p), this is the modulus;
208 * for curves over GF(2^m), this is the
209 * irreducible polynomial defining the field.
210 */

213 int poly[6]; /* Field specification for curves over GF(2^m).
214 * The irreducible f(t) is then of the form:
215 * t^poly[0] + t^poly[1] + ... + t^poly[k]
216 * where m = poly[0] > poly[1] > ... > poly[k] = 0.
217 * The array is terminated with poly[k+1]=-1.
218 * All elliptic curve irreducibles have at most 5
219 * non-zero terms.
220 */

222 BIGNUM a, b; /* Curve coefficients.
223 * (Here the assumption is that BIGNUMs can be used
224 * or abused for all kinds of fields, not just GF(p).)
225 * For characteristic > 3, the curve is defined
226 * by a Weierstrass equation of the form
227 * y^2 = x^3 + a*x + b.
228 * For characteristic 2, the curve is defined by
229 * an equation of the form
230 * y^2 + x*y = x^3 + a*x^2 + b.
231 */

233 int a_is_minus3; /* enable optimized point arithmetics for special case

235 void *field_data1; /* method-specific (e.g., Montgomery structure) */
236 void *field_data2; /* method-specific */
237 int (*field_mod_func)(BIGNUM *, const BIGNUM *, const BIGNUM *, BN_CTX *
238 } /* EC_GROUP */;

240 struct ec_key_st {
241 int version;

243 EC_GROUP *group;

245 EC_POINT *pub_key;
246 BIGNUM *priv_key;

248 unsigned int enc_flag;
249 point_conversion_form_t conv_form;

251 int references;
252 int flags;

254 EC_EXTRA_DATA *method_data;
255 } /* EC_KEY */;

257 /* Basically a 'mix-in' for extra data, but available for EC_GROUPS/EC_KEYS only
258 * (with visibility limited to 'package' level for now).
259 * We use the function pointers as index for retrieval; this obviates

```

```

260 * global ex_data-style index tables.
261 */
262 int EC_EX_DATA_set_data(EC_EXTRA_DATA **, void *data,
263 void *(*dup_func)(void *), void (*free_func)(void *), void (*clear_free_
264 void *EC_EX_DATA_get_data(const EC_EXTRA_DATA *,
265 void *(*dup_func)(void *), void (*free_func)(void *), void (*clear_free_
266 void EC_EX_DATA_free_data(EC_EXTRA_DATA **,
267 void *(*dup_func)(void *), void (*free_func)(void *), void (*clear_free_
268 void EC_EX_DATA_clear_free_data(EC_EXTRA_DATA **,
269 void *(*dup_func)(void *), void (*free_func)(void *), void (*clear_free_
270 void EC_EX_DATA_free_all_data(EC_EXTRA_DATA **);
271 void EC_EX_DATA_clear_free_all_data(EC_EXTRA_DATA **);

275 struct ec_point_st {
276     const EC_METHOD *meth;

278     /* All members except 'meth' are handled by the method functions,
279     * even if they appear generic */

281     BIGNUM X;
282     BIGNUM Y;
283     BIGNUM Z; /* Jacobian projective coordinates:
284     * (X, Y, Z) represents (X/Z^2, Y/Z^3) if Z != 0 */
285     int Z_is_one; /* enable optimized point arithmetics for special case */
286 } /* EC_POINT */;

290 /* method functions in ec_mult.c
291 * (ec.lib.c uses these as defaults if group->method->mul is 0) */
292 int ec_wNAF_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM *scalar,
293 size_t num, const EC_POINT *points[], const BIGNUM *scalars[], BN_CTX *)
294 int ec_wNAF_precompute_mult(EC_GROUP *group, BN_CTX *);
295 int ec_wNAF_have_precompute_mult(const EC_GROUP *group);

298 /* method functions in ecp_smpl.c */
299 int ec_GFp_simple_group_init(EC_GROUP *);
300 void ec_GFp_simple_group_finish(EC_GROUP *);
301 void ec_GFp_simple_group_clear_finish(EC_GROUP *);
302 int ec_GFp_simple_group_copy(EC_GROUP *, const EC_GROUP *);
303 int ec_GFp_simple_group_set_curve(EC_GROUP *, const BIGNUM *p, const BIGNUM *a,
304 int ec_GFp_simple_group_get_curve(const EC_GROUP *, BIGNUM *p, BIGNUM *a, BIGNUM
305 int ec_GFp_simple_group_get_degree(const EC_GROUP *);
306 int ec_GFp_simple_group_check_discriminant(const EC_GROUP *, BN_CTX *);
307 int ec_GFp_simple_point_init(EC_POINT *);
308 void ec_GFp_simple_point_finish(EC_POINT *);
309 void ec_GFp_simple_point_clear_finish(EC_POINT *);
310 int ec_GFp_simple_point_copy(EC_POINT *, const EC_POINT *);
311 int ec_GFp_simple_point_set_to_infinity(const EC_GROUP *, EC_POINT *);
312 int ec_GFp_simple_set_Jprojective_coordinates_GFp(const EC_GROUP *, EC_POINT *,
313 const BIGNUM *x, const BIGNUM *y, const BIGNUM *z, BN_CTX *);
314 int ec_GFp_simple_get_Jprojective_coordinates_GFp(const EC_GROUP *, const EC_POI
315 BIGNUM *x, BIGNUM *y, BIGNUM *z, BN_CTX *);
316 int ec_GFp_simple_point_set_affine_coordinates(const EC_GROUP *, EC_POINT *,
317 const BIGNUM *x, const BIGNUM *y, BN_CTX *);
318 int ec_GFp_simple_point_get_affine_coordinates(const EC_GROUP *, const EC_POINT
319 BIGNUM *x, BIGNUM *y, BN_CTX *);
320 int ec_GFp_simple_set_compressed_coordinates(const EC_GROUP *, EC_POINT *,
321 const BIGNUM *x, int y_bit, BN_CTX *);
322 size_t ec_GFp_simple_point2oct(const EC_GROUP *, const EC_POINT *, point_convers
323 unsigned char *buf, size_t len, BN_CTX *);
324 int ec_GFp_simple_oct2point(const EC_GROUP *, EC_POINT *,
325 const unsigned char *buf, size_t len, BN_CTX *);

```

```

326 int ec_GFp_simple_add(const EC_GROUP *, EC_POINT *r, const EC_POINT *a, const EC
327 int ec_GFp_simple_dbl(const EC_GROUP *, EC_POINT *r, const EC_POINT *a, BN_CTX *
328 int ec_GFp_simple_invert(const EC_GROUP *, EC_POINT *, BN_CTX *);
329 int ec_GFp_simple_is_at_infinity(const EC_GROUP *, const EC_POINT *);
330 int ec_GFp_simple_is_on_curve(const EC_GROUP *, const EC_POINT *, BN_CTX *);
331 int ec_GFp_simple_cmp(const EC_GROUP *, const EC_POINT *a, const EC_POINT *b, BN
332 int ec_GFp_simple_make_affine(const EC_GROUP *, EC_POINT *, BN_CTX *);
333 int ec_GFp_simple_points_make_affine(const EC_GROUP *, size_t num, EC_POINT *[],
334 int ec_GFp_simple_field_mul(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, const
335 int ec_GFp_simple_field_sqr(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CTX

338 /* method functions in ecp_mont.c */
339 int ec_GFp_mont_group_init(EC_GROUP *);
340 int ec_GFp_mont_group_set_curve(EC_GROUP *, const BIGNUM *p, const BIGNUM *a, co
341 void ec_GFp_mont_group_finish(EC_GROUP *);
342 void ec_GFp_mont_group_clear_finish(EC_GROUP *);
343 int ec_GFp_mont_group_copy(EC_GROUP *, const EC_GROUP *);
344 int ec_GFp_mont_field_mul(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, const BI
345 int ec_GFp_mont_field_sqr(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CTX *
346 int ec_GFp_mont_field_encode(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CT
347 int ec_GFp_mont_field_decode(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CT
348 int ec_GFp_mont_field_set_to_one(const EC_GROUP *, BIGNUM *r, BN_CTX *);

351 /* method functions in ecp_nist.c */
352 int ec_GFp_nist_group_copy(EC_GROUP *dest, const EC_GROUP *src);
353 int ec_GFp_nist_group_set_curve(EC_GROUP *, const BIGNUM *p, const BIGNUM *a, co
354 int ec_GFp_nist_field_mul(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, const BI
355 int ec_GFp_nist_field_sqr(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CTX *

358 /* method functions in ec2_smpl.c */
359 int ec_GF2m_simple_group_init(EC_GROUP *);
360 void ec_GF2m_simple_group_finish(EC_GROUP *);
361 void ec_GF2m_simple_group_clear_finish(EC_GROUP *);
362 int ec_GF2m_simple_group_copy(EC_GROUP *, const EC_GROUP *);
363 int ec_GF2m_simple_group_set_curve(EC_GROUP *, const BIGNUM *p, const BIGNUM *a,
364 int ec_GF2m_simple_group_get_curve(const EC_GROUP *, BIGNUM *p, BIGNUM *a, BIGNU
365 int ec_GF2m_simple_group_get_degree(const EC_GROUP *);
366 int ec_GF2m_simple_group_check_discriminant(const EC_GROUP *, BN_CTX *);
367 int ec_GF2m_simple_point_init(EC_POINT *);
368 void ec_GF2m_simple_point_finish(EC_POINT *);
369 void ec_GF2m_simple_point_clear_finish(EC_POINT *);
370 int ec_GF2m_simple_point_copy(EC_POINT *, const EC_POINT *);
371 int ec_GF2m_simple_point_set_to_infinity(const EC_GROUP *, EC_POINT *);
372 int ec_GF2m_simple_point_set_affine_coordinates(const EC_GROUP *, EC_POINT *,
373 const BIGNUM *x, const BIGNUM *y, BN_CTX *);
374 int ec_GF2m_simple_point_get_affine_coordinates(const EC_GROUP *, const EC_POINT
375 BIGNUM *x, BIGNUM *y, BN_CTX *);
376 int ec_GF2m_simple_set_compressed_coordinates(const EC_GROUP *, EC_POINT *,
377 const BIGNUM *x, int y_bit, BN_CTX *);
378 size_t ec_GF2m_simple_point2oct(const EC_GROUP *, const EC_POINT *, point_conver
379 unsigned char *buf, size_t len, BN_CTX *);
380 int ec_GF2m_simple_oct2point(const EC_GROUP *, EC_POINT *,
381 const unsigned char *buf, size_t len, BN_CTX *);
382 int ec_GF2m_simple_add(const EC_GROUP *, EC_POINT *r, const EC_POINT *a, const E
383 int ec_GF2m_simple_dbl(const EC_GROUP *, EC_POINT *r, const EC_POINT *a, BN_CTX
384 int ec_GF2m_simple_invert(const EC_GROUP *, EC_POINT *, BN_CTX *);
385 int ec_GF2m_simple_is_at_infinity(const EC_GROUP *, const EC_POINT *);
386 int ec_GF2m_simple_is_on_curve(const EC_GROUP *, const EC_POINT *, BN_CTX *);
387 int ec_GF2m_simple_cmp(const EC_GROUP *, const EC_POINT *a, const EC_POINT *b, B
388 int ec_GF2m_simple_make_affine(const EC_GROUP *, EC_POINT *, BN_CTX *);
389 int ec_GF2m_simple_points_make_affine(const EC_GROUP *, size_t num, EC_POINT *[]
390 int ec_GF2m_simple_field_mul(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, const
391 int ec_GF2m_simple_field_sqr(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, BN_CT

```

```
392 int ec_GF2m_simple_field_div(const EC_GROUP *, BIGNUM *r, const BIGNUM *a, const

395 /* method functions in ec2_mult.c */
396 int ec_GF2m_simple_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM *scalar,
397     size_t num, const EC_POINT *points[], const BIGNUM *scalars[], BN_CTX *)
398 int ec_GF2m_precompute_mult(EC_GROUP *group, BN_CTX *ctx);
399 int ec_GF2m_have_precompute_mult(const EC_GROUP *group);

401 /* method functions in ec2_mult.c */
402 int ec_GF2m_simple_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM *scalar,
403     size_t num, const EC_POINT *points[], const BIGNUM *scalars[], BN_CTX *)
404 int ec_GF2m_precompute_mult(EC_GROUP *group, BN_CTX *ctx);
405 int ec_GF2m_have_precompute_mult(const EC_GROUP *group);

407 #ifndef OPENSSL_EC_NISTP_64_GCC_128
408 /* method functions in ecp_nistp224.c */
409 int ec_GFp_nistp224_group_init(EC_GROUP *group);
410 int ec_GFp_nistp224_group_set_curve(EC_GROUP *group, const BIGNUM *p, const BIGN
411 int ec_GFp_nistp224_point_get_affine_coordinates(const EC_GROUP *group, const EC
412 int ec_GFp_nistp224_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM *scalar
413 int ec_GFp_nistp224_points_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM
414 int ec_GFp_nistp224_precompute_mult(EC_GROUP *group, BN_CTX *ctx);
415 int ec_GFp_nistp224_have_precompute_mult(const EC_GROUP *group);

417 /* method functions in ecp_nistp256.c */
418 int ec_GFp_nistp256_group_init(EC_GROUP *group);
419 int ec_GFp_nistp256_group_set_curve(EC_GROUP *group, const BIGNUM *p, const BIGN
420 int ec_GFp_nistp256_point_get_affine_coordinates(const EC_GROUP *group, const EC
421 int ec_GFp_nistp256_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM *scalar
422 int ec_GFp_nistp256_points_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM
423 int ec_GFp_nistp256_precompute_mult(EC_GROUP *group, BN_CTX *ctx);
424 int ec_GFp_nistp256_have_precompute_mult(const EC_GROUP *group);

426 /* method functions in ecp_nistp521.c */
427 int ec_GFp_nistp521_group_init(EC_GROUP *group);
428 int ec_GFp_nistp521_group_set_curve(EC_GROUP *group, const BIGNUM *p, const BIGN
429 int ec_GFp_nistp521_point_get_affine_coordinates(const EC_GROUP *group, const EC
430 int ec_GFp_nistp521_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM *scalar
431 int ec_GFp_nistp521_points_mul(const EC_GROUP *group, EC_POINT *r, const BIGNUM
432 int ec_GFp_nistp521_precompute_mult(EC_GROUP *group, BN_CTX *ctx);
433 int ec_GFp_nistp521_have_precompute_mult(const EC_GROUP *group);

435 /* utility functions in ecp_nistputil.c */
436 void ec_GFp_nistp_points_make_affine_internal(size_t num, void *point_array,
437     size_t felem_size, void *tmp_felems,
438     void (*felem_one)(void *out),
439     int (*felem_is_zero)(const void *in),
440     void (*felem_assign)(void *out, const void *in),
441     void (*felem_square)(void *out, const void *in),
442     void (*felem_mul)(void *out, const void *in1, const void *in2),
443     void (*felem_inv)(void *out, const void *in),
444     void (*felem_contract)(void *out, const void *in));
445 void ec_GFp_nistp_recode_scalar_bits(unsigned char *sign, unsigned char *digit,
446 #endif
```

new/usr/src/lib/openssl/include/ech_locl.h

1

```
*****
3700 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/ech_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ecdh/ech_locl.h */
2 /* =====
3 * Copyright (c) 2000-2005 The OpenSSL Project. All rights reserved.
4 *
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6 * modification, are permitted provided that the following conditions
7 * are met:
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 #ifndef HEADER_ECH_LOCL_H
57 #define HEADER_ECH_LOCL_H
58
59 #include <openssl/ecdh.h>
60
61 #ifdef __cplusplus
```

new/usr/src/lib/openssl/include/ech_locl.h

2

```
62 extern "C" {
63 #endif
64
65 struct ecdh_method
66 {
67     const char *name;
68     int (*compute_key)(void *key, size_t outlen, const EC_POINT *pub_key, EC
69         void *(*KDF)(const void *in, size_t inlen, void *out,
70 #if 0
71     int (*init)(EC_KEY *eckey);
72     int (*finish)(EC_KEY *eckey);
73 #endif
74     int flags;
75     char *app_data;
76 };
77
78 /* If this flag is set the ECDH method is FIPS compliant and can be used
79 * in FIPS mode. This is set in the validated module method. If an
80 * application sets this flag in its own methods it is its responsibility
81 * to ensure the result is compliant.
82 */
83
84 #define ECDH_FLAG_FIPS_METHOD 0x1
85
86 typedef struct ecdh_data_st {
87     /* EC_KEY METH_DATA part */
88     int (*init)(EC_KEY *);
89     /* method specific part */
90     ENGINE *engine;
91     int flags;
92     const ECDH_METHOD *meth;
93     CRYPTO_EX_DATA ex_data;
94 } ECDH_DATA;
95
96 ECDH_DATA *ecdh_check(EC_KEY *);
97
98 #ifdef __cplusplus
99 }
100 #endif
101
102 #endif /* HEADER_ECH_LOCL_H */
```

new/usr/src/lib/openssl/include/ecs_locl.h

1

```
*****
4184 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/ecs_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ecdsa/ecs_locl.h */
2 /*
3  * Written by Nils Larsch for the OpenSSL project
4  */
5 /* =====
6  * Copyright (c) 2000-2005 The OpenSSL Project. All rights reserved.
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #ifndef HEADER_ECS_LOCL_H
60 #define HEADER_ECS_LOCL_H
```

new/usr/src/lib/openssl/include/ecs_locl.h

2

```
62 #include <openssl/ecdsa.h>

64 #ifdef __cplusplus
65 extern "C" {
66 #endif

68 struct ecdsa_method
69 {
70     const char *name;
71     ECDSA_SIG *(*ecdsa_do_sign)(const unsigned char *dgst, int dgst_len,
72                                 const BIGNUM *inv, const BIGNUM *rp, EC_KEY *eckey);
73     int (*ecdsa_sign_setup)(EC_KEY *eckey, BN_CTX *ctx, BIGNUM **kinv,
74                             BIGNUM **r);
75     int (*ecdsa_do_verify)(const unsigned char *dgst, int dgst_len,
76                             const ECDSA_SIG *sig, EC_KEY *eckey);
77 #if 0
78     int (*init)(EC_KEY *eckey);
79     int (*finish)(EC_KEY *eckey);
80 #endif
81     int flags;
82     char *app_data;
83 };

85 /* If this flag is set the ECDSA method is FIPS compliant and can be used
86  * in FIPS mode. This is set in the validated module method. If an
87  * application sets this flag in its own methods it is its responsibility
88  * to ensure the result is compliant.
89  */

91 #define ECDSA_FLAG_FIPS_METHOD 0x1

93 typedef struct ecdsa_data_st {
94     /* EC_KEY METH_DATA part */
95     int (*init)(EC_KEY *);
96     /* method (ECDSA) specific part */
97     ENGINE *engine;
98     int flags;
99     const ECDSA_METHOD *meth;
100     CRYPTO_EX_DATA ex_data;
101 } ECDSA_DATA;

103 /** ecdsa_check
104  * checks whether ECKEY->meth_data is a pointer to a ECDSA_DATA structure
105  * and if not it removes the old meth_data and creates a ECDSA_DATA structure.
106  * \param eckey pointer to a EC_KEY object
107  * \return pointer to a ECDSA_DATA structure
108  */
109 ECDSA_DATA *ecdsa_check(EC_KEY *eckey);

111 #ifdef __cplusplus
112 }
113 #endif

115 #endif /* HEADER_ECS_LOCL_H */
```

new/usr/src/lib/openssl/include/eng_int.h

1

```
*****
8295 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/eng_int.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/eng_int.h */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 1999-2001 The OpenSSL Project. All rights reserved.
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
58 /* =====
59 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
60 * ECDH support in OpenSSL originally developed by
61 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
```

new/usr/src/lib/openssl/include/eng_int.h

2

```
62 */
63
64 #ifndef HEADER_ENGINE_INT_H
65 #define HEADER_ENGINE_INT_H
66
67 #include "cryptlib.h"
68 /* Take public definitions from engine.h */
69 #include <openssl/engine.h>
70
71 #ifdef __cplusplus
72 extern "C" {
73 #endif
74
75 /* If we compile with this symbol defined, then both reference counts in the
76 * ENGINE structure will be monitored with a line of output on stderr for each
77 * change. This prints the engine's pointer address (truncated to unsigned int),
78 * "struct" or "funct" to indicate the reference type, the before and after
79 * reference count, and the file:line-number pair. The "engine_ref_debug"
80 * statements must come *after* the change. */
81 #ifdef ENGINE_REF_COUNT_DEBUG
82
83 #define engine_ref_debug(e, isfunct, diff) \
84     fprintf(stderr, "engine: %08x %s from %d to %d (%s:%d)\n", \
85             (unsigned int)(e), (isfunct ? "funct" : "struct"), \
86             ((isfunct) ? ((e)->funct_ref - (diff)) : ((e)->struct_ref - (diff)), \
87             ((isfunct) ? (e)->funct_ref : (e)->struct_ref), \
88             (__FILE__, __LINE__));
89
90 #else
91
92 #define engine_ref_debug(e, isfunct, diff)
93
94 #endif
95
96 /* Any code that will need cleanup operations should use these functions to
97 * register callbacks. ENGINE_cleanup() will call all registered callbacks in
98 * order. NB: both the "add" functions assume CRYPTO_LOCK_ENGINE to already be
99 * held (in "write" mode). */
100 typedef void (ENGINE_CLEANUP_CB)(void);
101 typedef struct st_engine_cleanup_item
102 {
103     ENGINE_CLEANUP_CB *cb;
104 } ENGINE_CLEANUP_ITEM;
105 DECLARE_STACK_OF(ENGINE_CLEANUP_ITEM)
106 void engine_cleanup_add_first(ENGINE_CLEANUP_CB *cb);
107 void engine_cleanup_add_last(ENGINE_CLEANUP_CB *cb);
108
109 /* We need stacks of ENGINES for use in eng_table.c */
110 DECLARE_STACK_OF(ENGINE)
111
112 /* If this symbol is defined then engine_table_select(), the function that is
113 * used by RSA, DSA (etc) code to select registered ENGINES, cache defaults and
114 * functional references (etc), will display debugging summaries to stderr. */
115 /* #define ENGINE_TABLE_DEBUG */
116
117 /* This represents an implementation table. Dependent code should instantiate it
118 * as a (ENGINE_TABLE *) pointer value set initially to NULL. */
119 typedef struct st_engine_table ENGINE_TABLE;
120 int engine_table_register(ENGINE_TABLE **table, ENGINE_CLEANUP_CB *cleanup,
121     ENGINE *e, const int *nids, int num_nids, int setdefault);
122 void engine_table_unregister(ENGINE_TABLE **table, ENGINE *e);
123 void engine_table_cleanup(ENGINE_TABLE **table);
124 #ifndef ENGINE_TABLE_DEBUG
125 ENGINE *engine_table_select(ENGINE_TABLE **table, int nid);
126 #else
127 ENGINE *engine_table_select_tmp(ENGINE_TABLE **table, int nid, const char *f, in
```

```

128 #define engine_table_select(t,n) engine_table_select_tmp(t,n, __FILE__, __LINE__)
129 #endif
130 typedef void (engine_table_doall_cb)(int nid, STACK_OF(ENGINE) *sk, ENGINE *def,
131 void engine_table_doall(ENGINE_TABLE *table, engine_table_doall_cb *cb, void *ar

133 /* Internal versions of API functions that have control over locking. These are
134 * used between C files when functionality needs to be shared but the caller may
135 * already be controlling of the CRYPTO_LOCK_ENGINE lock. */
136 int engine_unlocked_init(ENGINE *e);
137 int engine_unlocked_finish(ENGINE *e, int unlock_for_handlers);
138 int engine_free_util(ENGINE *e, int locked);

140 /* This function will reset all "set"able values in an ENGINE to NULL. This
141 * won't touch reference counts or ex_data, but is equivalent to calling all the
142 * ENGINE_set_***() functions with a NULL value. */
143 void engine_set_all_null(ENGINE *e);

145 /* NB: Bitwise OR-able values for the "flags" variable in ENGINE are now exposed
146 * in engine.h. */

148 /* Free up dynamically allocated public key methods associated with ENGINE */

150 void engine_pkey_meths_free(ENGINE *e);
151 void engine_pkey_asn1_meths_free(ENGINE *e);

153 /* This is a structure for storing implementations of various crypto
154 * algorithms and functions. */
155 struct engine_st
156 {
157     const char *id;
158     const char *name;
159     const RSA_METHOD *rsa_meth;
160     const DSA_METHOD *dsa_meth;
161     const DH_METHOD *dh_meth;
162     const ECDH_METHOD *ecdh_meth;
163     const ECDSA_METHOD *ecdsa_meth;
164     const RAND_METHOD *rand_meth;
165     const STORE_METHOD *store_meth;
166     /* Cipher handling is via this callback */
167     ENGINE_CIPHERS_PTR ciphers;
168     /* Digest handling is via this callback */
169     ENGINE_DIGESTS_PTR digests;
170     /* Public key handling via this callback */
171     ENGINE_PKEY_METHS_PTR pkey_meths;
172     /* ASN1 public key handling via this callback */
173     ENGINE_PKEY_ASN1_METHS_PTR pkey_asn1_meths;

175     ENGINE_GEN_INT_FUNC_PTR destroy;

177     ENGINE_GEN_INT_FUNC_PTR init;
178     ENGINE_GEN_INT_FUNC_PTR finish;
179     ENGINE_CTRL_FUNC_PTR ctrl;
180     ENGINE_LOAD_KEY_PTR load_privkey;
181     ENGINE_LOAD_KEY_PTR load_pubkey;

183     ENGINE_SSL_CLIENT_CERT_PTR load_ssl_client_cert;

185     const ENGINE_CMD_DEFN *cmd_defns;
186     int flags;
187     /* reference count on the structure itself */
188     int struct_ref;
189     /* reference count on usability of the engine type. NB: This
190     * controls the loading and initialisation of any functionality
191     * required by this engine, whereas the previous count is
192     * simply to cope with (de)allocation of this structure. Hence,
193     * running_ref <= struct_ref at all times. */

```

```

194     int funct_ref;
195     /* A place to store per-ENGINE data */
196     CRYPTO_EX_DATA ex_data;
197     /* Used to maintain the linked-list of engines. */
198     struct engine_st *prev;
199     struct engine_st *next;
200 };

202 #ifdef __cplusplus
203 }
204 #endif

206 #endif /* HEADER_ENGINE_INT_H */

```



```

*****
13925 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/evp_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* evp_locl.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
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18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
23 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
58 /* Macros to code block cipher wrappers */
59
60 /* Wrapper functions for each cipher mode */

```

```

63 #define BLOCK_CIPHER_ecb_loop() \
64     size_t i, bl; \
65     bl = ctx->cipher->block_size; \
66     if(inl < bl) return 1; \
67     inl -= bl; \
68     for(i=0; i <= inl; i+=bl)
69
70 #define BLOCK_CIPHER_func_ecb(cname, cprefix, kstruct, ksched) \
71 static int cname##_ecb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out, const uns
72 {\
73     BLOCK_CIPHER_ecb_loop() \
74     cprefix##_ecb_encrypt(in + i, out + i, &((kstruct *)ctx->cipher_
75     return 1; \
76 }
77
78 #define EVP_MAXCHUNK ((size_t)1<<(sizeof(long)*8-2))
79
80 #define BLOCK_CIPHER_func_ofb(cname, cprefix, cbits, kstruct, ksched) \
81 static int cname##_ofb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out, const uns
82 {\
83     while(inl>=EVP_MAXCHUNK)\
84     {\
85         cprefix##_ofb##cbits##_encrypt(in, out, (long)EVP_MAXCHUNK, &((kstru
86         inl-=EVP_MAXCHUNK; \
87         in +=EVP_MAXCHUNK; \
88         out+=EVP_MAXCHUNK; \
89     }\
90     if (inl)\
91         cprefix##_ofb##cbits##_encrypt(in, out, (long)inl, &((kstruct *)ctx-
92     return 1; \
93 }
94
95 #define BLOCK_CIPHER_func_cbc(cname, cprefix, kstruct, ksched) \
96 static int cname##_cbc_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out, const uns
97 {\
98     while(inl>=EVP_MAXCHUNK) \
99     {\
100         cprefix##_cbc_encrypt(in, out, (long)EVP_MAXCHUNK, &((kstruct *)ctx-
101         inl-=EVP_MAXCHUNK; \
102         in +=EVP_MAXCHUNK; \
103         out+=EVP_MAXCHUNK; \
104     }\
105     if (inl)\
106         cprefix##_cbc_encrypt(in, out, (long)inl, &((kstruct *)ctx->cipher_d
107     return 1; \
108 }
109
110 #define BLOCK_CIPHER_func_cfb(cname, cprefix, cbits, kstruct, ksched) \
111 static int cname##_cfb##cbits##_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
112 {\
113     size_t chunk=EVP_MAXCHUNK; \
114     if (cbits==1) chunk>>=3; \
115     if (inl<chunk) chunk=inl; \
116     while(inl && inl>=chunk) \
117     {\
118         cprefix##_cfb##cbits##_encrypt(in, out, (long)((cbits==1) && !(ctx->
119         inl-=chunk; \
120         in +=chunk; \
121         out+=chunk; \
122         if(inl<chunk) chunk=inl; \
123     }\
124     return 1; \
125 }
126
127 #define BLOCK_CIPHER_all_funcs(cname, cprefix, cbits, kstruct, ksched) \

```

```

128     BLOCK_CIPHER_func_cbc(cname, cprefix, kstruct, ksched) \
129     BLOCK_CIPHER_func_cfb(cname, cprefix, cbits, kstruct, ksched) \
130     BLOCK_CIPHER_func_ecb(cname, cprefix, kstruct, ksched) \
131     BLOCK_CIPHER_func_ofb(cname, cprefix, cbits, kstruct, ksched)

133 #define BLOCK_CIPHER_def1(cname, nmode, mode, MODE, kstruct, nid, block_size, \
134     key_len, iv_len, flags, init_key, cleanup, \
135     set_asn1, get_asn1, ctrl) \
136 static const EVP_CIPHER cname##_mode = { \
137     nid##_nmode, block_size, key_len, iv_len, \
138     flags | EVP_CIPH_##MODE##_MODE, \
139     init_key, \
140     cname##_mode##_cipher, \
141     cleanup, \
142     sizeof(kstruct), \
143     set_asn1, get_asn1, \
144     ctrl, \
145     NULL \
146 }; \
147 const EVP_CIPHER *EVP_##cname##_mode(void) { return &cname##_mode; }

149 #define BLOCK_CIPHER_def_cbc(cname, kstruct, nid, block_size, key_len, \
150     iv_len, flags, init_key, cleanup, set_asn1, \
151     get_asn1, ctrl) \
152 BLOCK_CIPHER_def1(cname, cbc, cbc, CBC, kstruct, nid, block_size, key_len, \
153     iv_len, flags, init_key, cleanup, set_asn1, get_asn1, ctrl)

155 #define BLOCK_CIPHER_def_cfb(cname, kstruct, nid, key_len, \
156     iv_len, cbits, flags, init_key, cleanup, \
157     set_asn1, get_asn1, ctrl) \
158 BLOCK_CIPHER_def1(cname, cfb##_cbits, cfb##_cbits, CFB, kstruct, nid, 1, \
159     key_len, iv_len, flags, init_key, cleanup, set_asn1, \
160     get_asn1, ctrl)

162 #define BLOCK_CIPHER_def_ofb(cname, kstruct, nid, key_len, \
163     iv_len, cbits, flags, init_key, cleanup, \
164     set_asn1, get_asn1, ctrl) \
165 BLOCK_CIPHER_def1(cname, ofb##_cbits, ofb, OFB, kstruct, nid, 1, \
166     key_len, iv_len, flags, init_key, cleanup, set_asn1, \
167     get_asn1, ctrl)

169 #define BLOCK_CIPHER_def_ecb(cname, kstruct, nid, block_size, key_len, \
170     flags, init_key, cleanup, set_asn1, \
171     get_asn1, ctrl) \
172 BLOCK_CIPHER_def1(cname, ecb, ecb, ECB, kstruct, nid, block_size, key_len, \
173     0, flags, init_key, cleanup, set_asn1, get_asn1, ctrl)

175 #define BLOCK_CIPHER_defs(cname, kstruct, \
176     nid, block_size, key_len, iv_len, cbits, flags, \
177     init_key, cleanup, set_asn1, get_asn1, ctrl) \
178 BLOCK_CIPHER_def_cbc(cname, kstruct, nid, block_size, key_len, iv_len, flags, \
179     init_key, cleanup, set_asn1, get_asn1, ctrl) \
180 BLOCK_CIPHER_def_cfb(cname, kstruct, nid, key_len, iv_len, cbits, \
181     flags, init_key, cleanup, set_asn1, get_asn1, ctrl) \
182 BLOCK_CIPHER_def_ofb(cname, kstruct, nid, key_len, iv_len, cbits, \
183     flags, init_key, cleanup, set_asn1, get_asn1, ctrl) \
184 BLOCK_CIPHER_def_ecb(cname, kstruct, nid, block_size, key_len, flags, \
185     init_key, cleanup, set_asn1, get_asn1, ctrl)

188 /*
189 #define BLOCK_CIPHER_defs(cname, kstruct, \
190     nid, block_size, key_len, iv_len, flags, \
191     init_key, cleanup, set_asn1, get_asn1, ctrl) \
192 static const EVP_CIPHER cname##_cbc = { \
193     nid##_cbc, block_size, key_len, iv_len, \

```

```

194     flags | EVP_CIPH_CBC_MODE, \
195     init_key, \
196     cname##_cbc_cipher, \
197     cleanup, \
198     sizeof(EVP_CIPHER_CTX)-sizeof((((EVP_CIPHER_CTX *)NULL)->c)) + \
199     sizeof((((EVP_CIPHER_CTX *)NULL)->c.kstruct)), \
200     set_asn1, get_asn1, \
201     ctrl, \
202     NULL \
203 }; \
204 const EVP_CIPHER *EVP_##cname##_cbc(void) { return &cname##_cbc; } \
205 static const EVP_CIPHER cname##_cfb = { \
206     nid##_cfb64, 1, key_len, iv_len, \
207     flags | EVP_CIPH_CFB_MODE, \
208     init_key, \
209     cname##_cfb_cipher, \
210     cleanup, \
211     sizeof(EVP_CIPHER_CTX)-sizeof((((EVP_CIPHER_CTX *)NULL)->c)) + \
212     sizeof((((EVP_CIPHER_CTX *)NULL)->c.kstruct)), \
213     set_asn1, get_asn1, \
214     ctrl, \
215     NULL \
216 }; \
217 const EVP_CIPHER *EVP_##cname##_cfb(void) { return &cname##_cfb; } \
218 static const EVP_CIPHER cname##_ofb = { \
219     nid##_ofb64, 1, key_len, iv_len, \
220     flags | EVP_CIPH_OFB_MODE, \
221     init_key, \
222     cname##_ofb_cipher, \
223     cleanup, \
224     sizeof(EVP_CIPHER_CTX)-sizeof((((EVP_CIPHER_CTX *)NULL)->c)) + \
225     sizeof((((EVP_CIPHER_CTX *)NULL)->c.kstruct)), \
226     set_asn1, get_asn1, \
227     ctrl, \
228     NULL \
229 }; \
230 const EVP_CIPHER *EVP_##cname##_ofb(void) { return &cname##_ofb; } \
231 static const EVP_CIPHER cname##_ecb = { \
232     nid##_ecb, block_size, key_len, iv_len, \
233     flags | EVP_CIPH_ECB_MODE, \
234     init_key, \
235     cname##_ecb_cipher, \
236     cleanup, \
237     sizeof(EVP_CIPHER_CTX)-sizeof((((EVP_CIPHER_CTX *)NULL)->c)) + \
238     sizeof((((EVP_CIPHER_CTX *)NULL)->c.kstruct)), \
239     set_asn1, get_asn1, \
240     ctrl, \
241     NULL \
242 }; \
243 const EVP_CIPHER *EVP_##cname##_ecb(void) { return &cname##_ecb; } \
244 */

246 #define IMPLEMENT_BLOCK_CIPHER(cname, kstruct, ksched, \
247     block_size, key_len, iv_len, cbits, \
248     flags, init_key, \
249     cleanup, set_asn1, get_asn1, ctrl) \
250 BLOCK_CIPHER_all_funcs(cname, cprefix, cbits, kstruct, ksched) \
251 BLOCK_CIPHER_defs(cname, kstruct, nid, block_size, key_len, iv_len, \
252     cbits, flags, init_key, cleanup, set_asn1, \
253     get_asn1, ctrl)

255 #define EVP_C_DATA(kstruct, ctx) ((kstruct *) (ctx)->cipher_data)

257 #define IMPLEMENT_CFB(cipher, cprefix, kstruct, ksched, keysize, cbits, iv_len) \
258 BLOCK_CIPHER_func_cfb(cipher##_keysize, cprefix, cbits, kstruct, ksched) \
259 BLOCK_CIPHER_def_cfb(cipher##_keysize, kstruct, \

```

```

260     NID_##cipher##_##keysize, keysize/8, iv_len, cbits,
261     0, cipher##_init_key, NULL, \
262     EVP_CIPHER_set_asn1_iv, \
263     EVP_CIPHER_get_asn1_iv, \
264     NULL)

266 struct evp_pkey_ctx_st
267 {
268     /* Method associated with this operation */
269     const EVP_PKEY_METHOD *pmeth;
270     /* Engine that implements this method or NULL if builtin */
271     ENGINE *engine;
272     /* Key: may be NULL */
273     EVP_PKEY *pkey;
274     /* Peer key for key agreement, may be NULL */
275     EVP_PKEY *peerkey;
276     /* Actual operation */
277     int operation;
278     /* Algorithm specific data */
279     void *data;
280     /* Application specific data */
281     void *app_data;
282     /* Keygen callback */
283     EVP_PKEY_gen_cb *pkey_gen_cb;
284     /* implementation specific keygen data */
285     int *keygen_info;
286     int keygen_info_count;
287     } /* EVP_PKEY_CTX */;

289 #define EVP_PKEY_FLAG_DYNAMIC 1

291 struct evp_pkey_method_st
292 {
293     int pkey_id;
294     int flags;

296     int (*init)(EVP_PKEY_CTX *ctx);
297     int (*copy)(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src);
298     void (*cleanup)(EVP_PKEY_CTX *ctx);

300     int (*paramgen_init)(EVP_PKEY_CTX *ctx);
301     int (*paramgen)(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey);

303     int (*keygen_init)(EVP_PKEY_CTX *ctx);
304     int (*keygen)(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey);

306     int (*sign_init)(EVP_PKEY_CTX *ctx);
307     int (*sign)(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
308                const unsigned char *tbs, size_t tbslen);

310     int (*verify_init)(EVP_PKEY_CTX *ctx);
311     int (*verify)(EVP_PKEY_CTX *ctx,
312                  const unsigned char *sig, size_t siglen,
313                  const unsigned char *tbs, size_t tbslen);

315     int (*verify_recover_init)(EVP_PKEY_CTX *ctx);
316     int (*verify_recover)(EVP_PKEY_CTX *ctx,
317                           unsigned char *rout, size_t *routlen,
318                           const unsigned char *sig, size_t siglen);

320     int (*signctx_init)(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx);
321     int (*signctx)(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
322                   EVP_MD_CTX *mctx);

324     int (*verifyctx_init)(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx);
325     int (*verifyctx)(EVP_PKEY_CTX *ctx, const unsigned char *sig, int siglen,

```

```

326     EVP_MD_CTX *mctx);

328     int (*encrypt_init)(EVP_PKEY_CTX *ctx);
329     int (*encrypt)(EVP_PKEY_CTX *ctx, unsigned char *out, size_t *outlen,
330                   const unsigned char *in, size_t inlen);

332     int (*decrypt_init)(EVP_PKEY_CTX *ctx);
333     int (*decrypt)(EVP_PKEY_CTX *ctx, unsigned char *out, size_t *outlen,
334                   const unsigned char *in, size_t inlen);

336     int (*derive_init)(EVP_PKEY_CTX *ctx);
337     int (*derive)(EVP_PKEY_CTX *ctx, unsigned char *key, size_t *keylen);

339     int (*ctrl)(EVP_PKEY_CTX *ctx, int type, int p1, void *p2);
340     int (*ctrl_str)(EVP_PKEY_CTX *ctx, const char *type, const char *value);

343     } /* EVP_PKEY_METHOD */;

345 void evp_pkey_set_cb_translate(BN_GENCB *cb, EVP_PKEY_CTX *ctx);

347 int PKCS5_v2_PBKDF2_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
348                               ASN1_TYPE *param,
349                               const EVP_CIPHER *c, const EVP_MD *md, int en_de);

351 #ifdef OPENSSL_FIPS

353 #ifdef OPENSSL_DOING_MAKEDEPEND
354 #undef SHA1_Init
355 #undef SHA1_Update
356 #undef SHA224_Init
357 #undef SHA256_Init
358 #undef SHA384_Init
359 #undef SHA512_Init
360 #undef DES_set_key_unchecked
361 #endif

363 #define RIPEMD160_Init private_RIPEMD160_Init
364 #define WHIRLPOOL_Init private_WHIRLPOOL_Init
365 #define MD5_Init private_MD5_Init
366 #define MD4_Init private_MD4_Init
367 #define MD2_Init private_MD2_Init
368 #define MDC2_Init private_MDC2_Init
369 #define SHA_Init private_SHA_Init
370 #define SHA1_Init private_SHA1_Init
371 #define SHA224_Init private_SHA224_Init
372 #define SHA256_Init private_SHA256_Init
373 #define SHA384_Init private_SHA384_Init
374 #define SHA512_Init private_SHA512_Init

376 #define BF_set_key private_BF_set_key
377 #define CAST_set_key private_CAST_set_key
378 #define idea_set_encrypt_key private_idea_set_encrypt_key
379 #define SEED_set_key private_SEED_set_key
380 #define RC2_set_key private_RC2_set_key
381 #define RC4_set_key private_RC4_set_key
382 #define DES_set_key_unchecked private_DES_set_key_unchecked
383 #define Camellia_set_key private_Camellia_set_key

385 #endif

```

new/usr/src/lib/openssl/include/ext_dat.h

1

```
*****
4608 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/ext_dat.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ext_dat.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999-2004 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57 /*
58 /* This file contains a table of "standard" extensions */

60 extern X509V3_EXT_METHOD v3_bcons, v3_nscert, v3_key_usage, v3_ext_ku;
61 extern X509V3_EXT_METHOD v3_pkey_usage_period, v3_sxnet, v3_info, v3_sinfo;
```

new/usr/src/lib/openssl/include/ext_dat.h

2

```
62 extern X509V3_EXT_METHOD v3_ns_ia5_list[], v3_alt[], v3_skey_id, v3_akey_id;
63 extern X509V3_EXT_METHOD v3_crl_num, v3_crl_reason, v3_crl_invdate;
64 extern X509V3_EXT_METHOD v3_delta_crl, v3_cpols, v3_crlid, v3_freshest_crl;
65 extern X509V3_EXT_METHOD v3_ocsp_nonce, v3_ocsp_accresp, v3_ocsp_acutoff;
66 extern X509V3_EXT_METHOD v3_ocsp_crlid, v3_ocsp_nocheck, v3_ocsp_serviceloc;
67 extern X509V3_EXT_METHOD v3_crl_hold, v3_pci;
68 extern X509V3_EXT_METHOD v3_policy_mappings, v3_policy_constraints;
69 extern X509V3_EXT_METHOD v3_name_constraints, v3_inhibit_anyp, v3_idp;
70 extern X509V3_EXT_METHOD v3_addr, v3_asid;

72 /* This table will be searched using OBJ_bsearch so it *must* kept in
73  * order of the ext_nid values.
74  */

76 static const X509V3_EXT_METHOD *standard_exts[] = {
77  &v3_nscert,
78  &v3_ns_ia5_list[0],
79  &v3_ns_ia5_list[1],
80  &v3_ns_ia5_list[2],
81  &v3_ns_ia5_list[3],
82  &v3_ns_ia5_list[4],
83  &v3_ns_ia5_list[5],
84  &v3_ns_ia5_list[6],
85  &v3_skey_id,
86  &v3_key_usage,
87  &v3_pkey_usage_period,
88  &v3_alt[0],
89  &v3_alt[1],
90  &v3_bcons,
91  &v3_crl_num,
92  &v3_cpols,
93  &v3_akey_id,
94  &v3_crlid,
95  &v3_ext_ku,
96  &v3_delta_crl,
97  &v3_crl_reason,
98  #ifndef OPENSSL_NO_OCSP
99  &v3_crl_invdate,
100 #endif
101  &v3_sxnet,
102  &v3_info,
103  #ifndef OPENSSL_NO_RFC3779
104  &v3_addr,
105  &v3_asid,
106 #endif
107  #ifndef OPENSSL_NO_OCSP
108  &v3_ocsp_nonce,
109  &v3_ocsp_crlid,
110  &v3_ocsp_accresp,
111  &v3_ocsp_nocheck,
112  &v3_ocsp_acutoff,
113  &v3_ocsp_serviceloc,
114 #endif
115  &v3_sinfo,
116  &v3_policy_constraints,
117  #ifndef OPENSSL_NO_OCSP
118  &v3_crl_hold,
119 #endif
120  &v3_pci,
121  &v3_name_constraints,
122  &v3_policy_mappings,
123  &v3_inhibit_anyp,
124  &v3_idp,
125  &v3_alt[2],
126  &v3_freshest_crl,
127  };
```

new/usr/src/lib/openssl/include/ext_dat.h

3

```
129 /* Number of standard extensions */
```

```
131 #define STANDARD_EXTENSION_COUNT (sizeof(standard_exts)/sizeof(X509V3_EXT_METHOD
```

new/usr/src/lib/openssl/include/hw_pk11_err.h

1

```
*****
13663 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/hw_pk11_err.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
3  * Use is subject to license terms.
4  */

6 /* crypto/engine/hw_pk11_err.h */
7 /*
8  * This product includes software developed by the OpenSSL Project for
9  * use in the OpenSSL Toolkit (http://www.openssl.org/).
10 *
11 * This project also referenced hw_pkcs11-0.9.7b.patch written by
12 * Afchine Madjlessi.
13 */
14 /*
15 * =====
16 * Copyright (c) 2000-2001 The OpenSSL Project. All rights reserved.
17 *
18 * Redistribution and use in source and binary forms, with or without
19 * modification, are permitted provided that the following conditions
20 * are met:
21 *
22 * 1. Redistributions of source code must retain the above copyright
23 * notice, this list of conditions and the following disclaimer.
24 *
25 * 2. Redistributions in binary form must reproduce the above copyright
26 * notice, this list of conditions and the following disclaimer in
27 * the documentation and/or other materials provided with the
28 * distribution.
29 *
30 * 3. All advertising materials mentioning features or use of this
31 * software must display the following acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
34 *
35 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
36 * endorse or promote products derived from this software without
37 * prior written permission. For written permission, please contact
38 * licensing@OpenSSL.org.
39 *
40 * 5. Products derived from this software may not be called "OpenSSL"
41 * nor may "OpenSSL" appear in their names without prior written
42 * permission of the OpenSSL Project.
43 *
44 * 6. Redistributions of any form whatsoever must retain the following
45 * acknowledgment:
46 * "This product includes software developed by the OpenSSL Project
47 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
48 *
49 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT ''AS IS'' AND ANY
50 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
51 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
52 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
53 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
54 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
55 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
56 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
57 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
58 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
59 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
60 * OF THE POSSIBILITY OF SUCH DAMAGE.
61 * =====
```

new/usr/src/lib/openssl/include/hw_pk11_err.h

2

```
62 *
63 * This product includes cryptographic software written by Eric Young
64 * (eay@cryptsoft.com). This product includes software written by Tim
65 * Hudson (tjh@cryptsoft.com).
66 *
67 */

69 #ifndef HW_PK11_ERR_H
70 #define HW_PK11_ERR_H

72 void ERR_pk11_error(int function, int reason, char *file, int line);
73 void PK11err_add_data(int function, int reason, CK_RV rv);
74 #define PK11err(f, r) ERR_pk11_error((f), (r), __FILE__, __LINE__)

76 /* Error codes for the PK11 functions. */

78 /* Function codes. */

80 #define PK11_F_INIT 100
81 #define PK11_F_FINISH 101
82 #define PK11_F_DESTROY 102
83 #define PK11_F_CTRL 103
84 #define PK11_F_RSA_INIT 104
85 #define PK11_F_RSA_FINISH 105
86 #define PK11_F_GET_PUB_RSA_KEY 106
87 #define PK11_F_GET_PRIV_RSA_KEY 107
88 #define PK11_F_RSA_GEN_KEY 108
89 #define PK11_F_RSA_PUB_ENC 109
90 #define PK11_F_RSA_PRIV_ENC 110
91 #define PK11_F_RSA_PUB_DEC 111
92 #define PK11_F_RSA_PRIV_DEC 112
93 #define PK11_F_RSA_SIGN 113
94 #define PK11_F_RSA_VERIFY 114
95 #define PK11_F_RAND_ADD 115
96 #define PK11_F_RAND_BYTES 116
97 #define PK11_F_GET_SESSION 117
98 #define PK11_F_FREE_SESSION 118
99 #define PK11_F_LOAD_PUBKEY 119
100 #define PK11_F_LOAD_PRIVKEY 120
101 #define PK11_F_RSA_PUB_ENC_LOW 121
102 #define PK11_F_RSA_PRIV_ENC_LOW 122
103 #define PK11_F_RSA_PUB_DEC_LOW 123
104 #define PK11_F_RSA_PRIV_DEC_LOW 124
105 #define PK11_F_DSA_SIGN 125
106 #define PK11_F_DSA_VERIFY 126
107 #define PK11_F_DSA_INIT 127
108 #define PK11_F_DSA_FINISH 128
109 #define PK11_F_GET_PUB_DSA_KEY 129
110 #define PK11_F_GET_PRIV_DSA_KEY 130
111 #define PK11_F_DH_INIT 131
112 #define PK11_F_DH_FINISH 132
113 #define PK11_F_MOD_EXP_DH 133
114 #define PK11_F_GET_DH_KEY 134
115 #define PK11_F_FREE_ALL_SESSIONS 135
116 #define PK11_F_SETUP_SESSION 136
117 #define PK11_F_DESTROY_OBJECT 137
118 #define PK11_F_CIPHER_INIT 138
119 #define PK11_F_CIPHER_DO_CIPHER 139
120 #define PK11_F_GET_CIPHER_KEY 140
121 #define PK11_F_DIGEST_INIT 141
122 #define PK11_F_DIGEST_UPDATE 142
123 #define PK11_F_DIGEST_FINAL 143
124 #define PK11_F_CHOOSE_SLOT 144
125 #define PK11_F_CIPHER_FINAL 145
126 #define PK11_F_LIBRARY_INIT 146
127 #define PK11_F_LOAD 147
```

```

128 #define PK11_F_DH_GEN_KEY 148
129 #define PK11_F_DH_COMP_KEY 149
130 #define PK11_F_DIGEST_COPY 150
131 #define PK11_F_CIPHER_CLEANUP 151
132 #define PK11_F_ACTIVE_ADD 152
133 #define PK11_F_ACTIVE_DELETE 153
134 #define PK11_F_CHECK_HW_MECHANISMS 154
135 #define PK11_F_INIT_SYMMETRIC 155
136 #define PK11_F_ADD_AES_CTR_NIDS 156
137 #define PK11_F_INIT_ALL_LOCKS 157
138 #define PK11_F_RETURN_SESSION 158

140 /* Reason codes. */
141 #define PK11_R_ALREADY_LOADED 100
142 #define PK11_R_DSO_FAILURE 101
143 #define PK11_R_NOT_LOADED 102
144 #define PK11_R_PASSED_NULL_PARAMETER 103
145 #define PK11_R_COMMAND_NOT_IMPLEMENTED 104
146 #define PK11_R_INITIALIZE 105
147 #define PK11_R_FINALIZE 106
148 #define PK11_R_GETINFO 107
149 #define PK11_R_GETSLOTLIST 108
150 #define PK11_R_NO_MODULUS_OR_NO_EXPONENT 109
151 #define PK11_R_ATTRIBUT_SENSITIVE_OR_INVALID 110
152 #define PK11_R_GETATTRIBUTVALUE 111
153 #define PK11_R_NO_MODULUS 112
154 #define PK11_R_NO_EXPONENT 113
155 #define PK11_R_FINDOBJECTSINIT 114
156 #define PK11_R_FINDOBJECTS 115
157 #define PK11_R_FINDOBJECTSFINAL 116
158 #define PK11_R_CREATEOBJECT 118
159 #define PK11_R_DESTROYOBJECT 119
160 #define PK11_R_OPENSESSION 120
161 #define PK11_R_CLOSESESSION 121
162 #define PK11_R_ENCRYPTINIT 122
163 #define PK11_R_ENCRYPT 123
164 #define PK11_R_SIGNINIT 124
165 #define PK11_R_SIGN 125
166 #define PK11_R_DECRYPTINIT 126
167 #define PK11_R_DECRYPT 127
168 #define PK11_R_VERIFYINIT 128
169 #define PK11_R_VERIFY 129
170 #define PK11_R_VERIFYRECOVERINIT 130
171 #define PK11_R_VERIFYRECOVER 131
172 #define PK11_R_GEN_KEY 132
173 #define PK11_R_SEEDRANDOM 133
174 #define PK11_R_GENERATERANDOM 134
175 #define PK11_R_INVALID_MESSAGE_LENGTH 135
176 #define PK11_R_UNKNOWN_ALGORITHM_TYPE 136
177 #define PK11_R_UNKNOWN_ASN1_OBJECT_ID 137
178 #define PK11_R_UNKNOWN_PADDING_TYPE 138
179 #define PK11_R_PADDING_CHECK_FAILED 139
180 #define PK11_R_DIGEST_TOO_BIG 140
181 #define PK11_R_MALLOC_FAILURE 141
182 #define PK11_R_CTRL_COMMAND_NOT_IMPLEMENTED 142
183 #define PK11_R_DATA_GREATER_THAN_MOD_LEN 143
184 #define PK11_R_DATA_TOO_LARGE_FOR_MODULUS 144
185 #define PK11_R_MISSING_KEY_COMPONENT 145
186 #define PK11_R_INVALID_SIGNATURE_LENGTH 146
187 #define PK11_R_INVALID_DSA_SIGNATURE_R 147
188 #define PK11_R_INVALID_DSA_SIGNATURE_S 148
189 #define PK11_R_INCONSISTENT_KEY 149
190 #define PK11_R_ENCRYPTUPDATE 150
191 #define PK11_R_DECRYPTUPDATE 151
192 #define PK11_R_DIGESTINIT 152
193 #define PK11_R_DIGESTUPDATE 153

```

```

194 #define PK11_R_DIGESTFINAL 154
195 #define PK11_R_ENCRYPTFINAL 155
196 #define PK11_R_DECRYPTFINAL 156
197 #define PK11_R_NO_PRNG_SUPPORT 157
198 #define PK11_R_GETTOKENINFO 158
199 #define PK11_R_DERIVEKEY 159
200 #define PK11_R_GET_OPERATION_STATE 160
201 #define PK11_R_SET_OPERATION_STATE 161
202 #define PK11_R_INVALID_HANDLE 162
203 #define PK11_R_KEY_OR_IV_LEN_PROBLEM 163
204 #define PK11_R_INVALID_OPERATION_TYPE 164
205 #define PK11_R_ADD_NID_FAILED 165
206 #define PK11_R_ATFORK_FAILED 166

208 /* max byte length of a symmetric key we support */
209 #define PK11_KEY_LEN_MAX 32

211 /*
212  * This structure encapsulates all reusable information for a PKCS#11
213  * session. A list of these objects is created on behalf of the
214  * calling application using an on-demand method. Each operation
215  * type (see PK11_OPTYPE below) has its own per-process list.
216  * Each of the lists is basically a cache for faster PKCS#11 object
217  * access to avoid expensive C_Find{,Init,Final}Object() calls.
218  *
219  * When a new request comes in, an object will be taken from the list
220  * (if there is one) or a new one is created to handle the request
221  * (if the list is empty). See pk11_get_session() on how it is done.
222  */
223 typedef struct PK11_st_SESSION
224 {
225     struct PK11_st_SESSION *next;
226     CK_SESSION_HANDLE session; /* PK11 session handle */
227     pid_t pid; /* Current process ID */
228     union
229     {
230 #ifndef OPENSSL_NO_RSA
231         struct
232         {
233             CK_OBJECT_HANDLE rsa_pub_key; /* pub handle */
234             CK_OBJECT_HANDLE rsa_priv_key; /* priv handle */
235             RSA *rsa_pub; /* pub key addr */
236             BIGNUM *rsa_n_num; /* pub modulus */
237             BIGNUM *rsa_e_num; /* pub exponent */
238             RSA *rsa_priv; /* priv key addr */
239             BIGNUM *rsa_d_num; /* priv exponent */
240         } u_RSA;
241 #endif /* OPENSSL_NO_RSA */
242 #ifndef OPENSSL_NO_DSA
243         struct
244         {
245             CK_OBJECT_HANDLE dsa_pub_key; /* pub handle */
246             CK_OBJECT_HANDLE dsa_priv_key; /* priv handle */
247             DSA *dsa_pub; /* pub key addr */
248             BIGNUM *dsa_n_num; /* pub modulus */
249             DSA *dsa_priv; /* priv key addr */
250             BIGNUM *dsa_priv_num; /* priv key */
251         } u_DSA;
252 #endif /* OPENSSL_NO_DSA */
253 #ifndef OPENSSL_NO_DH
254         struct
255         {
256             CK_OBJECT_HANDLE dh_key; /* key handle */
257             DH *dh; /* dh key addr */
258             BIGNUM *dh_priv_num; /* priv dh key */
259         } u_DH;
260 #endif /* OPENSSL_NO_DH */
261     };
262 } PK11_SESSION;

```

```

260 #endif /* OPENSSSL_NO_DH */
261     struct
262     {
263         CK_OBJECT_HANDLE cipher_key; /* key handle */
264         unsigned char key[PK11_KEY_LEN_MAX];
265         int key_len; /* priv key len */
266         int encrypt; /* 1/0 enc/decr */
267     } u_cipher;
268     } opdata_u;
269 } PK11_SESSION;

271 #define opdata_rsa_pub_key opdata_u.u_RSA.rsa_pub_key
272 #define opdata_rsa_priv_key opdata_u.u_RSA.rsa_priv_key
273 #define opdata_rsa_pub opdata_u.u_RSA.rsa_pub
274 #define opdata_rsa_priv opdata_u.u_RSA.rsa_priv
275 #define opdata_rsa_n_num opdata_u.u_RSA.rsa_n_num
276 #define opdata_rsa_e_num opdata_u.u_RSA.rsa_e_num
277 #define opdata_rsa_d_num opdata_u.u_RSA.rsa_d_num
278 #define opdata_dsa_pub_key opdata_u.u_DSA.dsa_pub_key
279 #define opdata_dsa_priv_key opdata_u.u_DSA.dsa_priv_key
280 #define opdata_dsa_pub opdata_u.u_DSA.dsa_pub
281 #define opdata_dsa_pub_num opdata_u.u_DSA.dsa_pub_num
282 #define opdata_dsa_priv opdata_u.u_DSA.dsa_priv
283 #define opdata_dsa_priv_num opdata_u.u_DSA.dsa_priv_num
284 #define opdata_dh_key opdata_u.u_DH.dh_key
285 #define opdata_dh opdata_u.u_DH.dh
286 #define opdata_dh_priv_num opdata_u.u_DH.dh_priv_num
287 #define opdata_cipher_key opdata_u.u_cipher.cipher_key
288 #define opdata_key opdata_u.u_cipher.key
289 #define opdata_key_len opdata_u.u_cipher.key_len
290 #define opdata_encrypt opdata_u.u_cipher.encrypt

292 /*
293  * We have 3 different groups of operation types:
294  * 1) asymmetric operations
295  * 2) random operations
296  * 3) symmetric and digest operations
297  *
298  * This division into groups stems from the fact that it's common that hardware
299  * providers may support operations from one group only. For example, hardware
300  * providers on UltraSPARC T2, n2rng(7d), ncp(7d), and n2cp(7d), each support
301  * only a single group of operations.
302  *
303  * For every group a different slot can be chosen. That means that we must have
304  * at least 3 different lists of cached PKCS#11 sessions since sessions from
305  * different groups may be initialized in different slots.
306  *
307  * To provide locking granularity in multithreaded environment, the groups are
308  * further splitted into types with each type having a separate session cache.
309  */
310 typedef enum PK11_OPTYPE_ENUM
311 {
312     OP_RAND,
313     OP_RSA,
314     OP_DSA,
315     OP_DH,
316     OP_CIPHER,
317     OP_DIGEST,
318     OP_MAX
319 } PK11_OPTYPE;

321 /*
322  * This structure contains the heads of the lists forming the object caches
323  * and locks associated with the lists.
324  */
325 typedef struct PK11_st_CACHE

```

```

326     {
327         PK11_SESSION *head;
328         pthread_mutex_t *lock;
329     } PK11_CACHE;

331 /* structure for tracking handles of asymmetric key objects */
332 typedef struct PK11_active_st
333 {
334     CK_OBJECT_HANDLE h;
335     unsigned int refcnt;
336     struct PK11_active_st *prev;
337     struct PK11_active_st *next;
338 } PK11_active;

340 extern pthread_mutex_t *find_lock[];
341 extern PK11_active *active_list[];

343 #define LOCK_OBJSTORE(alg_type) \
344     (void) pthread_mutex_lock(find_lock[alg_type])
345 #define UNLOCK_OBJSTORE(alg_type) \
346     (void) pthread_mutex_unlock(find_lock[alg_type])

348 extern PK11_SESSION *pk11_get_session(PK11_OPTYPE optype);
349 extern void pk11_return_session(PK11_SESSION *sp, PK11_OPTYPE optype);

351 #ifndef OPENSSSL_NO_RSA
352 extern int pk11_destroy_rsa_key_objects(PK11_SESSION *session);
353 extern int pk11_destroy_rsa_object_pub(PK11_SESSION *sp, CK_BBOOL uselock);
354 extern int pk11_destroy_rsa_object_priv(PK11_SESSION *sp, CK_BBOOL uselock);
355 extern EVP_PKEY *pk11_load_privkey(ENGINE *e, const char *pubkey_file,
356     UI_METHOD *ui_method, void *callback_data);
357 extern EVP_PKEY *pk11_load_pubkey(ENGINE *e, const char *pubkey_file,
358     UI_METHOD *ui_method, void *callback_data);
359 extern RSA_METHOD *PK11_RSA(void);
360 #endif /* OPENSSSL_NO_RSA */
361 #ifndef OPENSSSL_NO_DSA
362 extern int pk11_destroy_dsa_key_objects(PK11_SESSION *session);
363 extern int pk11_destroy_dsa_object_pub(PK11_SESSION *sp, CK_BBOOL uselock);
364 extern int pk11_destroy_dsa_object_priv(PK11_SESSION *sp, CK_BBOOL uselock);
365 extern DSA_METHOD *PK11_DSA(void);
366 #endif /* OPENSSSL_NO_DSA */
367 #ifndef OPENSSSL_NO_DH
368 extern int pk11_destroy_dh_key_objects(PK11_SESSION *session);
369 extern int pk11_destroy_dh_object(PK11_SESSION *sp, CK_BBOOL uselock);
370 extern DH_METHOD *PK11_DH(void);
371 #endif /* OPENSSSL_NO_DH */

373 extern CK_FUNCTION_LIST_PTR pFuncList;

375 #endif /* HW_PK11_ERR_H */

```


new/usr/src/lib/openssl/include/kssl_lcl.h

1

```
*****
3439 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/kssl_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/kssl.h - mode: C; c-file-style: "eay" -.- */
2 /* Written by Vern Staats <staatsvr@asc.hpc.mil> for the OpenSSL project 2000.
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
16 * notice, this list of conditions and the following disclaimer in
17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
23 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26 * endorse or promote products derived from this software without
27 * prior written permission. For written permission, please contact
28 * licensing@OpenSSL.org.
29 *
30 * 5. Products derived from this software may not be called "OpenSSL"
31 * nor may "OpenSSL" appear in their names without prior written
32 * permission of the OpenSSL Project.
33 *
34 * 6. Redistributions of any form whatsoever must retain the following
35 * acknowledgment:
36 * "This product includes software developed by the OpenSSL Project
37 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #ifndef KSSL_LCL_H
60 #define KSSL_LCL_H
```

new/usr/src/lib/openssl/include/kssl_lcl.h

2

```
62 #include <openssl/kssl.h>

64 #ifndef OPENSSL_NO_KRB5

66 #ifdef __cplusplus
67 extern "C" {
68 #endif

70 /* Private (internal to OpenSSL) */
71 void print_krb5_data(char *label, krb5_data *kdata);
72 void print_krb5_authdata(char *label, krb5_authdata **adata);
73 void print_krb5_keyblock(char *label, krb5_keyblock *keyblk);

75 char *kstring(char *string);
76 char *knumber(int len, krb5_octet *contents);

78 const EVP_CIPHER *kssl_map_enc(krb5_etype enctype);

80 int kssl_keytab_is_available(KSSL_CTX *kssl_ctx);
81 int kssl_tgt_is_available(KSSL_CTX *kssl_ctx);

83 #ifdef __cplusplus
84 }
85 #endif
86 #endif /* OPENSSL_NO_KRB5 */
87 #endif /* KSSL_LCL_H */
```

new/usr/src/lib/openssl/include/md32_common.h

1

```
*****
12522 Fri May 30 18:31:15 2014
new/usr/src/lib/openssl/include/md32_common.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/md32_common.h */
2 /* =====
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45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 */
50
52 /*
53 * This is a generic 32 bit "collector" for message digest algorithms.
54 * Whenever needed it collects input character stream into chunks of
55 * 32 bit values and invokes a block function that performs actual hash
56 * calculations.
57 *
58 * Porting guide.
59 *
60 * Obligatory macros:
```

new/usr/src/lib/openssl/include/md32_common.h

2

```
62 * DATA_ORDER_IS_BIG_ENDIAN or DATA_ORDER_IS_LITTLE_ENDIAN
63 * this macro defines byte order of input stream.
64 * HASH_CBLOCK
65 * size of a unit chunk HASH_BLOCK operates on.
66 * HASH_LONG
67 * has to be at least 32 bit wide, if it's wider, then
68 * HASH_LONG_LOG2 "has to" be defined along
69 * HASH_CTX
70 * context structure that at least contains following
71 * members:
72 * typedef struct {
73 *     ...
74 *     HASH_LONG      Nl,Nh;
75 *     either {
76 *     HASH_LONG      data[HASH_LBLOCK];
77 *     unsigned char   data[HASH_CBLOCK];
78 *     };
79 *     unsigned int    num;
80 *     ...
81 * } HASH_CTX;
82 * data[] vector is expected to be zeroed upon first call to
83 * HASH_UPDATE.
84 * HASH_UPDATE
85 * name of "Update" function, implemented here.
86 * HASH_TRANSFORM
87 * name of "Transform" function, implemented here.
88 * HASH_FINAL
89 * name of "Final" function, implemented here.
90 * HASH_BLOCK_DATA_ORDER
91 * name of "block" function capable of treating *unaligned* input
92 * message in original (data) byte order, implemented externally.
93 * HASH_MAKE_STRING
94 * macro converging context variables to an ASCII hash string.
95 *
96 * MD5 example:
97 *
98 * #define DATA_ORDER_IS_LITTLE_ENDIAN
99 *
100 * #define HASH_LONG      MD5_LONG
101 * #define HASH_LONG_LOG2 MD5_LONG_LOG2
102 * #define HASH_CTX      MD5_CTX
103 * #define HASH_CBLOCK    MD5_CBLOCK
104 * #define HASH_UPDATE    MD5_Update
105 * #define HASH_TRANSFORM MD5_Transform
106 * #define HASH_FINAL     MD5_Final
107 * #define HASH_BLOCK_DATA_ORDER md5_block_data_order
108 *
109 * <appro@fy.chalmers.se>
110 */

112 #if !defined(DATA_ORDER_IS_BIG_ENDIAN) && !defined(DATA_ORDER_IS_LITTLE_ENDIAN)
113 #error "DATA_ORDER must be defined!"
114 #endif

116 #ifndef HASH_CBLOCK
117 #error "HASH_CBLOCK must be defined!"
118 #endif
119 #ifndef HASH_LONG
120 #error "HASH_LONG must be defined!"
121 #endif
122 #ifndef HASH_CTX
123 #error "HASH_CTX must be defined!"
124 #endif

126 #ifndef HASH_UPDATE
127 #error "HASH_UPDATE must be defined!"
```

```

128 #endif
129 #ifndef HASH_TRANSFORM
130 #error "HASH_TRANSFORM must be defined!"
131 #endif
132 #ifndef HASH_FINAL
133 #error "HASH_FINAL must be defined!"
134 #endif

136 #ifndef HASH_BLOCK_DATA_ORDER
137 #error "HASH_BLOCK_DATA_ORDER must be defined!"
138 #endif

140 /*
141  * Engage compiler specific rotate intrinsic function if available.
142  */
143 #undef ROTATE
144 #ifndef PEDANTIC
145 # if defined(_MSC_VER) || defined(__ICC)
146 #  define ROTATE(a,n) _lrotl(a,n)
147 # elif defined(__MWERKS__)
148 #  define ROTATE(a,n) _rlnw(a,n,0,31)
149 #  define ROTATE(a,n) _rlnw(a,n,0,31)
150 # elif defined(__MC68K__)
151 #  /* Motorola specific tweak. <appro@fy.chalmers.se> */
152 #  define ROTATE(a,n) ( n<24 ? _rol(a,n) : _ror(a,32-n) )
153 # else
154 #  define ROTATE(a,n) _rol(a,n)
155 # endif
156 # elif defined(__GNUC__) && __GNUC__>=2 && !defined(OPENSSL_NO_ASM) && !defined(
157 # /*
158  * Some GNU C inline assembler templates. Note that these are
159  * rotates by *constant* number of bits! But that's exactly
160  * what we need here...
161  *
162  * <appro@fy.chalmers.se>
163 # if defined(__i386) || defined(__i386__) || defined(__x86_64) || defined(__x86
164 #  define ROTATE(a,n) ({ register unsigned int ret; \
165 #    asm ( \
166 #      "roll %1,%0" \
167 #      : "=r"(ret) \
168 #      : "I"(n), "0"((unsigned int)(a)) \
169 #      : "cc"); \
170 #    ret; \
171 #  })
172 # elif defined(_ARCH_PPC) || defined(_ARCH_PPC64) || \
173 #   defined(__powerpc) || defined(__ppc__) || defined(__powerpc64__)
174 #  define ROTATE(a,n) ({ register unsigned int ret; \
175 #    asm ( \
176 #      "rlnw %0,%1,%2,0,31" \
177 #      : "=r"(ret) \
178 #      : "r"(a), "I"(n)); \
179 #    ret; \
180 #  })
181 # elif defined(__s390x__)
182 #  define ROTATE(a,n) ({ register unsigned int ret; \
183 #    asm ("rll %0,%1,%2" \
184 #      : "=r"(ret) \
185 #      : "r"(a), "I"(n)); \
186 #    ret; \
187 #  })
188 # endif
189 #endif
190 #endif /* PEDANTIC */

192 #ifndef ROTATE
193 #define ROTATE(a,n) (((a)<(n))|(((a)&0xffffffff)>>(32-(n))))

```

```

194 #endif

196 #if defined(DATA_ORDER_IS_BIG_ENDIAN)

198 #ifndef PEDANTIC
199 # if defined(__GNUC__) && __GNUC__>=2 && !defined(OPENSSL_NO_ASM) && !defined(OP
200 #  if ((defined(__i386) || defined(__i386__)) && !defined(I386_ONLY)) || \
201 #    (defined(__x86_64) || defined(__x86_64__))
202 #  if !defined(B_ENDIAN)
203 #  /*
204   * This gives ~30-40% performance improvement in SHA-256 compiled
205   * with gcc [on P4]. Well, first macro to be frank. We can pull
206   * this trick on x86* platforms only, because these CPUs can fetch
207   * unaligned data without raising an exception.
208   */
209 #  define HOST_c2l(c,l) ({ unsigned int r=((const unsigned int *) (c)); \
210 #    asm ("bswapl %0":"=r"(r):"0"(r)); \
211 #    (c)+=4; (l)=r; })
212 #  define HOST_l2c(l,c) ({ unsigned int r=(l); \
213 #    asm ("bswapl %0":"=r"(r):"0"(r)); \
214 #    *((unsigned int *) (c))=r; (c)+=4; r; })
215 #  endif
216 #  endif
217 #  endif
218 #  endif
219 # if defined(__s390__) || defined(__s390x__)
220 #  define HOST_c2l(c,l) {(l)=*((const unsigned int *) (c)), (c)+=4, (l)}
221 #  define HOST_l2c(l,c) {*((unsigned int *) (c))=(l), (c)+=4, (l)}
222 #  endif

224 #ifndef HOST_c2l
225 #define HOST_c2l(c,l) (l = (((unsigned long) (*(c++))) << 24), \
226 #   l |= (((unsigned long) (*(c++))) << 16), \
227 #   l |= (((unsigned long) (*(c++))) << 8), \
228 #   l |= (((unsigned long) (*(c++))) << 0), \
229 #   l)
230 #endif
231 #ifndef HOST_l2c
232 #define HOST_l2c(l,c) (*(c++)=(unsigned char) (((l)>>24)&0xff), \
233 #   *(c++)=(unsigned char) (((l)>>16)&0xff), \
234 #   *(c++)=(unsigned char) (((l)>>8)&0xff), \
235 #   *(c++)=(unsigned char) ((l)&0xff), \
236 #   l)
237 #endif

239 #elif defined(DATA_ORDER_IS_LITTLE_ENDIAN)

241 #ifndef PEDANTIC
242 # if defined(__GNUC__) && __GNUC__>=2 && !defined(OPENSSL_NO_ASM) && !defined(OP
243 #  if defined(__s390x__)
244 #  define HOST_c2l(c,l) ({ _asm ("lrv %0,%1" \
245 #    : "=d"(l) : "m" (*(const unsigned int *) (c)); \
246 #    (c)+=4; (l); })
247 #  define HOST_l2c(l,c) ({ _asm ("strv %1,%0" \
248 #    : "=m" (*(unsigned int *) (c)) : "d"(l); \
249 #    (c)+=4; (l); })
250 #  endif
251 #  endif
252 #  endif
253 # if defined(__i386) || defined(__i386__) || defined(__x86_64) || defined(__x86_6
254 #  ifndef B_ENDIAN
255 #  /* See comment in DATA_ORDER_IS_BIG_ENDIAN section. */
256 #  define HOST_c2l(c,l) {(l)=*((const unsigned int *) (c)), (c)+=4, (l)}
257 #  define HOST_l2c(l,c) {*((unsigned int *) (c))=(l), (c)+=4, (l)}
258 #  endif
259 #  endif

```

```

261 #ifndef HOST_c2l
262 #define HOST_c2l(c,l)  (l = (((unsigned long)(*(c++))) << 8), \
263                        l |= (((unsigned long)(*(c++))) << 8), \
264                        l |= (((unsigned long)(*(c++))) << 16), \
265                        l |= (((unsigned long)(*(c++))) << 24), \
266                        l)
267 #endif
268 #ifndef HOST_l2c
269 #define HOST_l2c(l,c)  (*(c++)=(unsigned char)(((l)>> 8)&0xff), \
270                        *((c++)=(unsigned char)(((l)>> 8)&0xff), \
271                        *((c++)=(unsigned char)(((l)>> 16)&0xff), \
272                        *((c++)=(unsigned char)(((l)>> 24)&0xff), \
273                        l)
274 #endif
275
276 #endif
277
278 /*
279  * Time for some action:-)
280  */
281
282 int HASH_UPDATE (HASH_CTX *c, const void *data_, size_t len)
283 {
284     const unsigned char *data=data_;
285     unsigned char *p;
286     HASH_LONG l;
287     size_t n;
288
289     if (len==0) return 1;
290
291     l=(c->Nl+(((HASH_LONG)len)<<3))&0xffffffffUL;
292     /* 95-05-24 eay Fixed a bug with the overflow handling, thanks to
293      * Wei Dai <weidai@eskimo.com> for pointing it out. */
294     if (l < c->Nl) /* overflow */
295         c->Nh++;
296     c->Nh+=(HASH_LONG)(len>>29); /* might cause compiler warning on 16-bi
297     c->Nl=l;
298
299     n = c->num;
300     if (n != 0)
301     {
302         p=(unsigned char *)c->data;
303
304         if (len >= HASH_CBLOCK || len+n >= HASH_CBLOCK)
305         {
306             memcpy (p+n,data,HASH_CBLOCK-n);
307             HASH_BLOCK_DATA_ORDER (c,p,1);
308             n = HASH_CBLOCK-n;
309             data += n;
310             len -= n;
311             c->num = 0;
312             memset (p,0,HASH_CBLOCK); /* keep it zeroed */
313         }
314         else
315         {
316             memcpy (p+n,data,len);
317             c->num += (unsigned int)len;
318             return 1;
319         }
320     }
321
322     n = len/HASH_CBLOCK;
323     if (n > 0)
324     {
325         HASH_BLOCK_DATA_ORDER (c,data,n);

```

```

326         n *= HASH_CBLOCK;
327         data += n;
328         len -= n;
329     }
330
331     if (len != 0)
332     {
333         p = (unsigned char *)c->data;
334         c->num = (unsigned int)len;
335         memcpy (p,data,len);
336     }
337     return 1;
338 }
339
340 void HASH_TRANSFORM (HASH_CTX *c, const unsigned char *data)
341 {
342     HASH_BLOCK_DATA_ORDER (c,data,1);
343 }
344
345 int HASH_FINAL (unsigned char *md, HASH_CTX *c)
346 {
347     unsigned char *p = (unsigned char *)c->data;
348     size_t n = c->num;
349
350     p[n] = 0x80; /* there is always room for one */
351     n++;
352
353     if (n > (HASH_CBLOCK-8))
354     {
355         memset (p+n,0,HASH_CBLOCK-n);
356         n=0;
357         HASH_BLOCK_DATA_ORDER (c,p,1);
358     }
359     memset (p+n,0,HASH_CBLOCK-8-n);
360
361     p += HASH_CBLOCK-8;
362     #if defined(DATA_ORDER_IS_BIG_ENDIAN)
363     (void)HOST_l2c(c->Nh,p);
364     (void)HOST_l2c(c->Nl,p);
365     #elif defined(DATA_ORDER_IS_LITTLE_ENDIAN)
366     (void)HOST_l2c(c->Nl,p);
367     (void)HOST_l2c(c->Nh,p);
368     #endif
369     p -= HASH_CBLOCK;
370     HASH_BLOCK_DATA_ORDER (c,p,1);
371     c->num=0;
372     memset (p,0,HASH_CBLOCK);
373
374     #ifndef HASH_MAKE_STRING
375     #error "HASH_MAKE_STRING must be defined!"
376     #else
377     HASH_MAKE_STRING(c,md);
378     #endif
379
380     return 1;
381 }
382
383 #ifndef MD32_REG_T
384 #if defined(__alpha) || defined(__sparcv9) || defined(__mips)
385 #define MD32_REG_T long
386 /*
387  * This comment was originally written for MD5, which is why it
388  * discusses A-D. But it basically applies to all 32-bit digests,
389  * which is why it was moved to common header file.

```

```
392 *
393 * In case you wonder why A-D are declared as long and not
394 * as MD5_LONG. Doing so results in slight performance
395 * boost on LP64 architectures. The catch is we don't
396 * really care if 32 MSBs of a 64-bit register get polluted
397 * with eventual overflows as we *save* only 32 LSBs in
398 * *either* case. Now declaring 'em long excuses the compiler
399 * from keeping 32 MSBs zeroed resulting in 13% performance
400 * improvement under SPARC Solaris7/64 and 5% under AlphaLinux.
401 * Well, to be honest it should say that this *prevents*
402 * performance degradation.
403 *                                     <appro@fy.chalmers.se>
404 */
405 #else
406 /*
407 * Above is not absolute and there are LP64 compilers that
408 * generate better code if MD32_REG_T is defined int. The above
409 * pre-processor condition reflects the circumstances under which
410 * the conclusion was made and is subject to further extension.
411 *                                     <appro@fy.chalmers.se>
412 */
413 #define MD32_REG_T int
414 #endif
415 #endif
```

new/usr/src/lib/openssl/include/md4_locl.h

1

4689 Fri May 30 18:31:16 2014
new/usr/src/lib/openssl/include/md4_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/md4/md4_locl.h */
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4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdlib.h>
60 #include <string.h>
61 #include <openssl/opensslconf.h>
```

new/usr/src/lib/openssl/include/md4_locl.h

2

62 #include <openssl/md4.h>

```
64 #ifndef MD4_LONG_LOG2
65 #define MD4_LONG_LOG2 2 /* default to 32 bits */
66 #endif
```

68 void md4_block_data_order (MD4_CTX *c, const void *p,size_t num);

70 #define DATA_ORDER_IS_LITTLE_ENDIAN

```
72 #define HASH_LONG          MD4_LONG
73 #define HASH_CTX           MD4_CTX
74 #define HASH_CBLOCK        MD4_CBLOCK
75 #define HASH_UPDATE         MD4_Update
76 #define HASH_TRANSFORM      MD4_Transform
77 #define HASH_FINAL          MD4_Final
78 #define HASH_MAKE_STRING(c,s) do { \
79     unsigned long ll; \
80     ll=(c)->A; (void)HOST_l2c(ll,(s)); \
81     ll=(c)->B; (void)HOST_l2c(ll,(s)); \
82     ll=(c)->C; (void)HOST_l2c(ll,(s)); \
83     ll=(c)->D; (void)HOST_l2c(ll,(s)); \
84 } while (0)
85 #define HASH_BLOCK_DATA_ORDER md4_block_data_order
```

87 #include "md32_common.h"

```
89 /*
90 #define F(x,y,z)          (((x) & (y)) | ((~(x)) & (z)))
91 #define G(x,y,z)          (((x) & (y)) | ((x) & ((z))) | ((y) & ((z))))
92 */
```

```
94 /* As pointed out by Wei Dai <weidai@eskimo.com>, the above can be
95 * simplified to the code below. Wei attributes these optimizations
96 * to Peter Gutmann's SHS code, and he attributes it to Rich Schroeppel.
97 */
98 #define F(b,c,d)          (((b) ^ (c)) & (d)) ^ (b)
99 #define G(b,c,d)          (((b) & (c)) | ((b) & (d)) | ((c) & (d)))
100 #define H(b,c,d)          ((b) ^ (c) ^ (d))
```

```
102 #define R0(a,b,c,d,k,s,t) { \
103     a+=((k)+(t)+F((b),(c),(d))); \
104     a=ROTATE(a,s); };
```

```
106 #define R1(a,b,c,d,k,s,t) { \
107     a+=((k)+(t)+G((b),(c),(d))); \
108     a=ROTATE(a,s); };
```

```
110 #define R2(a,b,c,d,k,s,t) { \
111     a+=((k)+(t)+H((b),(c),(d))); \
112     a=ROTATE(a,s); };
```

new/usr/src/lib/openssl/include/md5_locl.h

1

5194 Fri May 30 18:31:16 2014
new/usr/src/lib/openssl/include/md5_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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4  *
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6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdlib.h>
60 #include <string.h>
61 #include <openssl/e_os2.h>
```

new/usr/src/lib/openssl/include/md5_locl.h

2

```
62 #include <openssl/md5.h>
```

```
64 #ifndef MD5_LONG_LOG2
65 #define MD5_LONG_LOG2 2 /* default to 32 bits */
66 #endif
```

```
68 #ifdef MD5_ASM
69 # if defined(__i386) || defined(__i386__) || defined(_M_IX86) || defined(_INTEL
70     defined(__x86_64) || defined(__x86_64__) || defined(_M_AMD64) || defined(_M
71 #   define md5_block_data_order md5_block_asm_data_order
72 # elif defined(__ia64) || defined(__ia64__) || defined(_M_IA64)
73 #   define md5_block_data_order md5_block_asm_data_order
74 # endif
75 #endif
```

```
77 void md5_block_data_order (MD5_CTX *c, const void *p,size_t num);
```

```
79 #define DATA_ORDER_IS_LITTLE_ENDIAN
```

```
81 #define HASH_LONG MD5_LONG
82 #define HASH_CTX MD5_CTX
83 #define HASH_CBLOCK MD5_CBLOCK
84 #define HASH_UPDATE MD5_Update
85 #define HASH_TRANSFORM MD5_Transform
86 #define HASH_FINAL MD5_Final
87 #define HASH_MAKE_STRING(c,s) do { \
88     unsigned long ll; \
89     ll=(c)->A; (void)HOST_l2c(ll,(s)); \
90     ll=(c)->B; (void)HOST_l2c(ll,(s)); \
91     ll=(c)->C; (void)HOST_l2c(ll,(s)); \
92     ll=(c)->D; (void)HOST_l2c(ll,(s)); \
93 } while (0)
94 #define HASH_BLOCK_DATA_ORDER md5_block_data_order
```

```
96 #include "md32_common.h"
```

```
98 /*
99 #define F(x,y,z) (((x) & (y)) | ((~(x)) & (z)))
100 #define G(x,y,z) (((x) & (z)) | ((y) & (~(z))))
101 */
```

```
103 /* As pointed out by Wei Dai <weidai@eskimo.com>, the above can be
104 * simplified to the code below. Wei attributes these optimizations
105 * to Peter Gutmann's SHS code, and he attributes it to Rich Schroeppel.
106 */
```

```
107 #define F(b,c,d) (((c) ^ (d)) & (b)) ^ (d)
108 #define G(b,c,d) (((b) ^ (c)) & (d)) ^ (c)
109 #define H(b,c,d) ((b) ^ (c) ^ (d))
110 #define I(b,c,d) (((~(d)) | (b)) ^ (c))
```

```
112 #define R0(a,b,c,d,k,s,t) { \
113     a+=((k)+(t)+F((b),(c),(d))); \
114     a=ROTATE(a,s); \
115     a+=b; };
```

```
117 #define R1(a,b,c,d,k,s,t) { \
118     a+=((k)+(t)+G((b),(c),(d))); \
119     a=ROTATE(a,s); \
120     a+=b; };
```

```
122 #define R2(a,b,c,d,k,s,t) { \
123     a+=((k)+(t)+H((b),(c),(d))); \
124     a=ROTATE(a,s); \
125     a+=b; };
```

```
127 #define R3(a,b,c,d,k,s,t) { \
```

new/usr/src/lib/openssl/include/md5_locl.h

3

```
128     a+=((k)+(t)+I((b),(c),(d))); \
129     a=ROTATE(a,s); \
130     a+=b; };
```


new/usr/src/lib/openssl/include/modes_lcl.h

1

```
*****
3637 Fri May 30 18:31:16 2014
new/usr/src/lib/openssl/include/modes_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 2010 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use is governed by OpenSSL license.
5  * =====
6  */

8 #include <openssl/modes.h>

11 #if (defined(_WIN32) || defined(_WIN64)) && !defined(__MINGW32__)
12 typedef __int64 i64;
13 typedef unsigned __int64 u64;
14 #define U64(C) C##UI64
15 #elif defined(__arch64__)
16 typedef long i64;
17 typedef unsigned long u64;
18 #define U64(C) C##UL
19 #else
20 typedef long long i64;
21 typedef unsigned long long u64;
22 #define U64(C) C##ULL
23 #endif

25 typedef unsigned int u32;
26 typedef unsigned char u8;

28 #define STRICT_ALIGNMENT 1
29 #if defined(__i386) || defined(__i386__) || \
30     defined(__x86_64) || defined(__x86_64__) || \
31     defined(_M_IX86) || defined(_M_AMD64) || defined(_M_X64) || \
32     defined(__s390__) || defined(__s390x__)
33 # undef STRICT_ALIGNMENT
34 #endif

36 #if !defined(PEDANTIC) && !defined(OPENSSL_NO_ASM) && !defined(OPENSSL_NO_INLINE)
37 #if defined(__GNUC__) && __GNUC__ >= 2
38 # if defined(__x86_64) || defined(__x86_64__)
39 #  define BSWAP8(x) ({ u64 ret=(x); \
40                      __asm__ ("bswapq %0" \
41                               : "=r"(ret)); ret; })
42 #  define BSWAP4(x) ({ u32 ret=(x); \
43                      __asm__ ("bswapl %0" \
44                               : "=r"(ret)); ret; })
45 # elif (defined(__i386) || defined(__i386__)) && !defined(I386_ONLY)
46 #  define BSWAP8(x) ({ u32 lo=(u64)(x)>>32,hi=(x); \
47                      __asm__ ("bswapl %0; bswapl %1" \
48                               : "=r"(hi), "=r"(lo)); \
49                      (u64)hi<<32|lo; })
50 #  define BSWAP4(x) ({ u32 ret=(x); \
51                      __asm__ ("bswapl %0" \
52                               : "=r"(ret)); ret; })
53 # elif (defined(__arm__) || defined(__arm)) && !defined(STRICT_ALIGNMENT)
54 #  define BSWAP8(x) ({ u32 lo=(u64)(x)>>32,hi=(x); \
55                      __asm__ ("rev %0,%0; rev %1,%1" \
56                               : "=r"(hi), "=r"(lo)); \
57                      (u64)hi<<32|lo; })
58 #  define BSWAP4(x) ({ u32 ret; \
59                      __asm__ ("rev %0,%1" \
60                               : "=r"(ret) : "r"((u32)(x))); \
61                      ret; })

```

new/usr/src/lib/openssl/include/modes_lcl.h

2

```
62 # endif
63 #elif defined(_MSC_VER)
64 # if _MSC_VER>=1300
65 #  pragma intrinsic(_byteswap_uint64,_byteswap_ulong)
66 #  define BSWAP8(x) _byteswap_uint64((u64)(x))
67 #  define BSWAP4(x) _byteswap_ulong((u32)(x))
68 # elif defined(_M_IX86)
69 #  inline u32 _bswap4(u32 val) {
70 #    __asm mov eax,val
71 #    __asm bswap eax
72 #  }
73 #  define BSWAP4(x) _bswap4(x)
74 # endif
75 #endif
76 #endif

78 #if defined(BSWAP4) && !defined(STRICT_ALIGNMENT)
79 #define GETU32(p) BSWAP4(*(const u32*)(p))
80 #define PUTU32(p,v) *(u32*)(p) = BSWAP4(v)
81 #else
82 #define GETU32(p) ((u32)(p)[0]<<24|(u32)(p)[1]<<16|(u32)(p)[2]<<8|(u32)(p)[3])
83 #define PUTU32(p,v) ((p)[0]=(u8)((v)>>24),(p)[1]=(u8)((v)>>16),(p)[2]=(u8)((v)>>8),(p)[3]=(u8)(v))
84 #endif

86 /* GCM definitions */

88 typedef struct { u64 hi,lo; } u128;

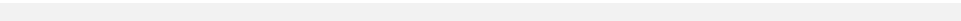
90 #ifdef TABLE_BITS
91 #undef TABLE_BITS
92 #endif
93 /*
94  * Even though permitted values for TABLE_BITS are 8, 4 and 1, it should
95  * never be set to 8 [or 1]. For further information see gcm128.c.
96  */
97 #define TABLE_BITS 4

99 struct gcm128_context {
100     /* Following 6 names follow names in GCM specification */
101     union { u64 u[2]; u32 d[4]; u8 c[16]; size_t t[16/sizeof(size_t)]; }
102     Yi,EKi,EK0,len,Xi,H;
103     /* Relative position of Xi, H and pre-computed Htable is used
104      * in some assembler modules, i.e. don't change the order! */
105     #if TABLE_BITS==8
106         u128 Htable[256];
107     #else
108         u128 Htable[16];
109         void (*gmult)(u64 Xi[2],const u128 Htable[16]);
110         void (*ghash)(u64 Xi[2],const u128 Htable[16],const u8 *inp,size_t len);
111     #endif
112     unsigned int mres, ares;
113     block128_f block;
114     void *key;
115 };

117 struct xts128_context {
118     void *key1, *key2;
119     block128_f block1,block2;
120 };

122 struct ccm128_context {
123     union { u64 u[2]; u8 c[16]; } nonce, cmac;
124     u64 blocks;
125     block128_f block;
126     void *key;
127 };

```



new/usr/src/lib/openssl/include/o_dir.h

1

```
*****
2111 Fri May 30 18:31:16 2014
new/usr/src/lib/openssl/include/o_dir.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/o_dir.h -*- mode:C; c-file-style: "eay" -*- */
2 /* Copied from Richard Levitte's (richard@levitte.org) LP library. All
3  * symbol names have been changed, with permission from the author.
4  */

6 /* SLP: LPLib/source/LPdir.h,v 1.1 2004/06/14 08:56:04 _cvs_levitte Exp $ */
7 /*
8  * Copyright (c) 2004, Richard Levitte <richard@levitte.org>
9  * All rights reserved.
10 *
11 * Redistribution and use in source and binary forms, with or without
12 * modification, are permitted provided that the following conditions
13 * are met:
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25 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
26 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
27 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
28 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
29 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
30 * SUCH DAMAGE.
31 */

34 #ifndef O_DIR_H
35 #define O_DIR_H

37 #ifdef __cplusplus
38 extern "C" {
39 #endif

41 typedef struct OPENSSL_dir_context_st OPENSSL_DIR_CTX;

43 /* returns NULL on error or end-of-directory.
44  * If it is end-of-directory, errno will be zero */
45 const char *OPENSSL_DIR_read(OPENSSL_DIR_CTX **ctx, const char *directory);
46 /* returns 1 on success, 0 on error */
47 int OPENSSL_DIR_end(OPENSSL_DIR_CTX **ctx);

49 #ifdef __cplusplus
50 }
51 #endif

53 #endif /* LPDIR_H */
```

new/usr/src/lib/openssl/include/o_str.h

1

```
*****
3061 Fri May 30 18:31:16 2014
new/usr/src/lib/openssl/include/o_str.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/o_str.h -*. mode:C; c-file-style: "eay" -*. */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2003.
4  */
5 /* =====
6  * Copyright (c) 2003 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
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18 * distribution.
19 *
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21 * software must display the following acknowledgment:
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24 *
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28 * licensing@OpenSSL.org.
29 *
30 * 5. Products derived from this software may not be called "OpenSSL"
31 * nor may "OpenSSL" appear in their names without prior written
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33 *
34 * 6. Redistributions of any form whatsoever must retain the following
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38 *
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #ifndef HEADER_O_STR_H
60 #define HEADER_O_STR_H
```

new/usr/src/lib/openssl/include/o_str.h

2

```
62 #include <stddef.h> /* to get size_t */

64 int OPENSSL_strcasecmp(const char *str1, const char *str2);
65 int OPENSSL_strncasecmp(const char *str1, const char *str2, size_t n);
66 int OPENSSL_memcmp(const void *p1, const void *p2, size_t n);

68 #endif
```

new/usr/src/lib/openssl/include/o_time.h

1

```
*****
2989 Fri May 30 18:31:16 2014
new/usr/src/lib/openssl/include/o_time.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/o_time.h -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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18  * distribution.
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #ifndef HEADER_O_TIME_H
60 #define HEADER_O_TIME_H
```

new/usr/src/lib/openssl/include/o_time.h

2

```
62 #include <time.h>

64 struct tm *OPENSSL_gmtime(const time_t *timer, struct tm *result);
65 int OPENSSL_gmtime_adj(struct tm *tm, int offset_day, long offset_sec);

67 #endif
```

new/usr/src/lib/openssl/include/obj_dat.h

1

```
*****
256051 Fri May 30 18:31:16 2014
new/usr/src/lib/openssl/include/obj_dat.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/objects/obj_dat.h */

3 /* THIS FILE IS GENERATED FROM objects.h by obj_dat.pl via the
4  * following command:
5  * perl obj_dat.pl obj_mac.h obj_dat.h
6  */

8 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
9  * All rights reserved.
10
11 * This package is an SSL implementation written
12 * by Eric Young (eay@cryptsoft.com).
13 * The implementation was written so as to conform with Netscapes SSL.
14
15 * This library is free for commercial and non-commercial use as long as
16 * the following conditions are aheared to. The following conditions
17 * apply to all code found in this distribution, be it the RC4, RSA,
18 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
19 * included with this distribution is covered by the same copyright terms
20 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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23 * the code are not to be removed.
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39 * "This product includes cryptographic software written by
40 * Eric Young (eay@cryptsoft.com)"
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46
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49 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
50 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
51 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
52 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
53 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
54 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
55 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
56 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
57 * SUCH DAMAGE.
58
59 * The licence and distribution terms for any publically available version or
60 * derivative of this code cannot be changed. i.e. this code cannot simply be
61 * copied and put under another distribution licence
```

new/usr/src/lib/openssl/include/obj_dat.h

2

```
62 * [including the GNU Public Licence.]
63 */

65 #define NUM_NID 920
66 #define NUM_SN 913
67 #define NUM_LN 913
68 #define NUM_OBJ 857

70 static const unsigned char lvalues[5980]={
71 0x00, /* [ 0] OBJ_undef */
72 0x2A,0x86,0x48,0x86,0xF7,0x0D, /* [ 1] OBJ_rsadsi */
73 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01, /* [ 7] OBJ_pkcs */
74 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x02,0x02, /* [14] OBJ_md2 */
75 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x02,0x05, /* [22] OBJ_md5 */
76 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x03,0x04, /* [30] OBJ_rc4 */
77 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x01, /* [38] OBJ_rsaEncryption */
78 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x02, /* [47] OBJ_md2WithRSAEncryption */
79 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x04, /* [56] OBJ_md5WithRSAEncryption */
80 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x01, /* [65] OBJ_pbewithMD2AndDES_CBC */
81 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x03, /* [74] OBJ_pbewithMD5AndDES_CBC */
82 0x55, /* [83] OBJ_X509 */
83 0x55,0x04, /* [84] OBJ_X509 */
84 0x55,0x04,0x03, /* [86] OBJ_commonName */
85 0x55,0x04,0x06, /* [89] OBJ_countryName */
86 0x55,0x04,0x07, /* [92] OBJ_localityName */
87 0x55,0x04,0x08, /* [95] OBJ_stateOrProvinceName */
88 0x55,0x04,0x0A, /* [98] OBJ_organizationName */
89 0x55,0x04,0x0B, /* [101] OBJ_organizationalUnitName */
90 0x55,0x08,0x01,0x01, /* [104] OBJ_rsa */
91 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x07, /* [108] OBJ_pkcs7 */
92 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x07,0x01, /* [116] OBJ_pkcs7_data */
93 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x07,0x02, /* [125] OBJ_pkcs7_signed */
94 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x07,0x03, /* [134] OBJ_pkcs7_enveloped */
95 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x07,0x04, /* [143] OBJ_pkcs7_signedAndEnveloped */
96 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x07,0x05, /* [152] OBJ_pkcs7_digest */
97 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x07,0x06, /* [161] OBJ_pkcs7_encrypted */
98 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x03, /* [170] OBJ_pkcs3 */
99 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x03,0x01, /* [178] OBJ_dhKeyAgreement */
100 0x2B,0x0E,0x03,0x02,0x06, /* [187] OBJ_des_ecb */
101 0x2B,0x0E,0x03,0x02,0x09, /* [192] OBJ_des_cfb64 */
102 0x2B,0x0E,0x03,0x02,0x07, /* [197] OBJ_des_cbc */
103 0x2B,0x0E,0x03,0x02,0x11, /* [202] OBJ_des_ede_ecb */
104 0x2B,0x06,0x01,0x04,0x01,0x81,0x3C,0x07,0x01,0x01,0x02, /* [207] OBJ_idea_cbc */
105 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x03,0x02, /* [218] OBJ_rc2_cbc */
106 0x2B,0x0E,0x03,0x02,0x12, /* [226] OBJ_sha */
107 0x2B,0x0E,0x03,0x02,0x0F, /* [231] OBJ_shawithRSAEncryption */
108 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x03,0x07, /* [236] OBJ_des_ede3_cbc */
109 0x2B,0x0E,0x03,0x02,0x08, /* [244] OBJ_des_ofb64 */
110 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09, /* [249] OBJ_pkcs9 */
111 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x01, /* [257] OBJ_pkcs9_emailAddress */
112 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x02, /* [266] OBJ_pkcs9_unstructuredName */
113 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x03, /* [275] OBJ_pkcs9_contentType */
114 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x04, /* [284] OBJ_pkcs9_messageDigest */
115 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x05, /* [293] OBJ_pkcs9_signingTime */
116 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x06, /* [302] OBJ_pkcs9_countersignature */
117 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x07, /* [311] OBJ_pkcs9_challengePassword */
118 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x08, /* [320] OBJ_pkcs9_unstructuredAddr */
119 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x09, /* [329] OBJ_pkcs9_extCrtAttribute */
120 0x60,0x86,0x48,0x01,0x86,0xF8,0x42, /* [338] OBJ_netscape */
121 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01, /* [345] OBJ_netscape_cert_extensio */
122 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x02, /* [353] OBJ_netscape_data_type */
123 0x2B,0x0E,0x03,0x02,0x1A, /* [361] OBJ_sha1 */
124 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x05, /* [366] OBJ_sha1WithRSAEncryption */
125 0x2B,0x0E,0x03,0x02,0x0D, /* [375] OBJ_dsawithSHA */
126 0x2B,0x0E,0x03,0x02,0x0C, /* [380] OBJ_dsa */
127 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x0B, /* [385] OBJ_pbewithSHA1AndRC2_CBC
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128 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x0C,/* [394] OBJ_id_pbkdf2 */
129 0x2B,0x0E,0x03,0x02,0x1B,/* [403] OBJ_dsaWithSHA1_2 */
130 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x01,/* [408] OBJ_netscape_cert_type */
131 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x02,/* [417] OBJ_netscape_base_url */
132 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x03,/* [426] OBJ_netscape_revocation_ur
133 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x04,/* [435] OBJ_netscape_ca_revocation
134 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x07,/* [444] OBJ_netscape_renewal_url */
135 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x08,/* [453] OBJ_netscape_ca_policy_url
136 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x0C,/* [462] OBJ_netscape_ssl_server_na
137 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x01,0x0D,/* [471] OBJ_netscape_comment */
138 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x02,0x05,/* [480] OBJ_netscape_cert_sequence
139 0x55,0x1D,/* [489] OBJ_id_ce */
140 0x55,0x1D,0x0E,/* [491] OBJ_subject_key_identifier
141 0x55,0x1D,0x0F,/* [494] OBJ_key_usage */
142 0x55,0x1D,0x10,/* [497] OBJ_private_key_usage_peri
143 0x55,0x1D,0x11,/* [500] OBJ_subject_alt_name */
144 0x55,0x1D,0x12,/* [503] OBJ_issuer_alt_name */
145 0x55,0x1D,0x13,/* [506] OBJ_basic_constraints */
146 0x55,0x1D,0x14,/* [509] OBJ_crl_number */
147 0x55,0x1D,0x20,/* [512] OBJ_certificate_policies */
148 0x55,0x1D,0x23,/* [515] OBJ_authority_key_identifi
149 0x2B,0x06,0x01,0x04,0x01,0x97,0x55,0x01,0x02,/* [518] OBJ_bf_cbc */
150 0x55,0x08,0x03,0x65,/* [527] OBJ_md2 */
151 0x55,0x08,0x03,0x64,/* [531] OBJ_md2WithRSA */
152 0x55,0x04,0x2A,/* [535] OBJ_givenName */
153 0x55,0x04,0x04,/* [538] OBJ_surname */
154 0x55,0x04,0x2B,/* [541] OBJ_initials */
155 0x55,0x1D,0x1F,/* [544] OBJ_crl_distribution_point
156 0x2B,0x0E,0x03,0x02,0x03,/* [547] OBJ_md5WithRSA */
157 0x55,0x04,0x05,/* [552] OBJ_serialNumber */
158 0x55,0x04,0x0C,/* [555] OBJ_title */
159 0x55,0x04,0x0D,/* [558] OBJ_description */
160 0x2A,0x86,0x48,0x86,0xF6,0x7D,0x07,0x42,0x0A,/* [561] OBJ_cast5_cbc */
161 0x2A,0x86,0x48,0x86,0xF6,0x7D,0x07,0x42,0x0C,/* [570] OBJ_pbewithMD5AndCast5_CBC
162 0x2A,0x86,0x48,0xCE,0x38,0x04,0x03,/* [579] OBJ_dsaWithSHA1 */
163 0x2B,0x0E,0x03,0x02,0x1D,/* [586] OBJ_sha1WithRSA */
164 0x2A,0x86,0x48,0xCE,0x38,0x04,0x01,/* [591] OBJ_dsa */
165 0x2B,0x24,0x03,0x02,0x01,/* [598] OBJ_ripemd160 */
166 0x2B,0x24,0x03,0x03,0x01,0x02,/* [603] OBJ_ripemd160WithRSA */
167 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x03,0x08,/* [609] OBJ_rc5_cbc */
168 0x29,0x01,0x01,0x85,0x1A,0x01,/* [617] OBJ_rle_compression */
169 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x08,/* [623] OBJ_zlib_compres
170 0x55,0x1D,0x25,/* [634] OBJ_ext_key_usage */
171 0x2B,0x06,0x01,0x05,0x05,0x07,/* [637] OBJ_id_pkix */
172 0x2B,0x06,0x01,0x05,0x05,0x07,0x03,/* [643] OBJ_id_kp */
173 0x2B,0x06,0x01,0x05,0x05,0x07,0x03,0x01,/* [650] OBJ_server_auth */
174 0x2B,0x06,0x01,0x05,0x05,0x07,0x03,0x02,/* [658] OBJ_client_auth */
175 0x2B,0x06,0x01,0x05,0x05,0x07,0x03,0x03,/* [666] OBJ_code_sign */
176 0x2B,0x06,0x01,0x05,0x05,0x07,0x03,0x04,/* [674] OBJ_email_protect */
177 0x2B,0x06,0x01,0x05,0x05,0x07,0x03,0x08,/* [682] OBJ_time_stamp */
178 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x02,0x01,0x15,/* [690] OBJ_ms_code_ind */
179 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x02,0x01,0x16,/* [700] OBJ_ms_code_com */
180 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x0A,0x03,0x01,/* [710] OBJ_ms_ctl_sign */
181 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x0A,0x03,0x03,/* [720] OBJ_ms_sgc */
182 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x0A,0x03,0x04,/* [730] OBJ_ms_efs */
183 0x60,0x86,0x48,0x01,0x86,0xF8,0x42,0x04,0x01,/* [740] OBJ_ns_sgc */
184 0x55,0x1D,0x1B,/* [749] OBJ_delta_crl */
185 0x55,0x1D,0x15,/* [752] OBJ_crl_reason */
186 0x55,0x1D,0x18,/* [755] OBJ_invalidity_date */
187 0x2B,0x65,0x01,0x04,0x01,/* [758] OBJ_sxnet */
188 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x01,0x01,/* [763] OBJ_pbe_withSHA1And12
189 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x01,0x02,/* [773] OBJ_pbe_withSHA1And40
190 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x01,0x03,/* [783] OBJ_pbe_withSHA1And3
191 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x01,0x04,/* [793] OBJ_pbe_withSHA1And2
192 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x01,0x05,/* [803] OBJ_pbe_withSHA1And12
193 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x01,0x06,/* [813] OBJ_pbe_withSHA1And40

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194 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x0A,0x01,0x01,/* [823] OBJ_keyBag */
195 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x0A,0x01,0x02,/* [834] OBJ_pkcs8Shroude
196 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x0A,0x01,0x03,/* [845] OBJ_certBag */
197 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x0A,0x01,0x04,/* [856] OBJ_crlBag */
198 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x0A,0x01,0x05,/* [867] OBJ_secretBag */
199 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x0C,0x0A,0x01,0x06,/* [878] OBJ_safeContents
200 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x14,/* [889] OBJ_friendlyName */
201 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x15,/* [898] OBJ_localKeyID */
202 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x16,0x01,/* [907] OBJ_x509Certificate */
203 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x16,0x02,/* [917] OBJ_sdscertificate */
204 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x17,0x01,/* [927] OBJ_x509Crl */
205 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x0D,/* [937] OBJ_pbcs2 */
206 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x0E,/* [946] OBJ_pbmac1 */
207 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x02,0x07,/* [955] OBJ_hmacWithSHA1 */
208 0x2B,0x06,0x01,0x05,0x05,0x07,0x02,0x01,/* [963] OBJ_id_qt_cps */
209 0x2B,0x06,0x01,0x05,0x05,0x07,0x02,0x02,/* [971] OBJ_id_qt_unotice */
210 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x0F,/* [979] OBJ_SMIMECapabilities */
211 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x04,/* [988] OBJ_pbewithMD2AndRC2_CBC */
212 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x06,/* [997] OBJ_pbewithMD5AndRC2_CBC */
213 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,0x0A,/* [1006] OBJ_pbewithSHA1AndDES_CBC
214 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x02,0x01,0x0E,/* [1015] OBJ_ms_ext_req */
215 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x0E,/* [1025] OBJ_ext_req */
216 0x55,0x04,0x29,/* [1034] OBJ_name */
217 0x55,0x04,0x2E,/* [1037] OBJ_dnQualifier */
218 0x2B,0x06,0x01,0x05,0x05,0x07,0x01,/* [1040] OBJ_id_pe */
219 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,/* [1047] OBJ_id_ad */
220 0x2B,0x06,0x01,0x05,0x05,0x07,0x01,0x01,/* [1054] OBJ_info_access */
221 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,/* [1062] OBJ_ad_OCSP */
222 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x02,/* [1070] OBJ_ad_ca_issuers */
223 0x2B,0x06,0x01,0x05,0x05,0x07,0x03,0x09,/* [1078] OBJ_OCSP_sign */
224 0x2B,/* [1086] OBJ_iso */
225 0x2A,/* [1087] OBJ_member_body */
226 0x2A,0x86,0x48,/* [1088] OBJ_ISO_US */
227 0x2A,0x86,0x48,0xCE,0x38,/* [1091] OBJ_X9_57 */
228 0x2A,0x86,0x48,0xCE,0x38,0x04,/* [1096] OBJ_X9cm */
229 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,/* [1102] OBJ_pkcs1 */
230 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x05,/* [1110] OBJ_pkcs5 */
231 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,/* [1118] OBJ_SMIME */
232 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,/* [1127] OBJ_id_smime_mod */
233 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,/* [1137] OBJ_id_smime_ct */
234 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,/* [1147] OBJ_id_smime_aa */
235 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,/* [1157] OBJ_id_smime_alg */
236 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x04,/* [1167] OBJ_id_smime_cd */
237 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x05,/* [1177] OBJ_id_smime_spq */
238 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x06,/* [1187] OBJ_id_smime_cti */
239 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x01,/* [1197] OBJ_id_smime_mo
240 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x02,/* [1208] OBJ_id_smime_mo
241 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x03,/* [1219] OBJ_id_smime_mo
242 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x04,/* [1230] OBJ_id_smime_mo
243 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x05,/* [1241] OBJ_id_smime_mo
244 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x06,/* [1252] OBJ_id_smime_mo
245 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x07,/* [1263] OBJ_id_smime_mo
246 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x00,0x08,/* [1274] OBJ_id_smime_mo
247 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x01,/* [1285] OBJ_id_smime_ct
248 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x02,/* [1296] OBJ_id_smime_ct
249 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x03,/* [1307] OBJ_id_smime_ct
250 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x04,/* [1318] OBJ_id_smime_ct
251 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x05,/* [1329] OBJ_id_smime_ct
252 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x06,/* [1340] OBJ_id_smime_ct
253 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x07,/* [1351] OBJ_id_smime_ct
254 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x01,0x08,/* [1362] OBJ_id_smime_ct
255 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x01,/* [1373] OBJ_id_smime_aa
256 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x02,/* [1384] OBJ_id_smime_aa
257 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x03,/* [1395] OBJ_id_smime_aa
258 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x04,/* [1406] OBJ_id_smime_aa
259 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x05,/* [1417] OBJ_id_smime_aa

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260 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x06,/* [1428] OBJ_id_smime_aa
261 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x07,/* [1439] OBJ_id_smime_aa
262 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x08,/* [1450] OBJ_id_smime_aa
263 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x09,/* [1461] OBJ_id_smime_aa
264 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x0A,/* [1472] OBJ_id_smime_aa
265 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x0B,/* [1483] OBJ_id_smime_aa
266 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x0C,/* [1494] OBJ_id_smime_aa
267 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x0D,/* [1505] OBJ_id_smime_aa
268 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x0E,/* [1516] OBJ_id_smime_aa
269 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x0F,/* [1527] OBJ_id_smime_aa
270 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x10,/* [1538] OBJ_id_smime_aa
271 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x11,/* [1549] OBJ_id_smime_aa
272 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x12,/* [1560] OBJ_id_smime_aa
273 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x13,/* [1571] OBJ_id_smime_aa
274 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x14,/* [1582] OBJ_id_smime_aa
275 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x15,/* [1593] OBJ_id_smime_aa
276 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x16,/* [1604] OBJ_id_smime_aa
277 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x17,/* [1615] OBJ_id_smime_aa
278 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x18,/* [1626] OBJ_id_smime_aa
279 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x19,/* [1637] OBJ_id_smime_aa
280 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x1A,/* [1648] OBJ_id_smime_aa
281 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x1B,/* [1659] OBJ_id_smime_aa
282 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x1C,/* [1670] OBJ_id_smime_aa
283 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x02,0x1D,/* [1681] OBJ_id_smime_aa
284 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x01,/* [1692] OBJ_id_smime_al
285 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x02,/* [1703] OBJ_id_smime_al
286 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x03,/* [1714] OBJ_id_smime_al
287 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x04,/* [1725] OBJ_id_smime_al
288 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x05,/* [1736] OBJ_id_smime_al
289 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x06,/* [1747] OBJ_id_smime_al
290 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x03,0x07,/* [1758] OBJ_id_smime_al
291 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x04,0x01,/* [1769] OBJ_id_smime_cd
292 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x05,0x01,/* [1780] OBJ_id_smime_sp
293 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x05,0x02,/* [1791] OBJ_id_smime_sp
294 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x06,0x01,/* [1802] OBJ_id_smime_ct
295 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x06,0x02,/* [1813] OBJ_id_smime_ct
296 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x06,0x03,/* [1824] OBJ_id_smime_ct
297 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x06,0x04,/* [1835] OBJ_id_smime_ct
298 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x06,0x05,/* [1846] OBJ_id_smime_ct
299 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x09,0x10,0x06,0x06,/* [1857] OBJ_id_smime_ct
300 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x02,0x04,/* [1868] OBJ_md4 */
301 0x2B,0x06,0x01,0x05,0x05,0x07,0x00,/* [1876] OBJ_id_pkix_mod */
302 0x2B,0x06,0x01,0x05,0x05,0x07,0x02,/* [1883] OBJ_id_qt */
303 0x2B,0x06,0x01,0x05,0x05,0x07,0x04,/* [1890] OBJ_id_it */
304 0x2B,0x06,0x01,0x05,0x05,0x07,0x05,/* [1897] OBJ_id_pkix */
305 0x2B,0x06,0x01,0x05,0x05,0x07,0x06,/* [1904] OBJ_id_alg */
306 0x2B,0x06,0x01,0x05,0x05,0x07,0x07,/* [1911] OBJ_id_cmc */
307 0x2B,0x06,0x01,0x05,0x05,0x07,0x08,/* [1918] OBJ_id_on */
308 0x2B,0x06,0x01,0x05,0x05,0x07,0x09,/* [1925] OBJ_id_pda */
309 0x2B,0x06,0x01,0x05,0x05,0x07,0x0A,/* [1932] OBJ_id_aca */
310 0x2B,0x06,0x01,0x05,0x05,0x07,0x0B,/* [1939] OBJ_id_qcs */
311 0x2B,0x06,0x01,0x05,0x05,0x07,0x0C,/* [1946] OBJ_id_cct */
312 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x01,/* [1953] OBJ_id_pkix1_explicit_88
313 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x02,/* [1961] OBJ_id_pkix1_implicit_88
314 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x03,/* [1969] OBJ_id_pkix1_explicit_93
315 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x04,/* [1977] OBJ_id_pkix1_implicit_93
316 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x05,/* [1985] OBJ_id_mod_crmf */
317 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x06,/* [1993] OBJ_id_mod_cmc */
318 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x07,/* [2001] OBJ_id_mod_kea_profile_88
319 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x08,/* [2009] OBJ_id_mod_kea_profile_93
320 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x09,/* [2017] OBJ_id_mod_cmp */
321 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x0A,/* [2025] OBJ_id_mod_qualified_cert
322 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x0B,/* [2033] OBJ_id_mod_qualified_cert
323 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x0C,/* [2041] OBJ_id_mod_attribute_cert
324 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x0D,/* [2049] OBJ_id_mod_timestamp_prot
325 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x0E,/* [2057] OBJ_id_mod_ocsp */

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326 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x0F,/* [2065] OBJ_id_mod_dvcs */
327 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x10,/* [2073] OBJ_id_mod_cmp2000 */
328 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x11,/* [2081] OBJ_biometricInfo */
329 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x12,/* [2089] OBJ_qcStatements */
330 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x13,/* [2097] OBJ_ac_auditEntity */
331 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x14,/* [2105] OBJ_ac_targeting */
332 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x15,/* [2113] OBJ_aaControls */
333 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x16,/* [2121] OBJ_sbgp_ipAddrBlock */
334 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x17,/* [2129] OBJ_sbgp_autonomousSysNum
335 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x18,/* [2137] OBJ_sbgp_routerIdentifier
336 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x19,/* [2145] OBJ_textNotice */
337 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x1A,/* [2153] OBJ_ipsecEndSystem */
338 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x1B,/* [2161] OBJ_ipsecTunnel */
339 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x1C,/* [2169] OBJ_ipsecUser */
340 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x1D,/* [2177] OBJ_dvcs */
341 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x1E,/* [2185] OBJ_id_it_caProtEncCert */
342 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x1F,/* [2193] OBJ_id_it_signKeyPairType
343 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x20,/* [2201] OBJ_id_it_encKeyPairTypes
344 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x21,/* [2209] OBJ_id_it_preferredSymmAl
345 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x22,/* [2217] OBJ_id_it_cakeyUpdateInfo
346 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x23,/* [2225] OBJ_id_it_currentCRL */
347 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x24,/* [2233] OBJ_id_it_unsupportedOIDs
348 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x25,/* [2241] OBJ_id_it_subscriptionReq
349 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x26,/* [2249] OBJ_id_it_subscriptionRes
350 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x27,/* [2257] OBJ_id_it_keyPairParamRep
351 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x28,/* [2265] OBJ_id_it_keyPairParamRep
352 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x29,/* [2273] OBJ_id_it_revPassphrase */
353 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x2A,/* [2281] OBJ_id_it_implicitConfirm
354 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x2B,/* [2289] OBJ_id_it_confirmWaitTime
355 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x2C,/* [2297] OBJ_id_it_origPKIMessage
356 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x2D,/* [2305] OBJ_id_regCtrl */
357 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x2E,/* [2313] OBJ_id_regInfo */
358 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x2F,/* [2321] OBJ_id_regCtrl_regToken */
359 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x30,/* [2330] OBJ_id_regCtrl_authentication
360 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x31,/* [2339] OBJ_id_regCtrl_pkiPublica
361 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x32,/* [2348] OBJ_id_regCtrl_pkiArchive
362 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x33,/* [2357] OBJ_id_regCtrl_oldCertID
363 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x34,/* [2366] OBJ_id_regCtrl_protocolEn
364 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x35,/* [2375] OBJ_id_regInfo_utf8Pairs
365 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x36,/* [2384] OBJ_id_regInfo_certReq */
366 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x37,/* [2393] OBJ_id_alg_des40 */
367 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x38,/* [2401] OBJ_id_alg_noSignature */
368 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x39,/* [2409] OBJ_id_alg_dh_sig_hmac_sh
369 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x3A,/* [2417] OBJ_id_alg_dh_pop */
370 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x3B,/* [2425] OBJ_id_cmc_statusInfo */
371 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x3C,/* [2433] OBJ_id_cmc_identification
372 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x3D,/* [2441] OBJ_id_cmc_identityProof
373 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x3E,/* [2449] OBJ_id_cmc_dataReturn */
374 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x3F,/* [2457] OBJ_id_cmc_transactionId
375 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x40,/* [2465] OBJ_id_cmc_senderNonce */
376 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x41,/* [2473] OBJ_id_cmc_recipientNonce
377 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x42,/* [2481] OBJ_id_cmc_addExtensions
378 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x43,/* [2489] OBJ_id_cmc_encryptedPOP */
379 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x44,/* [2497] OBJ_id_cmc_decryptedPOP */
380 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x45,/* [2505] OBJ_id_cmc_lraPOPwitness
381 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x46,/* [2513] OBJ_id_cmc_getCert */
382 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x47,/* [2521] OBJ_id_cmc_getCRL */
383 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x48,/* [2529] OBJ_id_cmc_revokeRequest
384 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x49,/* [2537] OBJ_id_cmc_regInfo */
385 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x4A,/* [2545] OBJ_id_cmc_responseInfo */
386 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x4B,/* [2553] OBJ_id_cmc_queryPending */
387 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x4C,/* [2561] OBJ_id_cmc_popLinkRandom
388 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x4D,/* [2569] OBJ_id_cmc_popLinkWitness
389 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x4E,/* [2577] OBJ_id_cmc_confirmCertAcc
390 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x4F,/* [2585] OBJ_id_on_personalData */
391 0x2B,0x06,0x01,0x05,0x05,0x07,0x0D,0x50,/* [2593] OBJ_id_pda_dateOfBIRTH */

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392 0x2B,0x06,0x01,0x05,0x05,0x07,0x09,0x02, /* [2601] OBJ_id_pda_placeOfBirth */
393 0x2B,0x06,0x01,0x05,0x05,0x07,0x09,0x03, /* [2609] OBJ_id_pda_gender */
394 0x2B,0x06,0x01,0x05,0x05,0x07,0x09,0x04, /* [2617] OBJ_id_pda_countryOfCitiz */
395 0x2B,0x06,0x01,0x05,0x05,0x07,0x09,0x05, /* [2625] OBJ_id_pda_countryOfResid */
396 0x2B,0x06,0x01,0x05,0x05,0x07,0x0A,0x01, /* [2633] OBJ_id_aca_authentication */
397 0x2B,0x06,0x01,0x05,0x05,0x07,0x0A,0x02, /* [2641] OBJ_id_aca_accessIdentity */
398 0x2B,0x06,0x01,0x05,0x05,0x07,0x0A,0x03, /* [2649] OBJ_id_aca_chargingIdent */
399 0x2B,0x06,0x01,0x05,0x05,0x07,0x0A,0x04, /* [2657] OBJ_id_aca_group */
400 0x2B,0x06,0x01,0x05,0x05,0x07,0x0A,0x05, /* [2665] OBJ_id_aca_role */
401 0x2B,0x06,0x01,0x05,0x05,0x07,0x0B,0x01, /* [2673] OBJ_id_qcs_pkixQCSyntax_v */
402 0x2B,0x06,0x01,0x05,0x05,0x07,0x0C,0x01, /* [2681] OBJ_id_cct_crs */
403 0x2B,0x06,0x01,0x05,0x05,0x07,0x0C,0x02, /* [2689] OBJ_id_cct_PKIData */
404 0x2B,0x06,0x01,0x05,0x05,0x07,0x0C,0x03, /* [2697] OBJ_id_cct_PKIResponse */
405 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x03, /* [2705] OBJ_ad_timeStamping */
406 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x04, /* [2713] OBJ_ad_dvcs */
407 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x01, /* [2721] OBJ_id_pkix_OCSP_basic */
408 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x02, /* [2730] OBJ_id_pkix_OCSP_Nonce */
409 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x03, /* [2739] OBJ_id_pkix_OCSP_CrLiD */
410 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x04, /* [2748] OBJ_id_pkix_OCSP_acceptab */
411 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x05, /* [2757] OBJ_id_pkix_OCSP_noCheck */
412 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x06, /* [2766] OBJ_id_pkix_OCSP_archiveC */
413 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x07, /* [2775] OBJ_id_pkix_OCSP_serviceL */
414 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x08, /* [2784] OBJ_id_pkix_OCSP_extended */
415 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x09, /* [2793] OBJ_id_pkix_OCSP_valid */
416 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x0A, /* [2802] OBJ_id_pkix_OCSP_path */
417 0x2B,0x06,0x01,0x05,0x05,0x07,0x30,0x01,0x0B, /* [2811] OBJ_id_pkix_OCSP_trustRoo */
418 0x2B,0x0E,0x03,0x02, /* [2820] OBJ_algorithm */
419 0x2B,0x0E,0x03,0x02,0x0B, /* [2824] OBJ_rsaSignature */
420 0x55,0x08, /* [2829] OBJ_X509algorithms */
421 0x2B, /* [2831] OBJ_org */
422 0x2B,0x06, /* [2832] OBJ_dod */
423 0x2B,0x06,0x01, /* [2834] OBJ_iana */
424 0x2B,0x06,0x01,0x01, /* [2837] OBJ_Directory */
425 0x2B,0x06,0x01,0x02, /* [2841] OBJ_Management */
426 0x2B,0x06,0x01,0x03, /* [2845] OBJ_Experimental */
427 0x2B,0x06,0x01,0x04, /* [2849] OBJ_Private */
428 0x2B,0x06,0x01,0x05, /* [2853] OBJ_Security */
429 0x2B,0x06,0x01,0x06, /* [2857] OBJ_SNMPv2 */
430 0x2B,0x06,0x01,0x07, /* [2861] OBJ_Mail */
431 0x2B,0x06,0x01,0x04,0x01, /* [2865] OBJ_Enterprises */
432 0x2B,0x06,0x01,0x04,0x01,0x8B,0x3A,0x82,0x58, /* [2870] OBJ_dcObject */
433 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x19, /* [2879] OBJ_domainComponent */
434 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x0D, /* [2889] OBJ_Domain */
435 0x00, /* [2899] OBJ_joint_iso_ccitt */
436 0x55,0x01,0x05, /* [2900] OBJ_selected_attribute_ty */
437 0x55,0x01,0x05,0x37, /* [2903] OBJ_clearance */
438 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x03, /* [2907] OBJ_md4WithRSAEncryption */
439 0x2B,0x06,0x01,0x05,0x05,0x07,0x01,0x0A, /* [2916] OBJ_ac_proxying */
440 0x2B,0x06,0x01,0x05,0x05,0x07,0x01,0x0B, /* [2924] OBJ_sinfo_access */
441 0x2B,0x06,0x01,0x05,0x05,0x07,0x0A,0x06, /* [2932] OBJ_id_aca_encAttr */
442 0x55,0x04,0x48, /* [2940] OBJ_role */
443 0x55,0x1D,0x24, /* [2943] OBJ_policy_constraints */
444 0x55,0x1D,0x37, /* [2946] OBJ_target_information */
445 0x55,0x1D,0x38, /* [2949] OBJ_no_rev_avail */
446 0x00, /* [2952] OBJ_ccitt */
447 0x2A,0x86,0x48,0xCE,0x3D, /* [2953] OBJ_ansi_X9_62 */
448 0x2A,0x86,0x48,0xCE,0x3D,0x01,0x01, /* [2958] OBJ_X9_62_prime_field */
449 0x2A,0x86,0x48,0xCE,0x3D,0x01,0x02, /* [2965] OBJ_X9_62_characteristic */
450 0x2A,0x86,0x48,0xCE,0x3D,0x02,0x01, /* [2972] OBJ_X9_62_id_ecPublicKey */
451 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x01,0x01, /* [2979] OBJ_X9_62_prime192v1 */
452 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x01,0x02, /* [2987] OBJ_X9_62_prime192v2 */
453 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x01,0x03, /* [2995] OBJ_X9_62_prime192v3 */
454 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x01,0x04, /* [3003] OBJ_X9_62_prime239v1 */
455 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x01,0x05, /* [3011] OBJ_X9_62_prime239v2 */
456 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x01,0x06, /* [3019] OBJ_X9_62_prime239v3 */
457 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x01,0x07, /* [3027] OBJ_X9_62_prime256v1 */

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458 0x2A,0x86,0x48,0xCE,0x3D,0x04,0x01, /* [3035] OBJ_ecdsa_with_SHA1 */
459 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x11,0x01, /* [3042] OBJ_ms_csp_name */
460 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x01, /* [3051] OBJ_aes_128_ecb */
461 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x02, /* [3060] OBJ_aes_128_cbc */
462 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x03, /* [3069] OBJ_aes_128_ofb128 */
463 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x04, /* [3078] OBJ_aes_128_cfb128 */
464 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x15, /* [3087] OBJ_aes_192_ecb */
465 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x16, /* [3096] OBJ_aes_192_cbc */
466 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x17, /* [3105] OBJ_aes_192_ofb128 */
467 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x18, /* [3114] OBJ_aes_192_cfb128 */
468 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x29, /* [3123] OBJ_aes_256_ecb */
469 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x2A, /* [3132] OBJ_aes_256_cbc */
470 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x2B, /* [3141] OBJ_aes_256_ofb128 */
471 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x2C, /* [3150] OBJ_aes_256_cfb128 */
472 0x55,0x1D,0x17, /* [3159] OBJ_hold_instruction_code */
473 0x2A,0x86,0x48,0xCE,0x38,0x02,0x01, /* [3162] OBJ_hold_instruction_none */
474 0x2A,0x86,0x48,0xCE,0x38,0x02,0x02, /* [3169] OBJ_hold_instruction_call */
475 0x2A,0x86,0x48,0xCE,0x38,0x02,0x03, /* [3176] OBJ_hold_instruction_reje */
476 0x09, /* [3183] OBJ_data */
477 0x09,0x92,0x26, /* [3184] OBJ_pss */
478 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C, /* [3187] OBJ_ucl */
479 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64, /* [3194] OBJ_pilot */
480 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01, /* [3202] OBJ_pilotAttributeType */
481 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x03, /* [3211] OBJ_pilotAttributeSyntax */
482 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04, /* [3220] OBJ_pilotObjectClass */
483 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x0A, /* [3229] OBJ_pilotGroups */
484 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x03,0x04, /* [3238] OBJ_iA5StringSyntax */
485 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x03,0x05, /* [3248] OBJ_caseIgnoreIA5Str */
486 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x03, /* [3258] OBJ_pilotObject */
487 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x04, /* [3268] OBJ_pilotPerson */
488 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x05, /* [3278] OBJ_account */
489 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x06, /* [3288] OBJ_document */
490 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x07, /* [3298] OBJ_room */
491 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x09, /* [3308] OBJ_documentSeries */
492 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x0E, /* [3318] OBJ_rfc822LocalPart */
493 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x0F, /* [3328] OBJ_dnsDomain */
494 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x11, /* [3338] OBJ_domainRelatedObj */
495 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x12, /* [3348] OBJ_friendlyCountry */
496 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x13, /* [3358] OBJ_simpleSecurityOb */
497 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x14, /* [3368] OBJ_pilotOrganizatio */
498 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x15, /* [3378] OBJ_pilotDSA */
499 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x04,0x16, /* [3388] OBJ_qualityLabelledD */
500 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x01, /* [3398] OBJ_userId */
501 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x02, /* [3408] OBJ_textEncodedORAdd */
502 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x03, /* [3418] OBJ_rfc822Mailbox */
503 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x04, /* [3428] OBJ_info */
504 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x05, /* [3438] OBJ_favouriteDrink */
505 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x06, /* [3448] OBJ_roomNumber */
506 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x07, /* [3458] OBJ_photo */
507 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x08, /* [3468] OBJ_userClass */
508 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x09, /* [3478] OBJ_host */
509 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x0A, /* [3488] OBJ_manager */
510 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x0B, /* [3498] OBJ_documentIdentifi */
511 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x0C, /* [3508] OBJ_documentTitle */
512 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x0D, /* [3518] OBJ_documentVersion */
513 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x0E, /* [3528] OBJ_documentAuthor */
514 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x0F, /* [3538] OBJ_documentLocation */
515 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x14, /* [3548] OBJ_homeTelephoNum */
516 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x15, /* [3558] OBJ_secretary */
517 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x16, /* [3568] OBJ_otherMailbox */
518 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x17, /* [3578] OBJ_lastModifiedTime */
519 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x18, /* [3588] OBJ_lastModifiedBy */
520 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x1A, /* [3598] OBJ_aRecord */
521 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x1B, /* [3608] OBJ_pilotAttributeTy */
522 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x1C, /* [3618] OBJ_mXRecord */
523 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x1D, /* [3628] OBJ_nSRecord */

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524 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x1E,/* [3638] OBJ_sOARRecord */
525 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x1F,/* [3648] OBJ_cNAMERecord */
526 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x25,/* [3658] OBJ_associatedDomain */
527 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x26,/* [3668] OBJ_associatedName */
528 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x27,/* [3678] OBJ_homePostalAddress */
529 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x28,/* [3688] OBJ_personalTitle */
530 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x29,/* [3698] OBJ_mobileTelephoneN */
531 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x2A,/* [3708] OBJ_pagerTelephoneNu */
532 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x2B,/* [3718] OBJ_friendlyCountryN */
533 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x2D,/* [3728] OBJ_organizationalSt */
534 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x2E,/* [3738] OBJ_janetMailbox */
535 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x2F,/* [3748] OBJ_mailPreferenceOp */
536 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x30,/* [3758] OBJ_buildingName */
537 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x31,/* [3768] OBJ_dSAQuality */
538 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x32,/* [3778] OBJ_singleLevelQuali */
539 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x33,/* [3788] OBJ_subtreeMinimumQu */
540 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x34,/* [3798] OBJ_subtreeMaximumQu */
541 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x35,/* [3808] OBJ_personalSignatur */
542 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x36,/* [3818] OBJ_dITRedirect */
543 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x37,/* [3828] OBJ_audio */
544 0x09,0x92,0x26,0x89,0x93,0xF2,0x2C,0x64,0x01,0x38,/* [3838] OBJ_documentPublishe */
545 0x55,0x04,0x2D,/* [3848] OBJ_x509UniqueIdentifier */
546 0x2B,0x06,0x01,0x07,0x01,/* [3851] OBJ_mime_mhs */
547 0x2B,0x06,0x01,0x07,0x01,0x01,/* [3856] OBJ_mime_mhs_headings */
548 0x2B,0x06,0x01,0x07,0x01,0x02,/* [3862] OBJ_mime_mhs_bodies */
549 0x2B,0x06,0x01,0x07,0x01,0x01,0x01,/* [3868] OBJ_id_hex_partial_messag */
550 0x2B,0x06,0x01,0x07,0x01,0x01,0x02,/* [3875] OBJ_id_hex_multipart_mess */
551 0x55,0x04,0x2C,/* [3882] OBJ_generationQualifier */
552 0x55,0x04,0x41,/* [3885] OBJ_pseudonym */
553 0x67,0x2A,/* [3888] OBJ_id_set */
554 0x67,0x2A,0x00,/* [3890] OBJ_set_cType */
555 0x67,0x2A,0x01,/* [3893] OBJ_set_msgExt */
556 0x67,0x2A,0x03,/* [3896] OBJ_set_attr */
557 0x67,0x2A,0x05,/* [3899] OBJ_set_policy */
558 0x67,0x2A,0x07,/* [3902] OBJ_set_certExt */
559 0x67,0x2A,0x08,/* [3905] OBJ_set_brand */
560 0x67,0x2A,0x00,0x00,/* [3908] OBJ_setct_PANData */
561 0x67,0x2A,0x00,0x01,/* [3912] OBJ_setct_PANToken */
562 0x67,0x2A,0x00,0x02,/* [3916] OBJ_setct_PANOnly */
563 0x67,0x2A,0x00,0x03,/* [3920] OBJ_setct_OIData */
564 0x67,0x2A,0x00,0x04,/* [3924] OBJ_setct_PI */
565 0x67,0x2A,0x00,0x05,/* [3928] OBJ_setct_PIData */
566 0x67,0x2A,0x00,0x06,/* [3932] OBJ_setct_PIDataUnsigned */
567 0x67,0x2A,0x00,0x07,/* [3936] OBJ_setct_HODInput */
568 0x67,0x2A,0x00,0x08,/* [3940] OBJ_setct_AuthResBaggage */
569 0x67,0x2A,0x00,0x09,/* [3944] OBJ_setct_AuthRevReqBagga */
570 0x67,0x2A,0x00,0x0A,/* [3948] OBJ_setct_AuthRevResBagga */
571 0x67,0x2A,0x00,0x0B,/* [3952] OBJ_setct_CapTokenSeq */
572 0x67,0x2A,0x00,0x0C,/* [3956] OBJ_setct_PInitResData */
573 0x67,0x2A,0x00,0x0D,/* [3960] OBJ_setct_PI_TBS */
574 0x67,0x2A,0x00,0x0E,/* [3964] OBJ_setct_PresData */
575 0x67,0x2A,0x00,0x10,/* [3968] OBJ_setct_AuthReqTBS */
576 0x67,0x2A,0x00,0x11,/* [3972] OBJ_setct_AuthResTBS */
577 0x67,0x2A,0x00,0x12,/* [3976] OBJ_setct_AuthResTBSX */
578 0x67,0x2A,0x00,0x13,/* [3980] OBJ_setct_AuthTokenTBS */
579 0x67,0x2A,0x00,0x14,/* [3984] OBJ_setct_CapTokenData */
580 0x67,0x2A,0x00,0x15,/* [3988] OBJ_setct_CapTokenTBS */
581 0x67,0x2A,0x00,0x16,/* [3992] OBJ_setct_AcqCardCodeMsg */
582 0x67,0x2A,0x00,0x17,/* [3996] OBJ_setct_AuthRevReqTBS */
583 0x67,0x2A,0x00,0x18,/* [4000] OBJ_setct_AuthRevResData */
584 0x67,0x2A,0x00,0x19,/* [4004] OBJ_setct_AuthRevResTBS */
585 0x67,0x2A,0x00,0x1A,/* [4008] OBJ_setct_CapReqTBS */
586 0x67,0x2A,0x00,0x1B,/* [4012] OBJ_setct_CapReqTBSX */
587 0x67,0x2A,0x00,0x1C,/* [4016] OBJ_setct_CapResData */
588 0x67,0x2A,0x00,0x1D,/* [4020] OBJ_setct_CapRevReqTBS */
589 0x67,0x2A,0x00,0x1E,/* [4024] OBJ_setct_CapRevReqTBSX */

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590 0x67,0x2A,0x00,0x1F,/* [4028] OBJ_setct_CapRevResData */
591 0x67,0x2A,0x00,0x20,/* [4032] OBJ_setct_CredReqTBS */
592 0x67,0x2A,0x00,0x21,/* [4036] OBJ_setct_CredReqTBSX */
593 0x67,0x2A,0x00,0x22,/* [4040] OBJ_setct_CredResData */
594 0x67,0x2A,0x00,0x23,/* [4044] OBJ_setct_CredRevReqTBS */
595 0x67,0x2A,0x00,0x24,/* [4048] OBJ_setct_CredRevReqTBSX */
596 0x67,0x2A,0x00,0x25,/* [4052] OBJ_setct_CredRevResData */
597 0x67,0x2A,0x00,0x26,/* [4056] OBJ_setct_PCertReqData */
598 0x67,0x2A,0x00,0x27,/* [4060] OBJ_setct_PCertResTBS */
599 0x67,0x2A,0x00,0x28,/* [4064] OBJ_setct_BatchAdminReqDa */
600 0x67,0x2A,0x00,0x29,/* [4068] OBJ_setct_BatchAdminResDa */
601 0x67,0x2A,0x00,0x2A,/* [4072] OBJ_setct_CardCInitResTBS */
602 0x67,0x2A,0x00,0x2B,/* [4076] OBJ_setct_MeAqCInitResTBS */
603 0x67,0x2A,0x00,0x2C,/* [4080] OBJ_setct_RegFormResTBS */
604 0x67,0x2A,0x00,0x2D,/* [4084] OBJ_setct_CertReqData */
605 0x67,0x2A,0x00,0x2E,/* [4088] OBJ_setct_CertReqTBS */
606 0x67,0x2A,0x00,0x2F,/* [4092] OBJ_setct_CertResData */
607 0x67,0x2A,0x00,0x30,/* [4096] OBJ_setct_CertInqReqTBS */
608 0x67,0x2A,0x00,0x31,/* [4100] OBJ_setct_ErrorTBS */
609 0x67,0x2A,0x00,0x32,/* [4104] OBJ_setct_PDUaSignedTBE */
610 0x67,0x2A,0x00,0x33,/* [4108] OBJ_setct_PUUnsignedTBE */
611 0x67,0x2A,0x00,0x34,/* [4112] OBJ_setct_AuthReqTBE */
612 0x67,0x2A,0x00,0x35,/* [4116] OBJ_setct_AuthResTBE */
613 0x67,0x2A,0x00,0x36,/* [4120] OBJ_setct_AuthResTBEX */
614 0x67,0x2A,0x00,0x37,/* [4124] OBJ_setct_AuthTokenTBE */
615 0x67,0x2A,0x00,0x38,/* [4128] OBJ_setct_CapTokenTBE */
616 0x67,0x2A,0x00,0x39,/* [4132] OBJ_setct_CapTokenTBEX */
617 0x67,0x2A,0x00,0x3A,/* [4136] OBJ_setct_AcqCardCodeMsgT */
618 0x67,0x2A,0x00,0x3B,/* [4140] OBJ_setct_AuthRevReqTBE */
619 0x67,0x2A,0x00,0x3C,/* [4144] OBJ_setct_AuthRevResTBE */
620 0x67,0x2A,0x00,0x3D,/* [4148] OBJ_setct_AuthRevResTBEB */
621 0x67,0x2A,0x00,0x3E,/* [4152] OBJ_setct_CapReqTBE */
622 0x67,0x2A,0x00,0x3F,/* [4156] OBJ_setct_CapReqTBEX */
623 0x67,0x2A,0x00,0x40,/* [4160] OBJ_setct_CapResTBE */
624 0x67,0x2A,0x00,0x41,/* [4164] OBJ_setct_CapRevReqTBE */
625 0x67,0x2A,0x00,0x42,/* [4168] OBJ_setct_CapRevReqTBEX */
626 0x67,0x2A,0x00,0x43,/* [4172] OBJ_setct_CapRevResTBE */
627 0x67,0x2A,0x00,0x44,/* [4176] OBJ_setct_CredReqTBE */
628 0x67,0x2A,0x00,0x45,/* [4180] OBJ_setct_CredReqTBEX */
629 0x67,0x2A,0x00,0x46,/* [4184] OBJ_setct_BCDistribution */
630 0x67,0x2A,0x00,0x47,/* [4188] OBJ_setct_CredRevReqTBE */
631 0x67,0x2A,0x00,0x48,/* [4192] OBJ_setct_CredRevReqTBEX */
632 0x67,0x2A,0x00,0x49,/* [4196] OBJ_setct_CredRevResTBE */
633 0x67,0x2A,0x00,0x4A,/* [4200] OBJ_setct_BatchAdminReqTB */
634 0x67,0x2A,0x00,0x4B,/* [4204] OBJ_setct_BatchAdminResTB */
635 0x67,0x2A,0x00,0x4C,/* [4208] OBJ_setct_RegFormReqTBE */
636 0x67,0x2A,0x00,0x4D,/* [4212] OBJ_setct_CertReqTBE */
637 0x67,0x2A,0x00,0x4E,/* [4216] OBJ_setct_CertReqTBEX */
638 0x67,0x2A,0x00,0x4F,/* [4220] OBJ_setct_CertResTBE */
639 0x67,0x2A,0x00,0x50,/* [4224] OBJ_setct_CRLNotification */
640 0x67,0x2A,0x00,0x51,/* [4228] OBJ_setct_CRLNotification */
641 0x67,0x2A,0x00,0x52,/* [4232] OBJ_setct_BCDistribution */
642 0x67,0x2A,0x01,0x01,/* [4236] OBJ_setext_genCrypt */
643 0x67,0x2A,0x01,0x03,/* [4240] OBJ_setext_miAuth */
644 0x67,0x2A,0x01,0x04,/* [4244] OBJ_setext_pinSecure */
645 0x67,0x2A,0x01,0x05,/* [4248] OBJ_setext_pinAny */
646 0x67,0x2A,0x01,0x07,/* [4252] OBJ_setext_track2 */
647 0x67,0x2A,0x01,0x08,/* [4256] OBJ_setext_cv */
648 0x67,0x2A,0x05,0x00,/* [4260] OBJ_set_policy_root */
649 0x67,0x2A,0x07,0x00,/* [4264] OBJ_setCext_hashedRoot */
650 0x67,0x2A,0x07,0x01,/* [4268] OBJ_setCext_certType */
651 0x67,0x2A,0x07,0x02,/* [4272] OBJ_setCext_merchData */
652 0x67,0x2A,0x07,0x03,/* [4276] OBJ_setCext_cCertRequired */
653 0x67,0x2A,0x07,0x04,/* [4280] OBJ_setCext_tunneling */
654 0x67,0x2A,0x07,0x05,/* [4284] OBJ_setCext_setExt */
655 0x67,0x2A,0x07,0x06,/* [4288] OBJ_setCext_setQualf */

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656 0x67,0x2A,0x07,0x07, /* [4292] OBJ_setCext_PGWYcapabilit
657 0x67,0x2A,0x07,0x08, /* [4296] OBJ_setCext_TokenIdentifi
658 0x67,0x2A,0x07,0x09, /* [4300] OBJ_setCext_Track2Data */
659 0x67,0x2A,0x07,0x0A, /* [4304] OBJ_setCext_TokenType */
660 0x67,0x2A,0x07,0x0B, /* [4308] OBJ_setCext_IssuerCapabil
661 0x67,0x2A,0x03,0x00, /* [4312] OBJ_setAttr_Cert */
662 0x67,0x2A,0x03,0x01, /* [4316] OBJ_setAttr_PGWYcap */
663 0x67,0x2A,0x03,0x02, /* [4320] OBJ_setAttr_TokenType */
664 0x67,0x2A,0x03,0x03, /* [4324] OBJ_setAttr_IssCap */
665 0x67,0x2A,0x03,0x00,0x00, /* [4328] OBJ_set_rootKeyThumb */
666 0x67,0x2A,0x03,0x00,0x01, /* [4332] OBJ_set_addPolicy */
667 0x67,0x2A,0x03,0x02,0x01, /* [4338] OBJ_setAttr_Token_EMV */
668 0x67,0x2A,0x03,0x02,0x02, /* [4343] OBJ_setAttr_Token_B0Prime
669 0x67,0x2A,0x03,0x03,0x03, /* [4348] OBJ_setAttr_IssCap_CVM */
670 0x67,0x2A,0x03,0x03,0x04, /* [4353] OBJ_setAttr_IssCap_T2 */
671 0x67,0x2A,0x03,0x03,0x05, /* [4358] OBJ_setAttr_IssCap_Sig */
672 0x67,0x2A,0x03,0x03,0x03,0x01, /* [4363] OBJ_setAttr_GenCryptgrm */
673 0x67,0x2A,0x03,0x03,0x04,0x01, /* [4369] OBJ_setAttr_T2Enc */
674 0x67,0x2A,0x03,0x03,0x04,0x02, /* [4375] OBJ_setAttr_T2cleartxt */
675 0x67,0x2A,0x03,0x03,0x05,0x01, /* [4381] OBJ_setAttr_TokICCSig */
676 0x67,0x2A,0x03,0x03,0x05,0x02, /* [4387] OBJ_setAttr_SecDevSig */
677 0x67,0x2A,0x08,0x01, /* [4393] OBJ_set_brand_IATA_ATA */
678 0x67,0x2A,0x08,0x1E, /* [4397] OBJ_set_brand_Diners */
679 0x67,0x2A,0x08,0x22, /* [4401] OBJ_set_brand_AmericanExp
680 0x67,0x2A,0x08,0x23, /* [4405] OBJ_set_brand_JCB */
681 0x67,0x2A,0x08,0x04, /* [4409] OBJ_set_brand_Visa */
682 0x67,0x2A,0x08,0x05, /* [4413] OBJ_set_brand_MasterCard
683 0x67,0x2A,0x08,0x0A,0x7B, /* [4417] OBJ_set_brand_Novus */
684 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x03,0x0A, /* [4422] OBJ_des_cdmf */
685 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x06, /* [4430] OBJ_rsa0AEPEncryptionSET
686 0x00, /* [4439] OBJ_itu_t */
687 0x50, /* [4440] OBJ_joint_iso_itu_t */
688 0x67, /* [4441] OBJ_international_organiz
689 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x14,0x02,0x02, /* [4442] OBJ_ms_smartcard_log
690 0x2B,0x06,0x01,0x04,0x01,0x82,0x37,0x14,0x02,0x03, /* [4452] OBJ_ms_upn */
691 0x55,0x04,0x09, /* [4462] OBJ_streetAddress */
692 0x55,0x04,0x11, /* [4465] OBJ_postalCode */
693 0x2B,0x06,0x01,0x05,0x05,0x07,0x15, /* [4468] OBJ_id_ppl */
694 0x2B,0x06,0x01,0x05,0x05,0x07,0x01,0x0E, /* [4475] OBJ_proxyCertInfo */
695 0x2B,0x06,0x01,0x05,0x05,0x07,0x15,0x00, /* [4483] OBJ_id_ppl_anyLanguage */
696 0x2B,0x06,0x01,0x05,0x05,0x07,0x15,0x01, /* [4491] OBJ_id_ppl_inheritAll */
697 0x55,0x1D,0x1E, /* [4499] OBJ_name_constraints */
698 0x2B,0x06,0x01,0x05,0x05,0x07,0x15,0x02, /* [4502] OBJ_Independent */
699 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x0B, /* [4510] OBJ_sha256WithRSAEncrypti
700 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x0C, /* [4519] OBJ_sha384WithRSAEncrypti
701 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x0D, /* [4528] OBJ_sha512WithRSAEncrypti
702 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x0E, /* [4537] OBJ_sha224WithRSAEncrypti
703 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x02,0x01, /* [4546] OBJ_sha256 */
704 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x02,0x02, /* [4555] OBJ_sha384 */
705 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x02,0x03, /* [4564] OBJ_sha512 */
706 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x02,0x04, /* [4573] OBJ_sha224 */
707 0x2B, /* [4582] OBJ_identified_organizati
708 0x2B,0x81,0x04, /* [4583] OBJ_certicom_arc */
709 0x67,0x2B, /* [4586] OBJ_wap */
710 0x67,0x2B,0x01, /* [4588] OBJ_wap_wsg */
711 0x2A,0x86,0x48,0xCE,0x3D,0x01,0x02,0x03, /* [4591] OBJ_X9_62_id_characterist
712 0x2A,0x86,0x48,0xCE,0x3D,0x01,0x02,0x03,0x01, /* [4599] OBJ_X9_62_onBasis */
713 0x2A,0x86,0x48,0xCE,0x3D,0x01,0x02,0x03,0x02, /* [4608] OBJ_X9_62_tpBasis */
714 0x2A,0x86,0x48,0xCE,0x3D,0x01,0x02,0x03,0x03, /* [4617] OBJ_X9_62_ppBasis */
715 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x01, /* [4626] OBJ_X9_62_c2pnbl63v1 */
716 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x02, /* [4634] OBJ_X9_62_c2pnbl63v2 */
717 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x03, /* [4642] OBJ_X9_62_c2pnbl63v3 */
718 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x04, /* [4650] OBJ_X9_62_c2pnbl63v4 */
719 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x05, /* [4658] OBJ_X9_62_c2tnb191v1 */
720 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x06, /* [4666] OBJ_X9_62_c2tnb191v2 */
721 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x07, /* [4674] OBJ_X9_62_c2tnb191v3 */

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722 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x08, /* [4682] OBJ_X9_62_c2onb191v4 */
723 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x09, /* [4690] OBJ_X9_62_c2onb191v5 */
724 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x0A, /* [4698] OBJ_X9_62_c2pnbl208w1 */
725 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x0B, /* [4706] OBJ_X9_62_c2tnb239v1 */
726 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x0C, /* [4714] OBJ_X9_62_c2tnb239v2 */
727 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x0D, /* [4722] OBJ_X9_62_c2tnb239v3 */
728 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x0E, /* [4730] OBJ_X9_62_c2onb239v4 */
729 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x0F, /* [4738] OBJ_X9_62_c2onb239v5 */
730 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x10, /* [4746] OBJ_X9_62_c2pnbl272w1 */
731 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x11, /* [4754] OBJ_X9_62_c2pnbl304w1 */
732 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x12, /* [4762] OBJ_X9_62_c2tnb359v1 */
733 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x13, /* [4770] OBJ_X9_62_c2pnbl368w1 */
734 0x2A,0x86,0x48,0xCE,0x3D,0x03,0x00,0x14, /* [4778] OBJ_X9_62_c2tnbl431r1 */
735 0x2B,0x81,0x04,0x00,0x06, /* [4786] OBJ_secpr112r1 */
736 0x2B,0x81,0x04,0x00,0x07, /* [4791] OBJ_secpr112r2 */
737 0x2B,0x81,0x04,0x00,0x1C, /* [4796] OBJ_secpr128r1 */
738 0x2B,0x81,0x04,0x00,0x1D, /* [4801] OBJ_secpr128r2 */
739 0x2B,0x81,0x04,0x00,0x09, /* [4806] OBJ_secpr160r1 */
740 0x2B,0x81,0x04,0x00,0x08, /* [4811] OBJ_secpr160r2 */
741 0x2B,0x81,0x04,0x00,0x1E, /* [4816] OBJ_secpr160r2 */
742 0x2B,0x81,0x04,0x00,0x1F, /* [4821] OBJ_secpr192k1 */
743 0x2B,0x81,0x04,0x00,0x20, /* [4826] OBJ_secpr224k1 */
744 0x2B,0x81,0x04,0x00,0x21, /* [4831] OBJ_secpr224r1 */
745 0x2B,0x81,0x04,0x00,0x0A, /* [4836] OBJ_secpr256k1 */
746 0x2B,0x81,0x04,0x00,0x22, /* [4841] OBJ_secpr384r1 */
747 0x2B,0x81,0x04,0x00,0x23, /* [4846] OBJ_secpr521r1 */
748 0x2B,0x81,0x04,0x00,0x04, /* [4851] OBJ_sect113r1 */
749 0x2B,0x81,0x04,0x00,0x05, /* [4856] OBJ_sect113r2 */
750 0x2B,0x81,0x04,0x00,0x16, /* [4861] OBJ_sect131r1 */
751 0x2B,0x81,0x04,0x00,0x17, /* [4866] OBJ_sect131r2 */
752 0x2B,0x81,0x04,0x00,0x01, /* [4871] OBJ_sect163k1 */
753 0x2B,0x81,0x04,0x00,0x02, /* [4876] OBJ_sect163r1 */
754 0x2B,0x81,0x04,0x00,0x0F, /* [4881] OBJ_sect163r2 */
755 0x2B,0x81,0x04,0x00,0x18, /* [4886] OBJ_sect193r1 */
756 0x2B,0x81,0x04,0x00,0x19, /* [4891] OBJ_sect193r2 */
757 0x2B,0x81,0x04,0x00,0x1A, /* [4896] OBJ_sect233k1 */
758 0x2B,0x81,0x04,0x00,0x1B, /* [4901] OBJ_sect233r1 */
759 0x2B,0x81,0x04,0x00,0x03, /* [4906] OBJ_sect239k1 */
760 0x2B,0x81,0x04,0x00,0x10, /* [4911] OBJ_sect283k1 */
761 0x2B,0x81,0x04,0x00,0x11, /* [4916] OBJ_sect283r1 */
762 0x2B,0x81,0x04,0x00,0x24, /* [4921] OBJ_sect409k1 */
763 0x2B,0x81,0x04,0x00,0x25, /* [4926] OBJ_sect409r1 */
764 0x2B,0x81,0x04,0x00,0x26, /* [4931] OBJ_sect571k1 */
765 0x2B,0x81,0x04,0x00,0x27, /* [4936] OBJ_sect571r1 */
766 0x67,0x2B,0x01,0x04,0x01, /* [4941] OBJ_wap_wsg_idm_ecid_wtls
767 0x67,0x2B,0x01,0x04,0x03, /* [4946] OBJ_wap_wsg_idm_ecid_wtls
768 0x67,0x2B,0x01,0x04,0x04, /* [4951] OBJ_wap_wsg_idm_ecid_wtls
769 0x67,0x2B,0x01,0x04,0x05, /* [4956] OBJ_wap_wsg_idm_ecid_wtls
770 0x67,0x2B,0x01,0x04,0x06, /* [4961] OBJ_wap_wsg_idm_ecid_wtls
771 0x67,0x2B,0x01,0x04,0x07, /* [4966] OBJ_wap_wsg_idm_ecid_wtls
772 0x67,0x2B,0x01,0x04,0x08, /* [4971] OBJ_wap_wsg_idm_ecid_wtls
773 0x67,0x2B,0x01,0x04,0x09, /* [4976] OBJ_wap_wsg_idm_ecid_wtls
774 0x67,0x2B,0x01,0x04,0x0A, /* [4981] OBJ_wap_wsg_idm_ecid_wtls
775 0x67,0x2B,0x01,0x04,0x0B, /* [4986] OBJ_wap_wsg_idm_ecid_wtls
776 0x67,0x2B,0x01,0x04,0x0C, /* [4991] OBJ_wap_wsg_idm_ecid_wtls
777 0x55,0x1D,0x20,0x00, /* [4996] OBJ_any_policy */
778 0x55,0x1D,0x21, /* [5000] OBJ_policy_mappings */
779 0x55,0x1D,0x36, /* [5003] OBJ_inhibit_any_policy */
780 0x2A,0x83,0x08,0x8C,0x9A,0x4B,0x3D,0x01,0x01,0x01,0x02, /* [5006] OBJ_camellia_12
781 0x2A,0x83,0x08,0x8C,0x9A,0x4B,0x3D,0x01,0x01,0x01,0x03, /* [5017] OBJ_camellia_19
782 0x2A,0x83,0x08,0x8C,0x9A,0x4B,0x3D,0x01,0x01,0x01,0x04, /* [5028] OBJ_camellia_25
783 0x03,0xA2,0x31,0x05,0x03,0x01,0x09,0x01, /* [5039] OBJ_camellia_128_ecb */
784 0x03,0xA2,0x31,0x05,0x03,0x01,0x09,0x15, /* [5047] OBJ_camellia_192_ecb */
785 0x03,0xA2,0x31,0x05,0x03,0x01,0x09,0x29, /* [5055] OBJ_camellia_256_ecb */
786 0x03,0xA2,0x31,0x05,0x03,0x01,0x09,0x04, /* [5063] OBJ_camellia_128_cfb128 */
787 0x03,0xA2,0x31,0x05,0x03,0x01,0x09,0x18, /* [5071] OBJ_camellia_192_cfb128 */

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788 0x03, 0xA2, 0x31, 0x05, 0x03, 0x01, 0x09, 0x2C, /* [5079] OBJ_camellia_256_cfb128 *
789 0x03, 0xA2, 0x31, 0x05, 0x03, 0x01, 0x09, 0x03, /* [5087] OBJ_camellia_128_ofb128 *
790 0x03, 0xA2, 0x31, 0x05, 0x03, 0x01, 0x09, 0x17, /* [5095] OBJ_camellia_192_ofb128 *
791 0x03, 0xA2, 0x31, 0x05, 0x03, 0x01, 0x09, 0x2B, /* [5103] OBJ_camellia_256_ofb128 *
792 0x55, 0x1D, 0x09, /* [5111] OBJ_subject_directory_att
793 0x55, 0x1D, 0x1C, /* [5114] OBJ_issuing_distribution
794 0x55, 0x1D, 0x1D, /* [5117] OBJ_certificate_issuer */
795 0x2A, 0x83, 0x1A, 0x8C, 0x9A, 0x44, /* [5120] OBJ_kisa */
796 0x2A, 0x83, 0x1A, 0x8C, 0x9A, 0x44, 0x01, 0x03, /* [5126] OBJ_seed_ecb */
797 0x2A, 0x83, 0x1A, 0x8C, 0x9A, 0x44, 0x01, 0x04, /* [5134] OBJ_seed_cbc */
798 0x2A, 0x83, 0x1A, 0x8C, 0x9A, 0x44, 0x01, 0x06, /* [5142] OBJ_seed_ofb128 */
799 0x2A, 0x83, 0x1A, 0x8C, 0x9A, 0x44, 0x01, 0x05, /* [5150] OBJ_seed_cfb128 */
800 0x2B, 0x06, 0x01, 0x05, 0x05, 0x08, 0x01, 0x01, /* [5158] OBJ_hmac_md5 */
801 0x2B, 0x06, 0x01, 0x05, 0x05, 0x08, 0x01, 0x02, /* [5166] OBJ_hmac_sha1 */
802 0x2A, 0x86, 0x48, 0x86, 0xF6, 0x7D, 0x07, 0x42, 0x0D, /* [5174] OBJ_id_PasswordBasedMAC *
803 0x2A, 0x86, 0x48, 0x86, 0xF6, 0x7D, 0x07, 0x42, 0x1E, /* [5183] OBJ_id_DHBasedMAC */
804 0x2B, 0x06, 0x01, 0x05, 0x05, 0x07, 0x04, 0x10, /* [5192] OBJ_id_it_supplLangTags */
805 0x2B, 0x06, 0x01, 0x05, 0x05, 0x07, 0x30, 0x05, /* [5200] OBJ_caRepository */
806 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x01, 0x09, 0x10, 0x01, 0x09, /* [5208] OBJ_id_smime_ct
807 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x01, 0x09, 0x10, 0x01, 0x1B, /* [5219] OBJ_id_ct_ascii
808 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x05, /* [5230] OBJ_id_aes128_wrap */
809 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x19, /* [5239] OBJ_id_aes192_wrap */
810 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x2D, /* [5248] OBJ_id_aes256_wrap */
811 0x2A, 0x86, 0x48, 0xCE, 0x3D, 0x04, 0x02, /* [5257] OBJ_ecdsa_with_Recommende
812 0x2A, 0x86, 0x48, 0xCE, 0x3D, 0x04, 0x03, /* [5264] OBJ_ecdsa_with_Specified
813 0x2A, 0x86, 0x48, 0xCE, 0x3D, 0x04, 0x03, 0x01, /* [5271] OBJ_ecdsa_with_SHA224 */
814 0x2A, 0x86, 0x48, 0xCE, 0x3D, 0x04, 0x03, 0x02, /* [5279] OBJ_ecdsa_with_SHA256 */
815 0x2A, 0x86, 0x48, 0xCE, 0x3D, 0x04, 0x03, 0x03, /* [5287] OBJ_ecdsa_with_SHA384 */
816 0x2A, 0x86, 0x48, 0xCE, 0x3D, 0x04, 0x03, 0x04, /* [5295] OBJ_ecdsa_with_SHA512 */
817 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x02, 0x06, /* [5303] OBJ_hmacWithMD5 */
818 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x02, 0x08, /* [5311] OBJ_hmacWithSHA224 */
819 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x02, 0x09, /* [5319] OBJ_hmacWithSHA256 */
820 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x02, 0x0A, /* [5327] OBJ_hmacWithSHA384 */
821 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x02, 0x0B, /* [5335] OBJ_hmacWithSHA512 */
822 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x03, 0x01, /* [5343] OBJ_dsa_with_SHA224 */
823 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x03, 0x02, /* [5352] OBJ_dsa_with_SHA256 */
824 0x2B, 0xCF, 0x06, 0x03, 0x00, 0x37, /* [5361] OBJ_whirlpool */
825 0x2A, 0x85, 0x03, 0x02, 0x02, /* [5367] OBJ_cryptopro */
826 0x2A, 0x85, 0x03, 0x02, 0x09, /* [5372] OBJ_cryptocom */
827 0x2A, 0x85, 0x03, 0x02, 0x02, 0x03, /* [5377] OBJ_id_GostR3411_94_with_
828 0x2A, 0x85, 0x03, 0x02, 0x02, 0x04, /* [5383] OBJ_id_GostR3411_94_with_
829 0x2A, 0x85, 0x03, 0x02, 0x02, 0x09, /* [5389] OBJ_id_GostR3411_94 */
830 0x2A, 0x85, 0x03, 0x02, 0x02, 0x0A, /* [5395] OBJ_id_HMACGostR3411_94 *
831 0x2A, 0x85, 0x03, 0x02, 0x02, 0x13, /* [5401] OBJ_id_GostR3410_2001 */
832 0x2A, 0x85, 0x03, 0x02, 0x02, 0x14, /* [5407] OBJ_id_GostR3410_94 */
833 0x2A, 0x85, 0x03, 0x02, 0x02, 0x15, /* [5413] OBJ_id_Gost28147_89 */
834 0x2A, 0x85, 0x03, 0x02, 0x02, 0x16, /* [5419] OBJ_id_Gost28147_89_MAC *
835 0x2A, 0x85, 0x03, 0x02, 0x02, 0x17, /* [5425] OBJ_id_GostR3411_94_prf *
836 0x2A, 0x85, 0x03, 0x02, 0x02, 0x62, /* [5431] OBJ_id_GostR3410_2001DH *
837 0x2A, 0x85, 0x03, 0x02, 0x02, 0x63, /* [5437] OBJ_id_GostR3410_94DH */
838 0x2A, 0x85, 0x03, 0x02, 0x02, 0x0E, 0x01, /* [5443] OBJ_id_Gost28147_89_Crypt
839 0x2A, 0x85, 0x03, 0x02, 0x02, 0x0E, 0x00, /* [5450] OBJ_id_Gost28147_89_None
840 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1E, 0x00, /* [5457] OBJ_id_GostR3411_94_TestP
841 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1E, 0x01, /* [5464] OBJ_id_GostR3411_94_Crypt
842 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x00, /* [5471] OBJ_id_Gost28147_89_TestP
843 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x01, /* [5478] OBJ_id_Gost28147_89_Crypt
844 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x02, /* [5485] OBJ_id_Gost28147_89_Crypt
845 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x03, /* [5492] OBJ_id_Gost28147_89_Crypt
846 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x04, /* [5499] OBJ_id_Gost28147_89_Crypt
847 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x05, /* [5506] OBJ_id_Gost28147_89_Crypt
848 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x06, /* [5513] OBJ_id_Gost28147_89_Crypt
849 0x2A, 0x85, 0x03, 0x02, 0x02, 0x1F, 0x07, /* [5520] OBJ_id_Gost28147_89_Crypt
850 0x2A, 0x85, 0x03, 0x02, 0x02, 0x20, 0x00, /* [5527] OBJ_id_GostR3410_94_TestP
851 0x2A, 0x85, 0x03, 0x02, 0x02, 0x20, 0x02, /* [5534] OBJ_id_GostR3410_94_Crypt
852 0x2A, 0x85, 0x03, 0x02, 0x02, 0x20, 0x03, /* [5541] OBJ_id_GostR3410_94_Crypt
853 0x2A, 0x85, 0x03, 0x02, 0x02, 0x20, 0x04, /* [5548] OBJ_id_GostR3410_94_Crypt

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854 0x2A, 0x85, 0x03, 0x02, 0x02, 0x20, 0x05, /* [5555] OBJ_id_GostR3410_94_Crypt
855 0x2A, 0x85, 0x03, 0x02, 0x02, 0x21, 0x01, /* [5562] OBJ_id_GostR3410_94_Crypt
856 0x2A, 0x85, 0x03, 0x02, 0x02, 0x21, 0x02, /* [5569] OBJ_id_GostR3410_94_Crypt
857 0x2A, 0x85, 0x03, 0x02, 0x02, 0x21, 0x03, /* [5576] OBJ_id_GostR3410_94_Crypt
858 0x2A, 0x85, 0x03, 0x02, 0x02, 0x23, 0x00, /* [5583] OBJ_id_GostR3410_2001_Tes
859 0x2A, 0x85, 0x03, 0x02, 0x02, 0x23, 0x01, /* [5590] OBJ_id_GostR3410_2001_Cry
860 0x2A, 0x85, 0x03, 0x02, 0x02, 0x23, 0x02, /* [5597] OBJ_id_GostR3410_2001_Cry
861 0x2A, 0x85, 0x03, 0x02, 0x02, 0x23, 0x03, /* [5604] OBJ_id_GostR3410_2001_Cry
862 0x2A, 0x85, 0x03, 0x02, 0x02, 0x24, 0x00, /* [5611] OBJ_id_GostR3410_2001_Cry
863 0x2A, 0x85, 0x03, 0x02, 0x02, 0x24, 0x01, /* [5618] OBJ_id_GostR3410_2001_Cry
864 0x2A, 0x85, 0x03, 0x02, 0x02, 0x14, 0x01, /* [5625] OBJ_id_GostR3410_94_a */
865 0x2A, 0x85, 0x03, 0x02, 0x02, 0x14, 0x02, /* [5632] OBJ_id_GostR3410_94_aBis
866 0x2A, 0x85, 0x03, 0x02, 0x02, 0x14, 0x03, /* [5639] OBJ_id_GostR3410_94_b */
867 0x2A, 0x85, 0x03, 0x02, 0x02, 0x14, 0x04, /* [5646] OBJ_id_GostR3410_94_bBis
868 0x2A, 0x85, 0x03, 0x02, 0x09, 0x01, 0x06, 0x01, /* [5653] OBJ_id_Gost28147_89_cc */
869 0x2A, 0x85, 0x03, 0x02, 0x09, 0x01, 0x05, 0x03, /* [5661] OBJ_id_GostR3410_94_cc */
870 0x2A, 0x85, 0x03, 0x02, 0x09, 0x01, 0x05, 0x04, /* [5669] OBJ_id_GostR3410_2001_cc
871 0x2A, 0x85, 0x03, 0x02, 0x09, 0x01, 0x03, 0x03, /* [5677] OBJ_id_GostR3411_94_with_
872 0x2A, 0x85, 0x03, 0x02, 0x09, 0x01, 0x03, 0x04, /* [5685] OBJ_id_GostR3411_94_with_
873 0x2A, 0x85, 0x03, 0x02, 0x09, 0x01, 0x08, 0x01, /* [5693] OBJ_id_GostR3410_2001_Par
874 0x2B, 0x06, 0x01, 0x04, 0x01, 0x82, 0x37, 0x11, 0x02, /* [5701] OBJ_LocalKeySet */
875 0x55, 0x1D, 0x2E, /* [5710] OBJ_freshest_crl */
876 0x2B, 0x06, 0x01, 0x05, 0x05, 0x07, 0x08, 0x03, /* [5713] OBJ_id_on_permanentIdenti
877 0x55, 0x04, 0x0E, /* [5721] OBJ_searchGuide */
878 0x55, 0x04, 0x0F, /* [5724] OBJ_businessCategory */
879 0x55, 0x04, 0x10, /* [5727] OBJ_postalAddress */
880 0x55, 0x04, 0x12, /* [5730] OBJ_postOfficeBox */
881 0x55, 0x04, 0x13, /* [5733] OBJ_physicalDeliveryOffic
882 0x55, 0x04, 0x14, /* [5736] OBJ_telephoneNumber */
883 0x55, 0x04, 0x15, /* [5739] OBJ_telemNumber */
884 0x55, 0x04, 0x16, /* [5742] OBJ_telemTerminalIdenti
885 0x55, 0x04, 0x17, /* [5745] OBJ_facsimileTelephoneNum
886 0x55, 0x04, 0x18, /* [5748] OBJ_x121Address */
887 0x55, 0x04, 0x19, /* [5751] OBJ_internationalISDNNumb
888 0x55, 0x04, 0x1A, /* [5754] OBJ_registeredAddress */
889 0x55, 0x04, 0x1B, /* [5757] OBJ_destinationIndicator
890 0x55, 0x04, 0x1C, /* [5760] OBJ_preferredDeliveryMeth
891 0x55, 0x04, 0x1D, /* [5763] OBJ_presentationAddress *
892 0x55, 0x04, 0x1E, /* [5766] OBJ_supportedApplicationC
893 0x55, 0x04, 0x1F, /* [5769] OBJ_member */
894 0x55, 0x04, 0x20, /* [5772] OBJ_owner */
895 0x55, 0x04, 0x21, /* [5775] OBJ_roleOccupant */
896 0x55, 0x04, 0x22, /* [5778] OBJ_seeAlso */
897 0x55, 0x04, 0x23, /* [5781] OBJ_userPassword */
898 0x55, 0x04, 0x24, /* [5784] OBJ_userCertificate */
899 0x55, 0x04, 0x25, /* [5787] OBJ_cACertificate */
900 0x55, 0x04, 0x26, /* [5790] OBJ_authorityRevocationLi
901 0x55, 0x04, 0x27, /* [5793] OBJ_certificateRevocation
902 0x55, 0x04, 0x28, /* [5796] OBJ_crossCertificatePair
903 0x55, 0x04, 0x2F, /* [5799] OBJ_enhancedSearchGuide *
904 0x55, 0x04, 0x30, /* [5802] OBJ_protocolInformation *
905 0x55, 0x04, 0x31, /* [5805] OBJ_distinguishedName */
906 0x55, 0x04, 0x32, /* [5808] OBJ_uniqueMember */
907 0x55, 0x04, 0x33, /* [5811] OBJ_houseIdentifier */
908 0x55, 0x04, 0x34, /* [5814] OBJ_supportedAlgorithms *
909 0x55, 0x04, 0x35, /* [5817] OBJ_deltaRevocationList *
910 0x55, 0x04, 0x36, /* [5820] OBJ_dmdName */
911 0x2A, 0x86, 0x48, 0x86, 0xF7, 0x0D, 0x01, 0x09, 0x10, 0x03, 0x09, /* [5823] OBJ_id_alg_PWRI
912 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x06, /* [5834] OBJ_aes_128_gcm */
913 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x07, /* [5843] OBJ_aes_128_ccm */
914 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x08, /* [5852] OBJ_id_aes128_wrap_pad */
915 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x1A, /* [5861] OBJ_aes_192_gcm */
916 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x1B, /* [5870] OBJ_aes_192_ccm */
917 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x1C, /* [5879] OBJ_id_aes192_wrap_pad */
918 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x2E, /* [5888] OBJ_aes_256_gcm */
919 0x60, 0x86, 0x48, 0x01, 0x65, 0x03, 0x04, 0x01, 0x2F, /* [5897] OBJ_aes_256_ccm */

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920 0x60,0x86,0x48,0x01,0x65,0x03,0x04,0x01,0x30,/* [5906] OBJ_id_aes256_wrap_pad */
921 0x2A,0x83,0x08,0x8C,0x9A,0x4B,0x3D,0x01,0x01,0x03,0x02,/* [5915] OBJ_id_camellia
922 0x2A,0x83,0x08,0x8C,0x9A,0x4B,0x3D,0x01,0x01,0x03,0x03,/* [5926] OBJ_id_camellia
923 0x2A,0x83,0x08,0x8C,0x9A,0x4B,0x3D,0x01,0x01,0x03,0x04,/* [5937] OBJ_id_camellia
924 0x55,0x1D,0x25,0x00,/* [5948] OBJ_anyExtendedKeyUsage */
925 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x08,/* [5952] OBJ_mgf1 */
926 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x0A,/* [5961] OBJ_rsassaPss */
927 0x2A,0x86,0x48,0x86,0xF7,0x0D,0x01,0x01,0x07,/* [5970] OBJ_rsasoaep */
928 };

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930 static const ASN1_OBJECT nid_objs[NUM_NID]={
931 {"UNDEF", "undefined", NID_undef, 1, &(lvalues[0])},
932 {"rsadsi", "RSA Data Security, Inc.", NID_rsadsi, 6, &(lvalues[1])},
933 {"pkcs", "RSA Data Security, Inc. PKCS", NID_pkcs, 7, &(lvalues[7])},
934 {"MD2", "md2", NID_md2, 8, &(lvalues[14])},
935 {"MD5", "md5", NID_md5, 8, &(lvalues[22])},
936 {"RC4", "rc4", NID_rc4, 8, &(lvalues[30])},
937 {"rsaEncryption", "rsaEncryption", NID_rsaEncryption, 9, &(lvalues[38])},
938 {"RSA-MD2", "md2WithRSAEncryption", NID_md2WithRSAEncryption, 9,
939  &(lvalues[47])},
940 {"RSA-MD5", "md5WithRSAEncryption", NID_md5WithRSAEncryption, 9,
941  &(lvalues[56])},
942 {"PBE-MD2-DES", "pbeWithMD2AndDES-CBC", NID_pbeWithMD2AndDES_CBC, 9,
943  &(lvalues[65])},
944 {"PBE-MD5-DES", "pbeWithMD5AndDES-CBC", NID_pbeWithMD5AndDES_CBC, 9,
945  &(lvalues[74])},
946 {"X500", "directory services (X.500)", NID_X500, 1, &(lvalues[83])},
947 {"X509", "X509", NID_X509, 2, &(lvalues[84])},
948 {"CN", "commonName", NID_commonName, 3, &(lvalues[86])},
949 {"C", "countryName", NID_countryName, 3, &(lvalues[89])},
950 {"L", "localityName", NID_localityName, 3, &(lvalues[92])},
951 {"ST", "stateOrProvinceName", NID_stateOrProvinceName, 3, &(lvalues[95])},
952 {"O", "organizationName", NID_organizationName, 3, &(lvalues[98])},
953 {"OU", "organizationalUnitName", NID_organizationalUnitName, 3,
954  &(lvalues[101])},
955 {"RSA", "rsa", NID_rsa, 4, &(lvalues[104])},
956 {"pkcs7", "pkcs7", NID_pkcs7, 8, &(lvalues[108])},
957 {"pkcs7-data", "pkcs7-data", NID_pkcs7_data, 9, &(lvalues[116])},
958 {"pkcs7-signedData", "pkcs7-signedData", NID_pkcs7_signed, 9,
959  &(lvalues[125])},
960 {"pkcs7-envelopedData", "pkcs7-envelopedData", NID_pkcs7_enveloped, 9,
961  &(lvalues[134])},
962 {"pkcs7-signedAndEnvelopedData", "pkcs7-signedAndEnvelopedData",
963  NID_pkcs7_signedAndEnveloped, 9, &(lvalues[143])},
964 {"pkcs7-digestData", "pkcs7-digestData", NID_pkcs7_digest, 9,
965  &(lvalues[152])},
966 {"pkcs7-encryptedData", "pkcs7-encryptedData", NID_pkcs7_encrypted, 9,
967  &(lvalues[161])},
968 {"pkcs3", "pkcs3", NID_pkcs3, 8, &(lvalues[170])},
969 {"dhKeyAgreement", "dhKeyAgreement", NID_dhKeyAgreement, 9,
970  &(lvalues[178])},
971 {"DES-ECB", "des-ecb", NID_des_ecb, 5, &(lvalues[187])},
972 {"DES-CFB", "des-cfb", NID_des_cfb64, 5, &(lvalues[192])},
973 {"DES-CBC", "des-cbc", NID_des_cbc, 5, &(lvalues[197])},
974 {"DES-EDE", "des-edc", NID_des_edc, 5, &(lvalues[202])},
975 {"DES-EDE3", "des-edc3", NID_des_edc3_ecb, 0, NULL},
976 {"IDEA-CBC", "idea-cbc", NID_idea_cbc, 11, &(lvalues[207])},
977 {"IDEA-CFB", "idea-cfb", NID_idea_cfb64, 0, NULL},
978 {"IDEA-ECB", "idea-ecb", NID_idea_ecb, 0, NULL},
979 {"RC2-CBC", "rc2-cbc", NID_rc2_cbc, 8, &(lvalues[218])},
980 {"RC2-ECB", "rc2-ecb", NID_rc2_ecb, 0, NULL},
981 {"RC2-CFB", "rc2-cfb", NID_rc2_cfb64, 0, NULL},
982 {"RC2-OFB", "rc2-ofb", NID_rc2_ofb64, 0, NULL},
983 {"SHA", "sha", NID_sha, 5, &(lvalues[226])},
984 {"RSA-SHA", "shaWithRSAEncryption", NID_shaWithRSAEncryption, 5,
985  &(lvalues[231])},

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986 {"DES-EDE-CBC", "des-edc-cbc", NID_des_edc_cbc, 0, NULL},
987 {"DES-EDE3-CBC", "des-edc3-cbc", NID_des_edc3_cbc, 8, &(lvalues[236])},
988 {"DES-OFB", "des-ofb", NID_des_ofb64, 5, &(lvalues[244])},
989 {"IDEA-OFB", "idea-ofb", NID_idea_ofb64, 0, NULL},
990 {"pkcs9", "pkcs9", NID_pkcs9, 8, &(lvalues[249])},
991 {"emailAddress", "emailAddress", NID_pkcs9_emailAddress, 9,
992  &(lvalues[257])},
993 {"unstructuredName", "unstructuredName", NID_pkcs9_unstructuredName, 9,
994  &(lvalues[266])},
995 {"contentType", "contentType", NID_pkcs9_contentType, 9, &(lvalues[275])},
996 {"messageDigest", "messageDigest", NID_pkcs9_messageDigest, 9,
997  &(lvalues[284])},
998 {"signingTime", "signingTime", NID_pkcs9_signingTime, 9, &(lvalues[293])},
999 {"counterSignature", "counterSignature", NID_pkcs9_countersignature, 9,
1000  &(lvalues[302])},
1001 {"challengePassword", "challengePassword", NID_pkcs9_challengePassword,
1002  9, &(lvalues[311])},
1003 {"unstructuredAddress", "unstructuredAddress",
1004  NID_pkcs9_unstructuredAddress, 9, &(lvalues[320])},
1005 {"extendedCertificateAttributes", "extendedCertificateAttributes",
1006  NID_pkcs9_extCertAttributes, 9, &(lvalues[329])},
1007 {"Netscape", "Netscape Communications Corp.", NID_netscape, 7,
1008  &(lvalues[338])},
1009 {"nsCertExt", "Netscape Certificate Extension",
1010  NID_netscape_cert_extension, 8, &(lvalues[345])},
1011 {"nsDataType", "Netscape Data Type", NID_netscape_data_type, 8,
1012  &(lvalues[353])},
1013 {"DES-EDE-CFB", "des-edc-cfb", NID_des_edc_cfb64, 0, NULL},
1014 {"DES-EDE3-CFB", "des-edc3-cfb", NID_des_edc3_cfb64, 0, NULL},
1015 {"DES-EDE-OFB", "des-edc-ofb", NID_des_edc_ofb64, 0, NULL},
1016 {"DES-EDE3-OFB", "des-edc3-ofb", NID_des_edc3_ofb64, 0, NULL},
1017 {"SHA1", "sha1", NID_sha1, 5, &(lvalues[361])},
1018 {"RSA-SHA1", "sha1WithRSAEncryption", NID_sha1WithRSAEncryption, 9,
1019  &(lvalues[366])},
1020 {"DSA-SHA", "dsaWithSHA", NID_dsaWithSHA, 5, &(lvalues[375])},
1021 {"DSA-old", "dsaEncryption-old", NID_dsa_2, 5, &(lvalues[380])},
1022 {"PBE-SHA1-RC2-64", "pbewithSHA1AndRC2-CBC", NID_pbewithSHA1AndRC2_CBC,
1023  9, &(lvalues[385])},
1024 {"PBKDF2", "PBKDF2", NID_id_pbkdf2, 9, &(lvalues[394])},
1025 {"DSA-SHA1-old", "dsaWithSHA1-old", NID_dsaWithSHA1_2, 5, &(lvalues[403])},
1026 {"nsCertType", "Netscape Cert Type", NID_netscape_cert_type, 9,
1027  &(lvalues[408])},
1028 {"nsBaseUrl", "Netscape Base Url", NID_netscape_base_url, 9,
1029  &(lvalues[417])},
1030 {"nsRevocationUrl", "Netscape Revocation Url",
1031  NID_netscape_revocation_url, 9, &(lvalues[426])},
1032 {"nsCaRevocationUrl", "Netscape CA Revocation Url",
1033  NID_netscape_ca_revocation_url, 9, &(lvalues[435])},
1034 {"nsRenewalUrl", "Netscape Renewal Url", NID_netscape_renewal_url, 9,
1035  &(lvalues[444])},
1036 {"nsCaPolicyUrl", "Netscape CA Policy Url", NID_netscape_ca_policy_url,
1037  9, &(lvalues[453])},
1038 {"nsSslServerName", "Netscape SSL Server Name",
1039  NID_netscape_ssl_server_name, 9, &(lvalues[462])},
1040 {"nsComment", "Netscape Comment", NID_netscape_comment, 9, &(lvalues[471])},
1041 {"nsCertSequence", "Netscape Certificate Sequence",
1042  NID_netscape_cert_sequence, 9, &(lvalues[480])},
1043 {"DESX-CBC", "desx-cbc", NID_desx_cbc, 0, NULL},
1044 {"id-ce", "id-ce", NID_id_ce, 2, &(lvalues[489])},
1045 {"subjectKeyIdentifier", "X509v3 Subject Key Identifier",
1046  NID_subject_key_identifier, 3, &(lvalues[491])},
1047 {"keyUsage", "X509v3 Key Usage", NID_key_usage, 3, &(lvalues[494])},
1048 {"privateKeyUsagePeriod", "X509v3 Private Key Usage Period",
1049  NID_private_key_usage_period, 3, &(lvalues[497])},
1050 {"subjectAltName", "X509v3 Subject Alternative Name",
1051  NID_subject_alt_name, 3, &(lvalues[500])},

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1052 {"issuerAltName", "X509v3 Issuer Alternative Name", NID_issuer_alt_name,
1053      3, &(lvalues[503]), 0},
1054 {"basicConstraints", "X509v3 Basic Constraints", NID_basic_constraints,
1055      3, &(lvalues[506]), 0},
1056 {"crlNumber", "X509v3 CRL Number", NID_crl_number, 3, &(lvalues[509]), 0},
1057 {"certificatePolicies", "X509v3 Certificate Policies",
1058      NID_certificate_policies, 3, &(lvalues[512]), 0},
1059 {"authorityKeyIdentifier", "X509v3 Authority Key Identifier",
1060      NID_authority_key_identifier, 3, &(lvalues[515]), 0},
1061 {"BF-CBC", "bf-cbc", NID_bf_cbc, 9, &(lvalues[518]), 0},
1062 {"BF-ECB", "bf-ecb", NID_bf_ecb, 0, NULL, 0},
1063 {"BF-CFB", "bf-cfb", NID_bf_cfb64, 0, NULL, 0},
1064 {"BF-OFB", "bf-ofb", NID_bf_ofb64, 0, NULL, 0},
1065 {"MDC2", "mdc2", NID_mdc2, 4, &(lvalues[527]), 0},
1066 {"RSA-MDC2", "mdc2WithRSA", NID_mdc2WithRSA, 4, &(lvalues[531]), 0},
1067 {"RC4-40", "rc4-40", NID_rc4_40, 0, NULL, 0},
1068 {"RC2-40-CBC", "rc2-40-cbc", NID_rc2_40_cbc, 0, NULL, 0},
1069 {"GN", "givenName", NID_givenName, 3, &(lvalues[535]), 0},
1070 {"SN", "surname", NID_surname, 3, &(lvalues[538]), 0},
1071 {"initials", "initials", NID_initials, 3, &(lvalues[541]), 0},
1072 {"NULL", NULL, NID_undef, 0, NULL, 0},
1073 {"crlDistributionPoints", "X509v3 CRL Distribution Points",
1074      NID_crl_distribution_points, 3, &(lvalues[544]), 0},
1075 {"RSA-NP-MD5", "md5WithRSA", NID_md5WithRSA, 5, &(lvalues[547]), 0},
1076 {"serialNumber", "serialNumber", NID_serialNumber, 3, &(lvalues[552]), 0},
1077 {"title", "title", NID_title, 3, &(lvalues[555]), 0},
1078 {"description", "description", NID_description, 3, &(lvalues[558]), 0},
1079 {"CAST5-CBC", "cast5-cbc", NID_cast5_cbc, 9, &(lvalues[561]), 0},
1080 {"CAST5-ECB", "cast5-ecb", NID_cast5_ecb, 0, NULL, 0},
1081 {"CAST5-CFB", "cast5-cfb", NID_cast5_cfb64, 0, NULL, 0},
1082 {"CAST5-OFB", "cast5-ofb", NID_cast5_ofb64, 0, NULL, 0},
1083 {"pbeWithMD5AndCast5CBC", "pbeWithMD5AndCast5CBC",
1084      NID_pbeWithMD5AndCast5CBC, 9, &(lvalues[570]), 0},
1085 {"DSA-SHA1", "dsaWithSHA1", NID_dsaWithSHA1, 7, &(lvalues[579]), 0},
1086 {"MD5-SHA1", "md5-sha1", NID_md5_sha1, 0, NULL, 0},
1087 {"RSA-SHA1-2", "sha1WithRSA", NID_sha1WithRSA, 5, &(lvalues[586]), 0},
1088 {"DSA", "dsaEncryption", NID_dsa, 7, &(lvalues[591]), 0},
1089 {"RIPEMD160", "ripemd160", NID_ripemd160, 5, &(lvalues[598]), 0},
1090 {"NULL", NULL, NID_undef, 0, NULL, 0},
1091 {"RSA-RIPEMD160", "ripemd160WithRSA", NID_ripemd160WithRSA, 6,
1092      &(lvalues[603]), 0},
1093 {"RC5-CBC", "rc5-cbc", NID_rc5_cbc, 8, &(lvalues[609]), 0},
1094 {"RC5-ECB", "rc5-ecb", NID_rc5_ecb, 0, NULL, 0},
1095 {"RC5-CFB", "rc5-cfb", NID_rc5_cfb64, 0, NULL, 0},
1096 {"RC5-OFB", "rc5-ofb", NID_rc5_ofb64, 0, NULL, 0},
1097 {"RLE", "run length compression", NID_rle_compression, 6, &(lvalues[617]), 0},
1098 {"ZLIB", "zlib compression", NID_zlib_compression, 11, &(lvalues[623]), 0},
1099 {"extendedKeyUsage", "X509v3 Extended Key Usage", NID_ext_key_usage, 3,
1100      &(lvalues[634]), 0},
1101 {"PKIX", "PKIX", NID_id_pkix, 6, &(lvalues[637]), 0},
1102 {"id-kp", "id-kp", NID_id_kp, 7, &(lvalues[643]), 0},
1103 {"serverAuth", "TLS Web Server Authentication", NID_server_auth, 8,
1104      &(lvalues[650]), 0},
1105 {"clientAuth", "TLS Web Client Authentication", NID_client_auth, 8,
1106      &(lvalues[658]), 0},
1107 {"codeSigning", "Code Signing", NID_code_sign, 8, &(lvalues[666]), 0},
1108 {"emailProtection", "E-mail Protection", NID_email_protect, 8,
1109      &(lvalues[674]), 0},
1110 {"timeStamping", "Time Stamping", NID_time_stamp, 8, &(lvalues[682]), 0},
1111 {"msCodeInd", "Microsoft Individual Code Signing", NID_ms_code_ind, 10,
1112      &(lvalues[690]), 0},
1113 {"msCodeCom", "Microsoft Commercial Code Signing", NID_ms_code_com, 10,
1114      &(lvalues[700]), 0},
1115 {"msCTLSign", "Microsoft Trust List Signing", NID_ms_ctl_sign, 10,
1116      &(lvalues[710]), 0},
1117 {"msSGC", "Microsoft Server Gated Crypto", NID_ms_sgc, 10, &(lvalues[720]), 0},

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1118 {"msEFS", "Microsoft Encrypted File System", NID_ms_efs, 10,
1119      &(lvalues[730]), 0},
1120 {"nsSGC", "Netscape Server Gated Crypto", NID_ns_sgc, 9, &(lvalues[740]), 0},
1121 {"deltaCRL", "X509v3 Delta CRL Indicator", NID_delta_crl, 3,
1122      &(lvalues[749]), 0},
1123 {"CRLReason", "X509v3 CRL Reason Code", NID_crl_reason, 3, &(lvalues[752]), 0},
1124 {"invalidityDate", "Invalidity Date", NID_invalidity_date, 3,
1125      &(lvalues[755]), 0},
1126 {"SXNetID", "Strong Extranet ID", NID_sxnet, 5, &(lvalues[758]), 0},
1127 {"PBE-SHA1-RC4-128", "pbeWithSHA1And128BitRC4",
1128      NID_pbe_withSHA1And128BitRC4, 10, &(lvalues[763]), 0},
1129 {"PBE-SHA1-RC4-40", "pbeWithSHA1And40BitRC4",
1130      NID_pbe_withSHA1And40BitRC4, 10, &(lvalues[773]), 0},
1131 {"PBE-SHA1-3DES", "pbeWithSHA1And3-KeyTripleDES-CBC",
1132      NID_pbe_withSHA1And3-KeyTripleDES_CBC, 10, &(lvalues[783]), 0},
1133 {"PBE-SHA1-2DES", "pbeWithSHA1And2-KeyTripleDES-CBC",
1134      NID_pbe_withSHA1And2-KeyTripleDES_CBC, 10, &(lvalues[793]), 0},
1135 {"PBE-SHA1-RC2-128", "pbeWithSHA1And128BitRC2-CBC",
1136      NID_pbe_withSHA1And128BitRC2_CBC, 10, &(lvalues[803]), 0},
1137 {"PBE-SHA1-RC2-40", "pbeWithSHA1And40BitRC2-CBC",
1138      NID_pbe_withSHA1And40BitRC2_CBC, 10, &(lvalues[813]), 0},
1139 {"keyBag", "keyBag", NID_keyBag, 11, &(lvalues[823]), 0},
1140 {"pkcs8ShroudedKeyBag", "pkcs8ShroudedKeyBag", NID_pkcs8ShroudedKeyBag,
1141      11, &(lvalues[834]), 0},
1142 {"certBag", "certBag", NID_certBag, 11, &(lvalues[845]), 0},
1143 {"crlBag", "crlBag", NID_crlBag, 11, &(lvalues[856]), 0},
1144 {"secretBag", "secretBag", NID_secretBag, 11, &(lvalues[867]), 0},
1145 {"safeContentsBag", "safeContentsBag", NID_safeContentsBag, 11,
1146      &(lvalues[878]), 0},
1147 {"friendlyName", "friendlyName", NID_friendlyName, 9, &(lvalues[889]), 0},
1148 {"localKeyID", "localKeyID", NID_localKeyID, 9, &(lvalues[898]), 0},
1149 {"x509Certificate", "x509Certificate", NID_x509Certificate, 10,
1150      &(lvalues[907]), 0},
1151 {"sdsiCertificate", "sdsiCertificate", NID_sdsiCertificate, 10,
1152      &(lvalues[917]), 0},
1153 {"x509Crl", "x509Crl", NID_x509Crl, 10, &(lvalues[927]), 0},
1154 {"PBES2", "PBES2", NID_pbes2, 9, &(lvalues[937]), 0},
1155 {"PBMAC1", "PBMAC1", NID_pbmac1, 9, &(lvalues[946]), 0},
1156 {"hmacWithSHA1", "hmacWithSHA1", NID_hmacWithSHA1, 8, &(lvalues[955]), 0},
1157 {"id-qt-cps", "Policy Qualifier CPS", NID_id_qt_cps, 8, &(lvalues[963]), 0},
1158 {"id-qt-unotice", "Policy Qualifier User Notice", NID_id_qt_unotice, 8,
1159      &(lvalues[971]), 0},
1160 {"RC2-64-CBC", "rc2-64-cbc", NID_rc2_64_cbc, 0, NULL, 0},
1161 {"SMIME-CAPS", "S/MIME Capabilities", NID_SMIMECapabilities, 9,
1162      &(lvalues[979]), 0},
1163 {"PBE-MD2-RC2-64", "pbeWithMD2AndRC2-CBC", NID_pbeWithMD2AndRC2_CBC, 9,
1164      &(lvalues[988]), 0},
1165 {"PBE-MD5-RC2-64", "pbeWithMD5AndRC2-CBC", NID_pbeWithMD5AndRC2_CBC, 9,
1166      &(lvalues[997]), 0},
1167 {"PBE-SHA1-DES", "pbeWithSHA1AndDES-CBC", NID_pbeWithSHA1AndDES_CBC, 9,
1168      &(lvalues[1006]), 0},
1169 {"msExtReq", "Microsoft Extension Request", NID_ms_ext_req, 10,
1170      &(lvalues[1015]), 0},
1171 {"extReq", "Extension Request", NID_ext_req, 9, &(lvalues[1025]), 0},
1172 {"name", "name", NID_name, 3, &(lvalues[1034]), 0},
1173 {"dnQualifier", "dnQualifier", NID_dnQualifier, 3, &(lvalues[1037]), 0},
1174 {"id-pe", "id-pe", NID_id_pe, 7, &(lvalues[1040]), 0},
1175 {"id-ad", "id-ad", NID_id_ad, 7, &(lvalues[1047]), 0},
1176 {"authorityInfoAccess", "Authority Information Access", NID_info_access,
1177      8, &(lvalues[1054]), 0},
1178 {"OCSP", "OCSP", NID_ad_OCSP, 8, &(lvalues[1062]), 0},
1179 {"caIssuers", "CA Issuers", NID_ad_ca_issuers, 8, &(lvalues[1070]), 0},
1180 {"OCSPSigning", "OCSP Signing", NID_OCSP_sign, 8, &(lvalues[1078]), 0},
1181 {"ISO", "iso", NID_iso, 1, &(lvalues[1086]), 0},
1182 {"member-body", "ISO Member Body", NID_member_body, 1, &(lvalues[1087]), 0},
1183 {"ISO-US", "ISO US Member Body", NID_ISO_US, 3, &(lvalues[1088]), 0},

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1184 {"X9-57", "X9.57", NID_X9_57, 5, &{values[1091]}, 0},
1185 {"X9cm", "X9.57 CM ?", NID_X9cm, 6, &{values[1096]}, 0},
1186 {"pkcs1", "pkcs1", NID_pkcs1, 8, &{values[1102]}, 0},
1187 {"pkcs5", "pkcs5", NID_pkcs5, 8, &{values[1110]}, 0},
1188 {"SMIME", "S/MIME", NID_SMIME, 9, &{values[1118]}, 0},
1189 {"id-smime-mod", "id-smime-mod", NID_id_smime_mod, 10, &{values[1127]}, 0},
1190 {"id-smime-ct", "id-smime-ct", NID_id_smime_ct, 10, &{values[1137]}, 0},
1191 {"id-smime-aa", "id-smime-aa", NID_id_smime_aa, 10, &{values[1147]}, 0},
1192 {"id-smime-alg", "id-smime-alg", NID_id_smime_alg, 10, &{values[1157]}, 0},
1193 {"id-smime-cd", "id-smime-cd", NID_id_smime_cd, 10, &{values[1167]}, 0},
1194 {"id-smime-spq", "id-smime-spq", NID_id_smime_spq, 10, &{values[1177]}, 0},
1195 {"id-smime-cti", "id-smime-cti", NID_id_smime_cti, 10, &{values[1187]}, 0},
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1197   &{values[1197]}, 0},
1198 {"id-smime-mod-ess", "id-smime-mod-ess", NID_id_smime_mod_ess, 11,
1199   &{values[1208]}, 0},
1200 {"id-smime-mod-oid", "id-smime-mod-oid", NID_id_smime_mod_oid, 11,
1201   &{values[1219]}, 0},
1202 {"id-smime-mod-msg-v3", "id-smime-mod-msg-v3", NID_id_smime_mod_msg_v3,
1203   11, &{values[1230]}, 0},
1204 {"id-smime-mod-ets-eSignature-88", "id-smime-mod-ets-eSignature-88",
1205   NID_id_smime_mod_ets_eSignature_88, 11, &{values[1241]}, 0},
1206 {"id-smime-mod-ets-eSignature-97", "id-smime-mod-ets-eSignature-97",
1207   NID_id_smime_mod_ets_eSignature_97, 11, &{values[1252]}, 0},
1208 {"id-smime-mod-ets-eSigPolicy-88", "id-smime-mod-ets-eSigPolicy-88",
1209   NID_id_smime_mod_ets_eSigPolicy_88, 11, &{values[1263]}, 0},
1210 {"id-smime-mod-ets-eSigPolicy-97", "id-smime-mod-ets-eSigPolicy-97",
1211   NID_id_smime_mod_ets_eSigPolicy_97, 11, &{values[1274]}, 0},
1212 {"id-smime-ct-receipt", "id-smime-ct-receipt", NID_id_smime_ct_receipt,
1213   11, &{values[1285]}, 0},
1214 {"id-smime-ct-authData", "id-smime-ct-authData",
1215   NID_id_smime_ct_authData, 11, &{values[1296]}, 0},
1216 {"id-smime-ct-publishCert", "id-smime-ct-publishCert",
1217   NID_id_smime_ct_publishCert, 11, &{values[1307]}, 0},
1218 {"id-smime-ct-TSTInfo", "id-smime-ct-TSTInfo", NID_id_smime_ct_TSTInfo,
1219   11, &{values[1318]}, 0},
1220 {"id-smime-ct-TDTInfo", "id-smime-ct-TDTInfo", NID_id_smime_ct_TDTInfo,
1221   11, &{values[1329]}, 0},
1222 {"id-smime-ct-contentInfo", "id-smime-ct-contentInfo",
1223   NID_id_smime_ct_contentInfo, 11, &{values[1340]}, 0},
1224 {"id-smime-ct-DVCSRequestData", "id-smime-ct-DVCSRequestData",
1225   NID_id_smime_ct_DVCSRequestData, 11, &{values[1351]}, 0},
1226 {"id-smime-ct-DVCSResponseData", "id-smime-ct-DVCSResponseData",
1227   NID_id_smime_ct_DVCSResponseData, 11, &{values[1362]}, 0},
1228 {"id-smime-aa-receiptRequest", "id-smime-aa-receiptRequest",
1229   NID_id_smime_aa_receiptRequest, 11, &{values[1373]}, 0},
1230 {"id-smime-aa-securityLabel", "id-smime-aa-securityLabel",
1231   NID_id_smime_aa_securityLabel, 11, &{values[1384]}, 0},
1232 {"id-smime-aa-mExpandHistory", "id-smime-aa-mExpandHistory",
1233   NID_id_smime_aa_mExpandHistory, 11, &{values[1395]}, 0},
1234 {"id-smime-aa-contentHint", "id-smime-aa-contentHint",
1235   NID_id_smime_aa_contentHint, 11, &{values[1406]}, 0},
1236 {"id-smime-aa-msgSigDigest", "id-smime-aa-msgSigDigest",
1237   NID_id_smime_aa_msgSigDigest, 11, &{values[1417]}, 0},
1238 {"id-smime-aa-encapContentType", "id-smime-aa-encapContentType",
1239   NID_id_smime_aa_encapContentType, 11, &{values[1428]}, 0},
1240 {"id-smime-aa-contentIdentifier", "id-smime-aa-contentIdentifier",
1241   NID_id_smime_aa_contentIdentifier, 11, &{values[1439]}, 0},
1242 {"id-smime-aa-macValue", "id-smime-aa-macValue",
1243   NID_id_smime_aa_macValue, 11, &{values[1450]}, 0},
1244 {"id-smime-aa-equivalentLabels", "id-smime-aa-equivalentLabels",
1245   NID_id_smime_aa_equivalentLabels, 11, &{values[1461]}, 0},
1246 {"id-smime-aa-contentReference", "id-smime-aa-contentReference",
1247   NID_id_smime_aa_contentReference, 11, &{values[1472]}, 0},
1248 {"id-smime-aa-encrypKeyPref", "id-smime-aa-encrypKeyPref",
1249   NID_id_smime_aa_encrypKeyPref, 11, &{values[1483]}, 0},

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1250 {"id-smime-aa-signingCertificate", "id-smime-aa-signingCertificate",
1251   NID_id_smime_aa_signingCertificate, 11, &{values[1494]}, 0},
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1253   NID_id_smime_aa_smimeEncryptCerts, 11, &{values[1505]}, 0},
1254 {"id-smime-aa-timeStampToken", "id-smime-aa-timeStampToken",
1255   NID_id_smime_aa_timeStampToken, 11, &{values[1516]}, 0},
1256 {"id-smime-aa-ets-sigPolicyId", "id-smime-aa-ets-sigPolicyId",
1257   NID_id_smime_aa_ets_sigPolicyId, 11, &{values[1527]}, 0},
1258 {"id-smime-aa-ets-commitmentType", "id-smime-aa-ets-commitmentType",
1259   NID_id_smime_aa_ets_commitmentType, 11, &{values[1538]}, 0},
1260 {"id-smime-aa-ets-signerLocation", "id-smime-aa-ets-signerLocation",
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2118 {"CAMELLIA-192-CFB8", "camellia-192-cfb8", NID_camellia_192_cfb8, 0, NULL, 0},
2119 {"CAMELLIA-256-CFB8", "camellia-256-cfb8", NID_camellia_256_cfb8, 0, NULL, 0},
2120 {"CAMELLIA-128-OFB", "camellia-128-ofb", NID_camellia_128_ofb128, 8,
2121   &(&values[5087]), 0},
2122 {"CAMELLIA-192-OFB", "camellia-192-ofb", NID_camellia_192_ofb128, 8,
2123   &(&values[5095]), 0},
2124 {"CAMELLIA-256-OFB", "camellia-256-ofb", NID_camellia_256_ofb128, 8,
2125   &(&values[5103]), 0},
2126 {"subjectDirectoryAttributes", "X509v3 Subject Directory Attributes",
2127   NID_subject_directory_attributes, 3, &(&values[5111]), 0},
2128 {"issuingDistributionPoint", "X509v3 Issuing Distribution Point",
2129   NID_issuing_distribution_point, 3, &(&values[5114]), 0},
2130 {"certificateIssuer", "X509v3 Certificate Issuer",
2131   NID_certificate_issuer, 3, &(&values[5117]), 0},
2132 {NULL, NULL, NID_undef, 0, NULL, 0},
2133 {"KISA", "kisa", NID_kisa, 6, &(&values[5120]), 0},
2134 {NULL, NULL, NID_undef, 0, NULL, 0},
2135 {NULL, NULL, NID_undef, 0, NULL, 0},
2136 {"SEED-ECB", "seed-ecb", NID_seed_ecb, 8, &(&values[5126]), 0},
2137 {"SEED-CBC", "seed-cbc", NID_seed_cbc, 8, &(&values[5134]), 0},
2138 {"SEED-OFB", "seed-ofb", NID_seed_ofb128, 8, &(&values[5142]), 0},
2139 {"SEED-CFB", "seed-cfb", NID_seed_cfb128, 8, &(&values[5150]), 0},
2140 {"HMAC-MD5", "hmac-md5", NID_hmac_md5, 8, &(&values[5158]), 0},
2141 {"HMAC-SHA1", "hmac-sha1", NID_hmac_sha1, 8, &(&values[5166]), 0},
2142 {"id-PasswordBasedMAC", "password based MAC", NID_id_PasswordBasedMAC, 9,
2143   &(&values[5174]), 0},
2144 {"id-DHBasedMac", "Diffie-Hellman based MAC", NID_id_DHBasedMac, 9,
2145   &(&values[5183]), 0},
2146 {"id-it-supplLangTags", "id-it-supplLangTags", NID_id_it_supplLangTags, 8,
2147   &(&values[5192]), 0},
2148 {"caRepository", "CA Repository", NID_caRepository, 8, &(&values[5200]), 0},
2149 {"id-smime-ct-compressedData", "id-smime-ct-compressedData",
2150   NID_id_smime_ct_compressedData, 11, &(&values[5208]), 0},
2151 {"id-ct-asciiTextWithCRLF", "id-ct-asciiTextWithCRLF",
2152   NID_id_ct_asciiTextWithCRLF, 11, &(&values[5219]), 0},
2153 {"id-aes128-wrap", "id-aes128-wrap", NID_id_aes128_wrap, 9,
2154   &(&values[5230]), 0},
2155 {"id-aes192-wrap", "id-aes192-wrap", NID_id_aes192_wrap, 9,
2156   &(&values[5239]), 0},
2157 {"id-aes256-wrap", "id-aes256-wrap", NID_id_aes256_wrap, 9,
2158   &(&values[5248]), 0},
2159 {"ecdsa-with-Recommended", "ecdsa-with-Recommended",
2160   NID_ecdsa_with_Recommended, 7, &(&values[5257]), 0},
2161 {"ecdsa-with-Specified", "ecdsa-with-Specified",
2162   NID_ecdsa_with_Specified, 7, &(&values[5264]), 0},
2163 {"ecdsa-with-SHA224", "ecdsa-with-SHA224", NID_ecdsa_with_SHA224, 8,
2164   &(&values[5271]), 0},
2165 {"ecdsa-with-SHA256", "ecdsa-with-SHA256", NID_ecdsa_with_SHA256, 8,
2166   &(&values[5279]), 0},
2167 {"ecdsa-with-SHA384", "ecdsa-with-SHA384", NID_ecdsa_with_SHA384, 8,
2168   &(&values[5287]), 0},
2169 {"ecdsa-with-SHA512", "ecdsa-with-SHA512", NID_ecdsa_with_SHA512, 8,
2170   &(&values[5295]), 0},
2171 {"hmacWithMD5", "hmacWithMD5", NID_hmacWithMD5, 8, &(&values[5303]), 0},
2172 {"hmacWithSHA224", "hmacWithSHA224", NID_hmacWithSHA224, 8,
2173   &(&values[5311]), 0},

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2174 {"hmacWithSHA256", "hmacWithSHA256", NID_hmacWithSHA256, 8,
2175   &(&values[5319]), 0},
2176 {"hmacWithSHA384", "hmacWithSHA384", NID_hmacWithSHA384, 8,
2177   &(&values[5327]), 0},
2178 {"hmacWithSHA512", "hmacWithSHA512", NID_hmacWithSHA512, 8,
2179   &(&values[5335]), 0},
2180 {"dsa_with_SHA224", "dsa_with_SHA224", NID_dsa_with_SHA224, 9,
2181   &(&values[5343]), 0},
2182 {"dsa_with_SHA256", "dsa_with_SHA256", NID_dsa_with_SHA256, 9,
2183   &(&values[5352]), 0},
2184 {"whirlpool", "whirlpool", NID_whirlpool, 6, &(&values[5361]), 0},
2185 {"cryptopro", "cryptopro", NID_cryptopro, 5, &(&values[5367]), 0},
2186 {"cryptocom", "cryptocom", NID_cryptocom, 5, &(&values[5372]), 0},
2187 {"id-GostR3411-94-with-GostR3410-2001",
2188   "GOST R 34.11-94 with GOST R 34.10-2001",
2189   NID_id_GostR3411_94_with_GostR3410_2001, 6, &(&values[5377]), 0},
2190 {"id-GostR3411-94-with-GostR3410-94",
2191   "GOST R 34.11-94 with GOST R 34.10-94",
2192   NID_id_GostR3411_94_with_GostR3410_94, 6, &(&values[5383]), 0},
2193 {"md_gost94", "GOST R 34.11-94", NID_id_GostR3411_94, 6, &(&values[5389]), 0},
2194 {"id-HMACGostR3411-94", "HMAC GOST 34.11-94", NID_id_HMACGostR3411_94, 6,
2195   &(&values[5395]), 0},
2196 {"gost2001", "GOST R 34.10-2001", NID_id_GostR3410_2001, 6,
2197   &(&values[5401]), 0},
2198 {"gost94", "GOST R 34.10-94", NID_id_GostR3410_94, 6, &(&values[5407]), 0},
2199 {"gost89", "GOST 28147-89", NID_id_Gost28147_89, 6, &(&values[5413]), 0},
2200 {"gost89-cnt", "gost89-cnt", NID_gost89_cnt, 0, NULL, 0},
2201 {"gost-mac", "GOST 28147-89 MAC", NID_id_Gost28147_89_MAC, 6,
2202   &(&values[5419]), 0},
2203 {"prf-gostR3411-94", "GOST R 34.11-94 PRF", NID_id_GostR3411_94_prf, 6,
2204   &(&values[5425]), 0},
2205 {"id-GostR3410-2001DH", "GOST R 34.10-2001 DH", NID_id_GostR3410_2001DH,
2206   6, &(&values[5431]), 0},
2207 {"id-GostR3410-94DH", "GOST R 34.10-94 DH", NID_id_GostR3410_94DH, 6,
2208   &(&values[5437]), 0},
2209 {"id-Gost28147-89-CryptoPro-KeyMeshing",
2210   "id-Gost28147-89-CryptoPro-KeyMeshing",
2211   NID_id_Gost28147_89_CryptoPro_KeyMeshing, 7, &(&values[5443]), 0},
2212 {"id-Gost28147-89-None-KeyMeshing", "id-Gost28147-89-None-KeyMeshing",
2213   NID_id_Gost28147_89_None_KeyMeshing, 7, &(&values[5450]), 0},
2214 {"id-GostR3411-94-TestParamSet", "id-GostR3411-94-TestParamSet",
2215   NID_id_GostR3411_94_TestParamSet, 7, &(&values[5457]), 0},
2216 {"id-GostR3411-94-CryptoProParamSet",
2217   "id-GostR3411-94-CryptoProParamSet",
2218   NID_id_GostR3411_94_CryptoProParamSet, 7, &(&values[5464]), 0},
2219 {"id-Gost28147-89-TestParamSet", "id-Gost28147-89-TestParamSet",
2220   NID_id_Gost28147_89_TestParamSet, 7, &(&values[5471]), 0},
2221 {"id-Gost28147-89-CryptoPro-A-ParamSet",
2222   "id-Gost28147-89-CryptoPro-A-ParamSet",
2223   NID_id_Gost28147_89_CryptoPro_A_ParamSet, 7, &(&values[5478]), 0},
2224 {"id-Gost28147-89-CryptoPro-B-ParamSet",
2225   "id-Gost28147-89-CryptoPro-B-ParamSet",
2226   NID_id_Gost28147_89_CryptoPro_B_ParamSet, 7, &(&values[5485]), 0},
2227 {"id-Gost28147-89-CryptoPro-C-ParamSet",
2228   "id-Gost28147-89-CryptoPro-C-ParamSet",
2229   NID_id_Gost28147_89_CryptoPro_C_ParamSet, 7, &(&values[5492]), 0},
2230 {"id-Gost28147-89-CryptoPro-D-ParamSet",
2231   "id-Gost28147-89-CryptoPro-D-ParamSet",
2232   NID_id_Gost28147_89_CryptoPro_D_ParamSet, 7, &(&values[5499]), 0},
2233 {"id-Gost28147-89-CryptoPro-Oscar-1-1-ParamSet",
2234   "id-Gost28147-89-CryptoPro-Oscar-1-1-ParamSet",
2235   NID_id_Gost28147_89_CryptoPro_Oscar_1_1_ParamSet, 7, &(&values[5506]), 0},
2236 {"id-Gost28147-89-CryptoPro-Oscar-1-0-ParamSet",
2237   "id-Gost28147-89-CryptoPro-Oscar-1-0-ParamSet",
2238   NID_id_Gost28147_89_CryptoPro_Oscar_1_0_ParamSet, 7, &(&values[5513]), 0},
2239 {"id-Gost28147-89-CryptoPro-Oscar-1-0-ParamSet",
2240   "id-Gost28147-89-CryptoPro-Oscar-1-0-ParamSet",
2241   NID_id_Gost28147_89_CryptoPro_Oscar_1_0_ParamSet, 7, &(&values[5513]), 0},

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2240     0},
2241 {"id-Gost28147-89-CryptoPro-RIC-1-ParamSet",
2242  "id-Gost28147-89-CryptoPro-RIC-1-ParamSet",
2243  NID_id_Gost28147_89_CryptoPro_RIC_1_ParamSet,7,&{lvalues[5520]},0},
2244 {"id-GostR3410-94-TestParamSet","id-GostR3410-94-TestParamSet",
2245  NID_id_GostR3410_94_TestParamSet,7,&{lvalues[5527]},0},
2246 {"id-GostR3410-94-CryptoPro-A-ParamSet",
2247  "id-GostR3410-94-CryptoPro-A-ParamSet",
2248  NID_id_GostR3410_94_CryptoPro_A_ParamSet,7,&{lvalues[5534]},0},
2249 {"id-GostR3410-94-CryptoPro-B-ParamSet",
2250  "id-GostR3410-94-CryptoPro-B-ParamSet",
2251  NID_id_GostR3410_94_CryptoPro_B_ParamSet,7,&{lvalues[5541]},0},
2252 {"id-GostR3410-94-CryptoPro-C-ParamSet",
2253  "id-GostR3410-94-CryptoPro-C-ParamSet",
2254  NID_id_GostR3410_94_CryptoPro_C_ParamSet,7,&{lvalues[5548]},0},
2255 {"id-GostR3410-94-CryptoPro-D-ParamSet",
2256  "id-GostR3410-94-CryptoPro-D-ParamSet",
2257  NID_id_GostR3410_94_CryptoPro_D_ParamSet,7,&{lvalues[5555]},0},
2258 {"id-GostR3410-94-CryptoPro-XchA-ParamSet",
2259  "id-GostR3410-94-CryptoPro-XchA-ParamSet",
2260  NID_id_GostR3410_94_CryptoPro_XchA_ParamSet,7,&{lvalues[5562]},0},
2261 {"id-GostR3410-94-CryptoPro-XchB-ParamSet",
2262  "id-GostR3410-94-CryptoPro-XchB-ParamSet",
2263  NID_id_GostR3410_94_CryptoPro_XchB_ParamSet,7,&{lvalues[5569]},0},
2264 {"id-GostR3410-94-CryptoPro-XchC-ParamSet",
2265  "id-GostR3410-94-CryptoPro-XchC-ParamSet",
2266  NID_id_GostR3410_94_CryptoPro_XchC_ParamSet,7,&{lvalues[5576]},0},
2267 {"id-GostR3410-2001-TestParamSet","id-GostR3410-2001-TestParamSet",
2268  NID_id_GostR3410_2001_TestParamSet,7,&{lvalues[5583]},0},
2269 {"id-GostR3410-2001-CryptoPro-A-ParamSet",
2270  "id-GostR3410-2001-CryptoPro-A-ParamSet",
2271  NID_id_GostR3410_2001_CryptoPro_A_ParamSet,7,&{lvalues[5590]},0},
2272 {"id-GostR3410-2001-CryptoPro-B-ParamSet",
2273  "id-GostR3410-2001-CryptoPro-B-ParamSet",
2274  NID_id_GostR3410_2001_CryptoPro_B_ParamSet,7,&{lvalues[5597]},0},
2275 {"id-GostR3410-2001-CryptoPro-C-ParamSet",
2276  "id-GostR3410-2001-CryptoPro-C-ParamSet",
2277  NID_id_GostR3410_2001_CryptoPro_C_ParamSet,7,&{lvalues[5604]},0},
2278 {"id-GostR3410-2001-CryptoPro-XchA-ParamSet",
2279  "id-GostR3410-2001-CryptoPro-XchA-ParamSet",
2280  NID_id_GostR3410_2001_CryptoPro_XchA_ParamSet,7,&{lvalues[5611]},0},
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2282 {"id-GostR3410-2001-CryptoPro-XchB-ParamSet",
2283  "id-GostR3410-2001-CryptoPro-XchB-ParamSet",
2284  NID_id_GostR3410_2001_CryptoPro_XchB_ParamSet,7,&{lvalues[5618]},0},
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2286 {"id-GostR3410-94-a","id-GostR3410-94-a",NID_id_GostR3410_94_a,7,
2287  &{lvalues[5625]},0},
2288 {"id-GostR3410-94-aBis","id-GostR3410-94-aBis",
2289  NID_id_GostR3410_94_aBis,7,&{lvalues[5632]},0},
2290 {"id-GostR3410-94-b","id-GostR3410-94-b",NID_id_GostR3410_94_b,7,
2291  &{lvalues[5639]},0},
2292 {"id-GostR3410-94-bBis","id-GostR3410-94-bBis",
2293  NID_id_GostR3410_94_bBis,7,&{lvalues[5646]},0},
2294 {"id-Gost28147-89-cc","GOST 28147-89 Cryptocom ParamSet",
2295  NID_id_Gost28147_89_cc,8,&{lvalues[5653]},0},
2296 {"gost94cc","GOST 34.10-94 Cryptocom",NID_id_GostR3410_94_cc,8,
2297  &{lvalues[5661]},0},
2298 {"gost2001cc","GOST 34.10-2001 Cryptocom",NID_id_GostR3410_2001_cc,8,
2299  &{lvalues[5669]},0},
2300 {"id-GostR3411-94-with-GostR3410-94-cc",
2301  "GOST R 34.11-94 with GOST R 34.10-94 Cryptocom",
2302  NID_id_GostR3411_94_with_GostR3410_94_cc,8,&{lvalues[5677]},0},
2303 {"id-GostR3411-94-with-GostR3410-2001-cc",
2304  "GOST R 34.11-94 with GOST R 34.10-2001 Cryptocom",
2305  NID_id_GostR3411_94_with_GostR3410_2001_cc,8,&{lvalues[5685]},0},

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2306 {"id-GostR3410-2001-ParamSet-cc",
2307  "GOST R 3410-2001 Parameter Set Cryptocom",
2308  NID_id_GostR3410_2001_ParamSet_cc,8,&{lvalues[5693]},0},
2309 {"hMAC","hmac",NID_hmac,0,NULL,0},
2310 {"LocalKeySet","Microsoft Local Key set",NID_LocalKeySet,9,
2311  &{lvalues[5701]},0},
2312 {"freshestCRL","X509v3 Freshest CRL",NID_freshest_crl,3,
2313  &{lvalues[5710]},0},
2314 {"id-on-permanentIdentifier","Permanent Identifier",
2315  NID_id_on_permanentIdentifier,8,&{lvalues[5713]},0},
2316 {"searchGuide","searchGuide",NID_searchGuide,3,&{lvalues[5721]},0},
2317 {"businessCategory","businessCategory",NID_businessCategory,3,
2318  &{lvalues[5724]},0},
2319 {"postalAddress","postalAddress",NID_postalAddress,3,&{lvalues[5727]},0},
2320 {"postOfficeBox","postOfficeBox",NID_postOfficeBox,3,&{lvalues[5730]},0},
2321 {"physicalDeliveryOfficeName","physicalDeliveryOfficeName",
2322  NID_physicalDeliveryOfficeName,3,&{lvalues[5733]},0},
2323 {"telephoneNumber","telephoneNumber",NID_telephoneNumber,3,
2324  &{lvalues[5736]},0},
2325 {"telexNumber","telexNumber",NID_telexNumber,3,&{lvalues[5739]},0},
2326 {"teletexTerminalIdentifier","teletexTerminalIdentifier",
2327  NID_teletexTerminalIdentifier,3,&{lvalues[5742]},0},
2328 {"facsimileTelephoneNumber","facsimileTelephoneNumber",
2329  NID_facsimileTelephoneNumber,3,&{lvalues[5745]},0},
2330 {"x121Address","x121Address",NID_x121Address,3,&{lvalues[5748]},0},
2331 {"internationalISDNNumber","internationalISDNNumber",
2332  NID_internationalISDNNumber,3,&{lvalues[5751]},0},
2333 {"registeredAddress","registeredAddress",NID_registeredAddress,3,
2334  &{lvalues[5754]},0},
2335 {"destinationIndicator","destinationIndicator",
2336  NID_destinationIndicator,3,&{lvalues[5757]},0},
2337 {"preferredDeliveryMethod","preferredDeliveryMethod",
2338  NID_preferredDeliveryMethod,3,&{lvalues[5760]},0},
2339 {"presentationAddress","presentationAddress",NID_presentationAddress,
2340  3,&{lvalues[5763]},0},
2341 {"supportedApplicationContext","supportedApplicationContext",
2342  NID_supportedApplicationContext,3,&{lvalues[5766]},0},
2343 {"member","member",NID_member,3,&{lvalues[5769]},0},
2344 {"owner","owner",NID_owner,3,&{lvalues[5772]},0},
2345 {"roleOccupant","roleOccupant",NID_roleOccupant,3,&{lvalues[5775]},0},
2346 {"seeAlso","seeAlso",NID_seeAlso,3,&{lvalues[5778]},0},
2347 {"userPassword","userPassword",NID_userPassword,3,&{lvalues[5781]},0},
2348 {"userCertificate","userCertificate",NID_userCertificate,3,
2349  &{lvalues[5784]},0},
2350 {"cACertificate","cACertificate",NID_cACertificate,3,&{lvalues[5787]},0},
2351 {"authorityRevocationList","authorityRevocationList",
2352  NID_authorityRevocationList,3,&{lvalues[5790]},0},
2353 {"certificateRevocationList","certificateRevocationList",
2354  NID_certificateRevocationList,3,&{lvalues[5793]},0},
2355 {"crossCertificatePair","crossCertificatePair",
2356  NID_crossCertificatePair,3,&{lvalues[5796]},0},
2357 {"enhancedSearchGuide","enhancedSearchGuide",NID_enhancedSearchGuide,
2358  3,&{lvalues[5799]},0},
2359 {"protocolInformation","protocolInformation",NID_protocolInformation,
2360  3,&{lvalues[5802]},0},
2361 {"distinguishedName","distinguishedName",NID_distinguishedName,3,
2362  &{lvalues[5805]},0},
2363 {"uniqueMember","uniqueMember",NID_uniqueMember,3,&{lvalues[5808]},0},
2364 {"houseIdentifier","houseIdentifier",NID_houseIdentifier,3,
2365  &{lvalues[5811]},0},
2366 {"supportedAlgorithms","supportedAlgorithms",NID_supportedAlgorithms,
2367  3,&{lvalues[5814]},0},
2368 {"deltaRevocationList","deltaRevocationList",NID_deltaRevocationList,
2369  3,&{lvalues[5817]},0},
2370 {"dmdName","dmdName",NID_dmdName,3,&{lvalues[5820]},0},
2371 {"id-alg-PWRI-KEK","id-alg-PWRI-KEK",NID_id_alg_PWRI_KEK,11,

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2372      &({lvalues[5823]}),0},
2373 {"CMAC", "cmac", NID_cmac, 0, NULL, 0},
2374 {"id-aes128-GCM", "aes-128-gcm", NID_aes_128_gcm, 9, &({lvalues[5834]}), 0},
2375 {"id-aes128-CCM", "aes-128-ccm", NID_aes_128_ccm, 9, &({lvalues[5843]}), 0},
2376 {"id-aes128-wrap-pad", "id-aes128-wrap-pad", NID_id_aes128_wrap_pad, 9,
2377      &({lvalues[5852]}), 0},
2378 {"id-aes192-GCM", "aes-192-gcm", NID_aes_192_gcm, 9, &({lvalues[5861]}), 0},
2379 {"id-aes192-CCM", "aes-192-ccm", NID_aes_192_ccm, 9, &({lvalues[5870]}), 0},
2380 {"id-aes192-wrap-pad", "id-aes192-wrap-pad", NID_id_aes192_wrap_pad, 9,
2381      &({lvalues[5879]}), 0},
2382 {"id-aes256-GCM", "aes-256-gcm", NID_aes_256_gcm, 9, &({lvalues[5888]}), 0},
2383 {"id-aes256-CCM", "aes-256-ccm", NID_aes_256_ccm, 9, &({lvalues[5897]}), 0},
2384 {"id-aes256-wrap-pad", "id-aes256-wrap-pad", NID_id_aes256_wrap_pad, 9,
2385      &({lvalues[5906]}), 0},
2386 {"AES-128-CTR", "aes-128-ctr", NID_aes_128_ctr, 0, NULL, 0},
2387 {"AES-192-CTR", "aes-192-ctr", NID_aes_192_ctr, 0, NULL, 0},
2388 {"AES-256-CTR", "aes-256-ctr", NID_aes_256_ctr, 0, NULL, 0},
2389 {"id-camellia128-wrap", "id-camellia128-wrap", NID_id_camellia128_wrap,
2390      11, &({lvalues[5915]}), 0},
2391 {"id-camellia192-wrap", "id-camellia192-wrap", NID_id_camellia192_wrap,
2392      11, &({lvalues[5926]}), 0},
2393 {"id-camellia256-wrap", "id-camellia256-wrap", NID_id_camellia256_wrap,
2394      11, &({lvalues[5937]}), 0},
2395 {"anyExtendedKeyUsage", "Any Extended Key Usage",
2396      NID_anyExtendedKeyUsage, 4, &({lvalues[5948]}), 0},
2397 {"MGF1", "mgf1", NID_mgf1, 9, &({lvalues[5952]}), 0},
2398 {"RSASSA-PSS", "rsassaPss", NID_rsassaPss, 9, &({lvalues[5961]}), 0},
2399 {"AES-128-XTS", "aes-128-xts", NID_aes_128_xts, 0, NULL, 0},
2400 {"AES-256-XTS", "aes-256-xts", NID_aes_256_xts, 0, NULL, 0},
2401 {"RC4-HMAC-MD5", "rc4-hmac-md5", NID_rc4_hmac_md5, 0, NULL, 0},
2402 {"AES-128-CBC-HMAC-SHA1", "aes-128-cbc-hmac-sha1",
2403      NID_aes_128_cbc_hmac_sha1, 0, NULL, 0},
2404 {"AES-192-CBC-HMAC-SHA1", "aes-192-cbc-hmac-sha1",
2405      NID_aes_192_cbc_hmac_sha1, 0, NULL, 0},
2406 {"AES-256-CBC-HMAC-SHA1", "aes-256-cbc-hmac-sha1",
2407      NID_aes_256_cbc_hmac_sha1, 0, NULL, 0},
2408 {"RSAES-OAEP", "rsaesOaep", NID_rsaesOaep, 9, &({lvalues[5970]}), 0},
2409 };

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2411 static const unsigned int sn_objs[NUM_SN]={
2412 364, /* "AD-DVCS" */
2413 419, /* "AES-128-CBC" */
2414 916, /* "AES-128-CBC-HMAC-SHA1" */
2415 421, /* "AES-128-CFB" */
2416 650, /* "AES-128-CFB1" */
2417 653, /* "AES-128-CFB8" */
2418 904, /* "AES-128-CTR" */
2419 418, /* "AES-128-ECB" */
2420 420, /* "AES-128-OFB" */
2421 913, /* "AES-128-XTS" */
2422 423, /* "AES-192-CBC" */
2423 917, /* "AES-192-CBC-HMAC-SHA1" */
2424 425, /* "AES-192-CFB" */
2425 651, /* "AES-192-CFB1" */
2426 654, /* "AES-192-CFB8" */
2427 905, /* "AES-192-CTR" */
2428 422, /* "AES-192-ECB" */
2429 424, /* "AES-192-OFB" */
2430 427, /* "AES-256-CBC" */
2431 918, /* "AES-256-CBC-HMAC-SHA1" */
2432 429, /* "AES-256-CFB" */
2433 652, /* "AES-256-CFB1" */
2434 655, /* "AES-256-CFB8" */
2435 906, /* "AES-256-CTR" */
2436 426, /* "AES-256-ECB" */
2437 428, /* "AES-256-OFB" */

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2438 914, /* "AES-256-XTS" */
2439 91, /* "BF-CBC" */
2440 93, /* "BF-CFB" */
2441 92, /* "BF-ECB" */
2442 94, /* "BF-OFB" */
2443 14, /* "C" */
2444 751, /* "CAMELLIA-128-CBC" */
2445 757, /* "CAMELLIA-128-CFB" */
2446 760, /* "CAMELLIA-128-CFB1" */
2447 763, /* "CAMELLIA-128-CFB8" */
2448 754, /* "CAMELLIA-128-ECB" */
2449 766, /* "CAMELLIA-128-OFB" */
2450 752, /* "CAMELLIA-192-CBC" */
2451 758, /* "CAMELLIA-192-CFB" */
2452 761, /* "CAMELLIA-192-CFB1" */
2453 764, /* "CAMELLIA-192-CFB8" */
2454 755, /* "CAMELLIA-192-ECB" */
2455 767, /* "CAMELLIA-192-OFB" */
2456 753, /* "CAMELLIA-256-CBC" */
2457 759, /* "CAMELLIA-256-CFB" */
2458 762, /* "CAMELLIA-256-CFB1" */
2459 765, /* "CAMELLIA-256-CFB8" */
2460 756, /* "CAMELLIA-256-ECB" */
2461 768, /* "CAMELLIA-256-OFB" */
2462 108, /* "CAST5-CBC" */
2463 110, /* "CAST5-CFB" */
2464 109, /* "CAST5-ECB" */
2465 111, /* "CAST5-OFB" */
2466 894, /* "CMAC" */
2467 13, /* "CN" */
2468 141, /* "CRLReason" */
2469 417, /* "CSPName" */
2470 367, /* "CrLID" */
2471 391, /* "DC" */
2472 31, /* "DES-CBC" */
2473 643, /* "DES-CDFM" */
2474 30, /* "DES-CFB" */
2475 656, /* "DES-CFB1" */
2476 657, /* "DES-CFB8" */
2477 29, /* "DES-ECB" */
2478 32, /* "DES-EDE" */
2479 43, /* "DES-EDE-CBC" */
2480 60, /* "DES-EDE-CFB" */
2481 62, /* "DES-EDE-OFB" */
2482 33, /* "DES-EDE3" */
2483 44, /* "DES-EDE3-CBC" */
2484 61, /* "DES-EDE3-CFB" */
2485 658, /* "DES-EDE3-CFB1" */
2486 659, /* "DES-EDE3-CFB8" */
2487 63, /* "DES-EDE3-OFB" */
2488 45, /* "DES-OFB" */
2489 80, /* "DESX-CBC" */
2490 380, /* "DOD" */
2491 116, /* "DSA" */
2492 66, /* "DSA-SHA" */
2493 113, /* "DSA-SHA1" */
2494 70, /* "DSA-SHA1-old" */
2495 67, /* "DSA-old" */
2496 297, /* "DVCS" */
2497 99, /* "GN" */
2498 855, /* "HMAC" */
2499 780, /* "HMAC-MD5" */
2500 781, /* "HMAC-SHA1" */
2501 381, /* "IANA" */
2502 34, /* "IDEA-CBC" */
2503 35, /* "IDEA-CFB" */

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2504 36, /* "IDEA-ECB" */
2505 46, /* "IDEA-OFB" */
2506 181, /* "ISO" */
2507 183, /* "ISO-US" */
2508 645, /* "ITU-T" */
2509 646, /* "JOINT-ISO-ITU-T" */
2510 773, /* "KISA" */
2511 15, /* "L" */
2512 856, /* "LocalKeySet" */
2513 3, /* "MD2" */
2514 257, /* "MD4" */
2515 4, /* "MD5" */
2516 114, /* "MD5-SHA1" */
2517 95, /* "MDC2" */
2518 911, /* "MGF1" */
2519 388, /* "Mail" */
2520 393, /* "NULL" */
2521 404, /* "NULL" */
2522 57, /* "Netscape" */
2523 366, /* "Nonce" */
2524 17, /* "O" */
2525 178, /* "OCSP" */
2526 180, /* "OCSPSigning" */
2527 379, /* "ORG" */
2528 18, /* "OU" */
2529 749, /* "Oakley-EC2N-3" */
2530 750, /* "Oakley-EC2N-4" */
2531 9, /* "PBE-MD2-DES" */
2532 168, /* "PBE-MD2-RC2-64" */
2533 10, /* "PBE-MD5-DES" */
2534 169, /* "PBE-MD5-RC2-64" */
2535 147, /* "PBE-SHA1-2DES" */
2536 146, /* "PBE-SHA1-3DES" */
2537 170, /* "PBE-SHA1-DES" */
2538 148, /* "PBE-SHA1-RC2-128" */
2539 149, /* "PBE-SHA1-RC2-40" */
2540 68, /* "PBE-SHA1-RC2-64" */
2541 144, /* "PBE-SHA1-RC4-128" */
2542 145, /* "PBE-SHA1-RC4-40" */
2543 161, /* "PBES2" */
2544 69, /* "PBKDF2" */
2545 162, /* "PBMAC1" */
2546 127, /* "PKIX" */
2547 98, /* "RC2-40-CBC" */
2548 166, /* "RC2-64-CBC" */
2549 37, /* "RC2-CBC" */
2550 39, /* "RC2-CFB" */
2551 38, /* "RC2-ECB" */
2552 40, /* "RC2-OFB" */
2553 5, /* "RC4" */
2554 97, /* "RC4-40" */
2555 915, /* "RC4-HMAC-MD5" */
2556 120, /* "RC5-CBC" */
2557 122, /* "RC5-CFB" */
2558 121, /* "RC5-ECB" */
2559 123, /* "RC5-OFB" */
2560 117, /* "RIPEMD160" */
2561 124, /* "RLE" */
2562 19, /* "RSA" */
2563 7, /* "RSA-MD2" */
2564 396, /* "RSA-MD4" */
2565 8, /* "RSA-MD5" */
2566 96, /* "RSA-MDC2" */
2567 104, /* "RSA-NP-MD5" */
2568 119, /* "RSA-RIPEMD160" */
2569 42, /* "RSA-SHA" */

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2570 65, /* "RSA-SHA1" */
2571 115, /* "RSA-SHA1-2" */
2572 671, /* "RSA-SHA224" */
2573 668, /* "RSA-SHA256" */
2574 669, /* "RSA-SHA384" */
2575 670, /* "RSA-SHA512" */
2576 919, /* "RSAES-OAEP" */
2577 912, /* "RSASSA-PSS" */
2578 777, /* "SEED-CBC" */
2579 779, /* "SEED-CFB" */
2580 776, /* "SEED-ECB" */
2581 778, /* "SEED-OFB" */
2582 41, /* "SHA" */
2583 64, /* "SHA1" */
2584 675, /* "SHA224" */
2585 672, /* "SHA256" */
2586 673, /* "SHA384" */
2587 674, /* "SHA512" */
2588 188, /* "SMIME" */
2589 167, /* "SMIME-CAPS" */
2590 100, /* "SN" */
2591 16, /* "ST" */
2592 143, /* "SXNetID" */
2593 458, /* "UID" */
2594 0, /* "UNDEF" */
2595 11, /* "X500" */
2596 378, /* "X500algorithms" */
2597 12, /* "X509" */
2598 184, /* "X9-57" */
2599 185, /* "X9cm" */
2600 125, /* "ZLIB" */
2601 478, /* "aRecord" */
2602 289, /* "aaControls" */
2603 287, /* "ac-auditEntity" */
2604 397, /* "ac-proxying" */
2605 288, /* "ac-targeting" */
2606 368, /* "acceptableResponses" */
2607 446, /* "account" */
2608 363, /* "ad_timestamping" */
2609 376, /* "algorithm" */
2610 405, /* "ansi-X9-62" */
2611 910, /* "anyExtendedKeyUsage" */
2612 746, /* "anyPolicy" */
2613 370, /* "archiveCutoff" */
2614 484, /* "associatedDomain" */
2615 485, /* "associatedName" */
2616 501, /* "audio" */
2617 177, /* "authorityInfoAccess" */
2618 90, /* "authorityKeyIdentifier" */
2619 882, /* "authorityRevocationList" */
2620 87, /* "basicConstraints" */
2621 365, /* "basicOCSPResponse" */
2622 285, /* "biometricInfo" */
2623 494, /* "buildingName" */
2624 860, /* "businessCategory" */
2625 691, /* "c2onb191v4" */
2626 692, /* "c2onb191v5" */
2627 697, /* "c2onb239v4" */
2628 698, /* "c2onb239v5" */
2629 684, /* "c2pnb163v1" */
2630 685, /* "c2pnb163v2" */
2631 686, /* "c2pnb163v3" */
2632 687, /* "c2pnb176v1" */
2633 693, /* "c2pnb208w1" */
2634 699, /* "c2pnb272w1" */
2635 700, /* "c2pnb304w1" */

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2636 702, /* "c2pnb368w1" */
2637 688, /* "c2tnb191v1" */
2638 689, /* "c2tnb191v2" */
2639 690, /* "c2tnb191v3" */
2640 694, /* "c2tnb239v1" */
2641 695, /* "c2tnb239v2" */
2642 696, /* "c2tnb239v3" */
2643 701, /* "c2tnb359v1" */
2644 703, /* "c2tnb431r1" */
2645 881, /* "cACertificate" */
2646 483, /* "cNAMERecord" */
2647 179, /* "caIssuers" */
2648 785, /* "caRepository" */
2649 443, /* "caseIgnoreIA5StringSyntax" */
2650 152, /* "certBag" */
2651 677, /* "certicom-arc" */
2652 771, /* "certificateIssuer" */
2653 89, /* "certificatePolicies" */
2654 883, /* "certificateRevocationList" */
2655 54, /* "challengePassword" */
2656 407, /* "characteristic-two-field" */
2657 395, /* "clearance" */
2658 130, /* "clientAuth" */
2659 131, /* "codeSigning" */
2660 50, /* "contentType" */
2661 53, /* "countersignature" */
2662 153, /* "crlBag" */
2663 103, /* "crlDistributionPoints" */
2664 88, /* "crlNumber" */
2665 884, /* "crossCertificatePair" */
2666 806, /* "cryptocom" */
2667 805, /* "cryptopro" */
2668 500, /* "dITRedirect" */
2669 451, /* "dNSDomain" */
2670 495, /* "dsaQuality" */
2671 434, /* "data" */
2672 390, /* "dcobject" */
2673 140, /* "deltaCRL" */
2674 891, /* "deltaRevocationList" */
2675 107, /* "description" */
2676 871, /* "destinationIndicator" */
2677 28, /* "dhKeyAgreement" */
2678 382, /* "directory" */
2679 887, /* "distinguishedName" */
2680 892, /* "dmdName" */
2681 174, /* "dnQualifier" */
2682 447, /* "document" */
2683 471, /* "documentAuthor" */
2684 468, /* "documentIdentifier" */
2685 472, /* "documentLocation" */
2686 502, /* "documentPublisher" */
2687 449, /* "documentSeries" */
2688 469, /* "documentTitle" */
2689 470, /* "documentVersion" */
2690 392, /* "domain" */
2691 452, /* "domainRelatedObject" */
2692 802, /* "dsa_with_SHA224" */
2693 803, /* "dsa_with_SHA256" */
2694 791, /* "ecdsa-with-Recommended" */
2695 416, /* "ecdsa-with-SHA1" */
2696 793, /* "ecdsa-with-SHA224" */
2697 794, /* "ecdsa-with-SHA256" */
2698 795, /* "ecdsa-with-SHA384" */
2699 796, /* "ecdsa-with-SHA512" */
2700 792, /* "ecdsa-with-Specified" */
2701 48, /* "emailAddress" */

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2702 132, /* "emailProtection" */
2703 885, /* "enhancedSearchGuide" */
2704 389, /* "enterprises" */
2705 384, /* "experimental" */
2706 172, /* "extReq" */
2707 56, /* "extendedCertificateAttributes" */
2708 126, /* "extendedKeyUsage" */
2709 372, /* "extendedStatus" */
2710 867, /* "facsimileTelephoneNumber" */
2711 462, /* "favouriteDrink" */
2712 857, /* "freshestCRL" */
2713 453, /* "friendlyCountry" */
2714 490, /* "friendlyCountryName" */
2715 156, /* "friendlyName" */
2716 509, /* "generationQualifier" */
2717 815, /* "gost-mac" */
2718 811, /* "gost2001" */
2719 851, /* "gost2001cc" */
2720 813, /* "gost89" */
2721 814, /* "gost89-cnt" */
2722 812, /* "gost94" */
2723 850, /* "gost94cc" */
2724 797, /* "hmacWithMD5" */
2725 163, /* "hmacWithSHA1" */
2726 798, /* "hmacWithSHA224" */
2727 799, /* "hmacWithSHA256" */
2728 800, /* "hmacWithSHA384" */
2729 801, /* "hmacWithSHA512" */
2730 432, /* "holdInstructionCallIssuer" */
2731 430, /* "holdInstructionCode" */
2732 431, /* "holdInstructionNone" */
2733 433, /* "holdInstructionReject" */
2734 486, /* "homePostalAddress" */
2735 473, /* "homeTelephoneNumber" */
2736 466, /* "host" */
2737 889, /* "houseIdentifier" */
2738 442, /* "ia5StringSyntax" */
2739 783, /* "id-DHBasedMac" */
2740 824, /* "id-Gost28147-89-CryptoPro-A-ParamSet" */
2741 825, /* "id-Gost28147-89-CryptoPro-B-ParamSet" */
2742 826, /* "id-Gost28147-89-CryptoPro-C-ParamSet" */
2743 827, /* "id-Gost28147-89-CryptoPro-D-ParamSet" */
2744 819, /* "id-Gost28147-89-CryptoPro-KeyMeshing" */
2745 829, /* "id-Gost28147-89-CryptoPro-Oscar-1-0-ParamSet" */
2746 828, /* "id-Gost28147-89-CryptoPro-Oscar-1-1-ParamSet" */
2747 830, /* "id-Gost28147-89-CryptoPro-RIC-1-ParamSet" */
2748 820, /* "id-Gost28147-89-None-KeyMeshing" */
2749 823, /* "id-Gost28147-89-TestParamSet" */
2750 849, /* "id-Gost28147-89-cc" */
2751 840, /* "id-GostR3410-2001-CryptoPro-A-ParamSet" */
2752 841, /* "id-GostR3410-2001-CryptoPro-B-ParamSet" */
2753 842, /* "id-GostR3410-2001-CryptoPro-C-ParamSet" */
2754 843, /* "id-GostR3410-2001-CryptoPro-XchA-ParamSet" */
2755 844, /* "id-GostR3410-2001-CryptoPro-XchB-ParamSet" */
2756 854, /* "id-GostR3410-2001-ParamSet-cc" */
2757 839, /* "id-GostR3410-2001-TestParamSet" */
2758 817, /* "id-GostR3410-2001DH" */
2759 832, /* "id-GostR3410-94-CryptoPro-A-ParamSet" */
2760 833, /* "id-GostR3410-94-CryptoPro-B-ParamSet" */
2761 834, /* "id-GostR3410-94-CryptoPro-C-ParamSet" */
2762 835, /* "id-GostR3410-94-CryptoPro-D-ParamSet" */
2763 836, /* "id-GostR3410-94-CryptoPro-XchA-ParamSet" */
2764 837, /* "id-GostR3410-94-CryptoPro-XchB-ParamSet" */
2765 838, /* "id-GostR3410-94-CryptoPro-XchC-ParamSet" */
2766 831, /* "id-GostR3410-94-TestParamSet" */
2767 845, /* "id-GostR3410-94-a" */

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2768 846, /* "id-GostR3410-94-aBis" */
2769 847, /* "id-GostR3410-94-b" */
2770 848, /* "id-GostR3410-94-bBis" */
2771 818, /* "id-GostR3410-94DH" */
2772 822, /* "id-GostR3411-94-CryptoProParamSet" */
2773 821, /* "id-GostR3411-94-TestParamSet" */
2774 807, /* "id-GostR3411-94-with-GostR3410-2001" */
2775 853, /* "id-GostR3411-94-with-GostR3410-2001-cc" */
2776 808, /* "id-GostR3411-94-with-GostR3410-94" */
2777 852, /* "id-GostR3411-94-with-GostR3410-94-cc" */
2778 810, /* "id-HMACGostR3411-94" */
2779 782, /* "id-PasswordBasedMAC" */
2780 266, /* "id-aca" */
2781 355, /* "id-aca-accessIdentity" */
2782 354, /* "id-aca-authenticationInfo" */
2783 356, /* "id-aca-chargingIdentity" */
2784 399, /* "id-aca-encAttr" */
2785 357, /* "id-aca-group" */
2786 358, /* "id-aca-role" */
2787 176, /* "id-ad" */
2788 896, /* "id-aes128-CCM" */
2789 895, /* "id-aes128-GCM" */
2790 788, /* "id-aes128-wrap" */
2791 897, /* "id-aes128-wrap-pad" */
2792 899, /* "id-aes192-CCM" */
2793 898, /* "id-aes192-GCM" */
2794 789, /* "id-aes192-wrap" */
2795 900, /* "id-aes192-wrap-pad" */
2796 902, /* "id-aes256-CCM" */
2797 901, /* "id-aes256-GCM" */
2798 790, /* "id-aes256-wrap" */
2799 903, /* "id-aes256-wrap-pad" */
2800 262, /* "id-alg" */
2801 893, /* "id-alg-PWRI-KEK" */
2802 323, /* "id-alg-des40" */
2803 326, /* "id-alg-dh-pop" */
2804 325, /* "id-alg-dh-sig-hmac-sha1" */
2805 324, /* "id-alg-noSignature" */
2806 907, /* "id-camellia128-wrap" */
2807 908, /* "id-camellia192-wrap" */
2808 909, /* "id-camellia256-wrap" */
2809 268, /* "id-cct" */
2810 361, /* "id-cct-PKIData" */
2811 362, /* "id-cct-PKIResponse" */
2812 360, /* "id-cct-crs" */
2813 81, /* "id-ce" */
2814 680, /* "id-characteristic-two-basis" */
2815 263, /* "id-cmc" */
2816 334, /* "id-cmc-addExtensions" */
2817 346, /* "id-cmc-confirmCertAcceptance" */
2818 330, /* "id-cmc-dataReturn" */
2819 336, /* "id-cmc-decryptPOP" */
2820 335, /* "id-cmc-encryptedPOP" */
2821 339, /* "id-cmc-getCRL" */
2822 338, /* "id-cmc-getCert" */
2823 328, /* "id-cmc-identification" */
2824 329, /* "id-cmc-identityProof" */
2825 337, /* "id-cmc-lraPOPWitness" */
2826 344, /* "id-cmc-popLinkRandom" */
2827 345, /* "id-cmc-popLinkWitness" */
2828 343, /* "id-cmc-queryPending" */
2829 333, /* "id-cmc-recipientNonce" */
2830 341, /* "id-cmc-regInfo" */
2831 342, /* "id-cmc-responseInfo" */
2832 340, /* "id-cmc-revokeRequest" */
2833 332, /* "id-cmc-senderNonce" */

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2834 327, /* "id-cmc-statusInfo" */
2835 331, /* "id-cmc-transactionId" */
2836 787, /* "id-ct-asciiTextWithCRLF" */
2837 408, /* "id-ecPublicKey" */
2838 508, /* "id-hex-multipart-message" */
2839 507, /* "id-hex-partial-message" */
2840 260, /* "id-it" */
2841 302, /* "id-it-caKeyUpdateInfo" */
2842 298, /* "id-it-caProtEncCert" */
2843 311, /* "id-it-confirmWaitTime" */
2844 303, /* "id-it-currentCRL" */
2845 300, /* "id-it-encKeyPairTypes" */
2846 310, /* "id-it-implicitConfirm" */
2847 308, /* "id-it-keyPairParamRep" */
2848 307, /* "id-it-keyPairParamReq" */
2849 312, /* "id-it-origPKIMessage" */
2850 301, /* "id-it-preferredSymmAlg" */
2851 309, /* "id-it-revPassphrase" */
2852 299, /* "id-it-signKeyPairTypes" */
2853 305, /* "id-it-subscriptionRequest" */
2854 306, /* "id-it-subscriptionResponse" */
2855 784, /* "id-it-supplLangTags" */
2856 304, /* "id-it-unsupportedOIDs" */
2857 128, /* "id-kp" */
2858 280, /* "id-mod-attribute-cert" */
2859 274, /* "id-mod-cmc" */
2860 277, /* "id-mod-cmp" */
2861 284, /* "id-mod-cmp2000" */
2862 273, /* "id-mod-crmf" */
2863 283, /* "id-mod-dvcs" */
2864 275, /* "id-mod-kea-profile-88" */
2865 276, /* "id-mod-kea-profile-93" */
2866 282, /* "id-mod-ocsp" */
2867 278, /* "id-mod-qualified-cert-88" */
2868 279, /* "id-mod-qualified-cert-93" */
2869 281, /* "id-mod-timestamp-protocol" */
2870 264, /* "id-on" */
2871 858, /* "id-on-permanentIdentifier" */
2872 347, /* "id-on-personalData" */
2873 265, /* "id-pda" */
2874 352, /* "id-pda-countryOfCitizenship" */
2875 353, /* "id-pda-countryOfResidence" */
2876 348, /* "id-pda-dateOfBirth" */
2877 351, /* "id-pda-gender" */
2878 349, /* "id-pda-placeOfBirth" */
2879 175, /* "id-pe" */
2880 261, /* "id-pkip" */
2881 258, /* "id-pkix-mod" */
2882 269, /* "id-pkix1-explicit-88" */
2883 271, /* "id-pkix1-explicit-93" */
2884 270, /* "id-pkix1-implicit-88" */
2885 272, /* "id-pkix1-implicit-93" */
2886 662, /* "id-ppl" */
2887 664, /* "id-ppl-anyLanguage" */
2888 667, /* "id-ppl-independent" */
2889 665, /* "id-ppl-inheritAll" */
2890 267, /* "id-qcs" */
2891 359, /* "id-qcs-pkixQCSyntax-v1" */
2892 259, /* "id-qt" */
2893 164, /* "id-qt-cps" */
2894 165, /* "id-qt-unotice" */
2895 313, /* "id-regCtrl" */
2896 316, /* "id-regCtrl-authenticator" */
2897 319, /* "id-regCtrl-oldCertID" */
2898 318, /* "id-regCtrl-pkiArchiveOptions" */
2899 317, /* "id-regCtrl-pkiPublicationInfo" */

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```
2900 320, /* "id-regCtrl-protocolEncrKey" */
2901 315, /* "id-regCtrl-regToken" */
2902 314, /* "id-regInfo" */
2903 322, /* "id-regInfo-certReq" */
2904 321, /* "id-regInfo-utf8Pairs" */
2905 512, /* "id-set" */
2906 191, /* "id-smime-aa" */
2907 215, /* "id-smime-aa-contentHint" */
2908 218, /* "id-smime-aa-contentIdentifier" */
2909 221, /* "id-smime-aa-contentReference" */
2910 240, /* "id-smime-aa-dvcs-dvc" */
2911 217, /* "id-smime-aa-encapContentType" */
2912 222, /* "id-smime-aa-encrypKeyPref" */
2913 220, /* "id-smime-aa-equivalentLabels" */
2914 232, /* "id-smime-aa-ets-CertificateRefs" */
2915 233, /* "id-smime-aa-ets-RevocationRefs" */
2916 238, /* "id-smime-aa-ets-archiveTimeStamp" */
2917 237, /* "id-smime-aa-ets-certCRLTimestamp" */
2918 234, /* "id-smime-aa-ets-certValues" */
2919 227, /* "id-smime-aa-ets-commitmentType" */
2920 231, /* "id-smime-aa-ets-contentTimestamp" */
2921 236, /* "id-smime-aa-ets-escTimeStamp" */
2922 230, /* "id-smime-aa-ets-otherSigCert" */
2923 235, /* "id-smime-aa-ets-revocationValues" */
2924 226, /* "id-smime-aa-ets-sigPolicyId" */
2925 229, /* "id-smime-aa-ets-signerAttr" */
2926 228, /* "id-smime-aa-ets-signerLocation" */
2927 219, /* "id-smime-aa-macValue" */
2928 214, /* "id-smime-aa-mExpandHistory" */
2929 216, /* "id-smime-aa-msgSigDigest" */
2930 212, /* "id-smime-aa-receiptRequest" */
2931 213, /* "id-smime-aa-securityLabel" */
2932 239, /* "id-smime-aa-signatureType" */
2933 223, /* "id-smime-aa-signingCertificate" */
2934 224, /* "id-smime-aa-smimeEncryptCerts" */
2935 225, /* "id-smime-aa-timeStampToken" */
2936 192, /* "id-smime-alg" */
2937 243, /* "id-smime-alg-3DESwrap" */
2938 246, /* "id-smime-alg-CMS3DESwrap" */
2939 247, /* "id-smime-alg-CMSRC2wrap" */
2940 245, /* "id-smime-alg-ESDH" */
2941 241, /* "id-smime-alg-ESDHwith3DES" */
2942 242, /* "id-smime-alg-ESDHwithRC2" */
2943 244, /* "id-smime-alg-RC2wrap" */
2944 193, /* "id-smime-cd" */
2945 248, /* "id-smime-cd-ldap" */
2946 190, /* "id-smime-ct" */
2947 210, /* "id-smime-ct-DVCSRequestData" */
2948 211, /* "id-smime-ct-DVCSResponseData" */
2949 208, /* "id-smime-ct-TDTInfo" */
2950 207, /* "id-smime-ct-TSTInfo" */
2951 205, /* "id-smime-ct-authData" */
2952 786, /* "id-smime-ct-compressedData" */
2953 209, /* "id-smime-ct-contentInfo" */
2954 206, /* "id-smime-ct-publishCert" */
2955 204, /* "id-smime-ct-receipt" */
2956 195, /* "id-smime-cti" */
2957 255, /* "id-smime-cti-ets-proofOfApproval" */
2958 256, /* "id-smime-cti-ets-proofOfCreation" */
2959 253, /* "id-smime-cti-ets-proofOfDelivery" */
2960 251, /* "id-smime-cti-ets-proofOfOrigin" */
2961 252, /* "id-smime-cti-ets-proofOfReceipt" */
2962 254, /* "id-smime-cti-ets-proofOfSender" */
2963 189, /* "id-smime-mod" */
2964 196, /* "id-smime-mod-cms" */
2965 197, /* "id-smime-mod-ess" */
```

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2966 202, /* "id-smime-mod-ets-eSigPolicy-88" */
2967 203, /* "id-smime-mod-ets-eSigPolicy-97" */
2968 200, /* "id-smime-mod-ets-eSignature-88" */
2969 201, /* "id-smime-mod-ets-eSignature-97" */
2970 199, /* "id-smime-mod-msg-v3" */
2971 198, /* "id-smime-mod-oid" */
2972 194, /* "id-smime-spq" */
2973 250, /* "id-smime-spq-ets-sqt-unotice" */
2974 249, /* "id-smime-spq-ets-sqt-uri" */
2975 676, /* "identified-organization" */
2976 461, /* "info" */
2977 748, /* "inhibitAnyPolicy" */
2978 101, /* "initials" */
2979 647, /* "international-organizations" */
2980 869, /* "internationalISDNNumber" */
2981 142, /* "invalidityDate" */
2982 294, /* "ipsecEndSystem" */
2983 295, /* "ipsecTunnel" */
2984 296, /* "ipsecUser" */
2985 86, /* "issuerAltName" */
2986 770, /* "issuingDistributionPoint" */
2987 492, /* "janetMailbox" */
2988 150, /* "keyBag" */
2989 83, /* "keyUsage" */
2990 477, /* "lastModifiedBy" */
2991 476, /* "lastModifiedTime" */
2992 157, /* "localKeyID" */
2993 480, /* "mXRecord" */
2994 460, /* "mail" */
2995 493, /* "mailPreferenceOption" */
2996 467, /* "manager" */
2997 809, /* "md_gost94" */
2998 875, /* "member" */
2999 182, /* "member-body" */
3000 51, /* "messageDigest" */
3001 383, /* "mgmt" */
3002 504, /* "mime-mhs" */
3003 506, /* "mime-mhs-bodies" */
3004 505, /* "mime-mhs-headings" */
3005 488, /* "mobileTelephoneNumber" */
3006 136, /* "msCTLSign" */
3007 135, /* "msCodeCom" */
3008 134, /* "msCodeInd" */
3009 138, /* "msEFS" */
3010 171, /* "msExtReq" */
3011 137, /* "msSGC" */
3012 648, /* "msSmartcardLogin" */
3013 649, /* "msUPN" */
3014 481, /* "nsRecord" */
3015 173, /* "name" */
3016 666, /* "nameConstraints" */
3017 369, /* "noCheck" */
3018 403, /* "noRevAvail" */
3019 72, /* "nsBaseUrl" */
3020 76, /* "nsCaPolicyUrl" */
3021 74, /* "nsCaRevocationUrl" */
3022 58, /* "nsCertExt" */
3023 79, /* "nsCertSequence" */
3024 71, /* "nsCertType" */
3025 78, /* "nsComment" */
3026 59, /* "nsDataType" */
3027 75, /* "nsRenewalUrl" */
3028 73, /* "nsRevocationUrl" */
3029 139, /* "nsSGC" */
3030 77, /* "nsSslServerName" */
3031 681, /* "onBasis" */
```

```
3032 491, /* "organizationalStatus" */
3033 475, /* "otherMailbox" */
3034 876, /* "owner" */
3035 489, /* "pagerTelephoneNumber" */
3036 374, /* "path" */
3037 112, /* "pbeWithMD5AndCast5CBC" */
3038 499, /* "personalSignature" */
3039 487, /* "personalTitle" */
3040 464, /* "photo" */
3041 863, /* "physicalDeliveryOfficeName" */
3042 437, /* "pilot" */
3043 439, /* "pilotAttributeSyntax" */
3044 438, /* "pilotAttributeType" */
3045 479, /* "pilotAttributeType27" */
3046 456, /* "pilotDSA" */
3047 441, /* "pilotGroups" */
3048 444, /* "pilotObject" */
3049 440, /* "pilotObjectClass" */
3050 455, /* "pilotOrganization" */
3051 445, /* "pilotPerson" */
3052 2, /* "pkcs" */
3053 186, /* "pkcs1" */
3054 27, /* "pkcs3" */
3055 187, /* "pkcs5" */
3056 20, /* "pkcs7" */
3057 21, /* "pkcs7-data" */
3058 25, /* "pkcs7-digestData" */
3059 26, /* "pkcs7-encryptedData" */
3060 23, /* "pkcs7-envelopedData" */
3061 24, /* "pkcs7-signedAndEnvelopedData" */
3062 22, /* "pkcs7-signedData" */
3063 151, /* "pkcs8ShroudedKeyBag" */
3064 47, /* "pkcs9" */
3065 401, /* "policyConstraints" */
3066 747, /* "policyMappings" */
3067 862, /* "postOfficeBox" */
3068 861, /* "postalAddress" */
3069 661, /* "postalCode" */
3070 683, /* "ppBasis" */
3071 872, /* "preferredDeliveryMethod" */
3072 873, /* "presentationAddress" */
3073 816, /* "prf-gostr3411-94" */
3074 406, /* "prime-field" */
3075 409, /* "prime192v1" */
3076 410, /* "prime192v2" */
3077 411, /* "prime192v3" */
3078 412, /* "prime239v1" */
3079 413, /* "prime239v2" */
3080 414, /* "prime239v3" */
3081 415, /* "prime256v1" */
3082 385, /* "private" */
3083 84, /* "privateKeyUsagePeriod" */
3084 886, /* "protocolInformation" */
3085 663, /* "proxyCertInfo" */
3086 510, /* "pseudonym" */
3087 435, /* "pss" */
3088 286, /* "qcStatements" */
3089 457, /* "qualityLabelledData" */
3090 450, /* "rFC822localPart" */
3091 870, /* "registeredAddress" */
3092 400, /* "role" */
3093 877, /* "roleOccupant" */
3094 448, /* "room" */
3095 463, /* "roomNumber" */
3096 6, /* "rsaEncryption" */
3097 644, /* "rsaOAEPEncryptionSET" */
```

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3098 377, /* "rsaSignature" */
3099 1, /* "rsads" */
3100 482, /* "sOARecord" */
3101 155, /* "safeContentsBag" */
3102 291, /* "sbgrp-autonomousSysNum" */
3103 290, /* "sbgrp-ipAddrBlock" */
3104 292, /* "sbgrp-routerIdentifier" */
3105 159, /* "sdsiCertificate" */
3106 859, /* "searchGuide" */
3107 704, /* "secp112r1" */
3108 705, /* "secp112r2" */
3109 706, /* "secp128r1" */
3110 707, /* "secp128r2" */
3111 708, /* "secp160k1" */
3112 709, /* "secp160r1" */
3113 710, /* "secp160r2" */
3114 711, /* "secp192k1" */
3115 712, /* "secp224k1" */
3116 713, /* "secp224r1" */
3117 714, /* "secp256k1" */
3118 715, /* "secp384r1" */
3119 716, /* "secp521r1" */
3120 154, /* "secretBag" */
3121 474, /* "secretary" */
3122 717, /* "sect113r1" */
3123 718, /* "sect113r2" */
3124 719, /* "sect131r1" */
3125 720, /* "sect131r2" */
3126 721, /* "sect163k1" */
3127 722, /* "sect163r1" */
3128 723, /* "sect163r2" */
3129 724, /* "sect193r1" */
3130 725, /* "sect193r2" */
3131 726, /* "sect233k1" */
3132 727, /* "sect233r1" */
3133 728, /* "sect239k1" */
3134 729, /* "sect283k1" */
3135 730, /* "sect283r1" */
3136 731, /* "sect409k1" */
3137 732, /* "sect409r1" */
3138 733, /* "sect571k1" */
3139 734, /* "sect571r1" */
3140 386, /* "security" */
3141 878, /* "seeAlso" */
3142 394, /* "selected-attribute-types" */
3143 105, /* "serialNumber" */
3144 129, /* "serverAuth" */
3145 371, /* "serviceLocator" */
3146 625, /* "set-addPolicy" */
3147 515, /* "set-attr" */
3148 518, /* "set-brand" */
3149 638, /* "set-brand-AmericanExpress" */
3150 637, /* "set-brand-Diners" */
3151 636, /* "set-brand-IATA-ATA" */
3152 639, /* "set-brand-JCB" */
3153 641, /* "set-brand-MasterCard" */
3154 642, /* "set-brand-Novus" */
3155 640, /* "set-brand-Visa" */
3156 517, /* "set-certExt" */
3157 513, /* "set-ctype" */
3158 514, /* "set-msgExt" */
3159 516, /* "set-policy" */
3160 607, /* "set-policy-root" */
3161 624, /* "set-rootKeyThumb" */
3162 620, /* "setAttr-Cert" */
3163 631, /* "setAttr-GenCrypTgrm" */
```

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3164 623, /* "setAttr-IssCap" */
3165 628, /* "setAttr-IssCap-CVM" */
3166 630, /* "setAttr-IssCap-Sig" */
3167 629, /* "setAttr-IssCap-T2" */
3168 621, /* "setAttr-PGWYcap" */
3169 635, /* "setAttr-SecDevSig" */
3170 632, /* "setAttr-T2Enc" */
3171 633, /* "setAttr-T2cleartxt" */
3172 634, /* "setAttr-TokICCSig" */
3173 627, /* "setAttr-Token-B0Prime" */
3174 626, /* "setAttr-Token-EMV" */
3175 622, /* "setAttr-TokenType" */
3176 619, /* "setCext-IssuerCapabilities" */
3177 615, /* "setCext-PGWYcapabilities" */
3178 616, /* "setCext-TokenIdentifier" */
3179 618, /* "setCext-TokenType" */
3180 617, /* "setCext-Track2Data" */
3181 611, /* "setCext-cCertRequired" */
3182 609, /* "setCext-certType" */
3183 608, /* "setCext-hashedRoot" */
3184 610, /* "setCext-merchData" */
3185 613, /* "setCext-setExt" */
3186 614, /* "setCext-setQualf" */
3187 612, /* "setCext-tunneling" */
3188 540, /* "setct-AcqCardCodeMsg" */
3189 576, /* "setct-AcqCardCodeMsgTBE" */
3190 570, /* "setct-AuthReqTBE" */
3191 534, /* "setct-AuthReqTBS" */
3192 527, /* "setct-AuthResBaggage" */
3193 571, /* "setct-AuthResTBE" */
3194 572, /* "setct-AuthResTBEX" */
3195 535, /* "setct-AuthResTBS" */
3196 536, /* "setct-AuthResTBSX" */
3197 528, /* "setct-AuthRevReqBaggage" */
3198 577, /* "setct-AuthRevReqTBE" */
3199 541, /* "setct-AuthRevReqTBS" */
3200 529, /* "setct-AuthRevResBaggage" */
3201 542, /* "setct-AuthRevResData" */
3202 578, /* "setct-AuthRevResTBE" */
3203 579, /* "setct-AuthRevResTBEB" */
3204 543, /* "setct-AuthRevResTBS" */
3205 573, /* "setct-AuthTokenTBE" */
3206 537, /* "setct-AuthTokenTBS" */
3207 600, /* "setct-BCIDistributionTBS" */
3208 558, /* "setct-BatchAdminReqData" */
3209 592, /* "setct-BatchAdminReqTBE" */
3210 559, /* "setct-BatchAdminResData" */
3211 593, /* "setct-BatchAdminResTBE" */
3212 599, /* "setct-CRLNotificationResTBS" */
3213 598, /* "setct-CRLNotificationTBS" */
3214 580, /* "setct-CapReqTBE" */
3215 581, /* "setct-CapReqTBEX" */
3216 544, /* "setct-CapReqTBS" */
3217 545, /* "setct-CapReqTBSX" */
3218 546, /* "setct-CapResData" */
3219 582, /* "setct-CapResTBE" */
3220 583, /* "setct-CapRevReqTBE" */
3221 584, /* "setct-CapRevReqTBEX" */
3222 547, /* "setct-CapRevReqTBS" */
3223 548, /* "setct-CapRevReqTBSX" */
3224 549, /* "setct-CapRevResData" */
3225 585, /* "setct-CapRevResTBE" */
3226 538, /* "setct-CapTokenData" */
3227 530, /* "setct-CapTokenSeq" */
3228 574, /* "setct-CapTokenTBE" */
3229 575, /* "setct-CapTokenTBEX" */
```

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3230 539, /* "setct-CapTokenTBS" */
3231 560, /* "setct-CardCInitResTBS" */
3232 566, /* "setct-CertInqReqTBS" */
3233 563, /* "setct-CertReqData" */
3234 595, /* "setct-CertReqTBE" */
3235 596, /* "setct-CertReqTBEX" */
3236 564, /* "setct-CertReqTBS" */
3237 565, /* "setct-CertResData" */
3238 597, /* "setct-CertResTBE" */
3239 586, /* "setct-CredReqTBE" */
3240 587, /* "setct-CredReqTBEX" */
3241 550, /* "setct-CredReqTBS" */
3242 551, /* "setct-CredReqTBSX" */
3243 552, /* "setct-CredResData" */
3244 588, /* "setct-CredResTBE" */
3245 589, /* "setct-CredRevReqTBE" */
3246 590, /* "setct-CredRevReqTBEX" */
3247 553, /* "setct-CredRevReqTBS" */
3248 554, /* "setct-CredRevReqTBSX" */
3249 555, /* "setct-CredRevResData" */
3250 591, /* "setct-CredRevResTBE" */
3251 567, /* "setct-ErrorTBS" */
3252 526, /* "setct-HODInput" */
3253 561, /* "setct-MeAqCInitResTBS" */
3254 522, /* "setct-OIData" */
3255 519, /* "setct-PANData" */
3256 521, /* "setct-PANOnly" */
3257 520, /* "setct-PANToken" */
3258 556, /* "setct-PCertReqData" */
3259 557, /* "setct-PCertResTBS" */
3260 523, /* "setct-PI" */
3261 532, /* "setct-PI-TBS" */
3262 524, /* "setct-PIData" */
3263 525, /* "setct-PIDataUnsigned" */
3264 568, /* "setct-PIDualSignedTBE" */
3265 569, /* "setct-PIUnsignedTBE" */
3266 531, /* "setct-PInitResData" */
3267 533, /* "setct-PResData" */
3268 594, /* "setct-RegFormReqTBE" */
3269 562, /* "setct-RegFormResTBS" */
3270 606, /* "setext-cv" */
3271 601, /* "setext-genCrypt" */
3272 602, /* "setext-miAuth" */
3273 604, /* "setext-pinAny" */
3274 603, /* "setext-pinSecure" */
3275 605, /* "setext-track2" */
3276 52, /* "signingTime" */
3277 454, /* "simpleSecurityObject" */
3278 496, /* "singleLevelQuality" */
3279 387, /* "snmpv2" */
3280 660, /* "street" */
3281 85, /* "subjectAltName" */
3282 769, /* "subjectDirectoryAttributes" */
3283 398, /* "subjectInfoAccess" */
3284 82, /* "subjectKeyIdentifier" */
3285 498, /* "subtreeMaximumQuality" */
3286 497, /* "subtreeMinimumQuality" */
3287 890, /* "supportedAlgorithms" */
3288 874, /* "supportedApplicationContext" */
3289 402, /* "targetInformation" */
3290 864, /* "telephoneNumber" */
3291 866, /* "teletexTerminalIdentifier" */
3292 865, /* "telexNumber" */
3293 459, /* "textEncodedORAddress" */
3294 293, /* "textNotice" */
3295 133, /* "timeStamping" */
```

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3296 106, /* "title" */
3297 682, /* "tpBasis" */
3298 375, /* "trustRoot" */
3299 436, /* "ucl" */
3300 888, /* "uniqueMember" */
3301 55, /* "unstructuredAddress" */
3302 49, /* "unstructuredName" */
3303 880, /* "userCertificate" */
3304 465, /* "userClass" */
3305 879, /* "userPassword" */
3306 373, /* "valid" */
3307 678, /* "wap" */
3308 679, /* "wap-wsg" */
3309 735, /* "wap-wsg-idm-ecid-wtls1" */
3310 743, /* "wap-wsg-idm-ecid-wtls10" */
3311 744, /* "wap-wsg-idm-ecid-wtls11" */
3312 745, /* "wap-wsg-idm-ecid-wtls12" */
3313 736, /* "wap-wsg-idm-ecid-wtls3" */
3314 737, /* "wap-wsg-idm-ecid-wtls4" */
3315 738, /* "wap-wsg-idm-ecid-wtls5" */
3316 739, /* "wap-wsg-idm-ecid-wtls6" */
3317 740, /* "wap-wsg-idm-ecid-wtls7" */
3318 741, /* "wap-wsg-idm-ecid-wtls8" */
3319 742, /* "wap-wsg-idm-ecid-wtls9" */
3320 804, /* "whirlpool" */
3321 868, /* "x121Address" */
3322 503, /* "x500UniqueIdentifier" */
3323 158, /* "x509Certificate" */
3324 160, /* "x509Crl" */
3325 };

3327 static const unsigned int ln_objs[NUM_LN]={
3328 363, /* "AD Time Stamping" */
3329 405, /* "ANSI X9.62" */
3330 368, /* "Acceptable OCSP Responses" */
3331 910, /* "Any Extended Key Usage" */
3332 664, /* "Any language" */
3333 177, /* "Authority Information Access" */
3334 365, /* "Basic OCSP Response" */
3335 285, /* "Biometric Info" */
3336 179, /* "CA Issuers" */
3337 785, /* "CA Repository" */
3338 131, /* "Code Signing" */
3339 783, /* "Diffie-Hellman based MAC" */
3340 382, /* "Directory" */
3341 392, /* "Domain" */
3342 132, /* "E-mail Protection" */
3343 389, /* "Enterprises" */
3344 384, /* "Experimental" */
3345 372, /* "Extended OCSP Status" */
3346 172, /* "Extension Request" */
3347 813, /* "GOST 28147-89" */
3348 849, /* "GOST 28147-89 Cryptocom ParamSet" */
3349 815, /* "GOST 28147-89 MAC" */
3350 851, /* "GOST 34.10-2001 Cryptocom" */
3351 850, /* "GOST 34.10-94 Cryptocom" */
3352 811, /* "GOST R 34.10-2001" */
3353 817, /* "GOST R 34.10-2001 DH" */
3354 812, /* "GOST R 34.10-94" */
3355 818, /* "GOST R 34.10-94 DH" */
3356 809, /* "GOST R 34.11-94" */
3357 816, /* "GOST R 34.11-94 PRF" */
3358 807, /* "GOST R 34.11-94 with GOST R 34.10-2001" */
3359 853, /* "GOST R 34.11-94 with GOST R 34.10-2001 Cryptocom" */
3360 808, /* "GOST R 34.11-94 with GOST R 34.10-94" */
3361 852, /* "GOST R 34.11-94 with GOST R 34.10-94 Cryptocom" */

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3362 854, /* "GOST R 3410-2001 Parameter Set Cryptocom" */
3363 810, /* "HMAC GOST 34.11-94" */
3364 432, /* "Hold Instruction Call Issuer" */
3365 430, /* "Hold Instruction Code" */
3366 431, /* "Hold Instruction None" */
3367 433, /* "Hold Instruction Reject" */
3368 634, /* "ICC or token signature" */
3369 294, /* "IPSec End System" */
3370 295, /* "IPSec Tunnel" */
3371 296, /* "IPSec User" */
3372 182, /* "ISO Member Body" */
3373 183, /* "ISO US Member Body" */
3374 667, /* "Independent" */
3375 665, /* "Inherit all" */
3376 647, /* "International Organizations" */
3377 142, /* "Invalidity Date" */
3378 504, /* "MIME MHS" */
3379 388, /* "Mail" */
3380 383, /* "Management" */
3381 417, /* "Microsoft CSP Name" */
3382 135, /* "Microsoft Commercial Code Signing" */
3383 138, /* "Microsoft Encrypted File System" */
3384 171, /* "Microsoft Extension Request" */
3385 134, /* "Microsoft Individual Code Signing" */
3386 856, /* "Microsoft Local Key set" */
3387 137, /* "Microsoft Server Gated Crypto" */
3388 648, /* "Microsoft Smartcardlogin" */
3389 136, /* "Microsoft Trust List Signing" */
3390 649, /* "Microsoft Universal Principal Name" */
3391 393, /* "NULL" */
3392 404, /* "NULL" */
3393 72, /* "Netscape Base Url" */
3394 76, /* "Netscape CA Policy Url" */
3395 74, /* "Netscape CA Revocation Url" */
3396 71, /* "Netscape Cert Type" */
3397 58, /* "Netscape Certificate Extension" */
3398 79, /* "Netscape Certificate Sequence" */
3399 78, /* "Netscape Comment" */
3400 57, /* "Netscape Communications Corp." */
3401 59, /* "Netscape Data Type" */
3402 75, /* "Netscape Renewal Url" */
3403 73, /* "Netscape Revocation Url" */
3404 77, /* "Netscape SSL Server Name" */
3405 139, /* "Netscape Server Gated Crypto" */
3406 178, /* "OCSP" */
3407 370, /* "OCSP Archive Cutoff" */
3408 367, /* "OCSP CRL ID" */
3409 369, /* "OCSP No Check" */
3410 366, /* "OCSP Nonce" */
3411 371, /* "OCSP Service Locator" */
3412 180, /* "OCSP Signing" */
3413 161, /* "PBES2" */
3414 69, /* "PBKDF2" */
3415 162, /* "PBMAC1" */
3416 127, /* "PKIX" */
3417 858, /* "Permanent Identifier" */
3418 164, /* "Policy Qualifier CPS" */
3419 165, /* "Policy Qualifier User Notice" */
3420 385, /* "Private" */
3421 663, /* "Proxy Certificate Information" */
3422 1, /* "RSA Data Security, Inc." */
3423 2, /* "RSA Data Security, Inc. PKCS" */
3424 188, /* "S/MIME" */
3425 167, /* "S/MIME Capabilities" */
3426 387, /* "SNMPv2" */
3427 512, /* "Secure Electronic Transactions" */

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3428 386, /* "Security" */
3429 394, /* "Selected Attribute Types" */
3430 143, /* "Strong Extranet ID" */
3431 398, /* "Subject Information Access" */
3432 130, /* "TLS Web Client Authentication" */
3433 129, /* "TLS Web Server Authentication" */
3434 133, /* "Time Stamping" */
3435 375, /* "Trust Root" */
3436 12, /* "X509" */
3437 402, /* "X509v3 AC Targeting" */
3438 746, /* "X509v3 Any Policy" */
3439 90, /* "X509v3 Authority Key Identifier" */
3440 87, /* "X509v3 Basic Constraints" */
3441 103, /* "X509v3 CRL Distribution Points" */
3442 88, /* "X509v3 CRL Number" */
3443 141, /* "X509v3 CRL Reason Code" */
3444 771, /* "X509v3 Certificate Issuer" */
3445 89, /* "X509v3 Certificate Policies" */
3446 140, /* "X509v3 Delta CRL Indicator" */
3447 126, /* "X509v3 Extended Key Usage" */
3448 857, /* "X509v3 Freshest CRL" */
3449 748, /* "X509v3 Inhibit Any Policy" */
3450 86, /* "X509v3 Issuer Alternative Name" */
3451 770, /* "X509v3 Issuing Distribution Point" */
3452 83, /* "X509v3 Key Usage" */
3453 666, /* "X509v3 Name Constraints" */
3454 403, /* "X509v3 No Revocation Available" */
3455 401, /* "X509v3 Policy Constraints" */
3456 747, /* "X509v3 Policy Mappings" */
3457 84, /* "X509v3 Private Key Usage Period" */
3458 85, /* "X509v3 Subject Alternative Name" */
3459 769, /* "X509v3 Subject Directory Attributes" */
3460 82, /* "X509v3 Subject Key Identifier" */
3461 184, /* "X9.57" */
3462 185, /* "X9.57 CM ?" */
3463 478, /* "aRecord" */
3464 289, /* "aaControls" */
3465 287, /* "ac-auditEntity" */
3466 397, /* "ac-proxying" */
3467 288, /* "ac-targeting" */
3468 446, /* "account" */
3469 364, /* "ad dvcs" */
3470 606, /* "additional verification" */
3471 419, /* "aes-128-cbc" */
3472 916, /* "aes-128-cbc-hmac-sha1" */
3473 896, /* "aes-128-ccm" */
3474 421, /* "aes-128-cfb" */
3475 650, /* "aes-128-cfb1" */
3476 653, /* "aes-128-cfb8" */
3477 904, /* "aes-128-ctr" */
3478 418, /* "aes-128-ecb" */
3479 895, /* "aes-128-gcm" */
3480 420, /* "aes-128-ofb" */
3481 913, /* "aes-128-xts" */
3482 423, /* "aes-192-cbc" */
3483 917, /* "aes-192-cbc-hmac-sha1" */
3484 899, /* "aes-192-ccm" */
3485 425, /* "aes-192-cfb" */
3486 651, /* "aes-192-cfb1" */
3487 654, /* "aes-192-cfb8" */
3488 905, /* "aes-192-ctr" */
3489 422, /* "aes-192-ecb" */
3490 898, /* "aes-192-gcm" */
3491 424, /* "aes-192-ofb" */
3492 427, /* "aes-256-cbc" */
3493 918, /* "aes-256-cbc-hmac-sha1" */
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3494 902, /* "aes-256-ccm" */
3495 429, /* "aes-256-cfb" */
3496 652, /* "aes-256-cfb1" */
3497 655, /* "aes-256-cfb8" */
3498 906, /* "aes-256-ctr" */
3499 426, /* "aes-256-ecb" */
3500 901, /* "aes-256-gcm" */
3501 428, /* "aes-256-ofb" */
3502 914, /* "aes-256-xts" */
3503 376, /* "algorithm" */
3504 484, /* "associatedDomain" */
3505 485, /* "associatedName" */
3506 501, /* "audio" */
3507 882, /* "authorityRevocationList" */
3508 91, /* "bf-cbc" */
3509 93, /* "bf-cfb" */
3510 92, /* "bf-ecb" */
3511 94, /* "bf-ofb" */
3512 494, /* "buildingName" */
3513 860, /* "businessCategory" */
3514 691, /* "c2onb191v4" */
3515 692, /* "c2onb191v5" */
3516 697, /* "c2onb239v4" */
3517 698, /* "c2onb239v5" */
3518 684, /* "c2pnb163v1" */
3519 685, /* "c2pnb163v2" */
3520 686, /* "c2pnb163v3" */
3521 687, /* "c2pnb176v1" */
3522 693, /* "c2pnb208w1" */
3523 699, /* "c2pnb272w1" */
3524 700, /* "c2pnb304w1" */
3525 702, /* "c2pnb368w1" */
3526 688, /* "c2tnb191v1" */
3527 689, /* "c2tnb191v2" */
3528 690, /* "c2tnb191v3" */
3529 694, /* "c2tnb239v1" */
3530 695, /* "c2tnb239v2" */
3531 696, /* "c2tnb239v3" */
3532 701, /* "c2tnb359v1" */
3533 703, /* "c2tnb431r1" */
3534 881, /* "cACertificate" */
3535 483, /* "cNAMERecord" */
3536 751, /* "camellia-128-cbc" */
3537 757, /* "camellia-128-cfb" */
3538 760, /* "camellia-128-cfb1" */
3539 763, /* "camellia-128-cfb8" */
3540 754, /* "camellia-128-ecb" */
3541 766, /* "camellia-128-ofb" */
3542 752, /* "camellia-192-cbc" */
3543 758, /* "camellia-192-cfb" */
3544 761, /* "camellia-192-cfb1" */
3545 764, /* "camellia-192-cfb8" */
3546 755, /* "camellia-192-ecb" */
3547 767, /* "camellia-192-ofb" */
3548 753, /* "camellia-256-cbc" */
3549 759, /* "camellia-256-cfb" */
3550 762, /* "camellia-256-cfb1" */
3551 765, /* "camellia-256-cfb8" */
3552 756, /* "camellia-256-ecb" */
3553 768, /* "camellia-256-ofb" */
3554 443, /* "caseIgnoreIAStringSyntax" */
3555 108, /* "cast5-cbc" */
3556 110, /* "cast5-cfb" */
3557 109, /* "cast5-ecb" */
3558 111, /* "cast5-ofb" */
3559 152, /* "certBag" */
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3560 677, /* "certicom-arc" */
3561 517, /* "certificate extensions" */
3562 883, /* "certificateRevocationList" */
3563 54, /* "challengePassword" */
3564 407, /* "characteristic-two-field" */
3565 395, /* "clearance" */
3566 633, /* "cleartext track 2" */
3567 894, /* "cmac" */
3568 13, /* "commonName" */
3569 513, /* "content types" */
3570 50, /* "contentType" */
3571 53, /* "countersignature" */
3572 14, /* "countryName" */
3573 153, /* "crlBag" */
3574 884, /* "crossCertificatePair" */
3575 806, /* "cryptocom" */
3576 805, /* "cryptopro" */
3577 500, /* "dITRedirect" */
3578 451, /* "dNSDomain" */
3579 495, /* "dSAQuality" */
3580 434, /* "data" */
3581 390, /* "dcObject" */
3582 891, /* "deltaRevocationList" */
3583 31, /* "des-cbc" */
3584 643, /* "des-cdmf" */
3585 30, /* "des-cfb" */
3586 656, /* "des-cfb1" */
3587 657, /* "des-cfb8" */
3588 29, /* "des-ecb" */
3589 32, /* "des-ede" */
3590 43, /* "des-ede-cbc" */
3591 60, /* "des-ede-cfb" */
3592 62, /* "des-ede-ofb" */
3593 33, /* "des-ede3" */
3594 44, /* "des-ede3-cbc" */
3595 61, /* "des-ede3-cfb" */
3596 658, /* "des-ede3-cfb1" */
3597 659, /* "des-ede3-cfb8" */
3598 63, /* "des-ede3-ofb" */
3599 45, /* "des-ofb" */
3600 107, /* "description" */
3601 871, /* "destinationIndicator" */
3602 80, /* "desx-cbc" */
3603 28, /* "dhKeyAgreement" */
3604 11, /* "directory services (X.500)" */
3605 378, /* "directory services - algorithms" */
3606 887, /* "distinguishedName" */
3607 892, /* "dmdName" */
3608 174, /* "dnQualifier" */
3609 447, /* "document" */
3610 471, /* "documentAuthor" */
3611 468, /* "documentIdentifier" */
3612 472, /* "documentLocation" */
3613 502, /* "documentPublisher" */
3614 449, /* "documentSeries" */
3615 469, /* "documentTitle" */
3616 470, /* "documentVersion" */
3617 380, /* "dod" */
3618 391, /* "domainComponent" */
3619 452, /* "domainRelatedObject" */
3620 116, /* "dsaEncryption" */
3621 67, /* "dsaEncryption-old" */
3622 66, /* "dsaWithSHA" */
3623 113, /* "dsaWithSHA1" */
3624 70, /* "dsaWithSHA1-old" */
3625 802, /* "dsa_with_SHA224" */

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3626 803, /* "dsa_with_SHA256" */
3627 297, /* "dvcs" */
3628 791, /* "ecdsa-with-Recommended" */
3629 416, /* "ecdsa-with-SHA1" */
3630 793, /* "ecdsa-with-SHA224" */
3631 794, /* "ecdsa-with-SHA256" */
3632 795, /* "ecdsa-with-SHA384" */
3633 796, /* "ecdsa-with-SHA512" */
3634 792, /* "ecdsa-with-Specified" */
3635 48, /* "emailAddress" */
3636 632, /* "encrypted track 2" */
3637 885, /* "enhancedSearchGuide" */
3638 56, /* "extendedCertificateAttributes" */
3639 867, /* "facsimileTelephoneNumber" */
3640 462, /* "favouriteDrink" */
3641 453, /* "friendlyCountry" */
3642 490, /* "friendlyCountryName" */
3643 156, /* "friendlyName" */
3644 631, /* "generate cryptogram" */
3645 509, /* "generationQualifier" */
3646 601, /* "generic cryptogram" */
3647 99, /* "givenName" */
3648 814, /* "gost89-cnt" */
3649 855, /* "hmac" */
3650 780, /* "hmac-md5" */
3651 781, /* "hmac-sha1" */
3652 797, /* "hmacWithMD5" */
3653 163, /* "hmacWithSHA1" */
3654 798, /* "hmacWithSHA224" */
3655 799, /* "hmacWithSHA256" */
3656 800, /* "hmacWithSHA384" */
3657 801, /* "hmacWithSHA512" */
3658 486, /* "homePostalAddress" */
3659 473, /* "homeTelephoneNumber" */
3660 466, /* "host" */
3661 889, /* "houseIdentifier" */
3662 442, /* "iA5StringSyntax" */
3663 381, /* "iana" */
3664 824, /* "id-Gost28147-89-CryptoPro-A-ParamSet" */
3665 825, /* "id-Gost28147-89-CryptoPro-B-ParamSet" */
3666 826, /* "id-Gost28147-89-CryptoPro-C-ParamSet" */
3667 827, /* "id-Gost28147-89-CryptoPro-D-ParamSet" */
3668 819, /* "id-Gost28147-89-CryptoPro-KeyMeshing" */
3669 829, /* "id-Gost28147-89-CryptoPro-Oscar-1-0-ParamSet" */
3670 828, /* "id-Gost28147-89-CryptoPro-Oscar-1-1-ParamSet" */
3671 830, /* "id-Gost28147-89-CryptoPro-RIC-1-ParamSet" */
3672 820, /* "id-Gost28147-89-None-KeyMeshing" */
3673 823, /* "id-Gost28147-89-TestParamSet" */
3674 840, /* "id-GostR3410-2001-CryptoPro-A-ParamSet" */
3675 841, /* "id-GostR3410-2001-CryptoPro-B-ParamSet" */
3676 842, /* "id-GostR3410-2001-CryptoPro-C-ParamSet" */
3677 843, /* "id-GostR3410-2001-CryptoPro-XchA-ParamSet" */
3678 844, /* "id-GostR3410-2001-CryptoPro-XchB-ParamSet" */
3679 839, /* "id-GostR3410-2001-TestParamSet" */
3680 832, /* "id-GostR3410-94-CryptoPro-A-ParamSet" */
3681 833, /* "id-GostR3410-94-CryptoPro-B-ParamSet" */
3682 834, /* "id-GostR3410-94-CryptoPro-C-ParamSet" */
3683 835, /* "id-GostR3410-94-CryptoPro-D-ParamSet" */
3684 836, /* "id-GostR3410-94-CryptoPro-XchA-ParamSet" */
3685 837, /* "id-GostR3410-94-CryptoPro-XchB-ParamSet" */
3686 838, /* "id-GostR3410-94-CryptoPro-XchC-ParamSet" */
3687 831, /* "id-GostR3410-94-TestParamSet" */
3688 845, /* "id-GostR3410-94-a" */
3689 846, /* "id-GostR3410-94-aBis" */
3690 847, /* "id-GostR3410-94-b" */
3691 848, /* "id-GostR3410-94-bBis" */

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3692 822, /* "id-GostR3411-94-CryptoProParamSet" */
3693 821, /* "id-GostR3411-94-TestParamSet" */
3694 266, /* "id-aca" */
3695 355, /* "id-aca-accessIdentity" */
3696 354, /* "id-aca-authenticationInfo" */
3697 356, /* "id-aca-chargingIdentity" */
3698 399, /* "id-aca-encAttrs" */
3699 357, /* "id-aca-group" */
3700 358, /* "id-aca-role" */
3701 176, /* "id-ad" */
3702 788, /* "id-aes128-wrap" */
3703 897, /* "id-aes128-wrap-pad" */
3704 789, /* "id-aes192-wrap" */
3705 900, /* "id-aes192-wrap-pad" */
3706 790, /* "id-aes256-wrap" */
3707 903, /* "id-aes256-wrap-pad" */
3708 262, /* "id-alg" */
3709 893, /* "id-alg-PWRI-KEK" */
3710 323, /* "id-alg-des40" */
3711 326, /* "id-alg-dh-pop" */
3712 325, /* "id-alg-dh-sig-hmac-sha1" */
3713 324, /* "id-alg-noSignature" */
3714 907, /* "id-camellia128-wrap" */
3715 908, /* "id-camellia192-wrap" */
3716 909, /* "id-camellia256-wrap" */
3717 268, /* "id-cct" */
3718 361, /* "id-cct-PKIData" */
3719 362, /* "id-cct-PKIResponse" */
3720 360, /* "id-cct-crs" */
3721 81, /* "id-ce" */
3722 680, /* "id-characteristic-two-basis" */
3723 263, /* "id-cmc" */
3724 334, /* "id-cmc-addExtensions" */
3725 346, /* "id-cmc-confirmCertAcceptance" */
3726 330, /* "id-cmc-dataReturn" */
3727 336, /* "id-cmc-decryptedPOP" */
3728 335, /* "id-cmc-encryptedPOP" */
3729 339, /* "id-cmc-getCRL" */
3730 338, /* "id-cmc-getCert" */
3731 328, /* "id-cmc-identification" */
3732 329, /* "id-cmc-identityProof" */
3733 337, /* "id-cmc-lraPOPWitness" */
3734 344, /* "id-cmc-popLinkRandom" */
3735 345, /* "id-cmc-popLinkWitness" */
3736 343, /* "id-cmc-queryPending" */
3737 333, /* "id-cmc-recipientNonce" */
3738 341, /* "id-cmc-regInfo" */
3739 342, /* "id-cmc-responseInfo" */
3740 340, /* "id-cmc-revokeRequest" */
3741 332, /* "id-cmc-senderNonce" */
3742 327, /* "id-cmc-statusInfo" */
3743 331, /* "id-cmc-transactionId" */
3744 787, /* "id-ct-asciiTextWithCRLF" */
3745 408, /* "id-ecPublicKey" */
3746 508, /* "id-hex-multipart-message" */
3747 507, /* "id-hex-partial-message" */
3748 260, /* "id-it" */
3749 302, /* "id-it-caKeyUpdateInfo" */
3750 298, /* "id-it-caProtEncCert" */
3751 311, /* "id-it-confirmWaitTime" */
3752 303, /* "id-it-currentCRL" */
3753 300, /* "id-it-encKeyPairTypes" */
3754 310, /* "id-it-implicitConfirm" */
3755 308, /* "id-it-keyPairParamRep" */
3756 307, /* "id-it-keyPairParamReq" */
3757 312, /* "id-it-origPKIMessage" */
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3758 301, /* "id-it-preferredSymmAlg" */
3759 309, /* "id-it-revPassphrase" */
3760 299, /* "id-it-signKeyPairTypes" */
3761 305, /* "id-it-subscriptionRequest" */
3762 306, /* "id-it-subscriptionResponse" */
3763 784, /* "id-it-supplLangTags" */
3764 304, /* "id-it-unsupportedOIDs" */
3765 128, /* "id-kp" */
3766 280, /* "id-mod-attribute-cert" */
3767 274, /* "id-mod-cmc" */
3768 277, /* "id-mod-cmp" */
3769 284, /* "id-mod-cmp2000" */
3770 273, /* "id-mod-crmf" */
3771 283, /* "id-mod-dvcs" */
3772 275, /* "id-mod-kea-profile-88" */
3773 276, /* "id-mod-kea-profile-93" */
3774 282, /* "id-mod-ocsp" */
3775 278, /* "id-mod-qualified-cert-88" */
3776 279, /* "id-mod-qualified-cert-93" */
3777 281, /* "id-mod-timestamp-protocol" */
3778 264, /* "id-on" */
3779 347, /* "id-on-personalData" */
3780 265, /* "id-pda" */
3781 352, /* "id-pda-countryOfCitizenship" */
3782 353, /* "id-pda-countryOfResidence" */
3783 348, /* "id-pda-dateOfBirth" */
3784 351, /* "id-pda-gender" */
3785 349, /* "id-pda-placeOfBirth" */
3786 175, /* "id-pe" */
3787 261, /* "id-pkip" */
3788 258, /* "id-pkix-mod" */
3789 269, /* "id-pkix1-explicit-88" */
3790 271, /* "id-pkix1-explicit-93" */
3791 270, /* "id-pkix1-implicit-88" */
3792 272, /* "id-pkix1-implicit-93" */
3793 662, /* "id-ppl" */
3794 267, /* "id-qcs" */
3795 359, /* "id-qcs-pkixQCSyntax-v1" */
3796 259, /* "id-qt" */
3797 313, /* "id-regCtrl" */
3798 316, /* "id-regCtrl-authenticator" */
3799 319, /* "id-regCtrl-oldCertID" */
3800 318, /* "id-regCtrl-pkiArchiveOptions" */
3801 317, /* "id-regCtrl-pkiPublicationInfo" */
3802 320, /* "id-regCtrl-protocolEncrKey" */
3803 315, /* "id-regCtrl-regToken" */
3804 314, /* "id-regInfo" */
3805 322, /* "id-regInfo-certReq" */
3806 321, /* "id-regInfo-utf8Pairs" */
3807 191, /* "id-smime-aa" */
3808 215, /* "id-smime-aa-contentHint" */
3809 218, /* "id-smime-aa-contentIdentifier" */
3810 221, /* "id-smime-aa-contentReference" */
3811 240, /* "id-smime-aa-dvcs-dvc" */
3812 217, /* "id-smime-aa-encapContentType" */
3813 222, /* "id-smime-aa-encrypKeyPref" */
3814 220, /* "id-smime-aa-equivalentLabels" */
3815 232, /* "id-smime-aa-ets-CertificateRefs" */
3816 233, /* "id-smime-aa-ets-RevocationRefs" */
3817 238, /* "id-smime-aa-ets-archiveTimeStamp" */
3818 237, /* "id-smime-aa-ets-certCRLTimestamp" */
3819 234, /* "id-smime-aa-ets-certValues" */
3820 227, /* "id-smime-aa-ets-commitmentType" */
3821 231, /* "id-smime-aa-ets-contentTimestamp" */
3822 236, /* "id-smime-aa-ets-escTimeStamp" */
3823 230, /* "id-smime-aa-ets-otherSigCert" */
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3824 235, /* "id-smime-aa-ets-revocationValues" */
3825 226, /* "id-smime-aa-ets-sigPolicyId" */
3826 229, /* "id-smime-aa-ets-signerAttr" */
3827 228, /* "id-smime-aa-ets-signerLocation" */
3828 219, /* "id-smime-aa-macValue" */
3829 214, /* "id-smime-aa-mlExpandHistory" */
3830 216, /* "id-smime-aa-msgSigDigest" */
3831 212, /* "id-smime-aa-receiptRequest" */
3832 213, /* "id-smime-aa-securityLabel" */
3833 239, /* "id-smime-aa-signatureType" */
3834 223, /* "id-smime-aa-signingCertificate" */
3835 224, /* "id-smime-aa-smimeEncryptCerts" */
3836 225, /* "id-smime-aa-timeStampToken" */
3837 192, /* "id-smime-alg" */
3838 243, /* "id-smime-alg-3DESWrap" */
3839 246, /* "id-smime-alg-CMS3DESWrap" */
3840 247, /* "id-smime-alg-CMSRC2Wrap" */
3841 245, /* "id-smime-alg-ESDH" */
3842 241, /* "id-smime-alg-ESDHwith3DES" */
3843 242, /* "id-smime-alg-ESDHwithRC2" */
3844 244, /* "id-smime-alg-RC2Wrap" */
3845 193, /* "id-smime-cd" */
3846 248, /* "id-smime-cd-ldap" */
3847 190, /* "id-smime-ct" */
3848 210, /* "id-smime-ct-DVCSRequestData" */
3849 211, /* "id-smime-ct-DVCSResponseData" */
3850 208, /* "id-smime-ct-TDTInfo" */
3851 207, /* "id-smime-ct-TSTInfo" */
3852 205, /* "id-smime-ct-authData" */
3853 786, /* "id-smime-ct-compressedData" */
3854 209, /* "id-smime-ct-contentInfo" */
3855 206, /* "id-smime-ct-publishCert" */
3856 204, /* "id-smime-ct-receipt" */
3857 195, /* "id-smime-cti" */
3858 255, /* "id-smime-cti-ets-proofOfApproval" */
3859 256, /* "id-smime-cti-ets-proofOfCreation" */
3860 253, /* "id-smime-cti-ets-proofOfDelivery" */
3861 251, /* "id-smime-cti-ets-proofOfOrigin" */
3862 252, /* "id-smime-cti-ets-proofOfReceipt" */
3863 254, /* "id-smime-cti-ets-proofOfSender" */
3864 189, /* "id-smime-mod" */
3865 196, /* "id-smime-mod-cms" */
3866 197, /* "id-smime-mod-ess" */
3867 202, /* "id-smime-mod-ets-eSigPolicy-88" */
3868 203, /* "id-smime-mod-ets-eSigPolicy-97" */
3869 200, /* "id-smime-mod-ets-eSignature-88" */
3870 201, /* "id-smime-mod-ets-eSignature-97" */
3871 199, /* "id-smime-mod-msg-v3" */
3872 198, /* "id-smime-mod-oid" */
3873 194, /* "id-smime-spg" */
3874 250, /* "id-smime-spg-ets-sqt-unotice" */
3875 249, /* "id-smime-spg-ets-sqt-uri" */
3876 34, /* "idea-cbc" */
3877 35, /* "idea-cfb" */
3878 36, /* "idea-ecb" */
3879 46, /* "idea-ofb" */
3880 676, /* "identified-organization" */
3881 461, /* "info" */
3882 101, /* "initials" */
3883 869, /* "internationalISDNNumber" */
3884 749, /* "ipsec3" */
3885 750, /* "ipsec4" */
3886 181, /* "iso" */
3887 623, /* "issuer capabilities" */
3888 645, /* "itu-t" */
3889 492, /* "janetMailbox" */
```

```
3890 646, /* "joint-iso-itu-t" */
3891 150, /* "keyBag" */
3892 773, /* "kisa" */
3893 477, /* "lastModifiedBy" */
3894 476, /* "lastModifiedTime" */
3895 157, /* "localKeyID" */
3896 15, /* "localityName" */
3897 480, /* "mXRecord" */
3898 493, /* "mailPreferenceOption" */
3899 467, /* "manager" */
3900 3, /* "md2" */
3901 7, /* "md2WithRSAEncryption" */
3902 257, /* "md4" */
3903 396, /* "md4WithRSAEncryption" */
3904 4, /* "md5" */
3905 114, /* "md5-sha1" */
3906 104, /* "md5WithRSA" */
3907 8, /* "md5WithRSAEncryption" */
3908 95, /* "mdc2" */
3909 96, /* "mdc2WithRSA" */
3910 875, /* "member" */
3911 602, /* "merchant initiated auth" */
3912 514, /* "message extensions" */
3913 51, /* "messageDigest" */
3914 911, /* "mgf1" */
3915 506, /* "mime-mhs-bodies" */
3916 505, /* "mime-mhs-headings" */
3917 488, /* "mobileTelephoneNumber" */
3918 481, /* "nsRecord" */
3919 173, /* "name" */
3920 681, /* "onBasis" */
3921 379, /* "org" */
3922 17, /* "organizationName" */
3923 491, /* "organizationalStatus" */
3924 18, /* "organizationalUnitName" */
3925 475, /* "otherMailbox" */
3926 876, /* "owner" */
3927 489, /* "pagerTelephoneNumber" */
3928 782, /* "password based MAC" */
3929 374, /* "path" */
3930 621, /* "payment gateway capabilities" */
3931 9, /* "pbewithMD2AndDES-CBC" */
3932 168, /* "pbewithMD2AndRC2-CBC" */
3933 112, /* "pbewithMD5AndCast5CBC" */
3934 10, /* "pbewithMD5AndDES-CBC" */
3935 169, /* "pbewithMD5AndRC2-CBC" */
3936 148, /* "pbewithSHA1And128BitRC2-CBC" */
3937 144, /* "pbewithSHA1And128BitRC4" */
3938 147, /* "pbewithSHA1And2-KeyTripleDES-CBC" */
3939 146, /* "pbewithSHA1And3-KeyTripleDES-CBC" */
3940 149, /* "pbewithSHA1And40BitRC2-CBC" */
3941 145, /* "pbewithSHA1And40BitRC4" */
3942 170, /* "pbewithSHA1AndDES-CBC" */
3943 68, /* "pbewithSHA1AndRC2-CBC" */
3944 499, /* "personalSignature" */
3945 487, /* "personalTitle" */
3946 464, /* "photo" */
3947 863, /* "physicalDeliveryOfficeName" */
3948 437, /* "pilot" */
3949 439, /* "pilotAttributeSyntax" */
3950 438, /* "pilotAttributeType" */
3951 479, /* "pilotAttributeType27" */
3952 456, /* "pilotDSA" */
3953 441, /* "pilotGroups" */
3954 444, /* "pilotObject" */
3955 440, /* "pilotObjectClass" */
```

```

3956 455, /* "pilotOrganization" */
3957 445, /* "pilotPerson" */
3958 186, /* "pkcs1" */
3959 27, /* "pkcs3" */
3960 187, /* "pkcs5" */
3961 20, /* "pkcs7" */
3962 21, /* "pkcs7-data" */
3963 25, /* "pkcs7-digestData" */
3964 26, /* "pkcs7-encryptedData" */
3965 23, /* "pkcs7-envelopedData" */
3966 24, /* "pkcs7-signedAndEnvelopedData" */
3967 22, /* "pkcs7-signedData" */
3968 151, /* "pkcs8ShroudedKeyBag" */
3969 47, /* "pkcs9" */
3970 862, /* "postOfficeBox" */
3971 861, /* "postalAddress" */
3972 661, /* "postalCode" */
3973 683, /* "ppBasis" */
3974 872, /* "preferredDeliveryMethod" */
3975 873, /* "presentationAddress" */
3976 406, /* "prime-field" */
3977 409, /* "prime192v1" */
3978 410, /* "prime192v2" */
3979 411, /* "prime192v3" */
3980 412, /* "prime239v1" */
3981 413, /* "prime239v2" */
3982 414, /* "prime239v3" */
3983 415, /* "prime256v1" */
3984 886, /* "protocolInformation" */
3985 510, /* "pseudonym" */
3986 435, /* "pss" */
3987 286, /* "qcStatements" */
3988 457, /* "qualityLabelledData" */
3989 450, /* "rfc822localPart" */
3990 98, /* "rc2-40-cbc" */
3991 166, /* "rc2-64-cbc" */
3992 37, /* "rc2-cbc" */
3993 39, /* "rc2-cfb" */
3994 38, /* "rc2-ecb" */
3995 40, /* "rc2-ofb" */
3996 5, /* "rc4" */
3997 97, /* "rc4-40" */
3998 915, /* "rc4-hmac-md5" */
3999 120, /* "rc5-cbc" */
4000 122, /* "rc5-cfb" */
4001 121, /* "rc5-ecb" */
4002 123, /* "rc5-ofb" */
4003 870, /* "registeredAddress" */
4004 460, /* "rfc822Mailbox" */
4005 117, /* "ripemd160" */
4006 119, /* "ripemd160WithRSA" */
4007 400, /* "role" */
4008 877, /* "roleOccupant" */
4009 448, /* "room" */
4010 463, /* "roomNumber" */
4011 19, /* "rsa" */
4012 6, /* "rsaEncryption" */
4013 644, /* "rsaOAEPEncryptionSET" */
4014 377, /* "rsaSignature" */
4015 919, /* "rsaesOaep" */
4016 912, /* "rsassaPss" */
4017 124, /* "run length compression" */
4018 482, /* "sOARecord" */
4019 155, /* "safeContentsBag" */
4020 291, /* "sbgp-autonomousSysNum" */
4021 290, /* "sbgp-ipAddrBlock" */

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4022 292, /* "sbgp-routerIdentifier" */
4023 159, /* "sdsiCertificate" */
4024 859, /* "searchGuide" */
4025 704, /* "secp112r1" */
4026 705, /* "secp112r2" */
4027 706, /* "secp128r1" */
4028 707, /* "secp128r2" */
4029 708, /* "secp160k1" */
4030 709, /* "secp160r1" */
4031 710, /* "secp160r2" */
4032 711, /* "secp192k1" */
4033 712, /* "secp224k1" */
4034 713, /* "secp224r1" */
4035 714, /* "secp256k1" */
4036 715, /* "secp384r1" */
4037 716, /* "secp521r1" */
4038 154, /* "secretBag" */
4039 474, /* "secretary" */
4040 717, /* "sect113r1" */
4041 718, /* "sect113r2" */
4042 719, /* "sect131r1" */
4043 720, /* "sect131r2" */
4044 721, /* "sect163k1" */
4045 722, /* "sect163r1" */
4046 723, /* "sect163r2" */
4047 724, /* "sect193r1" */
4048 725, /* "sect193r2" */
4049 726, /* "sect233k1" */
4050 727, /* "sect233r1" */
4051 728, /* "sect239k1" */
4052 729, /* "sect283k1" */
4053 730, /* "sect283r1" */
4054 731, /* "sect409k1" */
4055 732, /* "sect409r1" */
4056 733, /* "sect571k1" */
4057 734, /* "sect571r1" */
4058 635, /* "secure device signature" */
4059 878, /* "seeAlso" */
4060 777, /* "seed-cbc" */
4061 779, /* "seed-cfb" */
4062 776, /* "seed-ecb" */
4063 778, /* "seed-ofb" */
4064 105, /* "serialNumber" */
4065 625, /* "set-addPolicy" */
4066 515, /* "set-attr" */
4067 518, /* "set-brand" */
4068 638, /* "set-brand-AmericanExpress" */
4069 637, /* "set-brand-Diners" */
4070 636, /* "set-brand-IATA-ATA" */
4071 639, /* "set-brand-JCB" */
4072 641, /* "set-brand-MasterCard" */
4073 642, /* "set-brand-Novus" */
4074 640, /* "set-brand-Visa" */
4075 516, /* "set-policy" */
4076 607, /* "set-policy-root" */
4077 624, /* "set-rootKeyThumb" */
4078 620, /* "setAttr-Cert" */
4079 628, /* "setAttr-IssCap-CVM" */
4080 630, /* "setAttr-IssCap-Sig" */
4081 629, /* "setAttr-IssCap-T2" */
4082 627, /* "setAttr-Token-B0Prime" */
4083 626, /* "setAttr-Token-EMV" */
4084 622, /* "setAttr-TokenType" */
4085 619, /* "setCext-IssuerCapabilities" */
4086 615, /* "setCext-PGWYcapabilities" */
4087 616, /* "setCext-TokenIdentifier" */

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4088 618, /* "setCext-TokenType" */
4089 617, /* "setCext-Track2Data" */
4090 611, /* "setCext-cCertRequired" */
4091 609, /* "setCext-certType" */
4092 608, /* "setCext-hashedRoot" */
4093 610, /* "setCext-merchData" */
4094 613, /* "setCext-setExt" */
4095 614, /* "setCext-setQualf" */
4096 612, /* "setCext-tunneling" */
4097 540, /* "setct-AcqCardCodeMsg" */
4098 576, /* "setct-AcqCardCodeMsgTBE" */
4099 570, /* "setct-AuthReqTBE" */
4100 534, /* "setct-AuthReqTBS" */
4101 527, /* "setct-AuthResBaggage" */
4102 571, /* "setct-AuthResTBE" */
4103 572, /* "setct-AuthResTBEX" */
4104 535, /* "setct-AuthResTBS" */
4105 536, /* "setct-AuthResTBSX" */
4106 528, /* "setct-AuthRevReqBaggage" */
4107 577, /* "setct-AuthRevReqTBE" */
4108 541, /* "setct-AuthRevReqTBS" */
4109 529, /* "setct-AuthRevResBaggage" */
4110 542, /* "setct-AuthRevResData" */
4111 578, /* "setct-AuthRevResTBE" */
4112 579, /* "setct-AuthRevResTBEB" */
4113 543, /* "setct-AuthRevResTBS" */
4114 573, /* "setct-AuthTokenTBE" */
4115 537, /* "setct-AuthTokenTBS" */
4116 600, /* "setct-BCIDistributionTBS" */
4117 558, /* "setct-BatchAdminReqData" */
4118 592, /* "setct-BatchAdminReqTBE" */
4119 559, /* "setct-BatchAdminResData" */
4120 593, /* "setct-BatchAdminResTBE" */
4121 599, /* "setct-CRLNotificationResTBS" */
4122 598, /* "setct-CRLNotificationTBS" */
4123 580, /* "setct-CapReqTBE" */
4124 581, /* "setct-CapReqTBEX" */
4125 544, /* "setct-CapReqTBS" */
4126 545, /* "setct-CapReqTBSX" */
4127 546, /* "setct-CapResData" */
4128 582, /* "setct-CapResTBE" */
4129 583, /* "setct-CapRevReqTBE" */
4130 584, /* "setct-CapRevReqTBEX" */
4131 547, /* "setct-CapRevReqTBS" */
4132 548, /* "setct-CapRevReqTBSX" */
4133 549, /* "setct-CapRevResData" */
4134 585, /* "setct-CapRevResTBE" */
4135 538, /* "setct-CapTokenData" */
4136 530, /* "setct-CapTokenSeq" */
4137 574, /* "setct-CapTokenTBE" */
4138 575, /* "setct-CapTokenTBEX" */
4139 539, /* "setct-CapTokenTBS" */
4140 560, /* "setct-CardCInitResTBS" */
4141 566, /* "setct-CertInqReqTBS" */
4142 563, /* "setct-CertReqData" */
4143 595, /* "setct-CertReqTBE" */
4144 596, /* "setct-CertReqTBEX" */
4145 564, /* "setct-CertReqTBS" */
4146 565, /* "setct-CertResData" */
4147 597, /* "setct-CertResTBE" */
4148 586, /* "setct-CredReqTBE" */
4149 587, /* "setct-CredReqTBEX" */
4150 550, /* "setct-CredReqTBS" */
4151 551, /* "setct-CredReqTBSX" */
4152 552, /* "setct-CredResData" */
4153 588, /* "setct-CredResTBE" */
```

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4154 589, /* "setct-CredRevReqTBE" */
4155 590, /* "setct-CredRevReqTBEX" */
4156 553, /* "setct-CredRevReqTBS" */
4157 554, /* "setct-CredRevReqTBSX" */
4158 555, /* "setct-CredRevResData" */
4159 591, /* "setct-CredRevResTBE" */
4160 567, /* "setct-ErrorTBS" */
4161 526, /* "setct-HODInput" */
4162 561, /* "setct-MeAqCInitResTBS" */
4163 522, /* "setct-OIData" */
4164 519, /* "setct-PANData" */
4165 521, /* "setct-PANOnly" */
4166 520, /* "setct-PANToken" */
4167 556, /* "setct-PCertReqData" */
4168 557, /* "setct-PCertResTBS" */
4169 523, /* "setct-PI" */
4170 532, /* "setct-PI-TBS" */
4171 524, /* "setct-PIData" */
4172 525, /* "setct-PIDataUnsigned" */
4173 568, /* "setct-PIDualSignedTBE" */
4174 569, /* "setct-PIUnsignedTBE" */
4175 531, /* "setct-PInitResData" */
4176 533, /* "setct-PResData" */
4177 594, /* "setct-RegFormReqTBE" */
4178 562, /* "setct-RegFormResTBS" */
4179 604, /* "setext-pinAny" */
4180 603, /* "setext-pinSecure" */
4181 605, /* "setext-track2" */
4182 41, /* "sha" */
4183 64, /* "sha1" */
4184 115, /* "sha1WithRSA" */
4185 65, /* "sha1WithRSAEncryption" */
4186 675, /* "sha224" */
4187 671, /* "sha224WithRSAEncryption" */
4188 672, /* "sha256" */
4189 668, /* "sha256WithRSAEncryption" */
4190 673, /* "sha384" */
4191 669, /* "sha384WithRSAEncryption" */
4192 674, /* "sha512" */
4193 670, /* "sha512WithRSAEncryption" */
4194 42, /* "shaWithRSAEncryption" */
4195 52, /* "signingTime" */
4196 454, /* "simpleSecurityObject" */
4197 496, /* "singleLevelQuality" */
4198 16, /* "stateOrProvinceName" */
4199 660, /* "streetAddress" */
4200 498, /* "subtreeMaximumQuality" */
4201 497, /* "subtreeMinimumQuality" */
4202 890, /* "supportedAlgorithms" */
4203 874, /* "supportedApplicationContext" */
4204 100, /* "surname" */
4205 864, /* "telephoneNumber" */
4206 866, /* "teletexTerminalIdentifier" */
4207 865, /* "telexNumber" */
4208 459, /* "textEncodedORAddress" */
4209 293, /* "textNotice" */
4210 106, /* "title" */
4211 682, /* "tpBasis" */
4212 436, /* "ucl" */
4213 0, /* "undefined" */
4214 888, /* "uniqueMember" */
4215 55, /* "unstructuredAddress" */
4216 49, /* "unstructuredName" */
4217 880, /* "userCertificate" */
4218 465, /* "userClass" */
4219 458, /* "userId" */
```

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4220 879, /* "userPassword" */
4221 373, /* "valid" */
4222 678, /* "wap" */
4223 679, /* "wap-wsg" */
4224 735, /* "wap-wsg-idm-ecid-wtls1" */
4225 743, /* "wap-wsg-idm-ecid-wtls10" */
4226 744, /* "wap-wsg-idm-ecid-wtls11" */
4227 745, /* "wap-wsg-idm-ecid-wtls12" */
4228 736, /* "wap-wsg-idm-ecid-wtls3" */
4229 737, /* "wap-wsg-idm-ecid-wtls4" */
4230 738, /* "wap-wsg-idm-ecid-wtls5" */
4231 739, /* "wap-wsg-idm-ecid-wtls6" */
4232 740, /* "wap-wsg-idm-ecid-wtls7" */
4233 741, /* "wap-wsg-idm-ecid-wtls8" */
4234 742, /* "wap-wsg-idm-ecid-wtls9" */
4235 804, /* "whirlpool" */
4236 868, /* "x121Address" */
4237 503, /* "x500UniqueIdentifier" */
4238 158, /* "x509Certificate" */
4239 160, /* "x509Crl" */
4240 125, /* "zlib compression" */
4241 };

4243 static const unsigned int obj_objs[NUM_OBJ]={
4244 0, /* OBJ_undef 0 */
4245 393, /* OBJ_joint_iso_ccitt OBJ_joint_iso_itu_t */
4246 404, /* OBJ_ccitt OBJ_itu_t */
4247 645, /* OBJ_itu_t 0 */
4248 434, /* OBJ_data 0 9 */
4249 181, /* OBJ_iso 1 */
4250 182, /* OBJ_member_body 1 2 */
4251 379, /* OBJ_org 1 3 */
4252 676, /* OBJ_identified_organization 1 3 */
4253 646, /* OBJ_joint_iso_itu_t 2 */
4254 11, /* OBJ_X500 2 5 */
4255 647, /* OBJ_international_organizations 2 23 */
4256 380, /* OBJ_dod 1 3 6 */
4257 12, /* OBJ_X509 2 5 4 */
4258 378, /* OBJ_X500algorithms 2 5 8 */
4259 81, /* OBJ_id_ce 2 5 29 */
4260 512, /* OBJ_id_set 2 23 42 */
4261 678, /* OBJ_wap 2 23 43 */
4262 435, /* OBJ_pss 0 9 2342 */
4263 183, /* OBJ_ISO_US 1 2 840 */
4264 381, /* OBJ_iana 1 3 6 1 */
4265 677, /* OBJ_certicom_arc 1 3 132 */
4266 394, /* OBJ_selected_attribute_types 2 5 1 5 */
4267 13, /* OBJ_commonName 2 5 4 3 */
4268 100, /* OBJ_surname 2 5 4 4 */
4269 105, /* OBJ_serialNumber 2 5 4 5 */
4270 14, /* OBJ_countryName 2 5 4 6 */
4271 15, /* OBJ_localityName 2 5 4 7 */
4272 16, /* OBJ_stateOrProvinceName 2 5 4 8 */
4273 660, /* OBJ_streetAddress 2 5 4 9 */
4274 17, /* OBJ_organizationName 2 5 4 10 */
4275 18, /* OBJ_organizationalUnitName 2 5 4 11 */
4276 106, /* OBJ_title 2 5 4 12 */
4277 107, /* OBJ_description 2 5 4 13 */
4278 859, /* OBJ_searchGuide 2 5 4 14 */
4279 860, /* OBJ_businessCategory 2 5 4 15 */
4280 861, /* OBJ_postalAddress 2 5 4 16 */
4281 661, /* OBJ_postalCode 2 5 4 17 */
4282 862, /* OBJ_postOfficeBox 2 5 4 18 */
4283 863, /* OBJ_physicalDeliveryOfficeName 2 5 4 19 */
4284 864, /* OBJ_telephoneNumber 2 5 4 20 */
4285 865, /* OBJ_telexNumber 2 5 4 21 */

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4286 866, /* OBJ_teletexTerminalIdentifier 2 5 4 22 */
4287 867, /* OBJ_facsimileTelephoneNumber 2 5 4 23 */
4288 868, /* OBJ_x121Address 2 5 4 24 */
4289 869, /* OBJ_internationalISDNNumber 2 5 4 25 */
4290 870, /* OBJ_registeredAddress 2 5 4 26 */
4291 871, /* OBJ_destinationIndicator 2 5 4 27 */
4292 872, /* OBJ_preferredDeliveryMethod 2 5 4 28 */
4293 873, /* OBJ_presentationAddress 2 5 4 29 */
4294 874, /* OBJ_supportedApplicationContext 2 5 4 30 */
4295 875, /* OBJ_member 2 5 4 31 */
4296 876, /* OBJ_owner 2 5 4 32 */
4297 877, /* OBJ_roleOccupant 2 5 4 33 */
4298 878, /* OBJ_seeAlso 2 5 4 34 */
4299 879, /* OBJ_userPassword 2 5 4 35 */
4300 880, /* OBJ_userCertificate 2 5 4 36 */
4301 881, /* OBJ_cACertificate 2 5 4 37 */
4302 882, /* OBJ_authorityRevocationList 2 5 4 38 */
4303 883, /* OBJ_certificateRevocationList 2 5 4 39 */
4304 884, /* OBJ_crossCertificatePair 2 5 4 40 */
4305 173, /* OBJ_name 2 5 4 41 */
4306 99, /* OBJ_givenName 2 5 4 42 */
4307 101, /* OBJ_initials 2 5 4 43 */
4308 509, /* OBJ_generationQualifier 2 5 4 44 */
4309 503, /* OBJ_x500UniqueIdentifier 2 5 4 45 */
4310 174, /* OBJ_dnQualifier 2 5 4 46 */
4311 885, /* OBJ_enhancedSearchGuide 2 5 4 47 */
4312 886, /* OBJ_protocolInformation 2 5 4 48 */
4313 887, /* OBJ_distinguishedName 2 5 4 49 */
4314 888, /* OBJ_uniqueMember 2 5 4 50 */
4315 889, /* OBJ_houseIdentifier 2 5 4 51 */
4316 890, /* OBJ_supportedAlgorithms 2 5 4 52 */
4317 891, /* OBJ_deltaRevocationList 2 5 4 53 */
4318 892, /* OBJ_dmdName 2 5 4 54 */
4319 510, /* OBJ_pseudonym 2 5 4 65 */
4320 400, /* OBJ_role 2 5 4 72 */
4321 769, /* OBJ_subject_directory_attributes 2 5 29 9 */
4322 82, /* OBJ_subject_key_identifier 2 5 29 14 */
4323 83, /* OBJ_key_usage 2 5 29 15 */
4324 84, /* OBJ_private_key_usage_period 2 5 29 16 */
4325 85, /* OBJ_subject_alt_name 2 5 29 17 */
4326 86, /* OBJ_issuer_alt_name 2 5 29 18 */
4327 87, /* OBJ_basic_constraints 2 5 29 19 */
4328 88, /* OBJ_crl_number 2 5 29 20 */
4329 141, /* OBJ_crl_reason 2 5 29 21 */
4330 430, /* OBJ_hold_instruction_code 2 5 29 23 */
4331 142, /* OBJ_invalidity_date 2 5 29 24 */
4332 140, /* OBJ_delta_crl 2 5 29 27 */
4333 770, /* OBJ_issuing_distribution_point 2 5 29 28 */
4334 771, /* OBJ_certificate_issuer 2 5 29 29 */
4335 666, /* OBJ_name_constraints 2 5 29 30 */
4336 103, /* OBJ_crl_distribution_points 2 5 29 31 */
4337 89, /* OBJ_certificate_policies 2 5 29 32 */
4338 747, /* OBJ_policy_mappings 2 5 29 33 */
4339 90, /* OBJ_authority_key_identifier 2 5 29 35 */
4340 401, /* OBJ_policy_constraints 2 5 29 36 */
4341 126, /* OBJ_ext_key_usage 2 5 29 37 */
4342 857, /* OBJ_freshest_crl 2 5 29 46 */
4343 748, /* OBJ_inhibit_any_policy 2 5 29 54 */
4344 402, /* OBJ_target_information 2 5 29 55 */
4345 403, /* OBJ_no_rev_avail 2 5 29 56 */
4346 513, /* OBJ_set_ctype 2 23 42 0 */
4347 514, /* OBJ_set_msgExt 2 23 42 1 */
4348 515, /* OBJ_set_attr 2 23 42 3 */
4349 516, /* OBJ_set_policy 2 23 42 5 */
4350 517, /* OBJ_set_certExt 2 23 42 7 */
4351 518, /* OBJ_set_brand 2 23 42 8 */

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4352 679, /* OBJ_wap_wsg 2 23 43 1 */
4353 382, /* OBJ_Directory 1 3 6 1 1 */
4354 383, /* OBJ_Management 1 3 6 1 2 */
4355 384, /* OBJ_Experimental 1 3 6 1 3 */
4356 385, /* OBJ_Private 1 3 6 1 4 */
4357 386, /* OBJ_Security 1 3 6 1 5 */
4358 387, /* OBJ_SNMPv2 1 3 6 1 6 */
4359 388, /* OBJ_Mail 1 3 6 1 7 */
4360 376, /* OBJ_algorithm 1 3 14 3 2 */
4361 395, /* OBJ_clearance 2 5 1 5 55 */
4362 19, /* OBJ_rsa 2 5 8 1 1 */
4363 96, /* OBJ_mdc2WithRSA 2 5 8 3 100 */
4364 95, /* OBJ_mdc2 2 5 8 3 101 */
4365 746, /* OBJ_any_policy 2 5 29 32 0 */
4366 910, /* OBJ_anyExtendedKeyUsage 2 5 29 37 0 */
4367 519, /* OBJ_setct_PANData 2 23 42 0 0 */
4368 520, /* OBJ_setct_PANToken 2 23 42 0 1 */
4369 521, /* OBJ_setct_PANOnly 2 23 42 0 2 */
4370 522, /* OBJ_setct_OIData 2 23 42 0 3 */
4371 523, /* OBJ_setct_PI 2 23 42 0 4 */
4372 524, /* OBJ_setct_PIData 2 23 42 0 5 */
4373 525, /* OBJ_setct_PIDataUnsigned 2 23 42 0 6 */
4374 526, /* OBJ_setct_HODInput 2 23 42 0 7 */
4375 527, /* OBJ_setct_AuthResBaggage 2 23 42 0 8 */
4376 528, /* OBJ_setct_AuthRevReqBaggage 2 23 42 0 9 */
4377 529, /* OBJ_setct_AuthRevResBaggage 2 23 42 0 10 */
4378 530, /* OBJ_setct_CapTokenSeq 2 23 42 0 11 */
4379 531, /* OBJ_setct_PInitResData 2 23 42 0 12 */
4380 532, /* OBJ_setct_PI_TBS 2 23 42 0 13 */
4381 533, /* OBJ_setct_PResData 2 23 42 0 14 */
4382 534, /* OBJ_setct_AuthReqTBS 2 23 42 0 16 */
4383 535, /* OBJ_setct_AuthResTBS 2 23 42 0 17 */
4384 536, /* OBJ_setct_AuthResTBSX 2 23 42 0 18 */
4385 537, /* OBJ_setct_AuthTokenTBS 2 23 42 0 19 */
4386 538, /* OBJ_setct_CapTokenData 2 23 42 0 20 */
4387 539, /* OBJ_setct_CapTokenTBS 2 23 42 0 21 */
4388 540, /* OBJ_setct_AcqCardCodeMsg 2 23 42 0 22 */
4389 541, /* OBJ_setct_AuthRevReqTBS 2 23 42 0 23 */
4390 542, /* OBJ_setct_AuthRevResData 2 23 42 0 24 */
4391 543, /* OBJ_setct_AuthRevResTBS 2 23 42 0 25 */
4392 544, /* OBJ_setct_CapReqTBS 2 23 42 0 26 */
4393 545, /* OBJ_setct_CapReqTBSX 2 23 42 0 27 */
4394 546, /* OBJ_setct_CapResData 2 23 42 0 28 */
4395 547, /* OBJ_setct_CapRevReqTBS 2 23 42 0 29 */
4396 548, /* OBJ_setct_CapRevReqTBSX 2 23 42 0 30 */
4397 549, /* OBJ_setct_CapRevResData 2 23 42 0 31 */
4398 550, /* OBJ_setct_CredReqTBS 2 23 42 0 32 */
4399 551, /* OBJ_setct_CredReqTBSX 2 23 42 0 33 */
4400 552, /* OBJ_setct_CredResData 2 23 42 0 34 */
4401 553, /* OBJ_setct_CredRevReqTBS 2 23 42 0 35 */
4402 554, /* OBJ_setct_CredRevReqTBSX 2 23 42 0 36 */
4403 555, /* OBJ_setct_CredRevResData 2 23 42 0 37 */
4404 556, /* OBJ_setct_PCertReqData 2 23 42 0 38 */
4405 557, /* OBJ_setct_PCertResTBS 2 23 42 0 39 */
4406 558, /* OBJ_setct_BatchAdminReqData 2 23 42 0 40 */
4407 559, /* OBJ_setct_BatchAdminResData 2 23 42 0 41 */
4408 560, /* OBJ_setct_CardCInitResTBS 2 23 42 0 42 */
4409 561, /* OBJ_setct_MeAcCInitResTBS 2 23 42 0 43 */
4410 562, /* OBJ_setct_RegFormResTBS 2 23 42 0 44 */
4411 563, /* OBJ_setct_CertReqData 2 23 42 0 45 */
4412 564, /* OBJ_setct_CertReqTBS 2 23 42 0 46 */
4413 565, /* OBJ_setct_CertResData 2 23 42 0 47 */
4414 566, /* OBJ_setct_CertInqReqTBS 2 23 42 0 48 */
4415 567, /* OBJ_setct_ErrorTBS 2 23 42 0 49 */
4416 568, /* OBJ_setct_PIDualSignedTBE 2 23 42 0 50 */
4417 569, /* OBJ_setct_PIDualSignedTBE 2 23 42 0 51 */

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4418 570, /* OBJ_setct_AuthReqTBE 2 23 42 0 52 */
4419 571, /* OBJ_setct_AuthResTBE 2 23 42 0 53 */
4420 572, /* OBJ_setct_AuthResTBEX 2 23 42 0 54 */
4421 573, /* OBJ_setct_AuthTokenTBE 2 23 42 0 55 */
4422 574, /* OBJ_setct_CapTokenTBE 2 23 42 0 56 */
4423 575, /* OBJ_setct_CapTokenTBEX 2 23 42 0 57 */
4424 576, /* OBJ_setct_AcqCardCodeMsgTBE 2 23 42 0 58 */
4425 577, /* OBJ_setct_AuthRevReqTBE 2 23 42 0 59 */
4426 578, /* OBJ_setct_AuthRevResTBE 2 23 42 0 60 */
4427 579, /* OBJ_setct_AuthRevResTBEB 2 23 42 0 61 */
4428 580, /* OBJ_setct_CapReqTBE 2 23 42 0 62 */
4429 581, /* OBJ_setct_CapReqTBEX 2 23 42 0 63 */
4430 582, /* OBJ_setct_CapResTBE 2 23 42 0 64 */
4431 583, /* OBJ_setct_CapRevReqTBE 2 23 42 0 65 */
4432 584, /* OBJ_setct_CapRevReqTBEX 2 23 42 0 66 */
4433 585, /* OBJ_setct_CapRevResTBE 2 23 42 0 67 */
4434 586, /* OBJ_setct_CredReqTBE 2 23 42 0 68 */
4435 587, /* OBJ_setct_CredReqTBEX 2 23 42 0 69 */
4436 588, /* OBJ_setct_CredResTBE 2 23 42 0 70 */
4437 589, /* OBJ_setct_CredRevReqTBE 2 23 42 0 71 */
4438 590, /* OBJ_setct_CredRevReqTBEX 2 23 42 0 72 */
4439 591, /* OBJ_setct_CredRevResTBE 2 23 42 0 73 */
4440 592, /* OBJ_setct_BatchAdminReqTBE 2 23 42 0 74 */
4441 593, /* OBJ_setct_BatchAdminResTBE 2 23 42 0 75 */
4442 594, /* OBJ_setct_RegFormReqTBE 2 23 42 0 76 */
4443 595, /* OBJ_setct_CertReqTBE 2 23 42 0 77 */
4444 596, /* OBJ_setct_CertReqTBEX 2 23 42 0 78 */
4445 597, /* OBJ_setct_CertResTBE 2 23 42 0 79 */
4446 598, /* OBJ_setct_CRLNotificationTBS 2 23 42 0 80 */
4447 599, /* OBJ_setct_CRLNotificationResTBS 2 23 42 0 81 */
4448 600, /* OBJ_setct_BCIDistributionTBS 2 23 42 0 82 */
4449 601, /* OBJ_setext_genCrypt 2 23 42 1 1 */
4450 602, /* OBJ_setext_miAuth 2 23 42 1 3 */
4451 603, /* OBJ_setext_pinSecure 2 23 42 1 4 */
4452 604, /* OBJ_setext_pinAny 2 23 42 1 5 */
4453 605, /* OBJ_setext_track2 2 23 42 1 7 */
4454 606, /* OBJ_setext_cv 2 23 42 1 8 */
4455 620, /* OBJ_setAttr_Cert 2 23 42 3 0 */
4456 621, /* OBJ_setAttr_PGWCyap 2 23 42 3 1 */
4457 622, /* OBJ_setAttr_TokenType 2 23 42 3 2 */
4458 623, /* OBJ_setAttr_IssCap 2 23 42 3 3 */
4459 607, /* OBJ_set_policy_root 2 23 42 5 0 */
4460 608, /* OBJ_setCext_hashedRoot 2 23 42 7 0 */
4461 609, /* OBJ_setCext_certType 2 23 42 7 1 */
4462 610, /* OBJ_setCext_merchData 2 23 42 7 2 */
4463 611, /* OBJ_setCext_cCertRequired 2 23 42 7 3 */
4464 612, /* OBJ_setCext_tunneling 2 23 42 7 4 */
4465 613, /* OBJ_setCext_setExt 2 23 42 7 5 */
4466 614, /* OBJ_setCext_setQualf 2 23 42 7 6 */
4467 615, /* OBJ_setCext_PGWCyapabilities 2 23 42 7 7 */
4468 616, /* OBJ_setCext_TokenIdentifier 2 23 42 7 8 */
4469 617, /* OBJ_setCext_Track2Data 2 23 42 7 9 */
4470 618, /* OBJ_setCext_TokenType 2 23 42 7 10 */
4471 619, /* OBJ_setCext_IssuerCapabilities 2 23 42 7 11 */
4472 636, /* OBJ_set_brand_IATA_ATA 2 23 42 8 1 */
4473 640, /* OBJ_set_brand_Visa 2 23 42 8 4 */
4474 641, /* OBJ_set_brand_MasterCard 2 23 42 8 5 */
4475 637, /* OBJ_set_brand_Diners 2 23 42 8 30 */
4476 638, /* OBJ_set_brand_AmericanExpress 2 23 42 8 34 */
4477 639, /* OBJ_set_brand_JCB 2 23 42 8 35 */
4478 805, /* OBJ_cryptopro 1 2 643 2 2 */
4479 806, /* OBJ_cryptocom 1 2 643 2 9 */
4480 184, /* OBJ_X9_57 1 2 840 10040 */
4481 405, /* OBJ_ansi_X9_62 1 2 840 10045 */
4482 389, /* OBJ_Enterprises 1 3 6 1 4 1 */
4483 504, /* OBJ_mime_mhs 1 3 6 1 7 1 */

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4484 104, /* OBJ_md5WithRSA 1 3 14 3 2 3 */
4485 29, /* OBJ_des_ecb 1 3 14 3 2 6 */
4486 31, /* OBJ_des_cbc 1 3 14 3 2 7 */
4487 45, /* OBJ_des_ofb64 1 3 14 3 2 8 */
4488 30, /* OBJ_des_cfb64 1 3 14 3 2 9 */
4489 377, /* OBJ_rsaSignature 1 3 14 3 2 11 */
4490 67, /* OBJ_dsa_2 1 3 14 3 2 12 */
4491 66, /* OBJ_dsaWithSHA 1 3 14 3 2 13 */
4492 42, /* OBJ_shaWithRSAEncryption 1 3 14 3 2 15 */
4493 32, /* OBJ_des_ede_ecb 1 3 14 3 2 17 */
4494 41, /* OBJ_sha 1 3 14 3 2 18 */
4495 64, /* OBJ_sha1 1 3 14 3 2 26 */
4496 70, /* OBJ_dsaWithSHA1_2 1 3 14 3 2 27 */
4497 115, /* OBJ_sha1WithRSA 1 3 14 3 2 29 */
4498 117, /* OBJ_ripemd160 1 3 36 3 2 1 */
4499 143, /* OBJ_sxnet 1 3 101 1 4 1 */
4500 721, /* OBJ_sect163k1 1 3 132 0 1 */
4501 722, /* OBJ_sect163r1 1 3 132 0 2 */
4502 728, /* OBJ_sect239k1 1 3 132 0 3 */
4503 717, /* OBJ_sect113r1 1 3 132 0 4 */
4504 718, /* OBJ_sect113r2 1 3 132 0 5 */
4505 704, /* OBJ_secp112r1 1 3 132 0 6 */
4506 705, /* OBJ_secp112r2 1 3 132 0 7 */
4507 709, /* OBJ_secp160r1 1 3 132 0 8 */
4508 708, /* OBJ_secp160k1 1 3 132 0 9 */
4509 714, /* OBJ_sect256k1 1 3 132 0 10 */
4510 723, /* OBJ_sect163r2 1 3 132 0 15 */
4511 729, /* OBJ_sect283k1 1 3 132 0 16 */
4512 730, /* OBJ_sect283r1 1 3 132 0 17 */
4513 719, /* OBJ_sect131r1 1 3 132 0 22 */
4514 720, /* OBJ_sect131r2 1 3 132 0 23 */
4515 724, /* OBJ_sect193r1 1 3 132 0 24 */
4516 725, /* OBJ_sect193r2 1 3 132 0 25 */
4517 726, /* OBJ_sect233k1 1 3 132 0 26 */
4518 727, /* OBJ_sect233r1 1 3 132 0 27 */
4519 706, /* OBJ_secp128r1 1 3 132 0 28 */
4520 707, /* OBJ_secp128r2 1 3 132 0 29 */
4521 710, /* OBJ_secp160r2 1 3 132 0 30 */
4522 711, /* OBJ_secp192k1 1 3 132 0 31 */
4523 712, /* OBJ_secp224k1 1 3 132 0 32 */
4524 713, /* OBJ_secp224r1 1 3 132 0 33 */
4525 715, /* OBJ_secp384r1 1 3 132 0 34 */
4526 716, /* OBJ_secp521r1 1 3 132 0 35 */
4527 731, /* OBJ_sect409k1 1 3 132 0 36 */
4528 732, /* OBJ_sect409r1 1 3 132 0 37 */
4529 733, /* OBJ_sect571k1 1 3 132 0 38 */
4530 734, /* OBJ_sect571r1 1 3 132 0 39 */
4531 624, /* OBJ_set_rootKeyThumb 2 23 42 3 0 0 */
4532 625, /* OBJ_set_addPolicy 2 23 42 3 0 1 */
4533 626, /* OBJ_setAttr-Token-EMV 2 23 42 3 2 1 */
4534 627, /* OBJ_setAttr-Token-B0Prime 2 23 42 3 2 2 */
4535 628, /* OBJ_setAttr-IssCap-CVM 2 23 42 3 3 3 */
4536 629, /* OBJ_setAttr-IssCap-T2 2 23 42 3 3 4 */
4537 630, /* OBJ_setAttr-IssCap-Sig 2 23 42 3 3 5 */
4538 642, /* OBJ_set_brand-Novus 2 23 42 8 6011 */
4539 735, /* OBJ_wap_wsg_idm_ecid_wtls1 2 23 43 1 4 1 */
4540 736, /* OBJ_wap_wsg_idm_ecid_wtls3 2 23 43 1 4 3 */
4541 737, /* OBJ_wap_wsg_idm_ecid_wtls4 2 23 43 1 4 4 */
4542 738, /* OBJ_wap_wsg_idm_ecid_wtls5 2 23 43 1 4 5 */
4543 739, /* OBJ_wap_wsg_idm_ecid_wtls6 2 23 43 1 4 6 */
4544 740, /* OBJ_wap_wsg_idm_ecid_wtls7 2 23 43 1 4 7 */
4545 741, /* OBJ_wap_wsg_idm_ecid_wtls8 2 23 43 1 4 8 */
4546 742, /* OBJ_wap_wsg_idm_ecid_wtls9 2 23 43 1 4 9 */
4547 743, /* OBJ_wap_wsg_idm_ecid_wtls10 2 23 43 1 4 10 */
4548 744, /* OBJ_wap_wsg_idm_ecid_wtls11 2 23 43 1 4 11 */
4549 745, /* OBJ_wap_wsg_idm_ecid_wtls12 2 23 43 1 4 12 */

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4550 804, /* OBJ_whirlpool 1 0 10118 3 0 55 */
4551 124, /* OBJ_rle_compression 1 1 1 1 666 1 */
4552 773, /* OBJ_kisa 1 2 410 200004 */
4553 807, /* OBJ_id_GostR3411_94_with_GostR3410_2001 1 2 643 2 2 3 */
4554 808, /* OBJ_id_GostR3411_94_with_GostR3410_94 1 2 643 2 2 4 */
4555 809, /* OBJ_id_GostR3411_94 1 2 643 2 2 9 */
4556 810, /* OBJ_id_HMACGostR3411_94 1 2 643 2 2 10 */
4557 811, /* OBJ_id_GostR3410_2001 1 2 643 2 2 19 */
4558 812, /* OBJ_id_GostR3410_94 1 2 643 2 2 20 */
4559 813, /* OBJ_id_Gost28147_89 1 2 643 2 2 21 */
4560 815, /* OBJ_id_Gost28147_89_MAC 1 2 643 2 2 22 */
4561 816, /* OBJ_id_GostR3411_94_prf 1 2 643 2 2 23 */
4562 817, /* OBJ_id_GostR3410_2001DH 1 2 643 2 2 98 */
4563 818, /* OBJ_id_GostR3410_94DH 1 2 643 2 2 99 */
4564 1, /* OBJ_rsadsi 1 2 840 113549 */
4565 185, /* OBJ_X9cm 1 2 840 10040 4 */
4566 127, /* OBJ_id_pkix 1 3 6 1 5 5 7 */
4567 505, /* OBJ_mime_mhs_headings 1 3 6 1 7 1 1 */
4568 506, /* OBJ_mime_mhs_bodies 1 3 6 1 7 1 2 */
4569 119, /* OBJ_ripemd160WithRSA 1 3 36 3 3 1 2 */
4570 631, /* OBJ_setAttr-GenCryptgrm 2 23 42 3 3 3 1 */
4571 632, /* OBJ_setAttr-T2Enc 2 23 42 3 3 4 1 */
4572 633, /* OBJ_setAttr-T2cleartxt 2 23 42 3 3 4 2 */
4573 634, /* OBJ_setAttr-TokICCSig 2 23 42 3 3 5 1 */
4574 635, /* OBJ_setAttr-SecDevSig 2 23 42 3 3 5 2 */
4575 436, /* OBJ_ucl 0 9 2342 19200300 */
4576 820, /* OBJ_id_Gost28147_89_None_KeyMeshing 1 2 643 2 2 14 0 */
4577 819, /* OBJ_id_Gost28147_89_CryptoPro_KeyMeshing 1 2 643 2 2 14 1 */
4578 845, /* OBJ_id_GostR3410_94_a 1 2 643 2 2 20 1 */
4579 846, /* OBJ_id_GostR3410_94_aBis 1 2 643 2 2 20 2 */
4580 847, /* OBJ_id_GostR3410_94_b 1 2 643 2 2 20 3 */
4581 848, /* OBJ_id_GostR3410_94_bBis 1 2 643 2 2 20 4 */
4582 821, /* OBJ_id_GostR3411_94_TestParamSet 1 2 643 2 2 30 0 */
4583 822, /* OBJ_id_GostR3411_94_CryptoProParamSet 1 2 643 2 2 30 1 */
4584 823, /* OBJ_id_Gost28147_89_TestParamSet 1 2 643 2 2 31 0 */
4585 824, /* OBJ_id_Gost28147_89_CryptoPro_A_ParamSet 1 2 643 2 2 31 1 */
4586 825, /* OBJ_id_Gost28147_89_CryptoPro_B_ParamSet 1 2 643 2 2 31 2 */
4587 826, /* OBJ_id_Gost28147_89_CryptoPro_C_ParamSet 1 2 643 2 2 31 3 */
4588 827, /* OBJ_id_Gost28147_89_CryptoPro_D_ParamSet 1 2 643 2 2 31 4 */
4589 828, /* OBJ_id_Gost28147_89_CryptoPro_Oscar_1_ParamSet 1 2 643 2 2 31 5 */
4590 829, /* OBJ_id_Gost28147_89_CryptoPro_Oscar_1_0_ParamSet 1 2 643 2 2 31 6 */
4591 830, /* OBJ_id_Gost28147_89_CryptoPro_RIC_1_ParamSet 1 2 643 2 2 31 7 */
4592 831, /* OBJ_id_GostR3410_94_TestParamSet 1 2 643 2 2 32 0 */
4593 832, /* OBJ_id_GostR3410_94_CryptoPro_A_ParamSet 1 2 643 2 2 32 2 */
4594 833, /* OBJ_id_GostR3410_94_CryptoPro_B_ParamSet 1 2 643 2 2 32 3 */
4595 834, /* OBJ_id_GostR3410_94_CryptoPro_C_ParamSet 1 2 643 2 2 32 4 */
4596 835, /* OBJ_id_GostR3410_94_CryptoPro_D_ParamSet 1 2 643 2 2 32 5 */
4597 836, /* OBJ_id_GostR3410_94_CryptoPro_XchA_ParamSet 1 2 643 2 2 33 1 */
4598 837, /* OBJ_id_GostR3410_94_CryptoPro_XchB_ParamSet 1 2 643 2 2 33 2 */
4599 838, /* OBJ_id_GostR3410_94_CryptoPro_XchC_ParamSet 1 2 643 2 2 33 3 */
4600 839, /* OBJ_id_GostR3410_2001_TestParamSet 1 2 643 2 2 35 0 */
4601 840, /* OBJ_id_GostR3410_2001_CryptoPro_A_ParamSet 1 2 643 2 2 35 1 */
4602 841, /* OBJ_id_GostR3410_2001_CryptoPro_B_ParamSet 1 2 643 2 2 35 2 */
4603 842, /* OBJ_id_GostR3410_2001_CryptoPro_C_ParamSet 1 2 643 2 2 35 3 */
4604 843, /* OBJ_id_GostR3410_2001_CryptoPro_XchA_ParamSet 1 2 643 2 2 36 0 */
4605 844, /* OBJ_id_GostR3410_2001_CryptoPro_XchB_ParamSet 1 2 643 2 2 36 1 */
4606 2, /* OBJ_pkcs 1 2 840 113549 1 */
4607 431, /* OBJ_hold_instruction_none 1 2 840 10040 2 1 */
4608 432, /* OBJ_hold_instruction_call_issuer 1 2 840 10040 2 2 */
4609 433, /* OBJ_hold_instruction_reject 1 2 840 10040 2 3 */
4610 116, /* OBJ_dsa 1 2 840 10040 4 1 */
4611 113, /* OBJ_dsaWithSHA1 1 2 840 10040 4 3 */
4612 406, /* OBJ_X9_62_prime_field 1 2 840 10045 1 1 */
4613 407, /* OBJ_X9_62_characteristic_two_field 1 2 840 10045 1 2 */
4614 408, /* OBJ_X9_62_id_ecPublicKey 1 2 840 10045 2 1 */
4615 416, /* OBJ_ecdsa_with_SHA1 1 2 840 10045 4 1 */

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4616 791, /* OBJ_ecdsa_with_Recommended 1 2 840 10045 4 2 */
4617 792, /* OBJ_ecdsa_with_Specified 1 2 840 10045 4 3 */
4618 258, /* OBJ_id_pkix_mod 1 3 6 1 5 5 7 0 */
4619 175, /* OBJ_id_pe 1 3 6 1 5 5 7 1 */
4620 259, /* OBJ_id_qt 1 3 6 1 5 5 7 2 */
4621 128, /* OBJ_id_kp 1 3 6 1 5 5 7 3 */
4622 260, /* OBJ_id_it 1 3 6 1 5 5 7 4 */
4623 261, /* OBJ_id_pkip 1 3 6 1 5 5 7 5 */
4624 262, /* OBJ_id_alg 1 3 6 1 5 5 7 6 */
4625 263, /* OBJ_id_cmc 1 3 6 1 5 5 7 7 */
4626 264, /* OBJ_id_on 1 3 6 1 5 5 7 8 */
4627 265, /* OBJ_id_pda 1 3 6 1 5 5 7 9 */
4628 266, /* OBJ_id_aca 1 3 6 1 5 5 7 10 */
4629 267, /* OBJ_id_qcs 1 3 6 1 5 5 7 11 */
4630 268, /* OBJ_id_cct 1 3 6 1 5 5 7 12 */
4631 662, /* OBJ_id_ppl 1 3 6 1 5 5 7 21 */
4632 176, /* OBJ_id_ad 1 3 6 1 5 5 7 48 */
4633 507, /* OBJ_id_hex_partial_message 1 3 6 1 7 1 1 1 */
4634 508, /* OBJ_id_hex_multipart_message 1 3 6 1 7 1 1 2 */
4635 57, /* OBJ_netscape 2 16 840 1 113730 */
4636 754, /* OBJ_camellia_128_ecb 0 3 4401 5 3 1 9 1 */
4637 766, /* OBJ_camellia_128_ofb128 0 3 4401 5 3 1 9 3 */
4638 757, /* OBJ_camellia_128_cfb128 0 3 4401 5 3 1 9 4 */
4639 755, /* OBJ_camellia_192_ecb 0 3 4401 5 3 1 9 21 */
4640 767, /* OBJ_camellia_192_ofb128 0 3 4401 5 3 1 9 23 */
4641 758, /* OBJ_camellia_192_cfb128 0 3 4401 5 3 1 9 24 */
4642 756, /* OBJ_camellia_256_ecb 0 3 4401 5 3 1 9 41 */
4643 768, /* OBJ_camellia_256_ofb128 0 3 4401 5 3 1 9 43 */
4644 759, /* OBJ_camellia_256_cfb128 0 3 4401 5 3 1 9 44 */
4645 437, /* OBJ_pilot 0 9 2342 19200300 100 */
4646 776, /* OBJ_seed_ecb 1 2 410 200004 1 3 */
4647 777, /* OBJ_seed_cbc 1 2 410 200004 1 4 */
4648 779, /* OBJ_seed_cfb128 1 2 410 200004 1 5 */
4649 778, /* OBJ_seed_ofb128 1 2 410 200004 1 6 */
4650 852, /* OBJ_id_GostR3411_94_with_GostR3410_94_cc 1 2 643 2 9 1 3 3 */
4651 853, /* OBJ_id_GostR3411_94_with_GostR3410_2001_cc 1 2 643 2 9 1 3 4 */
4652 850, /* OBJ_id_GostR3410_94_cc 1 2 643 2 9 1 5 3 */
4653 851, /* OBJ_id_GostR3410_2001_cc 1 2 643 2 9 1 5 4 */
4654 849, /* OBJ_id_Gost28147_89_cc 1 2 643 2 9 1 6 1 */
4655 854, /* OBJ_id_GostR3410_2001_ParamSet_cc 1 2 643 2 9 1 8 1 */
4656 186, /* OBJ_pkcs1 1 2 840 113549 1 1 */
4657 27, /* OBJ_pkcs3 1 2 840 113549 1 3 */
4658 187, /* OBJ_pkcs5 1 2 840 113549 1 5 */
4659 20, /* OBJ_pkcs7 1 2 840 113549 1 7 */
4660 47, /* OBJ_pkcs9 1 2 840 113549 1 9 */
4661 3, /* OBJ_md2 1 2 840 113549 2 2 */
4662 257, /* OBJ_md4 1 2 840 113549 2 4 */
4663 4, /* OBJ_md5 1 2 840 113549 2 5 */
4664 797, /* OBJ_hmacWithMD5 1 2 840 113549 2 6 */
4665 163, /* OBJ_hmacWithSHA1 1 2 840 113549 2 7 */
4666 798, /* OBJ_hmacWithSHA224 1 2 840 113549 2 8 */
4667 799, /* OBJ_hmacWithSHA256 1 2 840 113549 2 9 */
4668 800, /* OBJ_hmacWithSHA384 1 2 840 113549 2 10 */
4669 801, /* OBJ_hmacWithSHA512 1 2 840 113549 2 11 */
4670 37, /* OBJ_rc2_cbc 1 2 840 113549 3 2 */
4671 5, /* OBJ_rc4 1 2 840 113549 3 4 */
4672 44, /* OBJ_des_ede3_cbc 1 2 840 113549 3 7 */
4673 120, /* OBJ_rc5_cbc 1 2 840 113549 3 8 */
4674 643, /* OBJ_des_cdmf 1 2 840 113549 3 10 */
4675 680, /* OBJ_X9_62_id_characteristic_two_basis 1 2 840 10045 1 2 3 */
4676 684, /* OBJ_X9_62_c2pnb163v1 1 2 840 10045 3 0 1 */
4677 685, /* OBJ_X9_62_c2pnb163v2 1 2 840 10045 3 0 2 */
4678 686, /* OBJ_X9_62_c2pnb163v3 1 2 840 10045 3 0 3 */
4679 687, /* OBJ_X9_62_c2pnb176v1 1 2 840 10045 3 0 4 */
4680 688, /* OBJ_X9_62_c2tnb191v1 1 2 840 10045 3 0 5 */
4681 689, /* OBJ_X9_62_c2tnb191v2 1 2 840 10045 3 0 6 */

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4682 690, /* OBJ_X9_62_c2tnb191v3 1 2 840 10045 3 0 7 */
4683 691, /* OBJ_X9_62_c2onb191v4 1 2 840 10045 3 0 8 */
4684 692, /* OBJ_X9_62_c2onb191v5 1 2 840 10045 3 0 9 */
4685 693, /* OBJ_X9_62_c2pnb208w1 1 2 840 10045 3 0 10 */
4686 694, /* OBJ_X9_62_c2tnb239v1 1 2 840 10045 3 0 11 */
4687 695, /* OBJ_X9_62_c2tnb239v2 1 2 840 10045 3 0 12 */
4688 696, /* OBJ_X9_62_c2tnb239v3 1 2 840 10045 3 0 13 */
4689 697, /* OBJ_X9_62_c2onb239v4 1 2 840 10045 3 0 14 */
4690 698, /* OBJ_X9_62_c2onb239v5 1 2 840 10045 3 0 15 */
4691 699, /* OBJ_X9_62_c2pnb272w1 1 2 840 10045 3 0 16 */
4692 700, /* OBJ_X9_62_c2pnb304w1 1 2 840 10045 3 0 17 */
4693 701, /* OBJ_X9_62_c2tnb359v1 1 2 840 10045 3 0 18 */
4694 702, /* OBJ_X9_62_c2pnb368w1 1 2 840 10045 3 0 19 */
4695 703, /* OBJ_X9_62_c2tnb431r1 1 2 840 10045 3 0 20 */
4696 409, /* OBJ_X9_62_prime192v1 1 2 840 10045 3 1 1 */
4697 410, /* OBJ_X9_62_prime192v2 1 2 840 10045 3 1 2 */
4698 411, /* OBJ_X9_62_prime192v3 1 2 840 10045 3 1 3 */
4699 412, /* OBJ_X9_62_prime239v1 1 2 840 10045 3 1 4 */
4700 413, /* OBJ_X9_62_prime239v2 1 2 840 10045 3 1 5 */
4701 414, /* OBJ_X9_62_prime239v3 1 2 840 10045 3 1 6 */
4702 415, /* OBJ_X9_62_prime256v1 1 2 840 10045 3 1 7 */
4703 793, /* OBJ_ecdsa_with_SHA224 1 2 840 10045 4 3 1 */
4704 794, /* OBJ_ecdsa_with_SHA256 1 2 840 10045 4 3 2 */
4705 795, /* OBJ_ecdsa_with_SHA384 1 2 840 10045 4 3 3 */
4706 796, /* OBJ_ecdsa_with_SHA512 1 2 840 10045 4 3 4 */
4707 269, /* OBJ_id_pkix1_explicit_88 1 3 6 1 5 5 7 0 1 */
4708 270, /* OBJ_id_pkix1_implicit_88 1 3 6 1 5 5 7 0 2 */
4709 271, /* OBJ_id_pkix1_explicit_93 1 3 6 1 5 5 7 0 3 */
4710 272, /* OBJ_id_pkix1_implicit_93 1 3 6 1 5 5 7 0 4 */
4711 273, /* OBJ_id_mod_crmf 1 3 6 1 5 5 7 0 5 */
4712 274, /* OBJ_id_mod_cmc 1 3 6 1 5 5 7 0 6 */
4713 275, /* OBJ_id_mod_kea_profile_88 1 3 6 1 5 5 7 0 7 */
4714 276, /* OBJ_id_mod_kea_profile_93 1 3 6 1 5 5 7 0 8 */
4715 277, /* OBJ_id_mod_cmp 1 3 6 1 5 5 7 0 9 */
4716 278, /* OBJ_id_mod_qualified_cert_88 1 3 6 1 5 5 7 0 10 */
4717 279, /* OBJ_id_mod_qualified_cert_93 1 3 6 1 5 5 7 0 11 */
4718 280, /* OBJ_id_mod_attribute_cert 1 3 6 1 5 5 7 0 12 */
4719 281, /* OBJ_id_mod_timestamp_protocol 1 3 6 1 5 5 7 0 13 */
4720 282, /* OBJ_id_mod_ocsp 1 3 6 1 5 5 7 0 14 */
4721 283, /* OBJ_id_mod_dvcs 1 3 6 1 5 5 7 0 15 */
4722 284, /* OBJ_id_mod_cmp2000 1 3 6 1 5 5 7 0 16 */
4723 177, /* OBJ_info_access 1 3 6 1 5 5 7 1 1 */
4724 285, /* OBJ_biometricInfo 1 3 6 1 5 5 7 1 2 */
4725 286, /* OBJ_qcStatements 1 3 6 1 5 5 7 1 3 */
4726 287, /* OBJ_ac_auditEntity 1 3 6 1 5 5 7 1 4 */
4727 288, /* OBJ_ac_targeting 1 3 6 1 5 5 7 1 5 */
4728 289, /* OBJ_aaControls 1 3 6 1 5 5 7 1 6 */
4729 290, /* OBJ_sbgp_ipAddrBlock 1 3 6 1 5 5 7 1 7 */
4730 291, /* OBJ_sbgp_autonomousSysNum 1 3 6 1 5 5 7 1 8 */
4731 292, /* OBJ_sbgp_routerIdentifier 1 3 6 1 5 5 7 1 9 */
4732 397, /* OBJ_ac_proxying 1 3 6 1 5 5 7 1 10 */
4733 398, /* OBJ_sinfo_access 1 3 6 1 5 5 7 1 11 */
4734 663, /* OBJ_proxyCertInfo 1 3 6 1 5 5 7 1 14 */
4735 164, /* OBJ_id_qt_cps 1 3 6 1 5 5 7 2 1 */
4736 165, /* OBJ_id_qt_unotice 1 3 6 1 5 5 7 2 2 */
4737 293, /* OBJ_textNotice 1 3 6 1 5 5 7 2 3 */
4738 129, /* OBJ_server_auth 1 3 6 1 5 5 7 3 1 */
4739 130, /* OBJ_client_auth 1 3 6 1 5 5 7 3 2 */
4740 131, /* OBJ_code_sign 1 3 6 1 5 5 7 3 3 */
4741 132, /* OBJ_email_protect 1 3 6 1 5 5 7 3 4 */
4742 294, /* OBJ_ipsecEndSystem 1 3 6 1 5 5 7 3 5 */
4743 295, /* OBJ_ipsecTunnel 1 3 6 1 5 5 7 3 6 */
4744 296, /* OBJ_ipsecUser 1 3 6 1 5 5 7 3 7 */
4745 133, /* OBJ_time_stamp 1 3 6 1 5 5 7 3 8 */
4746 180, /* OBJ_OCSP_sign 1 3 6 1 5 5 7 3 9 */
4747 297, /* OBJ_dvcs 1 3 6 1 5 5 7 3 10 */

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4748 298, /* OBJ_id_it_caProtEncCert 1 3 6 1 5 5 7 4 1 */
4749 299, /* OBJ_id_it_signKeyPairTypes 1 3 6 1 5 5 7 4 2 */
4750 300, /* OBJ_id_it_encKeyPairTypes 1 3 6 1 5 5 7 4 3 */
4751 301, /* OBJ_id_it_preferredSymmAlg 1 3 6 1 5 5 7 4 4 */
4752 302, /* OBJ_id_it_caKeyUpdateInfo 1 3 6 1 5 5 7 4 5 */
4753 303, /* OBJ_id_it_currentCRL 1 3 6 1 5 5 7 4 6 */
4754 304, /* OBJ_id_it_unsupportedOIDs 1 3 6 1 5 5 7 4 7 */
4755 305, /* OBJ_id_it_subscriptionRequest 1 3 6 1 5 5 7 4 8 */
4756 306, /* OBJ_id_it_subscriptionResponse 1 3 6 1 5 5 7 4 9 */
4757 307, /* OBJ_id_it_keyPairParamReq 1 3 6 1 5 5 7 4 10 */
4758 308, /* OBJ_id_it_keyPairParamRep 1 3 6 1 5 5 7 4 11 */
4759 309, /* OBJ_id_it_revPassphrase 1 3 6 1 5 5 7 4 12 */
4760 310, /* OBJ_id_it_implicitConfirm 1 3 6 1 5 5 7 4 13 */
4761 311, /* OBJ_id_it_confirmWaitTime 1 3 6 1 5 5 7 4 14 */
4762 312, /* OBJ_id_it_origPKIMessage 1 3 6 1 5 5 7 4 15 */
4763 784, /* OBJ_id_it_suppLangTags 1 3 6 1 5 5 7 4 16 */
4764 313, /* OBJ_id_regCtrl 1 3 6 1 5 5 7 5 1 */
4765 314, /* OBJ_id_regInfo 1 3 6 1 5 5 7 5 2 */
4766 323, /* OBJ_id_alg_des40 1 3 6 1 5 5 7 6 1 */
4767 324, /* OBJ_id_alg_noSignature 1 3 6 1 5 5 7 6 2 */
4768 325, /* OBJ_id_alg_dh_sig_hmac_sha1 1 3 6 1 5 5 7 6 3 */
4769 326, /* OBJ_id_alg_dh_pop 1 3 6 1 5 5 7 6 4 */
4770 327, /* OBJ_id_cmc_statusInfo 1 3 6 1 5 5 7 7 1 */
4771 328, /* OBJ_id_cmc_identification 1 3 6 1 5 5 7 7 2 */
4772 329, /* OBJ_id_cmc_identityProof 1 3 6 1 5 5 7 7 3 */
4773 330, /* OBJ_id_cmc_dataReturn 1 3 6 1 5 5 7 7 4 */
4774 331, /* OBJ_id_cmc_transactionId 1 3 6 1 5 5 7 7 5 */
4775 332, /* OBJ_id_cmc_senderNonce 1 3 6 1 5 5 7 7 6 */
4776 333, /* OBJ_id_cmc_recipientNonce 1 3 6 1 5 5 7 7 7 */
4777 334, /* OBJ_id_cmc_addExtensions 1 3 6 1 5 5 7 7 8 */
4778 335, /* OBJ_id_cmc_encryptedPOP 1 3 6 1 5 5 7 7 9 */
4779 336, /* OBJ_id_cmc_decryptedPOP 1 3 6 1 5 5 7 7 10 */
4780 337, /* OBJ_id_cmc_lraPOPWitness 1 3 6 1 5 5 7 7 11 */
4781 338, /* OBJ_id_cmc_getCert 1 3 6 1 5 5 7 7 15 */
4782 339, /* OBJ_id_cmc_getCRL 1 3 6 1 5 5 7 7 16 */
4783 340, /* OBJ_id_cmc_revokeRequest 1 3 6 1 5 5 7 7 17 */
4784 341, /* OBJ_id_cmc_regInfo 1 3 6 1 5 5 7 7 18 */
4785 342, /* OBJ_id_cmc_responseInfo 1 3 6 1 5 5 7 7 19 */
4786 343, /* OBJ_id_cmc_queryPending 1 3 6 1 5 5 7 7 21 */
4787 344, /* OBJ_id_cmc_popLinkRandom 1 3 6 1 5 5 7 7 22 */
4788 345, /* OBJ_id_cmc_popLinkWitness 1 3 6 1 5 5 7 7 23 */
4789 346, /* OBJ_id_cmc_confirmCertAcceptance 1 3 6 1 5 5 7 7 24 */
4790 347, /* OBJ_id_on_personalData 1 3 6 1 5 5 7 8 1 */
4791 858, /* OBJ_id_on_permanentIdentifier 1 3 6 1 5 5 7 8 3 */
4792 348, /* OBJ_id_pda_dateOfBirth 1 3 6 1 5 5 7 9 1 */
4793 349, /* OBJ_id_pda_placeOfBirth 1 3 6 1 5 5 7 9 2 */
4794 351, /* OBJ_id_pda_gender 1 3 6 1 5 5 7 9 3 */
4795 352, /* OBJ_id_pda_countryOfCitizenship 1 3 6 1 5 5 7 9 4 */
4796 353, /* OBJ_id_pda_countryOfResidence 1 3 6 1 5 5 7 9 5 */
4797 354, /* OBJ_id_aca_authenticationInfo 1 3 6 1 5 5 7 10 1 */
4798 355, /* OBJ_id_aca_accessIdentity 1 3 6 1 5 5 7 10 2 */
4799 356, /* OBJ_id_aca_chargingIdentity 1 3 6 1 5 5 7 10 3 */
4800 357, /* OBJ_id_aca_group 1 3 6 1 5 5 7 10 4 */
4801 358, /* OBJ_id_aca_role 1 3 6 1 5 5 7 10 5 */
4802 399, /* OBJ_id_aca_encAttrs 1 3 6 1 5 5 7 10 6 */
4803 359, /* OBJ_id_qcs_pkixQCSyntax_v1 1 3 6 1 5 5 7 11 1 */
4804 360, /* OBJ_id_cct_crs 1 3 6 1 5 5 7 12 1 */
4805 361, /* OBJ_id_cct_PKIData 1 3 6 1 5 5 7 12 2 */
4806 362, /* OBJ_id_cct_PKIResponse 1 3 6 1 5 5 7 12 3 */
4807 664, /* OBJ_id_ppl_anyLanguage 1 3 6 1 5 5 7 21 0 */
4808 665, /* OBJ_id_ppl_inheritAll 1 3 6 1 5 5 7 21 1 */
4809 667, /* OBJ_Independent 1 3 6 1 5 5 7 21 2 */
4810 178, /* OBJ_ad_OCSP 1 3 6 1 5 5 7 48 1 */
4811 179, /* OBJ_ad_ca_issuers 1 3 6 1 5 5 7 48 2 */
4812 363, /* OBJ_ad_timeStamping 1 3 6 1 5 5 7 48 3 */
4813 364, /* OBJ_ad_dvcs 1 3 6 1 5 5 7 48 4 */

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4814 785, /* OBJ_caRepository 1 3 6 1 5 5 7 48 5 */
4815 780, /* OBJ_hmac_md5 1 3 6 1 5 5 8 1 1 */
4816 781, /* OBJ_hmac_sha1 1 3 6 1 5 5 8 1 2 */
4817 58, /* OBJ_netscape_cert_extension 2 16 840 1 113730 1 */
4818 59, /* OBJ_netscape_data_type 2 16 840 1 113730 2 */
4819 438, /* OBJ_pilotAttributeType 0 9 2342 19200300 100 1 */
4820 439, /* OBJ_pilotAttributeSyntax 0 9 2342 19200300 100 3 */
4821 440, /* OBJ_pilotObjectClass 0 9 2342 19200300 100 4 */
4822 441, /* OBJ_pilotGroups 0 9 2342 19200300 100 10 */
4823 108, /* OBJ_cast5_cbc 1 2 840 113533 7 66 10 */
4824 112, /* OBJ_pbewithMD5AndCast5_CBC 1 2 840 113533 7 66 12 */
4825 782, /* OBJ_id_PasswordBasedMAC 1 2 840 113533 7 66 13 */
4826 783, /* OBJ_id_DHBasedMac 1 2 840 113533 7 66 30 */
4827 6, /* OBJ_rsaEncryption 1 2 840 113549 1 1 1 */
4828 7, /* OBJ_md2WithRSAEncryption 1 2 840 113549 1 1 2 */
4829 396, /* OBJ_md4WithRSAEncryption 1 2 840 113549 1 1 3 */
4830 8, /* OBJ_md5WithRSAEncryption 1 2 840 113549 1 1 4 */
4831 65, /* OBJ_sha1WithRSAEncryption 1 2 840 113549 1 1 5 */
4832 644, /* OBJ_rsaOAEPEncryptionSET 1 2 840 113549 1 1 6 */
4833 919, /* OBJ_rsaes0aep 1 2 840 113549 1 1 7 */
4834 911, /* OBJ_mgf1 1 2 840 113549 1 1 8 */
4835 912, /* OBJ_rsassaPss 1 2 840 113549 1 1 10 */
4836 668, /* OBJ_sha256WithRSAEncryption 1 2 840 113549 1 1 11 */
4837 669, /* OBJ_sha384WithRSAEncryption 1 2 840 113549 1 1 12 */
4838 670, /* OBJ_sha512WithRSAEncryption 1 2 840 113549 1 1 13 */
4839 671, /* OBJ_sha224WithRSAEncryption 1 2 840 113549 1 1 14 */
4840 28, /* OBJ_dhKeyAgreement 1 2 840 113549 1 3 1 */
4841 9, /* OBJ_pbewithMD2AndDES_CBC 1 2 840 113549 1 5 1 */
4842 10, /* OBJ_pbewithMD5AndDES_CBC 1 2 840 113549 1 5 3 */
4843 168, /* OBJ_pbewithMD2AndRC2_CBC 1 2 840 113549 1 5 4 */
4844 169, /* OBJ_pbewithMD5AndRC2_CBC 1 2 840 113549 1 5 6 */
4845 170, /* OBJ_pbewithSHA1AndDES_CBC 1 2 840 113549 1 5 10 */
4846 68, /* OBJ_pbewithSHA1AndRC2_CBC 1 2 840 113549 1 5 11 */
4847 69, /* OBJ_id_pbkdf2 1 2 840 113549 1 5 12 */
4848 161, /* OBJ_pbess 1 2 840 113549 1 5 13 */
4849 162, /* OBJ_pbmacc1 1 2 840 113549 1 5 14 */
4850 21, /* OBJ_pkcs7_data 1 2 840 113549 1 7 1 */
4851 22, /* OBJ_pkcs7_signed 1 2 840 113549 1 7 2 */
4852 23, /* OBJ_pkcs7_enveloped 1 2 840 113549 1 7 3 */
4853 24, /* OBJ_pkcs7_signedAndEnveloped 1 2 840 113549 1 7 4 */
4854 25, /* OBJ_pkcs7_digest 1 2 840 113549 1 7 5 */
4855 26, /* OBJ_pkcs7_encrypted 1 2 840 113549 1 7 6 */
4856 48, /* OBJ_pkcs9_emailAddress 1 2 840 113549 1 9 1 */
4857 49, /* OBJ_pkcs9_unstructuredName 1 2 840 113549 1 9 2 */
4858 50, /* OBJ_pkcs9_contentType 1 2 840 113549 1 9 3 */
4859 51, /* OBJ_pkcs9_messageDigest 1 2 840 113549 1 9 4 */
4860 52, /* OBJ_pkcs9_signingTime 1 2 840 113549 1 9 5 */
4861 53, /* OBJ_pkcs9_countersignature 1 2 840 113549 1 9 6 */
4862 54, /* OBJ_pkcs9_challengePassword 1 2 840 113549 1 9 7 */
4863 55, /* OBJ_pkcs9_unstructuredAddress 1 2 840 113549 1 9 8 */
4864 56, /* OBJ_pkcs9_extCertAttributes 1 2 840 113549 1 9 9 */
4865 172, /* OBJ_ext_req 1 2 840 113549 1 9 14 */
4866 167, /* OBJ_SMIMECapabilities 1 2 840 113549 1 9 15 */
4867 188, /* OBJ_SMIME 1 2 840 113549 1 9 16 */
4868 156, /* OBJ_friendlyName 1 2 840 113549 1 9 20 */
4869 157, /* OBJ_localKeyID 1 2 840 113549 1 9 21 */
4870 681, /* OBJ_X9_62_onBasis 1 2 840 10045 1 2 3 1 */
4871 682, /* OBJ_X9_62_tpBasis 1 2 840 10045 1 2 3 2 */
4872 683, /* OBJ_X9_62_ppBasis 1 2 840 10045 1 2 3 3 */
4873 417, /* OBJ_ms_csp_name 1 3 6 1 4 1 311 17 1 */
4874 856, /* OBJ_LocalKeySet 1 3 6 1 4 1 311 17 2 */
4875 390, /* OBJ_dcObject 1 3 6 1 4 1 1466 344 */
4876 91, /* OBJ_bf_cbc 1 3 6 1 4 1 3029 1 2 */
4877 315, /* OBJ_id_regCtrl_regToken 1 3 6 1 5 5 7 5 1 1 */
4878 316, /* OBJ_id_regCtrl_authenticator 1 3 6 1 5 5 7 5 1 2 */
4879 317, /* OBJ_id_regCtrl_pkiPublicationInfo 1 3 6 1 5 5 7 5 1 3 */

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4880 318, /* OBJ_id_regCtrl_pkiArchiveOptions 1 3 6 1 5 5 7 5 1 4 */
4881 319, /* OBJ_id_regCtrl_oldCertID 1 3 6 1 5 5 7 5 1 5 */
4882 320, /* OBJ_id_regCtrl_protocolEncrKey 1 3 6 1 5 5 7 5 1 6 */
4883 321, /* OBJ_id_regInfo_utf8Pairs 1 3 6 1 5 5 7 5 2 1 */
4884 322, /* OBJ_id_regInfo_certReq 1 3 6 1 5 5 7 5 2 2 */
4885 365, /* OBJ_id_pkix_OCSP_basic 1 3 6 1 5 5 7 48 1 1 */
4886 366, /* OBJ_id_pkix_OCSP_Nonce 1 3 6 1 5 5 7 48 1 2 */
4887 367, /* OBJ_id_pkix_OCSP_CrLID 1 3 6 1 5 5 7 48 1 3 */
4888 368, /* OBJ_id_pkix_OCSP_acceptableResponses 1 3 6 1 5 5 7 48 1 4 */
4889 369, /* OBJ_id_pkix_OCSP_noCheck 1 3 6 1 5 5 7 48 1 5 */
4890 370, /* OBJ_id_pkix_OCSP_archiveCutoff 1 3 6 1 5 5 7 48 1 6 */
4891 371, /* OBJ_id_pkix_OCSP_serviceLocator 1 3 6 1 5 5 7 48 1 7 */
4892 372, /* OBJ_id_pkix_OCSP_extendedStatus 1 3 6 1 5 5 7 48 1 8 */
4893 373, /* OBJ_id_pkix_OCSP_valid 1 3 6 1 5 5 7 48 1 9 */
4894 374, /* OBJ_id_pkix_OCSP_path 1 3 6 1 5 5 7 48 1 10 */
4895 375, /* OBJ_id_pkix_OCSP_trustRoot 1 3 6 1 5 5 7 48 1 11 */
4896 418, /* OBJ_aes_128_ecb 2 16 840 1 101 3 4 1 1 */
4897 419, /* OBJ_aes_128_cbc 2 16 840 1 101 3 4 1 2 */
4898 420, /* OBJ_aes_128_ofb128 2 16 840 1 101 3 4 1 3 */
4899 421, /* OBJ_aes_128_cfb128 2 16 840 1 101 3 4 1 4 */
4900 788, /* OBJ_id_aes128_wrap 2 16 840 1 101 3 4 1 5 */
4901 895, /* OBJ_aes_128_gcm 2 16 840 1 101 3 4 1 6 */
4902 896, /* OBJ_aes_128_ccm 2 16 840 1 101 3 4 1 7 */
4903 897, /* OBJ_id_aes128_wrap_pad 2 16 840 1 101 3 4 1 8 */
4904 422, /* OBJ_aes_192_ecb 2 16 840 1 101 3 4 1 21 */
4905 423, /* OBJ_aes_192_cbc 2 16 840 1 101 3 4 1 22 */
4906 424, /* OBJ_aes_192_ofb128 2 16 840 1 101 3 4 1 23 */
4907 425, /* OBJ_aes_192_cfb128 2 16 840 1 101 3 4 1 24 */
4908 789, /* OBJ_id_aes192_wrap 2 16 840 1 101 3 4 1 25 */
4909 898, /* OBJ_aes_192_gcm 2 16 840 1 101 3 4 1 26 */
4910 899, /* OBJ_aes_192_ccm 2 16 840 1 101 3 4 1 27 */
4911 900, /* OBJ_id_aes192_wrap_pad 2 16 840 1 101 3 4 1 28 */
4912 426, /* OBJ_aes_256_ecb 2 16 840 1 101 3 4 1 41 */
4913 427, /* OBJ_aes_256_cbc 2 16 840 1 101 3 4 1 42 */
4914 428, /* OBJ_aes_256_ofb128 2 16 840 1 101 3 4 1 43 */
4915 429, /* OBJ_aes_256_cfb128 2 16 840 1 101 3 4 1 44 */
4916 790, /* OBJ_id_aes256_wrap 2 16 840 1 101 3 4 1 45 */
4917 901, /* OBJ_aes_256_gcm 2 16 840 1 101 3 4 1 46 */
4918 902, /* OBJ_aes_256_ccm 2 16 840 1 101 3 4 1 47 */
4919 903, /* OBJ_id_aes256_wrap_pad 2 16 840 1 101 3 4 1 48 */
4920 672, /* OBJ_sha256 2 16 840 1 101 3 4 2 1 */
4921 673, /* OBJ_sha384 2 16 840 1 101 3 4 2 2 */
4922 674, /* OBJ_sha512 2 16 840 1 101 3 4 2 3 */
4923 675, /* OBJ_sha224 2 16 840 1 101 3 4 2 4 */
4924 802, /* OBJ_dsa_with_SHA224 2 16 840 1 101 3 4 3 1 */
4925 803, /* OBJ_dsa_with_SHA256 2 16 840 1 101 3 4 3 2 */
4926 71, /* OBJ_netscape_cert_type 2 16 840 1 113730 1 1 */
4927 72, /* OBJ_netscape_base_url 2 16 840 1 113730 1 2 */
4928 73, /* OBJ_netscape_revocation_url 2 16 840 1 113730 1 3 */
4929 74, /* OBJ_netscape_ca_revocation_url 2 16 840 1 113730 1 4 */
4930 75, /* OBJ_netscape_renewal_url 2 16 840 1 113730 1 7 */
4931 76, /* OBJ_netscape_ca_policy_url 2 16 840 1 113730 1 8 */
4932 77, /* OBJ_netscape_ssl_server_name 2 16 840 1 113730 1 12 */
4933 78, /* OBJ_netscape_comment 2 16 840 1 113730 1 13 */
4934 79, /* OBJ_netscape_cert_sequence 2 16 840 1 113730 2 5 */
4935 139, /* OBJ_ns_sgc 2 16 840 1 113730 4 1 */
4936 458, /* OBJ_userId 0 9 2342 19200300 100 1 1 */
4937 459, /* OBJ_textEncodedORAddress 0 9 2342 19200300 100 1 2 */
4938 460, /* OBJ_rfc822Mailbox 0 9 2342 19200300 100 1 3 */
4939 461, /* OBJ_info 0 9 2342 19200300 100 1 4 */
4940 462, /* OBJ_favouriteDrink 0 9 2342 19200300 100 1 5 */
4941 463, /* OBJ_roomNumber 0 9 2342 19200300 100 1 6 */
4942 464, /* OBJ_photo 0 9 2342 19200300 100 1 7 */
4943 465, /* OBJ_userClass 0 9 2342 19200300 100 1 8 */
4944 466, /* OBJ_host 0 9 2342 19200300 100 1 9 */
4945 467, /* OBJ_manager 0 9 2342 19200300 100 1 10 */

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4946 468, /* OBJ_documentIdentifier 0 9 2342 19200300 100 1 11 */
4947 469, /* OBJ_documentTitle 0 9 2342 19200300 100 1 12 */
4948 470, /* OBJ_documentVersion 0 9 2342 19200300 100 1 13 */
4949 471, /* OBJ_documentAuthor 0 9 2342 19200300 100 1 14 */
4950 472, /* OBJ_documentLocation 0 9 2342 19200300 100 1 15 */
4951 473, /* OBJ_homeTelephoneNumber 0 9 2342 19200300 100 1 20 */
4952 474, /* OBJ_secretary 0 9 2342 19200300 100 1 21 */
4953 475, /* OBJ_otherMailbox 0 9 2342 19200300 100 1 22 */
4954 476, /* OBJ_lastModifiedTime 0 9 2342 19200300 100 1 23 */
4955 477, /* OBJ_lastModifiedBy 0 9 2342 19200300 100 1 24 */
4956 391, /* OBJ_domainComponent 0 9 2342 19200300 100 1 25 */
4957 478, /* OBJ_aRecord 0 9 2342 19200300 100 1 26 */
4958 479, /* OBJ_pilotAttributeType27 0 9 2342 19200300 100 1 27 */
4959 480, /* OBJ_mxRecord 0 9 2342 19200300 100 1 28 */
4960 481, /* OBJ_nsRecord 0 9 2342 19200300 100 1 29 */
4961 482, /* OBJ_sOARRecord 0 9 2342 19200300 100 1 30 */
4962 483, /* OBJ_cNAMERecord 0 9 2342 19200300 100 1 31 */
4963 484, /* OBJ_associatedDomain 0 9 2342 19200300 100 1 37 */
4964 485, /* OBJ_associatedName 0 9 2342 19200300 100 1 38 */
4965 486, /* OBJ_homePostalAddress 0 9 2342 19200300 100 1 39 */
4966 487, /* OBJ_personalTitle 0 9 2342 19200300 100 1 40 */
4967 488, /* OBJ_mobileTelephoneNumber 0 9 2342 19200300 100 1 41 */
4968 489, /* OBJ_pagerTelephoneNumber 0 9 2342 19200300 100 1 42 */
4969 490, /* OBJ_friendlyCountryName 0 9 2342 19200300 100 1 43 */
4970 491, /* OBJ_organizationalStatus 0 9 2342 19200300 100 1 45 */
4971 492, /* OBJ_janetMailbox 0 9 2342 19200300 100 1 46 */
4972 493, /* OBJ_mailPreferenceOption 0 9 2342 19200300 100 1 47 */
4973 494, /* OBJ_buildingName 0 9 2342 19200300 100 1 48 */
4974 495, /* OBJ_dSAQuality 0 9 2342 19200300 100 1 49 */
4975 496, /* OBJ_singleLevelQuality 0 9 2342 19200300 100 1 50 */
4976 497, /* OBJ_subtreeMinimumQuality 0 9 2342 19200300 100 1 51 */
4977 498, /* OBJ_subtreeMaximumQuality 0 9 2342 19200300 100 1 52 */
4978 499, /* OBJ_personalSignature 0 9 2342 19200300 100 1 53 */
4979 500, /* OBJ_dITRedirect 0 9 2342 19200300 100 1 54 */
4980 501, /* OBJ_audio 0 9 2342 19200300 100 1 55 */
4981 502, /* OBJ_documentPublisher 0 9 2342 19200300 100 1 56 */
4982 442, /* OBJ_iA5StringSyntax 0 9 2342 19200300 100 3 4 */
4983 443, /* OBJ_caseIgnoreIA5StringSyntax 0 9 2342 19200300 100 3 5 */
4984 444, /* OBJ_pilotObject 0 9 2342 19200300 100 4 3 */
4985 445, /* OBJ_pilotPerson 0 9 2342 19200300 100 4 4 */
4986 446, /* OBJ_account 0 9 2342 19200300 100 4 5 */
4987 447, /* OBJ_document 0 9 2342 19200300 100 4 6 */
4988 448, /* OBJ_room 0 9 2342 19200300 100 4 7 */
4989 449, /* OBJ_documentSeries 0 9 2342 19200300 100 4 9 */
4990 392, /* OBJ_Domain 0 9 2342 19200300 100 4 13 */
4991 450, /* OBJ_rFC822LocalPart 0 9 2342 19200300 100 4 14 */
4992 451, /* OBJ_dNSDomain 0 9 2342 19200300 100 4 15 */
4993 452, /* OBJ_domainRelatedObject 0 9 2342 19200300 100 4 17 */
4994 453, /* OBJ_friendlyCountry 0 9 2342 19200300 100 4 18 */
4995 454, /* OBJ_simpleSecurityObject 0 9 2342 19200300 100 4 19 */
4996 455, /* OBJ_pilotOrganization 0 9 2342 19200300 100 4 20 */
4997 456, /* OBJ_pilotDSA 0 9 2342 19200300 100 4 21 */
4998 457, /* OBJ_qualityLabelledData 0 9 2342 19200300 100 4 22 */
4999 189, /* OBJ_id_smime_mod 1 2 840 113549 1 9 16 0 */
5000 190, /* OBJ_id_smime_ct 1 2 840 113549 1 9 16 1 */
5001 191, /* OBJ_id_smime_aa 1 2 840 113549 1 9 16 2 */
5002 192, /* OBJ_id_smime_alg 1 2 840 113549 1 9 16 3 */
5003 193, /* OBJ_id_smime_cd 1 2 840 113549 1 9 16 4 */
5004 194, /* OBJ_id_smime_spq 1 2 840 113549 1 9 16 5 */
5005 195, /* OBJ_id_smime_cti 1 2 840 113549 1 9 16 6 */
5006 158, /* OBJ_x509Certificate 1 2 840 113549 1 9 22 1 */
5007 159, /* OBJ_sdscCertificate 1 2 840 113549 1 9 22 2 */
5008 160, /* OBJ_x509Crl 1 2 840 113549 1 9 23 1 */
5009 144, /* OBJ_pbe_WithSHA1And128BitRC4 1 2 840 113549 1 12 1 1 */
5010 145, /* OBJ_pbe_WithSHA1And40BitRC4 1 2 840 113549 1 12 1 2 */
5011 146, /* OBJ_pbe_WithSHA1And3_Key_TripleDES_CBC 1 2 840 113549 1 12 1 3 */

```

```

5012 147, /* OBJ_pbe_WithSHA1And2_Key_TripleDES_CBC 1 2 840 113549 1 12 1 4 */
5013 148, /* OBJ_pbe_WithSHA1And128BitRC2_CBC 1 2 840 113549 1 12 1 5 */
5014 149, /* OBJ_pbe_WithSHA1And40BitRC2_CBC 1 2 840 113549 1 12 1 6 */
5015 171, /* OBJ_ms_ext_req 1 3 6 1 4 1 311 2 1 14 */
5016 134, /* OBJ_ms_code_ind 1 3 6 1 4 1 311 2 1 21 */
5017 135, /* OBJ_ms_code_com 1 3 6 1 4 1 311 2 1 22 */
5018 136, /* OBJ_ms_ctl_sign 1 3 6 1 4 1 311 10 3 1 */
5019 137, /* OBJ_ms_sgc 1 3 6 1 4 1 311 10 3 3 */
5020 138, /* OBJ_ms_efs 1 3 6 1 4 1 311 10 3 4 */
5021 648, /* OBJ_ms_smartcard_login 1 3 6 1 4 1 311 20 2 2 */
5022 649, /* OBJ_ms_upn 1 3 6 1 4 1 311 20 2 3 */
5023 751, /* OBJ_camellia_128_cbc 1 2 392 200011 61 1 1 1 2 */
5024 752, /* OBJ_camellia_192_cbc 1 2 392 200011 61 1 1 1 3 */
5025 753, /* OBJ_camellia_256_cbc 1 2 392 200011 61 1 1 1 4 */
5026 907, /* OBJ_id_camellia128_wrap 1 2 392 200011 61 1 1 3 2 */
5027 908, /* OBJ_id_camellia192_wrap 1 2 392 200011 61 1 1 3 3 */
5028 909, /* OBJ_id_camellia256_wrap 1 2 392 200011 61 1 1 3 4 */
5029 196, /* OBJ_id_smime_mod_cms 1 2 840 113549 1 9 16 0 1 */
5030 197, /* OBJ_id_smime_mod_ess 1 2 840 113549 1 9 16 0 2 */
5031 198, /* OBJ_id_smime_mod_oid 1 2 840 113549 1 9 16 0 3 */
5032 199, /* OBJ_id_smime_mod_msg_v3 1 2 840 113549 1 9 16 0 4 */
5033 200, /* OBJ_id_smime_mod_ets_eSignature 88 1 2 840 113549 1 9 16 0 5 */
5034 201, /* OBJ_id_smime_mod_ets_eSignature 97 1 2 840 113549 1 9 16 0 6 */
5035 202, /* OBJ_id_smime_mod_ets_eSigPolicy 88 1 2 840 113549 1 9 16 0 7 */
5036 203, /* OBJ_id_smime_mod_ets_eSigPolicy 97 1 2 840 113549 1 9 16 0 8 */
5037 204, /* OBJ_id_smime_ct_receipt 1 2 840 113549 1 9 16 1 1 */
5038 205, /* OBJ_id_smime_ct_authData 1 2 840 113549 1 9 16 1 2 */
5039 206, /* OBJ_id_smime_ct_publishCert 1 2 840 113549 1 9 16 1 3 */
5040 207, /* OBJ_id_smime_ct_TSTInfo 1 2 840 113549 1 9 16 1 4 */
5041 208, /* OBJ_id_smime_ct_TDTInfo 1 2 840 113549 1 9 16 1 5 */
5042 209, /* OBJ_id_smime_ct_contentInfo 1 2 840 113549 1 9 16 1 6 */
5043 210, /* OBJ_id_smime_ct_DVCSRequestData 1 2 840 113549 1 9 16 1 7 */
5044 211, /* OBJ_id_smime_ct_DVCSResponseData 1 2 840 113549 1 9 16 1 8 */
5045 786, /* OBJ_id_smime_ct_compressedData 1 2 840 113549 1 9 16 1 9 */
5046 787, /* OBJ_id_ct_asciiTextWithCRLF 1 2 840 113549 1 9 16 1 27 */
5047 212, /* OBJ_id_smime_aa_receiptRequest 1 2 840 113549 1 9 16 2 1 */
5048 213, /* OBJ_id_smime_aa_securityLabel 1 2 840 113549 1 9 16 2 2 */
5049 214, /* OBJ_id_smime_aa_mExpandHistory 1 2 840 113549 1 9 16 2 3 */
5050 215, /* OBJ_id_smime_aa_contentHint 1 2 840 113549 1 9 16 2 4 */
5051 216, /* OBJ_id_smime_aa_msgSigDigest 1 2 840 113549 1 9 16 2 5 */
5052 217, /* OBJ_id_smime_aa_encapContentType 1 2 840 113549 1 9 16 2 6 */
5053 218, /* OBJ_id_smime_aa_contentIdentifier 1 2 840 113549 1 9 16 2 7 */
5054 219, /* OBJ_id_smime_aa_macValue 1 2 840 113549 1 9 16 2 8 */
5055 220, /* OBJ_id_smime_aa_equivalentLabels 1 2 840 113549 1 9 16 2 9 */
5056 221, /* OBJ_id_smime_aa_contentReference 1 2 840 113549 1 9 16 2 10 */
5057 222, /* OBJ_id_smime_aa_encrypKeyPref 1 2 840 113549 1 9 16 2 11 */
5058 223, /* OBJ_id_smime_aa_signingCertificate 1 2 840 113549 1 9 16 2 12 */
5059 224, /* OBJ_id_smime_aa_smimeEncryptCerts 1 2 840 113549 1 9 16 2 13 */
5060 225, /* OBJ_id_smime_aa_timeStampToken 1 2 840 113549 1 9 16 2 14 */
5061 226, /* OBJ_id_smime_aa_ets_sigPolicyId 1 2 840 113549 1 9 16 2 15 */
5062 227, /* OBJ_id_smime_aa_ets_commitmentType 1 2 840 113549 1 9 16 2 16 */
5063 228, /* OBJ_id_smime_aa_ets_signerLocation 1 2 840 113549 1 9 16 2 17 */
5064 229, /* OBJ_id_smime_aa_ets_signerAttr 1 2 840 113549 1 9 16 2 18 */
5065 230, /* OBJ_id_smime_aa_ets_otherSigCert 1 2 840 113549 1 9 16 2 19 */
5066 231, /* OBJ_id_smime_aa_ets_contentTimestamp 1 2 840 113549 1 9 16 2 20 */
5067 232, /* OBJ_id_smime_aa_ets_CertificateRefs 1 2 840 113549 1 9 16 2 21 */
5068 233, /* OBJ_id_smime_aa_ets_RevocationRefs 1 2 840 113549 1 9 16 2 22 */
5069 234, /* OBJ_id_smime_aa_ets_certValues 1 2 840 113549 1 9 16 2 23 */
5070 235, /* OBJ_id_smime_aa_ets_revocationValues 1 2 840 113549 1 9 16 2 24 */
5071 236, /* OBJ_id_smime_aa_ets_escTimeStamp 1 2 840 113549 1 9 16 2 25 */
5072 237, /* OBJ_id_smime_aa_ets_certCRLTimestamp 1 2 840 113549 1 9 16 2 26 */
5073 238, /* OBJ_id_smime_aa_ets_archiveTimeStamp 1 2 840 113549 1 9 16 2 27 */
5074 239, /* OBJ_id_smime_aa_signatureType 1 2 840 113549 1 9 16 2 28 */
5075 240, /* OBJ_id_smime_aa_dvcs_dvc 1 2 840 113549 1 9 16 2 29 */
5076 241, /* OBJ_id_smime_alg_ESDHwith3DES 1 2 840 113549 1 9 16 3 1 */
5077 242, /* OBJ_id_smime_alg_ESDHwithRC2 1 2 840 113549 1 9 16 3 2 */

```

```

5078 243, /* OBJ_id_smime_alg_3DESwrap 1 2 840 113549 1 9 16 3 3 */
5079 244, /* OBJ_id_smime_alg_RC2wrap 1 2 840 113549 1 9 16 3 4 */
5080 245, /* OBJ_id_smime_alg_ESDH 1 2 840 113549 1 9 16 3 5 */
5081 246, /* OBJ_id_smime_alg_CMS3DESwrap 1 2 840 113549 1 9 16 3 6 */
5082 247, /* OBJ_id_smime_alg_CMSRC2wrap 1 2 840 113549 1 9 16 3 7 */
5083 125, /* OBJ_zlib_compression 1 2 840 113549 1 9 16 3 8 */
5084 893, /* OBJ_id_alg_PWRI_KEK 1 2 840 113549 1 9 16 3 9 */
5085 248, /* OBJ_id_smime_cd_ldap 1 2 840 113549 1 9 16 4 1 */
5086 249, /* OBJ_id_smime_spq_ets_sqt_uri 1 2 840 113549 1 9 16 5 1 */
5087 250, /* OBJ_id_smime_spq_ets_sqt_unotice 1 2 840 113549 1 9 16 5 2 */
5088 251, /* OBJ_id_smime_cti_ets_proofOfOrigin 1 2 840 113549 1 9 16 6 1 */
5089 252, /* OBJ_id_smime_cti_ets_proofOfReceipt 1 2 840 113549 1 9 16 6 2 */
5090 253, /* OBJ_id_smime_cti_ets_proofOfDelivery 1 2 840 113549 1 9 16 6 3 */
5091 254, /* OBJ_id_smime_cti_ets_proofOfSender 1 2 840 113549 1 9 16 6 4 */
5092 255, /* OBJ_id_smime_cti_ets_proofOfApproval 1 2 840 113549 1 9 16 6 5 */
5093 256, /* OBJ_id_smime_cti_ets_proofOfCreation 1 2 840 113549 1 9 16 6 6 */
5094 150, /* OBJ_keyBag 1 2 840 113549 1 12 10 1 1 */
5095 151, /* OBJ_pkcs8ShroudedKeyBag 1 2 840 113549 1 12 10 1 2 */
5096 152, /* OBJ_certBag 1 2 840 113549 1 12 10 1 3 */
5097 153, /* OBJ_crlBag 1 2 840 113549 1 12 10 1 4 */
5098 154, /* OBJ_secretBag 1 2 840 113549 1 12 10 1 5 */
5099 155, /* OBJ_safeContentsBag 1 2 840 113549 1 12 10 1 6 */
5100 34, /* OBJ_idea_cbc 1 3 6 1 4 1 188 7 1 1 2 */
5101 };

```

```

*****
2547 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/obj_xref.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* AUTOGENERATED BY objxref.pl, DO NOT EDIT */

3 typedef struct
4 {
5     int sign_id;
6     int hash_id;
7     int pkey_id;
8     } nid_triple;

10 static const nid_triple sigoid_srt[] =
11 {
12     {NID_md2WithRSAEncryption, NID_md2, NID_rsaEncryption},
13     {NID_md5WithRSAEncryption, NID_md5, NID_rsaEncryption},
14     {NID_shawithRSAEncryption, NID_sha, NID_rsaEncryption},
15     {NID_sha1WithRSAEncryption, NID_sha1, NID_rsaEncryption},
16     {NID_dsaWithSHA, NID_sha, NID_dsa},
17     {NID_dsaWithSHA1_2, NID_sha1, NID_dsa_2},
18     {NID_mdc2WithRSA, NID_mdc2, NID_rsaEncryption},
19     {NID_md5WithRSA, NID_md5, NID_rsa},
20     {NID_dsaWithSHA1, NID_sha1, NID_dsa},
21     {NID_sha1WithRSA, NID_sha1, NID_rsa},
22     {NID_ripemd160WithRSA, NID_ripemd160, NID_rsaEncryption},
23     {NID_md4WithRSAEncryption, NID_md4, NID_rsaEncryption},
24     {NID_ecdsa_with_SHA1, NID_sha1, NID_X9_62_id_ecPublicKey},
25     {NID_sha256WithRSAEncryption, NID_sha256, NID_rsaEncryption},
26     {NID_sha384WithRSAEncryption, NID_sha384, NID_rsaEncryption},
27     {NID_sha512WithRSAEncryption, NID_sha512, NID_rsaEncryption},
28     {NID_sha224WithRSAEncryption, NID_sha224, NID_rsaEncryption},
29     {NID_ecdsa_with_Recommended, NID_undef, NID_X9_62_id_ecPublicKey},
30     {NID_ecdsa_with_Specified, NID_undef, NID_X9_62_id_ecPublicKey},
31     {NID_ecdsa_with_SHA224, NID_sha224, NID_X9_62_id_ecPublicKey},
32     {NID_ecdsa_with_SHA256, NID_sha256, NID_X9_62_id_ecPublicKey},
33     {NID_ecdsa_with_SHA384, NID_sha384, NID_X9_62_id_ecPublicKey},
34     {NID_ecdsa_with_SHA512, NID_sha512, NID_X9_62_id_ecPublicKey},
35     {NID_dsa_with_SHA224, NID_sha224, NID_dsa},
36     {NID_dsa_with_SHA256, NID_sha256, NID_dsa},
37     {NID_id_GostR3411_94_with_GostR3410_2001, NID_id_GostR3411_94, NID_id_Go
38     {NID_id_GostR3411_94_with_GostR3410_94, NID_id_GostR3411_94, NID_id_Gost
39     {NID_id_GostR3411_94_with_GostR3410_94_cc, NID_id_GostR3411_94, NID_id_G
40     {NID_id_GostR3411_94_with_GostR3410_2001_cc, NID_id_GostR3411_94, NID_id
41     {NID_rsassaPss, NID_undef, NID_rsaEncryption},
42     };

44 static const nid_triple * const sigoid_srt_xref[] =
45 {
46     &sigoid_srt[29],
47     &sigoid_srt[17],
48     &sigoid_srt[18],
49     &sigoid_srt[0],
50     &sigoid_srt[1],
51     &sigoid_srt[7],
52     &sigoid_srt[2],
53     &sigoid_srt[4],
54     &sigoid_srt[3],
55     &sigoid_srt[9],
56     &sigoid_srt[5],
57     &sigoid_srt[8],
58     &sigoid_srt[12],
59     &sigoid_srt[6],
60     &sigoid_srt[10],
61     &sigoid_srt[11],

```

```

62     &sigoid_srt[13],
63     &sigoid_srt[24],
64     &sigoid_srt[20],
65     &sigoid_srt[14],
66     &sigoid_srt[21],
67     &sigoid_srt[15],
68     &sigoid_srt[22],
69     &sigoid_srt[16],
70     &sigoid_srt[23],
71     &sigoid_srt[19],
72     &sigoid_srt[25],
73     &sigoid_srt[26],
74     &sigoid_srt[27],
75     &sigoid_srt[28],
76     };

```

```

*****
5507 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/aes.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/aes/aes.h -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
3 * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
10 * notice, this list of conditions and the following disclaimer.
11 *
12 * 2. Redistributions in binary form must reproduce the above copyright
13 * notice, this list of conditions and the following disclaimer in
14 * the documentation and/or other materials provided with the
15 * distribution.
16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
19 * "This product includes software developed by the OpenSSL Project
20 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23 * endorse or promote products derived from this software without
24 * prior written permission. For written permission, please contact
25 * openssl-core@openssl.org.
26 *
27 * 5. Products derived from this software may not be called "OpenSSL"
28 * nor may "OpenSSL" appear in their names without prior written
29 * permission of the OpenSSL Project.
30 *
31 * 6. Redistributions of any form whatsoever must retain the following
32 * acknowledgment:
33 * "This product includes software developed by the OpenSSL Project
34 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
35 *
36 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 */
52 #ifndef HEADER_AES_H
53 #define HEADER_AES_H
55 #include <openssl/opensslconf.h>
57 #ifdef OPENSSL_NO_AES
58 #error AES is disabled.
59 #endif
61 #include <stddef.h>

```

```

63 #define AES_ENCRYPT 1
64 #define AES_DECRYPT 0
66 /* Because array size can't be a const in C, the following two are macros.
67 Both sizes are in bytes. */
68 #define AES_MAXNR 14
69 #define AES_BLOCK_SIZE 16
71 #ifdef __cplusplus
72 extern "C" {
73 #endif
75 /* This should be a hidden type, but EVP requires that the size be known */
76 struct aes_key_st {
77 #ifdef AES_LONG
78 unsigned long rd_key[4 * (AES_MAXNR + 1)];
79 #else
80 unsigned int rd_key[4 * (AES_MAXNR + 1)];
81 #endif
82 int rounds;
83 };
84 typedef struct aes_key_st AES_KEY;
86 const char *AES_options(void);
88 int AES_set_encrypt_key(const unsigned char *userKey, const int bits,
89 AES_KEY *key);
90 int AES_set_decrypt_key(const unsigned char *userKey, const int bits,
91 AES_KEY *key);
93 int private_AES_set_encrypt_key(const unsigned char *userKey, const int bits,
94 AES_KEY *key);
95 int private_AES_set_decrypt_key(const unsigned char *userKey, const int bits,
96 AES_KEY *key);
98 void AES_encrypt(const unsigned char *in, unsigned char *out,
99 const AES_KEY *key);
100 void AES_decrypt(const unsigned char *in, unsigned char *out,
101 const AES_KEY *key);
103 void AES_ecb_encrypt(const unsigned char *in, unsigned char *out,
104 const AES_KEY *key, const int enc);
105 void AES_cbc_encrypt(const unsigned char *in, unsigned char *out,
106 size_t length, const AES_KEY *key,
107 unsigned char *ivec, const int enc);
108 void AES_cfb128_encrypt(const unsigned char *in, unsigned char *out,
109 size_t length, const AES_KEY *key,
110 unsigned char *ivec, int *num, const int enc);
111 void AES_cfb1_encrypt(const unsigned char *in, unsigned char *out,
112 size_t length, const AES_KEY *key,
113 unsigned char *ivec, int *num, const int enc);
114 void AES_cfb8_encrypt(const unsigned char *in, unsigned char *out,
115 size_t length, const AES_KEY *key,
116 unsigned char *ivec, int *num, const int enc);
117 void AES_ofb128_encrypt(const unsigned char *in, unsigned char *out,
118 size_t length, const AES_KEY *key,
119 unsigned char *ivec, int *num);
120 void AES_ctr128_encrypt(const unsigned char *in, unsigned char *out,
121 size_t length, const AES_KEY *key,
122 unsigned char ivec[AES_BLOCK_SIZE],
123 unsigned char ecound_buf[AES_BLOCK_SIZE],
124 unsigned int *num);
125 /* NB: the IV is two blocks long */
126 void AES_ige_encrypt(const unsigned char *in, unsigned char *out,
127 size_t length, const AES_KEY *key,

```

```
128         unsigned char *ivec, const int enc);
129 /* NB: the IV is _four_ blocks long */
130 void AES_bi_ige_encrypt(const unsigned char *in, unsigned char *out,
131         size_t length, const AES_KEY *key,
132         const AES_KEY *key2, const unsigned char *ivec,
133         const int enc);
134
135 int AES_wrap_key(AES_KEY *key, const unsigned char *iv,
136         unsigned char *out,
137         const unsigned char *in, unsigned int inlen);
138 int AES_unwrap_key(AES_KEY *key, const unsigned char *iv,
139         unsigned char *out,
140         const unsigned char *in, unsigned int inlen);
141
142
143 #ifdef __cplusplus
144 }
145 #endif
146
147 #endif /* !HEADER_AES_H */
```

new/usr/src/lib/openssl/include/openssl/asn1.h

1

52190 Fri May 30 18:31:17 2014

new/usr/src/lib/openssl/include/openssl/asn1.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/asn1.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_ASN1_H
60 #define HEADER_ASN1_H
```

new/usr/src/lib/openssl/include/openssl/asn1.h

2

```
62 #include <time.h>
63 #include <openssl/e_os2.h>
64 #ifndef OPENSSL_NO_BIO
65 #include <openssl/bio.h>
66 #endif
67 #include <openssl/stack.h>
68 #include <openssl/safestack.h>
69
70 #include <openssl/symhacks.h>
71
72 #include <openssl/ssl_typ.h>
73 #ifndef OPENSSL_NO_DEPRECATED
74 #include <openssl/bn.h>
75 #endif
76
77 #ifdef OPENSSL_BUILD_SHLIBCRYPTO
78 # undef OPENSSL_EXTERN
79 # define OPENSSL_EXTERN OPENSSL_EXPORT
80 #endif
81
82 #ifdef __cplusplus
83 extern "C" {
84 #endif
85
86 #define V_ASN1_UNIVERSAL 0x00
87 #define V_ASN1_APPLICATION 0x40
88 #define V_ASN1_CONTEXT_SPECIFIC 0x80
89 #define V_ASN1_PRIVATE 0xc0
90
91 #define V_ASN1_CONSTRUCTED 0x20
92 #define V_ASN1_PRIMITIVE_TAG 0x1f
93 #define V_ASN1_PRIMATIVE_TAG 0x1f
94
95 #define V_ASN1_APP_CHOOSE -2 /* let the recipient choose */
96 #define V_ASN1_OTHER -3 /* used in ASN1_TYPE */
97 #define V_ASN1_ANY -4 /* used in ASN1 template code */
98
99 #define V_ASN1_NEG 0x100 /* negative flag */
100
101 #define V_ASN1_UNDEF -1
102 #define V_ASN1_EOC 0
103 #define V_ASN1_BOOLEAN 1 /**/
104 #define V_ASN1_INTEGER 2
105 #define V_ASN1_NEG_INTEGER (2 | V_ASN1_NEG)
106 #define V_ASN1_BIT_STRING 3
107 #define V_ASN1_OCTET_STRING 4
108 #define V_ASN1_NULL 5
109 #define V_ASN1_OBJECT 6
110 #define V_ASN1_OBJECT_DESCRIPTOR 7
111 #define V_ASN1_EXTERNAL 8
112 #define V_ASN1_REAL 9
113 #define V_ASN1_ENUMERATED 10
114 #define V_ASN1_NEG_ENUMERATED (10 | V_ASN1_NEG)
115 #define V_ASN1_UTF8STRING 12
116 #define V_ASN1_SEQUENCE 16
117 #define V_ASN1_SET 17
118 #define V_ASN1_NUMERICSTRING 18 /**/
119 #define V_ASN1_PRINTABLESTRING 19
120 #define V_ASN1_T61STRING 20
121 #define V_ASN1_TELETEXTSTRING 20 /* alias */
122 #define V_ASN1_VIDEOTEXSTRING 21 /**/
123 #define V_ASN1_IA5STRING 22
124 #define V_ASN1_UTCTIME 23
125 #define V_ASN1_GENERALIZEDTIME 24 /**/
126 #define V_ASN1_GRAPHICSTRING 25 /**/
127 #define V_ASN1_ISO64STRING 26 /**/
```



```

128 #define V_ASN1_VISIBLESTRING      26      /* alias */
129 #define V_ASN1_GENERALSTRING      27      /**/
130 #define V_ASN1_UNIVERSALSTRING    28      /**/
131 #define V_ASN1_BMPSTRING          30

133 /* For use with d2i_ASN1_type_bytes() */
134 #define B_ASN1_NUMERICSTRING      0x0001
135 #define B_ASN1_PRINTABLESTRING    0x0002
136 #define B_ASN1_T61STRING         0x0004
137 #define B_ASN1_TELETEXSTRING     0x0004
138 #define B_ASN1_VIDEOTEXSTRING    0x0008
139 #define B_ASN1_IA5STRING         0x0010
140 #define B_ASN1_GRAPHICSTRING     0x0020
141 #define B_ASN1_ISO64STRING       0x0040
142 #define B_ASN1_VISIBLESTRING     0x0040
143 #define B_ASN1_GENERALSTRING     0x0080
144 #define B_ASN1_UNIVERSALSTRING   0x0100
145 #define B_ASN1_OCTET_STRING      0x0200
146 #define B_ASN1_BIT_STRING        0x0400
147 #define B_ASN1_BMPSTRING         0x0800
148 #define B_ASN1_UNKNOWN           0x1000
149 #define B_ASN1_UTF8STRING        0x2000
150 #define B_ASN1_UTCTIME           0x4000
151 #define B_ASN1_GENERALIZEDTIME   0x8000
152 #define B_ASN1_SEQUENCE          0x10000

154 /* For use with ASN1_mbstring_copy() */
155 #define MBSTRING_FLAG             0x1000
156 #define MBSTRING_UTF8             (MBSTRING_FLAG)
157 #define MBSTRING_ASC              (MBSTRING_FLAG|1)
158 #define MBSTRING_BMP             (MBSTRING_FLAG|2)
159 #define MBSTRING_UNIV            (MBSTRING_FLAG|4)

161 #define SMIME_OLDMIME             0x400
162 #define SMIME_CRLFEO             0x800
163 #define SMIME_STREAM              0x1000

165 struct X509_algor_st;
166 DECLARE_STACK_OF(X509_ALGOR)

168 #define DECLARE_ASN1_SET_OF(type) /* filled in by mkstack.pl */
169 #define IMPLEMENT_ASN1_SET_OF(type) /* nothing, no longer needed */

171 /* We MUST make sure that, except for constness, asn1_ctx_st and
172  * asn1_const_ctx are exactly the same. Fortunately, as soon as
173  * the old ASN1 parsing macros are gone, we can throw this away
174  * as well... */
175 typedef struct asn1_ctx_st
176 {
177     unsigned char *p; /* work char pointer */
178     int eos; /* end of sequence read for indefinite encoding */
179     int error; /* error code to use when returning an error */
180     int inf; /* constructed if 0x20, indefinite is 0x21 */
181     int tag; /* tag from last 'get object' */
182     int xclass; /* class from last 'get object' */
183     long slen; /* length of last 'get object' */
184     unsigned char *max; /* largest value of p allowed */
185     unsigned char *q; /* temporary variable */
186     unsigned char **pp; /* variable */
187     int line; /* used in error processing */
188 } ASN1_CTX;

190 typedef struct asn1_const_ctx_st
191 {
192     const unsigned char *p; /* work char pointer */
193     int eos; /* end of sequence read for indefinite encoding */

```

```

194 int error; /* error code to use when returning an error */
195 int inf; /* constructed if 0x20, indefinite is 0x21 */
196 int tag; /* tag from last 'get object' */
197 int xclass; /* class from last 'get object' */
198 long slen; /* length of last 'get object' */
199 const unsigned char *max; /* largest value of p allowed */
200 const unsigned char *q; /* temporary variable */
201 const unsigned char **pp; /* variable */
202 int line; /* used in error processing */
203 } ASN1_const_CTX;

205 /* These are used internally in the ASN1_OBJECT to keep track of
206  * whether the names and data need to be free()ed */
207 #define ASN1_OBJECT_FLAG_DYNAMIC 0x01 /* internal use */
208 #define ASN1_OBJECT_FLAG_CRITICAL 0x02 /* critical x509v3 object id */
209 #define ASN1_OBJECT_FLAG_DYNAMIC_STRINGS 0x04 /* internal use */
210 #define ASN1_OBJECT_FLAG_DYNAMIC_DATA 0x08 /* internal use */
211 typedef struct asn1_object_st
212 {
213     const char *sn, *ln;
214     int nid;
215     int length;
216     const unsigned char *data; /* data remains const after init */
217     int flags; /* Should we free this one */
218 } ASN1_OBJECT;

220 #define ASN1_STRING_FLAG_BITS_LEFT 0x08 /* Set if 0x07 has bits left value */
221 /* This indicates that the ASN1_STRING is not a real value but just a place
222  * holder for the location where indefinite length constructed data should
223  * be inserted in the memory buffer
224  */
225 #define ASN1_STRING_FLAG_NDEF 0x010

227 /* This flag is used by the CMS code to indicate that a string is not
228  * complete and is a place holder for content when it had all been
229  * accessed. The flag will be reset when content has been written to it.
230  */

232 #define ASN1_STRING_FLAG_CONT 0x020
233 /* This flag is used by ASN1 code to indicate an ASN1_STRING is an MSTRING
234  * type.
235  */
236 #define ASN1_STRING_FLAG_MSTRING 0x040
237 /* This is the base type that holds just about everything :- ) */
238 struct asn1_string_st
239 {
240     int length;
241     int type;
242     unsigned char *data;
243     /* The value of the following field depends on the type being
244      * held. It is mostly being used for BIT_STRING so if the
245      * input data has a non-zero 'unused bits' value, it will be
246      * handled correctly */
247     long flags;
248 };

250 /* ASN1_ENCODING structure: this is used to save the received
251  * encoding of an ASN1 type. This is useful to get round
252  * problems with invalid encodings which can break signatures.
253  */

255 typedef struct ASN1_ENCODING_st
256 {
257     unsigned char *enc; /* DER encoding */
258     long len; /* Length of encoding */
259     int modified; /* set to 1 if 'enc' is invalid */

```

```

260     } ASN1_ENCODING;

262 /* Used with ASN1_LONG type: if a long is set to this it is omitted */
263 #define ASN1_LONG_UNDEF 0x7fffffffL

265 #define STABLE_FLAGS_MALLOC      0x01
266 #define STABLE_NO_MASK          0x02
267 #define DIRSTRING_TYPE \
268     (B_ASN1_PRINTABLESTRING|B_ASN1_T61STRING|B_ASN1_BMPSTRING|B_ASN1_UTF8STRING)
269 #define PKCS9STRING_TYPE (DIRSTRING_TYPE|B_ASN1_IA5STRING)

271 typedef struct asn1_string_table_st {
272     int nid;
273     long minsize;
274     long maxsize;
275     unsigned long mask;
276     unsigned long flags;
277 } ASN1_STRING_TABLE;

279 DECLARE_STACK_OF(ASN1_STRING_TABLE)

281 /* size limits: this stuff is taken straight from RFC2459 */

283 #define ub_name                32768
284 #define ub_common_name         64
285 #define ub_locality_name       128
286 #define ub_state_name          128
287 #define ub_organization_name   64
288 #define ub_organization_unit_name 64
289 #define ub_title                64
290 #define ub_email_address       128

292 /* Declarations for template structures: for full definitions
293  * see asn1t.h
294  */
295 typedef struct ASN1_TEMPLATE_st ASN1_TEMPLATE;
296 typedef struct ASN1_TLC_st ASN1_TLC;
297 /* This is just an opaque pointer */
298 typedef struct ASN1_VALUE_st ASN1_VALUE;

300 /* Declare ASN1 functions: the implement macro in in asn1t.h */

302 #define DECLARE_ASN1_FUNCTIONS(type) DECLARE_ASN1_FUNCTIONS_name(type, type)

304 #define DECLARE_ASN1_ALLOC_FUNCTIONS(type) \
305     DECLARE_ASN1_ALLOC_FUNCTIONS_name(type, type)

307 #define DECLARE_ASN1_FUNCTIONS_name(type, name) \
308     DECLARE_ASN1_ALLOC_FUNCTIONS_name(type, name) \
309     DECLARE_ASN1_ENCODE_FUNCTIONS(type, name, name)

311 #define DECLARE_ASN1_FUNCTIONS_fname(type, itname, name) \
312     DECLARE_ASN1_ALLOC_FUNCTIONS_name(type, name) \
313     DECLARE_ASN1_ENCODE_FUNCTIONS(type, itname, name)

315 #define DECLARE_ASN1_ENCODE_FUNCTIONS(type, itname, name) \
316     type *d2i_##name(type **a, const unsigned char **in, long len); \
317     int i2d_##name(type *a, unsigned char **out); \
318     DECLARE_ASN1_ITEM(itname)

320 #define DECLARE_ASN1_ENCODE_FUNCTIONS_const(type, name) \
321     type *d2i_##name(type **a, const unsigned char **in, long len); \
322     int i2d_##name(const type *a, unsigned char **out); \
323     DECLARE_ASN1_ITEM(name)

325 #define DECLARE_ASN1_NDEF_FUNCTION(name) \

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```

326     int i2d_##name##_NDEF(name *a, unsigned char **out);

328 #define DECLARE_ASN1_FUNCTIONS_const(name) \
329     DECLARE_ASN1_ALLOC_FUNCTIONS(name) \
330     DECLARE_ASN1_ENCODE_FUNCTIONS_const(name, name)

332 #define DECLARE_ASN1_ALLOC_FUNCTIONS_name(type, name) \
333     type *name##_new(void); \
334     void name##_free(type *a);

336 #define DECLARE_ASN1_PRINT_FUNCTION(stname) \
337     DECLARE_ASN1_PRINT_FUNCTION_fname(stname, stname)

339 #define DECLARE_ASN1_PRINT_FUNCTION_fname(stname, fname) \
340     int fname##_print_ctx(BIO *out, stname *x, int indent, \
341         const ASN1_PCTX *pctx);

343 #define D2I_OF(type) type *(*)(type **,const unsigned char **,long)
344 #define I2D_OF(type) int (*)(type *,unsigned char **)
345 #define I2D_OF_const(type) int (*)(const type *,unsigned char **)

347 #define CHECKED_D2I_OF(type, d2i) \
348     ((d2i_of_void*) (1 ? d2i : ((D2I_OF(type))0)))
349 #define CHECKED_I2D_OF(type, i2d) \
350     ((i2d_of_void*) (1 ? i2d : ((I2D_OF(type))0)))
351 #define CHECKED_NEW_OF(type, xnew) \
352     ((void *(*)(void)) (1 ? xnew : ((type *(*)(void))0)))
353 #define CHECKED_PTR_OF(type, p) \
354     ((void*) (1 ? p : (type*)0))
355 #define CHECKED_PPTR_OF(type, p) \
356     ((void**) (1 ? p : (type**)0))

358 #define TYPEDEF_D2I_OF(type) typedef type *d2i_of_##type(type **,const unsigned
359 #define TYPEDEF_I2D_OF(type) typedef int i2d_of_##type(type *,unsigned char **)
360 #define TYPEDEF_D2I2D_OF(type) TYPEDEF_D2I_OF(type); TYPEDEF_I2D_OF(type)

362 TYPEDEF_D2I2D_OF(void);

364 /* The following macros and typedefs allow an ASN1_ITEM
365  * to be embedded in a structure and referenced. Since
366  * the ASN1_ITEM pointers need to be globally accessible
367  * (possibly from shared libraries) they may exist in
368  * different forms. On platforms that support it the
369  * ASN1_ITEM structure itself will be globally exported.
370  * Other platforms will export a function that returns
371  * an ASN1_ITEM pointer.
372  *
373  * To handle both cases transparently the macros below
374  * should be used instead of hard coding an ASN1_ITEM
375  * pointer in a structure.
376  *
377  * The structure will look like this:
378  *
379  * typedef struct SOMETHING_st {
380  *     ...
381  *     ASN1_ITEM_EXP *iptr;
382  *     ...
383  * } SOMETHING;
384  *
385  * It would be initialised as e.g.:
386  *
387  * SOMETHING somevar = {...,ASN1_ITEM_ref(X509),...};
388  *
389  * and the actual pointer extracted with:
390  *
391  * const ASN1_ITEM *it = ASN1_ITEM_ptr(somevar.iptr);

```

```

392 *
393 * Finally an ASN1_ITEM pointer can be extracted from an
394 * appropriate reference with: ASN1_ITEM_rptr(x509). This
395 * would be used when a function takes an ASN1_ITEM * argument.
396 *
397 */

399 #ifndef OPENSSL_EXPORT_VAR_AS_FUNCTION

401 /* ASN1_ITEM pointer exported type */
402 typedef const ASN1_ITEM ASN1_ITEM_EXP;

404 /* Macro to obtain ASN1_ITEM pointer from exported type */
405 #define ASN1_ITEM_ptr(iptr) (iptr)

407 /* Macro to include ASN1_ITEM pointer from base type */
408 #define ASN1_ITEM_ref(iptr) (&(iptr##_it))

410 #define ASN1_ITEM_rptr(ref) (&(ref##_it))

412 #define DECLARE_ASN1_ITEM(name) \
413     OPENSSL_EXTERN const ASN1_ITEM name##_it;

415 #else

417 /* Platforms that can't easily handle shared global variables are declared
418  * as functions returning ASN1_ITEM pointers.
419  */

421 /* ASN1_ITEM pointer exported type */
422 typedef const ASN1_ITEM * ASN1_ITEM_EXP(void);

424 /* Macro to obtain ASN1_ITEM pointer from exported type */
425 #define ASN1_ITEM_ptr(iptr) (iptr())

427 /* Macro to include ASN1_ITEM pointer from base type */
428 #define ASN1_ITEM_ref(iptr) (iptr##_it)

430 #define ASN1_ITEM_rptr(ref) (ref##_it())

432 #define DECLARE_ASN1_ITEM(name) \
433     const ASN1_ITEM * name##_it(void);

435 #endif

437 /* Parameters used by ASN1_STRING_print_ex() */

439 /* These determine which characters to escape:
440  * RFC2253 special characters, control characters and
441  * MSB set characters
442  */

444 #define ASN1_STRFLGS_ESC_2253      1
445 #define ASN1_STRFLGS_ESC_CTRL      2
446 #define ASN1_STRFLGS_ESC_MSB       4

449 /* This flag determines how we do escaping: normally
450  * RC2253 backslash only, set this to use backslash and
451  * quote.
452  */

454 #define ASN1_STRFLGS_ESC_QUOTE      8

457 /* These three flags are internal use only. */

```

```

459 /* Character is a valid PrintableString character */
460 #define CHARTYPE_PRINTABLESTRING    0x10
461 /* Character needs escaping if it is the first character */
462 #define CHARTYPE_FIRST_ESC_2253     0x20
463 /* Character needs escaping if it is the last character */
464 #define CHARTYPE_LAST_ESC_2253      0x40

466 /* NB the internal flags are safely reused below by flags
467  * handled at the top level.
468  */

470 /* If this is set we convert all character strings
471  * to UTF8 first
472  */

474 #define ASN1_STRFLGS_UTF8_CONVERT    0x10

476 /* If this is set we don't attempt to interpret content:
477  * just assume all strings are 1 byte per character. This
478  * will produce some pretty odd looking output!
479  */

481 #define ASN1_STRFLGS_IGNORE_TYPE     0x20

483 /* If this is set we include the string type in the output */
484 #define ASN1_STRFLGS_SHOW_TYPE       0x40

486 /* This determines which strings to display and which to
487  * 'dump' (hex dump of content octets or DER encoding). We can
488  * only dump non character strings or everything. If we
489  * don't dump 'unknown' they are interpreted as character
490  * strings with 1 octet per character and are subject to
491  * the usual escaping options.
492  */

494 #define ASN1_STRFLGS_DUMP_ALL        0x80
495 #define ASN1_STRFLGS_DUMP_UNKNOWN    0x100

497 /* These determine what 'dumping' does, we can dump the
498  * content octets or the DER encoding: both use the
499  * RFC2253 #XXXXX notation.
500  */

502 #define ASN1_STRFLGS_DUMP_DER        0x200

504 /* All the string flags consistent with RFC2253,
505  * escaping control characters isn't essential in
506  * RFC2253 but it is advisable anyway.
507  */

509 #define ASN1_STRFLGS_RFC2253         (ASN1_STRFLGS_ESC_2253 | \
510                                         ASN1_STRFLGS_ESC_CTRL | \
511                                         ASN1_STRFLGS_ESC_MSB | \
512                                         ASN1_STRFLGS_UTF8_CONVERT | \
513                                         ASN1_STRFLGS_DUMP_UNKNOWN | \
514                                         ASN1_STRFLGS_DUMP_DER)

516 DECLARE_STACK_OF(ASN1_INTEGER)
517 DECLARE_ASN1_SET_OF(ASN1_INTEGER)

519 DECLARE_STACK_OF(ASN1_GENERALSTRING)

521 typedef struct asn1_type_st
522 {
523     int type;

```

```

524 union {
525     char *ptr;
526     ASN1_BOOLEAN boolean;
527     ASN1_STRING *asn1_string;
528     ASN1_OBJECT *object;
529     ASN1_INTEGER *integer;
530     ASN1_ENUMERATED *enumerated;
531     ASN1_BIT_STRING *bit_string;
532     ASN1_OCTET_STRING *octet_string;
533     ASN1_PRINTABLESTRING *printablestring;
534     ASN1_T61STRING *t61string;
535     ASN1_IA5STRING *ia5string;
536     ASN1_GENERALSTRING *generalstring;
537     ASN1_BMPSTRING *bmpstring;
538     ASN1_UNIVERSALSTRING *universalstring;
539     ASN1_UTCTIME *utctime;
540     ASN1_GENERALIZEDTIME *generalizedtime;
541     ASN1_VISIBLESTRING *visiblestring;
542     ASN1_UTF8STRING *utf8string;
543     /* set and sequence are left complete and still
544        * contain the set or sequence bytes */
545     ASN1_STRING *set;
546     ASN1_STRING *sequence;
547     ASN1_VALUE *asn1_value;
548     } value;
549 } ASN1_TYPE;

551 DECLARE_STACK_OF(ASN1_TYPE)
552 DECLARE_ASN1_SET_OF(ASN1_TYPE)

554 typedef STACK_OF(ASN1_TYPE) ASN1_SEQUENCE_ANY;

556 DECLARE_ASN1_ENCODE_FUNCTIONS_const(ASN1_SEQUENCE_ANY, ASN1_SEQUENCE_ANY)
557 DECLARE_ASN1_ENCODE_FUNCTIONS_const(ASN1_SEQUENCE_ANY, ASN1_SET_ANY)

559 typedef struct NETSCAPE_X509_st
560 {
561     ASN1_OCTET_STRING *header;
562     X509 *cert;
563 } NETSCAPE_X509;

565 /* This is used to contain a list of bit names */
566 typedef struct BIT_STRING_BITNAME_st {
567     int bitnum;
568     const char *lname;
569     const char *sname;
570 } BIT_STRING_BITNAME;

573 #define M_ASN1_STRING_length(x) ((x)->length)
574 #define M_ASN1_STRING_length_set(x, n) ((x)->length = (n))
575 #define M_ASN1_STRING_type(x) ((x)->type)
576 #define M_ASN1_STRING_data(x) ((x)->data)

578 /* Macros for string operations */
579 #define M_ASN1_BIT_STRING_new() (ASN1_BIT_STRING *)\
580     ASN1_STRING_type_new(V_ASN1_BIT_STRING)
581 #define M_ASN1_BIT_STRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
582 #define M_ASN1_BIT_STRING_dup(a) (ASN1_BIT_STRING *)\
583     ASN1_STRING_dup((const ASN1_STRING *)a)
584 #define M_ASN1_BIT_STRING_cmp(a,b) ASN1_STRING_cmp(\
585     (const ASN1_STRING *)a, (const ASN1_STRING *)b)
586 #define M_ASN1_BIT_STRING_set(a,b,c) ASN1_STRING_set((ASN1_STRING *)a,b,c)

588 #define M_ASN1_INTEGER_new() (ASN1_INTEGER *)\
589     ASN1_STRING_type_new(V_ASN1_INTEGER)

```

```

590 #define M_ASN1_INTEGER_free(a) ASN1_STRING_free((ASN1_STRING *)a)
591 #define M_ASN1_INTEGER_dup(a) (ASN1_INTEGER *)\
592     ASN1_STRING_dup((const ASN1_STRING *)a)
593 #define M_ASN1_INTEGER_cmp(a,b) ASN1_STRING_cmp(\
594     (const ASN1_STRING *)a, (const ASN1_STRING *)b)

596 #define M_ASN1_ENUMERATED_new() (ASN1_ENUMERATED *)\
597     ASN1_STRING_type_new(V_ASN1_ENUMERATED)
598 #define M_ASN1_ENUMERATED_free(a) ASN1_STRING_free((ASN1_STRING *)a)
599 #define M_ASN1_ENUMERATED_dup(a) (ASN1_ENUMERATED *)\
600     ASN1_STRING_dup((const ASN1_STRING *)a)
601 #define M_ASN1_ENUMERATED_cmp(a,b) ASN1_STRING_cmp(\
602     (const ASN1_STRING *)a, (const ASN1_STRING *)b)

604 #define M_ASN1_OCTET_STRING_new() (ASN1_OCTET_STRING *)\
605     ASN1_STRING_type_new(V_ASN1_OCTET_STRING)
606 #define M_ASN1_OCTET_STRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
607 #define M_ASN1_OCTET_STRING_dup(a) (ASN1_OCTET_STRING *)\
608     ASN1_STRING_dup((const ASN1_STRING *)a)
609 #define M_ASN1_OCTET_STRING_cmp(a,b) ASN1_STRING_cmp(\
610     (const ASN1_STRING *)a, (const ASN1_STRING *)b)
611 #define M_ASN1_OCTET_STRING_set(a,b,c) ASN1_STRING_set((ASN1_STRING *)a,b,c)
612 #define M_ASN1_OCTET_STRING_print(a,b) ASN1_STRING_print(a, (ASN1_STRING *)b)
613 #define M_i2d_ASN1_OCTET_STRING(a,pp) \
614     i2d_ASN1_bytes((ASN1_STRING *)a, pp, V_ASN1_OCTET_STRING, \
615     V_ASN1_UNIVERSAL)

617 #define B_ASN1_TIME \
618     B_ASN1_UTCTIME | \
619     B_ASN1_GENERALIZEDTIME

621 #define B_ASN1_PRINTABLE \
622     B_ASN1_NUMERICSTRING | \
623     B_ASN1_PRINTABLESTRING | \
624     B_ASN1_T61STRING | \
625     B_ASN1_IA5STRING | \
626     B_ASN1_BIT_STRING | \
627     B_ASN1_UNIVERSALSTRING | \
628     B_ASN1_BMPSTRING | \
629     B_ASN1_UTF8STRING | \
630     B_ASN1_SEQUENCE | \
631     B_ASN1_UNKNOWN

633 #define B_ASN1_DIRECTORYSTRING \
634     B_ASN1_PRINTABLESTRING | \
635     B_ASN1_TELETEXSTRING | \
636     B_ASN1_BMPSTRING | \
637     B_ASN1_UNIVERSALSTRING | \
638     B_ASN1_UTF8STRING

640 #define B_ASN1_DISPLAYTEXT \
641     B_ASN1_IA5STRING | \
642     B_ASN1_VISIBLESTRING | \
643     B_ASN1_BMPSTRING | \
644     B_ASN1_UTF8STRING

646 #define M_ASN1_PRINTABLE_new() ASN1_STRING_type_new(V_ASN1_T61STRING)
647 #define M_ASN1_PRINTABLE_free(a) ASN1_STRING_free((ASN1_STRING *)a)
648 #define M_i2d_ASN1_PRINTABLE(a,pp) i2d_ASN1_bytes((ASN1_STRING *)a,\
649     pp,a->type,V_ASN1_UNIVERSAL)
650 #define M_d2i_ASN1_PRINTABLE(a,pp,l) \
651     d2i_ASN1_type_bytes((ASN1_STRING **)a,pp,l, \
652     B_ASN1_PRINTABLE)

654 #define M_DIRECTORYSTRING_new() ASN1_STRING_type_new(V_ASN1_PRINTABLESTRING)
655 #define M_DIRECTORYSTRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)

```

```

656 #define M_i2d_DIRECTORYSTRING(a,pp) i2d_ASN1_bytes((ASN1_STRING *)a,\
657                                           pp,a->type,V_ASN1_UNIVERSAL)
658 #define M_d2i_DIRECTORYSTRING(a,pp,l) \
659     d2i_ASN1_type_bytes((ASN1_STRING **)a,pp,l, \
660                          B_ASN1_DIRECTORYSTRING)
661
662 #define M_DISPLAYTEXT_new() ASN1_STRING_type_new(V_ASN1_VISIBLESTRING)
663 #define M_DISPLAYTEXT_free(a) ASN1_STRING_free((ASN1_STRING *)a)
664 #define M_i2d_DISPLAYTEXT(a,pp) i2d_ASN1_bytes((ASN1_STRING *)a,\
665                                           pp,a->type,V_ASN1_UNIVERSAL)
666 #define M_d2i_DISPLAYTEXT(a,pp,l) \
667     d2i_ASN1_type_bytes((ASN1_STRING **)a,pp,l, \
668                          B_ASN1_DISPLAYTEXT)
669
670 #define M_ASN1_PRINTABLESTRING_new() (ASN1_PRINTABLESTRING *)\
671     ASN1_STRING_type_new(V_ASN1_PRINTABLESTRING)
672 #define M_ASN1_PRINTABLESTRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
673 #define M_i2d_ASN1_PRINTABLESTRING(a,pp) \
674     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_PRINTABLESTRING,\
675                    V_ASN1_UNIVERSAL)
676 #define M_d2i_ASN1_PRINTABLESTRING(a,pp,l) \
677     (ASN1_PRINTABLESTRING *)d2i_ASN1_type_bytes\
678     ((ASN1_STRING **)a,pp,l,B_ASN1_PRINTABLESTRING)
679
680 #define M_ASN1_T61STRING_new() (ASN1_T61STRING *)\
681     ASN1_STRING_type_new(V_ASN1_T61STRING)
682 #define M_ASN1_T61STRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
683 #define M_i2d_ASN1_T61STRING(a,pp) \
684     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_T61STRING,\
685                    V_ASN1_UNIVERSAL)
686 #define M_d2i_ASN1_T61STRING(a,pp,l) \
687     (ASN1_T61STRING *)d2i_ASN1_type_bytes\
688     ((ASN1_STRING **)a,pp,l,B_ASN1_T61STRING)
689
690 #define M_ASN1_IA5STRING_new() (ASN1_IA5STRING *)\
691     ASN1_STRING_type_new(V_ASN1_IA5STRING)
692 #define M_ASN1_IA5STRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
693 #define M_ASN1_IA5STRING_dup(a) \
694     (ASN1_IA5STRING *)ASN1_STRING_dup((const ASN1_STRING *)a)
695 #define M_i2d_ASN1_IA5STRING(a,pp) \
696     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_IA5STRING,\
697                    V_ASN1_UNIVERSAL)
698 #define M_d2i_ASN1_IA5STRING(a,pp,l) \
699     (ASN1_IA5STRING *)d2i_ASN1_type_bytes((ASN1_STRING **)a,pp,l,\
700     B_ASN1_IA5STRING)
701
702 #define M_ASN1_UTCTIME_new() (ASN1_UTCTIME *)\
703     ASN1_STRING_type_new(V_ASN1_UTCTIME)
704 #define M_ASN1_UTCTIME_free(a) ASN1_STRING_free((ASN1_STRING *)a)
705 #define M_ASN1_UTCTIME_dup(a) (ASN1_UTCTIME *)\
706     ASN1_STRING_dup((const ASN1_STRING *)a)
707
708 #define M_ASN1_GENERALIZEDTIME_new() (ASN1_GENERALIZEDTIME *)\
709     ASN1_STRING_type_new(V_ASN1_GENERALIZEDTIME)
710 #define M_ASN1_GENERALIZEDTIME_free(a) ASN1_STRING_free((ASN1_STRING *)a)
711 #define M_ASN1_GENERALIZEDTIME_dup(a) (ASN1_GENERALIZEDTIME *)ASN1_STRING_dup(\
712     (const ASN1_STRING *)a)
713
714 #define M_ASN1_TIME_new() (ASN1_TIME *)\
715     ASN1_STRING_type_new(V_ASN1_UTCTIME)
716 #define M_ASN1_TIME_free(a) ASN1_STRING_free((ASN1_STRING *)a)
717 #define M_ASN1_TIME_dup(a) (ASN1_TIME *)\
718     ASN1_STRING_dup((const ASN1_STRING *)a)
719
720 #define M_ASN1_GENERALSTRING_new() (ASN1_GENERALSTRING *)\
721     ASN1_STRING_type_new(V_ASN1_GENERALSTRING)

```

```

722 #define M_ASN1_GENERALSTRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
723 #define M_i2d_ASN1_GENERALSTRING(a,pp) \
724     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_GENERALSTRING,\
725                    V_ASN1_UNIVERSAL)
726 #define M_d2i_ASN1_GENERALSTRING(a,pp,l) \
727     (ASN1_GENERALSTRING *)d2i_ASN1_type_bytes\
728     ((ASN1_STRING **)a,pp,l,B_ASN1_GENERALSTRING)
729
730 #define M_ASN1_UNIVERSALSTRING_new() (ASN1_UNIVERSALSTRING *)\
731     ASN1_STRING_type_new(V_ASN1_UNIVERSALSTRING)
732 #define M_ASN1_UNIVERSALSTRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
733 #define M_i2d_ASN1_UNIVERSALSTRING(a,pp) \
734     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_UNIVERSALSTRING,\
735                    V_ASN1_UNIVERSAL)
736 #define M_d2i_ASN1_UNIVERSALSTRING(a,pp,l) \
737     (ASN1_UNIVERSALSTRING *)d2i_ASN1_type_bytes\
738     ((ASN1_STRING **)a,pp,l,B_ASN1_UNIVERSALSTRING)
739
740 #define M_ASN1_BMPSTRING_new() (ASN1_BMPSTRING *)\
741     ASN1_STRING_type_new(V_ASN1_BMPSTRING)
742 #define M_ASN1_BMPSTRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
743 #define M_i2d_ASN1_BMPSTRING(a,pp) \
744     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_BMPSTRING,\
745                    V_ASN1_UNIVERSAL)
746 #define M_d2i_ASN1_BMPSTRING(a,pp,l) \
747     (ASN1_BMPSTRING *)d2i_ASN1_type_bytes\
748     ((ASN1_STRING **)a,pp,l,B_ASN1_BMPSTRING)
749
750 #define M_ASN1_VISIBLESTRING_new() (ASN1_VISIBLESTRING *)\
751     ASN1_STRING_type_new(V_ASN1_VISIBLESTRING)
752 #define M_ASN1_VISIBLESTRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
753 #define M_i2d_ASN1_VISIBLESTRING(a,pp) \
754     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_VISIBLESTRING,\
755                    V_ASN1_UNIVERSAL)
756 #define M_d2i_ASN1_VISIBLESTRING(a,pp,l) \
757     (ASN1_VISIBLESTRING *)d2i_ASN1_type_bytes\
758     ((ASN1_STRING **)a,pp,l,B_ASN1_VISIBLESTRING)
759
760 #define M_ASN1_UTF8STRING_new() (ASN1_UTF8STRING *)\
761     ASN1_STRING_type_new(V_ASN1_UTF8STRING)
762 #define M_ASN1_UTF8STRING_free(a) ASN1_STRING_free((ASN1_STRING *)a)
763 #define M_i2d_ASN1_UTF8STRING(a,pp) \
764     i2d_ASN1_bytes((ASN1_STRING *)a,pp,V_ASN1_UTF8STRING,\
765                    V_ASN1_UNIVERSAL)
766 #define M_d2i_ASN1_UTF8STRING(a,pp,l) \
767     (ASN1_UTF8STRING *)d2i_ASN1_type_bytes\
768     ((ASN1_STRING **)a,pp,l,B_ASN1_UTF8STRING)
769
770 /* for the is_set parameter to i2d_ASN1_SET */
771 #define IS_SEQUENCE 0
772 #define IS_SET 1
773
774 DECLARE_ASN1_FUNCTIONS_fname(ASN1_TYPE, ASN1_ANY, ASN1_TYPE)
775
776 int ASN1_TYPE_get(ASN1_TYPE *a);
777 void ASN1_TYPE_set(ASN1_TYPE *a, int type, void *value);
778 int ASN1_TYPE_set1(ASN1_TYPE *a, int type, const void *value);
779 int ASN1_TYPE_cmp(ASN1_TYPE *a, ASN1_TYPE *b);
780
781 ASN1_OBJECT * ASN1_OBJECT_new(void);
782 void ASN1_OBJECT_free(ASN1_OBJECT *a);
783 int i2d_ASN1_OBJECT(ASN1_OBJECT *a, unsigned char **pp);
784 ASN1_OBJECT * c2i_ASN1_OBJECT(ASN1_OBJECT **a, const unsigned char **pp,
785                                long length);
786 ASN1_OBJECT * d2i_ASN1_OBJECT(ASN1_OBJECT **a, const unsigned char **pp,
787                                long length);

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789 DECLARE_ASN1_ITEM(ASN1_OBJECT)

791 DECLARE_STACK_OF(ASN1_OBJECT)
792 DECLARE_ASN1_SET_OF(ASN1_OBJECT)

794 ASN1_STRING * ASN1_STRING_new(void);
795 void ASN1_STRING_free(ASN1_STRING *a);
796 int ASN1_STRING_copy(ASN1_STRING *dst, const ASN1_STRING *str);
797 ASN1_STRING * ASN1_STRING_dup(const ASN1_STRING *a);
798 ASN1_STRING * ASN1_STRING_type_new(int type);
799 int ASN1_STRING_cmp(const ASN1_STRING *a, const ASN1_STRING *b);
800 /* Since this is used to store all sorts of things, via macros, for now, make
801    its data void */
802 int ASN1_STRING_set(ASN1_STRING *str, const void *data, int len);
803 void ASN1_STRING_set0(ASN1_STRING *str, void *data, int len);
804 int ASN1_STRING_length(const ASN1_STRING *x);
805 void ASN1_STRING_length_set(ASN1_STRING *x, int n);
806 int ASN1_STRING_type(ASN1_STRING *x);
807 unsigned char * ASN1_STRING_data(ASN1_STRING *x);

809 DECLARE_ASN1_FUNCTIONS(ASN1_BIT_STRING)
810 int i2c_ASN1_BIT_STRING(ASN1_BIT_STRING *a, unsigned char **pp);
811 ASN1_BIT_STRING *c2i_ASN1_BIT_STRING(ASN1_BIT_STRING **a, const unsigned char **pp,
812    long length);
813 int ASN1_BIT_STRING_set(ASN1_BIT_STRING *a, unsigned char *d,
814    int length);
815 int ASN1_BIT_STRING_set_bit(ASN1_BIT_STRING *a, int n, int value);
816 int ASN1_BIT_STRING_get_bit(ASN1_BIT_STRING *a, int n);
817 int ASN1_BIT_STRING_check(ASN1_BIT_STRING *a,
818    unsigned char *flags, int flags_len);

820 #ifndef OPENSSL_NO_BIO
821 int ASN1_BIT_STRING_name_print(BIO *out, ASN1_BIT_STRING *bs,
822    BIT_STRING_BITNAME *tbl, int indent);
823 #endif
824 int ASN1_BIT_STRING_num_asc(char *name, BIT_STRING_BITNAME *tbl);
825 int ASN1_BIT_STRING_set_asc(ASN1_BIT_STRING *bs, char *name, int value,
826    BIT_STRING_BITNAME *tbl);

828 int i2d_ASN1_BOOLEAN(int a, unsigned char **pp);
829 int d2i_ASN1_BOOLEAN(int *a, const unsigned char **pp, long length);

831 DECLARE_ASN1_FUNCTIONS(ASN1_INTEGER)
832 int i2c_ASN1_INTEGER(ASN1_INTEGER *a, unsigned char **pp);
833 ASN1_INTEGER *c2i_ASN1_INTEGER(ASN1_INTEGER **a, const unsigned char **pp,
834    long length);
835 ASN1_INTEGER *d2i_ASN1_INTEGER(ASN1_INTEGER **a, const unsigned char **pp,
836    long length);
837 ASN1_INTEGER * ASN1_INTEGER_dup(const ASN1_INTEGER *x);
838 int ASN1_INTEGER_cmp(const ASN1_INTEGER *x, const ASN1_INTEGER *y);

840 DECLARE_ASN1_FUNCTIONS(ASN1_ENUMERATED)

842 int ASN1_UTCTIME_check(ASN1_UTCTIME *a);
843 ASN1_UTCTIME *ASN1_UTCTIME_set(ASN1_UTCTIME *s, time_t t);
844 ASN1_UTCTIME *ASN1_UTCTIME_adj(ASN1_UTCTIME *s, time_t t,
845    int offset_day, long offset_sec);
846 int ASN1_UTCTIME_set_string(ASN1_UTCTIME *s, const char *str);
847 int ASN1_UTCTIME_cmp_time_t(const ASN1_UTCTIME *s, time_t t);
848 #if 0
849 time_t ASN1_UTCTIME_get(const ASN1_UTCTIME *s);
850 #endif

852 int ASN1_GENERALIZEDTIME_check(ASN1_GENERALIZEDTIME *a);
853 ASN1_GENERALIZEDTIME *ASN1_GENERALIZEDTIME_set(ASN1_GENERALIZEDTIME *s, time_t t)

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854 ASN1_GENERALIZEDTIME *ASN1_GENERALIZEDTIME_adj(ASN1_GENERALIZEDTIME *s,
855    time_t t, int offset_day, long offset_sec);
856 int ASN1_GENERALIZEDTIME_set_string(ASN1_GENERALIZEDTIME *s, const char *str);

858 DECLARE_ASN1_FUNCTIONS(ASN1_OCTET_STRING)
859 ASN1_OCTET_STRING * ASN1_OCTET_STRING_dup(const ASN1_OCTET_STRING *a);
860 int ASN1_OCTET_STRING_cmp(const ASN1_OCTET_STRING *a, const ASN1_OCTET_STRING *b);
861 int ASN1_OCTET_STRING_set(ASN1_OCTET_STRING *str, const unsigned char *data,
    int length);

863 DECLARE_ASN1_FUNCTIONS(ASN1_VISIBLESTRING)
864 DECLARE_ASN1_FUNCTIONS(ASN1_UNIVERSALSTRING)
865 DECLARE_ASN1_FUNCTIONS(ASN1_UTF8STRING)
866 DECLARE_ASN1_FUNCTIONS(ASN1_NULL)
867 DECLARE_ASN1_FUNCTIONS(ASN1_BMPSTRING)

869 int UTF8_getc(const unsigned char *str, int len, unsigned long *val);
870 int UTF8_putc(unsigned char *str, int len, unsigned long value);

872 DECLARE_ASN1_FUNCTIONS_name(ASN1_STRING, ASN1_PRINTABLE)

874 DECLARE_ASN1_FUNCTIONS_name(ASN1_STRING, DIRECTORYSTRING)
875 DECLARE_ASN1_FUNCTIONS_name(ASN1_STRING, DISPLAYTEXT)
876 DECLARE_ASN1_FUNCTIONS(ASN1_PRINTABLESTRING)
877 DECLARE_ASN1_FUNCTIONS(ASN1_T61STRING)
878 DECLARE_ASN1_FUNCTIONS(ASN1_IA5STRING)
879 DECLARE_ASN1_FUNCTIONS(ASN1_GENERALSTRING)
880 DECLARE_ASN1_FUNCTIONS(ASN1_UTCTIME)
881 DECLARE_ASN1_FUNCTIONS(ASN1_GENERALIZEDTIME)
882 DECLARE_ASN1_FUNCTIONS(ASN1_TIME)

884 DECLARE_ASN1_ITEM(ASN1_OCTET_STRING_NDEF)

886 ASN1_TIME *ASN1_TIME_set(ASN1_TIME *s, time_t t);
887 ASN1_TIME *ASN1_TIME_adj(ASN1_TIME *s, time_t t,
888    int offset_day, long offset_sec);
889 int ASN1_TIME_check(ASN1_TIME *t);
890 ASN1_GENERALIZEDTIME *ASN1_TIME_to_generalizedtime(ASN1_TIME *t, ASN1_GENERALIZEDTIME *g);
891 int ASN1_TIME_set_string(ASN1_TIME *s, const char *str);

893 int i2d_ASN1_SET(STACK_OF(OPENSSL_BLOCK) *a, unsigned char **pp,
894    int ex_tag, int ex_class,
895    int is_set);
896 STACK_OF(OPENSSL_BLOCK) *d2i_ASN1_SET(STACK_OF(OPENSSL_BLOCK) **a,
897    const unsigned char **pp,
898    long length, d2i_of_void *d2i,
899    void (*free_func)(OPENSSL_BLOCK), int ex_tag,
900    int ex_class);

902 #ifndef OPENSSL_NO_BIO
903 int i2a_ASN1_INTEGER(BIO *bp, ASN1_INTEGER *a);
904 int a2i_ASN1_INTEGER(BIO *bp, ASN1_INTEGER *bs, char *buf, int size);
905 int i2a_ASN1_ENUMERATED(BIO *bp, ASN1_ENUMERATED *a);
906 int a2i_ASN1_ENUMERATED(BIO *bp, ASN1_ENUMERATED *bs, char *buf, int size);
907 int i2a_ASN1_OBJECT(BIO *bp, ASN1_OBJECT *a);
908 int a2i_ASN1_STRING(BIO *bp, ASN1_STRING *bs, char *buf, int size);
909 int i2a_ASN1_STRING(BIO *bp, ASN1_STRING *a, int type);
910 #endif
911 int i2t_ASN1_OBJECT(char *buf, int buf_len, ASN1_OBJECT *a);

913 int a2d_ASN1_OBJECT(unsigned char *out, int olen, const char *buf, int num);
914 ASN1_OBJECT *ASN1_OBJECT_create(int nid, unsigned char *data, int len,
915    const char *sn, const char *ln);

917 int ASN1_INTEGER_set(ASN1_INTEGER *a, long v);
918 long ASN1_INTEGER_get(const ASN1_INTEGER *a);
919 ASN1_INTEGER *BN_to_ASN1_INTEGER(const BIGNUM *bn, ASN1_INTEGER *ai);

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920 BIGNUM *ASN1_INTEGER_to_BN(const ASN1_INTEGER *ai,BIGNUM *bn);

922 int ASN1_ENUMERATED_set(ASN1_ENUMERATED *a, long v);
923 long ASN1_ENUMERATED_get(ASN1_ENUMERATED *a);
924 ASN1_ENUMERATED *BN_to_ASN1_ENUMERATED(BIGNUM *bn, ASN1_ENUMERATED *ai);
925 BIGNUM *ASN1_ENUMERATED_to_BN(ASN1_ENUMERATED *ai,BIGNUM *bn);

927 /* General */
928 /* given a string, return the correct type, max is the maximum length */
929 int ASN1_PRINTABLE_type(const unsigned char *s, int max);

931 int i2d_ASN1_bytes(ASN1_STRING *a, unsigned char **pp, int tag, int xclass);
932 ASN1_STRING *d2i_ASN1_bytes(ASN1_STRING **a, const unsigned char **pp,
933     long length, int Ptag, int Pclass);
934 unsigned long ASN1_tag2bit(int tag);
935 /* type is one or more of the B_ASN1 values. */
936 ASN1_STRING *d2i_ASN1_type_bytes(ASN1_STRING **a,const unsigned char **pp,
937     long length,int type);

939 /* PARSING */
940 int asn1_Finish(ASN1_CTX *c);
941 int asn1_const_Finish(ASN1_const_CTX *c);

943 /* SPECIALS */
944 int ASN1_get_object(const unsigned char **pp, long *plength, int *ptag,
945     int *pclass, long omax);
946 int ASN1_check_infinite_end(unsigned char **p,long len);
947 int ASN1_const_check_infinite_end(const unsigned char **p,long len);
948 void ASN1_put_object(unsigned char **pp, int constructed, int length,
949     int tag, int xclass);
950 int ASN1_put_eoc(unsigned char **pp);
951 int ASN1_object_size(int constructed, int length, int tag);

953 /* Used to implement other functions */
954 void *ASN1_dup(i2d_of_void *i2d, d2i_of_void *d2i, void *x);

956 #define ASN1_dup_of(type,i2d,d2i,x) \
957     ((type*)ASN1_dup(CHECKED_I2D_OF(type, i2d), \
958         CHECKED_D2I_OF(type, d2i), \
959         CHECKED_PTR_OF(type, x)))

961 #define ASN1_dup_of_const(type,i2d,d2i,x) \
962     ((type*)ASN1_dup(CHECKED_I2D_OF(const type, i2d), \
963         CHECKED_D2I_OF(type, d2i), \
964         CHECKED_PTR_OF(const type, x)))

966 void *ASN1_item_dup(const ASN1_ITEM *it, void *x);

968 /* ASN1 alloc/free macros for when a type is only used internally */

970 #define M_ASN1_new_of(type) (type *)ASN1_item_new(ASN1_ITEM_rptr(type))
971 #define M_ASN1_free_of(x, type) \
972     ASN1_item_free(CHECKED_PTR_OF(type, x), ASN1_ITEM_rptr(type))

974 #ifndef OPENSSL_NO_FP_API
975 void *ASN1_d2i_fp(void *(*xnew)(void), d2i_of_void *d2i, FILE *in, void **x);

977 #define ASN1_d2i_fp_of(type,xnew,d2i,in,x) \
978     ((type*)ASN1_d2i_fp(CHECKED_NEW_OF(type, xnew), \
979         CHECKED_D2I_OF(type, d2i), \
980         in, \
981         CHECKED_PPTR_OF(type, x)))

983 void *ASN1_item_d2i_fp(const ASN1_ITEM *it, FILE *in, void *x);
984 int ASN1_i2d_fp(i2d_of_void *i2d,FILE *out,void *x);

```

```

986 #define ASN1_i2d_fp_of(type,i2d,out,x) \
987     (ASN1_i2d_fp(CHECKED_I2D_OF(type, i2d), \
988         out, \
989         CHECKED_PTR_OF(type, x)))

991 #define ASN1_i2d_fp_of_const(type,i2d,out,x) \
992     (ASN1_i2d_fp(CHECKED_I2D_OF(const type, i2d), \
993         out, \
994         CHECKED_PTR_OF(const type, x)))

996 int ASN1_item_i2d_fp(const ASN1_ITEM *it, FILE *out, void *x);
997 int ASN1_STRING_print_ex_fp(FILE *fp, ASN1_STRING *str, unsigned long flags);
998 #endif

1000 int ASN1_STRING_to_UTF8(unsigned char **out, ASN1_STRING *in);

1002 #ifndef OPENSSL_NO_BIO
1003 void *ASN1_d2i_bio(void *(*xnew)(void), d2i_of_void *d2i, BIO *in, void **x);

1005 #define ASN1_d2i_bio_of(type,xnew,d2i,in,x) \
1006     ((type*)ASN1_d2i_bio( CHECKED_NEW_OF(type, xnew), \
1007         CHECKED_D2I_OF(type, d2i), \
1008         in, \
1009         CHECKED_PPTR_OF(type, x)))

1011 void *ASN1_item_d2i_bio(const ASN1_ITEM *it, BIO *in, void *x);
1012 int ASN1_i2d_bio(i2d_of_void *i2d,BIO *out, unsigned char *x);

1014 #define ASN1_i2d_bio_of(type,i2d,out,x) \
1015     (ASN1_i2d_bio(CHECKED_I2D_OF(type, i2d), \
1016         out, \
1017         CHECKED_PTR_OF(type, x)))

1019 #define ASN1_i2d_bio_of_const(type,i2d,out,x) \
1020     (ASN1_i2d_bio(CHECKED_I2D_OF(const type, i2d), \
1021         out, \
1022         CHECKED_PTR_OF(const type, x)))

1024 int ASN1_item_i2d_bio(const ASN1_ITEM *it, BIO *out, void *x);
1025 int ASN1_UTCTIME_print(BIO *fp, const ASN1_UTCTIME *a);
1026 int ASN1_GENERALIZEDTIME_print(BIO *fp, const ASN1_GENERALIZEDTIME *a);
1027 int ASN1_TIME_print(BIO *fp, const ASN1_TIME *a);
1028 int ASN1_STRING_print(BIO *bp, const ASN1_STRING *v);
1029 int ASN1_STRING_print_ex(BIO *out, ASN1_STRING *str, unsigned long flags);
1030 int ASN1_bn_print(BIO *bp, const char *number, const BIGNUM *num,
1031     unsigned char *buf, int off);
1032 int ASN1_parse(BIO *bp,const unsigned char *pp,long len,int indent);
1033 int ASN1_parse_dump(BIO *bp,const unsigned char *pp,long len,int indent,int dump);
1034 #endif
1035 const char *ASN1_tag2str(int tag);

1037 /* Used to load and write netscape format cert */

1039 DECLARE_ASN1_FUNCTIONS(NETSCAPE_X509)

1041 int ASN1_UNIVERSALSTRING_to_string(ASN1_UNIVERSALSTRING *s);

1043 int ASN1_TYPE_set_octetstring(ASN1_TYPE *a,
1044     unsigned char *data, int len);
1045 int ASN1_TYPE_get_octetstring(ASN1_TYPE *a,
1046     unsigned char *data, int max_len);
1047 int ASN1_TYPE_set_int_octetstring(ASN1_TYPE *a, long num,
1048     unsigned char *data, int len);
1049 int ASN1_TYPE_get_int_octetstring(ASN1_TYPE *a,long *num,
1050     unsigned char *data, int max_len);

```

```

1052 STACK_OF(OPENSSSL_BLOCK) *ASN1_seq_unpack(const unsigned char *buf, int len,
1053                                             d2i_of_void *d2i, void (*free_func)(OPENSSSL_BLOCK))
1054 unsigned char *ASN1_seq_pack(STACK_OF(OPENSSSL_BLOCK) *safes, i2d_of_void *i2d,
1055                               unsigned char **buf, int *len);
1056 void *ASN1_unpack_string(ASN1_STRING *oct, d2i_of_void *d2i);
1057 void *ASN1_item_unpack(ASN1_STRING *oct, const ASN1_ITEM *it);
1058 ASN1_STRING *ASN1_pack_string(void *obj, i2d_of_void *i2d,
1059                               ASN1_OCTET_STRING **oct);

1061 #define ASN1_pack_string_of(type,obj,i2d,oct) \
1062     (ASN1_pack_string(CHECKED_PTR_OF(type, obj), \
1063                       CHECKED_I2D_OF(type, i2d), \
1064                       oct))

1066 ASN1_STRING *ASN1_item_pack(void *obj, const ASN1_ITEM *it, ASN1_OCTET_STRING **

1068 void ASN1_STRING_set_default_mask(unsigned long mask);
1069 int ASN1_STRING_set_default_mask_asc(const char *p);
1070 unsigned long ASN1_STRING_get_default_mask(void);
1071 int ASN1_mbstring_copy(ASN1_STRING **out, const unsigned char *in, int len,
1072                        int inform, unsigned long mask);
1073 int ASN1_mbstring_ncopy(ASN1_STRING **out, const unsigned char *in, int len,
1074                        int inform, unsigned long mask,
1075                        long minsize, long maxsize);

1077 ASN1_STRING *ASN1_STRING_set_by_NID(ASN1_STRING **out,
1078                                     const unsigned char *in, int inlen, int inform, int nid);
1079 ASN1_STRING_TABLE *ASN1_STRING_TABLE_get(int nid);
1080 int ASN1_STRING_TABLE_add(int, long, long, unsigned long, unsigned long);
1081 void ASN1_STRING_TABLE_cleanup(void);

1083 /* ASN1 template functions */

1085 /* Old API compatible functions */
1086 ASN1_VALUE *ASN1_item_new(const ASN1_ITEM *it);
1087 void ASN1_item_free(ASN1_VALUE *val, const ASN1_ITEM *it);
1088 ASN1_VALUE *ASN1_item_d2i(ASN1_VALUE **val, const unsigned char **in, long len,
1089 int ASN1_item_i2d(ASN1_VALUE *val, unsigned char **out, const ASN1_ITEM *it);
1090 int ASN1_item_ndef_i2d(ASN1_VALUE *val, unsigned char **out, const ASN1_ITEM *it

1092 void ASN1_add_oid_module(void);

1094 ASN1_TYPE *ASN1_generate_nconf(char *str, CONF *nconf);
1095 ASN1_TYPE *ASN1_generate_v3(char *str, X509V3_CTX *cnf);

1097 /* ASN1 Print flags */

1099 /* Indicate missing OPTIONAL fields */
1100 #define ASN1_PCTX_FLAGS_SHOW_ABSENT 0x001
1101 /* Mark start and end of SEQUENCE */
1102 #define ASN1_PCTX_FLAGS_SHOW_SEQUENCE 0x002
1103 /* Mark start and end of SEQUENCE/SET OF */
1104 #define ASN1_PCTX_FLAGS_SHOW_SSOF 0x004
1105 /* Show the ASN1 type of primitives */
1106 #define ASN1_PCTX_FLAGS_SHOW_TYPE 0x008
1107 /* Don't show ASN1 type of ANY */
1108 #define ASN1_PCTX_FLAGS_NO_ANY_TYPE 0x010
1109 /* Don't show ASN1 type of MSTRINGS */
1110 #define ASN1_PCTX_FLAGS_NO_MSTRING_TYPE 0x020
1111 /* Don't show field names in SEQUENCE */
1112 #define ASN1_PCTX_FLAGS_NO_FIELD_NAME 0x040
1113 /* Show structure names of each SEQUENCE field */
1114 #define ASN1_PCTX_FLAGS_SHOW_FIELD_STRUCT_NAME 0x080
1115 /* Don't show structure name even at top level */
1116 #define ASN1_PCTX_FLAGS_NO_STRUCT_NAME 0x100

```

```

1118 int ASN1_item_print(BIO *out, ASN1_VALUE *ifld, int indent,
1119                    const ASN1_ITEM *it, const ASN1_PCTX *pctx);
1120 ASN1_PCTX *ASN1_PCTX_new(void);
1121 void ASN1_PCTX_free(ASN1_PCTX *p);
1122 unsigned long ASN1_PCTX_get_flags(ASN1_PCTX *p);
1123 void ASN1_PCTX_set_flags(ASN1_PCTX *p, unsigned long flags);
1124 unsigned long ASN1_PCTX_get_nm_flags(ASN1_PCTX *p);
1125 void ASN1_PCTX_set_nm_flags(ASN1_PCTX *p, unsigned long flags);
1126 unsigned long ASN1_PCTX_get_cert_flags(ASN1_PCTX *p);
1127 void ASN1_PCTX_set_cert_flags(ASN1_PCTX *p, unsigned long flags);
1128 unsigned long ASN1_PCTX_get_oid_flags(ASN1_PCTX *p);
1129 void ASN1_PCTX_set_oid_flags(ASN1_PCTX *p, unsigned long flags);
1130 unsigned long ASN1_PCTX_get_str_flags(ASN1_PCTX *p);
1131 void ASN1_PCTX_set_str_flags(ASN1_PCTX *p, unsigned long flags);

1133 BIO_METHOD *BIO_f_asn1(void);

1135 BIO *BIO_new_NDEF(BIO *out, ASN1_VALUE *val, const ASN1_ITEM *it);

1137 int i2d_ASN1_bio_stream(BIO *out, ASN1_VALUE *val, BIO *in, int flags,
1138                        const ASN1_ITEM *it);
1139 int PEM_write_bio_ASN1_stream(BIO *out, ASN1_VALUE *val, BIO *in, int flags,
1140                              const char *hdr,
1141                              const ASN1_ITEM *it);
1142 int SMIME_write_ASN1(BIO *bio, ASN1_VALUE *val, BIO *data, int flags,
1143                    int ctype_nid, int econid_nid,
1144                    STACK_OF(X509_ALGOR) *mdalgs,
1145                    const ASN1_ITEM *it);
1146 ASN1_VALUE *SMIME_read_ASN1(BIO *bio, BIO **bcont, const ASN1_ITEM *it);
1147 int SMIME_crlf_copy(BIO *in, BIO *out, int flags);
1148 int SMIME_text(BIO *in, BIO *out);

1150 /* BEGIN ERROR CODES */
1151 /* The following lines are auto generated by the script mkerr.pl. Any changes
1152  * made after this point may be overwritten when the script is next run.
1153  */
1154 void ERR_load_ASN1_strings(void);

1156 /* Error codes for the ASN1 functions. */

1158 /* Function codes. */
1159 #define ASN1_F_A2D_ASN1_OBJECT 100
1160 #define ASN1_F_A2I_ASN1_ENUMERATED 101
1161 #define ASN1_F_A2I_ASN1_INTEGER 102
1162 #define ASN1_F_A2I_ASN1_STRING 103
1163 #define ASN1_F_APPEND_EXP 176
1164 #define ASN1_F_ASN1_BIT_STRING_SET_BIT 183
1165 #define ASN1_F_ASN1_CB 177
1166 #define ASN1_F_ASN1_CHECK_TLEN 104
1167 #define ASN1_F_ASN1_COLLATE_PRIMITIVE 105
1168 #define ASN1_F_ASN1_COLLECT 106
1169 #define ASN1_F_ASN1_D2I_EX_PRIMITIVE 108
1170 #define ASN1_F_ASN1_D2I_FP 109
1171 #define ASN1_F_ASN1_D2I_READ_BIO 107
1172 #define ASN1_F_ASN1_DIGEST 184
1173 #define ASN1_F_ASN1_DO_ADB 110
1174 #define ASN1_F_ASN1_DUP 111
1175 #define ASN1_F_ASN1_ENUMERATED_SET 112
1176 #define ASN1_F_ASN1_ENUMERATED_TO_BN 113
1177 #define ASN1_F_ASN1_EX_C2I 204
1178 #define ASN1_F_ASN1_FIND_END 190
1179 #define ASN1_F_ASN1_GENERALIZEDTIME_ADJ 216
1180 #define ASN1_F_ASN1_GENERALIZEDTIME_SET 185
1181 #define ASN1_F_ASN1_GENERATE_V3 178
1182 #define ASN1_F_ASN1_GET_OBJECT 114
1183 #define ASN1_F_ASN1_HEADER_NEW 115

```



```
1184 #define ASN1_F_ASN1_I2D_BIO 116
1185 #define ASN1_F_ASN1_I2D_FP 117
1186 #define ASN1_F_ASN1_INTEGER_SET 118
1187 #define ASN1_F_ASN1_INTEGER_TO_BN 119
1188 #define ASN1_F_ASN1_ITEM_D2I_FP 206
1189 #define ASN1_F_ASN1_ITEM_DUP 191
1190 #define ASN1_F_ASN1_ITEM_EX_COMBINE_NEW 121
1191 #define ASN1_F_ASN1_ITEM_EX_D2I 120
1192 #define ASN1_F_ASN1_ITEM_I2D_BIO 192
1193 #define ASN1_F_ASN1_ITEM_I2D_FP 193
1194 #define ASN1_F_ASN1_ITEM_PACK 198
1195 #define ASN1_F_ASN1_ITEM_SIGN 195
1196 #define ASN1_F_ASN1_ITEM_SIGN_CTX 220
1197 #define ASN1_F_ASN1_ITEM_UNPACK 199
1198 #define ASN1_F_ASN1_ITEM_VERIFY 197
1199 #define ASN1_F_ASN1_MBSTRING_NCOPY 122
1200 #define ASN1_F_ASN1_OBJECT_NEW 123
1201 #define ASN1_F_ASN1_OUTPUT_DATA 214
1202 #define ASN1_F_ASN1_PACK_STRING 124
1203 #define ASN1_F_ASN1_PCTX_NEW 205
1204 #define ASN1_F_ASN1_PKCS5_PBE_SET 125
1205 #define ASN1_F_ASN1_SEQ_PACK 126
1206 #define ASN1_F_ASN1_SEQ_UNPACK 127
1207 #define ASN1_F_ASN1_SIGN 128
1208 #define ASN1_F_ASN1_STR2TYPE 179
1209 #define ASN1_F_ASN1_STRING_SET 186
1210 #define ASN1_F_ASN1_STRING_TABLE_ADD 129
1211 #define ASN1_F_ASN1_STRING_TYPE_NEW 130
1212 #define ASN1_F_ASN1_TEMPLATE_EX_D2I 132
1213 #define ASN1_F_ASN1_TEMPLATE_NEW 133
1214 #define ASN1_F_ASN1_TEMPLATE_NOEXP_D2I 131
1215 #define ASN1_F_ASN1_TIME_ADJ 217
1216 #define ASN1_F_ASN1_TIME_SET 175
1217 #define ASN1_F_ASN1_TYPE_GET_INT_OCTETSTRING 134
1218 #define ASN1_F_ASN1_TYPE_GET_OCTETSTRING 135
1219 #define ASN1_F_ASN1_UNPACK_STRING 136
1220 #define ASN1_F_ASN1_UTCTIME_ADJ 218
1221 #define ASN1_F_ASN1_UTCTIME_SET 187
1222 #define ASN1_F_ASN1_VERIFY 137
1223 #define ASN1_F_B64_READ_ASN1 209
1224 #define ASN1_F_B64_WRITE_ASN1 210
1225 #define ASN1_F_BIO_NEW_NDEF 208
1226 #define ASN1_F_BITSTR_CB 180
1227 #define ASN1_F_BN_TO_ASN1_ENUMERATED 138
1228 #define ASN1_F_BN_TO_ASN1_INTEGER 139
1229 #define ASN1_F_C2I_ASN1_BIT_STRING 189
1230 #define ASN1_F_C2I_ASN1_INTEGER 194
1231 #define ASN1_F_C2I_ASN1_OBJECT 196
1232 #define ASN1_F_COLLECT_DATA 140
1233 #define ASN1_F_D2I_ASN1_BIT_STRING 141
1234 #define ASN1_F_D2I_ASN1_BOOLEAN 142
1235 #define ASN1_F_D2I_ASN1_BYTES 143
1236 #define ASN1_F_D2I_ASN1_GENERALIZEDTIME 144
1237 #define ASN1_F_D2I_ASN1_HEADER 145
1238 #define ASN1_F_D2I_ASN1_INTEGER 146
1239 #define ASN1_F_D2I_ASN1_OBJECT 147
1240 #define ASN1_F_D2I_ASN1_SET 148
1241 #define ASN1_F_D2I_ASN1_TYPE_BYTES 149
1242 #define ASN1_F_D2I_ASN1_UIINTEGER 150
1243 #define ASN1_F_D2I_ASN1_UTCTIME 151
1244 #define ASN1_F_D2I_AUTOPRIVATEKEY 207
1245 #define ASN1_F_D2I_NETSCAPE_RSA 152
1246 #define ASN1_F_D2I_NETSCAPE_RSA_2 153
1247 #define ASN1_F_D2I_PRIVATEKEY 154
1248 #define ASN1_F_D2I_PUBLICKEY 155
1249 #define ASN1_F_D2I_RSA_NET 200
```

```
1250 #define ASN1_F_D2I_RSA_NET_2 201
1251 #define ASN1_F_D2I_X509 156
1252 #define ASN1_F_D2I_X509_CINF 157
1253 #define ASN1_F_D2I_X509_PKEY 159
1254 #define ASN1_F_I2D_ASN1_BIO_STREAM 211
1255 #define ASN1_F_I2D_ASN1_SET 188
1256 #define ASN1_F_I2D_ASN1_TIME 160
1257 #define ASN1_F_I2D_DSA_PUBKEY 161
1258 #define ASN1_F_I2D_EC_PUBKEY 181
1259 #define ASN1_F_I2D_PRIVATEKEY 163
1260 #define ASN1_F_I2D_PUBLICKEY 164
1261 #define ASN1_F_I2D_RSA_NET 162
1262 #define ASN1_F_I2D_RSA_PUBKEY 165
1263 #define ASN1_F_LONG_C2I 166
1264 #define ASN1_F_OLD_MODULE_INIT 174
1265 #define ASN1_F_PARSE_TAGGING 182
1266 #define ASN1_F_PKCS5_PBE2_SET_IV 167
1267 #define ASN1_F_PKCS5_PBE_SET 202
1268 #define ASN1_F_PKCS5_PBE_SET0_ALGOR 215
1269 #define ASN1_F_PKCS5_PBKDF2_SET 219
1270 #define ASN1_F_SMIME_READ_ASN1 212
1271 #define ASN1_F_SMIME_TEXT 213
1272 #define ASN1_F_X509_CINF_NEW 168
1273 #define ASN1_F_X509_CRL_ADD0_REVOKED 169
1274 #define ASN1_F_X509_INFO_NEW 170
1275 #define ASN1_F_X509_NAME_ENCODE 203
1276 #define ASN1_F_X509_NAME_EX_D2I 158
1277 #define ASN1_F_X509_NAME_EX_NEW 171
1278 #define ASN1_F_X509_NEW 172
1279 #define ASN1_F_X509_PKEY_NEW 173

1281 /* Reason codes. */
1282 #define ASN1_R_ADDING_OBJECT 171
1283 #define ASN1_R_ASN1_PARSE_ERROR 203
1284 #define ASN1_R_ASN1_SIG_PARSE_ERROR 204
1285 #define ASN1_R_AUX_ERROR 100
1286 #define ASN1_R_BAD_CLASS 101
1287 #define ASN1_R_BAD_OBJECT_HEADER 102
1288 #define ASN1_R_BAD_PASSWORD_READ 103
1289 #define ASN1_R_BAD_TAG 104
1290 #define ASN1_R_BMPSTRING_IS_WRONG_LENGTH 214
1291 #define ASN1_R_BN_LIB 105
1292 #define ASN1_R_BOOLEAN_IS_WRONG_LENGTH 106
1293 #define ASN1_R_BUFFER_TOO_SMALL 107
1294 #define ASN1_R_CIPHER_HAS_NO_OBJECT_IDENTIFIER 108
1295 #define ASN1_R_CONTEXT_NOT_INITIALISED 217
1296 #define ASN1_R_DATA_IS_WRONG 109
1297 #define ASN1_R_DECODE_ERROR 110
1298 #define ASN1_R_DECODING_ERROR 111
1299 #define ASN1_R_DEPTH_EXCEEDED 174
1300 #define ASN1_R_DIGEST_AND_KEY_TYPE_NOT_SUPPORTED 198
1301 #define ASN1_R_ENCODE_ERROR 112
1302 #define ASN1_R_ERROR_GETTING_TIME 173
1303 #define ASN1_R_ERROR_LOADING_SECTION 172
1304 #define ASN1_R_ERROR_PARSING_SET_ELEMENT 113
1305 #define ASN1_R_ERROR_SETTING_CIPHER_PARAMS 114
1306 #define ASN1_R_EXPECTING_AN_INTEGER 115
1307 #define ASN1_R_EXPECTING_AN_OBJECT 116
1308 #define ASN1_R_EXPECTING_A_BOOLEAN 117
1309 #define ASN1_R_EXPECTING_A_TIME 118
1310 #define ASN1_R_EXPLICIT_LENGTH_MISMATCH 119
1311 #define ASN1_R_EXPLICIT_TAG_NOT_CONSTRUCTED 120
1312 #define ASN1_R_FIELD_MISSING 121
1313 #define ASN1_R_FIRST_NUM_TOO_LARGE 122
1314 #define ASN1_R_HEADER_TOO_LONG 123
1315 #define ASN1_R_ILLEGAL_BITSTRING_FORMAT 175
```

```
1316 #define ASN1_R_ILLEGAL_BOOLEAN 176
1317 #define ASN1_R_ILLEGAL_CHARACTERS 124
1318 #define ASN1_R_ILLEGAL_FORMAT 177
1319 #define ASN1_R_ILLEGAL_HEX 178
1320 #define ASN1_R_ILLEGAL_IMPLICIT_TAG 179
1321 #define ASN1_R_ILLEGAL_INTEGER 180
1322 #define ASN1_R_ILLEGAL_NESTED_TAGGING 181
1323 #define ASN1_R_ILLEGAL_NULL 125
1324 #define ASN1_R_ILLEGAL_NULL_VALUE 182
1325 #define ASN1_R_ILLEGAL_OBJECT 183
1326 #define ASN1_R_ILLEGAL_OPTIONAL_ANY 126
1327 #define ASN1_R_ILLEGAL_OPTIONS_ON_ITEM_TEMPLATE 170
1328 #define ASN1_R_ILLEGAL_TAGGED_ANY 127
1329 #define ASN1_R_ILLEGAL_TIME_VALUE 184
1330 #define ASN1_R_INTEGER_NOT_ASCII_FORMAT 185
1331 #define ASN1_R_INTEGER_TOO_LARGE_FOR_LONG 128
1332 #define ASN1_R_INVALID_BMPSTRING_LENGTH 129
1333 #define ASN1_R_INVALID_DIGIT 130
1334 #define ASN1_R_INVALID_MIME_TYPE 205
1335 #define ASN1_R_INVALID_MODIFIER 186
1336 #define ASN1_R_INVALID_NUMBER 187
1337 #define ASN1_R_INVALID_OBJECT_ENCODING 216
1338 #define ASN1_R_INVALID_SEPARATOR 131
1339 #define ASN1_R_INVALID_TIME_FORMAT 132
1340 #define ASN1_R_INVALID_UNIVERSALSTRING_LENGTH 133
1341 #define ASN1_R_INVALID_UTF8STRING 134
1342 #define ASN1_R_IV_TOO_LARGE 135
1343 #define ASN1_R_LENGTH_ERROR 136
1344 #define ASN1_R_LIST_ERROR 188
1345 #define ASN1_R_MIME_NO_CONTENT_TYPE 206
1346 #define ASN1_R_MIME_PARSE_ERROR 207
1347 #define ASN1_R_MIME_SIG_PARSE_ERROR 208
1348 #define ASN1_R_MISSING_EOC 137
1349 #define ASN1_R_MISSING_SECOND_NUMBER 138
1350 #define ASN1_R_MISSING_VALUE 189
1351 #define ASN1_R_MSTRING_NOT_UNIVERSAL 139
1352 #define ASN1_R_MSTRING_WRONG_TAG 140
1353 #define ASN1_R_NESTED_ASN1_STRING 197
1354 #define ASN1_R_NON_HEX_CHARACTERS 141
1355 #define ASN1_R_NOT_ASCII_FORMAT 190
1356 #define ASN1_R_NOT_ENOUGH_DATA 142
1357 #define ASN1_R_NO_CONTENT_TYPE 209
1358 #define ASN1_R_NO_DEFAULT_DIGEST 201
1359 #define ASN1_R_NO_MATCHING_CHOICE_TYPE 143
1360 #define ASN1_R_NO_MULTIPART_BODY_FAILURE 210
1361 #define ASN1_R_NO_MULTIPART_BOUNDARY 211
1362 #define ASN1_R_NO_SIG_CONTENT_TYPE 212
1363 #define ASN1_R_NULL_IS_WRONG_LENGTH 144
1364 #define ASN1_R_OBJECT_NOT_ASCII_FORMAT 191
1365 #define ASN1_R_ODD_NUMBER_OF_CHARS 145
1366 #define ASN1_R_PRIVATE_KEY_HEADER_MISSING 146
1367 #define ASN1_R_SECOND_NUMBER_TOO_LARGE 147
1368 #define ASN1_R_SEQUENCE_LENGTH_MISMATCH 148
1369 #define ASN1_R_SEQUENCE_NOT_CONSTRUCTED 149
1370 #define ASN1_R_SEQUENCE_OR_SET_NEEDS_CONFIG 192
1371 #define ASN1_R_SHORT_LINE 150
1372 #define ASN1_R_SIG_INVALID_MIME_TYPE 213
1373 #define ASN1_R_STREAMING_NOT_SUPPORTED 202
1374 #define ASN1_R_STRING_TOO_LONG 151
1375 #define ASN1_R_STRING_TOO_SHORT 152
1376 #define ASN1_R_TAG_VALUE_TOO_HIGH 153
1377 #define ASN1_R_THE_ASN1_OBJECT_IDENTIFIER_IS_NOT_KNOWN_FOR_THIS_MD 154
1378 #define ASN1_R_TIME_NOT_ASCII_FORMAT 193
1379 #define ASN1_R_TOO_LONG 155
1380 #define ASN1_R_TYPE_NOT_CONSTRUCTED 156
1381 #define ASN1_R_UNABLE_TO_DECODE_RSA_KEY 157
```

```
1382 #define ASN1_R_UNABLE_TO_DECODE_RSA_PRIVATE_KEY 158
1383 #define ASN1_R_UNEXPECTED_EOC 159
1384 #define ASN1_R_UNIVERSALSTRING_IS_WRONG_LENGTH 215
1385 #define ASN1_R_UNKNOWN_FORMAT 160
1386 #define ASN1_R_UNKNOWN_MESSAGE_DIGEST_ALGORITHM 161
1387 #define ASN1_R_UNKNOWN_OBJECT_TYPE 162
1388 #define ASN1_R_UNKNOWN_PUBLIC_KEY_TYPE 163
1389 #define ASN1_R_UNKNOWN_SIGNATURE_ALGORITHM 199
1390 #define ASN1_R_UNKNOWN_TAG 194
1391 #define ASN1_R_UNKNOWN_FORMAT 195
1392 #define ASN1_R_UNSUPPORTED_ANY_DEFINED_BY_TYPE 164
1393 #define ASN1_R_UNSUPPORTED_CIPHER 165
1394 #define ASN1_R_UNSUPPORTED_ENCRYPTION_ALGORITHM 166
1395 #define ASN1_R_UNSUPPORTED_PUBLIC_KEY_TYPE 167
1396 #define ASN1_R_UNSUPPORTED_TYPE 196
1397 #define ASN1_R_WRONG_PUBLIC_KEY_TYPE 200
1398 #define ASN1_R_WRONG_TAG 168
1399 #define ASN1_R_WRONG_TYPE 169
```

```
1401 #ifdef __cplusplus
1402 }
1403 #endif
1404 #endif
```

new/usr/src/lib/openssl/include/openssl/asn1_mac.h

1

```
*****
19143 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/asn1_mac.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/asn1/asn1_mac.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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57 */

59 #ifndef HEADER_ASN1_MAC_H
60 #define HEADER_ASN1_MAC_H
```

new/usr/src/lib/openssl/include/openssl/asn1_mac.h

2

```
62 #include <openssl/asn1.h>

64 #ifdef _cplusplus
65 extern "C" {
66 #endif

68 #ifndef ASN1_MAC_ERR_LIB
69 #define ASN1_MAC_ERR_LIB ERR_LIB_ASN1
70 #endif

72 #define ASN1_MAC_H_err(f,r,line) \
73     ERR_PUT_error(ASN1_MAC_ERR_LIB,(f),(r),__FILE__,(line))

75 #define M_ASN1_D2I_vars(a,type,func) \
76     ASN1_const_CTX c; \
77     type ret=NULL; \
78     \
79     c.pp=(const unsigned char **)pp; \
80     c.q=*(const unsigned char **)pp; \
81     c.error=ERR_R_NESTED_ASN1_ERROR; \
82     if ((a == NULL) || ((*a) == NULL)) \
83         { if ((ret=(type)func()) == NULL) \
84             { c.line=__LINE__; goto err; } } \
85     else ret=(*a);

87 #define M_ASN1_D2I_Init() \
88     c.p=*(const unsigned char **)pp; \
89     c.max=(length == 0)?0:(c.p+length);

91 #define M_ASN1_D2I_Finish_2(a) \
92     if (!asn1_const_Finish(&c)) \
93         { c.line=__LINE__; goto err; } \
94     *(const unsigned char **)pp=c.p; \
95     if (a != NULL) (*a)=ret; \
96     return(ret);

98 #define M_ASN1_D2I_Finish(a,func,e) \
99     M_ASN1_D2I_Finish_2(a); \
100 err:\
101     ASN1_MAC_H_err((e),c.error,c.line); \
102     asn1_add_error(*(const unsigned char **)pp,(int)(c.q- *pp)); \
103     if ((ret != NULL) && ((a == NULL) || (*a != ret))) func(ret); \
104     return(NULL)

106 #define M_ASN1_D2I_start_sequence() \
107     if (!asn1_GetSequence(&c,&length)) \
108         { c.line=__LINE__; goto err; }
109 /* Begin reading ASN1 without a surrounding sequence */
110 #define M_ASN1_D2I_begin() \
111     c.slen = length;

113 /* End reading ASN1 with no check on length */
114 #define M_ASN1_D2I_Finish_nolen(a, func, e) \
115     *pp=c.p; \
116     if (a != NULL) (*a)=ret; \
117     return(ret); \
118 err:\
119     ASN1_MAC_H_err((e),c.error,c.line); \
120     asn1_add_error(*pp,(int)(c.q- *pp)); \
121     if ((ret != NULL) && ((a == NULL) || (*a != ret))) func(ret); \
122     return(NULL)

124 #define M_ASN1_D2I_end_sequence() \
125     (((c.inf&1) == 0)?(c.slen <= 0): \
126         (c.eos=ASN1_const_check_infinite_end(&c.p,c.slen)))
```

```

128 /* Don't use this with d2i_ASN1_BOOLEAN() */
129 #define M_ASN1_D2I_get(b, func) \
130     c.q=c.p; \
131     if (func(&(b),&c.p,c.slen) == NULL) \
132         {c.line=__LINE__; goto err; } \
133     c.slen--(c.p-c.q);

135 /* Don't use this with d2i_ASN1_BOOLEAN() */
136 #define M_ASN1_D2I_get_x(type,b,func) \
137     c.q=c.p; \
138     if (((D2I_OF(type))func)(&(b),&c.p,c.slen) == NULL) \
139         {c.line=__LINE__; goto err; } \
140     c.slen--(c.p-c.q);

142 /* use this instead () */
143 #define M_ASN1_D2I_get_int(b,func) \
144     c.q=c.p; \
145     if (func(&(b),&c.p,c.slen) < 0) \
146         {c.line=__LINE__; goto err; } \
147     c.slen--(c.p-c.q);

149 #define M_ASN1_D2I_get_opt(b,func,type) \
150     if ((c.slen != 0) && ((M_ASN1_next & (~V_ASN1_CONSTRUCTED)) \
151         == (V_ASN1_UNIVERSAL|(type)))) \
152         { \
153             M_ASN1_D2I_get(b,func); \
154         }

156 #define M_ASN1_D2I_get_int_opt(b,func,type) \
157     if ((c.slen != 0) && ((M_ASN1_next & (~V_ASN1_CONSTRUCTED)) \
158         == (V_ASN1_UNIVERSAL|(type)))) \
159         { \
160             M_ASN1_D2I_get_int(b,func); \
161         }

163 #define M_ASN1_D2I_get_imp(b,func, type) \
164     M_ASN1_next=(tmp & V_ASN1_CONSTRUCTED)|type; \
165     c.q=c.p; \
166     if (func(&(b),&c.p,c.slen) == NULL) \
167         {c.line=__LINE__; M_ASN1_next_prev = tmp; goto err; } \
168     c.slen--(c.p-c.q); \
169     M_ASN1_next_prev=tmp;

171 #define M_ASN1_D2I_get_IMP_opt(b,func,tag,type) \
172     if ((c.slen != 0) && ((M_ASN1_next & (~V_ASN1_CONSTRUCTED)) == \
173         (V_ASN1_CONTEXT_SPECIFIC|(tag)))) \
174         { \
175             unsigned char tmp = M_ASN1_next; \
176             M_ASN1_D2I_get_imp(b,func, type); \
177         }

179 #define M_ASN1_D2I_get_set(r,func,free_func) \
180     M_ASN1_D2I_get_imp_set(r,func,free_func, \
181         V_ASN1_SET,V_ASN1_UNIVERSAL);

183 #define M_ASN1_D2I_get_set_type(type,r,func,free_func) \
184     M_ASN1_D2I_get_imp_set_type(type,r,func,free_func, \
185         V_ASN1_SET,V_ASN1_UNIVERSAL);

187 #define M_ASN1_D2I_get_set_opt(r,func,free_func) \
188     if ((c.slen != 0) && (M_ASN1_next == (V_ASN1_UNIVERSAL| \
189         V_ASN1_CONSTRUCTED|V_ASN1_SET))) \
190         { M_ASN1_D2I_get_set(r,func,free_func); }

192 #define M_ASN1_D2I_get_set_opt_type(type,r,func,free_func) \
193     if ((c.slen != 0) && (M_ASN1_next == (V_ASN1_UNIVERSAL| \

```

```

194         V_ASN1_CONSTRUCTED|V_ASN1_SET))) \
195         { M_ASN1_D2I_get_set_type(type,r,func,free_func); }

197 #define M_ASN1_I2D_len_SET_opt(a,f) \
198     if ((a != NULL) && (sk_num(a) != 0)) \
199         M_ASN1_I2D_len_SET(a,f);

201 #define M_ASN1_I2D_put_SET_opt(a,f) \
202     if ((a != NULL) && (sk_num(a) != 0)) \
203         M_ASN1_I2D_put_SET(a,f);

205 #define M_ASN1_I2D_put_SEQUENCE_opt(a,f) \
206     if ((a != NULL) && (sk_num(a) != 0)) \
207         M_ASN1_I2D_put_SEQUENCE(a,f);

209 #define M_ASN1_I2D_put_SEQUENCE_opt_type(type,a,f) \
210     if ((a != NULL) && (sk_#type##_num(a) != 0)) \
211         M_ASN1_I2D_put_SEQUENCE_type(type,a,f);

213 #define M_ASN1_D2I_get_IMP_set_opt(b,func,free_func,tag) \
214     if ((c.slen != 0) && \
215         (M_ASN1_next == \
216         (V_ASN1_CONTEXT_SPECIFIC|V_ASN1_CONSTRUCTED|(tag)))) \
217         { \
218             M_ASN1_D2I_get_imp_set(b,func,free_func, \
219                 tag,V_ASN1_CONTEXT_SPECIFIC); \
220         }

222 #define M_ASN1_D2I_get_IMP_set_opt_type(type,b,func,free_func,tag) \
223     if ((c.slen != 0) && \
224         (M_ASN1_next == \
225         (V_ASN1_CONTEXT_SPECIFIC|V_ASN1_CONSTRUCTED|(tag)))) \
226         { \
227             M_ASN1_D2I_get_imp_set_type(type,b,func,free_func, \
228                 tag,V_ASN1_CONTEXT_SPECIFIC); \
229         }

231 #define M_ASN1_D2I_get_seq(r,func,free_func) \
232     M_ASN1_D2I_get_imp_set(r,func,free_func, \
233         V_ASN1_SEQUENCE,V_ASN1_UNIVERSAL);

235 #define M_ASN1_D2I_get_seq_type(type,r,func,free_func) \
236     M_ASN1_D2I_get_imp_set_type(type,r,func,free_func, \
237         V_ASN1_SEQUENCE,V_ASN1_UNIVERSAL);

239 #define M_ASN1_D2I_get_seq_opt(r,func,free_func) \
240     if ((c.slen != 0) && (M_ASN1_next == (V_ASN1_UNIVERSAL| \
241         V_ASN1_CONSTRUCTED|V_ASN1_SEQUENCE))) \
242         { M_ASN1_D2I_get_seq(r,func,free_func); }

244 #define M_ASN1_D2I_get_seq_opt_type(type,r,func,free_func) \
245     if ((c.slen != 0) && (M_ASN1_next == (V_ASN1_UNIVERSAL| \
246         V_ASN1_CONSTRUCTED|V_ASN1_SEQUENCE))) \
247         { M_ASN1_D2I_get_seq_type(type,r,func,free_func); }

249 #define M_ASN1_D2I_get_IMP_set(r,func,free_func,x) \
250     M_ASN1_D2I_get_imp_set(r,func,free_func, \
251         x,V_ASN1_CONTEXT_SPECIFIC);

253 #define M_ASN1_D2I_get_IMP_set_type(type,r,func,free_func,x) \
254     M_ASN1_D2I_get_imp_set_type(type,r,func,free_func, \
255         x,V_ASN1_CONTEXT_SPECIFIC);

257 #define M_ASN1_D2I_get_imp_set(r,func,free_func,a,b) \
258     c.q=c.p; \
259     if (d2i_ASN1_SET(&(r),&c.p,c.slen,(char *(*))func, \

```

```

260         (void (*)())free_func,a,b) == NULL) \
261         { c.line=__LINE__; goto err; } \
262         c.slen--(c.p-c.q);

264 #define M_ASN1_D2I_get_imp_set_type(type,r,func,free_func,a,b) \
265         c.q=c.p; \
266         if (d2i_ASN1_SET_OF_##type(&r,&c.p,c.slen,func, \
267                                     free_func,a,b) == NULL) \
268         { c.line=__LINE__; goto err; } \
269         c.slen--(c.p-c.q);

271 #define M_ASN1_D2I_get_set_strings(r,func,a,b) \
272         c.q=c.p; \
273         if (d2i_ASN1_STRING_SET(&r,&c.p,c.slen,a,b) == NULL) \
274         { c.line=__LINE__; goto err; } \
275         c.slen--(c.p-c.q);

277 #define M_ASN1_D2I_get_EXP_opt(r,func,tag) \
278         if ((c.slen != 0L) && (M_ASN1_next == \
279             (V_ASN1_CONSTRUCTED|V_ASN1_CONTEXT_SPECIFIC|tag))) \
280         { \
281             int Tinf,Ttag,Tclass; \
282             long Tlen; \
283             \
284             c.q=c.p; \
285             Tinf=ASN1_get_object(&c.p,&Tlen,&Ttag,&Tclass,c.slen); \
286             if (Tinf & 0x80) \
287             { c.error=ERR_R_BAD_ASN1_OBJECT_HEADER; \
288               c.line=__LINE__; goto err; } \
289             if (Tinf == (V_ASN1_CONSTRUCTED+1)) \
290             { Tlen = c.slen - (c.p - c.q) - 2; \
291               if (func(&r,&c.p,Tlen) == NULL) \
292               { c.line=__LINE__; goto err; } \
293               if (Tinf == (V_ASN1_CONSTRUCTED+1)) { \
294                 Tlen = c.slen - (c.p - c.q); \
295                 if(!ASN1_const_check_infinite_end(&c.p, Tlen)) \
296                 { c.error=ERR_R_MISSING_ASN1_EOS; \
297                   c.line=__LINE__; goto err; } \
298               } \
299               c.slen--(c.p-c.q); \
300             } \
301         }

302 #define M_ASN1_D2I_get_EXP_set_opt(r,func,free_func,tag,b) \
303         if ((c.slen != 0) && (M_ASN1_next == \
304             (V_ASN1_CONSTRUCTED|V_ASN1_CONTEXT_SPECIFIC|tag))) \
305         { \
306             int Tinf,Ttag,Tclass; \
307             long Tlen; \
308             \
309             c.q=c.p; \
310             Tinf=ASN1_get_object(&c.p,&Tlen,&Ttag,&Tclass,c.slen); \
311             if (Tinf & 0x80) \
312             { c.error=ERR_R_BAD_ASN1_OBJECT_HEADER; \
313               c.line=__LINE__; goto err; } \
314             if (Tinf == (V_ASN1_CONSTRUCTED+1)) \
315             { Tlen = c.slen - (c.p - c.q) - 2; \
316               if (d2i_ASN1_SET(&r,&c.p,Tlen,(char *())func, \
317                               (void *())free_func, \
318                               b,V_ASN1_UNIVERSAL) == NULL) \
319               { c.line=__LINE__; goto err; } \
320               if (Tinf == (V_ASN1_CONSTRUCTED+1)) { \
321                 Tlen = c.slen - (c.p - c.q); \
322                 if(!ASN1_check_infinite_end(&c.p, Tlen)) \
323                 { c.error=ERR_R_MISSING_ASN1_EOS; \
324                   c.line=__LINE__; goto err; } \
325               } \
326             } \
327         }

```

```

326         c.slen--(c.p-c.q); \
327         }

329 #define M_ASN1_D2I_get_EXP_set_opt_type(type,r,func,free_func,tag,b) \
330         if ((c.slen != 0) && (M_ASN1_next == \
331             (V_ASN1_CONSTRUCTED|V_ASN1_CONTEXT_SPECIFIC|tag))) \
332         { \
333             int Tinf,Ttag,Tclass; \
334             long Tlen; \
335             \
336             c.q=c.p; \
337             Tinf=ASN1_get_object(&c.p,&Tlen,&Ttag,&Tclass,c.slen); \
338             if (Tinf & 0x80) \
339             { c.error=ERR_R_BAD_ASN1_OBJECT_HEADER; \
340               c.line=__LINE__; goto err; } \
341             if (Tinf == (V_ASN1_CONSTRUCTED+1)) \
342             { Tlen = c.slen - (c.p - c.q) - 2; \
343               if (d2i_ASN1_SET_OF_##type(&r,&c.p,Tlen,func, \
344                                       free_func,b,V_ASN1_UNIVERSAL) == NULL) \
345               { c.line=__LINE__; goto err; } \
346               if (Tinf == (V_ASN1_CONSTRUCTED+1)) { \
347                 Tlen = c.slen - (c.p - c.q); \
348                 if(!ASN1_check_infinite_end(&c.p, Tlen)) \
349                 { c.error=ERR_R_MISSING_ASN1_EOS; \
350                   c.line=__LINE__; goto err; } \
351               } \
352               c.slen--(c.p-c.q); \
353             } \
354         }

355 /* New macros */
356 #define M_ASN1_New_Malloc(ret,type) \
357         if ((ret=(type *)OPENSSL_malloc(sizeof(type))) == NULL) \
358         { c.line=__LINE__; goto err2; }

360 #define M_ASN1_New(arg,func) \
361         if (((arg)=func()) == NULL) return(NULL)

363 #define M_ASN1_New_Error(a) \
364 /* err: ASN1_MAC_H_err((a),ERR_R_NESTED_ASN1_ERROR,c.line); \
365         return(NULL); */ \
366         err2: ASN1_MAC_H_err((a),ERR_R_MALLOC_FAILURE,c.line); \
367         return(NULL)

370 /* BIG UGLY WARNING! This is so damn ugly I wanna puke. Unfortunately,
371     some macros that use ASN1_const_CTX still insist on writing in the input
372     stream. ARGH! ARGH! ARGH! Let's get rid of this macro package.
373     Please? -- Richard Levitte */
374 #define M_ASN1_next ((unsigned char *) (c.p))
375 #define M_ASN1_next_prev ((unsigned char *) (c.q))

377 /*****

379 #define M_ASN1_I2D_vars(a) int r=0,ret=0; \
380                          unsigned char *p; \
381                          if (a == NULL) return(0)

383 /* Length Macros */
384 #define M_ASN1_I2D_len(a,f) ret+=f(a,NULL)
385 #define M_ASN1_I2D_len_IMP_opt(a,f) if (a != NULL) M_ASN1_I2D_len(a,f)

387 #define M_ASN1_I2D_len_SET(a,f) \
388         ret+=i2d_ASN1_SET(a,NULL,f,V_ASN1_SET,V_ASN1_UNIVERSAL,IS_SET);

390 #define M_ASN1_I2D_len_SET_type(type,a,f) \
391         ret+=i2d_ASN1_SET_OF_##type(a,NULL,f,V_ASN1_SET, \

```

```

392             V_ASN1_UNIVERSAL, IS_SET);

394 #define M_ASN1_I2D_len_SEQUENCE(a,f) \
395     ret+=i2d_ASN1_SET(a,NULL,f,V_ASN1_SEQUENCE,V_ASN1_UNIVERSAL, \
396         IS_SEQUENCE);

398 #define M_ASN1_I2D_len_SEQUENCE_type(type,a,f) \
399     ret+=i2d_ASN1_SET_OF_##type(a,NULL,f,V_ASN1_SEQUENCE, \
400         V_ASN1_UNIVERSAL,IS_SEQUENCE)

402 #define M_ASN1_I2D_len_SEQUENCE_opt(a,f) \
403     if ((a != NULL) && (sk_num(a) != 0)) \
404         M_ASN1_I2D_len_SEQUENCE(a,f);

406 #define M_ASN1_I2D_len_SEQUENCE_opt_type(type,a,f) \
407     if ((a != NULL) && (sk_##type##_num(a) != 0)) \
408         M_ASN1_I2D_len_SEQUENCE_type(type,a,f);

410 #define M_ASN1_I2D_len_IMP_SET(a,f,x) \
411     ret+=i2d_ASN1_SET(a,NULL,f,x,V_ASN1_CONTEXT_SPECIFIC,IS_SET);

413 #define M_ASN1_I2D_len_IMP_SET_type(type,a,f,x) \
414     ret+=i2d_ASN1_SET_OF_##type(a,NULL,f,x, \
415         V_ASN1_CONTEXT_SPECIFIC,IS_SET);

417 #define M_ASN1_I2D_len_IMP_SET_opt(a,f,x) \
418     if ((a != NULL) && (sk_num(a) != 0)) \
419         ret+=i2d_ASN1_SET(a,NULL,f,x,V_ASN1_CONTEXT_SPECIFIC, \
420             IS_SET);

422 #define M_ASN1_I2D_len_IMP_SET_opt_type(type,a,f,x) \
423     if ((a != NULL) && (sk_##type##_num(a) != 0)) \
424         ret+=i2d_ASN1_SET_OF_##type(a,NULL,f,x, \
425             V_ASN1_CONTEXT_SPECIFIC,IS_SET);

427 #define M_ASN1_I2D_len_IMP_SEQUENCE(a,f,x) \
428     ret+=i2d_ASN1_SET(a,NULL,f,x,V_ASN1_CONTEXT_SPECIFIC, \
429         IS_SEQUENCE);

431 #define M_ASN1_I2D_len_IMP_SEQUENCE_opt(a,f,x) \
432     if ((a != NULL) && (sk_num(a) != 0)) \
433         ret+=i2d_ASN1_SET(a,NULL,f,x,V_ASN1_CONTEXT_SPECIFIC, \
434             IS_SEQUENCE);

436 #define M_ASN1_I2D_len_IMP_SEQUENCE_opt_type(type,a,f,x) \
437     if ((a != NULL) && (sk_##type##_num(a) != 0)) \
438         ret+=i2d_ASN1_SET_OF_##type(a,NULL,f,x, \
439             V_ASN1_CONTEXT_SPECIFIC, \
440             IS_SEQUENCE);

442 #define M_ASN1_I2D_len_EXP_opt(a,f,mtag,v) \
443     if (a != NULL) \
444     { \
445         v=f(a,NULL); \
446         ret+=ASN1_object_size(1,v,mtag); \
447     }

449 #define M_ASN1_I2D_len_EXP_SET_opt(a,f,mtag,tag,v) \
450     if ((a != NULL) && (sk_num(a) != 0)) \
451     { \
452         v=i2d_ASN1_SET(a,NULL,f,tag,V_ASN1_UNIVERSAL,IS_SET); \
453         ret+=ASN1_object_size(1,v,mtag); \
454     }

456 #define M_ASN1_I2D_len_EXP_SEQUENCE_opt(a,f,mtag,tag,v) \
457     if ((a != NULL) && (sk_num(a) != 0)) \

```

```

458     { \
459         v=i2d_ASN1_SET(a,NULL,f,tag,V_ASN1_UNIVERSAL, \
460             IS_SEQUENCE); \
461         ret+=ASN1_object_size(1,v,mtag); \
462     }

464 #define M_ASN1_I2D_len_EXP_SEQUENCE_opt_type(type,a,f,mtag,tag,v) \
465     if ((a != NULL) && (sk_##type##_num(a) != 0)) \
466     { \
467         v=i2d_ASN1_SET_OF_##type(a,NULL,f,tag, \
468             V_ASN1_UNIVERSAL, \
469             IS_SEQUENCE); \
470         ret+=ASN1_object_size(1,v,mtag); \
471     }

473 /* Put Macros */
474 #define M_ASN1_I2D_put(a,f)      f(a,&p)

476 #define M_ASN1_I2D_put_IMP_opt(a,f,t) \
477     if (a != NULL) \
478     { \
479         unsigned char *q=p; \
480         f(a,&p); \
481         *q=(V_ASN1_CONTEXT_SPECIFIC|t|(*q&V_ASN1_CONSTRUCTED)); \
482     }

484 #define M_ASN1_I2D_put_SET(a,f) i2d_ASN1_SET(a,&p,f,V_ASN1_SET, \
485     V_ASN1_UNIVERSAL,IS_SET)
486 #define M_ASN1_I2D_put_SET_type(type,a,f) \
487     i2d_ASN1_SET_OF_##type(a,&p,f,V_ASN1_SET,V_ASN1_UNIVERSAL,IS_SET)
488 #define M_ASN1_I2D_put_IMP_SET(a,f,x) i2d_ASN1_SET(a,&p,f,x, \
489     V_ASN1_CONTEXT_SPECIFIC,IS_SET)
490 #define M_ASN1_I2D_put_IMP_SET_type(type,a,f,x) \
491     i2d_ASN1_SET_OF_##type(a,&p,f,x,V_ASN1_CONTEXT_SPECIFIC,IS_SET)
492 #define M_ASN1_I2D_put_IMP_SEQUENCE(a,f,x) i2d_ASN1_SET(a,&p,f,x, \
493     V_ASN1_CONTEXT_SPECIFIC,IS_SEQUENCE)

495 #define M_ASN1_I2D_put_SEQUENCE(a,f) i2d_ASN1_SET(a,&p,f,V_ASN1_SEQUENCE, \
496     V_ASN1_UNIVERSAL,IS_SEQUENCE)

498 #define M_ASN1_I2D_put_SEQUENCE_type(type,a,f) \
499     i2d_ASN1_SET_OF_##type(a,&p,f,V_ASN1_SEQUENCE,V_ASN1_UNIVERSAL, \
500     IS_SEQUENCE)

502 #define M_ASN1_I2D_put_SEQUENCE_opt(a,f) \
503     if ((a != NULL) && (sk_num(a) != 0)) \
504         M_ASN1_I2D_put_SEQUENCE(a,f);

506 #define M_ASN1_I2D_put_IMP_SET_opt(a,f,x) \
507     if ((a != NULL) && (sk_num(a) != 0)) \
508     { \
509         i2d_ASN1_SET(a,&p,f,x,V_ASN1_CONTEXT_SPECIFIC, \
510             IS_SET); \
511     }

512 #define M_ASN1_I2D_put_IMP_SET_opt_type(type,a,f,x) \
513     if ((a != NULL) && (sk_##type##_num(a) != 0)) \
514     { \
515         i2d_ASN1_SET_OF_##type(a,&p,f,x, \
516             V_ASN1_CONTEXT_SPECIFIC, \
517             IS_SET); \
518     }

517 #define M_ASN1_I2D_put_IMP_SEQUENCE_opt(a,f,x) \
518     if ((a != NULL) && (sk_num(a) != 0)) \
519     { \
520         i2d_ASN1_SET(a,&p,f,x,V_ASN1_CONTEXT_SPECIFIC, \
521             IS_SEQUENCE); \
522     }

522 #define M_ASN1_I2D_put_IMP_SEQUENCE_opt_type(type,a,f,x) \
523     if ((a != NULL) && (sk_##type##_num(a) != 0)) \

```

```
524         { i2d_ASN1_SET_OF_##type(a,&p,f,x, \
525                                     V_ASN1_CONTEXT_SPECIFIC, \
526                                     IS_SEQUENCE); }

528 #define M_ASN1_I2D_put_EXP_opt(a,f,tag,v) \
529     if (a != NULL) \
530     { \
531         ASN1_put_object(&p,1,v,tag,V_ASN1_CONTEXT_SPECIFIC); \
532         f(a,&p); \
533     }

535 #define M_ASN1_I2D_put_EXP_SET_opt(a,f,mtag,tag,v) \
536     if ((a != NULL) && (sk_num(a) != 0)) \
537     { \
538         ASN1_put_object(&p,1,v,mtag,V_ASN1_CONTEXT_SPECIFIC); \
539         i2d_ASN1_SET(a,&p,f,tag,V_ASN1_UNIVERSAL,IS_SET); \
540     }

542 #define M_ASN1_I2D_put_EXP_SEQUENCE_opt(a,f,mtag,tag,v) \
543     if ((a != NULL) && (sk_num(a) != 0)) \
544     { \
545         ASN1_put_object(&p,1,v,mtag,V_ASN1_CONTEXT_SPECIFIC); \
546         i2d_ASN1_SET(a,&p,f,tag,V_ASN1_UNIVERSAL,IS_SEQUENCE); \
547     }

549 #define M_ASN1_I2D_put_EXP_SEQUENCE_opt_type(type,a,f,mtag,tag,v) \
550     if ((a != NULL) && (sk_##type##_num(a) != 0)) \
551     { \
552         ASN1_put_object(&p,1,v,mtag,V_ASN1_CONTEXT_SPECIFIC); \
553         i2d_ASN1_SET_OF_##type(a,&p,f,tag,V_ASN1_UNIVERSAL, \
554                                IS_SEQUENCE); \
555     }

557 #define M_ASN1_I2D_seq_total() \
558     r=ASN1_object_size(1,ret,V_ASN1_SEQUENCE); \
559     if (pp == NULL) return(r); \
560     p= *pp; \
561     ASN1_put_object(&p,1,ret,V_ASN1_SEQUENCE,V_ASN1_UNIVERSAL)

563 #define M_ASN1_I2D_INF_seq_start(tag,ctx) \
564     *(p++)=(V_ASN1_CONSTRUCTED|(tag)|(ctx)); \
565     *(p++)=0x80

567 #define M_ASN1_I2D_INF_seq_end() *(p++)=0x00; *(p++)=0x00

569 #define M_ASN1_I2D_finish()    *pp=p; \
570     return(r);

572 int asn1_GetSequence(ASN1_const_CTX *c, long *length);
573 void asn1_add_error(const unsigned char *address,int offset);
574 #ifdef __cplusplus
575 }
576 #endif
578 #endif
```

new/usr/src/lib/openssl/include/openssl/asn1t.h

1

```
*****
30092 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/asn1t.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* asn1t.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000-2005 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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14  *
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19  *
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42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57 #ifndef HEADER_ASN1T_H
58 #define HEADER_ASN1T_H
59
61 #include <stddef.h>
```

new/usr/src/lib/openssl/include/openssl/asn1t.h

2

```
62 #include <openssl/e_os2.h>
63 #include <openssl/asn1.h>
64
65 #ifdef OPENSSL_BUILD_SHLIBCRYPTO
66 # undef OPENSSL_EXTERN
67 # define OPENSSL_EXTERN OPENSSL_EXPORT
68 #endif
69
70 /* ASN1 template defines, structures and functions */
71
72 #ifdef __cplusplus
73 extern "C" {
74 #endif
75
76 #ifndef OPENSSL_EXPORT_VAR_AS_FUNCTION
77
78 /* Macro to obtain ASN1_ADB pointer from a type (only used internally) */
79 #define ASN1_ADB_ptr(iptr) ((const ASN1_ADB *) (iptr))
80
81 /* Macros for start and end of ASN1_ITEM definition */
82
83 #define ASN1_ITEM_start(itname) \
84     OPENSSL_GLOBAL const ASN1_ITEM itname##_it = {
85
86 #define ASN1_ITEM_end(itname) \
87     };
88
89 #else
90
91 /* Macro to obtain ASN1_ADB pointer from a type (only used internally) */
92 #define ASN1_ADB_ptr(iptr) ((const ASN1_ADB *) (iptr))
93
94 /* Macros for start and end of ASN1_ITEM definition */
95
96 #define ASN1_ITEM_start(itname) \
97     const ASN1_ITEM * itname##_it(void) \
98     { \
99         static const ASN1_ITEM local_it = {
100
101 #define ASN1_ITEM_end(itname) \
102         }; \
103         return &local_it; \
104     }
105
106 #endif
107
108 /* Macros to aid ASN1 template writing */
109
110 #define ASN1_ITEM_TEMPLATE(tname) \
111     static const ASN1_TEMPLATE tname##_item_tt
112
113 #define ASN1_ITEM_TEMPLATE_END(tname) \
114     ;\
115     ASN1_ITEM_start(tname) \
116     ASN1_ITYPE_PRIMITIVE,\
117     -1,\
118     &tname##_item_tt,\
119     0,\
120     NULL,\
121     0,\
122     #tname \
123     ASN1_ITEM_end(tname)
```



```

130 /* This is a ASN1 type which just embeds a template */
131
132 /* This pair helps declare a SEQUENCE. We can do:
133 *
134 *     ASN1_SEQUENCE(stname) = {
135 *         ... SEQUENCE components ...
136 *     } ASN1_SEQUENCE_END(stname)
137 *
138 * This will produce an ASN1_ITEM called stname_it
139 * for a structure called stname.
140 *
141 * If you want the same structure but a different
142 * name then use:
143 *
144 *     ASN1_SEQUENCE(itname) = {
145 *         ... SEQUENCE components ...
146 *     } ASN1_SEQUENCE_END_name(stname, itname)
147 *
148 * This will create an item called itname_it using
149 * a structure called stname.
150 */
151
152 #define ASN1_SEQUENCE(tname) \
153     static const ASN1_TEMPLATE tname##_seq_tt[]
154
155 #define ASN1_SEQUENCE_END(stname) ASN1_SEQUENCE_END_name(stname, stname)
156
157 #define ASN1_SEQUENCE_END_name(stname, tname) \
158     ;\
159     ASN1_ITEM_start(tname) \
160         ASN1_ITYPE_SEQUENCE,\
161         V_ASN1_SEQUENCE,\
162         tname##_seq_tt,\
163         sizeof(tname##_seq_tt) / sizeof(ASN1_TEMPLATE),\
164         NULL,\
165         sizeof(stname),\
166         #stname \
167     ASN1_ITEM_end(tname)
168
169 #define ASN1_NDEF_SEQUENCE(tname) \
170     ASN1_SEQUENCE(tname)
171
172 #define ASN1_NDEF_SEQUENCE_cb(tname, cb) \
173     ASN1_SEQUENCE_cb(tname, cb)
174
175 #define ASN1_SEQUENCE_cb(tname, cb) \
176     static const ASN1_AUX tname##_aux = {NULL, 0, 0, 0, cb, 0}; \
177     ASN1_SEQUENCE(tname)
178
179 #define ASN1_BROKEN_SEQUENCE(tname) \
180     static const ASN1_AUX tname##_aux = {NULL, ASN1_AFLG_BROKEN, 0, 0, 0, 0} \
181     ASN1_SEQUENCE(tname)
182
183 #define ASN1_SEQUENCE_ref(tname, cb, lck) \
184     static const ASN1_AUX tname##_aux = {NULL, ASN1_AFLG_REFCOUNT, offsetof( \
185     ASN1_SEQUENCE(tname)
186
187 #define ASN1_SEQUENCE_enc(tname, enc, cb) \
188     static const ASN1_AUX tname##_aux = {NULL, ASN1_AFLG_ENCODING, 0, 0, cb, \
189     ASN1_SEQUENCE(tname)
190
191 #define ASN1_NDEF_SEQUENCE_END(tname) \
192     ;\
193     ASN1_ITEM_start(tname) \

```

```

194         ASN1_ITYPE_NDEF_SEQUENCE,\
195         V_ASN1_SEQUENCE,\
196         tname##_seq_tt,\
197         sizeof(tname##_seq_tt) / sizeof(ASN1_TEMPLATE),\
198         NULL,\
199         sizeof(tname),\
200         #tname \
201     ASN1_ITEM_end(tname)
202
203 #define ASN1_BROKEN_SEQUENCE_END(stname) ASN1_SEQUENCE_END_ref(stname, stname)
204
205 #define ASN1_SEQUENCE_END_enc(stname, tname) ASN1_SEQUENCE_END_ref(stname, tname)
206
207 #define ASN1_SEQUENCE_END_cb(stname, tname) ASN1_SEQUENCE_END_ref(stname, tname)
208
209 #define ASN1_SEQUENCE_END_ref(stname, tname) \
210     ;\
211     ASN1_ITEM_start(tname) \
212         ASN1_ITYPE_SEQUENCE,\
213         V_ASN1_SEQUENCE,\
214         tname##_seq_tt,\
215         sizeof(tname##_seq_tt) / sizeof(ASN1_TEMPLATE),\
216         &tname##_aux,\
217         sizeof(stname),\
218         #stname \
219     ASN1_ITEM_end(tname)
220
221 #define ASN1_NDEF_SEQUENCE_END_cb(stname, tname) \
222     ;\
223     ASN1_ITEM_start(tname) \
224         ASN1_ITYPE_NDEF_SEQUENCE,\
225         V_ASN1_SEQUENCE,\
226         tname##_seq_tt,\
227         sizeof(tname##_seq_tt) / sizeof(ASN1_TEMPLATE),\
228         &tname##_aux,\
229         sizeof(stname),\
230         #stname \
231     ASN1_ITEM_end(tname)
232
233 /* This pair helps declare a CHOICE type. We can do:
234 *
235 *     ASN1_CHOICE(chname) = {
236 *         ... CHOICE options ...
237 *     } ASN1_CHOICE_END(chname)
238 *
239 * This will produce an ASN1_ITEM called chname_it
240 * for a structure called chname. The structure
241 * definition must look like this:
242 * typedef struct {
243 *     int type;
244 *     union {
245 *         ASN1_SOMETHING *opt1;
246 *         ASN1_SOMEOTHER *opt2;
247 *     } value;
248 * } chname;
249 *
250 * the name of the selector must be 'type'.
251 * to use an alternative selector name use the
252 * ASN1_CHOICE_END_selector() version.
253 */
254
255 #define ASN1_CHOICE(tname) \
256     static const ASN1_TEMPLATE tname##_ch_tt[]
257
258 #define ASN1_CHOICE_cb(tname, cb) \

```

```

260 static const ASN1_AUX tname##_aux = {NULL, 0, 0, 0, cb, 0}; \
261 ASN1_CHOICE(tname)

263 #define ASN1_CHOICE_END(stname) ASN1_CHOICE_END_name(stname, stname)

265 #define ASN1_CHOICE_END_name(stname, tname) ASN1_CHOICE_END_selector(stname, tname)

267 #define ASN1_CHOICE_END_selector(stname, tname, selname) \
268 ;\
269 ASN1_ITEM_start(tname) \
270     ASN1_ITYPE_CHOICE,\
271     offsetof(stname,selname) ,\
272     tname##_ch_tt,\
273     sizeof(tname##_ch_tt) / sizeof(ASN1_TEMPLATE),\
274     NULL,\
275     sizeof(stname),\
276     #stname \
277     ASN1_ITEM_end(tname)

279 #define ASN1_CHOICE_END_cb(stname, tname, selname) \
280 ;\
281 ASN1_ITEM_start(tname) \
282     ASN1_ITYPE_CHOICE,\
283     offsetof(stname,selname) ,\
284     tname##_ch_tt,\
285     sizeof(tname##_ch_tt) / sizeof(ASN1_TEMPLATE),\
286     &tname##_aux,\
287     sizeof(stname),\
288     #stname \
289     ASN1_ITEM_end(tname)

291 /* This helps with the template wrapper form of ASN1_ITEM */

293 #define ASN1_EX_TEMPLATE_TYPE(flags, tag, name, type) { \
294     (flags), (tag), 0,\
295     #name, ASN1_ITEM_ref(type) }

297 /* These help with SEQUENCE or CHOICE components */

299 /* used to declare other types */

301 #define ASN1_EX_TYPE(flags, tag, stname, field, type) { \
302     (flags), (tag), offsetof(stname, field),\
303     #field, ASN1_ITEM_ref(type) }

305 /* used when the structure is combined with the parent */

307 #define ASN1_EX_COMBINE(flags, tag, type) { \
308     (flags)|ASN1_TFLG_COMBINE, (tag), 0, NULL, ASN1_ITEM_ref(type) }

310 /* implicit and explicit helper macros */

312 #define ASN1_IMP_EX(stname, field, type, tag, ex) \
313     ASN1_EX_TYPE(ASN1_TFLG_IMPLICIT | ex, tag, stname, field, type)

315 #define ASN1_EXP_EX(stname, field, type, tag, ex) \
316     ASN1_EX_TYPE(ASN1_TFLG_EXPLICIT | ex, tag, stname, field, type)

318 /* Any defined by macros: the field used is in the table itself */

320 #ifndef OPENSSL_EXPORT_VAR_AS_FUNCTION
321 #define ASN1_ADB_OBJECT(tblname) { ASN1_TFLG_ADB_OID, -1, 0, #tblname, (const AS
322 #define ASN1_ADB_INTEGER(tblname) { ASN1_TFLG_ADB_INT, -1, 0, #tblname, (const A
323 #else
324 #define ASN1_ADB_OBJECT(tblname) { ASN1_TFLG_ADB_OID, -1, 0, #tblname, tblname##
325 #define ASN1_ADB_INTEGER(tblname) { ASN1_TFLG_ADB_INT, -1, 0, #tblname, tblname##

```

```

326 #endif
327 /* Plain simple type */
328 #define ASN1_SIMPLE(stname, field, type) ASN1_EX_TYPE(0,0, stname, field, type)

330 /* OPTIONAL simple type */
331 #define ASN1_OPT(stname, field, type) ASN1_EX_TYPE(ASN1_TFLG_OPTIONAL, 0, stname

333 /* IMPLICIT tagged simple type */
334 #define ASN1_IMP(stname, field, type, tag) ASN1_IMP_EX(stname, field, type, tag,

336 /* IMPLICIT tagged OPTIONAL simple type */
337 #define ASN1_IMP_OPT(stname, field, type, tag) ASN1_IMP_EX(stname, field, type,

339 /* Same as above but EXPLICIT */

341 #define ASN1_EXP(stname, field, type, tag) ASN1_EXP_EX(stname, field, type, tag,
342 #define ASN1_EXP_OPT(stname, field, type, tag) ASN1_EXP_EX(stname, field, type,

344 /* SEQUENCE OF type */
345 #define ASN1_SEQUENCE_OF(stname, field, type) \
346     ASN1_EX_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, stname, field, type)

348 /* OPTIONAL SEQUENCE OF */
349 #define ASN1_SEQUENCE_OF_OPT(stname, field, type) \
350     ASN1_EX_TYPE(ASN1_TFLG_SEQUENCE_OF|ASN1_TFLG_OPTIONAL, 0, stname

352 /* Same as above but for SET OF */

354 #define ASN1_SET_OF(stname, field, type) \
355     ASN1_EX_TYPE(ASN1_TFLG_SET_OF, 0, stname, field, type)

357 #define ASN1_SET_OF_OPT(stname, field, type) \
358     ASN1_EX_TYPE(ASN1_TFLG_SET_OF|ASN1_TFLG_OPTIONAL, 0, stname, fie

360 /* Finally compound types of SEQUENCE, SET, IMPLICIT, EXPLICIT and OPTIONAL */

362 #define ASN1_IMP_SET_OF(stname, field, type, tag) \
363     ASN1_IMP_EX(stname, field, type, tag, ASN1_TFLG_SET_OF)

365 #define ASN1_EXP_SET_OF(stname, field, type, tag) \
366     ASN1_EXP_EX(stname, field, type, tag, ASN1_TFLG_SET_OF)

368 #define ASN1_IMP_SET_OF_OPT(stname, field, type, tag) \
369     ASN1_IMP_EX(stname, field, type, tag, ASN1_TFLG_SET_OF|A

371 #define ASN1_EXP_SET_OF_OPT(stname, field, type, tag) \
372     ASN1_EXP_EX(stname, field, type, tag, ASN1_TFLG_SET_OF|A

374 #define ASN1_IMP_SEQUENCE_OF(stname, field, type, tag) \
375     ASN1_IMP_EX(stname, field, type, tag, ASN1_TFLG_SEQUENCE

377 #define ASN1_IMP_SEQUENCE_OF_OPT(stname, field, type, tag) \
378     ASN1_IMP_EX(stname, field, type, tag, ASN1_TFLG_SEQUENCE

380 #define ASN1_EXP_SEQUENCE_OF(stname, field, type, tag) \
381     ASN1_EXP_EX(stname, field, type, tag, ASN1_TFLG_SEQUENCE

383 #define ASN1_EXP_SEQUENCE_OF_OPT(stname, field, type, tag) \
384     ASN1_EXP_EX(stname, field, type, tag, ASN1_TFLG_SEQUENCE

386 /* EXPLICIT using indefinite length constructed form */
387 #define ASN1_NDEF_EXP(stname, field, type, tag) \
388     ASN1_EXP_EX(stname, field, type, tag, ASN1_TFLG_NDEF)

390 /* EXPLICIT OPTIONAL using indefinite length constructed form */
391 #define ASN1_NDEF_EXP_OPT(stname, field, type, tag) \

```

```

392 ASN1_EXP_EX(stname, field, type, tag, ASN1_TFLG_OPTIONAL
394 /* Macros for the ASN1_ADB structure */
396 #define ASN1_ADB(name) \
397     static const ASN1_ADB_TABLE name##_adbtbl[]
399 #ifndef OPENSSL_EXPORT_VAR_AS_FUNCTION
401 #define ASN1_ADB_END(name, flags, field, app_table, def, none) \
402     ;\
403     static const ASN1_ADB name##_adb = {\
404         flags,\
405         offsetof(name, field),\
406         app_table,\
407         name##_adbtbl,\
408         sizeof(name##_adbtbl) / sizeof(ASN1_ADB_TABLE),\
409         def,\
410         none\
411     }
413 #else
415 #define ASN1_ADB_END(name, flags, field, app_table, def, none) \
416     ;\
417     static const ASN1_ITEM *name##_adb(void) \
418     {\
419         static const ASN1_ADB internal_adb = \
420             {\
421                 flags,\
422                 offsetof(name, field),\
423                 app_table,\
424                 name##_adbtbl,\
425                 sizeof(name##_adbtbl) / sizeof(ASN1_ADB_TABLE),\
426                 def,\
427                 none\
428             };\
429         return (const ASN1_ITEM *) &internal_adb; \
430     } \
431     void dummy_function(void)
433 #endif
435 #define ADB_ENTRY(val, template) {val, template}
437 #define ASN1_ADB_TEMPLATE(name) \
438     static const ASN1_TEMPLATE name##_tt
440 /* This is the ASN1 template structure that defines
441  * a wrapper round the actual type. It determines the
442  * actual position of the field in the value structure,
443  * various flags such as OPTIONAL and the field name.
444  */
446 struct ASN1_TEMPLATE_st {
447     unsigned long flags; /* Various flags */
448     long tag; /* tag, not used if no tagging */
449     unsigned long offset; /* Offset of this field in structure */
450 #ifndef NO_ASN1_FIELD_NAMES
451     const char *field_name; /* Field name */
452 #endif
453     ASN1_ITEM_EXP *item; /* Relevant ASN1_ITEM or ASN1_ADB */
454 };
456 /* Macro to extract ASN1_ITEM and ASN1_ADB pointer from ASN1_TEMPLATE */

```

```

458 #define ASN1_TEMPLATE_item(t) (t->item_ptr)
459 #define ASN1_TEMPLATE_adb(t) (t->item_ptr)
461 typedef struct ASN1_ADB_TABLE_st ASN1_ADB_TABLE;
462 typedef struct ASN1_ADB_st ASN1_ADB;
464 struct ASN1_ADB_st {
465     unsigned long flags; /* Various flags */
466     unsigned long offset; /* Offset of selector field */
467     STACK_OF(ASN1_ADB_TABLE) **app_items; /* Application defined items */
468     const ASN1_ADB_TABLE *tbl; /* Table of possible types */
469     long tblcount; /* Number of entries in tbl */
470     const ASN1_TEMPLATE *default_tt; /* Type to use if no match */
471     const ASN1_TEMPLATE *null_tt; /* Type to use if selector is NULL */
472 };
474 struct ASN1_ADB_TABLE_st {
475     long value; /* NID for an object or value for an int */
476     const ASN1_TEMPLATE tt; /* item for this value */
477 };
479 /* template flags */
481 /* Field is optional */
482 #define ASN1_TFLG_OPTIONAL (0x1)
484 /* Field is a SET OF */
485 #define ASN1_TFLG_SET_OF (0x1 << 1)
487 /* Field is a SEQUENCE OF */
488 #define ASN1_TFLG_SEQUENCE_OF (0x2 << 1)
490 /* Special case: this refers to a SET OF that
491  * will be sorted into DER order when encoded *and*
492  * the corresponding STACK will be modified to match
493  * the new order.
494  */
495 #define ASN1_TFLG_SET_ORDER (0x3 << 1)
497 /* Mask for SET OF or SEQUENCE OF */
498 #define ASN1_TFLG_SK_MASK (0x3 << 1)
500 /* These flags mean the tag should be taken from the
501  * tag field. If EXPLICIT then the underlying type
502  * is used for the inner tag.
503  */
505 /* IMPLICIT tagging */
506 #define ASN1_TFLG_IMPTAG (0x1 << 3)
509 /* EXPLICIT tagging, inner tag from underlying type */
510 #define ASN1_TFLG_EXPTAG (0x2 << 3)
512 #define ASN1_TFLG_TAG_MASK (0x3 << 3)
514 /* context specific IMPLICIT */
515 #define ASN1_TFLG_IMPLICIT ASN1_TFLG_IMPTAG|ASN1_TFLG_CONTEXT
517 /* context specific EXPLICIT */
518 #define ASN1_TFLG_EXPLICIT ASN1_TFLG_EXPTAG|ASN1_TFLG_CONTEXT
520 /* If tagging is in force these determine the
521  * type of tag to use. Otherwise the tag is
522  * determined by the underlying type. These
523  * values reflect the actual octet format.

```

```

524 */
526 /* Universal tag */
527 #define ASN1_TFLG_UNIVERSAL      (0x0<<6)
528 /* Application tag */
529 #define ASN1_TFLG_APPLICATION    (0x1<<6)
530 /* Context specific tag */
531 #define ASN1_TFLG_CONTEXT        (0x2<<6)
532 /* Private tag */
533 #define ASN1_TFLG_PRIVATE        (0x3<<6)
535 #define ASN1_TFLG_TAG_CLASS      (0x3<<6)
537 /* These are for ANY DEFINED BY type. In this case
538 * the 'item' field points to an ASN1_ADB structure
539 * which contains a table of values to decode the
540 * relevant type
541 */
543 #define ASN1_TFLG_ADB_MASK       (0x3<<8)
545 #define ASN1_TFLG_ADB_OID        (0x1<<8)
547 #define ASN1_TFLG_ADB_INT        (0x1<<9)
549 /* This flag means a parent structure is passed
550 * instead of the field: this is useful is a
551 * SEQUENCE is being combined with a CHOICE for
552 * example. Since this means the structure and
553 * item name will differ we need to use the
554 * ASN1_CHOICE_END_name() macro for example.
555 */
557 #define ASN1_TFLG_COMBINE        (0x1<<10)
559 /* This flag when present in a SEQUENCE OF, SET OF
560 * or EXPLICIT causes indefinite length constructed
561 * encoding to be used if required.
562 */
564 #define ASN1_TFLG_NDEF           (0x1<<11)
566 /* This is the actual ASN1 item itself */
568 struct ASN1_ITEM_st {
569     char itype;          /* The item type, primitive, SEQUENCE, CHOICE or
570                          /* underlying type */
571     long utype;          /* If SEQUENCE or CHOICE this contains the conte
572     const ASN1_TEMPLATE *templates; /* Number of templates if SEQUENCE or CHOICE */
573     long tcount;         /* functions that handle this type */
574     const void *funcs;    /* Structure size (usually)*/
575     long size;           /* Structure size (usually)*/
576     #ifndef NO_ASN1_FIELD_NAMES
577     const char *sname;    /* Structure name */
578     #endif
579 };
580 /* These are values for the itype field and
581 * determine how the type is interpreted.
582 */
583 /* For PRIMITIVE types the underlying type
584 * determines the behaviour if items is NULL.
585 */
586 /* Otherwise templates must contain a single
587 * template and the type is treated in the
588 * same way as the type specified in the template.
589 */

```

```

590 * For SEQUENCE types the templates field points
591 * to the members, the size field is the
592 * structure size.
593 *
594 * For CHOICE types the templates field points
595 * to each possible member (typically a union)
596 * and the 'size' field is the offset of the
597 * selector.
598 *
599 * The 'funcs' field is used for application
600 * specific functions.
601 *
602 * For COMPAT types the funcs field gives a
603 * set of functions that handle this type, this
604 * supports the old d2i, i2d convention.
605 *
606 * The EXTERN type uses a new style d2i/i2d.
607 * The new style should be used where possible
608 * because it avoids things like the d2i IMPLICIT
609 * hack.
610 *
611 * MSTRING is a multiple string type, it is used
612 * for a CHOICE of character strings where the
613 * actual strings all occupy an ASN1_STRING
614 * structure. In this case the 'utype' field
615 * has a special meaning, it is used as a mask
616 * of acceptable types using the B_ASN1 constants.
617 *
618 * NDEF_SEQUENCE is the same as SEQUENCE except
619 * that it will use indefinite length constructed
620 * encoding if requested.
621 *
622 */
624 #define ASN1_ITYPE_PRIMITIVE      0x0
626 #define ASN1_ITYPE_SEQUENCE      0x1
628 #define ASN1_ITYPE_CHOICE        0x2
630 #define ASN1_ITYPE_COMPAT        0x3
632 #define ASN1_ITYPE_EXTERN        0x4
634 #define ASN1_ITYPE_MSTRING        0x5
636 #define ASN1_ITYPE_NDEF_SEQUENCE  0x6
638 /* Cache for ASN1 tag and length, so we
639 * don't keep re-reading it for things
640 * like CHOICE
641 */
643 struct ASN1_TLC_st{
644     char valid;          /* Values below are valid */
645     int ret;             /* return value */
646     long plen;           /* length */
647     int ptag;            /* class value */
648     int pclass;          /* class value */
649     int hdrlen;          /* header length */
650 };
652 /* Typedefs for ASN1 function pointers */
654 typedef ASN1_VALUE * ASN1_new_func(void);
655 typedef void ASN1_free_func(ASN1_VALUE *a);

```

```

656 typedef ASN1_VALUE * ASN1_d2i_func(ASN1_VALUE **a, const unsigned char **in, lo
657 typedef int ASN1_i2d_func(ASN1_VALUE * a, unsigned char **in);

659 typedef int ASN1_ex_d2i(ASN1_VALUE **pval, const unsigned char **in, long len, c
660 int tag, int aclass, char opt, ASN1_TLC

662 typedef int ASN1_ex_i2d(ASN1_VALUE **pval, unsigned char **out, const ASN1_ITEM
663 typedef int ASN1_ex_new_func(ASN1_VALUE **pval, const ASN1_ITEM *it);
664 typedef void ASN1_ex_free_func(ASN1_VALUE **pval, const ASN1_ITEM *it);

666 typedef int ASN1_ex_print_func(BIO *out, ASN1_VALUE **pval,
667 int indent, const char *fname,
668 const ASN1_PCTX *pctx);

670 typedef int ASN1_primitive_i2c(ASN1_VALUE **pval, unsigned char *cont, int *puty
671 typedef int ASN1_primitive_c2i(ASN1_VALUE **pval, const unsigned char *cont, int
672 typedef int ASN1_primitive_print(BIO *out, ASN1_VALUE **pval, const ASN1_ITEM *i

674 typedef struct ASN1_COMPAT_FUNCS_st {
675     ASN1_new_func *asn1_new;
676     ASN1_free_func *asn1_free;
677     ASN1_d2i_func *asn1_d2i;
678     ASN1_i2d_func *asn1_i2d;
679 } ASN1_COMPAT_FUNCS;

681 typedef struct ASN1_EXTERN_FUNCS_st {
682     void *app_data;
683     ASN1_ex_new_func *asn1_ex_new;
684     ASN1_ex_free_func *asn1_ex_free;
685     ASN1_ex_free_func *asn1_ex_clear;
686     ASN1_ex_d2i *asn1_ex_d2i;
687     ASN1_ex_i2d *asn1_ex_i2d;
688     ASN1_ex_print_func *asn1_ex_print;
689 } ASN1_EXTERN_FUNCS;

691 typedef struct ASN1_PRIMITIVE_FUNCS_st {
692     void *app_data;
693     unsigned long flags;
694     ASN1_ex_new_func *prim_new;
695     ASN1_ex_free_func *prim_free;
696     ASN1_ex_free_func *prim_clear;
697     ASN1_primitive_c2i *prim_c2i;
698     ASN1_primitive_i2c *prim_i2c;
699     ASN1_primitive_print *prim_print;
700 } ASN1_PRIMITIVE_FUNCS;

702 /* This is the ASN1_AUX structure: it handles various
703 * miscellaneous requirements. For example the use of
704 * reference counts and an informational callback.
705 *
706 * The "informational callback" is called at various
707 * points during the ASN1 encoding and decoding. It can
708 * be used to provide minor customisation of the structures
709 * used. This is most useful where the supplied routines
710 * *almost* do the right thing but need some extra help
711 * at a few points. If the callback returns zero then
712 * it is assumed a fatal error has occurred and the
713 * main operation should be abandoned.
714 *
715 * If major changes in the default behaviour are required
716 * then an external type is more appropriate.
717 */

719 typedef int ASN1_aux_cb(int operation, ASN1_VALUE **in, const ASN1_ITEM *it,
720 void *exarg);

```

```

722 typedef struct ASN1_AUX_st {
723     void *app_data;
724     int flags;
725     int ref_offset; /* Offset of reference value */
726     int ref_lock; /* Lock type to use */
727     ASN1_aux_cb *asn1_cb;
728     int enc_offset; /* Offset of ASN1_ENCODING structure */
729 } ASN1_AUX;

731 /* For print related callbacks exarg points to this structure */
732 typedef struct ASN1_PRINT_ARG_st {
733     BIO *out;
734     int indent;
735     const ASN1_PCTX *pctx;
736 } ASN1_PRINT_ARG;

738 /* For streaming related callbacks exarg points to this structure */
739 typedef struct ASN1_STREAM_ARG_st {
740     /* BIO to stream through */
741     BIO *out;
742     /* BIO with filters appended */
743     BIO *ndef_bio;
744     /* Streaming I/O boundary */
745     unsigned char **boundary;
746 } ASN1_STREAM_ARG;

748 /* Flags in ASN1_AUX */

750 /* Use a reference count */
751 #define ASN1_AFLG_REFCOUNT 1
752 /* Save the encoding of structure (useful for signatures) */
753 #define ASN1_AFLG_ENCODING 2
754 /* The Sequence length is invalid */
755 #define ASN1_AFLG_BROKEN 4

757 /* operation values for asn1_cb */

759 #define ASN1_OP_NEW_PRE 0
760 #define ASN1_OP_NEW_POST 1
761 #define ASN1_OP_FREE_PRE 2
762 #define ASN1_OP_FREE_POST 3
763 #define ASN1_OP_D2I_PRE 4
764 #define ASN1_OP_D2I_POST 5
765 #define ASN1_OP_I2D_PRE 6
766 #define ASN1_OP_I2D_POST 7
767 #define ASN1_OP_PRINT_PRE 8
768 #define ASN1_OP_PRINT_POST 9
769 #define ASN1_OP_STREAM_PRE 10
770 #define ASN1_OP_STREAM_POST 11
771 #define ASN1_OP_DETACHED_PRE 12
772 #define ASN1_OP_DETACHED_POST 13

774 /* Macro to implement a primitive type */
775 #define IMPLEMENT_ASN1_TYPE(stname) IMPLEMENT_ASN1_TYPE_ex(stname, stname, 0)
776 #define IMPLEMENT_ASN1_TYPE_ex(itname, vname, ex) \
777     ASN1_ITEM_start(itname) \
778     ASN1_ITYPE_PRIMITIVE, V_##vname, NULL, 0 \
779     ASN1_ITEM_end(itname)

781 /* Macro to implement a multi string type */
782 #define IMPLEMENT_ASN1_MSTRING(itname, mask) \
783     ASN1_ITEM_start(itname) \
784     ASN1_ITYPE_MSTRING, mask, NULL, 0, NULL, \
785     ASN1_ITEM_end(itname)

787 /* Macro to implement an ASN1_ITEM in terms of old style funcs */

```

```

789 #define IMPLEMENT_COMPAT_ASN1(sname) IMPLEMENT_COMPAT_ASN1_type(sname, V_ASN1_SE

791 #define IMPLEMENT_COMPAT_ASN1_type(sname, tag) \
792     static const ASN1_COMPAT_FUNCS sname##_ff = { \
793         (ASN1_new_func *)sname##_new, \
794         (ASN1_free_func *)sname##_free, \
795         (ASN1_d2i_func *)d2i_##sname, \
796         (ASN1_i2d_func *)i2d_##sname, \
797     }; \
798     ASN1_ITEM_start(sname) \
799         ASN1_ITYPE_COMPAT, \
800         tag, \
801         NULL, \
802         0, \
803         &sname##_ff, \
804         0, \
805         #sname \
806     ASN1_ITEM_end(sname)

808 #define IMPLEMENT_EXTERN_ASN1(sname, tag, fptrs) \
809     ASN1_ITEM_start(sname) \
810         ASN1_ITYPE_EXTERN, \
811         tag, \
812         NULL, \
813         0, \
814         &fptrs, \
815         0, \
816         #sname \
817     ASN1_ITEM_end(sname)

819 /* Macro to implement standard functions in terms of ASN1_ITEM structures */

821 #define IMPLEMENT_ASN1_FUNCTIONS(sname) IMPLEMENT_ASN1_FUNCTIONS_fname(sname,

823 #define IMPLEMENT_ASN1_FUNCTIONS_name(sname, itname) IMPLEMENT_ASN1_FUNCTIONS_f

825 #define IMPLEMENT_ASN1_FUNCTIONS_ENCODE_name(sname, itname) \
826     IMPLEMENT_ASN1_FUNCTIONS_ENCODE_fname(sname, itname, it

828 #define IMPLEMENT_STATIC_ASN1_ALLOC_FUNCTIONS(sname) \
829     IMPLEMENT_ASN1_ALLOC_FUNCTIONS_pfname(static, sname, sname, st

831 #define IMPLEMENT_ASN1_ALLOC_FUNCTIONS(sname) \
832     IMPLEMENT_ASN1_ALLOC_FUNCTIONS_fname(sname, sname, sname)

834 #define IMPLEMENT_ASN1_ALLOC_FUNCTIONS_pfname(pre, sname, itname, fname) \
835     pre sname *fname##_new(void) \
836     { \
837         return (sname *)ASN1_item_new(ASN1_ITEM_rptr(itname)); \
838     } \
839     pre void fname##_free(sname *a) \
840     { \
841         ASN1_item_free((ASN1_VALUE *)a, ASN1_ITEM_rptr(itname)); \
842     }

844 #define IMPLEMENT_ASN1_ALLOC_FUNCTIONS_fname(sname, itname, fname) \
845     sname *fname##_new(void) \
846     { \
847         return (sname *)ASN1_item_new(ASN1_ITEM_rptr(itname)); \
848     } \
849     void fname##_free(sname *a) \
850     { \
851         ASN1_item_free((ASN1_VALUE *)a, ASN1_ITEM_rptr(itname)); \
852     }

```

```

854 #define IMPLEMENT_ASN1_FUNCTIONS_fname(sname, itname, fname) \
855     IMPLEMENT_ASN1_ENCODE_FUNCTIONS_fname(sname, itname, fname) \
856     IMPLEMENT_ASN1_ALLOC_FUNCTIONS_fname(sname, itname, fname)

858 #define IMPLEMENT_ASN1_ENCODE_FUNCTIONS_fname(sname, itname, fname) \
859     sname *d2i_##fname(sname **a, const unsigned char **in, long len) \
860     { \
861         return (sname *)ASN1_item_d2i((ASN1_VALUE **)a, in, len, ASN1_I

862     } \
863     int i2d_##fname(sname *a, unsigned char **out) \
864     { \
865         return ASN1_item_i2d((ASN1_VALUE *)a, out, ASN1_ITEM_rptr(itname)

866     }

868 #define IMPLEMENT_ASN1_NDEF_FUNCTION(sname) \
869     int i2d_##sname##_NDEF(sname *a, unsigned char **out) \
870     { \
871         return ASN1_item_ndef_i2d((ASN1_VALUE *)a, out, ASN1_ITEM_rptr(s

872     }

874 /* This includes evil casts to remove const: they will go away when full
875  * ASN1 constification is done.
876  */
877 #define IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(sname, itname, fname) \
878     sname *d2i_##fname(sname **a, const unsigned char **in, long len) \
879     { \
880         return (sname *)ASN1_item_d2i((ASN1_VALUE **)a, in, len, ASN1_I

881     } \
882     int i2d_##fname(const sname *a, unsigned char **out) \
883     { \
884         return ASN1_item_i2d((ASN1_VALUE *)a, out, ASN1_ITEM_rptr(itname)

885     }

887 #define IMPLEMENT_ASN1_DUP_FUNCTION(sname) \
888     sname * sname##_dup(sname *x) \
889     { \
890         return ASN1_item_dup(ASN1_ITEM_rptr(sname), x); \
891     }

893 #define IMPLEMENT_ASN1_PRINT_FUNCTION(sname) \
894     IMPLEMENT_ASN1_PRINT_FUNCTION_fname(sname, sname, sname)

896 #define IMPLEMENT_ASN1_PRINT_FUNCTION_fname(sname, itname, fname) \
897     int fname##_print_ctx(BIO *out, sname *x, int indent, \
898         const ASN1_PCTX *pctx) \
899     { \
900         return ASN1_item_print(out, (ASN1_VALUE *)x, indent, \
901             ASN1_ITEM_rptr(itname), pctx); \
902     }

904 #define IMPLEMENT_ASN1_FUNCTIONS_const(name) \
905     IMPLEMENT_ASN1_FUNCTIONS_const_fname(name, name, name)

907 #define IMPLEMENT_ASN1_FUNCTIONS_const_fname(sname, itname, fname) \
908     IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(sname, itname, fname) \
909     IMPLEMENT_ASN1_ALLOC_FUNCTIONS_fname(sname, itname, fname)

911 /* external definitions for primitive types */

913 DECLARE_ASN1_ITEM(ASN1_BOOLEAN)
914 DECLARE_ASN1_ITEM(ASN1_TBOOLEAN)
915 DECLARE_ASN1_ITEM(ASN1_FBOOLEAN)
916 DECLARE_ASN1_ITEM(ASN1_SEQUENCE)
917 DECLARE_ASN1_ITEM(CBIGNUM)
918 DECLARE_ASN1_ITEM(BIGNUM)
919 DECLARE_ASN1_ITEM(LONG)

```

```
920 DECLARE_ASN1_ITEM(ZLONG)

922 DECLARE_STACK_OF(ASN1_VALUE)

924 /* Functions used internally by the ASN1 code */

926 int ASN1_item_ex_new(ASN1_VALUE **pval, const ASN1_ITEM *it);
927 void ASN1_item_ex_free(ASN1_VALUE **pval, const ASN1_ITEM *it);
928 int ASN1_template_new(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt);
929 int ASN1_primitive_new(ASN1_VALUE **pval, const ASN1_ITEM *it);

931 void ASN1_template_free(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt);
932 int ASN1_template_d2i(ASN1_VALUE **pval, const unsigned char **in, long len, con
933 int ASN1_item_ex_d2i(ASN1_VALUE **pval, const unsigned char **in, long len, cons
934 int tag, int aclass, char opt, ASN1_TLC *ctx);

936 int ASN1_item_ex_i2d(ASN1_VALUE **pval, unsigned char **out, const ASN1_ITEM *it
937 int ASN1_template_i2d(ASN1_VALUE **pval, unsigned char **out, const ASN1_TEMPLAT
938 void ASN1_primitive_free(ASN1_VALUE **pval, const ASN1_ITEM *it);

940 int asn1_ex_i2c(ASN1_VALUE **pval, unsigned char *cont, int *putype, const ASN1_
941 int asn1_ex_c2i(ASN1_VALUE **pval, const unsigned char *cont, int len, int utype

943 int asn1_get_choice_selector(ASN1_VALUE **pval, const ASN1_ITEM *it);
944 int asn1_set_choice_selector(ASN1_VALUE **pval, int value, const ASN1_ITEM *it);

946 ASN1_VALUE ** asn1_get_field_ptr(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt);

948 const ASN1_TEMPLATE *asn1_do_adb(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt, int

950 int asn1_do_lock(ASN1_VALUE **pval, int op, const ASN1_ITEM *it);

952 void asn1_enc_init(ASN1_VALUE **pval, const ASN1_ITEM *it);
953 void asn1_enc_free(ASN1_VALUE **pval, const ASN1_ITEM *it);
954 int asn1_enc_restore(int *len, unsigned char **out, ASN1_VALUE **pval, const ASN
955 int asn1_enc_save(ASN1_VALUE **pval, const unsigned char *in, int inlen, const A

957 #ifdef __cplusplus
958 }
959 #endif
960 #endif
```

```

*****
32987 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/bio.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bio/bio.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef HEADER_BIO_H
60 #define HEADER_BIO_H

```

```

62 #include <openssl/e_os2.h>
63
64 #ifndef OPENSSL_NO_FP_API
65 #include <stdio.h>
66 #endif
67 #include <stdarg.h>
68
69 #include <openssl/crypto.h>
70
71 #ifndef OPENSSL_NO_SCTP
72 #ifndef OPENSSL_SYS_VMS
73 #include <stdint.h>
74 #else
75 #include <inttypes.h>
76 #endif
77 #endif
78
79 #ifdef __cplusplus
80 extern "C" {
81 #endif
82
83 /* These are the 'types' of BIOs */
84 #define BIO_TYPE_NONE 0
85 #define BIO_TYPE_MEM (1|0x0400)
86 #define BIO_TYPE_FILE (2|0x0400)
87
88 #define BIO_TYPE_FD (4|0x0400|0x0100)
89 #define BIO_TYPE_SOCKET (5|0x0400|0x0100)
90 #define BIO_TYPE_NULL (6|0x0400)
91 #define BIO_TYPE_SSL (7|0x0200)
92 #define BIO_TYPE_MD (8|0x0200) /* passive filter */
93 #define BIO_TYPE_BUFFER (9|0x0200) /* filter */
94 #define BIO_TYPE_CIPHER (10|0x0200) /* filter */
95 #define BIO_TYPE_BASE64 (11|0x0200) /* filter */
96 #define BIO_TYPE_CONNECT (12|0x0400|0x0100) /* socket - connect */
97 #define BIO_TYPE_ACCEPT (13|0x0400|0x0100) /* socket for accept */
98 #define BIO_TYPE_PROXY_CLIENT (14|0x0200) /* client proxy BIO */
99 #define BIO_TYPE_PROXY_SERVER (15|0x0200) /* server proxy BIO */
100 #define BIO_TYPE_NBIO_TEST (16|0x0200) /* server proxy BIO */
101 #define BIO_TYPE_NULL_FILTER (17|0x0200)
102 #define BIO_TYPE_BER (18|0x0200) /* BER -> bin filter */
103 #define BIO_TYPE_BIO (19|0x0400) /* (half a) BIO pair */
104 #define BIO_TYPE_LINEBUFFER (20|0x0200) /* filter */
105 #define BIO_TYPE_DGRAM (21|0x0400|0x0100)
106 #ifndef OPENSSL_NO_SCTP
107 #define BIO_TYPE_DGRAM_SCTP (24|0x0400|0x0100)
108 #endif
109 #endif
110 #define BIO_TYPE_ASN1 (22|0x0200) /* filter */
111 #define BIO_TYPE_COMP (23|0x0200) /* filter */
112
113 #define BIO_TYPE_DESCRIPTOR 0x0100 /* socket, fd, connect or accept */
114 #define BIO_TYPE_FILTER 0x0200
115 #define BIO_TYPE_SOURCE_SINK 0x0400
116
117 /* BIO_FILENAME_READ|BIO_CLOSE to open or close on free.
118  * BIO_set_fp(in, stdin, BIO_NOCLOSE); */
119 #define BIO_NOCLOSE 0x00
120 #define BIO_CLOSE 0x01
121
122 /* These are used in the following macros and are passed to
123  * BIO_ctrl() */
124 #define BIO_CTRL_RESET 1 /* opt - rewind/zero etc */
125 #define BIO_CTRL_EOF 2 /* opt - are we at the eof */
126 #define BIO_CTRL_EXTRA_TITBITS 3 /* opt - extra tit-bits */
127 #define BIO_CTRL_SET 4 /* man - set the 'IO' type */
128 #define BIO_CTRL_GET 5 /* man - get the 'IO' type */

```



```

128 #define BIO_CTRL_PUSH        6 /* opt - internal, used to signify change */
129 #define BIO_CTRL_POP         7 /* opt - internal, used to signify change */
130 #define BIO_CTRL_GET_CLOSE    8 /* man - set the 'close' on free */
131 #define BIO_CTRL_SET_CLOSE    9 /* man - set the 'close' on free */
132 #define BIO_CTRL_PENDING     10 /* opt - is their more data buffered */
133 #define BIO_CTRL_FLUSH       11 /* opt - 'flush' buffered output */
134 #define BIO_CTRL_DUP          12 /* man - extra stuff for 'duped' BIO */
135 #define BIO_CTRL_WPENDING     13 /* opt - number of bytes still to write */
136 /* callback is int cb(BIO *bio, state, ret); */
137 #define BIO_CTRL_SET_CALLBACK 14 /* opt - set callback function */
138 #define BIO_CTRL_GET_CALLBACK 15 /* opt - set callback function */

140 #define BIO_CTRL_SET_FILENAME 30 /* BIO_s_file special */

142 /* dgram BIO stuff */
143 #define BIO_CTRL_DGRAM_CONNECT 31 /* BIO dgram special */
144 #define BIO_CTRL_DGRAM_SET_CONNECTED 32 /* allow for an externally
145 * connected socket to be
146 * passed in */
147 #define BIO_CTRL_DGRAM_SET_RECV_TIMEOUT 33 /* setsockopt, essentially */
148 #define BIO_CTRL_DGRAM_GET_RECV_TIMEOUT 34 /* getsockopt, essentially */
149 #define BIO_CTRL_DGRAM_SET_SEND_TIMEOUT 35 /* setsockopt, essentially */
150 #define BIO_CTRL_DGRAM_GET_SEND_TIMEOUT 36 /* getsockopt, essentially */

152 #define BIO_CTRL_DGRAM_GET_RECV_TIMER_EXP 37 /* flag whether the last */
153 #define BIO_CTRL_DGRAM_GET_SEND_TIMER_EXP 38 /* I/O operation timed out */
154
155 /* #ifdef IP_MTU_DISCOVER */
156 #define BIO_CTRL_DGRAM_MTU_DISCOVER 39 /* set DF bit on egress packets */
157 /* #endif */

159 #define BIO_CTRL_DGRAM_QUERY_MTU 40 /* as kernel for current MTU */
160 #define BIO_CTRL_DGRAM_GET_FALLBACK_MTU 47
161 #define BIO_CTRL_DGRAM_GET_MTU 41 /* get cached value for MTU */
162 #define BIO_CTRL_DGRAM_SET_MTU 42 /* set cached value for
163 * MTU. want to use this
164 * if asking the kernel
165 * fails */

167 #define BIO_CTRL_DGRAM_MTU_EXCEEDED 43 /* check whether the MTU
168 * was exceed in the
169 * previous write
170 * operation */

172 #define BIO_CTRL_DGRAM_GET_PEER 46
173 #define BIO_CTRL_DGRAM_SET_PEER 44 /* Destination for the data */

175 #define BIO_CTRL_DGRAM_SET_NEXT_TIMEOUT 45 /* Next DTLS handshake timeout to
176 * adjust socket timeouts */

178 #ifndef OPENSSL_NO_SCTP
179 /* SCTP stuff */
180 #define BIO_CTRL_DGRAM_SCTP_SET_IN_HANDSHAKE 50
181 #define BIO_CTRL_DGRAM_SCTP_ADD_AUTH_KEY 51
182 #define BIO_CTRL_DGRAM_SCTP_NEXT_AUTH_KEY 52
183 #define BIO_CTRL_DGRAM_SCTP_AUTH_CCS_RCVD 53
184 #define BIO_CTRL_DGRAM_SCTP_GET_SNDFINFO 60
185 #define BIO_CTRL_DGRAM_SCTP_SET_SNDFINFO 61
186 #define BIO_CTRL_DGRAM_SCTP_GET_RCVINFO 62
187 #define BIO_CTRL_DGRAM_SCTP_SET_RCVINFO 63
188 #define BIO_CTRL_DGRAM_SCTP_GET_PRINFO 64
189 #define BIO_CTRL_DGRAM_SCTP_SET_PRINFO 65
190 #define BIO_CTRL_DGRAM_SCTP_SAVE_SHUTDOWN 70
191 #endif

193 /* modifiers */

```

```

194 #define BIO_FP_READ           0x02
195 #define BIO_FP_WRITE          0x04
196 #define BIO_FP_APPEND         0x08
197 #define BIO_FP_TEXT           0x10

199 #define BIO_FLAGS_READ        0x01
200 #define BIO_FLAGS_WRITE       0x02
201 #define BIO_FLAGS_IO_SPECIAL  0x04
202 #define BIO_FLAGS_RWS (BIO_FLAGS_READ|BIO_FLAGS_WRITE|BIO_FLAGS_IO_SPECIAL)
203 #define BIO_FLAGS_SHOULD_RETRY 0x08
204 #ifndef BIO_FLAGS_UPLINK
205 /* "UPLINK" flag denotes file descriptors provided by application.
206 * It defaults to 0, as most platforms don't require UPLINK interface. */
207 #define BIO_FLAGS_UPLINK      0
208 #endif

210 /* Used in BIO_gethostbyname() */
211 #define BIO_GHBN_CTRL_HITS      1
212 #define BIO_GHBN_CTRL_MISSES    2
213 #define BIO_GHBN_CTRL_CACHE_SIZE 3
214 #define BIO_GHBN_CTRL_GET_ENTRY 4
215 #define BIO_GHBN_CTRL_FLUSH     5

217 /* Mostly used in the SSL BIO */
218 /* Not used anymore
219 * #define BIO_FLAGS_PROTOCOL_DELAYED_READ 0x10
220 * #define BIO_FLAGS_PROTOCOL_DELAYED_WRITE 0x20
221 * #define BIO_FLAGS_PROTOCOL_STARTUP 0x40
222 */

224 #define BIO_FLAGS_BASE64_NO_NL 0x100

226 /* This is used with memory BIOs: it means we shouldn't free up or change the
227 * data in any way.
228 */
229 #define BIO_FLAGS_MEM_RDONLY 0x200

231 typedef struct bio_st BIO;

233 void BIO_set_flags(BIO *b, int flags);
234 int BIO_test_flags(const BIO *b, int flags);
235 void BIO_clear_flags(BIO *b, int flags);

237 #define BIO_get_flags(b) BIO_test_flags(b, ~(0x0))
238 #define BIO_set_retry_special(b) \
239     BIO_set_flags(b, (BIO_FLAGS_IO_SPECIAL|BIO_FLAGS_SHOULD_RETRY))
240 #define BIO_set_retry_read(b) \
241     BIO_set_flags(b, (BIO_FLAGS_READ|BIO_FLAGS_SHOULD_RETRY))
242 #define BIO_set_retry_write(b) \
243     BIO_set_flags(b, (BIO_FLAGS_WRITE|BIO_FLAGS_SHOULD_RETRY))

245 /* These are normally used internally in BIOs */
246 #define BIO_clear_retry_flags(b) \
247     BIO_clear_flags(b, (BIO_FLAGS_RWS|BIO_FLAGS_SHOULD_RETRY))
248 #define BIO_get_retry_flags(b) \
249     BIO_test_flags(b, (BIO_FLAGS_RWS|BIO_FLAGS_SHOULD_RETRY))

251 /* These should be used by the application to tell why we should retry */
252 #define BIO_should_read(a) BIO_test_flags(a, BIO_FLAGS_READ)
253 #define BIO_should_write(a) BIO_test_flags(a, BIO_FLAGS_WRITE)
254 #define BIO_should_io_special(a) BIO_test_flags(a, BIO_FLAGS_IO_SPECIAL)
255 #define BIO_retry_type(a) BIO_test_flags(a, BIO_FLAGS_RWS)
256 #define BIO_should_retry(a) BIO_test_flags(a, BIO_FLAGS_SHOULD_RETRY)

258 /* The next three are used in conjunction with the
259 * BIO_should_io_special() condition. After this returns true,

```

```

260 * BIO *BIO_get_retry_BIO(BIO *bio, int *reason); will walk the BIO
261 * stack and return the 'reason' for the special and the offending BIO.
262 * Given a BIO, BIO_get_retry_reason(bio) will return the code. */
263 /* Returned from the SSL bio when the certificate retrieval code had an error */
264 #define BIO_RR_SSL_X509_LOOKUP 0x01
265 /* Returned from the connect BIO when a connect would have blocked */
266 #define BIO_RR_CONNECT 0x02
267 /* Returned from the accept BIO when an accept would have blocked */
268 #define BIO_RR_ACCEPT 0x03

270 /* These are passed by the BIO callback */
271 #define BIO_CB_FREE 0x01
272 #define BIO_CB_READ 0x02
273 #define BIO_CB_WRITE 0x03
274 #define BIO_CB_PUTS 0x04
275 #define BIO_CB_GETS 0x05
276 #define BIO_CB_CTRL 0x06

278 /* The callback is called before and after the underling operation,
279 * The BIO_CB_RETURN flag indicates if it is after the call */
280 #define BIO_CB_RETURN 0x80
281 #define BIO_CB_return(a) ((a)&BIO_CB_RETURN)
282 #define BIO_cb_pre(a) (!((a)&BIO_CB_RETURN))
283 #define BIO_cb_post(a) ((a)&BIO_CB_RETURN)

285 long (*BIO_get_callback(const BIO *b)) (struct bio_st *,int,const char *,int, lo
286 void BIO_set_callback(BIO *b,
287 long (*callback)(struct bio_st *,int,const char *,int, long,long));
288 char *BIO_get_callback_arg(const BIO *b);
289 void BIO_set_callback_arg(BIO *b, char *arg);

291 const char * BIO_method_name(const BIO *b);
292 int BIO_method_type(const BIO *b);

294 typedef void bio_info_cb(struct bio_st *, int, const char *, int, long, long);

296 typedef struct bio_method_st
297 {
298     int type;
299     const char *name;
300     int (*bwrite)(BIO *, const char *, int);
301     int (*bread)(BIO *, char *, int);
302     int (*bputs)(BIO *, const char *);
303     int (*bgets)(BIO *, char *, int);
304     long (*ctrl)(BIO *, int, long, void *);
305     int (*create)(BIO *);
306     int (*destroy)(BIO *);
307     long (*callback_ctrl)(BIO *, int, bio_info_cb *);
308 } BIO_METHOD;

310 struct bio_st
311 {
312     BIO_METHOD *method;
313     /* bio, mode, argp, argi, ret */
314     long (*callback)(struct bio_st *,int,const char *,int, long,long);
315     char *cb_arg; /* first argument for the callback */

317     int init;
318     int shutdown;
319     int flags; /* extra storage */
320     int retry_reason;
321     int num;
322     void *ptr;
323     struct bio_st *next_bio; /* used by filter BIOs */
324     struct bio_st *prev_bio; /* used by filter BIOs */
325     int references;

```

```

326     unsigned long num_read;
327     unsigned long num_write;

329     CRYPTO_EX_DATA ex_data;
330 };

332 DECLARE_STACK_OF(BIO)

334 typedef struct bio_f_buffer_ctx_struct
335 {
336     /* Buffers are setup like this:
337     * <----- size ----->
338     * +-----+
339     * | consumed | remaining | free space |
340     * +-----+
341     * <-- off --><----- len ----->
342     */
343 } bio_f_buffer_ctx_struct;

345 /* BIO *bio; */ /* this is now in the BIO struct */
346 int ibuf_size; /* how big is the input buffer */
347 int obuf_size; /* how big is the output buffer */

349 char *ibuf; /* the char array */
350 int ibuf_len; /* how many bytes are in it */
351 int ibuf_off; /* write/read offset */

353 char *obuf; /* the char array */
354 int obuf_len; /* how many bytes are in it */
355 int obuf_off; /* write/read offset */
356 } BIO_F_BUFFER_CTX;

358 /* Prefix and suffix callback in ASN1 BIO */
359 typedef int asn1_ps_func(BIO *b, unsigned char **pbuf, int *plen, void *parg);

361 #ifndef OPENSSL_NO_SCTP
362 /* SCTP parameter structs */
363 struct bio_dgram_sctp_sndinfo
364 {
365     uint16_t snd_sid;
366     uint16_t snd_flags;
367     uint32_t snd_ppid;
368     uint32_t snd_context;
369 };

371 struct bio_dgram_sctp_rcvinfo
372 {
373     uint16_t rcv_sid;
374     uint16_t rcv_ssn;
375     uint16_t rcv_flags;
376     uint32_t rcv_ppid;
377     uint32_t rcv_tsn;
378     uint32_t rcv_cumtsn;
379     uint32_t rcv_context;
380 };

382 struct bio_dgram_sctp_prinfo
383 {
384     uint16_t pr_policy;
385     uint32_t pr_value;
386 };
387 #endif

389 /* connect BIO stuff */
390 #define BIO_CONN_S_BEFORE 1
391 #define BIO_CONN_S_GET_IP 2

```

```

392 #define BIO_CONN_S_GET_PORT          3
393 #define BIO_CONN_S_CREATE_SOCKET     4
394 #define BIO_CONN_S_CONNECT           5
395 #define BIO_CONN_S_OK                6
396 #define BIO_CONN_S_BLOCKED_CONNECT  7
397 #define BIO_CONN_S_NBIO              8
398 /*#define BIO_CONN_get_param_hostname BIO_ctrl */

400 #define BIO_C_SET_CONNECT             100
401 #define BIO_C_DO_STATE_MACHINE       101
402 #define BIO_C_SET_NBIO               102
403 #define BIO_C_SET_PROXY_PARAM        103
404 #define BIO_C_SET_FD                 104
405 #define BIO_C_GET_FD                 105
406 #define BIO_C_SET_FILE_PTR           106
407 #define BIO_C_GET_FILE_PTR           107
408 #define BIO_C_SET_FILENAME           108
409 #define BIO_C_SET_SSL                 109
410 #define BIO_C_GET_SSL                110
411 #define BIO_C_SET_MD                 111
412 #define BIO_C_GET_MD                 112
413 #define BIO_C_GET_CIPHER_STATUS      113
414 #define BIO_C_SET_BUF_MEM            114
415 #define BIO_C_GET_BUF_MEM_PTR        115
416 #define BIO_C_GET_BUFF_NUM_LINES    116
417 #define BIO_C_SET_BUFF_SIZE         117
418 #define BIO_C_SET_ACCEPT             118
419 #define BIO_C_SET_SSL_MODE           119
420 #define BIO_C_GET_MD_CTX             120
421 #define BIO_C_GET_PROXY_PARAM        121
422 #define BIO_C_SET_BUFF_READ_DATA    122 /* data to read first */
423 #define BIO_C_GET_CONNECT            123
424 #define BIO_C_GET_ACCEPT             124
425 #define BIO_C_SET_SSL_RENEGOTIATE_BYTES 125
426 #define BIO_C_GET_SSL_NUM_RENEGOTIATES 126
427 #define BIO_C_SET_SSL_RENEGOTIATE_TIMEOUT 127
428 #define BIO_C_FILE_SEEK              128
429 #define BIO_C_GET_CIPHER_CTX         129
430 #define BIO_C_SET_BUF_MEM_EOF_RETURN 130 /* return end of input value */
431 #define BIO_C_SET_BIND_MODE          131
432 #define BIO_C_GET_BIND_MODE          132
433 #define BIO_C_FILE_TELL              133
434 #define BIO_C_GET_SOCKETS            134
435 #define BIO_C_SET_SOCKETS            135

437 #define BIO_C_SET_WRITE_BUF_SIZE     136 /* for BIO_s_bio */
438 #define BIO_C_GET_WRITE_BUF_SIZE     137
439 #define BIO_C_MAKE_BIO_PAIR          138
440 #define BIO_C_DESTROY_BIO_PAIR       139
441 #define BIO_C_GET_WRITE_GUARANTEE    140
442 #define BIO_C_GET_READ_REQUEST       141
443 #define BIO_C_SHUTDOWN_WR            142
444 #define BIO_C_NREAD0                 143
445 #define BIO_C_NREAD                  144
446 #define BIO_C_NWRITE0                145
447 #define BIO_C_NWRITE                 146
448 #define BIO_C_RESET_READ_REQUEST     147
449 #define BIO_C_SET_MD_CTX             148

451 #define BIO_C_SET_PREFIX             149
452 #define BIO_C_GET_PREFIX             150
453 #define BIO_C_SET_SUFFIX             151
454 #define BIO_C_GET_SUFFIX             152

456 #define BIO_C_SET_EX_ARG             153
457 #define BIO_C_GET_EX_ARG            154

```

```

459 #define BIO_set_app_data(s,arg)      BIO_set_ex_data(s,0,arg)
460 #define BIO_get_app_data(s)         BIO_get_ex_data(s,0)

462 /* BIO_s_connect() and BIO_s_socks4a_connect() */
463 #define BIO_set_conn_hostname(b,name) BIO_ctrl(b,BIO_C_SET_CONNECT,0,(char *)name)
464 #define BIO_set_conn_port(b,port)   BIO_ctrl(b,BIO_C_SET_CONNECT,1,(char *)port)
465 #define BIO_set_conn_ip(b,ip)       BIO_ctrl(b,BIO_C_SET_CONNECT,2,(char *)ip)
466 #define BIO_set_conn_int_port(b,port) BIO_ctrl(b,BIO_C_SET_CONNECT,3,(char *)port)
467 #define BIO_get_conn_hostname(b)    BIO_ptr_ctrl(b,BIO_C_GET_CONNECT,0)
468 #define BIO_get_conn_port(b)        BIO_ptr_ctrl(b,BIO_C_GET_CONNECT,1)
469 #define BIO_get_conn_ip(b)          BIO_ptr_ctrl(b,BIO_C_GET_CONNECT,2)
470 #define BIO_get_conn_int_port(b)    BIO_int_ctrl(b,BIO_C_GET_CONNECT,3,0)

473 #define BIO_set_nbio(b,n)           BIO_ctrl(b,BIO_C_SET_NBIO,(n),NULL)

475 /* BIO_s_accept_socket() */
476 #define BIO_set_accept_port(b,name) BIO_ctrl(b,BIO_C_SET_ACCEPT,0,(char *)name)
477 #define BIO_get_accept_port(b)      BIO_ptr_ctrl(b,BIO_C_GET_ACCEPT,0)
478 /* #define BIO_set_nbio(b,n)      BIO_ctrl(b,BIO_C_SET_NBIO,(n),NULL) */
479 #define BIO_set_nbio_accept(b,n)    BIO_ctrl(b,BIO_C_SET_ACCEPT,1,(n)?(void *)"a":N)
480 #define BIO_set_accept_bios(b,bio)  BIO_ctrl(b,BIO_C_SET_ACCEPT,2,(char *)bio)

482 #define BIO_BIND_NORMAL              0
483 #define BIO_BIND_REUSEADDR_IF_UNUSED 1
484 #define BIO_BIND_REUSEADDR          2
485 #define BIO_set_bind_mode(b,mode)   BIO_ctrl(b,BIO_C_SET_BIND_MODE,mode,NULL)
486 #define BIO_get_bind_mode(b,mode)   BIO_ctrl(b,BIO_C_GET_BIND_MODE,0,NULL)

488 #define BIO_do_connect(b)            BIO_do_handshake(b)
489 #define BIO_do_accept(b)             BIO_do_handshake(b)
490 #define BIO_do_handshake(b)          BIO_ctrl(b,BIO_C_DO_STATE_MACHINE,0,NULL)

492 /* BIO_s_proxy_client() */
493 #define BIO_set_url(b,url)           BIO_ctrl(b,BIO_C_SET_PROXY_PARAM,0,(char *)url)
494 #define BIO_set_proxies(b,p)         BIO_ctrl(b,BIO_C_SET_PROXY_PARAM,1,(char *)p)
495 /* BIO_set_nbio(b,n) */
496 #define BIO_set_filter_bio(b,s)      BIO_ctrl(b,BIO_C_SET_PROXY_PARAM,2,(char *)s)
497 /* BIO *BIO_get_filter_bio(BIO *bio); */
498 #define BIO_set_proxy_cb(b,cb)       BIO_callback_ctrl(b,BIO_C_SET_PROXY_PARAM,3,(void *)cb)
499 #define BIO_set_proxy_header(b,sk)   BIO_ctrl(b,BIO_C_SET_PROXY_PARAM,4,(char *)sk)
500 #define BIO_set_no_connect_return(b,bool) BIO_int_ctrl(b,BIO_C_SET_PROXY_PARAM,5,NULL)

502 #define BIO_get_proxy_header(b,skp)   BIO_ctrl(b,BIO_C_GET_PROXY_PARAM,0,(char *)skp)
503 #define BIO_get_proxies(b,pxy_p)     BIO_ctrl(b,BIO_C_GET_PROXY_PARAM,1,(char *)pxy_p)
504 #define BIO_get_url(b,url)           BIO_ctrl(b,BIO_C_GET_PROXY_PARAM,2,(char *)url)
505 #define BIO_get_no_connect_return(b)  BIO_int_ctrl(b,BIO_C_GET_PROXY_PARAM,5,NULL)

507 #define BIO_set_fd(b,fd,c)           BIO_int_ctrl(b,BIO_C_SET_FD,c,fd)
508 #define BIO_get_fd(b,c)              BIO_ctrl(b,BIO_C_GET_FD,0,(char *)c)

510 #define BIO_set_fp(b,fp,c)           BIO_ctrl(b,BIO_C_SET_FILE_PTR,c,(char *)fp)
511 #define BIO_get_fp(b,fpp)            BIO_ctrl(b,BIO_C_GET_FILE_PTR,0,(char *)fpp)

513 #define BIO_seek(b,ofs) (int)BIO_ctrl(b,BIO_C_FILE_SEEK,ofs,NULL)
514 #define BIO_tell(b) (int)BIO_ctrl(b,BIO_C_FILE_TELL,0,NULL)

516 /* name is cast to lose const, but might be better to route through a function
517 so we can do it safely */
518 #ifndef CONST_STRICT
519 /* If you are wondering why this isn't defined, its because CONST_STRICT is
520 purely a compile-time kludge to allow const to be checked.
521 */
522 int BIO_read_filename(BIO *b,const char *name);
523 #else

```

```

524 #define BIO_read_filename(b,name) BIO_ctrl(b,BIO_C_SET_FILENAME, \
525     BIO_CLOSE|BIO_FP_READ,(char *)name)
526 #endif
527 #define BIO_write_filename(b,name) BIO_ctrl(b,BIO_C_SET_FILENAME, \
528     BIO_CLOSE|BIO_FP_WRITE,name)
529 #define BIO_append_filename(b,name) BIO_ctrl(b,BIO_C_SET_FILENAME, \
530     BIO_CLOSE|BIO_FP_APPEND,name)
531 #define BIO_rw_filename(b,name) BIO_ctrl(b,BIO_C_SET_FILENAME, \
532     BIO_CLOSE|BIO_FP_READ|BIO_FP_WRITE,name)

534 /* WARNING WARNING, this ups the reference count on the read bio of the
535  * SSL structure. This is because the ssl read BIO is now pointed to by
536  * the next_bio field in the bio. So when you free the BIO, make sure
537  * you are doing a BIO_free_all() to catch the underlying BIO. */
538 #define BIO_set_ssl(b,ssl,c) BIO_ctrl(b,BIO_C_SET_SSL,c,(char *)ssl)
539 #define BIO_get_ssl(b,sslp) BIO_ctrl(b,BIO_C_GET_SSL,0,(char *)sslp)
540 #define BIO_set_ssl_mode(b,client) BIO_ctrl(b,BIO_C_SSL_MODE,client,NULL)
541 #define BIO_set_ssl_renegotiate_bytes(b,num) \
542     BIO_ctrl(b,BIO_C_SET_SSL_RENEGOTIATE_BYTES,num,NULL);
543 #define BIO_get_num_renegotiates(b) \
544     BIO_ctrl(b,BIO_C_GET_SSL_NUM_RENEGOTIATES,0,NULL);
545 #define BIO_set_ssl_renegotiate_timeout(b,seconds) \
546     BIO_ctrl(b,BIO_C_SET_SSL_RENEGOTIATE_TIMEOUT,seconds,NULL);

548 /* defined in evp.h */
549 /* #define BIO_set_md(b,md) BIO_ctrl(b,BIO_C_SET_MD,1,(char *)md) */

551 #define BIO_get_mem_data(b,pp) BIO_ctrl(b,BIO_CTRL_INFO,0,(char *)pp)
552 #define BIO_set_mem_buf(b,bm,c) BIO_ctrl(b,BIO_C_SET_BUF_MEM,c,(char *)bm)
553 #define BIO_get_mem_ptr(b,pp) BIO_ctrl(b,BIO_C_GET_BUF_MEM_PTR,0,(char *)pp)
554 #define BIO_set_mem_eof_return(b,v) \
555     BIO_ctrl(b,BIO_C_SET_BUF_MEM_EOF_RETURN,v,NULL)

557 /* For the BIO_f_buffer() type */
558 #define BIO_get_buffer_num_lines(b) BIO_ctrl(b,BIO_C_GET_BUFF_NUM_LINES,0,NU
559 #define BIO_set_buffer_size(b,size) BIO_ctrl(b,BIO_C_SET_BUFF_SIZE,size,NULL
560 #define BIO_set_read_buffer_size(b,size) BIO_int_ctrl(b,BIO_C_SET_BUFF_SIZE,size
561 #define BIO_set_write_buffer_size(b,size) BIO_int_ctrl(b,BIO_C_SET_BUFF_SIZE,size
562 #define BIO_set_buffer_read_data(b,buf,num) BIO_ctrl(b,BIO_C_SET_BUFF_READ_DATA,

564 /* Don't use the next one unless you know what you are doing :- ) */
565 #define BIO_dup_state(b,ret) BIO_ctrl(b,BIO_CTRL_DUP,0,(char *)ret))

567 #define BIO_reset(b) (int)BIO_ctrl(b,BIO_CTRL_RESET,0,NULL)
568 #define BIO_eof(b) (int)BIO_ctrl(b,BIO_CTRL_EOF,0,NULL)
569 #define BIO_set_close(b,c) (int)BIO_ctrl(b,BIO_CTRL_SET_CLOSE,(c),NULL)
570 #define BIO_get_close(b) (int)BIO_ctrl(b,BIO_CTRL_GET_CLOSE,0,NULL)
571 #define BIO_pending(b) (int)BIO_ctrl(b,BIO_CTRL_PENDING,0,NULL)
572 #define BIO_wpending(b) (int)BIO_ctrl(b,BIO_CTRL_WPENDING,0,NULL)
573 /* ...pending macros have inappropriate return type */
574 size_t BIO_ctrl_pending(BIO *b);
575 size_t BIO_ctrl_wpending(BIO *b);
576 #define BIO_flush(b) (int)BIO_ctrl(b,BIO_CTRL_FLUSH,0,NULL)
577 #define BIO_get_info_callback(b,cbp) (int)BIO_ctrl(b,BIO_CTRL_GET_CALLBACK,0, \
578     cbp)
579 #define BIO_set_info_callback(b,cb) (int)BIO_callback_ctrl(b,BIO_CTRL_SET_CALLBA

581 /* For the BIO_f_buffer() type */
582 #define BIO_buffer_get_num_lines(b) BIO_ctrl(b,BIO_CTRL_GET,0,NULL)

584 /* For BIO_s_bio() */
585 #define BIO_set_write_buf_size(b,size) (int)BIO_ctrl(b,BIO_C_SET_WRITE_BUF_SIZE,
586 #define BIO_get_write_buf_size(b,size) (size_t)BIO_ctrl(b,BIO_C_GET_WRITE_BUF_SI
587 #define BIO_make_bio_pair(b1,b2) (int)BIO_ctrl(b1,BIO_C_MAKE_BIO_PAIR,0,b2)
588 #define BIO_destroy_bio_pair(b) (int)BIO_ctrl(b,BIO_C_DESTROY_BIO_PAIR,0,NULL)
589 #define BIO_shutdown_wr(b) (int)BIO_ctrl(b, BIO_C_SHUTDOWN_WR, 0, NULL)

```

```

590 /* macros with inappropriate type -- but ...pending macros use int too: */
591 #define BIO_get_write_guarantee(b) (int)BIO_ctrl(b,BIO_C_GET_WRITE_GUARANTEE,0,N
592 #define BIO_get_read_request(b) (int)BIO_ctrl(b,BIO_C_GET_READ_REQUEST,0,NULL
593 size_t BIO_ctrl_get_write_guarantee(BIO *b);
594 size_t BIO_ctrl_get_read_request(BIO *b);
595 int BIO_ctrl_reset_read_request(BIO *b);

597 /* ctrl macros for dgram */
598 #define BIO_ctrl_dgram_connect(b,peer) \
599     (int)BIO_ctrl(b,BIO_CTRL_DGRAM_CONNECT,0,(char *)peer)
600 #define BIO_ctrl_set_connected(b, state, peer) \
601     (int)BIO_ctrl(b, BIO_CTRL_DGRAM_SET_CONNECTED, state, (char *)peer)
602 #define BIO_dgram_recv_timedout(b) \
603     (int)BIO_ctrl(b, BIO_CTRL_DGRAM_GET_RECV_TIMER_EXP, 0, NULL)
604 #define BIO_dgram_send_timedout(b) \
605     (int)BIO_ctrl(b, BIO_CTRL_DGRAM_GET_SEND_TIMER_EXP, 0, NULL)
606 #define BIO_dgram_get_peer(b,peer) \
607     (int)BIO_ctrl(b, BIO_CTRL_DGRAM_GET_PEER, 0, (char *)peer)
608 #define BIO_dgram_set_peer(b,peer) \
609     (int)BIO_ctrl(b, BIO_CTRL_DGRAM_SET_PEER, 0, (char *)peer)

611 /* These two aren't currently implemented */
612 /* int BIO_get_ex_num(BIO *bio); */
613 /* void BIO_set_ex_free_func(BIO *bio,int idx,void (*cb)()); */
614 int BIO_set_ex_data(BIO *bio,int idx,void *data);
615 void *BIO_get_ex_data(BIO *bio,int idx);
616 int BIO_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
617     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
618 unsigned long BIO_number_read(BIO *bio);
619 unsigned long BIO_number_written(BIO *bio);

621 /* For BIO_f_asn1() */
622 int BIO_asn1_set_prefix(BIO *b, asn1_ps_func *prefix,
623     asn1_ps_func *prefix_free);
624 int BIO_asn1_get_prefix(BIO *b, asn1_ps_func **pprefix,
625     asn1_ps_func **pprefix_free);
626 int BIO_asn1_set_suffix(BIO *b, asn1_ps_func *suffix,
627     asn1_ps_func *suffix_free);
628 int BIO_asn1_get_suffix(BIO *b, asn1_ps_func **psuffix,
629     asn1_ps_func **psuffix_free);

631 # ifndef OPENSSL_NO_FP_API
632 BIO_METHOD *BIO_s_file(void);
633 BIO *BIO_new_file(const char *filename, const char *mode);
634 BIO *BIO_new_fp(FILE *stream, int close_flag);
635 # define BIO_s_file_internal BIO_s_file
636 # endif
637 BIO * BIO_new(BIO_METHOD *type);
638 int BIO_set(BIO *a,BIO_METHOD *type);
639 int BIO_free(BIO *a);
640 void BIO_vfree(BIO *a);
641 int BIO_read(BIO *b, void *data, int len);
642 int BIO_gets(BIO *bp,char *buf, int size);
643 int BIO_write(BIO *b, const void *data, int len);
644 int BIO_puts(BIO *bp,const char *buf);
645 int BIO_indent(BIO *b,int indent,int max);
646 long BIO_ctrl(BIO *bp,int cmd,long larg,void *parg);
647 long BIO_callback_ctrl(BIO *b, int cmd, void (*fp)(struct bio_st *, int, const c
648 char * BIO_ptr_ctrl(BIO *bp,int cmd,long larg);
649 long BIO_int_ctrl(BIO *bp,int cmd,long larg,int iarg);
650 BIO * BIO_push(BIO *b,BIO *append);
651 BIO * BIO_pop(BIO *b);
652 void BIO_free_all(BIO *a);
653 BIO * BIO_find_type(BIO *b,int bio_type);
654 BIO * BIO_next(BIO *b);
655 BIO * BIO_get_retry_BIO(BIO *bio, int *reason);

```

```

656 int BIO_get_retry_reason(BIO *bio);
657 BIO * BIO_dup_chain(BIO *in);

659 int BIO_nread0(BIO *bio, char **buf);
660 int BIO_nread(BIO *bio, char **buf, int num);
661 int BIO_nwrite0(BIO *bio, char **buf);
662 int BIO_nwrite(BIO *bio, char **buf, int num);

664 long BIO_debug_callback(BIO *bio,int cmd,const char *argp,int argi,
665 long argl,long ret);

667 BIO_METHOD *BIO_s_mem(void);
668 BIO *BIO_new_mem_buf(void *buf, int len);
669 BIO_METHOD *BIO_s_socket(void);
670 BIO_METHOD *BIO_s_connect(void);
671 BIO_METHOD *BIO_s_accept(void);
672 BIO_METHOD *BIO_s_fd(void);
673 #ifndef OPENSSL_SYS_OS2
674 BIO_METHOD *BIO_s_log(void);
675 #endif
676 BIO_METHOD *BIO_s_bio(void);
677 BIO_METHOD *BIO_s_null(void);
678 BIO_METHOD *BIO_f_null(void);
679 BIO_METHOD *BIO_f_buffer(void);
680 #ifdef OPENSSL_SYS_VMS
681 BIO_METHOD *BIO_f_linebuffer(void);
682 #endif
683 BIO_METHOD *BIO_f_nbio_test(void);
684 #ifndef OPENSSL_NO_DGRAM
685 BIO_METHOD *BIO_s_datagram(void);
686 #ifndef OPENSSL_NO_SCTP
687 BIO_METHOD *BIO_s_datagram_sctp(void);
688 #endif
689 #endif

691 /* BIO_METHOD *BIO_f_ber(void); */

693 int BIO_sock_should_retry(int i);
694 int BIO_sock_non_fatal_error(int error);
695 int BIO_dgram_non_fatal_error(int error);

697 int BIO_fd_should_retry(int i);
698 int BIO_fd_non_fatal_error(int error);
699 int BIO_dump_cb(int (*cb)(const void *data, size_t len, void *u),
700 void *u, const char *s, int len);
701 int BIO_dump_indent_cb(int (*cb)(const void *data, size_t len, void *u),
702 void *u, const char *s, int len, int indent);
703 int BIO_dump(BIO *b,const char *bytes,int len);
704 int BIO_dump_indent(BIO *b,const char *bytes,int len,int indent);
705 #ifndef OPENSSL_NO_FP_API
706 int BIO_dump_fp(FILE *fp, const char *s, int len);
707 int BIO_dump_indent_fp(FILE *fp, const char *s, int len, int indent);
708 #endif
709 struct hostent *BIO_gethostbyname(const char *name);
710 /* We might want a thread-safe interface too:
711 * struct hostent *BIO_gethostbyname_r(const char *name,
712 * struct hostent *result, void *buffer, size_t buflen);
713 * or something similar (caller allocates a struct hostent,
714 * pointed to by "result", and additional buffer space for the various
715 * substructures; if the buffer does not suffice, NULL is returned
716 * and an appropriate error code is set).
717 */
718 int BIO_sock_error(int sock);
719 int BIO_socket_ioctl(int fd, long type, void *arg);
720 int BIO_socket_nbio(int fd,int mode);
721 int BIO_get_port(const char *str, unsigned short *port_ptr);

```

```

722 int BIO_get_host_ip(const char *str, unsigned char *ip);
723 int BIO_get_accept_socket(char *host_port,int mode);
724 int BIO_accept(int sock,char **ip_port);
725 int BIO_sock_init(void );
726 void BIO_sock_cleanup(void);
727 int BIO_set_tcp_ndelay(int sock,int turn_on);

729 BIO *BIO_new_socket(int sock, int close_flag);
730 BIO *BIO_new_dgram(int fd, int close_flag);
731 #ifndef OPENSSL_NO_SCTP
732 BIO *BIO_new_dgram_sctp(int fd, int close_flag);
733 int BIO_dgram_is_sctp(BIO *bio);
734 int BIO_dgram_sctp_notification_cb(BIO *b,
735 void (*handle_notifications)(BIO *bio, void *
736 void *context);
737 int BIO_dgram_sctp_wait_for_dry(BIO *b);
738 int BIO_dgram_sctp_msg_waiting(BIO *b);
739 #endif
740 BIO *BIO_new_fd(int fd, int close_flag);
741 BIO *BIO_new_connect(char *host_port);
742 BIO *BIO_new_accept(char *host_port);

744 int BIO_new_bio_pair(BIO **bio1, size_t writebuf1,
745 BIO **bio2, size_t writebuf2);
746 /* If successful, returns 1 and in *bio1, *bio2 two BIO pair endpoints.
747 * Otherwise returns 0 and sets *bio1 and *bio2 to NULL.
748 * Size 0 uses default value.
749 */

751 void BIO_copy_next_retry(BIO *b);

753 /*long BIO_ghbn_ctrl(int cmd,int iarg,char *parg);*/

755 #ifdef _GNUC_
756 # define __bio_h_attr__ __attribute__
757 #else
758 # define __bio_h_attr__(x)
759 #endif
760 int BIO_printf(BIO *bio, const char *format, ...)
761 __bio_h_attr__((__format__ (__printf__,2,3)));
762 int BIO_vprintf(BIO *bio, const char *format, va_list args)
763 __bio_h_attr__((__format__ (__printf__,2,0)));
764 int BIO_snprintf(char *buf, size_t n, const char *format, ...)
765 __bio_h_attr__((__format__ (__printf__,3,4)));
766 int BIO_vsnprintf(char *buf, size_t n, const char *format, va_list args)
767 __bio_h_attr__((__format__ (__printf__,3,0)));
768 #undef __bio_h_attr__

770 /* BEGIN ERROR CODES */
771 /* The following lines are auto generated by the script mkerr.pl. Any changes
772 * made after this point may be overwritten when the script is next run.
773 */
774 void ERR_load_BIO_strings(void);

776 /* Error codes for the BIO functions. */

778 /* Function codes. */
779 #define BIO_F_AcPT_STATE 100
780 #define BIO_F_BIO_ACCEPT 101
781 #define BIO_F_BIO_BER_GET_HEADER 102
782 #define BIO_F_BIO_CALLBACK_CTRL 131
783 #define BIO_F_BIO_CTRL 103
784 #define BIO_F_BIO_GETHOSTBYNAME 120
785 #define BIO_F_BIO_GETS 104
786 #define BIO_F_BIO_GET_ACCEPT_SOCKET 105
787 #define BIO_F_BIO_GET_HOST_IP 106

```

```
788 #define BIO_F_BIO_GET_PORT 107
789 #define BIO_F_BIO_MAKE_PAIR 121
790 #define BIO_F_BIO_NEW 108
791 #define BIO_F_BIO_NEW_FILE 109
792 #define BIO_F_BIO_NEW_MEM_BUF 126
793 #define BIO_F_BIO_NREAD 123
794 #define BIO_F_BIO_NREAD0 124
795 #define BIO_F_BIO_NWRITE 125
796 #define BIO_F_BIO_NWRITE0 122
797 #define BIO_F_BIO_PUTS 110
798 #define BIO_F_BIO_READ 111
799 #define BIO_F_BIO_SOCKET_INIT 112
800 #define BIO_F_BIO_WRITE 113
801 #define BIO_F_BUFFER_CTRL 114
802 #define BIO_F_CONN_CTRL 127
803 #define BIO_F_CONN_STATE 115
804 #define BIO_F_DGRAM_SCTP_READ 132
805 #define BIO_F_FILE_CTRL 116
806 #define BIO_F_FILE_READ 130
807 #define BIO_F_LINEBUFFER_CTRL 129
808 #define BIO_F_MEM_READ 128
809 #define BIO_F_MEM_WRITE 117
810 #define BIO_F_SSL_NEW 118
811 #define BIO_F_WSASTARTUP 119

813 /* Reason codes. */
814 #define BIO_R_ACCEPT_ERROR 100
815 #define BIO_R_BAD_FOPEN_MODE 101
816 #define BIO_R_BAD_HOSTNAME_LOOKUP 102
817 #define BIO_R_BROKEN_PIPE 124
818 #define BIO_R_CONNECT_ERROR 103
819 #define BIO_R_EOF_ON_MEMORY_BIO 127
820 #define BIO_R_ERROR_SETTING_NBIO 104
821 #define BIO_R_ERROR_SETTING_NBIO_ON_ACCEPTED_SOCKET 105
822 #define BIO_R_ERROR_SETTING_NBIO_ON_ACCEPT_SOCKET 106
823 #define BIO_R_GETHOSTBYNAME_ADDR_IS_NOT_AF_INET 107
824 #define BIO_R_INVALID_ARGUMENT 125
825 #define BIO_R_INVALID_IP_ADDRESS 108
826 #define BIO_R_IN_USE 123
827 #define BIO_R_KEEPAIVE 109
828 #define BIO_R_NBIO_CONNECT_ERROR 110
829 #define BIO_R_NO_ACCEPT_PORT_SPECIFIED 111
830 #define BIO_R_NO_HOSTNAME_SPECIFIED 112
831 #define BIO_R_NO_PORT_DEFINED 113
832 #define BIO_R_NO_PORT_SPECIFIED 114
833 #define BIO_R_NO_SUCH_FILE 128
834 #define BIO_R_NULL_PARAMETER 115
835 #define BIO_R_TAG_MISMATCH 116
836 #define BIO_R_UNABLE_TO_BIND_SOCKET 117
837 #define BIO_R_UNABLE_TO_CREATE_SOCKET 118
838 #define BIO_R_UNABLE_TO_LISTEN_SOCKET 119
839 #define BIO_R_UNINITIALIZED 120
840 #define BIO_R_UNSUPPORTED_METHOD 121
841 #define BIO_R_WRITE_TO_READ_ONLY_BIO 126
842 #define BIO_R_WSASTARTUP 122

844 #ifdef __cplusplus
845 }
846 #endif
847 #endif
```

new/usr/src/lib/openssl/include/openssl/blowfish.h

1

5143 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/blowfish.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bf/blowfish.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_BLOWFISH_H
60 #define HEADER_BLOWFISH_H
```

new/usr/src/lib/openssl/include/openssl/blowfish.h

2

```
62 #include <openssl/e_os2.h>

64 #ifdef __cplusplus
65 extern "C" {
66 #endif

68 #ifndef OPENSSL_NO_BF
69 #error BF is disabled.
70 #endif

72 #define BF_ENCRYPT      1
73 #define BF_DECRYPT      0

75 /*
76  * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
77  * ! BF_LONG has to be at least 32 bits wide. If it's wider, then !
78  * ! BF_LONG_LOG2 has to be defined along. !
79  * ! !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
80  */

82 #if defined(__LP32__)
83 #define BF_LONG unsigned long
84 #elif defined(OPENSSL_SYS_CRAY) || defined(__ILP64__)
85 #define BF_LONG unsigned long
86 #define BF_LONG_LOG2 3
87 /*
88  * _CRAY note. I could declare short, but I have no idea what impact
89  * does it have on performance on none-T3E machines. I could declare
90  * int, but at least on C90 sizeof(int) can be chosen at compile time.
91  * So I've chosen long...
92  *
93  * <appro@fy.chalmers.se>
94  */
95 #else
96 #define BF_LONG unsigned int
97 #endif

98 #define BF_ROUNDS      16
99 #define BF_BLOCK        8

101 typedef struct bf_key_st
102 {
103     BF_LONG P[BF_ROUNDS+2];
104     BF_LONG S[4*256];
105 } BF_KEY;

107 #ifndef OPENSSL_FIPS
108 void private_BF_set_key(BF_KEY *key, int len, const unsigned char *data);
109 #endif
110 void BF_set_key(BF_KEY *key, int len, const unsigned char *data);

112 void BF_encrypt(BF_LONG *data, const BF_KEY *key);
113 void BF_decrypt(BF_LONG *data, const BF_KEY *key);

115 void BF_ecb_encrypt(const unsigned char *in, unsigned char *out,
116                     const BF_KEY *key, int enc);
117 void BF_cbc_encrypt(const unsigned char *in, unsigned char *out, long length,
118                     const BF_KEY *schedule, unsigned char *ivec, int enc);
119 void BF_cfb64_encrypt(const unsigned char *in, unsigned char *out, long length,
120                       const BF_KEY *schedule, unsigned char *ivec, int *num, int enc);
121 void BF_ofb64_encrypt(const unsigned char *in, unsigned char *out, long length,
122                       const BF_KEY *schedule, unsigned char *ivec, int *num);
123 const char *BF_options(void);

125 #ifdef __cplusplus
126 }
127 #endif
```

129 #endif

36559 Fri May 30 18:31:17 2014
 new/usr/src/lib/openssl/include/openssl/bn.h
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/bn/bn.h */
2 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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57 */
58 /* =====
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60 *
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103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 *
114 * Portions of the attached software ("Contribution") are developed by
115 * SUN MICROSYSTEMS, INC., and are contributed to the OpenSSL project.
116 *
117 * The Contribution is licensed pursuant to the Eric Young open source
118 * license provided above.
119 *
120 * The binary polynomial arithmetic software is originally written by
121 * Sheueling Chang Shantz and Douglas Stebila of Sun Microsystems Laboratories.
122 *
123 */
124
125 #ifndef HEADER_BN_H
126 #define HEADER_BN_H

```

```

128 #include <openssl/e_os2.h>
129 #ifndef OPENSSL_NO_FP_API
130 #include <stdio.h> /* FILE */
131 #endif
132 #include <openssl/ssl_typ.h>
133 #include <openssl/crypto.h>

135 #ifdef __cplusplus
136 extern "C" {
137 #endif

139 /* These preprocessor symbols control various aspects of the bignum headers and
140  * library code. They're not defined by any "normal" configuration, as they are
141  * intended for development and testing purposes. NB: defining all three can be
142  * useful for debugging application code as well as openssl itself.
143  */
144 * BN_DEBUG - turn on various debugging alterations to the bignum code
145 * BN_DEBUG_RAND - uses random poisoning of unused words to trip up
146 * mismanagement of bignum internals. You must also define BN_DEBUG.
147 */
148 /* #define BN_DEBUG */
149 /* #define BN_DEBUG_RAND */

151 #ifndef OPENSSL_SMALL_FOOTPRINT
152 #define BN_MUL_COMBA
153 #define BN_SQR_COMBA
154 #define BN_RECURSION
155 #endif

157 /* This next option uses the C libraries (2 word)/(1 word) function.
158  * If it is not defined, I use my C version (which is slower).
159  * The reason for this flag is that when the particular C compiler
160  * library routine is used, and the library is linked with a different
161  * compiler, the library is missing. This mostly happens when the
162  * library is built with gcc and then linked using normal cc. This would
163  * be a common occurrence because gcc normally produces code that is
164  * 2 times faster than system compilers for the big number stuff.
165  * For machines with only one compiler (or shared libraries), this should
166  * be on. Again this in only really a problem on machines
167  * using "long long's", are 32bit, and are not using my assembler code. */
168 #if defined(OPENSSL_SYS_MSDOS) || defined(OPENSSL_SYS_WINDOWS) || \
169     defined(OPENSSL_SYS_WIN32) || defined(linux)
170 # ifndef BN_DIV2W
171 #  define BN_DIV2W
172 # endif
173 #endif

175 /* assuming long is 64bit - this is the DEC Alpha
176  * unsigned long long is only 64 bits :-/, don't define
177  * BN_LLONG for the DEC Alpha */
178 #ifdef SIXTY_FOUR_BIT_LONG
179 #define BN_ULLONG      unsigned long long
180 #define BN_ULONG      unsigned long
181 #define BN_LONG       long
182 #define BN_BITS       128
183 #define BN_BYTES      8
184 #define BN_BITS2      64
185 #define BN_BITS4      32
186 #define BN_MASK       (0xffffffffffffffffffffffffffffffffLL)
187 #define BN_MASK2      (0xfffffffffffffffffL)
188 #define BN_MASK2L     (0xfffffffffL)
189 #define BN_MASK2h     (0xffffffff00000000L)
190 #define BN_MASK2h1    (0xffffffff80000000L)
191 #define BN_TBIT       (0x8000000000000000L)
192 #define BN_DEC_CONV    (10000000000000000000ULL)
193 #define BN_DEC_FMT1    "%lu"

```

```

194 #define BN_DEC_FMT2    "%019lu"
195 #define BN_DEC_NUM     19
196 #define BN_HEX_FMT1    "%lx"
197 #define BN_HEX_FMT2    "%016lx"
198 #endif

200 /* This is where the long long data type is 64 bits, but long is 32.
201  * For machines where there are 64bit registers, this is the mode to use.
202  * IRIX, on R4000 and above should use this mode, along with the relevant
203  * assembler code :-). Do NOT define BN_LLONG.
204  */
205 #ifdef SIXTY_FOUR_BIT
206 #undef BN_LLONG
207 #undef BN_ULLONG
208 #define BN_ULONG      unsigned long long
209 #define BN_LONG       long long
210 #define BN_BITS       128
211 #define BN_BYTES      8
212 #define BN_BITS2      64
213 #define BN_BITS4      32
214 #define BN_MASK2      (0xfffffffffffffffffLL)
215 #define BN_MASK2L     (0xfffffffffL)
216 #define BN_MASK2h     (0xffffffff00000000LL)
217 #define BN_MASK2h1    (0xffffffff80000000LL)
218 #define BN_TBIT       (0x8000000000000000LL)
219 #define BN_DEC_CONV    (10000000000000000000ULL)
220 #define BN_DEC_FMT1    "%llu"
221 #define BN_DEC_FMT2    "%019llu"
222 #define BN_DEC_NUM     19
223 #define BN_HEX_FMT1    "%llx"
224 #define BN_HEX_FMT2    "%016llx"
225 #endif

227 #ifdef THIRTY_TWO_BIT
228 #ifdef BN_LLONG
229 # if defined(_WIN32) && !defined(__GNUC__)
230 #  define BN_ULLONG      unsigned __int64
231 #  define BN_MASK        (0xfffffffffffffffffI64)
232 # else
233 #  define BN_ULLONG      unsigned long long
234 #  define BN_MASK        (0xfffffffffffffffffLL)
235 # endif
236 #endif
237 #define BN_ULONG      unsigned int
238 #define BN_LONG       int
239 #define BN_BITS       64
240 #define BN_BYTES      4
241 #define BN_BITS2      32
242 #define BN_BITS4      16
243 #define BN_MASK2      (0xfffffffffL)
244 #define BN_MASK2L     (0xfffffL)
245 #define BN_MASK2h1    (0xffff8000L)
246 #define BN_MASK2h     (0xffff0000L)
247 #define BN_TBIT       (0x80000000L)
248 #define BN_DEC_CONV    (1000000000L)
249 #define BN_DEC_FMT1    "%u"
250 #define BN_DEC_FMT2    "%09u"
251 #define BN_DEC_NUM     9
252 #define BN_HEX_FMT1    "%x"
253 #define BN_HEX_FMT2    "%08x"
254 #endif

256 /* 2011-02-22 SMS.
257  * In various places, a size_t variable or a type cast to size_t was
258  * used to perform integer-only operations on pointers. This failed on
259  * VMS with 64-bit pointers (CC /POINTER_SIZE = 64) because size_t is

```



```

392         (b) >= 550 ? 5 : \
393         (b) >= 450 ? 6 : \
394         (b) >= 400 ? 7 : \
395         (b) >= 350 ? 8 : \
396         (b) >= 300 ? 9 : \
397         (b) >= 250 ? 12 : \
398         (b) >= 200 ? 15 : \
399         (b) >= 150 ? 18 : \
400         /* b >= 100 */ 27)

402 #define BN_num_bytes(a) ((BN_num_bits(a)+7)/8)

404 /* Note that BN_abs_is_word didn't work reliably for w == 0 until 0.9.8 */
405 #define BN_abs_is_word(a,w) (((a)->top == 1) && ((a)->d[0] == (BN_ULONG)(w))) |
406         (((w) == 0) && ((a)->top == 0))
407 #define BN_is_zero(a) ((a)->top == 0)
408 #define BN_is_one(a) (BN_abs_is_word((a),1) && !(a)->neg)
409 #define BN_is_word(a,w) (BN_abs_is_word((a),(w)) && !(a)->neg)
410 #define BN_is_odd(a) (((a)->top > 0) && ((a)->d[0] & 1))

412 #define BN_one(a) (BN_set_word((a),1))
413 #define BN_zero_ex(a) \
414     do { \
415         BIGNUM *tmp_bn = (a); \
416         tmp_bn->top = 0; \
417         tmp_bn->neg = 0; \
418     } while(0)
419 #ifndef OPENSSL_NO_DEPRECATED
420 #define BN_zero(a) BN_zero_ex(a)
421 #else
422 #define BN_zero(a) (BN_set_word((a),0))
423 #endif

425 const BIGNUM *BN_value_one(void);
426 char *BN_options(void);
427 BN_CTX *BN_CTX_new(void);
428 #ifndef OPENSSL_NO_DEPRECATED
429 void BN_CTX_init(BN_CTX *c);
430 #endif
431 void BN_CTX_free(BN_CTX *c);
432 void BN_CTX_start(BN_CTX *ctx);
433 BIGNUM *BN_CTX_get(BN_CTX *ctx);
434 void BN_CTX_end(BN_CTX *ctx);
435 int BN_rand(BIGNUM *rnd, int bits, int top, int bottom);
436 int BN_pseudo_rand(BIGNUM *rnd, int bits, int top, int bottom);
437 int BN_rand_range(BIGNUM *rnd, const BIGNUM *range);
438 int BN_pseudo_rand_range(BIGNUM *rnd, const BIGNUM *range);
439 int BN_num_bits(const BIGNUM *a);
440 int BN_num_bits_word(BN_ULONG);
441 BIGNUM *BN_new(void);
442 void BN_init(BIGNUM *);
443 void BN_clear_free(BIGNUM *a);
444 BIGNUM *BN_copy(BIGNUM *a, const BIGNUM *b);
445 void BN_swap(BIGNUM *a, BIGNUM *b);
446 BIGNUM *BN_bin2bn(const unsigned char *s, int len, BIGNUM *ret);
447 int BN_bn2bin(const BIGNUM *a, unsigned char *to);
448 BIGNUM *BN_mpi2bn(const unsigned char *s, int len, BIGNUM *ret);
449 int BN_bn2mpi(const BIGNUM *a, unsigned char *to);
450 int BN_sub(BIGNUM *r, const BIGNUM *a, const BIGNUM *b);
451 int BN_usub(BIGNUM *r, const BIGNUM *a, const BIGNUM *b);
452 int BN_uadd(BIGNUM *r, const BIGNUM *a, const BIGNUM *b);
453 int BN_add(BIGNUM *r, const BIGNUM *a, const BIGNUM *b);
454 int BN_mul(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, BN_CTX *ctx);
455 int BN_sqr(BIGNUM *r, const BIGNUM *a, BN_CTX *ctx);
456 /** BN_set_negative sets sign of a BIGNUM
457  * \param b pointer to the BIGNUM object

```

```

458  * \param n 0 if the BIGNUM b should be positive and a value != 0 otherwise
459  */
460 void BN_set_negative(BIGNUM *b, int n);
461 /** BN_is_negative returns 1 if the BIGNUM is negative
462  * \param a pointer to the BIGNUM object
463  * \return 1 if a < 0 and 0 otherwise
464  */
465 #define BN_is_negative(a) ((a)->neg != 0)

467 int BN_div(BIGNUM *dv, BIGNUM *rem, const BIGNUM *m, const BIGNUM *d,
468     BN_CTX *ctx);
469 #define BN_mod(rem,m,d,ctx) BN_div(NULL,(rem),(m),(d),(ctx))
470 int BN_nnmod(BIGNUM *r, const BIGNUM *m, const BIGNUM *d, BN_CTX *ctx);
471 int BN_mod_add(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *m,
472     BN_CTX *ctx);
473 int BN_mod_sub(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *m,
474     BN_CTX *ctx);
475 int BN_mod_mul(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *m,
476     BN_CTX *ctx);
477 int BN_mod_sqr(BIGNUM *r, const BIGNUM *a, const BIGNUM *m, BN_CTX *ctx);
478 int BN_mod_lshift1(BIGNUM *r, const BIGNUM *a, const BIGNUM *m, BN_CTX *ctx);
479 int BN_mod_lshift1_quick(BIGNUM *r, const BIGNUM *a, const BIGNUM *m);
480 int BN_mod_lshift(BIGNUM *r, const BIGNUM *a, int n, const BIGNUM *m, BN_CTX *ctx);
481 int BN_mod_lshift_quick(BIGNUM *r, const BIGNUM *a, int n, const BIGNUM *m);

483 BN_ULONG BN_mod_word(const BIGNUM *a, BN_ULONG w);
484 BN_ULONG BN_div_word(BIGNUM *a, BN_ULONG w);
485 int BN_mul_word(BIGNUM *a, BN_ULONG w);
486 int BN_add_word(BIGNUM *a, BN_ULONG w);
487 int BN_sub_word(BIGNUM *a, BN_ULONG w);
488 int BN_set_word(BIGNUM *a, BN_ULONG w);
489 BN_ULONG BN_get_word(const BIGNUM *a);

491 int BN_cmp(const BIGNUM *a, const BIGNUM *b);
492 void BN_free(BIGNUM *a);
493 int BN_is_bit_set(const BIGNUM *a, int n);
494 int BN_lshift(BIGNUM *r, const BIGNUM *a, int n);
495 int BN_lshift1(BIGNUM *r, const BIGNUM *a);
496 int BN_exp(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx);

498 int BN_mod_exp(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
499     const BIGNUM *m, BN_CTX *ctx);
500 int BN_mod_exp_mont(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
501     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *m_ctx);
502 int BN_mod_exp_mont_consttime(BIGNUM *rr, const BIGNUM *a, const BIGNUM *p,
503     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *in_mont);
504 int BN_mod_exp_mont_word(BIGNUM *r, BN_ULONG a, const BIGNUM *p,
505     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *m_ctx);
506 int BN_mod_exp2_mont(BIGNUM *r, const BIGNUM *a1, const BIGNUM *p1,
507     const BIGNUM *a2, const BIGNUM *p2, const BIGNUM *m,
508     BN_CTX *ctx, BN_MONT_CTX *m_ctx);
509 int BN_mod_exp_simple(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
510     const BIGNUM *m, BN_CTX *ctx);

512 int BN_mask_bits(BIGNUM *a, int n);
513 #ifndef OPENSSL_NO_FP_API
514 int BN_print_fp(FILE *fp, const BIGNUM *a);
515 #endif
516 #ifndef HEADER_BIO_H
517 int BN_print(BIO *fp, const BIGNUM *a);
518 #else
519 int BN_print(void *fp, const BIGNUM *a);
520 #endif
521 int BN_reciprocal(BIGNUM *r, const BIGNUM *m, int len, BN_CTX *ctx);
522 int BN_rshift(BIGNUM *r, const BIGNUM *a, int n);
523 int BN_rshift1(BIGNUM *r, const BIGNUM *a);

```

```

524 void BN_clear(BIGNUM *a);
525 BIGNUM *BN_dup(const BIGNUM *a);
526 int BN_ucmp(const BIGNUM *a, const BIGNUM *b);
527 int BN_set_bit(BIGNUM *a, int n);
528 int BN_clear_bit(BIGNUM *a, int n);
529 char * BN_bn2hex(const BIGNUM *a);
530 char * BN_bn2dec(const BIGNUM *a);
531 int BN_hex2bn(BIGNUM **a, const char *str);
532 int BN_dec2bn(BIGNUM **a, const char *str);
533 int BN_asc2bn(BIGNUM **a, const char *str);
534 int BN_gcd(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, BN_CTX *ctx);
535 int BN_kronecker(const BIGNUM *a, const BIGNUM *b, BN_CTX *ctx); /* returns -2
536 BIGNUM *BN_mod_inverse(BIGNUM *ret,
537 const BIGNUM *a, const BIGNUM *n, BN_CTX *ctx);
538 BIGNUM *BN_mod_sqrt(BIGNUM *ret,
539 const BIGNUM *a, const BIGNUM *n, BN_CTX *ctx);

541 void BN_consttime_swap(BN_ULONG swap, BIGNUM *a, BIGNUM *b, int nwords);

543 /* Deprecated versions */
544 #ifndef OPENSSL_NO_DEPRECATED
545 BIGNUM *BN_generate_prime(BIGNUM *ret, int bits, int safe,
546 const BIGNUM *add, const BIGNUM *rem,
547 void (*callback)(int, int, void *), void *cb_arg);
548 int BN_is_prime(const BIGNUM *p, int nchecks,
549 void (*callback)(int, int, void *),
550 BN_CTX *ctx, void *cb_arg);
551 int BN_is_prime_fasttest(const BIGNUM *p, int nchecks,
552 void (*callback)(int, int, void *), BN_CTX *ctx, void *cb_arg,
553 int do_trial_division);
554 #endif /* !defined(OPENSSL_NO_DEPRECATED) */

556 /* Newer versions */
557 int BN_generate_prime_ex(BIGNUM *ret, int bits, int safe, const BIGNUM *add,
558 const BIGNUM *rem, BN_GENCB *cb);
559 int BN_is_prime_ex(const BIGNUM *p, int nchecks, BN_CTX *ctx, BN_GENCB *cb);
560 int BN_is_prime_fasttest_ex(const BIGNUM *p, int nchecks, BN_CTX *ctx,
561 int do_trial_division, BN_GENCB *cb);

563 int BN_X931_generate_Xpq(BIGNUM *Xp, BIGNUM *Xq, int nbits, BN_CTX *ctx);

565 int BN_X931_derive_prime_ex(BIGNUM *p, BIGNUM *p1, BIGNUM *p2,
566 const BIGNUM *Xp, const BIGNUM *Xp1, const BIGNUM *Xp2,
567 const BIGNUM *e, BN_CTX *ctx, BN_GENCB *cb);
568 int BN_X931_generate_prime_ex(BIGNUM *p, BIGNUM *p1, BIGNUM *p2,
569 BIGNUM *Xp1, BIGNUM *Xp2,
570 const BIGNUM *Xp,
571 const BIGNUM *e, BN_CTX *ctx,
572 BN_GENCB *cb);

574 BN_MONT_CTX *BN_MONT_CTX_new(void);
575 void BN_MONT_CTX_init(BN_MONT_CTX *ctx);
576 int BN_mod_mul_montgomery(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
577 BN_MONT_CTX *mont, BN_CTX *ctx);
578 #define BN_to_montgomery(r, a, mont, ctx) BN_mod_mul_montgomery(\
579 (r), (a), &((mont)->RR), (mont), (ctx))
580 int BN_from_montgomery(BIGNUM *r, const BIGNUM *a,
581 BN_MONT_CTX *mont, BN_CTX *ctx);
582 void BN_MONT_CTX_free(BN_MONT_CTX *mont);
583 int BN_MONT_CTX_set(BN_MONT_CTX *mont, const BIGNUM *mod, BN_CTX *ctx);
584 BN_MONT_CTX *BN_MONT_CTX_copy(BN_MONT_CTX *to, BN_MONT_CTX *from);
585 BN_MONT_CTX *BN_MONT_CTX_set_locked(BN_MONT_CTX **pmont, int lock,
586 const BIGNUM *mod, BN_CTX *ctx);

588 /* BN_BLINDING flags */
589 #define BN_BLINDING_NO_UPDATE 0x00000001

```

```

590 #define BN_BLINDING_NO_RECREATE 0x00000002

592 BN_BLINDING *BN_BLINDING_new(const BIGNUM *A, const BIGNUM *Ai, BIGNUM *mod);
593 void BN_BLINDING_free(BN_BLINDING *b);
594 int BN_BLINDING_update(BN_BLINDING *b, BN_CTX *ctx);
595 int BN_BLINDING_convert(BIGNUM *n, BN_BLINDING *b, BN_CTX *ctx);
596 int BN_BLINDING_invert(BIGNUM *n, BN_BLINDING *b, BN_CTX *ctx);
597 int BN_BLINDING_convert_ex(BIGNUM *n, BIGNUM *r, BN_BLINDING *b, BN_CTX *);
598 int BN_BLINDING_invert_ex(BIGNUM *n, const BIGNUM *r, BN_BLINDING *b, BN_CTX *);
599 #ifndef OPENSSL_NO_DEPRECATED
600 unsigned long BN_BLINDING_get_thread_id(const BN_BLINDING *);
601 void BN_BLINDING_set_thread_id(BN_BLINDING *, unsigned long);
602 #endif
603 CRYPTO_THREADID *BN_BLINDING_thread_id(BN_BLINDING *);
604 unsigned long BN_BLINDING_get_flags(const BN_BLINDING *);
605 void BN_BLINDING_set_flags(BN_BLINDING *, unsigned long);
606 BN_BLINDING *BN_BLINDING_create_param(BN_BLINDING *b,
607 const BIGNUM *e, BIGNUM *m, BN_CTX *ctx,
608 int (*bn_mod_exp)(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
609 const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *m_ctx),
610 BN_MONT_CTX *m_ctx);

612 #ifndef OPENSSL_NO_DEPRECATED
613 void BN_set_params(int mul, int high, int low, int mont);
614 int BN_get_params(int which); /* 0, mul, 1 high, 2 low, 3 mont */
615 #endif

617 void BN_RECP_CTX_init(BN_RECP_CTX *recp);
618 BN_RECP_CTX *BN_RECP_CTX_new(void);
619 void BN_RECP_CTX_free(BN_RECP_CTX *recp);
620 int BN_RECP_CTX_set(BN_RECP_CTX *recp, const BIGNUM *rdiv, BN_CTX *ctx);
621 int BN_mod_mul_reciprocal(BIGNUM *r, const BIGNUM *x, const BIGNUM *y,
622 BN_RECP_CTX *recp, BN_CTX *ctx);
623 int BN_mod_exp_recp(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
624 const BIGNUM *m, BN_CTX *ctx);
625 int BN_div_recp(BIGNUM *dv, BIGNUM *rem, const BIGNUM *m,
626 BN_RECP_CTX *recp, BN_CTX *ctx);

628 #ifndef OPENSSL_NO_EC2M

630 /* Functions for arithmetic over binary polynomials represented by BIGNUMs.
631 * The BIGNUM::neg property of BIGNUMs representing binary polynomials is
632 * ignored.
633 * Note that input arguments are not const so that their bit arrays can
634 * be expanded to the appropriate size if needed.
635 */

639 int BN_GF2m_add(BIGNUM *r, const BIGNUM *a, const BIGNUM *b); /* r = a + b */
640 #define BN_GF2m_sub(r, a, b) BN_GF2m_add(r, a, b)
641 int BN_GF2m_mod(BIGNUM *r, const BIGNUM *a, const BIGNUM *p); /* r = a mod p */
642 int BN_GF2m_mod_mul(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
643 const BIGNUM *p, BN_CTX *ctx); /* r = (a * b) mod p */
644 int BN_GF2m_mod_sqr(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
645 BN_CTX *ctx); /* r = (a * a) mod p */
646 int BN_GF2m_mod_inv(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
647 BN_CTX *ctx); /* r = (1 / a) mod p */
648 int BN_GF2m_mod_div(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
649 const BIGNUM *p, BN_CTX *ctx); /* r = (a / b) mod p */
650 int BN_GF2m_mod_exp(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
651 const BIGNUM *p, BN_CTX *ctx); /* r = (a ^ b) mod p */
652 int BN_GF2m_mod_sqrt(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
653 BN_CTX *ctx); /* r = sqrt(a) mod p */
654 int BN_GF2m_mod_solve_quad(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
655 BN_CTX *ctx); /* r^2 + r = a mod p */

```

```

656 #define BN_GF2m_cmp(a, b) BN_ucmp((a), (b))
657 /* Some functions allow for representation of the irreducible polynomials
658  * as an unsigned int[], say p. The irreducible f(t) is then of the form:
659  *  $t^p[0] + t^p[1] + \dots + t^p[k]$ 
660  * where  $m = p[0] > p[1] > \dots > p[k] = 0$ .
661  */
662 int BN_GF2m_mod_arr(BIGNUM *r, const BIGNUM *a, const int p[]);
663 /* r = a mod p */
664 int BN_GF2m_mod_mul_arr(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
665 const int p[], BN_CTX *ctx); /* r = (a * b) mod p */
666 int BN_GF2m_mod_sqr_arr(BIGNUM *r, const BIGNUM *a, const int p[],
667 BN_CTX *ctx); /* r = (a * a) mod p */
668 int BN_GF2m_mod_inv_arr(BIGNUM *r, const BIGNUM *b, const int p[],
669 BN_CTX *ctx); /* r = (1 / b) mod p */
670 int BN_GF2m_mod_div_arr(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
671 const int p[], BN_CTX *ctx); /* r = (a / b) mod p */
672 int BN_GF2m_mod_exp_arr(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
673 const int p[], BN_CTX *ctx); /* r = (a ^ b) mod p */
674 int BN_GF2m_mod_sqrt_arr(BIGNUM *r, const BIGNUM *a,
675 const int p[], BN_CTX *ctx); /* r = sqrt(a) mod p */
676 int BN_GF2m_mod_solve_quad_arr(BIGNUM *r, const BIGNUM *a,
677 const int p[], BN_CTX *ctx); /*  $r^2 + r = a$  mod p */
678 int BN_GF2m_poly2arr(const BIGNUM *a, int p[], int max);
679 int BN_GF2m_arr2poly(const int p[], BIGNUM *a);

681 #endif

683 /* faster mod functions for the 'NIST primes'
684  * 0 <= a < p^2 */
685 int BN_nist_mod_192(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx);
686 int BN_nist_mod_224(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx);
687 int BN_nist_mod_256(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx);
688 int BN_nist_mod_384(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx);
689 int BN_nist_mod_521(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx);

691 const BIGNUM *BN_get0_nist_prime_192(void);
692 const BIGNUM *BN_get0_nist_prime_224(void);
693 const BIGNUM *BN_get0_nist_prime_256(void);
694 const BIGNUM *BN_get0_nist_prime_384(void);
695 const BIGNUM *BN_get0_nist_prime_521(void);

697 /* library internal functions */

699 #define bn_expand(a,bits) ((((((bits+BN_BITS2-1)/BN_BITS2)) <= (a)->dmax)?\
700 (a):bn_expand2((a),(bits+BN_BITS2-1)/BN_BITS2))
701 #define bn_wexpand(a,words) (((words) <= (a)->dmax)?(a):bn_expand2((a),(words)))
702 BIGNUM *bn_expand2(BIGNUM *a, int words);
703 #ifndef OPENSSL_NO_DEPRECATED
704 BIGNUM *bn_dup_expand(const BIGNUM *a, int words); /* unused */
705 #endif

707 /* Bignum consistency macros
708  * There is one "API" macro, bn_fix_top(), for stripping leading zeroes from
709  * bignum data after direct manipulations on the data. There is also an
710  * "internal" macro, bn_check_top(), for verifying that there are no leading
711  * zeroes. Unfortunately, some auditing is required due to the fact that
712  * bn_fix_top() has become an overabused duct-tape because bignum data is
713  * occasionally passed around in an inconsistent state. So the following
714  * changes have been made to sort this out;
715  * - bn_fix_top()'s implementation has been moved to bn_correct_top()
716  * - if BN_DEBUG isn't defined, bn_fix_top() maps to bn_correct_top(), and
717  *   bn_check_top() is as before.
718  * - if BN_DEBUG *is* defined;
719  *   - bn_check_top() tries to pollute unused words even if the bignum 'top' is
720  *     consistent. (ed: only if BN_DEBUG RAND is defined)
721  *   - bn_fix_top() maps to bn_check_top() rather than "fixing" anything.

```

```

722  * The idea is to have debug builds flag up inconsistent bignums when they
723  * occur. If that occurs in a bn_fix_top(), we examine the code in question; if
724  * the use of bn_fix_top() was appropriate (ie. it follows directly after code
725  * that manipulates the bignum) it is converted to bn_correct_top(), and if it
726  * was not appropriate, we convert it permanently to bn_check_top() and track
727  * down the cause of the bug. Eventually, no internal code should be using the
728  * bn_fix_top() macro. External applications and libraries should try this with
729  * their own code too, both in terms of building against the openssl headers
730  * with BN_DEBUG defined *and* linking with a version of OpenSSL built with it
731  * defined. This not only improves external code, it provides more test
732  * coverage for openssl's own code.
733  */

735 #ifdef BN_DEBUG

737 /* We only need assert() when debugging */
738 #include <assert.h>

740 #ifdef BN_DEBUG_RAND
741 /* To avoid "make update" cvs wars due to BN_DEBUG, use some tricks */
742 #ifndef RAND_pseudo_bytes
743 int RAND_pseudo_bytes(unsigned char *buf, int num);
744 #define BN_DEBUG_TRIX
745 #endif
746 #define bn_pollute(a) \
747     do { \
748         const BIGNUM *bnum1 = (a); \
749         if(_bnum1->top < _bnum1->dmax) { \
750             unsigned char _tmp_char; \
751             /* We cast away const without the compiler knowing, any
752              * *genuinely* constant variables that aren't mutable \
753              * wouldn't be constructed with top!=dmax. */ \
754             BN_ULONG *not_const; \
755             memcpy(&not_const, &bnum1->d, sizeof(BN_ULONG)); \
756             RAND_pseudo_bytes(&tmp_char, 1); \
757             memset((unsigned char *)(&not_const + _bnum1->top), _tmp
758                 (_bnum1->dmax - _bnum1->top) * sizeof(BN_ULONG))
759         } \
760     } while(0)
761 #ifdef BN_DEBUG_TRIX
762 #undef RAND_pseudo_bytes
763 #endif
764 #else
765 #define bn_pollute(a)
766 #endif
767 #define bn_check_top(a) \
768     do { \
769         const BIGNUM *bnum2 = (a); \
770         if (_bnum2 != NULL) { \
771             assert((_bnum2->top == 0) || \
772                 (_bnum2->d[_bnum2->top - 1] != 0)); \
773             bn_pollute(_bnum2); \
774         } \
775     } while(0)

777 #define bn_fix_top(a) bn_check_top(a)

779 #define bn_check_size(bn, bits) bn_wcheck_size(bn, ((bits+BN_BITS2-1)/BN_BITS2))
780 #define bn_wcheck_size(bn, words) \
781     do { \
782         const BIGNUM *bnum2 = (bn); \
783         assert(words <= (_bnum2->dmax && words >= (_bnum2->top)); \
784     } while(0)

786 #else /* !BN_DEBUG */

```

```

788 #define bn_pollute(a)
789 #define bn_check_top(a)
790 #define bn_fix_top(a)          bn_correct_top(a)
791 #define bn_check_size(bn, bits)
792 #define bn_wcheck_size(bn, words)

794 #endif

796 #define bn_correct_top(a) \
797 { \
798     BN_ULONG *ftl; \
799     int tmp_top = (a)->top; \
800     if (tmp_top > 0) \
801     { \
802         for (ftl= &((a)->d[tmp_top-1]); tmp_top > 0; tmp_top--) \
803             if (*(ftl--)) break; \
804         (a)->top = tmp_top; \
805     } \
806     bn_pollute(a); \
807 }

809 BN_ULONG bn_mul_add_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w)
810 BN_ULONG bn_mul_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w);
811 void bn_sqr_words(BN_ULONG *rp, const BN_ULONG *ap, int num);
812 BN_ULONG bn_div_words(BN_ULONG h, BN_ULONG l, BN_ULONG d);
813 BN_ULONG bn_add_words(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, int n)
814 BN_ULONG bn_sub_words(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, int n)

816 /* Primes from RFC 2409 */
817 BIGNUM *get_rfc2409_prime_768(BIGNUM *bn);
818 BIGNUM *get_rfc2409_prime_1024(BIGNUM *bn);

820 /* Primes from RFC 3526 */
821 BIGNUM *get_rfc3526_prime_1536(BIGNUM *bn);
822 BIGNUM *get_rfc3526_prime_2048(BIGNUM *bn);
823 BIGNUM *get_rfc3526_prime_3072(BIGNUM *bn);
824 BIGNUM *get_rfc3526_prime_4096(BIGNUM *bn);
825 BIGNUM *get_rfc3526_prime_6144(BIGNUM *bn);
826 BIGNUM *get_rfc3526_prime_8192(BIGNUM *bn);

828 int BN_bntest_rand(BIGNUM *rnd, int bits, int top, int bottom);

830 /* BEGIN ERROR CODES */
831 /* The following lines are auto generated by the script mkerr.pl. Any changes
832  * made after this point may be overwritten when the script is next run.
833  */
834 void ERR_load_BN_strings(void);

836 /* Error codes for the BN functions. */

838 /* Function codes. */
839 #define BN_F_BNRRAND 127
840 #define BN_F_BN_BLINDING_CONVERT_EX 100
841 #define BN_F_BN_BLINDING_CREATE_PARAM 128
842 #define BN_F_BN_BLINDING_INVERT_EX 101
843 #define BN_F_BN_BLINDING_NEW 102
844 #define BN_F_BN_BLINDING_UPDATE 103
845 #define BN_F_BN_BN2DEC 104
846 #define BN_F_BN_BN2HEX 105
847 #define BN_F_BN_CTX_GET 116
848 #define BN_F_BN_CTX_NEW 106
849 #define BN_F_BN_CTX_START 129
850 #define BN_F_BN_DIV 107
851 #define BN_F_BN_DIV_NO_BRANCH 138
852 #define BN_F_BN_DIV_RECP 130
853 #define BN_F_BN_EXP 123

```

```

854 #define BN_F_BN_EXPAND2 108
855 #define BN_F_BN_EXPAND_INTERNAL 120
856 #define BN_F_BN_GF2M_MOD 131
857 #define BN_F_BN_GF2M_MOD_EXP 132
858 #define BN_F_BN_GF2M_MOD_MUL 133
859 #define BN_F_BN_GF2M_MOD_SOLVE_QUAD 134
860 #define BN_F_BN_GF2M_MOD_SOLVE_QUAD_ARR 135
861 #define BN_F_BN_GF2M_MOD_SQR 136
862 #define BN_F_BN_GF2M_MOD_SQRT 137
863 #define BN_F_BN_MOD_EXP2_MONT 118
864 #define BN_F_BN_MOD_EXP_MONT 109
865 #define BN_F_BN_MOD_EXP_MONT_CONSTTIME 124
866 #define BN_F_BN_MOD_EXP_MONT_WORD 117
867 #define BN_F_BN_MOD_EXP_RECP 125
868 #define BN_F_BN_MOD_EXP_SIMPLE 126
869 #define BN_F_BN_MOD_INVERSE 110
870 #define BN_F_BN_MOD_INVERSE_NO_BRANCH 139
871 #define BN_F_BN_MOD_LSHIFT_QUICK 119
872 #define BN_F_BN_MOD_MUL_RECIPROCAL 111
873 #define BN_F_BN_MOD_SQRT 121
874 #define BN_F_BN_MPI2BN 112
875 #define BN_F_BN_NEW 113
876 #define BN_F_BN_RAND 114
877 #define BN_F_BN_RAND_RANGE 122
878 #define BN_F_BN_USUB 115

880 /* Reason codes. */
881 #define BN_R_ARG2_LT_ARG3 100
882 #define BN_R_BAD_RECIPROCAL 101
883 #define BN_R_BIGNUM_TOO_LONG 114
884 #define BN_R_CALLED_WITH_EVEN_MODULUS 102
885 #define BN_R_DIV_BY_ZERO 103
886 #define BN_R_ENCODING_ERROR 104
887 #define BN_R_EXPAND_ON_STATIC_BIGNUM_DATA 105
888 #define BN_R_INPUT_NOT_REDUCED 110
889 #define BN_R_INVALID_LENGTH 106
890 #define BN_R_INVALID_RANGE 115
891 #define BN_R_NOT_A_SQUARE 111
892 #define BN_R_NOT_INITIALIZED 107
893 #define BN_R_NO_INVERSE 108
894 #define BN_R_NO_SOLUTION 116
895 #define BN_R_P_IS_NOT_PRIME 112
896 #define BN_R_TOO_MANY_ITERATIONS 113
897 #define BN_R_TOO_MANY_TEMPORARY_VARIABLES 109

899 #ifdef __cplusplus
900 }
901 #endif
902 #endif

```

new/usr/src/lib/openssl/include/openssl/buffer.h

1

4652 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/buffer.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/buffer/buffer.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
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39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
```

```
59 #ifndef HEADER_BUFFER_H
60 #define HEADER_BUFFER_H
```

new/usr/src/lib/openssl/include/openssl/buffer.h

2

```
62 #include <openssl/ssl_typ.h>
```

```
64 #ifdef __cplusplus
65 extern "C" {
66 #endif
```

```
68 #include <stddef.h>
```

```
70 #if !defined(NO_SYS_TYPES_H)
71 #include <sys/types.h>
72 #endif
```

```
74 /* Already declared in ssl_typ.h */
75 /* typedef struct buf_mem_st BUF_MEM; */
```

```
77 struct buf_mem_st
78 {
79     size_t length; /* current number of bytes */
80     char *data;
81     size_t max; /* size of buffer */
82 };
```

```
84 BUF_MEM *BUF_MEM_new(void);
85 void BUF_MEM_free(BUF_MEM *a);
86 int BUF_MEM_grow(BUF_MEM *str, size_t len);
87 int BUF_MEM_grow_clean(BUF_MEM *str, size_t len);
88 char * BUF_strdup(const char *str);
89 char * BUF_strndup(const char *str, size_t siz);
90 void * BUF_memdup(const void *data, size_t siz);
91 void BUF_reverse(unsigned char *out, const unsigned char *in, size_t siz);
```

```
93 /* safe string functions */
94 size_t BUF_strlcpy(char *dst, const char *src, size_t siz);
95 size_t BUF_strlcat(char *dst, const char *src, size_t siz);
```

```
98 /* BEGIN ERROR CODES */
```

```
99 /* The following lines are auto generated by the script mkerr.pl. Any changes
100 * made after this point may be overwritten when the script is next run.
```

```
101 */
```

```
102 void ERR_load_BUF_strings(void);
```

```
104 /* Error codes for the BUF functions. */
```

```
106 /* Function codes. */
107 #define BUF_F_BUF_MEMDUP 103
108 #define BUF_F_BUF_MEM_GROW 100
109 #define BUF_F_BUF_MEM_GROW_CLEAN 105
110 #define BUF_F_BUF_MEM_NEW 101
111 #define BUF_F_BUF_STRDUP 102
112 #define BUF_F_BUF_STRNDUP 104
```

```
114 /* Reason codes. */
```

```
116 #ifdef __cplusplus
117 }
118 #endif
119 #endif
```


new/usr/src/lib/openssl/include/openssl/camellia.h

1

```
*****
4956 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/camellia.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/camellia/camellia.h *- mode:C; c-file-style: "eay" *- */
2 /* =====
3 * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
10 * notice, this list of conditions and the following disclaimer.
11 *
12 * 2. Redistributions in binary form must reproduce the above copyright
13 * notice, this list of conditions and the following disclaimer in
14 * the documentation and/or other materials provided with the
15 * distribution.
16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
19 * "This product includes software developed by the OpenSSL Project
20 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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31 * 6. Redistributions of any form whatsoever must retain the following
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35 *
36 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
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38 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 */
52 #ifndef HEADER_CAMELLIA_H
53 #define HEADER_CAMELLIA_H
55 #include <openssl/opensslconf.h>
57 #ifdef OPENSSL_NO_CAMELLIA
58 #error CAMELLIA is disabled.
59 #endif
61 #include <stddef.h>
```

new/usr/src/lib/openssl/include/openssl/camellia.h

2

```
63 #define CAMELLIA_ENCRYPT 1
64 #define CAMELLIA_DECRYPT 0
66 /* Because array size can't be a const in C, the following two are macros.
67 Both sizes are in bytes. */
69 #ifdef __cplusplus
70 extern "C" {
71 #endif
73 /* This should be a hidden type, but EVP requires that the size be known */
75 #define CAMELLIA_BLOCK_SIZE 16
76 #define CAMELLIA_TABLE_BYTE_LEN 272
77 #define CAMELLIA_TABLE_WORD_LEN (CAMELLIA_TABLE_BYTE_LEN / 4)
79 typedef unsigned int KEY_TABLE_TYPE[CAMELLIA_TABLE_WORD_LEN]; /* to match with W
81 struct camellia_key_st
82 {
83     union {
84         double d; /* ensures 64-bit align */
85         KEY_TABLE_TYPE rd_key;
86     } u;
87     int grand_rounds;
88 };
89 typedef struct camellia_key_st CAMELLIA_KEY;
91 #ifndef OPENSSL_FIPS
92 int private_camellia_set_key(const unsigned char *userKey, const int bits,
93 CAMELLIA_KEY *key);
94 #endif
95 int Camellia_set_key(const unsigned char *userKey, const int bits,
96 CAMELLIA_KEY *key);
98 void Camellia_encrypt(const unsigned char *in, unsigned char *out,
99 const CAMELLIA_KEY *key);
100 void Camellia_decrypt(const unsigned char *in, unsigned char *out,
101 const CAMELLIA_KEY *key);
103 void Camellia_ecb_encrypt(const unsigned char *in, unsigned char *out,
104 const CAMELLIA_KEY *key, const int enc);
105 void Camellia_cbc_encrypt(const unsigned char *in, unsigned char *out,
106 size_t length, const CAMELLIA_KEY *key,
107 unsigned char *ivec, const int enc);
108 void Camellia_cfb128_encrypt(const unsigned char *in, unsigned char *out,
109 size_t length, const CAMELLIA_KEY *key,
110 unsigned char *ivec, int *num, const int enc);
111 void Camellia_cfb1_encrypt(const unsigned char *in, unsigned char *out,
112 size_t length, const CAMELLIA_KEY *key,
113 unsigned char *ivec, int *num, const int enc);
114 void Camellia_cfb8_encrypt(const unsigned char *in, unsigned char *out,
115 size_t length, const CAMELLIA_KEY *key,
116 unsigned char *ivec, int *num, const int enc);
117 void Camellia_ofb128_encrypt(const unsigned char *in, unsigned char *out,
118 size_t length, const CAMELLIA_KEY *key,
119 unsigned char *ivec, int *num);
120 void Camellia_ctr128_encrypt(const unsigned char *in, unsigned char *out,
121 size_t length, const CAMELLIA_KEY *key,
122 unsigned char ivec[CAMELLIA_BLOCK_SIZE],
123 unsigned char ecound_buf[CAMELLIA_BLOCK_SIZE],
124 unsigned int *num);
126 #ifdef __cplusplus
127 }
```

new/usr/src/lib/openssl/include/openssl/camellia.h

3

```
128 #endif
```

```
130 #endif /* !HEADER_Camellia_H */
```

new/usr/src/lib/openssl/include/openssl/cast.h

1

```
*****
4492 Fri May 30 18:31:17 2014
new/usr/src/lib/openssl/include/openssl/cast.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cast/cast.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_CAST_H
60 #define HEADER_CAST_H
```

new/usr/src/lib/openssl/include/openssl/cast.h

2

```
62 #ifdef __cplusplus
63 extern "C" {
64 #endif
66 #include <openssl/opensslconf.h>
68 #ifdef OPENSSL_NO_CAST
69 #error CAST is disabled.
70 #endif
72 #define CAST_ENCRYPT 1
73 #define CAST_DECRYPT 0
75 #define CAST_LONG unsigned int
77 #define CAST_BLOCK 8
78 #define CAST_KEY_LENGTH 16
80 typedef struct cast_key_st
81 {
82     CAST_LONG data[32];
83     int short_key; /* Use reduced rounds for short key */
84 } CAST_KEY;
86 #ifdef OPENSSL_FIPS
87 void private_CAST_set_key(CAST_KEY *key, int len, const unsigned char *data);
88 #endif
89 void CAST_set_key(CAST_KEY *key, int len, const unsigned char *data);
90 void CAST_ecb_encrypt(const unsigned char *in, unsigned char *out, const CAST_KEY *key, int enc);
91 void CAST_encrypt(CAST_LONG *data, const CAST_KEY *key);
92 void CAST_decrypt(CAST_LONG *data, const CAST_KEY *key);
93 void CAST_cbc_encrypt(const unsigned char *in, unsigned char *out, long length, const CAST_KEY *ks, unsigned char *iv, int enc);
94 void CAST_cfb64_encrypt(const unsigned char *in, unsigned char *out, long length, const CAST_KEY *schedule, unsigned char *iv, int *num, int enc);
95 void CAST_ofb64_encrypt(const unsigned char *in, unsigned char *out, long length, const CAST_KEY *schedule, unsigned char *iv, int *num);
103 #ifdef __cplusplus
104 }
105 #endif
107 #endif
```

new/usr/src/lib/openssl/include/openssl/cmac.h

1

```
*****
3244 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/cmac.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cmac/cmac.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2010 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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21  *    software must display the following acknowledgment:
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

55 #ifndef HEADER_CMAC_H
56 #define HEADER_CMAC_H

58 #ifdef __cplusplus
59 extern "C" {
60 #endif
```

new/usr/src/lib/openssl/include/openssl/cmac.h

2

```
62 #include <openssl/evp.h>

64 /* Opaque */
65 typedef struct CMAC_CTX_st CMAC_CTX;

67 CMAC_CTX *CMAC_CTX_new(void);
68 void CMAC_CTX_cleanup(CMAC_CTX *ctx);
69 void CMAC_CTX_free(CMAC_CTX *ctx);
70 EVP_CIPHER_CTX *CMAC_CTX_get0_cipher_ctx(CMAC_CTX *ctx);
71 int CMAC_CTX_copy(CMAC_CTX *out, const CMAC_CTX *in);

73 int CMAC_Init(CMAC_CTX *ctx, const void *key, size_t keylen,
74               const EVP_CIPHER *cipher, ENGINE *impl);
75 int CMAC_Update(CMAC_CTX *ctx, const void *data, size_t dlen);
76 int CMAC_Final(CMAC_CTX *ctx, unsigned char *out, size_t *poutlen);
77 int CMAC_resume(CMAC_CTX *ctx);

79 #ifdef __cplusplus
80 }
81 #endif
82 #endif
```

new/usr/src/lib/openssl/include/openssl/cms.h

1

```
*****
19927 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/cms.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

55 #ifndef HEADER_CMS_H
56 #define HEADER_CMS_H

58 #include <openssl/x509.h>

60 #ifndef OPENSSL_NO_CMS
61 #error CMS is disabled.
```

new/usr/src/lib/openssl/include/openssl/cms.h

2

```
62 #endif

64 #ifdef __cplusplus
65 extern "C" {
66 #endif

69 typedef struct CMS_ContentInfo_st CMS_ContentInfo;
70 typedef struct CMS_SignerInfo_st CMS_SignerInfo;
71 typedef struct CMS_CertificateChoices CMS_CertificateChoices;
72 typedef struct CMS_RevocationInfoChoice_st CMS_RevocationInfoChoice;
73 typedef struct CMS_RecipientInfo_st CMS_RecipientInfo;
74 typedef struct CMS_ReceiptRequest_st CMS_ReceiptRequest;
75 typedef struct CMS_Receipt_st CMS_Receipt;

77 DECLARE_STACK_OF(CMS_SignerInfo)
78 DECLARE_STACK_OF(GENERAL_NAMES)
79 DECLARE_ASN1_FUNCTIONS(CMS_ContentInfo)
80 DECLARE_ASN1_FUNCTIONS(CMS_ReceiptRequest)
81 DECLARE_ASN1_PRINT_FUNCTION(CMS_ContentInfo)

83 #define CMS_SIGNERINFO_ISSUER_SERIAL 0
84 #define CMS_SIGNERINFO_KEYIDENTIFIER 1

86 #define CMS_RECIPINFO_TRANS 0
87 #define CMS_RECIPINFO_AGREE 1
88 #define CMS_RECIPINFO_KEY 2
89 #define CMS_RECIPINFO_PASS 3
90 #define CMS_RECIPINFO_OTHER 4

92 /* S/MIME related flags */

94 #define CMS_TEXT 0x1
95 #define CMS_NOCERTS 0x2
96 #define CMS_NO_CONTENT_VERIFY 0x4
97 #define CMS_NO_ATTR_VERIFY 0x8
98 #define CMS_NOSIGS \
99     (CMS_NO_CONTENT_VERIFY|CMS_NO_ATTR_VERIFY)
100 #define CMS_NOINTERN 0x10
101 #define CMS_NO_SIGNER_CERT_VERIFY 0x20
102 #define CMS_NOVERIFY 0x20
103 #define CMS_DETACHED 0x40
104 #define CMS_BINARY 0x80
105 #define CMS_NOATTR 0x100
106 #define CMS_NOSMIMECAP 0x200
107 #define CMS_NOOLDMIMETYPE 0x400
108 #define CMS_CRLFEOL 0x800
109 #define CMS_STREAM 0x1000
110 #define CMS_NOCRL 0x2000
111 #define CMS_PARTIAL 0x4000
112 #define CMS_REUSE_DIGEST 0x8000
113 #define CMS_USE_KEYID 0x10000
114 #define CMS_DEBUG_DECRYPT 0x20000

116 const ASN1_OBJECT *CMS_get0_type(CMS_ContentInfo *cms);

118 BIO *CMS_dataInit(CMS_ContentInfo *cms, BIO *icont);
119 int CMS_dataFinal(CMS_ContentInfo *cms, BIO *bio);

121 ASN1_OCTET_STRING **CMS_get0_content(CMS_ContentInfo *cms);
122 int CMS_is_detached(CMS_ContentInfo *cms);
123 int CMS_set_detached(CMS_ContentInfo *cms, int detached);

125 #ifdef HEADER_PEM_H
126 DECLARE_PEM_rw_const(CMS, CMS_ContentInfo)
127 #endif
```

```

129 int CMS_stream(unsigned char ***boundary, CMS_ContentInfo *cms);
130 CMS_ContentInfo *d2i_CMS_bio(BIO *bp, CMS_ContentInfo **cms);
131 int i2d_CMS_bio(BIO *bp, CMS_ContentInfo *cms);

133 BIO *BIO_new_CMS(BIO *out, CMS_ContentInfo *cms);
134 int i2d_CMS_bio_stream(BIO *out, CMS_ContentInfo *cms, BIO *in, int flags);
135 int PEM_write_bio_CMS_stream(BIO *out, CMS_ContentInfo *cms, BIO *in, int flags)
136 CMS_ContentInfo *SMIME_read_CMS(BIO *bio, BIO **bcont);
137 int SMIME_write_CMS(BIO *bio, CMS_ContentInfo *cms, BIO *data, int flags);

139 int CMS_final(CMS_ContentInfo *cms, BIO *data, BIO *dcont, unsigned int flags);

141 CMS_ContentInfo *CMS_sign(X509 *signcert, EVP_PKEY *pkey, STACK_OF(X509) *certs,
142                          BIO *data, unsigned int flags);

144 CMS_ContentInfo *CMS_sign_receipt(CMS_SignerInfo *si,
145                                  X509 *signcert, EVP_PKEY *pkey,
146                                  STACK_OF(X509) *certs,
147                                  unsigned int flags);

149 int CMS_data(CMS_ContentInfo *cms, BIO *out, unsigned int flags);
150 CMS_ContentInfo *CMS_data_create(BIO *in, unsigned int flags);

152 int CMS_digest_verify(CMS_ContentInfo *cms, BIO *dcont, BIO *out,
153                      unsigned int flags);
154 CMS_ContentInfo *CMS_digest_create(BIO *in, const EVP_MD *md,
155                                   unsigned int flags);

157 int CMS_EncryptedData_decrypt(CMS_ContentInfo *cms,
158                              const unsigned char *key, size_t keylen,
159                              BIO *dcont, BIO *out, unsigned int flags);

161 CMS_ContentInfo *CMS_EncryptedData_encrypt(BIO *in, const EVP_CIPHER *cipher,
162                                             const unsigned char *key, size_t keylen,
163                                             unsigned int flags);

165 int CMS_EncryptedData_set1_key(CMS_ContentInfo *cms, const EVP_CIPHER *ciph,
166                               const unsigned char *key, size_t keylen);

168 int CMS_verify(CMS_ContentInfo *cms, STACK_OF(X509) *certs,
169               X509_STORE *store, BIO *dcont, BIO *out, unsigned int flags);

171 int CMS_verify_receipt(CMS_ContentInfo *rcms, CMS_ContentInfo *ocms,
172                       STACK_OF(X509) *certs,
173                       X509_STORE *store, unsigned int flags);

175 STACK_OF(X509) *CMS_get0_signers(CMS_ContentInfo *cms);

177 CMS_ContentInfo *CMS_encrypt(STACK_OF(X509) *certs, BIO *in,
178                              const EVP_CIPHER *cipher, unsigned int flags);

180 int CMS_decrypt(CMS_ContentInfo *cms, EVP_PKEY *pkey, X509 *cert,
181               BIO *dcont, BIO *out,
182               unsigned int flags);
183
184 int CMS_decrypt_set1_pkey(CMS_ContentInfo *cms, EVP_PKEY *pk, X509 *cert);
185 int CMS_decrypt_set1_key(CMS_ContentInfo *cms,
186                          unsigned char *key, size_t keylen,
187                          unsigned char *id, size_t idlen);
188 int CMS_decrypt_set1_password(CMS_ContentInfo *cms,
189                              unsigned char *pass, ossl_ssize_t passlen);

191 STACK_OF(CMS_RecipientInfo) *CMS_get0_RecipientInfos(CMS_ContentInfo *cms);
192 int CMS_RecipientInfo_type(CMS_RecipientInfo *ri);
193 CMS_ContentInfo *CMS_EnvelopedData_create(const EVP_CIPHER *cipher);

```

```

194 CMS_RecipientInfo *CMS_add1_recipient_cert(CMS_ContentInfo *cms,
195                                             X509 *recip, unsigned int flags);
196 int CMS_RecipientInfo_set0_pkey(CMS_RecipientInfo *ri, EVP_PKEY *pkey);
197 int CMS_RecipientInfo_ktri_cert_cmp(CMS_RecipientInfo *ri, X509 *cert);
198 int CMS_RecipientInfo_ktri_get0_algs(CMS_RecipientInfo *ri,
199                                     EVP_PKEY **pk, X509 **recip,
200                                     X509_ALGOR **palg);
201 int CMS_RecipientInfo_ktri_get0_signer_id(CMS_RecipientInfo *ri,
202                                           ASN1_OCTET_STRING **keyid,
203                                           X509_NAME **issuer, ASN1_INTEGER **sno);

205 CMS_RecipientInfo *CMS_add0_recipient_key(CMS_ContentInfo *cms, int nid,
206                                           unsigned char *key, size_t keylen,
207                                           unsigned char *id, size_t idlen,
208                                           ASN1_GENERALIZEDTIME *date,
209                                           ASN1_OBJECT *otherTypeId,
210                                           ASN1_TYPE *otherType);

212 int CMS_RecipientInfo_kekri_get0_id(CMS_RecipientInfo *ri,
213                                     X509_ALGOR **palg,
214                                     ASN1_OCTET_STRING **pid,
215                                     ASN1_GENERALIZEDTIME **pdate,
216                                     ASN1_OBJECT **pothrid,
217                                     ASN1_TYPE **pothertype);

219 int CMS_RecipientInfo_set0_key(CMS_RecipientInfo *ri,
220                               unsigned char *key, size_t keylen);

222 int CMS_RecipientInfo_kekri_id_cmp(CMS_RecipientInfo *ri,
223                                    const unsigned char *id, size_t idlen);

225 int CMS_RecipientInfo_set0_password(CMS_RecipientInfo *ri,
226                                     unsigned char *pass,
227                                     ossl_ssize_t passlen);

229 CMS_RecipientInfo *CMS_add0_recipient_password(CMS_ContentInfo *cms,
230                                                 int iter, int wrap_nid, int pbe_nid,
231                                                 unsigned char *pass,
232                                                 ossl_ssize_t passlen,
233                                                 const EVP_CIPHER *kekciph);

235 int CMS_RecipientInfo_decrypt(CMS_ContentInfo *cms, CMS_RecipientInfo *ri);
236
237 int CMS_uncompress(CMS_ContentInfo *cms, BIO *dcont, BIO *out,
238                   unsigned int flags);
239 CMS_ContentInfo *CMS_compress(BIO *in, int comp_nid, unsigned int flags);

241 int CMS_set1_eContentType(CMS_ContentInfo *cms, const ASN1_OBJECT *oid);
242 const ASN1_OBJECT *CMS_get0_eContentType(CMS_ContentInfo *cms);

244 CMS_CertificateChoices *CMS_add0_CertificateChoices(CMS_ContentInfo *cms);
245 int CMS_add0_crl(CMS_ContentInfo *cms, X509_CRL *crl);
246 int CMS_add1_cert(CMS_ContentInfo *cms, X509 *cert);
247 STACK_OF(X509) *CMS_get1_certs(CMS_ContentInfo *cms);

249 CMS_RevocationInfoChoice *CMS_add0_RevocationInfoChoice(CMS_ContentInfo *cms);
250 int CMS_add0_crl(CMS_ContentInfo *cms, X509_CRL *crl);
251 int CMS_add1_crl(CMS_ContentInfo *cms, X509_CRL *crl);
252 STACK_OF(X509_CRL) *CMS_get1_crls(CMS_ContentInfo *cms);

254 int CMS_SignedData_init(CMS_ContentInfo *cms);
255 CMS_SignerInfo *CMS_add1_signer(CMS_ContentInfo *cms,
256                                 X509 *signer, EVP_PKEY *pk, const EVP_MD *md,
257                                 unsigned int flags);
258 STACK_OF(CMS_SignerInfo) *CMS_get0_SignerInfos(CMS_ContentInfo *cms);

```

```

260 void CMS_SignerInfo_set1_signer_cert(CMS_SignerInfo *si, X509 *signer);
261 int CMS_SignerInfo_get0_signer_id(CMS_SignerInfo *si,
262     ASN1_OCTET_STRING **keyid,
263     X509_NAME **issuer, ASN1_INTEGER **sno);
264 int CMS_SignerInfo_cert_cmp(CMS_SignerInfo *si, X509 *cert);
265 int CMS_set1_signers_certs(CMS_ContentInfo *cms, STACK_OF(X509) *certs,
266     unsigned int flags);
267 void CMS_SignerInfo_get0_algs(CMS_SignerInfo *si, EVP_PKEY **pk, X509 **signer,
268     X509_ALGOR **pdig, X509_ALGOR **psig);
269 int CMS_SignerInfo_sign(CMS_SignerInfo *si);
270 int CMS_SignerInfo_verify(CMS_SignerInfo *si);
271 int CMS_SignerInfo_verify_content(CMS_SignerInfo *si, BIO *chain);

273 int CMS_add_smimecap(CMS_SignerInfo *si, STACK_OF(X509_ALGOR) *algs);
274 int CMS_add_simple_smimecap(STACK_OF(X509_ALGOR) **algs,
275     int algnid, int keysize);
276 int CMS_add_standard_smimecap(STACK_OF(X509_ALGOR) **smcap);

278 int CMS_signed_get_attr_count(const CMS_SignerInfo *si);
279 int CMS_signed_get_attr_by_NID(const CMS_SignerInfo *si, int nid,
280     int lastpos);
281 int CMS_signed_get_attr_by_OBJ(const CMS_SignerInfo *si, ASN1_OBJECT *obj,
282     int lastpos);
283 X509_ATTRIBUTE *CMS_signed_get_attr(const CMS_SignerInfo *si, int loc);
284 X509_ATTRIBUTE *CMS_signed_delete_attr(CMS_SignerInfo *si, int loc);
285 int CMS_signed_add1_attr(CMS_SignerInfo *si, X509_ATTRIBUTE *attr);
286 int CMS_signed_add1_attr_by_OBJ(CMS_SignerInfo *si,
287     const ASN1_OBJECT *obj, int type,
288     const void *bytes, int len);
289 int CMS_signed_add1_attr_by_NID(CMS_SignerInfo *si,
290     int nid, int type,
291     const void *bytes, int len);
292 int CMS_signed_add1_attr_by_txt(CMS_SignerInfo *si,
293     const char *attrname, int type,
294     const void *bytes, int len);
295 void *CMS_signed_get0_data_by_OBJ(CMS_SignerInfo *si, ASN1_OBJECT *oid,
296     int lastpos, int type);

298 int CMS_unsigned_get_attr_count(const CMS_SignerInfo *si);
299 int CMS_unsigned_get_attr_by_NID(const CMS_SignerInfo *si, int nid,
300     int lastpos);
301 int CMS_unsigned_get_attr_by_OBJ(const CMS_SignerInfo *si, ASN1_OBJECT *obj,
302     int lastpos);
303 X509_ATTRIBUTE *CMS_unsigned_get_attr(const CMS_SignerInfo *si, int loc);
304 X509_ATTRIBUTE *CMS_unsigned_delete_attr(CMS_SignerInfo *si, int loc);
305 int CMS_unsigned_add1_attr(CMS_SignerInfo *si, X509_ATTRIBUTE *attr);
306 int CMS_unsigned_add1_attr_by_OBJ(CMS_SignerInfo *si,
307     const ASN1_OBJECT *obj, int type,
308     const void *bytes, int len);
309 int CMS_unsigned_add1_attr_by_NID(CMS_SignerInfo *si,
310     int nid, int type,
311     const void *bytes, int len);
312 int CMS_unsigned_add1_attr_by_txt(CMS_SignerInfo *si,
313     const char *attrname, int type,
314     const void *bytes, int len);
315 void *CMS_unsigned_get0_data_by_OBJ(CMS_SignerInfo *si, ASN1_OBJECT *oid,
316     int lastpos, int type);

318 #ifdef HEADER_X509V3_H

320 int CMS_get1_ReceiptRequest(CMS_SignerInfo *si, CMS_ReceiptRequest **pr);
321 CMS_ReceiptRequest *CMS_ReceiptRequest_create0(unsigned char *id, int idlen,
322     int allorfirst,
323     STACK_OF(GENERAL_NAMES) *receiptList,
324     STACK_OF(GENERAL_NAMES) *receiptsTo);
325 int CMS_add1_ReceiptRequest(CMS_SignerInfo *si, CMS_ReceiptRequest *rr);

```

```

326 void CMS_ReceiptRequest_get0_values(CMS_ReceiptRequest *rr,
327     ASN1_STRING **pcid,
328     int *pallorfirst,
329     STACK_OF(GENERAL_NAMES) **plist,
330     STACK_OF(GENERAL_NAMES) **prto);

332 #endif

334 /* BEGIN ERROR CODES */
335 /* The following lines are auto generated by the script mkerr.pl. Any changes
336  * made after this point may be overwritten when the script is next run.
337  */
338 void ERR_load_CMS_strings(void);

340 /* Error codes for the CMS functions. */

342 /* Function codes. */
343 #define CMS_F_CHECK_CONTENT 99
344 #define CMS_F_CMS_ADD0_CERT 164
345 #define CMS_F_CMS_ADD0_RECIPIENT_KEY 100
346 #define CMS_F_CMS_ADD0_RECIPIENT_PASSWORD 165
347 #define CMS_F_CMS_ADD1_RECEIPTREQUEST 158
348 #define CMS_F_CMS_ADD1_RECIPIENT_CERT 101
349 #define CMS_F_CMS_ADD1_SIGNER 102
350 #define CMS_F_CMS_ADD1_SIGNINGTIME 103
351 #define CMS_F_CMS_COMPRESS 104
352 #define CMS_F_CMS_COMPRESSEDDATA_CREATE 105
353 #define CMS_F_CMS_COMPRESSEDDATA_INIT_BIO 106
354 #define CMS_F_CMS_COPY_CONTENT 107
355 #define CMS_F_CMS_COPY_MESSAGEDIGEST 108
356 #define CMS_F_CMS_DATA 109
357 #define CMS_F_CMS_DATAFINAL 110
358 #define CMS_F_CMS_DATAINIT 111
359 #define CMS_F_CMS_DECRYPT 112
360 #define CMS_F_CMS_DECRYPT_SET1_KEY 113
361 #define CMS_F_CMS_DECRYPT_SET1_PASSWORD 166
362 #define CMS_F_CMS_DECRYPT_SET1_PKEY 114
363 #define CMS_F_CMS_DIGESTALGORITHM_FIND_CTX 115
364 #define CMS_F_CMS_DIGESTALGORITHM_INIT_BIO 116
365 #define CMS_F_CMS_DIGESTEDDATA_DO_FINAL 117
366 #define CMS_F_CMS_DIGEST_VERIFY 118
367 #define CMS_F_CMS_ENCODE_RECEIPT 161
368 #define CMS_F_CMS_ENCRYPT 119
369 #define CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO 120
370 #define CMS_F_CMS_ENCRYPTEDDATA_DECRYPT 121
371 #define CMS_F_CMS_ENCRYPTEDDATA_ENCRYPT 122
372 #define CMS_F_CMS_ENCRYPTEDDATA_SET1_KEY 123
373 #define CMS_F_CMS_ENVELOPEDDATA_CREATE 124
374 #define CMS_F_CMS_ENVELOPEDDATA_INIT_BIO 125
375 #define CMS_F_CMS_ENVELOPED_DATA_INIT 126
376 #define CMS_F_CMS_FINAL 127
377 #define CMS_F_CMS_GET0_CERTIFICATE_CHOICES 128
378 #define CMS_F_CMS_GET0_CONTENT 129
379 #define CMS_F_CMS_GET0_ECONTENT_TYPE 130
380 #define CMS_F_CMS_GET0_ENVELOPED 131
381 #define CMS_F_CMS_GET0_REVOCATION_CHOICES 132
382 #define CMS_F_CMS_GET0_SIGNED 133
383 #define CMS_F_CMS_MSGSIGDIGEST_ADD1 162
384 #define CMS_F_CMS_RECEIPTREQUEST_CREATE0 159
385 #define CMS_F_CMS_RECEIPT_VERIFY 160
386 #define CMS_F_CMS_RECIPIENTINFO_DECRYPT 134
387 #define CMS_F_CMS_RECIPIENTINFO_KEYRI_DECRYPT 135
388 #define CMS_F_CMS_RECIPIENTINFO_KEYRI_ENCRYPT 136
389 #define CMS_F_CMS_RECIPIENTINFO_KEYRI_GET0_ID 137
390 #define CMS_F_CMS_RECIPIENTINFO_KEYRI_ID_CMP 138
391 #define CMS_F_CMS_RECIPIENTINFO_KTRI_CERT_CMP 139

```

```

392 #define CMS_F_CMS_RECIPIENTINFO_KTRI_DECRYPT 140
393 #define CMS_F_CMS_RECIPIENTINFO_KTRI_ENCRYPT 141
394 #define CMS_F_CMS_RECIPIENTINFO_KTRI_GET0_ALGS 142
395 #define CMS_F_CMS_RECIPIENTINFO_KTRI_GET0_SIGNER_ID 143
396 #define CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT 167
397 #define CMS_F_CMS_RECIPIENTINFO_SET0_KEY 144
398 #define CMS_F_CMS_RECIPIENTINFO_SET0_PASSWORD 168
399 #define CMS_F_CMS_RECIPIENTINFO_SET0_PKEY 145
400 #define CMS_F_CMS_SET1_SIGNERIDENTIFIER 146
401 #define CMS_F_CMS_SET_DETACHED 147
402 #define CMS_F_CMS_SIGN 148
403 #define CMS_F_CMS_SIGNED_DATA_INIT 149
404 #define CMS_F_CMS_SIGNERINFO_CONTENT_SIGN 150
405 #define CMS_F_CMS_SIGNERINFO_SIGN 151
406 #define CMS_F_CMS_SIGNERINFO_VERIFY 152
407 #define CMS_F_CMS_SIGNERINFO_VERIFY_CERT 153
408 #define CMS_F_CMS_SIGNERINFO_VERIFY_CONTENT 154
409 #define CMS_F_CMS_SIGN_RECEIPT 163
410 #define CMS_F_CMS_STREAM 155
411 #define CMS_F_CMS_UNCOMPRESS 156
412 #define CMS_F_CMS_VERIFY 157

414 /* Reason codes. */
415 #define CMS_R_ADD_SIGNER_ERROR 99
416 #define CMS_R_CERTIFICATE_ALREADY_PRESENT 175
417 #define CMS_R_CERTIFICATE_HAS_NO_KEYID 160
418 #define CMS_R_CERTIFICATE_VERIFY_ERROR 100
419 #define CMS_R_CIPHER_INITIALISATION_ERROR 101
420 #define CMS_R_CIPHER_PARAMETER_INITIALISATION_ERROR 102
421 #define CMS_R_CMS_DATAFINAL_ERROR 103
422 #define CMS_R_CMS_LIB 104
423 #define CMS_R_CONTENTIDENTIFIER_MISMATCH 170
424 #define CMS_R_CONTENT_NOT_FOUND 105
425 #define CMS_R_CONTENT_TYPE_MISMATCH 171
426 #define CMS_R_CONTENT_TYPE_NOT_COMPRESSED_DATA 106
427 #define CMS_R_CONTENT_TYPE_NOT_ENVELOPED_DATA 107
428 #define CMS_R_CONTENT_TYPE_NOT_SIGNED_DATA 108
429 #define CMS_R_CONTENT_VERIFY_ERROR 109
430 #define CMS_R_CTRL_ERROR 110
431 #define CMS_R_CTRL_FAILURE 111
432 #define CMS_R_DECRYPT_ERROR 112
433 #define CMS_R_DIGEST_ERROR 161
434 #define CMS_R_ERROR_GETTING_PUBLIC_KEY 113
435 #define CMS_R_ERROR_READING_MESSAGEDIGEST_ATTRIBUTE 114
436 #define CMS_R_ERROR_SETTING_KEY 115
437 #define CMS_R_ERROR_SETTING_RECIPIENTINFO 116
438 #define CMS_R_INVALID_ENCRYPTED_KEY_LENGTH 117
439 #define CMS_R_INVALID_KEY_ENCRYPTION_PARAMETER 176
440 #define CMS_R_INVALID_KEY_LENGTH 118
441 #define CMS_R_MD_BIO_INIT_ERROR 119
442 #define CMS_R_MESSAGEDIGEST_ATTRIBUTE_WRONG_LENGTH 120
443 #define CMS_R_MESSAGEDIGEST_WRONG_LENGTH 121
444 #define CMS_R_MSGSIGDIGEST_ERROR 172
445 #define CMS_R_MSGSIGDIGEST_VERIFICATION_FAILURE 162
446 #define CMS_R_MSGSIGDIGEST_WRONG_LENGTH 163
447 #define CMS_R_NEED_ONE_SIGNER 164
448 #define CMS_R_NOT_A_SIGNED_RECEIPT 165
449 #define CMS_R_NOT_ENCRYPTED_DATA 122
450 #define CMS_R_NOT_KEY 123
451 #define CMS_R_NOT_KEY_TRANSPORT 124
452 #define CMS_R_NOT_PWRI 177
453 #define CMS_R_NOT_SUPPORTED_FOR_THIS_KEY_TYPE 125
454 #define CMS_R_NO_CIPHER 126
455 #define CMS_R_NO_CONTENT 127
456 #define CMS_R_NO_CONTENT_TYPE 173
457 #define CMS_R_NO_DEFAULT_DIGEST 128

```

```

458 #define CMS_R_NO_DIGEST_SET 129
459 #define CMS_R_NO_KEY 130
460 #define CMS_R_NO_KEY_OR_CERT 174
461 #define CMS_R_NO_MATCHING_DIGEST 131
462 #define CMS_R_NO_MATCHING_RECIPIENT 132
463 #define CMS_R_NO_MATCHING_SIGNATURE 166
464 #define CMS_R_NO_MSGSIGDIGEST 167
465 #define CMS_R_NO_PASSWORD 178
466 #define CMS_R_NO_PRIVATE_KEY 133
467 #define CMS_R_NO_PUBLIC_KEY 134
468 #define CMS_R_NO_RECEIPT_REQUEST 168
469 #define CMS_R_NO_SIGNERS 135
470 #define CMS_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE 136
471 #define CMS_R_RECEIPT_DECODE_ERROR 169
472 #define CMS_R_RECIPIENT_ERROR 137
473 #define CMS_R_SIGNER_CERTIFICATE_NOT_FOUND 138
474 #define CMS_R_SIGNFINAL_ERROR 139
475 #define CMS_R_SMIME_TEXT_ERROR 140
476 #define CMS_R_STORE_INIT_ERROR 141
477 #define CMS_R_TYPE_NOT_COMPRESSED_DATA 142
478 #define CMS_R_TYPE_NOT_DATA 143
479 #define CMS_R_TYPE_NOT_DIGESTED_DATA 144
480 #define CMS_R_TYPE_NOT_ENCRYPTED_DATA 145
481 #define CMS_R_TYPE_NOT_ENVELOPED_DATA 146
482 #define CMS_R_UNABLE_TO_FINALIZE_CONTEXT 147
483 #define CMS_R_UNKNOWN_CIPHER 148
484 #define CMS_R_UNKNOWN_DIGEST_ALGORITHM 149
485 #define CMS_R_UNKNOWN_ID 150
486 #define CMS_R_UNSUPPORTED_COMPRESSION_ALGORITHM 151
487 #define CMS_R_UNSUPPORTED_CONTENT_TYPE 152
488 #define CMS_R_UNSUPPORTED_KEY_ALGORITHM 153
489 #define CMS_R_UNSUPPORTED_KEY_ENCRYPTION_ALGORITHM 179
490 #define CMS_R_UNSUPPORTED_RECIPIENT_TYPE 154
491 #define CMS_R_UNSUPPORTED_RECIPIENTINFO_TYPE 155
492 #define CMS_R_UNSUPPORTED_TYPE 156
493 #define CMS_R_UNWRAP_ERROR 157
494 #define CMS_R_UNWRAP_FAILURE 180
495 #define CMS_R_VERIFICATION_FAILURE 158
496 #define CMS_R_WRAP_ERROR 159

498 #ifdef __cplusplus
499 }
500 #endif
501 #endif

```


new/usr/src/lib/openssl/include/openssl/comp.h

1

```
*****
1978 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/comp.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

2 #ifndef HEADER_COMP_H
3 #define HEADER_COMP_H

5 #include <openssl/crypto.h>

7 #ifdef __cplusplus
8 extern "C" {
9 #endif

11 typedef struct comp_ctx_st COMP_CTX;

13 typedef struct comp_method_st
14 {
15     int type; /* NID for compression library */
16     const char *name; /* A text string to identify the library */
17     int (*init)(COMP_CTX *ctx);
18     void (*finish)(COMP_CTX *ctx);
19     int (*compress)(COMP_CTX *ctx,
20                     unsigned char *out, unsigned int olen,
21                     unsigned char *in, unsigned int ilen);
22     int (*expand)(COMP_CTX *ctx,
23                   unsigned char *out, unsigned int olen,
24                   unsigned char *in, unsigned int ilen);
25     /* The following two do NOTHING, but are kept for backward compatibility
26     long (*ctrl)(void);
27     long (*callback_ctrl)(void);
28     } COMP_METHOD;

30 struct comp_ctx_st
31 {
32     COMP_METHOD *meth;
33     unsigned long compress_in;
34     unsigned long compress_out;
35     unsigned long expand_in;
36     unsigned long expand_out;

38     CRYPTO_EX_DATA ex_data;
39 };

42 COMP_CTX *COMP_CTX_new(COMP_METHOD *meth);
43 void COMP_CTX_free(COMP_CTX *ctx);
44 int COMP_compress_block(COMP_CTX *ctx, unsigned char *out, int olen,
45                          unsigned char *in, int ilen);
46 int COMP_expand_block(COMP_CTX *ctx, unsigned char *out, int olen,
47                       unsigned char *in, int ilen);
48 COMP_METHOD *COMP_rle(void);
49 COMP_METHOD *COMP_zlib(void);
50 void COMP_zlib_cleanup(void);

52 #ifdef HEADER_BIO_H
53 #ifdef ZLIB
54 BIO_METHOD *BIO_f_zlib(void);
55 #endif
56 #endif

58 /* BEGIN ERROR CODES */
59 /* The following lines are auto generated by the script mkerr.pl. Any changes
60 * made after this point may be overwritten when the script is next run.
61 */
```

new/usr/src/lib/openssl/include/openssl/comp.h

2

```
62 void ERR_load_COMP_strings(void);

64 /* Error codes for the COMP functions. */

66 /* Function codes. */
67 #define COMP_F_BIO_ZLIB_FLUSH 99
68 #define COMP_F_BIO_ZLIB_NEW 100
69 #define COMP_F_BIO_ZLIB_READ 101
70 #define COMP_F_BIO_ZLIB_WRITE 102

72 /* Reason codes. */
73 #define COMP_R_ZLIB_DEFLATE_ERROR 99
74 #define COMP_R_ZLIB_INFLATE_ERROR 100
75 #define COMP_R_ZLIB_NOT_SUPPORTED 101

77 #ifdef __cplusplus
78 }
79 #endif
80 #endif
```

new/usr/src/lib/openssl/include/openssl/conf.h

1

```
*****
9848 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/conf.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/conf/conf.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_CONF_H
60 #define HEADER_CONF_H
```

new/usr/src/lib/openssl/include/openssl/conf.h

2

```
62 #include <openssl/bio.h>
63 #include <openssl/lhash.h>
64 #include <openssl/stack.h>
65 #include <openssl/safestack.h>
66 #include <openssl/e_os2.h>

68 #include <openssl/openssl_typ.h>

70 #ifdef __cplusplus
71 extern "C" {
72 #endif

74 typedef struct
75 {
76     char *section;
77     char *name;
78     char *value;
79 } CONF_VALUE;

81 DECLARE_STACK_OF(CONF_VALUE);
82 DECLARE_LHASH_OF(CONF_VALUE);

84 struct conf_st;
85 struct conf_method_st;
86 typedef struct conf_method_st CONF_METHOD;

88 struct conf_method_st
89 {
90     const char *name;
91     CONF *(*create)(CONF_METHOD *meth);
92     int (*init)(CONF *conf);
93     int (*destroy)(CONF *conf);
94     int (*destroy_data)(CONF *conf);
95     int (*load_bio)(CONF *conf, BIO *bp, long *eline);
96     int (*dump)(const CONF *conf, BIO *bp);
97     int (*is_number)(const CONF *conf, char c);
98     int (*to_int)(const CONF *conf, char c);
99     int (*load)(CONF *conf, const char *name, long *eline);
100 };

102 /* Module definitions */

104 typedef struct conf_imodule_st CONF_IMODULE;
105 typedef struct conf_module_st CONF_MODULE;

107 DECLARE_STACK_OF(CONF_MODULE);
108 DECLARE_STACK_OF(CONF_IMODULE);

110 /* DSO module function typedefs */
111 typedef int conf_init_func(CONF_IMODULE *md, const CONF *cnf);
112 typedef void conf_finish_func(CONF_IMODULE *md);

114 #define CONF_MFLAGS_IGNORE_ERRORS 0x1
115 #define CONF_MFLAGS_IGNORE_RETURN_CODES 0x2
116 #define CONF_MFLAGS_SILENT 0x4
117 #define CONF_MFLAGS_NO_DSO 0x8
118 #define CONF_MFLAGS_IGNORE_MISSING_FILE 0x10
119 #define CONF_MFLAGS_DEFAULT_SECTION 0x20

121 int CONF_set_default_method(CONF_METHOD *meth);
122 void CONF_set_nconf(CONF *conf, LHASH_OF(CONF_VALUE) *hash);
123 LHASH_OF(CONF_VALUE) *CONF_load(LHASH_OF(CONF_VALUE) *conf, const char *file,
124                                 long *eline);
125 #ifndef OPENSSL_NO_FP_API
126 LHASH_OF(CONF_VALUE) *CONF_load_fp(LHASH_OF(CONF_VALUE) *conf, FILE *fp,
127                                    long *eline);
```

```

128 #endif
129 LHASH_OF(CONF_VALUE) *CONF_load_bio(LHASH_OF(CONF_VALUE) *conf, BIO *bp, long *el
130 STACK_OF(CONF_VALUE) *CONF_get_section(LHASH_OF(CONF_VALUE) *conf,
131                                     const char *section);
132 char *CONF_get_string(LHASH_OF(CONF_VALUE) *conf, const char *group,
133                     const char *name);
134 long CONF_get_number(LHASH_OF(CONF_VALUE) *conf, const char *group,
135                     const char *name);
136 void CONF_free(LHASH_OF(CONF_VALUE) *conf);
137 int CONF_dump_fp(LHASH_OF(CONF_VALUE) *conf, FILE *out);
138 int CONF_dump_bio(LHASH_OF(CONF_VALUE) *conf, BIO *out);

140 void OPENSSL_config(const char *config_name);
141 void OPENSSL_no_config(void);

143 /* New conf code. The semantics are different from the functions above.
144    If that wasn't the case, the above functions would have been replaced */

146 struct conf_st
147 {
148     CONF_METHOD *meth;
149     void *meth_data;
150     LHASH_OF(CONF_VALUE) *data;
151 };

153 CONF *NCONF_new(CONF_METHOD *meth);
154 CONF_METHOD *NCONF_default(void);
155 CONF_METHOD *NCONF_WIN32(void);
156 #if 0 /* Just to give you an idea of what I have in mind */
157 CONF_METHOD *NCONF_XML(void);
158 #endif
159 void NCONF_free(CONF *conf);
160 void NCONF_free_data(CONF *conf);

162 int NCONF_load(CONF *conf, const char *file, long *eline);
163 #ifndef OPENSSL_NO_FP_API
164 int NCONF_load_fp(CONF *conf, FILE *fp, long *eline);
165 #endif
166 int NCONF_load_bio(CONF *conf, BIO *bp, long *eline);
167 STACK_OF(CONF_VALUE) *NCONF_get_section(const CONF *conf, const char *section);
168 char *NCONF_get_string(const CONF *conf, const char *group, const char *name);
169 int NCONF_get_number_e(const CONF *conf, const char *group, const char *name,
170                       long *result);
171 int NCONF_dump_fp(const CONF *conf, FILE *out);
172 int NCONF_dump_bio(const CONF *conf, BIO *out);

174 #if 0 /* The following function has no error checking,
175        and should therefore be avoided */
176 long NCONF_get_number(CONF *conf, char *group, char *name);
177 #else
178 #define NCONF_get_number(c,g,n,r) NCONF_get_number_e(c,g,n,r)
179 #endif
180
181 /* Module functions */

183 int CONF_modules_load(const CONF *cnf, const char *appname,
184                     unsigned long flags);
185 int CONF_modules_load_file(const char *filename, const char *appname,
186                          unsigned long flags);
187 void CONF_modules_unload(int all);
188 void CONF_modules_finish(void);
189 void CONF_modules_free(void);
190 int CONF_module_add(const char *name, conf_init_func *ifunc,
191                   conf_finish_func *ffunc);

193 const char *CONF_imodule_get_name(const CONF_IMODULE *md);

```

```

194 const char *CONF_imodule_get_value(const CONF_IMODULE *md);
195 void *CONF_imodule_get_usr_data(const CONF_IMODULE *md);
196 void CONF_imodule_set_usr_data(CONF_IMODULE *md, void *usr_data);
197 CONF_MODULE *CONF_imodule_get_module(const CONF_IMODULE *md);
198 unsigned long CONF_imodule_get_flags(const CONF_IMODULE *md);
199 void CONF_imodule_set_flags(CONF_IMODULE *md, unsigned long flags);
200 void *CONF_module_get_usr_data(CONF_MODULE *pmod);
201 void CONF_module_set_usr_data(CONF_MODULE *pmod, void *usr_data);

203 char *CONF_get1_default_config_file(void);

205 int CONF_parse_list(const char *list, int sep, int nospc,
206                   int (*list_cb)(const char *elem, int len, void *usr), void *arg);

208 void OPENSSL_load_builtin_modules(void);

210 /* BEGIN ERROR CODES */
211 /* The following lines are auto generated by the script mkerr.pl. Any changes
212    * made after this point may be overwritten when the script is next run.
213    */
214 void ERR_load_CONF_strings(void);

216 /* Error codes for the CONF functions. */

218 /* Function codes. */
219 #define CONF_F_CONF_DUMP_FP 104
220 #define CONF_F_CONF_LOAD 100
221 #define CONF_F_CONF_LOAD_BIO 102
222 #define CONF_F_CONF_LOAD_FP 103
223 #define CONF_F_CONF_MODULES_LOAD 116
224 #define CONF_F_CONF_PARSE_LIST 119
225 #define CONF_F_DEF_LOAD 120
226 #define CONF_F_DEF_LOAD_BIO 121
227 #define CONF_F_MODULE_INIT 115
228 #define CONF_F_MODULE_LOAD_DSO 117
229 #define CONF_F_MODULE_RUN 118
230 #define CONF_F_NCONF_DUMP_BIO 105
231 #define CONF_F_NCONF_DUMP_FP 106
232 #define CONF_F_NCONF_GET_NUMBER 107
233 #define CONF_F_NCONF_GET_NUMBER_E 112
234 #define CONF_F_NCONF_GET_SECTION 108
235 #define CONF_F_NCONF_GET_STRING 109
236 #define CONF_F_NCONF_LOAD 113
237 #define CONF_F_NCONF_LOAD_BIO 110
238 #define CONF_F_NCONF_LOAD_FP 114
239 #define CONF_F_NCONF_NEW 111
240 #define CONF_F_STR_COPY 101

242 /* Reason codes. */
243 #define CONF_R_ERROR_LOADING_DSO 110
244 #define CONF_R_LIST_CANNOT_BE_NULL 115
245 #define CONF_R_MISSING_CLOSE_SQUARE_BRACKET 100
246 #define CONF_R_MISSING_EQUAL_SIGN 101
247 #define CONF_R_MISSING_FINISH_FUNCTION 111
248 #define CONF_R_MISSING_INIT_FUNCTION 112
249 #define CONF_R_MODULE_INITIALIZATION_ERROR 109
250 #define CONF_R_NO_CLOSE_BRACE 102
251 #define CONF_R_NO_CONF 105
252 #define CONF_R_NO_CONF_OR_ENVIRONMENT_VARIABLE 106
253 #define CONF_R_NO_SECTION 107
254 #define CONF_R_NO_SUCH_FILE 114
255 #define CONF_R_NO_VALUE 108
256 #define CONF_R_UNABLE_TO_CREATE_NEW_SECTION 103
257 #define CONF_R_UNKNOWN_MODULE_NAME 113
258 #define CONF_R_VARIABLE_HAS_NO_VALUE 104

```

new/usr/src/lib/openssl/include/openssl/conf.h

5

```
260 #ifdef __cplusplus
261 }
262 #endif
263 #endif
```

new/usr/src/lib/openssl/include/openssl/conf_api.h

1

4080 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/conf_api.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* conf_api.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef HEADER_CONF_API_H
60 #define HEADER_CONF_API_H
```

new/usr/src/lib/openssl/include/openssl/conf_api.h

2

```
62 #include <openssl/lhash.h>
63 #include <openssl/conf.h>
64
65 #ifdef __cplusplus
66 extern "C" {
67 #endif
68
69 /* Up until OpenSSL 0.9.5a, this was new_section */
70 CONF_VALUE *CONF_new_section(CONF *conf, const char *section);
71 /* Up until OpenSSL 0.9.5a, this was get_section */
72 CONF_VALUE *CONF_get_section(const CONF *conf, const char *section);
73 /* Up until OpenSSL 0.9.5a, this was CONF_get_section */
74 STACK_OF(CONF_VALUE) *_CONF_get_section_values(const CONF *conf,
75 const char *section);
76
77 int _CONF_add_string(CONF *conf, CONF_VALUE *section, CONF_VALUE *value);
78 char *_CONF_get_string(const CONF *conf, const char *section,
79 const char *name);
80 long _CONF_get_number(const CONF *conf, const char *section, const char *name);
81
82 int _CONF_new_data(CONF *conf);
83 void _CONF_free_data(CONF *conf);
84
85 #ifdef __cplusplus
86 }
87 #endif
88 #endif
```

new/usr/src/lib/openssl/include/openssl/crypto.h

1

```
*****
24337 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/crypto.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/crypto.h */
2 /*
3  * Copyright (c) 1998-2006 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
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15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
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20  * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
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25  * openssl-core@openssl.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
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31  * 6. Redistributions of any form whatsoever must retain the following
32  * acknowledgment:
33  * "This product includes software developed by the OpenSSL Project
34  * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT 'AS IS' AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */
55 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
56  * All rights reserved.
57  *
58  * This package is an SSL implementation written
59  * by Eric Young (eay@cryptsoft.com).
60  * The implementation was written so as to conform with Netscapes SSL.
61  *
```

new/usr/src/lib/openssl/include/openssl/crypto.h

2

```
62 * This library is free for commercial and non-commercial use as long as
63 * the following conditions are aheared to. The following conditions
64 * apply to all code found in this distribution, be it the RC4, RSA,
65 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
66 * included with this distribution is covered by the same copyright terms
67 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
68 *
69 * Copyright remains Eric Young's, and as such any Copyright notices in
70 * the code are not to be removed.
71 * If this package is used in a product, Eric Young should be given attribution
72 * as the author of the parts of the library used.
73 * This can be in the form of a textual message at program startup or
74 * in documentation (online or textual) provided with the package.
75 *
76 * Redistribution and use in source and binary forms, with or without
77 * modification, are permitted provided that the following conditions
78 * are met:
79 * 1. Redistributions of source code must retain the copyright
80 * notice, this list of conditions and the following disclaimer.
81 * 2. Redistributions in binary form must reproduce the above copyright
82 * notice, this list of conditions and the following disclaimer in the
83 * documentation and/or other materials provided with the distribution.
84 * 3. All advertising materials mentioning features or use of this software
85 * must display the following acknowledgement:
86 * "This product includes cryptographic software written by
87 * Eric Young (eay@cryptsoft.com)"
88 * The word 'cryptographic' can be left out if the rouines from the library
89 * being used are not cryptographic related :-).
90 * 4. If you include any Windows specific code (or a derivative thereof) from
91 * the apps directory (application code) you must include an acknowledgement:
92 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
93 *
94 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG 'AS IS' AND
95 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
96 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
97 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
98 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
99 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
100 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
101 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
102 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
103 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
104 * SUCH DAMAGE.
105 *
106 * The licence and distribution terms for any publically available version or
107 * derivative of this code cannot be changed. i.e. this code cannot simply be
108 * copied and put under another distribution licence
109 * [including the GNU Public Licence.]
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 * ECDH support in OpenSSL originally developed by
114 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
115 */

117 #ifndef HEADER_CRYPT0_H
118 #define HEADER_CRYPT0_H

120 #include <stdlib.h>

122 #include <openssl/e_os2.h>

124 #ifndef OPENSSL_NO_FP_API
125 #include <stdio.h>
126 #endif
```

```

128 #include <openssl/stack.h>
129 #include <openssl/safestack.h>
130 #include <openssl/opensslv.h>
131 #include <openssl/ssl_typ.h>

133 #ifdef CHARSET_EBCDIC
134 #include <openssl/ebcdic.h>
135 #endif

137 /* Resolve problems on some operating systems with symbol names that clash
138    one way or another */
139 #include <openssl/symhacks.h>

141 #ifdef __cplusplus
142 extern "C" {
143 #endif

145 /* Backward compatibility to SSLeay */
146 /* This is more to be used to check the correct DLL is being used
147    * in the MS world. */
148 #define SSLEAY_VERSION_NUMBER OPENSSL_VERSION_NUMBER
149 #define SSLEAY_VERSION 0
150 /* #define SSLEAY_OPTIONS 1 no longer supported */
151 #define SSLEAY_CFLAGS 2
152 #define SSLEAY_BUILT_ON 3
153 #define SSLEAY_PLATFORM 4
154 #define SSLEAY_DIR 5

156 /* Already declared in ssl_typ.h */
157 #if 0
158 typedef struct crypto_ex_data_st CRYPTO_EX_DATA;
159 /* Called when a new object is created */
160 typedef int CRYPTO_EX_new(void *parent, void *ptr, CRYPTO_EX_DATA *ad,
161                          int idx, long argl, void *argp);
162 /* Called when an object is free()ed */
163 typedef void CRYPTO_EX_free(void *parent, void *ptr, CRYPTO_EX_DATA *ad,
164                           int idx, long argl, void *argp);
165 /* Called when we need to dup an object */
166 typedef int CRYPTO_EX_dup(CRYPTO_EX_DATA *to, CRYPTO_EX_DATA *from, void *from_d
167                          int idx, long argl, void *argp);
168 #endif

170 /* A generic structure to pass assorted data in a expandable way */
171 typedef struct openssl_item_st
172 {
173     int code;
174     void *value; /* Not used for flag attributes */
175     size_t value_size; /* Max size of value for output, length for input */
176     size_t *value_length; /* Returned length of value for output */
177 } OPENSSL_ITEM;

180 /* When changing the CRYPTO_LOCK_* list, be sure to maintain the text lock
181    * names in cryptlib.c
182    */

184 #define CRYPTO_LOCK_ERR 1
185 #define CRYPTO_LOCK_EX_DATA 2
186 #define CRYPTO_LOCK_X509 3
187 #define CRYPTO_LOCK_X509_INFO 4
188 #define CRYPTO_LOCK_X509_PKEY 5
189 #define CRYPTO_LOCK_X509_CRL 6
190 #define CRYPTO_LOCK_X509_REQ 7
191 #define CRYPTO_LOCK_DSA 8
192 #define CRYPTO_LOCK_RSA 9
193 #define CRYPTO_LOCK_EVP_PKEY 10

```

```

194 #define CRYPTO_LOCK_X509_STORE 11
195 #define CRYPTO_LOCK_SSL_CTX 12
196 #define CRYPTO_LOCK_SSL_CERT 13
197 #define CRYPTO_LOCK_SSL_SESSION 14
198 #define CRYPTO_LOCK_SSL_SESS_CERT 15
199 #define CRYPTO_LOCK_SSL 16
200 #define CRYPTO_LOCK_SSL_METHOD 17
201 #define CRYPTO_LOCK_RAND 18
202 #define CRYPTO_LOCK_RAND2 19
203 #define CRYPTO_LOCK_MALLOC 20
204 #define CRYPTO_LOCK_BIO 21
205 #define CRYPTO_LOCK_GETHOSTBYNAME 22
206 #define CRYPTO_LOCK_GETSERVBYNAME 23
207 #define CRYPTO_LOCK_READDIR 24
208 #define CRYPTO_LOCK_RSA_BLINDING 25
209 #define CRYPTO_LOCK_DH 26
210 #define CRYPTO_LOCK_MALLOC2 27
211 #define CRYPTO_LOCK_DSO 28
212 #define CRYPTO_LOCK_DYNLOCK 29
213 #define CRYPTO_LOCK_ENGINE 30
214 #define CRYPTO_LOCK_UI 31
215 #define CRYPTO_LOCK_ECDSA 32
216 #define CRYPTO_LOCK_EC 33
217 #define CRYPTO_LOCK_ECDH 34
218 #define CRYPTO_LOCK_BN 35
219 #define CRYPTO_LOCK_EC_PRE_COMP 36
220 #define CRYPTO_LOCK_STORE 37
221 #define CRYPTO_LOCK_COMP 38
222 #define CRYPTO_LOCK_FIPS 39
223 #define CRYPTO_LOCK_FIPS2 40
224 #define CRYPTO_NUM_LOCKS 41

226 #define CRYPTO_LOCK 1
227 #define CRYPTO_UNLOCK 2
228 #define CRYPTO_READ 4
229 #define CRYPTO_WRITE 8

231 #ifndef OPENSSL_NO_LOCKING
232 #ifndef CRYPTO_w_lock
233 #define CRYPTO_w_lock(type) \
234     CRYPTO_lock(CRYPTO_LOCK|CRYPTO_WRITE,type,__FILE__,__LINE__)
235 #define CRYPTO_w_unlock(type) \
236     CRYPTO_lock(CRYPTO_UNLOCK|CRYPTO_WRITE,type,__FILE__,__LINE__)
237 #define CRYPTO_r_lock(type) \
238     CRYPTO_lock(CRYPTO_LOCK|CRYPTO_READ,type,__FILE__,__LINE__)
239 #define CRYPTO_r_unlock(type) \
240     CRYPTO_lock(CRYPTO_UNLOCK|CRYPTO_READ,type,__FILE__,__LINE__)
241 #define CRYPTO_add(addr,amount,type) \
242     CRYPTO_add_lock(addr,amount,type,__FILE__,__LINE__)
243 #endif
244 #else
245 #define CRYPTO_w_lock(a)
246 #define CRYPTO_w_unlock(a)
247 #define CRYPTO_r_lock(a)
248 #define CRYPTO_r_unlock(a)
249 #define CRYPTO_add(a,b,c) ((*(a))+=(b))
250 #endif

252 /* Some applications as well as some parts of OpenSSL need to allocate
253    and deallocate locks in a dynamic fashion. The following typedef
254    makes this possible in a type-safe manner. */
255 /* struct CRYPTO_dynlock_value has to be defined by the application. */
256 typedef struct
257 {
258     int references;
259     struct CRYPTO_dynlock_value *data;

```

```

260     } CRYPTO_dynlock;

263 /* The following can be used to detect memory leaks in the SSLeay library.
264 * It used, it turns on malloc checking */

266 #define CRYPTO_MEM_CHECK_OFF    0x0    /* an enum */
267 #define CRYPTO_MEM_CHECK_ON     0x1    /* a bit */
268 #define CRYPTO_MEM_CHECK_ENABLE 0x2    /* a bit */
269 #define CRYPTO_MEM_CHECK_DISABLE 0x3    /* an enum */

271 /* The following are bit values to turn on or off options connected to the
272 * malloc checking functionality */

274 /* Adds time to the memory checking information */
275 #define V_CRYPTO_MDEBUG_TIME    0x1 /* a bit */
276 /* Adds thread number to the memory checking information */
277 #define V_CRYPTO_MDEBUG_THREAD 0x2 /* a bit */

279 #define V_CRYPTO_MDEBUG_ALL (V_CRYPTO_MDEBUG_TIME | V_CRYPTO_MDEBUG_THREAD)

282 /* predec of the BIO type */
283 typedef struct bio_st BIO_dummy;

285 struct crypto_ex_data_st
286 {
287     STACK_OF(void) *sk;
288     int dummy; /* gcc is screwing up this data structure :( */
289 };
290 DECLARE_STACK_OF(void)

292 /* This stuff is basically class callback functions
293 * The current classes are SSL_CTX, SSL, SSL_SESSION, and a few more */

295 typedef struct crypto_ex_data_func_st
296 {
297     long argl; /* Arbitrary long */
298     void *argp; /* Arbitrary void */
299     CRYPTO_EX_new *new_func;
300     CRYPTO_EX_free *free_func;
301     CRYPTO_EX_dup *dup_func;
302 } CRYPTO_EX_DATA_FUNCS;

304 DECLARE_STACK_OF(CRYPTO_EX_DATA_FUNCS)

306 /* Per class, we have a STACK of CRYPTO_EX_DATA_FUNCS for each CRYPTO_EX_DATA
307 * entry.
308 */

310 #define CRYPTO_EX_INDEX_BIO 0
311 #define CRYPTO_EX_INDEX_SSL 1
312 #define CRYPTO_EX_INDEX_SSL_CTX 2
313 #define CRYPTO_EX_INDEX_SSL_SESSION 3
314 #define CRYPTO_EX_INDEX_X509_STORE 4
315 #define CRYPTO_EX_INDEX_X509_STORE_CTX 5
316 #define CRYPTO_EX_INDEX_RSA 6
317 #define CRYPTO_EX_INDEX_DSA 7
318 #define CRYPTO_EX_INDEX_DH 8
319 #define CRYPTO_EX_INDEX_ENGINE 9
320 #define CRYPTO_EX_INDEX_X509 10
321 #define CRYPTO_EX_INDEX_UI 11
322 #define CRYPTO_EX_INDEX_ECDSA 12
323 #define CRYPTO_EX_INDEX_ECDH 13
324 #define CRYPTO_EX_INDEX_COMP 14
325 #define CRYPTO_EX_INDEX_STORE 15

```

```

327 /* Dynamically assigned indexes start from this value (don't use directly, use
328 * via CRYPTO_ex_data_new_class). */
329 #define CRYPTO_EX_INDEX_USER 100

332 /* This is the default callbacks, but we can have others as well:
333 * this is needed in Win32 where the application malloc and the
334 * library malloc may not be the same.
335 */
336 #define CRYPTO_malloc_init() CRYPTO_set_mem_functions(\
337     malloc, realloc, free)

339 #if defined CRYPTO_MDEBUG_ALL || defined CRYPTO_MDEBUG_TIME || defined CRYPTO_MD
340 # ifndef CRYPTO_MDEBUG /* avoid duplicate #define */
341 #  define CRYPTO_MDEBUG
342 # endif
343 #endif

345 /* Set standard debugging functions (not done by default
346 * unless CRYPTO_MDEBUG is defined) */
347 #define CRYPTO_malloc_debug_init() do {\
348     CRYPTO_set_mem_debug_functions(\
349         CRYPTO_dbg_malloc,\
350         CRYPTO_dbg_realloc,\
351         CRYPTO_dbg_free,\
352         CRYPTO_dbg_set_options,\
353         CRYPTO_dbg_get_options);\
354 } while(0)

356 int CRYPTO_mem_ctrl(int mode);
357 int CRYPTO_is_mem_check_on(void);

359 /* for applications */
360 #define MemCheck_start() CRYPTO_mem_ctrl(CRYPTO_MEM_CHECK_ON)
361 #define MemCheck_stop() CRYPTO_mem_ctrl(CRYPTO_MEM_CHECK_OFF)

363 /* for library-internal use */
364 #define MemCheck_on() CRYPTO_mem_ctrl(CRYPTO_MEM_CHECK_ENABLE)
365 #define MemCheck_off() CRYPTO_mem_ctrl(CRYPTO_MEM_CHECK_DISABLE)
366 #define is_MemCheck_on() CRYPTO_is_mem_check_on()

368 #define OPENSSL_malloc(num) CRYPTO_malloc((int)num, __FILE__, __LINE__)
369 #define OPENSSL_strdup(str) CRYPTO_strdup((str), __FILE__, __LINE__)
370 #define OPENSSL_realloc(addr, num) \
371     CRYPTO_realloc((char *)addr, (int)num, __FILE__, __LINE__)
372 #define OPENSSL_realloc_clean(addr, old_num, num) \
373     CRYPTO_realloc_clean(addr, old_num, num, __FILE__, __LINE__)
374 #define OPENSSL_remalloc(addr, num) \
375     CRYPTO_remalloc((char **)addr, (int)num, __FILE__, __LINE__)
376 #define OPENSSL_freeFunc CRYPTO_free
377 #define OPENSSL_free(addr) CRYPTO_free(addr)

379 #define OPENSSL_malloc_locked(num) \
380     CRYPTO_malloc_locked((int)num, __FILE__, __LINE__)
381 #define OPENSSL_free_locked(addr) CRYPTO_free_locked(addr)

384 const char *SSLeay_version(int type);
385 unsigned long SSLeay(void);

387 int OPENSSL_issetugid(void);

389 /* An opaque type representing an implementation of "ex_data" support */
390 typedef struct st_CRYPTO_EX_DATA_IMPL CRYPTO_EX_DATA_IMPL;
391 /* Return an opaque pointer to the current "ex_data" implementation */

```



```

392 const CRYPTO_EX_DATA_IMPL *CRYPTO_get_ex_data_implementation(void);
393 /* Sets the "ex_data" implementation to be used (if it's not too late) */
394 int CRYPTO_set_ex_data_implementation(const CRYPTO_EX_DATA_IMPL *i);
395 /* Get a new "ex_data" class, and return the corresponding "class_index" */
396 int CRYPTO_ex_data_new_class(void);
397 /* Within a given class, get/register a new index */
398 int CRYPTO_get_ex_new_index(int class_index, long argl, void *argp,
399     CRYPTO_EX_new *new_func, CRYPTO_EX_dup *dup_func,
400     CRYPTO_EX_free *free_func);
401 /* Initialise/duplicate/free CRYPTO_EX_DATA variables corresponding to a given
402  * class (invokes whatever per-class callbacks are applicable) */
403 int CRYPTO_new_ex_data(int class_index, void *obj, CRYPTO_EX_DATA *ad);
404 int CRYPTO_dup_ex_data(int class_index, CRYPTO_EX_DATA *to,
405     CRYPTO_EX_DATA *from);
406 void CRYPTO_free_ex_data(int class_index, void *obj, CRYPTO_EX_DATA *ad);
407 /* Get/set data in a CRYPTO_EX_DATA variable corresponding to a particular index
408  * (relative to the class type involved) */
409 int CRYPTO_set_ex_data(CRYPTO_EX_DATA *ad, int idx, void *val);
410 void *CRYPTO_get_ex_data(const CRYPTO_EX_DATA *ad, int idx);
411 /* This function cleans up all "ex_data" state. It mustn't be called under
412  * potential race-conditions. */
413 void CRYPTO_cleanup_all_ex_data(void);

415 int CRYPTO_get_new_lockid(char *name);

417 int CRYPTO_num_locks(void); /* return CRYPTO_NUM_LOCKS (shared libs!) */
418 void CRYPTO_lock(int mode, int type, const char *file, int line);
419 void CRYPTO_set_locking_callback(void (*func)(int mode, int type,
420     const char *file, int line));
421 void (*CRYPTO_get_locking_callback(void))(int mode, int type, const char *file,
422     int line);
423 void CRYPTO_set_add_lock_callback(int (*func)(int *num, int mount, int type,
424     const char *file, int line));
425 int (*CRYPTO_get_add_lock_callback(void))(int *num, int mount, int type,
426     const char *file, int line);

428 /* Don't use this structure directly. */
429 typedef struct crypto_threadid_st
430 {
431     void *ptr;
432     unsigned long val;
433 } CRYPTO_THREADID;
434 /* Only use CRYPTO_THREADID_set_numeric[pointer]() within callbacks */
435 void CRYPTO_THREADID_set_numeric(CRYPTO_THREADID *id, unsigned long val);
436 void CRYPTO_THREADID_set_pointer(CRYPTO_THREADID *id, void *ptr);
437 int CRYPTO_THREADID_set_callback(void (*threadid_func)(CRYPTO_THREADID *));
438 void (*CRYPTO_THREADID_get_callback(void))(CRYPTO_THREADID *);
439 void CRYPTO_THREADID_current(CRYPTO_THREADID *id);
440 int CRYPTO_THREADID_cmp(const CRYPTO_THREADID *a, const CRYPTO_THREADID *b);
441 void CRYPTO_THREADID_cpy(CRYPTO_THREADID *dest, const CRYPTO_THREADID *src);
442 unsigned long CRYPTO_THREADID_hash(const CRYPTO_THREADID *id);
443 #ifndef OPENSSL_NO_DEPRECATED
444 void CRYPTO_set_id_callback(unsigned long (*func)(void));
445 unsigned long (*CRYPTO_get_id_callback(void))(void);
446 unsigned long CRYPTO_thread_id(void);
447 #endif

449 const char *CRYPTO_get_lock_name(int type);
450 int CRYPTO_add_lock(int *pointer, int amount, int type, const char *file,
451     int line);

453 int CRYPTO_get_new_dynlockid(void);
454 void CRYPTO_destroy_dynlockid(int i);
455 struct CRYPTO_dynlock_value *CRYPTO_get_dynlock_value(int i);
456 void CRYPTO_set_dynlock_create_callback(struct CRYPTO_dynlock_value *(*dyn_creat
457 void CRYPTO_set_dynlock_lock_callback(void (*dyn_lock_function)(int mode, struct

```

```

458 void CRYPTO_set_dynlock_destroy_callback(void (*dyn_destroy_function)(struct CRY
459 struct CRYPTO_dynlock_value *(*CRYPTO_get_dynlock_create_callback(void))(const c
460 void (*CRYPTO_get_dynlock_lock_callback(void))(int mode, struct CRYPTO_dynlock_v
461 void (*CRYPTO_get_dynlock_destroy_callback(void))(struct CRYPTO_dynlock_value *l

463 /* CRYPTO_set_mem_functions includes CRYPTO_set_locked_mem_functions --
464  * call the latter last if you need different functions */
465 int CRYPTO_set_mem_functions(void *(*m)(size_t), void *(*r)(void *, size_t), void
466 int CRYPTO_set_locked_mem_functions(void *(*m)(size_t), void (*free_func)(void *
467 int CRYPTO_set_mem_ex_functions(void *(*m)(size_t, const char *, int),
468     void *(*r)(void *, size_t, const char *, int),
469     void *(*f)(void *));
470 int CRYPTO_set_locked_mem_ex_functions(void *(*m)(size_t, const char *, int),
471     void (*free_func)(void *));
472 int CRYPTO_set_mem_debug_functions(void (*m)(void *, int, const char *, int, int),
473     void (*r)(void *, void *, int, const char *, int),
474     void (*f)(void *, int),
475     void (*so)(long),
476     long (*go)(void));
477 void CRYPTO_get_mem_functions(void *(*m)(size_t), void *(*r)(void *, size_t), v
478 void CRYPTO_get_locked_mem_functions(void *(*m)(size_t), void (*f)(void *));
479 void CRYPTO_get_mem_ex_functions(void *(*m)(size_t, const char *, int),
480     void *(*r)(void *, size_t, const char *, int),
481     void (*f)(void *));
482 void CRYPTO_get_locked_mem_ex_functions(void *(*m)(size_t, const char *, int),
483     void (*f)(void *));
484 void CRYPTO_get_mem_debug_functions(void (*m)(void *, int, const char *, int, int),
485     void (*r)(void *, void *, int, const char *, in
486     void (*f)(void *, int),
487     void (*so)(long),
488     long (*go)(void));

490 void *CRYPTO_malloc_locked(int num, const char *file, int line);
491 void CRYPTO_free_locked(void *ptr);
492 void *CRYPTO_malloc(int num, const char *file, int line);
493 char *CRYPTO_strdup(const char *str, const char *file, int line);
494 void CRYPTO_free(void *ptr);
495 void *CRYPTO_realloc(void *addr, int num, const char *file, int line);
496 void *CRYPTO_realloc_clean(void *addr, int old_num, int num, const char *file,
497     int line);
498 void *CRYPTO_realloc(void *addr, int num, const char *file, int line);

500 void OPENSSL_cleanse(void *ptr, size_t len);

502 void CRYPTO_set_mem_debug_options(long bits);
503 long CRYPTO_get_mem_debug_options(void);

505 #define CRYPTO_push_info(info) \
506     CRYPTO_push_info_(info, __FILE__, __LINE__);
507 int CRYPTO_push_info_(const char *info, const char *file, int line);
508 int CRYPTO_pop_info(void);
509 int CRYPTO_remove_all_info(void);

512 /* Default debugging functions (enabled by CRYPTO_malloc_debug_init() macro;
513  * used as default in CRYPTO_MDEBUG compilations): */
514 /* The last argument has the following significance:
515  *
516  * 0: called before the actual memory allocation has taken place
517  * 1: called after the actual memory allocation has taken place
518  */
519 void CRYPTO_dbg_malloc(void *addr, int num, const char *file, int line, int before_p
520 void CRYPTO_dbg_realloc(void *addr1, void *addr2, int num, const char *file, int lin
521 void CRYPTO_dbg_free(void *addr, int before_p);
522 /* Tell the debugging code about options. By default, the following values
523  * apply:

```

```

524 *
525 * 0:          Clear all options.
526 * V_CRYPT0_MDEBUG_TIME (1): Set the "Show Time" option.
527 * V_CRYPT0_MDEBUG_THREAD (2): Set the "Show Thread Number" option.
528 * V_CRYPT0_MDEBUG_ALL (3): 1 + 2
529 */
530 void CRYPT0_dbg_set_options(long bits);
531 long CRYPT0_dbg_get_options(void);

534 #ifndef OPENSSL_NO_FP_API
535 void CRYPT0_mem_leaks_fp(FILE *);
536 #endif
537 void CRYPT0_mem_leaks(struct bio_st *bio);
538 /* unsigned long order, char *file, int line, int num_bytes, char *addr */
539 typedef void *CRYPT0_MEM_LEAK_CB(unsigned long, const char *, int, int, void *);
540 void CRYPT0_mem_leaks_cb(CRYPT0_MEM_LEAK_CB *cb);

542 /* die if we have to */
543 void OpenSSLDie(const char *file, int line, const char *assertion);
544 #define OPENSSL_assert(e) (void)((e) ? 0 : (OpenSSLDie(__FILE__, __LINE__,
545
546 unsigned long *OPENSSL_ia32cap_loc(void);
547 #define OPENSSL_ia32cap (*(OPENSSL_ia32cap_loc()))
548 int OPENSSL_isservice(void);

550 int FIPS_mode(void);
551 int FIPS_mode_set(int r);

553 void OPENSSL_init(void);

555 #define fips_md_init(alg) fips_md_init_ctx(alg, alg)

557 #ifdef OPENSSL_FIPS
558 #define fips_md_init_ctx(alg, cx) \
559     int alg##_Init(cx##_CTX *c) \
560     { \
561         if (FIPS_mode()) OpenSSLDie(__FILE__, __LINE__, \
562             "Low level API call to digest '" #alg "' forbidden in FIPS mode!")
563         return private_##alg##_Init(c); \
564     } \
565     int private_##alg##_Init(cx##_CTX *c)

567 #define fips_cipher_abort(alg) \
568     if (FIPS_mode()) OpenSSLDie(__FILE__, __LINE__, \
569         "Low level API call to cipher '" #alg "' forbidden in FIPS mode!")

571 #else
572 #define fips_md_init_ctx(alg, cx) \
573     int alg##_Init(cx##_CTX *c)
574 #define fips_cipher_abort(alg) while(0)
575 #endif

577 /* CRYPT0_memcmp returns zero iff the |len| bytes at |a| and |b| are equal. It
578  * takes an amount of time dependent on |len|, but independent of the contents
579  * of |a| and |b|. Unlike memcmp, it cannot be used to put elements into a
580  * defined order as the return value when a != b is undefined, other than to be
581  * non-zero. */
582 int CRYPT0_memcmp(const void *a, const void *b, size_t len);

584 /* BEGIN ERROR CODES */
585 /* The following lines are auto generated by the script mkerr.pl. Any changes
586  * made after this point may be overwritten when the script is next run.
587  */
588 void ERR_load_CRYPT0_strings(void);

```

```

590 /* Error codes for the CRYPT0 functions. */

592 /* Function codes. */
593 #define CRYPT0_F_CRYPT0_GET_EX_NEW_INDEX 100
594 #define CRYPT0_F_CRYPT0_GET_NEW_DYNLOCKID 103
595 #define CRYPT0_F_CRYPT0_GET_NEW_LOCKID 101
596 #define CRYPT0_F_CRYPT0_SET_EX_DATA 102
597 #define CRYPT0_F_DEF_ADD_INDEX 104
598 #define CRYPT0_F_DEF_GET_CLASS 105
599 #define CRYPT0_F_FIPS_MODE_SET 109
600 #define CRYPT0_F_INT_DUP_EX_DATA 106
601 #define CRYPT0_F_INT_FREE_EX_DATA 107
602 #define CRYPT0_F_INT_NEW_EX_DATA 108

604 /* Reason codes. */
605 #define CRYPT0_R_FIPS_MODE_NOT_SUPPORTED 101
606 #define CRYPT0_R_NO_DYNLOCK_CREATE_CALLBACK 100

608 #ifdef __cplusplus
609 }
610 #endif
611 #endif

```

new/usr/src/lib/openssl/include/openssl/des.h

1

```
*****
19849 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/des.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/des/des.h */
2 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ''AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_NEW_DES_H
60 #define HEADER_NEW_DES_H
```

new/usr/src/lib/openssl/include/openssl/des.h

2

```
62 #include <openssl/e_os2.h> /* OPENSSL_EXTERN, OPENSSL_NO_DES,
63  * DES_LONG (via openssl/opensslconf.h) */

65 #ifndef OPENSSL_NO_DES
66 #error DES is disabled.
67 #endif

69 #ifndef OPENSSL_BUILD_SHLIBCRYPTO
70 #undef OPENSSL_EXTERN
71 #define OPENSSL_EXTERN OPENSSL_EXPORT
72 #endif

74 #ifndef __cplusplus
75 extern "C" {
76 #endif

78 typedef unsigned char DES_cblock[8];
79 typedef /* const */ unsigned char const_DES_cblock[8];
80 /* With "const", gcc 2.8.1 on Solaris thinks that DES_cblock *
81  * and const_DES_cblock * are incompatible pointer types. */

83 typedef struct DES_ks
84 {
85     union
86     {
87         DES_cblock cblock;
88         /* make sure things are correct size on machines with
89          * 8 byte longs */
90         DES_LONG deslong[2];
91     } ks[16];
92     DES_key_schedule;
93 } DES_ks;

94 #ifndef OPENSSL_DISABLE_OLD_DES_SUPPORT
95 #ifndef OPENSSL_ENABLE_OLD_DES_SUPPORT
96 #define OPENSSL_ENABLE_OLD_DES_SUPPORT
97 #endif
98 #endif

100 #ifndef OPENSSL_ENABLE_OLD_DES_SUPPORT
101 #include <openssl/des_old.h>
102 #endif

104 #define DES_KEY_SZ (sizeof(DES_cblock))
105 #define DES_SCHEDULE_SZ (sizeof(DES_key_schedule))

107 #define DES_ENCRYPT 1
108 #define DES_DECRYPT 0

110 #define DES_CBC_MODE 0
111 #define DES_PCBC_MODE 1

113 #define DES_ecb2_encrypt(i,o,k1,k2,e) \
114     DES_ecb3_encrypt((i),(o),(k1),(k2),(k1),(e))

116 #define DES_ede2_cbc_encrypt(i,o,l,k1,k2,iv,e) \
117     DES_ede3_cbc_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(e))

119 #define DES_ede2_cfb64_encrypt(i,o,l,k1,k2,iv,n,e) \
120     DES_ede3_cfb64_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(n),(e))

122 #define DES_ede2_ofb64_encrypt(i,o,l,k1,k2,iv,n) \
123     DES_ede3_ofb64_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(n))

125 OPENSSL_DECLARE_GLOBAL(int,DES_check_key); /* defaults to false */
126 #define DES_check_key OPENSSL_GLOBAL_REF(DES_check_key)
127 OPENSSL_DECLARE_GLOBAL(int,DES_rw_mode); /* defaults to DES_PCBC_MODE */
```

```

128 #define DES_rw_mode OPENSSL_GLOBAL_REF(DES_rw_mode)

130 const char *DES_options(void);
131 void DES_ecb3_encrypt(const DES_cblock *input, DES_cblock *output,
132                      DES_key_schedule *ks1, DES_key_schedule *ks2,
133                      DES_key_schedule *ks3, int enc);
134 DES_LONG DES_cbc_cksum(const unsigned char *input, DES_cblock *output,
135                       long length, DES_key_schedule *schedule,
136                       const DES_cblock *ivec);
137 /* DES_cbc_encrypt does not update the IV! Use DES_ncbc_encrypt instead. */
138 void DES_cbc_encrypt(const unsigned char *input, unsigned char *output,
139                     long length, DES_key_schedule *schedule, DES_cblock *ivec,
140                     int enc);
141 void DES_ncbc_encrypt(const unsigned char *input, unsigned char *output,
142                      long length, DES_key_schedule *schedule, DES_cblock *ivec,
143                      int enc);
144 void DES_xcbc_encrypt(const unsigned char *input, unsigned char *output,
145                      long length, DES_key_schedule *schedule, DES_cblock *ivec,
146                      const DES_cblock *inw, const DES_cblock *outw, int enc);
147 void DES_cfb_encrypt(const unsigned char *in, unsigned char *out, int numbits,
148                    long length, DES_key_schedule *schedule, DES_cblock *ivec,
149                    int enc);
150 void DES_ecb_encrypt(const DES_cblock *input, DES_cblock *output,
151                     DES_key_schedule *ks, int enc);

153 /* This is the DES encryption function that gets called by just about
154    every other DES routine in the library. You should not use this
155    function except to implement 'modes' of DES. I say this because the
156    functions that call this routine do the conversion from 'char **' to
157    long, and this needs to be done to make sure 'non-aligned' memory
158    access do not occur. The characters are loaded 'little endian'.
159    Data is a pointer to 2 unsigned long's and ks is the
160    DES_key_schedule to use. enc, is non zero specifies encryption,
161    zero if decryption. */
162 void DES_encrypt1(DES_LONG *data, DES_key_schedule *ks, int enc);

164 /* This functions is the same as DES_encrypt1() except that the DES
165    initial permutation (IP) and final permutation (FP) have been left
166    out. As for DES_encrypt1(), you should not use this function.
167    It is used by the routines in the library that implement triple DES.
168    IP() DES_encrypt2() DES_encrypt2() DES_encrypt2() FP() is the same
169    as DES_encrypt1() DES_encrypt1() DES_encrypt1() except faster :-). */
170 void DES_encrypt2(DES_LONG *data, DES_key_schedule *ks, int enc);

172 void DES_encrypt3(DES_LONG *data, DES_key_schedule *ks1,
173                  DES_key_schedule *ks2, DES_key_schedule *ks3);
174 void DES_decrypt3(DES_LONG *data, DES_key_schedule *ks1,
175                  DES_key_schedule *ks2, DES_key_schedule *ks3);
176 void DES_ede3_cbc_encrypt(const unsigned char *input, unsigned char *output,
177                          long length,
178                          DES_key_schedule *ks1, DES_key_schedule *ks2,
179                          DES_key_schedule *ks3, DES_cblock *ivec, int enc);
180 void DES_ede3_cbc_encrypt(const unsigned char *in, unsigned char *out,
181                          long length,
182                          DES_key_schedule *ks1, DES_key_schedule *ks2,
183                          DES_key_schedule *ks3,
184                          DES_cblock *ivec1, DES_cblock *ivec2,
185                          int enc);
186 void DES_ede3_cfb64_encrypt(const unsigned char *in, unsigned char *out,
187                            long length, DES_key_schedule *ks1,
188                            DES_key_schedule *ks2, DES_key_schedule *ks3,
189                            DES_cblock *ivec, int *num, int enc);
190 void DES_ede3_cfb_encrypt(const unsigned char *in, unsigned char *out,
191                          int numbits, long length, DES_key_schedule *ks1,
192                          DES_key_schedule *ks2, DES_key_schedule *ks3,
193                          DES_cblock *ivec, int enc);

```

```

194 void DES_ede3_ofb64_encrypt(const unsigned char *in, unsigned char *out,
195                             long length, DES_key_schedule *ks1,
196                             DES_key_schedule *ks2, DES_key_schedule *ks3,
197                             DES_cblock *ivec, int *num);
198 #if 0
199 void DES_xwhite_in2out(const DES_cblock *DES_key, const DES_cblock *in_white,
200                      DES_cblock *out_white);
201 #endif

203 int DES_enc_read(int fd, void *buf, int len, DES_key_schedule *sched,
204                 DES_cblock *iv);
205 int DES_enc_write(int fd, const void *buf, int len, DES_key_schedule *sched,
206                  DES_cblock *iv);
207 char *DES_fcrypt(const char *buf, const char *salt, char *ret);
208 char *DES_crypt(const char *buf, const char *salt);
209 void DES_ofb_encrypt(const unsigned char *in, unsigned char *out, int numbits,
210                    long length, DES_key_schedule *schedule, DES_cblock *ivec);
211 void DES_pcbc_encrypt(const unsigned char *input, unsigned char *output,
212                      long length, DES_key_schedule *schedule, DES_cblock *ivec,
213                      int enc);
214 DES_LONG DES_quad_cksum(const unsigned char *input, DES_cblock output[],
215                        long length, int out_count, DES_cblock *seed);
216 int DES_random_key(DES_cblock *ret);
217 void DES_set_odd_parity(DES_cblock *key);
218 int DES_check_key_parity(const DES_cblock *key);
219 int DES_is_weak_key(const DES_cblock *key);
220 /* DES_set_key (= set_key = DES_key_sched = key_sched) calls
221    * DES_set_key_checked if global variable DES_check_key is set,
222    * DES_set_key_unchecked otherwise. */
223 int DES_set_key(const DES_cblock *key, DES_key_schedule *schedule);
224 int DES_key_sched(const DES_cblock *key, DES_key_schedule *schedule);
225 int DES_set_key_checked(const DES_cblock *key, DES_key_schedule *schedule);
226 void DES_set_key_unchecked(const DES_cblock *key, DES_key_schedule *schedule);
227 #ifndef OPENSSL_FIPS
228 void private_DES_set_key_unchecked(const DES_cblock *key, DES_key_schedule *schedule);
229 #endif
230 void DES_string_to_key(const char *str, DES_cblock *key);
231 void DES_string_to_2keys(const char *str, DES_cblock *key1, DES_cblock *key2);
232 void DES_cfb64_encrypt(const unsigned char *in, unsigned char *out, long length,
233                      DES_key_schedule *schedule, DES_cblock *ivec, int *num,
234                      int enc);
235 void DES_ofb64_encrypt(const unsigned char *in, unsigned char *out, long length,
236                      DES_key_schedule *schedule, DES_cblock *ivec, int *num);

238 int DES_read_password(DES_cblock *key, const char *prompt, int verify);
239 int DES_read_2passwords(DES_cblock *key1, DES_cblock *key2, const char *prompt,
240                       int verify);

242 #define DES_fixup_key_parity DES_set_odd_parity

244 #ifdef __cplusplus
245 }
246 #endif

248 #endif

```

new/usr/src/lib/openssl/include/openssl/des_old.h

1

```
*****
18238 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/des_old.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/des_old.h *- mode:C; c-file-style: "eay" *- */

3 /* WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING
4 *
5 * The function names in here are deprecated and are only present to
6 * provide an interface compatible with openssl 0.9.6 and older as
7 * well as libdes. OpenSSL now provides functions where "des_" has
8 * been replaced with "DES_" in the names, to make it possible to
9 * make incompatible changes that are needed for C type security and
10 * other stuff.
11 *
12 * This include files has two compatibility modes:
13 *
14 * - If OPENSSL_DES_LIBDES_COMPATIBILITY is defined, you get an API
15 *   that is compatible with libdes and SLeay.
16 * - If OPENSSL_DES_LIBDES_COMPATIBILITY isn't defined, you get an
17 *   API that is compatible with OpenSSL 0.9.5x to 0.9.6x.
18 *
19 * Note that these modes break earlier snapshots of OpenSSL, where
20 * libdes compatibility was the only available mode or (later on) the
21 * preferred compatibility mode. However, after much consideration
22 * (and more or less violent discussions with external parties), it
23 * was concluded that OpenSSL should be compatible with earlier versions
24 * of itself before anything else. Also, in all honesty, libdes is
25 * an old beast that shouldn't really be used any more.
26 *
27 * Please consider starting to use the DES_ functions rather than the
28 * des_ ones. The des_ functions will disappear completely before
29 * OpenSSL 1.0!
30 *
31 * WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING
32 */

34 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
35 * project 2001.
36 */
37 /* =====
38 * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
39 *
40 * Redistribution and use in source and binary forms, with or without
41 * modification, are permitted provided that the following conditions
42 * are met:
43 *
44 * 1. Redistributions of source code must retain the above copyright
45 *    notice, this list of conditions and the following disclaimer.
46 *
47 * 2. Redistributions in binary form must reproduce the above copyright
48 *    notice, this list of conditions and the following disclaimer in
49 *    the documentation and/or other materials provided with the
50 *    distribution.
51 *
52 * 3. All advertising materials mentioning features or use of this
53 *    software must display the following acknowledgment:
54 *    "This product includes software developed by the OpenSSL Project
55 *    for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
56 *
57 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
58 *    endorse or promote products derived from this software without
59 *    prior written permission. For written permission, please contact
60 *    openssl-core@openssl.org.
61 */
```

new/usr/src/lib/openssl/include/openssl/des_old.h

2

```
62 * 5. Products derived from this software may not be called "OpenSSL"
63 * nor may "OpenSSL" appear in their names without prior written
64 * permission of the OpenSSL Project.
65 *
66 * 6. Redistributions of any form whatsoever must retain the following
67 * acknowledgment:
68 * "This product includes software developed by the OpenSSL Project
69 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
70 *
71 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
72 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
73 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
74 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
75 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
76 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
77 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
78 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
79 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
80 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
81 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
82 * OF THE POSSIBILITY OF SUCH DAMAGE.
83 * =====
84 *
85 * This product includes cryptographic software written by Eric Young
86 * (eay@cryptsoft.com). This product includes software written by Tim
87 * Hudson (tjh@cryptsoft.com).
88 *
89 */

91 #ifndef HEADER_DES_H
92 #define HEADER_DES_H

94 #include <openssl/e_os2.h> /* OPENSSL_EXTERN, OPENSSL_NO_DES, DES_LONG */

96 #ifndef OPENSSL_NO_DES
97 #error DES is disabled.
98 #endif

100 #ifndef HEADER_NEW_DES_H
101 #error You must include des.h, not des_old.h directly.
102 #endif

104 #ifndef _KERBEROS_DES_H
105 #error <openssl/des_old.h> replaces <kerberos/des.h>.
106 #endif

108 #include <openssl/symhacks.h>

110 #ifndef OPENSSL_BUILD_SHLIBCRYPTO
111 # undef OPENSSL_EXTERN
112 # define OPENSSL_EXTERN OPENSSL_EXPORT
113 #endif

115 #ifdef __cplusplus
116 extern "C" {
117 #endif

119 #ifdef _
120 #undef _
121 #endif

123 typedef unsigned char _ossl_old_des_cblock[8];
124 typedef struct _ossl_old_des_ks_struct
125 {
126     union {
127         _ossl_old_des_cblock _;
```

```

128      /* make sure things are correct size on machines with
129       * 8 byte longs */
130      DES_LONG pad[2];
131      } ks;
132      } _ossl_old_des_key_schedule[16];

134 #ifndef OPENSSSL_DES_LIBDES_COMPATIBILITY
135 #define des_cblock DES_cblock
136 #define const_des_cblock const DES_cblock
137 #define des_key_schedule DES_key_schedule
138 #define des_ecb3_encrypt(i,o,k1,k2,k3,e)\
139     DES_ecb3_encrypt((i),(o),(k1),(k2),(k3),(e))
140 #define des_ede3_cbc_encrypt(i,o,l,k1,k2,k3,iv,e)\
141     DES_ede3_cbc_encrypt((i),(o),(l),(k1),(k2),(k3),(iv),(e))
142 #define des_ede3_cbc_encrypt(i,o,l,k1,k2,k3,iv1,iv2,e)\
143     DES_ede3_cbc_encrypt((i),(o),(l),(k1),(k2),(k3),(iv1),(iv2),(e))
144 #define des_ede3_cfb64_encrypt(i,o,l,k1,k2,k3,iv,n,e)\
145     DES_ede3_cfb64_encrypt((i),(o),(l),(k1),(k2),(k3),(iv),(n),(e))
146 #define des_ede3_ofb64_encrypt(i,o,l,k1,k2,k3,iv,n)\
147     DES_ede3_ofb64_encrypt((i),(o),(l),(k1),(k2),(k3),(iv),(n))
148 #define des_options()\
149     DES_options()
150 #define des_cbc_cksum(i,o,l,k,iv)\
151     DES_cbc_cksum((i),(o),(l),(k),(iv))
152 #define des_cbc_encrypt(i,o,l,k,iv,e)\
153     DES_cbc_encrypt((i),(o),(l),(k),(iv),(e))
154 #define des_ncbc_encrypt(i,o,l,k,iv,e)\
155     DES_ncbc_encrypt((i),(o),(l),(k),(iv),(e))
156 #define des_xcbc_encrypt(i,o,l,k,iv,inw,outw,e)\
157     DES_xcbc_encrypt((i),(o),(l),(k),(iv),(inw),(outw),(e))
158 #define des_cfb_encrypt(i,o,n,l,k,iv,e)\
159     DES_cfb_encrypt((i),(o),(n),(l),(k),(iv),(e))
160 #define des_ecb_encrypt(i,o,k,e)\
161     DES_ecb_encrypt((i),(o),(k),(e))
162 #define des_encrypt1(d,k,e)\
163     DES_encrypt1((d),(k),(e))
164 #define des_encrypt2(d,k,e)\
165     DES_encrypt2((d),(k),(e))
166 #define des_encrypt3(d,k1,k2,k3)\
167     DES_encrypt3((d),(k1),(k2),(k3))
168 #define des_decrypt3(d,k1,k2,k3)\
169     DES_decrypt3((d),(k1),(k2),(k3))
170 #define des_xwhite_in2out(k,i,o)\
171     DES_xwhite_in2out((k),(i),(o))
172 #define des_enc_read(f,b,l,k,iv)\
173     DES_enc_read((f),(b),(l),(k),(iv))
174 #define des_enc_write(f,b,l,k,iv)\
175     DES_enc_write((f),(b),(l),(k),(iv))
176 #define des_fcrypt(b,s,r)\
177     DES_fcrypt((b),(s),(r))
178 #if 0
179 #define des_crypt(b,s)\
180     DES_crypt((b),(s))
181 #if !defined(PERL5) && !defined(__FreeBSD__) && !defined(NEXT) && !defined(__OpenBSD__)
182 #define des_crypt(b,s)\
183     DES_crypt((b),(s))
184 #endif
185 #endif
186 #define des_ofb_encrypt(i,o,n,l,k,iv)\
187     DES_ofb_encrypt((i),(o),(n),(l),(k),(iv))
188 #define des_pcbc_encrypt(i,o,l,k,iv,e)\
189     DES_pcbc_encrypt((i),(o),(l),(k),(iv),(e))
190 #define des_quad_cksum(i,o,l,c,s)\
191     DES_quad_cksum((i),(o),(l),(c),(s))
192 #define des_random_seed(k)\
193     _ossl_096_des_random_seed((k))

```

```

194 #define des_random_key(r)\
195     DES_random_key((r))
196 #define des_read_password(k,p,v) \
197     DES_read_password((k),(p),(v))
198 #define des_read_2passwords(k1,k2,p,v) \
199     DES_read_2passwords((k1),(k2),(p),(v))
200 #define des_set_odd_parity(k)\
201     DES_set_odd_parity((k))
202 #define des_check_key_parity(k)\
203     DES_check_key_parity((k))
204 #define des_is_weak_key(k)\
205     DES_is_weak_key((k))
206 #define des_set_key(k,ks)\
207     DES_set_key((k),(ks))
208 #define des_key_sched(k,ks)\
209     DES_key_sched((k),(ks))
210 #define des_set_key_checked(k,ks)\
211     DES_set_key_checked((k),(ks))
212 #define des_set_key_unchecked(k,ks)\
213     DES_set_key_unchecked((k),(ks))
214 #define des_string_to_key(s,k)\
215     DES_string_to_key((s),(k))
216 #define des_string_to_2keys(s,k1,k2)\
217     DES_string_to_2keys((s),(k1),(k2))
218 #define des_cfb64_encrypt(i,o,l,ks,iv,n,e)\
219     DES_cfb64_encrypt((i),(o),(l),(ks),(iv),(n),(e))
220 #define des_ofb64_encrypt(i,o,l,ks,iv,n)\
221     DES_ofb64_encrypt((i),(o),(l),(ks),(iv),(n))
222
224 #define des_ecb2_encrypt(i,o,k1,k2,e) \
225     des_ecb3_encrypt((i),(o),(k1),(k2),(k1),(e))
226
227 #define des_ede2_cbc_encrypt(i,o,l,k1,k2,iv,e) \
228     des_ede3_cbc_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(e))
229
230 #define des_ede2_cfb64_encrypt(i,o,l,k1,k2,iv,n,e) \
231     des_ede3_cfb64_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(n),(e))
232
233 #define des_ede2_ofb64_encrypt(i,o,l,k1,k2,iv,n) \
234     des_ede3_ofb64_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(n))
235
236 #define des_check_key DES_check_key
237 #define des_rw_mode DES_rw_mode
238 #else /* libdes compatibility */
239 /* Map all symbol names to _ossl_old_des_* form, so we avoid all
240  * clashes with libdes */
241 #define des_cblock _ossl_old_des_cblock
242 #define des_key_schedule _ossl_old_des_key_schedule
243 #define des_ecb3_encrypt(i,o,k1,k2,k3,e)\
244     _ossl_old_des_ecb3_encrypt((i),(o),(k1),(k2),(k3),(e))
245 #define des_ede3_cbc_encrypt(i,o,l,k1,k2,k3,iv,e)\
246     _ossl_old_des_ede3_cbc_encrypt((i),(o),(l),(k1),(k2),(k3),(iv),(e))
247 #define des_ede3_cfb64_encrypt(i,o,l,k1,k2,k3,iv,n,e)\
248     _ossl_old_des_ede3_cfb64_encrypt((i),(o),(l),(k1),(k2),(k3),(iv),(n),(e))
249 #define des_ede3_ofb64_encrypt(i,o,l,k1,k2,k3,iv,n)\
250     _ossl_old_des_ede3_ofb64_encrypt((i),(o),(l),(k1),(k2),(k3),(iv),(n))
251 #define des_options()\
252     _ossl_old_des_options()
253 #define des_cbc_cksum(i,o,l,k,iv)\
254     _ossl_old_des_cbc_cksum((i),(o),(l),(k),(iv))
255 #define des_cbc_encrypt(i,o,l,k,iv,e)\
256     _ossl_old_des_cbc_encrypt((i),(o),(l),(k),(iv),(e))
257 #define des_ncbc_encrypt(i,o,l,k,iv,e)\
258     _ossl_old_des_ncbc_encrypt((i),(o),(l),(k),(iv),(e))
259 #define des_xcbc_encrypt(i,o,l,k,iv,inw,outw,e)\

```

```

260 _ossl_old_des_xcbc_encrypt((i),(o),(l),(k),(iv),(inw),(outw),(e))
261 #define des_cfb_encrypt(i,o,n,l,k,iv,e)\
262 _ossl_old_des_cfb_encrypt((i),(o),(n),(l),(k),(iv),(e))
263 #define des_ecb_encrypt(i,o,k,e)\
264 _ossl_old_des_ecb_encrypt((i),(o),(k),(e))
265 #define des_encrypt(d,k,e)\
266 _ossl_old_des_encrypt((d),(k),(e))
267 #define des_encrypt2(d,k,e)\
268 _ossl_old_des_encrypt2((d),(k),(e))
269 #define des_encrypt3(d,k1,k2,k3)\
270 _ossl_old_des_encrypt3((d),(k1),(k2),(k3))
271 #define des_decrypt3(d,k1,k2,k3)\
272 _ossl_old_des_decrypt3((d),(k1),(k2),(k3))
273 #define des_xwhite_in2out(k,i,o)\
274 _ossl_old_des_xwhite_in2out((k),(i),(o))
275 #define des_enc_read(f,b,l,k,iv)\
276 _ossl_old_des_enc_read((f),(b),(l),(k),(iv))
277 #define des_enc_write(f,b,l,k,iv)\
278 _ossl_old_des_enc_write((f),(b),(l),(k),(iv))
279 #define des_fcrypt(b,s,r)\
280 _ossl_old_des_fcrypt((b),(s),(r))
281 #define des_crypt(b,s)\
282 _ossl_old_des_crypt((b),(s))
283 #if 0
284 #define crypt(b,s)\
285 _ossl_old_crypt((b),(s))
286 #endif
287 #define des_ofb_encrypt(i,o,n,l,k,iv)\
288 _ossl_old_des_ofb_encrypt((i),(o),(n),(l),(k),(iv))
289 #define des_pcbc_encrypt(i,o,l,k,iv,e)\
290 _ossl_old_des_pcbc_encrypt((i),(o),(l),(k),(iv),(e))
291 #define des_quad_cksum(i,o,l,c,s)\
292 _ossl_old_des_quad_cksum((i),(o),(l),(c),(s))
293 #define des_random_seed(k)\
294 _ossl_old_des_random_seed((k))
295 #define des_random_key(r)\
296 _ossl_old_des_random_key((r))
297 #define des_read_password(k,p,v) \
298 _ossl_old_des_read_password((k),(p),(v))
299 #define des_read_2passwords(k1,k2,p,v) \
300 _ossl_old_des_read_2passwords((k1),(k2),(p),(v))
301 #define des_set_odd_parity(k)\
302 _ossl_old_des_set_odd_parity((k))
303 #define des_is_weak_key(k)\
304 _ossl_old_des_is_weak_key((k))
305 #define des_set_key(k,ks)\
306 _ossl_old_des_set_key((k),(ks))
307 #define des_key_sched(k,ks)\
308 _ossl_old_des_key_sched((k),(ks))
309 #define des_string_to_key(s,k)\
310 _ossl_old_des_string_to_key((s),(k))
311 #define des_string_to_2keys(s,k1,k2)\
312 _ossl_old_des_string_to_2keys((s),(k1),(k2))
313 #define des_cfb64_encrypt(i,o,l,ks,iv,n,e)\
314 _ossl_old_des_cfb64_encrypt((i),(o),(l),(ks),(iv),(n),(e))
315 #define des_ofb64_encrypt(i,o,l,ks,iv,n)\
316 _ossl_old_des_ofb64_encrypt((i),(o),(l),(ks),(iv),(n))
317
319 #define des_ecb2_encrypt(i,o,k1,k2,e) \
320 des_ecb3_encrypt((i),(o),(k1),(k2),(k1),(e))
322 #define des_ede2_cbc_encrypt(i,o,l,k1,k2,iv,e) \
323 des_ede3_cbc_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(e))
325 #define des_ede2_cfb64_encrypt(i,o,l,k1,k2,iv,n,e) \

```

```

326 des_ede3_cfb64_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(n),(e))
328 #define des_ede2_ofb64_encrypt(i,o,l,k1,k2,iv,n) \
329 des_ede3_ofb64_encrypt((i),(o),(l),(k1),(k2),(k1),(iv),(n))
331 #define des_check_key DES_check_key
332 #define des_rw_mode DES_rw_mode
333 #endif
335 const char *_ossl_old_des_options(void);
336 void _ossl_old_des_ecb3_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
337 _ossl_old_des_key_schedule ks1, _ossl_old_des_key_schedule ks2,
338 _ossl_old_des_key_schedule ks3, int enc);
339 DES_LONG _ossl_old_des_cbc_cksum(_ossl_old_des_cblock *input, _ossl_old_des_cblock
340 long length, _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *iv
341 void _ossl_old_des_cbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
342 _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *ivec, int enc);
343 void _ossl_old_des_ncbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
344 _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *ivec, int enc);
345 void _ossl_old_des_xcbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
346 _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *ivec,
347 _ossl_old_des_cblock *inw, _ossl_old_des_cblock *outw, int enc);
348 void _ossl_old_des_cfb_encrypt(unsigned char *in, unsigned char *out, int numbits,
349 long length, _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *iv
350 void _ossl_old_des_ecb_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
351 _ossl_old_des_key_schedule ks, int enc);
352 void _ossl_old_des_encrypt(DES_LONG *data, _ossl_old_des_key_schedule ks, int enc
353 void _ossl_old_des_encrypt2(DES_LONG *data, _ossl_old_des_key_schedule ks, int enc
354 void _ossl_old_des_encrypt3(DES_LONG *data, _ossl_old_des_key_schedule ks1,
355 _ossl_old_des_key_schedule ks2, _ossl_old_des_key_schedule ks3);
356 void _ossl_old_des_decrypt3(DES_LONG *data, _ossl_old_des_key_schedule ks1,
357 _ossl_old_des_key_schedule ks2, _ossl_old_des_key_schedule ks3);
358 void _ossl_old_des_ede3_cbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_c
359 long length, _ossl_old_des_key_schedule ks1, _ossl_old_des_key_schedule
360 _ossl_old_des_key_schedule ks3, _ossl_old_des_cblock *ivec, int enc);
361 void _ossl_old_des_ede3_cfb64_encrypt(unsigned char *in, unsigned char *out,
362 long length, _ossl_old_des_key_schedule ks1, _ossl_old_des_key_schedule
363 _ossl_old_des_key_schedule ks3, _ossl_old_des_cblock *ivec, int *num, in
364 void _ossl_old_des_ede3_ofb64_encrypt(unsigned char *in, unsigned char *out,
365 long length, _ossl_old_des_key_schedule ks1, _ossl_old_des_key_schedule
366 _ossl_old_des_key_schedule ks3, _ossl_old_des_cblock *ivec, int *num);
367 #if 0
368 void _ossl_old_des_xwhite_in2out(_ossl_old_des_cblock (*des_key), _ossl_old_des_
369 _ossl_old_des_cblock (*out_white));
370 #endif
372 int _ossl_old_des_enc_read(int fd, char *buf, int len, _ossl_old_des_key_schedule s
373 _ossl_old_des_cblock *iv);
374 int _ossl_old_des_enc_write(int fd, char *buf, int len, _ossl_old_des_key_schedule
375 _ossl_old_des_cblock *iv);
376 char *_ossl_old_des_fcrypt(const char *buf, const char *salt, char *ret);
377 char *_ossl_old_des_crypt(const char *buf, const char *salt);
378 #if !defined(PERL5) && !defined(NEXT)
379 char *_ossl_old_crypt(const char *buf, const char *salt);
380 #endif
381 void _ossl_old_des_ofb_encrypt(unsigned char *in, unsigned char *out,
382 int numbits, long length, _ossl_old_des_key_schedule schedule, _ossl_old_de
383 void _ossl_old_des_pcbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
384 _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *ivec, int enc);
385 DES_LONG _ossl_old_des_quad_cksum(_ossl_old_des_cblock *input, _ossl_old_des_cblo
386 long length, int out_count, _ossl_old_des_cblock *seed);
387 void _ossl_old_des_random_seed(_ossl_old_des_cblock key);
388 void _ossl_old_des_random_key(_ossl_old_des_cblock ret);
389 int _ossl_old_des_read_password(_ossl_old_des_cblock *key, const char *prompt, int
390 int _ossl_old_des_read_2passwords(_ossl_old_des_cblock *key1, _ossl_old_des_cblo
391 const char *prompt, int verify);

```

```
392 void _ossl_old_des_set_odd_parity(_ossl_old_des_cblock *key);
393 int _ossl_old_des_is_weak_key(_ossl_old_des_cblock *key);
394 int _ossl_old_des_set_key(_ossl_old_des_cblock *key, _ossl_old_des_key_schedule s
395 int _ossl_old_des_key_sched(_ossl_old_des_cblock *key, _ossl_old_des_key_schedule
396 void _ossl_old_des_string_to_key(char *str, _ossl_old_des_cblock *key);
397 void _ossl_old_des_string_to_2keys(char *str, _ossl_old_des_cblock *key1, _ossl_ol
398 void _ossl_old_des_cfb64_encrypt(unsigned char *in, unsigned char *out, long len
399     _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *ivec, int *nu
400 void _ossl_old_des_ofb64_encrypt(unsigned char *in, unsigned char *out, long len
401     _ossl_old_des_key_schedule schedule, _ossl_old_des_cblock *ivec, int *nu

403 void _ossl_096_des_random_seed(des_cblock *key);

405 /* The following definitions provide compatibility with the MIT Kerberos
406  * library. The _ossl_old_des_key_schedule structure is not binary compatible. */

408 #define _KERBEROS_DES_H

410 #define KRBDES_ENCRYPT DES_ENCRYPT
411 #define KRBDES_DECRYPT DES_DECRYPT

413 #ifdef KERBEROS
414 # define ENCRYPT DES_ENCRYPT
415 # define DECRYPT DES_DECRYPT
416 #endif

418 #ifndef NCOMPAT
419 # define C_Block des_cblock
420 # define Key_schedule des_key_schedule
421 # define KEY_SZ DES_KEY_SZ
422 # define string_to_key des_string_to_key
423 # define read_pw_string des_read_pw_string
424 # define random_key des_random_key
425 # define pcbc_encrypt des_pcbc_encrypt
426 # define set_key des_set_key
427 # define key_sched des_key_sched
428 # define ecb_encrypt des_ecb_encrypt
429 # define cbc_encrypt des_cbc_encrypt
430 # define ncbc_encrypt des_ncbc_encrypt
431 # define xcbc_encrypt des_xcbc_encrypt
432 # define cbc_cksum des_cbc_cksum
433 # define quad_cksum des_quad_cksum
434 # define check_parity des_check_key_parity
435 #endif

437 #define des_fixup_key_parity DES_fixup_key_parity

439 #ifdef __cplusplus
440 }
441 #endif

443 /* for DES_read_pw_string et al */
444 #include <openssl/ui_compat.h>

446 #endif
```

9979 Fri May 30 18:31:18 2014
 new/usr/src/lib/openssl/include/openssl/dh.h
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1  /* crypto/dh/dh.h */
2  /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3   * All rights reserved.
4   *
5   * This package is an SSL implementation written
6   * by Eric Young (eay@cryptsoft.com).
7   * The implementation was written so as to conform with Netscapes SSL.
8   *
9   * This library is free for commercial and non-commercial use as long as
10  * the following conditions are aheared to. The following conditions
11  * apply to all code found in this distribution, be it the RC4, RSA,
12  * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13  * included with this distribution is covered by the same copyright terms
14  * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15  *
16  * Copyright remains Eric Young's, and as such any Copyright notices in
17  * the code are not to be removed.
18  * If this package is used in a product, Eric Young should be given attribution
19  * as the author of the parts of the library used.
20  * This can be in the form of a textual message at program startup or
21  * in documentation (online or textual) provided with the package.
22  *
23  * Redistribution and use in source and binary forms, with or without
24  * modification, are permitted provided that the following conditions
25  * are met:
26  * 1. Redistributions of source code must retain the copyright
27  * notice, this list of conditions and the following disclaimer.
28  * 2. Redistributions in binary form must reproduce the above copyright
29  * notice, this list of conditions and the following disclaimer in the
30  * documentation and/or other materials provided with the distribution.
31  * 3. All advertising materials mentioning features or use of this software
32  * must display the following acknowledgement:
33  * "This product includes cryptographic software written by
34  * Eric Young (eay@cryptsoft.com)"
35  * The word 'cryptographic' can be left out if the rouines from the library
36  * being used are not cryptographic related :-).
37  * 4. If you include any Windows specific code (or a derivative thereof) from
38  * the apps directory (application code) you must include an acknowledgement:
39  * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40  *
41  * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42  * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44  * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45  * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46  * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47  * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49  * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50  * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51  * SUCH DAMAGE.
52  *
53  * The licence and distribution terms for any publically available version or
54  * derivative of this code cannot be changed. i.e. this code cannot simply be
55  * copied and put under another distribution licence
56  * [including the GNU Public Licence.]
57  */

59 #ifndef HEADER_DH_H
60 #define HEADER_DH_H

```

62 #include <openssl/e_os2.h>

64 #ifdef OPENSSL_NO_DH
 65 #error DH is disabled.
 66 #endif

68 #ifndef OPENSSL_NO_BIO
 69 #include <openssl/bio.h>
 70 #endif
 71 #include <openssl/openssl_typ.h>
 72 #ifndef OPENSSL_NO_DEPRECATED
 73 #include <openssl/bn.h>
 74 #endif
 75

76 #ifndef OPENSSL_DH_MAX_MODULUS_BITS
 77 #define OPENSSL_DH_MAX_MODULUS_BITS 10000
 78 #endif

80 #define DH_FLAG_CACHE_MONT_P 0x01
 81 #define DH_FLAG_NO_EXP_CONSTTIME 0x02 /* new with 0.9.7h; the built-in DH
 82 * implementation now uses constant time
 83 * modular exponentiation for secret expon
 84 * by default. This flag causes the
 85 * faster variable sliding window method t
 86 * be used for all exponents.
 87 */

89 /* If this flag is set the DH method is FIPS compliant and can be used
 90 * in FIPS mode. This is set in the validated module method. If an
 91 * application sets this flag in its own methods it is its responsibility
 92 * to ensure the result is compliant.
 93 */

95 #define DH_FLAG_FIPS_METHOD 0x0400

97 /* If this flag is set the operations normally disabled in FIPS mode are
 98 * permitted it is then the applications responsibility to ensure that the
 99 * usage is compliant.
 100 */

102 #define DH_FLAG_NON_FIPS_ALLOW 0x0400

104 #ifdef __cplusplus
 105 extern "C" {
 106 #endif

108 /* Already defined in openssl_typ.h */
 109 /* typedef struct dh_st DH; */
 110 /* typedef struct dh_method DH_METHOD; */

```

112 struct dh_method
113 {
114     const char *name;
115     /* Methods here */
116     int (*generate_key)(DH *dh);
117     int (*compute_key)(unsigned char *key, const BIGNUM *pub_key, DH *dh);
118     int (*bn_mod_exp)(const DH *dh, BIGNUM *r, const BIGNUM *a,
119                       const BIGNUM *p, const BIGNUM *m, BN_CTX *ctx,
120                       BN_MONT_CTX *m_ctx); /* Can be null */
121
122     int (*init)(DH *dh);
123     int (*finish)(DH *dh);
124     int flags;
125     char *app_data;
126     /* If this is non-NULL, it will be used to generate parameters */
127     int (*generate_params)(DH *dh, int prime_len, int generator, BN_GENCB *c

```

```

128     };
129
130 struct dh_st
131 {
132     /* This first argument is used to pick up errors when
133      * a DH is passed instead of a EVP_PKEY */
134     int pad;
135     int version;
136     BIGNUM *p;
137     BIGNUM *g;
138     long length; /* optional */
139     BIGNUM *pub_key; /* g^x */
140     BIGNUM *priv_key; /* x */
141
142     int flags;
143     BN_MONT_CTX *method_mont_p;
144     /* Place holders if we want to do X9.42 DH */
145     BIGNUM *q;
146     BIGNUM *j;
147     unsigned char *seed;
148     int seedlen;
149     BIGNUM *counter;
150
151     int references;
152     CRYPTO_EX_DATA ex_data;
153     const DH_METHOD *meth;
154     ENGINE *engine;
155 };
156
157 #define DH_GENERATOR_2      2
158 /* #define DH_GENERATOR_3  3 */
159 #define DH_GENERATOR_5      5
160
161 /* DH_check error codes */
162 #define DH_CHECK_P_NOT_PRIME      0x01
163 #define DH_CHECK_P_NOT_SAFE_PRIME 0x02
164 #define DH_UNABLE_TO_CHECK_GENERATOR 0x04
165 #define DH_NOT_SUITABLE_GENERATOR 0x08
166
167 /* DH_check_pub_key error codes */
168 #define DH_CHECK_PUBKEY_TOO_SMALL 0x01
169 #define DH_CHECK_PUBKEY_TOO_LARGE 0x02
170
171 /* primes p where (p-1)/2 is prime too are called "safe"; we define
172    this for backward compatibility: */
173 #define DH_CHECK_P_NOT_STRONG_PRIME DH_CHECK_P_NOT_SAFE_PRIME
174
175 #define d2i_DHparams_fp(fp,x) (DH *)ASN1_d2i_fp((char *(*))DH_new, \
176     (char *(*))d2i_DHparams,(fp),(unsigned char **)(x))
177 #define i2d_DHparams_fp(fp,x) ASN1_i2d_fp(i2d_DHparams,(fp), \
178     (unsigned char **)(x))
179 #define d2i_DHparams_bio(bp,x) ASN1_d2i_bio_of(DH,DH_new,d2i_DHparams,bp,x)
180 #define i2d_DHparams_bio(bp,x) ASN1_i2d_bio_of_const(DH,i2d_DHparams,bp,x)
181
182 DH *DHparams_dup(DH *);
183
184 const DH_METHOD *DH_OpenSSL(void);
185
186 void DH_set_default_method(const DH_METHOD *meth);
187 const DH_METHOD *DH_get_default_method(void);
188 int DH_set_method(DH *dh, const DH_METHOD *meth);
189 DH *DH_new_method(ENGINE *engine);
190
191 DH * DH_new(void);
192 void DH_free(DH *dh);
193 int DH_up_ref(DH *dh);

```

```

194 int DH_size(const DH *dh);
195 int DH_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
196     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
197 int DH_set_ex_data(DH *d, int idx, void *arg);
198 void *DH_get_ex_data(DH *d, int idx);
199
200 /* Deprecated version */
201 #ifndef OPENSSL_NO_DEPRECATED
202 DH * DH_generate_parameters(int prime_len,int generator,
203     void (*callback)(int,int,void *),void *cb_arg);
204 #endif /* !defined(OPENSSL_NO_DEPRECATED) */
205
206 /* New version */
207 int DH_generate_parameters_ex(DH *dh, int prime_len,int generator, BN_GENCB
208     cb);
209 int DH_check(const DH *dh,int *codes);
210 int DH_check_pub_key(const DH *dh,const BIGNUM *pub_key, int *codes);
211 int DH_generate_key(DH *dh);
212 int DH_compute_key(unsigned char *key,const BIGNUM *pub_key,DH *dh);
213 DH * d2i_DHparams(DH **a,const unsigned char **pp, long length);
214 int i2d_DHparams(const DH *a,unsigned char **pp);
215 #ifndef OPENSSL_NO_FP_API
216 int DHparams_print_fp(FILE *fp, const DH *x);
217 #endif
218 #ifndef OPENSSL_NO_BIO
219 int DHparams_print(BIO *bp, const DH *x);
220 #else
221 int DHparams_print(char *bp, const DH *x);
222 #endif
223
224 #define EVP_PKEY_CTX_set_dh_paramgen_prime_len(ctx, len) \
225     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_DH, EVP_PKEY_OP_PARAMGEN, \
226         EVP_PKEY_CTRL_DH_PARAMGEN_PRIME_LEN, len, NULL)
227
228 #define EVP_PKEY_CTX_set_dh_paramgen_generator(ctx, gen) \
229     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_DH, EVP_PKEY_OP_PARAMGEN, \
230         EVP_PKEY_CTRL_DH_PARAMGEN_GENERATOR, gen, NULL)
231
232 #define EVP_PKEY_CTRL_DH_PARAMGEN_PRIME_LEN (EVP_PKEY_ALG_CTRL + 1)
233 #define EVP_PKEY_CTRL_DH_PARAMGEN_GENERATOR (EVP_PKEY_ALG_CTRL + 2)
234
235 /* BEGIN ERROR CODES */
236 /* The following lines are auto generated by the script mkerr.pl. Any changes
237    * made after this point may be overwritten when the script is next run.
238    */
239 void ERR_load_DH_strings(void);
240
241 /* Error codes for the DH functions. */
242
243 /* Function codes. */
244 #define DH_F_COMPUTE_KEY      102
245 #define DH_F_DHPARAMS_PRINT_FP 101
246 #define DH_F_DH_BUILTIN_GENPARAMS 106
247 #define DH_F_DH_COMPUTE_KEY  114
248 #define DH_F_DH_GENERATE_KEY  115
249 #define DH_F_DH_GENERATE_PARAMETERS_EX 116
250 #define DH_F_DH_NEW_METHOD    105
251 #define DH_F_DH_PARAM_DECODE   107
252 #define DH_F_DH_PRIV_DECODE    110
253 #define DH_F_DH_PRIV_ENCODE    111
254 #define DH_F_DH_PUB_DECODE     108
255 #define DH_F_DH_PUB_ENCODE     109
256 #define DH_F_DO_DH_PRINT       100
257 #define DH_F_GENERATE_KEY      103
258 #define DH_F_GENERATE_PARAMETERS 104

```

```
260 #define DH_F_PKEY_DH_DERIVE 112
261 #define DH_F_PKEY_DH_KEYGEN 113

263 /* Reason codes. */
264 #define DH_R_BAD_GENERATOR 101
265 #define DH_R_BN_DECODE_ERROR 109
266 #define DH_R_BN_ERROR 106
267 #define DH_R_DECODE_ERROR 104
268 #define DH_R_INVALID_PUBKEY 102
269 #define DH_R_KEYS_NOT_SET 108
270 #define DH_R_KEY_SIZE_TOO_SMALL 110
271 #define DH_R_MODULUS_TOO_LARGE 103
272 #define DH_R_NON_FIPS_METHOD 111
273 #define DH_R_NO_PARAMETERS_SET 107
274 #define DH_R_NO_PRIVATE_VALUE 100
275 #define DH_R_PARAMETER_ENCODING_ERROR 105

277 #ifdef __cplusplus
278 }
279 #endif
280 #endif
```

new/usr/src/lib/openssl/include/openssl/dsa.h

1

12057 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/dsa.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/dsa/dsa.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /*
60 * The DSS routines are based on patches supplied by
61 * Steven Schoch <schoch@sheba.arc.nasa.gov>. He basically did the
```

new/usr/src/lib/openssl/include/openssl/dsa.h

2

```
62 * work and I have just tweaked them a little to fit into my
63 * stylistic vision for SSLeay :-) */
64
65 #ifndef HEADER_DSA_H
66 #define HEADER_DSA_H
67
68 #include <openssl/e_os2.h>
69
70 #ifdef OPENSSL_NO_DSA
71 #error DSA is disabled.
72 #endif
73
74 #ifndef OPENSSL_NO_BIO
75 #include <openssl/bio.h>
76 #endif
77 #include <openssl/crypto.h>
78 #include <openssl/ssl_typ.h>
79
80 #ifndef OPENSSL_NO_DEPRECATED
81 #include <openssl/bn.h>
82 #ifndef OPENSSL_NO_DH
83 #include <openssl/dh.h>
84 #endif
85 #endif
86
87 #ifndef OPENSSL_DSA_MAX_MODULUS_BITS
88 #define OPENSSL_DSA_MAX_MODULUS_BITS 10000
89 #endif
90
91 #define DSA_FLAG_CACHE_MONT_P 0x01
92 #define DSA_FLAG_NO_EXP_CONSTTIME 0x02 /* new with 0.9.7h; the built-in DS
93 * implementation now uses constant
94 * modular exponentiation for secre
95 * by default. This flag causes the
96 * faster variable sliding window m
97 * be used for all exponents.
98 */
99
100 /* If this flag is set the DSA method is FIPS compliant and can be used
101 * in FIPS mode. This is set in the validated module method. If an
102 * application sets this flag in its own methods it is its responsibility
103 * to ensure the result is compliant.
104 */
105
106 #define DSA_FLAG_FIPS_METHOD 0x0400
107
108 /* If this flag is set the operations normally disabled in FIPS mode are
109 * permitted it is then the applications responsibility to ensure that the
110 * usage is compliant.
111 */
112
113 #define DSA_FLAG_NON_FIPS_ALLOW 0x0400
114
115 #ifdef __cplusplus
116 extern "C" {
117 #endif
118
119 /* Already defined in ssl_typ.h */
120 /* typedef struct dsa_st DSA; */
121 /* typedef struct dsa_method DSA_METHOD; */
122
123 typedef struct DSA_SIG_st
124 {
125     BIGNUM *r;
126     BIGNUM *s;
127 } DSA_SIG;
```

```

129 struct dsa_method
130 {
131     const char *name;
132     DSA_SIG * (*dsa_do_sign)(const unsigned char *dgst, int dlen, DSA *dsa);
133     int (*dsa_sign_setup)(DSA *dsa, BN_CTX *ctx_in, BIGNUM **kinvp,
134                                     BIGNUM **rp);
135     int (*dsa_do_verify)(const unsigned char *dgst, int dgst_len,
136                             DSA_SIG *sig, DSA *dsa);
137     int (*dsa_mod_exp)(DSA *dsa, BIGNUM *rr, BIGNUM *a1, BIGNUM *p1,
138                         BIGNUM *a2, BIGNUM *p2, BIGNUM *m, BN_CTX *ctx,
139                         BN_MONT_CTX *in_mont);
140     int (*bn_mod_exp)(DSA *dsa, BIGNUM *r, BIGNUM *a, const BIGNUM *p,
141                       const BIGNUM *m, BN_CTX *ctx,
142                       BN_MONT_CTX *m_ctx); /* Can be null */
143     int (*init)(DSA *dsa);
144     int (*finish)(DSA *dsa);
145     int flags;
146     char *app_data;
147     /* If this is non-NULL, it is used to generate DSA parameters */
148     int (*dsa_paramgen)(DSA *dsa, int bits,
149                        const unsigned char *seed, int seed_len,
150                        int *counter_ret, unsigned long *h_ret,
151                        BN_GENCB *cb);
152     /* If this is non-NULL, it is used to generate DSA keys */
153     int (*dsa_keygen)(DSA *dsa);
154 };

156 struct dsa_st
157 {
158     /* This first variable is used to pick up errors where
159      * a DSA is passed instead of of a EVP_PKEY */
160     int pad;
161     long version;
162     int write_params;
163     BIGNUM *p;
164     BIGNUM *q; /* == 20 */
165     BIGNUM *g;

167     BIGNUM *pub_key; /* y public key */
168     BIGNUM *priv_key; /* x private key */

170     BIGNUM *kinv; /* Signing pre-calc */
171     BIGNUM *r; /* Signing pre-calc */

173     int flags;
174     /* Normally used to cache montgomery values */
175     BN_MONT_CTX *method_mont_p;
176     int references;
177     CRYPTO_EX_DATA ex_data;
178     const DSA_METHOD *meth;
179     /* functional reference if 'meth' is ENGINE-provided */
180     ENGINE *engine;
181 };

183 #define d2i_DSAParams_fp(fp,x) (DSA *)ASN1_d2i_fp((char *(*))DSA_new, \
184 (char *(*))d2i_DSAParams,(fp),(unsigned char **)(x))
185 #define i2d_DSAParams_fp(fp,x) ASN1_i2d_fp(i2d_DSAParams,(fp), \
186 (unsigned char **)(x))
187 #define d2i_DSAParams_bio(bp,x) ASN1_d2i_bio_of(DSA,DSA_new,d2i_DSAParams,bp,x)
188 #define i2d_DSAParams_bio(bp,x) ASN1_i2d_bio_of_const(DSA,i2d_DSAParams,bp,x)

191 DSA *DSAParams_dup(DSA *x);
192 DSA_SIG * DSA_SIG_new(void);
193 void DSA_SIG_free(DSA_SIG *a);

```

```

194 int i2d_DSA_SIG(const DSA_SIG *a, unsigned char **pp);
195 DSA_SIG * d2i_DSA_SIG(DSA_SIG **v, const unsigned char **pp, long length);

197 DSA_SIG * DSA_do_sign(const unsigned char *dgst,int dlen,DSA *dsa);
198 int DSA_do_verify(const unsigned char *dgst,int dgst_len,
199                  DSA_SIG *sig,DSA *dsa);

201 const DSA_METHOD *DSA_OpenSSL(void);

203 void DSA_set_default_method(const DSA_METHOD *);
204 const DSA_METHOD *DSA_get_default_method(void);
205 int DSA_set_method(DSA *dsa, const DSA_METHOD *);

207 DSA * DSA_new(void);
208 DSA * DSA_new_method(ENGINE *engine);
209 void DSA_free (DSA *r);
210 /* "up" the DSA object's reference count */
211 int DSA_up_ref(DSA *r);
212 int DSA_size(const DSA *);
213 /* next 4 return -1 on error */
214 int DSA_sign_setup( DSA *dsa,BN_CTX *ctx_in,BIGNUM **kinvp,BIGNUM **rp);
215 int DSA_sign(int type,const unsigned char *dgst,int dlen,
216             unsigned char *sig, unsigned int *siglen, DSA *dsa);
217 int DSA_verify(int type,const unsigned char *dgst,int dgst_len,
218              const unsigned char *sigbuf, int siglen, DSA *dsa);
219 int DSA_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
220                          CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
221 int DSA_set_ex_data(DSA *d, int idx, void *arg);
222 void *DSA_get_ex_data(DSA *d, int idx);

224 DSA * d2i_DSAPublicKey(DSA **a, const unsigned char **pp, long length);
225 DSA * d2i_DSAPrivateKey(DSA **a, const unsigned char **pp, long length);
226 DSA * d2i_DSAParams(DSA **a, const unsigned char **pp, long length);

228 /* Deprecated version */
229 #ifndef OPENSSL_NO_DEPRECATED
230 DSA * DSA_generate_parameters(int bits,
231                               unsigned char *seed,int seed_len,
232                               int *counter_ret, unsigned long *h_ret,void
233                               (*callback)(int, int, void *),void *cb_arg);
234 #endif /* !defined(OPENSSL_NO_DEPRECATED) */

236 /* New version */
237 int DSA_generate_parameters_ex(DSA *dsa, int bits,
238                               const unsigned char *seed,int seed_len,
239                               int *counter_ret, unsigned long *h_ret, BN_GENCB *cb);

241 int DSA_generate_key(DSA *a);
242 int i2d_DSAPublicKey(const DSA *a, unsigned char **pp);
243 int i2d_DSAPrivateKey(const DSA *a, unsigned char **pp);
244 int i2d_DSAParams(const DSA *a,unsigned char **pp);

246 #ifndef OPENSSL_NO_BIO
247 int DSAParams_print(BIO *bp, const DSA *x);
248 int DSA_print(BIO *bp, const DSA *x, int off);
249 #endif
250 #ifndef OPENSSL_NO_FP_API
251 int DSAParams_print_fp(FILE *fp, const DSA *x);
252 int DSA_print_fp(FILE *bp, const DSA *x, int off);
253 #endif

255 #define DSS_prime_checks 50
256 /* Primality test according to FIPS PUB 186[-1], Appendix 2.1:
257  * 50 rounds of Rabin-Miller */
258 #define DSA_is_prime(n, callback, cb_arg) \
259     BN_is_prime(n, DSS_prime_checks, callback, NULL, cb_arg)

```

```

261 #ifndef OPENSSL_NO_DH
262 /* Convert DSA structure (key or just parameters) into DH structure
263  * (be careful to avoid small subgroup attacks when using this!) */
264 DH *DSA_dup_DH(const DSA *r);
265 #endif

267 #define EVP_PKEY_CTX_set_dsa_paramgen_bits(ctx, nbits) \
268     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_DSA, EVP_PKEY_OP_PARAMGEN, \
269                       EVP_PKEY_CTRL_DSA_PARAMGEN_BITS, nbits, NULL)

271 #define EVP_PKEY_CTRL_DSA_PARAMGEN_BITS      (EVP_PKEY_ALG_CTRL + 1)
272 #define EVP_PKEY_CTRL_DSA_PARAMGEN_Q_BITS   (EVP_PKEY_ALG_CTRL + 2)
273 #define EVP_PKEY_CTRL_DSA_PARAMGEN_MD       (EVP_PKEY_ALG_CTRL + 3)

275 /* BEGIN ERROR CODES */
276 /* The following lines are auto generated by the script mkerr.pl. Any changes
277  * made after this point may be overwritten when the script is next run.
278  */
279 void ERR_load_DSA_strings(void);

281 /* Error codes for the DSA functions. */

283 /* Function codes. */
284 #define DSA_F_D2I_DSA_SIG 110
285 #define DSA_F_D0_DSA_PRINT 104
286 #define DSA_F_DSAPARAMS_PRINT 100
287 #define DSA_F_DSAPARAMS_PRINT_FP 101
288 #define DSA_F_DSA_DO_SIGN 112
289 #define DSA_F_DSA_DO_VERIFY 113
290 #define DSA_F_DSA_GENERATE_KEY 124
291 #define DSA_F_DSA_GENERATE_PARAMETERS_EX 123
292 #define DSA_F_DSA_NEW_METHOD 103
293 #define DSA_F_DSA_PARAM_DECODE 119
294 #define DSA_F_DSA_PRINT_FP 105
295 #define DSA_F_DSA_PRIV_DECODE 115
296 #define DSA_F_DSA_PRIV_ENCODE 116
297 #define DSA_F_DSA_PUB_DECODE 117
298 #define DSA_F_DSA_PUB_ENCODE 118
299 #define DSA_F_DSA_SIGN 106
300 #define DSA_F_DSA_SIGN_SETUP 107
301 #define DSA_F_DSA_SIG_NEW 109
302 #define DSA_F_DSA_SIG_PRINT 125
303 #define DSA_F_DSA_VERIFY 108
304 #define DSA_F_I2D_DSA_SIG 111
305 #define DSA_F_OLD_DSA_PRIV_DECODE 122
306 #define DSA_F_PKEY_DSA_CTRL 120
307 #define DSA_F_PKEY_DSA_KEYGEN 121
308 #define DSA_F_SIG_CB 114

310 /* Reason codes. */
311 #define DSA_R_BAD_Q_VALUE 102
312 #define DSA_R_BN_DECODE_ERROR 108
313 #define DSA_R_BN_ERROR 109
314 #define DSA_R_DATA_TOO_LARGE_FOR_KEY_SIZE 100
315 #define DSA_R_DECODE_ERROR 104
316 #define DSA_R_INVALID_DIGEST_TYPE 106
317 #define DSA_R_MISSING_PARAMETERS 101
318 #define DSA_R_MODULUS_TOO_LARGE 103
319 #define DSA_R_NEED_NEW_SETUP_VALUES 110
320 #define DSA_R_NON_FIPS_DSA_METHOD 111
321 #define DSA_R_NO_PARAMETERS_SET 107
322 #define DSA_R_PARAMETER_ENCODING_ERROR 105

324 #ifdef __cplusplus
325 }

```

```

326 #endif
327 #endif

```

new/usr/src/lib/openssl/include/openssl/dso.h

1

```
*****
18095 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/dso.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* dso.h -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
16 * notice, this list of conditions and the following disclaimer in
17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
23 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26 * endorse or promote products derived from this software without
27 * prior written permission. For written permission, please contact
28 * licensing@OpenSSL.org.
29 *
30 * 5. Products derived from this software may not be called "OpenSSL"
31 * nor may "OpenSSL" appear in their names without prior written
32 * permission of the OpenSSL Project.
33 *
34 * 6. Redistributions of any form whatsoever must retain the following
35 * acknowledgment:
36 * "This product includes software developed by the OpenSSL Project
37 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */

59 #ifndef HEADER_DSO_H
60 #define HEADER_DSO_H
```

new/usr/src/lib/openssl/include/openssl/dso.h

2

```
62 #include <openssl/crypto.h>

64 #ifdef __cplusplus
65 extern "C" {
66 #endif

68 /* These values are used as commands to DSO_ctrl() */
69 #define DSO_CTRL_GET_FLAGS      1
70 #define DSO_CTRL_SET_FLAGS      2
71 #define DSO_CTRL_OR_FLAGS      3

73 /* By default, DSO_load() will translate the provided filename into a form
74  * typical for the platform (more specifically the DSO_METHOD) using the
75  * dso_name_converter function of the method. Eg. win32 will transform "blah"
76  * into "blah.dll", and dlfcn will transform it into "libblah.so". The
77  * behaviour can be overridden by setting the name_converter callback in the DSO
78  * object (using DSO_set_name_converter()). This callback could even utilise
79  * the DSO_METHOD's converter too if it only wants to override behaviour for
80  * one or two possible DSO methods. However, the following flag can be set in a
81  * DSO to prevent *any* native name-translation at all - eg. if the caller has
82  * prompted the user for a path to a driver library so the filename should be
83  * interpreted as-is. */
84 #define DSO_FLAG_NO_NAME_TRANSLATION      0x01
85 /* An extra flag to give if only the extension should be added as
86  * translation. This is obviously only of importance on Unix and
87  * other operating systems where the translation also may prefix
88  * the name with something, like 'lib', and ignored everywhere else.
89  * This flag is also ignored if DSO_FLAG_NO_NAME_TRANSLATION is used
90  * at the same time. */
91 #define DSO_FLAG_NAME_TRANSLATION_EXT_ONLY      0x02

93 /* The following flag controls the translation of symbol names to upper
94  * case. This is currently only being implemented for OpenVMS.
95  */
96 #define DSO_FLAG_UPCASE_SYMBOL      0x10

98 /* This flag loads the library with public symbols.
99  * Meaning: The exported symbols of this library are public
100 * to all libraries loaded after this library.
101 * At the moment only implemented in unix.
102 */
103 #define DSO_FLAG_GLOBAL_SYMBOLS      0x20

106 typedef void (*DSO_FUNC_TYPE)(void);

108 typedef struct dso_st DSO;

110 /* The function prototype used for method functions (or caller-provided
111  * callbacks) that transform filenames. They are passed a DSO structure pointer
112  * (or NULL if they are to be used independantly of a DSO object) and a
113  * filename to transform. They should either return NULL (if there is an error
114  * condition) or a newly allocated string containing the transformed form that
115  * the caller will need to free with OPENSSL_free() when done. */
116 typedef char* (*DSO_NAME_CONVERTER_FUNC)(DSO *, const char *);
117 /* The function prototype used for method functions (or caller-provided
118  * callbacks) that merge two file specifications. They are passed a
119  * DSO structure pointer (or NULL if they are to be used independantly of
120  * a DSO object) and two file specifications to merge. They should
121  * either return NULL (if there is an error condition) or a newly allocated
122  * string containing the result of merging that the caller will need
123  * to free with OPENSSL_free() when done.
124  * Here, merging means that bits and pieces are taken from each of the
125  * file specifications and added together in whatever fashion that is
126  * sensible for the DSO method in question. The only rule that really
127  * applies is that if the two specification contain pieces of the same
```

```

128 * type, the copy from the first string takes priority. One could see
129 * it as the first specification is the one given by the user and the
130 * second being a bunch of defaults to add on if they're missing in the
131 * first. */
132 typedef char* (*DSO_MERGER_FUNC)(DSO *, const char *, const char *);

134 typedef struct dso_meth_st
135 {
136     const char *name;
137     /* Loads a shared library, NB: new DSO_METHODs must ensure that a
138      * successful load populates the loaded_filename field, and likewise a
139      * successful unload OPENSSL_frees and NULLs it out. */
140     int (*dso_load)(DSO *dso);
141     /* Unloads a shared library */
142     int (*dso_unload)(DSO *dso);
143     /* Binds a variable */
144     void (*dso_bind_var)(DSO *dso, const char *symname);
145     /* Binds a function - assumes a return type of DSO_FUNC_TYPE.
146      * This should be cast to the real function prototype by the
147      * caller. Platforms that don't have compatible representations
148      * for different prototypes (this is possible within ANSI C)
149      * are highly unlikely to have shared libraries at all, let
150      * alone a DSO_METHOD implemented for them. */
151     DSO_FUNC_TYPE (*dso_bind_func)(DSO *dso, const char *symname);

153 /* I don't think this would actually be used in any circumstances. */
154 #if 0
155     /* Unbinds a variable */
156     int (*dso_unbind_var)(DSO *dso, char *symname, void *symptr);
157     /* Unbinds a function */
158     int (*dso_unbind_func)(DSO *dso, char *symname, DSO_FUNC_TYPE symptr);
159 #endif

160     /* The generic (yuck) "ctrl()" function. NB: Negative return
161      * values (rather than zero) indicate errors. */
162     long (*dso_ctrl)(DSO *dso, int cmd, long larg, void *parg);
163     /* The default DSO_METHOD-specific function for converting filenames to
164      * a canonical native form. */
165     DSO_NAME_CONVERTER_FUNC dso_name_converter;
166     /* The default DSO_METHOD-specific function for converting filenames to
167      * a canonical native form. */
168     DSO_MERGER_FUNC dso_merger;

170     /* [De]Initialisation handlers. */
171     int (*init)(DSO *dso);
172     int (*finish)(DSO *dso);

174     /* Return pathname of the module containing location */
175     int (*pathbyaddr)(void *addr, char *path, int sz);
176     /* Perform global symbol lookup, i.e. among *all* modules */
177     void *(*globallookup)(const char *symname);
178 } DSO_METHOD;

180 /******
181 /* The low-level handle type used to refer to a loaded shared library */

183 struct dso_st
184 {
185     DSO_METHOD *meth;
186     /* Standard dlopen uses a (void *). Win32 uses a HANDLE. VMS
187      * doesn't use anything but will need to cache the filename
188      * for use in the dso_bind handler. All in all, let each
189      * method control its own destiny. "Handles" and such go in
190      * a STACK. */
191     STACK_OF(void) *meth_data;
192     int references;
193     int flags;

```

```

194     /* For use by applications etc ... use this for your bits'n'pieces,
195      * don't touch meth_data! */
196     CRYPTO_EX_DATA ex_data;
197     /* If this callback function pointer is set to non-NULL, then it will
198      * be used in DSO_load() in place of meth->dso_name_converter. NB: This
199      * should normally be set using DSO_set_name_converter(). */
200     DSO_NAME_CONVERTER_FUNC name_converter;
201     /* If this callback function pointer is set to non-NULL, then it will
202      * be used in DSO_load() in place of meth->dso_merger. NB: This
203      * should normally be set using DSO_set_merger(). */
204     DSO_MERGER_FUNC merger;
205     /* This is populated with (a copy of) the platform-independant
206      * filename used for this DSO. */
207     char *filename;
208     /* This is populated with (a copy of) the translated filename by which
209      * the DSO was actually loaded. It is NULL iff the DSO is not currently
210      * loaded. NB: This is here because the filename translation process
211      * may involve a callback being invoked more than once not only to
212      * convert to a platform-specific form, but also to try different
213      * filenames in the process of trying to perform a load. As such, this
214      * variable can be used to indicate (a) whether this DSO structure
215      * corresponds to a loaded library or not, and (b) the filename with
216      * which it was actually loaded. */
217     char *loaded_filename;
218 };

221 DSO * DSO_new(void);
222 DSO * DSO_new_method(DSO_METHOD *method);
223 int DSO_free(DSO *dso);
224 int DSO_flags(DSO *dso);
225 int DSO_up_ref(DSO *dso);
226 long DSO_ctrl(DSO *dso, int cmd, long larg, void *parg);

228 /* This function sets the DSO's name_converter callback. If it is non-NULL,
229 * then it will be used instead of the associated DSO_METHOD's function. If
230 * oldcb is non-NULL then it is set to the function pointer value being
231 * replaced. Return value is non-zero for success. */
232 int DSO_set_name_converter(DSO *dso, DSO_NAME_CONVERTER_FUNC cb,
233     DSO_NAME_CONVERTER_FUNC *oldcb);
234 /* These functions can be used to get/set the platform-independant filename
235 * used for a DSO. NB: set will fail if the DSO is already loaded. */
236 const char *DSO_get_filename(DSO *dso);
237 int DSO_set_filename(DSO *dso, const char *filename);
238 /* This function will invoke the DSO's name_converter callback to translate a
239 * filename, or if the callback isn't set it will instead use the DSO_METHOD's
240 * converter. If "filename" is NULL, the "filename" in the DSO itself will be
241 * used. If the DSO_FLAG_NO_NAME_TRANSLATION flag is set, then the filename is
242 * simply duplicated. NB: This function is usually called from within a
243 * DSO_METHOD during the processing of a DSO_load() call, and is exposed so that
244 * caller-created DSO_METHODs can do the same thing. A non-NULL return value
245 * will need to be OPENSSL_free()'d. */
246 char *DSO_convert_filename(DSO *dso, const char *filename);
247 /* This function will invoke the DSO's merger callback to merge two file
248 * specifications, or if the callback isn't set it will instead use the
249 * DSO_METHOD's merger. A non-NULL return value will need to be
250 * OPENSSL_free()'d. */
251 char *DSO_merge(DSO *dso, const char *filespec1, const char *filespec2);
252 /* If the DSO is currently loaded, this returns the filename that it was loaded
253 * under, otherwise it returns NULL. So it is also useful as a test as to
254 * whether the DSO is currently loaded. NB: This will not necessarily return
255 * the same value as DSO_convert_filename(dso, dso->filename), because the
256 * DSO_METHOD's load function may have tried a variety of filenames (with
257 * and/or without the aid of the converters) before settling on the one it
258 * actually loaded. */
259 const char *DSO_get_loaded_filename(DSO *dso);

```



```

261 void DSO_set_default_method(DSO_METHOD *meth);
262 DSO_METHOD *DSO_get_default_method(void);
263 DSO_METHOD *DSO_get_method(DSO *dso);
264 DSO_METHOD *DSO_set_method(DSO *dso, DSO_METHOD *meth);

266 /* The all-singing all-dancing load function, you normally pass NULL
267  * for the first and third parameters. Use DSO_up and DSO_free for
268  * subsequent reference count handling. Any flags passed in will be set
269  * in the constructed DSO after its init() function but before the
270  * load operation. If 'dso' is non-NULL, 'flags' is ignored. */
271 DSO *DSO_load(DSO *dso, const char *filename, DSO_METHOD *meth, int flags);

273 /* This function binds to a variable inside a shared library. */
274 void *DSO_bind_var(DSO *dso, const char *symname);

276 /* This function binds to a function inside a shared library. */
277 DSO_FUNC_TYPE DSO_bind_func(DSO *dso, const char *symname);

279 /* This method is the default, but will beg, borrow, or steal whatever
280  * method should be the default on any particular platform (including
281  * DSO_METH_null() if necessary). */
282 DSO_METHOD *DSO_METHOD_openssl(void);

284 /* This method is defined for all platforms - if a platform has no
285  * DSO support then this will be the only method! */
286 DSO_METHOD *DSO_METHOD_null(void);

288 /* If DSO_DLFCN is defined, the standard dlfcn.h-style functions
289  * (dlopen, dlclose, dlsym, etc) will be used and incorporated into
290  * this method. If not, this method will return NULL. */
291 DSO_METHOD *DSO_METHOD_dlfcn(void);

293 /* If DSO_DL is defined, the standard dl.h-style functions (shl_load,
294  * shl_unload, shl_findsym, etc) will be used and incorporated into
295  * this method. If not, this method will return NULL. */
296 DSO_METHOD *DSO_METHOD_dl(void);

298 /* If WIN32 is defined, use DLLs. If not, return NULL. */
299 DSO_METHOD *DSO_METHOD_win32(void);

301 /* If VMS is defined, use shared images. If not, return NULL. */
302 DSO_METHOD *DSO_METHOD_vms(void);

304 /* This function writes null-terminated pathname of DSO module
305  * containing 'addr' into 'sz' large caller-provided 'path' and
306  * returns the number of characters [including trailing zero]
307  * written to it. If 'sz' is 0 or negative, 'path' is ignored and
308  * required amount of characters [including trailing zero] to
309  * accomodate pathname is returned. If 'addr' is NULL, then
310  * pathname of cryptolib itself is returned. Negative or zero
311  * return value denotes error.
312  */
313 int DSO_pathbyaddr(void *addr, char *path, int sz);

315 /* This function should be used with caution! It looks up symbols in
316  * all loaded modules and if module gets unloaded by somebody else
317  * attempt to dereference the pointer is doomed to have fatal
318  * consequences. Primary usage for this function is to probe 'core'
319  * system functionality, e.g. check if getnameinfo(3) is available
320  * at run-time without bothering about OS-specific details such as
321  * libc.so.versioning or where does it actually reside: in libc
322  * itself or libsocket. */
323 void *DSO_global_lookup(const char *name);

325 /* If BeOS is defined, use shared images. If not, return NULL. */

```

```

326 DSO_METHOD *DSO_METHOD_beos(void);

328 /* BEGIN ERROR CODES */
329 /* The following lines are auto generated by the script mkerr.pl. Any changes
330  * made after this point may be overwritten when the script is next run.
331  */
332 void ERR_load_DSO_strings(void);

334 /* Error codes for the DSO functions. */

336 /* Function codes. */
337 #define DSO_F_BEOS_BIND_FUNC 144
338 #define DSO_F_BEOS_BIND_VAR 145
339 #define DSO_F_BEOS_LOAD 146
340 #define DSO_F_BEOS_NAME_CONVERTER 147
341 #define DSO_F_BEOS_UNLOAD 148
342 #define DSO_F_DLFCN_BIND_FUNC 100
343 #define DSO_F_DLFCN_BIND_VAR 101
344 #define DSO_F_DLFCN_LOAD 102
345 #define DSO_F_DLFCN_MERGER 130
346 #define DSO_F_DLFCN_NAME_CONVERTER 123
347 #define DSO_F_DLFCN_UNLOAD 103
348 #define DSO_F_DL_BIND_FUNC 104
349 #define DSO_F_DL_BIND_VAR 105
350 #define DSO_F_DL_LOAD 106
351 #define DSO_F_DL_MERGER 131
352 #define DSO_F_DL_NAME_CONVERTER 124
353 #define DSO_F_DL_UNLOAD 107
354 #define DSO_F_DSO_BIND_FUNC 108
355 #define DSO_F_DSO_BIND_VAR 109
356 #define DSO_F_DSO_CONVERT_FILENAME 126
357 #define DSO_F_DSO_CTRL 110
358 #define DSO_F_DSO_FREE 111
359 #define DSO_F_DSO_GET_FILENAME 127
360 #define DSO_F_DSO_GET_LOADED_FILENAME 128
361 #define DSO_F_DSO_GLOBAL_LOOKUP 139
362 #define DSO_F_DSO_LOAD 112
363 #define DSO_F_DSO_MERGE 132
364 #define DSO_F_DSO_NEW_METHOD 113
365 #define DSO_F_DSO_PATHBYADDR 140
366 #define DSO_F_DSO_SET_FILENAME 129
367 #define DSO_F_DSO_SET_NAME_CONVERTER 122
368 #define DSO_F_DSO_UP_REF 114
369 #define DSO_F_GLOBAL_LOOKUP_FUNC 138
370 #define DSO_F_PATHBYADDR 137
371 #define DSO_F_VMS_BIND_SYM 115
372 #define DSO_F_VMS_LOAD 116
373 #define DSO_F_VMS_MERGER 133
374 #define DSO_F_VMS_UNLOAD 117
375 #define DSO_F_WIN32_BIND_FUNC 118
376 #define DSO_F_WIN32_BIND_VAR 119
377 #define DSO_F_WIN32_GLOBALLOOKUP 142
378 #define DSO_F_WIN32_GLOBALLOOKUP_FUNC 143
379 #define DSO_F_WIN32_JOINER 135
380 #define DSO_F_WIN32_LOAD 120
381 #define DSO_F_WIN32_MERGER 134
382 #define DSO_F_WIN32_NAME_CONVERTER 125
383 #define DSO_F_WIN32_PATHBYADDR 141
384 #define DSO_F_WIN32_SPLITTER 136
385 #define DSO_F_WIN32_UNLOAD 121

387 /* Reason codes. */
388 #define DSO_R_CTRL_FAILED 100
389 #define DSO_R_DSO_ALREADY_LOADED 110
390 #define DSO_R_EMPTY_FILE_STRUCTURE 113
391 #define DSO_R_FAILURE 114

```

```
392 #define DSO_R_FILENAME_TOO_BIG          101
393 #define DSO_R_FINISH_FAILED              102
394 #define DSO_R_INCORRECT_FILE_SYNTAX      115
395 #define DSO_R_LOAD_FAILED                103
396 #define DSO_R_NAME_TRANSLATION_FAILED    109
397 #define DSO_R_NO_FILENAME                111
398 #define DSO_R_NO_FILE_SPECIFICATION      116
399 #define DSO_R_NULL_HANDLE                104
400 #define DSO_R_SET_FILENAME_FAILED        112
401 #define DSO_R_STACK_ERROR                 105
402 #define DSO_R_SYM_FAILURE                 106
403 #define DSO_R_UNLOAD_FAILED              107
404 #define DSO_R_UNSUPPORTED                108

406 #ifdef __cplusplus
407 }
408 #endif
409 #endif
```

new/usr/src/lib/openssl/include/openssl/dtls1.h

1

```
*****
8026 Fri May 30 18:31:18 2014
new/usr/src/lib/openssl/include/openssl/dtls1.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/dtls1.h */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /* =====
7  * Copyright (c) 1999-2005 The OpenSSL Project. All rights reserved.
8  *
9  * Redistribution and use in source and binary forms, with or without
10 * modification, are permitted provided that the following conditions
11 * are met:
12 *
13 * 1. Redistributions of source code must retain the above copyright
14 * notice, this list of conditions and the following disclaimer.
15 *
16 * 2. Redistributions in binary form must reproduce the above copyright
17 * notice, this list of conditions and the following disclaimer in
18 * the documentation and/or other materials provided with the
19 * distribution.
20 *
21 * 3. All advertising materials mentioning features or use of this
22 * software must display the following acknowledgment:
23 * "This product includes software developed by the OpenSSL Project
24 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
25 *
26 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
27 * endorse or promote products derived from this software without
28 * prior written permission. For written permission, please contact
29 * openssl-core@OpenSSL.org.
30 *
31 * 5. Products derived from this software may not be called "OpenSSL"
32 * nor may "OpenSSL" appear in their names without prior written
33 * permission of the OpenSSL Project.
34 *
35 * 6. Redistributions of any form whatsoever must retain the following
36 * acknowledgment:
37 * "This product includes software developed by the OpenSSL Project
38 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
39 *
40 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
41 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
42 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
43 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
44 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
45 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
46 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
47 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
49 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
50 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 * =====
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 */
58
60 #ifndef HEADER_DTLS1_H
61 #define HEADER_DTLS1_H
```

new/usr/src/lib/openssl/include/openssl/dtls1.h

2

```
63 #include <openssl/buffer.h>
64 #include <openssl/pqueue.h>
65 #ifdef OPENSSL_SYS_VMS
66 #include <resource.h>
67 #include <sys/timeb.h>
68 #endif
69 #ifdef OPENSSL_SYS_WIN32
70 /* Needed for struct timeval */
71 #include <winsock.h>
72 #elif defined(OPENSSL_SYS_NETWARE) && !defined(_WINSOCK2API_)
73 #include <sys/timeval.h>
74 #else
75 #if defined(OPENSSL_SYS_VXWORKS)
76 #include <sys/times.h>
77 #else
78 #include <sys/time.h>
79 #endif
80 #endif
81
82 #ifdef __cplusplus
83 extern "C" {
84 #endif
85
86 #define DTLS1_VERSION 0xFEFF
87 #define DTLS1_BAD_VER 0x0100
88
89 #if 0
90 /* this alert description is not specified anywhere... */
91 #define DTLS1_AD_MISSING_HANDSHAKE_MESSAGE 110
92 #endif
93
94 /* lengths of messages */
95 #define DTLS1_COOKIE_LENGTH 256
96
97 #define DTLS1_RT_HEADER_LENGTH 13
98
99 #define DTLS1_HM_HEADER_LENGTH 12
100
101 #define DTLS1_HM_BAD_FRAGMENT -2
102 #define DTLS1_HM_FRAGMENT_RETRY -3
103
104 #define DTLS1_CCS_HEADER_LENGTH 1
105
106 #ifdef DTLS1_AD_MISSING_HANDSHAKE_MESSAGE
107 #define DTLS1_AL_HEADER_LENGTH 7
108 #else
109 #define DTLS1_AL_HEADER_LENGTH 2
110 #endif
111
112 #ifndef OPENSSL_NO_SSL_INTER
113
114 #ifndef OPENSSL_NO_SCTP
115 #define DTLS1_SCTP_AUTH_LABEL "EXPORTER_DTLS_OVER_SCTP"
116 #endif
117
118 typedef struct dtls1_bitmap_st
119 {
120     unsigned long map; /* track 32 packets on 32-bit systems
121                        * and 64 - on 64-bit systems */
122     unsigned char max_seq_num[8]; /* max record number seen so far,
123                                   * 64-bit value in big-endian
124                                   * encoding */
125 } DTLS1_BITMAP;
126
127 struct dtls1_retransmit_state
```

```

128     {
129         EVP_CIPHER_CTX *enc_write_ctx; /* cryptographic state */
130         EVP_MD_CTX *write_hash;        /* used for mac generation */
131 #ifndef OPENSSL_NO_COMP
132         COMP_CTX *compress;            /* compression */
133 #else
134         char *compress;
135 #endif
136         SSL_SESSION *session;
137         unsigned short epoch;
138     };
139
140 struct hm_header_st
141 {
142     unsigned char type;
143     unsigned long msg_len;
144     unsigned short seq;
145     unsigned long frag_off;
146     unsigned long frag_len;
147     unsigned int is_ccs;
148     struct dtls1_retransmit_state saved_retransmit_state;
149 };
150
151 struct ccs_header_st
152 {
153     unsigned char type;
154     unsigned short seq;
155 };
156
157 struct dtls1_timeout_st
158 {
159     /* Number of read timeouts so far */
160     unsigned int read_timeouts;
161
162     /* Number of write timeouts so far */
163     unsigned int write_timeouts;
164
165     /* Number of alerts received so far */
166     unsigned int num_alerts;
167 };
168
169 typedef struct record_pqueue_st
170 {
171     unsigned short epoch;
172     pqueue q;
173 } record_pqueue;
174
175 typedef struct hm_fragment_st
176 {
177     struct hm_header_st msg_header;
178     unsigned char *fragment;
179     unsigned char *reassembly;
180 } hm_fragment;
181
182 typedef struct dtls1_state_st
183 {
184     unsigned int send_cookie;
185     unsigned char cookie[DTLS1_COOKIE_LENGTH];
186     unsigned char rcvd_cookie[DTLS1_COOKIE_LENGTH];
187     unsigned int cookie_len;
188
189     /*
190      * The current data and handshake epoch. This is initially
191      * undefined, and starts at zero once the initial handshake is
192      * completed
193      */

```

```

194     unsigned short r_epoch;
195     unsigned short w_epoch;
196
197     /* records being received in the current epoch */
198     DTLS1_BITMAP bitmap;
199
200     /* renegotiation starts a new set of sequence numbers */
201     DTLS1_BITMAP next_bitmap;
202
203     /* handshake message numbers */
204     unsigned short handshake_write_seq;
205     unsigned short next_handshake_write_seq;
206
207     unsigned short handshake_read_seq;
208
209     /* save last sequence number for retransmissions */
210     unsigned char last_write_sequence[8];
211
212     /* Received handshake records (processed and unprocessed) */
213     record_pqueue unprocessed_rcds;
214     record_pqueue processed_rcds;
215
216     /* Buffered handshake messages */
217     pqueue buffered_messages;
218
219     /* Buffered (sent) handshake records */
220     pqueue sent_messages;
221
222     /* Buffered application records.
223      * Only for records between CCS and Finished
224      * to prevent either protocol violation or
225      * unnecessary message loss.
226      */
227     record_pqueue buffered_app_data;
228
229     /* Is set when listening for new connections with dtls1_listen() */
230     unsigned int listen;
231
232     unsigned int mtu; /* max DTLS packet size */
233
234     struct hm_header_st w_msg_hdr;
235     struct hm_header_st r_msg_hdr;
236
237     struct dtls1_timeout_st timeout;
238
239     /* Indicates when the last handshake msg or heartbeat sent will timeout */
240     struct timeval next_timeout;
241
242     /* Timeout duration */
243     unsigned short timeout_duration;
244
245     /* storage for Alert/Handshake protocol data received but not
246      * yet processed by ssl3_read_bytes: */
247     unsigned char alert_fragment[DTLS1_AL_HEADER_LENGTH];
248     unsigned int alert_fragment_len;
249     unsigned char handshake_fragment[DTLS1_HM_HEADER_LENGTH];
250     unsigned int handshake_fragment_len;
251
252     unsigned int retransmitting;
253     unsigned int change_cipher_spec_ok;
254
255 #ifndef OPENSSL_NO_SCTP
256     /* used when SSL_ST_XX_FLUSH is entered */
257     int next_state;
258
259     int shutdown_received;

```

```
260 #endif

262     } DTLS1_STATE;

264 typedef struct dtls1_record_data_st
265 {
266     unsigned char *packet;
267     unsigned int   packet_length;
268     SSL3_BUFFER    rbuf;
269     SSL3_RECORD    rrec;
270 #ifndef OPENSSL_NO_SCTP
271     struct bio_dgram_sctp_rcvinfo recordinfo;
272 #endif
273 } DTLS1_RECORD_DATA;

275 #endif

277 /* Timeout multipliers (timeout slice is defined in apps/timeouts.h */
278 #define DTLS1_TMO_READ_COUNT      2
279 #define DTLS1_TMO_WRITE_COUNT     2

281 #define DTLS1_TMO_ALERT_COUNT     12

283 #ifdef __cplusplus
284 }
285 #endif
286 #endif
```

new/usr/src/lib/openssl/include/openssl/e_os2.h

1

```
*****
19444 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/e_os2.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* e_os2.h */
2 /* =====
3  * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
24  * prior written permission. For written permission, please contact
25  * openssl-core@openssl.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
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40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 #include <openssl/opensslconf.h>

58 #ifndef HEADER_E_OS2_H
59 #define HEADER_E_OS2_H

61 #ifdef __cplusplus
```

new/usr/src/lib/openssl/include/openssl/e_os2.h

2

```
62 extern "C" {
63 #endif

65 /*****
66  * Detect operating systems. This probably needs completing.
67  * The result is that at least one OPENSSL_SYS_os macro should be defined.
68  * However, if none is defined, Unix is assumed.
69  */

71 #define OPENSSL_SYS_UNIX

73 /* ----- Macintosh, before MacOS X ----- */
74 #if defined(__MWERKS__) && defined(macintosh) || defined(OPENSSL_SYSNAME_MAC)
75 # undef OPENSSL_SYS_UNIX
76 # define OPENSSL_SYS_MACINTOSH_CLASSIC
77 #endif

79 /* ----- NetWare ----- */
80 #if defined(NETWARE) || defined(OPENSSL_SYSNAME_NETWARE)
81 # undef OPENSSL_SYS_UNIX
82 # define OPENSSL_SYS_NETWARE
83 #endif

85 /* ----- Microsoft operating systems ----- */

87 /* Note that MSDOS actually denotes 32-bit environments running on top of
88  * MS-DOS, such as DJGPP one. */
89 #if defined(OPENSSL_SYSNAME_MSDOS)
90 # undef OPENSSL_SYS_UNIX
91 # define OPENSSL_SYS_MSDOS
92 #endif

94 /* For 32 bit environment, there seems to be the CygWin environment and then
95  * all the others that try to do the same thing Microsoft does... */
96 #if defined(OPENSSL_SYSNAME_UWIN)
97 # undef OPENSSL_SYS_UNIX
98 # define OPENSSL_SYS_WIN32_UWIN
99 #else
100 # if defined(_CYGWIN32_) || defined(OPENSSL_SYSNAME_CYGWIN32)
101 #   undef OPENSSL_SYS_UNIX
102 #   define OPENSSL_SYS_WIN32_CYGWIN
103 # else
104 #   if defined(_WIN32) || defined(OPENSSL_SYSNAME_WIN32)
105 #     undef OPENSSL_SYS_UNIX
106 #     define OPENSSL_SYS_WIN32
107 #   endif
108 #   if defined(OPENSSL_SYSNAME_WINNT)
109 #     undef OPENSSL_SYS_UNIX
110 #     define OPENSSL_SYS_WINNT
111 #   endif
112 #   if defined(OPENSSL_SYSNAME_Wince)
113 #     undef OPENSSL_SYS_UNIX
114 #     define OPENSSL_SYS_Wince
115 #   endif
116 #   endif
117 #endif

119 /* Anything that tries to look like Microsoft is "Windows" */
120 #if defined(OPENSSL_SYS_WIN32) || defined(OPENSSL_SYS_WINNT) || defined(OPENSSL_
```

```

128 /* DLL settings. This part is a bit tough, because it's up to the application
129    implementor how he or she will link the application, so it requires some
130    macro to be used. */
131 #ifdef OPENSSL_SYS_WINDOWS
132 # ifndef OPENSSL_OPT_WINDLL
133 #  if defined(_WINDLL) /* This is used when building OpenSSL to indicate that
134                        DLL linkage should be used */
135 #   define OPENSSL_OPT_WINDLL
136 #  endif
137 # endif
138 #endif

140 /* ----- OpenVMS ----- */
141 #if defined(__VMS) || defined(VMS) || defined(OPENSSL_SYSNAME_VMS)
142 # undef OPENSSL_SYS_UNIX
143 # define OPENSSL_SYS_VMS
144 # if defined(__DECC)
145 #  define OPENSSL_SYS_VMS_DECC
146 # elif defined(__DECCXX)
147 #  define OPENSSL_SYS_VMS_DECC
148 #  define OPENSSL_SYS_VMS_DECCXX
149 # else
150 #  define OPENSSL_SYS_VMS_NODECC
151 # endif
152 #endif

154 /* ----- OS/2 ----- */
155 #if defined(__EMX__) || defined(__OS2__)
156 # undef OPENSSL_SYS_UNIX
157 # define OPENSSL_SYS_OS2
158 #endif

160 /* ----- Unix ----- */
161 #ifdef OPENSSL_SYS_UNIX
162 # if defined(linux) || defined(__linux__) || defined(OPENSSL_SYSNAME_LINUX)
163 #  define OPENSSL_SYS_LINUX
164 # endif
165 # ifdef OPENSSL_SYSNAME_MPE
166 #  define OPENSSL_SYS_MPE
167 # endif
168 # ifdef OPENSSL_SYSNAME_SNI
169 #  define OPENSSL_SYS_SNI
170 # endif
171 # ifdef OPENSSL_SYSNAME_ULTRASPARC
172 #  define OPENSSL_SYS_ULTRASPARC
173 # endif
174 # ifdef OPENSSL_SYSNAME_NEWS4
175 #  define OPENSSL_SYS_NEWS4
176 # endif
177 # ifdef OPENSSL_SYSNAME_MACOSX
178 #  define OPENSSL_SYS_MACOSX
179 # endif
180 # ifdef OPENSSL_SYSNAME_MACOSX_RHAPSODY
181 #  define OPENSSL_SYS_MACOSX_RHAPSODY
182 #  define OPENSSL_SYS_MACOSX
183 # endif
184 # ifdef OPENSSL_SYSNAME_SUNOS
185 #  define OPENSSL_SYS_SUNOS
186 # endif
187 # if defined(_CRAY) || defined(OPENSSL_SYSNAME_CRAY)
188 #  define OPENSSL_SYS_CRAY
189 # endif
190 # if defined(_AIX) || defined(OPENSSL_SYSNAME_AIX)
191 #  define OPENSSL_SYS_AIX
192 # endif
193 #endif

```

```

195 /* ----- VOS ----- */
196 #if defined(__VOS__) || defined(OPENSSL_SYSNAME_VOS)
197 # define OPENSSL_SYS_VOS
198 # ifdef __HPPA__
199 #  define OPENSSL_SYS_VOS_HPPA
200 # endif
201 # ifdef __IA32__
202 #  define OPENSSL_SYS_VOS_IA32
203 # endif
204 #endif

206 /* ----- VxWorks ----- */
207 #ifdef OPENSSL_SYSNAME_VXWORKS
208 # define OPENSSL_SYS_VXWORKS
209 #endif

211 /* ----- BeOS ----- */
212 #if defined(__BEOS__)
213 # define OPENSSL_SYS_BEOS
214 # include <sys/socket.h>
215 # if defined(BONE_VERSION)
216 #  define OPENSSL_SYS_BEOS_BONE
217 # else
218 #  define OPENSSL_SYS_BEOS_R5
219 # endif
220 #endif

222 /**
223  * That's it for OS-specific stuff
224  *****/

227 /* Specials for I/O an exit */
228 #ifdef OPENSSL_SYS_MSDOS
229 # define OPENSSL_UNISTD_IO <io.h>
230 # define OPENSSL_DECLARE_EXIT extern void exit(int);
231 #else
232 # define OPENSSL_UNISTD_IO OPENSSL_UNISTD
233 # define OPENSSL_DECLARE_EXIT /* declared in unistd.h */
234 #endif

236 /* Definitions of OPENSSL_GLOBAL and OPENSSL_EXTERN, to define and declare
237    certain global symbols that, with some compilers under VMS, have to be
238    defined and declared explicitly with globaldef and globalref.
239    Definitions of OPENSSL_EXPORT and OPENSSL_IMPORT, to define and declare
240    DLL exports and imports for compilers under Win32. These are a little
241    more complicated to use. Basically, for any library that exports some
242    global variables, the following code must be present in the header file
243    that declares them, before OPENSSL_EXTERN is used:

245    #ifdef SOME_BUILD_FLAG_MACRO
246    # undef OPENSSL_EXTERN
247    # define OPENSSL_EXTERN OPENSSL_EXPORT
248    #endif

250    The default is to have OPENSSL_EXPORT, OPENSSL_IMPORT and OPENSSL_GLOBAL
251    have some generally sensible values, and for OPENSSL_EXTERN to have the
252    value OPENSSL_IMPORT.
253 */

255 #if defined(OPENSSL_SYS_VMS_NODECC)
256 # define OPENSSL_EXPORT globalref
257 # define OPENSSL_IMPORT globalref
258 # define OPENSSL_GLOBAL globaldef
259 # elif defined(OPENSSL_SYS_WINDOWS) && defined(OPENSSL_OPT_WINDLL)

```

```
260 # define OPENSSL_EXPORT extern __declspec(dllexport)
261 # define OPENSSL_IMPORT extern __declspec(dllimport)
262 # define OPENSSL_GLOBAL
263 #else
264 # define OPENSSL_EXPORT extern
265 # define OPENSSL_IMPORT extern
266 # define OPENSSL_GLOBAL
267 #endif
268 #define OPENSSL_EXTERN OPENSSL_IMPORT

270 /* Macros to allow global variables to be reached through function calls when
271    required (if a shared library version requires it, for example.
272    The way it's done allows definitions like this:

274    // in foobar.c
275    OPENSSL_IMPLEMENT_GLOBAL(int,foobar,0)
276    // in foobar.h
277    OPENSSL_DECLARE_GLOBAL(int,foobar);
278    #define foobar OPENSSL_GLOBAL_REF(foobar)
279 */
280 #ifdef OPENSSL_EXPORT_VAR_AS_FUNCTION
281 # define OPENSSL_IMPLEMENT_GLOBAL(type,name,value)          \
282     type *_shadow_##name(void)                             \
283     { static type _hide_##name=value; return &_hide_##name; }
284 # define OPENSSL_DECLARE_GLOBAL(type,name) type *_shadow_##name(void)
285 # define OPENSSL_GLOBAL_REF(name) (*(_shadow_##name()))
286 #else
287 # define OPENSSL_IMPLEMENT_GLOBAL(type,name,value) OPENSSL_GLOBAL type _shadow_#
288 # define OPENSSL_DECLARE_GLOBAL(type,name) OPENSSL_EXPORT type _shadow_##name
289 # define OPENSSL_GLOBAL_REF(name) _shadow_##name
290 #endif

292 #if defined(OPENSSL_SYS_MACINTOSH_CLASSIC) && macintosh==1 && !defined(MAC_OS_GU
293 # define ossl_ssize_t long
294 #endif

296 #ifdef OPENSSL_SYS_MSDOS
297 # define ossl_ssize_t long
298 #endif

300 #if defined(NeXT) || defined(OPENSSL_SYS_NEWS4) || defined(OPENSSL_SYS_SUNOS)
301 # define ssize_t int
302 #endif

304 #if defined(__ultrix) && !defined(ssize_t)
305 # define ossl_ssize_t int
306 #endif

308 #ifndef ossl_ssize_t
309 # define ossl_ssize_t ssize_t
310 #endif

312 #ifdef __cplusplus
313 }
314 #endif
315 #endif
```


new/usr/src/lib/openssl/include/openssl/ebcdic.h

1

540 Fri May 30 18:31:19 2014

new/usr/src/lib/openssl/include/openssl/ebcdic.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

1 /* crypto/ebcdic.h */

3 #ifndef HEADER_EBCDIC_H

4 #define HEADER_EBCDIC_H

6 #include <sys/types.h>

8 /* Avoid name clashes with other applications */

9 #define os_toascii _openssl_os_toascii

10 #define os_toebcdic _openssl_os_toebcdic

11 #define ebcdic2ascii _openssl_ebcdic2ascii

12 #define ascii2ebcdic _openssl_ascii2ebcdic

14 extern const unsigned char os_toascii[256];

15 extern const unsigned char os_toebcdic[256];

16 void *ebcdic2ascii(void *dest, const void *srce, size_t count);

17 void *ascii2ebcdic(void *dest, const void *srce, size_t count);

19 #endif

new/usr/src/lib/openssl/include/openssl/engine.h

1

```
*****
40614 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/engine.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* openssl/engine.h */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 1999-2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
16 * notice, this list of conditions and the following disclaimer in
17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
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43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
58 /* =====
59 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
60 * ECDH support in OpenSSL originally developed by
61 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
```

new/usr/src/lib/openssl/include/openssl/engine.h

2

```
62 */

64 #ifndef HEADER_ENGINE_H
65 #define HEADER_ENGINE_H

67 #include <openssl/opensslconf.h>

69 #ifndef OPENSSL_NO_ENGINE
70 #error ENGINE is disabled.
71 #endif

73 #ifndef OPENSSL_NO_DEPRECATED
74 #include <openssl/bn.h>
75 #ifndef OPENSSL_NO_RSA
76 #include <openssl/rsa.h>
77 #endif
78 #ifndef OPENSSL_NO_DSA
79 #include <openssl/dsa.h>
80 #endif
81 #ifndef OPENSSL_NO_DH
82 #include <openssl/dh.h>
83 #endif
84 #ifndef OPENSSL_NO_ECDH
85 #include <openssl/ecdh.h>
86 #endif
87 #ifndef OPENSSL_NO_ECDSA
88 #include <openssl/ecdsa.h>
89 #endif
90 #include <openssl/rand.h>
91 #include <openssl/ui.h>
92 #include <openssl/err.h>
93 #endif

95 #include <openssl/openssl_typ.h>
96 #include <openssl/symhacks.h>

98 #include <openssl/x509.h>

100 #ifdef __cplusplus
101 extern "C" {
102 #endif

104 /* These flags are used to control combinations of algorithm (methods)
105  * by bitwise "OR"ing. */
106 #define ENGINE_METHOD_RSA (unsigned int)0x0001
107 #define ENGINE_METHOD_DSA (unsigned int)0x0002
108 #define ENGINE_METHOD_DH (unsigned int)0x0004
109 #define ENGINE_METHOD_RAND (unsigned int)0x0008
110 #define ENGINE_METHOD_ECDH (unsigned int)0x0010
111 #define ENGINE_METHOD_ECDSA (unsigned int)0x0020
112 #define ENGINE_METHOD_CIPHERS (unsigned int)0x0040
113 #define ENGINE_METHOD_DIGESTS (unsigned int)0x0080
114 #define ENGINE_METHOD_STORE (unsigned int)0x0100
115 #define ENGINE_METHOD_PKEY_METHS (unsigned int)0x0200
116 #define ENGINE_METHOD_PKEY_ASN1_METHS (unsigned int)0x0400
117 /* Obvious all-or-nothing cases. */
118 #define ENGINE_METHOD_ALL (unsigned int)0xFFFF
119 #define ENGINE_METHOD_NONE (unsigned int)0x0000

121 /* This(ese) flag(s) controls behaviour of the ENGINE_TABLE mechanism used
122  * internally to control registration of ENGINE implementations, and can be set
123  * by ENGINE_set_table_flags(). The "NOINIT" flag prevents attempts to
124  * initialise registered ENGINES if they are not already initialised. */
125 #define ENGINE_TABLE_FLAG_NOINIT (unsigned int)0x0001

127 /* ENGINE flags that can be set by ENGINE_set_flags(). */
```

```

128 /* #define ENGINE_FLAGS_MALLOCED      0x0001 */ /* Not used */

130 /* This flag is for ENGINES that wish to handle the various 'CMD'-related
131  * control commands on their own. Without this flag, ENGINE_ctrl() handles these
132  * control commands on behalf of the ENGINE using their "cmd_defns" data. */
133 #define ENGINE_FLAGS_MANUAL_CMD_CTRL    (int)0x0002

135 /* This flag is for ENGINES who return new duplicate structures when found via
136  * "ENGINE_by_id()". When an ENGINE must store state (eg. if ENGINE_ctrl()
137  * commands are called in sequence as part of some stateful process like
138  * key-generation setup and execution), it can set this flag - then each attempt
139  * to obtain the ENGINE will result in it being copied into a new structure.
140  * Normally, ENGINES don't declare this flag so ENGINE_by_id() just increments
141  * the existing ENGINE's structural reference count. */
142 #define ENGINE_FLAGS_BY_ID_COPY         (int)0x0004

144 /* This flag if for an ENGINE that does not want its methods registered as
145  * part of ENGINE_register_all_complete() for example if the methods are
146  * not usable as default methods.
147  */

149 #define ENGINE_FLAGS_NO_REGISTER_ALL    (int)0x0008

151 /* ENGINES can support their own command types, and these flags are used in
152  * ENGINE_CTRL_GET_CMD_FLAGS to indicate to the caller what kind of input each
153  * command expects. Currently only numeric and string input is supported. If a
154  * control command supports none of the _NUMERIC, _STRING, or _NO_INPUT options,
155  * then it is regarded as an "internal" control command - and not for use in
156  * config setting situations. As such, they're not available to the
157  * ENGINE_ctrl_cmd_string() function, only raw ENGINE_ctrl() access. Changes to
158  * this list of 'command types' should be reflected carefully in
159  * ENGINE_cmd_is_executable() and ENGINE_ctrl_cmd_string(). */

161 /* accepts a 'long' input value (3rd parameter to ENGINE_ctrl) */
162 #define ENGINE_CMD_FLAG_NUMERIC         (unsigned int)0x0001
163 /* accepts string input (cast from 'void*' to 'const char*', 4th parameter to
164  * ENGINE_ctrl) */
165 #define ENGINE_CMD_FLAG_STRING          (unsigned int)0x0002
166 /* Indicates that the control command takes *no* input. Ie. the control command
167  * is unparameterised. */
168 #define ENGINE_CMD_FLAG_NO_INPUT        (unsigned int)0x0004
169 /* Indicates that the control command is internal. This control command won't
170  * be shown in any output, and is only usable through the ENGINE_ctrl_cmd()
171  * function. */
172 #define ENGINE_CMD_FLAG_INTERNAL        (unsigned int)0x0008

174 /* NB: These 3 control commands are deprecated and should not be used. ENGINES
175  * relying on these commands should compile conditional support for
176  * compatibility (eg. if these symbols are defined) but should also migrate the
177  * same functionality to their own ENGINE-specific control functions that can be
178  * "discovered" by calling applications. The fact these control commands
179  * wouldn't be "executable" (ie. usable by text-based config) doesn't change the
180  * fact that application code can find and use them without requiring per-ENGINE
181  * hacking. */

183 /* These flags are used to tell the ctrl function what should be done.
184  * All command numbers are shared between all engines, even if some don't
185  * make sense to some engines. In such a case, they do nothing but return
186  * the error ENGINE_R_CTRL_COMMAND_NOT_IMPLEMENTED. */
187 #define ENGINE_CTRL_SET_LOGSTREAM        1
188 #define ENGINE_CTRL_SET_PASSWORD_CALLBACK 2
189 #define ENGINE_CTRL_HUP                  3 /* Close and reinitialise any
190  * handles/connections etc. */
191 #define ENGINE_CTRL_SET_USER_INTERFACE  4 /* Alternative to callback */
192 #define ENGINE_CTRL_SET_CALLBACK_DATA    5 /* User-specific data, used
193  * when calling the password

```

```

194                                     callback and the user
195                                     interface */
196 #define ENGINE_CTRL_LOAD_CONFIGURATION  6 /* Load a configuration, given
197  * a string that represents a
198  * file name or so */
199 #define ENGINE_CTRL_LOAD_SECTION        7 /* Load data from a given
200  * section in the already load
201  * configuration */

203 /* These control commands allow an application to deal with an arbitrary engine
204  * in a dynamic way. Warn: Negative return values indicate errors FOR THESE
205  * COMMANDS because zero is used to indicate 'end-of-list'. Other commands,
206  * including ENGINE-specific command types, return zero for an error.
207  */
208 /* An ENGINE can choose to implement these ctrl functions, and can internally
209  * manage things however it chooses - it does so by setting the
210  * ENGINE_FLAGS_MANUAL_CMD_CTRL flag (using ENGINE_set_flags()). Otherwise the
211  * ENGINE_ctrl() code handles this on the ENGINE's behalf using the cmd_defns
212  * data (set using ENGINE_set_cmd_defns()). This means an ENGINE's ctrl()
213  * handler need only implement its own commands - the above "meta" commands will
214  * be taken care of. */

216 /* Returns non-zero if the supplied ENGINE has a ctrl() handler. If "not", then
217  * all the remaining control commands will return failure, so it is worth
218  * checking this first if the caller is trying to "discover" the engine's
219  * capabilities and doesn't want errors generated unnecessarily. */
220 #define ENGINE_CTRL_HAS_CTRL_FUNCTION    10
221 /* Returns a positive command number for the first command supported by the
222  * engine. Returns zero if no ctrl commands are supported. */
223 #define ENGINE_CTRL_GET_FIRST_CMD_TYPE   11
224 /* The 'long' argument specifies a command implemented by the engine, and the
225  * return value is the next command supported, or zero if there are no more. */
226 #define ENGINE_CTRL_GET_NEXT_CMD_TYPE    12
227 /* The 'void*' argument is a command name (cast from 'const char*'), and the
228  * return value is the command that corresponds to it. */
229 #define ENGINE_CTRL_GET_CMD_FROM_NAME    13
230 /* The next two allow a command to be converted into its corresponding string
231  * form. In each case, the 'long' argument supplies the command. In the NAME_LEN
232  * case, the return value is the length of the command name (not counting a
233  * trailing EOL). In the NAME case, the 'void*' argument must be a string buffer
234  * large enough, and it will be populated with the name of the command (WITH a
235  * trailing EOL). */
236 #define ENGINE_CTRL_GET_NAME_LEN_FROM_CMD 14
237 #define ENGINE_CTRL_GET_NAME_FROM_CMD     15
238 /* The next two are similar but give a "short description" of a command. */
239 #define ENGINE_CTRL_GET_DESC_LEN_FROM_CMD 16
240 #define ENGINE_CTRL_GET_DESC_FROM_CMD     17
241 /* With this command, the return value is the OR'd combination of
242  * ENGINE_CMD_FLAG_*** values that indicate what kind of input a given
243  * engine-specific ctrl command expects. */
244 #define ENGINE_CTRL_GET_CMD_FLAGS        18

246 /* ENGINE implementations should start the numbering of their own control
247  * commands from this value. (ie. ENGINE_CMD_BASE, ENGINE_CMD_BASE + 1, etc). */
248 #define ENGINE_CMD_BASE                  200

250 /* NB: These 2 nCipher "chil" control commands are deprecated, and their
251  * functionality is now available through ENGINE-specific control commands
252  * (exposed through the above-mentioned 'CMD'-handling). Code using these 2
253  * commands should be migrated to the more general command handling before these
254  * are removed. */

256 /* Flags specific to the nCipher "chil" engine */
257 #define ENGINE_CTRL_CHIL_SET_FORKCHECK    100
258 /* Depending on the value of the (long)i argument, this sets or
259  * unsets the SimpleForkCheck flag in the CHIL API to enable or

```

```

260      * disable checking and workarounds for applications that fork().
261      */
262 #define ENGINE_CTRL_CHIL_NO_LOCKING 101
263 /* This prevents the initialisation function from providing mutex
264    * callbacks to the nCipher library. */

266 /* If an ENGINE supports its own specific control commands and wishes the
267    * framework to handle the above 'ENGINE_CMD_***'-manipulation commands on its
268    * behalf, it should supply a null-terminated array of ENGINE_CMD_DEFN entries
269    * to ENGINE_set_cmd_defns(). It should also implement a ctrl() handler that
270    * supports the stated commands (ie. the "cmd_num" entries as described by the
271    * array). NB: The array must be ordered in increasing order of cmd_num.
272    * "null-terminated" means that the last ENGINE_CMD_DEFN element has cmd_num set
273    * to zero and/or cmd_name set to NULL. */
274 typedef struct ENGINE_CMD_DEFN_st
275 {
276     unsigned int cmd_num; /* The command number */
277     const char *cmd_name; /* The command name itself */
278     const char *cmd_desc; /* A short description of the command */
279     unsigned int cmd_flags; /* The input the command expects */
280 } ENGINE_CMD_DEFN;

282 /* Generic function pointer */
283 typedef int (*ENGINE_GEN_FUNC_PTR)(void);
284 /* Generic function pointer taking no arguments */
285 typedef int (*ENGINE_GEN_INT_FUNC_PTR)(ENGINE *);
286 /* Specific control function pointer */
287 typedef int (*ENGINE_CTRL_FUNC_PTR)(ENGINE *, int, long, void *, void (*)(void))
288 /* Generic load key function pointer */
289 typedef EVP_PKEY *(*ENGINE_LOAD_KEY_PTR)(ENGINE *, const char *,
290     UI_METHOD *ui_method, void *callback_data);
291 typedef int (*ENGINE_SSL_CLIENT_CERT_PTR)(ENGINE *, SSL *ssl,
292     STACK_OF(X509_NAME) *ca_dn, X509 **pcert, EVP_PKEY **pkey,
293     STACK_OF(X509) **pother, UI_METHOD *ui_method, void *callback_data);
294 /* These callback types are for an ENGINE's handler for cipher and digest logic.
295    * These handlers have these prototypes;
296    * int foo(ENGINE *e, const EVP_CIPHER **cipher, const int **nids, int nid);
297    * int foo(ENGINE *e, const EVP_MD **digest, const int **nids, int nid);
298    * Looking at how to implement these handlers in the case of cipher support, if
299    * the framework wants the EVP_CIPHER for 'nid', it will call;
300    * foo(e, &p_evp_cipher, NULL, nid); (return zero for failure)
301    * If the framework wants a list of supported 'nids', it will call;
302    * foo(e, NULL, &p_nids, 0); (returns number of 'nids' or -1 for error)
303    */
304 /* Returns to a pointer to the array of supported cipher 'nid's. If the second
305    * parameter is non-NULL it is set to the size of the returned array. */
306 typedef int (*ENGINE_CIPHERS_PTR)(ENGINE *, const EVP_CIPHER **, const int **, int);
307 typedef int (*ENGINE_DIGESTS_PTR)(ENGINE *, const EVP_MD **, const int **, int);
308 typedef int (*ENGINE_PKEY_METHS_PTR)(ENGINE *, EVP_PKEY_METHOD **, const int **, int);
309 typedef int (*ENGINE_PKEY_ASN1_METHS_PTR)(ENGINE *, EVP_PKEY_ASN1_METHOD **, const int **, int);
310 /* STRUCTURE functions ... all of these functions deal with pointers to ENGINE
311    * structures where the pointers have a "structural reference". This means that
312    * their reference is to allowed access to the structure but it does not imply
313    * that the structure is functional. To simply increment or decrement the
314    * structural reference count, use ENGINE_by_id and ENGINE_free. NB: This is not
315    * required when iterating using ENGINE_get_next as it will automatically
316    * decrement the structural reference count of the "current" ENGINE and
317    * increment the structural reference count of the ENGINE it returns (unless it
318    * is NULL). */

320 /* Get the first/last "ENGINE" type available. */
321 ENGINE *ENGINE_get_first(void);
322 ENGINE *ENGINE_get_last(void);
323 /* Iterate to the next/previous "ENGINE" type (NULL = end of the list). */
324 ENGINE *ENGINE_get_next(ENGINE *e);
325 ENGINE *ENGINE_get_prev(ENGINE *e);

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326 /* Add another "ENGINE" type into the array. */
327 int ENGINE_add(ENGINE *e);
328 /* Remove an existing "ENGINE" type from the array. */
329 int ENGINE_remove(ENGINE *e);
330 /* Retrieve an engine from the list by its unique "id" value. */
331 ENGINE *ENGINE_by_id(const char *id);
332 /* Add all the built-in engines. */
333 void ENGINE_load_openssl(void);
334 void ENGINE_load_dynamic(void);
335 #ifndef OPENSSL_NO_STATIC_ENGINE
336 void ENGINE_load_4758cca(void);
337 void ENGINE_load_aep(void);
338 void ENGINE_load_atalla(void);
339 void ENGINE_load_chil(void);
340 void ENGINE_load_cswift(void);
341 void ENGINE_load_nuron(void);
342 void ENGINE_load_sureware(void);
343 void ENGINE_load_ubsec(void);
344 void ENGINE_load_padlock(void);
345 void ENGINE_load_capi(void);
346 #ifndef OPENSSL_NO_GMP
347 void ENGINE_load_gmp(void);
348 #endif
349 #ifndef OPENSSL_NO_GOST
350 void ENGINE_load_gost(void);
351 #endif
352 #endif
353 void ENGINE_load_cryptodev(void);
354 void ENGINE_load_pk11(void);
355 void ENGINE_load_rsax(void);
356 void ENGINE_load_rdrand(void);
357 void ENGINE_load_builtin_engines(void);

359 /* Get and set global flags (ENGINE_TABLE_FLAG_*) for the implementation
360    * "registry" handling. */
361 unsigned int ENGINE_get_table_flags(void);
362 void ENGINE_set_table_flags(unsigned int flags);

364 /* Manage registration of ENGINES per "table". For each type, there are 3
365    * functions;
366    * ENGINE_register_***(e) - registers the implementation from 'e' (if it has o
367    * ENGINE_unregister_***(e) - unregister the implementation from 'e'
368    * ENGINE_register_all_***() - call ENGINE_register_***() for each 'e' in the
369    * Cleanup is automatically registered from each table when required, so
370    * ENGINE_cleanup() will reverse any "register" operations. */

372 int ENGINE_register_RSA(ENGINE *e);
373 void ENGINE_unregister_RSA(ENGINE *e);
374 void ENGINE_register_all_RSA(void);

376 int ENGINE_register_DSA(ENGINE *e);
377 void ENGINE_unregister_DSA(ENGINE *e);
378 void ENGINE_register_all_DSA(void);

380 int ENGINE_register_ECDH(ENGINE *e);
381 void ENGINE_unregister_ECDH(ENGINE *e);
382 void ENGINE_register_all_ECDH(void);

384 int ENGINE_register_ECDSA(ENGINE *e);
385 void ENGINE_unregister_ECDSA(ENGINE *e);
386 void ENGINE_register_all_ECDSA(void);

388 int ENGINE_register_DH(ENGINE *e);
389 void ENGINE_unregister_DH(ENGINE *e);
390 void ENGINE_register_all_DH(void);

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392 int ENGINE_register RAND(ENGINE *e);
393 void ENGINE_unregister RAND(ENGINE *e);
394 void ENGINE_register_all RAND(void);

396 int ENGINE_register_STORE(ENGINE *e);
397 void ENGINE_unregister_STORE(ENGINE *e);
398 void ENGINE_register_all_STORE(void);

400 int ENGINE_register_ciphers(ENGINE *e);
401 void ENGINE_unregister_ciphers(ENGINE *e);
402 void ENGINE_register_all_ciphers(void);

404 int ENGINE_register_digests(ENGINE *e);
405 void ENGINE_unregister_digests(ENGINE *e);
406 void ENGINE_register_all_digests(void);

408 int ENGINE_register_pkey_meths(ENGINE *e);
409 void ENGINE_unregister_pkey_meths(ENGINE *e);
410 void ENGINE_register_all_pkey_meths(void);

412 int ENGINE_register_pkey_asn1_meths(ENGINE *e);
413 void ENGINE_unregister_pkey_asn1_meths(ENGINE *e);
414 void ENGINE_register_all_pkey_asn1_meths(void);

416 /* These functions register all support from the above categories. Note, use of
417 * these functions can result in static linkage of code your application may not
418 * need. If you only need a subset of functionality, consider using more
419 * selective initialisation. */
420 int ENGINE_register_complete(ENGINE *e);
421 int ENGINE_register_all_complete(void);

423 /* Send parameterised control commands to the engine. The possibilities to send
424 * down an integer, a pointer to data or a function pointer are provided. Any of
425 * the parameters may or may not be NULL, depending on the command number. In
426 * actuality, this function only requires a structural (rather than functional)
427 * reference to an engine, but many control commands may require the engine be
428 * functional. The caller should be aware of trying commands that require an
429 * operational ENGINE, and only use functional references in such situations. */
430 int ENGINE_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)(void));

432 /* This function tests if an ENGINE-specific command is usable as a "setting".
433 * Eg. in an application's config file that gets processed through
434 * ENGINE_ctrl_cmd_string(). If this returns zero, it is not available to
435 * ENGINE_ctrl_cmd_string(), only ENGINE_ctrl(). */
436 int ENGINE_cmd_is_executable(ENGINE *e, int cmd);

438 /* This function works like ENGINE_ctrl() with the exception of taking a
439 * command name instead of a command number, and can handle optional commands.
440 * See the comment on ENGINE_ctrl_cmd_string() for an explanation on how to
441 * use the cmd_name and cmd_optional. */
442 int ENGINE_ctrl_cmd(ENGINE *e, const char *cmd_name,
443 long i, void *p, void (*f)(void), int cmd_optional);

445 /* This function passes a command-name and argument to an ENGINE. The cmd_name
446 * is converted to a command number and the control command is called using
447 * 'arg' as an argument (unless the ENGINE doesn't support such a command, in
448 * which case no control command is called). The command is checked for input
449 * flags, and if necessary the argument will be converted to a numeric value. If
450 * cmd_optional is non-zero, then if the ENGINE doesn't support the given
451 * cmd_name the return value will be success anyway. This function is intended
452 * for applications to use so that users (or config files) can supply
453 * engine-specific config data to the ENGINE at run-time to control behaviour of
454 * specific engines. As such, it shouldn't be used for calling ENGINE_ctrl()
455 * functions that return data, deal with binary data, or that are otherwise
456 * supposed to be used directly through ENGINE_ctrl() in application code. Any
457 * "return" data from an ENGINE_ctrl() operation in this function will be lost -

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458 * the return value is interpreted as failure if the return value is zero,
459 * success otherwise, and this function returns a boolean value as a result. In
460 * other words, vendors of 'ENGINE'-enabled devices should write ENGINE
461 * implementations with parameterisations that work in this scheme, so that
462 * compliant ENGINE-based applications can work consistently with the same
463 * configuration for the same ENGINE-enabled devices, across applications. */
464 int ENGINE_ctrl_cmd_string(ENGINE *e, const char *cmd_name, const char *arg,
465 int cmd_optional);

467 /* These functions are useful for manufacturing new ENGINE structures. They
468 * don't address reference counting at all - one uses them to populate an ENGINE
469 * structure with personalised implementations of things prior to using it
470 * directly or adding it to the builtin ENGINE list in OpenSSL. These are also
471 * here so that the ENGINE structure doesn't have to be exposed and break binary
472 * compatibility! */
473 ENGINE *ENGINE_new(void);
474 int ENGINE_free(ENGINE *e);
475 int ENGINE_up_ref(ENGINE *e);
476 int ENGINE_set_id(ENGINE *e, const char *id);
477 int ENGINE_set_name(ENGINE *e, const char *name);
478 int ENGINE_set_RSA(ENGINE *e, const RSA_METHOD *rsa_meth);
479 int ENGINE_set_DSA(ENGINE *e, const DSA_METHOD *dsa_meth);
480 int ENGINE_set_ECDH(ENGINE *e, const ECDH_METHOD *ecdh_meth);
481 int ENGINE_set_ECDSA(ENGINE *e, const ECDSA_METHOD *ecdsa_meth);
482 int ENGINE_set_DH(ENGINE *e, const DH_METHOD *dh_meth);
483 int ENGINE_set_RAND(ENGINE *e, const RAND_METHOD *rand_meth);
484 int ENGINE_set_STORE(ENGINE *e, const STORE_METHOD *store_meth);
485 int ENGINE_set_destroy_function(ENGINE *e, ENGINE_GEN_INT_FUNC_PTR destroy_f);
486 int ENGINE_set_init_function(ENGINE *e, ENGINE_GEN_INT_FUNC_PTR init_f);
487 int ENGINE_set_finish_function(ENGINE *e, ENGINE_GEN_INT_FUNC_PTR finish_f);
488 int ENGINE_set_ctrl_function(ENGINE *e, ENGINE_CTRL_FUNC_PTR ctrl_f);
489 int ENGINE_set_load_privkey_function(ENGINE *e, ENGINE_LOAD_KEY_PTR loadpriv_f);
490 int ENGINE_set_load_pubkey_function(ENGINE *e, ENGINE_LOAD_KEY_PTR loadpub_f);
491 int ENGINE_set_load_ssl_client_cert_function(ENGINE *e,
492 ENGINE_SSL_CLIENT_CERT_PTR loadssl_f);
493 int ENGINE_set_ciphers(ENGINE *e, ENGINE_CIPHERS_PTR f);
494 int ENGINE_set_digests(ENGINE *e, ENGINE_DIGESTS_PTR f);
495 int ENGINE_set_pkey_meths(ENGINE *e, ENGINE_PKEY_METHS_PTR f);
496 int ENGINE_set_pkey_asn1_meths(ENGINE *e, ENGINE_PKEY_ASN1_METHS_PTR f);
497 int ENGINE_set_flags(ENGINE *e, int flags);
498 int ENGINE_set_cmd_defns(ENGINE *e, const ENGINE_CMD_DEFN *defns);
499 /* These functions allow control over any per-structure ENGINE data. */
500 int ENGINE_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
501 CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
502 int ENGINE_set_ex_data(ENGINE *e, int idx, void *arg);
503 void *ENGINE_get_ex_data(const ENGINE *e, int idx);

505 /* This function cleans up anything that needs it. Eg. the ENGINE_add() function
506 * automatically ensures the list cleanup function is registered to be called
507 * from ENGINE_cleanup(). Similarly, all ENGINE_register_*** functions ensure
508 * ENGINE_cleanup() will clean up after them. */
509 void ENGINE_cleanup(void);

511 /* These return values from within the ENGINE structure. These can be useful
512 * with functional references as well as structural references - it depends
513 * which you obtained. Using the result for functional purposes if you only
514 * obtained a structural reference may be problematic! */
515 const char *ENGINE_get_id(const ENGINE *e);
516 const char *ENGINE_get_name(const ENGINE *e);
517 const RSA_METHOD *ENGINE_get_RSA(const ENGINE *e);
518 const DSA_METHOD *ENGINE_get_DSA(const ENGINE *e);
519 const ECDH_METHOD *ENGINE_get_ECDH(const ENGINE *e);
520 const ECDSA_METHOD *ENGINE_get_ECDSA(const ENGINE *e);
521 const DH_METHOD *ENGINE_get_DH(const ENGINE *e);
522 const RAND_METHOD *ENGINE_get_RAND(const ENGINE *e);
523 const STORE_METHOD *ENGINE_get_STORE(const ENGINE *e);

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524 ENGINE_GEN_INT_FUNC_PTR ENGINE_get_destroy_function(const ENGINE *e);
525 ENGINE_GEN_INT_FUNC_PTR ENGINE_get_init_function(const ENGINE *e);
526 ENGINE_GEN_INT_FUNC_PTR ENGINE_get_finish_function(const ENGINE *e);
527 ENGINE_CTRL_FUNC_PTR ENGINE_get_ctrl_function(const ENGINE *e);
528 ENGINE_LOAD_KEY_PTR ENGINE_get_load_privkey_function(const ENGINE *e);
529 ENGINE_LOAD_KEY_PTR ENGINE_get_load_pubkey_function(const ENGINE *e);
530 ENGINE_SSL_CLIENT_CERT_PTR ENGINE_get_ssl_client_cert_function(const ENGINE *e);
531 ENGINE_CIPHERS_PTR ENGINE_get_ciphers(const ENGINE *e);
532 ENGINE_DIGESTS_PTR ENGINE_get_digests(const ENGINE *e);
533 ENGINE_PKEY_METHS_PTR ENGINE_get_pkey_meths(const ENGINE *e);
534 ENGINE_PKEY_ASN1_METHS_PTR ENGINE_get_pkey_asn1_meths(const ENGINE *e);
535 const EVP_CIPHER *ENGINE_get_cipher(ENGINE *e, int nid);
536 const EVP_MD *ENGINE_get_digest(ENGINE *e, int nid);
537 const EVP_PKEY_METHOD *ENGINE_get_pkey_meth(ENGINE *e, int nid);
538 const EVP_PKEY_ASN1_METHOD *ENGINE_get_pkey_asn1_meth(ENGINE *e, int nid);
539 const EVP_PKEY_ASN1_METHOD *ENGINE_get_pkey_asn1_meth_str(ENGINE *e,
540     const char *str, int len);
541 const EVP_PKEY_ASN1_METHOD *ENGINE_pkey_asn1_find_str(ENGINE **pe,
542     const char *str, int len);
543 const ENGINE_CMD_DEFN *ENGINE_get_cmd_defns(const ENGINE *e);
544 int ENGINE_get_flags(const ENGINE *e);

546 /* FUNCTIONAL functions. These functions deal with ENGINE structures
547  * that have (or will) be initialised for use. Broadly speaking, the
548  * structural functions are useful for iterating the list of available
549  * engine types, creating new engine types, and other "list" operations.
550  * These functions actually deal with ENGINES that are to be used. As
551  * such these functions can fail (if applicable) when particular
552  * engines are unavailable - eg. if a hardware accelerator is not
553  * attached or not functioning correctly. Each ENGINE has 2 reference
554  * counts; structural and functional. Every time a functional reference
555  * is obtained or released, a corresponding structural reference is
556  * automatically obtained or released too. */

558 /* Initialise a engine type for use (or up its reference count if it's
559  * already in use). This will fail if the engine is not currently
560  * operational and cannot initialise. */
561 int ENGINE_init(ENGINE *e);
562 /* Free a functional reference to a engine type. This does not require
563  * a corresponding call to ENGINE_free as it also releases a structural
564  * reference. */
565 int ENGINE_finish(ENGINE *e);

567 /* The following functions handle keys that are stored in some secondary
568  * location, handled by the engine. The storage may be on a card or
569  * whatever. */
570 EVP_PKEY *ENGINE_load_private_key(ENGINE *e, const char *key_id,
571     UI_METHOD *ui_method, void *callback_data);
572 EVP_PKEY *ENGINE_load_public_key(ENGINE *e, const char *key_id,
573     UI_METHOD *ui_method, void *callback_data);
574 int ENGINE_load_ssl_client_cert(ENGINE *e, SSL *s,
575     STACK_OF(X509_NAME) *ca_dn, X509 **pcert, EVP_PKEY **ppkey,
576     STACK_OF(X509) **pother,
577     UI_METHOD *ui_method, void *callback_data);

579 /* This returns a pointer for the current ENGINE structure that
580  * is (by default) performing any RSA operations. The value returned
581  * is an incremented reference, so it should be free'd (ENGINE_finish)
582  * before it is discarded. */
583 ENGINE *ENGINE_get_default_RSA(void);
584 /* Same for the other "methods" */
585 ENGINE *ENGINE_get_default_DSA(void);
586 ENGINE *ENGINE_get_default_ECDH(void);
587 ENGINE *ENGINE_get_default_ECDSA(void);
588 ENGINE *ENGINE_get_default_DH(void);
589 ENGINE *ENGINE_get_default_RAND(void);

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590 /* These functions can be used to get a functional reference to perform
591  * ciphering or digesting corresponding to "nid". */
592 ENGINE *ENGINE_get_cipher_engine(int nid);
593 ENGINE *ENGINE_get_digest_engine(int nid);
594 ENGINE *ENGINE_get_pkey_meth_engine(int nid);
595 ENGINE *ENGINE_get_pkey_asn1_meth_engine(int nid);

597 /* This sets a new default ENGINE structure for performing RSA
598  * operations. If the result is non-zero (success) then the ENGINE
599  * structure will have had its reference count up'd so the caller
600  * should still free their own reference 'e'. */
601 int ENGINE_set_default_RSA(ENGINE *e);
602 int ENGINE_set_default_string(ENGINE *e, const char *def_list);
603 /* Same for the other "methods" */
604 int ENGINE_set_default_DSA(ENGINE *e);
605 int ENGINE_set_default_ECDH(ENGINE *e);
606 int ENGINE_set_default_ECDSA(ENGINE *e);
607 int ENGINE_set_default_DH(ENGINE *e);
608 int ENGINE_set_default_RAND(ENGINE *e);
609 int ENGINE_set_default_ciphers(ENGINE *e);
610 int ENGINE_set_default_digests(ENGINE *e);
611 int ENGINE_set_default_pkey_meths(ENGINE *e);
612 int ENGINE_set_default_pkey_asn1_meths(ENGINE *e);

614 /* The combination "set" - the flags are bitwise "OR"d from the
615  * ENGINE_METHOD *** defines above. As with the "ENGINE_register_complete()"
616  * function, this function can result in unnecessary static linkage. If your
617  * application requires only specific functionality, consider using more
618  * selective functions. */
619 int ENGINE_set_default(ENGINE *e, unsigned int flags);

621 void ENGINE_add_conf_module(void);

623 /* Deprecated functions ... */
624 /* int ENGINE_clear_defaults(void); */

626 /*****
627  * DYNAMIC ENGINE SUPPORT
628  *****/

630 /* Binary/behaviour compatibility levels */
631 #define OSSL_DYNAMIC_VERSION (unsigned long)0x00020000
632 /* Binary versions older than this are too old for us (whether we're a loader or
633  * a loadee) */
634 #define OSSL_DYNAMIC_OLDEST (unsigned long)0x00020000

636 /* When compiling an ENGINE entirely as an external shared library, loadable by
637  * the "dynamic" ENGINE, these types are needed. The 'dynamic_fns' structure
638  * type provides the calling application's (or library's) error functionality
639  * and memory management function pointers to the loaded library. These should
640  * be used/set in the loaded library code so that the loading application's
641  * 'state' will be used/changed in all operations. The 'static_state' pointer
642  * allows the loaded library to know if it shares the same static data as the
643  * calling application (or library), and thus whether these callbacks need to be
644  * set or not. */
645 typedef void *(*dyn_MEM_malloc_cb)(size_t);
646 typedef void *(*dyn_MEM_realloc_cb)(void *, size_t);
647 typedef void *(*dyn_MEM_free_cb)(void *);
648 typedef struct st_dynamic_MEM_fns {
649     dyn_MEM_malloc_cb malloc_cb;
650     dyn_MEM_realloc_cb realloc_cb;
651     dyn_MEM_free_cb free_cb;
652 } dynamic_MEM_fns;
653 /* FIXME: Perhaps the memory and locking code (crypto.h) should declare and use
654  * these types so we (and any other dependant code) can simplify a bit?? */
655 typedef void (*dyn_lock_locking_cb)(int,int,const char *,int);

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656 typedef int (*dyn_lock_add_lock_cb)(int*,int,int,const char *,int);
657 typedef struct CRYPTO_dynlock_value *(*dyn_dynlock_create_cb)(
658     const char *,int);
659 typedef void (*dyn_dynlock_lock_cb)(int,struct CRYPTO_dynlock_value *,
660     const char *,int);
661 typedef void (*dyn_dynlock_destroy_cb)(struct CRYPTO_dynlock_value *,
662     const char *,int);
663 typedef struct st_dynamic_LOCK_fns {
664     dyn_lock_locking_cb;
665     dyn_lock_add_lock_cb;
666     dyn_dynlock_create_cb;
667     dyn_dynlock_lock_cb;
668     dyn_dynlock_destroy_cb;
669 } dynamic_LOCK_fns;
670 /* The top-level structure */
671 typedef struct st_dynamic_fns {
672     void;
673     const ERR_FNS;
674     const CRYPTO_EX_DATA_IMPL;
675     dynamic_MEM_fns;
676     dynamic_LOCK_fns;
677 } dynamic_fns;

679 /* The version checking function should be of this prototype. NB: The
680 * ossl_version value passed in is the OSSL_DYNAMIC_VERSION of the loading code.
681 * If this function returns zero, it indicates a (potential) version
682 * incompatibility and the loaded library doesn't believe it can proceed.
683 * Otherwise, the returned value is the (latest) version supported by the
684 * loading library. The loader may still decide that the loaded code's version
685 * is unsatisfactory and could veto the load. The function is expected to
686 * be implemented with the symbol name "v_check", and a default implementation
687 * can be fully instantiated with IMPLEMENT_DYNAMIC_CHECK_FN(). */
688 typedef unsigned long (*dynamic_v_check_fn)(unsigned long ossl_version);
689 #define IMPLEMENT_DYNAMIC_CHECK_FN() \
690     OPENSSL_EXPORT unsigned long v_check(unsigned long v); \
691     OPENSSL_EXPORT unsigned long v_check(unsigned long v) { \
692         if(v >= OSSL_DYNAMIC_OLDEST) return OSSL_DYNAMIC_VERSION; \
693         return 0; }

695 /* This function is passed the ENGINE structure to initialise with its own
696 * function and command settings. It should not adjust the structural or
697 * functional reference counts. If this function returns zero, (a) the load will
698 * be aborted, (b) the previous ENGINE state will be memcpy'd back onto the
699 * structure, and (c) the shared library will be unloaded. So implementations
700 * should do their own internal cleanup in failure circumstances otherwise they
701 * could leak. The 'id' parameter, if non-NULL, represents the ENGINE id that
702 * the loader is looking for. If this is NULL, the shared library can choose to
703 * return failure or to initialise a 'default' ENGINE. If non-NULL, the shared
704 * library must initialise only an ENGINE matching the passed 'id'. The function
705 * is expected to be implemented with the symbol name "bind_engine". A standard
706 * implementation can be instantiated with IMPLEMENT_DYNAMIC_BIND_FN(fn) where
707 * the parameter 'fn' is a callback function that populates the ENGINE structure
708 * and returns an int value (zero for failure). 'fn' should have prototype;
709 * [static] int fn(ENGINE *e, const char *id); */
710 typedef int (*dynamic_bind_engine)(ENGINE *e, const char *id,
711     const dynamic_fns *fns);
712 #define IMPLEMENT_DYNAMIC_BIND_FN(fn) \
713     OPENSSL_EXPORT \
714     int bind_engine(ENGINE *e, const char *id, const dynamic_fns *fns); \
715     OPENSSL_EXPORT \
716     int bind_engine(ENGINE *e, const char *id, const dynamic_fns *fns) { \
717         if(ENGINE_get_static_state() == fns->static_state) goto skip_cbs \
718         if(!CRYPTO_set_mem_functions(fns->mem_fns.malloc_cb, \
719             fns->mem_fns.realloc_cb, fns->mem_fns.free_cb)) \
720             return 0; \
721         CRYPTO_set_locking_callback(fns->lock_fns.lock_locking_cb); \

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722     CRYPTO_set_add_lock_callback(fns->lock_fns.lock_add_lock_cb); \
723     CRYPTO_set_dynlock_create_callback(fns->lock_fns.dynlock_create_ \
724     CRYPTO_set_dynlock_lock_callback(fns->lock_fns.dynlock_lock_cb); \
725     CRYPTO_set_dynlock_destroy_callback(fns->lock_fns.dynlock_destro \
726     if(!CRYPTO_set_ex_data_implementation(fns->ex_data_fns)) \
727         return 0; \
728     if(!ERR_set_implementation(fns->err_fns)) return 0; \
729     skip_cbs: \
730     if(!fn(e,id)) return 0; \
731     return 1; }

733 /* If the loading application (or library) and the loaded ENGINE library share
734 * the same static data (eg. they're both dynamically linked to the same
735 * libcrypto.so) we need a way to avoid trying to set system callbacks - this
736 * would fail, and for the same reason that it's unnecessary to try. If the
737 * loaded ENGINE has (or gets from through the loader) its own copy of the
738 * libcrypto static data, we will need to set the callbacks. The easiest way to
739 * detect this is to have a function that returns a pointer to some static data
740 * and let the loading application and loaded ENGINE compare their respective
741 * values. */
742 void *ENGINE_get_static_state(void);

744 #if defined(__OpenBSD__) || defined(__FreeBSD__) || defined(HAVE_CRYPTODEV)
745 void ENGINE_setup_bsd_cryptodev(void);
746 #endif

748 /* BEGIN ERROR CODES */
749 /* The following lines are auto generated by the script mkerr.pl. Any changes
750 * made after this point may be overwritten when the script is next run.
751 */
752 void ERR_load_ENGINE_strings(void);

754 /* Error codes for the ENGINE functions. */

756 /* Function codes. */
757 #define ENGINE_F_DYNAMIC_CTRL 180
758 #define ENGINE_F_DYNAMIC_GET_DATA_CTX 181
759 #define ENGINE_F_DYNAMIC_LOAD 182
760 #define ENGINE_F_DYNAMIC_SET_DATA_CTX 183
761 #define ENGINE_F_ENGINE_ADD 184
762 #define ENGINE_F_ENGINE_BY_ID 185
763 #define ENGINE_F_ENGINE_CMD_IS_EXECUTABLE 186
764 #define ENGINE_F_ENGINE_CTRL 187
765 #define ENGINE_F_ENGINE_CTRL_CMD 188
766 #define ENGINE_F_ENGINE_CTRL_CMD_STRING 189
767 #define ENGINE_F_ENGINE_FINISH 190
768 #define ENGINE_F_ENGINE_FREE_UTIL 191
769 #define ENGINE_F_ENGINE_GET_CIPHER 192
770 #define ENGINE_F_ENGINE_GET_DEFAULT_TYPE 193
771 #define ENGINE_F_ENGINE_GET_DIGEST 194
772 #define ENGINE_F_ENGINE_GET_NEXT 195
773 #define ENGINE_F_ENGINE_GET_PKEY_ASN1_METH 196
774 #define ENGINE_F_ENGINE_GET_PKEY_METH 197
775 #define ENGINE_F_ENGINE_GET_PREV 198
776 #define ENGINE_F_ENGINE_INIT 199
777 #define ENGINE_F_ENGINE_LIST_ADD 200
778 #define ENGINE_F_ENGINE_LIST_REMOVE 201
779 #define ENGINE_F_ENGINE_LOAD_PRIVATE_KEY 202
780 #define ENGINE_F_ENGINE_LOAD_PUBLIC_KEY 203
781 #define ENGINE_F_ENGINE_LOAD_SSL_CLIENT_CERT 204
782 #define ENGINE_F_ENGINE_NEW 205
783 #define ENGINE_F_ENGINE_REMOVE 206
784 #define ENGINE_F_ENGINE_SET_DEFAULT_STRING 207
785 #define ENGINE_F_ENGINE_SET_DEFAULT_TYPE 208
786 #define ENGINE_F_ENGINE_SET_ID 209
787 #define ENGINE_F_ENGINE_SET_NAME 210

```

```
788 #define ENGINE_F_ENGINE_TABLE_REGISTER 184
789 #define ENGINE_F_ENGINE_UNLOAD_KEY 152
790 #define ENGINE_F_ENGINE_UNLOCKED_FINISH 191
791 #define ENGINE_F_ENGINE_UP_REF 190
792 #define ENGINE_F_INT_CTRL_HELPER 172
793 #define ENGINE_F_INT_ENGINE_CONFIGURE 188
794 #define ENGINE_F_INT_ENGINE_MODULE_INIT 187
795 #define ENGINE_F_LOG_MESSAGE 141

797 /* Reason codes. */
798 #define ENGINE_R_ALREADY_LOADED 100
799 #define ENGINE_R_ARGUMENT_IS_NOT_A_NUMBER 133
800 #define ENGINE_R_CMD_NOT_EXECUTABLE 134
801 #define ENGINE_R_COMMAND_TAKES_INPUT 135
802 #define ENGINE_R_COMMAND_TAKES_NO_INPUT 136
803 #define ENGINE_R_CONFLICTING_ENGINE_ID 103
804 #define ENGINE_R_CTRL_COMMAND_NOT_IMPLEMENTED 119
805 #define ENGINE_R_DH_NOT_IMPLEMENTED 139
806 #define ENGINE_R_DSA_NOT_IMPLEMENTED 140
807 #define ENGINE_R_DSO_FAILURE 104
808 #define ENGINE_R_DSO_NOT_FOUND 132
809 #define ENGINE_R_ENGINES_SECTION_ERROR 148
810 #define ENGINE_R_ENGINE_CONFIGURATION_ERROR 102
811 #define ENGINE_R_ENGINE_IS_NOT_IN_LIST 105
812 #define ENGINE_R_ENGINE_SECTION_ERROR 149
813 #define ENGINE_R_FAILED_LOADING_PRIVATE_KEY 128
814 #define ENGINE_R_FAILED_LOADING_PUBLIC_KEY 129
815 #define ENGINE_R_FINISH_FAILED 106
816 #define ENGINE_R_GET_HANDLE_FAILED 107
817 #define ENGINE_R_ID_OR_NAME_MISSING 108
818 #define ENGINE_R_INIT_FAILED 109
819 #define ENGINE_R_INTERNAL_LIST_ERROR 110
820 #define ENGINE_R_INVALID_ARGUMENT 143
821 #define ENGINE_R_INVALID_CMD_NAME 137
822 #define ENGINE_R_INVALID_CMD_NUMBER 138
823 #define ENGINE_R_INVALID_INIT_VALUE 151
824 #define ENGINE_R_INVALID_STRING 150
825 #define ENGINE_R_NOT_INITIALISED 117
826 #define ENGINE_R_NOT_LOADED 112
827 #define ENGINE_R_NO_CONTROL_FUNCTION 120
828 #define ENGINE_R_NO_INDEX 144
829 #define ENGINE_R_NO_LOAD_FUNCTION 125
830 #define ENGINE_R_NO_REFERENCE 130
831 #define ENGINE_R_NO_SUCH_ENGINE 116
832 #define ENGINE_R_NO_UNLOAD_FUNCTION 126
833 #define ENGINE_R_PROVIDE_PARAMETERS 113
834 #define ENGINE_R_RSA_NOT_IMPLEMENTED 141
835 #define ENGINE_R_UNIMPLEMENTED_CIPHER 146
836 #define ENGINE_R_UNIMPLEMENTED_DIGEST 147
837 #define ENGINE_R_UNIMPLEMENTED_PUBLIC_KEY_METHOD 101
838 #define ENGINE_R_VERSION_INCOMPATIBILITY 145

840 #ifdef __cplusplus
841 }
842 #endif
843 #endif
```



```

*****
15862 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/err.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/err/err.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright (c) 1998-2006 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without

```

```

62 * modification, are permitted provided that the following conditions
63 * are met:
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66 * notice, this list of conditions and the following disclaimer.
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68 * 2. Redistributions in binary form must reproduce the above copyright
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71 * distribution.
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76 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
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100 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
101 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
102 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #ifndef HEADER_ERR_H
113 #define HEADER_ERR_H
114
115 #include <openssl/e_os2.h>
116
117 #ifndef OPENSSL_NO_FP_API
118 #include <stdio.h>
119 #include <stdlib.h>
120 #endif
121
122 #include <openssl/openssl_typ.h>
123 #ifndef OPENSSL_NO_BIO
124 #include <openssl/bio.h>
125 #endif
126 #ifndef OPENSSL_NO_LHASH
127 #include <openssl/lhash.h>

```

```

128 #endif

130 #ifdef __cplusplus
131 extern "C" {
132 #endif

134 #ifndef OPENSSSL_NO_ERR
135 #define ERR_PUT_error(a,b,c,d,e) ERR_put_error(a,b,c,d,e)
136 #else
137 #define ERR_PUT_error(a,b,c,d,e) ERR_put_error(a,b,c,NULL,0)
138 #endif

140 #include <errno.h>

142 #define ERR_TXT_MALLOCED 0x01
143 #define ERR_TXT_STRING 0x02

145 #define ERR_FLAG_MARK 0x01

147 #define ERR_NUM_ERRORS 16
148 typedef struct err_state_st
149 {
150     CRYPTO_THREADID tid;
151     int err_flags[ERR_NUM_ERRORS];
152     unsigned long err_buffer[ERR_NUM_ERRORS];
153     char *err_data[ERR_NUM_ERRORS];
154     int err_data_flags[ERR_NUM_ERRORS];
155     const char *err_file[ERR_NUM_ERRORS];
156     int err_line[ERR_NUM_ERRORS];
157     int top,bottom;
158 } ERR_STATE;

160 /* library */
161 #define ERR_LIB_NONE 1
162 #define ERR_LIB_SYS 2
163 #define ERR_LIB_BN 3
164 #define ERR_LIB_RSA 4
165 #define ERR_LIB_DH 5
166 #define ERR_LIB_EVP 6
167 #define ERR_LIB_BUF 7
168 #define ERR_LIB_OBJ 8
169 #define ERR_LIB_PEM 9
170 #define ERR_LIB_DSA 10
171 #define ERR_LIB_X509 11
172 /* #define ERR_LIB_METH 12 */
173 #define ERR_LIB_ASN1 13
174 #define ERR_LIB_CONF 14
175 #define ERR_LIB_CRYPT 15
176 #define ERR_LIB_EC 16
177 #define ERR_LIB_SSL 20
178 /* #define ERR_LIB_SSL23 21 */
179 /* #define ERR_LIB_SSL2 22 */
180 /* #define ERR_LIB_SSL3 23 */
181 /* #define ERR_LIB_RSAREF 30 */
182 /* #define ERR_LIB_PROXY 31 */
183 #define ERR_LIB_BIO 32
184 #define ERR_LIB_PKCS7 33
185 #define ERR_LIB_X509V3 34
186 #define ERR_LIB_PKCS12 35
187 #define ERR_LIB_RAND 36
188 #define ERR_LIB_DSO 37
189 #define ERR_LIB_ENGINE 38
190 #define ERR_LIB_OCSP 39
191 #define ERR_LIB_UI 40
192 #define ERR_LIB_COMP 41
193 #define ERR_LIB_ECDSA 42

```

```

194 #define ERR_LIB_ECDH 43
195 #define ERR_LIB_STORE 44
196 #define ERR_LIB_FIPS 45
197 #define ERR_LIB_CMS 46
198 #define ERR_LIB_TS 47
199 #define ERR_LIB_HMAC 48
200 #define ERR_LIB_JPAKE 49

202 #define ERR_LIB_USER 128

204 #define SYSerr(f,r) ERR_PUT_error(ERR_LIB_SYS,(f),(r),__FILE__,__LINE__)
205 #define BNerr(f,r) ERR_PUT_error(ERR_LIB_BN,(f),(r),__FILE__,__LINE__)
206 #define RSAerr(f,r) ERR_PUT_error(ERR_LIB_RSA,(f),(r),__FILE__,__LINE__)
207 #define DHerr(f,r) ERR_PUT_error(ERR_LIB_DH,(f),(r),__FILE__,__LINE__)
208 #define EVPerr(f,r) ERR_PUT_error(ERR_LIB_EVP,(f),(r),__FILE__,__LINE__)
209 #define BUFerr(f,r) ERR_PUT_error(ERR_LIB_BUF,(f),(r),__FILE__,__LINE__)
210 #define OBJerr(f,r) ERR_PUT_error(ERR_LIB_OBJ,(f),(r),__FILE__,__LINE__)
211 #define PEMerr(f,r) ERR_PUT_error(ERR_LIB_PEM,(f),(r),__FILE__,__LINE__)
212 #define DSAerr(f,r) ERR_PUT_error(ERR_LIB_DSA,(f),(r),__FILE__,__LINE__)
213 #define X509err(f,r) ERR_PUT_error(ERR_LIB_X509,(f),(r),__FILE__,__LINE__)
214 #define ASN1err(f,r) ERR_PUT_error(ERR_LIB_ASN1,(f),(r),__FILE__,__LINE__)
215 #define CONFerr(f,r) ERR_PUT_error(ERR_LIB_CONF,(f),(r),__FILE__,__LINE__)
216 #define CRYPTOerr(f,r) ERR_PUT_error(ERR_LIB_CRYPT,(f),(r),__FILE__,__LINE__)
217 #define ECerr(f,r) ERR_PUT_error(ERR_LIB_EC,(f),(r),__FILE__,__LINE__)
218 #define SSLerr(f,r) ERR_PUT_error(ERR_LIB_SSL,(f),(r),__FILE__,__LINE__)
219 #define BIOerr(f,r) ERR_PUT_error(ERR_LIB_BIO,(f),(r),__FILE__,__LINE__)
220 #define PKCS7err(f,r) ERR_PUT_error(ERR_LIB_PKCS7,(f),(r),__FILE__,__LINE__)
221 #define X509V3err(f,r) ERR_PUT_error(ERR_LIB_X509V3,(f),(r),__FILE__,__LINE__)
222 #define PKCS12err(f,r) ERR_PUT_error(ERR_LIB_PKCS12,(f),(r),__FILE__,__LINE__)
223 #define RANDerr(f,r) ERR_PUT_error(ERR_LIB_RAND,(f),(r),__FILE__,__LINE__)
224 #define DSOerr(f,r) ERR_PUT_error(ERR_LIB_DSO,(f),(r),__FILE__,__LINE__)
225 #define ENGINEerr(f,r) ERR_PUT_error(ERR_LIB_ENGINE,(f),(r),__FILE__,__LINE__)
226 #define OCSPerr(f,r) ERR_PUT_error(ERR_LIB_OCSP,(f),(r),__FILE__,__LINE__)
227 #define UIerr(f,r) ERR_PUT_error(ERR_LIB_UI,(f),(r),__FILE__,__LINE__)
228 #define COMPerr(f,r) ERR_PUT_error(ERR_LIB_COMP,(f),(r),__FILE__,__LINE__)
229 #define ECDSAerr(f,r) ERR_PUT_error(ERR_LIB_ECDSA,(f),(r),__FILE__,__LINE__)
230 #define ECDHerr(f,r) ERR_PUT_error(ERR_LIB_ECDH,(f),(r),__FILE__,__LINE__)
231 #define STOREerr(f,r) ERR_PUT_error(ERR_LIB_STORE,(f),(r),__FILE__,__LINE__)
232 #define FIPSerr(f,r) ERR_PUT_error(ERR_LIB_FIPS,(f),(r),__FILE__,__LINE__)
233 #define CMSerr(f,r) ERR_PUT_error(ERR_LIB_CMS,(f),(r),__FILE__,__LINE__)
234 #define TSerr(f,r) ERR_PUT_error(ERR_LIB_TS,(f),(r),__FILE__,__LINE__)
235 #define HMACerr(f,r) ERR_PUT_error(ERR_LIB_HMAC,(f),(r),__FILE__,__LINE__)
236 #define JPAKEerr(f,r) ERR_PUT_error(ERR_LIB_JPAKE,(f),(r),__FILE__,__LINE__)

238 /* Borland C seems too stupid to be able to shift and do longs in
239  * the pre-processor :( */
240 #define ERR_PACK(l,f,r) (((((unsigned long)l)&0xffL)*0x1000000)| \
241 (((unsigned long)f)&0xffL)*0x1000)| \
242 (((unsigned long)r)&0xffL))
243 #define ERR_GET_LIB(l) (int)((((unsigned long)l)>>24L)&0xffL)
244 #define ERR_GET_FUNC(l) (int)((((unsigned long)l)>>12L)&0xffL)
245 #define ERR_GET_REASON(l) (int)((l)&0xffL)
246 #define ERR_FATAL_ERROR(l) (int)((l)&ERR_R_FATAL)

249 /* OS functions */
250 #define SYS_F_FOPEN 1
251 #define SYS_F_CONNECT 2
252 #define SYS_F_GETSERVBYNAME 3
253 #define SYS_F_SOCKET 4
254 #define SYS_F_IOCTL_SOCKET 5
255 #define SYS_F_BIND 6
256 #define SYS_F_LISTEN 7
257 #define SYS_F_ACCEPT 8
258 #define SYS_F_WSASTARTUP 9 /* Winsock stuff */
259 #define SYS_F_OPENDIR 10

```

```

260 #define SYS_F_READ 11

263 /* reasons */
264 #define ERR_R_SYS_LIB ERR_LIB_SYS /* 2 */
265 #define ERR_R_BN_LIB ERR_LIB_BN /* 3 */
266 #define ERR_R_RSA_LIB ERR_LIB_RSA /* 4 */
267 #define ERR_R_DH_LIB ERR_LIB_DH /* 5 */
268 #define ERR_R_EVP_LIB ERR_LIB_EVP /* 6 */
269 #define ERR_R_BUF_LIB ERR_LIB_BUF /* 7 */
270 #define ERR_R_OBJ_LIB ERR_LIB_OBJ /* 8 */
271 #define ERR_R_PEM_LIB ERR_LIB_PEM /* 9 */
272 #define ERR_R_DSA_LIB ERR_LIB_DSA /* 10 */
273 #define ERR_R_X509_LIB ERR_LIB_X509 /* 11 */
274 #define ERR_R_ASN1_LIB ERR_LIB_ASN1 /* 13 */
275 #define ERR_R_CONF_LIB ERR_LIB_CONF /* 14 */
276 #define ERR_R_CRYPT0_LIB ERR_LIB_CRYPT0 /* 15 */
277 #define ERR_R_EC_LIB ERR_LIB_EC /* 16 */
278 #define ERR_R_SSL_LIB ERR_LIB_SSL /* 20 */
279 #define ERR_R_BIO_LIB ERR_LIB_BIO /* 32 */
280 #define ERR_R_PKCS7_LIB ERR_LIB_PKCS7 /* 33 */
281 #define ERR_R_X509V3_LIB ERR_LIB_X509V3 /* 34 */
282 #define ERR_R_PKCS12_LIB ERR_LIB_PKCS12 /* 35 */
283 #define ERR_R_RAND_LIB ERR_LIB_RAND /* 36 */
284 #define ERR_R_DSO_LIB ERR_LIB_DSO /* 37 */
285 #define ERR_R_ENGINE_LIB ERR_LIB_ENGINE /* 38 */
286 #define ERR_R_OCSP_LIB ERR_LIB_OCSP /* 39 */
287 #define ERR_R_UI_LIB ERR_LIB_UI /* 40 */
288 #define ERR_R_COMP_LIB ERR_LIB_COMP /* 41 */
289 #define ERR_R_ECDSA_LIB ERR_LIB_ECDSA /* 42 */
290 #define ERR_R_ECDH_LIB ERR_LIB_ECDH /* 43 */
291 #define ERR_R_STORE_LIB ERR_LIB_STORE /* 44 */
292 #define ERR_R_TS_LIB ERR_LIB_TS /* 45 */

294 #define ERR_R_NESTED_ASN1_ERROR 58
295 #define ERR_R_BAD_ASN1_OBJECT_HEADER 59
296 #define ERR_R_BAD_GET_ASN1_OBJECT_CALL 60
297 #define ERR_R_EXPECTING_AN_ASN1_SEQUENCE 61
298 #define ERR_R_ASN1_LENGTH_MISMATCH 62
299 #define ERR_R_MISSING_ASN1_EOS 63

301 /* fatal error */
302 #define ERR_R_FATAL 64
303 #define ERR_R_MALLOC_FAILURE (1|ERR_R_FATAL)
304 #define ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED (2|ERR_R_FATAL)
305 #define ERR_R_PASSED_NULL_PARAMETER (3|ERR_R_FATAL)
306 #define ERR_R_INTERNAL_ERROR (4|ERR_R_FATAL)
307 #define ERR_R_DISABLED (5|ERR_R_FATAL)

309 /* 99 is the maximum possible ERR_R... code, higher values
310 * are reserved for the individual libraries */

313 typedef struct ERR_string_data_st
314 {
315     unsigned long error;
316     const char *string;
317 } ERR_STRING_DATA;

319 void ERR_put_error(int lib, int func, int reason, const char *file, int line);
320 void ERR_set_error_data(char *data, int flags);

322 unsigned long ERR_get_error(void);
323 unsigned long ERR_get_error_line(const char **file, int *line);
324 unsigned long ERR_get_error_line_data(const char **file, int *line,
325                                     const char **data, int *flags);

```

```

326 unsigned long ERR_peek_error(void);
327 unsigned long ERR_peek_error_line(const char **file, int *line);
328 unsigned long ERR_peek_error_line_data(const char **file, int *line,
329                                       const char **data, int *flags);
330 unsigned long ERR_peek_last_error(void);
331 unsigned long ERR_peek_last_error_line(const char **file, int *line);
332 unsigned long ERR_peek_last_error_line_data(const char **file, int *line,
333                                             const char **data, int *flags);
334 void ERR_clear_error(void);
335 char *ERR_error_string(unsigned long e, char *buf);
336 void ERR_error_string_n(unsigned long e, char *buf, size_t len);
337 const char *ERR_lib_error_string(unsigned long e);
338 const char *ERR_func_error_string(unsigned long e);
339 const char *ERR_reason_error_string(unsigned long e);
340 void ERR_print_errors_cb(int (*cb)(const char *str, size_t len, void *u),
341                         void *u);
342 #ifndef OPENSSL_NO_FP_API
343 void ERR_print_errors_fp(FILE *fp);
344 #endif
345 #ifndef OPENSSL_NO_BIO
346 void ERR_print_errors(BIO *bp);
347 #endif
348 void ERR_add_error_data(int num, ...);
349 void ERR_add_error_vdata(int num, va_list args);
350 void ERR_load_strings(int lib, ERR_STRING_DATA str[]);
351 void ERR_unload_strings(int lib, ERR_STRING_DATA str[]);
352 void ERR_load_ERR_strings(void);
353 void ERR_load_crypto_strings(void);
354 void ERR_free_strings(void);

356 void ERR_remove_thread_state(const CRYPTO_THREADID *tid);
357 #ifndef OPENSSL_NO_DEPRECATED
358 void ERR_remove_state(unsigned long pid); /* if zero we look it up */
359 #endif
360 ERR_STATE *ERR_get_state(void);

362 #ifndef OPENSSL_NO_LHASH
363 LHASH_OF(ERR_STRING_DATA) *ERR_get_string_table(void);
364 LHASH_OF(ERR_STATE) *ERR_get_err_state_table(void);
365 void ERR_release_err_state_table(LHASH_OF(ERR_STATE) **hash);
366 #endif

368 int ERR_get_next_error_library(void);

370 int ERR_set_mark(void);
371 int ERR_pop_to_mark(void);

373 /* Already defined in ossl_typ.h */
374 /* typedef struct st_ERR_FNS ERR_FNS; */
375 /* An application can use this function and provide the return value to loaded
376 * modules that should use the application's ERR state/functionality */
377 const ERR_FNS *ERR_get_implementation(void);
378 /* A loaded module should call this function prior to any ERR operations using
379 * the application's "ERR_FNS". */
380 int ERR_set_implementation(const ERR_FNS *fns);

382 #ifdef __cplusplus
383 }
384 #endif

386 #endif

```

new/usr/src/lib/openssl/include/openssl/evp.h

1

52791 Fri May 30 18:31:19 2014

new/usr/src/lib/openssl/include/openssl/evp.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/evp.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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57 */
```

59 #ifndef HEADER_ENVELOPE_H

60 #define HEADER_ENVELOPE_H

new/usr/src/lib/openssl/include/openssl/evp.h

2

```
62 #ifndef OPENSSL_ALGORITHM_DEFINES
63 # include <openssl/opensslconf.h>
64 #else
65 # define OPENSSL_ALGORITHM_DEFINES
66 # include <openssl/opensslconf.h>
67 # undef OPENSSL_ALGORITHM_DEFINES
68 #endif
69
70 #include <openssl/ossl_typ.h>
71
72 #include <openssl/symhacks.h>
73
74 #ifndef OPENSSL_NO_BIO
75 #include <openssl/bio.h>
76 #endif
77
78 /*
79 #define EVP_RC2_KEY_SIZE 16
80 #define EVP_RC4_KEY_SIZE 16
81 #define EVP_BLOWFISH_KEY_SIZE 16
82 #define EVP_CAST5_KEY_SIZE 16
83 #define EVP_RC5_32_12_16_KEY_SIZE 16
84 */
85 #define EVP_MAX_MD_SIZE 64 /* longest known is SHA512 */
86 #define EVP_MAX_KEY_LENGTH 64
87 #define EVP_MAX_IV_LENGTH 16
88 #define EVP_MAX_BLOCK_LENGTH 32
89
90 #define PKCS5_SALT_LEN 8
91 /* Default PKCS#5 iteration count */
92 #define PKCS5_DEFAULT_ITER 2048
93
94 #include <openssl/objects.h>
95
96 #define EVP_PK_RSA 0x0001
97 #define EVP_PK_DSA 0x0002
98 #define EVP_PK_DH 0x0004
99 #define EVP_PK_EC 0x0008
100 #define EVP_PKT_SIGN 0x0010
101 #define EVP_PKT_ENC 0x0020
102 #define EVP_PKT_EXCH 0x0040
103 #define EVP_PKS_RSA 0x0100
104 #define EVP_PKS_DSA 0x0200
105 #define EVP_PKS_EC 0x0400
106 #define EVP_PKT_EXP 0x1000 /* <= 512 bit key */
107
108 #define EVP_PKEY_NONE NID_undef
109 #define EVP_PKEY_RSA NID_rsaEncryption
110 #define EVP_PKEY_RSA2 NID_rsa
111 #define EVP_PKEY_DSA NID_dsa
112 #define EVP_PKEY_DSA1 NID_dsa_2
113 #define EVP_PKEY_DSA2 NID_dsaWithSHA
114 #define EVP_PKEY_DSA3 NID_dsaWithSHA1
115 #define EVP_PKEY_DSA4 NID_dsaWithSHA1_2
116 #define EVP_PKEY_DH NID_dhKeyAgreement
117 #define EVP_PKEY_EC NID_X9_62_id_ecPublicKey
118 #define EVP_PKEY_HMAC NID_hmac
119 #define EVP_PKEY_CMAC NID_cmac
120
121 #ifdef __cplusplus
122 extern "C" {
123 #endif
124
125 /* Type needs to be a bit field
126  * Sub-type needs to be for variations on the method, as in, can it do
127  * arbitrary encryption.... */
```

```

128 struct evp_pkey_st
129 {
130     int type;
131     int save_type;
132     int references;
133     const EVP_PKEY_ASN1_METHOD *ameth;
134     ENGINE *engine;
135     union {
136         char *ptr;
137 #ifndef OPENSSL_NO_RSA
138         struct rsa_st *rsa;    /* RSA */
139 #endif
140 #ifndef OPENSSL_NO_DSA
141         struct dsa_st *dsa;    /* DSA */
142 #endif
143 #ifndef OPENSSL_NO_DH
144         struct dh_st *dh;      /* DH */
145 #endif
146 #ifndef OPENSSL_NO_EC
147         struct ec_key_st *ec;  /* ECC */
148 #endif
149     } pkey;
150     int save_parameters;
151     STACK_OF(X509_ATTRIBUTE) *attributes; /* [ 0 ] */
152 } /* EVP_PKEY */;

154 #define EVP_PKEY_MO_SIGN        0x0001
155 #define EVP_PKEY_MO_VERIFY      0x0002
156 #define EVP_PKEY_MO_ENCRYPT      0x0004
157 #define EVP_PKEY_MO_DECRYPT      0x0008

159 #ifndef EVP_MD
160 struct env_md_st
161 {
162     int type;
163     int pkey_type;
164     int md_size;
165     unsigned long flags;
166     int (*init)(EVP_MD_CTX *ctx);
167     int (*update)(EVP_MD_CTX *ctx, const void *data, size_t count);
168     int (*final)(EVP_MD_CTX *ctx, unsigned char *md);
169     int (*copy)(EVP_MD_CTX *to, const EVP_MD_CTX *from);
170     int (*cleanup)(EVP_MD_CTX *ctx);

172     /* FIXME: prototype these some day */
173     int (*sign)(int type, const unsigned char *m, unsigned int m_length,
174                unsigned char *sigret, unsigned int *siglen, void *key);
175     int (*verify)(int type, const unsigned char *m, unsigned int m_length,
176                  const unsigned char *sigbuf, unsigned int siglen,
177                  void *key);
178     int required_pkey_type[5]; /*EVP_PKEY_XXX */
179     int block_size;
180     int ctx_size; /* how big does the ctx->md_data need to be */
181     /* control function */
182     int (*md_ctrl)(EVP_MD_CTX *ctx, int cmd, int p1, void *p2);
183 } /* EVP_MD */;

185 typedef int evp_sign_method(int type, const unsigned char *m,
186                             unsigned int m_length, unsigned char *sigret,
187                             unsigned int *siglen, void *key);
188 typedef int evp_verify_method(int type, const unsigned char *m,
189                               unsigned int m_length, const unsigned char *sigbuf,
190                               unsigned int siglen, void *key);

192 #define EVP_MD_FLAG_ONESHOT    0x0001 /* digest can only handle a single
193                                         * block */

```

```

195 #define EVP_MD_FLAG_PKEY_DIGEST 0x0002 /* digest is a "clone" digest used
196                                           * which is a copy of an existing
197                                           * one for a specific public key type.
198                                           * EVP_dss1() etc */

200 /* Digest uses EVP_PKEY_METHOD for signing instead of MD specific signing */

202 #define EVP_MD_FLAG_PKEY_METHOD_SIGNATURE    0x0004

204 /* DigestAlgorithmIdentifier flags... */

206 #define EVP_MD_FLAG_DIGALGID_MASK            0x0018

208 /* NULL or absent parameter accepted. Use NULL */

210 #define EVP_MD_FLAG_DIGALGID_NULL            0x0000

212 /* NULL or absent parameter accepted. Use NULL for PKCS#1 otherwise absent */

214 #define EVP_MD_FLAG_DIGALGID_ABSENT          0x0008

216 /* Custom handling via ctrl */

218 #define EVP_MD_FLAG_DIGALGID_CUSTOM          0x0018

220 #define EVP_MD_FLAG_FIPS                    0x0400 /* Note if suitable for use in FIPS mode */

222 /* Digest ctrls */

224 #define EVP_MD_CTRL_DIGALGID                0x1
225 #define EVP_MD_CTRL_MICALG                  0x2

227 /* Minimum Algorithm specific ctrl value */

229 #define EVP_MD_CTRL_ALG_CTRL                0x1000

231 #define EVP_PKEY_NULL_method                NULL, NULL, {0,0,0,0}

233 #ifndef OPENSSL_NO_DSA
234 #define EVP_PKEY_DSA_method                  (evp_sign_method *)DSA_sign, \
235                                               (evp_verify_method *)DSA_verify, \
236                                               {EVP_PKEY_DSA, EVP_PKEY_DSA2, EVP_PKEY_DSA3, \
237                                                 EVP_PKEY_DSA4, 0}
238 #else
239 #define EVP_PKEY_DSA_method                  EVP_PKEY_NULL_method
240 #endif

242 #ifndef OPENSSL_NO_ECDSA
243 #define EVP_PKEY_ECDSA_method                (evp_sign_method *)ECDSA_sign, \
244                                               (evp_verify_method *)ECDSA_verify, \
245                                               {EVP_PKEY_EC, 0, 0, 0}
246 #else
247 #define EVP_PKEY_ECDSA_method                EVP_PKEY_NULL_method
248 #endif

250 #ifndef OPENSSL_NO_RSA
251 #define EVP_PKEY_RSA_method                  (evp_sign_method *)RSA_sign, \
252                                               (evp_verify_method *)RSA_verify, \
253                                               {EVP_PKEY_RSA, EVP_PKEY_RSA2, 0, 0}
254 #define EVP_PKEY_RSA_ASN1_OCTET_STRING_method \
255     (evp_sign_method *)RSA_sign_ASN1_OCTET_STRING, \
256     (evp_verify_method *)RSA_verify_ASN1_OCTET_STRING, \
257     {EVP_PKEY_RSA, EVP_PKEY_RSA2, 0, 0}
258 #else
259 #define EVP_PKEY_RSA_method                  EVP_PKEY_NULL_method

```

```

260 #define EVP_PKEY_RSA_ASN1_OCTET_STRING_method EVP_PKEY_NULL_method
261 #endif

263 #endif /* !EVP_MD */

265 struct env_md_ctx_st
266 {
267     const EVP_MD *digest;
268     ENGINE *engine; /* functional reference if 'digest' is ENGINE-provided */
269     unsigned long flags;
270     void *md_data;
271     /* Public key context for sign/verify */
272     EVP_PKEY_CTX *pctx;
273     /* Update function: usually copied from EVP_MD */
274     int (*update)(EVP_MD_CTX *ctx, const void *data, size_t count);
275 } /* EVP_MD_CTX */;

277 /* values for EVP_MD_CTX flags */

279 #define EVP_MD_CTX_FLAG_ONESHOT 0x0001 /* digest update will be called
280     * once only */
281 #define EVP_MD_CTX_FLAG_CLEANED 0x0002 /* context has already been
282     * cleaned */
283 #define EVP_MD_CTX_FLAG_REUSE 0x0004 /* Don't free up ctx->md_data
284     * in EVP_MD_CTX_cleanup */
285 /* FIPS and pad options are ignored in 1.0.0, definitions are here
286 * so we don't accidentally reuse the values for other purposes.
287 */

289 #define EVP_MD_CTX_FLAG_NON_FIPS_ALLOW 0x0008 /* Allow use of non FIPS digest
290     * in FIPS mode */

292 /* The following PAD options are also currently ignored in 1.0.0, digest
293 * parameters are handled through EVP_DigestSign*() and EVP_DigestVerify*()
294 * instead.
295 */
296 #define EVP_MD_CTX_FLAG_PAD_MASK 0xF0 /* RSA mode to use */
297 #define EVP_MD_CTX_FLAG_PAD_PKCS1 0x00 /* PKCS#1 v1.5 mode */
298 #define EVP_MD_CTX_FLAG_PAD_X931 0x10 /* X9.31 mode */
299 #define EVP_MD_CTX_FLAG_PAD_PSS 0x20 /* PSS mode */

301 #define EVP_MD_CTX_FLAG_NO_INIT 0x0100 /* Don't initialize md_data */

303 struct evp_cipher_st
304 {
305     int nid;
306     int block_size;
307     int key_len; /* Default value for variable length ciphers */
308     int iv_len;
309     unsigned long flags; /* Various flags */
310     int (*init)(EVP_CIPHER_CTX *ctx, const unsigned char *key,
311         const unsigned char *iv, int enc); /* init key */
312     int (*do_cipher)(EVP_CIPHER_CTX *ctx, unsigned char *out,
313         const unsigned char *in, size_t inl); /* encrypt/decrypt
314     int (*cleanup)(EVP_CIPHER_CTX *); /* cleanup ctx */
315     int ctx_size; /* how big ctx->cipher_data needs to be */
316     int (*set_asn1_parameters)(EVP_CIPHER_CTX *, ASN1_TYPE *); /* Populate a
317     int (*get_asn1_parameters)(EVP_CIPHER_CTX *, ASN1_TYPE *); /* Get param
318     int (*ctrl)(EVP_CIPHER_CTX *, int type, int arg, void *ptr); /* Miscella
319     void *app_data; /* Application data */
320 } /* EVP_CIPHER */;

322 /* Values for cipher flags */

324 /* Modes for ciphers */

```

```

326 #define EVP_CIPH_STREAM_CIPHER 0x0
327 #define EVP_CIPH_ECB_MODE 0x1
328 #define EVP_CIPH_CBC_MODE 0x2
329 #define EVP_CIPH_CFB_MODE 0x3
330 #define EVP_CIPH_OFB_MODE 0x4
331 #define EVP_CIPH_CTR_MODE 0x5
332 #define EVP_CIPH_GCM_MODE 0x6
333 #define EVP_CIPH_CCM_MODE 0x7
334 #define EVP_CIPH_XTS_MODE 0x10001
335 #define EVP_CIPH_MODE 0xF0007
336 /* Set if variable length cipher */
337 #define EVP_CIPH_VARIABLE_LENGTH 0x8
338 /* Set if the iv handling should be done by the cipher itself */
339 #define EVP_CIPH_CUSTOM_IV 0x10
340 /* Set if the cipher's init() function should be called if key is NULL */
341 #define EVP_CIPH_ALWAYS_CALL_INIT 0x20
342 /* Call ctrl() to init cipher parameters */
343 #define EVP_CIPH_CTRL_INIT 0x40
344 /* Don't use standard key length function */
345 #define EVP_CIPH_CUSTOM_KEY_LENGTH 0x80
346 /* Don't use standard block padding */
347 #define EVP_CIPH_NO_PADDING 0x100
348 /* cipher handles random key generation */
349 #define EVP_CIPH_RAND_KEY 0x200
350 /* cipher has its own additional copying logic */
351 #define EVP_CIPH_CUSTOM_COPY 0x400
352 /* Allow use default ASN1 get/set iv */
353 #define EVP_CIPH_FLAG_DEFAULT_ASN1 0x1000
354 /* Buffer length in bits not bytes: CFB1 mode only */
355 #define EVP_CIPH_FLAG_LENGTH_BITS 0x2000
356 /* Note if suitable for use in FIPS mode */
357 #define EVP_CIPH_FLAG_FIPS 0x4000
358 /* Allow non FIPS cipher in FIPS mode */
359 #define EVP_CIPH_FLAG_NON_FIPS_ALLOW 0x8000
360 /* Cipher handles any and all padding logic as well
361 * as finalisation.
362 */
363 #define EVP_CIPH_FLAG_CUSTOM_CIPHER 0x100000
364 #define EVP_CIPH_FLAG_AEAD_CIPHER 0x200000

366 /* ctrl() values */

368 #define EVP_CTRL_INIT 0x0
369 #define EVP_CTRL_SET_KEY_LENGTH 0x1
370 #define EVP_CTRL_GET_RC2_KEY_BITS 0x2
371 #define EVP_CTRL_SET_RC2_KEY_BITS 0x3
372 #define EVP_CTRL_GET_RC5_ROUNDS 0x4
373 #define EVP_CTRL_SET_RC5_ROUNDS 0x5
374 #define EVP_CTRL_RAND_KEY 0x6
375 #define EVP_CTRL_PBE_PRf_NID 0x7
376 #define EVP_CTRL_COPY 0x8
377 #define EVP_CTRL_GCM_SET_IVLEN 0x9
378 #define EVP_CTRL_GCM_GET_TAG 0x10
379 #define EVP_CTRL_GCM_SET_TAG 0x11
380 #define EVP_CTRL_GCM_SET_IV_FIXED 0x12
381 #define EVP_CTRL_GCM_IV_GEN 0x13
382 #define EVP_CTRL_CCM_SET_IVLEN EVP_CTRL_GCM_SET_IVLEN
383 #define EVP_CTRL_CCM_GET_TAG EVP_CTRL_GCM_GET_TAG
384 #define EVP_CTRL_CCM_SET_TAG EVP_CTRL_GCM_SET_TAG
385 #define EVP_CTRL_CCM_SET_L 0x14
386 #define EVP_CTRL_CCM_SET_MSGLEN 0x15
387 /* AEAD cipher deduces payload length and returns number of bytes
388 * required to store MAC and eventual padding. Subsequent call to
389 * EVP_Cipher even appends/verifies MAC.
390 */
391 #define EVP_CTRL_AEAD_TLS1_AAD 0x16

```

```

392 /* Used by composite AEAD ciphers, no-op in GCM, CCM... */
393 #define EVP_CTRL_AEAD_SET_MAC_KEY 0x17
394 /* Set the GCM invocation field, decrypt only */
395 #define EVP_CTRL_GCM_SET_IV_INV 0x18

397 /* GCM TLS constants */
398 /* Length of fixed part of IV derived from PRF */
399 #define EVP_GCM_TLS_FIXED_IV_LEN 4
400 /* Length of explicit part of IV part of TLS records */
401 #define EVP_GCM_TLS_EXPLICIT_IV_LEN 8
402 /* Length of tag for TLS */
403 #define EVP_GCM_TLS_TAG_LEN 16

405 typedef struct evp_cipher_info_st
406 {
407     const EVP_CIPHER *cipher;
408     unsigned char iv[EVP_MAX_IV_LENGTH];
409 } EVP_CIPHER_INFO;

411 struct evp_cipher_ctx_st
412 {
413     const EVP_CIPHER *cipher;
414     ENGINE *engine; /* functional reference if 'cipher' is ENGINE-provided */
415     int encrypt; /* encrypt or decrypt */
416     int buf_len; /* number we have left */

418     unsigned char oiv[EVP_MAX_IV_LENGTH]; /* original iv */
419     unsigned char iv[EVP_MAX_IV_LENGTH]; /* working iv */
420     unsigned char buf[EVP_MAX_BLOCK_LENGTH]; /* saved partial block */
421     int num; /* used by cfb/ofb/ctr mode */

423     void *app_data; /* application stuff */
424     int key_len; /* May change for variable length cipher */
425     unsigned long flags; /* Various flags */
426     void *cipher_data; /* per EVP data */
427     int final_used;
428     int block_mask;
429     unsigned char final[EVP_MAX_BLOCK_LENGTH]; /* possible final block */
430 } /* EVP_CIPHER_CTX */;

432 typedef struct evp_Encode_Ctx_st
433 {
434     int num; /* number saved in a partial encode/decode */
435     int length; /* The length is either the output line length
436                  * (in input bytes) or the shortest input line
437                  * length that is ok. Once decoding begins,
438                  * the length is adjusted up each time a longer
439                  * line is decoded */
440     unsigned char enc_data[80]; /* data to encode */
441     int line_num; /* number read on current line */
442     int expect_nl;
443 } EVP_ENCODE_CTX;

445 /* Password based encryption function */
446 typedef int (EVP_PBE_KEYGEN)(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
447                               ASN1_TYPE *param, const EVP_CIPHER *cipher,
448                               const EVP_MD *md, int en_de);

450 #ifndef OPENSSL_NO_RSA
451 #define EVP_PKEY_assign_RSA(pkey, rsa) EVP_PKEY_assign((pkey), EVP_PKEY_RSA, \
452                                                         (char *) (rsa))
453 #endif

455 #ifndef OPENSSL_NO_DSA
456 #define EVP_PKEY_assign_DSA(pkey, dsa) EVP_PKEY_assign((pkey), EVP_PKEY_DSA, \
457                                                         (char *) (dsa))

```

```

458 #endif

460 #ifndef OPENSSL_NO_DH
461 #define EVP_PKEY_assign_DH(pkey, dh) EVP_PKEY_assign((pkey), EVP_PKEY_DH, \
462                                                         (char *) (dh))
463 #endif

465 #ifndef OPENSSL_NO_EC
466 #define EVP_PKEY_assign_EC_KEY(pkey, eckey) EVP_PKEY_assign((pkey), EVP_PKEY_EC, \
467                                                         (char *) (eckey))
468 #endif

470 /* Add some extra combinations */
471 #define EVP_get_digestbynid(a) EVP_get_digestbyname(OBJ_nid2sn(a))
472 #define EVP_get_digestbyobj(a) EVP_get_digestbynid(OBJ_obj2nid(a))
473 #define EVP_get_cipherbynid(a) EVP_get_cipherbyname(OBJ_nid2sn(a))
474 #define EVP_get_cipherbyobj(a) EVP_get_cipherbynid(OBJ_obj2nid(a))

476 int EVP_MD_type(const EVP_MD *md);
477 #define EVP_MD_nid(e) EVP_MD_type(e)
478 #define EVP_MD_name(e) OBJ_nid2sn(EVP_MD_nid(e))
479 int EVP_MD_pkey_type(const EVP_MD *md);
480 int EVP_MD_size(const EVP_MD *md);
481 int EVP_MD_block_size(const EVP_MD *md);
482 unsigned long EVP_MD_flags(const EVP_MD *md);

484 const EVP_MD *EVP_MD_CTX_md(const EVP_MD_CTX *ctx);
485 #define EVP_MD_CTX_md(e) EVP_MD_size(EVP_MD_CTX_md(e))
486 #define EVP_MD_CTX_block_size(e) EVP_MD_block_size(EVP_MD_CTX_md(e))
487 #define EVP_MD_CTX_type(e) EVP_MD_type(EVP_MD_CTX_md(e))

489 int EVP_CIPHER_nid(const EVP_CIPHER *cipher);
490 #define EVP_CIPHER_name(e) OBJ_nid2sn(EVP_CIPHER_nid(e))
491 int EVP_CIPHER_block_size(const EVP_CIPHER *cipher);
492 int EVP_CIPHER_key_length(const EVP_CIPHER *cipher);
493 int EVP_CIPHER_iv_length(const EVP_CIPHER *cipher);
494 unsigned long EVP_CIPHER_flags(const EVP_CIPHER *cipher);
495 #define EVP_CIPHER_mode(e) (EVP_CIPHER_flags(e) & EVP_CIPH_MODE)

497 const EVP_CIPHER *EVP_CIPHER_CTX_cipher(const EVP_CIPHER_CTX *ctx);
498 int EVP_CIPHER_CTX_nid(const EVP_CIPHER_CTX *ctx);
499 int EVP_CIPHER_CTX_block_size(const EVP_CIPHER_CTX *ctx);
500 int EVP_CIPHER_CTX_key_length(const EVP_CIPHER_CTX *ctx);
501 int EVP_CIPHER_CTX_iv_length(const EVP_CIPHER_CTX *ctx);
502 int EVP_CIPHER_CTX_copy(EVP_CIPHER_CTX *out, const EVP_CIPHER_CTX *in);
503 void *EVP_CIPHER_CTX_get_app_data(const EVP_CIPHER_CTX *ctx);
504 void EVP_CIPHER_CTX_set_app_data(EVP_CIPHER_CTX *ctx, void *data);
505 #define EVP_CIPHER_CTX_type(c) EVP_CIPHER_type(EVP_CIPHER_CTX_cipher(c))
506 unsigned long EVP_CIPHER_CTX_flags(const EVP_CIPHER_CTX *ctx);
507 #define EVP_CIPHER_CTX_mode(e) (EVP_CIPHER_CTX_flags(e) & EVP_CIPH_MODE)

509 #define EVP_ENCODE_LENGTH(l) (((l+2)/3*4)+(l/48+1)*2+80)
510 #define EVP_DECODE_LENGTH(l) (((l+3)/4*3+80)

512 #define EVP_SignInit_ex(a,b,c) EVP_DigestInit_ex(a,b,c)
513 #define EVP_SignInit(a,b) EVP_DigestInit(a,b)
514 #define EVP_SignUpdate(a,b,c) EVP_DigestUpdate(a,b,c)
515 #define EVP_VerifyInit_ex(a,b,c) EVP_DigestInit_ex(a,b,c)
516 #define EVP_VerifyInit(a,b) EVP_DigestInit(a,b)
517 #define EVP_VerifyUpdate(a,b,c) EVP_DigestUpdate(a,b,c)
518 #define EVP_OpenUpdate(a,b,c,d,e) EVP_DecryptUpdate(a,b,c,d,e)
519 #define EVP_SealUpdate(a,b,c,d,e) EVP_EncryptUpdate(a,b,c,d,e)
520 #define EVP_DigestSignUpdate(a,b,c) EVP_DigestUpdate(a,b,c)
521 #define EVP_DigestVerifyUpdate(a,b,c) EVP_DigestUpdate(a,b,c)

523 #ifndef CONST_STRICT

```

```

524 void BIO_set_md(BIO *,const EVP_MD *md);
525 #else
526 # define BIO_set_md(b,md)          BIO_ctrl(b,BIO_C_SET_MD,0,(char *)md)
527 #endif
528 #define BIO_get_md(b,mdp)          BIO_ctrl(b,BIO_C_GET_MD,0,(char *)mdp)
529 #define BIO_get_md_ctx(b,mdcp)     BIO_ctrl(b,BIO_C_GET_MD_CTX,0,(char *)mdcp)
530 #define BIO_set_md_ctx(b,mdcp)     BIO_ctrl(b,BIO_C_SET_MD_CTX,0,(char *)mdcp)
531 #define BIO_get_cipher_status(b)    BIO_ctrl(b,BIO_C_GET_CIPHER_STATUS,0,NULL)
532 #define BIO_get_cipher_ctx(b,c_pp) BIO_ctrl(b,BIO_C_GET_CIPHER_CTX,0,(char *)c_pp)

534 int EVP_Cipher(EVP_CIPHER_CTX *c,
535                unsigned char *out,
536                const unsigned char *in,
537                unsigned int inl);

539 #define EVP_add_cipher_alias(n,alias) \
540     OBJ_NAME_add((alias),OBJ_NAME_TYPE_CIPHER_METH|OBJ_NAME_ALIAS,(n))
541 #define EVP_add_digest_alias(n,alias) \
542     OBJ_NAME_add((alias),OBJ_NAME_TYPE_MD_METH|OBJ_NAME_ALIAS,(n))
543 #define EVP_delete_cipher_alias(alias) \
544     OBJ_NAME_remove(alias,OBJ_NAME_TYPE_CIPHER_METH|OBJ_NAME_ALIAS);
545 #define EVP_delete_digest_alias(alias) \
546     OBJ_NAME_remove(alias,OBJ_NAME_TYPE_MD_METH|OBJ_NAME_ALIAS);

548 void EVP_MD_CTX_init(EVP_MD_CTX *ctx);
549 int EVP_MD_CTX_cleanup(EVP_MD_CTX *ctx);
550 EVP_MD_CTX *EVP_MD_CTX_create(void);
551 void EVP_MD_CTX_destroy(EVP_MD_CTX *ctx);
552 int EVP_MD_CTX_copy_ex(EVP_MD_CTX *out,const EVP_MD_CTX *in);
553 void EVP_MD_CTX_set_flags(EVP_MD_CTX *ctx, int flags);
554 void EVP_MD_CTX_clear_flags(EVP_MD_CTX *ctx, int flags);
555 int EVP_MD_CTX_test_flags(const EVP_MD_CTX *ctx,int flags);
556 int EVP_DigestInit_ex(EVP_MD_CTX *ctx, const EVP_MD *type, ENGINE *impl);
557 int EVP_DigestUpdate(EVP_MD_CTX *ctx,const void *d,
558                     size_t cnt);
559 int EVP_DigestFinal_ex(EVP_MD_CTX *ctx,unsigned char *md,unsigned int *s);
560 int EVP_Digest(const void *data, size_t count,
561               unsigned char *md, unsigned int *size, const EVP_MD *type, ENGIN
562               unsigned char *md, unsigned int *size, const EVP_MD *type, ENGIN

563 int EVP_MD_CTX_copy(EVP_MD_CTX *out,const EVP_MD_CTX *in);
564 int EVP_DigestInit(EVP_MD_CTX *ctx, const EVP_MD *type);
565 int EVP_DigestFinal(EVP_MD_CTX *ctx,unsigned char *md,unsigned int *s);

567 int EVP_read_pw_string(char *buf,int length,const char *prompt,int verify);
568 int EVP_read_pw_string_min(char *buf,int minlen,int maxlen,const char *promp
569 void EVP_set_pw_prompt(const char *prompt);
570 char * EVP_get_pw_prompt(void);

572 int EVP_BytesToKey(const EVP_CIPHER *type,const EVP_MD *md,
573                  const unsigned char *salt, const unsigned char *data,
574                  int data1, int count, unsigned char *key,unsigned char *iv);

576 void EVP_CIPHER_CTX_set_flags(EVP_CIPHER_CTX *ctx, int flags);
577 void EVP_CIPHER_CTX_clear_flags(EVP_CIPHER_CTX *ctx, int flags);
578 int EVP_CIPHER_CTX_test_flags(const EVP_CIPHER_CTX *ctx,int flags);

580 int EVP_EncryptInit(EVP_CIPHER_CTX *ctx,const EVP_CIPHER *cipher,
581                   const unsigned char *key, const unsigned char *iv);
582 int EVP_EncryptInit_ex(EVP_CIPHER_CTX *ctx,const EVP_CIPHER *cipher, ENGINE
583                   const unsigned char *key, const unsigned char *iv);
584 int EVP_EncryptUpdate(EVP_CIPHER_CTX *ctx, unsigned char *out,
585                   int *outl, const unsigned char *in, int inl);
586 int EVP_EncryptFinal_ex(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl);
587 int EVP_EncryptFinal(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl);

589 int EVP_DecryptInit(EVP_CIPHER_CTX *ctx,const EVP_CIPHER *cipher,
```

```

590     const unsigned char *key, const unsigned char *iv);
591 int EVP_DecryptInit_ex(EVP_CIPHER_CTX *ctx,const EVP_CIPHER *cipher, ENGINE
592     const unsigned char *key, const unsigned char *iv);
593 int EVP_DecryptUpdate(EVP_CIPHER_CTX *ctx, unsigned char *out,
594     int *outl, const unsigned char *in, int inl);
595 int EVP_DecryptFinal(EVP_CIPHER_CTX *ctx, unsigned char *outm, int *outl);
596 int EVP_DecryptFinal_ex(EVP_CIPHER_CTX *ctx, unsigned char *outm, int *outl)

598 int EVP_CipherInit(EVP_CIPHER_CTX *ctx,const EVP_CIPHER *cipher,
599     const unsigned char *key,const unsigned char *iv,
600     int enc);
601 int EVP_CipherInit_ex(EVP_CIPHER_CTX *ctx,const EVP_CIPHER *cipher, ENGINE *
602     const unsigned char *key,const unsigned char *iv,
603     int enc);
604 int EVP_CipherUpdate(EVP_CIPHER_CTX *ctx, unsigned char *out,
605     int *outl, const unsigned char *in, int inl);
606 int EVP_CipherFinal(EVP_CIPHER_CTX *ctx, unsigned char *outm, int *outl);
607 int EVP_CipherFinal_ex(EVP_CIPHER_CTX *ctx, unsigned char *outm, int *outl);

609 int EVP_SignFinal(EVP_MD_CTX *ctx,unsigned char *md,unsigned int *s,
610     EVP_PKEY *pkey);

612 int EVP_VerifyFinal(EVP_MD_CTX *ctx,const unsigned char *sigbuf,
613     unsigned int siglen,EVP_PKEY *pkey);

615 int EVP_DigestSignInit(EVP_MD_CTX *ctx, EVP_PKEY_CTX **pctx,
616     const EVP_MD *type, ENGINE *e, EVP_PKEY *pkey);
617 int EVP_DigestSignFinal(EVP_MD_CTX *ctx,
618     unsigned char *sigret, size_t *siglen);

620 int EVP_DigestVerifyInit(EVP_MD_CTX *ctx, EVP_PKEY_CTX **pctx,
621     const EVP_MD *type, ENGINE *e, EVP_PKEY *pkey);
622 int EVP_DigestVerifyFinal(EVP_MD_CTX *ctx,
623     unsigned char *sig, size_t siglen);

625 int EVP_OpenInit(EVP_CIPHER_CTX *ctx,const EVP_CIPHER *type,
626     const unsigned char *ek, int ekl, const unsigned char *iv,
627     EVP_PKEY *priv);
628 int EVP_OpenFinal(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl);

630 int EVP_SealInit(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *type,
631     unsigned char **ek, int *ekl, unsigned char *iv,
632     EVP_PKEY **pubk, int npubk);
633 int EVP_SealFinal(EVP_CIPHER_CTX *ctx,unsigned char *out,int *outl);

635 void EVP_EncodeInit(EVP_ENCODE_CTX *ctx);
636 void EVP_EncodeUpdate(EVP_ENCODE_CTX *ctx,unsigned char *out,int *outl,
637     const unsigned char *in,int inl);
638 void EVP_EncodeFinal(EVP_ENCODE_CTX *ctx,unsigned char *out,int *outl);
639 int EVP_EncodeBlock(unsigned char *t, const unsigned char *f, int n);

641 void EVP_DecodeInit(EVP_ENCODE_CTX *ctx);
642 int EVP_DecodeUpdate(EVP_ENCODE_CTX *ctx,unsigned char *out,int *outl,
643     const unsigned char *in, int inl);
644 int EVP_DecodeFinal(EVP_ENCODE_CTX *ctx, unsigned
645     char *out, int *outl);
646 int EVP_DecodeBlock(unsigned char *t, const unsigned char *f, int n);

648 void EVP_CIPHER_CTX_init(EVP_CIPHER_CTX *a);
649 int EVP_CIPHER_CTX_cleanup(EVP_CIPHER_CTX *a);
650 EVP_CIPHER_CTX *EVP_CIPHER_CTX_new(void);
651 void EVP_CIPHER_CTX_free(EVP_CIPHER_CTX *a);
652 int EVP_CIPHER_CTX_set_key_length(EVP_CIPHER_CTX *x, int keylen);
653 int EVP_CIPHER_CTX_set_padding(EVP_CIPHER_CTX *c, int pad);
654 int EVP_CIPHER_CTX_ctrl(EVP_CIPHER_CTX *ctx, int type, int arg, void *ptr);
655 int EVP_CIPHER_CTX_rand_key(EVP_CIPHER_CTX *ctx, unsigned char *key);
```



```

657 #ifndef OPENSSL_NO_BIO
658 BIO_METHOD *BIO_f_md(void);
659 BIO_METHOD *BIO_f_base64(void);
660 BIO_METHOD *BIO_f_cipher(void);
661 BIO_METHOD *BIO_f_reliable(void);
662 void BIO_set_cipher(BIO *b, const EVP_CIPHER *c, const unsigned char *k,
663                    const unsigned char *i, int enc);
664 #endif

666 const EVP_MD *EVP_md_null(void);
667 #ifndef OPENSSL_NO_MD2
668 const EVP_MD *EVP_md2(void);
669 #endif
670 #ifndef OPENSSL_NO_MD4
671 const EVP_MD *EVP_md4(void);
672 #endif
673 #ifndef OPENSSL_NO_MD5
674 const EVP_MD *EVP_md5(void);
675 #endif
676 #ifndef OPENSSL_NO_SHA
677 const EVP_MD *EVP_sha(void);
678 const EVP_MD *EVP_sha1(void);
679 const EVP_MD *EVP_dss(void);
680 const EVP_MD *EVP_dss1(void);
681 const EVP_MD *EVP_ecdsa(void);
682 #endif
683 #ifndef OPENSSL_NO_SHA256
684 const EVP_MD *EVP_sha224(void);
685 const EVP_MD *EVP_sha256(void);
686 #endif
687 #ifndef OPENSSL_NO_SHA512
688 const EVP_MD *EVP_sha384(void);
689 const EVP_MD *EVP_sha512(void);
690 #endif
691 #ifndef OPENSSL_NO_MDC2
692 const EVP_MD *EVP_mdc2(void);
693 #endif
694 #ifndef OPENSSL_NO_RIPEMD
695 const EVP_MD *EVP_ripemd160(void);
696 #endif
697 #ifndef OPENSSL_NO_WHIRLPOOL
698 const EVP_MD *EVP_whirlpool(void);
699 #endif
700 const EVP_CIPHER *EVP_enc_null(void);          /* does nothing :-) */
701 #ifndef OPENSSL_NO_DES
702 const EVP_CIPHER *EVP_des_ecb(void);
703 const EVP_CIPHER *EVP_des_ede(void);
704 const EVP_CIPHER *EVP_des_ede3(void);
705 const EVP_CIPHER *EVP_des_ede_ecb(void);
706 const EVP_CIPHER *EVP_des_ede3_ecb(void);
707 const EVP_CIPHER *EVP_des_cfb64(void);
708 # define EVP_des_cfb EVP_des_cfb64
709 const EVP_CIPHER *EVP_des_cfb1(void);
710 const EVP_CIPHER *EVP_des_cfb8(void);
711 const EVP_CIPHER *EVP_des_ede_cfb64(void);
712 # define EVP_des_ede_cfb EVP_des_ede_cfb64
713 #if 0
714 const EVP_CIPHER *EVP_des_ede_cfb1(void);
715 const EVP_CIPHER *EVP_des_ede_cfb8(void);
716 #endif
717 const EVP_CIPHER *EVP_des_ede3_cfb64(void);
718 # define EVP_des_ede3_cfb EVP_des_ede3_cfb64
719 const EVP_CIPHER *EVP_des_ede3_cfb1(void);
720 const EVP_CIPHER *EVP_des_ede3_cfb8(void);
721 const EVP_CIPHER *EVP_des_ofb(void);

```

```

722 const EVP_CIPHER *EVP_des_ede_ofb(void);
723 const EVP_CIPHER *EVP_des_ede3_ofb(void);
724 const EVP_CIPHER *EVP_des_cbc(void);
725 const EVP_CIPHER *EVP_des_ede_cbc(void);
726 const EVP_CIPHER *EVP_des_ede3_cbc(void);
727 const EVP_CIPHER *EVP_desx_cbc(void);
728 /* This should now be supported through the dev_crypto ENGINE. But also, why are
729    * rc4 and md5 declarations made here inside a "NO_DES" precompiler branch? */
730 #if 0
731 # ifdef OPENSSL_OPENBSD_DEV_CRYPT
732 const EVP_CIPHER *EVP_dev_crypto_des_ede3_cbc(void);
733 const EVP_CIPHER *EVP_dev_crypto_rc4(void);
734 const EVP_MD *EVP_dev_crypto_md5(void);
735 # endif
736 #endif
737 #endif
738 #ifndef OPENSSL_NO_RC4
739 const EVP_CIPHER *EVP_rc4(void);
740 const EVP_CIPHER *EVP_rc4_40(void);
741 #ifndef OPENSSL_NO_MD5
742 const EVP_CIPHER *EVP_rc4_hmac_md5(void);
743 #endif
744 #endif
745 #ifndef OPENSSL_NO_IDEA
746 const EVP_CIPHER *EVP_idea_ecb(void);
747 const EVP_CIPHER *EVP_idea_cfb64(void);
748 # define EVP_idea_cfb EVP_idea_cfb64
749 const EVP_CIPHER *EVP_idea_ofb(void);
750 const EVP_CIPHER *EVP_idea_cbc(void);
751 #endif
752 #ifndef OPENSSL_NO_RC2
753 const EVP_CIPHER *EVP_rc2_ecb(void);
754 const EVP_CIPHER *EVP_rc2_cbc(void);
755 const EVP_CIPHER *EVP_rc2_40_cbc(void);
756 const EVP_CIPHER *EVP_rc2_64_cbc(void);
757 const EVP_CIPHER *EVP_rc2_cfb64(void);
758 # define EVP_rc2_cfb EVP_rc2_cfb64
759 const EVP_CIPHER *EVP_rc2_ofb(void);
760 #endif
761 #ifndef OPENSSL_NO_BF
762 const EVP_CIPHER *EVP_bf_ecb(void);
763 const EVP_CIPHER *EVP_bf_cbc(void);
764 const EVP_CIPHER *EVP_bf_cfb64(void);
765 # define EVP_bf_cfb EVP_bf_cfb64
766 const EVP_CIPHER *EVP_bf_ofb(void);
767 #endif
768 #ifndef OPENSSL_NO_CAST
769 const EVP_CIPHER *EVP_cast5_ecb(void);
770 const EVP_CIPHER *EVP_cast5_cbc(void);
771 const EVP_CIPHER *EVP_cast5_cfb64(void);
772 # define EVP_cast5_cfb EVP_cast5_cfb64
773 const EVP_CIPHER *EVP_cast5_ofb(void);
774 #endif
775 #ifndef OPENSSL_NO_RC5
776 const EVP_CIPHER *EVP_rc5_32_12_16_cbc(void);
777 const EVP_CIPHER *EVP_rc5_32_12_16_ecb(void);
778 const EVP_CIPHER *EVP_rc5_32_12_16_cfb64(void);
779 # define EVP_rc5_32_12_16_cfb EVP_rc5_32_12_16_cfb64
780 const EVP_CIPHER *EVP_rc5_32_12_16_ofb(void);
781 #endif
782 #ifndef OPENSSL_NO_AES
783 const EVP_CIPHER *EVP_aes_128_ecb(void);
784 const EVP_CIPHER *EVP_aes_128_cbc(void);
785 const EVP_CIPHER *EVP_aes_128_cfb1(void);
786 const EVP_CIPHER *EVP_aes_128_cfb8(void);
787 const EVP_CIPHER *EVP_aes_128_cfb128(void);

```

```

788 # define EVP_aes_128_cfb EVP_aes_128_cfb128
789 const EVP_CIPHER *EVP_aes_128_ofb(void);
790 const EVP_CIPHER *EVP_aes_128_ctr(void);
791 const EVP_CIPHER *EVP_aes_128_ccm(void);
792 const EVP_CIPHER *EVP_aes_128_gcm(void);
793 const EVP_CIPHER *EVP_aes_128_xts(void);
794 const EVP_CIPHER *EVP_aes_192_ecb(void);
795 const EVP_CIPHER *EVP_aes_192_cbc(void);
796 const EVP_CIPHER *EVP_aes_192_cfb1(void);
797 const EVP_CIPHER *EVP_aes_192_cfb8(void);
798 const EVP_CIPHER *EVP_aes_192_cfb128(void);
799 # define EVP_aes_192_cfb EVP_aes_192_cfb128
800 const EVP_CIPHER *EVP_aes_192_ofb(void);
801 const EVP_CIPHER *EVP_aes_192_ctr(void);
802 const EVP_CIPHER *EVP_aes_192_ccm(void);
803 const EVP_CIPHER *EVP_aes_192_gcm(void);
804 const EVP_CIPHER *EVP_aes_256_ecb(void);
805 const EVP_CIPHER *EVP_aes_256_cbc(void);
806 const EVP_CIPHER *EVP_aes_256_cfb1(void);
807 const EVP_CIPHER *EVP_aes_256_cfb8(void);
808 const EVP_CIPHER *EVP_aes_256_cfb128(void);
809 # define EVP_aes_256_cfb EVP_aes_256_cfb128
810 const EVP_CIPHER *EVP_aes_256_ofb(void);
811 const EVP_CIPHER *EVP_aes_256_ctr(void);
812 const EVP_CIPHER *EVP_aes_256_ccm(void);
813 const EVP_CIPHER *EVP_aes_256_gcm(void);
814 const EVP_CIPHER *EVP_aes_256_xts(void);
815 #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_SHA1)
816 const EVP_CIPHER *EVP_aes_128_cbc_hmac_sha1(void);
817 const EVP_CIPHER *EVP_aes_256_cbc_hmac_sha1(void);
818 #endif
819 #endif
820 #ifndef OPENSSL_NO_CAMELLIA
821 const EVP_CIPHER *EVP_camellia_128_ecb(void);
822 const EVP_CIPHER *EVP_camellia_128_cbc(void);
823 const EVP_CIPHER *EVP_camellia_128_cfb1(void);
824 const EVP_CIPHER *EVP_camellia_128_cfb8(void);
825 const EVP_CIPHER *EVP_camellia_128_cfb128(void);
826 # define EVP_camellia_128_cfb EVP_camellia_128_cfb128
827 const EVP_CIPHER *EVP_camellia_128_ofb(void);
828 const EVP_CIPHER *EVP_camellia_192_ecb(void);
829 const EVP_CIPHER *EVP_camellia_192_cbc(void);
830 const EVP_CIPHER *EVP_camellia_192_cfb1(void);
831 const EVP_CIPHER *EVP_camellia_192_cfb8(void);
832 const EVP_CIPHER *EVP_camellia_192_cfb128(void);
833 # define EVP_camellia_192_cfb EVP_camellia_192_cfb128
834 const EVP_CIPHER *EVP_camellia_192_ofb(void);
835 const EVP_CIPHER *EVP_camellia_256_ecb(void);
836 const EVP_CIPHER *EVP_camellia_256_cbc(void);
837 const EVP_CIPHER *EVP_camellia_256_cfb1(void);
838 const EVP_CIPHER *EVP_camellia_256_cfb8(void);
839 const EVP_CIPHER *EVP_camellia_256_cfb128(void);
840 # define EVP_camellia_256_cfb EVP_camellia_256_cfb128
841 const EVP_CIPHER *EVP_camellia_256_ofb(void);
842 #endif
844 #ifndef OPENSSL_NO_SEED
845 const EVP_CIPHER *EVP_seed_ecb(void);
846 const EVP_CIPHER *EVP_seed_cbc(void);
847 const EVP_CIPHER *EVP_seed_cfb128(void);
848 # define EVP_seed_cfb EVP_seed_cfb128
849 const EVP_CIPHER *EVP_seed_ofb(void);
850 #endif

852 void OPENSSL_add_all_algorithms_noconf(void);
853 void OPENSSL_add_all_algorithms_conf(void);

```

```

855 #ifdef OPENSSL_LOAD_CONF
856 #define OpenSSL_add_all_algorithms() \
857     OPENSSL_add_all_algorithms_conf()
858 #else
859 #define OpenSSL_add_all_algorithms() \
860     OPENSSL_add_all_algorithms_noconf()
861 #endif

863 void OpenSSL_add_all_ciphers(void);
864 void OpenSSL_add_all_digests(void);
865 #define SSL_add_all_algorithms() OpenSSL_add_all_algorithms()
866 #define SSL_add_all_ciphers() OpenSSL_add_all_ciphers()
867 #define SSL_add_all_digests() OpenSSL_add_all_digests()

869 int EVP_add_cipher(const EVP_CIPHER *cipher);
870 int EVP_add_digest(const EVP_MD *digest);

872 const EVP_CIPHER *EVP_get_cipherbyname(const char *name);
873 const EVP_MD *EVP_get_digestbyname(const char *name);
874 void EVP_cleanup(void);

876 void EVP_CIPHER_do_all(void (*fn)(const EVP_CIPHER *ciph,
877     const char *from, const char *to, void *x), void *arg);
878 void EVP_CIPHER_do_all_sorted(void (*fn)(const EVP_CIPHER *ciph,
879     const char *from, const char *to, void *x), void *arg);

881 void EVP_MD_do_all(void (*fn)(const EVP_MD *ciph,
882     const char *from, const char *to, void *x), void *arg);
883 void EVP_MD_do_all_sorted(void (*fn)(const EVP_MD *ciph,
884     const char *from, const char *to, void *x), void *arg);

886 int EVP_PKEY_decrypt_old(unsigned char *dec_key,
887     const unsigned char *enc_key, int enc_key_len,
888     EVP_PKEY *private_key);
889 int EVP_PKEY_encrypt_old(unsigned char *enc_key,
890     const unsigned char *key, int key_len,
891     EVP_PKEY *pub_key);
892 int EVP_PKEY_type(int type);
893 int EVP_PKEY_id(const EVP_PKEY *pkey);
894 int EVP_PKEY_base_id(const EVP_PKEY *pkey);
895 int EVP_PKEY_bits(EVP_PKEY *pkey);
896 int EVP_PKEY_size(EVP_PKEY *pkey);
897 int EVP_PKEY_set_type(EVP_PKEY *pkey, int type);
898 int EVP_PKEY_set_type_str(EVP_PKEY *pkey, const char *str, int len);
899 int EVP_PKEY_assign(EVP_PKEY *pkey, int type, void *key);
900 void *EVP_PKEY_get0(EVP_PKEY *pkey);

902 #ifndef OPENSSL_NO_RSA
903 struct rsa_st;
904 int EVP_PKEY_set1_RSA(EVP_PKEY *pkey, struct rsa_st *key);
905 struct rsa_st *EVP_PKEY_get1_RSA(EVP_PKEY *pkey);
906 #endif
907 #ifndef OPENSSL_NO_DSA
908 struct dsa_st;
909 int EVP_PKEY_set1_DSA(EVP_PKEY *pkey, struct dsa_st *key);
910 struct dsa_st *EVP_PKEY_get1_DSA(EVP_PKEY *pkey);
911 #endif
912 #ifndef OPENSSL_NO_DH
913 struct dh_st;
914 int EVP_PKEY_set1_DH(EVP_PKEY *pkey, struct dh_st *key);
915 struct dh_st *EVP_PKEY_get1_DH(EVP_PKEY *pkey);
916 #endif
917 #ifndef OPENSSL_NO_EC
918 struct ec_key_st;
919 int EVP_PKEY_set1_EC_KEY(EVP_PKEY *pkey, struct ec_key_st *key);

```

```
new/usr/src/lib/openssl/include/openssl/evp.h
```

[illegible]

```

1054 #define EVP_PKEY_OP_UNDEFINED 0
1055 #define EVP_PKEY_OP_PARAMGEN (1<<1)
1056 #define EVP_PKEY_OP_KEYGEN (1<<2)
1057 #define EVP_PKEY_OP_SIGN (1<<3)
1058 #define EVP_PKEY_OP_VERIFY (1<<4)
1059 #define EVP_PKEY_OP_VERIFYRECOVER (1<<5)
1060 #define EVP_PKEY_OP_SIGNCTX (1<<6)
1061 #define EVP_PKEY_OP_VERIFYCTX (1<<7)
1062 #define EVP_PKEY_OP_ENCRYPT (1<<8)
1063 #define EVP_PKEY_OP_DECRYPT (1<<9)
1064 #define EVP_PKEY_OP_DERIVE (1<<10)

1066 #define EVP_PKEY_OP_TYPE_SIG \
1067     (EVP_PKEY_OP_SIGN | EVP_PKEY_OP_VERIFY | EVP_PKEY_OP_VERIFYRECOVER |
1068      | EVP_PKEY_OP_SIGNCTX | EVP_PKEY_OP_VERIFYCTX)

1070 #define EVP_PKEY_OP_TYPE_CRYPT \
1071     (EVP_PKEY_OP_ENCRYPT | EVP_PKEY_OP_DECRYPT)

1073 #define EVP_PKEY_OP_TYPE_NOGEN \
1074     (EVP_PKEY_OP_SIG | EVP_PKEY_OP_CRYPT | EVP_PKEY_OP_DERIVE)

1076 #define EVP_PKEY_OP_TYPE_GEN \
1077     (EVP_PKEY_OP_PARAMGEN | EVP_PKEY_OP_KEYGEN)

1079 #define EVP_PKEY_CTX_set_signature_md(ctx, md) \
1080     EVP_PKEY_CTX_ctrl(ctx, -1, EVP_PKEY_OP_TYPE_SIG, \
1081                       EVP_PKEY_CTRL_MD, 0, (void *)md)

1083 #define EVP_PKEY_CTRL_MD 1
1084 #define EVP_PKEY_CTRL_PEER_KEY 2

1086 #define EVP_PKEY_CTRL_PKCS7_ENCRYPT 3
1087 #define EVP_PKEY_CTRL_PKCS7_DECRYPT 4

1089 #define EVP_PKEY_CTRL_PKCS7_SIGN 5

1091 #define EVP_PKEY_CTRL_SET_MAC_KEY 6

1093 #define EVP_PKEY_CTRL_DIGESTINIT 7

1095 /* Used by GOST key encryption in TLS */
1096 #define EVP_PKEY_CTRL_SET_IV 8

1098 #define EVP_PKEY_CTRL_CMS_ENCRYPT 9
1099 #define EVP_PKEY_CTRL_CMS_DECRYPT 10
1100 #define EVP_PKEY_CTRL_CMS_SIGN 11

1102 #define EVP_PKEY_CTRL_CIPHER 12

1104 #define EVP_PKEY_ALG_CTRL 0x1000

1107 #define EVP_PKEY_FLAG_AUTOARGLEN 2
1108 /* Method handles all operations: don't assume any digest related
1109  * defaults.
1110  */
1111 #define EVP_PKEY_FLAG_SIGCTX_CUSTOM 4

1113 const EVP_PKEY_METHOD *EVP_PKEY_meth_find(int type);
1114 EVP_PKEY_METHOD* EVP_PKEY_meth_new(int id, int flags);
1115 void EVP_PKEY_meth_get0_info(int *ppkey_id, int *pflags,
1116                             const EVP_PKEY_METHOD *meth);
1117 void EVP_PKEY_meth_copy(EVP_PKEY_METHOD *dst, const EVP_PKEY_METHOD *src);

```

```

1118 void EVP_PKEY_meth_free(EVP_PKEY_METHOD *pmeth);
1119 int EVP_PKEY_meth_add0(const EVP_PKEY_METHOD *pmeth);

1121 EVP_PKEY_CTX *EVP_PKEY_CTX_new(EVP_PKEY *pkey, ENGINE *e);
1122 EVP_PKEY_CTX *EVP_PKEY_CTX_new_id(int id, ENGINE *e);
1123 EVP_PKEY_CTX *EVP_PKEY_CTX_dup(EVP_PKEY_CTX *ctx);
1124 void EVP_PKEY_CTX_free(EVP_PKEY_CTX *ctx);

1126 int EVP_PKEY_CTX_ctrl(EVP_PKEY_CTX *ctx, int keytype, int optype,
1127                      int cmd, int p1, void *p2);
1128 int EVP_PKEY_CTX_ctrl_str(EVP_PKEY_CTX *ctx, const char *type,
1129                          const char *value);

1131 int EVP_PKEY_CTX_get_operation(EVP_PKEY_CTX *ctx);
1132 void EVP_PKEY_CTX_set0_keygen_info(EVP_PKEY_CTX *ctx, int *dat, int datlen);

1134 EVP_PKEY *EVP_PKEY_new_mac_key(int type, ENGINE *e,
1135                                const unsigned char *key, int keylen);

1137 void EVP_PKEY_CTX_set_data(EVP_PKEY_CTX *ctx, void *data);
1138 void *EVP_PKEY_CTX_get_data(EVP_PKEY_CTX *ctx);
1139 EVP_PKEY *EVP_PKEY_CTX_get0_pkey(EVP_PKEY_CTX *ctx);

1141 EVP_PKEY *EVP_PKEY_CTX_get0_peerkey(EVP_PKEY_CTX *ctx);

1143 void EVP_PKEY_CTX_set_app_data(EVP_PKEY_CTX *ctx, void *data);
1144 void *EVP_PKEY_CTX_get_app_data(EVP_PKEY_CTX *ctx);

1146 int EVP_PKEY_sign_init(EVP_PKEY_CTX *ctx);
1147 int EVP_PKEY_sign(EVP_PKEY_CTX *ctx,
1148                  unsigned char *sig, size_t *siglen,
1149                  const unsigned char *tbs, size_t tbslen);
1150 int EVP_PKEY_verify_init(EVP_PKEY_CTX *ctx);
1151 int EVP_PKEY_verify(EVP_PKEY_CTX *ctx,
1152                   const unsigned char *sig, size_t siglen,
1153                   const unsigned char *tbs, size_t tbslen);
1154 int EVP_PKEY_verify_recover_init(EVP_PKEY_CTX *ctx);
1155 int EVP_PKEY_verify_recover(EVP_PKEY_CTX *ctx,
1156                            unsigned char *rout, size_t *routlen,
1157                            const unsigned char *sig, size_t siglen);
1158 int EVP_PKEY_encrypt_init(EVP_PKEY_CTX *ctx);
1159 int EVP_PKEY_encrypt(EVP_PKEY_CTX *ctx,
1160                    unsigned char *out, size_t *outlen,
1161                    const unsigned char *in, size_t inlen);
1162 int EVP_PKEY_decrypt_init(EVP_PKEY_CTX *ctx);
1163 int EVP_PKEY_decrypt(EVP_PKEY_CTX *ctx,
1164                    unsigned char *out, size_t *outlen,
1165                    const unsigned char *in, size_t inlen);

1167 int EVP_PKEY_derive_init(EVP_PKEY_CTX *ctx);
1168 int EVP_PKEY_derive_set_peer(EVP_PKEY_CTX *ctx, EVP_PKEY *peer);
1169 int EVP_PKEY_derive(EVP_PKEY_CTX *ctx, unsigned char *key, size_t *keylen);

1171 typedef int EVP_PKEY_gen_cb(EVP_PKEY_CTX *ctx);

1173 int EVP_PKEY_paramgen_init(EVP_PKEY_CTX *ctx);
1174 int EVP_PKEY_paramgen(EVP_PKEY_CTX *ctx, EVP_PKEY **ppkey);
1175 int EVP_PKEY_keygen_init(EVP_PKEY_CTX *ctx);
1176 int EVP_PKEY_keygen(EVP_PKEY_CTX *ctx, EVP_PKEY **ppkey);

1178 void EVP_PKEY_CTX_set_cb(EVP_PKEY_CTX *ctx, EVP_PKEY_gen_cb *cb);
1179 EVP_PKEY_gen_cb *EVP_PKEY_CTX_get_cb(EVP_PKEY_CTX *ctx);

1181 int EVP_PKEY_CTX_get_keygen_info(EVP_PKEY_CTX *ctx, int idx);

1183 void EVP_PKEY_meth_set_init(EVP_PKEY_METHOD *pmeth,

```

```

1184     int (*init)(EVP_PKEY_CTX *ctx));

1186 void EVP_PKEY_meth_set_copy(EVP_PKEY_METHOD *pmeth,
1187     int (*copy)(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src));

1189 void EVP_PKEY_meth_set_cleanup(EVP_PKEY_METHOD *pmeth,
1190     void (*cleanup)(EVP_PKEY_CTX *ctx));

1192 void EVP_PKEY_meth_set_paramgen(EVP_PKEY_METHOD *pmeth,
1193     int (*paramgen_init)(EVP_PKEY_CTX *ctx),
1194     int (*paramgen)(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey));

1196 void EVP_PKEY_meth_set_keygen(EVP_PKEY_METHOD *pmeth,
1197     int (*keygen_init)(EVP_PKEY_CTX *ctx),
1198     int (*keygen)(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey));

1200 void EVP_PKEY_meth_set_sign(EVP_PKEY_METHOD *pmeth,
1201     int (*sign_init)(EVP_PKEY_CTX *ctx),
1202     int (*sign)(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
1203         const unsigned char *tbs, size_t tbslen));

1205 void EVP_PKEY_meth_set_verify(EVP_PKEY_METHOD *pmeth,
1206     int (*verify_init)(EVP_PKEY_CTX *ctx),
1207     int (*verify)(EVP_PKEY_CTX *ctx, const unsigned char *sig, size_t siglen,
1208         const unsigned char *tbs, size_t tbslen));

1210 void EVP_PKEY_meth_set_verify_recover(EVP_PKEY_METHOD *pmeth,
1211     int (*verify_recover_init)(EVP_PKEY_CTX *ctx),
1212     int (*verify_recover)(EVP_PKEY_CTX *ctx,
1213         unsigned char *sig, size_t *siglen,
1214         const unsigned char *tbs, size_t tbslen));

1216 void EVP_PKEY_meth_set_signctx(EVP_PKEY_METHOD *pmeth,
1217     int (*signctx_init)(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx),
1218     int (*signctx)(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
1219         EVP_MD_CTX *mctx));

1221 void EVP_PKEY_meth_set_verifyctx(EVP_PKEY_METHOD *pmeth,
1222     int (*verifyctx_init)(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx),
1223     int (*verifyctx)(EVP_PKEY_CTX *ctx, const unsigned char *sig, int siglen,
1224         EVP_MD_CTX *mctx));

1226 void EVP_PKEY_meth_set_encrypt(EVP_PKEY_METHOD *pmeth,
1227     int (*encrypt_init)(EVP_PKEY_CTX *ctx),
1228     int (*encryptfn)(EVP_PKEY_CTX *ctx, unsigned char *out, size_t *outlen,
1229         const unsigned char *in, size_t inlen));

1231 void EVP_PKEY_meth_set_decrypt(EVP_PKEY_METHOD *pmeth,
1232     int (*decrypt_init)(EVP_PKEY_CTX *ctx),
1233     int (*decrypt)(EVP_PKEY_CTX *ctx, unsigned char *out, size_t *outlen,
1234         const unsigned char *in, size_t inlen));

1236 void EVP_PKEY_meth_set_derive(EVP_PKEY_METHOD *pmeth,
1237     int (*derive_init)(EVP_PKEY_CTX *ctx),
1238     int (*derive)(EVP_PKEY_CTX *ctx, unsigned char *key, size_t *keylen));

1240 void EVP_PKEY_meth_set_ctrl(EVP_PKEY_METHOD *pmeth,
1241     int (*ctrl)(EVP_PKEY_CTX *ctx, int type, int p1, void *p2),
1242     int (*ctrl_str)(EVP_PKEY_CTX *ctx,
1243         const char *type, const char *value));

1245 void EVP_add_alg_module(void);

1247 /* BEGIN ERROR CODES */
1248 /* The following lines are auto generated by the script mkerr.pl. Any changes
1249  * made after this point may be overwritten when the script is next run.

```

```

1250 */
1251 void ERR_load_EVP_strings(void);

1253 /* Error codes for the EVP functions. */

1255 /* Function codes. */
1256 #define EVP_F_AESNI_INIT_KEY 165
1257 #define EVP_F_AESNI_XTS_CIPHER 176
1258 #define EVP_F_AES_INIT_KEY 133
1259 #define EVP_F_AES_XTS 172
1260 #define EVP_F_AES_XTS_CIPHER 175
1261 #define EVP_F_ALG_MODULE_INIT 177
1262 #define EVP_F_CAMELLIA_INIT_KEY 159
1263 #define EVP_F_CMAC_INIT 173
1264 #define EVP_F_D2I_PKEY 100
1265 #define EVP_F_DO_SIGVER_INIT 161
1266 #define EVP_F_DSAPKEY2PKCS8 134
1267 #define EVP_F_DSA_PKEY2PKCS8 135
1268 #define EVP_F_ECDSA_PKEY2PKCS8 129
1269 #define EVP_F_ECKEY_PKEY2PKCS8 132
1270 #define EVP_F_EVP_CIPHERINIT_EX 123
1271 #define EVP_F_EVP_CIPHER_CTX_COPY 163
1272 #define EVP_F_EVP_CIPHER_CTX_CTRL 124
1273 #define EVP_F_EVP_CIPHER_CTX_SET_KEY_LENGTH 122
1274 #define EVP_F_EVP_DECRYPTFINAL_EX 101
1275 #define EVP_F_EVP_DIGESTINIT_EX 128
1276 #define EVP_F_EVP_ENCRYPTFINAL_EX 127
1277 #define EVP_F_EVP_MD_CTX_COPY_EX 110
1278 #define EVP_F_EVP_MD_SIZE 162
1279 #define EVP_F_EVP_OPENINIT 102
1280 #define EVP_F_EVP_PBE_ALG_ADD 115
1281 #define EVP_F_EVP_PBE_ALG_ADD_TYPE 160
1282 #define EVP_F_EVP_PBE_CIPHERINIT 116
1283 #define EVP_F_EVP_PKCS82PKEY 111
1284 #define EVP_F_EVP_PKCS82PKEY_BROKEN 136
1285 #define EVP_F_EVP_PKEY2PKCS8_BROKEN 113
1286 #define EVP_F_EVP_PKEY_COPY_PARAMETERS 103
1287 #define EVP_F_EVP_PKEY_CTX_CTRL 137
1288 #define EVP_F_EVP_PKEY_CTX_CTRL_STR 150
1289 #define EVP_F_EVP_PKEY_CTX_DUP 156
1290 #define EVP_F_EVP_PKEY_DECRYPT 104
1291 #define EVP_F_EVP_PKEY_DECRYPT_INIT 138
1292 #define EVP_F_EVP_PKEY_DECRYPT_OLD 151
1293 #define EVP_F_EVP_PKEY_DERIVE 153
1294 #define EVP_F_EVP_PKEY_DERIVE_INIT 154
1295 #define EVP_F_EVP_PKEY_DERIVE_SET_PEER 155
1296 #define EVP_F_EVP_PKEY_ENCRYPT 105
1297 #define EVP_F_EVP_PKEY_ENCRYPT_INIT 139
1298 #define EVP_F_EVP_PKEY_ENCRYPT_OLD 152
1299 #define EVP_F_EVP_PKEY_GET1_DH 119
1300 #define EVP_F_EVP_PKEY_GET1_DSA 120
1301 #define EVP_F_EVP_PKEY_GET1_ECDSA 130
1302 #define EVP_F_EVP_PKEY_GET1_EC_KEY 131
1303 #define EVP_F_EVP_PKEY_GET1_RSA 121
1304 #define EVP_F_EVP_PKEY_KEYGEN 146
1305 #define EVP_F_EVP_PKEY_KEYGEN_INIT 147
1306 #define EVP_F_EVP_PKEY_NEW 106
1307 #define EVP_F_EVP_PKEY_PARAMGEN 148
1308 #define EVP_F_EVP_PKEY_PARAMGEN_INIT 149
1309 #define EVP_F_EVP_PKEY_SIGN 140
1310 #define EVP_F_EVP_PKEY_SIGN_INIT 141
1311 #define EVP_F_EVP_PKEY_VERIFY 142
1312 #define EVP_F_EVP_PKEY_VERIFY_INIT 143
1313 #define EVP_F_EVP_PKEY_VERIFY_RECOVER 144
1314 #define EVP_F_EVP_PKEY_VERIFY_RECOVER_INIT 145
1315 #define EVP_F_EVP_RIJNDAEL 126

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1316 #define EVP_F_EVP_SIGNFINAL 107
1317 #define EVP_F_EVP_VERIFYFINAL 108
1318 #define EVP_F_FIPS_CIPHERINIT 166
1319 #define EVP_F_FIPS_CIPHER_CTX_COPY 170
1320 #define EVP_F_FIPS_CIPHER_CTX_CTRL 167
1321 #define EVP_F_FIPS_CIPHER_CTX_SET_KEY_LENGTH 171
1322 #define EVP_F_FIPS_DIGESTINIT 168
1323 #define EVP_F_FIPS_MD_CTX_COPY 169
1324 #define EVP_F_HMAC_INIT_EX 174
1325 #define EVP_F_INT_CTX_NEW 157
1326 #define EVP_F_PKCS5_PBE_KEYIVGEN 117
1327 #define EVP_F_PKCS5_V2_PBE_KEYIVGEN 118
1328 #define EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN 164
1329 #define EVP_F_PKCS8_SET_BROKEN 112
1330 #define EVP_F_PKEY_SET_TYPE 158
1331 #define EVP_F_RC2_MAGIC_TO_METH 109
1332 #define EVP_F_RC5_CTRL 125

1334 /* Reason codes. */
1335 #define EVP_R_AES_IV_SETUP_FAILED 162
1336 #define EVP_R_AES_KEY_SETUP_FAILED 143
1337 #define EVP_R_ASN1_LIB 140
1338 #define EVP_R_BAD_BLOCK_LENGTH 136
1339 #define EVP_R_BAD_DECRYPT 100
1340 #define EVP_R_BAD_KEY_LENGTH 137
1341 #define EVP_R_BN_DECODE_ERROR 112
1342 #define EVP_R_BN_PUBKEY_ERROR 113
1343 #define EVP_R_BUFFER_TOO_SMALL 155
1344 #define EVP_R_CAMELLIA_KEY_SETUP_FAILED 157
1345 #define EVP_R_CIPHER_PARAMETER_ERROR 122
1346 #define EVP_R_COMMAND_NOT_SUPPORTED 147
1347 #define EVP_R_CTRL_NOT_IMPLEMENTED 132
1348 #define EVP_R_CTRL_OPERATION_NOT_IMPLEMENTED 133
1349 #define EVP_R_DATA_NOT_MULTIPLE_OF_BLOCK_LENGTH 138
1350 #define EVP_R_DECODE_ERROR 114
1351 #define EVP_R_DIFFERENT_KEY_TYPES 101
1352 #define EVP_R_DIFFERENT_PARAMETERS 153
1353 #define EVP_R_DISABLED_FOR_FIPS 163
1354 #define EVP_R_ENCODE_ERROR 115
1355 #define EVP_R_ERROR_LOADING_SECTION 165
1356 #define EVP_R_ERROR_SETTING_FIPS_MODE 166
1357 #define EVP_R_EVP_PBE_CIPHERINIT_ERROR 119
1358 #define EVP_R_EXPECTING_AN_RSA_KEY 127
1359 #define EVP_R_EXPECTING_A_DH_KEY 128
1360 #define EVP_R_EXPECTING_A_DSA_KEY 129
1361 #define EVP_R_EXPECTING_A_ECDSA_KEY 141
1362 #define EVP_R_EXPECTING_A_EC_KEY 142
1363 #define EVP_R_FIPS_MODE_NOT_SUPPORTED 167
1364 #define EVP_R_INITIALIZATION_ERROR 134
1365 #define EVP_R_INPUT_NOT_INITIALIZED 111
1366 #define EVP_R_INVALID_DIGEST 152
1367 #define EVP_R_INVALID_FIPS_MODE 168
1368 #define EVP_R_INVALID_KEY_LENGTH 130
1369 #define EVP_R_INVALID_OPERATION 148
1370 #define EVP_R_IV_TOO_LARGE 102
1371 #define EVP_R_KEYGEN_FAILURE 120
1372 #define EVP_R_MESSAGE_DIGEST_IS_NULL 159
1373 #define EVP_R_METHOD_NOT_SUPPORTED 144
1374 #define EVP_R_MISSING_PARAMETERS 103
1375 #define EVP_R_NO_CIPHER_SET 131
1376 #define EVP_R_NO_DEFAULT_DIGEST 158
1377 #define EVP_R_NO_DIGEST_SET 139
1378 #define EVP_R_NO_DSA_PARAMETERS 116
1379 #define EVP_R_NO_KEY_SET 154
1380 #define EVP_R_NO_OPERATION_SET 149
1381 #define EVP_R_NO_SIGN_FUNCTION_CONFIGURED 104

```

```

1382 #define EVP_R_NO_VERIFY_FUNCTION_CONFIGURED 105
1383 #define EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE 150
1384 #define EVP_R_OPERATION_NOT_INITIALIZED 151
1385 #define EVP_R_PKCS8_UNKNOWN_BROKEN_TYPE 117
1386 #define EVP_R_PRIVATE_KEY_DECODE_ERROR 145
1387 #define EVP_R_PRIVATE_KEY_ENCODE_ERROR 146
1388 #define EVP_R_PUBLIC_KEY_NOT_RSA 106
1389 #define EVP_R_TOO_LARGE 164
1390 #define EVP_R_UNKNOWN_CIPHER 160
1391 #define EVP_R_UNKNOWN_DIGEST 161
1392 #define EVP_R_UNKNOWN_OPTION 169
1393 #define EVP_R_UNKNOWN_PBE_ALGORITHM 121
1394 #define EVP_R_UNSUPPORTED_NUMBER_OF_ROUNDS 135
1395 #define EVP_R_UNSUPPORTED_ALGORITHM 156
1396 #define EVP_R_UNSUPPORTED_CIPHER 107
1397 #define EVP_R_UNSUPPORTED_KEYLENGTH 123
1398 #define EVP_R_UNSUPPORTED_KEY_DERIVATION_FUNCTION 124
1399 #define EVP_R_UNSUPPORTED_KEY_SIZE 108
1400 #define EVP_R_UNSUPPORTED_PRF 125
1401 #define EVP_R_UNSUPPORTED_PRIVATE_KEY_ALGORITHM 118
1402 #define EVP_R_UNSUPPORTED_SALT_TYPE 126
1403 #define EVP_R_WRONG_FINAL_BLOCK_LENGTH 109
1404 #define EVP_R_WRONG_PUBLIC_KEY_TYPE 110

1406 #ifdef __cplusplus
1407 }
1408 #endif
1409 #endif

```

```

*****
4476 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/hmac.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/hmac/hmac.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
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19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publicly available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 #ifndef HEADER_HMAC_H
59 #define HEADER_HMAC_H
60
61 #include <openssl/opensslconf.h>

```

```

63 #ifdef OPENSSL_NO_HMAC
64 #error HMAC is disabled.
65 #endif
66
67 #include <openssl/evp.h>
68
69 #define HMAC_MAX_MD_CBLOCK      128      /* largest known is SHA512 */
70
71 #ifdef __cplusplus
72 extern "C" {
73 #endif
74
75 typedef struct hmac_ctx_st
76 {
77     const EVP_MD *md;
78     EVP_MD_CTX md_ctx;
79     EVP_MD_CTX i_ctx;
80     EVP_MD_CTX o_ctx;
81     unsigned int key_length;
82     unsigned char key[HMAC_MAX_MD_CBLOCK];
83 } HMAC_CTX;
84
85 #define HMAC_size(e)      (EVP_MD_size((e)->md))
86
87 void HMAC_CTX_init(HMAC_CTX *ctx);
88 void HMAC_CTX_cleanup(HMAC_CTX *ctx);
89
90 #define HMAC_cleanup(ctx) HMAC_CTX_cleanup(ctx) /* deprecated */
91
92 int HMAC_Init(HMAC_CTX *ctx, const void *key, int len,
93               const EVP_MD *md); /* deprecated */
94 int HMAC_Init_ex(HMAC_CTX *ctx, const void *key, int len,
95                  const EVP_MD *md, ENGINE *impl);
96 int HMAC_Update(HMAC_CTX *ctx, const unsigned char *data, size_t len);
97 int HMAC_Final(HMAC_CTX *ctx, unsigned char *md, unsigned int *len);
98 unsigned char *HMAC(const EVP_MD *evp_md, const void *key, int key_len,
99                    const unsigned char *d, size_t n, unsigned char *md,
100                    unsigned int *md_len);
101 int HMAC_CTX_copy(HMAC_CTX *dctx, HMAC_CTX *sctx);
102
103 void HMAC_CTX_set_flags(HMAC_CTX *ctx, unsigned long flags);
104
105 #ifdef __cplusplus
106 }
107 #endif
108 #endif
109
110 #endif

```

new/usr/src/lib/openssl/include/openssl/krb5_asn.h

1

```
*****
7642 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/krb5_asn.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* krb5_asn.h */
2 /* Written by Vern Staats <staatsvr@asc.hpc.mil> for the OpenSSL project,
3 ** using ocsf/{*.h,*asn.c} as a starting point
4 */

6 /* =====
7 * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
8 *
9 * Redistribution and use in source and binary forms, with or without
10 * modification, are permitted provided that the following conditions
11 * are met:
12 *
13 * 1. Redistributions of source code must retain the above copyright
14 * notice, this list of conditions and the following disclaimer.
15 *
16 * 2. Redistributions in binary form must reproduce the above copyright
17 * notice, this list of conditions and the following disclaimer in
18 * the documentation and/or other materials provided with the
19 * distribution.
20 *
21 * 3. All advertising materials mentioning features or use of this
22 * software must display the following acknowledgment:
23 * "This product includes software developed by the OpenSSL Project
24 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
25 *
26 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
27 * endorse or promote products derived from this software without
28 * prior written permission. For written permission, please contact
29 * openssl-core@openssl.org.
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31 * 5. Products derived from this software may not be called "OpenSSL"
32 * nor may "OpenSSL" appear in their names without prior written
33 * permission of the OpenSSL Project.
34 *
35 * 6. Redistributions of any form whatsoever must retain the following
36 * acknowledgment:
37 * "This product includes software developed by the OpenSSL Project
38 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
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51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 * =====
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */

60 #ifndef HEADER_KRB5_ASN_H
61 #define HEADER_KRB5_ASN_H
```

new/usr/src/lib/openssl/include/openssl/krb5_asn.h

2

```
63 /*
64 #include <krb5.h>
65 */
66 #include <openssl/safestack.h>

68 #ifdef __cplusplus
69 extern "C" {
70 #endif

73 /* ASN.1 from Kerberos RFC 1510
74 */

76 /* EncryptedData ::= SEQUENCE {
77 ** etype[0] INTEGER, -- EncryptionType
78 ** kvno[1] INTEGER OPTIONAL,
79 ** cipher[2] OCTET STRING -- ciphertext
80 ** }
81 */
82 typedef struct krb5_encdata_st
83 {
84 ASN1_INTEGER *etype;
85 ASN1_INTEGER *kvno;
86 ASN1_OCTET_STRING *cipher;
87 } KRB5_ENCDATA;

89 DECLARE_STACK_OF(KRB5_ENCDATA)

91 /* PrincipalName ::= SEQUENCE {
92 ** name-type[0] INTEGER,
93 ** name-string[1] SEQUENCE OF GeneralString
94 ** }
95 */
96 typedef struct krb5_princname_st
97 {
98 ASN1_INTEGER *nametype;
99 STACK_OF(ASN1_GENERALSTRING) *namestring;
100 } KRB5_PRINCNAME;

102 DECLARE_STACK_OF(KRB5_PRINCNAME)

105 /* Ticket ::= [APPLICATION 1] SEQUENCE {
106 ** tkt-vno[0] INTEGER,
107 ** realm[1] Realm,
108 ** sname[2] PrincipalName,
109 ** enc-part[3] EncryptedData
110 ** }
111 */
112 typedef struct krb5_tktbody_st
113 {
114 ASN1_INTEGER *tktvno;
115 ASN1_GENERALSTRING *realm;
116 KRB5_PRINCNAME *sname;
117 KRB5_ENCDATA *encdata;
118 } KRB5_TKTBODY;

120 typedef STACK_OF(KRB5_TKTBODY) KRB5_TICKET;
121 DECLARE_STACK_OF(KRB5_TKTBODY)

124 /* AP-REQ ::= [APPLICATION 14] SEQUENCE {
125 ** pvno[0] INTEGER,
126 ** msg-type[1] INTEGER,
127 ** ap-options[2] APOptions,
```



```

128 **          ticket[3]          Ticket,
129 **          authenticator[4]    EncryptedData
130 **      }
131 **
132 **      APOptions ::= BIT STRING {
133 **          reserved(0), use-session-key(1), mutual-required(2) }
134 */
135 typedef struct krb5_ap_req_st
136 {
137     ASN1_INTEGER          *pvno;
138     ASN1_INTEGER          *msgtype;
139     ASN1_BIT_STRING       *apoptions;
140     KRB5_TICKET           *ticket;
141     KRB5_ENCDATA          *authenticator;
142 } KRB5_APREQBODY;

144 typedef STACK_OF(KRB5_APREQBODY) KRB5_APREQ;
145 DECLARE_STACK_OF(KRB5_APREQBODY)

148 /*      Authenticator Stuff      */

151 /*      Checksum ::= SEQUENCE {
152 **          cksumtype[0]          INTEGER,
153 **          checksum[1]          OCTET STRING
154 **      }
155 */
156 typedef struct krb5_checksum_st
157 {
158     ASN1_INTEGER          *ctype;
159     ASN1_OCTET_STRING     *checksum;
160 } KRB5_CHECKSUM;

162 DECLARE_STACK_OF(KRB5_CHECKSUM)

165 /*      EncryptionKey ::= SEQUENCE {
166 **          keytype[0]          INTEGER,
167 **          keyvalue[1]         OCTET STRING
168 **      }
169 */
170 typedef struct krb5_encryptionkey_st
171 {
172     ASN1_INTEGER          *ktype;
173     ASN1_OCTET_STRING     *keyvalue;
174 } KRB5_ENCKEY;

176 DECLARE_STACK_OF(KRB5_ENCKEY)

179 /*      AuthorizationData ::= SEQUENCE OF SEQUENCE {
180 **          ad-type[0]          INTEGER,
181 **          ad-data[1]         OCTET STRING
182 **      }
183 */
184 typedef struct krb5_authorization_st
185 {
186     ASN1_INTEGER          *adtype;
187     ASN1_OCTET_STRING     *addata;
188 } KRB5_AUTHDATA;

190 DECLARE_STACK_OF(KRB5_AUTHDATA)

192
193 /*      -- Unencrypted authenticator

```

```

194 **      Authenticator ::= [APPLICATION 2] SEQUENCE {
195 **          authenticator-vno[0]    INTEGER,
196 **          crealm[1]              Realm,
197 **          cname[2]               PrincipalName,
198 **          cksum[3]               Checksum OPTIONAL,
199 **          cusec[4]               INTEGER,
200 **          ctime[5]               KerberosTime,
201 **          subkey[6]              EncryptionKey OPTIONAL,
202 **          seq-number[7]          INTEGER OPTIONAL,
203 **          authorization-data[8]   AuthorizationData OPTIONAL
204 **      }
205 */
206 typedef struct krb5_authenticator_st
207 {
208     ASN1_INTEGER          *avno;
209     ASN1_GENERALSTRING     *crealm;
210     KRB5_PRINCNAME         *cname;
211     KRB5_CHECKSUM          *cksum;
212     ASN1_INTEGER          *cusec;
213     ASN1_GENERALIZEDTIME   *ctime;
214     KRB5_ENCKEY           *subkey;
215     ASN1_INTEGER          *seqnum;
216     KRB5_AUTHDATA         *authorization;
217 } KRB5_AUTHENTBODY;

219 typedef STACK_OF(KRB5_AUTHENTBODY) KRB5_AUTHENT;
220 DECLARE_STACK_OF(KRB5_AUTHENTBODY)

223 /*      DECLARE_ASN1_FUNCTIONS(type) = DECLARE_ASN1_FUNCTIONS_name(type, type) =
224 **      type *name##_new(void);
225 **      void name##_free(type *a);
226 **      DECLARE_ASN1_ENCODE_FUNCTIONS(type, name, name) =
227 **      DECLARE_ASN1_ENCODE_FUNCTIONS(type, itname, name) =
228 **      type *d2i_##name(type **a, const unsigned char **in, long len);
229 **      int i2d_##name(type *a, unsigned char **out);
230 **      DECLARE_ASN1_ITEM(itname) = OPENSSL_EXTERN const ASN1_ITEM itname##_it
231 */

233 DECLARE_ASN1_FUNCTIONS(KRB5_ENCDATA)
234 DECLARE_ASN1_FUNCTIONS(KRB5_PRINCNAME)
235 DECLARE_ASN1_FUNCTIONS(KRB5_TKTBODY)
236 DECLARE_ASN1_FUNCTIONS(KRB5_APREQBODY)
237 DECLARE_ASN1_FUNCTIONS(KRB5_TICKET)
238 DECLARE_ASN1_FUNCTIONS(KRB5_APREQ)

240 DECLARE_ASN1_FUNCTIONS(KRB5_CHECKSUM)
241 DECLARE_ASN1_FUNCTIONS(KRB5_ENCKEY)
242 DECLARE_ASN1_FUNCTIONS(KRB5_AUTHDATA)
243 DECLARE_ASN1_FUNCTIONS(KRB5_AUTHENTBODY)
244 DECLARE_ASN1_FUNCTIONS(KRB5_AUTHENT)

247 /*      BEGIN ERROR CODES      */
248 /*      The following lines are auto generated by the script mkerr.pl. Any changes
249 *      made after this point may be overwritten when the script is next run.
250 */

252 #ifdef __cplusplus
253 }
254 #endif
255 #endif

```

new/usr/src/lib/openssl/include/openssl/kssl.h

1

```
*****
6290 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/kssl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/kssl.h - mode: C; c-file-style: "eay" -.- */
2 /* Written by Vern Staats <staatsvr@asc.hpc.mil> for the OpenSSL project 2000.
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
58
59 /*
60 **      19990701      VRS      Started.
61 */
```

new/usr/src/lib/openssl/include/openssl/kssl.h

2

```
63 #ifndef KSSL_H
64 #define KSSL_H
65
66 #include <openssl/opensslconf.h>
67
68 #ifndef OPENSSL_NO_KRB5
69
70 #include <stdio.h>
71 #include <ctype.h>
72 #include <krb5.h>
73 #ifdef OPENSSL_SYS_WIN32
74 /* These can sometimes get redefined indirectly by krb5 header files
75  * after they get undefed in ossl_typ.h
76  */
77 #undef X509_NAME
78 #undef X509_EXTENSIONS
79 #undef OCSP_REQUEST
80 #undef OCSP_RESPONSE
81 #endif
82
83 #ifdef __cplusplus
84 extern "C" {
85 #endif
86
87 /*
88 **      Depending on which KRB5 implementation used, some types from
89 **      the other may be missing. Resolve that here and now
90 */
91 #ifdef KRB5_HEIMDAL
92 typedef unsigned char krb5_octet;
93 #define FAR
94 #else
95
96 #ifndef FAR
97 #define FAR
98 #endif
99
100 #endif
101
102 /*
103 **      Uncomment this to debug kssl problems or
104 **      to trace usage of the Kerberos session key
105 **      #define      KSSL_DEBUG
106 */
107
108 #ifndef KRB5SVC
109 #define KRB5SVC "host"
110 #endif
111
112 #ifndef KRB5KEYTAB
113 #define KRB5KEYTAB "/etc/krb5.keytab"
114 #endif
115
116 #ifndef KRB5SENDAUTH
117 #define KRB5SENDAUTH 1
118 #endif
119
120 #ifndef KRB5CHECKAUTH
121 #define KRB5CHECKAUTH 1
122 #endif
123
124 #ifndef KSSL_CLOCKSKEW
125 #define KSSL_CLOCKSKEW 300;
126 #endif
```

```

128 #define KSSL_ERR_MAX    255
129 typedef struct kssl_err_st {
130     int reason;
131     char text[KSSL_ERR_MAX+1];
132 } KSSL_ERR;

135 /*      Context for passing
136 **      (1) Kerberos session key to SSL, and
137 **      (2)      Config data between application and SSL lib
138 */
139 typedef struct kssl_ctx_st
140 {
141     /*      used by:      disposition:      */
142     char *service_name; /* C,S      default ok (kssl) */
143     char *service_host; /* C        input, REQUIRED */
144     char *client_princ; /* S        output from krb5 ticket */
145     char *keytab_file; /* S        NULL (/etc/krb5.keytab) */
146     char *cred_cache; /* C        NULL (default) */
147     krb5_enctype enctype;
148     int length;
149     krb5_octet FAR *key;
150 } KSSL_CTX;

152 #define KSSL_CLIENT      1
153 #define KSSL_SERVER      2
154 #define KSSL_SERVICE     3
155 #define KSSL_KEYTAB      4

157 #define KSSL_CTX_OK      0
158 #define KSSL_CTX_ERR     1
159 #define KSSL_NOMEM      2

161 /* Public (for use by applications that use OpenSSL with Kerberos 5 support */
162 krb5_error_code kssl_ctx_setstring(KSSL_CTX *kssl_ctx, int which, char *text);
163 KSSL_CTX *kssl_ctx_new(void);
164 KSSL_CTX *kssl_ctx_free(KSSL_CTX *kssl_ctx);
165 void kssl_ctx_show(KSSL_CTX *kssl_ctx);
166 krb5_error_code kssl_ctx_setprinc(KSSL_CTX *kssl_ctx, int which,
167     krb5_data *realm, krb5_data *entity, int nentities);
168 krb5_error_code kssl_cget_tkt(KSSL_CTX *kssl_ctx, krb5_data **enc_tkt,
169     krb5_data *authntp, KSSL_ERR *kssl_err);
170 krb5_error_code kssl_sget_tkt(KSSL_CTX *kssl_ctx, krb5_data *indata,
171     krb5_ticket_times *ttimes, KSSL_ERR *kssl_err);
172 krb5_error_code kssl_ctx_setkey(KSSL_CTX *kssl_ctx, krb5_keyblock *session);
173 void kssl_err_set(KSSL_ERR *kssl_err, int reason, char *text);
174 void kssl_krb5_free_data_contents(krb5_context context, krb5_data *data);
175 krb5_error_code kssl_build_principal_2(krb5_context context,
176     krb5_principal *princ, int rlen, const char *realm,
177     int slen, const char *svc, int hlen, const char *host);
178 krb5_error_code kssl_validate_times(krb5_timestamp atime,
179     krb5_ticket_times *ttimes);
180 krb5_error_code kssl_check_authent(KSSL_CTX *kssl_ctx, krb5_data *authntp,
181     krb5_timestamp *atimep, KSSL_ERR *kssl_err);
182 unsigned char *kssl_skip_confound(krb5_enctype enctype, unsigned char *authn);

184 void SSL_set0_kssl_ctx(SSL *s, KSSL_CTX *kctx);
185 KSSL_CTX *SSL_get0_kssl_ctx(SSL *s);
186 char *kssl_ctx_get0_client_princ(KSSL_CTX *kctx);

188 #ifdef __cplusplus
189 }
190 #endif
191 #endif /* OPENSSL_NO_KRB5 */
192 #endif /* KSSL_H */

```

```

*****
9092 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/lhash.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/lhash/lhash.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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11 * apply to all code found in this distribution, be it the RC4, RSA,
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28 * 2. Redistributions in binary form must reproduce the above copyright
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34 * Eric Young (eay@cryptsoft.com)"
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* Header for dynamic hash table routines
60 * Author - Eric Young
61 */

```

```

63 #ifndef HEADER_LHASH_H
64 #define HEADER_LHASH_H
65
66 #include <openssl/e_os2.h>
67 #ifndef OPENSSL_NO_FP_API
68 #include <stdio.h>
69 #endif
70
71 #ifndef OPENSSL_NO_BIO
72 #include <openssl/bio.h>
73 #endif
74
75 #ifdef __cplusplus
76 extern "C" {
77 #endif
78
79 typedef struct lhash_node_st
80 {
81     void *data;
82     struct lhash_node_st *next;
83 } #ifndef OPENSSL_NO_HASH_COMP
84 unsigned long hash;
85 #endif
86 } LHASH_NODE;
87
88 typedef int (*LHASH_COMP_FN_TYPE)(const void *, const void *);
89 typedef unsigned long (*LHASH_HASH_FN_TYPE)(const void *);
90 typedef void (*LHASH_DOALL_FN_TYPE)(void *);
91 typedef void (*LHASH_DOALL_ARG_FN_TYPE)(void *, void *);
92
93 /* Macros for declaring and implementing type-safe wrappers for LHASH callbacks.
94  * This way, callbacks can be provided to LHASH structures without function
95  * pointer casting and the macro-defined callbacks provide per-variable casting
96  * before deferring to the underlying type-specific callbacks. NB: It is
97  * possible to place a "static" in front of both the DECLARE and IMPLEMENT
98  * macros if the functions are strictly internal. */
99
100 /* First: "hash" functions */
101 #define DECLARE_LHASH_HASH_FN(name, o_type) \
102     unsigned long name##_LHASH_HASH(const void *);
103 #define IMPLEMENT_LHASH_HASH_FN(name, o_type) \
104     unsigned long name##_LHASH_HASH(const void *arg) { \
105         const o_type *a = arg; \
106         return name##_hash(a); }
107 #define LHASH_HASH_FN(name) name##_LHASH_HASH
108
109 /* Second: "compare" functions */
110 #define DECLARE_LHASH_COMP_FN(name, o_type) \
111     int name##_LHASH_COMP(const void *, const void *);
112 #define IMPLEMENT_LHASH_COMP_FN(name, o_type) \
113     int name##_LHASH_COMP(const void *arg1, const void *arg2) { \
114         const o_type *a = arg1; \
115         const o_type *b = arg2; \
116         return name##_cmp(a,b); }
117 #define LHASH_COMP_FN(name) name##_LHASH_COMP
118
119 /* Third: "doall" functions */
120 #define DECLARE_LHASH_DOALL_FN(name, o_type) \
121     void name##_LHASH_DOALL(void *);
122 #define IMPLEMENT_LHASH_DOALL_FN(name, o_type) \
123     void name##_LHASH_DOALL(void *arg) { \
124         o_type *a = arg; \
125         name##_doall(a); }
126 #define LHASH_DOALL_FN(name) name##_LHASH_DOALL

```

```

128 /* Fourth: "doall_arg" functions */
129 #define DECLARE_LHASH_DOALL_ARG_FN(name, o_type, a_type) \
130     void name##_LHASH_DOALL_ARG(void *, void *);
131 #define IMPLEMENT_LHASH_DOALL_ARG_FN(name, o_type, a_type) \
132     void name##_LHASH_DOALL_ARG(void *arg1, void *arg2) { \
133         o_type *a = arg1; \
134         a_type *b = arg2; \
135         name##_doall_arg(a, b); \
136 #define LHASH_DOALL_ARG_FN(name) name##_LHASH_DOALL_ARG

138 typedef struct lhash_st
139 {
140     LHASH_NODE **b;
141     LHASH_COMP_FN_TYPE comp;
142     LHASH_HASH_FN_TYPE hash;
143     unsigned int num_nodes;
144     unsigned int num_alloc_nodes;
145     unsigned int p;
146     unsigned int pmax;
147     unsigned long up_load; /* load times 256 */
148     unsigned long down_load; /* load times 256 */
149     unsigned long num_items;

151     unsigned long num_expands;
152     unsigned long num_expand_reallocs;
153     unsigned long num_contracts;
154     unsigned long num_contract_reallocs;
155     unsigned long num_hash_calls;
156     unsigned long num_comp_calls;
157     unsigned long num_insert;
158     unsigned long num_replace;
159     unsigned long num_delete;
160     unsigned long num_no_delete;
161     unsigned long num_retrieve;
162     unsigned long num_retrieve_miss;
163     unsigned long num_hash_comps;

165     int error;
166 } _LHASH; /* Do not use _LHASH directly, use LHASH_OF
167            * and friends */

169 #define LH_LOAD_MULT    256

171 /* Indicates a malloc() error in the last call, this is only bad
172  * in lh_insert(). */
173 #define lh_error(lh)    ((lh)->error)

175 _LHASH *lh_new(LHASH_HASH_FN_TYPE h, LHASH_COMP_FN_TYPE c);
176 void lh_free(_LHASH *lh);
177 void *lh_insert(_LHASH *lh, void *data);
178 void *lh_delete(_LHASH *lh, const void *data);
179 void *lh_retrieve(_LHASH *lh, const void *data);
180 void lh_doall(_LHASH *lh, LHASH_DOALL_FN_TYPE func);
181 void lh_doall_arg(_LHASH *lh, LHASH_DOALL_ARG_FN_TYPE func, void *arg);
182 unsigned long lh_strhash(const char *c);
183 unsigned long lh_num_items(const _LHASH *lh);

185 #ifndef OPENSSL_NO_FP_API
186 void lh_stats(const _LHASH *lh, FILE *out);
187 void lh_node_stats(const _LHASH *lh, FILE *out);
188 void lh_node_usage_stats(const _LHASH *lh, FILE *out);
189 #endif

191 #ifndef OPENSSL_NO_BIO
192 void lh_stats_bio(const _LHASH *lh, BIO *out);
193 void lh_node_stats_bio(const _LHASH *lh, BIO *out);

```

```

194 void lh_node_usage_stats_bio(const _LHASH *lh, BIO *out);
195 #endif

197 /* Type checking... */

199 #define LHASH_OF(type) struct lhash_st_##type

201 #define DECLARE_LHASH_OF(type) LHASH_OF(type) { int dummy; }

203 #define CHECKED_LHASH_OF(type, lh) \
204     ((_LHASH *)CHECKED_PTR_OF(LHASH_OF(type), lh))

206 /* Define wrapper functions. */
207 #define LHM_lh_new(type, name) \
208     ((LHASH_OF(type) *)lh_new(LHASH_HASH_FN(name), LHASH_COMP_FN(name)))
209 #define LHM_lh_error(type, lh) \
210     lh_error(CHECKED_LHASH_OF(type, lh))
211 #define LHM_lh_insert(type, lh, inst) \
212     ((type *)lh_insert(CHECKED_LHASH_OF(type, lh), \
213         CHECKED_PTR_OF(type, inst)))
214 #define LHM_lh_retrieve(type, lh, inst) \
215     ((type *)lh_retrieve(CHECKED_LHASH_OF(type, lh), \
216         CHECKED_PTR_OF(type, inst)))
217 #define LHM_lh_delete(type, lh, inst) \
218     ((type *)lh_delete(CHECKED_LHASH_OF(type, lh), \
219         CHECKED_PTR_OF(type, inst)))
220 #define LHM_lh_doall(type, lh, fn) lh_doall(CHECKED_LHASH_OF(type, lh), fn)
221 #define LHM_lh_doall_arg(type, lh, fn, arg_type, arg) \
222     lh_doall_arg(CHECKED_LHASH_OF(type, lh), fn, CHECKED_PTR_OF(arg_type, arg))
223 #define LHM_lh_num_items(type, lh) lh_num_items(CHECKED_LHASH_OF(type, lh))
224 #define LHM_lh_down_load(type, lh) (CHECKED_LHASH_OF(type, lh)->down_load)
225 #define LHM_lh_node_stats_bio(type, lh, out) \
226     lh_node_stats_bio(CHECKED_LHASH_OF(type, lh), out)
227 #define LHM_lh_node_usage_stats_bio(type, lh, out) \
228     lh_node_usage_stats_bio(CHECKED_LHASH_OF(type, lh), out)
229 #define LHM_lh_stats_bio(type, lh, out) \
230     lh_stats_bio(CHECKED_LHASH_OF(type, lh), out)
231 #define LHM_lh_free(type, lh) lh_free(CHECKED_LHASH_OF(type, lh))

233 DECLARE_LHASH_OF(OPENSSL_STRING);
234 DECLARE_LHASH_OF(OPENSSL_CSTRING);

236 #ifdef __cplusplus
237 }
238 #endif

240 #endif

```

new/usr/src/lib/openssl/include/openssl/md2.h

1

3958 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/md2.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/md/md2.h */
2 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_MD2_H
60 #define HEADER_MD2_H
```

new/usr/src/lib/openssl/include/openssl/md2.h

2

```
62 #include <openssl/opensslconf.h> /* OPENSSL_NO_MD2, MD2_INT */
63 #ifndef OPENSSL_NO_MD2
64 #error MD2 is disabled.
65 #endif
66 #include <stddef.h>
67
68 #define MD2_DIGEST_LENGTH 16
69 #define MD2_BLOCK 16
70
71 #ifdef __cplusplus
72 extern "C" {
73 #endif
74
75 typedef struct MD2state_st
76 {
77     unsigned int num;
78     unsigned char data[MD2_BLOCK];
79     MD2_INT cksm[MD2_BLOCK];
80     MD2_INT state[MD2_BLOCK];
81 } MD2_CTX;
82
83 const char *MD2_options(void);
84 #ifdef OPENSSL_FIPS
85 int private_MD2_Init(MD2_CTX *c);
86 #endif
87 int MD2_Init(MD2_CTX *c);
88 int MD2_Update(MD2_CTX *c, const unsigned char *data, size_t len);
89 int MD2_Final(unsigned char *md, MD2_CTX *c);
90 unsigned char *MD2(const unsigned char *d, size_t n, unsigned char *md);
91 #ifdef __cplusplus
92 }
93 #endif
95 #endif
```

new/usr/src/lib/openssl/include/openssl/md4.h

1

```
*****
4692 Fri May 30 18:31:19 2014
new/usr/src/lib/openssl/include/openssl/md4.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/md4/md4.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_MD4_H
60 #define HEADER_MD4_H
```

new/usr/src/lib/openssl/include/openssl/md4.h

2

```
62 #include <openssl/e_os2.h>
63 #include <stddef.h>

65 #ifdef __cplusplus
66 extern "C" {
67 #endif

69 #ifdef OPENSSL_NO_MD4
70 #error MD4 is disabled.
71 #endif

73 /*
74  * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
75  * ! MD4_LONG has to be at least 32 bits wide. If it's wider, then !
76  * ! MD4_LONG_LOG2 has to be defined along. !
77  * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
78 */

80 #if defined(__LP32__)
81 #define MD4_LONG unsigned long
82 #elif defined(OPENSSL_SYS_CRAY) || defined(__ILP64__)
83 #define MD4_LONG unsigned long
84 #define MD4_LONG_LOG2 3
85 /*
86  * _CRAY note. I could declare short, but I have no idea what impact
87  * does it have on performance on none-T3E machines. I could declare
88  * int, but at least on C90 sizeof(int) can be chosen at compile time.
89  * So I've chosen long...
90  *
91  * <appro@fy.chalmers.se>
92  */
93 #define MD4_LONG unsigned int
94 #endif

96 #define MD4_CBLOCK 64
97 #define MD4_LBLOCK (MD4_CBLOCK/4)
98 #define MD4_DIGEST_LENGTH 16

100 typedef struct MD4state_st
101 {
102     MD4_LONG A,B,C,D;
103     MD4_LONG Nl,Nh;
104     MD4_LONG data[MD4_LBLOCK];
105     unsigned int num;
106     } MD4_CTX;

108 #ifdef OPENSSL_FIPS
109 int private_MD4_Init(MD4_CTX *c);
110 #endif
111 int MD4_Init(MD4_CTX *c);
112 int MD4_Update(MD4_CTX *c, const void *data, size_t len);
113 int MD4_Final(unsigned char *md, MD4_CTX *c);
114 unsigned char *MD4(const unsigned char *d, size_t n, unsigned char *md);
115 void MD4_Transform(MD4_CTX *c, const unsigned char *b);
116 #ifdef __cplusplus
117 }
118 #endif

120 #endif
```

new/usr/src/lib/openssl/include/openssl/md5.h

1

```
*****
4692 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/md5.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/md5/md5.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_MD5_H
60 #define HEADER_MD5_H
```

new/usr/src/lib/openssl/include/openssl/md5.h

2

```
62 #include <openssl/e_os2.h>
63 #include <stddef.h>

65 #ifdef __cplusplus
66 extern "C" {
67 #endif

69 #ifdef OPENSSL_NO_MD5
70 #error MD5 is disabled.
71 #endif

73 /*
74 * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
75 * ! MD5_LONG has to be at least 32 bits wide. If it's wider, then !
76 * ! MD5_LONG_LOG2 has to be defined along. !
77 * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
78 */

80 #if defined(__LP32__)
81 #define MD5_LONG unsigned long
82 #elif defined(OPENSSL_SYS_CRAY) || defined(__ILP64__)
83 #define MD5_LONG unsigned long
84 #define MD5_LONG_LOG2 3
85 /*
86 * _CRAY note. I could declare short, but I have no idea what impact
87 * does it have on performance on none-T3E machines. I could declare
88 * int, but at least on C90 sizeof(int) can be chosen at compile time.
89 * So I've chosen long...
90 *
91 */
92 #else
93 #define MD5_LONG unsigned int
94 #endif

96 #define MD5_CBLOCK 64
97 #define MD5_LBLOCK (MD5_CBLOCK/4)
98 #define MD5_DIGEST_LENGTH 16

100 typedef struct MD5state_st
101 {
102     MD5_LONG A,B,C,D;
103     MD5_LONG Nl,Nh;
104     MD5_LONG data[MD5_LBLOCK];
105     unsigned int num;
106     } MD5_CTX;

108 #ifdef OPENSSL_FIPS
109 int private_MD5_Init(MD5_CTX *c);
110 #endif
111 int MD5_Init(MD5_CTX *c);
112 int MD5_Update(MD5_CTX *c, const void *data, size_t len);
113 int MD5_Final(unsigned char *md, MD5_CTX *c);
114 unsigned char *MD5(const unsigned char *d, size_t n, unsigned char *md);
115 void MD5_Transform(MD5_CTX *c, const unsigned char *b);
116 #ifdef __cplusplus
117 }
118 #endif

120 #endif
```



```

*****
5619 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/modes.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
3  *
4  * Rights for redistribution and usage in source and binary
5  * forms are granted according to the OpenSSL license.
6  */

8 #include <stddef.h>

10 typedef void (*block128_f)(const unsigned char in[16],
11                             unsigned char out[16],
12                             const void *key);

14 typedef void (*cbc128_f)(const unsigned char *in, unsigned char *out,
15                             size_t len, const void *key,
16                             unsigned char ivec[16], int enc);

18 typedef void (*ctr128_f)(const unsigned char *in, unsigned char *out,
19                             size_t blocks, const void *key,
20                             const unsigned char ivec[16]);

22 typedef void (*ccm128_f)(const unsigned char *in, unsigned char *out,
23                             size_t blocks, const void *key,
24                             const unsigned char ivec[16], unsigned char cmac[16]);

26 void CRYPTO_cbc128_encrypt(const unsigned char *in, unsigned char *out,
27                             size_t len, const void *key,
28                             unsigned char ivec[16], block128_f block);
29 void CRYPTO_cbc128_decrypt(const unsigned char *in, unsigned char *out,
30                             size_t len, const void *key,
31                             unsigned char ivec[16], block128_f block);

33 void CRYPTO_ctr128_encrypt(const unsigned char *in, unsigned char *out,
34                             size_t len, const void *key,
35                             unsigned char ivec[16], unsigned char ecount_buf[16],
36                             unsigned int *num, block128_f block);

38 void CRYPTO_ctr128_encrypt_ctr32(const unsigned char *in, unsigned char *out,
39                             size_t len, const void *key,
40                             unsigned char ivec[16], unsigned char ecount_buf[16],
41                             unsigned int *num, ctr128_f ctr);

43 void CRYPTO_ofb128_encrypt(const unsigned char *in, unsigned char *out,
44                             size_t len, const void *key,
45                             unsigned char ivec[16], int *num,
46                             block128_f block);

48 void CRYPTO_cfb128_encrypt(const unsigned char *in, unsigned char *out,
49                             size_t len, const void *key,
50                             unsigned char ivec[16], int *num,
51                             int enc, block128_f block);
52 void CRYPTO_cfb128_8_encrypt(const unsigned char *in, unsigned char *out,
53                             size_t length, const void *key,
54                             unsigned char ivec[16], int *num,
55                             int enc, block128_f block);
56 void CRYPTO_cfb128_1_encrypt(const unsigned char *in, unsigned char *out,
57                             size_t bits, const void *key,
58                             unsigned char ivec[16], int *num,
59                             int enc, block128_f block);

61 size_t CRYPTO_cts128_encrypt_block(const unsigned char *in, unsigned char *out,

```

```

62         size_t len, const void *key,
63         unsigned char ivec[16], block128_f block);
64 size_t CRYPTO_cts128_encrypt(const unsigned char *in, unsigned char *out,
65                             size_t len, const void *key,
66                             unsigned char ivec[16], cbc128_f cbc);
67 size_t CRYPTO_cts128_decrypt_block(const unsigned char *in, unsigned char *out,
68                                     size_t len, const void *key,
69                                     unsigned char ivec[16], block128_f block);
70 size_t CRYPTO_cts128_decrypt(const unsigned char *in, unsigned char *out,
71                             size_t len, const void *key,
72                             unsigned char ivec[16], cbc128_f cbc);

74 size_t CRYPTO_nistcts128_encrypt_block(const unsigned char *in, unsigned char *o
75                                     size_t len, const void *key,
76                                     unsigned char ivec[16], block128_f block);
77 size_t CRYPTO_nistcts128_encrypt(const unsigned char *in, unsigned char *out,
78                                     size_t len, const void *key,
79                                     unsigned char ivec[16], cbc128_f cbc);
80 size_t CRYPTO_nistcts128_decrypt_block(const unsigned char *in, unsigned char *o
81                                     size_t len, const void *key,
82                                     unsigned char ivec[16], block128_f block);
83 size_t CRYPTO_nistcts128_decrypt(const unsigned char *in, unsigned char *out,
84                                     size_t len, const void *key,
85                                     unsigned char ivec[16], cbc128_f cbc);

87 typedef struct gcm128_context GCM128_CONTEXT;

89 GCM128_CONTEXT *CRYPTO_gcm128_new(void *key, block128_f block);
90 void CRYPTO_gcm128_init(GCM128_CONTEXT *ctx, void *key, block128_f block);
91 void CRYPTO_gcm128_setiv(GCM128_CONTEXT *ctx, const unsigned char *iv,
92                             size_t len);
93 int CRYPTO_gcm128_aad(GCM128_CONTEXT *ctx, const unsigned char *aad,
94                             size_t len);
95 int CRYPTO_gcm128_encrypt(GCM128_CONTEXT *ctx,
96                             const unsigned char *in, unsigned char *out,
97                             size_t len);
98 int CRYPTO_gcm128_decrypt(GCM128_CONTEXT *ctx,
99                             const unsigned char *in, unsigned char *out,
100                             size_t len);
101 int CRYPTO_gcm128_encrypt_ctr32(GCM128_CONTEXT *ctx,
102                                 const unsigned char *in, unsigned char *out,
103                                 size_t len, ctr128_f stream);
104 int CRYPTO_gcm128_decrypt_ctr32(GCM128_CONTEXT *ctx,
105                                 const unsigned char *in, unsigned char *out,
106                                 size_t len, ctr128_f stream);
107 int CRYPTO_gcm128_finish(GCM128_CONTEXT *ctx, const unsigned char *tag,
108                             size_t len);
109 void CRYPTO_gcm128_tag(GCM128_CONTEXT *ctx, unsigned char *tag, size_t len);
110 void CRYPTO_gcm128_release(GCM128_CONTEXT *ctx);

112 typedef struct ccm128_context CCM128_CONTEXT;

114 void CRYPTO_ccm128_init(CCM128_CONTEXT *ctx,
115                             unsigned int M, unsigned int L, void *key, block128_f block);
116 int CRYPTO_ccm128_setiv(CCM128_CONTEXT *ctx,
117                             const unsigned char *nonce, size_t nlen, size_t mlen);
118 void CRYPTO_ccm128_aad(CCM128_CONTEXT *ctx,
119                             const unsigned char *aad, size_t alen);
120 int CRYPTO_ccm128_encrypt(CCM128_CONTEXT *ctx,
121                             const unsigned char *inp, unsigned char *out, size_t len);
122 int CRYPTO_ccm128_decrypt(CCM128_CONTEXT *ctx,
123                             const unsigned char *inp, unsigned char *out, size_t len);
124 int CRYPTO_ccm128_encrypt_ccm64(CCM128_CONTEXT *ctx,
125                                 const unsigned char *inp, unsigned char *out, size_t len,
126                                 ccm128_f stream);
127 int CRYPTO_ccm128_decrypt_ccm64(CCM128_CONTEXT *ctx,

```

new/usr/src/lib/openssl/include/openssl/modes.h

3

```
128     const unsigned char *inp, unsigned char *out, size_t len,  
129     ccm128_f stream);  
130 size_t CRYPTO_ccm128_tag(CCM128_CONTEXT *ctx, unsigned char *tag, size_t len);  
  
132 typedef struct xts128_context XTS128_CONTEXT;  
  
134 int CRYPTO_xts128_encrypt(const XTS128_CONTEXT *ctx, const unsigned char iv[16],  
135     const unsigned char *inp, unsigned char *out, size_t len, int enc);
```

new/usr/src/lib/openssl/include/openssl/obj_mac.h

1

```
*****
136214 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/obj_mac.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/objects/obj_mac.h */

3 /* THIS FILE IS GENERATED FROM objects.txt by objects.pl via the
4 * following command:
5 * perl objects.pl objects.txt obj_mac.num obj_mac.h
6 */

8 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
9 * All rights reserved.
10 *
11 * This package is an SSL implementation written
12 * by Eric Young (eay@cryptsoft.com).
13 * The implementation was written so as to conform with Netscapes SSL.
14 *
15 * This library is free for commercial and non-commercial use as long as
16 * the following conditions are aheared to. The following conditions
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18 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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20 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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27 * in documentation (online or textual) provided with the package.
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30 * modification, are permitted provided that the following conditions
31 * are met:
32 * 1. Redistributions of source code must retain the copyright
33 * notice, this list of conditions and the following disclaimer.
34 * 2. Redistributions in binary form must reproduce the above copyright
35 * notice, this list of conditions and the following disclaimer in the
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37 * 3. All advertising materials mentioning features or use of this software
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```

new/usr/src/lib/openssl/include/openssl/obj_mac.h

2

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62 * [including the GNU Public Licence.]
63 */

65 #define SN_undef "UNDEF"
66 #define LN_undef "undefined"
67 #define NID_undef 0
68 #define OBJ_undef 0L

70 #define SN_itu_t "ITU-T"
71 #define LN_itu_t "itu-t"
72 #define NID_itu_t 645
73 #define OBJ_itu_t 0L

75 #define NID_ccitt 404
76 #define OBJ_ccitt OBJ_itu_t

78 #define SN_iso "ISO"
79 #define LN_iso "iso"
80 #define NID_iso 181
81 #define OBJ_iso 1L

83 #define SN_joint_iso_itu_t "JOINT-ISO-ITU-T"
84 #define LN_joint_iso_itu_t "joint-iso-itu-t"
85 #define NID_joint_iso_itu_t 646
86 #define OBJ_joint_iso_itu_t 2L

88 #define NID_joint_iso_ccitt 393
89 #define OBJ_joint_iso_ccitt OBJ_joint_iso_itu_t

91 #define SN_member_body "member-body"
92 #define LN_member_body "ISO Member Body"
93 #define NID_member_body 182
94 #define OBJ_member_body OBJ_iso,2L

96 #define SN_identified_organization "identified-organization"
97 #define NID_identified_organization 676
98 #define OBJ_identified_organization OBJ_iso,3L

100 #define SN_hmac_md5 "HMAC-MD5"
101 #define LN_hmac_md5 "hmac-md5"
102 #define NID_hmac_md5 780
103 #define OBJ_hmac_md5 OBJ_identified_organization,6L,1L,5L,5L,8L,1L,1L

105 #define SN_hmac_sha1 "HMAC-SHA1"
106 #define LN_hmac_sha1 "hmac-sha1"
107 #define NID_hmac_sha1 781
108 #define OBJ_hmac_sha1 OBJ_identified_organization,6L,1L,5L,5L,8L,1L,2L

110 #define SN_certicom_arc "certicom-arc"
111 #define NID_certicom_arc 677
112 #define OBJ_certicom_arc OBJ_identified_organization,132L

114 #define SN_international_organizations "international-organizations"
115 #define LN_international_organizations "International Organizations"
116 #define NID_international_organizations 647
117 #define OBJ_international_organizations OBJ_joint_iso_itu_t,23L

119 #define SN_wap "wap"
120 #define NID_wap 678
121 #define OBJ_wap OBJ_international_organizations,43L

123 #define SN_wap_wsg "wap-wsg"
124 #define NID_wap_wsg 679
125 #define OBJ_wap_wsg OBJ_wap,1L

127 #define SN_selected_attribute_types "selected-attribute-types"
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128 #define LN_selected_attribute_types      "Selected Attribute Types"
129 #define NID_selected_attribute_types     394
130 #define OBJ_selected_attribute_types     OBJ_joint_iso_itu_t, 5L, 1L, 5L

132 #define SN_clearance                     "clearance"
133 #define NID_clearance                     395
134 #define OBJ_clearance                     OBJ_selected_attribute_types, 55L

136 #define SN_ISO_US                        "ISO-US"
137 #define LN_ISO_US                        "ISO US Member Body"
138 #define NID_ISO_US                       183
139 #define OBJ_ISO_US                       OBJ_member_body, 840L

141 #define SN_X9_57                         "X9-57"
142 #define LN_X9_57                         "X9.57"
143 #define NID_X9_57                        184
144 #define OBJ_X9_57                        OBJ_ISO_US, 10040L

146 #define SN_X9cm                         "X9cm"
147 #define LN_X9cm                         "X9.57 CM ?"
148 #define NID_X9cm                         185
149 #define OBJ_X9cm                         OBJ_X9_57, 4L

151 #define SN_dsa                           "DSA"
152 #define LN_dsa                           "dsaEncryption"
153 #define NID_dsa                           116
154 #define OBJ_dsa                           OBJ_X9cm, 1L

156 #define SN_dsaWithSHA1                   "DSA-SHA1"
157 #define LN_dsaWithSHA1                   "dsaWithSHA1"
158 #define NID_dsaWithSHA1                   113
159 #define OBJ_dsaWithSHA1                   OBJ_X9cm, 3L

161 #define SN_ansi_X9_62                    "ansi-X9-62"
162 #define LN_ansi_X9_62                    "ANSI X9.62"
163 #define NID_ansi_X9_62                    405
164 #define OBJ_ansi_X9_62                    OBJ_ISO_US, 10045L

166 #define OBJ_X9_62_id_fieldType            OBJ_ansi_X9_62, 1L

168 #define SN_X9_62_prime_field              "prime-field"
169 #define NID_X9_62_prime_field              406
170 #define OBJ_X9_62_prime_field              OBJ_X9_62_id_fieldType, 1L

172 #define SN_X9_62_characteristic_two_field "characteristic-two-fiel
173 #define NID_X9_62_characteristic_two_field 407
174 #define OBJ_X9_62_characteristic_two_field OBJ_X9_62_id_fieldType, 2

176 #define SN_X9_62_id_characteristic_two_basis "id-characteristic-two-b
177 #define NID_X9_62_id_characteristic_two_basis 680
178 #define OBJ_X9_62_id_characteristic_two_basis OBJ_X9_62_characteristic

180 #define SN_X9_62_onBasis                  "onBasis"
181 #define NID_X9_62_onBasis                  681
182 #define OBJ_X9_62_onBasis                  OBJ_X9_62_id_characteristic_two_basis, 1L

184 #define SN_X9_62_tpBasis                  "tpBasis"
185 #define NID_X9_62_tpBasis                  682
186 #define OBJ_X9_62_tpBasis                  OBJ_X9_62_id_characteristic_two_basis, 2L

188 #define SN_X9_62_ppBasis                  "ppBasis"
189 #define NID_X9_62_ppBasis                  683
190 #define OBJ_X9_62_ppBasis                  OBJ_X9_62_id_characteristic_two_basis, 3L

192 #define OBJ_X9_62_id_publicKeyType        OBJ_ansi_X9_62, 2L

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194 #define SN_X9_62_id_ecPublicKey          "id-ecPublicKey"
195 #define NID_X9_62_id_ecPublicKey          408
196 #define OBJ_X9_62_id_ecPublicKey          OBJ_X9_62_id_publicKeyType, 1L

198 #define OBJ_X9_62_ellipticCurve           OBJ_ansi_X9_62, 3L

200 #define OBJ_X9_62_c_TwoCurve              OBJ_X9_62_ellipticCurve, 0L

202 #define SN_X9_62_c2pnb163v1              "c2pnb163v1"
203 #define NID_X9_62_c2pnb163v1              684
204 #define OBJ_X9_62_c2pnb163v1              OBJ_X9_62_c_TwoCurve, 1L

206 #define SN_X9_62_c2pnb163v2              "c2pnb163v2"
207 #define NID_X9_62_c2pnb163v2              685
208 #define OBJ_X9_62_c2pnb163v2              OBJ_X9_62_c_TwoCurve, 2L

210 #define SN_X9_62_c2pnb163v3              "c2pnb163v3"
211 #define NID_X9_62_c2pnb163v3              686
212 #define OBJ_X9_62_c2pnb163v3              OBJ_X9_62_c_TwoCurve, 3L

214 #define SN_X9_62_c2pnb176v1              "c2pnb176v1"
215 #define NID_X9_62_c2pnb176v1              687
216 #define OBJ_X9_62_c2pnb176v1              OBJ_X9_62_c_TwoCurve, 4L

218 #define SN_X9_62_c2tnb191v1              "c2tnb191v1"
219 #define NID_X9_62_c2tnb191v1              688
220 #define OBJ_X9_62_c2tnb191v1              OBJ_X9_62_c_TwoCurve, 5L

222 #define SN_X9_62_c2tnb191v2              "c2tnb191v2"
223 #define NID_X9_62_c2tnb191v2              689
224 #define OBJ_X9_62_c2tnb191v2              OBJ_X9_62_c_TwoCurve, 6L

226 #define SN_X9_62_c2tnb191v3              "c2tnb191v3"
227 #define NID_X9_62_c2tnb191v3              690
228 #define OBJ_X9_62_c2tnb191v3              OBJ_X9_62_c_TwoCurve, 7L

230 #define SN_X9_62_c2onb191v4              "c2onb191v4"
231 #define NID_X9_62_c2onb191v4              691
232 #define OBJ_X9_62_c2onb191v4              OBJ_X9_62_c_TwoCurve, 8L

234 #define SN_X9_62_c2onb191v5              "c2onb191v5"
235 #define NID_X9_62_c2onb191v5              692
236 #define OBJ_X9_62_c2onb191v5              OBJ_X9_62_c_TwoCurve, 9L

238 #define SN_X9_62_c2pnb208w1              "c2pnb208w1"
239 #define NID_X9_62_c2pnb208w1              693
240 #define OBJ_X9_62_c2pnb208w1              OBJ_X9_62_c_TwoCurve, 10L

242 #define SN_X9_62_c2tnb239v1              "c2tnb239v1"
243 #define NID_X9_62_c2tnb239v1              694
244 #define OBJ_X9_62_c2tnb239v1              OBJ_X9_62_c_TwoCurve, 11L

246 #define SN_X9_62_c2tnb239v2              "c2tnb239v2"
247 #define NID_X9_62_c2tnb239v2              695
248 #define OBJ_X9_62_c2tnb239v2              OBJ_X9_62_c_TwoCurve, 12L

250 #define SN_X9_62_c2tnb239v3              "c2tnb239v3"
251 #define NID_X9_62_c2tnb239v3              696
252 #define OBJ_X9_62_c2tnb239v3              OBJ_X9_62_c_TwoCurve, 13L

254 #define SN_X9_62_c2onb239v4              "c2onb239v4"
255 #define NID_X9_62_c2onb239v4              697
256 #define OBJ_X9_62_c2onb239v4              OBJ_X9_62_c_TwoCurve, 14L

258 #define SN_X9_62_c2onb239v5              "c2onb239v5"
259 #define NID_X9_62_c2onb239v5              698

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260 #define OBJ_X9_62_c2onb239v5      OBJ_X9_62_c_TwoCurve,15L
262 #define SN_X9_62_c2pnb272w1        "c2pnb272w1"
263 #define NID_X9_62_c2pnb272w1        699
264 #define OBJ_X9_62_c2pnb272w1        OBJ_X9_62_c_TwoCurve,16L
266 #define SN_X9_62_c2pnb304w1        "c2pnb304w1"
267 #define NID_X9_62_c2pnb304w1        700
268 #define OBJ_X9_62_c2pnb304w1        OBJ_X9_62_c_TwoCurve,17L
270 #define SN_X9_62_c2tnb359v1        "c2tnb359v1"
271 #define NID_X9_62_c2tnb359v1        701
272 #define OBJ_X9_62_c2tnb359v1        OBJ_X9_62_c_TwoCurve,18L
274 #define SN_X9_62_c2pnb368w1        "c2pnb368w1"
275 #define NID_X9_62_c2pnb368w1        702
276 #define OBJ_X9_62_c2pnb368w1        OBJ_X9_62_c_TwoCurve,19L
278 #define SN_X9_62_c2tnb431r1        "c2tnb431r1"
279 #define NID_X9_62_c2tnb431r1        703
280 #define OBJ_X9_62_c2tnb431r1        OBJ_X9_62_c_TwoCurve,20L
282 #define OBJ_X9_62_primeCurve        OBJ_X9_62_ellipticCurve,1L
284 #define SN_X9_62_prime192v1        "prime192v1"
285 #define NID_X9_62_prime192v1        409
286 #define OBJ_X9_62_prime192v1        OBJ_X9_62_primeCurve,1L
288 #define SN_X9_62_prime192v2        "prime192v2"
289 #define NID_X9_62_prime192v2        410
290 #define OBJ_X9_62_prime192v2        OBJ_X9_62_primeCurve,2L
292 #define SN_X9_62_prime192v3        "prime192v3"
293 #define NID_X9_62_prime192v3        411
294 #define OBJ_X9_62_prime192v3        OBJ_X9_62_primeCurve,3L
296 #define SN_X9_62_prime239v1        "prime239v1"
297 #define NID_X9_62_prime239v1        412
298 #define OBJ_X9_62_prime239v1        OBJ_X9_62_primeCurve,4L
300 #define SN_X9_62_prime239v2        "prime239v2"
301 #define NID_X9_62_prime239v2        413
302 #define OBJ_X9_62_prime239v2        OBJ_X9_62_primeCurve,5L
304 #define SN_X9_62_prime239v3        "prime239v3"
305 #define NID_X9_62_prime239v3        414
306 #define OBJ_X9_62_prime239v3        OBJ_X9_62_primeCurve,6L
308 #define SN_X9_62_prime256v1        "prime256v1"
309 #define NID_X9_62_prime256v1        415
310 #define OBJ_X9_62_prime256v1        OBJ_X9_62_primeCurve,7L
312 #define OBJ_X9_62_id_ecSigType      OBJ_ansi_X9_62,4L
314 #define SN_ecdsa_with_SHA1          "ecdsa-with-SHA1"
315 #define NID_ecdsa_with_SHA1          416
316 #define OBJ_ecdsa_with_SHA1          OBJ_X9_62_id_ecSigType,1L
318 #define SN_ecdsa_with_Recommended    "ecdsa-with-Recommended"
319 #define NID_ecdsa_with_Recommended    791
320 #define OBJ_ecdsa_with_Recommended    OBJ_X9_62_id_ecSigType,2L
322 #define SN_ecdsa_with_Specified      "ecdsa-with-Specified"
323 #define NID_ecdsa_with_Specified      792
324 #define OBJ_ecdsa_with_Specified      OBJ_X9_62_id_ecSigType,3L

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326 #define SN_ecdsa_with_SHA224        "ecdsa-with-SHA224"
327 #define NID_ecdsa_with_SHA224        793
328 #define OBJ_ecdsa_with_SHA224        OBJ_ecdsa_with_Specified,1L
330 #define SN_ecdsa_with_SHA256        "ecdsa-with-SHA256"
331 #define NID_ecdsa_with_SHA256        794
332 #define OBJ_ecdsa_with_SHA256        OBJ_ecdsa_with_Specified,2L
334 #define SN_ecdsa_with_SHA384        "ecdsa-with-SHA384"
335 #define NID_ecdsa_with_SHA384        795
336 #define OBJ_ecdsa_with_SHA384        OBJ_ecdsa_with_Specified,3L
338 #define SN_ecdsa_with_SHA512        "ecdsa-with-SHA512"
339 #define NID_ecdsa_with_SHA512        796
340 #define OBJ_ecdsa_with_SHA512        OBJ_ecdsa_with_Specified,4L
342 #define OBJ_secg_ellipticCurve        OBJ_certicom_arc,0L
344 #define SN_secp112r1                "secp112r1"
345 #define NID_secp112r1                704
346 #define OBJ_secp112r1                OBJ_secg_ellipticCurve,6L
348 #define SN_secp112r2                "secp112r2"
349 #define NID_secp112r2                705
350 #define OBJ_secp112r2                OBJ_secg_ellipticCurve,7L
352 #define SN_secp128r1                "secp128r1"
353 #define NID_secp128r1                706
354 #define OBJ_secp128r1                OBJ_secg_ellipticCurve,28L
356 #define SN_secp128r2                "secp128r2"
357 #define NID_secp128r2                707
358 #define OBJ_secp128r2                OBJ_secg_ellipticCurve,29L
360 #define SN_secp160k1                "secp160k1"
361 #define NID_secp160k1                708
362 #define OBJ_secp160k1                OBJ_secg_ellipticCurve,9L
364 #define SN_secp160r1                "secp160r1"
365 #define NID_secp160r1                709
366 #define OBJ_secp160r1                OBJ_secg_ellipticCurve,8L
368 #define SN_secp160r2                "secp160r2"
369 #define NID_secp160r2                710
370 #define OBJ_secp160r2                OBJ_secg_ellipticCurve,30L
372 #define SN_secp192k1                "secp192k1"
373 #define NID_secp192k1                711
374 #define OBJ_secp192k1                OBJ_secg_ellipticCurve,31L
376 #define SN_secp224k1                "secp224k1"
377 #define NID_secp224k1                712
378 #define OBJ_secp224k1                OBJ_secg_ellipticCurve,32L
380 #define SN_secp224r1                "secp224r1"
381 #define NID_secp224r1                713
382 #define OBJ_secp224r1                OBJ_secg_ellipticCurve,33L
384 #define SN_secp256k1                "secp256k1"
385 #define NID_secp256k1                714
386 #define OBJ_secp256k1                OBJ_secg_ellipticCurve,10L
388 #define SN_secp384r1                "secp384r1"
389 #define NID_secp384r1                715
390 #define OBJ_secp384r1                OBJ_secg_ellipticCurve,34L

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392 #define SN_secp521r1 "secp521r1"
393 #define NID_secp521r1 716
394 #define OBJ_secp521r1 OBJ_secg_ellipticCurve, 35L

396 #define SN_sect113r1 "sect113r1"
397 #define NID_sect113r1 717
398 #define OBJ_sect113r1 OBJ_secg_ellipticCurve, 4L

400 #define SN_sect113r2 "sect113r2"
401 #define NID_sect113r2 718
402 #define OBJ_sect113r2 OBJ_secg_ellipticCurve, 5L

404 #define SN_sect131r1 "sect131r1"
405 #define NID_sect131r1 719
406 #define OBJ_sect131r1 OBJ_secg_ellipticCurve, 22L

408 #define SN_sect131r2 "sect131r2"
409 #define NID_sect131r2 720
410 #define OBJ_sect131r2 OBJ_secg_ellipticCurve, 23L

412 #define SN_sect163k1 "sect163k1"
413 #define NID_sect163k1 721
414 #define OBJ_sect163k1 OBJ_secg_ellipticCurve, 1L

416 #define SN_sect163r1 "sect163r1"
417 #define NID_sect163r1 722
418 #define OBJ_sect163r1 OBJ_secg_ellipticCurve, 2L

420 #define SN_sect163r2 "sect163r2"
421 #define NID_sect163r2 723
422 #define OBJ_sect163r2 OBJ_secg_ellipticCurve, 15L

424 #define SN_sect193r1 "sect193r1"
425 #define NID_sect193r1 724
426 #define OBJ_sect193r1 OBJ_secg_ellipticCurve, 24L

428 #define SN_sect193r2 "sect193r2"
429 #define NID_sect193r2 725
430 #define OBJ_sect193r2 OBJ_secg_ellipticCurve, 25L

432 #define SN_sect233k1 "sect233k1"
433 #define NID_sect233k1 726
434 #define OBJ_sect233k1 OBJ_secg_ellipticCurve, 26L

436 #define SN_sect233r1 "sect233r1"
437 #define NID_sect233r1 727
438 #define OBJ_sect233r1 OBJ_secg_ellipticCurve, 27L

440 #define SN_sect239k1 "sect239k1"
441 #define NID_sect239k1 728
442 #define OBJ_sect239k1 OBJ_secg_ellipticCurve, 3L

444 #define SN_sect283k1 "sect283k1"
445 #define NID_sect283k1 729
446 #define OBJ_sect283k1 OBJ_secg_ellipticCurve, 16L

448 #define SN_sect283r1 "sect283r1"
449 #define NID_sect283r1 730
450 #define OBJ_sect283r1 OBJ_secg_ellipticCurve, 17L

452 #define SN_sect409k1 "sect409k1"
453 #define NID_sect409k1 731
454 #define OBJ_sect409k1 OBJ_secg_ellipticCurve, 36L

456 #define SN_sect409r1 "sect409r1"
457 #define NID_sect409r1 732
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458 #define OBJ_sect409r1 OBJ_secg_ellipticCurve, 37L

460 #define SN_sect571k1 "sect571k1"
461 #define NID_sect571k1 733
462 #define OBJ_sect571k1 OBJ_secg_ellipticCurve, 38L

464 #define SN_sect571r1 "sect571r1"
465 #define NID_sect571r1 734
466 #define OBJ_sect571r1 OBJ_secg_ellipticCurve, 39L

468 #define OBJ_wap_wsg_idm_ecid OBJ_wap_wsg, 4L

470 #define SN_wap_wsg_idm_ecid_wtls1 "wap-wsg-idm-ecid-wtls1"
471 #define NID_wap_wsg_idm_ecid_wtls1 735
472 #define OBJ_wap_wsg_idm_ecid_wtls1 OBJ_wap_wsg_idm_ecid, 1L

474 #define SN_wap_wsg_idm_ecid_wtls3 "wap-wsg-idm-ecid-wtls3"
475 #define NID_wap_wsg_idm_ecid_wtls3 736
476 #define OBJ_wap_wsg_idm_ecid_wtls3 OBJ_wap_wsg_idm_ecid, 3L

478 #define SN_wap_wsg_idm_ecid_wtls4 "wap-wsg-idm-ecid-wtls4"
479 #define NID_wap_wsg_idm_ecid_wtls4 737
480 #define OBJ_wap_wsg_idm_ecid_wtls4 OBJ_wap_wsg_idm_ecid, 4L

482 #define SN_wap_wsg_idm_ecid_wtls5 "wap-wsg-idm-ecid-wtls5"
483 #define NID_wap_wsg_idm_ecid_wtls5 738
484 #define OBJ_wap_wsg_idm_ecid_wtls5 OBJ_wap_wsg_idm_ecid, 5L

486 #define SN_wap_wsg_idm_ecid_wtls6 "wap-wsg-idm-ecid-wtls6"
487 #define NID_wap_wsg_idm_ecid_wtls6 739
488 #define OBJ_wap_wsg_idm_ecid_wtls6 OBJ_wap_wsg_idm_ecid, 6L

490 #define SN_wap_wsg_idm_ecid_wtls7 "wap-wsg-idm-ecid-wtls7"
491 #define NID_wap_wsg_idm_ecid_wtls7 740
492 #define OBJ_wap_wsg_idm_ecid_wtls7 OBJ_wap_wsg_idm_ecid, 7L

494 #define SN_wap_wsg_idm_ecid_wtls8 "wap-wsg-idm-ecid-wtls8"
495 #define NID_wap_wsg_idm_ecid_wtls8 741
496 #define OBJ_wap_wsg_idm_ecid_wtls8 OBJ_wap_wsg_idm_ecid, 8L

498 #define SN_wap_wsg_idm_ecid_wtls9 "wap-wsg-idm-ecid-wtls9"
499 #define NID_wap_wsg_idm_ecid_wtls9 742
500 #define OBJ_wap_wsg_idm_ecid_wtls9 OBJ_wap_wsg_idm_ecid, 9L

502 #define SN_wap_wsg_idm_ecid_wtls10 "wap-wsg-idm-ecid-wtls10"
503 #define NID_wap_wsg_idm_ecid_wtls10 743
504 #define OBJ_wap_wsg_idm_ecid_wtls10 OBJ_wap_wsg_idm_ecid, 10L

506 #define SN_wap_wsg_idm_ecid_wtls11 "wap-wsg-idm-ecid-wtls11"
507 #define NID_wap_wsg_idm_ecid_wtls11 744
508 #define OBJ_wap_wsg_idm_ecid_wtls11 OBJ_wap_wsg_idm_ecid, 11L

510 #define SN_wap_wsg_idm_ecid_wtls12 "wap-wsg-idm-ecid-wtls12"
511 #define NID_wap_wsg_idm_ecid_wtls12 745
512 #define OBJ_wap_wsg_idm_ecid_wtls12 OBJ_wap_wsg_idm_ecid, 12L

514 #define SN_cast5_cbc "CAST5-CBC"
515 #define LN_cast5_cbc "cast5-cbc"
516 #define NID_cast5_cbc 108
517 #define OBJ_cast5_cbc OBJ_ISO_US, 113533L, 7L, 66L, 10L

519 #define SN_cast5_ecb "CAST5-ECB"
520 #define LN_cast5_ecb "cast5-ecb"
521 #define NID_cast5_ecb 109

523 #define SN_cast5_cfb64 "CAST5-CFB"
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524 #define LN_cast5_cfb64      "cast5-cfb"
525 #define NID_cast5_cfb64     110

527 #define SN_cast5_ofb64      "CAST5-OFB"
528 #define LN_cast5_ofb64     "cast5-ofb"
529 #define NID_cast5_ofb64     111

531 #define LN_pbeWithMD5AndCast5_CBC      "pbeWithMD5AndCast5CBC"
532 #define NID_pbeWithMD5AndCast5_CBC     112
533 #define OBJ_pbeWithMD5AndCast5_CBC     OBJ_ISO_US, 113533L, 7L, 66L, 12L

535 #define SN_id_PasswordBasedMAC      "id-PasswordBasedMAC"
536 #define LN_id_PasswordBasedMAC     "password based MAC"
537 #define NID_id_PasswordBasedMAC     782
538 #define OBJ_id_PasswordBasedMAC     OBJ_ISO_US, 113533L, 7L, 66L, 13L

540 #define SN_id_DHBasedMac      "id-DHBasedMac"
541 #define LN_id_DHBasedMac     "Diffie-Hellman based MAC"
542 #define NID_id_DHBasedMac     783
543 #define OBJ_id_DHBasedMac     OBJ_ISO_US, 113533L, 7L, 66L, 30L

545 #define SN_rsadsi      "rsadsi"
546 #define LN_rsadsi     "RSA Data Security, Inc."
547 #define NID_rsadsi    1
548 #define OBJ_rsadsi    OBJ_ISO_US, 113549L

550 #define SN_pkcs      "pkcs"
551 #define LN_pkcs     "RSA Data Security, Inc. PKCS"
552 #define NID_pkcs    2
553 #define OBJ_pkcs    OBJ_rsadsi, 1L

555 #define SN_pkcs1      "pkcs1"
556 #define NID_pkcs1     186
557 #define OBJ_pkcs1     OBJ_pkcs, 1L

559 #define LN_rsaEncryption      "rsaEncryption"
560 #define NID_rsaEncryption     6
561 #define OBJ_rsaEncryption     OBJ_pkcs1, 1L

563 #define SN_md2WithRSAEncryption      "RSA-MD2"
564 #define LN_md2WithRSAEncryption     "md2WithRSAEncryption"
565 #define NID_md2WithRSAEncryption     7
566 #define OBJ_md2WithRSAEncryption     OBJ_pkcs1, 2L

568 #define SN_md4WithRSAEncryption      "RSA-MD4"
569 #define LN_md4WithRSAEncryption     "md4WithRSAEncryption"
570 #define NID_md4WithRSAEncryption     396
571 #define OBJ_md4WithRSAEncryption     OBJ_pkcs1, 3L

573 #define SN_md5WithRSAEncryption      "RSA-MD5"
574 #define LN_md5WithRSAEncryption     "md5WithRSAEncryption"
575 #define NID_md5WithRSAEncryption     8
576 #define OBJ_md5WithRSAEncryption     OBJ_pkcs1, 4L

578 #define SN_sha1WithRSAEncryption      "RSA-SHA1"
579 #define LN_sha1WithRSAEncryption     "sha1WithRSAEncryption"
580 #define NID_sha1WithRSAEncryption     65
581 #define OBJ_sha1WithRSAEncryption     OBJ_pkcs1, 5L

583 #define SN_rsaesOaep      "RSAES-OAEP"
584 #define LN_rsaesOaep     "rsaesOaep"
585 #define NID_rsaesOaep     919
586 #define OBJ_rsaesOaep     OBJ_pkcs1, 7L

588 #define SN_mgf1      "MGF1"
589 #define LN_mgf1     "mgf1"

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590 #define NID_mgf1      911
591 #define OBJ_mgf1     OBJ_pkcs1, 8L

593 #define SN_rsassaPss      "RSASSA-PSS"
594 #define LN_rsassaPss     "rsassaPss"
595 #define NID_rsassaPss     912
596 #define OBJ_rsassaPss     OBJ_pkcs1, 10L

598 #define SN_sha256WithRSAEncryption      "RSA-SHA256"
599 #define LN_sha256WithRSAEncryption     "sha256WithRSAEncryption"
600 #define NID_sha256WithRSAEncryption     668
601 #define OBJ_sha256WithRSAEncryption     OBJ_pkcs1, 11L

603 #define SN_sha384WithRSAEncryption      "RSA-SHA384"
604 #define LN_sha384WithRSAEncryption     "sha384WithRSAEncryption"
605 #define NID_sha384WithRSAEncryption     669
606 #define OBJ_sha384WithRSAEncryption     OBJ_pkcs1, 12L

608 #define SN_sha512WithRSAEncryption      "RSA-SHA512"
609 #define LN_sha512WithRSAEncryption     "sha512WithRSAEncryption"
610 #define NID_sha512WithRSAEncryption     670
611 #define OBJ_sha512WithRSAEncryption     OBJ_pkcs1, 13L

613 #define SN_sha224WithRSAEncryption      "RSA-SHA224"
614 #define LN_sha224WithRSAEncryption     "sha224WithRSAEncryption"
615 #define NID_sha224WithRSAEncryption     671
616 #define OBJ_sha224WithRSAEncryption     OBJ_pkcs1, 14L

618 #define SN_pkcs3      "pkcs3"
619 #define NID_pkcs3     27
620 #define OBJ_pkcs3     OBJ_pkcs, 3L

622 #define LN_dhKeyAgreement      "dhKeyAgreement"
623 #define NID_dhKeyAgreement     28
624 #define OBJ_dhKeyAgreement     OBJ_pkcs3, 1L

626 #define SN_pkcs5      "pkcs5"
627 #define NID_pkcs5     187
628 #define OBJ_pkcs5     OBJ_pkcs, 5L

630 #define SN_pbeWithMD2AndDES_CBC      "PBE-MD2-DES"
631 #define LN_pbeWithMD2AndDES_CBC     "pbeWithMD2AndDES-CBC"
632 #define NID_pbeWithMD2AndDES_CBC     9
633 #define OBJ_pbeWithMD2AndDES_CBC     OBJ_pkcs5, 1L

635 #define SN_pbeWithMD5AndDES_CBC      "PBE-MD5-DES"
636 #define LN_pbeWithMD5AndDES_CBC     "pbeWithMD5AndDES-CBC"
637 #define NID_pbeWithMD5AndDES_CBC     10
638 #define OBJ_pbeWithMD5AndDES_CBC     OBJ_pkcs5, 3L

640 #define SN_pbeWithMD2AndRC2_CBC      "PBE-MD2-RC2-64"
641 #define LN_pbeWithMD2AndRC2_CBC     "pbeWithMD2AndRC2-CBC"
642 #define NID_pbeWithMD2AndRC2_CBC     168
643 #define OBJ_pbeWithMD2AndRC2_CBC     OBJ_pkcs5, 4L

645 #define SN_pbeWithMD5AndRC2_CBC      "PBE-MD5-RC2-64"
646 #define LN_pbeWithMD5AndRC2_CBC     "pbeWithMD5AndRC2-CBC"
647 #define NID_pbeWithMD5AndRC2_CBC     169
648 #define OBJ_pbeWithMD5AndRC2_CBC     OBJ_pkcs5, 6L

650 #define SN_pbeWithSHA1AndDES_CBC      "PBE-SHA1-DES"
651 #define LN_pbeWithSHA1AndDES_CBC     "pbeWithSHA1AndDES-CBC"
652 #define NID_pbeWithSHA1AndDES_CBC     170
653 #define OBJ_pbeWithSHA1AndDES_CBC     OBJ_pkcs5, 10L

655 #define SN_pbeWithSHA1AndRC2_CBC      "PBE-SHA1-RC2-64"

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656 #define LN_pbewithSHA1AndRC2_CBC "pbewithSHA1AndRC2-CBC"
657 #define NID_pbewithSHA1AndRC2_CBC 68
658 #define OBJ_pbewithSHA1AndRC2_CBC OBJ_pkcs5, 11L

660 #define LN_id_pbkdf2 "PBKDF2"
661 #define NID_id_pbkdf2 69
662 #define OBJ_id_pbkdf2 OBJ_pkcs5, 12L

664 #define LN_pbes2 "PBES2"
665 #define NID_pbes2 161
666 #define OBJ_pbes2 OBJ_pkcs5, 13L

668 #define LN_pbmac1 "PBMAC1"
669 #define NID_pbmac1 162
670 #define OBJ_pbmac1 OBJ_pkcs5, 14L

672 #define SN_pkcs7 "pkcs7"
673 #define NID_pkcs7 20
674 #define OBJ_pkcs7 OBJ_pkcs, 7L

676 #define LN_pkcs7_data "pkcs7-data"
677 #define NID_pkcs7_data 21
678 #define OBJ_pkcs7_data OBJ_pkcs7, 1L

680 #define LN_pkcs7_signed "pkcs7-signedData"
681 #define NID_pkcs7_signed 22
682 #define OBJ_pkcs7_signed OBJ_pkcs7, 2L

684 #define LN_pkcs7_enveloped "pkcs7-envelopedData"
685 #define NID_pkcs7_enveloped 23
686 #define OBJ_pkcs7_enveloped OBJ_pkcs7, 3L

688 #define LN_pkcs7_signedAndEnveloped "pkcs7-signedAndEnvelopedData"
689 #define NID_pkcs7_signedAndEnveloped 24
690 #define OBJ_pkcs7_signedAndEnveloped OBJ_pkcs7, 4L

692 #define LN_pkcs7_digest "pkcs7-digestData"
693 #define NID_pkcs7_digest 25
694 #define OBJ_pkcs7_digest OBJ_pkcs7, 5L

696 #define LN_pkcs7_encrypted "pkcs7-encryptedData"
697 #define NID_pkcs7_encrypted 26
698 #define OBJ_pkcs7_encrypted OBJ_pkcs7, 6L

700 #define SN_pkcs9 "pkcs9"
701 #define NID_pkcs9 47
702 #define OBJ_pkcs9 OBJ_pkcs, 9L

704 #define LN_pkcs9_emailAddress "emailAddress"
705 #define NID_pkcs9_emailAddress 48
706 #define OBJ_pkcs9_emailAddress OBJ_pkcs9, 1L

708 #define LN_pkcs9_unstructuredName "unstructuredName"
709 #define NID_pkcs9_unstructuredName 49
710 #define OBJ_pkcs9_unstructuredName OBJ_pkcs9, 2L

712 #define LN_pkcs9_contentType "contentType"
713 #define NID_pkcs9_contentType 50
714 #define OBJ_pkcs9_contentType OBJ_pkcs9, 3L

716 #define LN_pkcs9_messageDigest "messageDigest"
717 #define NID_pkcs9_messageDigest 51
718 #define OBJ_pkcs9_messageDigest OBJ_pkcs9, 4L

720 #define LN_pkcs9_signingTime "signingTime"
721 #define NID_pkcs9_signingTime 52

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722 #define OBJ_pkcs9_signingTime OBJ_pkcs9, 5L

724 #define LN_pkcs9_countersignature "countersignature"
725 #define NID_pkcs9_countersignature 53
726 #define OBJ_pkcs9_countersignature OBJ_pkcs9, 6L

728 #define LN_pkcs9_challengePassword "challengePassword"
729 #define NID_pkcs9_challengePassword 54
730 #define OBJ_pkcs9_challengePassword OBJ_pkcs9, 7L

732 #define LN_pkcs9_unstructuredAddress "unstructuredAddress"
733 #define NID_pkcs9_unstructuredAddress 55
734 #define OBJ_pkcs9_unstructuredAddress OBJ_pkcs9, 8L

736 #define LN_pkcs9_extCertAttributes "extendedCertificateAttributes"
737 #define NID_pkcs9_extCertAttributes 56
738 #define OBJ_pkcs9_extCertAttributes OBJ_pkcs9, 9L

740 #define SN_ext_req "extReq"
741 #define LN_ext_req "Extension Request"
742 #define NID_ext_req 172
743 #define OBJ_ext_req OBJ_pkcs9, 14L

745 #define SN_SMIMECapabilities "SMIME-CAPS"
746 #define LN_SMIMECapabilities "S/MIME Capabilities"
747 #define NID_SMIMECapabilities 167
748 #define OBJ_SMIMECapabilities OBJ_pkcs9, 15L

750 #define SN_SMIME "SMIME"
751 #define LN_SMIME "S/MIME"
752 #define NID_SMIME 188
753 #define OBJ_SMIME OBJ_pkcs9, 16L

755 #define SN_id_smime_mod "id-smime-mod"
756 #define NID_id_smime_mod 189
757 #define OBJ_id_smime_mod OBJ_SMIME, 0L

759 #define SN_id_smime_ct "id-smime-ct"
760 #define NID_id_smime_ct 190
761 #define OBJ_id_smime_ct OBJ_SMIME, 1L

763 #define SN_id_smime_aa "id-smime-aa"
764 #define NID_id_smime_aa 191
765 #define OBJ_id_smime_aa OBJ_SMIME, 2L

767 #define SN_id_smime_alg "id-smime-alg"
768 #define NID_id_smime_alg 192
769 #define OBJ_id_smime_alg OBJ_SMIME, 3L

771 #define SN_id_smime_cd "id-smime-cd"
772 #define NID_id_smime_cd 193
773 #define OBJ_id_smime_cd OBJ_SMIME, 4L

775 #define SN_id_smime_spq "id-smime-spq"
776 #define NID_id_smime_spq 194
777 #define OBJ_id_smime_spq OBJ_SMIME, 5L

779 #define SN_id_smime_cti "id-smime-cti"
780 #define NID_id_smime_cti 195
781 #define OBJ_id_smime_cti OBJ_SMIME, 6L

783 #define SN_id_smime_mod_cms "id-smime-mod-cms"
784 #define NID_id_smime_mod_cms 196
785 #define OBJ_id_smime_mod_cms OBJ_id_smime_mod, 1L

787 #define SN_id_smime_mod_ess "id-smime-mod-ess"

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788 #define NID_id_smime_mod_ess 197
789 #define OBJ_id_smime_mod_ess OBJ_id_smime_mod,2L

791 #define SN_id_smime_mod_oid "id-smime-mod-oid"
792 #define NID_id_smime_mod_oid 198
793 #define OBJ_id_smime_mod_oid OBJ_id_smime_mod,3L

795 #define SN_id_smime_mod_msg_v3 "id-smime-mod-msg-v3"
796 #define NID_id_smime_mod_msg_v3 199
797 #define OBJ_id_smime_mod_msg_v3 OBJ_id_smime_mod,4L

799 #define SN_id_smime_mod_ets_eSignature_88 "id-smime-mod-ets-eSigna
800 #define NID_id_smime_mod_ets_eSignature_88 200
801 #define OBJ_id_smime_mod_ets_eSignature_88 OBJ_id_smime_mod,5L

803 #define SN_id_smime_mod_ets_eSignature_97 "id-smime-mod-ets-eSigna
804 #define NID_id_smime_mod_ets_eSignature_97 201
805 #define OBJ_id_smime_mod_ets_eSignature_97 OBJ_id_smime_mod,6L

807 #define SN_id_smime_mod_ets_eSigPolicy_88 "id-smime-mod-ets-eSigPo
808 #define NID_id_smime_mod_ets_eSigPolicy_88 202
809 #define OBJ_id_smime_mod_ets_eSigPolicy_88 OBJ_id_smime_mod,7L

811 #define SN_id_smime_mod_ets_eSigPolicy_97 "id-smime-mod-ets-eSigPo
812 #define NID_id_smime_mod_ets_eSigPolicy_97 203
813 #define OBJ_id_smime_mod_ets_eSigPolicy_97 OBJ_id_smime_mod,8L

815 #define SN_id_smime_ct_receipt "id-smime-ct-receipt"
816 #define NID_id_smime_ct_receipt 204
817 #define OBJ_id_smime_ct_receipt OBJ_id_smime_ct,1L

819 #define SN_id_smime_ct_authData "id-smime-ct-authData"
820 #define NID_id_smime_ct_authData 205
821 #define OBJ_id_smime_ct_authData OBJ_id_smime_ct,2L

823 #define SN_id_smime_ct_publishCert "id-smime-ct-publishCert"
824 #define NID_id_smime_ct_publishCert 206
825 #define OBJ_id_smime_ct_publishCert OBJ_id_smime_ct,3L

827 #define SN_id_smime_ct_TSTInfo "id-smime-ct-TSTInfo"
828 #define NID_id_smime_ct_TSTInfo 207
829 #define OBJ_id_smime_ct_TSTInfo OBJ_id_smime_ct,4L

831 #define SN_id_smime_ct_TDTInfo "id-smime-ct-TDTInfo"
832 #define NID_id_smime_ct_TDTInfo 208
833 #define OBJ_id_smime_ct_TDTInfo OBJ_id_smime_ct,5L

835 #define SN_id_smime_ct_contentInfo "id-smime-ct-contentInfo"
836 #define NID_id_smime_ct_contentInfo 209
837 #define OBJ_id_smime_ct_contentInfo OBJ_id_smime_ct,6L

839 #define SN_id_smime_ct_DVCSRequestData "id-smime-ct-DVCSRequestData"
840 #define NID_id_smime_ct_DVCSRequestData 210
841 #define OBJ_id_smime_ct_DVCSRequestData OBJ_id_smime_ct,7L

843 #define SN_id_smime_ct_DVCSResponseData "id-smime-ct-DVCSResponseData"
844 #define NID_id_smime_ct_DVCSResponseData 211
845 #define OBJ_id_smime_ct_DVCSResponseData OBJ_id_smime_ct,8L

847 #define SN_id_smime_ct_compressedData "id-smime-ct-compressedData"
848 #define NID_id_smime_ct_compressedData 786
849 #define OBJ_id_smime_ct_compressedData OBJ_id_smime_ct,9L

851 #define SN_id_ct_asciiTextWithCRLF "id-ct-asciiTextWithCRLF"
852 #define NID_id_ct_asciiTextWithCRLF 787
853 #define OBJ_id_ct_asciiTextWithCRLF OBJ_id_smime_ct,27L

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855 #define SN_id_smime_aa_receiptRequest "id-smime-aa-receiptRequest"
856 #define NID_id_smime_aa_receiptRequest 212
857 #define OBJ_id_smime_aa_receiptRequest OBJ_id_smime_aa,1L

859 #define SN_id_smime_aa_securityLabel "id-smime-aa-securityLabel"
860 #define NID_id_smime_aa_securityLabel 213
861 #define OBJ_id_smime_aa_securityLabel OBJ_id_smime_aa,2L

863 #define SN_id_smime_aa_mExpandHistory "id-smime-aa-mExpandHistory"
864 #define NID_id_smime_aa_mExpandHistory 214
865 #define OBJ_id_smime_aa_mExpandHistory OBJ_id_smime_aa,3L

867 #define SN_id_smime_aa_contentHint "id-smime-aa-contentHint"
868 #define NID_id_smime_aa_contentHint 215
869 #define OBJ_id_smime_aa_contentHint OBJ_id_smime_aa,4L

871 #define SN_id_smime_aa_msgSigDigest "id-smime-aa-msgSigDigest"
872 #define NID_id_smime_aa_msgSigDigest 216
873 #define OBJ_id_smime_aa_msgSigDigest OBJ_id_smime_aa,5L

875 #define SN_id_smime_aa_encapContentType "id-smime-aa-encapContentType"
876 #define NID_id_smime_aa_encapContentType 217
877 #define OBJ_id_smime_aa_encapContentType OBJ_id_smime_aa,6L

879 #define SN_id_smime_aa_contentIdentifier "id-smime-aa-contentIden
880 #define NID_id_smime_aa_contentIdentifier 218
881 #define OBJ_id_smime_aa_contentIdentifier OBJ_id_smime_aa,7L

883 #define SN_id_smime_aa_macValue "id-smime-aa-macValue"
884 #define NID_id_smime_aa_macValue 219
885 #define OBJ_id_smime_aa_macValue OBJ_id_smime_aa,8L

887 #define SN_id_smime_aa_equivalentLabels "id-smime-aa-equivalentLabels"
888 #define NID_id_smime_aa_equivalentLabels 220
889 #define OBJ_id_smime_aa_equivalentLabels OBJ_id_smime_aa,9L

891 #define SN_id_smime_aa_contentReference "id-smime-aa-contentReference"
892 #define NID_id_smime_aa_contentReference 221
893 #define OBJ_id_smime_aa_contentReference OBJ_id_smime_aa,10L

895 #define SN_id_smime_aa_encrypKeyPref "id-smime-aa-encrypKeyPref"
896 #define NID_id_smime_aa_encrypKeyPref 222
897 #define OBJ_id_smime_aa_encrypKeyPref OBJ_id_smime_aa,11L

899 #define SN_id_smime_aa_signingCertificate "id-smime-aa-signingCert
900 #define NID_id_smime_aa_signingCertificate 223
901 #define OBJ_id_smime_aa_signingCertificate OBJ_id_smime_aa,12L

903 #define SN_id_smime_aa_smimeEncryptCerts "id-smime-aa-smimeEncrypt
904 #define NID_id_smime_aa_smimeEncryptCerts 224
905 #define OBJ_id_smime_aa_smimeEncryptCerts OBJ_id_smime_aa,13L

907 #define SN_id_smime_aa_timeStampToken "id-smime-aa-timeStampToken"
908 #define NID_id_smime_aa_timeStampToken 225
909 #define OBJ_id_smime_aa_timeStampToken OBJ_id_smime_aa,14L

911 #define SN_id_smime_aa_ets_sigPolicyId "id-smime-aa-ets-sigPolicyId"
912 #define NID_id_smime_aa_ets_sigPolicyId 226
913 #define OBJ_id_smime_aa_ets_sigPolicyId OBJ_id_smime_aa,15L

915 #define SN_id_smime_aa_ets_commitmentType "id-smime-aa-ets-commitm
916 #define NID_id_smime_aa_ets_commitmentType 227
917 #define OBJ_id_smime_aa_ets_commitmentType OBJ_id_smime_aa,16L

919 #define SN_id_smime_aa_ets_signerLocation "id-smime-aa-ets-signerL

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920 #define NID_id_smime_aa_ets_signerLocation      228
921 #define OBJ_id_smime_aa_ets_signerLocation      OBJ_id_smime_aa,17L

923 #define SN_id_smime_aa_ets_signerAttr          "id-smime-aa-ets-signerAttr"
924 #define NID_id_smime_aa_ets_signerAttr        229
925 #define OBJ_id_smime_aa_ets_signerAttr        OBJ_id_smime_aa,18L

927 #define SN_id_smime_aa_ets_otherSigCert        "id-smime-aa-ets-otherSigCert"
928 #define NID_id_smime_aa_ets_otherSigCert      230
929 #define OBJ_id_smime_aa_ets_otherSigCert      OBJ_id_smime_aa,19L

931 #define SN_id_smime_aa_ets_contentTimestamp    "id-smime-aa-ets-content"
932 #define NID_id_smime_aa_ets_contentTimestamp  231
933 #define OBJ_id_smime_aa_ets_contentTimestamp  OBJ_id_smime_aa,20L

935 #define SN_id_smime_aa_ets_CertificateRefs     "id-smime-aa-ets-Certifi"
936 #define NID_id_smime_aa_ets_CertificateRefs   232
937 #define OBJ_id_smime_aa_ets_CertificateRefs   OBJ_id_smime_aa,21L

939 #define SN_id_smime_aa_ets_RevocationRefs     "id-smime-aa-ets-Revocat"
940 #define NID_id_smime_aa_ets_RevocationRefs    233
941 #define OBJ_id_smime_aa_ets_RevocationRefs    OBJ_id_smime_aa,22L

943 #define SN_id_smime_aa_ets_certValues         "id-smime-aa-ets-certValues"
944 #define NID_id_smime_aa_ets_certValues        234
945 #define OBJ_id_smime_aa_ets_certValues        OBJ_id_smime_aa,23L

947 #define SN_id_smime_aa_ets_revocationValues   "id-smime-aa-ets-revocat"
948 #define NID_id_smime_aa_ets_revocationValues  235
949 #define OBJ_id_smime_aa_ets_revocationValues  OBJ_id_smime_aa,24L

951 #define SN_id_smime_aa_ets_escTimeStamp        "id-smime-aa-ets-escTimeStamp"
952 #define NID_id_smime_aa_ets_escTimeStamp      236
953 #define OBJ_id_smime_aa_ets_escTimeStamp      OBJ_id_smime_aa,25L

955 #define SN_id_smime_aa_ets_certCRLTimestamp   "id-smime-aa-ets-certCRL"
956 #define NID_id_smime_aa_ets_certCRLTimestamp  237
957 #define OBJ_id_smime_aa_ets_certCRLTimestamp  OBJ_id_smime_aa,26L

959 #define SN_id_smime_aa_ets_archiveTimeStamp    "id-smime-aa-ets-archive"
960 #define NID_id_smime_aa_ets_archiveTimeStamp  238
961 #define OBJ_id_smime_aa_ets_archiveTimeStamp  OBJ_id_smime_aa,27L

963 #define SN_id_smime_aa_signatureType          "id-smime-aa-signatureType"
964 #define NID_id_smime_aa_signatureType        239
965 #define OBJ_id_smime_aa_signatureType        OBJ_id_smime_aa,28L

967 #define SN_id_smime_aa_dvcs_dvc              "id-smime-aa-dvcs-dvc"
968 #define NID_id_smime_aa_dvcs_dvc            240
969 #define OBJ_id_smime_aa_dvcs_dvc            OBJ_id_smime_aa,29L

971 #define SN_id_smime_alg_ESDHwith3DES         "id-smime-alg-ESDHwith3DES"
972 #define NID_id_smime_alg_ESDHwith3DES       241
973 #define OBJ_id_smime_alg_ESDHwith3DES       OBJ_id_smime_alg,1L

975 #define SN_id_smime_alg_ESDHwithRC2          "id-smime-alg-ESDHwithRC2"
976 #define NID_id_smime_alg_ESDHwithRC2        242
977 #define OBJ_id_smime_alg_ESDHwithRC2        OBJ_id_smime_alg,2L

979 #define SN_id_smime_alg_3DESwrap              "id-smime-alg-3DESwrap"
980 #define NID_id_smime_alg_3DESwrap            243
981 #define OBJ_id_smime_alg_3DESwrap            OBJ_id_smime_alg,3L

983 #define SN_id_smime_alg_RC2wrap              "id-smime-alg-RC2wrap"
984 #define NID_id_smime_alg_RC2wrap            244
985 #define OBJ_id_smime_alg_RC2wrap            OBJ_id_smime_alg,4L

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987 #define SN_id_smime_alg_ESDH                "id-smime-alg-ESDH"
988 #define NID_id_smime_alg_ESDH                245
989 #define OBJ_id_smime_alg_ESDH                OBJ_id_smime_alg,5L

991 #define SN_id_smime_alg_CMS3DESwrap          "id-smime-alg-CMS3DESwrap"
992 #define NID_id_smime_alg_CMS3DESwrap        246
993 #define OBJ_id_smime_alg_CMS3DESwrap        OBJ_id_smime_alg,6L

995 #define SN_id_smime_alg_CMSRC2wrap           "id-smime-alg-CMSRC2wrap"
996 #define NID_id_smime_alg_CMSRC2wrap         247
997 #define OBJ_id_smime_alg_CMSRC2wrap         OBJ_id_smime_alg,7L

999 #define SN_id_alg_PWRI_KEK                  "id-alg-PWRI-KEK"
1000 #define NID_id_alg_PWRI_KEK                 893
1001 #define OBJ_id_alg_PWRI_KEK                 OBJ_id_smime_alg,9L

1003 #define SN_id_smime_cd_ldap                  "id-smime-cd-ldap"
1004 #define NID_id_smime_cd_ldap                 248
1005 #define OBJ_id_smime_cd_ldap                 OBJ_id_smime_cd,1L

1007 #define SN_id_smime_spq_ets_sqt_uri          "id-smime-spq-ets-sqt-uri"
1008 #define NID_id_smime_spq_ets_sqt_uri         249
1009 #define OBJ_id_smime_spq_ets_sqt_uri         OBJ_id_smime_spq,1L

1011 #define SN_id_smime_spq_ets_sqt_unotice      "id-smime-spq-ets-sqt-unotice"
1012 #define NID_id_smime_spq_ets_sqt_unotice     250
1013 #define OBJ_id_smime_spq_ets_sqt_unotice     OBJ_id_smime_spq,2L

1015 #define SN_id_smime_cti_ets_proofOfOrigin    "id-smime-cti-ets-proofOf"
1016 #define NID_id_smime_cti_ets_proofOfOrigin   251
1017 #define OBJ_id_smime_cti_ets_proofOfOrigin   OBJ_id_smime_cti,1L

1019 #define SN_id_smime_cti_ets_proofOfReceipt   "id-smime-cti-ets-proofOf"
1020 #define NID_id_smime_cti_ets_proofOfReceipt  252
1021 #define OBJ_id_smime_cti_ets_proofOfReceipt  OBJ_id_smime_cti,2L

1023 #define SN_id_smime_cti_ets_proofOfDelivery  "id-smime-cti-ets-proofOf"
1024 #define NID_id_smime_cti_ets_proofOfDelivery 253
1025 #define OBJ_id_smime_cti_ets_proofOfDelivery OBJ_id_smime_cti,3L

1027 #define SN_id_smime_cti_ets_proofOfSender    "id-smime-cti-ets-proofOf"
1028 #define NID_id_smime_cti_ets_proofOfSender   254
1029 #define OBJ_id_smime_cti_ets_proofOfSender   OBJ_id_smime_cti,4L

1031 #define SN_id_smime_cti_ets_proofOfApproval  "id-smime-cti-ets-proofOf"
1032 #define NID_id_smime_cti_ets_proofOfApproval 255
1033 #define OBJ_id_smime_cti_ets_proofOfApproval OBJ_id_smime_cti,5L

1035 #define SN_id_smime_cti_ets_proofOfCreation  "id-smime-cti-ets-proofOf"
1036 #define NID_id_smime_cti_ets_proofOfCreation 256
1037 #define OBJ_id_smime_cti_ets_proofOfCreation OBJ_id_smime_cti,6L

1039 #define LN_friendlyName                      "friendlyName"
1040 #define NID_friendlyName                     156
1041 #define OBJ_friendlyName                     OBJ_pkcs9,20L

1043 #define LN_localKeyID                        "localKeyID"
1044 #define NID_localKeyID                       157
1045 #define OBJ_localKeyID                       OBJ_pkcs9,21L

1047 #define SN_ms_csp_name                       "CSPName"
1048 #define LN_ms_csp_name                       "Microsoft CSP Name"
1049 #define NID_ms_csp_name                      417
1050 #define OBJ_ms_csp_name                      1L,3L,6L,1L,4L,1L,311L,17L,1L

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1052 #define SN_LocalKeySet "LocalKeySet"
1053 #define LN_LocalKeySet "Microsoft Local Key set"
1054 #define NID_LocalKeySet 856
1055 #define OBJ_LocalKeySet 1L, 3L, 6L, 1L, 4L, 1L, 311L, 17L, 2L

1057 #define OBJ_certTypes OBJ_pkcs9, 22L

1059 #define LN_x509Certificate "x509Certificate"
1060 #define NID_x509Certificate 158
1061 #define OBJ_x509Certificate OBJ_certTypes, 1L

1063 #define LN_sdsiCertificate "sdsiCertificate"
1064 #define NID_sdsiCertificate 159
1065 #define OBJ_sdsiCertificate OBJ_certTypes, 2L

1067 #define OBJ_crlTypes OBJ_pkcs9, 23L

1069 #define LN_x509Crl "x509Crl"
1070 #define NID_x509Crl 160
1071 #define OBJ_x509Crl OBJ_crlTypes, 1L

1073 #define OBJ_pkcs12 OBJ_pkcs, 12L

1075 #define OBJ_pkcs12_pbeids OBJ_pkcs12, 1L

1077 #define SN_pbe_WithSHA1And128BitRC4 "PBE-SHA1-RC4-128"
1078 #define LN_pbe_WithSHA1And128BitRC4 "pbeWithSHA1And128BitRC4"
1079 #define NID_pbe_WithSHA1And128BitRC4 144
1080 #define OBJ_pbe_WithSHA1And128BitRC4 OBJ_pkcs12_pbeids, 1L

1082 #define SN_pbe_WithSHA1And40BitRC4 "PBE-SHA1-RC4-40"
1083 #define LN_pbe_WithSHA1And40BitRC4 "pbeWithSHA1And40BitRC4"
1084 #define NID_pbe_WithSHA1And40BitRC4 145
1085 #define OBJ_pbe_WithSHA1And40BitRC4 OBJ_pkcs12_pbeids, 2L

1087 #define SN_pbe_WithSHA1And3_Key_TripleDES_CBC "PBE-SHA1-3DES"
1088 #define LN_pbe_WithSHA1And3_Key_TripleDES_CBC "pbeWithSHA1And3-KeyTrip"
1089 #define NID_pbe_WithSHA1And3_Key_TripleDES_CBC 146
1090 #define OBJ_pbe_WithSHA1And3_Key_TripleDES_CBC OBJ_pkcs12_pbeids, 3L

1092 #define SN_pbe_WithSHA1And2_Key_TripleDES_CBC "PBE-SHA1-2DES"
1093 #define LN_pbe_WithSHA1And2_Key_TripleDES_CBC "pbeWithSHA1And2-KeyTrip"
1094 #define NID_pbe_WithSHA1And2_Key_TripleDES_CBC 147
1095 #define OBJ_pbe_WithSHA1And2_Key_TripleDES_CBC OBJ_pkcs12_pbeids, 4L

1097 #define SN_pbe_WithSHA1And128BitRC2_CBC "PBE-SHA1-RC2-128"
1098 #define LN_pbe_WithSHA1And128BitRC2_CBC "pbeWithSHA1And128BitRC2-CBC"
1099 #define NID_pbe_WithSHA1And128BitRC2_CBC 148
1100 #define OBJ_pbe_WithSHA1And128BitRC2_CBC OBJ_pkcs12_pbeids, 5L

1102 #define SN_pbe_WithSHA1And40BitRC2_CBC "PBE-SHA1-RC2-40"
1103 #define LN_pbe_WithSHA1And40BitRC2_CBC "pbeWithSHA1And40BitRC2-CBC"
1104 #define NID_pbe_WithSHA1And40BitRC2_CBC 149
1105 #define OBJ_pbe_WithSHA1And40BitRC2_CBC OBJ_pkcs12_pbeids, 6L

1107 #define OBJ_pkcs12_Version1 OBJ_pkcs12, 10L

1109 #define OBJ_pkcs12_BagIds OBJ_pkcs12_Version1, 1L

1111 #define LN_keyBag "keyBag"
1112 #define NID_keyBag 150
1113 #define OBJ_keyBag OBJ_pkcs12_BagIds, 1L

1115 #define LN_pkcs8ShroudedKeyBag "pkcs8ShroudedKeyBag"
1116 #define NID_pkcs8ShroudedKeyBag 151
1117 #define OBJ_pkcs8ShroudedKeyBag OBJ_pkcs12_BagIds, 2L
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1119 #define LN_certBag "certBag"
1120 #define NID_certBag 152
1121 #define OBJ_certBag OBJ_pkcs12_BagIds, 3L

1123 #define LN_crlBag "crlBag"
1124 #define NID_crlBag 153
1125 #define OBJ_crlBag OBJ_pkcs12_BagIds, 4L

1127 #define LN_secretBag "secretBag"
1128 #define NID_secretBag 154
1129 #define OBJ_secretBag OBJ_pkcs12_BagIds, 5L

1131 #define LN_safeContentsBag "safeContentsBag"
1132 #define NID_safeContentsBag 155
1133 #define OBJ_safeContentsBag OBJ_pkcs12_BagIds, 6L

1135 #define SN_md2 "MD2"
1136 #define LN_md2 "md2"
1137 #define NID_md2 3
1138 #define OBJ_md2 OBJ_rsadsi, 2L, 2L

1140 #define SN_md4 "MD4"
1141 #define LN_md4 "md4"
1142 #define NID_md4 257
1143 #define OBJ_md4 OBJ_rsadsi, 2L, 4L

1145 #define SN_md5 "MD5"
1146 #define LN_md5 "md5"
1147 #define NID_md5 4
1148 #define OBJ_md5 OBJ_rsadsi, 2L, 5L

1150 #define SN_md5_sha1 "MD5-SHA1"
1151 #define LN_md5_sha1 "md5-sha1"
1152 #define NID_md5_sha1 114

1154 #define LN_hmacWithMD5 "hmacWithMD5"
1155 #define NID_hmacWithMD5 797
1156 #define OBJ_hmacWithMD5 OBJ_rsadsi, 2L, 6L

1158 #define LN_hmacWithSHA1 "hmacWithSHA1"
1159 #define NID_hmacWithSHA1 163
1160 #define OBJ_hmacWithSHA1 OBJ_rsadsi, 2L, 7L

1162 #define LN_hmacWithSHA224 "hmacWithSHA224"
1163 #define NID_hmacWithSHA224 798
1164 #define OBJ_hmacWithSHA224 OBJ_rsadsi, 2L, 8L

1166 #define LN_hmacWithSHA256 "hmacWithSHA256"
1167 #define NID_hmacWithSHA256 799
1168 #define OBJ_hmacWithSHA256 OBJ_rsadsi, 2L, 9L

1170 #define LN_hmacWithSHA384 "hmacWithSHA384"
1171 #define NID_hmacWithSHA384 800
1172 #define OBJ_hmacWithSHA384 OBJ_rsadsi, 2L, 10L

1174 #define LN_hmacWithSHA512 "hmacWithSHA512"
1175 #define NID_hmacWithSHA512 801
1176 #define OBJ_hmacWithSHA512 OBJ_rsadsi, 2L, 11L

1178 #define SN_rc2_cbc "RC2-CBC"
1179 #define LN_rc2_cbc "rc2-cbc"
1180 #define NID_rc2_cbc 37
1181 #define OBJ_rc2_cbc OBJ_rsadsi, 3L, 2L

1183 #define SN_rc2_ecb "RC2-ECB"
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1184 #define LN_rc2_ecb          "rc2-ecb"
1185 #define NID_rc2_ecb          38

1187 #define SN_rc2_cfb64         "RC2-CFB"
1188 #define LN_rc2_cfb64         "rc2-cfb"
1189 #define NID_rc2_cfb64        39

1191 #define SN_rc2_ofb64         "RC2-OFB"
1192 #define LN_rc2_ofb64         "rc2-ofb"
1193 #define NID_rc2_ofb64        40

1195 #define SN_rc2_40_cbc        "RC2-40-CBC"
1196 #define LN_rc2_40_cbc        "rc2-40-cbc"
1197 #define NID_rc2_40_cbc       98

1199 #define SN_rc2_64_cbc        "RC2-64-CBC"
1200 #define LN_rc2_64_cbc        "rc2-64-cbc"
1201 #define NID_rc2_64_cbc       166

1203 #define SN_rc4               "RC4"
1204 #define LN_rc4               "rc4"
1205 #define NID_rc4              5
1206 #define OBJ_rc4              OBJ_rsadsi, 3L, 4L

1208 #define SN_rc4_40            "RC4-40"
1209 #define LN_rc4_40            "rc4-40"
1210 #define NID_rc4_40           97

1212 #define SN_des_ede3_cbc      "DES-EDE3-CBC"
1213 #define LN_des_ede3_cbc      "des-ede3-cbc"
1214 #define NID_des_ede3_cbc     44
1215 #define OBJ_des_ede3_cbc     OBJ_rsadsi, 3L, 7L

1217 #define SN_rc5_cbc           "RC5-CBC"
1218 #define LN_rc5_cbc           "rc5-cbc"
1219 #define NID_rc5_cbc          120
1220 #define OBJ_rc5_cbc          OBJ_rsadsi, 3L, 8L

1222 #define SN_rc5_ecb           "RC5-ECB"
1223 #define LN_rc5_ecb           "rc5-ecb"
1224 #define NID_rc5_ecb          121

1226 #define SN_rc5_cfb64         "RC5-CFB"
1227 #define LN_rc5_cfb64         "rc5-cfb"
1228 #define NID_rc5_cfb64        122

1230 #define SN_rc5_ofb64         "RC5-OFB"
1231 #define LN_rc5_ofb64         "rc5-ofb"
1232 #define NID_rc5_ofb64        123

1234 #define SN_ms_ext_req         "msExtReq"
1235 #define LN_ms_ext_req         "Microsoft Extension Request"
1236 #define NID_ms_ext_req        171
1237 #define OBJ_ms_ext_req        1L, 3L, 6L, 1L, 4L, 1L, 311L, 2L, 1L, 14L

1239 #define SN_ms_code_ind        "msCodeInd"
1240 #define LN_ms_code_ind        "Microsoft Individual Code Signing"
1241 #define NID_ms_code_ind       134
1242 #define OBJ_ms_code_ind       1L, 3L, 6L, 1L, 4L, 1L, 311L, 2L, 1L, 21L

1244 #define SN_ms_code_com        "msCodeCom"
1245 #define LN_ms_code_com        "Microsoft Commercial Code Signing"
1246 #define NID_ms_code_com       135
1247 #define OBJ_ms_code_com       1L, 3L, 6L, 1L, 4L, 1L, 311L, 2L, 1L, 22L

1249 #define SN_ms_ctl_sign        "msCTLSign"

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1250 #define LN_ms_ctl_sign       "Microsoft Trust List Signing"
1251 #define NID_ms_ctl_sign      136
1252 #define OBJ_ms_ctl_sign      1L, 3L, 6L, 1L, 4L, 1L, 311L, 10L, 3L, 1L

1254 #define SN_ms_sgc            "msSGC"
1255 #define LN_ms_sgc            "Microsoft Server Gated Crypto"
1256 #define NID_ms_sgc           137
1257 #define OBJ_ms_sgc           1L, 3L, 6L, 1L, 4L, 1L, 311L, 10L, 3L, 3L

1259 #define SN_ms_efs            "msEFS"
1260 #define LN_ms_efs            "Microsoft Encrypted File System"
1261 #define NID_ms_efs           138
1262 #define OBJ_ms_efs           1L, 3L, 6L, 1L, 4L, 1L, 311L, 10L, 3L, 4L

1264 #define SN_ms_smartcard_login "msSmartcardLogin"
1265 #define LN_ms_smartcard_login "Microsoft Smartcardlogin"
1266 #define NID_ms_smartcard_login 648
1267 #define OBJ_ms_smartcard_login 1L, 3L, 6L, 1L, 4L, 1L, 311L, 20L, 2L, 2L

1269 #define SN_ms_upn            "msUPN"
1270 #define LN_ms_upn            "Microsoft Universal Principal Name"
1271 #define NID_ms_upn           649
1272 #define OBJ_ms_upn           1L, 3L, 6L, 1L, 4L, 1L, 311L, 20L, 2L, 3L

1274 #define SN_idea_cbc          "IDEA-CBC"
1275 #define LN_idea_cbc          "idea-cbc"
1276 #define NID_idea_cbc         34
1277 #define OBJ_idea_cbc         1L, 3L, 6L, 1L, 4L, 1L, 188L, 7L, 1L, 1L, 2L

1279 #define SN_idea_ecb          "IDEA-ECB"
1280 #define LN_idea_ecb          "idea-ecb"
1281 #define NID_idea_ecb         36

1283 #define SN_idea_cfb64        "IDEA-CFB"
1284 #define LN_idea_cfb64        "idea-cfb"
1285 #define NID_idea_cfb64       35

1287 #define SN_idea_ofb64        "IDEA-OFB"
1288 #define LN_idea_ofb64        "idea-ofb"
1289 #define NID_idea_ofb64       46

1291 #define SN_bf_cbc            "BF-CBC"
1292 #define LN_bf_cbc            "bf-cbc"
1293 #define NID_bf_cbc           91
1294 #define OBJ_bf_cbc           1L, 3L, 6L, 1L, 4L, 1L, 3029L, 1L, 2L

1296 #define SN_bf_ecb            "BF-ECB"
1297 #define LN_bf_ecb            "bf-ecb"
1298 #define NID_bf_ecb           92

1300 #define SN_bf_cfb64          "BF-CFB"
1301 #define LN_bf_cfb64          "bf-cfb"
1302 #define NID_bf_cfb64         93

1304 #define SN_bf_ofb64          "BF-OFB"
1305 #define LN_bf_ofb64          "bf-ofb"
1306 #define NID_bf_ofb64         94

1308 #define SN_id_pkix            "PKIX"
1309 #define NID_id_pkix          127
1310 #define OBJ_id_pkix          1L, 3L, 6L, 1L, 5L, 5L, 7L

1312 #define SN_id_pkix_mod        "id-pkix-mod"
1313 #define NID_id_pkix_mod      258
1314 #define OBJ_id_pkix_mod      OBJ_id_pkix, 0L

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1316 #define SN_id_pe "id-pe"
1317 #define NID_id_pe 175
1318 #define OBJ_id_pe OBJ_id_pkix,1L

1320 #define SN_id_qt "id-qt"
1321 #define NID_id_qt 259
1322 #define OBJ_id_qt OBJ_id_pkix,2L

1324 #define SN_id_kp "id-kp"
1325 #define NID_id_kp 128
1326 #define OBJ_id_kp OBJ_id_pkix,3L

1328 #define SN_id_it "id-it"
1329 #define NID_id_it 260
1330 #define OBJ_id_it OBJ_id_pkix,4L

1332 #define SN_id_pkip "id-pkip"
1333 #define NID_id_pkip 261
1334 #define OBJ_id_pkip OBJ_id_pkix,5L

1336 #define SN_id_alg "id-alg"
1337 #define NID_id_alg 262
1338 #define OBJ_id_alg OBJ_id_pkix,6L

1340 #define SN_id_cmc "id-cmc"
1341 #define NID_id_cmc 263
1342 #define OBJ_id_cmc OBJ_id_pkix,7L

1344 #define SN_id_on "id-on"
1345 #define NID_id_on 264
1346 #define OBJ_id_on OBJ_id_pkix,8L

1348 #define SN_id_pda "id-pda"
1349 #define NID_id_pda 265
1350 #define OBJ_id_pda OBJ_id_pkix,9L

1352 #define SN_id_aca "id-ac"
1353 #define NID_id_aca 266
1354 #define OBJ_id_aca OBJ_id_pkix,10L

1356 #define SN_id_qcs "id-qcs"
1357 #define NID_id_qcs 267
1358 #define OBJ_id_qcs OBJ_id_pkix,11L

1360 #define SN_id_cct "id-cct"
1361 #define NID_id_cct 268
1362 #define OBJ_id_cct OBJ_id_pkix,12L

1364 #define SN_id_ppl "id-ppl"
1365 #define NID_id_ppl 662
1366 #define OBJ_id_ppl OBJ_id_pkix,21L

1368 #define SN_id_ad "id-ad"
1369 #define NID_id_ad 176
1370 #define OBJ_id_ad OBJ_id_pkix,48L

1372 #define SN_id_pkix1_explicit_88 "id-pkix1-explicit-88"
1373 #define NID_id_pkix1_explicit_88 269
1374 #define OBJ_id_pkix1_explicit_88 OBJ_id_pkix_mod,1L

1376 #define SN_id_pkix1_implicit_88 "id-pkix1-implicit-88"
1377 #define NID_id_pkix1_implicit_88 270
1378 #define OBJ_id_pkix1_implicit_88 OBJ_id_pkix_mod,2L

1380 #define SN_id_pkix1_explicit_93 "id-pkix1-explicit-93"
1381 #define NID_id_pkix1_explicit_93 271

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1382 #define OBJ_id_pkix1_explicit_93 OBJ_id_pkix_mod,3L

1384 #define SN_id_pkix1_implicit_93 "id-pkix1-implicit-93"
1385 #define NID_id_pkix1_implicit_93 272
1386 #define OBJ_id_pkix1_implicit_93 OBJ_id_pkix_mod,4L

1388 #define SN_id_mod_crmf "id-mod-crmf"
1389 #define NID_id_mod_crmf 273
1390 #define OBJ_id_mod_crmf OBJ_id_pkix_mod,5L

1392 #define SN_id_mod_cmc "id-mod-cmc"
1393 #define NID_id_mod_cmc 274
1394 #define OBJ_id_mod_cmc OBJ_id_pkix_mod,6L

1396 #define SN_id_mod_kea_profile_88 "id-mod-kea-profile-88"
1397 #define NID_id_mod_kea_profile_88 275
1398 #define OBJ_id_mod_kea_profile_88 OBJ_id_pkix_mod,7L

1400 #define SN_id_mod_kea_profile_93 "id-mod-kea-profile-93"
1401 #define NID_id_mod_kea_profile_93 276
1402 #define OBJ_id_mod_kea_profile_93 OBJ_id_pkix_mod,8L

1404 #define SN_id_mod_cmp "id-mod-cmp"
1405 #define NID_id_mod_cmp 277
1406 #define OBJ_id_mod_cmp OBJ_id_pkix_mod,9L

1408 #define SN_id_mod_qualified_cert_88 "id-mod-qualified-cert-88"
1409 #define NID_id_mod_qualified_cert_88 278
1410 #define OBJ_id_mod_qualified_cert_88 OBJ_id_pkix_mod,10L

1412 #define SN_id_mod_qualified_cert_93 "id-mod-qualified-cert-93"
1413 #define NID_id_mod_qualified_cert_93 279
1414 #define OBJ_id_mod_qualified_cert_93 OBJ_id_pkix_mod,11L

1416 #define SN_id_mod_attribute_cert "id-mod-attribute-cert"
1417 #define NID_id_mod_attribute_cert 280
1418 #define OBJ_id_mod_attribute_cert OBJ_id_pkix_mod,12L

1420 #define SN_id_mod_timestamp_protocol "id-mod-timestamp-protocol"
1421 #define NID_id_mod_timestamp_protocol 281
1422 #define OBJ_id_mod_timestamp_protocol OBJ_id_pkix_mod,13L

1424 #define SN_id_mod_ocsp "id-mod-ocsp"
1425 #define NID_id_mod_ocsp 282
1426 #define OBJ_id_mod_ocsp OBJ_id_pkix_mod,14L

1428 #define SN_id_mod_dvcs "id-mod-dvcs"
1429 #define NID_id_mod_dvcs 283
1430 #define OBJ_id_mod_dvcs OBJ_id_pkix_mod,15L

1432 #define SN_id_mod_cmp2000 "id-mod-cmp2000"
1433 #define NID_id_mod_cmp2000 284
1434 #define OBJ_id_mod_cmp2000 OBJ_id_pkix_mod,16L

1436 #define SN_info_access "authorityInfoAccess"
1437 #define LN_info_access "Authority Information Access"
1438 #define NID_info_access 177
1439 #define OBJ_info_access OBJ_id_pe,1L

1441 #define SN_biometricInfo "biometricInfo"
1442 #define LN_biometricInfo "Biometric Info"
1443 #define NID_biometricInfo 285
1444 #define OBJ_biometricInfo OBJ_id_pe,2L

1446 #define SN_qcStatements "qcStatements"
1447 #define NID_qcStatements 286

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1448 #define OBJ_qcStatements OBJ_id_pe,3L
1450 #define SN_ac_auditEntity "ac-auditEntity"
1451 #define NID_ac_auditEntity 287
1452 #define OBJ_ac_auditEntity OBJ_id_pe,4L
1454 #define SN_ac_targeting "ac-targeting"
1455 #define NID_ac_targeting 288
1456 #define OBJ_ac_targeting OBJ_id_pe,5L
1458 #define SN_aaControls "aaControls"
1459 #define NID_aaControls 289
1460 #define OBJ_aaControls OBJ_id_pe,6L
1462 #define SN_sbgp_ipAddrBlock "sbgp-ipAddrBlock"
1463 #define NID_sbgp_ipAddrBlock 290
1464 #define OBJ_sbgp_ipAddrBlock OBJ_id_pe,7L
1466 #define SN_sbgp_autonomousSysNum "sbgp-autonomousSysNum"
1467 #define NID_sbgp_autonomousSysNum 291
1468 #define OBJ_sbgp_autonomousSysNum OBJ_id_pe,8L
1470 #define SN_sbgp_routerIdentifier "sbgp-routerIdentifier"
1471 #define NID_sbgp_routerIdentifier 292
1472 #define OBJ_sbgp_routerIdentifier OBJ_id_pe,9L
1474 #define SN_ac_proxying "ac-proxying"
1475 #define NID_ac_proxying 397
1476 #define OBJ_ac_proxying OBJ_id_pe,10L
1478 #define SN_sinfo_access "subjectInfoAccess"
1479 #define LN_sinfo_access "Subject Information Access"
1480 #define NID_sinfo_access 398
1481 #define OBJ_sinfo_access OBJ_id_pe,11L
1483 #define SN_proxyCertInfo "proxyCertInfo"
1484 #define LN_proxyCertInfo "Proxy Certificate Information"
1485 #define NID_proxyCertInfo 663
1486 #define OBJ_proxyCertInfo OBJ_id_pe,14L
1488 #define SN_id_qt_cps "id-qt-cps"
1489 #define LN_id_qt_cps "Policy Qualifier CPS"
1490 #define NID_id_qt_cps 164
1491 #define OBJ_id_qt_cps OBJ_id_qt,1L
1493 #define SN_id_qt_unotice "id-qt-unotice"
1494 #define LN_id_qt_unotice "Policy Qualifier User Notice"
1495 #define NID_id_qt_unotice 165
1496 #define OBJ_id_qt_unotice OBJ_id_qt,2L
1498 #define SN_textNotice "textNotice"
1499 #define NID_textNotice 293
1500 #define OBJ_textNotice OBJ_id_qt,3L
1502 #define SN_server_auth "serverAuth"
1503 #define LN_server_auth "TLS Web Server Authentication"
1504 #define NID_server_auth 129
1505 #define OBJ_server_auth OBJ_id_kp,1L
1507 #define SN_client_auth "clientAuth"
1508 #define LN_client_auth "TLS Web Client Authentication"
1509 #define NID_client_auth 130
1510 #define OBJ_client_auth OBJ_id_kp,2L
1512 #define SN_code_sign "codeSigning"
1513 #define LN_code_sign "Code Signing"
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1514 #define NID_code_sign 131
1515 #define OBJ_code_sign OBJ_id_kp,3L
1517 #define SN_email_protect "emailProtection"
1518 #define LN_email_protect "E-mail Protection"
1519 #define NID_email_protect 132
1520 #define OBJ_email_protect OBJ_id_kp,4L
1522 #define SN_ipsecEndSystem "ipsecEndSystem"
1523 #define LN_ipsecEndSystem "IPSec End System"
1524 #define NID_ipsecEndSystem 294
1525 #define OBJ_ipsecEndSystem OBJ_id_kp,5L
1527 #define SN_ipsecTunnel "ipsecTunnel"
1528 #define LN_ipsecTunnel "IPSec Tunnel"
1529 #define NID_ipsecTunnel 295
1530 #define OBJ_ipsecTunnel OBJ_id_kp,6L
1532 #define SN_ipsecUser "ipsecUser"
1533 #define LN_ipsecUser "IPSec User"
1534 #define NID_ipsecUser 296
1535 #define OBJ_ipsecUser OBJ_id_kp,7L
1537 #define SN_time_stamp "timeStamping"
1538 #define LN_time_stamp "Time Stamping"
1539 #define NID_time_stamp 133
1540 #define OBJ_time_stamp OBJ_id_kp,8L
1542 #define SN_OCSP_sign "OCSPSigning"
1543 #define LN_OCSP_sign "OCSP Signing"
1544 #define NID_OCSP_sign 180
1545 #define OBJ_OCSP_sign OBJ_id_kp,9L
1547 #define SN_dvcs "DVCS"
1548 #define LN_dvcs "dvcs"
1549 #define NID_dvcs 297
1550 #define OBJ_dvcs OBJ_id_kp,10L
1552 #define SN_id_it_caProtEncCert "id-it-caProtEncCert"
1553 #define NID_id_it_caProtEncCert 298
1554 #define OBJ_id_it_caProtEncCert OBJ_id_it,1L
1556 #define SN_id_it_signKeyPairTypes "id-it-signKeyPairTypes"
1557 #define NID_id_it_signKeyPairTypes 299
1558 #define OBJ_id_it_signKeyPairTypes OBJ_id_it,2L
1560 #define SN_id_it_encKeyPairTypes "id-it-encKeyPairTypes"
1561 #define NID_id_it_encKeyPairTypes 300
1562 #define OBJ_id_it_encKeyPairTypes OBJ_id_it,3L
1564 #define SN_id_it_preferredSymmAlg "id-it-preferredSymmAlg"
1565 #define NID_id_it_preferredSymmAlg 301
1566 #define OBJ_id_it_preferredSymmAlg OBJ_id_it,4L
1568 #define SN_id_it_caKeyUpdateInfo "id-it-caKeyUpdateInfo"
1569 #define NID_id_it_caKeyUpdateInfo 302
1570 #define OBJ_id_it_caKeyUpdateInfo OBJ_id_it,5L
1572 #define SN_id_it_currentCRL "id-it-currentCRL"
1573 #define NID_id_it_currentCRL 303
1574 #define OBJ_id_it_currentCRL OBJ_id_it,6L
1576 #define SN_id_it_unsupportedOIDs "id-it-unsupportedOIDs"
1577 #define NID_id_it_unsupportedOIDs 304
1578 #define OBJ_id_it_unsupportedOIDs OBJ_id_it,7L
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1580 #define SN_id_it_subscriptionRequest "id-it-subscriptionRequest"
1581 #define NID_id_it_subscriptionRequest 305
1582 #define OBJ_id_it_subscriptionRequest OBJ_id_it, 8L

1584 #define SN_id_it_subscriptionResponse "id-it-subscriptionResponse"
1585 #define NID_id_it_subscriptionResponse 306
1586 #define OBJ_id_it_subscriptionResponse OBJ_id_it, 9L

1588 #define SN_id_it_keyPairParamReq "id-it-keyPairParamReq"
1589 #define NID_id_it_keyPairParamReq 307
1590 #define OBJ_id_it_keyPairParamReq OBJ_id_it, 10L

1592 #define SN_id_it_keyPairParamRep "id-it-keyPairParamRep"
1593 #define NID_id_it_keyPairParamRep 308
1594 #define OBJ_id_it_keyPairParamRep OBJ_id_it, 11L

1596 #define SN_id_it_revPassphrase "id-it-revPassphrase"
1597 #define NID_id_it_revPassphrase 309
1598 #define OBJ_id_it_revPassphrase OBJ_id_it, 12L

1600 #define SN_id_it_implicitConfirm "id-it-implicitConfirm"
1601 #define NID_id_it_implicitConfirm 310
1602 #define OBJ_id_it_implicitConfirm OBJ_id_it, 13L

1604 #define SN_id_it_confirmWaitTime "id-it-confirmWaitTime"
1605 #define NID_id_it_confirmWaitTime 311
1606 #define OBJ_id_it_confirmWaitTime OBJ_id_it, 14L

1608 #define SN_id_it_origPKIMessage "id-it-origPKIMessage"
1609 #define NID_id_it_origPKIMessage 312
1610 #define OBJ_id_it_origPKIMessage OBJ_id_it, 15L

1612 #define SN_id_it_supplLangTags "id-it-supplLangTags"
1613 #define NID_id_it_supplLangTags 784
1614 #define OBJ_id_it_supplLangTags OBJ_id_it, 16L

1616 #define SN_id_regCtrl "id-regCtrl"
1617 #define NID_id_regCtrl 313
1618 #define OBJ_id_regCtrl OBJ_id_pkim, 1L

1620 #define SN_id_regInfo "id-regInfo"
1621 #define NID_id_regInfo 314
1622 #define OBJ_id_regInfo OBJ_id_pkim, 2L

1624 #define SN_id_regCtrl_regToken "id-regCtrl-regToken"
1625 #define NID_id_regCtrl_regToken 315
1626 #define OBJ_id_regCtrl_regToken OBJ_id_regCtrl, 1L

1628 #define SN_id_regCtrl_authenticator "id-regCtrl-authenticator"
1629 #define NID_id_regCtrl_authenticator 316
1630 #define OBJ_id_regCtrl_authenticator OBJ_id_regCtrl, 2L

1632 #define SN_id_regCtrl_pkiPublicationInfo "id-regCtrl-pkiPublicati"
1633 #define NID_id_regCtrl_pkiPublicationInfo 317
1634 #define OBJ_id_regCtrl_pkiPublicationInfo OBJ_id_regCtrl, 3L

1636 #define SN_id_regCtrl_pkiArchiveOptions "id-regCtrl-pkiArchiveOptions"
1637 #define NID_id_regCtrl_pkiArchiveOptions 318
1638 #define OBJ_id_regCtrl_pkiArchiveOptions OBJ_id_regCtrl, 4L

1640 #define SN_id_regCtrl_oldCertID "id-regCtrl-oldCertID"
1641 #define NID_id_regCtrl_oldCertID 319
1642 #define OBJ_id_regCtrl_oldCertID OBJ_id_regCtrl, 5L

1644 #define SN_id_regCtrl_protocolEncrKey "id-regCtrl-protocolEncrKey"
1645 #define NID_id_regCtrl_protocolEncrKey 320
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1646 #define OBJ_id_regCtrl_protocolEncrKey OBJ_id_regCtrl, 6L

1648 #define SN_id_regInfo_utf8Pairs "id-regInfo-utf8Pairs"
1649 #define NID_id_regInfo_utf8Pairs 321
1650 #define OBJ_id_regInfo_utf8Pairs OBJ_id_regInfo, 1L

1652 #define SN_id_regInfo_certReq "id-regInfo-certReq"
1653 #define NID_id_regInfo_certReq 322
1654 #define OBJ_id_regInfo_certReq OBJ_id_regInfo, 2L

1656 #define SN_id_alg_des40 "id-alg-des40"
1657 #define NID_id_alg_des40 323
1658 #define OBJ_id_alg_des40 OBJ_id_alg, 1L

1660 #define SN_id_alg_noSignature "id-alg-noSignature"
1661 #define NID_id_alg_noSignature 324
1662 #define OBJ_id_alg_noSignature OBJ_id_alg, 2L

1664 #define SN_id_alg_dh_sig_hmac_sha1 "id-alg-dh-sig-hmac-sha1"
1665 #define NID_id_alg_dh_sig_hmac_sha1 325
1666 #define OBJ_id_alg_dh_sig_hmac_sha1 OBJ_id_alg, 3L

1668 #define SN_id_alg_dh_pop "id-alg-dh-pop"
1669 #define NID_id_alg_dh_pop 326
1670 #define OBJ_id_alg_dh_pop OBJ_id_alg, 4L

1672 #define SN_id_cmc_statusInfo "id-cmc-statusInfo"
1673 #define NID_id_cmc_statusInfo 327
1674 #define OBJ_id_cmc_statusInfo OBJ_id_cmc, 1L

1676 #define SN_id_cmc_identification "id-cmc-identification"
1677 #define NID_id_cmc_identification 328
1678 #define OBJ_id_cmc_identification OBJ_id_cmc, 2L

1680 #define SN_id_cmc_identityProof "id-cmc-identityProof"
1681 #define NID_id_cmc_identityProof 329
1682 #define OBJ_id_cmc_identityProof OBJ_id_cmc, 3L

1684 #define SN_id_cmc_dataReturn "id-cmc-dataReturn"
1685 #define NID_id_cmc_dataReturn 330
1686 #define OBJ_id_cmc_dataReturn OBJ_id_cmc, 4L

1688 #define SN_id_cmc_transactionId "id-cmc-transactionId"
1689 #define NID_id_cmc_transactionId 331
1690 #define OBJ_id_cmc_transactionId OBJ_id_cmc, 5L

1692 #define SN_id_cmc_senderNonce "id-cmc-senderNonce"
1693 #define NID_id_cmc_senderNonce 332
1694 #define OBJ_id_cmc_senderNonce OBJ_id_cmc, 6L

1696 #define SN_id_cmc_recipientNonce "id-cmc-recipientNonce"
1697 #define NID_id_cmc_recipientNonce 333
1698 #define OBJ_id_cmc_recipientNonce OBJ_id_cmc, 7L

1700 #define SN_id_cmc_addExtensions "id-cmc-addExtensions"
1701 #define NID_id_cmc_addExtensions 334
1702 #define OBJ_id_cmc_addExtensions OBJ_id_cmc, 8L

1704 #define SN_id_cmc_encryptedPOP "id-cmc-encryptedPOP"
1705 #define NID_id_cmc_encryptedPOP 335
1706 #define OBJ_id_cmc_encryptedPOP OBJ_id_cmc, 9L

1708 #define SN_id_cmc_decryptedPOP "id-cmc-decryptedPOP"
1709 #define NID_id_cmc_decryptedPOP 336
1710 #define OBJ_id_cmc_decryptedPOP OBJ_id_cmc, 10L
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1712 #define SN_id_cmc_lraPOPWitness      "id-cmc-lraPOPWitness"
1713 #define NID_id_cmc_lraPOPWitness      337
1714 #define OBJ_id_cmc_lraPOPWitness      OBJ_id_cmc, 11L

1716 #define SN_id_cmc_getCert             "id-cmc-getCert"
1717 #define NID_id_cmc_getCert            338
1718 #define OBJ_id_cmc_getCert            OBJ_id_cmc, 15L

1720 #define SN_id_cmc_getCRL              "id-cmc-getCRL"
1721 #define NID_id_cmc_getCRL            339
1722 #define OBJ_id_cmc_getCRL            OBJ_id_cmc, 16L

1724 #define SN_id_cmc_revokeRequest       "id-cmc-revokeRequest"
1725 #define NID_id_cmc_revokeRequest      340
1726 #define OBJ_id_cmc_revokeRequest      OBJ_id_cmc, 17L

1728 #define SN_id_cmc_regInfo             "id-cmc-regInfo"
1729 #define NID_id_cmc_regInfo            341
1730 #define OBJ_id_cmc_regInfo            OBJ_id_cmc, 18L

1732 #define SN_id_cmc_responseInfo        "id-cmc-responseInfo"
1733 #define NID_id_cmc_responseInfo       342
1734 #define OBJ_id_cmc_responseInfo       OBJ_id_cmc, 19L

1736 #define SN_id_cmc_queryPending        "id-cmc-queryPending"
1737 #define NID_id_cmc_queryPending       343
1738 #define OBJ_id_cmc_queryPending       OBJ_id_cmc, 21L

1740 #define SN_id_cmc_popLinkRandom        "id-cmc-popLinkRandom"
1741 #define NID_id_cmc_popLinkRandom      344
1742 #define OBJ_id_cmc_popLinkRandom      OBJ_id_cmc, 22L

1744 #define SN_id_cmc_popLinkWitness      "id-cmc-popLinkWitness"
1745 #define NID_id_cmc_popLinkWitness     345
1746 #define OBJ_id_cmc_popLinkWitness     OBJ_id_cmc, 23L

1748 #define SN_id_cmc_confirmCertAcceptance "id-cmc-confirmCertAcceptance"
1749 #define NID_id_cmc_confirmCertAcceptance 346
1750 #define OBJ_id_cmc_confirmCertAcceptance OBJ_id_cmc, 24L

1752 #define SN_id_on_personalData         "id-on-personalData"
1753 #define NID_id_on_personalData        347
1754 #define OBJ_id_on_personalData        OBJ_id_on, 1L

1756 #define SN_id_on_permanentIdentifier   "id-on-permanentIdentifier"
1757 #define LN_id_on_permanentIdentifier   "Permanent Identifier"
1758 #define NID_id_on_permanentIdentifier 858
1759 #define OBJ_id_on_permanentIdentifier OBJ_id_on, 3L

1761 #define SN_id_pda_dateOfBirth          "id-pda-dateOfBirth"
1762 #define NID_id_pda_dateOfBirth        348
1763 #define OBJ_id_pda_dateOfBirth        OBJ_id_pda, 1L

1765 #define SN_id_pda_placeOfBirth         "id-pda-placeOfBirth"
1766 #define NID_id_pda_placeOfBirth        349
1767 #define OBJ_id_pda_placeOfBirth        OBJ_id_pda, 2L

1769 #define SN_id_pda_gender              "id-pda-gender"
1770 #define NID_id_pda_gender              351
1771 #define OBJ_id_pda_gender              OBJ_id_pda, 3L

1773 #define SN_id_pda_countryOfCitizenship "id-pda-countryOfCitizenship"
1774 #define NID_id_pda_countryOfCitizenship 352
1775 #define OBJ_id_pda_countryOfCitizenship OBJ_id_pda, 4L

1777 #define SN_id_pda_countryOfResidence   "id-pda-countryOfResidence"

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1778 #define NID_id_pda_countryOfResidence 353
1779 #define OBJ_id_pda_countryOfResidence OBJ_id_pda, 5L

1781 #define SN_id_aca_authenticationInfo "id-aca-authenticationInfo"
1782 #define NID_id_aca_authenticationInfo 354
1783 #define OBJ_id_aca_authenticationInfo OBJ_id_aca, 1L

1785 #define SN_id_aca_accessIdentity      "id-aca-accessIdentity"
1786 #define NID_id_aca_accessIdentity     355
1787 #define OBJ_id_aca_accessIdentity     OBJ_id_aca, 2L

1789 #define SN_id_aca_chargingIdentity    "id-aca-chargingIdentity"
1790 #define NID_id_aca_chargingIdentity   356
1791 #define OBJ_id_aca_chargingIdentity   OBJ_id_aca, 3L

1793 #define SN_id_aca_group               "id-aca-group"
1794 #define NID_id_aca_group              357
1795 #define OBJ_id_aca_group              OBJ_id_aca, 4L

1797 #define SN_id_aca_role               "id-aca-role"
1798 #define NID_id_aca_role              358
1799 #define OBJ_id_aca_role              OBJ_id_aca, 5L

1801 #define SN_id_aca_encAttr            "id-aca-encAttr"
1802 #define NID_id_aca_encAttr           399
1803 #define OBJ_id_aca_encAttr           OBJ_id_aca, 6L

1805 #define SN_id_qcs_pkixQCSyntax_v1    "id-qcs-pkixQCSyntax-v1"
1806 #define NID_id_qcs_pkixQCSyntax_v1   359
1807 #define OBJ_id_qcs_pkixQCSyntax_v1   OBJ_id_qcs, 1L

1809 #define SN_id_cct_crs                "id-cct-crs"
1810 #define NID_id_cct_crs               360
1811 #define OBJ_id_cct_crs               OBJ_id_cct, 1L

1813 #define SN_id_cct_PKIData            "id-cct-PKIData"
1814 #define NID_id_cct_PKIData           361
1815 #define OBJ_id_cct_PKIData           OBJ_id_cct, 2L

1817 #define SN_id_cct_PKIResponse        "id-cct-PKIResponse"
1818 #define NID_id_cct_PKIResponse       362
1819 #define OBJ_id_cct_PKIResponse       OBJ_id_cct, 3L

1821 #define SN_id_ppl_anyLanguage        "id-ppl-anyLanguage"
1822 #define LN_id_ppl_anyLanguage        "Any language"
1823 #define NID_id_ppl_anyLanguage       664
1824 #define OBJ_id_ppl_anyLanguage       OBJ_id_ppl, 0L

1826 #define SN_id_ppl_inheritAll         "id-ppl-inheritAll"
1827 #define LN_id_ppl_inheritAll         "Inherit all"
1828 #define NID_id_ppl_inheritAll        665
1829 #define OBJ_id_ppl_inheritAll        OBJ_id_ppl, 1L

1831 #define SN_Independent               "id-ppl-independent"
1832 #define LN_Independent               "Independent"
1833 #define NID_Independent              667
1834 #define OBJ_Independent              OBJ_id_ppl, 2L

1836 #define SN_ad_OCSP                  "OCSP"
1837 #define LN_ad_OCSP                  "OCSP"
1838 #define NID_ad_OCSP                 178
1839 #define OBJ_ad_OCSP                 OBJ_id_ad, 1L

1841 #define SN_ad_ca_issuers             "caIssuers"
1842 #define LN_ad_ca_issuers             "CA Issuers"
1843 #define NID_ad_ca_issuers            179

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1844 #define OBJ_ad_ca_issuers          OBJ_id_ad,2L
1846 #define SN_ad_timeStamping          "ad timestamping"
1847 #define LN_ad_timeStamping          "AD Time Stamping"
1848 #define NID_ad_timeStamping         363
1849 #define OBJ_ad_timeStamping         OBJ_id_ad,3L

1851 #define SN_ad_dvcs                  "AD_DVCS"
1852 #define LN_ad_dvcs                  "ad dvcs"
1853 #define NID_ad_dvcs                 364
1854 #define OBJ_ad_dvcs                 OBJ_id_ad,4L

1856 #define SN_caRepository             "caRepository"
1857 #define LN_caRepository             "CA Repository"
1858 #define NID_caRepository            785
1859 #define OBJ_caRepository            OBJ_id_ad,5L

1861 #define OBJ_id_pkix_OCSP            OBJ_ad_OCSP

1863 #define SN_id_pkix_OCSP_basic        "basicOCSPResponse"
1864 #define LN_id_pkix_OCSP_basic        "Basic OCSP Response"
1865 #define NID_id_pkix_OCSP_basic       365
1866 #define OBJ_id_pkix_OCSP_basic       OBJ_id_pkix_OCSP,1L

1868 #define SN_id_pkix_OCSP_Nonce        "Nonce"
1869 #define LN_id_pkix_OCSP_Nonce        "OCSP Nonce"
1870 #define NID_id_pkix_OCSP_Nonce       366
1871 #define OBJ_id_pkix_OCSP_Nonce       OBJ_id_pkix_OCSP,2L

1873 #define SN_id_pkix_OCSP_CrLID        "CrLID"
1874 #define LN_id_pkix_OCSP_CrLID        "OCSP CRL ID"
1875 #define NID_id_pkix_OCSP_CrLID       367
1876 #define OBJ_id_pkix_OCSP_CrLID       OBJ_id_pkix_OCSP,3L

1878 #define SN_id_pkix_OCSP_acceptableResponses "acceptableResponses"
1879 #define LN_id_pkix_OCSP_acceptableResponses "Acceptable OCSP Respons"
1880 #define NID_id_pkix_OCSP_acceptableResponses 368
1881 #define OBJ_id_pkix_OCSP_acceptableResponses OBJ_id_pkix_OCSP,4L

1883 #define SN_id_pkix_OCSP_noCheck       "noCheck"
1884 #define LN_id_pkix_OCSP_noCheck       "OCSP No Check"
1885 #define NID_id_pkix_OCSP_noCheck      369
1886 #define OBJ_id_pkix_OCSP_noCheck      OBJ_id_pkix_OCSP,5L

1888 #define SN_id_pkix_OCSP_archiveCutoff "archiveCutoff"
1889 #define LN_id_pkix_OCSP_archiveCutoff "OCSP Archive Cutoff"
1890 #define NID_id_pkix_OCSP_archiveCutoff 370
1891 #define OBJ_id_pkix_OCSP_archiveCutoff OBJ_id_pkix_OCSP,6L

1893 #define SN_id_pkix_OCSP_serviceLocator "serviceLocator"
1894 #define LN_id_pkix_OCSP_serviceLocator "OCSP Service Locator"
1895 #define NID_id_pkix_OCSP_serviceLocator 371
1896 #define OBJ_id_pkix_OCSP_serviceLocator OBJ_id_pkix_OCSP,7L

1898 #define SN_id_pkix_OCSP_extendedStatus "extendedStatus"
1899 #define LN_id_pkix_OCSP_extendedStatus "Extended OCSP Status"
1900 #define NID_id_pkix_OCSP_extendedStatus 372
1901 #define OBJ_id_pkix_OCSP_extendedStatus OBJ_id_pkix_OCSP,8L

1903 #define SN_id_pkix_OCSP_valid         "valid"
1904 #define NID_id_pkix_OCSP_valid        373
1905 #define OBJ_id_pkix_OCSP_valid        OBJ_id_pkix_OCSP,9L

1907 #define SN_id_pkix_OCSP_path          "path"
1908 #define NID_id_pkix_OCSP_path         374
1909 #define OBJ_id_pkix_OCSP_path         OBJ_id_pkix_OCSP,10L

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1911 #define SN_id_pkix_OCSP_trustRoot    "trustRoot"
1912 #define LN_id_pkix_OCSP_trustRoot    "Trust Root"
1913 #define NID_id_pkix_OCSP_trustRoot    375
1914 #define OBJ_id_pkix_OCSP_trustRoot    OBJ_id_pkix_OCSP,11L

1916 #define SN_algorithm                 "algorithm"
1917 #define LN_algorithm                 "algorithm"
1918 #define NID_algorithm                376
1919 #define OBJ_algorithm                1L,3L,14L,3L,2L

1921 #define SN_md5WithRSA                "RSA-NP-MD5"
1922 #define LN_md5WithRSA                "md5WithRSA"
1923 #define NID_md5WithRSA                104
1924 #define OBJ_md5WithRSA                OBJ_algorithm,3L

1926 #define SN_des_ecb                   "DES-ECB"
1927 #define LN_des_ecb                   "des-ecb"
1928 #define NID_des_ecb                  29
1929 #define OBJ_des_ecb                  OBJ_algorithm,6L

1931 #define SN_des_cbc                   "DES-CBC"
1932 #define LN_des_cbc                   "des-cbc"
1933 #define NID_des_cbc                  31
1934 #define OBJ_des_cbc                  OBJ_algorithm,7L

1936 #define SN_des_ofb64                 "DES-OFB"
1937 #define LN_des_ofb64                 "des-ofb"
1938 #define NID_des_ofb64                45
1939 #define OBJ_des_ofb64                OBJ_algorithm,8L

1941 #define SN_des_cfb64                 "DES-CFB"
1942 #define LN_des_cfb64                 "des-cfb"
1943 #define NID_des_cfb64                30
1944 #define OBJ_des_cfb64                OBJ_algorithm,9L

1946 #define SN_rsaSignature               "rsaSignature"
1947 #define NID_rsaSignature              377
1948 #define OBJ_rsaSignature              OBJ_algorithm,11L

1950 #define SN_dsa_2                     "DSA-old"
1951 #define LN_dsa_2                     "dsaEncryption-old"
1952 #define NID_dsa_2                    67
1953 #define OBJ_dsa_2                    OBJ_algorithm,12L

1955 #define SN_dsaWithSHA                 "DSA-SHA"
1956 #define LN_dsaWithSHA                 "dsaWithSHA"
1957 #define NID_dsaWithSHA                66
1958 #define OBJ_dsaWithSHA                OBJ_algorithm,13L

1960 #define SN_shawithRSAEncryption        "RSA-SHA"
1961 #define LN_shawithRSAEncryption        "shawithRSAEncryption"
1962 #define NID_shawithRSAEncryption        42
1963 #define OBJ_shawithRSAEncryption        OBJ_algorithm,15L

1965 #define SN_des_ede_ecb                "DES-EDE"
1966 #define LN_des_ede_ecb                "des-ede"
1967 #define NID_des_ede_ecb                32
1968 #define OBJ_des_ede_ecb                OBJ_algorithm,17L

1970 #define SN_des_ede3_ecb               "DES-EDE3"
1971 #define LN_des_ede3_ecb               "des-ede3"
1972 #define NID_des_ede3_ecb               33

1974 #define SN_des_ede_cbc                "DES-EDE-CBC"
1975 #define LN_des_ede_cbc                "des-ede-cbc"

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1976 #define NID_des_ede_cbc          43
1978 #define SN_des_ede_cfb64           "DES-EDE-CFB"
1979 #define LN_des_ede_cfb64            "des-ede-cfb"
1980 #define NID_des_ede_cfb64          60
1982 #define SN_des_ede3_cfb64           "DES-EDE3-CFB"
1983 #define LN_des_ede3_cfb64           "des-ede3-cfb"
1984 #define NID_des_ede3_cfb64         61
1986 #define SN_des_ede_ofb64            "DES-EDE-OFB"
1987 #define LN_des_ede_ofb64            "des-ede-ofb"
1988 #define NID_des_ede_ofb64          62
1990 #define SN_des_ede3_ofb64           "DES-EDE3-OFB"
1991 #define LN_des_ede3_ofb64           "des-ede3-ofb"
1992 #define NID_des_ede3_ofb64         63
1994 #define SN_desx_cbc                 "DESX-CBC"
1995 #define LN_desx_cbc                 "desx-cbc"
1996 #define NID_desx_cbc                80
1998 #define SN_sha                      "SHA"
1999 #define LN_sha                      "sha"
2000 #define NID_sha                     41
2001 #define OBJ_sha                     OBJ_algorithm,18L
2003 #define SN_sha1                     "SHA1"
2004 #define LN_sha1                     "sha1"
2005 #define NID_sha1                    64
2006 #define OBJ_sha1                    OBJ_algorithm,26L
2008 #define SN_dsaWithSHA1_2            "DSA-SHA1-old"
2009 #define LN_dsaWithSHA1_2            "dsaWithSHA1-old"
2010 #define NID_dsaWithSHA1_2          70
2011 #define OBJ_dsaWithSHA1_2           OBJ_algorithm,27L
2013 #define SN_sha1WithRSA              "RSA-SHA1-2"
2014 #define LN_sha1WithRSA              "sha1WithRSA"
2015 #define NID_sha1WithRSA            115
2016 #define OBJ_sha1WithRSA             OBJ_algorithm,29L
2018 #define SN_ripemd160               "RIPEMD160"
2019 #define LN_ripemd160               "ripemd160"
2020 #define NID_ripemd160              117
2021 #define OBJ_ripemd160              1L,3L,36L,3L,2L,1L
2023 #define SN_ripemd160WithRSA         "RSA-RIPEMD160"
2024 #define LN_ripemd160WithRSA         "ripemd160WithRSA"
2025 #define NID_ripemd160WithRSA       119
2026 #define OBJ_ripemd160WithRSA        1L,3L,36L,3L,3L,1L,2L
2028 #define SN_sxnet                    "SXNetID"
2029 #define LN_sxnet                    "Strong Extranet ID"
2030 #define NID_sxnet                   143
2031 #define OBJ_sxnet                   1L,3L,101L,1L,4L,1L
2033 #define SN_X500                     "X500"
2034 #define LN_X500                     "directory services (X.500)"
2035 #define NID_X500                    11
2036 #define OBJ_X500                    2L,5L
2038 #define SN_X509                     "X509"
2039 #define NID_X509                    12
2040 #define OBJ_X509                    OBJ_X500,4L
```

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2042 #define SN_commonName              "CN"
2043 #define LN_commonName               "commonName"
2044 #define NID_commonName              13
2045 #define OBJ_commonName              OBJ_X509,3L
2047 #define SN_surname                   "SN"
2048 #define LN_surname                  "surname"
2049 #define NID_surname                 100
2050 #define OBJ_surname                 OBJ_X509,4L
2052 #define LN_serialNumber              "serialNumber"
2053 #define NID_serialNumber            105
2054 #define OBJ_serialNumber            OBJ_X509,5L
2056 #define SN_countryName              "C"
2057 #define LN_countryName              "countryName"
2058 #define NID_countryName            14
2059 #define OBJ_countryName            OBJ_X509,6L
2061 #define SN_localityName             "L"
2062 #define LN_localityName             "localityName"
2063 #define NID_localityName            15
2064 #define OBJ_localityName            OBJ_X509,7L
2066 #define SN_stateOrProvinceName      "ST"
2067 #define LN_stateOrProvinceName      "stateOrProvinceName"
2068 #define NID_stateOrProvinceName     16
2069 #define OBJ_stateOrProvinceName     OBJ_X509,8L
2071 #define SN_streetAddress             "street"
2072 #define LN_streetAddress             "streetAddress"
2073 #define NID_streetAddress           660
2074 #define OBJ_streetAddress           OBJ_X509,9L
2076 #define SN_organizationName         "O"
2077 #define LN_organizationName         "organizationName"
2078 #define NID_organizationName        17
2079 #define OBJ_organizationName        OBJ_X509,10L
2081 #define SN_organizationalUnitName    "OU"
2082 #define LN_organizationalUnitName    "organizationalUnitName"
2083 #define NID_organizationalUnitName  18
2084 #define OBJ_organizationalUnitName  OBJ_X509,11L
2086 #define SN_title                     "title"
2087 #define LN_title                     "title"
2088 #define NID_title                   106
2089 #define OBJ_title                   OBJ_X509,12L
2091 #define LN_description              "description"
2092 #define NID_description             107
2093 #define OBJ_description             OBJ_X509,13L
2095 #define LN_searchGuide              "searchGuide"
2096 #define NID_searchGuide             859
2097 #define OBJ_searchGuide            OBJ_X509,14L
2099 #define LN_businessCategory          "businessCategory"
2100 #define NID_businessCategory        860
2101 #define OBJ_businessCategory        OBJ_X509,15L
2103 #define LN_postalAddress             "postalAddress"
2104 #define NID_postalAddress           861
2105 #define OBJ_postalAddress           OBJ_X509,16L
2107 #define LN_postalCode               "postalCode"
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2108 #define NID_postalCode          661
2109 #define OBJ_postalCode            OBJ_X509, 17L

2111 #define LN_postOfficeBox          "postOfficeBox"
2112 #define NID_postOfficeBox        862
2113 #define OBJ_postOfficeBox        OBJ_X509, 18L

2115 #define LN_physicalDeliveryOfficeName "physicalDeliveryOfficeName"
2116 #define NID_physicalDeliveryOfficeName 863
2117 #define OBJ_physicalDeliveryOfficeName  OBJ_X509, 19L

2119 #define LN_telephoneNumber        "telephoneNumber"
2120 #define NID_telephoneNumber      864
2121 #define OBJ_telephoneNumber      OBJ_X509, 20L

2123 #define LN_telexNumber           "telexNumber"
2124 #define NID_telexNumber          865
2125 #define OBJ_telexNumber          OBJ_X509, 21L

2127 #define LN_teletexTerminalIdentifier "teletexTerminalIdentifier"
2128 #define NID_teletexTerminalIdentifier 866
2129 #define OBJ_teletexTerminalIdentifier  OBJ_X509, 22L

2131 #define LN_facsimileTelephoneNumber "facsimileTelephoneNumber"
2132 #define NID_facsimileTelephoneNumber 867
2133 #define OBJ_facsimileTelephoneNumber  OBJ_X509, 23L

2135 #define LN_x121Address           "x121Address"
2136 #define NID_x121Address          868
2137 #define OBJ_x121Address          OBJ_X509, 24L

2139 #define LN_internationaliSDNNumber "internationaliSDNNumber"
2140 #define NID_internationaliSDNNumber 869
2141 #define OBJ_internationaliSDNNumber  OBJ_X509, 25L

2143 #define LN_registeredAddress      "registeredAddress"
2144 #define NID_registeredAddress     870
2145 #define OBJ_registeredAddress     OBJ_X509, 26L

2147 #define LN_destinationIndicator   "destinationIndicator"
2148 #define NID_destinationIndicator  871
2149 #define OBJ_destinationIndicator  OBJ_X509, 27L

2151 #define LN_preferredDeliveryMethod "preferredDeliveryMethod"
2152 #define NID_preferredDeliveryMethod 872
2153 #define OBJ_preferredDeliveryMethod  OBJ_X509, 28L

2155 #define LN_presentationAddress    "presentationAddress"
2156 #define NID_presentationAddress   873
2157 #define OBJ_presentationAddress   OBJ_X509, 29L

2159 #define LN_supportedApplicationContext "supportedApplicationContext"
2160 #define NID_supportedApplicationContext 874
2161 #define OBJ_supportedApplicationContext  OBJ_X509, 30L

2163 #define SN_member                 "member"
2164 #define NID_member                875
2165 #define OBJ_member                OBJ_X509, 31L

2167 #define SN_owner                  "owner"
2168 #define NID_owner                 876
2169 #define OBJ_owner                 OBJ_X509, 32L

2171 #define LN_roleOccupant           "roleOccupant"
2172 #define NID_roleOccupant          877
2173 #define OBJ_roleOccupant          OBJ_X509, 33L
```

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2175 #define SN_seeAlso               "seeAlso"
2176 #define NID_seeAlso              878
2177 #define OBJ_seeAlso              OBJ_X509, 34L

2179 #define LN_userPassword           "userPassword"
2180 #define NID_userPassword         879
2181 #define OBJ_userPassword         OBJ_X509, 35L

2183 #define LN_userCertificate        "userCertificate"
2184 #define NID_userCertificate      880
2185 #define OBJ_userCertificate      OBJ_X509, 36L

2187 #define LN_cACertificate         "cACertificate"
2188 #define NID_cACertificate        881
2189 #define OBJ_cACertificate        OBJ_X509, 37L

2191 #define LN_authorityRevocationList "authorityRevocationList"
2192 #define NID_authorityRevocationList 882
2193 #define OBJ_authorityRevocationList  OBJ_X509, 38L

2195 #define LN_certificateRevocationList "certificateRevocationList"
2196 #define NID_certificateRevocationList 883
2197 #define OBJ_certificateRevocationList  OBJ_X509, 39L

2199 #define LN_crossCertificatePair    "crossCertificatePair"
2200 #define NID_crossCertificatePair    884
2201 #define OBJ_crossCertificatePair    OBJ_X509, 40L

2203 #define SN_name                  "name"
2204 #define LN_name                  "name"
2205 #define NID_name                 173
2206 #define OBJ_name                 OBJ_X509, 41L

2208 #define SN_givenName             "GN"
2209 #define LN_givenName             "givenName"
2210 #define NID_givenName            99
2211 #define OBJ_givenName            OBJ_X509, 42L

2213 #define SN_initials              "initials"
2214 #define LN_initials              "initials"
2215 #define NID_initials             101
2216 #define OBJ_initials             OBJ_X509, 43L

2218 #define LN_generationQualifier    "generationQualifier"
2219 #define NID_generationQualifier    509
2220 #define OBJ_generationQualifier    OBJ_X509, 44L

2222 #define LN_x500UniqueIdentifier   "x500UniqueIdentifier"
2223 #define NID_x500UniqueIdentifier   503
2224 #define OBJ_x500UniqueIdentifier   OBJ_X509, 45L

2226 #define SN_dnQualifier           "dnQualifier"
2227 #define LN_dnQualifier           "dnQualifier"
2228 #define NID_dnQualifier          174
2229 #define OBJ_dnQualifier          OBJ_X509, 46L

2231 #define LN_enhancedSearchGuide    "enhancedSearchGuide"
2232 #define NID_enhancedSearchGuide    885
2233 #define OBJ_enhancedSearchGuide    OBJ_X509, 47L

2235 #define LN_protocolInformation    "protocolInformation"
2236 #define NID_protocolInformation    886
2237 #define OBJ_protocolInformation    OBJ_X509, 48L

2239 #define LN_distinguishedName      "distinguishedName"
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2240 #define NID_distinguishedName      887
2241 #define OBJ_distinguishedName        OBJ_X509,49L

2243 #define LN_uniqueMember              "uniqueMember"
2244 #define NID_uniqueMember             888
2245 #define OBJ_uniqueMember             OBJ_X509,50L

2247 #define LN_houseIdentifier           "houseIdentifier"
2248 #define NID_houseIdentifier          889
2249 #define OBJ_houseIdentifier          OBJ_X509,51L

2251 #define LN_supportedAlgorithms       "supportedAlgorithms"
2252 #define NID_supportedAlgorithms      890
2253 #define OBJ_supportedAlgorithms      OBJ_X509,52L

2255 #define LN_deltaRevocationList       "deltaRevocationList"
2256 #define NID_deltaRevocationList      891
2257 #define OBJ_deltaRevocationList      OBJ_X509,53L

2259 #define SN_dmdName                   "dmdName"
2260 #define NID_dmdName                  892
2261 #define OBJ_dmdName                  OBJ_X509,54L

2263 #define LN_pseudonym                 "pseudonym"
2264 #define NID_pseudonym                510
2265 #define OBJ_pseudonym                OBJ_X509,65L

2267 #define SN_role                       "role"
2268 #define LN_role                       "role"
2269 #define NID_role                     400
2270 #define OBJ_role                     OBJ_X509,72L

2272 #define SN_X500algorithms             "X500algorithms"
2273 #define LN_X500algorithms             "directory services - algorithms"
2274 #define NID_X500algorithms           378
2275 #define OBJ_X500algorithms           OBJ_X500,8L

2277 #define SN_rsa                       "RSA"
2278 #define LN_rsa                       "rsa"
2279 #define NID_rsa                      19
2280 #define OBJ_rsa                      OBJ_X500algorithms,1L,1L

2282 #define SN_mdc2WithRSA               "RSA-MDC2"
2283 #define LN_mdc2WithRSA               "mdc2WithRSA"
2284 #define NID_mdc2WithRSA             96
2285 #define OBJ_mdc2WithRSA             OBJ_X500algorithms,3L,100L

2287 #define SN_mdc2                      "MDC2"
2288 #define LN_mdc2                      "mdc2"
2289 #define NID_mdc2                    95
2290 #define OBJ_mdc2                    OBJ_X500algorithms,3L,101L

2292 #define SN_id_ce                     "id-ce"
2293 #define NID_id_ce                    81
2294 #define OBJ_id_ce                    OBJ_X500,29L

2296 #define SN_subject_directory_attributes "subjectDirectoryAttributes"
2297 #define LN_subject_directory_attributes "X509v3 Subject Directory Attrib
2298 #define NID_subject_directory_attributes 769
2299 #define OBJ_subject_directory_attributes OBJ_id_ce,9L

2301 #define SN_subject_key_identifier     "subjectKeyIdentifier"
2302 #define LN_subject_key_identifier     "X509v3 Subject Key Identifier"
2303 #define NID_subject_key_identifier    82
2304 #define OBJ_subject_key_identifier    OBJ_id_ce,14L
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2306 #define SN_key_usage                "keyUsage"
2307 #define LN_key_usage                  "X509v3 Key Usage"
2308 #define NID_key_usage                83
2309 #define OBJ_key_usage                OBJ_id_ce,15L

2311 #define SN_private_key_usage_period   "privateKeyUsagePeriod"
2312 #define LN_private_key_usage_period   "X509v3 Private Key Usage Period
2313 #define NID_private_key_usage_period  84
2314 #define OBJ_private_key_usage_period  OBJ_id_ce,16L

2316 #define SN_subject_alt_name           "subjectAltName"
2317 #define LN_subject_alt_name           "X509v3 Subject Alternative Name"
2318 #define NID_subject_alt_name         85
2319 #define OBJ_subject_alt_name         OBJ_id_ce,17L

2321 #define SN_issuer_alt_name            "issuerAltName"
2322 #define LN_issuer_alt_name            "X509v3 Issuer Alternative Name"
2323 #define NID_issuer_alt_name          86
2324 #define OBJ_issuer_alt_name          OBJ_id_ce,18L

2326 #define SN_basic_constraints          "basicConstraints"
2327 #define LN_basic_constraints          "X509v3 Basic Constraints"
2328 #define NID_basic_constraints         87
2329 #define OBJ_basic_constraints         OBJ_id_ce,19L

2331 #define SN_crl_number                "crlNumber"
2332 #define LN_crl_number                "X509v3 CRL Number"
2333 #define NID_crl_number               88
2334 #define OBJ_crl_number               OBJ_id_ce,20L

2336 #define SN_crl_reason                "CRLReason"
2337 #define LN_crl_reason                "X509v3 CRL Reason Code"
2338 #define NID_crl_reason               141
2339 #define OBJ_crl_reason               OBJ_id_ce,21L

2341 #define SN_invalidity_date            "invalidityDate"
2342 #define LN_invalidity_date            "Invalidity Date"
2343 #define NID_invalidity_date          142
2344 #define OBJ_invalidity_date          OBJ_id_ce,24L

2346 #define SN_delta_crl                 "deltaCRL"
2347 #define LN_delta_crl                 "X509v3 Delta CRL Indicator"
2348 #define NID_delta_crl                140
2349 #define OBJ_delta_crl                OBJ_id_ce,27L

2351 #define SN_issuing_distribution_point "issuingDistributionPoint"
2352 #define LN_issuing_distribution_point "X509v3 Issuing Distrubution Poi
2353 #define NID_issuing_distribution_point 770
2354 #define OBJ_issuing_distribution_point OBJ_id_ce,28L

2356 #define SN_certificate_issuer         "certificateIssuer"
2357 #define LN_certificate_issuer         "X509v3 Certificate Issuer"
2358 #define NID_certificate_issuer        771
2359 #define OBJ_certificate_issuer        OBJ_id_ce,29L

2361 #define SN_name_constraints            "nameConstraints"
2362 #define LN_name_constraints            "X509v3 Name Constraints"
2363 #define NID_name_constraints          666
2364 #define OBJ_name_constraints          OBJ_id_ce,30L

2366 #define SN_crl_distribution_points     "crlDistributionPoints"
2367 #define LN_crl_distribution_points     "X509v3 CRL Distribution Points"
2368 #define NID_crl_distribution_points    103
2369 #define OBJ_crl_distribution_points    OBJ_id_ce,31L

2371 #define SN_certificate_policies        "certificatePolicies"
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2372 #define LN_certificate_policies "X509v3 Certificate Policies"
2373 #define NID_certificate_policies 89
2374 #define OBJ_certificate_policies OBJ_id_ce, 32L

2376 #define SN_any_policy "anyPolicy"
2377 #define LN_any_policy "X509v3 Any Policy"
2378 #define NID_any_policy 746
2379 #define OBJ_any_policy OBJ_certificate_policies, 0L

2381 #define SN_policy_mappings "policyMappings"
2382 #define LN_policy_mappings "X509v3 Policy Mappings"
2383 #define NID_policy_mappings 747
2384 #define OBJ_policy_mappings OBJ_id_ce, 33L

2386 #define SN_authority_key_identifier "authorityKeyIdentifier"
2387 #define LN_authority_key_identifier "X509v3 Authority Key Identifier"
2388 #define NID_authority_key_identifier 90
2389 #define OBJ_authority_key_identifier OBJ_id_ce, 35L

2391 #define SN_policy_constraints "policyConstraints"
2392 #define LN_policy_constraints "X509v3 Policy Constraints"
2393 #define NID_policy_constraints 401
2394 #define OBJ_policy_constraints OBJ_id_ce, 36L

2396 #define SN_ext_key_usage "extendedKeyUsage"
2397 #define LN_ext_key_usage "X509v3 Extended Key Usage"
2398 #define NID_ext_key_usage 126
2399 #define OBJ_ext_key_usage OBJ_id_ce, 37L

2401 #define SN_freshest_crl "freshestCRL"
2402 #define LN_freshest_crl "X509v3 Freshest CRL"
2403 #define NID_freshest_crl 857
2404 #define OBJ_freshest_crl OBJ_id_ce, 46L

2406 #define SN_inhibit_any_policy "inhibitAnyPolicy"
2407 #define LN_inhibit_any_policy "X509v3 Inhibit Any Policy"
2408 #define NID_inhibit_any_policy 748
2409 #define OBJ_inhibit_any_policy OBJ_id_ce, 54L

2411 #define SN_target_information "targetInformation"
2412 #define LN_target_information "X509v3 AC Targeting"
2413 #define NID_target_information 402
2414 #define OBJ_target_information OBJ_id_ce, 55L

2416 #define SN_no_rev_avail "noRevAvail"
2417 #define LN_no_rev_avail "X509v3 No Revocation Available"
2418 #define NID_no_rev_avail 403
2419 #define OBJ_no_rev_avail OBJ_id_ce, 56L

2421 #define SN_anyExtendedKeyUsage "anyExtendedKeyUsage"
2422 #define LN_anyExtendedKeyUsage "Any Extended Key Usage"
2423 #define NID_anyExtendedKeyUsage 910
2424 #define OBJ_anyExtendedKeyUsage OBJ_ext_key_usage, 0L

2426 #define SN_netscape "Netscape"
2427 #define LN_netscape "Netscape Communications Corp."
2428 #define NID_netscape 57
2429 #define OBJ_netscape 2L, 16L, 840L, 1L, 113730L

2431 #define SN_netscape_cert_extension "nsCertExt"
2432 #define LN_netscape_cert_extension "Netscape Certificate Extension"
2433 #define NID_netscape_cert_extension 58
2434 #define OBJ_netscape_cert_extension OBJ_netscape, 1L

2436 #define SN_netscape_data_type "nsDataType"
2437 #define LN_netscape_data_type "Netscape Data Type"

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2438 #define NID_netscape_data_type 59
2439 #define OBJ_netscape_data_type OBJ_netscape, 2L

2441 #define SN_netscape_cert_type "nsCertType"
2442 #define LN_netscape_cert_type "Netscape Cert Type"
2443 #define NID_netscape_cert_type 71
2444 #define OBJ_netscape_cert_type OBJ_netscape_cert_extension, 1L

2446 #define SN_netscape_base_url "nsBaseUrl"
2447 #define LN_netscape_base_url "Netscape Base Url"
2448 #define NID_netscape_base_url 72
2449 #define OBJ_netscape_base_url OBJ_netscape_cert_extension, 2L

2451 #define SN_netscape_revocation_url "nsRevocationUrl"
2452 #define LN_netscape_revocation_url "Netscape Revocation Url"
2453 #define NID_netscape_revocation_url 73
2454 #define OBJ_netscape_revocation_url OBJ_netscape_cert_extension, 3L

2456 #define SN_netscape_ca_revocation_url "nsCaRevocationUrl"
2457 #define LN_netscape_ca_revocation_url "Netscape CA Revocation Url"
2458 #define NID_netscape_ca_revocation_url 74
2459 #define OBJ_netscape_ca_revocation_url OBJ_netscape_cert_extension, 4L

2461 #define SN_netscape_renewal_url "nsRenewalUrl"
2462 #define LN_netscape_renewal_url "Netscape Renewal Url"
2463 #define NID_netscape_renewal_url 75
2464 #define OBJ_netscape_renewal_url OBJ_netscape_cert_extension, 7L

2466 #define SN_netscape_ca_policy_url "nsCaPolicyUrl"
2467 #define LN_netscape_ca_policy_url "Netscape CA Policy Url"
2468 #define NID_netscape_ca_policy_url 76
2469 #define OBJ_netscape_ca_policy_url OBJ_netscape_cert_extension, 8L

2471 #define SN_netscape_ssl_server_name "nsSslServerName"
2472 #define LN_netscape_ssl_server_name "Netscape SSL Server Name"
2473 #define NID_netscape_ssl_server_name 77
2474 #define OBJ_netscape_ssl_server_name OBJ_netscape_cert_extension, 12L

2476 #define SN_netscape_comment "nsComment"
2477 #define LN_netscape_comment "Netscape Comment"
2478 #define NID_netscape_comment 78
2479 #define OBJ_netscape_comment OBJ_netscape_cert_extension, 13L

2481 #define SN_netscape_cert_sequence "nsCertSequence"
2482 #define LN_netscape_cert_sequence "Netscape Certificate Sequence"
2483 #define NID_netscape_cert_sequence 79
2484 #define OBJ_netscape_cert_sequence OBJ_netscape_data_type, 5L

2486 #define SN_ns_sgc "nsSGC"
2487 #define LN_ns_sgc "Netscape Server Gated Crypto"
2488 #define NID_ns_sgc 139
2489 #define OBJ_ns_sgc OBJ_netscape, 4L, 1L

2491 #define SN_org "ORG"
2492 #define LN_org "org"
2493 #define NID_org 379
2494 #define OBJ_org OBJ_iso, 3L

2496 #define SN_dod "DOD"
2497 #define LN_dod "dod"
2498 #define NID_dod 380
2499 #define OBJ_dod OBJ_org, 6L

2501 #define SN_iana "IANA"
2502 #define LN_iana "iana"
2503 #define NID_iana 381

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2504 #define OBJ_iana                OBJ_dod,1L
2506 #define OBJ_internet              OBJ_iana
2508 #define SN_Directory               "directory"
2509 #define LN_Directory               "Directory"
2510 #define NID_Directory              382
2511 #define OBJ_Directory              OBJ_internet,1L
2513 #define SN_Management              "mgmt"
2514 #define LN_Management              "Management"
2515 #define NID_Management              383
2516 #define OBJ_Management              OBJ_internet,2L
2518 #define SN_Experimental            "experimental"
2519 #define LN_Experimental            "Experimental"
2520 #define NID_Experimental            384
2521 #define OBJ_Experimental            OBJ_internet,3L
2523 #define SN_Private                 "private"
2524 #define LN_Private                 "Private"
2525 #define NID_Private                 385
2526 #define OBJ_Private                 OBJ_internet,4L
2528 #define SN_Security                "security"
2529 #define LN_Security                "Security"
2530 #define NID_Security                386
2531 #define OBJ_Security                OBJ_internet,5L
2533 #define SN_SNMPv2                  "snmpv2"
2534 #define LN_SNMPv2                  "SNMPv2"
2535 #define NID_SNMPv2                  387
2536 #define OBJ_SNMPv2                  OBJ_internet,6L
2538 #define LN_Mail                    "Mail"
2539 #define NID_Mail                    388
2540 #define OBJ_Mail                    OBJ_internet,7L
2542 #define SN_Enterprises              "enterprises"
2543 #define LN_Enterprises              "Enterprises"
2544 #define NID_Enterprises              389
2545 #define OBJ_Enterprises              OBJ_Private,1L
2547 #define SN_dcObject                "dcobject"
2548 #define LN_dcObject                "dcObject"
2549 #define NID_dcObject                390
2550 #define OBJ_dcObject                OBJ_Enterprises,1466L,344L
2552 #define SN_mime_mhs                "mime-mhs"
2553 #define LN_mime_mhs                "MIME MHS"
2554 #define NID_mime_mhs                504
2555 #define OBJ_mime_mhs                OBJ_Mail,1L
2557 #define SN_mime_mhs_headings        "mime-mhs-headings"
2558 #define LN_mime_mhs_headings        "mime-mhs-headings"
2559 #define NID_mime_mhs_headings        505
2560 #define OBJ_mime_mhs_headings        OBJ_mime_mhs,1L
2562 #define SN_mime_mhs_bodies          "mime-mhs-bodies"
2563 #define LN_mime_mhs_bodies          "mime-mhs-bodies"
2564 #define NID_mime_mhs_bodies          506
2565 #define OBJ_mime_mhs_bodies          OBJ_mime_mhs,2L
2567 #define SN_id_hex_partial_message    "id-hex-partial-message"
2568 #define LN_id_hex_partial_message    "id-hex-partial-message"
2569 #define NID_id_hex_partial_message    507

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2570 #define OBJ_id_hex_partial_message    OBJ_mime_mhs_headings,1L
2572 #define SN_id_hex_multipart_message    "id-hex-multipart-message"
2573 #define LN_id_hex_multipart_message    "id-hex-multipart-message"
2574 #define NID_id_hex_multipart_message    508
2575 #define OBJ_id_hex_multipart_message    OBJ_mime_mhs_headings,2L
2577 #define SN_rle_compression           "RLE"
2578 #define LN_rle_compression           "run length compression"
2579 #define NID_rle_compression           124
2580 #define OBJ_rle_compression           1L,1L,1L,1L,666L,1L
2582 #define SN_zlib_compression           "ZLIB"
2583 #define LN_zlib_compression           "zlib compression"
2584 #define NID_zlib_compression           125
2585 #define OBJ_zlib_compression           OBJ_id_smime_alg,8L
2587 #define OBJ_csor                     2L,16L,840L,1L,101L,3L
2589 #define OBJ_nistAlgorithms            OBJ_csor,4L
2591 #define OBJ_aes                       OBJ_nistAlgorithms,1L
2593 #define SN_aes_128_ecb                "AES-128-ECB"
2594 #define LN_aes_128_ecb                "aes-128-ecb"
2595 #define NID_aes_128_ecb                418
2596 #define OBJ_aes_128_ecb                OBJ_aes,1L
2598 #define SN_aes_128_cbc                "AES-128-CBC"
2599 #define LN_aes_128_cbc                "aes-128-cbc"
2600 #define NID_aes_128_cbc                419
2601 #define OBJ_aes_128_cbc                OBJ_aes,2L
2603 #define SN_aes_128_ofb128              "AES-128-OFB"
2604 #define LN_aes_128_ofb128              "aes-128-ofb"
2605 #define NID_aes_128_ofb128              420
2606 #define OBJ_aes_128_ofb128              OBJ_aes,3L
2608 #define SN_aes_128_cfb128              "AES-128-CFB"
2609 #define LN_aes_128_cfb128              "aes-128-cfb"
2610 #define NID_aes_128_cfb128              421
2611 #define OBJ_aes_128_cfb128              OBJ_aes,4L
2613 #define SN_id_aes128_wrap              "id-aes128-wrap"
2614 #define NID_id_aes128_wrap              788
2615 #define OBJ_id_aes128_wrap              OBJ_aes,5L
2617 #define SN_aes_128_gcm                 "id-aes128-GCM"
2618 #define LN_aes_128_gcm                 "aes-128-gcm"
2619 #define NID_aes_128_gcm                 895
2620 #define OBJ_aes_128_gcm                 OBJ_aes,6L
2622 #define SN_aes_128_ccm                 "id-aes128-CCM"
2623 #define LN_aes_128_ccm                 "aes-128-ccm"
2624 #define NID_aes_128_ccm                 896
2625 #define OBJ_aes_128_ccm                 OBJ_aes,7L
2627 #define SN_id_aes128_wrap_pad          "id-aes128-wrap-pad"
2628 #define NID_id_aes128_wrap_pad          897
2629 #define OBJ_id_aes128_wrap_pad          OBJ_aes,8L
2631 #define SN_aes_192_ecb                 "AES-192-ECB"
2632 #define LN_aes_192_ecb                 "aes-192-ecb"
2633 #define NID_aes_192_ecb                 422
2634 #define OBJ_aes_192_ecb                 OBJ_aes,21L

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2636 #define SN_aes_192_cbc          "AES-192-CBC"
2637 #define LN_aes_192_cbc          "aes-192-cbc"
2638 #define NID_aes_192_cbc        423
2639 #define OBJ_aes_192_cbc         OBJ_aes, 22L

2641 #define SN_aes_192_ofb128        "AES-192-OFB"
2642 #define LN_aes_192_ofb128        "aes-192-ofb"
2643 #define NID_aes_192_ofb128      424
2644 #define OBJ_aes_192_ofb128      OBJ_aes, 23L

2646 #define SN_aes_192_cfb128        "AES-192-CFB"
2647 #define LN_aes_192_cfb128        "aes-192-cfb"
2648 #define NID_aes_192_cfb128      425
2649 #define OBJ_aes_192_cfb128      OBJ_aes, 24L

2651 #define SN_id_aes192_wrap        "id-aes192-wrap"
2652 #define NID_id_aes192_wrap       789
2653 #define OBJ_id_aes192_wrap       OBJ_aes, 25L

2655 #define SN_aes_192_gcm          "id-aes192-GCM"
2656 #define LN_aes_192_gcm          "aes-192-gcm"
2657 #define NID_aes_192_gcm         898
2658 #define OBJ_aes_192_gcm         OBJ_aes, 26L

2660 #define SN_aes_192_ccm          "id-aes192-CCM"
2661 #define LN_aes_192_ccm          "aes-192-ccm"
2662 #define NID_aes_192_ccm         899
2663 #define OBJ_aes_192_ccm         OBJ_aes, 27L

2665 #define SN_id_aes192_wrap_pad    "id-aes192-wrap-pad"
2666 #define NID_id_aes192_wrap_pad   900
2667 #define OBJ_id_aes192_wrap_pad   OBJ_aes, 28L

2669 #define SN_aes_256_ecb          "AES-256-ECB"
2670 #define LN_aes_256_ecb          "aes-256-ecb"
2671 #define NID_aes_256_ecb         426
2672 #define OBJ_aes_256_ecb         OBJ_aes, 41L

2674 #define SN_aes_256_cbc          "AES-256-CBC"
2675 #define LN_aes_256_cbc          "aes-256-cbc"
2676 #define NID_aes_256_cbc         427
2677 #define OBJ_aes_256_cbc         OBJ_aes, 42L

2679 #define SN_aes_256_ofb128        "AES-256-OFB"
2680 #define LN_aes_256_ofb128        "aes-256-ofb"
2681 #define NID_aes_256_ofb128      428
2682 #define OBJ_aes_256_ofb128      OBJ_aes, 43L

2684 #define SN_aes_256_cfb128        "AES-256-CFB"
2685 #define LN_aes_256_cfb128        "aes-256-cfb"
2686 #define NID_aes_256_cfb128      429
2687 #define OBJ_aes_256_cfb128      OBJ_aes, 44L

2689 #define SN_id_aes256_wrap        "id-aes256-wrap"
2690 #define NID_id_aes256_wrap       790
2691 #define OBJ_id_aes256_wrap       OBJ_aes, 45L

2693 #define SN_aes_256_gcm          "id-aes256-GCM"
2694 #define LN_aes_256_gcm          "aes-256-gcm"
2695 #define NID_aes_256_gcm         901
2696 #define OBJ_aes_256_gcm         OBJ_aes, 46L

2698 #define SN_aes_256_ccm          "id-aes256-CCM"
2699 #define LN_aes_256_ccm          "aes-256-ccm"
2700 #define NID_aes_256_ccm         902
2701 #define OBJ_aes_256_ccm         OBJ_aes, 47L

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2703 #define SN_id_aes256_wrap_pad    "id-aes256-wrap-pad"
2704 #define NID_id_aes256_wrap_pad   903
2705 #define OBJ_id_aes256_wrap_pad   OBJ_aes, 48L

2707 #define SN_aes_128_cfb1          "AES-128-CFB1"
2708 #define LN_aes_128_cfb1          "aes-128-cfb1"
2709 #define NID_aes_128_cfb1         650

2711 #define SN_aes_192_cfb1          "AES-192-CFB1"
2712 #define LN_aes_192_cfb1          "aes-192-cfb1"
2713 #define NID_aes_192_cfb1         651

2715 #define SN_aes_256_cfb1          "AES-256-CFB1"
2716 #define LN_aes_256_cfb1          "aes-256-cfb1"
2717 #define NID_aes_256_cfb1         652

2719 #define SN_aes_128_cfb8          "AES-128-CFB8"
2720 #define LN_aes_128_cfb8          "aes-128-cfb8"
2721 #define NID_aes_128_cfb8         653

2723 #define SN_aes_192_cfb8          "AES-192-CFB8"
2724 #define LN_aes_192_cfb8          "aes-192-cfb8"
2725 #define NID_aes_192_cfb8         654

2727 #define SN_aes_256_cfb8          "AES-256-CFB8"
2728 #define LN_aes_256_cfb8          "aes-256-cfb8"
2729 #define NID_aes_256_cfb8         655

2731 #define SN_aes_128_ctr          "AES-128-CTR"
2732 #define LN_aes_128_ctr          "aes-128-ctr"
2733 #define NID_aes_128_ctr          904

2735 #define SN_aes_192_ctr          "AES-192-CTR"
2736 #define LN_aes_192_ctr          "aes-192-ctr"
2737 #define NID_aes_192_ctr          905

2739 #define SN_aes_256_ctr          "AES-256-CTR"
2740 #define LN_aes_256_ctr          "aes-256-ctr"
2741 #define NID_aes_256_ctr          906

2743 #define SN_aes_128_xts          "AES-128-XTS"
2744 #define LN_aes_128_xts          "aes-128-xts"
2745 #define NID_aes_128_xts         913

2747 #define SN_aes_256_xts          "AES-256-XTS"
2748 #define LN_aes_256_xts          "aes-256-xts"
2749 #define NID_aes_256_xts         914

2751 #define SN_des_cfb1              "DES-CFB1"
2752 #define LN_des_cfb1              "des-cfb1"
2753 #define NID_des_cfb1             656

2755 #define SN_des_cfb8              "DES-CFB8"
2756 #define LN_des_cfb8              "des-cfb8"
2757 #define NID_des_cfb8             657

2759 #define SN_des_ede3_cfb1         "DES-EDE3-CFB1"
2760 #define LN_des_ede3_cfb1         "des-ede3-cfb1"
2761 #define NID_des_ede3_cfb1        658

2763 #define SN_des_ede3_cfb8         "DES-EDE3-CFB8"
2764 #define LN_des_ede3_cfb8         "des-ede3-cfb8"
2765 #define NID_des_ede3_cfb8        659

2767 #define OBJ_nist_hashalgs        OBJ_nistAlgorithms, 2L

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2769 #define SN_sha256          "SHA256"
2770 #define LN_sha256          "sha256"
2771 #define NID_sha256          672
2772 #define OBJ_sha256          OBJ_nist_hashalgs,1L

2774 #define SN_sha384          "SHA384"
2775 #define LN_sha384          "sha384"
2776 #define NID_sha384          673
2777 #define OBJ_sha384          OBJ_nist_hashalgs,2L

2779 #define SN_sha512          "SHA512"
2780 #define LN_sha512          "sha512"
2781 #define NID_sha512          674
2782 #define OBJ_sha512          OBJ_nist_hashalgs,3L

2784 #define SN_sha224          "SHA224"
2785 #define LN_sha224          "sha224"
2786 #define NID_sha224          675
2787 #define OBJ_sha224          OBJ_nist_hashalgs,4L

2789 #define OBJ_dsa_with_sha2      OBJ_nistAlgorithms,3L

2791 #define SN_dsa_with_SHA224      "dsa_with_SHA224"
2792 #define NID_dsa_with_SHA224      802
2793 #define OBJ_dsa_with_SHA224      OBJ_dsa_with_sha2,1L

2795 #define SN_dsa_with_SHA256      "dsa_with_SHA256"
2796 #define NID_dsa_with_SHA256      803
2797 #define OBJ_dsa_with_SHA256      OBJ_dsa_with_sha2,2L

2799 #define SN_hold_instruction_code "holdInstructionCode"
2800 #define LN_hold_instruction_code "Hold Instruction Code"
2801 #define NID_hold_instruction_code 430
2802 #define OBJ_hold_instruction_code OBJ_id_ce,23L

2804 #define OBJ_holdInstruction      OBJ_X9_57,2L

2806 #define SN_hold_instruction_none "holdInstructionNone"
2807 #define LN_hold_instruction_none "Hold Instruction None"
2808 #define NID_hold_instruction_none 431
2809 #define OBJ_hold_instruction_none OBJ_holdInstruction,1L

2811 #define SN_hold_instruction_call_issuer "holdInstructionCallIssuer"
2812 #define LN_hold_instruction_call_issuer "Hold Instruction Call Issuer"
2813 #define NID_hold_instruction_call_issuer 432
2814 #define OBJ_hold_instruction_call_issuer OBJ_holdInstruction,2L

2816 #define SN_hold_instruction_reject "holdInstructionReject"
2817 #define LN_hold_instruction_reject "Hold Instruction Reject"
2818 #define NID_hold_instruction_reject 433
2819 #define OBJ_hold_instruction_reject OBJ_holdInstruction,3L

2821 #define SN_data          "data"
2822 #define NID_data          434
2823 #define OBJ_data          OBJ_itu_t,9L

2825 #define SN_pss          "pss"
2826 #define NID_pss          435
2827 #define OBJ_pss          OBJ_data,2342L

2829 #define SN_ucl          "ucl"
2830 #define NID_ucl          436
2831 #define OBJ_ucl          OBJ_pss,19200300L

2833 #define SN_pilot          "pilot"

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2834 #define NID_pilot          437
2835 #define OBJ_pilot          OBJ_ucl,100L

2837 #define LN_pilotAttributeType "pilotAttributeType"
2838 #define NID_pilotAttributeType 438
2839 #define OBJ_pilotAttributeType OBJ_pilot,1L

2841 #define LN_pilotAttributeSyntax "pilotAttributeSyntax"
2842 #define NID_pilotAttributeSyntax 439
2843 #define OBJ_pilotAttributeSyntax OBJ_pilot,3L

2845 #define LN_pilotObjectClass "pilotObjectClass"
2846 #define NID_pilotObjectClass 440
2847 #define OBJ_pilotObjectClass OBJ_pilot,4L

2849 #define LN_pilotGroups "pilotGroups"
2850 #define NID_pilotGroups 441
2851 #define OBJ_pilotGroups OBJ_pilot,10L

2853 #define LN_iA5StringSyntax "iA5StringSyntax"
2854 #define NID_iA5StringSyntax 442
2855 #define OBJ_iA5StringSyntax OBJ_pilotAttributeSyntax,4L

2857 #define LN_caseIgnoreIA5StringSyntax "caseIgnoreIA5StringSyntax"
2858 #define NID_caseIgnoreIA5StringSyntax 443
2859 #define OBJ_caseIgnoreIA5StringSyntax OBJ_pilotAttributeSyntax,5L

2861 #define LN_pilotObject "pilotObject"
2862 #define NID_pilotObject 444
2863 #define OBJ_pilotObject OBJ_pilotObjectClass,3L

2865 #define LN_pilotPerson "pilotPerson"
2866 #define NID_pilotPerson 445
2867 #define OBJ_pilotPerson OBJ_pilotObjectClass,4L

2869 #define SN_account "account"
2870 #define NID_account 446
2871 #define OBJ_account OBJ_pilotObjectClass,5L

2873 #define SN_document "document"
2874 #define NID_document 447
2875 #define OBJ_document OBJ_pilotObjectClass,6L

2877 #define SN_room "room"
2878 #define NID_room 448
2879 #define OBJ_room OBJ_pilotObjectClass,7L

2881 #define LN_documentSeries "documentSeries"
2882 #define NID_documentSeries 449
2883 #define OBJ_documentSeries OBJ_pilotObjectClass,9L

2885 #define SN_Domain "domain"
2886 #define LN_Domain "Domain"
2887 #define NID_Domain 392
2888 #define OBJ_Domain OBJ_pilotObjectClass,13L

2890 #define LN_rFC822localPart "rFC822localPart"
2891 #define NID_rFC822localPart 450
2892 #define OBJ_rFC822localPart OBJ_pilotObjectClass,14L

2894 #define LN_dNSDomain "dNSDomain"
2895 #define NID_dNSDomain 451
2896 #define OBJ_dNSDomain OBJ_pilotObjectClass,15L

2898 #define LN_domainRelatedObject "domainRelatedObject"
2899 #define NID_domainRelatedObject 452

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2900 #define OBJ_domainRelatedObject      OBJ_pilotObjectClass, 17L

2902 #define LN_friendlyCountry              "friendlyCountry"
2903 #define NID_friendlyCountry             453
2904 #define OBJ_friendlyCountry             OBJ_pilotObjectClass, 18L

2906 #define LN_simpleSecurityObject          "simpleSecurityObject"
2907 #define NID_simpleSecurityObject        454
2908 #define OBJ_simpleSecurityObject        OBJ_pilotObjectClass, 19L

2910 #define LN_pilotOrganization             "pilotOrganization"
2911 #define NID_pilotOrganization            455
2912 #define OBJ_pilotOrganization           OBJ_pilotObjectClass, 20L

2914 #define LN_pilotDSA                     "pilotDSA"
2915 #define NID_pilotDSA                    456
2916 #define OBJ_pilotDSA                    OBJ_pilotObjectClass, 21L

2918 #define LN_qualityLabelledData           "qualityLabelledData"
2919 #define NID_qualityLabelledData         457
2920 #define OBJ_qualityLabelledData         OBJ_pilotObjectClass, 22L

2922 #define SN_userId                       "UID"
2923 #define LN_userId                       "userId"
2924 #define NID_userId                      458
2925 #define OBJ_userId                      OBJ_pilotAttributeType, 1L

2927 #define LN_textEncodedORAddress          "textEncodedORAddress"
2928 #define NID_textEncodedORAddress         459
2929 #define OBJ_textEncodedORAddress         OBJ_pilotAttributeType, 2L

2931 #define SN_rfc822Mailbox                 "mail"
2932 #define LN_rfc822Mailbox                 "rfc822Mailbox"
2933 #define NID_rfc822Mailbox                460
2934 #define OBJ_rfc822Mailbox                OBJ_pilotAttributeType, 3L

2936 #define SN_info                          "info"
2937 #define NID_info                         461
2938 #define OBJ_info                         OBJ_pilotAttributeType, 4L

2940 #define LN_favouriteDrink                 "favouriteDrink"
2941 #define NID_favouriteDrink               462
2942 #define OBJ_favouriteDrink               OBJ_pilotAttributeType, 5L

2944 #define LN_roomNumber                    "roomNumber"
2945 #define NID_roomNumber                   463
2946 #define OBJ_roomNumber                   OBJ_pilotAttributeType, 6L

2948 #define SN_photo                         "photo"
2949 #define NID_photo                        464
2950 #define OBJ_photo                        OBJ_pilotAttributeType, 7L

2952 #define LN_userClass                     "userClass"
2953 #define NID_userClass                    465
2954 #define OBJ_userClass                    OBJ_pilotAttributeType, 8L

2956 #define SN_host                          "host"
2957 #define NID_host                         466
2958 #define OBJ_host                         OBJ_pilotAttributeType, 9L

2960 #define SN_manager                       "manager"
2961 #define NID_manager                      467
2962 #define OBJ_manager                      OBJ_pilotAttributeType, 10L

2964 #define LN_documentIdentifier             "documentIdentifier"
2965 #define NID_documentIdentifier            468
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2966 #define OBJ_documentIdentifier          OBJ_pilotAttributeType, 11L

2968 #define LN_documentTitle                 "documentTitle"
2969 #define NID_documentTitle                469
2970 #define OBJ_documentTitle                OBJ_pilotAttributeType, 12L

2972 #define LN_documentVersion                "documentVersion"
2973 #define NID_documentVersion              470
2974 #define OBJ_documentVersion              OBJ_pilotAttributeType, 13L

2976 #define LN_documentAuthor                "documentAuthor"
2977 #define NID_documentAuthor               471
2978 #define OBJ_documentAuthor               OBJ_pilotAttributeType, 14L

2980 #define LN_documentLocation              "documentLocation"
2981 #define NID_documentLocation             472
2982 #define OBJ_documentLocation             OBJ_pilotAttributeType, 15L

2984 #define LN_homeTelephoneNumber           "homeTelephoneNumber"
2985 #define NID_homeTelephoneNumber         473
2986 #define OBJ_homeTelephoneNumber         OBJ_pilotAttributeType, 20L

2988 #define SN_secretary                     "secretary"
2989 #define NID_secretary                    474
2990 #define OBJ_secretary                    OBJ_pilotAttributeType, 21L

2992 #define LN_otherMailbox                  "otherMailbox"
2993 #define NID_otherMailbox                 475
2994 #define OBJ_otherMailbox                 OBJ_pilotAttributeType, 22L

2996 #define LN_lastModifiedTime              "lastModifiedTime"
2997 #define NID_lastModifiedTime             476
2998 #define OBJ_lastModifiedTime             OBJ_pilotAttributeType, 23L

3000 #define LN_lastModifiedBy                 "lastModifiedBy"
3001 #define NID_lastModifiedBy               477
3002 #define OBJ_lastModifiedBy               OBJ_pilotAttributeType, 24L

3004 #define SN_domainComponent                "DC"
3005 #define LN_domainComponent               "domainComponent"
3006 #define NID_domainComponent              391
3007 #define OBJ_domainComponent              OBJ_pilotAttributeType, 25L

3009 #define LN_aRecord                       "aRecord"
3010 #define NID_aRecord                      478
3011 #define OBJ_aRecord                      OBJ_pilotAttributeType, 26L

3013 #define LN_pilotAttributeType27          "pilotAttributeType27"
3014 #define NID_pilotAttributeType27         479
3015 #define OBJ_pilotAttributeType27         OBJ_pilotAttributeType, 27L

3017 #define LN_mXRecord                      "mXRecord"
3018 #define NID_mXRecord                     480
3019 #define OBJ_mXRecord                     OBJ_pilotAttributeType, 28L

3021 #define LN_nSRecord                      "nSRecord"
3022 #define NID_nSRecord                     481
3023 #define OBJ_nSRecord                     OBJ_pilotAttributeType, 29L

3025 #define LN_sOARecord                     "sOARecord"
3026 #define NID_sOARecord                    482
3027 #define OBJ_sOARecord                    OBJ_pilotAttributeType, 30L

3029 #define LN_cNAMERecord                   "cNAMERecord"
3030 #define NID_cNAMERecord                   483
3031 #define OBJ_cNAMERecord                   OBJ_pilotAttributeType, 31L
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3033 #define LN_associatedDomain      "associatedDomain"
3034 #define NID_associatedDomain      484
3035 #define OBJ_associatedDomain      OBJ_pilotAttributeType, 37L

3037 #define LN_associatedName          "associatedName"
3038 #define NID_associatedName        485
3039 #define OBJ_associatedName        OBJ_pilotAttributeType, 38L

3041 #define LN_homePostalAddress       "homePostalAddress"
3042 #define NID_homePostalAddress     486
3043 #define OBJ_homePostalAddress     OBJ_pilotAttributeType, 39L

3045 #define LN_personalTitle           "personalTitle"
3046 #define NID_personalTitle         487
3047 #define OBJ_personalTitle         OBJ_pilotAttributeType, 40L

3049 #define LN_mobileTelephoneNumber   "mobileTelephoneNumber"
3050 #define NID_mobileTelephoneNumber 488
3051 #define OBJ_mobileTelephoneNumber OBJ_pilotAttributeType, 41L

3053 #define LN_pagerTelephoneNumber    "pagerTelephoneNumber"
3054 #define NID_pagerTelephoneNumber  489
3055 #define OBJ_pagerTelephoneNumber  OBJ_pilotAttributeType, 42L

3057 #define LN_friendlyCountryName     "friendlyCountryName"
3058 #define NID_friendlyCountryName    490
3059 #define OBJ_friendlyCountryName    OBJ_pilotAttributeType, 43L

3061 #define LN_organizationalStatus     "organizationalStatus"
3062 #define NID_organizationalStatus    491
3063 #define OBJ_organizationalStatus    OBJ_pilotAttributeType, 45L

3065 #define LN_janetMailbox             "janetMailbox"
3066 #define NID_janetMailbox            492
3067 #define OBJ_janetMailbox            OBJ_pilotAttributeType, 46L

3069 #define LN_mailPreferenceOption     "mailPreferenceOption"
3070 #define NID_mailPreferenceOption    493
3071 #define OBJ_mailPreferenceOption    OBJ_pilotAttributeType, 47L

3073 #define LN_buildingName             "buildingName"
3074 #define NID_buildingName            494
3075 #define OBJ_buildingName            OBJ_pilotAttributeType, 48L

3077 #define LN_dSAQuality               "dSAQuality"
3078 #define NID_dSAQuality              495
3079 #define OBJ_dSAQuality              OBJ_pilotAttributeType, 49L

3081 #define LN_singleLevelQuality       "singleLevelQuality"
3082 #define NID_singleLevelQuality      496
3083 #define OBJ_singleLevelQuality      OBJ_pilotAttributeType, 50L

3085 #define LN_subtreeMinimumQuality    "subtreeMinimumQuality"
3086 #define NID_subtreeMinimumQuality   497
3087 #define OBJ_subtreeMinimumQuality   OBJ_pilotAttributeType, 51L

3089 #define LN_subtreeMaximumQuality    "subtreeMaximumQuality"
3090 #define NID_subtreeMaximumQuality   498
3091 #define OBJ_subtreeMaximumQuality   OBJ_pilotAttributeType, 52L

3093 #define LN_personalSignature         "personalSignature"
3094 #define NID_personalSignature       499
3095 #define OBJ_personalSignature       OBJ_pilotAttributeType, 53L

3097 #define LN_dITRedirect              "dITRedirect"

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3098 #define NID_dITRedirect            500
3099 #define OBJ_dITRedirect            OBJ_pilotAttributeType, 54L

3101 #define SN_audio                   "audio"
3102 #define NID_audio                  501
3103 #define OBJ_audio                  OBJ_pilotAttributeType, 55L

3105 #define LN_documentPublisher       "documentPublisher"
3106 #define NID_documentPublisher      502
3107 #define OBJ_documentPublisher      OBJ_pilotAttributeType, 56L

3109 #define SN_id_set                  "id-set"
3110 #define LN_id_set                  "Secure Electronic Transactions"
3111 #define NID_id_set                 512
3112 #define OBJ_id_set                 OBJ_international_organizations, 42L

3114 #define SN_set_ctype               "set-ctype"
3115 #define LN_set_ctype               "content types"
3116 #define NID_set_ctype              513
3117 #define OBJ_set_ctype              OBJ_id_set, 0L

3119 #define SN_set_msgExt              "set-msgExt"
3120 #define LN_set_msgExt              "message extensions"
3121 #define NID_set_msgExt             514
3122 #define OBJ_set_msgExt             OBJ_id_set, 1L

3124 #define SN_set_attr                "set-attr"
3125 #define NID_set_attr               515
3126 #define OBJ_set_attr               OBJ_id_set, 3L

3128 #define SN_set_policy              "set-policy"
3129 #define NID_set_policy             516
3130 #define OBJ_set_policy             OBJ_id_set, 5L

3132 #define SN_set_certExt             "set-certExt"
3133 #define LN_set_certExt             "certificate extensions"
3134 #define NID_set_certExt            517
3135 #define OBJ_set_certExt            OBJ_id_set, 7L

3137 #define SN_set_brand               "set-brand"
3138 #define NID_set_brand              518
3139 #define OBJ_set_brand              OBJ_id_set, 8L

3141 #define SN_setct_PANData           "setct-PANData"
3142 #define NID_setct_PANData          519
3143 #define OBJ_setct_PANData          OBJ_set_ctype, 0L

3145 #define SN_setct_PANToken          "setct-PANToken"
3146 #define NID_setct_PANToken         520
3147 #define OBJ_setct_PANToken         OBJ_set_ctype, 1L

3149 #define SN_setct_PANOnly           "setct-PANOnly"
3150 #define NID_setct_PANOnly          521
3151 #define OBJ_setct_PANOnly          OBJ_set_ctype, 2L

3153 #define SN_setct_OIData            "setct-OIData"
3154 #define NID_setct_OIData           522
3155 #define OBJ_setct_OIData           OBJ_set_ctype, 3L

3157 #define SN_setct_PI                "setct-PI"
3158 #define NID_setct_PI               523
3159 #define OBJ_setct_PI               OBJ_set_ctype, 4L

3161 #define SN_setct_PIData            "setct-PIData"
3162 #define NID_setct_PIData           524
3163 #define OBJ_setct_PIData           OBJ_set_ctype, 5L

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3165 #define SN_setct_PIDataUnsigned      "setct-PIDataUnsigned"
3166 #define NID_setct_PIDataUnsigned      525
3167 #define OBJ_setct_PIDataUnsigned      OBJ_set_ctype, 6L

3169 #define SN_setct_HODInput              "setct-HODInput"
3170 #define NID_setct_HODInput            526
3171 #define OBJ_setct_HODInput            OBJ_set_ctype, 7L

3173 #define SN_setct_AuthResBaggage        "setct-AuthResBaggage"
3174 #define NID_setct_AuthResBaggage      527
3175 #define OBJ_setct_AuthResBaggage      OBJ_set_ctype, 8L

3177 #define SN_setct_AuthRevReqBaggage     "setct-AuthRevReqBaggage"
3178 #define NID_setct_AuthRevReqBaggage    528
3179 #define OBJ_setct_AuthRevReqBaggage    OBJ_set_ctype, 9L

3181 #define SN_setct_AuthRevResBaggage     "setct-AuthRevResBaggage"
3182 #define NID_setct_AuthRevResBaggage    529
3183 #define OBJ_setct_AuthRevResBaggage    OBJ_set_ctype, 10L

3185 #define SN_setct_CapTokenSeq           "setct-CapTokenSeq"
3186 #define NID_setct_CapTokenSeq          530
3187 #define OBJ_setct_CapTokenSeq          OBJ_set_ctype, 11L

3189 #define SN_setct_PInitResData          "setct-PInitResData"
3190 #define NID_setct_PInitResData         531
3191 #define OBJ_setct_PInitResData         OBJ_set_ctype, 12L

3193 #define SN_setct_PI_TBS                "setct-PI-TBS"
3194 #define NID_setct_PI_TBS               532
3195 #define OBJ_setct_PI_TBS              OBJ_set_ctype, 13L

3197 #define SN_setct_PResData              "setct-PResData"
3198 #define NID_setct_PResData             533
3199 #define OBJ_setct_PResData            OBJ_set_ctype, 14L

3201 #define SN_setct_AuthReqTBS            "setct-AuthReqTBS"
3202 #define NID_setct_AuthReqTBS           534
3203 #define OBJ_setct_AuthReqTBS          OBJ_set_ctype, 16L

3205 #define SN_setct_AuthResTBS            "setct-AuthResTBS"
3206 #define NID_setct_AuthResTBS           535
3207 #define OBJ_setct_AuthResTBS          OBJ_set_ctype, 17L

3209 #define SN_setct_AuthResTBSX           "setct-AuthResTBSX"
3210 #define NID_setct_AuthResTBSX          536
3211 #define OBJ_setct_AuthResTBSX         OBJ_set_ctype, 18L

3213 #define SN_setct_AuthTokenTBS          "setct-AuthTokenTBS"
3214 #define NID_setct_AuthTokenTBS         537
3215 #define OBJ_setct_AuthTokenTBS        OBJ_set_ctype, 19L

3217 #define SN_setct_CapTokenData          "setct-CapTokenData"
3218 #define NID_setct_CapTokenData         538
3219 #define OBJ_setct_CapTokenData        OBJ_set_ctype, 20L

3221 #define SN_setct_CapTokenTBS           "setct-CapTokenTBS"
3222 #define NID_setct_CapTokenTBS          539
3223 #define OBJ_setct_CapTokenTBS         OBJ_set_ctype, 21L

3225 #define SN_setct_AcqCardCodeMsg        "setct-AcqCardCodeMsg"
3226 #define NID_setct_AcqCardCodeMsg       540
3227 #define OBJ_setct_AcqCardCodeMsg       OBJ_set_ctype, 22L

3229 #define SN_setct_AuthRevReqTBS         "setct-AuthRevReqTBS"

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3230 #define NID_setct_AuthRevReqTBS       541
3231 #define OBJ_setct_AuthRevReqTBS       OBJ_set_ctype, 23L

3233 #define SN_setct_AuthRevResData        "setct-AuthRevResData"
3234 #define NID_setct_AuthRevResData      542
3235 #define OBJ_setct_AuthRevResData      OBJ_set_ctype, 24L

3237 #define SN_setct_AuthRevResTBS        "setct-AuthRevResTBS"
3238 #define NID_setct_AuthRevResTBS       543
3239 #define OBJ_setct_AuthRevResTBS       OBJ_set_ctype, 25L

3241 #define SN_setct_CapReqTBS            "setct-CapReqTBS"
3242 #define NID_setct_CapReqTBS           544
3243 #define OBJ_setct_CapReqTBS           OBJ_set_ctype, 26L

3245 #define SN_setct_CapReqTBSX           "setct-CapReqTBSX"
3246 #define NID_setct_CapReqTBSX          545
3247 #define OBJ_setct_CapReqTBSX         OBJ_set_ctype, 27L

3249 #define SN_setct_CapResData           "setct-CapResData"
3250 #define NID_setct_CapResData          546
3251 #define OBJ_setct_CapResData          OBJ_set_ctype, 28L

3253 #define SN_setct_CapRevReqTBS         "setct-CapRevReqTBS"
3254 #define NID_setct_CapRevReqTBS        547
3255 #define OBJ_setct_CapRevReqTBS        OBJ_set_ctype, 29L

3257 #define SN_setct_CapRevReqTBSX        "setct-CapRevReqTBSX"
3258 #define NID_setct_CapRevReqTBSX       548
3259 #define OBJ_setct_CapRevReqTBSX       OBJ_set_ctype, 30L

3261 #define SN_setct_CapRevResData         "setct-CapRevResData"
3262 #define NID_setct_CapRevResData        549
3263 #define OBJ_setct_CapRevResData        OBJ_set_ctype, 31L

3265 #define SN_setct_CredReqTBS           "setct-CredReqTBS"
3266 #define NID_setct_CredReqTBS          550
3267 #define OBJ_setct_CredReqTBS          OBJ_set_ctype, 32L

3269 #define SN_setct_CredReqTBSX           "setct-CredReqTBSX"
3270 #define NID_setct_CredReqTBSX         551
3271 #define OBJ_setct_CredReqTBSX         OBJ_set_ctype, 33L

3273 #define SN_setct_CredResData           "setct-CredResData"
3274 #define NID_setct_CredResData          552
3275 #define OBJ_setct_CredResData          OBJ_set_ctype, 34L

3277 #define SN_setct_CredRevReqTBS         "setct-CredRevReqTBS"
3278 #define NID_setct_CredRevReqTBS        553
3279 #define OBJ_setct_CredRevReqTBS        OBJ_set_ctype, 35L

3281 #define SN_setct_CredRevReqTBSX        "setct-CredRevReqTBSX"
3282 #define NID_setct_CredRevReqTBSX       554
3283 #define OBJ_setct_CredRevReqTBSX       OBJ_set_ctype, 36L

3285 #define SN_setct_CredRevResData        "setct-CredRevResData"
3286 #define NID_setct_CredRevResData       555
3287 #define OBJ_setct_CredRevResData       OBJ_set_ctype, 37L

3289 #define SN_setct_PCertReqData          "setct-PCertReqData"
3290 #define NID_setct_PCertReqData         556
3291 #define OBJ_setct_PCertReqData         OBJ_set_ctype, 38L

3293 #define SN_setct_PCertResTBS           "setct-PCertResTBS"
3294 #define NID_setct_PCertResTBS          557
3295 #define OBJ_setct_PCertResTBS          OBJ_set_ctype, 39L

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3297 #define SN_setct_BatchAdminReqData      "setct-BatchAdminReqData"
3298 #define NID_setct_BatchAdminReqData      558
3299 #define OBJ_setct_BatchAdminReqData      OBJ_set_ctype, 40L

3301 #define SN_setct_BatchAdminResData      "setct-BatchAdminResData"
3302 #define NID_setct_BatchAdminResData      559
3303 #define OBJ_setct_BatchAdminResData      OBJ_set_ctype, 41L

3305 #define SN_setct_CardCInitResTBS      "setct-CardCInitResTBS"
3306 #define NID_setct_CardCInitResTBS      560
3307 #define OBJ_setct_CardCInitResTBS      OBJ_set_ctype, 42L

3309 #define SN_setct_MeAqCInitResTBS      "setct-MeAqCInitResTBS"
3310 #define NID_setct_MeAqCInitResTBS      561
3311 #define OBJ_setct_MeAqCInitResTBS      OBJ_set_ctype, 43L

3313 #define SN_setct_RegFormResTBS      "setct-RegFormResTBS"
3314 #define NID_setct_RegFormResTBS      562
3315 #define OBJ_setct_RegFormResTBS      OBJ_set_ctype, 44L

3317 #define SN_setct_CertReqData      "setct-CertReqData"
3318 #define NID_setct_CertReqData      563
3319 #define OBJ_setct_CertReqData      OBJ_set_ctype, 45L

3321 #define SN_setct_CertReqTBS      "setct-CertReqTBS"
3322 #define NID_setct_CertReqTBS      564
3323 #define OBJ_setct_CertReqTBS      OBJ_set_ctype, 46L

3325 #define SN_setct_CertResData      "setct-CertResData"
3326 #define NID_setct_CertResData      565
3327 #define OBJ_setct_CertResData      OBJ_set_ctype, 47L

3329 #define SN_setct_CertInqReqTBS      "setct-CertInqReqTBS"
3330 #define NID_setct_CertInqReqTBS      566
3331 #define OBJ_setct_CertInqReqTBS      OBJ_set_ctype, 48L

3333 #define SN_setct_ErrorTBS      "setct-ErrorTBS"
3334 #define NID_setct_ErrorTBS      567
3335 #define OBJ_setct_ErrorTBS      OBJ_set_ctype, 49L

3337 #define SN_setct_PIDualSignedTBE      "setct-PIDualSignedTBE"
3338 #define NID_setct_PIDualSignedTBE      568
3339 #define OBJ_setct_PIDualSignedTBE      OBJ_set_ctype, 50L

3341 #define SN_setct_PUUnsignedTBE      "setct-PUUnsignedTBE"
3342 #define NID_setct_PUUnsignedTBE      569
3343 #define OBJ_setct_PUUnsignedTBE      OBJ_set_ctype, 51L

3345 #define SN_setct_AuthReqTBE      "setct-AuthReqTBE"
3346 #define NID_setct_AuthReqTBE      570
3347 #define OBJ_setct_AuthReqTBE      OBJ_set_ctype, 52L

3349 #define SN_setct_AuthResTBE      "setct-AuthResTBE"
3350 #define NID_setct_AuthResTBE      571
3351 #define OBJ_setct_AuthResTBE      OBJ_set_ctype, 53L

3353 #define SN_setct_AuthResTBEX      "setct-AuthResTBEX"
3354 #define NID_setct_AuthResTBEX      572
3355 #define OBJ_setct_AuthResTBEX      OBJ_set_ctype, 54L

3357 #define SN_setct_AuthTokenTBE      "setct-AuthTokenTBE"
3358 #define NID_setct_AuthTokenTBE      573
3359 #define OBJ_setct_AuthTokenTBE      OBJ_set_ctype, 55L

3361 #define SN_setct_CapTokenTBE      "setct-CapTokenTBE"

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3362 #define NID_setct_CapTokenTBE      574
3363 #define OBJ_setct_CapTokenTBE      OBJ_set_ctype, 56L

3365 #define SN_setct_CapTokenTBEX      "setct-CapTokenTBEX"
3366 #define NID_setct_CapTokenTBEX      575
3367 #define OBJ_setct_CapTokenTBEX      OBJ_set_ctype, 57L

3369 #define SN_setct_AcqCardCodeMsgTBE      "setct-AcqCardCodeMsgTBE"
3370 #define NID_setct_AcqCardCodeMsgTBE      576
3371 #define OBJ_setct_AcqCardCodeMsgTBE      OBJ_set_ctype, 58L

3373 #define SN_setct_AuthRevReqTBE      "setct-AuthRevReqTBE"
3374 #define NID_setct_AuthRevReqTBE      577
3375 #define OBJ_setct_AuthRevReqTBE      OBJ_set_ctype, 59L

3377 #define SN_setct_AuthRevResTBE      "setct-AuthRevResTBE"
3378 #define NID_setct_AuthRevResTBE      578
3379 #define OBJ_setct_AuthRevResTBE      OBJ_set_ctype, 60L

3381 #define SN_setct_AuthRevResTBEB      "setct-AuthRevResTBEB"
3382 #define NID_setct_AuthRevResTBEB      579
3383 #define OBJ_setct_AuthRevResTBEB      OBJ_set_ctype, 61L

3385 #define SN_setct_CapReqTBE      "setct-CapReqTBE"
3386 #define NID_setct_CapReqTBE      580
3387 #define OBJ_setct_CapReqTBE      OBJ_set_ctype, 62L

3389 #define SN_setct_CapReqTBEX      "setct-CapReqTBEX"
3390 #define NID_setct_CapReqTBEX      581
3391 #define OBJ_setct_CapReqTBEX      OBJ_set_ctype, 63L

3393 #define SN_setct_CapResTBE      "setct-CapResTBE"
3394 #define NID_setct_CapResTBE      582
3395 #define OBJ_setct_CapResTBE      OBJ_set_ctype, 64L

3397 #define SN_setct_CapRevReqTBE      "setct-CapRevReqTBE"
3398 #define NID_setct_CapRevReqTBE      583
3399 #define OBJ_setct_CapRevReqTBE      OBJ_set_ctype, 65L

3401 #define SN_setct_CapRevReqTBEX      "setct-CapRevReqTBEX"
3402 #define NID_setct_CapRevReqTBEX      584
3403 #define OBJ_setct_CapRevReqTBEX      OBJ_set_ctype, 66L

3405 #define SN_setct_CapRevResTBE      "setct-CapRevResTBE"
3406 #define NID_setct_CapRevResTBE      585
3407 #define OBJ_setct_CapRevResTBE      OBJ_set_ctype, 67L

3409 #define SN_setct_CredReqTBE      "setct-CredReqTBE"
3410 #define NID_setct_CredReqTBE      586
3411 #define OBJ_setct_CredReqTBE      OBJ_set_ctype, 68L

3413 #define SN_setct_CredReqTBEX      "setct-CredReqTBEX"
3414 #define NID_setct_CredReqTBEX      587
3415 #define OBJ_setct_CredReqTBEX      OBJ_set_ctype, 69L

3417 #define SN_setct_CredResTBE      "setct-CredResTBE"
3418 #define NID_setct_CredResTBE      588
3419 #define OBJ_setct_CredResTBE      OBJ_set_ctype, 70L

3421 #define SN_setct_CredRevReqTBE      "setct-CredRevReqTBE"
3422 #define NID_setct_CredRevReqTBE      589
3423 #define OBJ_setct_CredRevReqTBE      OBJ_set_ctype, 71L

3425 #define SN_setct_CredRevReqTBEX      "setct-CredRevReqTBEX"
3426 #define NID_setct_CredRevReqTBEX      590
3427 #define OBJ_setct_CredRevReqTBEX      OBJ_set_ctype, 72L

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3429 #define SN_setct_CredRevResTBE      "setct-CredRevResTBE"
3430 #define NID_setct_CredRevResTBE      591
3431 #define OBJ_setct_CredRevResTBE      OBJ_set_ctype, 73L

3433 #define SN_setct_BatchAdminReqTBE    "setct-BatchAdminReqTBE"
3434 #define NID_setct_BatchAdminReqTBE  592
3435 #define OBJ_setct_BatchAdminReqTBE  OBJ_set_ctype, 74L

3437 #define SN_setct_BatchAdminResTBE    "setct-BatchAdminResTBE"
3438 #define NID_setct_BatchAdminResTBE  593
3439 #define OBJ_setct_BatchAdminResTBE  OBJ_set_ctype, 75L

3441 #define SN_setct_RegFormReqTBE       "setct-RegFormReqTBE"
3442 #define NID_setct_RegFormReqTBE     594
3443 #define OBJ_setct_RegFormReqTBE     OBJ_set_ctype, 76L

3445 #define SN_setct_CertReqTBE          "setct-CertReqTBE"
3446 #define NID_setct_CertReqTBE        595
3447 #define OBJ_setct_CertReqTBE        OBJ_set_ctype, 77L

3449 #define SN_setct_CertReqTBEX         "setct-CertReqTBEX"
3450 #define NID_setct_CertReqTBEX       596
3451 #define OBJ_setct_CertReqTBEX       OBJ_set_ctype, 78L

3453 #define SN_setct_CertResTBE          "setct-CertResTBE"
3454 #define NID_setct_CertResTBE        597
3455 #define OBJ_setct_CertResTBE        OBJ_set_ctype, 79L

3457 #define SN_setct_CRLNotificationTBS  "setct-CRLNotificationTBS"
3458 #define NID_setct_CRLNotificationTBS 598
3459 #define OBJ_setct_CRLNotificationTBS  OBJ_set_ctype, 80L

3461 #define SN_setct_CRLNotificationResTBS "setct-CRLNotificationResTBS"
3462 #define NID_setct_CRLNotificationResTBS 599
3463 #define OBJ_setct_CRLNotificationResTBS  OBJ_set_ctype, 81L

3465 #define SN_setct_BCIDistributionTBS   "setct-BCIDistributionTBS"
3466 #define NID_setct_BCIDistributionTBS  600
3467 #define OBJ_setct_BCIDistributionTBS  OBJ_set_ctype, 82L

3469 #define SN_setext_genCrypt            "setext-genCrypt"
3470 #define LN_setext_genCrypt            "generic cryptogram"
3471 #define NID_setext_genCrypt          601
3472 #define OBJ_setext_genCrypt          OBJ_set_msgExt, 1L

3474 #define SN_setext_miAuth              "setext-miAuth"
3475 #define LN_setext_miAuth              "merchant initiated auth"
3476 #define NID_setext_miAuth            602
3477 #define OBJ_setext_miAuth            OBJ_set_msgExt, 3L

3479 #define SN_setext_pinSecure           "setext-pinSecure"
3480 #define NID_setext_pinSecure          603
3481 #define OBJ_setext_pinSecure          OBJ_set_msgExt, 4L

3483 #define SN_setext_pinAny              "setext-pinAny"
3484 #define NID_setext_pinAny             604
3485 #define OBJ_setext_pinAny             OBJ_set_msgExt, 5L

3487 #define SN_setext_track2              "setext-track2"
3488 #define NID_setext_track2            605
3489 #define OBJ_setext_track2            OBJ_set_msgExt, 7L

3491 #define SN_setext_cv                  "setext-cv"
3492 #define LN_setext_cv                  "additional verification"
3493 #define NID_setext_cv                 606

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3494 #define OBJ_setext_cv                OBJ_set_msgExt, 8L

3496 #define SN_set_policy_root            "set-policy-root"
3497 #define NID_set_policy_root          607
3498 #define OBJ_set_policy_root          OBJ_set_policy, 0L

3500 #define SN_setCext_hashedRoot         "setCext-hashedRoot"
3501 #define NID_setCext_hashedRoot       608
3502 #define OBJ_setCext_hashedRoot       OBJ_set_certExt, 0L

3504 #define SN_setCext_certType           "setCext-certType"
3505 #define NID_setCext_certType         609
3506 #define OBJ_setCext_certType         OBJ_set_certExt, 1L

3508 #define SN_setCext_merchData          "setCext-merchData"
3509 #define NID_setCext_merchData        610
3510 #define OBJ_setCext_merchData        OBJ_set_certExt, 2L

3512 #define SN_setCext_cCertRequired      "setCext-cCertRequired"
3513 #define NID_setCext_cCertRequired    611
3514 #define OBJ_setCext_cCertRequired    OBJ_set_certExt, 3L

3516 #define SN_setCext_tunneling          "setCext-tunneling"
3517 #define NID_setCext_tunneling        612
3518 #define OBJ_setCext_tunneling        OBJ_set_certExt, 4L

3520 #define SN_setCext_setExt             "setCext-setExt"
3521 #define NID_setCext_setExt           613
3522 #define OBJ_setCext_setExt           OBJ_set_certExt, 5L

3524 #define SN_setCext_setQualf          "setCext-setQualf"
3525 #define NID_setCext_setQualf        614
3526 #define OBJ_setCext_setQualf        OBJ_set_certExt, 6L

3528 #define SN_setCext_PGWYcapabilities   "setCext-PGWYcapabilities"
3529 #define NID_setCext_PGWYcapabilities 615
3530 #define OBJ_setCext_PGWYcapabilities OBJ_set_certExt, 7L

3532 #define SN_setCext_TokenIdentifier    "setCext-TokenIdentifier"
3533 #define NID_setCext_TokenIdentifier  616
3534 #define OBJ_setCext_TokenIdentifier  OBJ_set_certExt, 8L

3536 #define SN_setCext_Track2Data         "setCext-Track2Data"
3537 #define NID_setCext_Track2Data       617
3538 #define OBJ_setCext_Track2Data       OBJ_set_certExt, 9L

3540 #define SN_setCext_TokenType          "setCext-TokenType"
3541 #define NID_setCext_TokenType        618
3542 #define OBJ_setCext_TokenType        OBJ_set_certExt, 10L

3544 #define SN_setCext_IssuerCapabilities "setCext-IssuerCapabilities"
3545 #define NID_setCext_IssuerCapabilities 619
3546 #define OBJ_setCext_IssuerCapabilities OBJ_set_certExt, 11L

3548 #define SN_setAttr_Cert               "setAttr-Cert"
3549 #define NID_setAttr_Cert              620
3550 #define OBJ_setAttr_Cert              OBJ_set_attr, 0L

3552 #define SN_setAttr_PGWYcap            "setAttr-PGWYcap"
3553 #define LN_setAttr_PGWYcap            "payment gateway capabilities"
3554 #define NID_setAttr_PGWYcap          621
3555 #define OBJ_setAttr_PGWYcap          OBJ_set_attr, 1L

3557 #define SN_setAttr_TokenType          "setAttr-TokenType"
3558 #define NID_setAttr_TokenType        622
3559 #define OBJ_setAttr_TokenType        OBJ_set_attr, 2L

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3561 #define SN_setAttr_IssCap      "setAttr-IssCap"
3562 #define LN_setAttr_IssCap      "issuer capabilities"
3563 #define NID_setAttr_IssCap      623
3564 #define OBJ_setAttr_IssCap      OBJ_set_attr,3L

3566 #define SN_set_rootKeyThumb     "set-rootKeyThumb"
3567 #define NID_set_rootKeyThumb    624
3568 #define OBJ_set_rootKeyThumb    OBJ_setAttr_Cert,0L

3570 #define SN_set_addPolicy        "set-addPolicy"
3571 #define NID_set_addPolicy       625
3572 #define OBJ_set_addPolicy       OBJ_setAttr_Cert,1L

3574 #define SN_setAttr_Token_EMV    "setAttr-Token-EMV"
3575 #define NID_setAttr_Token_EMV  626
3576 #define OBJ_setAttr_Token_EMV   OBJ_setAttr_TokenType,1L

3578 #define SN_setAttr_Token_B0Prime "setAttr-Token-B0Prime"
3579 #define NID_setAttr_Token_B0Prime 627
3580 #define OBJ_setAttr_Token_B0Prime OBJ_setAttr_TokenType,2L

3582 #define SN_setAttr_IssCap_CVM   "setAttr-IssCap-CVM"
3583 #define NID_setAttr_IssCap_CVM  628
3584 #define OBJ_setAttr_IssCap_CVM  OBJ_setAttr_IssCap,3L

3586 #define SN_setAttr_IssCap_T2    "setAttr-IssCap-T2"
3587 #define NID_setAttr_IssCap_T2   629
3588 #define OBJ_setAttr_IssCap_T2   OBJ_setAttr_IssCap,4L

3590 #define SN_setAttr_IssCap_Sig   "setAttr-IssCap-Sig"
3591 #define NID_setAttr_IssCap_Sig  630
3592 #define OBJ_setAttr_IssCap_Sig  OBJ_setAttr_IssCap,5L

3594 #define SN_setAttr_GenCryptgrm  "setAttr-GenCryptgrm"
3595 #define LN_setAttr_GenCryptgrm  "generate cryptogram"
3596 #define NID_setAttr_GenCryptgrm 631
3597 #define OBJ_setAttr_GenCryptgrm  OBJ_setAttr_IssCap_CVM,1L

3599 #define SN_setAttr_T2Enc        "setAttr-T2Enc"
3600 #define LN_setAttr_T2Enc        "encrypted track 2"
3601 #define NID_setAttr_T2Enc       632
3602 #define OBJ_setAttr_T2Enc       OBJ_setAttr_IssCap_T2,1L

3604 #define SN_setAttr_T2cleartxt   "setAttr-T2cleartxt"
3605 #define LN_setAttr_T2cleartxt   "cleartext track 2"
3606 #define NID_setAttr_T2cleartxt  633
3607 #define OBJ_setAttr_T2cleartxt  OBJ_setAttr_IssCap_T2,2L

3609 #define SN_setAttr_TokICCSig    "setAttr-TokICCSig"
3610 #define LN_setAttr_TokICCSig    "ICC or token signature"
3611 #define NID_setAttr_TokICCSig   634
3612 #define OBJ_setAttr_TokICCSig   OBJ_setAttr_IssCap_Sig,1L

3614 #define SN_setAttr_SecDevSig     "setAttr-SecDevSig"
3615 #define LN_setAttr_SecDevSig     "secure device signature"
3616 #define NID_setAttr_SecDevSig    635
3617 #define OBJ_setAttr_SecDevSig    OBJ_setAttr_IssCap_Sig,2L

3619 #define SN_set_brand_IATA_ATA    "set-brand-IATA-ATA"
3620 #define NID_set_brand_IATA_ATA   636
3621 #define OBJ_set_brand_IATA_ATA   OBJ_set_brand,1L

3623 #define SN_set_brand_Diners      "set-brand-Diners"
3624 #define NID_set_brand_Diners     637
3625 #define OBJ_set_brand_Diners     OBJ_set_brand,30L

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3627 #define SN_set_brand_AmericanExpress "set-brand-AmericanExpress"
3628 #define NID_set_brand_AmericanExpress 638
3629 #define OBJ_set_brand_AmericanExpress OBJ_set_brand,34L

3631 #define SN_set_brand_JCB          "set-brand-JCB"
3632 #define NID_set_brand_JCB        639
3633 #define OBJ_set_brand_JCB        OBJ_set_brand,35L

3635 #define SN_set_brand_Visa         "set-brand-Visa"
3636 #define NID_set_brand_Visa       640
3637 #define OBJ_set_brand_Visa       OBJ_set_brand,4L

3639 #define SN_set_brand_MasterCard   "set-brand-MasterCard"
3640 #define NID_set_brand_MasterCard  641
3641 #define OBJ_set_brand_MasterCard  OBJ_set_brand,5L

3643 #define SN_set_brand_Novus        "set-brand-Novus"
3644 #define NID_set_brand_Novus       642
3645 #define OBJ_set_brand_Novus       OBJ_set_brand,6011L

3647 #define SN_des_cdmf              "DES-CDMF"
3648 #define LN_des_cdmf              "des-cdmf"
3649 #define NID_des_cdmf             643
3650 #define OBJ_des_cdmf             OBJ_rsadsi,3L,10L

3652 #define SN_rsa0AEPEncryptionSET   "rsa0AEPEncryptionSET"
3653 #define NID_rsa0AEPEncryptionSET  644
3654 #define OBJ_rsa0AEPEncryptionSET  OBJ_rsadsi,1L,1L,6L

3656 #define SN_ipsec3                "Oakley-EC2N-3"
3657 #define LN_ipsec3                "ipsec3"
3658 #define NID_ipsec3              749

3660 #define SN_ipsec4                "Oakley-EC2N-4"
3661 #define LN_ipsec4                "ipsec4"
3662 #define NID_ipsec4              750

3664 #define SN_whirlpool             "whirlpool"
3665 #define LN_whirlpool             804
3666 #define OBJ_whirlpool           OBJ_iso,0L,10118L,3L,0L,55L

3668 #define SN_cryptopro             "cryptopro"
3669 #define NID_cryptopro            805
3670 #define OBJ_cryptopro           OBJ_member_body,643L,2L,2L

3672 #define SN_cryptocom             "cryptocom"
3673 #define NID_cryptocom            806
3674 #define OBJ_cryptocom           OBJ_member_body,643L,2L,9L

3676 #define SN_id_GostR3411_94_with_GostR3410_2001 "id-GostR3411-94-with-Go"
3677 #define LN_id_GostR3411_94_with_GostR3410_2001 "GOST R 34.11-94 with GO"
3678 #define NID_id_GostR3411_94_with_GostR3410_2001 807
3679 #define OBJ_id_GostR3411_94_with_GostR3410_2001 OBJ_cryptopro,3L

3681 #define SN_id_GostR3411_94_with_GostR3410_94 "id-GostR3411-94-with-Go"
3682 #define LN_id_GostR3411_94_with_GostR3410_94 "GOST R 34.11-94 with GO"
3683 #define NID_id_GostR3411_94_with_GostR3410_94 808
3684 #define OBJ_id_GostR3411_94_with_GostR3410_94 OBJ_cryptopro,4L

3686 #define SN_id_GostR3411_94        "md_gost94"
3687 #define LN_id_GostR3411_94        "GOST R 34.11-94"
3688 #define NID_id_GostR3411_94      809
3689 #define OBJ_id_GostR3411_94      OBJ_cryptopro,9L

3691 #define SN_id_HMACGostR3411_94    "id-HMACGostR3411-94"

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3692 #define LN_id_HMACGostR3411_94 "HMAC GOST 34.11-94"
3693 #define NID_id_HMACGostR3411_94 810
3694 #define OBJ_id_HMACGostR3411_94 OBJ_cryptopro,10L

3696 #define SN_id_GostR3410_2001 "gost2001"
3697 #define LN_id_GostR3410_2001 "GOST R 34.10-2001"
3698 #define NID_id_GostR3410_2001 811
3699 #define OBJ_id_GostR3410_2001 OBJ_cryptopro,19L

3701 #define SN_id_GostR3410_94 "gost94"
3702 #define LN_id_GostR3410_94 "GOST R 34.10-94"
3703 #define NID_id_GostR3410_94 812
3704 #define OBJ_id_GostR3410_94 OBJ_cryptopro,20L

3706 #define SN_id_Gost28147_89 "gost89"
3707 #define LN_id_Gost28147_89 "GOST 28147-89"
3708 #define NID_id_Gost28147_89 813
3709 #define OBJ_id_Gost28147_89 OBJ_cryptopro,21L

3711 #define SN_gost89_cnt "gost89-cnt"
3712 #define NID_gost89_cnt 814

3714 #define SN_id_Gost28147_89_MAC "gost-mac"
3715 #define LN_id_Gost28147_89_MAC "GOST 28147-89 MAC"
3716 #define NID_id_Gost28147_89_MAC 815
3717 #define OBJ_id_Gost28147_89_MAC OBJ_cryptopro,22L

3719 #define SN_id_GostR3411_94_prf "prf-gostr3411-94"
3720 #define LN_id_GostR3411_94_prf "GOST R 34.11-94 PRF"
3721 #define NID_id_GostR3411_94_prf 816
3722 #define OBJ_id_GostR3411_94_prf OBJ_cryptopro,23L

3724 #define SN_id_GostR3410_2001DH "id-GostR3410-2001DH"
3725 #define LN_id_GostR3410_2001DH "GOST R 34.10-2001 DH"
3726 #define NID_id_GostR3410_2001DH 817
3727 #define OBJ_id_GostR3410_2001DH OBJ_cryptopro,98L

3729 #define SN_id_GostR3410_94DH "id-GostR3410-94DH"
3730 #define LN_id_GostR3410_94DH "GOST R 34.10-94 DH"
3731 #define NID_id_GostR3410_94DH 818
3732 #define OBJ_id_GostR3410_94DH OBJ_cryptopro,99L

3734 #define SN_id_Gost28147_89_CryptoPro_KeyMeshing "id-Gost28147-89-CryptoP
3735 #define NID_id_Gost28147_89_CryptoPro_KeyMeshing 819
3736 #define OBJ_id_Gost28147_89_CryptoPro_KeyMeshing OBJ_cryptopro,14

3738 #define SN_id_Gost28147_89_None_KeyMeshing "id-Gost28147-89-None-Ke
3739 #define NID_id_Gost28147_89_None_KeyMeshing 820
3740 #define OBJ_id_Gost28147_89_None_KeyMeshing OBJ_cryptopro,14L,0L

3742 #define SN_id_GostR3411_94_TestParamSet "id-GostR3411-94-TestParamSet"
3743 #define NID_id_GostR3411_94_TestParamSet 821
3744 #define OBJ_id_GostR3411_94_TestParamSet OBJ_cryptopro,30L,0L

3746 #define SN_id_GostR3411_94_CryptoProParamSet "id-GostR3411-94-CryptoP
3747 #define NID_id_GostR3411_94_CryptoProParamSet 822
3748 #define OBJ_id_GostR3411_94_CryptoProParamSet OBJ_cryptopro,30L,1L

3750 #define SN_id_Gost28147_89_TestParamSet "id-Gost28147-89-TestParamSet"
3751 #define NID_id_Gost28147_89_TestParamSet 823
3752 #define OBJ_id_Gost28147_89_TestParamSet OBJ_cryptopro,31L,0L

3754 #define SN_id_Gost28147_89_CryptoPro_A_ParamSet "id-Gost28147-89-CryptoP
3755 #define NID_id_Gost28147_89_CryptoPro_A_ParamSet 824
3756 #define OBJ_id_Gost28147_89_CryptoPro_A_ParamSet OBJ_cryptopro,31
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3758 #define SN_id_Gost28147_89_CryptoPro_B_ParamSet "id-Gost28147-89-CryptoP
3759 #define NID_id_Gost28147_89_CryptoPro_B_ParamSet 825
3760 #define OBJ_id_Gost28147_89_CryptoPro_B_ParamSet OBJ_cryptopro,31

3762 #define SN_id_Gost28147_89_CryptoPro_C_ParamSet "id-Gost28147-89-CryptoP
3763 #define NID_id_Gost28147_89_CryptoPro_C_ParamSet 826
3764 #define OBJ_id_Gost28147_89_CryptoPro_C_ParamSet OBJ_cryptopro,31

3766 #define SN_id_Gost28147_89_CryptoPro_D_ParamSet "id-Gost28147-89-CryptoP
3767 #define NID_id_Gost28147_89_CryptoPro_D_ParamSet 827
3768 #define OBJ_id_Gost28147_89_CryptoPro_D_ParamSet OBJ_cryptopro,31

3770 #define SN_id_Gost28147_89_CryptoPro_Oscar_1_1_ParamSet "id-Gost28147-89
3771 #define NID_id_Gost28147_89_CryptoPro_Oscar_1_1_ParamSet 828
3772 #define OBJ_id_Gost28147_89_CryptoPro_Oscar_1_1_ParamSet OBJ_cryp

3774 #define SN_id_Gost28147_89_CryptoPro_Oscar_1_0_ParamSet "id-Gost28147-89
3775 #define NID_id_Gost28147_89_CryptoPro_Oscar_1_0_ParamSet 829
3776 #define OBJ_id_Gost28147_89_CryptoPro_Oscar_1_0_ParamSet OBJ_cryp

3778 #define SN_id_Gost28147_89_CryptoPro_RIC_1_ParamSet "id-Gost28147-89
3779 #define NID_id_Gost28147_89_CryptoPro_RIC_1_ParamSet 830
3780 #define OBJ_id_Gost28147_89_CryptoPro_RIC_1_ParamSet OBJ_cryptopro,31

3782 #define SN_id_GostR3410_94_TestParamSet "id-GostR3410-94-TestParamSet"
3783 #define NID_id_GostR3410_94_TestParamSet 831
3784 #define OBJ_id_GostR3410_94_TestParamSet OBJ_cryptopro,32L,0L

3786 #define SN_id_GostR3410_94_CryptoPro_A_ParamSet "id-GostR3410-94-CryptoP
3787 #define NID_id_GostR3410_94_CryptoPro_A_ParamSet 832
3788 #define OBJ_id_GostR3410_94_CryptoPro_A_ParamSet OBJ_cryptopro,32

3790 #define SN_id_GostR3410_94_CryptoPro_B_ParamSet "id-GostR3410-94-CryptoP
3791 #define NID_id_GostR3410_94_CryptoPro_B_ParamSet 833
3792 #define OBJ_id_GostR3410_94_CryptoPro_B_ParamSet OBJ_cryptopro,32

3794 #define SN_id_GostR3410_94_CryptoPro_C_ParamSet "id-GostR3410-94-CryptoP
3795 #define NID_id_GostR3410_94_CryptoPro_C_ParamSet 834
3796 #define OBJ_id_GostR3410_94_CryptoPro_C_ParamSet OBJ_cryptopro,32

3798 #define SN_id_GostR3410_94_CryptoPro_D_ParamSet "id-GostR3410-94-CryptoP
3799 #define NID_id_GostR3410_94_CryptoPro_D_ParamSet 835
3800 #define OBJ_id_GostR3410_94_CryptoPro_D_ParamSet OBJ_cryptopro,32

3802 #define SN_id_GostR3410_94_CryptoPro_XchA_ParamSet "id-GostR3410-94
3803 #define NID_id_GostR3410_94_CryptoPro_XchA_ParamSet 836
3804 #define OBJ_id_GostR3410_94_CryptoPro_XchA_ParamSet OBJ_cryptopro,33

3806 #define SN_id_GostR3410_94_CryptoPro_XchB_ParamSet "id-GostR3410-94
3807 #define NID_id_GostR3410_94_CryptoPro_XchB_ParamSet 837
3808 #define OBJ_id_GostR3410_94_CryptoPro_XchB_ParamSet OBJ_cryptopro,33

3810 #define SN_id_GostR3410_94_CryptoPro_XchC_ParamSet "id-GostR3410-94
3811 #define NID_id_GostR3410_94_CryptoPro_XchC_ParamSet 838
3812 #define OBJ_id_GostR3410_94_CryptoPro_XchC_ParamSet OBJ_cryptopro,33

3814 #define SN_id_GostR3410_2001_TestParamSet "id-GostR3410-2001-TestP
3815 #define NID_id_GostR3410_2001_TestParamSet 839
3816 #define OBJ_id_GostR3410_2001_TestParamSet OBJ_cryptopro,35L,0L

3818 #define SN_id_GostR3410_2001_CryptoPro_A_ParamSet "id-GostR3410-20
3819 #define NID_id_GostR3410_2001_CryptoPro_A_ParamSet 840
3820 #define OBJ_id_GostR3410_2001_CryptoPro_A_ParamSet OBJ_cryptopro,35

3822 #define SN_id_GostR3410_2001_CryptoPro_B_ParamSet "id-GostR3410-20
3823 #define NID_id_GostR3410_2001_CryptoPro_B_ParamSet 841
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3824 #define OBJ_id_GostR3410_2001_CryptoPro_B_ParamSet      OBJ_cryptopro,35
3826 #define SN_id_GostR3410_2001_CryptoPro_C_ParamSet        "id-GostR3410-20
3827 #define NID_id_GostR3410_2001_CryptoPro_C_ParamSet        842
3828 #define OBJ_id_GostR3410_2001_CryptoPro_C_ParamSet        OBJ_cryptopro,35

3830 #define SN_id_GostR3410_2001_CryptoPro_XchA_ParamSet      "id-GostR3410-20
3831 #define NID_id_GostR3410_2001_CryptoPro_XchA_ParamSet      843
3832 #define OBJ_id_GostR3410_2001_CryptoPro_XchA_ParamSet      OBJ_cryptopro,36

3834 #define SN_id_GostR3410_2001_CryptoPro_XchB_ParamSet      "id-GostR3410-20
3835 #define NID_id_GostR3410_2001_CryptoPro_XchB_ParamSet      844
3836 #define OBJ_id_GostR3410_2001_CryptoPro_XchB_ParamSet      OBJ_cryptopro,36

3838 #define SN_id_GostR3410_94_a          "id-GostR3410-94-a"
3839 #define NID_id_GostR3410_94_a          845
3840 #define OBJ_id_GostR3410_94_a          OBJ_id_GostR3410_94,1L

3842 #define SN_id_GostR3410_94_aBis        "id-GostR3410-94-aBis"
3843 #define NID_id_GostR3410_94_aBis        846
3844 #define OBJ_id_GostR3410_94_aBis        OBJ_id_GostR3410_94,2L

3846 #define SN_id_GostR3410_94_b          "id-GostR3410-94-b"
3847 #define NID_id_GostR3410_94_b          847
3848 #define OBJ_id_GostR3410_94_b          OBJ_id_GostR3410_94,3L

3850 #define SN_id_GostR3410_94_bBis        "id-GostR3410-94-bBis"
3851 #define NID_id_GostR3410_94_bBis        848
3852 #define OBJ_id_GostR3410_94_bBis        OBJ_id_GostR3410_94,4L

3854 #define SN_id_Gost28147_89_cc          "id-Gost28147-89-cc"
3855 #define LN_id_Gost28147_89_cc          "GOST 28147-89 Cryptocom ParamSet"
3856 #define NID_id_Gost28147_89_cc          849
3857 #define OBJ_id_Gost28147_89_cc          OBJ_cryptocom,1L,6L,1L

3859 #define SN_id_GostR3410_94_cc          "gost94cc"
3860 #define LN_id_GostR3410_94_cc          "GOST 34.10-94 Cryptocom"
3861 #define NID_id_GostR3410_94_cc          850
3862 #define OBJ_id_GostR3410_94_cc          OBJ_cryptocom,1L,5L,3L

3864 #define SN_id_GostR3410_2001_cc        "gost2001cc"
3865 #define LN_id_GostR3410_2001_cc        "GOST 34.10-2001 Cryptocom"
3866 #define NID_id_GostR3410_2001_cc        851
3867 #define OBJ_id_GostR3410_2001_cc        OBJ_cryptocom,1L,5L,4L

3869 #define SN_id_GostR3411_94_with_GostR3410_94_cc          "id-GostR3411-94-with-Go
3870 #define LN_id_GostR3411_94_with_GostR3410_94_cc          "GOST R 34.11-94 with GO
3871 #define NID_id_GostR3411_94_with_GostR3410_94_cc          852
3872 #define OBJ_id_GostR3411_94_with_GostR3410_94_cc          OBJ_cryptocom,1L

3874 #define SN_id_GostR3411_94_with_GostR3410_2001_cc        "id-GostR3411-94
3875 #define LN_id_GostR3411_94_with_GostR3410_2001_cc        "GOST R 34.11-94
3876 #define NID_id_GostR3411_94_with_GostR3410_2001_cc        853
3877 #define OBJ_id_GostR3411_94_with_GostR3410_2001_cc        OBJ_cryptocom,1L

3879 #define SN_id_GostR3410_2001_ParamSet_cc          "id-GostR3410-2001-Param
3880 #define LN_id_GostR3410_2001_ParamSet_cc          "GOST R 3410-2001 Parame
3881 #define NID_id_GostR3410_2001_ParamSet_cc          854
3882 #define OBJ_id_GostR3410_2001_ParamSet_cc          OBJ_cryptocom,1L,8L,1L

3884 #define SN_camellia_128_cbc          "CAMELLIA-128-CBC"
3885 #define LN_camellia_128_cbc          "camellia-128-cbc"
3886 #define NID_camellia_128_cbc          751
3887 #define OBJ_camellia_128_cbc          1L,2L,392L,200011L,61L,1L,1L,1L,2L

3889 #define SN_camellia_192_cbc          "CAMELLIA-192-CBC"

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3890 #define LN_camellia_192_cbc          "camellia-192-cbc"
3891 #define NID_camellia_192_cbc          752
3892 #define OBJ_camellia_192_cbc          1L,2L,392L,200011L,61L,1L,1L,1L,3L

3894 #define SN_camellia_256_cbc          "CAMELLIA-256-CBC"
3895 #define LN_camellia_256_cbc          "camellia-256-cbc"
3896 #define NID_camellia_256_cbc          753
3897 #define OBJ_camellia_256_cbc          1L,2L,392L,200011L,61L,1L,1L,1L,4L

3899 #define SN_id_camellia128_wrap        "id-camellia128-wrap"
3900 #define NID_id_camellia128_wrap        907
3901 #define OBJ_id_camellia128_wrap        1L,2L,392L,200011L,61L,1L,1L,3L,2L

3903 #define SN_id_camellia192_wrap        "id-camellia192-wrap"
3904 #define NID_id_camellia192_wrap        908
3905 #define OBJ_id_camellia192_wrap        1L,2L,392L,200011L,61L,1L,1L,3L,3L

3907 #define SN_id_camellia256_wrap        "id-camellia256-wrap"
3908 #define NID_id_camellia256_wrap        909
3909 #define OBJ_id_camellia256_wrap        1L,2L,392L,200011L,61L,1L,1L,3L,4L

3911 #define OBJ_ntt_ds                    0L,3L,4401L,5L

3913 #define OBJ_camellia                  OBJ_ntt_ds,3L,1L,9L

3915 #define SN_camellia_128_ecb          "CAMELLIA-128-ECB"
3916 #define LN_camellia_128_ecb          "camellia-128-ecb"
3917 #define NID_camellia_128_ecb          754
3918 #define OBJ_camellia_128_ecb          OBJ_camellia,1L

3920 #define SN_camellia_128_ofb128        "CAMELLIA-128-OFB"
3921 #define LN_camellia_128_ofb128        "camellia-128-ofb"
3922 #define NID_camellia_128_ofb128        766
3923 #define OBJ_camellia_128_ofb128        OBJ_camellia,3L

3925 #define SN_camellia_128_cfb128        "CAMELLIA-128-CFB"
3926 #define LN_camellia_128_cfb128        "camellia-128-cfb"
3927 #define NID_camellia_128_cfb128        757
3928 #define OBJ_camellia_128_cfb128        OBJ_camellia,4L

3930 #define SN_camellia_192_ecb          "CAMELLIA-192-ECB"
3931 #define LN_camellia_192_ecb          "camellia-192-ecb"
3932 #define NID_camellia_192_ecb          755
3933 #define OBJ_camellia_192_ecb          OBJ_camellia,21L

3935 #define SN_camellia_192_ofb128        "CAMELLIA-192-OFB"
3936 #define LN_camellia_192_ofb128        "camellia-192-ofb"
3937 #define NID_camellia_192_ofb128        767
3938 #define OBJ_camellia_192_ofb128        OBJ_camellia,23L

3940 #define SN_camellia_192_cfb128        "CAMELLIA-192-CFB"
3941 #define LN_camellia_192_cfb128        "camellia-192-cfb"
3942 #define NID_camellia_192_cfb128        758
3943 #define OBJ_camellia_192_cfb128        OBJ_camellia,24L

3945 #define SN_camellia_256_ecb          "CAMELLIA-256-ECB"
3946 #define LN_camellia_256_ecb          "camellia-256-ecb"
3947 #define NID_camellia_256_ecb          756
3948 #define OBJ_camellia_256_ecb          OBJ_camellia,41L

3950 #define SN_camellia_256_ofb128        "CAMELLIA-256-OFB"
3951 #define LN_camellia_256_ofb128        "camellia-256-ofb"
3952 #define NID_camellia_256_ofb128        768
3953 #define OBJ_camellia_256_ofb128        OBJ_camellia,43L

3955 #define SN_camellia_256_cfb128        "CAMELLIA-256-CFB"

```



```
3956 #define LN_camellia_256_cfb128 "camellia-256-cfb"
3957 #define NID_camellia_256_cfb128 759
3958 #define OBJ_camellia_256_cfb128 OBJ_camellia,44L

3960 #define SN_camellia_128_cfb1 "CAMELLIA-128-CFB1"
3961 #define LN_camellia_128_cfb1 "camellia-128-cfb1"
3962 #define NID_camellia_128_cfb1 760

3964 #define SN_camellia_192_cfb1 "CAMELLIA-192-CFB1"
3965 #define LN_camellia_192_cfb1 "camellia-192-cfb1"
3966 #define NID_camellia_192_cfb1 761

3968 #define SN_camellia_256_cfb1 "CAMELLIA-256-CFB1"
3969 #define LN_camellia_256_cfb1 "camellia-256-cfb1"
3970 #define NID_camellia_256_cfb1 762

3972 #define SN_camellia_128_cfb8 "CAMELLIA-128-CFB8"
3973 #define LN_camellia_128_cfb8 "camellia-128-cfb8"
3974 #define NID_camellia_128_cfb8 763

3976 #define SN_camellia_192_cfb8 "CAMELLIA-192-CFB8"
3977 #define LN_camellia_192_cfb8 "camellia-192-cfb8"
3978 #define NID_camellia_192_cfb8 764

3980 #define SN_camellia_256_cfb8 "CAMELLIA-256-CFB8"
3981 #define LN_camellia_256_cfb8 "camellia-256-cfb8"
3982 #define NID_camellia_256_cfb8 765

3984 #define SN_kisa "KISA"
3985 #define LN_kisa "kisa"
3986 #define NID_kisa 773
3987 #define OBJ_kisa OBJ_member_body,410L,200004L

3989 #define SN_seed_ecb "SEED-ECB"
3990 #define LN_seed_ecb "seed-ecb"
3991 #define NID_seed_ecb 776
3992 #define OBJ_seed_ecb OBJ_kisa,1L,3L

3994 #define SN_seed_cbc "SEED-CBC"
3995 #define LN_seed_cbc "seed-cbc"
3996 #define NID_seed_cbc 777
3997 #define OBJ_seed_cbc OBJ_kisa,1L,4L

3999 #define SN_seed_cfb128 "SEED-CFB"
4000 #define LN_seed_cfb128 "seed-cfb"
4001 #define NID_seed_cfb128 779
4002 #define OBJ_seed_cfb128 OBJ_kisa,1L,5L

4004 #define SN_seed_ofb128 "SEED-OFB"
4005 #define LN_seed_ofb128 "seed-ofb"
4006 #define NID_seed_ofb128 778
4007 #define OBJ_seed_ofb128 OBJ_kisa,1L,6L

4009 #define SN_hmac "HMAC"
4010 #define LN_hmac "hmac"
4011 #define NID_hmac 855

4013 #define SN_cmac "CMAC"
4014 #define LN_cmac "cmac"
4015 #define NID_cmac 894

4017 #define SN_rc4_hmac_md5 "RC4-HMAC-MD5"
4018 #define LN_rc4_hmac_md5 "rc4-hmac-md5"
4019 #define NID_rc4_hmac_md5 915

4021 #define SN_aes_128_cbc_hmac_sha1 "AES-128-CBC-HMAC-SHA1"
```

```
4022 #define LN_aes_128_cbc_hmac_sha1 "aes-128-cbc-hmac-sha1"
4023 #define NID_aes_128_cbc_hmac_sha1 916

4025 #define SN_aes_192_cbc_hmac_sha1 "AES-192-CBC-HMAC-SHA1"
4026 #define LN_aes_192_cbc_hmac_sha1 "aes-192-cbc-hmac-sha1"
4027 #define NID_aes_192_cbc_hmac_sha1 917

4029 #define SN_aes_256_cbc_hmac_sha1 "AES-256-CBC-HMAC-SHA1"
4030 #define LN_aes_256_cbc_hmac_sha1 "aes-256-cbc-hmac-sha1"
4031 #define NID_aes_256_cbc_hmac_sha1 918
```

new/usr/src/lib/openssl/include/openssl/objects.h

1

36641 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/objects.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/objects/objects.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_OBJECTS_H
60 #define HEADER_OBJECTS_H
```

new/usr/src/lib/openssl/include/openssl/objects.h

2

```
62 #define USE_OBJ_MAC
64 #ifdef USE_OBJ_MAC
65 #include <openssl/obj_mac.h>
66 #else
67 #define SN_undef "UNDEF"
68 #define LN_undef "undefined"
69 #define NID_undef 0
70 #define OBJ_undef 0L
72 #define SN_Algorithm "Algorithm"
73 #define LN_algorithm "algorithm"
74 #define NID_algorithm 38
75 #define OBJ_algorithm 1L,3L,14L,3L,2L
77 #define LN_rsadsi "rsadsi"
78 #define NID_rsadsi 1
79 #define OBJ_rsadsi 1L,2L,840L,113549L
81 #define LN_pkcs "pkcs"
82 #define NID_pkcs 2
83 #define OBJ_pkcs OBJ_rsadsi,1L
85 #define SN_md2 "MD2"
86 #define LN_md2 "md2"
87 #define NID_md2 3
88 #define OBJ_md2 OBJ_rsadsi,2L,2L
90 #define SN_md5 "MD5"
91 #define LN_md5 "md5"
92 #define NID_md5 4
93 #define OBJ_md5 OBJ_rsadsi,2L,5L
95 #define SN_rc4 "RC4"
96 #define LN_rc4 "rc4"
97 #define NID_rc4 5
98 #define OBJ_rc4 OBJ_rsadsi,3L,4L
100 #define LN_rsaEncryption "rsaEncryption"
101 #define NID_rsaEncryption 6
102 #define OBJ_rsaEncryption OBJ_pkcs,1L,1L
104 #define SN_md2WithRSAEncryption "RSA-MD2"
105 #define LN_md2WithRSAEncryption "md2WithRSAEncryption"
106 #define NID_md2WithRSAEncryption 7
107 #define OBJ_md2WithRSAEncryption OBJ_pkcs,1L,2L
109 #define SN_md5WithRSAEncryption "RSA-MD5"
110 #define LN_md5WithRSAEncryption "md5WithRSAEncryption"
111 #define NID_md5WithRSAEncryption 8
112 #define OBJ_md5WithRSAEncryption OBJ_pkcs,1L,4L
114 #define SN_pbewithMD2AndDES_CBC "PBE-MD2-DES"
115 #define LN_pbewithMD2AndDES_CBC "pbewithMD2AndDES-CBC"
116 #define NID_pbewithMD2AndDES_CBC 9
117 #define OBJ_pbewithMD2AndDES_CBC OBJ_pkcs,5L,1L
119 #define SN_pbewithMD5AndDES_CBC "PBE-MD5-DES"
120 #define LN_pbewithMD5AndDES_CBC "pbewithMD5AndDES-CBC"
121 #define NID_pbewithMD5AndDES_CBC 10
122 #define OBJ_pbewithMD5AndDES_CBC OBJ_pkcs,5L,3L
124 #define LN_X500 "X500"
125 #define NID_X500 11
126 #define OBJ_X500 2L,5L
```

```

128 #define LN_X509 "X509"
129 #define NID_X509 12
130 #define OBJ_X509 OBJ_X500, 4L

132 #define SN_commonName "CN"
133 #define LN_commonName "commonName"
134 #define NID_commonName 13
135 #define OBJ_commonName OBJ_X509, 3L

137 #define SN_countryName "C"
138 #define LN_countryName "countryName"
139 #define NID_countryName 14
140 #define OBJ_countryName OBJ_X509, 6L

142 #define SN_localityName "L"
143 #define LN_localityName "localityName"
144 #define NID_localityName 15
145 #define OBJ_localityName OBJ_X509, 7L

147 /* Postal Address? PA */

149 /* should be "ST" (rfc1327) but MS uses 'S' */
150 #define SN_stateOrProvinceName "ST"
151 #define LN_stateOrProvinceName "stateOrProvinceName"
152 #define NID_stateOrProvinceName 16
153 #define OBJ_stateOrProvinceName OBJ_X509, 8L

155 #define SN_organizationName "O"
156 #define LN_organizationName "organizationName"
157 #define NID_organizationName 17
158 #define OBJ_organizationName OBJ_X509, 10L

160 #define SN_organizationalUnitName "OU"
161 #define LN_organizationalUnitName "organizationalUnitName"
162 #define NID_organizationalUnitName 18
163 #define OBJ_organizationalUnitName OBJ_X509, 11L

165 #define SN_rsa "RSA"
166 #define LN_rsa "rsa"
167 #define NID_rsa 19
168 #define OBJ_rsa OBJ_X500, 8L, 1L, 1L

170 #define LN_pkcs7 "pkcs7"
171 #define NID_pkcs7 20
172 #define OBJ_pkcs7 OBJ_pkcs, 7L

174 #define LN_pkcs7_data "pkcs7-data"
175 #define NID_pkcs7_data 21
176 #define OBJ_pkcs7_data OBJ_pkcs7, 1L

178 #define LN_pkcs7_signed "pkcs7-signedData"
179 #define NID_pkcs7_signed 22
180 #define OBJ_pkcs7_signed OBJ_pkcs7, 2L

182 #define LN_pkcs7_enveloped "pkcs7-envelopedData"
183 #define NID_pkcs7_enveloped 23
184 #define OBJ_pkcs7_enveloped OBJ_pkcs7, 3L

186 #define LN_pkcs7_signedAndEnveloped "pkcs7-signedAndEnvelopedData"
187 #define NID_pkcs7_signedAndEnveloped 24
188 #define OBJ_pkcs7_signedAndEnveloped OBJ_pkcs7, 4L

190 #define LN_pkcs7_digest "pkcs7-digestData"
191 #define NID_pkcs7_digest 25
192 #define OBJ_pkcs7_digest OBJ_pkcs7, 5L

```

```

194 #define LN_pkcs7_encrypted "pkcs7-encryptedData"
195 #define NID_pkcs7_encrypted 26
196 #define OBJ_pkcs7_encrypted OBJ_pkcs7, 6L

198 #define LN_pkcs3 "pkcs3"
199 #define NID_pkcs3 27
200 #define OBJ_pkcs3 OBJ_pkcs, 3L

202 #define LN_dhKeyAgreement "dhKeyAgreement"
203 #define NID_dhKeyAgreement 28
204 #define OBJ_dhKeyAgreement OBJ_pkcs3, 1L

206 #define SN_des_ecb "DES-ECB"
207 #define LN_des_ecb "des-ecb"
208 #define NID_des_ecb 29
209 #define OBJ_des_ecb OBJ_algorithm, 6L

211 #define SN_des_cfb64 "DES-CFB"
212 #define LN_des_cfb64 "des-cfb"
213 #define NID_des_cfb64 30
214 /* IV + num */
215 #define OBJ_des_cfb64 OBJ_algorithm, 9L

217 #define SN_des_cbc "DES-CBC"
218 #define LN_des_cbc "des-cbc"
219 #define NID_des_cbc 31
220 /* IV */
221 #define OBJ_des_cbc OBJ_algorithm, 7L

223 #define SN_des_ede "DES-EDE"
224 #define LN_des_ede "des-ede"
225 #define NID_des_ede 32
226 /* ?? */
227 #define OBJ_des_ede OBJ_algorithm, 17L

229 #define SN_des_ede3 "DES-EDE3"
230 #define LN_des_ede3 "des-ede3"
231 #define NID_des_ede3 33

233 #define SN_idea_cbc "IDEA-CBC"
234 #define LN_idea_cbc "idea-cbc"
235 #define NID_idea_cbc 34
236 #define OBJ_idea_cbc 1L, 3L, 6L, 1L, 4L, 1L, 188L, 7L, 1L, 1L, 2L

238 #define SN_idea_cfb64 "IDEA-CFB"
239 #define LN_idea_cfb64 "idea-cfb"
240 #define NID_idea_cfb64 35

242 #define SN_idea_ecb "IDEA-ECB"
243 #define LN_idea_ecb "idea-ecb"
244 #define NID_idea_ecb 36

246 #define SN_rc2_cbc "RC2-CBC"
247 #define LN_rc2_cbc "rc2-cbc"
248 #define NID_rc2_cbc 37
249 #define OBJ_rc2_cbc OBJ_rsads, 3L, 2L

251 #define SN_rc2_ecb "RC2-ECB"
252 #define LN_rc2_ecb "rc2-ecb"
253 #define NID_rc2_ecb 38

255 #define SN_rc2_cfb64 "RC2-CFB"
256 #define LN_rc2_cfb64 "rc2-cfb"
257 #define NID_rc2_cfb64 39

259 #define SN_rc2_ofb64 "RC2-OFB"

```

```

260 #define LN_rc2_ofb64 "rc2-ofb"
261 #define NID_rc2_ofb64 40

263 #define SN_sha "SHA"
264 #define LN_sha "sha"
265 #define NID_sha 41
266 #define OBJ_sha OBJ_algorithm, 18L

268 #define SN_shaWithRSAEncryption "RSA-SHA"
269 #define LN_shaWithRSAEncryption "shaWithRSAEncryption"
270 #define NID_shaWithRSAEncryption 42
271 #define OBJ_shaWithRSAEncryption OBJ_algorithm, 15L

273 #define SN_des_ede_cbc "DES-EDE-CBC"
274 #define LN_des_ede_cbc "des-ede-cbc"
275 #define NID_des_ede_cbc 43

277 #define SN_des_ede3_cbc "DES-EDE3-CBC"
278 #define LN_des_ede3_cbc "des-ede3-cbc"
279 #define NID_des_ede3_cbc 44
280 #define OBJ_des_ede3_cbc OBJ_rsadsi, 3L, 7L

282 #define SN_des_ofb64 "DES-OFB"
283 #define LN_des_ofb64 "des-ofb"
284 #define NID_des_ofb64 45
285 #define OBJ_des_ofb64 OBJ_algorithm, 8L

287 #define SN_idea_ofb64 "IDEA-OFB"
288 #define LN_idea_ofb64 "idea-ofb"
289 #define NID_idea_ofb64 46

291 #define LN_pkcs9 "pkcs9"
292 #define NID_pkcs9 47
293 #define OBJ_pkcs9 OBJ_pkcs, 9L

295 #define SN_pkcs9_emailAddress "Email"
296 #define LN_pkcs9_emailAddress "emailAddress"
297 #define NID_pkcs9_emailAddress 48
298 #define OBJ_pkcs9_emailAddress OBJ_pkcs, 1L

300 #define LN_pkcs9_unstructuredName "unstructuredName"
301 #define NID_pkcs9_unstructuredName 49
302 #define OBJ_pkcs9_unstructuredName OBJ_pkcs, 2L

304 #define LN_pkcs9_contentType "contentType"
305 #define NID_pkcs9_contentType 50
306 #define OBJ_pkcs9_contentType OBJ_pkcs, 3L

308 #define LN_pkcs9_messageDigest "messageDigest"
309 #define NID_pkcs9_messageDigest 51
310 #define OBJ_pkcs9_messageDigest OBJ_pkcs, 4L

312 #define LN_pkcs9_signingTime "signingTime"
313 #define NID_pkcs9_signingTime 52
314 #define OBJ_pkcs9_signingTime OBJ_pkcs, 5L

316 #define LN_pkcs9_countersignature "countersignature"
317 #define NID_pkcs9_countersignature 53
318 #define OBJ_pkcs9_countersignature OBJ_pkcs, 6L

320 #define LN_pkcs9_challengePassword "challengePassword"
321 #define NID_pkcs9_challengePassword 54
322 #define OBJ_pkcs9_challengePassword OBJ_pkcs, 7L

324 #define LN_pkcs9_unstructuredAddress "unstructuredAddress"
325 #define NID_pkcs9_unstructuredAddress 55

```

```

326 #define OBJ_pkcs9_unstructuredAddress OBJ_pkcs, 8L

328 #define LN_pkcs9_extCertAttributes "extendedCertificateAttributes"
329 #define NID_pkcs9_extCertAttributes 56
330 #define OBJ_pkcs9_extCertAttributes OBJ_pkcs, 9L

332 #define SN_netscape "Netscape"
333 #define LN_netscape "Netscape Communications Corp."
334 #define NID_netscape 57
335 #define OBJ_netscape 2L, 16L, 840L, 1L, 113730L

337 #define SN_netscape_cert_extension "nsCertExt"
338 #define LN_netscape_cert_extension "Netscape Certificate Extension"
339 #define NID_netscape_cert_extension 58
340 #define OBJ_netscape_cert_extension OBJ_netscape, 1L

342 #define SN_netscape_data_type "nsDataType"
343 #define LN_netscape_data_type "Netscape Data Type"
344 #define NID_netscape_data_type 59
345 #define OBJ_netscape_data_type OBJ_netscape, 2L

347 #define SN_des_ede_cfb64 "DES-EDE-CFB"
348 #define LN_des_ede_cfb64 "des-ede-cfb"
349 #define NID_des_ede_cfb64 60

351 #define SN_des_ede3_cfb64 "DES-EDE3-CFB"
352 #define LN_des_ede3_cfb64 "des-ede3-cfb"
353 #define NID_des_ede3_cfb64 61

355 #define SN_des_ede_ofb64 "DES-EDE-OFB"
356 #define LN_des_ede_ofb64 "des-ede-ofb"
357 #define NID_des_ede_ofb64 62

359 #define SN_des_ede3_ofb64 "DES-EDE3-OFB"
360 #define LN_des_ede3_ofb64 "des-ede3-ofb"
361 #define NID_des_ede3_ofb64 63

363 /* I'm not sure about the object ID */
364 #define SN_sha1 "SHA1"
365 #define LN_sha1 "sha1"
366 #define NID_sha1 64
367 #define OBJ_sha1 OBJ_algorithm, 26L
368 /* 28 Jun 1996 - eay */
369 /* #define OBJ_sha1 1L, 3L, 14L, 2L, 26L, 05L <- wrong */

371 #define SN_sha1WithRSAEncryption "RSA-SHA1"
372 #define LN_sha1WithRSAEncryption "sha1WithRSAEncryption"
373 #define NID_sha1WithRSAEncryption 65
374 #define OBJ_sha1WithRSAEncryption OBJ_pkcs, 1L, 5L

376 #define SN_dsaWithSHA "DSA-SHA"
377 #define LN_dsaWithSHA "dsaWithSHA"
378 #define NID_dsaWithSHA 66
379 #define OBJ_dsaWithSHA OBJ_algorithm, 13L

381 #define SN_dsa_2 "DSA-old"
382 #define LN_dsa_2 "dsaEncryption-old"
383 #define NID_dsa_2 67
384 #define OBJ_dsa_2 OBJ_algorithm, 12L

386 /* proposed by microsoft to RSA */
387 #define SN_pbewithSHA1AndRC2_CBC "PBE-SHA1-RC2-64"
388 #define LN_pbewithSHA1AndRC2_CBC "pbewithSHA1AndRC2-CBC"
389 #define NID_pbewithSHA1AndRC2_CBC 68
390 #define OBJ_pbewithSHA1AndRC2_CBC OBJ_pkcs, 5L, 11L

```

```

392 /* proposed by microsoft to RSA as pbewithSHA1AndRC4: it is now
393  * defined explicitly in PKCS#5 v2.0 as id-PBKDF2 which is something
394  * completely different.
395  */
396 #define LN_id_pbkdf2 "PBKDF2"
397 #define NID_id_pbkdf2 69
398 #define OBJ_id_pbkdf2 OBJ_pkcs,5L,12L

400 #define SN_dsaWithSHA1_2 "DSA-SHA1-old"
401 #define LN_dsaWithSHA1_2 "dsaWithSHA1-old"
402 #define NID_dsaWithSHA1_2 70
403 /* Got this one from 'sdn706r20.pdf' which is actually an NSA document :-) */
404 #define OBJ_dsaWithSHA1_2 OBJ_algorithm,27L

406 #define SN_netscape_cert_type "nsCertType"
407 #define LN_netscape_cert_type "Netscape Cert Type"
408 #define NID_netscape_cert_type 71
409 #define OBJ_netscape_cert_type OBJ_netscape_cert_extension,1L

411 #define SN_netscape_base_url "nsBaseUrl"
412 #define LN_netscape_base_url "Netscape Base Url"
413 #define NID_netscape_base_url 72
414 #define OBJ_netscape_base_url OBJ_netscape_cert_extension,2L

416 #define SN_netscape_revocation_url "nsRevocationUrl"
417 #define LN_netscape_revocation_url "Netscape Revocation Url"
418 #define NID_netscape_revocation_url 73
419 #define OBJ_netscape_revocation_url OBJ_netscape_cert_extension,3L

421 #define SN_netscape_ca_revocation_url "nsCaRevocationUrl"
422 #define LN_netscape_ca_revocation_url "Netscape CA Revocation Url"
423 #define NID_netscape_ca_revocation_url 74
424 #define OBJ_netscape_ca_revocation_url OBJ_netscape_cert_extension,4L

426 #define SN_netscape_renewal_url "nsRenewalUrl"
427 #define LN_netscape_renewal_url "Netscape Renewal Url"
428 #define NID_netscape_renewal_url 75
429 #define OBJ_netscape_renewal_url OBJ_netscape_cert_extension,7L

431 #define SN_netscape_ca_policy_url "nsCaPolicyUrl"
432 #define LN_netscape_ca_policy_url "Netscape CA Policy Url"
433 #define NID_netscape_ca_policy_url 76
434 #define OBJ_netscape_ca_policy_url OBJ_netscape_cert_extension,8L

436 #define SN_netscape_ssl_server_name "nsSslServerName"
437 #define LN_netscape_ssl_server_name "Netscape SSL Server Name"
438 #define NID_netscape_ssl_server_name 77
439 #define OBJ_netscape_ssl_server_name OBJ_netscape_cert_extension,12L

441 #define SN_netscape_comment "nsComment"
442 #define LN_netscape_comment "Netscape Comment"
443 #define NID_netscape_comment 78
444 #define OBJ_netscape_comment OBJ_netscape_cert_extension,13L

446 #define SN_netscape_cert_sequence "nsCertSequence"
447 #define LN_netscape_cert_sequence "Netscape Certificate Sequence"
448 #define NID_netscape_cert_sequence 79
449 #define OBJ_netscape_cert_sequence OBJ_netscape_data_type,5L

451 #define SN_desx_cbc "DESX-CBC"
452 #define LN_desx_cbc "desx-cbc"
453 #define NID_desx_cbc 80

455 #define SN_id_ce "id-ce"
456 #define NID_id_ce 81
457 #define OBJ_id_ce 2L,5L,29L

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459 #define SN_subject_key_identifier "subjectKeyIdentifier"
460 #define LN_subject_key_identifier "X509v3 Subject Key Identifier"
461 #define NID_subject_key_identifier 82
462 #define OBJ_subject_key_identifier OBJ_id_ce,14L

464 #define SN_key_usage "keyUsage"
465 #define LN_key_usage "X509v3 Key Usage"
466 #define NID_key_usage 83
467 #define OBJ_key_usage OBJ_id_ce,15L

469 #define SN_private_key_usage_period "privateKeyUsagePeriod"
470 #define LN_private_key_usage_period "X509v3 Private Key Usage Period"
471 #define NID_private_key_usage_period 84
472 #define OBJ_private_key_usage_period OBJ_id_ce,16L

474 #define SN_subject_alt_name "subjectAltName"
475 #define LN_subject_alt_name "X509v3 Subject Alternative Name"
476 #define NID_subject_alt_name 85
477 #define OBJ_subject_alt_name OBJ_id_ce,17L

479 #define SN_issuer_alt_name "issuerAltName"
480 #define LN_issuer_alt_name "X509v3 Issuer Alternative Name"
481 #define NID_issuer_alt_name 86
482 #define OBJ_issuer_alt_name OBJ_id_ce,18L

484 #define SN_basic_constraints "basicConstraints"
485 #define LN_basic_constraints "X509v3 Basic Constraints"
486 #define NID_basic_constraints 87
487 #define OBJ_basic_constraints OBJ_id_ce,19L

489 #define SN_crl_number "crlNumber"
490 #define LN_crl_number "X509v3 CRL Number"
491 #define NID_crl_number 88
492 #define OBJ_crl_number OBJ_id_ce,20L

494 #define SN_certificate_policies "certificatePolicies"
495 #define LN_certificate_policies "X509v3 Certificate Policies"
496 #define NID_certificate_policies 89
497 #define OBJ_certificate_policies OBJ_id_ce,32L

499 #define SN_authority_key_identifier "authorityKeyIdentifier"
500 #define LN_authority_key_identifier "X509v3 Authority Key Identifier"
501 #define NID_authority_key_identifier 90
502 #define OBJ_authority_key_identifier OBJ_id_ce,35L

504 #define SN_bf_cbc "BF-CBC"
505 #define LN_bf_cbc "bf-cbc"
506 #define NID_bf_cbc 91
507 #define OBJ_bf_cbc 1L,3L,6L,1L,4L,1L,3029L,1L,2L

509 #define SN_bf_ecb "BF-ECB"
510 #define LN_bf_ecb "bf-ecb"
511 #define NID_bf_ecb 92

513 #define SN_bf_cfb64 "BF-CFB"
514 #define LN_bf_cfb64 "bf-cfb"
515 #define NID_bf_cfb64 93

517 #define SN_bf_ofb64 "BF-OFB"
518 #define LN_bf_ofb64 "bf-ofb"
519 #define NID_bf_ofb64 94

521 #define SN_mdc2 "MDC2"
522 #define LN_mdc2 "mdc2"
523 #define NID_mdc2 95

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524 #define OBJ_mdc2                2L,5L,8L,3L,101L
525 /* An alternative?              1L,3L,14L,3L,2L,19L */

527 #define SN_mdc2WithRSA           "RSA-MDC2"
528 #define LN_mdc2WithRSA           "mdc2withRSA"
529 #define NID_mdc2WithRSA          96
530 #define OBJ_mdc2WithRSA          2L,5L,8L,3L,100L

532 #define SN_rc4_40                "RC4-40"
533 #define LN_rc4_40                "rc4-40"
534 #define NID_rc4_40              97

536 #define SN_rc2_40_cbc            "RC2-40-CBC"
537 #define LN_rc2_40_cbc            "rc2-40-cbc"
538 #define NID_rc2_40_cbc          98

540 #define SN_givenName             "G"
541 #define LN_givenName             "givenName"
542 #define NID_givenName            99
543 #define OBJ_givenName            OBJ_X509,42L

545 #define SN_surname               "S"
546 #define LN_surname              "surname"
547 #define NID_surname              100
548 #define OBJ_surname              OBJ_X509,4L

550 #define SN_initials              "I"
551 #define LN_initials              "initials"
552 #define NID_initials             101
553 #define OBJ_initials             OBJ_X509,43L

555 #define SN_uniqueIdentifier       "UID"
556 #define LN_uniqueIdentifier       "uniqueIdentifier"
557 #define NID_uniqueIdentifier      102
558 #define OBJ_uniqueIdentifier      OBJ_X509,45L

560 #define SN_crl_distribution_points "crlDistributionPoints"
561 #define LN_crl_distribution_points "X509v3 CRL Distribution Points"
562 #define NID_crl_distribution_points 103
563 #define OBJ_crl_distribution_points OBJ_id_ce,31L

565 #define SN_md5WithRSA            "RSA-NP-MD5"
566 #define LN_md5WithRSA            "md5WithRSA"
567 #define NID_md5WithRSA           104
568 #define OBJ_md5WithRSA           OBJ_algorithm,3L

570 #define SN_serialNumber           "SN"
571 #define LN_serialNumber           "serialNumber"
572 #define NID_serialNumber         105
573 #define OBJ_serialNumber         OBJ_X509,5L

575 #define SN_title                 "T"
576 #define LN_title                 "title"
577 #define NID_title                106
578 #define OBJ_title                OBJ_X509,12L

580 #define SN_description            "D"
581 #define LN_description            "description"
582 #define NID_description          107
583 #define OBJ_description          OBJ_X509,13L

585 /* CAST5 is CAST-128, I'm just sticking with the documentation */
586 #define SN_cast5_cbc              "CAST5-CBC"
587 #define LN_cast5_cbc              "cast5-cbc"
588 #define NID_cast5_cbc            108
589 #define OBJ_cast5_cbc            1L,2L,840L,113533L,7L,66L,10L

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591 #define SN_cast5_ecb              "CAST5-ECB"
592 #define LN_cast5_ecb              "cast5-ecb"
593 #define NID_cast5_ecb            109

595 #define SN_cast5_cfb64            "CAST5-CFB"
596 #define LN_cast5_cfb64            "cast5-cfb"
597 #define NID_cast5_cfb64          110

599 #define SN_cast5_ofb64            "CAST5-OFB"
600 #define LN_cast5_ofb64            "cast5-ofb"
601 #define NID_cast5_ofb64          111

603 #define LN_pbewithMD5AndCast5_CBC "pbewithMD5AndCast5CBC"
604 #define NID_pbewithMD5AndCast5_CBC 112
605 #define OBJ_pbewithMD5AndCast5_CBC 1L,2L,840L,113533L,7L,66L,12L

607 /* This is one sun will soon be using :-{
608  * id-dsa-with-sha1 ID ::= {
609  *   iso(1) member-body(2) us(840) x9-57 (10040) x9cm(4) 3 }
610  */
611 #define SN_dsaWithSHA1            "DSA-SHA1"
612 #define LN_dsaWithSHA1            "dsaWithSHA1"
613 #define NID_dsaWithSHA1          113
614 #define OBJ_dsaWithSHA1          1L,2L,840L,10040L,4L,3L

616 #define NID_md5_sha1              114
617 #define SN_md5_sha1              "MD5-SHA1"
618 #define LN_md5_sha1              "md5-sha1"

620 #define SN_sha1WithRSA            "RSA-SHA1-2"
621 #define LN_sha1WithRSA            "sha1WithRSA"
622 #define NID_sha1WithRSA          115
623 #define OBJ_sha1WithRSA          OBJ_algorithm,29L

625 #define SN_dsa                   "DSA"
626 #define LN_dsa                   "dsaEncryption"
627 #define NID_dsa                  116
628 #define OBJ_dsa                  1L,2L,840L,10040L,4L,1L

630 #define SN_ripemd160              "RIPEMD160"
631 #define LN_ripemd160              "ripemd160"
632 #define NID_ripemd160            117
633 #define OBJ_ripemd160            1L,3L,36L,3L,2L,1L

635 /* The name should actually be rsaSignatureWithripemd160, but I'm going
636  * to continue using the convention I'm using with the other ciphers */
637 #define SN_ripemd160WithRSA        "RSA-RIPEMD160"
638 #define LN_ripemd160WithRSA        "ripemd160WithRSA"
639 #define NID_ripemd160WithRSA      119
640 #define OBJ_ripemd160WithRSA      1L,3L,36L,3L,3L,1L,2L

642 /* Taken from rfc2040
643  * RC5_CBC_Parameters ::= SEQUENCE {
644  *   version          INTEGER (v1.0(16)),
645  *   rounds            INTEGER (8..127),
646  *   blockSizeInBits  INTEGER (64, 128),
647  *   iv               OCTET STRING OPTIONAL
648  * }
649  */
650 #define SN_rc5_cbc                "RC5-CBC"
651 #define LN_rc5_cbc                "rc5-cbc"
652 #define NID_rc5_cbc              120
653 #define OBJ_rc5_cbc              OBJ_rsadsi,3L,8L

655 #define SN_rc5_ecb                "RC5-ECB"

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656 #define LN_rc5_ecb "rc5-ecb"
657 #define NID_rc5_ecb 121

659 #define SN_rc5_cfb64 "RC5-CFB"
660 #define LN_rc5_cfb64 "rc5-cfb"
661 #define NID_rc5_cfb64 122

663 #define SN_rc5_ofb64 "RC5-OFB"
664 #define LN_rc5_ofb64 "rc5-ofb"
665 #define NID_rc5_ofb64 123

667 #define SN_rle_compression "RLE"
668 #define LN_rle_compression "run length compression"
669 #define NID_rle_compression 124
670 #define OBJ_rle_compression 1L,1L,1L,1L,666L,1L

672 #define SN_zlib_compression "ZLIB"
673 #define LN_zlib_compression "zlib compression"
674 #define NID_zlib_compression 125
675 #define OBJ_zlib_compression 1L,1L,1L,1L,666L,2L

677 #define SN_ext_key_usage "extendedKeyUsage"
678 #define LN_ext_key_usage "X509v3 Extended Key Usage"
679 #define NID_ext_key_usage 126
680 #define OBJ_ext_key_usage OBJ_id_ce,37

682 #define SN_id_pkix "PKIX"
683 #define NID_id_pkix 127
684 #define OBJ_id_pkix 1L,3L,6L,1L,5L,5L,7L

686 #define SN_id_kp "id-kp"
687 #define NID_id_kp 128
688 #define OBJ_id_kp OBJ_id_pkix,3L

690 /* PKIX extended key usage OIDs */

692 #define SN_server_auth "serverAuth"
693 #define LN_server_auth "TLS Web Server Authentication"
694 #define NID_server_auth 129
695 #define OBJ_server_auth OBJ_id_kp,1L

697 #define SN_client_auth "clientAuth"
698 #define LN_client_auth "TLS Web Client Authentication"
699 #define NID_client_auth 130
700 #define OBJ_client_auth OBJ_id_kp,2L

702 #define SN_code_sign "codeSigning"
703 #define LN_code_sign "Code Signing"
704 #define NID_code_sign 131
705 #define OBJ_code_sign OBJ_id_kp,3L

707 #define SN_email_protect "emailProtection"
708 #define LN_email_protect "E-mail Protection"
709 #define NID_email_protect 132
710 #define OBJ_email_protect OBJ_id_kp,4L

712 #define SN_time_stamp "timeStamping"
713 #define LN_time_stamp "Time Stamping"
714 #define NID_time_stamp 133
715 #define OBJ_time_stamp OBJ_id_kp,8L

717 /* Additional extended key usage OIDs: Microsoft */

719 #define SN_ms_code_ind "msCodeInd"
720 #define LN_ms_code_ind "Microsoft Individual Code Signing"
721 #define NID_ms_code_ind 134

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722 #define OBJ_ms_code_ind 1L,3L,6L,1L,4L,1L,311L,2L,1L,21L

724 #define SN_ms_code_com "msCodeCom"
725 #define LN_ms_code_com "Microsoft Commercial Code Signing"
726 #define NID_ms_code_com 135
727 #define OBJ_ms_code_com 1L,3L,6L,1L,4L,1L,311L,2L,1L,22L

729 #define SN_ms_ctl_sign "msCTLSign"
730 #define LN_ms_ctl_sign "Microsoft Trust List Signing"
731 #define NID_ms_ctl_sign 136
732 #define OBJ_ms_ctl_sign 1L,3L,6L,1L,4L,1L,311L,10L,3L,1L

734 #define SN_ms_sgc "msSGC"
735 #define LN_ms_sgc "Microsoft Server Gated Crypto"
736 #define NID_ms_sgc 137
737 #define OBJ_ms_sgc 1L,3L,6L,1L,4L,1L,311L,10L,3L,3L

739 #define SN_ms_efs "msEFS"
740 #define LN_ms_efs "Microsoft Encrypted File System"
741 #define NID_ms_efs 138
742 #define OBJ_ms_efs 1L,3L,6L,1L,4L,1L,311L,10L,3L,4L

744 /* Additional usage: Netscape */

746 #define SN_ns_sgc "nsSGC"
747 #define LN_ns_sgc "Netscape Server Gated Crypto"
748 #define NID_ns_sgc 139
749 #define OBJ_ns_sgc OBJ_netscape,4L,1L

751 #define SN_delta_crl "deltaCRL"
752 #define LN_delta_crl "X509v3 Delta CRL Indicator"
753 #define NID_delta_crl 140
754 #define OBJ_delta_crl OBJ_id_ce,27L

756 #define SN_crl_reason "CRLReason"
757 #define LN_crl_reason "CRL Reason Code"
758 #define NID_crl_reason 141
759 #define OBJ_crl_reason OBJ_id_ce,21L

761 #define SN_invalidity_date "invalidityDate"
762 #define LN_invalidity_date "Invalidity Date"
763 #define NID_invalidity_date 142
764 #define OBJ_invalidity_date OBJ_id_ce,24L

766 #define SN_sxnet "SXNetID"
767 #define LN_sxnet "Strong Extranet ID"
768 #define NID_sxnet 143
769 #define OBJ_sxnet 1L,3L,101L,1L,4L,1L

771 /* PKCS12 and related OBJECT IDENTIFIERS */

773 #define OBJ_pkcs12 OBJ_pkcs,12L
774 #define OBJ_pkcs12_pbeids OBJ_pkcs12, 1

776 #define SN_pbe_withSHA1And128BitRC4 "PBE-SHA1-RC4-128"
777 #define LN_pbe_withSHA1And128BitRC4 "pbeWithSHA1And128BitRC4"
778 #define NID_pbe_withSHA1And128BitRC4 144
779 #define OBJ_pbe_withSHA1And128BitRC4 OBJ_pkcs12_pbeids, 1L

781 #define SN_pbe_withSHA1And40BitRC4 "PBE-SHA1-RC4-40"
782 #define LN_pbe_withSHA1And40BitRC4 "pbeWithSHA1And40BitRC4"
783 #define NID_pbe_withSHA1And40BitRC4 145
784 #define OBJ_pbe_withSHA1And40BitRC4 OBJ_pkcs12_pbeids, 2L

786 #define SN_pbe_withSHA1And3_Key_TripleDES_CBC "PBE-SHA1-3DES"
787 #define LN_pbe_withSHA1And3_Key_TripleDES_CBC "pbeWithSHA1And3-KeyTripleDES-CB

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788 #define NID_pbe_WithSHA1And3_Key_TripleDES_CBC 146
789 #define OBJ_pbe_WithSHA1And3_Key_TripleDES_CBC OBJ_pkcs12_pbeids, 3L

791 #define SN_pbe_WithSHA1And2_Key_TripleDES_CBC "PBE-SHA1-2DES"
792 #define LN_pbe_WithSHA1And2_Key_TripleDES_CBC "pbeWithSHA1And2-KeyTripleDES-CB
793 #define NID_pbe_WithSHA1And2_Key_TripleDES_CBC 147
794 #define OBJ_pbe_WithSHA1And2_Key_TripleDES_CBC OBJ_pkcs12_pbeids, 4L

796 #define SN_pbe_WithSHA1And128BitRC2_CBC "PBE-SHA1-RC2-128"
797 #define LN_pbe_WithSHA1And128BitRC2_CBC "pbeWithSHA1And128BitRC2-CBC"
798 #define NID_pbe_WithSHA1And128BitRC2_CBC 148
799 #define OBJ_pbe_WithSHA1And128BitRC2_CBC OBJ_pkcs12_pbeids, 5L

801 #define SN_pbe_WithSHA1And40BitRC2_CBC "PBE-SHA1-RC2-40"
802 #define LN_pbe_WithSHA1And40BitRC2_CBC "pbeWithSHA1And40BitRC2-CBC"
803 #define NID_pbe_WithSHA1And40BitRC2_CBC 149
804 #define OBJ_pbe_WithSHA1And40BitRC2_CBC OBJ_pkcs12_pbeids, 6L

806 #define OBJ_pkcs12_Version1 OBJ_pkcs12, 10L

808 #define OBJ_pkcs12_BagIds OBJ_pkcs12_Version1, 1L

810 #define LN_keyBag "keyBag"
811 #define NID_keyBag 150
812 #define OBJ_keyBag OBJ_pkcs12_BagIds, 1L

814 #define LN_pkcs8ShroudedKeyBag "pkcs8ShroudedKeyBag"
815 #define NID_pkcs8ShroudedKeyBag 151
816 #define OBJ_pkcs8ShroudedKeyBag OBJ_pkcs12_BagIds, 2L

818 #define LN_certBag "certBag"
819 #define NID_certBag 152
820 #define OBJ_certBag OBJ_pkcs12_BagIds, 3L

822 #define LN_crlBag "crlBag"
823 #define NID_crlBag 153
824 #define OBJ_crlBag OBJ_pkcs12_BagIds, 4L

826 #define LN_secretBag "secretBag"
827 #define NID_secretBag 154
828 #define OBJ_secretBag OBJ_pkcs12_BagIds, 5L

830 #define LN_safeContentsBag "safeContentsBag"
831 #define NID_safeContentsBag 155
832 #define OBJ_safeContentsBag OBJ_pkcs12_BagIds, 6L

834 #define LN_friendlyName "friendlyName"
835 #define NID_friendlyName 156
836 #define OBJ_friendlyName OBJ_pkcs9, 20L

838 #define LN_localKeyID "localKeyID"
839 #define NID_localKeyID 157
840 #define OBJ_localKeyID OBJ_pkcs9, 21L

842 #define OBJ_certTypes OBJ_pkcs9, 22L

844 #define LN_x509Certificate "x509Certificate"
845 #define NID_x509Certificate 158
846 #define OBJ_x509Certificate OBJ_certTypes, 1L

848 #define LN_sdsiCertificate "sdsiCertificate"
849 #define NID_sdsiCertificate 159
850 #define OBJ_sdsiCertificate OBJ_certTypes, 2L

852 #define OBJ_crlTypes OBJ_pkcs9, 23L

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854 #define LN_x509Crl "x509Crl"
855 #define NID_x509Crl 160
856 #define OBJ_x509Crl OBJ_crlTypes, 1L

858 /* PKCS#5 v2 OIDs */

860 #define LN_pbcs2 "PBES2"
861 #define NID_pbcs2 161
862 #define OBJ_pbcs2 OBJ_pkcs, 5L, 13L

864 #define LN_pbmac1 "PBMAC1"
865 #define NID_pbmac1 162
866 #define OBJ_pbmac1 OBJ_pkcs, 5L, 14L

868 #define LN_hmacWithSHA1 "hmacWithSHA1"
869 #define NID_hmacWithSHA1 163
870 #define OBJ_hmacWithSHA1 OBJ_rsadsi, 2L, 7L

872 /* Policy Qualifier Ids */

874 #define LN_id_qt_cps "Policy Qualifier CPS"
875 #define SN_id_qt_cps "id-qt-cps"
876 #define NID_id_qt_cps 164
877 #define OBJ_id_qt_cps OBJ_id_pkix, 2L, 1L

879 #define LN_id_qt_unotice "Policy Qualifier User Notice"
880 #define SN_id_qt_unotice "id-qt-unotice"
881 #define NID_id_qt_unotice 165
882 #define OBJ_id_qt_unotice OBJ_id_pkix, 2L, 2L

884 #define SN_rc2_64_cbc "RC2-64-CBC"
885 #define LN_rc2_64_cbc "rc2-64-cbc"
886 #define NID_rc2_64_cbc 166

888 #define SN_SMIMECapabilities "SMIME-CAPS"
889 #define LN_SMIMECapabilities "S/MIME Capabilities"
890 #define NID_SMIMECapabilities 167
891 #define OBJ_SMIMECapabilities OBJ_pkcs9, 15L

893 #define SN_pbeWithMD2AndRC2_CBC "PBE-MD2-RC2-64"
894 #define LN_pbeWithMD2AndRC2_CBC "pbeWithMD2AndRC2-CBC"
895 #define NID_pbeWithMD2AndRC2_CBC 168
896 #define OBJ_pbeWithMD2AndRC2_CBC OBJ_pkcs, 5L, 4L

898 #define SN_pbeWithMD5AndRC2_CBC "PBE-MD5-RC2-64"
899 #define LN_pbeWithMD5AndRC2_CBC "pbeWithMD5AndRC2-CBC"
900 #define NID_pbeWithMD5AndRC2_CBC 169
901 #define OBJ_pbeWithMD5AndRC2_CBC OBJ_pkcs, 5L, 6L

903 #define SN_pbeWithSHA1AndDES_CBC "PBE-SHA1-DES"
904 #define LN_pbeWithSHA1AndDES_CBC "pbeWithSHA1AndDES-CBC"
905 #define NID_pbeWithSHA1AndDES_CBC 170
906 #define OBJ_pbeWithSHA1AndDES_CBC OBJ_pkcs, 5L, 10L

908 /* Extension request OIDs */

910 #define LN_ms_ext_req "Microsoft Extension Request"
911 #define SN_ms_ext_req "msExtReq"
912 #define NID_ms_ext_req 171
913 #define OBJ_ms_ext_req 1L, 3L, 6L, 1L, 4L, 1L, 311L, 2L, 1L, 14L

915 #define LN_ext_req "Extension Request"
916 #define SN_ext_req "extReq"
917 #define NID_ext_req 172
918 #define OBJ_ext_req OBJ_pkcs9, 14L

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920 #define SN_name "name"
921 #define LN_name "name"
922 #define NID_name 173
923 #define OBJ_name OBJ_X509,41L

925 #define SN_dnQualifier "dnQualifier"
926 #define LN_dnQualifier "dnQualifier"
927 #define NID_dnQualifier 174
928 #define OBJ_dnQualifier OBJ_X509,46L

930 #define SN_id_pe "id-pe"
931 #define NID_id_pe 175
932 #define OBJ_id_pe OBJ_id_pkix,1L

934 #define SN_id_ad "id-ad"
935 #define NID_id_ad 176
936 #define OBJ_id_ad OBJ_id_pkix,48L

938 #define SN_info_access "authorityInfoAccess"
939 #define LN_info_access "Authority Information Access"
940 #define NID_info_access 177
941 #define OBJ_info_access OBJ_id_pe,1L

943 #define SN_ad_OCSP "OCSP"
944 #define LN_ad_OCSP "OCSP"
945 #define NID_ad_OCSP 178
946 #define OBJ_ad_OCSP OBJ_id_ad,1L

948 #define SN_ad_ca_issuers "caIssuers"
949 #define LN_ad_ca_issuers "CA Issuers"
950 #define NID_ad_ca_issuers 179
951 #define OBJ_ad_ca_issuers OBJ_id_ad,2L

953 #define SN_OCSP_sign "OCSPSigning"
954 #define LN_OCSP_sign "OCSP Signing"
955 #define NID_OCSP_sign 180
956 #define OBJ_OCSP_sign OBJ_id_kp,9L
957 #endif /* USE_OBJ_MAC */

959 #include <openssl/bio.h>
960 #include <openssl/asn1.h>

962 #define OBJ_NAME_TYPE_UNDEF 0x00
963 #define OBJ_NAME_TYPE_MD_METH 0x01
964 #define OBJ_NAME_TYPE_CIPHER_METH 0x02
965 #define OBJ_NAME_TYPE_PKEY_METH 0x03
966 #define OBJ_NAME_TYPE_COMP_METH 0x04
967 #define OBJ_NAME_TYPE_NUM 0x05

969 #define OBJ_NAME_ALIAS 0x8000

971 #define OBJ_BSEARCH_VALUE_ON_NOMATCH 0x01
972 #define OBJ_BSEARCH_FIRST_VALUE_ON_MATCH 0x02

975 #ifdef __cplusplus
976 extern "C" {
977 #endif

979 typedef struct obj_name_st
980 {
981     int type;
982     int alias;
983     const char *name;
984     const char *data;
985 } OBJ_NAME;

```

```

987 #define OBJ_create_and_add_object(a,b,c) OBJ_create(a,b,c)

990 int OBJ_NAME_init(void);
991 int OBJ_NAME_new_index(unsigned long (*hash_func)(const char *),
992     int (*cmp_func)(const char *, const char *),
993     void (*free_func)(const char *, int, const char *));
994 const char *OBJ_NAME_get(const char *name,int type);
995 int OBJ_NAME_add(const char *name,int type,const char *data);
996 int OBJ_NAME_remove(const char *name,int type);
997 void OBJ_NAME_cleanup(int type); /* -1 for everything */
998 void OBJ_NAME_do_all(int type,void (*fn)(const OBJ_NAME *,void *arg),
999     void *arg);
1000 void OBJ_NAME_do_all_sorted(int type,void (*fn)(const OBJ_NAME *,void *arg),
1001     void *arg);

1003 ASN1_OBJECT * OBJ_dup(const ASN1_OBJECT *o);
1004 ASN1_OBJECT * OBJ_nid2obj(int n);
1005 const char * OBJ_nid2ln(int n);
1006 const char * OBJ_nid2sn(int n);
1007 int OBJ_obj2nid(const ASN1_OBJECT *o);
1008 ASN1_OBJECT * OBJ_txt2obj(const char *s, int no_name);
1009 int OBJ_obj2txt(char *buf, int buf_len, const ASN1_OBJECT *a, int no_name);
1010 int OBJ_txt2nid(const char *s);
1011 int OBJ_ln2nid(const char *s);
1012 int OBJ_sn2nid(const char *s);
1013 int OBJ_cmp(const ASN1_OBJECT *a,const ASN1_OBJECT *b);
1014 const void * OBJ_bsearch_(const void *key,const void *base,int num,int size,
1015     int (*cmp)(const void *, const void *));
1016 const void * OBJ_bsearch_ex_(const void *key,const void *base,int num,
1017     int size,
1018     int (*cmp)(const void *, const void *),
1019     int flags);

1021 #define DECLARE_OBJ_BSEARCH_CMP_FN(scope, type1, type2, nm) \
1022     static int nm##_cmp_BSEARCH_CMP_FN(const void *, const void *); \
1023     static int nm##_cmp(type1 const *, type2 const *); \
1024     scope type2 * OBJ_bsearch_##nm(type1 *key, type2 const *base, int num)

1026 #define DECLARE_OBJ_BSEARCH_CMP_FN(type1, type2, cmp) \
1027     DECLARE_OBJ_BSEARCH_CMP_FN(static, type1, type2, cmp)
1028 #define DECLARE_OBJ_BSEARCH_GLOBAL_CMP_FN(type1, type2, nm) \
1029     type2 * OBJ_bsearch_##nm(type1 *key, type2 const *base, int num)

1031 /*
1032  * Unsolved problem: if a type is actually a pointer type, like
1033  * nid_triple is, then its impossible to get a const where you need
1034  * it. Consider:
1035  *
1036  * typedef int nid_triple[3];
1037  * const void *a;
1038  * const nid_triple const *a = a;
1039  *
1040  * The assignment discards a const because what you really want is:
1041  *
1042  * const int const * const *a = a;
1043  *
1044  * But if you do that, you lose the fact that a is an array of 3 ints,
1045  * which breaks comparison functions.
1046  *
1047  * Thus we end up having to cast, sadly, or unpack the
1048  * declarations. Or, as I finally did in this case, declare nid_triple
1049  * to be a struct, which it should have been in the first place.
1050  *
1051  * Ben, August 2008.

```

```

1052 *
1053 * Also, strictly speaking not all types need be const, but handling
1054 * the non-constness means a lot of complication, and in practice
1055 * comparison routines do always not touch their arguments.
1056 */

1058 #define IMPLEMENT_OBJ_BSEARCH_CMP_FN(type1, type2, nm) \
1059     static int nm##_cmp_BSEARCH_CMP_FN(const void *a_, const void *b_) \
1060     { \
1061         type1 const *a = a_; \
1062         type2 const *b = b_; \
1063         return nm##_cmp(a,b); \
1064     } \
1065     static type2 *OBJ_bsearch_##nm(type1 *key, type2 const *base, int num) \
1066     { \
1067         return (type2 *)OBJ_bsearch_(key, base, num, sizeof(type2), \
1068                                     nm##_cmp_BSEARCH_CMP_FN); \
1069     } \
1070     extern void dummy_prototype(void)

1072 #define IMPLEMENT_OBJ_BSEARCH_GLOBAL_CMP_FN(type1, type2, nm) \
1073     static int nm##_cmp_BSEARCH_CMP_FN(const void *a_, const void *b_) \
1074     { \
1075         type1 const *a = a_; \
1076         type2 const *b = b_; \
1077         return nm##_cmp(a,b); \
1078     } \
1079     type2 *OBJ_bsearch_##nm(type1 *key, type2 const *base, int num) \
1080     { \
1081         return (type2 *)OBJ_bsearch_(key, base, num, sizeof(type2), \
1082                                     nm##_cmp_BSEARCH_CMP_FN); \
1083     } \
1084     extern void dummy_prototype(void)

1086 #define OBJ_bsearch(type1,key,type2,base,num,cmp) \
1087     ((type2 *)OBJ_bsearch_(CHECKED_PTR_OF(type1,key),CHECKED_PTR_OF(type2,base), \
1088                             num,sizeof(type2), \
1089                             ((void)CHECKED_PTR_OF(type1,cmp##_type_1), \
1090                             (void)CHECKED_PTR_OF(type2,cmp##_type_2), \
1091                             cmp##_BSEARCH_CMP_FN)))

1093 #define OBJ_bsearch_ex(type1,key,type2,base,num,cmp,flags) \
1094     ((type2 *)OBJ_bsearch_ex_(CHECKED_PTR_OF(type1,key),CHECKED_PTR_OF(type2,base) \
1095                               num,sizeof(type2), \
1096                               ((void)CHECKED_PTR_OF(type1,cmp##_type_1), \
1097                               (void)type_2=CHECKED_PTR_OF(type2,cmp##_type_2), \
1098                               cmp##_BSEARCH_CMP_FN)),flags)

1100 int OBJ_new_nid(int num);
1101 int OBJ_add_object(const ASN1_OBJECT *obj);
1102 int OBJ_create(const char *oid,const char *sn,const char *ln);
1103 void OBJ_cleanup(void);
1104 int OBJ_create_objects(BIO *in);

1106 int OBJ_find_sigid_algs(int signid, int *pdig_nid, int *ppkey_nid);
1107 int OBJ_find_sigid_by_algs(int *psignid, int dig_nid, int pkey_nid);
1108 int OBJ_add_sigid(int signid, int dig_id, int pkey_id);
1109 void OBJ_sigid_free(void);

1111 extern int obj_cleanup_defer;
1112 void check_defer(int nid);

1114 /* BEGIN ERROR CODES */
1115 /* The following lines are auto generated by the script mkerr.pl. Any changes
1116 * made after this point may be overwritten when the script is next run.
1117 */

```

```

1118 void ERR_load_OBJ_strings(void);

1120 /* Error codes for the OBJ functions. */

1122 /* Function codes. */
1123 #define OBJ_F_OBJ_ADD_OBJECT 105
1124 #define OBJ_F_OBJ_CREATE 100
1125 #define OBJ_F_OBJ_DUP 101
1126 #define OBJ_F_OBJ_NAME_NEW_INDEX 106
1127 #define OBJ_F_OBJ_NID2LN 102
1128 #define OBJ_F_OBJ_NID2OBJ 103
1129 #define OBJ_F_OBJ_NID2SN 104

1131 /* Reason codes. */
1132 #define OBJ_R_MALLOC_FAILURE 100
1133 #define OBJ_R_UNKNOWN_NID 101

1135 #ifdef __cplusplus
1136 }
1137 #endif
1138 #endif

```

new/usr/src/lib/openssl/include/openssl/ocsp.h

1

```
*****
24041 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/ocsp.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ocsp.h */
2 /* Written by Tom Titchener <Tom.Titchener@groove.net> for the OpenSSL
3  * project. */

5 /* History:
6  * This file was transfered to Richard Levitte from CertCo by Kathy
7  * Weinhold in mid-spring 2000 to be included in OpenSSL or released
8  * as a patch kit. */

10 /* =====
11  * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
12  *
13  * Redistribution and use in source and binary forms, with or without
14  * modification, are permitted provided that the following conditions
15  * are met:
16  *
17  * 1. Redistributions of source code must retain the above copyright
18  * notice, this list of conditions and the following disclaimer.
19  *
20  * 2. Redistributions in binary form must reproduce the above copyright
21  * notice, this list of conditions and the following disclaimer in
22  * the documentation and/or other materials provided with the
23  * distribution.
24  *
25  * 3. All advertising materials mentioning features or use of this
26  * software must display the following acknowledgment:
27  * "This product includes software developed by the OpenSSL Project
28  * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
29  *
30  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
31  * endorse or promote products derived from this software without
32  * prior written permission. For written permission, please contact
33  * openssl-core@openssl.org.
34  *
35  * 5. Products derived from this software may not be called "OpenSSL"
36  * nor may "OpenSSL" appear in their names without prior written
37  * permission of the OpenSSL Project.
38  *
39  * 6. Redistributions of any form whatsoever must retain the following
40  * acknowledgment:
41  * "This product includes software developed by the OpenSSL Project
42  * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
43  *
44  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
45  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
46  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
47  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
48  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
49  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
50  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
51  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
52  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
53  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
54  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
55  * OF THE POSSIBILITY OF SUCH DAMAGE.
56  * =====
57  *
58  * This product includes cryptographic software written by Eric Young
59  * (eay@cryptsoft.com). This product includes software written by Tim
60  * Hudson (tjh@cryptsoft.com).
61  *
```

new/usr/src/lib/openssl/include/openssl/ocsp.h

2

```
62 */

64 #ifndef HEADER_OCSP_H
65 #define HEADER_OCSP_H

67 #include <openssl/ssl_typ.h>
68 #include <openssl/x509.h>
69 #include <openssl/x509v3.h>
70 #include <openssl/safestack.h>

72 #ifdef __cplusplus
73 extern "C" {
74 #endif

76 /* Various flags and values */

78 #define OCSP_DEFAULT_NONCE_LENGTH 16

80 #define OCSP_NOCERTS 0x1
81 #define OCSP_NOINTERN 0x2
82 #define OCSP_NOSIGS 0x4
83 #define OCSP_NOCHAIN 0x8
84 #define OCSP_NOVERIFY 0x10
85 #define OCSP_NOEXPLICIT 0x20
86 #define OCSP_NOCASIGN 0x40
87 #define OCSP_NODELEGATED 0x80
88 #define OCSP_NOCHECKS 0x100
89 #define OCSP_TRUSTOTHER 0x200
90 #define OCSP_RESPID_KEY 0x400
91 #define OCSP_NOTIME 0x800

93 /* CertID ::= SEQUENCE {
94  *     hashAlgorithm AlgorithmIdentifier,
95  *     issuerNameHash OCTET STRING, -- Hash of Issuer's DN
96  *     issuerKeyHash OCTET STRING, -- Hash of Issuers public key (excludi
97  *     serialNumber CertificateSerialNumber }
98  */
99 typedef struct ocsp_cert_id_st
100 {
101     X509_ALGOR *hashAlgorithm;
102     ASN1_OCTET_STRING *issuerNameHash;
103     ASN1_OCTET_STRING *issuerKeyHash;
104     ASN1_INTEGER *serialNumber;
105 } OCSP_CERTID;

107 DECLARE_STACK_OF(OCSP_CERTID)

109 /* Request ::= SEQUENCE {
110  *     reqCert CertID,
111  *     singleRequestExtensions [0] EXPLICIT Extensions OPTIONAL }
112  */
113 typedef struct ocsp_one_request_st
114 {
115     OCSP_CERTID *reqCert;
116     STACK_OF(X509_EXTENSION) *singleRequestExtensions;
117 } OCSP_ONEREQ;

119 DECLARE_STACK_OF(OCSP_ONEREQ)
120 DECLARE_ASN1_SET_OF(OCSP_ONEREQ)

123 /* TBSRequest ::= SEQUENCE {
124  *     version [0] EXPLICIT Version DEFAULT v1,
125  *     requestorName [1] EXPLICIT GeneralName OPTIONAL,
126  *     requestList SEQUENCE OF Request,
127  *     requestExtensions [2] EXPLICIT Extensions OPTIONAL }
128  */
```

```

128 */
129 typedef struct ocsp_req_info_st
130 {
131     ASN1_INTEGER *version;
132     GENERAL_NAME *requestorName;
133     STACK_OF(OCSP_ONEREQ) *requestList;
134     STACK_OF(X509_EXTENSION) *requestExtensions;
135 } OCSP_REQINFO;

137 /* Signature ::= SEQUENCE {
138 *     signatureAlgorithm AlgorithmIdentifier,
139 *     signature BIT STRING,
140 *     certs [0] EXPLICIT SEQUENCE OF Certificate OPTIONAL }
141 */
142 typedef struct ocsp_signature_st
143 {
144     X509_ALGOR *signatureAlgorithm;
145     ASN1_BIT_STRING *signature;
146     STACK_OF(X509) *certs;
147 } OCSP_SIGNATURE;

149 /* OCSPRequest ::= SEQUENCE {
150 *     tbsRequest TBSRequest,
151 *     optionalSignature [0] EXPLICIT Signature OPTIONAL }
152 */
153 typedef struct ocsp_request_st
154 {
155     OCSP_REQINFO *tbsRequest;
156     OCSP_SIGNATURE *optionalSignature; /* OPTIONAL */
157 } OCSP_REQUEST;

159 /* OCSPResponseStatus ::= ENUMERATED {
160 *     successful (0), --Response has valid confirmations
161 *     malformedRequest (1), --Illegal confirmation request
162 *     internalError (2), --Internal error in issuer
163 *     tryLater (3), --Try again later
164 *     --(4) is not used
165 *     sigRequired (5), --Must sign the request
166 *     unauthorized (6) --Request unauthorized
167 * }
168 */
169 #define OCSP_RESPONSE_STATUS_SUCCESSFUL 0
170 #define OCSP_RESPONSE_STATUS_MALFORMEDREQUEST 1
171 #define OCSP_RESPONSE_STATUS_INTERNALERROR 2
172 #define OCSP_RESPONSE_STATUS_TRYLATER 3
173 #define OCSP_RESPONSE_STATUS_SIGREQUIRED 5
174 #define OCSP_RESPONSE_STATUS_UNAUTHORIZED 6

176 /* ResponseBytes ::= SEQUENCE {
177 *     responseType OBJECT IDENTIFIER,
178 *     response OCTET STRING }
179 */
180 typedef struct ocsp_resp_bytes_st
181 {
182     ASN1_OBJECT *responseType;
183     ASN1_OCTET_STRING *response;
184 } OCSP_RESPBYTES;

186 /* OCSPResponse ::= SEQUENCE {
187 *     responseStatus OCSPResponseStatus,
188 *     responseBytes [0] EXPLICIT ResponseBytes OPTIONAL }
189 */
190 struct ocsp_response_st
191 {
192     ASN1_ENUMERATED *responseStatus;
193     OCSP_RESPBYTES *responseBytes;

```

```

194     };

196 /* ResponderID ::= CHOICE {
197 *     byName [1] Name,
198 *     byKey [2] KeyHash }
199 */
200 #define V_OCSP_RESPID_NAME 0
201 #define V_OCSP_RESPID_KEY 1
202 struct ocsp_responder_id_st
203 {
204     int type;
205     union {
206         X509_NAME *byName;
207         ASN1_OCTET_STRING *byKey;
208     } value;
209 };

211 DECLARE_STACK_OF(OCSP_RESPID)
212 DECLARE_ASN1_FUNCTIONS(OCSP_RESPID)

214 /* KeyHash ::= OCTET STRING --SHA-1 hash of responder's public key
215 * --(excluding the tag and length fields)
216 */

218 /* RevokedInfo ::= SEQUENCE {
219 *     revocationTime GeneralizedTime,
220 *     revocationReason [0] EXPLICIT CRLReason OPTIONAL }
221 */
222 typedef struct ocsp_revoked_info_st
223 {
224     ASN1_GENERALIZEDTIME *revocationTime;
225     ASN1_ENUMERATED *revocationReason;
226 } OCSP_REVOKEDINFO;

228 /* CertStatus ::= CHOICE {
229 *     good [0] IMPLICIT NULL,
230 *     revoked [1] IMPLICIT RevokedInfo,
231 *     unknown [2] IMPLICIT UnknownInfo }
232 */
233 #define V_OCSP_CERTSTATUS_GOOD 0
234 #define V_OCSP_CERTSTATUS_REVOKED 1
235 #define V_OCSP_CERTSTATUS_UNKNOWN 2
236 typedef struct ocsp_cert_status_st
237 {
238     int type;
239     union {
240         ASN1_NULL *good;
241         OCSP_REVOKEDINFO *revoked;
242         ASN1_NULL *unknown;
243     } value;
244 } OCSP_CERTSTATUS;

246 /* SingleResponse ::= SEQUENCE {
247 *     certID CertID,
248 *     certStatus CertStatus,
249 *     thisUpdate GeneralizedTime,
250 *     nextUpdate [0] EXPLICIT GeneralizedTime OPTIONAL,
251 *     singleExtensions [1] EXPLICIT Extensions OPTIONAL }
252 */
253 typedef struct ocsp_single_response_st
254 {
255     OCSP_CERTID *certId;
256     OCSP_CERTSTATUS *certStatus;
257     ASN1_GENERALIZEDTIME *thisUpdate;
258     ASN1_GENERALIZEDTIME *nextUpdate;
259     STACK_OF(X509_EXTENSION) *singleExtensions;

```

```

260     } OCSP_SINGLERESP;

262 DECLARE_STACK_OF(OCSP_SINGLERESP)
263 DECLARE_ASN1_SET_OF(OCSP_SINGLERESP)

265 /* ResponseData ::= SEQUENCE {
266  *     version                [0] EXPLICIT Version DEFAULT v1,
267  *     responderID            ResponderID,
268  *     producedAt              GeneralizedTime,
269  *     responses               SEQUENCE OF SingleResponse,
270  *     responseExtensions     [1] EXPLICIT Extensions OPTIONAL }
271 */
272 typedef struct ocsp_response_data_st
273 {
274     ASN1_INTEGER *version;
275     OCSP_RESPID *responderId;
276     ASN1_GENERALIZEDTIME *producedAt;
277     STACK_OF(OCSP_SINGLERESP) *responses;
278     STACK_OF(X509_EXTENSION) *responseExtensions;
279 } OCSP_RESPDATA;

281 /* BasicOCSPResponse ::= SEQUENCE {
282  *     tbsResponseData         ResponseData,
283  *     signatureAlgorithm      AlgorithmIdentifier,
284  *     signature                BIT STRING,
285  *     certs                   [0] EXPLICIT SEQUENCE OF Certificate OPTIONAL }
286 */
287 /* Note 1:
288  The value for "signature" is specified in the OCSP rfc2560 as follows:
289  "The value for the signature SHALL be computed on the hash of the DER
290  encoding ResponseData." This means that you must hash the DER-encoded
291  tbsResponseData, and then run it through a crypto-signing function, which
292  will (at least w/RSA) do a hash-'n'-private-encrypt operation. This seems
293  a bit odd, but that's the spec. Also note that the data structures do not
294  leave anywhere to independently specify the algorithm used for the initial
295  hash. So, we look at the signature-specification algorithm, and try to do
296  something intelligent. -- Kathy Weinhold, CertCo */
297 /* Note 2:
298  It seems that the mentioned passage from RFC 2560 (section 4.2.1) is open
299  for interpretation. I've done tests against another responder, and found
300  that it doesn't do the double hashing that the RFC seems to say one
301  should. Therefore, all relevant functions take a flag saying which
302  variant should be used. -- Richard Levitte, OpenSSL team and CeloCom */
303 typedef struct ocsp_basic_response_st
304 {
305     OCSP_RESPDATA *tbsResponseData;
306     X509_ALGOR *signatureAlgorithm;
307     ASN1_BIT_STRING *signature;
308     STACK_OF(X509) *certs;
309 } OCSP_BASICRESP;

311 /*
312  * CRLReason ::= ENUMERATED {
313  *     unspecified                (0),
314  *     keyCompromise              (1),
315  *     cACompromise               (2),
316  *     affiliationChanged         (3),
317  *     superseded                 (4),
318  *     cessationOfOperation       (5),
319  *     certificateHold            (6),
320  *     removeFromCRL             (8) }
321 */
322 #define OCSP_REVOKED_STATUS_NOSTATUS -1
323 #define OCSP_REVOKED_STATUS_UNSPECIFIED 0
324 #define OCSP_REVOKED_STATUS_KEYCOMPROMISE 1
325 #define OCSP_REVOKED_STATUS_CACOMPROMISE 2

```

```

326 #define OCSP_REVOKED_STATUS_AFFILIATIONCHANGED 3
327 #define OCSP_REVOKED_STATUS_SUPERSEDED 4
328 #define OCSP_REVOKED_STATUS_CESSATIONOFOperation 5
329 #define OCSP_REVOKED_STATUS_CERTIFICATEHOLD 6
330 #define OCSP_REVOKED_STATUS_REMOVEFROMCRL 8

332 /* CrlID ::= SEQUENCE {
333  *     crlUrl                [0] EXPLICIT IA5String OPTIONAL,
334  *     crlNum                [1] EXPLICIT INTEGER OPTIONAL,
335  *     crlTime               [2] EXPLICIT GeneralizedTime OPTIONAL }
336 */
337 typedef struct ocsp_crl_id_st
338 {
339     ASN1_IA5STRING *crlUrl;
340     ASN1_INTEGER *crlNum;
341     ASN1_GENERALIZEDTIME *crlTime;
342 } OCSP_CRLID;

344 /* ServiceLocator ::= SEQUENCE {
345  *     issuer                Name,
346  *     locator               AuthorityInfoAccessSyntax OPTIONAL }
347 */
348 typedef struct ocsp_service_locator_st
349 {
350     X509_NAME* issuer;
351     STACK_OF(ACCESS_DESCRIPTION) *locator;
352 } OCSP_SERVICELOC;

354 #define PEM_STRING_OCSP_REQUEST "OCSP REQUEST"
355 #define PEM_STRING_OCSP_RESPONSE "OCSP RESPONSE"

357 #define d2i_OCSP_REQUEST_bio(bp,p) ASN1_d2i_bio_of(OCSP_REQUEST,OCSP_REQUEST_new

359 #define d2i_OCSP_RESPONSE_bio(bp,p) ASN1_d2i_bio_of(OCSP_RESPONSE,OCSP_RESPONSE_

361 #define PEM_read_bio_OCSP_REQUEST(bp,x,cb) (OCSP_REQUEST *)PEM_ASN1_read_bio(\
362     (char *(*))d2i_OCSP_REQUEST,PEM_STRING_OCSP_REQUEST,bp,(char **)x,cb,NULL

364 #define PEM_read_bio_OCSP_RESPONSE(bp,x,cb)(OCSP_RESPONSE *)PEM_ASN1_read_bio(\
365     (char *(*))d2i_OCSP_RESPONSE,PEM_STRING_OCSP_RESPONSE,bp,(char **)x,cb,NU

367 #define PEM_write_bio_OCSP_REQUEST(bp,o) \
368     PEM_ASN1_write_bio((int (*)(*))i2d_OCSP_REQUEST,PEM_STRING_OCSP_REQUEST,\
369     bp,(char *)o, NULL,NULL,0,NULL,NULL)

371 #define PEM_write_bio_OCSP_RESPONSE(bp,o) \
372     PEM_ASN1_write_bio((int (*)(*))i2d_OCSP_RESPONSE,PEM_STRING_OCSP_RESPONSE,\
373     bp,(char *)o, NULL,NULL,0,NULL,NULL)

375 #define i2d_OCSP_RESPONSE_bio(bp,o) ASN1_i2d_bio_of(OCSP_RESPONSE,i2d_OCSP_RESPO

377 #define i2d_OCSP_REQUEST_bio(bp,o) ASN1_i2d_bio_of(OCSP_REQUEST,i2d_OCSP_REQUEST

379 #define OCSP_REQUEST_sign(o,pkey,md) \
380     ASN1_item_sign(ASN1_ITEM_rptr(OCSP_REQINFO),\
381     o->optionalSignature->signatureAlgorithm,NULL,\
382     o->optionalSignature->signature,o->tbsRequest,pkey,md)

384 #define OCSP_BASICRESP_sign(o,pkey,md,d) \
385     ASN1_item_sign(ASN1_ITEM_rptr(OCSP_RESPDATA),o->signatureAlgorithm,NULL,\
386     o->signature,o->tbsResponseData,pkey,md)

388 #define OCSP_REQUEST_verify(a,r) ASN1_item_verify(ASN1_ITEM_rptr(OCSP_REQINFO),\
389     a->optionalSignature->signatureAlgorithm,\
390     a->optionalSignature->signature,a->tbsRequest,r)

```

```

392 #define OCSP_BASICRESP_verify(a,r,d) ASN1_item_verify(ASN1_ITEM_rptr(OCSP_RESPDATA
393 a->signatureAlgorithm,a->signature,a->tbsResponseData,r)

395 #define ASN1_BIT_STRING_digest(data,type,md,len) \
396     ASN1_item_digest(ASN1_ITEM_rptr(ASN1_BIT_STRING),type,data,md,len)

398 #define OCSP_CERTSTATUS_dup(cs)\
399     (OCSP_CERTSTATUS*)ASN1_dup((int(*)())i2d_OCSP_CERTSTATUS,\
400     (char *(*))d2i_OCSP_CERTSTATUS,(char *) (cs))

402 OCSP_CERTID *OCSP_CERTID_dup(OCSP_CERTID *id);

404 OCSP_RESPONSE *OCSP_sendreq_bio(BIO *b, char *path, OCSP_REQUEST *req);
405 OCSP_REQ_CTX *OCSP_sendreq_new(BIO *io, char *path, OCSP_REQUEST *req,
406                                 int maxline);
407 int OCSP_sendreq_nbio(OCSP_RESPONSE **presp, OCSP_REQ_CTX *rctx);
408 void OCSP_REQ_CTX_free(OCSP_REQ_CTX *rctx);
409 int OCSP_REQ_CTX_set1_req(OCSP_REQ_CTX *rctx, OCSP_REQUEST *req);
410 int OCSP_REQ_CTX_add1_header(OCSP_REQ_CTX *rctx,
411                             const char *name, const char *value);

413 OCSP_CERTID *OCSP_cert_to_id(const EVP_MD *dgst, X509 *subject, X509 *issuer);

415 OCSP_CERTID *OCSP_cert_id_new(const EVP_MD *dgst,
416                               X509_NAME *issuerName,
417                               ASN1_BIT_STRING *issuerKey,
418                               ASN1_INTEGER *serialNumber);

420 OCSP_ONEREQ *OCSP_request_add0_id(OCSP_REQUEST *req, OCSP_CERTID *cid);

422 int OCSP_request_add1_nonce(OCSP_REQUEST *req, unsigned char *val, int len);
423 int OCSP_basic_add1_nonce(OCSP_BASICRESP *resp, unsigned char *val, int len);
424 int OCSP_check_nonce(OCSP_REQUEST *req, OCSP_BASICRESP *bs);
425 int OCSP_copy_nonce(OCSP_BASICRESP *resp, OCSP_REQUEST *req);

427 int OCSP_request_set1_name(OCSP_REQUEST *req, X509_NAME *nm);
428 int OCSP_request_add1_cert(OCSP_REQUEST *req, X509 *cert);

430 int OCSP_request_sign(OCSP_REQUEST *req,
431                       X509 *signer,
432                       EVP_PKEY *key,
433                       const EVP_MD *dgst,
434                       STACK_OF(X509) *certs,
435                       unsigned long flags);

437 int OCSP_response_status(OCSP_RESPONSE *resp);
438 OCSP_BASICRESP *OCSP_response_get1_basic(OCSP_RESPONSE *resp);

440 int OCSP_resp_count(OCSP_BASICRESP *bs);
441 OCSP_SINGLERESP *OCSP_resp_get0(OCSP_BASICRESP *bs, int idx);
442 int OCSP_resp_find(OCSP_BASICRESP *bs, OCSP_CERTID *id, int last);
443 int OCSP_single_get0_status(OCSP_SINGLERESP *single, int *reason,
444                             ASN1_GENERALIZEDTIME **revtime,
445                             ASN1_GENERALIZEDTIME **thisupd,
446                             ASN1_GENERALIZEDTIME **nextupd);
447 int OCSP_resp_find_status(OCSP_BASICRESP *bs, OCSP_CERTID *id, int *status,
448                             int *reason,
449                             ASN1_GENERALIZEDTIME **revtime,
450                             ASN1_GENERALIZEDTIME **thisupd,
451                             ASN1_GENERALIZEDTIME **nextupd);
452 int OCSP_check_validity(ASN1_GENERALIZEDTIME *thisupd,
453                         ASN1_GENERALIZEDTIME *nextupd,
454                         long sec, long maxsec);

456 int OCSP_request_verify(OCSP_REQUEST *req, STACK_OF(X509) *certs, X509_STORE *st

```

```

458 int OCSP_parse_url(char *url, char **phost, char **pport, char **ppath, int *pss

460 int OCSP_id_issuer_cmp(OCSP_CERTID *a, OCSP_CERTID *b);
461 int OCSP_id_cmp(OCSP_CERTID *a, OCSP_CERTID *b);

463 int OCSP_request_onereq_count(OCSP_REQUEST *req);
464 OCSP_ONEREQ *OCSP_request_onereq_get0(OCSP_REQUEST *req, int i);
465 OCSP_CERTID *OCSP_onereq_get0_id(OCSP_ONEREQ *one);
466 int OCSP_id_get0_info(ASN1_OCTET_STRING **piNameHash, ASN1_OBJECT **pmd,
467                      ASN1_OCTET_STRING **pikeyHash,
468                      ASN1_INTEGER **pserial, OCSP_CERTID *cid);
469 int OCSP_request_is_signed(OCSP_REQUEST *req);
470 OCSP_RESPONSE *OCSP_response_create(int status, OCSP_BASICRESP *bs);
471 OCSP_SINGLERESP *OCSP_basic_add1_status(OCSP_BASICRESP *rsp,
472                                         OCSP_CERTID *cid,
473                                         int status, int reason,
474                                         ASN1_TIME *revtime,
475                                         ASN1_TIME *thisupd, ASN1_TIME *nextupd);
476 int OCSP_basic_add1_cert(OCSP_BASICRESP *rsp, X509 *cert);
477 int OCSP_basic_sign(OCSP_BASICRESP *brsp,
478                    X509 *signer, EVP_PKEY *key, const EVP_MD *dgst,
479                    STACK_OF(X509) *certs, unsigned long flags);

481 X509_EXTENSION *OCSP_crlID_new(char *url, long *n, char *tim);

483 X509_EXTENSION *OCSP_accept_responses_new(char **oids);

485 X509_EXTENSION *OCSP_archive_cutoff_new(char *tim);

487 X509_EXTENSION *OCSP_url_svcloc_new(X509_NAME *issuer, char **urls);

489 int OCSP_REQUEST_get_ext_count(OCSP_REQUEST *x);
490 int OCSP_REQUEST_get_ext_by_NID(OCSP_REQUEST *x, int nid, int lastpos);
491 int OCSP_REQUEST_get_ext_by_OBJ(OCSP_REQUEST *x, ASN1_OBJECT *obj, int lastpos);
492 int OCSP_REQUEST_get_ext_by_critical(OCSP_REQUEST *x, int crit, int lastpos);
493 X509_EXTENSION *OCSP_REQUEST_get_ext(OCSP_REQUEST *x, int loc);
494 X509_EXTENSION *OCSP_REQUEST_delete_ext(OCSP_REQUEST *x, int loc);
495 void *OCSP_REQUEST_get1_ext_d2i(OCSP_REQUEST *x, int nid, int *crit, int *idx);
496 int OCSP_REQUEST_add1_ext_i2d(OCSP_REQUEST *x, int nid, void *value, int crit,
497                               unsigned long flags);
498 int OCSP_REQUEST_add_ext(OCSP_REQUEST *x, X509_EXTENSION *ex, int loc);

500 int OCSP_ONEREQ_get_ext_count(OCSP_ONEREQ *x);
501 int OCSP_ONEREQ_get_ext_by_NID(OCSP_ONEREQ *x, int nid, int lastpos);
502 int OCSP_ONEREQ_get_ext_by_OBJ(OCSP_ONEREQ *x, ASN1_OBJECT *obj, int lastpos);
503 int OCSP_ONEREQ_get_ext_by_critical(OCSP_ONEREQ *x, int crit, int lastpos);
504 X509_EXTENSION *OCSP_ONEREQ_get_ext(OCSP_ONEREQ *x, int loc);
505 X509_EXTENSION *OCSP_ONEREQ_delete_ext(OCSP_ONEREQ *x, int loc);
506 void *OCSP_ONEREQ_get1_ext_d2i(OCSP_ONEREQ *x, int nid, int *crit, int *idx);
507 int OCSP_ONEREQ_add1_ext_i2d(OCSP_ONEREQ *x, int nid, void *value, int crit,
508                               unsigned long flags);
509 int OCSP_ONEREQ_add_ext(OCSP_ONEREQ *x, X509_EXTENSION *ex, int loc);

511 int OCSP_BASICRESP_get_ext_count(OCSP_BASICRESP *x);
512 int OCSP_BASICRESP_get_ext_by_NID(OCSP_BASICRESP *x, int nid, int lastpos);
513 int OCSP_BASICRESP_get_ext_by_OBJ(OCSP_BASICRESP *x, ASN1_OBJECT *obj, int lastpos)
514 int OCSP_BASICRESP_get_ext_by_critical(OCSP_BASICRESP *x, int crit, int lastpos)
515 X509_EXTENSION *OCSP_BASICRESP_get_ext(OCSP_BASICRESP *x, int loc);
516 X509_EXTENSION *OCSP_BASICRESP_delete_ext(OCSP_BASICRESP *x, int loc);
517 void *OCSP_BASICRESP_get1_ext_d2i(OCSP_BASICRESP *x, int nid, int *crit, int *idx)
518 int OCSP_BASICRESP_add1_ext_i2d(OCSP_BASICRESP *x, int nid, void *value, int crit,
519                               unsigned long flags);
520 int OCSP_BASICRESP_add_ext(OCSP_BASICRESP *x, X509_EXTENSION *ex, int loc);

522 int OCSP_SINGLERESP_get_ext_count(OCSP_SINGLERESP *x);
523 int OCSP_SINGLERESP_get_ext_by_NID(OCSP_SINGLERESP *x, int nid, int lastpos);

```

```

524 int OCSP_SINGLERESP_get_ext_by_OBJ(OCSP_SINGLERESP *x, ASN1_OBJECT *obj, int las
525 int OCSP_SINGLERESP_get_ext_by_critical(OCSP_SINGLERESP *x, int crit, int lastpo
526 X509_EXTENSION *OCSP_SINGLERESP_get_ext(OCSP_SINGLERESP *x, int loc);
527 X509_EXTENSION *OCSP_SINGLERESP_delete_ext(OCSP_SINGLERESP *x, int loc);
528 void *OCSP_SINGLERESP_get1_ext_d2i(OCSP_SINGLERESP *x, int nid, int *crit, int *
529 int OCSP_SINGLERESP_add1_ext_i2d(OCSP_SINGLERESP *x, int nid, void *value, int c
530                                     unsigned long flags);
531 int OCSP_SINGLERESP_add_ext(OCSP_SINGLERESP *x, X509_EXTENSION *ex, int loc);

533 DECLARE_ASN1_FUNCTIONS(OCSP_SINGLERESP)
534 DECLARE_ASN1_FUNCTIONS(OCSP_CERTSTATUS)
535 DECLARE_ASN1_FUNCTIONS(OCSP_REVOKEDINFO)
536 DECLARE_ASN1_FUNCTIONS(OCSP_BASICRESP)
537 DECLARE_ASN1_FUNCTIONS(OCSP_RESPDATA)
538 DECLARE_ASN1_FUNCTIONS(OCSP_RESPID)
539 DECLARE_ASN1_FUNCTIONS(OCSP_RESPONSE)
540 DECLARE_ASN1_FUNCTIONS(OCSP_RESPBYTES)
541 DECLARE_ASN1_FUNCTIONS(OCSP_ONEREQ)
542 DECLARE_ASN1_FUNCTIONS(OCSP_CERTID)
543 DECLARE_ASN1_FUNCTIONS(OCSP_REQUEST)
544 DECLARE_ASN1_FUNCTIONS(OCSP_SIGNATURE)
545 DECLARE_ASN1_FUNCTIONS(OCSP_REQINFO)
546 DECLARE_ASN1_FUNCTIONS(OCSP_CRLID)
547 DECLARE_ASN1_FUNCTIONS(OCSP_SERVICELOC)

549 const char *OCSP_response_status_str(long s);
550 const char *OCSP_cert_status_str(long s);
551 const char *OCSP_crl_reason_str(long s);

553 int OCSP_REQUEST_print(BIO *bp, OCSP_REQUEST *a, unsigned long flags);
554 int OCSP_RESPONSE_print(BIO *bp, OCSP_RESPONSE *o, unsigned long flags);

556 int OCSP_basic_verify(OCSP_BASICRESP *bs, STACK_OF(X509) *certs,
557                      X509_STORE *st, unsigned long flags);

559 /* BEGIN ERROR CODES */
560 /* The following lines are auto generated by the script mkerr.pl. Any changes
561  * made after this point may be overwritten when the script is next run.
562  */
563 void ERR_load_OCSP_strings(void);

565 /* Error codes for the OCSP functions. */

567 /* Function codes. */
568 #define OCSP_F_ASN1_STRING_ENCODE 100
569 #define OCSP_F_D2I_OCSP_NONCE 102
570 #define OCSP_F_OCSP_BASIC_ADD1_STATUS 103
571 #define OCSP_F_OCSP_BASIC_SIGN 104
572 #define OCSP_F_OCSP_BASIC_VERIFY 105
573 #define OCSP_F_OCSP_CERT_ID_NEW 101
574 #define OCSP_F_OCSP_CHECK_DELEGATED 106
575 #define OCSP_F_OCSP_CHECK_IDS 107
576 #define OCSP_F_OCSP_CHECK_ISSUER 108
577 #define OCSP_F_OCSP_CHECK_VALIDITY 115
578 #define OCSP_F_OCSP_MATCH_ISSUERID 109
579 #define OCSP_F_OCSP_PARSE_URL 114
580 #define OCSP_F_OCSP_REQUEST_SIGN 110
581 #define OCSP_F_OCSP_REQUEST_VERIFY 116
582 #define OCSP_F_OCSP_RESPONSE_GET1_BASIC 111
583 #define OCSP_F_OCSP_SENDREQ_BIO 112
584 #define OCSP_F_OCSP_SENDREQ_NBIO 117
585 #define OCSP_F_PARSE_HTTP_LINE1 118
586 #define OCSP_F_REQUEST_VERIFY 113

588 /* Reason codes. */
589 #define OCSP_R_BAD_DATA 100

```

```

590 #define OCSP_R_CERTIFICATE_VERIFY_ERROR 101
591 #define OCSP_R_DIGEST_ERR 102
592 #define OCSP_R_ERROR_IN_NEXTUPDATE_FIELD 122
593 #define OCSP_R_ERROR_IN_THISUPDATE_FIELD 123
594 #define OCSP_R_ERROR_PARSING_URL 121
595 #define OCSP_R_MISSING_OCSPSIGNING_USAGE 103
596 #define OCSP_R_NEXTUPDATE_BEFORE_THISUPDATE 124
597 #define OCSP_R_NOT_BASIC_RESPONSE 104
598 #define OCSP_R_NO_CERTIFICATES_IN_CHAIN 105
599 #define OCSP_R_NO_CONTENT 106
600 #define OCSP_R_NO_PUBLIC_KEY 107
601 #define OCSP_R_NO_RESPONSE_DATA 108
602 #define OCSP_R_NO_REVOKED_TIME 109
603 #define OCSP_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE 110
604 #define OCSP_R_REQUEST_NOT_SIGNED 128
605 #define OCSP_R_RESPONSE_CONTAINS_NO_REVOCATION_DATA 111
606 #define OCSP_R_ROOT_CA_NOT_TRUSTED 112
607 #define OCSP_R_SERVER_READ_ERROR 113
608 #define OCSP_R_SERVER_RESPONSE_ERROR 114
609 #define OCSP_R_SERVER_RESPONSE_PARSE_ERROR 115
610 #define OCSP_R_SERVER_WRITE_ERROR 116
611 #define OCSP_R_SIGNATURE_FAILURE 117
612 #define OCSP_R_SIGNER_CERTIFICATE_NOT_FOUND 118
613 #define OCSP_R_STATUS_EXPIRED 125
614 #define OCSP_R_STATUS_NOT_YET_VALID 126
615 #define OCSP_R_STATUS_TOO_OLD 127
616 #define OCSP_R_UNKNOWN_MESSAGE_DIGEST 119
617 #define OCSP_R_UNKNOWN_NID 120
618 #define OCSP_R_UNSUPPORTED_REQUESTORNAME_TYPE 129

620 #ifdef __cplusplus
621 }
622 #endif
623 #endif

```

new/usr/src/lib/openssl/include/openssl/opensslconf.h

1

```
*****
9889 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/opensslconf.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* opensslconf.h */
2 /* WARNING: Generated automatically from opensslconf.h.in by Configure. */

4 /* OpenSSL was configured with the following options: */
5 #ifndef OPENSSL_DOING_MAKEDEPEND

8 #ifndef OPENSSL_NO_EC
9 # define OPENSSL_NO_EC
10 #endif
11 #ifndef OPENSSL_NO_EC_NISTP_64_GCC_128
12 # define OPENSSL_NO_EC_NISTP_64_GCC_128
13 #endif
14 #ifndef OPENSSL_NO_ECDH
15 # define OPENSSL_NO_ECDH
16 #endif
17 #ifndef OPENSSL_NO_ECDSA
18 # define OPENSSL_NO_ECDSA
19 #endif
20 #ifndef OPENSSL_NO_GMP
21 # define OPENSSL_NO_GMP
22 #endif
23 #ifndef OPENSSL_NO_GOST
24 # define OPENSSL_NO_GOST
25 #endif
26 #ifndef OPENSSL_NO_HW_4758_CCA
27 # define OPENSSL_NO_HW_4758_CCA
28 #endif
29 #ifndef OPENSSL_NO_HW_AEP
30 # define OPENSSL_NO_HW_AEP
31 #endif
32 #ifndef OPENSSL_NO_HW_ATALLA
33 # define OPENSSL_NO_HW_ATALLA
34 #endif
35 #ifndef OPENSSL_NO_HW_CHIL
36 # define OPENSSL_NO_HW_CHIL
37 #endif
38 #ifndef OPENSSL_NO_HW_CSWIFT
39 # define OPENSSL_NO_HW_CSWIFT
40 #endif
41 #ifndef OPENSSL_NO_HW_GMP
42 # define OPENSSL_NO_HW_GMP
43 #endif
44 #ifndef OPENSSL_NO_HW_NCIPHER
45 # define OPENSSL_NO_HW_NCIPHER
46 #endif
47 #ifndef OPENSSL_NO_HW_NURON
48 # define OPENSSL_NO_HW_NURON
49 #endif
50 #ifndef OPENSSL_NO_HW_PADLOCK
51 # define OPENSSL_NO_HW_PADLOCK
52 #endif
53 #ifndef OPENSSL_NO_HW_SUREWARE
54 # define OPENSSL_NO_HW_SUREWARE
55 #endif
56 #ifndef OPENSSL_NO_HW_UBSEC
57 # define OPENSSL_NO_HW_UBSEC
58 #endif
59 #ifndef OPENSSL_NO_IDEA
60 # define OPENSSL_NO_IDEA
61 #endif
```

new/usr/src/lib/openssl/include/openssl/opensslconf.h

2

```
62 #ifndef OPENSSL_NO_JPAKE
63 # define OPENSSL_NO_JPAKE
64 #endif
65 #ifndef OPENSSL_NO_KRB5
66 # define OPENSSL_NO_KRB5
67 #endif
68 #ifndef OPENSSL_NO_MDC2
69 # define OPENSSL_NO_MDC2
70 #endif
71 #ifndef OPENSSL_NO_RC3
72 # define OPENSSL_NO_RC3
73 #endif
74 #ifndef OPENSSL_NO_RC5
75 # define OPENSSL_NO_RC5
76 #endif
77 #ifndef OPENSSL_NO_RFC3779
78 # define OPENSSL_NO_RFC3779
79 #endif
80 #ifndef OPENSSL_NO_SCTP
81 # define OPENSSL_NO_SCTP
82 #endif
83 #ifndef OPENSSL_NO_SEED
84 # define OPENSSL_NO_SEED
85 #endif
86 #ifndef OPENSSL_NO_STORE
87 # define OPENSSL_NO_STORE
88 #endif
89 #ifndef OPENSSL_NO_WHIRLPOOL
90 # define OPENSSL_NO_WHIRLPOOL
91 #endif
92 #ifndef OPENSSL_NO_WHIRLPOOL
93 # define OPENSSL_NO_WHIRLPOOL
94 #endif

96 #endif /* OPENSSL_DOING_MAKEDEPEND */

98 #ifndef OPENSSL_THREADS
99 # define OPENSSL_THREADS
100 #endif
101 #ifndef OPENSSL_NO_STATIC_ENGINE
102 # define OPENSSL_NO_STATIC_ENGINE
103 #endif

105 /* The OPENSSL_NO_* macros are also defined as NO_* if the application
106  asks for it. This is a transient feature that is provided for those
107  who haven't had the time to do the appropriate changes in their
108  applications. */
109 #ifdef OPENSSL_ALGORITHM_DEFINES
110 # if defined(OPENSSL_NO_EC) && !defined(NO_EC)
111 #  define NO_EC
112 # endif
113 # if defined(OPENSSL_NO_EC_NISTP_64_GCC_128) && !defined(NO_EC_NISTP_64_GCC_128)
114 #  define NO_EC_NISTP_64_GCC_128
115 # endif
116 # if defined(OPENSSL_NO_ECDH) && !defined(NO_ECDH)
117 #  define NO_ECDH
118 # endif
119 # if defined(OPENSSL_NO_ECDSA) && !defined(NO_ECDSA)
120 #  define NO_ECDSA
121 # endif
122 # if defined(OPENSSL_NO_GMP) && !defined(NO_GMP)
123 #  define NO_GMP
124 # endif
125 # if defined(OPENSSL_NO_GOST) && !defined(NO_GOST)
126 #  define NO_GOST
127 # endif
```


new/usr/src/lib/openssl/include/openssl/opensslconf.h

3

```
128 # if defined(OPENSSL_NO_HW_4758_CCA) && !defined(NO_HW_4758_CCA)
129 #   define NO_HW_4758_CCA
130 # endif
131 # if defined(OPENSSL_NO_HW_AEP) && !defined(NO_HW_AEP)
132 #   define NO_HW_AEP
133 # endif
134 # if defined(OPENSSL_NO_HW_ATALLA) && !defined(NO_HW_ATALLA)
135 #   define NO_HW_ATALLA
136 # endif
137 # if defined(OPENSSL_NO_HW_CHIL) && !defined(NO_HW_CHIL)
138 #   define NO_HW_CHIL
139 # endif
140 # if defined(OPENSSL_NO_HW_CSWIFT) && !defined(NO_HW_CSWIFT)
141 #   define NO_HW_CSWIFT
142 # endif
143 # if defined(OPENSSL_NO_HW_GMP) && !defined(NO_HW_GMP)
144 #   define NO_HW_GMP
145 # endif
146 # if defined(OPENSSL_NO_HW_NCIPHER) && !defined(NO_HW_NCIPHER)
147 #   define NO_HW_NCIPHER
148 # endif
149 # if defined(OPENSSL_NO_HW_NURON) && !defined(NO_HW_NURON)
150 #   define NO_HW_NURON
151 # endif
152 # if defined(OPENSSL_NO_HW_PADLOCK) && !defined(NO_HW_PADLOCK)
153 #   define NO_HW_PADLOCK
154 # endif
155 # if defined(OPENSSL_NO_HW_SUREWARE) && !defined(NO_HW_SUREWARE)
156 #   define NO_HW_SUREWARE
157 # endif
158 # if defined(OPENSSL_NO_HW_UBSEC) && !defined(NO_HW_UBSEC)
159 #   define NO_HW_UBSEC
160 # endif
161 # if defined(OPENSSL_NO_IDEA) && !defined(NO_IDEA)
162 #   define NO_IDEA
163 # endif
164 # if defined(OPENSSL_NO_JPAKE) && !defined(NO_JPAKE)
165 #   define NO_JPAKE
166 # endif
167 # if defined(OPENSSL_NO_KRB5) && !defined(NO_KRB5)
168 #   define NO_KRB5
169 # endif
170 # if defined(OPENSSL_NO_MDC2) && !defined(NO_MDC2)
171 #   define NO_MDC2
172 # endif
173 # if defined(OPENSSL_NO_RC3) && !defined(NO_RC3)
174 #   define NO_RC3
175 # endif
176 # if defined(OPENSSL_NO_RC5) && !defined(NO_RC5)
177 #   define NO_RC5
178 # endif
179 # if defined(OPENSSL_NO_RFC3779) && !defined(NO_RFC3779)
180 #   define NO_RFC3779
181 # endif
182 # if defined(OPENSSL_NO_SCTP) && !defined(NO_SCTP)
183 #   define NO_SCTP
184 # endif
185 # if defined(OPENSSL_NO_SEED) && !defined(NO_SEED)
186 #   define NO_SEED
187 # endif
188 # if defined(OPENSSL_NO_STORE) && !defined(NO_STORE)
189 #   define NO_STORE
190 # endif
191 # if defined(OPENSSL_NO_WHIRLPOOL) && !defined(NO_WHIRLPOOL)
192 #   define NO_WHIRLPOOL
193 # endif
```

new/usr/src/lib/openssl/include/openssl/opensslconf.h

4

```
194 # if defined(OPENSSL_NO_WHIRLPOOL) && !defined(NO_WHIRLPOOL)
195 #   define NO_WHIRLPOOL
196 # endif
197 #endif

199 #define OPENSSL_CPUID_OBJ

201 /* crypto/opensslconf.h.in */

203 #include <openssl/sunw_prefix.h>

205 /* Generate 80386 code? */
206 #undef I386_ONLY

208 #if !(defined(VMS) || defined(__VMS)) /* VMS uses logical names instead */
209 #if defined(HEADER_CRYPTLIB_H) && !defined(OPENSSLDIR)
210 #if defined(__sparcv9) || defined(__x86_64)
211 #define ENGINESDIR "/lib/openssl/engines/64"
212 #else
213 #define ENGINESDIR "/lib/openssl/engines"
214 #endif
215 #define OPENSSLDIR "/etc/openssl"
216 #endif
217 #endif

219 #undef OPENSSL_UNISTD
220 #define OPENSSL_UNISTD <unistd.h>

222 #undef OPENSSL_EXPORT_VAR_AS_FUNCTION

224 #if defined(HEADER_IDEA_H) && !defined(IDEA_INT)
225 #define IDEA_INT unsigned int
226 #endif

228 #if defined(HEADER_MD2_H) && !defined(MD2_INT)
229 #define MD2_INT unsigned int
230 #endif

232 #if defined(HEADER_RC2_H) && !defined(RC2_INT)
233 /* I need to put in a mod for the alpha - eay */
234 #define RC2_INT unsigned int
235 #endif

237 #if defined(HEADER_RC4_H)
238 #if !defined(RC4_INT)
239 /* using int types make the structure larger but make the code faster
240  * on most boxes I have tested - up to %20 faster. */
241 /*
242  * I don't know what does "most" mean, but declaring "int" is a must on:
243  * - Intel P6 because partial register stalls are very expensive;
244  * - elder Alpha because it lacks byte load/store instructions;
245  */
246 #define RC4_INT unsigned int
247 #endif
248 #if !defined(RC4_CHUNK)
249 /*
250  * This enables code handling data aligned at natural CPU word
251  * boundary. See crypto/rc4/rc4_enc.c for further details.
252  */
253 #define RC4_CHUNK unsigned long
254 #endif
255 #endif

257 #if (defined(HEADER_NEW_DES_H) || defined(HEADER_DES_H)) && !defined(DESS_LONG)
258 /* If this is set to 'unsigned int' on a DEC Alpha, this gives about a
259  * %20 speed up (longs are 8 bytes, int's are 4). */
```

```

260 #ifndef DES_LONG
261 #if defined(__sparcv9) || defined(__x86_64)
262 #define DES_LONG unsigned int
263 #else
264 #define DES_LONG unsigned long
265 #endif
266 #endif
267 #endif

269 #if defined(HEADER_BN_H) && !defined(CONFIG_HEADER_BN_H)
270 #define CONFIG_HEADER_BN_H
271 /*
272  * OpenSSL revision 1.521 from 2005-12-15 in OpenSSL_1_0_0-stable branch changed
273  * 64 bit sparcv9 configuration from SIXTY_FOUR_BIT_LONG to BN_LLONG.
274  */
275 #if defined(__x86_64)
276 #undef BN_LLONG
277 #else
278 #define BN_LLONG
279 #endif

281 /* Should we define BN_DIV2W here? */

283 /* Only one for the following should be defined */
284 #if defined(__x86_64)
285 #define SIXTY_FOUR_BIT_LONG
286 #undef THIRTY_TWO_BIT
287 #else
288 #undef SIXTY_FOUR_BIT_LONG
289 #undef SIXTY_FOUR_BIT
290 #define THIRTY_TWO_BIT
291 #endif
292 #undef SIXTY_FOUR_BIT
293 #endif

295 #if defined(HEADER_RC4_LOCL_H) && !defined(CONFIG_HEADER_RC4_LOCL_H)
296 #define CONFIG_HEADER_RC4_LOCL_H
297 /* if this is defined data[i] is used instead of *data, this is a %20
298  * speedup on x86 */
299 #define RC4_INDEX
300 #endif

302 #if defined(HEADER_BF_LOCL_H) && !defined(CONFIG_HEADER_BF_LOCL_H)
303 #define CONFIG_HEADER_BF_LOCL_H
304 #define BF_PTR
305 #endif /* HEADER_BF_LOCL_H */

307 #if defined(HEADER_DES_LOCL_H) && !defined(CONFIG_HEADER_DES_LOCL_H)
308 #define CONFIG_HEADER_DES_LOCL_H
309 #ifndef DES_DEFAULT_OPTIONS
310 /* the following is tweaked from a config script, that is why it is a
311  * protected undef/define */
312 #ifndef DES_PTR
313 #define DES_PTR
314 #endif

316 /* This helps C compiler generate the correct code for multiple functional
317  * units. It reduces register dependencies at the expense of 2 more
318  * registers */
319 #ifndef DES_RISC1
320 #define DES_RISC1
321 #endif

323 #ifndef DES_RISC2
324 #undef DES_RISC2
325 #endif

```

```

327 #if defined(DES_RISC1) && defined(DES_RISC2)
328 YOU SHOULD NOT HAVE BOTH DES_RISC1 AND DES_RISC2 DEFINED!!!!
329 #endif

331 /* Unroll the inner loop, this sometimes helps, sometimes hinders.
332  * Very mucy CPU dependant */
333 #ifndef DES_UNROLL
334 #define DES_UNROLL
335 #endif

337 /* These default values were supplied by
338  * Peter Gutman <pgut001@cs.auckland.ac.nz>
339  * They are only used if nothing else has been defined */
340 #if !defined(DES_PTR) && !defined(DES_RISC1) && !defined(DES_RISC2) && !defined(
341 /* Special defines which change the way the code is built depending on the
342 CPU and OS. For SGI machines you can use _MIPS_SZLONG (32 or 64) to find
343 even newer MIPS CPU's, but at the moment one size fits all for
344 optimization options. Older Sparc's work better with only UNROLL, but
345 there's no way to tell at compile time what it is you're running on */
346
347 #if defined( sun ) /* Newer Sparc's */
348 # define DES_PTR
349 # define DES_RISC1
350 # define DES_UNROLL
351 #elif defined( _ultrix ) /* Older MIPS */
352 # define DES_PTR
353 # define DES_RISC2
354 # define DES_UNROLL
355 #elif defined( __osf1__ ) /* Alpha */
356 # define DES_PTR
357 # define DES_RISC2
358 #elif defined( _AIX ) /* RS6000 */
359 /* Unknown */
360 #elif defined( _hpux ) /* HP-PA */
361 /* Unknown */
362 #elif defined( __aux ) /* 68K */
363 /* Unknown */
364 #elif defined( __dgux ) /* 88K (but P6 in latest boxes) */
365 # define DES_UNROLL
366 #elif defined( _sgi ) /* Newer MIPS */
367 # define DES_PTR
368 # define DES_RISC2
369 # define DES_UNROLL
370 #elif defined(i386) || defined(__i386__) /* x86 boxes, should be gcc */
371 # define DES_PTR
372 # define DES_RISC1
373 # define DES_UNROLL
374 #endif /* Systems-specific speed defines */
375 #endif

377 #endif /* DES_DEFAULT_OPTIONS */
378 #endif /* HEADER_DES_LOCL_H */

```

new/usr/src/lib/openssl/include/openssl/openssl.h

1

```
*****
3750 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/openssl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #ifndef HEADER_OPENSSLV_H
2 #define HEADER_OPENSSLV_H

4 /* Numeric release version identifier:
5 * MNNFFPPS: major minor fix patch status
6 * The status nibble has one of the values 0 for development, 1 to e for betas
7 * 1 to 14, and f for release. The patch level is exactly that.
8 * For example:
9 * 0.9.3-dev      0x00903000
10 * 0.9.3-beta1   0x00903001
11 * 0.9.3-beta2-dev 0x00903002
12 * 0.9.3-beta2   0x00903002 (same as ...beta2-dev)
13 * 0.9.3         0x0090300f
14 * 0.9.3a        0x0090301f
15 * 0.9.4         0x0090400f
16 * 1.2.3z        0x102031af
17 *
18 * For continuity reasons (because 0.9.5 is already out, and is coded
19 * 0x00905100), between 0.9.5 and 0.9.6 the coding of the patch level
20 * part is slightly different, by setting the highest bit. This means
21 * that 0.9.5a looks like this: 0x0090581f. At 0.9.6, we can start
22 * with 0x0090600S...
23 *
24 * (Prior to 0.9.3-dev a different scheme was used: 0.9.2b is 0x0922.)
25 * (Prior to 0.9.5a beta1, a different scheme was used: MMNFFRBB for
26 * major minor fix final patch/beta)
27 */
28 #define OPENSSL_VERSION_NUMBER 0x1000107fL
29 #ifdef OPENSSL_FIPS
30 #define OPENSSL_VERSION_TEXT "OpenSSL 1.0.1g-fips 7 Apr 2014"
31 #else
32 #define OPENSSL_VERSION_TEXT "OpenSSL 1.0.1g 7 Apr 2014"
33 #endif
34 #define OPENSSL_VERSION_PTEXT " part of " OPENSSL_VERSION_TEXT

37 /* The macros below are to be used for shared library (.so, .dll, ...)
38 * versioning. That kind of versioning works a bit differently between
39 * operating systems. The most usual scheme is to set a major and a minor
40 * number, and have the runtime loader check that the major number is equal
41 * to what it was at application link time, while the minor number has to
42 * be greater or equal to what it was at application link time. With this
43 * scheme, the version number is usually part of the file name, like this:
44 *
45 *     libcrypto.so.0.9
46 *
47 * Some unixen also make a softlink with the major version number only:
48 *
49 *     libcrypto.so.0
50 *
51 * On Tru64 and IRIX 6.x it works a little bit differently. There, the
52 * shared library version is stored in the file, and is actually a series
53 * of versions, separated by colons. The rightmost version present in the
54 * library when linking an application is stored in the application to be
55 * matched at run time. When the application is run, a check is done to
56 * see if the library version stored in the application matches any of the
57 * versions in the version string of the library itself.
58 * This version string can be constructed in any way, depending on what
59 * kind of matching is desired. However, to implement the same scheme as
60 * the one used in the other unixen, all compatible versions, from lowest
61 * to highest, should be part of the string. Consecutive builds would
```

new/usr/src/lib/openssl/include/openssl/openssl.h

2

```
62 * give the following versions strings:
63 *
64 *     3.0
65 *     3.0:3.1
66 *     3.0:3.1:3.2
67 *     4.0
68 *     4.0:4.1
69 *
70 * Notice how version 4 is completely incompatible with version, and
71 * therefore give the breach you can see.
72 *
73 * There may be other schemes as well that I haven't yet discovered.
74 *
75 * So, here's the way it works here: first of all, the library version
76 * number doesn't need at all to match the overall OpenSSL version.
77 * However, it's nice and more understandable if it actually does.
78 * The current library version is stored in the macro SHLIB_VERSION_NUMBER,
79 * which is just a piece of text in the format "M.m.e" (Major, minor, edit).
80 * For the sake of Tru64, IRIX, and any other OS that behaves in similar ways,
81 * we need to keep a history of version numbers, which is done in the
82 * macro SHLIB_VERSION_HISTORY. The numbers are separated by colons and
83 * should only keep the versions that are binary compatible with the current.
84 */
85 #define SHLIB_VERSION_HISTORY ""
86 #define SHLIB_VERSION_NUMBER "1.0.0"

89 #endif /* HEADER_OPENSSLV_H */
```

new/usr/src/lib/openssl/include/openssl/openssl_typ.h

1

```
*****
7397 Fri May 30 18:31:20 2014
new/usr/src/lib/openssl/include/openssl/openssl_typ.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* =====
2  * Copyright (c) 1998-2001 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
19 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
22 * endorse or promote products derived from this software without
23 * prior written permission. For written permission, please contact
24 * openssl-core@openssl.org.
25 *
26 * 5. Products derived from this software may not be called "OpenSSL"
27 * nor may "OpenSSL" appear in their names without prior written
28 * permission of the OpenSSL Project.
29 *
30 * 6. Redistributions of any form whatsoever must retain the following
31 * acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
34 *
35 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
37 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
38 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
39 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
40 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
41 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
42 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #ifndef HEADER_OPENSSL_TYPES_H
56 #define HEADER_OPENSSL_TYPES_H

58 #include <openssl/e_os2.h>

60 #ifndef NO_ASN1_TYPEDEFS
61 #define ASN1_INTEGER ASN1_STRING
```

new/usr/src/lib/openssl/include/openssl/openssl_typ.h

2

```
62 #define ASN1_ENUMERATED ASN1_STRING
63 #define ASN1_BIT_STRING ASN1_STRING
64 #define ASN1_OCTET_STRING ASN1_STRING
65 #define ASN1_PRINTABLESTRING ASN1_STRING
66 #define ASN1_T61STRING ASN1_STRING
67 #define ASN1_IA5STRING ASN1_STRING
68 #define ASN1_UTCTIME ASN1_STRING
69 #define ASN1_GENERALIZEDTIME ASN1_STRING
70 #define ASN1_TIME ASN1_STRING
71 #define ASN1_GENERALSTRING ASN1_STRING
72 #define ASN1_UNIVERSALSTRING ASN1_STRING
73 #define ASN1_BMPSTRING ASN1_STRING
74 #define ASN1_VISIBLESTRING ASN1_STRING
75 #define ASN1_UTF8STRING ASN1_STRING
76 #define ASN1_BOOLEAN int
77 #define ASN1_NULL int
78 #else
79 typedef struct asn1_string_st ASN1_INTEGER;
80 typedef struct asn1_string_st ASN1_ENUMERATED;
81 typedef struct asn1_string_st ASN1_BIT_STRING;
82 typedef struct asn1_string_st ASN1_OCTET_STRING;
83 typedef struct asn1_string_st ASN1_PRINTABLESTRING;
84 typedef struct asn1_string_st ASN1_T61STRING;
85 typedef struct asn1_string_st ASN1_IA5STRING;
86 typedef struct asn1_string_st ASN1_GENERALSTRING;
87 typedef struct asn1_string_st ASN1_UNIVERSALSTRING;
88 typedef struct asn1_string_st ASN1_BMPSTRING;
89 typedef struct asn1_string_st ASN1_UTCTIME;
90 typedef struct asn1_string_st ASN1_TIME;
91 typedef struct asn1_string_st ASN1_GENERALIZEDTIME;
92 typedef struct asn1_string_st ASN1_VISIBLESTRING;
93 typedef struct asn1_string_st ASN1_UTF8STRING;
94 typedef struct asn1_string_st ASN1_STRING;
95 typedef int ASN1_BOOLEAN;
96 typedef int ASN1_NULL;
97 #endif

99 typedef struct ASN1_ITEM_st ASN1_ITEM;
100 typedef struct asn1_ctx_st ASN1_PCTX;

102 #ifdef OPENSSL_SYS_WIN32
103 #undef X509_NAME
104 #undef X509_EXTENSIONS
105 #undef X509_CERT_PAIR
106 #undef PKCS7_ISSUER_AND_SERIAL
107 #undef OCSP_REQUEST
108 #undef OCSP_RESPONSE
109 #endif

111 #ifdef BIGNUM
112 #undef BIGNUM
113 #endif
114 typedef struct bignum_st BIGNUM;
115 typedef struct bignum_ctx BN_CTX;
116 typedef struct bn_blinding_st BN_BLINDING;
117 typedef struct bn_mont_ctx_st BN_MONT_CTX;
118 typedef struct bn_recp_ctx_st BN_RECP_CTX;
119 typedef struct bn_gencb_st BN_GENCB;

121 typedef struct buf_mem_st BUF_MEM;

123 typedef struct evp_cipher_st EVP_CIPHER;
124 typedef struct evp_cipher_ctx_st EVP_CIPHER_CTX;
125 typedef struct env_md_st EVP_MD;
126 typedef struct env_md_ctx_st EVP_MD_CTX;
127 typedef struct evp_pkey_st EVP_PKEY;
```

```

129 typedef struct evp_pkey_asn1_method_st EVP_PKEY_ASN1_METHOD;

131 typedef struct evp_pkey_method_st EVP_PKEY_METHOD;
132 typedef struct evp_pkey_ctx_st EVP_PKEY_CTX;

134 typedef struct dh_st DH;
135 typedef struct dh_method DH_METHOD;

137 typedef struct dsa_st DSA;
138 typedef struct dsa_method DSA_METHOD;

140 typedef struct rsa_st RSA;
141 typedef struct rsa_meth_st RSA_METHOD;

143 typedef struct rand_meth_st RAND_METHOD;

145 typedef struct ecdh_method ECDH_METHOD;
146 typedef struct ecdsa_method ECDSA_METHOD;

148 typedef struct x509_st X509;
149 typedef struct X509_algor_st X509_ALGOR;
150 typedef struct X509_crl_st X509_CRL;
151 typedef struct X509_crl_method_st X509_CRL_METHOD;
152 typedef struct X509_revoked_st X509_REVOKED;
153 typedef struct X509_name_st X509_NAME;
154 typedef struct X509_pubkey_st X509_PUBKEY;
155 typedef struct X509_store_st X509_STORE;
156 typedef struct X509_store_ctx_st X509_STORE_CTX;

158 typedef struct pkcs8_priv_key_info_st PKCS8_PRIV_KEY_INFO;

160 typedef struct v3_ext_ctx X509V3_CTX;
161 typedef struct conf_st CONF;

163 typedef struct store_st STORE;
164 typedef struct store_method_st STORE_METHOD;

166 typedef struct ui_st UI;
167 typedef struct ui_method_st UI_METHOD;

169 typedef struct st_ERR_FNS ERR_FNS;

171 typedef struct engine_st ENGINE;
172 typedef struct ssl_st SSL;
173 typedef struct ssl_ctx_st SSL_CTX;

175 typedef struct X509_POLICY_NODE_st X509_POLICY_NODE;
176 typedef struct X509_POLICY_LEVEL_st X509_POLICY_LEVEL;
177 typedef struct X509_POLICY_TREE_st X509_POLICY_TREE;
178 typedef struct X509_POLICY_CACHE_st X509_POLICY_CACHE;

180 typedef struct AUTHORITY_KEYID_st AUTHORITY_KEYID;
181 typedef struct DIST_POINT_st DIST_POINT;
182 typedef struct ISSUING_DIST_POINT_st ISSUING_DIST_POINT;
183 typedef struct NAME_CONSTRAINTS_st NAME_CONSTRAINTS;

185 /* If placed in pkcs12.h, we end up with a circular dependency with pkcs7.h */
186 #define DECLARE_PKCS12_STACK_OF(type) /* Nothing */
187 #define IMPLEMENT_PKCS12_STACK_OF(type) /* Nothing */

189 typedef struct crypto_ex_data_st CRYPTO_EX_DATA;
190 /* Callback types for crypto.h */
191 typedef int CRYPTO_EX_new(void *parent, void *ptr, CRYPTO_EX_DATA *ad,
192                          int idx, long argl, void *argp);
193 typedef void CRYPTO_EX_free(void *parent, void *ptr, CRYPTO_EX_DATA *ad,

```

```

194                          int idx, long argl, void *argp);
195 typedef int CRYPTO_EX_dup(CRYPTO_EX_DATA *to, CRYPTO_EX_DATA *from, void *from_d
196                          int idx, long argl, void *argp);

198 typedef struct ocspl_req_ctx_st OCSP_REQ_CTX;
199 typedef struct ocspl_response_st OCSP_RESPONSE;
200 typedef struct ocspl_responder_id_st OCSP_RESPID;

202 #endif /* def HEADER_OPENSSL_TYPES_H */

```

21992 Fri May 30 18:31:21 2014
 new/usr/src/lib/openssl/include/openssl/pem.h
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/pem/pem.h */
2 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_PEM_H
60 #define HEADER_PEM_H

```

```

62 #include <openssl/e_os2.h>
63 #ifndef OPENSSL_NO_BIO
64 #include <openssl/bio.h>
65 #endif
66 #ifndef OPENSSL_NO_STACK
67 #include <openssl/stack.h>
68 #endif
69 #include <openssl/evp.h>
70 #include <openssl/x509.h>
71 #include <openssl/pem2.h>

73 #ifdef __cplusplus
74 extern "C" {
75 #endif

77 #define PEM_BUFSIZE                1024

79 #define PEM_OBJ_UNDEF              0
80 #define PEM_OBJ_X509              1
81 #define PEM_OBJ_X509_REQ          2
82 #define PEM_OBJ_CRL               3
83 #define PEM_OBJ_SSL_SESSION       4
84 #define PEM_OBJ_PRIV_KEY          10
85 #define PEM_OBJ_PRIV_RSA          11
86 #define PEM_OBJ_PRIV_DSA          12
87 #define PEM_OBJ_PRIV_DH           13
88 #define PEM_OBJ_PUB_RSA           14
89 #define PEM_OBJ_PUB_DSA           15
90 #define PEM_OBJ_PUB_DH            16
91 #define PEM_OBJ_DHPARAMS          17
92 #define PEM_OBJ_DSAPARAMS         18
93 #define PEM_OBJ_PRIV_RSA_PUBLIC   19
94 #define PEM_OBJ_PRIV_ECDSA        20
95 #define PEM_OBJ_PUB_ECDSA         21
96 #define PEM_OBJ_ECPARAMETERS      22

98 #define PEM_ERROR                  30
99 #define PEM_DEK_DES_CBC           40
100 #define PEM_DEK_IDEA_CBC          45
101 #define PEM_DEK_DES_EDE           50
102 #define PEM_DEK_DES_ECB           60
103 #define PEM_DEK_RSA               70
104 #define PEM_DEK_RSA_MD2           80
105 #define PEM_DEK_RSA_MD5           90

107 #define PEM_MD_MD2                 NID_md2
108 #define PEM_MD_MD5                 NID_md5
109 #define PEM_MD_SHA                 NID_sha
110 #define PEM_MD_MD2_RSA             NID_md2WithRSAEncryption
111 #define PEM_MD_MD5_RSA             NID_md5WithRSAEncryption
112 #define PEM_MD_SHA_RSA             NID_sha1WithRSAEncryption

114 #define PEM_STRING_X509_OLD        "X509 CERTIFICATE"
115 #define PEM_STRING_X509           "CERTIFICATE"
116 #define PEM_STRING_X509_PAIR       "CERTIFICATE PAIR"
117 #define PEM_STRING_X509_TRUSTED    "TRUSTED CERTIFICATE"
118 #define PEM_STRING_X509_REQ_OLD    "NEW CERTIFICATE REQUEST"
119 #define PEM_STRING_X509_REQ        "CERTIFICATE REQUEST"
120 #define PEM_STRING_X509_CRL        "X509 CRL"
121 #define PEM_STRING_EVP_PKEY        "ANY PRIVATE KEY"
122 #define PEM_STRING_PUBLIC          "PUBLIC KEY"
123 #define PEM_STRING_RSA             "RSA PRIVATE KEY"
124 #define PEM_STRING_RSA_PUBLIC      "RSA PUBLIC KEY"
125 #define PEM_STRING_DSA             "DSA PRIVATE KEY"
126 #define PEM_STRING_DSA_PUBLIC      "DSA PUBLIC KEY"
127 #define PEM_STRING_PKCS7           "PKCS7"

```

```

128 #define PEM_STRING_PKCS7_SIGNED "PKCS #7 SIGNED DATA"
129 #define PEM_STRING_PKCS8 "ENCRYPTED PRIVATE KEY"
130 #define PEM_STRING_PKCS8INF "PRIVATE KEY"
131 #define PEM_STRING_DHPARAMS "DH PARAMETERS"
132 #define PEM_STRING_SSL_SESSION "SSL SESSION PARAMETERS"
133 #define PEM_STRING_DSAPARAMS "DSA PARAMETERS"
134 #define PEM_STRING_ECDSA_PUBLIC "ECDSA PUBLIC KEY"
135 #define PEM_STRING_ECPARAMETERS "EC PARAMETERS"
136 #define PEM_STRING_ECPRIVATEKEY "EC PRIVATE KEY"
137 #define PEM_STRING_PARAMETERS "PARAMETERS"
138 #define PEM_STRING_CMS "CMS"

140 /* Note that this structure is initialised by PEM_SealInit and cleaned up
141    by PEM_SealFinal (at least for now) */
142 typedef struct PEM_Encode_Seal_st
143 {
144     EVP_ENCODE_CTX encode;
145     EVP_MD_CTX md;
146     EVP_CIPHER_CTX cipher;
147 } PEM_ENCODE_SEAL_CTX;

149 /* enc_type is one off */
150 #define PEM_TYPE_ENCRYPTED 10
151 #define PEM_TYPE_MIC_ONLY 20
152 #define PEM_TYPE_MIC_CLEAR 30
153 #define PEM_TYPE_CLEAR 40

155 typedef struct pem_recip_st
156 {
157     char *name;
158     X509_NAME *dn;

160     int cipher;
161     int key_enc;
162     /* char iv[8]; unused and wrong size */
163 } PEM_USER;

165 typedef struct pem_ctx_st
166 {
167     int type; /* what type of object */

169     struct {
170         int version;
171         int mode;
172     } proc_type;

174     char *domain;

176     struct {
177         int cipher;
178         /* unused, and wrong size
179         unsigned char iv[8]; */
180     } DEK_info;

181     PEM_USER *originator;

184     int num_recipient;
185     PEM_USER **recipient;

187     /* XXX(ben): don't think this is used!
188     STACK *x509_chain; /* certificate chain */
189     EVP_MD *md; /* signature type */

191     int md_enc; /* is the md encrypted or not? */
192     int md_len; /* length of md_data */
193     char *md_data; /* message digest, could be pkey encrypted */

```

```

195     EVP_CIPHER *dec; /* date encryption cipher */
196     int key_len; /* key length */
197     unsigned char *key; /* key */
198     /* unused, and wrong size
199     unsigned char iv[8]; */

201     int data_enc; /* is the data encrypted */
202     int data_len;
203     unsigned char *data;
204 } PEM_CTX;

207 /* These macros make the PEM_read/PEM_write functions easier to maintain and
208    * write. Now they are all implemented with either:
209    * IMPLEMENT_PEM_rw(...) or IMPLEMENT_PEM_rw_cb(...)
210    */

212 #ifdef OPENSSL_NO_FP_API

214 #define IMPLEMENT_PEM_read_fp(name, type, str, asn1) /**/
215 #define IMPLEMENT_PEM_write_fp(name, type, str, asn1) /**/
216 #define IMPLEMENT_PEM_write_fp_const(name, type, str, asn1) /**/
217 #define IMPLEMENT_PEM_write_cb_fp(name, type, str, asn1) /**/
218 #define IMPLEMENT_PEM_write_cb_fp_const(name, type, str, asn1) /**/

220 #else

222 #define IMPLEMENT_PEM_read_fp(name, type, str, asn1) \
223     type *PEM_read_##name(FILE *fp, type **x, pem_password_cb *cb, void *u) \
224     { \
225         return PEM_ASN1_read((i2d_of_void *)i2d_##asn1, str, fp, (void **)x, cb, u); \
226     }

228 #define IMPLEMENT_PEM_write_fp(name, type, str, asn1) \
229     int PEM_write_##name(FILE *fp, type *x) \
230     { \
231         return PEM_ASN1_write((i2d_of_void *)i2d_##asn1, str, fp, x, NULL, NULL, 0, NULL, NULL); \
232     }

234 #define IMPLEMENT_PEM_write_fp_const(name, type, str, asn1) \
235     int PEM_write_##name(FILE *fp, const type *x) \
236     { \
237         return PEM_ASN1_write((i2d_of_void *)i2d_##asn1, str, fp, (void *)x, NULL, NULL, 0, NULL, NULL); \
238     }

240 #define IMPLEMENT_PEM_write_cb_fp(name, type, str, asn1) \
241     int PEM_write_##name(FILE *fp, type *x, const EVP_CIPHER *enc, \
242         unsigned char *kstr, int klen, pem_password_cb *cb, \
243         void *u) \
244     { \
245         return PEM_ASN1_write((i2d_of_void *)i2d_##asn1, str, fp, x, enc, kstr, klen, cb, u); \
246     }

248 #define IMPLEMENT_PEM_write_cb_fp_const(name, type, str, asn1) \
249     int PEM_write_##name(FILE *fp, type *x, const EVP_CIPHER *enc, \
250         unsigned char *kstr, int klen, pem_password_cb *cb, \
251         void *u) \
252     { \
253         return PEM_ASN1_write((i2d_of_void *)i2d_##asn1, str, fp, x, enc, kstr, klen, cb, u); \
254     }

256 #endif

258 #define IMPLEMENT_PEM_read_bio(name, type, str, asn1) \
259     type *PEM_read_bio_##name(BIO *bp, type **x, pem_password_cb *cb, void *u) \

```

```

260 { \
261 return PEM_ASN1_read_bio((d2i_of_void *)d2i_##asn1, str,bp,(void **)x,cb,u); \
262 }

264 #define IMPLEMENT_PEM_write_bio(name, type, str, asn1) \
265 int PEM_write_bio_##name(BIO *bp, type *x) \
266 { \
267 return PEM_ASN1_write_bio((i2d_of_void *)i2d_##asn1,str,bp,x,NULL,NULL,0,NULL,NU
268 }

270 #define IMPLEMENT_PEM_write_bio_const(name, type, str, asn1) \
271 int PEM_write_bio_##name(BIO *bp, const type *x) \
272 { \
273 return PEM_ASN1_write_bio((i2d_of_void *)i2d_##asn1,str,bp,(void *)x,NULL,NULL,0
274 }

276 #define IMPLEMENT_PEM_write_cb_bio(name, type, str, asn1) \
277 int PEM_write_bio_##name(BIO *bp, type *x, const EVP_CIPHER *enc, \
278     unsigned char *kstr, int klen, pem_password_cb *cb, void *u) \
279 { \
280     return PEM_ASN1_write_bio((i2d_of_void *)i2d_##asn1,str,bp,x,enc,kstr,kl
281 }

283 #define IMPLEMENT_PEM_write_cb_bio_const(name, type, str, asn1) \
284 int PEM_write_bio_##name(BIO *bp, type *x, const EVP_CIPHER *enc, \
285     unsigned char *kstr, int klen, pem_password_cb *cb, void *u) \
286 { \
287     return PEM_ASN1_write_bio((i2d_of_void *)i2d_##asn1,str,bp,(void *)x,enc
288 }

290 #define IMPLEMENT_PEM_write(name, type, str, asn1) \
291     IMPLEMENT_PEM_write_bio(name, type, str, asn1) \
292     IMPLEMENT_PEM_write_fp(name, type, str, asn1)

294 #define IMPLEMENT_PEM_write_const(name, type, str, asn1) \
295     IMPLEMENT_PEM_write_bio_const(name, type, str, asn1) \
296     IMPLEMENT_PEM_write_fp_const(name, type, str, asn1)

298 #define IMPLEMENT_PEM_write_cb(name, type, str, asn1) \
299     IMPLEMENT_PEM_write_cb_bio(name, type, str, asn1) \
300     IMPLEMENT_PEM_write_cb_fp(name, type, str, asn1)

302 #define IMPLEMENT_PEM_write_cb_const(name, type, str, asn1) \
303     IMPLEMENT_PEM_write_cb_bio_const(name, type, str, asn1) \
304     IMPLEMENT_PEM_write_cb_fp_const(name, type, str, asn1)

306 #define IMPLEMENT_PEM_read(name, type, str, asn1) \
307     IMPLEMENT_PEM_read_bio(name, type, str, asn1) \
308     IMPLEMENT_PEM_read_fp(name, type, str, asn1)

310 #define IMPLEMENT_PEM_rw(name, type, str, asn1) \
311     IMPLEMENT_PEM_read(name, type, str, asn1) \
312     IMPLEMENT_PEM_write(name, type, str, asn1)

314 #define IMPLEMENT_PEM_rw_const(name, type, str, asn1) \
315     IMPLEMENT_PEM_read(name, type, str, asn1) \
316     IMPLEMENT_PEM_write_const(name, type, str, asn1)

318 #define IMPLEMENT_PEM_rw_cb(name, type, str, asn1) \
319     IMPLEMENT_PEM_read(name, type, str, asn1) \
320     IMPLEMENT_PEM_write_cb(name, type, str, asn1)

322 /* These are the same except they are for the declarations */

324 #if defined(OPENSSL_NO_FP_API)

```

```

326 #define DECLARE_PEM_read_fp(name, type) /**/
327 #define DECLARE_PEM_write_fp(name, type) /**/
328 #define DECLARE_PEM_write_cb_fp(name, type) /**/

330 #else

332 #define DECLARE_PEM_read_fp(name, type) \
333     type *PEM_read_##name(FILE *fp, type **x, pem_password_cb *cb, void *u);

335 #define DECLARE_PEM_write_fp(name, type) \
336     int PEM_write_##name(FILE *fp, type *x);

338 #define DECLARE_PEM_write_fp_const(name, type) \
339     int PEM_write_##name(FILE *fp, const type *x);

341 #define DECLARE_PEM_write_cb_fp(name, type) \
342     int PEM_write_##name(FILE *fp, type *x, const EVP_CIPHER *enc, \
343     unsigned char *kstr, int klen, pem_password_cb *cb, void *u);

345 #endif

347 #ifndef OPENSSL_NO_BIO
348 #define DECLARE_PEM_read_bio(name, type) \
349     type *PEM_read_bio_##name(BIO *bp, type **x, pem_password_cb *cb, void *
351 #define DECLARE_PEM_write_bio(name, type) \
352     int PEM_write_bio_##name(BIO *bp, type *x);

354 #define DECLARE_PEM_write_bio_const(name, type) \
355     int PEM_write_bio_##name(BIO *bp, const type *x);

357 #define DECLARE_PEM_write_cb_bio(name, type) \
358     int PEM_write_bio_##name(BIO *bp, type *x, const EVP_CIPHER *enc, \
359     unsigned char *kstr, int klen, pem_password_cb *cb, void *u);

361 #else

363 #define DECLARE_PEM_read_bio(name, type) /**/
364 #define DECLARE_PEM_write_bio(name, type) /**/
365 #define DECLARE_PEM_write_bio_const(name, type) /**/
366 #define DECLARE_PEM_write_cb_bio(name, type) /**/

368 #endif

370 #define DECLARE_PEM_write(name, type) \
371     DECLARE_PEM_write_bio(name, type) \
372     DECLARE_PEM_write_fp(name, type)

374 #define DECLARE_PEM_write_const(name, type) \
375     DECLARE_PEM_write_bio_const(name, type) \
376     DECLARE_PEM_write_fp_const(name, type)

378 #define DECLARE_PEM_write_cb(name, type) \
379     DECLARE_PEM_write_cb_bio(name, type) \
380     DECLARE_PEM_write_cb_fp(name, type)

382 #define DECLARE_PEM_read(name, type) \
383     DECLARE_PEM_read_bio(name, type) \
384     DECLARE_PEM_read_fp(name, type)

386 #define DECLARE_PEM_rw(name, type) \
387     DECLARE_PEM_read(name, type) \
388     DECLARE_PEM_write(name, type)

390 #define DECLARE_PEM_rw_const(name, type) \
391     DECLARE_PEM_read(name, type) \

```



```

392 DECLARE_PEM_write_const(name, type)

394 #define DECLARE_PEM_rw_cb(name, type) \
395 DECLARE_PEM_read(name, type) \
396 DECLARE_PEM_write_cb(name, type)

398 #if 1
399 /* "userdata": new with OpenSSL 0.9.4 */
400 typedef int pem_password_cb(char *buf, int size, int rwflag, void *userdata);
401 #else
402 /* OpenSSL 0.9.3, 0.9.3a */
403 typedef int pem_password_cb(char *buf, int size, int rwflag);
404 #endif

406 int PEM_get_EVP_CIPHER_INFO(char *header, EVP_CIPHER_INFO *cipher);
407 int PEM_do_header(EVP_CIPHER_INFO *cipher, unsigned char *data, long *len,
408 pem_password_cb *callback, void *u);

410 #ifndef OPENSSL_NO_BIO
411 int PEM_read_bio(BIO *bp, char **name, char **header,
412 unsigned char **data, long *len);
413 int PEM_write_bio(BIO *bp, const char *name, char *hdr, unsigned char *data,
414 long len);
415 int PEM_bytes_read_bio(unsigned char **pdata, long *plen, char **pnm, const char
416 pem_password_cb *cb, void *u);
417 void * PEM_ASN1_read(d2i_of_void *d2i, const char *name, BIO *bp,
418 void **x, pem_password_cb *cb, void *u);
419 int PEM_ASN1_write_bio(i2d_of_void *i2d, const char *name, BIO *bp, void *x,
420 const EVP_CIPHER *enc, unsigned char *kstr, int klen,
421 pem_password_cb *cb, void *u);

423 STACK_OF(X509_INFO) * PEM_X509_INFO_read_bio(BIO *bp, STACK_OF(X509_INFO) *sk,
424 int PEM_X509_INFO_write_bio(BIO *bp, X509_INFO *xi, EVP_CIPHER *enc,
425 unsigned char *kstr, int klen, pem_password_cb *cb, void *u);
426 #endif

428 int PEM_read(FILE *fp, char **name, char **header,
429 unsigned char **data, long *len);
430 int PEM_write(FILE *fp, char *name, char *hdr, unsigned char *data, long len);
431 void * PEM_ASN1_read(d2i_of_void *d2i, const char *name, FILE *fp, void **x,
432 pem_password_cb *cb, void *u);
433 int PEM_ASN1_write(i2d_of_void *i2d, const char *name, FILE *fp,
434 void *x, const EVP_CIPHER *enc, unsigned char *kstr,
435 int klen, pem_password_cb *callback, void *u);
436 STACK_OF(X509_INFO) * PEM_X509_INFO_read(FILE *fp, STACK_OF(X509_INFO) *sk,
437 pem_password_cb *cb, void *u);

439 int PEM_SealInit(PEM_ENCODE_SEAL_CTX *ctx, EVP_CIPHER *type,
440 EVP_MD *md_type, unsigned char **ek, int *ekl,
441 unsigned char *iv, EVP_PKEY **pubk, int npubk);
442 void PEM_SealUpdate(PEM_ENCODE_SEAL_CTX *ctx, unsigned char *out, int *outl,
443 unsigned char *in, int inl);
444 int PEM_SealFinal(PEM_ENCODE_SEAL_CTX *ctx, unsigned char *sig, int *sigl,
445 unsigned char *out, int *outl, EVP_PKEY *priv);

447 void PEM_SignInit(EVP_MD_CTX *ctx, EVP_MD *type);
448 void PEM_SignUpdate(EVP_MD_CTX *ctx, unsigned char *d, unsigned int cnt);
449 int PEM_SignFinal(EVP_MD_CTX *ctx, unsigned char *sigret,
450 unsigned int *siglen, EVP_PKEY *pkey);

452 int PEM_def_callback(char *buf, int num, int w, void *key);
453 void PEM_proc_type(char *buf, int type);
454 void PEM_dek_info(char *buf, const char *type, int len, char *str);

457 #include <openssl/symhacks.h>

```

```

459 DECLARE_PEM_rw(X509, X509)

461 DECLARE_PEM_rw(X509_AUX, X509)

463 DECLARE_PEM_rw(X509_CERT_PAIR, X509_CERT_PAIR)

465 DECLARE_PEM_rw(X509_REQ, X509_REQ)
466 DECLARE_PEM_write(X509_REQ_NEW, X509_REQ)

468 DECLARE_PEM_rw(X509_CRL, X509_CRL)

470 DECLARE_PEM_rw(PKCS7, PKCS7)

472 DECLARE_PEM_rw(NETSCAPE_CERT_SEQUENCE, NETSCAPE_CERT_SEQUENCE)

474 DECLARE_PEM_rw(PKCS8, X509_SIG)

476 DECLARE_PEM_rw(PKCS8_PRIV_KEY_INFO, PKCS8_PRIV_KEY_INFO)

478 #ifndef OPENSSL_NO_RSA
480 DECLARE_PEM_rw_cb(RSAPrivateKey, RSA)
482 DECLARE_PEM_rw_const(RSAPublicKey, RSA)
483 DECLARE_PEM_rw(RSA_PUBKEY, RSA)

485 #endif

487 #ifndef OPENSSL_NO_DSA
489 DECLARE_PEM_rw_cb(DSAPrivateKey, DSA)

491 DECLARE_PEM_rw(DSA_PUBKEY, DSA)

493 DECLARE_PEM_rw_const(DSAPrparams, DSA)

495 #endif

497 #ifndef OPENSSL_NO_EC
498 DECLARE_PEM_rw_const(ECParameters, EC_GROUP)
499 DECLARE_PEM_rw_cb(ECPrivateKey, EC_KEY)
500 DECLARE_PEM_rw(EC_PUBKEY, EC_KEY)
501 #endif

503 #ifndef OPENSSL_NO_DH
505 DECLARE_PEM_rw_const(DHparams, DH)

507 #endif

509 DECLARE_PEM_rw_cb(PrivateKey, EVP_PKEY)

511 DECLARE_PEM_rw(PUBKEY, EVP_PKEY)

513 int PEM_write_bio_PKCS8PrivateKey_nid(BIO *bp, EVP_PKEY *x, int nid,
514 char *kstr, int klen,
515 pem_password_cb *cb, void *u);
516 int PEM_write_bio_PKCS8PrivateKey(BIO *bp, EVP_PKEY *x, const EVP_CIPHER *,
517 char *kstr, int, pem_password_cb *, void *u);
518 int i2d_PKCS8PrivateKey_bio(BIO *bp, EVP_PKEY *x, const EVP_CIPHER *enc,
519 char *kstr, int klen,
520 pem_password_cb *cb, void *u);
521 int i2d_PKCS8PrivateKey_nid_bio(BIO *bp, EVP_PKEY *x, int nid,
522 char *kstr, int klen,
523 pem_password_cb *cb, void *u);

```

```

524 EVP_PKEY *d2i_PKCS8PrivateKey_bio(BIO *bp, EVP_PKEY **x, pem_password_cb *cb, vo
526 int i2d_PKCS8PrivateKey_fp(FILE *fp, EVP_PKEY *x, const EVP_CIPHER *enc,
527     char *kstr, int klen,
528     pem_password_cb *cb, void *u);
529 int i2d_PKCS8PrivateKey_nid_fp(FILE *fp, EVP_PKEY *x, int nid,
530     char *kstr, int klen,
531     pem_password_cb *cb, void *u);
532 int PEM_write_PKCS8PrivateKey_nid(FILE *fp, EVP_PKEY *x, int nid,
533     char *kstr, int klen,
534     pem_password_cb *cb, void *u);

536 EVP_PKEY *d2i_PKCS8PrivateKey_fp(FILE *fp, EVP_PKEY **x, pem_password_cb *cb, vo

538 int PEM_write_PKCS8PrivateKey(FILE *fp, EVP_PKEY *x, const EVP_CIPHER *enc,
539     char *kstr, int klen, pem_password_cb *cd, void *u)

541 EVP_PKEY *PEM_read_bio_Parameters(BIO *bp, EVP_PKEY **x);
542 int PEM_write_bio_Parameters(BIO *bp, EVP_PKEY *x);

545 EVP_PKEY *b2i_PrivateKey(const unsigned char **in, long length);
546 EVP_PKEY *b2i_PublicKey(const unsigned char **in, long length);
547 EVP_PKEY *b2i_PrivateKey_bio(BIO *in);
548 EVP_PKEY *b2i_PublicKey_bio(BIO *in);
549 int i2b_PrivateKey_bio(BIO *out, EVP_PKEY *pk);
550 int i2b_PublicKey_bio(BIO *out, EVP_PKEY *pk);
551 #ifndef OPENSSL_NO_RC4
552 EVP_PKEY *b2i_PVK_bio(BIO *in, pem_password_cb *cb, void *u);
553 int i2b_PVK_bio(BIO *out, EVP_PKEY *pk, int enclevel,
554     pem_password_cb *cb, void *u);
555 #endif

558 /* BEGIN ERROR CODES */
559 /* The following lines are auto generated by the script mkerr.pl. Any changes
560  * made after this point may be overwritten when the script is next run.
561  */
562 void ERR_load_PEM_strings(void);

564 /* Error codes for the PEM functions. */

566 /* Function codes. */
567 #define PEM_F_B2I_DSS 127
568 #define PEM_F_B2I_PVK_BIO 128
569 #define PEM_F_B2I_RSA 129
570 #define PEM_F_CHECK_BITLEN_DSA 130
571 #define PEM_F_CHECK_BITLEN_RSA 131
572 #define PEM_F_D2I_PKCS8PRIVATEKEY_BIO 120
573 #define PEM_F_D2I_PKCS8PRIVATEKEY_FP 121
574 #define PEM_F_D0_B2I 132
575 #define PEM_F_D0_B2I_BIO 133
576 #define PEM_F_D0_BLOB_HEADER 134
577 #define PEM_F_D0_PK8PKEY 126
578 #define PEM_F_D0_PK8PKEY_FP 125
579 #define PEM_F_D0_PVK_BODY 135
580 #define PEM_F_D0_PVK_HEADER 136
581 #define PEM_F_I2B_PVK 137
582 #define PEM_F_I2B_PVK_BIO 138
583 #define PEM_F_LOAD_IV 101
584 #define PEM_F_PEM_ASN1_READ 102
585 #define PEM_F_PEM_ASN1_READ_BIO 103
586 #define PEM_F_PEM_ASN1_WRITE 104
587 #define PEM_F_PEM_ASN1_WRITE_BIO 105
588 #define PEM_F_PEM_DEF_CALLBACK 100
589 #define PEM_F_PEM_D0_HEADER 106

```

```

590 #define PEM_F_PEM_F_PEM_WRITE_PKCS8PRIVATEKEY 118
591 #define PEM_F_PEM_GET_EVP_CIPHER_INFO 107
592 #define PEM_F_PEM_PK8PKEY 119
593 #define PEM_F_PEM_READ 108
594 #define PEM_F_PEM_READ_BIO 109
595 #define PEM_F_PEM_READ_BIO_PARAMETERS 140
596 #define PEM_F_PEM_READ_BIO_PRIVATEKEY 123
597 #define PEM_F_PEM_READ_PRIVATEKEY 124
598 #define PEM_F_PEM_SEALFINAL 110
599 #define PEM_F_PEM_SEALINIT 111
600 #define PEM_F_PEM_SIGNFINAL 112
601 #define PEM_F_PEM_WRITE 113
602 #define PEM_F_PEM_WRITE_BIO 114
603 #define PEM_F_PEM_WRITE_PRIVATEKEY 139
604 #define PEM_F_PEM_X509_INFO_READ 115
605 #define PEM_F_PEM_X509_INFO_READ_BIO 116
606 #define PEM_F_PEM_X509_INFO_WRITE_BIO 117

608 /* Reason codes. */
609 #define PEM_R_BAD_BASE64_DECODE 100
610 #define PEM_R_BAD_DECRYPT 101
611 #define PEM_R_BAD_END_LINE 102
612 #define PEM_R_BAD_IV_CHARS 103
613 #define PEM_R_BAD_MAGIC_NUMBER 116
614 #define PEM_R_BAD_PASSWORD_READ 104
615 #define PEM_R_BAD_VERSION_NUMBER 117
616 #define PEM_R_BIO_WRITE_FAILURE 118
617 #define PEM_R_CIPHER_IS_NULL 127
618 #define PEM_R_ERROR_CONVERTING_PRIVATE_KEY 115
619 #define PEM_R_EXPECTING_PRIVATE_KEY_BLOB 119
620 #define PEM_R_EXPECTING_PUBLIC_KEY_BLOB 120
621 #define PEM_R_INCONSISTENT_HEADER 121
622 #define PEM_R_KEYBLOB_HEADER_PARSE_ERROR 122
623 #define PEM_R_KEYBLOB_TOO_SHORT 123
624 #define PEM_R_NOT_DEK_INFO 105
625 #define PEM_R_NOT_ENCRYPTED 106
626 #define PEM_R_NOT_PROC_TYPE 107
627 #define PEM_R_NO_START_LINE 108
628 #define PEM_R_PROBLEMS_GETTING_PASSWORD 109
629 #define PEM_R_PUBLIC_KEY_NO_RSA 110
630 #define PEM_R_PVK_DATA_TOO_SHORT 124
631 #define PEM_R_PVK_TOO_SHORT 125
632 #define PEM_R_READ_KEY 111
633 #define PEM_R_SHORT_HEADER 112
634 #define PEM_R_UNSUPPORTED_CIPHER 113
635 #define PEM_R_UNSUPPORTED_ENCRYPTION 114
636 #define PEM_R_UNSUPPORTED_KEY_COMPONENTS 126

638 #ifdef __cplusplus
639 }
640 #endif
641 #endif

```

new/usr/src/lib/openssl/include/openssl/pem2.h

1

```
*****
2863 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/pem2.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
19 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 /*
56  * This header only exists to break a circular dependency between pem and err
57  * Ben 30 Jan 1999.
58  */

60 #ifdef __cplusplus
61 extern "C" {
```

new/usr/src/lib/openssl/include/openssl/pem2.h

2

```
62 #endif

64 #ifndef HEADER_PEM_H
65 void ERR_load_PEM_strings(void);
66 #endif

68 #ifdef __cplusplus
69 }
70 #endif
```

new/usr/src/lib/openssl/include/openssl/pkcs12.h

1

```
*****
12654 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/pkcs12.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* pkcs12.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57

59 #ifndef HEADER_PKCS12_H
60 #define HEADER_PKCS12_H
```

new/usr/src/lib/openssl/include/openssl/pkcs12.h

2

```
62 #include <openssl/bio.h>
63 #include <openssl/x509.h>

65 #ifdef __cplusplus
66 extern "C" {
67 #endif

69 #define PKCS12_KEY_ID 1
70 #define PKCS12_IV_ID 2
71 #define PKCS12_MAC_ID 3

73 /* Default iteration count */
74 #ifndef PKCS12_DEFAULT_ITER
75 #define PKCS12_DEFAULT_ITER PKCS5_DEFAULT_ITER
76 #endif

78 #define PKCS12_MAC_KEY_LENGTH 20

80 #define PKCS12_SALT_LEN 8

82 /* Uncomment out next line for unicode password and names, otherwise ASCII */

84 /*#define PBE_UNICODE*/

86 #ifdef PBE_UNICODE
87 #define PKCS12_key_gen PKCS12_key_gen_uni
88 #define PKCS12_add_friendlyname PKCS12_add_friendlyname_uni
89 #else
90 #define PKCS12_key_gen PKCS12_key_gen_asc
91 #define PKCS12_add_friendlyname PKCS12_add_friendlyname_asc
92 #endif

94 /* MS key usage constants */

96 #define KEY_EX 0x10
97 #define KEY_SIG 0x80

99 typedef struct {
100 X509_SIG *dinfo;
101 ASN1_OCTET_STRING *salt;
102 ASN1_INTEGER *iter; /* defaults to 1 */
103 } PKCS12_MAC_DATA;

105 typedef struct {
106 ASN1_INTEGER *version;
107 PKCS12_MAC_DATA *mac;
108 PKCS7 *authsafes;
109 } PKCS12;

111 typedef struct {
112 ASN1_OBJECT *type;
113 union {
114 struct pkcs12_bag_st *bag; /* secret, crl and certbag */
115 struct pkcs8_priv_key_info_st *keybag; /* keybag */
116 X509_SIG *shkeybag; /* shrouded key bag */
117 STACK_OF(PKCS12_SAFEBAG) *safes;
118 ASN1_TYPE *other;
119 } value;
120 STACK_OF(X509_ATTRIBUTE) *attrib;
121 } PKCS12_SAFEBAG;

123 DECLARE_STACK_OF(PKCS12_SAFEBAG)
124 DECLARE_ASN1_SET_OF(PKCS12_SAFEBAG)
125 DECLARE_PKCS12_STACK_OF(PKCS12_SAFEBAG)

127 typedef struct pkcs12_bag_st {
```

```

128 ASN1_OBJECT *type;
129 union {
130     ASN1_OCTET_STRING *x509cert;
131     ASN1_OCTET_STRING *x509crl;
132     ASN1_OCTET_STRING *octet;
133     ASN1_IA5STRING *sdsicert;
134     ASN1_TYPE *other; /* Secret or other bag */
135 }value;
136 } PKCS12_BAGS;

138 #define PKCS12_ERROR    0
139 #define PKCS12_OK      1

141 /* Compatibility macros */

143 #define M_PKCS12_x5092certbag PKCS12_x5092certbag
144 #define M_PKCS12_x509crl2certbag PKCS12_x509crl2certbag

146 #define M_PKCS12_certbag2x509 PKCS12_certbag2x509
147 #define M_PKCS12_certbag2x509crl PKCS12_certbag2x509crl

149 #define M_PKCS12_unpack_p7data PKCS12_unpack_p7data
150 #define M_PKCS12_pack_authsafes PKCS12_pack_authsafes
151 #define M_PKCS12_unpack_authsafes PKCS12_unpack_authsafes
152 #define M_PKCS12_unpack_p7encdata PKCS12_unpack_p7encdata

154 #define M_PKCS12_decrypt_skey PKCS12_decrypt_skey
155 #define M_PKCS8_decrypt PKCS8_decrypt

157 #define M_PKCS12_bag_type(bg) OBJ_obj2nid((bg)->type)
158 #define M_PKCS12_cert_bag_type(bg) OBJ_obj2nid((bg)->value.bag->type)
159 #define M_PKCS12_crl_bag_type M_PKCS12_cert_bag_type

161 #define PKCS12_get_attr(bag, attr_nid) \
162     PKCS12_get_attr_gen(bag->attrib, attr_nid)

164 #define PKCS8_get_attr(p8, attr_nid) \
165     PKCS12_get_attr_gen(p8->attributes, attr_nid)

167 #define PKCS12_mac_present(p12) ((p12)->mac ? 1 : 0)

170 PKCS12_SAFEBAG *PKCS12_x5092certbag(X509 *x509);
171 PKCS12_SAFEBAG *PKCS12_x509crl2certbag(X509_CRL *crl);
172 X509 *PKCS12_certbag2x509(PKCS12_SAFEBAG *bag);
173 X509_CRL *PKCS12_certbag2x509crl(PKCS12_SAFEBAG *bag);

175 PKCS12_SAFEBAG *PKCS12_item_pack_safebag(void *obj, const ASN1_ITEM *it, int nid
176     int nid2);
177 PKCS12_SAFEBAG *PKCS12_MAKE_KEYBAG(PKCS8_PRIV_KEY_INFO *p8);
178 PKCS8_PRIV_KEY_INFO *PKCS8_decrypt(X509_SIG *p8, const char *pass, int passlen);
179 PKCS8_PRIV_KEY_INFO *PKCS12_decrypt_skey(PKCS12_SAFEBAG *bag, const char *pass,
180     int passlen);
181 X509_SIG *PKCS8_encrypt(int pbe_nid, const EVP_CIPHER *cipher,
182     const char *pass, int passlen,
183     unsigned char *salt, int saltlen, int iter,
184     PKCS8_PRIV_KEY_INFO *p8);
185 PKCS12_SAFEBAG *PKCS12_MAKE_SHKEYBAG(int pbe_nid, const char *pass,
186     int passlen, unsigned char *salt,
187     int saltlen, int iter,
188     PKCS8_PRIV_KEY_INFO *p8);
189 PKCS7 *PKCS12_pack_p7data(STACK_OF(PKCS12_SAFEBAG) *sk);
190 STACK_OF(PKCS12_SAFEBAG) *PKCS12_unpack_p7data(PKCS7 *p7);
191 PKCS7 *PKCS12_pack_p7encdata(int pbe_nid, const char *pass, int passlen,
192     unsigned char *salt, int saltlen, int iter,
193     STACK_OF(PKCS12_SAFEBAG) *bags);

```

```

194 STACK_OF(PKCS12_SAFEBAG) *PKCS12_unpack_p7encdata(PKCS7 *p7, const char *pass, i
196 int PKCS12_pack_authsafes(PKCS12 *p12, STACK_OF(PKCS7) *safes);
197 STACK_OF(PKCS7) *PKCS12_unpack_authsafes(PKCS12 *p12);

199 int PKCS12_add_localkeyid(PKCS12_SAFEBAG *bag, unsigned char *name, int namelen)
200 int PKCS12_add_friendlyname_asc(PKCS12_SAFEBAG *bag, const char *name,
201     int namelen);
202 int PKCS12_add_CSPName_asc(PKCS12_SAFEBAG *bag, const char *name,
203     int namelen);
204 int PKCS12_add_friendlyname_uni(PKCS12_SAFEBAG *bag, const unsigned char *name,
205     int namelen);
206 int PKCS8_add_keyusage(PKCS8_PRIV_KEY_INFO *p8, int usage);
207 ASN1_TYPE *PKCS12_get_attr_gen(STACK_OF(X509_ATTRIBUTE) *attrs, int attr_nid);
208 char *PKCS12_get_friendlyname(PKCS12_SAFEBAG *bag);
209 unsigned char *PKCS12_pbe_crypt(X509_ALGOR *algor, const char *pass,
210     int passlen, unsigned char *in, int inlen,
211     unsigned char **data, int *datalen, int en_de);
212 void * PKCS12_item_decrypt_d2i(X509_ALGOR *algor, const ASN1_ITEM *it,
213     const char *pass, int passlen, ASN1_OCTET_STRING *oct, int zbuf);
214 ASN1_OCTET_STRING *PKCS12_item_i2d_encrypt(X509_ALGOR *algor, const ASN1_ITEM *i
215     const char *pass, int passlen,
216     void *obj, int zbuf);
217 PKCS12 *PKCS12_init(int mode);
218 int PKCS12_key_gen_asc(const char *pass, int passlen, unsigned char *salt,
219     int saltlen, int id, int iter, int n,
220     unsigned char *out, const EVP_MD *md_type);
221 int PKCS12_key_gen_uni(unsigned char *pass, int passlen, unsigned char *salt, in
222 int PKCS12_PBE_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
223     ASN1_TYPE *param, const EVP_CIPHER *cipher, const EVP_M
224     int en_de);
225 int PKCS12_gen_mac(PKCS12 *p12, const char *pass, int passlen,
226     unsigned char *mac, unsigned int *maclen);
227 int PKCS12_verify_mac(PKCS12 *p12, const char *pass, int passlen);
228 int PKCS12_set_mac(PKCS12 *p12, const char *pass, int passlen,
229     unsigned char *salt, int saltlen, int iter,
230     const EVP_MD *md_type);
231 int PKCS12_setup_mac(PKCS12 *p12, int iter, unsigned char *salt,
232     int saltlen, const EVP_MD *md_type);
233 unsigned char *OPENSSL_asc2uni(const char *asc, int asclen, unsigned char **uni,
234     char *OPENSSL_uni2asc(unsigned char *uni, int unilen);

236 DECLARE_ASN1_FUNCTIONS(PKCS12)
237 DECLARE_ASN1_FUNCTIONS(PKCS12_MAC_DATA)
238 DECLARE_ASN1_FUNCTIONS(PKCS12_SAFEBAG)
239 DECLARE_ASN1_FUNCTIONS(PKCS12_BAGS)

241 DECLARE_ASN1_ITEM(PKCS12_SAFEBAGS)
242 DECLARE_ASN1_ITEM(PKCS12_AUTHSAFES)

244 void PKCS12_PBE_add(void);
245 int PKCS12_parse(PKCS12 *p12, const char *pass, EVP_PKEY **pkey, X509 **cert,
246     STACK_OF(X509) **ca);
247 PKCS12 *PKCS12_create(char *pass, char *name, EVP_PKEY *pkey, X509 *cert,
248     STACK_OF(X509) *ca, int nid_key, int nid_cert, int iter
249     int mac_iter, int keytype);

251 PKCS12_SAFEBAG *PKCS12_add_cert(STACK_OF(PKCS12_SAFEBAG) **pbags, X509 *cert);
252 PKCS12_SAFEBAG *PKCS12_add_key(STACK_OF(PKCS12_SAFEBAG) **pbags, EVP_PKEY *key,
253     int key_usage, int iter,
254     int key_nid, char *pass);
255 int PKCS12_add_safe(STACK_OF(PKCS7) **psafes, STACK_OF(PKCS12_SAFEBAG) *bags,
256     int safe_nid, int iter, char *pass);
257 PKCS12 *PKCS12_add_safes(STACK_OF(PKCS7) *safes, int p7_nid);

259 int i2d_PKCS12_bio(BIO *bp, PKCS12 *p12);

```

```

260 int i2d_PKCS12_fp(FILE *fp, PKCS12 *p12);
261 PKCS12 *d2i_PKCS12_bio(BIO *bp, PKCS12 **p12);
262 PKCS12 *d2i_PKCS12_fp(FILE *fp, PKCS12 **p12);
263 int PKCS12_newpass(PKCS12 *p12, char *oldpass, char *newpass);

265 /* BEGIN ERROR CODES */
266 /* The following lines are auto generated by the script mkerr.pl. Any changes
267  * made after this point may be overwritten when the script is next run.
268  */
269 void ERR_load_PKCS12_strings(void);

271 /* Error codes for the PKCS12 functions. */

273 /* Function codes. */
274 #define PKCS12_F_PARSE_BAG 129
275 #define PKCS12_F_PARSE_BAGS 103
276 #define PKCS12_F_PKCS12_ADD_FRIENDLYNAME 100
277 #define PKCS12_F_PKCS12_ADD_FRIENDLYNAME_ASC 127
278 #define PKCS12_F_PKCS12_ADD_FRIENDLYNAME_UNI 102
279 #define PKCS12_F_PKCS12_ADD_LOCALKEYID 104
280 #define PKCS12_F_PKCS12_CREATE 105
281 #define PKCS12_F_PKCS12_GEN_MAC 107
282 #define PKCS12_F_PKCS12_INIT 109
283 #define PKCS12_F_PKCS12_ITEM_DECRYPT_D2I 106
284 #define PKCS12_F_PKCS12_ITEM_I2D_ENCRYPT 108
285 #define PKCS12_F_PKCS12_ITEM_PACK_SAFEBAG 117
286 #define PKCS12_F_PKCS12_KEY_GEN_ASC 110
287 #define PKCS12_F_PKCS12_KEY_GEN_UNI 111
288 #define PKCS12_F_PKCS12_MAKE_KEYBAG 112
289 #define PKCS12_F_PKCS12_MAKE_SHKEYBAG 113
290 #define PKCS12_F_PKCS12_NEWPASS 128
291 #define PKCS12_F_PKCS12_PACK_P7DATA 114
292 #define PKCS12_F_PKCS12_PACK_P7ENCDATA 115
293 #define PKCS12_F_PKCS12_PARSE 118
294 #define PKCS12_F_PKCS12_PBE_CRYPT 119
295 #define PKCS12_F_PKCS12_PBE_KEYIVGEN 120
296 #define PKCS12_F_PKCS12_SETUP_MAC 122
297 #define PKCS12_F_PKCS12_SET_MAC 123
298 #define PKCS12_F_PKCS12_UNPACK_AUTHSAFES 130
299 #define PKCS12_F_PKCS12_UNPACK_P7DATA 131
300 #define PKCS12_F_PKCS12_VERIFY_MAC 126
301 #define PKCS12_F_PKCS8_ADD_KEYUSAGE 124
302 #define PKCS12_F_PKCS8_ENCRYPT 125

304 /* Reason codes. */
305 #define PKCS12_R_CANT_PACK_STRUCTURE 100
306 #define PKCS12_R_CONTENT_TYPE_NOT_DATA 121
307 #define PKCS12_R_DECODE_ERROR 101
308 #define PKCS12_R_ENCODE_ERROR 102
309 #define PKCS12_R_ENCRYPT_ERROR 103
310 #define PKCS12_R_ERROR_SETTING_ENCRYPTED_DATA_TYPE 120
311 #define PKCS12_R_INVALID_NULL_ARGUMENT 104
312 #define PKCS12_R_INVALID_NULL_PKCS12_POINTER 105
313 #define PKCS12_R_IV_GEN_ERROR 106
314 #define PKCS12_R_KEY_GEN_ERROR 107
315 #define PKCS12_R_MAC_ABSENT 108
316 #define PKCS12_R_MAC_GENERATION_ERROR 109
317 #define PKCS12_R_MAC_SETUP_ERROR 110
318 #define PKCS12_R_MAC_STRING_SET_ERROR 111
319 #define PKCS12_R_MAC_VERIFY_ERROR 112
320 #define PKCS12_R_MAC_VERIFY_FAILURE 113
321 #define PKCS12_R_PARSE_ERROR 114
322 #define PKCS12_R_PKCS12_ALGOR_CIPHERINIT_ERROR 115
323 #define PKCS12_R_PKCS12_CIPHERFINAL_ERROR 116
324 #define PKCS12_R_PKCS12_PBE_CRYPT_ERROR 117
325 #define PKCS12_R_UNKNOWN_DIGEST_ALGORITHM 118

```

```

326 #define PKCS12_R_UNSUPPORTED_PKCS12_MODE 119

328 #ifdef __cplusplus
329 }
330 #endif
331 #endif

```

new/usr/src/lib/openssl/include/openssl/pkcs7.h

1

18064 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/pkcs7.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/pkcs7/pkcs7.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
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17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef HEADER_PKCS7_H
60 #define HEADER_PKCS7_H
```

new/usr/src/lib/openssl/include/openssl/pkcs7.h

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/bio.h>
64 #include <openssl/e_os2.h>
65
66 #include <openssl/symhacks.h>
67 #include <openssl/openssl_typ.h>
68
69 #ifdef __cplusplus
70 extern "C" {
71 #endif
72
73 #ifdef OPENSSL_SYS_WIN32
74 /* Under Win32 theses are defined in wincrypt.h */
75 #undef PKCS7_ISSUER_AND_SERIAL
76 #undef PKCS7_SIGNER_INFO
77 #endif
78
79 /*
80 Encryption_ID          DES-CBC
81 Digest_ID              MD5
82 Digest_Encryption_ID   rsaEncryption
83 Key_Encryption_ID      rsaEncryption
84 */
85
86 typedef struct pkcs7_issuer_and_serial_st
87 {
88     X509_NAME *issuer;
89     ASN1_INTEGER *serial;
90 } PKCS7_ISSUER_AND_SERIAL;
91
92 typedef struct pkcs7_signer_info_st
93 {
94     ASN1_INTEGER *version; /* version 1 */
95     PKCS7_ISSUER_AND_SERIAL *issuer_and_serial;
96     X509_ALGOR *digest_alg;
97     STACK_OF(X509_ATTRIBUTE) *auth_attr; /* [ 0 ] */
98     X509_ALGOR *digest_enc_alg;
99     ASN1_OCTET_STRING *enc_digest;
100    STACK_OF(X509_ATTRIBUTE) *unauth_attr; /* [ 1 ] */
101
102    /* The private key to sign with */
103    EVP_PKEY *pkey;
104    } PKCS7_SIGNER_INFO;
105
106 DECLARE_STACK_OF(PKCS7_SIGNER_INFO)
107 DECLARE_ASN1_SET_OF(PKCS7_SIGNER_INFO)
108
109 typedef struct pkcs7_recip_info_st
110 {
111     ASN1_INTEGER *version; /* version 0 */
112     PKCS7_ISSUER_AND_SERIAL *issuer_and_serial;
113     X509_ALGOR *key_enc_algor;
114     ASN1_OCTET_STRING *enc_key;
115     X509 *cert; /* get the pub-key from this */
116    } PKCS7_RECIP_INFO;
117
118 DECLARE_STACK_OF(PKCS7_RECIP_INFO)
119 DECLARE_ASN1_SET_OF(PKCS7_RECIP_INFO)
120
121 typedef struct pkcs7_signed_st
122 {
123     ASN1_INTEGER *version; /* version 1 */
124     STACK_OF(X509_ALGOR) *md_algs; /* md used */
125     STACK_OF(X509) *cert; /* [ 0 ] */
126     STACK_OF(X509_CRL) *crl; /* [ 1 ] */
127     STACK_OF(PKCS7_SIGNER_INFO) *signer_info;
```

```

129     struct pkcs7_st                *contents;
130     } PKCS7_SIGNED;
131 /* The above structure is very very similar to PKCS7_SIGN_ENVELOPE.
132 * How about merging the two */

134 typedef struct pkcs7_enc_content_st
135 {
136     ASN1_OBJECT                    *content_type;
137     X509_ALGOR                     *algorithm;
138     ASN1_OCTET_STRING              *enc_data;      /* [ 0 ] */
139     const EVP_CIPHER               *cipher;
140     } PKCS7_ENC_CONTENT;

142 typedef struct pkcs7_enveloped_st
143 {
144     ASN1_INTEGER                   *version;      /* version 0 */
145     STACK_OF(PKCS7_RECIP_INFO)    *recipientinfo;
146     PKCS7_ENC_CONTENT             *enc_data;
147     } PKCS7_ENVELOPE;

149 typedef struct pkcs7_signedandenveloped_st
150 {
151     ASN1_INTEGER                   *version;      /* version 1 */
152     STACK_OF(X509_ALGOR)           *md_algs;     /* md used */
153     STACK_OF(X509)                 *cert;        /* [ 0 ] */
154     STACK_OF(X509_CRL)             *crl;         /* [ 1 ] */
155     STACK_OF(PKCS7_SIGNER_INFO)    *signer_info;

157     PKCS7_ENC_CONTENT             *enc_data;
158     STACK_OF(PKCS7_RECIP_INFO)    *recipientinfo;
159     } PKCS7_SIGN_ENVELOPE;

161 typedef struct pkcs7_digest_st
162 {
163     ASN1_INTEGER                   *version;      /* version 0 */
164     X509_ALGOR                     *md;          /* md used */
165     struct pkcs7_st                *contents;
166     ASN1_OCTET_STRING              *digest;
167     } PKCS7_DIGEST;

169 typedef struct pkcs7_encrypted_st
170 {
171     ASN1_INTEGER                   *version;      /* version 0 */
172     PKCS7_ENC_CONTENT             *enc_data;
173     } PKCS7_ENCRYPT;

175 typedef struct pkcs7_st
176 {
177     /* The following is non NULL if it contains ASN1 encoding of
178     * this structure */
179     unsigned char *asn1;
180     long length;

182 #define PKCS7_S_HEADER 0
183 #define PKCS7_S_BODY 1
184 #define PKCS7_S_TAIL 2
185     int state; /* used during processing */

187     int detached;

189     ASN1_OBJECT *type;
190     /* content as defined by the type */
191     /* all encryption/message digests are applied to the 'contents',
192     * leaving out the 'type' field. */
193     union {

```

```

194     char *ptr;

196     /* NID_pkcs7_data */
197     ASN1_OCTET_STRING *data;

199     /* NID_pkcs7_signed */
200     PKCS7_SIGNED *sign;

202     /* NID_pkcs7_enveloped */
203     PKCS7_ENVELOPE *enveloped;

205     /* NID_pkcs7_signedAndEnveloped */
206     PKCS7_SIGN_ENVELOPE *signed_and_enveloped;

208     /* NID_pkcs7_digest */
209     PKCS7_DIGEST *digest;

211     /* NID_pkcs7_encrypted */
212     PKCS7_ENCRYPT *encrypted;

214     /* Anything else */
215     ASN1_TYPE *other;
216     } d;
217     } PKCS7;

219 DECLARE_STACK_OF(PKCS7)
220 DECLARE_ASN1_SET_OF(PKCS7)
221 DECLARE_PKCS12_STACK_OF(PKCS7)

223 #define PKCS7_OP_SET_DETACHED_SIGNATURE 1
224 #define PKCS7_OP_GET_DETACHED_SIGNATURE 2

226 #define PKCS7_get_signed_attributes(si) ((si)->auth_attr)
227 #define PKCS7_get_attributes(si) ((si)->unauth_attr)

229 #define PKCS7_type_is_signed(a) (OBJ_obj2nid((a)->type) == NID_pkcs7_signed)
230 #define PKCS7_type_is_encrypted(a) (OBJ_obj2nid((a)->type) == NID_pkcs7_encrypt)
231 #define PKCS7_type_is_enveloped(a) (OBJ_obj2nid((a)->type) == NID_pkcs7_envelope)
232 #define PKCS7_type_is_signedAndEnveloped(a) \
233     (OBJ_obj2nid((a)->type) == NID_pkcs7_signedAndEnveloped)
234 #define PKCS7_type_is_data(a) (OBJ_obj2nid((a)->type) == NID_pkcs7_data)
235 #define PKCS7_type_is_digest(a) (OBJ_obj2nid((a)->type) == NID_pkcs7_digest)
236 #define PKCS7_type_is_encrypted(a) \
237     (OBJ_obj2nid((a)->type) == NID_pkcs7_encrypted)

239 #define PKCS7_type_is_digest(a) (OBJ_obj2nid((a)->type) == NID_pkcs7_digest)

241 #define PKCS7_set_detached(p,v) \
242     PKCS7_ctrl(p,PKCS7_OP_SET_DETACHED_SIGNATURE,v,NULL)
243 #define PKCS7_get_detached(p) \
244     PKCS7_ctrl(p,PKCS7_OP_GET_DETACHED_SIGNATURE,0,NULL)

246 #define PKCS7_is_detached(p7) (PKCS7_type_is_signed(p7) && PKCS7_get_detached(p7))

248 /* S/MIME related flags */

250 #define PKCS7_TEXT 0x1
251 #define PKCS7_NOCERTS 0x2
252 #define PKCS7_NOSIGS 0x4
253 #define PKCS7_NOCHAIN 0x8
254 #define PKCS7_NOINTERN 0x10
255 #define PKCS7_NOVERIFY 0x20
256 #define PKCS7_DETACHED 0x40
257 #define PKCS7_BINARY 0x80
258 #define PKCS7_NOATTR 0x100
259 #define PKCS7_NOSMIMECAP 0x200

```



```

260 #define PKCS7_NOOLDMIMETYPE      0x400
261 #define PKCS7_CRLFEOI            0x800
262 #define PKCS7_STREAM              0x1000
263 #define PKCS7_NOCRL              0x2000
264 #define PKCS7_PARTIAL            0x4000
265 #define PKCS7_REUSE_DIGEST       0x8000

267 /* Flags: for compatibility with older code */

269 #define SMIME_TEXT      PKCS7_TEXT
270 #define SMIME_NOCERTS   PKCS7_NOCERTS
271 #define SMIME_NOSIGS    PKCS7_NOSIGS
272 #define SMIME_NOCHAIN   PKCS7_NOCHAIN
273 #define SMIME_NOINTERN  PKCS7_NOINTERN
274 #define SMIME_NOVERIFY  PKCS7_NOVERIFY
275 #define SMIME_DETACHED  PKCS7_DETACHED
276 #define SMIME_BINARY    PKCS7_BINARY
277 #define SMIME_NOATTR    PKCS7_NOATTR

279 DECLARE_ASN1_FUNCTIONS(PKCS7_ISSUER_AND_SERIAL)

281 int PKCS7_ISSUER_AND_SERIAL_digest(PKCS7_ISSUER_AND_SERIAL *data, const EVP_MD *t
282 unsigned char *md, unsigned int *len);
283 #ifndef OPENSSL_NO_FP_API
284 PKCS7 *d2i_PKCS7_fp(FILE *fp, PKCS7 **p7);
285 int i2d_PKCS7_fp(FILE *fp, PKCS7 *p7);
286 #endif
287 PKCS7 *PKCS7_dup(PKCS7 *p7);
288 PKCS7 *d2i_PKCS7_bio(BIO *bp, PKCS7 **p7);
289 int i2d_PKCS7_bio(BIO *bp, PKCS7 *p7);
290 int i2d_PKCS7_bio_stream(BIO *out, PKCS7 *p7, BIO *in, int flags);
291 int PEM_write_bio_PKCS7_stream(BIO *out, PKCS7 *p7, BIO *in, int flags);

293 DECLARE_ASN1_FUNCTIONS(PKCS7_SIGNER_INFO)
294 DECLARE_ASN1_FUNCTIONS(PKCS7_RECIP_INFO)
295 DECLARE_ASN1_FUNCTIONS(PKCS7_SIGNED)
296 DECLARE_ASN1_FUNCTIONS(PKCS7_ENC_CONTENT)
297 DECLARE_ASN1_FUNCTIONS(PKCS7_ENVELOPE)
298 DECLARE_ASN1_FUNCTIONS(PKCS7_SIGN_ENVELOPE)
299 DECLARE_ASN1_FUNCTIONS(PKCS7_DIGEST)
300 DECLARE_ASN1_FUNCTIONS(PKCS7_ENCRYPT)
301 DECLARE_ASN1_FUNCTIONS(PKCS7)

303 DECLARE_ASN1_ITEM(PKCS7_ATTR_SIGN)
304 DECLARE_ASN1_ITEM(PKCS7_ATTR_VERIFY)

306 DECLARE_ASN1_NDEF_FUNCTION(PKCS7)
307 DECLARE_ASN1_PRINT_FUNCTION(PKCS7)

309 long PKCS7_ctrl(PKCS7 *p7, int cmd, long larg, char *parg);

311 int PKCS7_set_type(PKCS7 *p7, int type);
312 int PKCS7_set0_type_other(PKCS7 *p7, int type, ASN1_TYPE *other);
313 int PKCS7_set_content(PKCS7 *p7, PKCS7 *p7_data);
314 int PKCS7_SIGNER_INFO_set(PKCS7_SIGNER_INFO *p7i, X509 *x509, EVP_PKEY *pkey,
315 const EVP_MD *dgst);
316 int PKCS7_SIGNER_INFO_sign(PKCS7_SIGNER_INFO *si);
317 int PKCS7_add_signer(PKCS7 *p7, PKCS7_SIGNER_INFO *p7i);
318 int PKCS7_add_certificate(PKCS7 *p7, X509 *x509);
319 int PKCS7_add_crl(PKCS7 *p7, X509_CRL *x509);
320 int PKCS7_content_new(PKCS7 *p7, int nid);
321 int PKCS7_dataVerify(X509_STORE *cert_store, X509_STORE_CTX *ctx,
322 BIO *bio, PKCS7 *p7, PKCS7_SIGNER_INFO *si);
323 int PKCS7_signatureVerify(BIO *bio, PKCS7 *p7, PKCS7_SIGNER_INFO *si,
324 X509 *x509);

```

```

326 BIO *PKCS7_dataInit(PKCS7 *p7, BIO *bio);
327 int PKCS7_dataFinal(PKCS7 *p7, BIO *bio);
328 BIO *PKCS7_dataDecode(PKCS7 *p7, EVP_PKEY *pkey, BIO *in_bio, X509 *pcert);

331 PKCS7_SIGNER_INFO *PKCS7_add_signature(PKCS7 *p7, X509 *x509,
332 EVP_PKEY *pkey, const EVP_MD *dgst);
333 X509 *PKCS7_cert_from_signer_info(PKCS7 *p7, PKCS7_SIGNER_INFO *si);
334 int PKCS7_set_digest(PKCS7 *p7, const EVP_MD *md);
335 STACK_OF(PKCS7_SIGNER_INFO) *PKCS7_get_signer_info(PKCS7 *p7);

337 PKCS7_RECIP_INFO *PKCS7_add_recipient(PKCS7 *p7, X509 *x509);
338 void PKCS7_SIGNER_INFO_get0_algs(PKCS7_SIGNER_INFO *si, EVP_PKEY **pk,
339 X509_ALGOR **pdig, X509_ALGOR **psig);
340 void PKCS7_RECIP_INFO_get0_alg(PKCS7_RECIP_INFO *ri, X509_ALGOR **penc);
341 int PKCS7_add_recipient_info(PKCS7 *p7, PKCS7_RECIP_INFO *ri);
342 int PKCS7_RECIP_INFO_set(PKCS7_RECIP_INFO *p7i, X509 *x509);
343 int PKCS7_set_cipher(PKCS7 *p7, const EVP_CIPHER *cipher);
344 int PKCS7_stream(unsigned char **boundary, PKCS7 *p7);

346 PKCS7_ISSUER_AND_SERIAL *PKCS7_get_issuer_and_serial(PKCS7 *p7, int idx);
347 ASN1_OCTET_STRING *PKCS7_digest_from_attributes(STACK_OF(X509_ATTRIBUTE) *sk);
348 int PKCS7_add_signed_attribute(PKCS7_SIGNER_INFO *p7si, int nid, int type,
349 void *data);
350 int PKCS7_add_attribute(PKCS7_SIGNER_INFO *p7si, int nid, int atrtype,
351 void *value);
352 ASN1_TYPE *PKCS7_get_attribute(PKCS7_SIGNER_INFO *si, int nid);
353 ASN1_TYPE *PKCS7_get_signed_attribute(PKCS7_SIGNER_INFO *si, int nid);
354 int PKCS7_set_signed_attributes(PKCS7_SIGNER_INFO *p7si,
355 STACK_OF(X509_ATTRIBUTE) *sk);
356 int PKCS7_set_attributes(PKCS7_SIGNER_INFO *p7si, STACK_OF(X509_ATTRIBUTE) *sk);

359 PKCS7 *PKCS7_sign(X509 *signcert, EVP_PKEY *pkey, STACK_OF(X509) *certs,
360 BIO *data, int flags);

362 PKCS7_SIGNER_INFO *PKCS7_sign_add_signer(PKCS7 *p7,
363 X509 *signcert, EVP_PKEY *pkey, const EVP_MD *md,
364 int flags);

366 int PKCS7_final(PKCS7 *p7, BIO *data, int flags);
367 int PKCS7_verify(PKCS7 *p7, STACK_OF(X509) *certs, X509_STORE *store,
368 BIO *indata, BIO *out, int flags);
369 STACK_OF(X509) *PKCS7_get0_signers(PKCS7 *p7, STACK_OF(X509) *certs, int flags);
370 PKCS7 *PKCS7_encrypt(STACK_OF(X509) *certs, BIO *in, const EVP_CIPHER *cipher,
371 int flags);
372 int PKCS7_decrypt(PKCS7 *p7, EVP_PKEY *pkey, X509 *cert, BIO *data, int flags);

374 int PKCS7_add_attrib_smimecap(PKCS7_SIGNER_INFO *si,
375 STACK_OF(X509_ALGOR) *cap);
376 STACK_OF(X509_ALGOR) *PKCS7_get_smimecap(PKCS7_SIGNER_INFO *si);
377 int PKCS7_simple_smimecap(STACK_OF(X509_ALGOR) *sk, int nid, int arg);

379 int PKCS7_add_attrib_content_type(PKCS7_SIGNER_INFO *si, ASN1_OBJECT *coid);
380 int PKCS7_add0_attrib_signing_time(PKCS7_SIGNER_INFO *si, ASN1_TIME *t);
381 int PKCS7_add1_attrib_digest(PKCS7_SIGNER_INFO *si,
382 const unsigned char *md, int mdlen);

384 int SMIME_write_PKCS7(BIO *bio, PKCS7 *p7, BIO *data, int flags);
385 PKCS7 *SMIME_read_PKCS7(BIO *bio, BIO **bcont);

387 BIO *BIO_new_PKCS7(BIO *out, PKCS7 *p7);

390 /* BEGIN ERROR CODES */
391 /* The following lines are auto generated by the script mkerr.pl. Any changes

```

```

392  * made after this point may be overwritten when the script is next run.
393  */
394 void ERR_load_PKCS7_strings(void);

396 /* Error codes for the PKCS7 functions. */

398 /* Function codes. */
399 #define PKCS7_F_B64_READ_PKCS7 120
400 #define PKCS7_F_B64_WRITE_PKCS7 121
401 #define PKCS7_F_DO_PKCS7_SIGNED_ATTRIB 136
402 #define PKCS7_F_I2D_PKCS7_BIO_STREAM 140
403 #define PKCS7_F_PKCS7_ADD0_ATTRIB_SIGNING_TIME 135
404 #define PKCS7_F_PKCS7_ADD_ATTRIB_SMIMECAP 118
405 #define PKCS7_F_PKCS7_ADD_CERTIFICATE 100
406 #define PKCS7_F_PKCS7_ADD_CRL 101
407 #define PKCS7_F_PKCS7_ADD_RECIPIENT_INFO 102
408 #define PKCS7_F_PKCS7_ADD_SIGNATURE 131
409 #define PKCS7_F_PKCS7_ADD_SIGNER 103
410 #define PKCS7_F_PKCS7_BIO_ADD_DIGEST 125
411 #define PKCS7_F_PKCS7_COPY_EXISTING_DIGEST 138
412 #define PKCS7_F_PKCS7_CTRL 104
413 #define PKCS7_F_PKCS7_DATADECODE 112
414 #define PKCS7_F_PKCS7_DATAFINAL 128
415 #define PKCS7_F_PKCS7_DATAINIT 105
416 #define PKCS7_F_PKCS7_DATASIGN 106
417 #define PKCS7_F_PKCS7_DATAVERIFY 107
418 #define PKCS7_F_PKCS7_DECRYPT 114
419 #define PKCS7_F_PKCS7_DECRYPT_RINFO 133
420 #define PKCS7_F_PKCS7_ENCODE_RINFO 132
421 #define PKCS7_F_PKCS7_ENCRYPT 115
422 #define PKCS7_F_PKCS7_FINAL 134
423 #define PKCS7_F_PKCS7_FIND_DIGEST 127
424 #define PKCS7_F_PKCS7_GET0_SIGNERS 124
425 #define PKCS7_F_PKCS7_RECIP_INFO_SET 130
426 #define PKCS7_F_PKCS7_SET_CIPHER 108
427 #define PKCS7_F_PKCS7_SET_CONTENT 109
428 #define PKCS7_F_PKCS7_SET_DIGEST 126
429 #define PKCS7_F_PKCS7_SET_TYPE 110
430 #define PKCS7_F_PKCS7_SIGN 116
431 #define PKCS7_F_PKCS7_SIGNATUREVERIFY 113
432 #define PKCS7_F_PKCS7_SIGNER_INFO_SET 129
433 #define PKCS7_F_PKCS7_SIGNER_INFO_SIGN 139
434 #define PKCS7_F_PKCS7_SIGN_ADD_SIGNER 137
435 #define PKCS7_F_PKCS7_SIMPLE_SMIMECAP 119
436 #define PKCS7_F_PKCS7_VERIFY 117
437 #define PKCS7_F_SMIME_READ_PKCS7 122
438 #define PKCS7_F_SMIME_TEXT 123

```

```

440 /* Reason codes. */
441 #define PKCS7_R_CERTIFICATE_VERIFY_ERROR 117
442 #define PKCS7_R_CIPHER_HAS_NO_OBJECT_IDENTIFIER 144
443 #define PKCS7_R_CIPHER_NOT_INITIALIZED 116
444 #define PKCS7_R_CONTENT_AND_DATA_PRESENT 118
445 #define PKCS7_R_CTRL_ERROR 152
446 #define PKCS7_R_DECODE_ERROR 130
447 #define PKCS7_R_DECRYPTED_KEY_IS_WRONG_LENGTH 100
448 #define PKCS7_R_DECRYPT_ERROR 119
449 #define PKCS7_R_DIGEST_FAILURE 101
450 #define PKCS7_R_ENCRYPTION_CTRL_FAILURE 149
451 #define PKCS7_R_ENCRYPTION_NOT_SUPPORTED_FOR_THIS_KEY_TYPE 150
452 #define PKCS7_R_ERROR_ADDING_RECIPIENT 120
453 #define PKCS7_R_ERROR_SETTING_CIPHER 121
454 #define PKCS7_R_INVALID_MIME_TYPE 131
455 #define PKCS7_R_INVALID_NULL_POINTER 143
456 #define PKCS7_R_MIME_NO_CONTENT_TYPE 132
457 #define PKCS7_R_MIME_PARSE_ERROR 133

```

```

458 #define PKCS7_R_MIME_SIG_PARSE_ERROR 134
459 #define PKCS7_R_MISSING_CERIPEND_INFO 103
460 #define PKCS7_R_NO_CONTENT 122
461 #define PKCS7_R_NO_CONTENT_TYPE 135
462 #define PKCS7_R_NO_DEFAULT_DIGEST 151
463 #define PKCS7_R_NO_MATCHING_DIGEST_TYPE_FOUND 154
464 #define PKCS7_R_NO_MULTIPART_BODY_FAILURE 136
465 #define PKCS7_R_NO_MULTIPART_BOUNDARY 137
466 #define PKCS7_R_NO_RECIPIENT_MATCHES_CERTIFICATE 115
467 #define PKCS7_R_NO_RECIPIENT_MATCHES_KEY 146
468 #define PKCS7_R_NO_SIGNATURES_ON_DATA 123
469 #define PKCS7_R_NO_SIGNERS 142
470 #define PKCS7_R_NO_SIG_CONTENT_TYPE 138
471 #define PKCS7_R_OPERATION_NOT_SUPPORTED_ON_THIS_TYPE 104
472 #define PKCS7_R_PKCS7_ADD_SIGNATURE_ERROR 124
473 #define PKCS7_R_PKCS7_ADD_SIGNER_ERROR 153
474 #define PKCS7_R_PKCS7_DATAFINAL 126
475 #define PKCS7_R_PKCS7_DATAFINAL_ERROR 125
476 #define PKCS7_R_PKCS7_DATASIGN 145
477 #define PKCS7_R_PKCS7_PARSE_ERROR 139
478 #define PKCS7_R_PKCS7_SIG_PARSE_ERROR 140
479 #define PKCS7_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE 127
480 #define PKCS7_R_SIGNATURE_FAILURE 105
481 #define PKCS7_R_SIGNER_CERTIFICATE_NOT_FOUND 128
482 #define PKCS7_R_SIGNING_CTRL_FAILURE 147
483 #define PKCS7_R_SIGNING_NOT_SUPPORTED_FOR_THIS_KEY_TYPE 148
484 #define PKCS7_R_SIG_INVALID_MIME_TYPE 141
485 #define PKCS7_R_SMIME_TEXT_ERROR 129
486 #define PKCS7_R_UNABLE_TO_FIND_CERTIFICATE 106
487 #define PKCS7_R_UNABLE_TO_FIND_MEM_BIO 107
488 #define PKCS7_R_UNABLE_TO_FIND_MESSAGE_DIGEST 108
489 #define PKCS7_R_UNKNOWN_DIGEST_TYPE 109
490 #define PKCS7_R_UNKNOWN_OPERATION 110
491 #define PKCS7_R_UNSUPPORTED_CIPHER_TYPE 111
492 #define PKCS7_R_UNSUPPORTED_CONTENT_TYPE 112
493 #define PKCS7_R_WRONG_CONTENT_TYPE 113
494 #define PKCS7_R_WRONG_PKCS7_TYPE 114

496 #ifdef __cplusplus
497 }
498 #endif
499 #endif

```

new/usr/src/lib/openssl/include/openssl/pqueue.h

1

```
*****
3580 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/pqueue.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/pqueue/pqueue.h */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * Copyright (c) 1999-2005 The OpenSSL Project. All rights reserved.
8  *
9  * Redistribution and use in source and binary forms, with or without
10 * modification, are permitted provided that the following conditions
11 * are met:
12 *
13 * 1. Redistributions of source code must retain the above copyright
14 * notice, this list of conditions and the following disclaimer.
15 *
16 * 2. Redistributions in binary form must reproduce the above copyright
17 * notice, this list of conditions and the following disclaimer in
18 * the documentation and/or other materials provided with the
19 * distribution.
20 *
21 * 3. All advertising materials mentioning features or use of this
22 * software must display the following acknowledgment:
23 * "This product includes software developed by the OpenSSL Project
24 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
25 *
26 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
27 * endorse or promote products derived from this software without
28 * prior written permission. For written permission, please contact
29 * openssl-core@OpenSSL.org.
30 *
31 * 5. Products derived from this software may not be called "OpenSSL"
32 * nor may "OpenSSL" appear in their names without prior written
33 * permission of the OpenSSL Project.
34 *
35 * 6. Redistributions of any form whatsoever must retain the following
36 * acknowledgment:
37 * "This product includes software developed by the OpenSSL Project
38 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
39 *
40 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
41 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
42 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
43 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
44 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
45 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
46 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
47 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
49 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
50 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 *
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */

60 #ifndef HEADER_PQUEUE_H
61 #define HEADER_PQUEUE_H
```

new/usr/src/lib/openssl/include/openssl/pqueue.h

2

```
63 #include <stdio.h>
64 #include <stdlib.h>
65 #include <string.h>

67 typedef struct _pqueue *pqueue;

69 typedef struct _pitem
70 {
71     unsigned char priority[8]; /* 64-bit value in big-endian encoding */
72     void *data;
73     struct _pitem *next;
74 } pitem;

76 typedef struct _pitem *piterator;

78 pitem *pitem_new(unsigned char *prio64be, void *data);
79 void pitem_free(pitem *item);

81 pqueue pqueue_new(void);
82 void pqueue_free(pqueue pq);

84 pitem *pqueue_insert(pqueue pq, pitem *item);
85 pitem *pqueue_peek(pqueue pq);
86 pitem *pqueue_pop(pqueue pq);
87 pitem *pqueue_find(pqueue pq, unsigned char *prio64be);
88 pitem *pqueue_iterator(pqueue pq);
89 pitem *pqueue_next(piterator *iter);

91 void pqueue_print(pqueue pq);
92 int pqueue_size(pqueue pq);

94 #endif /* ! HEADER_PQUEUE_H */
```

new/usr/src/lib/openssl/include/openssl/rand.h

1

```
*****
5578 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/rand.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rand/rand.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_RAND_H
60 #define HEADER_RAND_H
```

new/usr/src/lib/openssl/include/openssl/rand.h

2

```
62 #include <stdlib.h>
63 #include <openssl/openssl_typ.h>
64 #include <openssl/e_os2.h>

66 #if defined(OPENSSL_SYS_WINDOWS)
67 #include <windows.h>
68 #endif

70 #ifdef __cplusplus
71 extern "C" {
72 #endif

74 #if defined(OPENSSL_FIPS)
75 #define FIPS_RAND_SIZE_T size_t
76 #endif

78 /* Already defined in openssl_typ.h */
79 /* typedef struct rand_meth_st RAND_METHOD; */

81 struct rand_meth_st
82 {
83     void (*seed)(const void *buf, int num);
84     int (*bytes)(unsigned char *buf, int num);
85     void (*cleanup)(void);
86     void (*add)(const void *buf, int num, double entropy);
87     int (*pseudorand)(unsigned char *buf, int num);
88     int (*status)(void);
89 };

91 #ifdef BN_DEBUG
92 extern int rand_predictable;
93 #endif

95 int RAND_set_rand_method(const RAND_METHOD *meth);
96 const RAND_METHOD *RAND_get_rand_method(void);
97 #ifndef OPENSSL_NO_ENGINE
98 int RAND_set_rand_engine(ENGINE *engine);
99 #endif
100 RAND_METHOD *RAND_SSLeay(void);
101 void RAND_cleanup(void);
102 int RAND_bytes(unsigned char *buf,int num);
103 int RAND_pseudo_bytes(unsigned char *buf,int num);
104 void RAND_seed(const void *buf,int num);
105 void RAND_add(const void *buf,int num,double entropy);
106 int RAND_load_file(const char *file,long max_bytes);
107 int RAND_write_file(const char *file);
108 const char *RAND_file_name(char *file,size_t num);
109 int RAND_status(void);
110 int RAND_query_egd_bytes(const char *path, unsigned char *buf, int bytes);
111 int RAND_egd(const char *path);
112 int RAND_egd_bytes(const char *path,int bytes);
113 int RAND_poll(void);

115 #if defined(OPENSSL_SYS_WINDOWS) || defined(OPENSSL_SYS_WIN32)

117 void RAND_screen(void);
118 int RAND_event(UINT, WPARAM, LPARAM);

120 #endif

122 #ifdef OPENSSL_FIPS
123 void RAND_set_fips_drbg_type(int type, int flags);
124 int RAND_init_fips(void);
125 #endif

127 /* BEGIN ERROR CODES */
```

```
128 /* The following lines are auto generated by the script mkerr.pl. Any changes
129 * made after this point may be overwritten when the script is next run.
130 */
131 void ERR_load_RAND_strings(void);

133 /* Error codes for the RAND functions. */

135 /* Function codes. */
136 #define RAND_F_RAND_GET_RAND_METHOD          101
137 #define RAND_F_RAND_INIT_FIPS                102
138 #define RAND_F_SSLEAY_RAND_BYTES             100

140 /* Reason codes. */
141 #define RAND_R_DUAL_EC_DRBG_DISABLED         104
142 #define RAND_R_ERROR_INITIALISING_DRBG       102
143 #define RAND_R_ERROR_INSTANTIATING_DRBG      103
144 #define RAND_R_NO_FIPS_RANDOM_METHOD_SET     101
145 #define RAND_R_PRNG_NOT_SEEDED               100

147 #ifdef __cplusplus
148 }
149 #endif
150 #endif
```

new/usr/src/lib/openssl/include/openssl/rc2.h

1

```
*****
4405 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/rc2.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rc2/rc2.h */
2 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_RC2_H
60 #define HEADER_RC2_H
```

new/usr/src/lib/openssl/include/openssl/rc2.h

2

```
62 #include <openssl/opensslconf.h> /* OPENSSSL_NO_RC2, RC2_INT */
63 #ifndef OPENSSSL_NO_RC2
64 #error RC2 is disabled.
65 #endif

67 #define RC2_ENCRYPT 1
68 #define RC2_DECRYPT 0

70 #define RC2_BLOCK 8
71 #define RC2_KEY_LENGTH 16

73 #ifdef __cplusplus
74 extern "C" {
75 #endif

77 typedef struct rc2_key_st
78 {
79     RC2_INT data[64];
80     } RC2_KEY;

82 #ifndef OPENSSSL_FIPS
83 void private_RC2_set_key(RC2_KEY *key, int len, const unsigned char *data,int bi
84 #endif
85 void RC2_set_key(RC2_KEY *key, int len, const unsigned char *data,int bits);
86 void RC2_ecb_encrypt(const unsigned char *in,unsigned char *out,RC2_KEY *key,
87     int enc);
88 void RC2_encrypt(unsigned long *data,RC2_KEY *key);
89 void RC2_decrypt(unsigned long *data,RC2_KEY *key);
90 void RC2_cbc_encrypt(const unsigned char *in, unsigned char *out, long length,
91     RC2_KEY *ks, unsigned char *iv, int enc);
92 void RC2_cfb64_encrypt(const unsigned char *in, unsigned char *out,
93     long length, RC2_KEY *schedule, unsigned char *ivec,
94     int *num, int enc);
95 void RC2_ofb64_encrypt(const unsigned char *in, unsigned char *out,
96     long length, RC2_KEY *schedule, unsigned char *ivec,
97     int *num);

99 #ifdef __cplusplus
100 }
101 #endif

103 #endif
```

new/usr/src/lib/openssl/include/openssl/rc4.h

1

3797 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/rc4.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/rc4/rc4.h */
2 /* Copyright (C) 1995-1997 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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32 * must display the following acknowledgement:
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34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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51 * SUCH DAMAGE.
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56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_RC4_H
60 #define HEADER_RC4_H
```

new/usr/src/lib/openssl/include/openssl/rc4.h

2

```
62 #include <openssl/opensslconf.h> /* OPENSSSL_NO_RC4, RC4_INT */
63 #ifndef OPENSSSL_NO_RC4
64 #error RC4 is disabled.
65 #endif
67 #include <stddef.h>
69 #ifdef __cplusplus
70 extern "C" {
71 #endif
73 typedef struct rc4_key_st
74 {
75     RC4_INT x,y;
76     RC4_INT data[256];
77 } RC4_KEY;
79
80 const char *RC4_options(void);
81 void RC4_set_key(RC4_KEY *key, int len, const unsigned char *data);
82 void private_RC4_set_key(RC4_KEY *key, int len, const unsigned char *data);
83 void RC4(RC4_KEY *key, size_t len, const unsigned char *indata,
84          unsigned char *outdata);
86 #ifdef __cplusplus
87 }
88 #endif
90 #endif
```

new/usr/src/lib/openssl/include/openssl/ripemd.h

1

```
*****
4327 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/ripemd.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ripemd/ripemd.h */
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5  * This package is an SSL implementation written
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8  *
9  * This library is free for commercial and non-commercial use as long as
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57 */
59 #ifndef HEADER_RIPEMD_H
60 #define HEADER_RIPEMD_H
```

new/usr/src/lib/openssl/include/openssl/ripemd.h

2

```
62 #include <openssl/e_os2.h>
63 #include <stddef.h>
64
65 #ifdef __cplusplus
66 extern "C" {
67 #endif
68
69 #ifndef OPENSSL_NO_RIPEMD
70 #error RIPEMD is disabled.
71 #endif
72
73 #if defined(__LP32__)
74 #define RIPEMD160_LONG unsigned long
75 #elif defined(OPENSSL_SYS_CRAY) || defined(__ILP64__)
76 #define RIPEMD160_LONG unsigned long
77 #define RIPEMD160_LONG_LOG2 3
78 #else
79 #define RIPEMD160_LONG unsigned int
80 #endif
81
82 #define RIPEMD160_CBLOCK 64
83 #define RIPEMD160_LBLOCK (RIPEMD160_CBLOCK/4)
84 #define RIPEMD160_DIGEST_LENGTH 20
85
86 typedef struct RIPEMD160state_st
87 {
88     RIPEMD160_LONG A,B,C,D,E;
89     RIPEMD160_LONG Nl,Nh;
90     RIPEMD160_LONG data[RIPEMD160_LBLOCK];
91     unsigned int num;
92 } RIPEMD160_CTX;
93
94 #ifndef OPENSSL_FIPS
95 int private_RIPEMD160_Init(RIPEMD160_CTX *c);
96 #endif
97 int RIPEMD160_Init(RIPEMD160_CTX *c);
98 int RIPEMD160_Update(RIPEMD160_CTX *c, const void *data, size_t len);
99 int RIPEMD160_Final(unsigned char *md, RIPEMD160_CTX *c);
100 unsigned char *RIPEMD160(const unsigned char *d, size_t n,
101     unsigned char *md);
102 void RIPEMD160_Transform(RIPEMD160_CTX *c, const unsigned char *b);
103 #ifdef __cplusplus
104 }
105 #endif
107 #endif
```


new/usr/src/lib/openssl/include/openssl/rsa.h

1

22870 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/rsa.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/rsa/rsa.h */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef HEADER_RSA_H
60 #define HEADER_RSA_H
```

new/usr/src/lib/openssl/include/openssl/rsa.h

2

```
62 #include <openssl/asn1.h>
```

```
64 #ifndef OPENSSL_NO_BIO
65 #include <openssl/bio.h>
66 #endif
67 #include <openssl/crypto.h>
68 #include <openssl/ssl_typ.h>
69 #ifndef OPENSSL_NO_DEPRECATED
70 #include <openssl/bn.h>
71 #endif
```

```
73 #ifdef OPENSSL_NO_RSA
74 #error RSA is disabled.
75 #endif
```

```
77 #ifdef __cplusplus
78 extern "C" {
79 #endif
```

```
81 /* Declared already in ssl_typ.h */
82 /* typedef struct rsa_st RSA; */
83 /* typedef struct rsa_meth_st RSA_METHOD; */
```

```
85 struct rsa_meth_st
86 {
87     const char *name;
88     int (*rsa_pub_enc)(int flen, const unsigned char *from,
89                        unsigned char *to,
90                        RSA *rsa, int padding);
91     int (*rsa_pub_dec)(int flen, const unsigned char *from,
92                        unsigned char *to,
93                        RSA *rsa, int padding);
94     int (*rsa_priv_enc)(int flen, const unsigned char *from,
95                         unsigned char *to,
96                         RSA *rsa, int padding);
97     int (*rsa_priv_dec)(int flen, const unsigned char *from,
98                         unsigned char *to,
99                         RSA *rsa, int padding);
100     int (*rsa_mod_exp)(BIGNUM *r0, const BIGNUM *I, RSA *rsa, BN_CTX *ctx); /*
101     int (*bn_mod_exp)(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
102                      const BIGNUM *m, BN_CTX *ctx,
103                      BN_MONT_CTX *m_ctx); /* Can be null */
104     int (*init)(RSA *rsa); /* called at new */
105     int (*finish)(RSA *rsa); /* called at free */
106     int flags; /* RSA_METHOD_FLAG_* things */
107     char *app_data; /* may be needed! */
108     /* New sign and verify functions: some libraries don't allow arbitrary data
109     * to be signed/verified: this allows them to be used. Note: for this to work
110     * the RSA_public_decrypt() and RSA_private_encrypt() should *NOT* be used
111     * RSA_sign(), RSA_verify() should be used instead. Note: for backwards
112     * compatibility this functionality is only enabled if the RSA_FLAG_SIGN_VER
113     * option is set in 'flags'.
114     */
115     int (*rsa_sign)(int type,
116                     const unsigned char *m, unsigned int m_length,
117                     unsigned char *sigret, unsigned int *siglen, const RSA *rsa);
118     int (*rsa_verify)(int dtype,
119                       const unsigned char *m, unsigned int m_length,
120                       const unsigned char *sigbuf, unsigned int siglen,
121                       const RSA *rsa);
122     /* If this callback is NULL, the builtin software RSA key-gen will be used. This
123     * is for behavioural compatibility whilst the code gets rewired, but one day
124     * it would be nice to assume there are no such things as "builtin software"
125     * implementations. */
126     int (*rsa_keygen)(RSA *rsa, int bits, BIGNUM *e, BN_GENCB *cb);
127     };
```

```

129 struct rsa_st
130 {
131     /* The first parameter is used to pickup errors where
132      * this is passed instead of aEVP_PKEY, it is set to 0 */
133     int pad;
134     long version;
135     const RSA_METHOD *meth;
136     /* functional reference if 'meth' is ENGINE-provided */
137     ENGINE *engine;
138     BIGNUM *n;
139     BIGNUM *e;
140     BIGNUM *d;
141     BIGNUM *p;
142     BIGNUM *q;
143     BIGNUM *dmp1;
144     BIGNUM *dmq1;
145     BIGNUM *iqmp;
146     /* be careful using this if the RSA structure is shared */
147     CRYPTO_EX_DATA ex_data;
148     int references;
149     int flags;

151     /* Used to cache montgomery values */
152     BN_MONT_CTX *_method_mod_n;
153     BN_MONT_CTX *_method_mod_p;
154     BN_MONT_CTX *_method_mod_q;

156     /* all BIGNUM values are actually in the following data, if it is not
157      * NULL */
158     char *bignum_data;
159     BN_BLINDING *blinding;
160     BN_BLINDING *mt_blinding;
161 };

163 #ifndef OPENSSL_RSA_MAX_MODULUS_BITS
164 # define OPENSSL_RSA_MAX_MODULUS_BITS 16384
165 #endif

167 #ifndef OPENSSL_RSA_SMALL_MODULUS_BITS
168 # define OPENSSL_RSA_SMALL_MODULUS_BITS 3072
169 #endif
170 #ifndef OPENSSL_RSA_MAX_PUBEXP_BITS
171 # define OPENSSL_RSA_MAX_PUBEXP_BITS 64 /* exponent limit enforced for "large
172 #endif

174 #define RSA_3 0x3L
175 #define RSA_F4 0x10001L

177 #define RSA_METHOD_FLAG_NO_CHECK 0x0001 /* don't check pub/private match

179 #define RSA_FLAG_CACHE_PUBLIC 0x0002
180 #define RSA_FLAG_CACHE_PRIVATE 0x0004
181 #define RSA_FLAG_BLINDING 0x0008
182 #define RSA_FLAG_THREAD_SAFE 0x0010
183 /* This flag means the private key operations will be handled by rsa_mod_exp
184  * and that they do not depend on the private key components being present:
185  * for example a key stored in external hardware. Without this flag bn_mod_exp
186  * gets called when private key components are absent.
187  */
188 #define RSA_FLAG_EXT_PKEY 0x0020

190 /* This flag in the RSA_METHOD enables the new rsa_sign, rsa_verify functions.
191  */
192 #define RSA_FLAG_SIGN_VER 0x0040

```

```

194 #define RSA_FLAG_NO_BLINDING 0x0080 /* new with 0.9.6j and 0.9.7b; th
195     /* RSA implementation now uses bl
196     /* default (ignoring RSA_FLAG_BLI
197     /* but other engines might not ne
198     */
199 #define RSA_FLAG_NO_CONSTTIME 0x0100 /* new with 0.9.8f; the built-in
200     /* implementation now uses consta
201     /* operations by default in priva
202     /* e.g., constant time modular ex
203     /* modular inverse without leakin
204     /* division without leaking branc
205     /* flag disables these constant t
206     /* operations and results in fast
207     /* private key operations.
208     */
209 #ifndef OPENSSL_NO_DEPRECATED
210 #define RSA_FLAG_NO_EXP_CONSTTIME RSA_FLAG_NO_CONSTTIME /* deprecated name for t
211     /* new with 0.9.7h; the built-in
212     /* implementation now uses consta
213     /* modular exponentiation for sec
214     /* by default. This flag causes t
215     /* faster variable sliding window
216     /* be used for all exponents.
217     */
218 #endif

221 #define EVP_PKEY_CTX_set_rsa_padding(ctx, pad) \
222     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, -1, EVP_PKEY_CTRL_RSA_PADDING, \
223         pad, NULL)

225 #define EVP_PKEY_CTX_get_rsa_padding(ctx, ppad) \
226     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, -1, \
227         EVP_PKEY_CTRL_GET_RSA_PADDING, 0, ppad)

229 #define EVP_PKEY_CTX_set_rsa_pss_saltlen(ctx, len) \
230     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, \
231         (EVP_PKEY_OP_SIGN|EVP_PKEY_OP_VERIFY), \
232         EVP_PKEY_CTRL_RSA_PSS_SALTLEN, \
233         len, NULL)

235 #define EVP_PKEY_CTX_get_rsa_pss_saltlen(ctx, plen) \
236     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, \
237         (EVP_PKEY_OP_SIGN|EVP_PKEY_OP_VERIFY), \
238         EVP_PKEY_CTRL_GET_RSA_PSS_SALTLEN, \
239         0, plen)

241 #define EVP_PKEY_CTX_set_rsa_keygen_bits(ctx, bits) \
242     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, EVP_PKEY_OP_KEYGEN, \
243         EVP_PKEY_CTRL_RSA_KEYGEN_BITS, bits, NULL)

245 #define EVP_PKEY_CTX_set_rsa_keygen_pubexp(ctx, pubexp) \
246     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, EVP_PKEY_OP_KEYGEN, \
247         EVP_PKEY_CTRL_RSA_KEYGEN_PUBEXP, 0, pubexp)

249 #define EVP_PKEY_CTX_set_rsa_mgf1_md(ctx, md) \
250     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, EVP_PKEY_OP_TYPE_SIG, \
251         EVP_PKEY_CTRL_RSA_MGF1_MD, 0, (void *)md)

253 #define EVP_PKEY_CTX_get_rsa_mgf1_md(ctx, pmd) \
254     EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_RSA, EVP_PKEY_OP_TYPE_SIG, \
255         EVP_PKEY_CTRL_GET_RSA_MGF1_MD, 0, (void *)pmd)

257 #define EVP_PKEY_CTRL_RSA_PADDING (EVP_PKEY_ALG_CTRL + 1)
258 #define EVP_PKEY_CTRL_RSA_PSS_SALTLEN (EVP_PKEY_ALG_CTRL + 2)

```

```

260 #define EVP_PKEY_CTRL_RSA_KEYGEN_BITS (EVP_PKEY_ALG_CTRL + 3)
261 #define EVP_PKEY_CTRL_RSA_KEYGEN_PUBEXP (EVP_PKEY_ALG_CTRL + 4)
262 #define EVP_PKEY_CTRL_RSA_MGF1_MD (EVP_PKEY_ALG_CTRL + 5)

264 #define EVP_PKEY_CTRL_GET_RSA_PADDING (EVP_PKEY_ALG_CTRL + 6)
265 #define EVP_PKEY_CTRL_GET_RSA_PSS_SALTLEN (EVP_PKEY_ALG_CTRL + 7)
266 #define EVP_PKEY_CTRL_GET_RSA_MGF1_MD (EVP_PKEY_ALG_CTRL + 8)

268 #define RSA_PKCS1_PADDING 1
269 #define RSA_SSLV23_PADDING 2
270 #define RSA_NO_PADDING 3
271 #define RSA_PKCS1_OAEP_PADDING 4
272 #define RSA_X931_PADDING 5
273 /* EVP_PKEY_ only */
274 #define RSA_PKCS1_PSS_PADDING 6

276 #define RSA_PKCS1_PADDING_SIZE 11

278 #define RSA_set_app_data(s,arg) RSA_set_ex_data(s,0,arg)
279 #define RSA_get_app_data(s) RSA_get_ex_data(s,0)

281 RSA * RSA_new(void);
282 RSA * RSA_new_method(ENGINE *engine);
283 int RSA_size(const RSA *rsa);

285 /* Deprecated version */
286 #ifndef OPENSSL_NO_DEPRECATED
287 RSA * RSA_generate_key(int bits, unsigned long e,void
288 (*callback)(int,int,void *),void *cb_arg);
289 #endif /* !defined(OPENSSL_NO_DEPRECATED) */

291 /* New version */
292 int RSA_generate_key_ex(RSA *rsa, int bits, BIGNUM *e, BN_GENCB *cb);

294 int RSA_check_key(const RSA *);
295 /* next 4 return -1 on error */
296 int RSA_public_encrypt(int flen, const unsigned char *from,
297 unsigned char *to, RSA *rsa,int padding);
298 int RSA_private_encrypt(int flen, const unsigned char *from,
299 unsigned char *to, RSA *rsa,int padding);
300 int RSA_public_decrypt(int flen, const unsigned char *from,
301 unsigned char *to, RSA *rsa,int padding);
302 int RSA_private_decrypt(int flen, const unsigned char *from,
303 unsigned char *to, RSA *rsa,int padding);
304 void RSA_free (RSA *r);
305 /* "up" the RSA object's reference count */
306 int RSA_up_ref(RSA *r);

308 int RSA_flags(const RSA *r);

310 void RSA_set_default_method(const RSA_METHOD *meth);
311 const RSA_METHOD *RSA_get_default_method(void);
312 const RSA_METHOD *RSA_get_method(const RSA *rsa);
313 int RSA_set_method(RSA *rsa, const RSA_METHOD *meth);

315 /* This function needs the memory locking malloc callbacks to be installed */
316 int RSA_memory_lock(RSA *r);

318 /* these are the actual SSLeay RSA functions */
319 const RSA_METHOD *RSA_PKCS1_SSLeay(void);

321 const RSA_METHOD *RSA_null_method(void);

323 DECLARE_ASN1_ENCODE_FUNCTIONS_const(RSA, RSAPublicKey)
324 DECLARE_ASN1_ENCODE_FUNCTIONS_const(RSA, RSAPrivateKey)

```

```

326 typedef struct rsa_pss_params_st
327 {
328     X509_ALGOR *hashAlgorithm;
329     X509_ALGOR *maskGenAlgorithm;
330     ASN1_INTEGER *saltLength;
331     ASN1_INTEGER *trailerField;
332 } RSA_PSS_PARAMS;

334 DECLARE_ASN1_FUNCTIONS(RSA_PSS_PARAMS)

336 #ifndef OPENSSL_NO_FP_API
337 int RSA_print_fp(FILE *fp, const RSA *r,int offset);
338 #endif

340 #ifndef OPENSSL_NO_BIO
341 int RSA_print(BIO *bp, const RSA *r,int offset);
342 #endif

344 #ifndef OPENSSL_NO_RC4
345 int i2d_RSA_NET(const RSA *a, unsigned char **pp,
346 int (*cb)(char *buf, int len, const char *prompt, int verify),
347 int sgckey);
348 RSA *d2i_RSA_NET(RSA **a, const unsigned char **pp, long length,
349 int (*cb)(char *buf, int len, const char *prompt, int verify),
350 int sgckey);

352 int i2d_Netscape_RSA(const RSA *a, unsigned char **pp,
353 int (*cb)(char *buf, int len, const char *prompt,
354 int verify));
355 RSA *d2i_Netscape_RSA(RSA **a, const unsigned char **pp, long length,
356 int (*cb)(char *buf, int len, const char *prompt,
357 int verify));
358 #endif

360 /* The following 2 functions sign and verify a X509_SIG ASN1 object
361 * inside PKCS#1 padded RSA encryption */
362 int RSA_sign(int type, const unsigned char *m, unsigned int m_length,
363 unsigned char *sigret, unsigned int *siglen, RSA *rsa);
364 int RSA_verify(int type, const unsigned char *m, unsigned int m_length,
365 const unsigned char *sigbuf, unsigned int siglen, RSA *rsa);

367 /* The following 2 function sign and verify a ASN1_OCTET_STRING
368 * object inside PKCS#1 padded RSA encryption */
369 int RSA_sign_ASN1_OCTET_STRING(int type,
370 const unsigned char *m, unsigned int m_length,
371 unsigned char *sigret, unsigned int *siglen, RSA *rsa);
372 int RSA_verify_ASN1_OCTET_STRING(int type,
373 const unsigned char *m, unsigned int m_length,
374 unsigned char *sigbuf, unsigned int siglen, RSA *rsa);

376 int RSA_blinding_on(RSA *rsa, BN_CTX *ctx);
377 void RSA_blinding_off(RSA *rsa);
378 BN_BLINDING *RSA_setup_blinding(RSA *rsa, BN_CTX *ctx);

380 int RSA_padding_add_PKCS1_type_1(unsigned char *to,int tlen,
381 const unsigned char *f,int fl);
382 int RSA_padding_check_PKCS1_type_1(unsigned char *to,int tlen,
383 const unsigned char *f,int fl,int rsa_len);
384 int RSA_padding_add_PKCS1_type_2(unsigned char *to,int tlen,
385 const unsigned char *f,int fl);
386 int RSA_padding_check_PKCS1_type_2(unsigned char *to,int tlen,
387 const unsigned char *f,int fl,int rsa_len);
388 int PKCS1_MGF1(unsigned char *mask, long len,
389 const unsigned char *seed, long seedlen, const EVP_MD *dgst);
390 int RSA_padding_add_PKCS1_OAEP(unsigned char *to,int tlen,
391 const unsigned char *f,int fl,

```

```

392     const unsigned char *p,int pl);
393 int RSA_padding_check_PKCS1_OAEP(unsigned char *to,int tlen,
394     const unsigned char *f,int fl,int rsa_len,
395     const unsigned char *p,int pl);
396 int RSA_padding_add_SSLv23(unsigned char *to,int tlen,
397     const unsigned char *f,int fl);
398 int RSA_padding_check_SSLv23(unsigned char *to,int tlen,
399     const unsigned char *f,int fl,int rsa_len);
400 int RSA_padding_add_none(unsigned char *to,int tlen,
401     const unsigned char *f,int fl);
402 int RSA_padding_check_none(unsigned char *to,int tlen,
403     const unsigned char *f,int fl,int rsa_len);
404 int RSA_padding_add_X931(unsigned char *to,int tlen,
405     const unsigned char *f,int fl);
406 int RSA_padding_check_X931(unsigned char *to,int tlen,
407     const unsigned char *f,int fl,int rsa_len);
408 int RSA_X931_hash_id(int nid);

410 int RSA_verify_PKCS1_PSS(RSA *rsa, const unsigned char *mHash,
411     const EVP_MD *Hash, const unsigned char *EM, int sLen);
412 int RSA_padding_add_PKCS1_PSS(RSA *rsa, unsigned char *EM,
413     const unsigned char *mHash,
414     const EVP_MD *Hash, int sLen);

416 int RSA_verify_PKCS1_PSS_mgf1(RSA *rsa, const unsigned char *mHash,
417     const EVP_MD *Hash, const EVP_MD *mgf1Hash,
418     const unsigned char *EM, int sLen);

420 int RSA_padding_add_PKCS1_PSS_mgf1(RSA *rsa, unsigned char *EM,
421     const unsigned char *mHash,
422     const EVP_MD *Hash, const EVP_MD *mgf1Hash, int sLen);

424 int RSA_get_ex_new_index(long arg1, void *argp, CRYPTO_EX_new *new_func,
425     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
426 int RSA_set_ex_data(RSA *r,int idx,void *arg);
427 void *RSA_get_ex_data(const RSA *r, int idx);

429 RSA *RSAPublicKey_dup(RSA *rsa);
430 RSA *RSAPrivateKey_dup(RSA *rsa);

432 /* If this flag is set the RSA method is FIPS compliant and can be used
433  * in FIPS mode. This is set in the validated module method. If an
434  * application sets this flag in its own methods it is its responsibility
435  * to ensure the result is compliant.
436  */

438 #define RSA_FLAG_FIPS_METHOD                0x0400

440 /* If this flag is set the operations normally disabled in FIPS mode are
441  * permitted it is then the applications responsibility to ensure that the
442  * usage is compliant.
443  */

445 #define RSA_FLAG_NON_FIPS_ALLOW              0x0400
446 /* Application has decided PRNG is good enough to generate a key: don't
447  * check.
448  */

449 #define RSA_FLAG_CHECKED                     0x0800

451 /* BEGIN ERROR CODES */
452 /* The following lines are auto generated by the script mkerr.pl. Any changes
453  * made after this point may be overwritten when the script is next run.
454  */
455 void ERR_load_RSA_strings(void);

457 /* Error codes for the RSA functions. */

```

```

459 /* Function codes. */
460 #define RSA_F_CHECK_PADDING_MD                140
461 #define RSA_F_DO_RSA_PRINT                    146
462 #define RSA_F_INT_RSA_VERIFY                  145
463 #define RSA_F_MEMORY_LOCK                     100
464 #define RSA_F_OLD_RSA_PRIV_DECODE             147
465 #define RSA_F_PKEY_RSA_CTRL                   143
466 #define RSA_F_PKEY_RSA_CTRL_STR               144
467 #define RSA_F_PKEY_RSA_SIGN                   142
468 #define RSA_F_PKEY_RSA_VERIFY                 154
469 #define RSA_F_PKEY_RSA_VERIFYRECOVER          141
470 #define RSA_F_RSA_BUILTIN_KEYGEN              129
471 #define RSA_F_RSA_CHECK_KEY                   123
472 #define RSA_F_RSA_EAY_PRIVATE_DECRYPT          101
473 #define RSA_F_RSA_EAY_PRIVATE_ENCRYPT          102
474 #define RSA_F_RSA_EAY_PUBLIC_DECRYPT           103
475 #define RSA_F_RSA_EAY_PUBLIC_ENCRYPT           104
476 #define RSA_F_RSA_GENERATE_KEY                105
477 #define RSA_F_RSA_GENERATE_KEY_EX             155
478 #define RSA_F_RSA_ITEM_VERIFY                 156
479 #define RSA_F_RSA_MEMORY_LOCK                 130
480 #define RSA_F_RSA_NEW_METHOD                  106
481 #define RSA_F_RSA_NULL                        124
482 #define RSA_F_RSA_NULL_MOD_EXP                 131
483 #define RSA_F_RSA_NULL_PRIVATE_DECRYPT          132
484 #define RSA_F_RSA_NULL_PRIVATE_ENCRYPT          133
485 #define RSA_F_RSA_NULL_PUBLIC_DECRYPT           134
486 #define RSA_F_RSA_NULL_PUBLIC_ENCRYPT           135
487 #define RSA_F_RSA_PADDING_ADD_NONE             107
488 #define RSA_F_RSA_PADDING_ADD_PKCS1_OAEP       121
489 #define RSA_F_RSA_PADDING_ADD_PKCS1_PSS        125
490 #define RSA_F_RSA_PADDING_ADD_PKCS1_PSS_MGF1   148
491 #define RSA_F_RSA_PADDING_ADD_PKCS1_TYPE_1     108
492 #define RSA_F_RSA_PADDING_ADD_PKCS1_TYPE_2     109
493 #define RSA_F_RSA_PADDING_ADD_SSLV23           110
494 #define RSA_F_RSA_PADDING_ADD_X931             127
495 #define RSA_F_RSA_PADDING_CHECK_NONE            111
496 #define RSA_F_RSA_PADDING_CHECK_PKCS1_OAEP      122
497 #define RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_1    112
498 #define RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_2    113
499 #define RSA_F_RSA_PADDING_CHECK_SSLV23          114
500 #define RSA_F_RSA_PADDING_CHECK_X931            128
501 #define RSA_F_RSA_PRINT                         115
502 #define RSA_F_RSA_PRINT_FP                      116
503 #define RSA_F_RSA_PRIVATE_DECRYPT               150
504 #define RSA_F_RSA_PRIVATE_ENCRYPT               151
505 #define RSA_F_RSA_PRIV_DECODE                  137
506 #define RSA_F_RSA_PRIV_ENCODE                  138
507 #define RSA_F_RSA_PUBLIC_DECRYPT                152
508 #define RSA_F_RSA_PUBLIC_ENCRYPT                153
509 #define RSA_F_RSA_PUB_DECODE                   139
510 #define RSA_F_RSA_SETUP_BLINDING               136
511 #define RSA_F_RSA_SIGN                          117
512 #define RSA_F_RSA_SIGN_ASN1_OCTET_STRING       118
513 #define RSA_F_RSA_VERIFY                       119
514 #define RSA_F_RSA_VERIFY_ASN1_OCTET_STRING     120
515 #define RSA_F_RSA_VERIFY_PKCS1_PSS            126
516 #define RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1        149

518 /* Reason codes. */
519 #define RSA_R_ALGORITHM_MISMATCH               100
520 #define RSA_R_BAD_E_VALUE                      101
521 #define RSA_R_BAD_FIXED_HEADER_DECRYPT          102
522 #define RSA_R_BAD_PAD_BYTE_COUNT              103
523 #define RSA_R_BAD_SIGNATURE                    104

```

```
524 #define RSA_R_BLOCK_TYPE_IS_NOT_01 106
525 #define RSA_R_BLOCK_TYPE_IS_NOT_02 107
526 #define RSA_R_DATA_GREATER_THAN_MOD_LEN 108
527 #define RSA_R_DATA_TOO_LARGE 109
528 #define RSA_R_DATA_TOO_LARGE_FOR_KEY_SIZE 110
529 #define RSA_R_DATA_TOO_LARGE_FOR_MODULUS 132
530 #define RSA_R_DATA_TOO_SMALL 111
531 #define RSA_R_DATA_TOO_SMALL_FOR_KEY_SIZE 122
532 #define RSA_R_DIGEST_TOO_BIG_FOR_RSA_KEY 112
533 #define RSA_R_DMP1_NOT_CONGRUENT_TO_D 124
534 #define RSA_R_DMQ1_NOT_CONGRUENT_TO_D 125
535 #define RSA_R_D_E_NOT_CONGRUENT_TO_1 123
536 #define RSA_R_FIRST_OCTET_INVALID 133
537 #define RSA_R_ILLEGAL_OR_UNSUPPORTED_PADDING_MODE 144
538 #define RSA_R_INVALID_DIGEST_LENGTH 143
539 #define RSA_R_INVALID_HEADER 137
540 #define RSA_R_INVALID_KEYBITS 145
541 #define RSA_R_INVALID_MESSAGE_LENGTH 131
542 #define RSA_R_INVALID_MGF1_MD 156
543 #define RSA_R_INVALID_PADDING 138
544 #define RSA_R_INVALID_PADDING_MODE 141
545 #define RSA_R_INVALID_PSS_PARAMETERS 149
546 #define RSA_R_INVALID_PSS_SALTLEN 146
547 #define RSA_R_INVALID_SALT_LENGTH 150
548 #define RSA_R_INVALID_TRAILER 139
549 #define RSA_R_INVALID_X931_DIGEST 142
550 #define RSA_R_IQMP_NOT_INVERSE_OF_Q 126
551 #define RSA_R_KEY_SIZE_TOO_SMALL 120
552 #define RSA_R_LAST_OCTET_INVALID 134
553 #define RSA_R_MODULUS_TOO_LARGE 105
554 #define RSA_R_NON_FIPS_RSA_METHOD 157
555 #define RSA_R_NO_PUBLIC_EXPONENT 140
556 #define RSA_R_NULL_BEFORE_BLOCK_MISSING 113
557 #define RSA_R_N_DOES_NOT_EQUAL_P_Q 127
558 #define RSA_R_OAEP_DECODING_ERROR 121
559 #define RSA_R_OPERATION_NOT_ALLOWED_IN_FIPS_MODE 158
560 #define RSA_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE 148
561 #define RSA_R_PADDING_CHECK_FAILED 114
562 #define RSA_R_P_NOT_PRIME 128
563 #define RSA_R_Q_NOT_PRIME 129
564 #define RSA_R_RSA_OPERATIONS_NOT_SUPPORTED 130
565 #define RSA_R_SLEN_CHECK_FAILED 136
566 #define RSA_R_SLEN_RECOVERY_FAILED 135
567 #define RSA_R_SSLV3_ROLLBACK_ATTACK 115
568 #define RSA_R_THE_ASN1_OBJECT_IDENTIFIER_IS_NOT_KNOWN_FOR_THIS_MD 116
569 #define RSA_R_UNKNOWN_ALGORITHM_TYPE 117
570 #define RSA_R_UNKNOWN_MASK_DIGEST 151
571 #define RSA_R_UNKNOWN_PADDING_TYPE 118
572 #define RSA_R_UNKNOWN_PSS_DIGEST 152
573 #define RSA_R_UNSUPPORTED_MASK_ALGORITHM 153
574 #define RSA_R_UNSUPPORTED_MASK_PARAMETER 154
575 #define RSA_R_UNSUPPORTED_SIGNATURE_TYPE 155
576 #define RSA_R_VALUE_MISSING 147
577 #define RSA_R_WRONG_SIGNATURE_LENGTH 119

579 #ifdef __cplusplus
580 }
581 #endif
582 #endif
```

new/usr/src/lib/openssl/include/openssl/safestack.h

1

```
*****
184155 Fri May 30 18:31:21 2014
new/usr/src/lib/openssl/include/openssl/safestack.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
19 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
22 * endorse or promote products derived from this software without
23 * prior written permission. For written permission, please contact
24 * openssl-core@openssl.org.
25 *
26 * 5. Products derived from this software may not be called "OpenSSL"
27 * nor may "OpenSSL" appear in their names without prior written
28 * permission of the OpenSSL Project.
29 *
30 * 6. Redistributions of any form whatsoever must retain the following
31 * acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
34 *
35 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
37 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
38 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
39 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
40 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
41 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
42 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #ifndef HEADER_SAFESTACK_H
56 #define HEADER_SAFESTACK_H

58 #include <openssl/stack.h>

60 #ifndef CHECKED_PTR_OF
61 #define CHECKED_PTR_OF(type, p) \
```

new/usr/src/lib/openssl/include/openssl/safestack.h

2

```
62 ((void*) (1 ? p : (type*)0))
63 #endif

65 /* In C++ we get problems because an explicit cast is needed from (void *)
66 * we use CHECKED_STACK_OF to ensure the correct type is passed in the macros
67 * below.
68 */

70 #define CHECKED_STACK_OF(type, p) \
71 ((STACK_OF(type)) (1 ? p : (STACK_OF(type)*0)))

73 #define CHECKED_SK_FREE_FUNC(type, p) \
74 ((void (*)(void *)) ((1 ? p : (void (*)(type *))0)))

76 #define CHECKED_SK_FREE_FUNC2(type, p) \
77 ((void (*)(void *)) ((1 ? p : (void (*)(type))0)))

79 #define CHECKED_SK_CMP_FUNC(type, p) \
80 ((int (*)(const void *, const void *)) \
81 ((1 ? p : (int (*)(const type * const *, const type * const *))0)))

83 #define STACK_OF(type) struct stack_st_##type
84 #define PREDECLARE_STACK_OF(type) STACK_OF(type);

86 #define DECLARE_STACK_OF(type) \
87 STACK_OF(type) \
88 { \
89     STACK stack; \
90 };
91 #define DECLARE_SPECIAL_STACK_OF(type, type2) \
92 STACK_OF(type) \
93 { \
94     STACK stack; \
95 };

97 #define IMPLEMENT_STACK_OF(type) /* nada (obsolete in new safestack approach)*/

100 /* Strings are special: normally an lhash entry will point to a single
101 * (somewhat) mutable object. In the case of strings:
102 *
103 * a) Instead of a single char, there is an array of chars, NUL-terminated.
104 * b) The string may have be immutable.
105 *
106 * So, they need their own declarations. Especially important for
107 * type-checking tools, such as Deputy.
108 *
109 o * In practice, however, it appears to be hard to have a const
110 * string. For now, I'm settling for dealing with the fact it is a
111 * string at all.
112 */
113 typedef char *OPENSSL_STRING;

115 typedef const char *OPENSSL_CSTRING;

117 /* Confusingly, LHASH_OF(STRING) deals with char ** throughout, but
118 * STACK_OF(STRING) is really more like STACK_OF(char), only, as
119 * mentioned above, instead of a single char each entry is a
120 * NUL-terminated array of chars. So, we have to implement STRING
121 * specially for STACK_OF. This is dealt with in the autogenerated
122 * macros below.
123 */

125 DECLARE_SPECIAL_STACK_OF(OPENSSL_STRING, char)

127 /* Similarly, we sometimes use a block of characters, NOT
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128 * nul-terminated. These should also be distinguished from "normal"
129 * stacks. */

131 typedef void *OPENSSL_BLOCK;
132 DECLARE_SPECIAL_STACK_OF(OPENSSL_BLOCK, void)

134 /* SKM_sk_... stack macros are internal to safestack.h:
135 * never use them directly, use sk_<type>_... instead */
136 #define SKM_sk_new(type, cmp) \
137     ((STACK_OF(type) *)sk_new(CHECKED_SK_CMP_FUNC(type, cmp)))
138 #define SKM_sk_new_null(type) \
139     ((STACK_OF(type) *)sk_new_null())
140 #define SKM_sk_free(type, st) \
141     sk_free(CHECKED_STACK_OF(type, st))
142 #define SKM_sk_num(type, st) \
143     sk_num(CHECKED_STACK_OF(type, st))
144 #define SKM_sk_value(type, st, i) \
145     ((type *)sk_value(CHECKED_STACK_OF(type, st), i))
146 #define SKM_sk_set(type, st, i, val) \
147     sk_set(CHECKED_STACK_OF(type, st), i, CHECKED_PTR_OF(type, val))
148 #define SKM_sk_zero(type, st) \
149     sk_zero(CHECKED_STACK_OF(type, st))
150 #define SKM_sk_push(type, st, val) \
151     sk_push(CHECKED_STACK_OF(type, st), CHECKED_PTR_OF(type, val))
152 #define SKM_sk_unshift(type, st, val) \
153     sk_unshift(CHECKED_STACK_OF(type, st), CHECKED_PTR_OF(type, val))
154 #define SKM_sk_find(type, st, val) \
155     sk_find(CHECKED_STACK_OF(type, st), CHECKED_PTR_OF(type, val))
156 #define SKM_sk_find_ex(type, st, val) \
157     sk_find_ex(CHECKED_STACK_OF(type, st), \
158         CHECKED_PTR_OF(type, val))
159 #define SKM_sk_delete(type, st, i) \
160     (type *)sk_delete(CHECKED_STACK_OF(type, st), i)
161 #define SKM_sk_delete_ptr(type, st, ptr) \
162     (type *)sk_delete_ptr(CHECKED_STACK_OF(type, st), CHECKED_PTR_OF(type, ptr))
163 #define SKM_sk_insert(type, st, val, i) \
164     sk_insert(CHECKED_STACK_OF(type, st), CHECKED_PTR_OF(type, val), i)
165 #define SKM_sk_set_cmp_func(type, st, cmp) \
166     ((int (*)(const type *, const type *, const type *)) \
167     sk_set_cmp_func(CHECKED_STACK_OF(type, st), CHECKED_SK_CMP_FUNC(type, cmp)))
168 #define SKM_sk_dup(type, st) \
169     (STACK_OF(type) *)sk_dup(CHECKED_STACK_OF(type, st))
170 #define SKM_sk_pop_free(type, st, free_func) \
171     sk_pop_free(CHECKED_STACK_OF(type, st), CHECKED_SK_FREE_FUNC(type, free_func))
172 #define SKM_sk_shift(type, st) \
173     (type *)sk_shift(CHECKED_STACK_OF(type, st))
174 #define SKM_sk_pop(type, st) \
175     (type *)sk_pop(CHECKED_STACK_OF(type, st))
176 #define SKM_sk_sort(type, st) \
177     sk_sort(CHECKED_STACK_OF(type, st))
178 #define SKM_sk_is_sorted(type, st) \
179     sk_is_sorted(CHECKED_STACK_OF(type, st))

181 #define SKM_ASN1_SET_OF_d2i(type, st, pp, length, d2i_func, free_func, ex_tag, ex_class, \
182     (STACK_OF(type) *)d2i_ASN1_SET( \
183         (STACK_OF(OPENSSL_BLOCK) **)CHECKED_PTR_OF(STACK \
184         pp, length, \
185         CHECKED_D2I_OF(type, d2i_func), \
186         CHECKED_SK_FREE_FUNC(type, free_func), \
187         ex_tag, ex_class)

189 #define SKM_ASN1_SET_OF_i2d(type, st, pp, i2d_func, ex_tag, ex_class, is_set) \
190     i2d_ASN1_SET((STACK_OF(OPENSSL_BLOCK) *)CHECKED_STACK_OF(type, st), pp, \
191     CHECKED_I2D_OF(type, i2d_func), \
192     ex_tag, ex_class, is_set)

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194 #define SKM_ASN1_seq_pack(type, st, i2d_func, buf, len) \
195     ASN1_seq_pack(CHECKED_PTR_OF(STACK_OF(type), st), \
196         CHECKED_I2D_OF(type, i2d_func), buf, len)

198 #define SKM_ASN1_seq_unpack(type, buf, len, d2i_func, free_func) \
199     (STACK_OF(type) *)ASN1_seq_unpack(buf, len, CHECKED_D2I_OF(type, d2i_func), \
200     free_func)

201 #define SKM_PKCS12_decrypt_d2i(type, algor, d2i_func, free_func, pass, passlen, \
202     (STACK_OF(type) *)PKCS12_decrypt_d2i(algor, \
203     CHECKED_D2I_OF(type, d2i_func), \
204     CHECKED_SK_FREE_FUNC(type, free_func), \
205     pass, passlen, oct, seq)

207 /* This block of defines is updated by util/mkstack.pl, please do not touch! */
208 #define sk_ACCESS_DESCRIPTION_new(cmp) SKM_sk_new(ACCESS_DESCRIPTION, (cmp))
209 #define sk_ACCESS_DESCRIPTION_new_null() SKM_sk_new_null(ACCESS_DESCRIPTION)
210 #define sk_ACCESS_DESCRIPTION_free(st) SKM_sk_free(ACCESS_DESCRIPTION, (st))
211 #define sk_ACCESS_DESCRIPTION_num(st) SKM_sk_num(ACCESS_DESCRIPTION, (st))
212 #define sk_ACCESS_DESCRIPTION_value(st, i) SKM_sk_value(ACCESS_DESCRIPTION, (st), i)
213 #define sk_ACCESS_DESCRIPTION_set(st, i, val) SKM_sk_set(ACCESS_DESCRIPTION, (st), i, val)
214 #define sk_ACCESS_DESCRIPTION_zero(st) SKM_sk_zero(ACCESS_DESCRIPTION, (st))
215 #define sk_ACCESS_DESCRIPTION_push(st, val) SKM_sk_push(ACCESS_DESCRIPTION, (st), val)
216 #define sk_ACCESS_DESCRIPTION_unshift(st, val) SKM_sk_unshift(ACCESS_DESCRIPTION, (st), val)
217 #define sk_ACCESS_DESCRIPTION_find(st, val) SKM_sk_find(ACCESS_DESCRIPTION, (st), val)
218 #define sk_ACCESS_DESCRIPTION_find_ex(st, val) SKM_sk_find_ex(ACCESS_DESCRIPTION, (st), val)
219 #define sk_ACCESS_DESCRIPTION_delete(st, i) SKM_sk_delete(ACCESS_DESCRIPTION, (st), i)
220 #define sk_ACCESS_DESCRIPTION_delete_ptr(st, ptr) SKM_sk_delete_ptr(ACCESS_DESCRIPTION, (st), ptr)
221 #define sk_ACCESS_DESCRIPTION_insert(st, val, i) SKM_sk_insert(ACCESS_DESCRIPTION, (st), val, i)
222 #define sk_ACCESS_DESCRIPTION_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ACCESS_DESCRIPTION, (st), cmp)
223 #define sk_ACCESS_DESCRIPTION_dup(st) SKM_sk_dup(ACCESS_DESCRIPTION, (st))
224 #define sk_ACCESS_DESCRIPTION_pop_free(st, free_func) SKM_sk_pop_free(ACCESS_DESCRIPTION, (st), free_func)
225 #define sk_ACCESS_DESCRIPTION_shift(st) SKM_sk_shift(ACCESS_DESCRIPTION, (st))
226 #define sk_ACCESS_DESCRIPTION_pop(st) SKM_sk_pop(ACCESS_DESCRIPTION, (st))
227 #define sk_ACCESS_DESCRIPTION_sort(st) SKM_sk_sort(ACCESS_DESCRIPTION, (st))
228 #define sk_ACCESS_DESCRIPTION_is_sorted(st) SKM_sk_is_sorted(ACCESS_DESCRIPTION, (st))

230 #define sk_ASIDOrRange_new(cmp) SKM_sk_new(ASIDOrRange, (cmp))
231 #define sk_ASIDOrRange_new_null() SKM_sk_new_null(ASIDOrRange)
232 #define sk_ASIDOrRange_free(st) SKM_sk_free(ASIDOrRange, (st))
233 #define sk_ASIDOrRange_num(st) SKM_sk_num(ASIDOrRange, (st))
234 #define sk_ASIDOrRange_value(st, i) SKM_sk_value(ASIDOrRange, (st), i)
235 #define sk_ASIDOrRange_set(st, i, val) SKM_sk_set(ASIDOrRange, (st), i, val)
236 #define sk_ASIDOrRange_zero(st) SKM_sk_zero(ASIDOrRange, (st))
237 #define sk_ASIDOrRange_push(st, val) SKM_sk_push(ASIDOrRange, (st), val)
238 #define sk_ASIDOrRange_unshift(st, val) SKM_sk_unshift(ASIDOrRange, (st), val)
239 #define sk_ASIDOrRange_find(st, val) SKM_sk_find(ASIDOrRange, (st), val)
240 #define sk_ASIDOrRange_find_ex(st, val) SKM_sk_find_ex(ASIDOrRange, (st), val)
241 #define sk_ASIDOrRange_delete(st, i) SKM_sk_delete(ASIDOrRange, (st), i)
242 #define sk_ASIDOrRange_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASIDOrRange, (st), ptr)
243 #define sk_ASIDOrRange_insert(st, val, i) SKM_sk_insert(ASIDOrRange, (st), val, i)
244 #define sk_ASIDOrRange_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASIDOrRange, (st), cmp)
245 #define sk_ASIDOrRange_dup(st) SKM_sk_dup(ASIDOrRange, (st))
246 #define sk_ASIDOrRange_pop_free(st, free_func) SKM_sk_pop_free(ASIDOrRange, (st), free_func)
247 #define sk_ASIDOrRange_shift(st) SKM_sk_shift(ASIDOrRange, (st))
248 #define sk_ASIDOrRange_pop(st) SKM_sk_pop(ASIDOrRange, (st))
249 #define sk_ASIDOrRange_sort(st) SKM_sk_sort(ASIDOrRange, (st))
250 #define sk_ASIDOrRange_is_sorted(st) SKM_sk_is_sorted(ASIDOrRange, (st))

252 #define sk_ASN1_GENERALSTRING_new(cmp) SKM_sk_new(ASN1_GENERALSTRING, (cmp))
253 #define sk_ASN1_GENERALSTRING_new_null() SKM_sk_new_null(ASN1_GENERALSTRING)
254 #define sk_ASN1_GENERALSTRING_free(st) SKM_sk_free(ASN1_GENERALSTRING, (st))
255 #define sk_ASN1_GENERALSTRING_num(st) SKM_sk_num(ASN1_GENERALSTRING, (st))
256 #define sk_ASN1_GENERALSTRING_value(st, i) SKM_sk_value(ASN1_GENERALSTRING, (st), i)
257 #define sk_ASN1_GENERALSTRING_set(st, i, val) SKM_sk_set(ASN1_GENERALSTRING, (st), i, val)
258 #define sk_ASN1_GENERALSTRING_zero(st) SKM_sk_zero(ASN1_GENERALSTRING, (st))
259 #define sk_ASN1_GENERALSTRING_push(st, val) SKM_sk_push(ASN1_GENERALSTRING, (st), val)

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260 #define sk ASN1_GENERALSTRING_unshift(st, val) SKM_sk_unshift(ASN1_GENERALSTRING,
261 #define sk ASN1_GENERALSTRING_find(st, val) SKM_sk_find(ASN1_GENERALSTRING, (st)
262 #define sk ASN1_GENERALSTRING_find_ex(st, val) SKM_sk_find_ex(ASN1_GENERALSTRING
263 #define sk ASN1_GENERALSTRING_delete(st, i) SKM_sk_delete(ASN1_GENERALSTRING, (s
264 #define sk ASN1_GENERALSTRING_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASN1_GENERAL
265 #define sk ASN1_GENERALSTRING_insert(st, val, i) SKM_sk_insert(ASN1_GENERALSTRIN
266 #define sk ASN1_GENERALSTRING_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASN1_GEN
267 #define sk ASN1_GENERALSTRING_dup(st) SKM_sk_dup(ASN1_GENERALSTRING, st)
268 #define sk ASN1_GENERALSTRING_pop_free(st, free_func) SKM_sk_pop_free(ASN1_GENER
269 #define sk ASN1_GENERALSTRING_shift(st) SKM_sk_shift(ASN1_GENERALSTRING, (st))
270 #define sk ASN1_GENERALSTRING_pop(st) SKM_sk_pop(ASN1_GENERALSTRING, (st))
271 #define sk ASN1_GENERALSTRING_sort(st) SKM_sk_sort(ASN1_GENERALSTRING, (st))
272 #define sk ASN1_GENERALSTRING_is_sorted(st) SKM_sk_is_sorted(ASN1_GENERALSTRING,

274 #define sk ASN1_INTEGER_new(cmp) SKM_sk_new(ASN1_INTEGER, (cmp))
275 #define sk ASN1_INTEGER_new_null() SKM_sk_new_null(ASN1_INTEGER)
276 #define sk ASN1_INTEGER_free(st) SKM_sk_free(ASN1_INTEGER, (st))
277 #define sk ASN1_INTEGER_num(st) SKM_sk_num(ASN1_INTEGER, (st))
278 #define sk ASN1_INTEGER_value(st, i) SKM_sk_value(ASN1_INTEGER, (st), (i))
279 #define sk ASN1_INTEGER_set(st, i, val) SKM_sk_set(ASN1_INTEGER, (st), (i), (val)
280 #define sk ASN1_INTEGER_zero(st) SKM_sk_zero(ASN1_INTEGER, (st))
281 #define sk ASN1_INTEGER_push(st, val) SKM_sk_push(ASN1_INTEGER, (st), (val))
282 #define sk ASN1_INTEGER_unshift(st, val) SKM_sk_unshift(ASN1_INTEGER, (st), (val)
283 #define sk ASN1_INTEGER_find(st, val) SKM_sk_find(ASN1_INTEGER, (st), (val))
284 #define sk ASN1_INTEGER_find_ex(st, val) SKM_sk_find_ex(ASN1_INTEGER, (st), (val)
285 #define sk ASN1_INTEGER_delete(st, i) SKM_sk_delete(ASN1_INTEGER, (st), (i))
286 #define sk ASN1_INTEGER_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASN1_INTEGER, (st)
287 #define sk ASN1_INTEGER_insert(st, val, i) SKM_sk_insert(ASN1_INTEGER, (st), (va
288 #define sk ASN1_INTEGER_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASN1_INTEGER,
289 #define sk ASN1_INTEGER_dup(st) SKM_sk_dup(ASN1_INTEGER, st)
290 #define sk ASN1_INTEGER_pop_free(st, free_func) SKM_sk_pop_free(ASN1_INTEGER, (s
291 #define sk ASN1_INTEGER_shift(st) SKM_sk_shift(ASN1_INTEGER, (st))
292 #define sk ASN1_INTEGER_pop(st) SKM_sk_pop(ASN1_INTEGER, (st))
293 #define sk ASN1_INTEGER_sort(st) SKM_sk_sort(ASN1_INTEGER, (st))
294 #define sk ASN1_INTEGER_is_sorted(st) SKM_sk_is_sorted(ASN1_INTEGER, (st))

296 #define sk ASN1_OBJECT_new(cmp) SKM_sk_new(ASN1_OBJECT, (cmp))
297 #define sk ASN1_OBJECT_new_null() SKM_sk_new_null(ASN1_OBJECT)
298 #define sk ASN1_OBJECT_free(st) SKM_sk_free(ASN1_OBJECT, (st))
299 #define sk ASN1_OBJECT_num(st) SKM_sk_num(ASN1_OBJECT, (st))
300 #define sk ASN1_OBJECT_value(st, i) SKM_sk_value(ASN1_OBJECT, (st), (i))
301 #define sk ASN1_OBJECT_set(st, i, val) SKM_sk_set(ASN1_OBJECT, (st), (i), (val))
302 #define sk ASN1_OBJECT_zero(st) SKM_sk_zero(ASN1_OBJECT, (st))
303 #define sk ASN1_OBJECT_push(st, val) SKM_sk_push(ASN1_OBJECT, (st), (val))
304 #define sk ASN1_OBJECT_unshift(st, val) SKM_sk_unshift(ASN1_OBJECT, (st), (val))
305 #define sk ASN1_OBJECT_find(st, val) SKM_sk_find(ASN1_OBJECT, (st), (val))
306 #define sk ASN1_OBJECT_find_ex(st, val) SKM_sk_find_ex(ASN1_OBJECT, (st), (val))
307 #define sk ASN1_OBJECT_delete(st, i) SKM_sk_delete(ASN1_OBJECT, (st), (i))
308 #define sk ASN1_OBJECT_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASN1_OBJECT, (st),
309 #define sk ASN1_OBJECT_insert(st, val, i) SKM_sk_insert(ASN1_OBJECT, (st), (val)
310 #define sk ASN1_OBJECT_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASN1_OBJECT, (s
311 #define sk ASN1_OBJECT_dup(st) SKM_sk_dup(ASN1_OBJECT, st)
312 #define sk ASN1_OBJECT_pop_free(st, free_func) SKM_sk_pop_free(ASN1_OBJECT, (st)
313 #define sk ASN1_OBJECT_shift(st) SKM_sk_shift(ASN1_OBJECT, (st))
314 #define sk ASN1_OBJECT_pop(st) SKM_sk_pop(ASN1_OBJECT, (st))
315 #define sk ASN1_OBJECT_sort(st) SKM_sk_sort(ASN1_OBJECT, (st))
316 #define sk ASN1_OBJECT_is_sorted(st) SKM_sk_is_sorted(ASN1_OBJECT, (st))

318 #define sk ASN1_STRING_TABLE_new(cmp) SKM_sk_new(ASN1_STRING_TABLE, (cmp))
319 #define sk ASN1_STRING_TABLE_new_null() SKM_sk_new_null(ASN1_STRING_TABLE)
320 #define sk ASN1_STRING_TABLE_free(st) SKM_sk_free(ASN1_STRING_TABLE, (st))
321 #define sk ASN1_STRING_TABLE_num(st) SKM_sk_num(ASN1_STRING_TABLE, (st))
322 #define sk ASN1_STRING_TABLE_value(st, i) SKM_sk_value(ASN1_STRING_TABLE, (st),
323 #define sk ASN1_STRING_TABLE_set(st, i, val) SKM_sk_set(ASN1_STRING_TABLE, (st),
324 #define sk ASN1_STRING_TABLE_zero(st) SKM_sk_zero(ASN1_STRING_TABLE, (st))
325 #define sk ASN1_STRING_TABLE_push(st, val) SKM_sk_push(ASN1_STRING_TABLE, (st),

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326 #define sk ASN1_STRING_TABLE_unshift(st, val) SKM_sk_unshift(ASN1_STRING_TABLE,
327 #define sk ASN1_STRING_TABLE_find(st, val) SKM_sk_find(ASN1_STRING_TABLE, (st)
328 #define sk ASN1_STRING_TABLE_find_ex(st, val) SKM_sk_find_ex(ASN1_STRING_TABLE,
329 #define sk ASN1_STRING_TABLE_delete(st, i) SKM_sk_delete(ASN1_STRING_TABLE, (st)
330 #define sk ASN1_STRING_TABLE_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASN1_STRING_T
331 #define sk ASN1_STRING_TABLE_insert(st, val, i) SKM_sk_insert(ASN1_STRING_TABLE,
332 #define sk ASN1_STRING_TABLE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASN1_STR
333 #define sk ASN1_STRING_TABLE_dup(st) SKM_sk_dup(ASN1_STRING_TABLE, st)
334 #define sk ASN1_STRING_TABLE_pop_free(st, free_func) SKM_sk_pop_free(ASN1_STRING
335 #define sk ASN1_STRING_TABLE_shift(st) SKM_sk_shift(ASN1_STRING_TABLE, (st))
336 #define sk ASN1_STRING_TABLE_pop(st) SKM_sk_pop(ASN1_STRING_TABLE, (st))
337 #define sk ASN1_STRING_TABLE_sort(st) SKM_sk_sort(ASN1_STRING_TABLE, (st))
338 #define sk ASN1_STRING_TABLE_is_sorted(st) SKM_sk_is_sorted(ASN1_STRING_TABLE, (

340 #define sk ASN1_TYPE_new(cmp) SKM_sk_new(ASN1_TYPE, (cmp))
341 #define sk ASN1_TYPE_new_null() SKM_sk_new_null(ASN1_TYPE)
342 #define sk ASN1_TYPE_free(st) SKM_sk_free(ASN1_TYPE, (st))
343 #define sk ASN1_TYPE_num(st) SKM_sk_num(ASN1_TYPE, (st))
344 #define sk ASN1_TYPE_value(st, i) SKM_sk_value(ASN1_TYPE, (st), (i))
345 #define sk ASN1_TYPE_set(st, i, val) SKM_sk_set(ASN1_TYPE, (st), (i), (val))
346 #define sk ASN1_TYPE_zero(st) SKM_sk_zero(ASN1_TYPE, (st))
347 #define sk ASN1_TYPE_push(st, val) SKM_sk_push(ASN1_TYPE, (st), (val))
348 #define sk ASN1_TYPE_unshift(st, val) SKM_sk_unshift(ASN1_TYPE, (st), (val))
349 #define sk ASN1_TYPE_find(st, val) SKM_sk_find(ASN1_TYPE, (st), (val))
350 #define sk ASN1_TYPE_find_ex(st, val) SKM_sk_find_ex(ASN1_TYPE, (st), (val))
351 #define sk ASN1_TYPE_delete(st, i) SKM_sk_delete(ASN1_TYPE, (st), (i))
352 #define sk ASN1_TYPE_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASN1_TYPE, (st), (ptr)
353 #define sk ASN1_TYPE_insert(st, val, i) SKM_sk_insert(ASN1_TYPE, (st), (val), (i
354 #define sk ASN1_TYPE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASN1_TYPE, (st),
355 #define sk ASN1_TYPE_dup(st) SKM_sk_dup(ASN1_TYPE, st)
356 #define sk ASN1_TYPE_pop_free(st, free_func) SKM_sk_pop_free(ASN1_TYPE, (st), (f
357 #define sk ASN1_TYPE_shift(st) SKM_sk_shift(ASN1_TYPE, (st))
358 #define sk ASN1_TYPE_pop(st) SKM_sk_pop(ASN1_TYPE, (st))
359 #define sk ASN1_TYPE_sort(st) SKM_sk_sort(ASN1_TYPE, (st))
360 #define sk ASN1_TYPE_is_sorted(st) SKM_sk_is_sorted(ASN1_TYPE, (st))

362 #define sk ASN1_UTF8STRING_new(cmp) SKM_sk_new(ASN1_UTF8STRING, (cmp))
363 #define sk ASN1_UTF8STRING_new_null() SKM_sk_new_null(ASN1_UTF8STRING)
364 #define sk ASN1_UTF8STRING_free(st) SKM_sk_free(ASN1_UTF8STRING, (st))
365 #define sk ASN1_UTF8STRING_num(st) SKM_sk_num(ASN1_UTF8STRING, (st))
366 #define sk ASN1_UTF8STRING_value(st, i) SKM_sk_value(ASN1_UTF8STRING, (st), (i))
367 #define sk ASN1_UTF8STRING_set(st, i, val) SKM_sk_set(ASN1_UTF8STRING, (st), (i)
368 #define sk ASN1_UTF8STRING_zero(st) SKM_sk_zero(ASN1_UTF8STRING, (st))
369 #define sk ASN1_UTF8STRING_push(st, val) SKM_sk_push(ASN1_UTF8STRING, (st), (val)
370 #define sk ASN1_UTF8STRING_unshift(st, val) SKM_sk_unshift(ASN1_UTF8STRING, (st)
371 #define sk ASN1_UTF8STRING_find(st, val) SKM_sk_find(ASN1_UTF8STRING, (st), (val)
372 #define sk ASN1_UTF8STRING_find_ex(st, val) SKM_sk_find_ex(ASN1_UTF8STRING, (st)
373 #define sk ASN1_UTF8STRING_delete(st, i) SKM_sk_delete(ASN1_UTF8STRING, (st), (i
374 #define sk ASN1_UTF8STRING_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASN1_UTF8STRIN
375 #define sk ASN1_UTF8STRING_insert(st, val, i) SKM_sk_insert(ASN1_UTF8STRING, (st
376 #define sk ASN1_UTF8STRING_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASN1_UTF8ST
377 #define sk ASN1_UTF8STRING_dup(st) SKM_sk_dup(ASN1_UTF8STRING, st)
378 #define sk ASN1_UTF8STRING_pop_free(st, free_func) SKM_sk_pop_free(ASN1_UTF8STR
379 #define sk ASN1_UTF8STRING_shift(st) SKM_sk_shift(ASN1_UTF8STRING, (st))
380 #define sk ASN1_UTF8STRING_pop(st) SKM_sk_pop(ASN1_UTF8STRING, (st))
381 #define sk ASN1_UTF8STRING_sort(st) SKM_sk_sort(ASN1_UTF8STRING, (st))
382 #define sk ASN1_UTF8STRING_is_sorted(st) SKM_sk_is_sorted(ASN1_UTF8STRING, (st))

384 #define sk ASN1_VALUE_new(cmp) SKM_sk_new(ASN1_VALUE, (cmp))
385 #define sk ASN1_VALUE_new_null() SKM_sk_new_null(ASN1_VALUE)
386 #define sk ASN1_VALUE_free(st) SKM_sk_free(ASN1_VALUE, (st))
387 #define sk ASN1_VALUE_num(st) SKM_sk_num(ASN1_VALUE, (st))
388 #define sk ASN1_VALUE_value(st, i) SKM_sk_value(ASN1_VALUE, (st), (i))
389 #define sk ASN1_VALUE_set(st, i, val) SKM_sk_set(ASN1_VALUE, (st), (i), (val))
390 #define sk ASN1_VALUE_zero(st) SKM_sk_zero(ASN1_VALUE, (st))
391 #define sk ASN1_VALUE_push(st, val) SKM_sk_push(ASN1_VALUE, (st), (val))

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392 #define sk_ASN1_VALUE_unshift(st, val) SKM_sk_unshift(ASN1_VALUE, (st), (val))
393 #define sk_ASN1_VALUE_find(st, val) SKM_sk_find(ASN1_VALUE, (st), (val))
394 #define sk_ASN1_VALUE_find_ex(st, val) SKM_sk_find_ex(ASN1_VALUE, (st), (val))
395 #define sk_ASN1_VALUE_delete(st, i) SKM_sk_delete(ASN1_VALUE, (st), (i))
396 #define sk_ASN1_VALUE_delete_ptr(st, ptr) SKM_sk_delete_ptr(ASN1_VALUE, (st), (ptr))
397 #define sk_ASN1_VALUE_insert(st, val, i) SKM_sk_insert(ASN1_VALUE, (st), (val), (i))
398 #define sk_ASN1_VALUE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ASN1_VALUE, (st), (cmp))
399 #define sk_ASN1_VALUE_dup(st) SKM_sk_dup(ASN1_VALUE, (st))
400 #define sk_ASN1_VALUE_pop_free(st, free_func) SKM_sk_pop_free(ASN1_VALUE, (st), (free_func))
401 #define sk_ASN1_VALUE_shift(st) SKM_sk_shift(ASN1_VALUE, (st))
402 #define sk_ASN1_VALUE_pop(st) SKM_sk_pop(ASN1_VALUE, (st))
403 #define sk_ASN1_VALUE_sort(st) SKM_sk_sort(ASN1_VALUE, (st))
404 #define sk_ASN1_VALUE_is_sorted(st) SKM_sk_is_sorted(ASN1_VALUE, (st))

406 #define sk_BIO_new(cmp) SKM_sk_new(BIO, (cmp))
407 #define sk_BIO_new_null() SKM_sk_new_null(BIO)
408 #define sk_BIO_free(st) SKM_sk_free(BIO, (st))
409 #define sk_BIO_num(st) SKM_sk_num(BIO, (st))
410 #define sk_BIO_value(st, i) SKM_sk_value(BIO, (st), (i))
411 #define sk_BIO_set(st, i, val) SKM_sk_set(BIO, (st), (i), (val))
412 #define sk_BIO_zero(st) SKM_sk_zero(BIO, (st))
413 #define sk_BIO_push(st, val) SKM_sk_push(BIO, (st), (val))
414 #define sk_BIO_unshift(st, val) SKM_sk_unshift(BIO, (st), (val))
415 #define sk_BIO_find(st, val) SKM_sk_find(BIO, (st), (val))
416 #define sk_BIO_find_ex(st, val) SKM_sk_find_ex(BIO, (st), (val))
417 #define sk_BIO_delete(st, i) SKM_sk_delete(BIO, (st), (i))
418 #define sk_BIO_delete_ptr(st, ptr) SKM_sk_delete_ptr(BIO, (st), (ptr))
419 #define sk_BIO_insert(st, val, i) SKM_sk_insert(BIO, (st), (val), (i))
420 #define sk_BIO_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(BIO, (st), (cmp))
421 #define sk_BIO_dup(st) SKM_sk_dup(BIO, (st))
422 #define sk_BIO_pop_free(st, free_func) SKM_sk_pop_free(BIO, (st), (free_func))
423 #define sk_BIO_shift(st) SKM_sk_shift(BIO, (st))
424 #define sk_BIO_pop(st) SKM_sk_pop(BIO, (st))
425 #define sk_BIO_sort(st) SKM_sk_sort(BIO, (st))
426 #define sk_BIO_is_sorted(st) SKM_sk_is_sorted(BIO, (st))

428 #define sk_BY_DIR_ENTRY_new(cmp) SKM_sk_new(BY_DIR_ENTRY, (cmp))
429 #define sk_BY_DIR_ENTRY_new_null() SKM_sk_new_null(BY_DIR_ENTRY)
430 #define sk_BY_DIR_ENTRY_free(st) SKM_sk_free(BY_DIR_ENTRY, (st))
431 #define sk_BY_DIR_ENTRY_num(st) SKM_sk_num(BY_DIR_ENTRY, (st))
432 #define sk_BY_DIR_ENTRY_value(st, i) SKM_sk_value(BY_DIR_ENTRY, (st), (i))
433 #define sk_BY_DIR_ENTRY_set(st, i, val) SKM_sk_set(BY_DIR_ENTRY, (st), (i), (val))
434 #define sk_BY_DIR_ENTRY_zero(st) SKM_sk_zero(BY_DIR_ENTRY, (st))
435 #define sk_BY_DIR_ENTRY_push(st, val) SKM_sk_push(BY_DIR_ENTRY, (st), (val))
436 #define sk_BY_DIR_ENTRY_unshift(st, val) SKM_sk_unshift(BY_DIR_ENTRY, (st), (val))
437 #define sk_BY_DIR_ENTRY_find(st, val) SKM_sk_find(BY_DIR_ENTRY, (st), (val))
438 #define sk_BY_DIR_ENTRY_find_ex(st, val) SKM_sk_find_ex(BY_DIR_ENTRY, (st), (val))
439 #define sk_BY_DIR_ENTRY_delete(st, i) SKM_sk_delete(BY_DIR_ENTRY, (st), (i))
440 #define sk_BY_DIR_ENTRY_delete_ptr(st, ptr) SKM_sk_delete_ptr(BY_DIR_ENTRY, (st), (ptr))
441 #define sk_BY_DIR_ENTRY_insert(st, val, i) SKM_sk_insert(BY_DIR_ENTRY, (st), (val), (i))
442 #define sk_BY_DIR_ENTRY_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(BY_DIR_ENTRY, (st), (cmp))
443 #define sk_BY_DIR_ENTRY_dup(st) SKM_sk_dup(BY_DIR_ENTRY, (st))
444 #define sk_BY_DIR_ENTRY_pop_free(st, free_func) SKM_sk_pop_free(BY_DIR_ENTRY, (st), (free_func))
445 #define sk_BY_DIR_ENTRY_shift(st) SKM_sk_shift(BY_DIR_ENTRY, (st))
446 #define sk_BY_DIR_ENTRY_pop(st) SKM_sk_pop(BY_DIR_ENTRY, (st))
447 #define sk_BY_DIR_ENTRY_sort(st) SKM_sk_sort(BY_DIR_ENTRY, (st))
448 #define sk_BY_DIR_ENTRY_is_sorted(st) SKM_sk_is_sorted(BY_DIR_ENTRY, (st))

450 #define sk_BY_DIR_HASH_new(cmp) SKM_sk_new(BY_DIR_HASH, (cmp))
451 #define sk_BY_DIR_HASH_new_null() SKM_sk_new_null(BY_DIR_HASH)
452 #define sk_BY_DIR_HASH_free(st) SKM_sk_free(BY_DIR_HASH, (st))
453 #define sk_BY_DIR_HASH_num(st) SKM_sk_num(BY_DIR_HASH, (st))
454 #define sk_BY_DIR_HASH_value(st, i) SKM_sk_value(BY_DIR_HASH, (st), (i))
455 #define sk_BY_DIR_HASH_set(st, i, val) SKM_sk_set(BY_DIR_HASH, (st), (i), (val))
456 #define sk_BY_DIR_HASH_zero(st) SKM_sk_zero(BY_DIR_HASH, (st))
457 #define sk_BY_DIR_HASH_push(st, val) SKM_sk_push(BY_DIR_HASH, (st), (val))

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458 #define sk_BY_DIR_HASH_unshift(st, val) SKM_sk_unshift(BY_DIR_HASH, (st), (val))
459 #define sk_BY_DIR_HASH_find(st, val) SKM_sk_find(BY_DIR_HASH, (st), (val))
460 #define sk_BY_DIR_HASH_find_ex(st, val) SKM_sk_find_ex(BY_DIR_HASH, (st), (val))
461 #define sk_BY_DIR_HASH_delete(st, i) SKM_sk_delete(BY_DIR_HASH, (st), (i))
462 #define sk_BY_DIR_HASH_delete_ptr(st, ptr) SKM_sk_delete_ptr(BY_DIR_HASH, (st), (ptr))
463 #define sk_BY_DIR_HASH_insert(st, val, i) SKM_sk_insert(BY_DIR_HASH, (st), (val), (i))
464 #define sk_BY_DIR_HASH_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(BY_DIR_HASH, (st), (cmp))
465 #define sk_BY_DIR_HASH_dup(st) SKM_sk_dup(BY_DIR_HASH, (st))
466 #define sk_BY_DIR_HASH_pop_free(st, free_func) SKM_sk_pop_free(BY_DIR_HASH, (st), (free_func))
467 #define sk_BY_DIR_HASH_shift(st) SKM_sk_shift(BY_DIR_HASH, (st))
468 #define sk_BY_DIR_HASH_pop(st) SKM_sk_pop(BY_DIR_HASH, (st))
469 #define sk_BY_DIR_HASH_sort(st) SKM_sk_sort(BY_DIR_HASH, (st))
470 #define sk_BY_DIR_HASH_is_sorted(st) SKM_sk_is_sorted(BY_DIR_HASH, (st))

472 #define sk_CMS_CertificateChoices_new(cmp) SKM_sk_new(CMS_CertificateChoices, (cmp))
473 #define sk_CMS_CertificateChoices_new_null() SKM_sk_new_null(CMS_CertificateChoices)
474 #define sk_CMS_CertificateChoices_free(st) SKM_sk_free(CMS_CertificateChoices, (st))
475 #define sk_CMS_CertificateChoices_num(st) SKM_sk_num(CMS_CertificateChoices, (st))
476 #define sk_CMS_CertificateChoices_value(st, i) SKM_sk_value(CMS_CertificateChoices, (st), (i))
477 #define sk_CMS_CertificateChoices_set(st, i, val) SKM_sk_set(CMS_CertificateChoices, (st), (i), (val))
478 #define sk_CMS_CertificateChoices_zero(st) SKM_sk_zero(CMS_CertificateChoices, (st))
479 #define sk_CMS_CertificateChoices_push(st, val) SKM_sk_push(CMS_CertificateChoices, (st), (val))
480 #define sk_CMS_CertificateChoices_unshift(st, val) SKM_sk_unshift(CMS_CertificateChoices, (st), (val))
481 #define sk_CMS_CertificateChoices_find(st, val) SKM_sk_find(CMS_CertificateChoices, (st), (val))
482 #define sk_CMS_CertificateChoices_find_ex(st, val) SKM_sk_find_ex(CMS_CertificateChoices, (st), (val))
483 #define sk_CMS_CertificateChoices_delete(st, i) SKM_sk_delete(CMS_CertificateChoices, (st), (i))
484 #define sk_CMS_CertificateChoices_delete_ptr(st, ptr) SKM_sk_delete_ptr(CMS_CertificateChoices, (st), (ptr))
485 #define sk_CMS_CertificateChoices_insert(st, val, i) SKM_sk_insert(CMS_CertificateChoices, (st), (val), (i))
486 #define sk_CMS_CertificateChoices_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CMS_CertificateChoices, (st), (cmp))
487 #define sk_CMS_CertificateChoices_dup(st) SKM_sk_dup(CMS_CertificateChoices, (st))
488 #define sk_CMS_CertificateChoices_pop_free(st, free_func) SKM_sk_pop_free(CMS_CertificateChoices, (st), (free_func))
489 #define sk_CMS_CertificateChoices_shift(st) SKM_sk_shift(CMS_CertificateChoices, (st))
490 #define sk_CMS_CertificateChoices_pop(st) SKM_sk_pop(CMS_CertificateChoices, (st))
491 #define sk_CMS_CertificateChoices_sort(st) SKM_sk_sort(CMS_CertificateChoices, (st))
492 #define sk_CMS_CertificateChoices_is_sorted(st) SKM_sk_is_sorted(CMS_CertificateChoices, (st))

494 #define sk_CMS_RecipientInfo_new(cmp) SKM_sk_new(CMS_RecipientInfo, (cmp))
495 #define sk_CMS_RecipientInfo_new_null() SKM_sk_new_null(CMS_RecipientInfo)
496 #define sk_CMS_RecipientInfo_free(st) SKM_sk_free(CMS_RecipientInfo, (st))
497 #define sk_CMS_RecipientInfo_num(st) SKM_sk_num(CMS_RecipientInfo, (st))
498 #define sk_CMS_RecipientInfo_value(st, i) SKM_sk_value(CMS_RecipientInfo, (st), (i))
499 #define sk_CMS_RecipientInfo_set(st, i, val) SKM_sk_set(CMS_RecipientInfo, (st), (i), (val))
500 #define sk_CMS_RecipientInfo_zero(st) SKM_sk_zero(CMS_RecipientInfo, (st))
501 #define sk_CMS_RecipientInfo_push(st, val) SKM_sk_push(CMS_RecipientInfo, (st), (val))
502 #define sk_CMS_RecipientInfo_unshift(st, val) SKM_sk_unshift(CMS_RecipientInfo, (st), (val))
503 #define sk_CMS_RecipientInfo_find(st, val) SKM_sk_find(CMS_RecipientInfo, (st), (val))
504 #define sk_CMS_RecipientInfo_find_ex(st, val) SKM_sk_find_ex(CMS_RecipientInfo, (st), (val))
505 #define sk_CMS_RecipientInfo_delete(st, i) SKM_sk_delete(CMS_RecipientInfo, (st), (i))
506 #define sk_CMS_RecipientInfo_delete_ptr(st, ptr) SKM_sk_delete_ptr(CMS_RecipientInfo, (st), (ptr))
507 #define sk_CMS_RecipientInfo_insert(st, val, i) SKM_sk_insert(CMS_RecipientInfo, (st), (val), (i))
508 #define sk_CMS_RecipientInfo_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CMS_RecipientInfo, (st), (cmp))
509 #define sk_CMS_RecipientInfo_dup(st) SKM_sk_dup(CMS_RecipientInfo, (st))
510 #define sk_CMS_RecipientInfo_pop_free(st, free_func) SKM_sk_pop_free(CMS_RecipientInfo, (st), (free_func))
511 #define sk_CMS_RecipientInfo_shift(st) SKM_sk_shift(CMS_RecipientInfo, (st))
512 #define sk_CMS_RecipientInfo_pop(st) SKM_sk_pop(CMS_RecipientInfo, (st))
513 #define sk_CMS_RecipientInfo_sort(st) SKM_sk_sort(CMS_RecipientInfo, (st))
514 #define sk_CMS_RecipientInfo_is_sorted(st) SKM_sk_is_sorted(CMS_RecipientInfo, (st))

516 #define sk_CMS_RevocationInfoChoice_new(cmp) SKM_sk_new(CMS_RevocationInfoChoice, (cmp))
517 #define sk_CMS_RevocationInfoChoice_new_null() SKM_sk_new_null(CMS_RevocationInfoChoice)
518 #define sk_CMS_RevocationInfoChoice_free(st) SKM_sk_free(CMS_RevocationInfoChoice, (st))
519 #define sk_CMS_RevocationInfoChoice_num(st) SKM_sk_num(CMS_RevocationInfoChoice, (st))
520 #define sk_CMS_RevocationInfoChoice_value(st, i) SKM_sk_value(CMS_RevocationInfoChoice, (st), (i))
521 #define sk_CMS_RevocationInfoChoice_set(st, i, val) SKM_sk_set(CMS_RevocationInfoChoice, (st), (i), (val))
522 #define sk_CMS_RevocationInfoChoice_zero(st) SKM_sk_zero(CMS_RevocationInfoChoice, (st))
523 #define sk_CMS_RevocationInfoChoice_push(st, val) SKM_sk_push(CMS_RevocationInfoChoice, (st), (val))

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524 #define sk_CMS_RevocationInfoChoice_unshift(st, val) SKM_sk_unshift(CMS_Revocati
525 #define sk_CMS_RevocationInfoChoice_find(st, val) SKM_sk_find(CMS_RevocationInfo
526 #define sk_CMS_RevocationInfoChoice_find_ex(st, val) SKM_sk_find_ex(CMS_Revocati
527 #define sk_CMS_RevocationInfoChoice_delete(st, i) SKM_sk_delete(CMS_RevocationIn
528 #define sk_CMS_RevocationInfoChoice_delete_ptr(st, ptr) SKM_sk_delete_ptr(CMS_Re
529 #define sk_CMS_RevocationInfoChoice_insert(st, val, i) SKM_sk_insert(CMS_Revocat
530 #define sk_CMS_RevocationInfoChoice_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CM
531 #define sk_CMS_RevocationInfoChoice_dup(st) SKM_sk_dup(CMS_RevocationInfoChoice,
532 #define sk_CMS_RevocationInfoChoice_pop_free(st, free_func) SKM_sk_pop_free(CMS_
533 #define sk_CMS_RevocationInfoChoice_shift(st) SKM_sk_shift(CMS_RevocationInfoCho
534 #define sk_CMS_RevocationInfoChoice_pop(st) SKM_sk_pop(CMS_RevocationInfoChoice,
535 #define sk_CMS_RevocationInfoChoice_sort(st) SKM_sk_sort(CMS_RevocationInfoChoic
536 #define sk_CMS_RevocationInfoChoice_is_sorted(st) SKM_sk_is_sorted(CMS_Revocatio

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538 #define sk_CMS_SignerInfo_new(cmp) SKM_sk_new(CMS_SignerInfo, (cmp))
539 #define sk_CMS_SignerInfo_new_null() SKM_sk_new_null(CMS_SignerInfo)
540 #define sk_CMS_SignerInfo_free(st) SKM_sk_free(CMS_SignerInfo, (st))
541 #define sk_CMS_SignerInfo_num(st) SKM_sk_num(CMS_SignerInfo, (st))
542 #define sk_CMS_SignerInfo_value(st, i) SKM_sk_value(CMS_SignerInfo, (st), (i))
543 #define sk_CMS_SignerInfo_set(st, i, val) SKM_sk_set(CMS_SignerInfo, (st), (i),
544 #define sk_CMS_SignerInfo_zero(st) SKM_sk_zero(CMS_SignerInfo, (st))
545 #define sk_CMS_SignerInfo_push(st, val) SKM_sk_push(CMS_SignerInfo, (st), (val))
546 #define sk_CMS_SignerInfo_unshift(st, val) SKM_sk_unshift(CMS_SignerInfo, (st),
547 #define sk_CMS_SignerInfo_find(st, val) SKM_sk_find(CMS_SignerInfo, (st), (val))
548 #define sk_CMS_SignerInfo_find_ex(st, val) SKM_sk_find_ex(CMS_SignerInfo, (st),
549 #define sk_CMS_SignerInfo_delete(st, i) SKM_sk_delete(CMS_SignerInfo, (st), (i))
550 #define sk_CMS_SignerInfo_delete_ptr(st, ptr) SKM_sk_delete_ptr(CMS_SignerInfo,
551 #define sk_CMS_SignerInfo_insert(st, val, i) SKM_sk_insert(CMS_SignerInfo, (st),
552 #define sk_CMS_SignerInfo_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CMS_SignerIn
553 #define sk_CMS_SignerInfo_dup(st) SKM_sk_dup(CMS_SignerInfo, st)
554 #define sk_CMS_SignerInfo_pop_free(st, free_func) SKM_sk_pop_free(CMS_SignerInfo
555 #define sk_CMS_SignerInfo_shift(st) SKM_sk_shift(CMS_SignerInfo, (st))
556 #define sk_CMS_SignerInfo_pop(st) SKM_sk_pop(CMS_SignerInfo, (st))
557 #define sk_CMS_SignerInfo_sort(st) SKM_sk_sort(CMS_SignerInfo, (st))
558 #define sk_CMS_SignerInfo_is_sorted(st) SKM_sk_is_sorted(CMS_SignerInfo, (st))

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560 #define sk_CONF_IMODULE_new(cmp) SKM_sk_new(CONF_IMODULE, (cmp))
561 #define sk_CONF_IMODULE_new_null() SKM_sk_new_null(CONF_IMODULE)
562 #define sk_CONF_IMODULE_free(st) SKM_sk_free(CONF_IMODULE, (st))
563 #define sk_CONF_IMODULE_num(st) SKM_sk_num(CONF_IMODULE, (st))
564 #define sk_CONF_IMODULE_value(st, i) SKM_sk_value(CONF_IMODULE, (st), (i))
565 #define sk_CONF_IMODULE_set(st, i, val) SKM_sk_set(CONF_IMODULE, (st), (i), (val)
566 #define sk_CONF_IMODULE_zero(st) SKM_sk_zero(CONF_IMODULE, (st))
567 #define sk_CONF_IMODULE_push(st, val) SKM_sk_push(CONF_IMODULE, (st), (val))
568 #define sk_CONF_IMODULE_unshift(st, val) SKM_sk_unshift(CONF_IMODULE, (st), (val)
569 #define sk_CONF_IMODULE_find(st, val) SKM_sk_find(CONF_IMODULE, (st), (val))
570 #define sk_CONF_IMODULE_find_ex(st, val) SKM_sk_find_ex(CONF_IMODULE, (st), (val)
571 #define sk_CONF_IMODULE_delete(st, i) SKM_sk_delete(CONF_IMODULE, (st), (i))
572 #define sk_CONF_IMODULE_delete_ptr(st, ptr) SKM_sk_delete_ptr(CONF_IMODULE, (st)
573 #define sk_CONF_IMODULE_insert(st, val, i) SKM_sk_insert(CONF_IMODULE, (st), (va
574 #define sk_CONF_IMODULE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CONF_IMODULE,
575 #define sk_CONF_IMODULE_dup(st) SKM_sk_dup(CONF_IMODULE, st)
576 #define sk_CONF_IMODULE_pop_free(st, free_func) SKM_sk_pop_free(CONF_IMODULE, (s
577 #define sk_CONF_IMODULE_shift(st) SKM_sk_shift(CONF_IMODULE, (st))
578 #define sk_CONF_IMODULE_pop(st) SKM_sk_pop(CONF_IMODULE, (st))
579 #define sk_CONF_IMODULE_sort(st) SKM_sk_sort(CONF_IMODULE, (st))
580 #define sk_CONF_IMODULE_is_sorted(st) SKM_sk_is_sorted(CONF_IMODULE, (st))

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582 #define sk_CONF_MODULE_new(cmp) SKM_sk_new(CONF_MODULE, (cmp))
583 #define sk_CONF_MODULE_new_null() SKM_sk_new_null(CONF_MODULE)
584 #define sk_CONF_MODULE_free(st) SKM_sk_free(CONF_MODULE, (st))
585 #define sk_CONF_MODULE_num(st) SKM_sk_num(CONF_MODULE, (st))
586 #define sk_CONF_MODULE_value(st, i) SKM_sk_value(CONF_MODULE, (st), (i))
587 #define sk_CONF_MODULE_set(st, i, val) SKM_sk_set(CONF_MODULE, (st), (i), (val))
588 #define sk_CONF_MODULE_zero(st) SKM_sk_zero(CONF_MODULE, (st))
589 #define sk_CONF_MODULE_push(st, val) SKM_sk_push(CONF_MODULE, (st), (val))

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590 #define sk_CONF_MODULE_unshift(st, val) SKM_sk_unshift(CONF_MODULE, (st), (val))
591 #define sk_CONF_MODULE_find(st, val) SKM_sk_find(CONF_MODULE, (st), (val))
592 #define sk_CONF_MODULE_find_ex(st, val) SKM_sk_find_ex(CONF_MODULE, (st), (val))
593 #define sk_CONF_MODULE_delete(st, i) SKM_sk_delete(CONF_MODULE, (st), (i))
594 #define sk_CONF_MODULE_delete_ptr(st, ptr) SKM_sk_delete_ptr(CONF_MODULE, (st),
595 #define sk_CONF_MODULE_insert(st, val, i) SKM_sk_insert(CONF_MODULE, (st), (val)
596 #define sk_CONF_MODULE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CONF_MODULE, (s
597 #define sk_CONF_MODULE_dup(st) SKM_sk_dup(CONF_MODULE, st)
598 #define sk_CONF_MODULE_pop_free(st, free_func) SKM_sk_pop_free(CONF_MODULE, (st)
599 #define sk_CONF_MODULE_shift(st) SKM_sk_shift(CONF_MODULE, (st))
600 #define sk_CONF_MODULE_pop(st) SKM_sk_pop(CONF_MODULE, (st))
601 #define sk_CONF_MODULE_sort(st) SKM_sk_sort(CONF_MODULE, (st))
602 #define sk_CONF_MODULE_is_sorted(st) SKM_sk_is_sorted(CONF_MODULE, (st))

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604 #define sk_CONF_VALUE_new(cmp) SKM_sk_new(CONF_VALUE, (cmp))
605 #define sk_CONF_VALUE_new_null() SKM_sk_new_null(CONF_VALUE)
606 #define sk_CONF_VALUE_free(st) SKM_sk_free(CONF_VALUE, (st))
607 #define sk_CONF_VALUE_num(st) SKM_sk_num(CONF_VALUE, (st))
608 #define sk_CONF_VALUE_value(st, i) SKM_sk_value(CONF_VALUE, (st), (i))
609 #define sk_CONF_VALUE_set(st, i, val) SKM_sk_set(CONF_VALUE, (st), (i), (val))
610 #define sk_CONF_VALUE_zero(st) SKM_sk_zero(CONF_VALUE, (st))
611 #define sk_CONF_VALUE_push(st, val) SKM_sk_push(CONF_VALUE, (st), (val))
612 #define sk_CONF_VALUE_unshift(st, val) SKM_sk_unshift(CONF_VALUE, (st), (val))
613 #define sk_CONF_VALUE_find(st, val) SKM_sk_find(CONF_VALUE, (st), (val))
614 #define sk_CONF_VALUE_find_ex(st, val) SKM_sk_find_ex(CONF_VALUE, (st), (val))
615 #define sk_CONF_VALUE_delete(st, i) SKM_sk_delete(CONF_VALUE, (st), (i))
616 #define sk_CONF_VALUE_delete_ptr(st, ptr) SKM_sk_delete_ptr(CONF_VALUE, (st), (p
617 #define sk_CONF_VALUE_insert(st, val, i) SKM_sk_insert(CONF_VALUE, (st), (val),
618 #define sk_CONF_VALUE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CONF_VALUE, (st)
619 #define sk_CONF_VALUE_dup(st) SKM_sk_dup(CONF_VALUE, st)
620 #define sk_CONF_VALUE_pop_free(st, free_func) SKM_sk_pop_free(CONF_VALUE, (st),
621 #define sk_CONF_VALUE_shift(st) SKM_sk_shift(CONF_VALUE, (st))
622 #define sk_CONF_VALUE_pop(st) SKM_sk_pop(CONF_VALUE, (st))
623 #define sk_CONF_VALUE_sort(st) SKM_sk_sort(CONF_VALUE, (st))
624 #define sk_CONF_VALUE_is_sorted(st) SKM_sk_is_sorted(CONF_VALUE, (st))

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626 #define sk_CRYPTO_EX_DATA_FUNCS_new(cmp) SKM_sk_new(CRYPTO_EX_DATA_FUNCS, (cmp))
627 #define sk_CRYPTO_EX_DATA_FUNCS_new_null() SKM_sk_new_null(CRYPTO_EX_DATA_FUNCS)
628 #define sk_CRYPTO_EX_DATA_FUNCS_free(st) SKM_sk_free(CRYPTO_EX_DATA_FUNCS, (st))
629 #define sk_CRYPTO_EX_DATA_FUNCS_num(st) SKM_sk_num(CRYPTO_EX_DATA_FUNCS, (st))
630 #define sk_CRYPTO_EX_DATA_FUNCS_value(st, i) SKM_sk_value(CRYPTO_EX_DATA_FUNCS,
631 #define sk_CRYPTO_EX_DATA_FUNCS_set(st, i, val) SKM_sk_set(CRYPTO_EX_DATA_FUNCS,
632 #define sk_CRYPTO_EX_DATA_FUNCS_zero(st) SKM_sk_zero(CRYPTO_EX_DATA_FUNCS, (st))
633 #define sk_CRYPTO_EX_DATA_FUNCS_push(st, val) SKM_sk_push(CRYPTO_EX_DATA_FUNCS,
634 #define sk_CRYPTO_EX_DATA_FUNCS_unshift(st, val) SKM_sk_unshift(CRYPTO_EX_DATA_F
635 #define sk_CRYPTO_EX_DATA_FUNCS_find(st, val) SKM_sk_find(CRYPTO_EX_DATA_FUNCS,
636 #define sk_CRYPTO_EX_DATA_FUNCS_find_ex(st, val) SKM_sk_find_ex(CRYPTO_EX_DATA_F
637 #define sk_CRYPTO_EX_DATA_FUNCS_delete(st, i) SKM_sk_delete(CRYPTO_EX_DATA_FUNCS
638 #define sk_CRYPTO_EX_DATA_FUNCS_delete_ptr(st, ptr) SKM_sk_delete_ptr(CRYPTO_EX
639 #define sk_CRYPTO_EX_DATA_FUNCS_insert(st, val, i) SKM_sk_insert(CRYPTO_EX_DATA
640 #define sk_CRYPTO_EX_DATA_FUNCS_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CRYPTO
641 #define sk_CRYPTO_EX_DATA_FUNCS_dup(st) SKM_sk_dup(CRYPTO_EX_DATA_FUNCS, st)
642 #define sk_CRYPTO_EX_DATA_FUNCS_pop_free(st, free_func) SKM_sk_pop_free(CRYPTO_E
643 #define sk_CRYPTO_EX_DATA_FUNCS_shift(st) SKM_sk_shift(CRYPTO_EX_DATA_FUNCS, (st
644 #define sk_CRYPTO_EX_DATA_FUNCS_pop(st) SKM_sk_pop(CRYPTO_EX_DATA_FUNCS, (st))
645 #define sk_CRYPTO_EX_DATA_FUNCS_sort(st) SKM_sk_sort(CRYPTO_EX_DATA_FUNCS, (st))
646 #define sk_CRYPTO_EX_DATA_FUNCS_is_sorted(st) SKM_sk_is_sorted(CRYPTO_EX_DATA_FU

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648 #define sk_CRYPTO_dynlock_new(cmp) SKM_sk_new(CRYPTO_dynlock, (cmp))
649 #define sk_CRYPTO_dynlock_new_null() SKM_sk_new_null(CRYPTO_dynlock)
650 #define sk_CRYPTO_dynlock_free(st) SKM_sk_free(CRYPTO_dynlock, (st))
651 #define sk_CRYPTO_dynlock_num(st) SKM_sk_num(CRYPTO_dynlock, (st))
652 #define sk_CRYPTO_dynlock_value(st, i) SKM_sk_value(CRYPTO_dynlock, (st), (i))
653 #define sk_CRYPTO_dynlock_set(st, i, val) SKM_sk_set(CRYPTO_dynlock, (st), (i),
654 #define sk_CRYPTO_dynlock_zero(st) SKM_sk_zero(CRYPTO_dynlock, (st))
655 #define sk_CRYPTO_dynlock_push(st, val) SKM_sk_push(CRYPTO_dynlock, (st), (val))

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656 #define sk_CRYPTODYNLOCK_unshift(st, val) SKM_sk_unshift(CRYPTODYNLOCK, (st),
657 #define sk_CRYPTODYNLOCK_find(st, val) SKM_sk_find(CRYPTODYNLOCK, (st), (val))
658 #define sk_CRYPTODYNLOCK_find_ex(st, val) SKM_sk_find_ex(CRYPTODYNLOCK, (st),
659 #define sk_CRYPTODYNLOCK_delete(st, i) SKM_sk_delete(CRYPTODYNLOCK, (st), (i))
660 #define sk_CRYPTODYNLOCK_delete_ptr(st, ptr) SKM_sk_delete_ptr(CRYPTODYNLOCK,
661 #define sk_CRYPTODYNLOCK_insert(st, val, i) SKM_sk_insert(CRYPTODYNLOCK, (st),
662 #define sk_CRYPTODYNLOCK_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(CRYPTODYNLOCK,
663 #define sk_CRYPTODYNLOCK_dup(st) SKM_sk_dup(CRYPTODYNLOCK, (st))
664 #define sk_CRYPTODYNLOCK_pop_free(st, free_func) SKM_sk_pop_free(CRYPTODYNLOCK,
665 #define sk_CRYPTODYNLOCK_shift(st) SKM_sk_shift(CRYPTODYNLOCK, (st))
666 #define sk_CRYPTODYNLOCK_pop(st) SKM_sk_pop(CRYPTODYNLOCK, (st))
667 #define sk_CRYPTODYNLOCK_sort(st) SKM_sk_sort(CRYPTODYNLOCK, (st))
668 #define sk_CRYPTODYNLOCK_is_sorted(st) SKM_sk_is_sorted(CRYPTODYNLOCK, (st))

670 #define sk_DISTPOINT_new(cmp) SKM_sk_new(DISTPOINT, (cmp))
671 #define sk_DISTPOINT_new_null() SKM_sk_new_null(DISTPOINT)
672 #define sk_DISTPOINT_free(st) SKM_sk_free(DISTPOINT, (st))
673 #define sk_DISTPOINT_num(st) SKM_sk_num(DISTPOINT, (st))
674 #define sk_DISTPOINT_value(st, i) SKM_sk_value(DISTPOINT, (st), (i))
675 #define sk_DISTPOINT_set(st, i, val) SKM_sk_set(DISTPOINT, (st), (i), (val))
676 #define sk_DISTPOINT_zero(st) SKM_sk_zero(DISTPOINT, (st))
677 #define sk_DISTPOINT_push(st, val) SKM_sk_push(DISTPOINT, (st), (val))
678 #define sk_DISTPOINT_unshift(st, val) SKM_sk_unshift(DISTPOINT, (st), (val))
679 #define sk_DISTPOINT_find(st, val) SKM_sk_find(DISTPOINT, (st), (val))
680 #define sk_DISTPOINT_find_ex(st, val) SKM_sk_find_ex(DISTPOINT, (st), (val))
681 #define sk_DISTPOINT_delete(st, i) SKM_sk_delete(DISTPOINT, (st), (i))
682 #define sk_DISTPOINT_delete_ptr(st, ptr) SKM_sk_delete_ptr(DISTPOINT, (st), (ptr))
683 #define sk_DISTPOINT_insert(st, val, i) SKM_sk_insert(DISTPOINT, (st), (val), (i))
684 #define sk_DISTPOINT_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(DISTPOINT, (st), (cmp))
685 #define sk_DISTPOINT_dup(st) SKM_sk_dup(DISTPOINT, (st))
686 #define sk_DISTPOINT_pop_free(st, free_func) SKM_sk_pop_free(DISTPOINT, (st), (free_func))
687 #define sk_DISTPOINT_shift(st) SKM_sk_shift(DISTPOINT, (st))
688 #define sk_DISTPOINT_pop(st) SKM_sk_pop(DISTPOINT, (st))
689 #define sk_DISTPOINT_sort(st) SKM_sk_sort(DISTPOINT, (st))
690 #define sk_DISTPOINT_is_sorted(st) SKM_sk_is_sorted(DISTPOINT, (st))

692 #define sk_ENGINE_new(cmp) SKM_sk_new(ENGINE, (cmp))
693 #define sk_ENGINE_new_null() SKM_sk_new_null(ENGINE)
694 #define sk_ENGINE_free(st) SKM_sk_free(ENGINE, (st))
695 #define sk_ENGINE_num(st) SKM_sk_num(ENGINE, (st))
696 #define sk_ENGINE_value(st, i) SKM_sk_value(ENGINE, (st), (i))
697 #define sk_ENGINE_set(st, i, val) SKM_sk_set(ENGINE, (st), (i), (val))
698 #define sk_ENGINE_zero(st) SKM_sk_zero(ENGINE, (st))
699 #define sk_ENGINE_push(st, val) SKM_sk_push(ENGINE, (st), (val))
700 #define sk_ENGINE_unshift(st, val) SKM_sk_unshift(ENGINE, (st), (val))
701 #define sk_ENGINE_find(st, val) SKM_sk_find(ENGINE, (st), (val))
702 #define sk_ENGINE_find_ex(st, val) SKM_sk_find_ex(ENGINE, (st), (val))
703 #define sk_ENGINE_delete(st, i) SKM_sk_delete(ENGINE, (st), (i))
704 #define sk_ENGINE_delete_ptr(st, ptr) SKM_sk_delete_ptr(ENGINE, (st), (ptr))
705 #define sk_ENGINE_insert(st, val, i) SKM_sk_insert(ENGINE, (st), (val), (i))
706 #define sk_ENGINE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ENGINE, (st), (cmp))
707 #define sk_ENGINE_dup(st) SKM_sk_dup(ENGINE, (st))
708 #define sk_ENGINE_pop_free(st, free_func) SKM_sk_pop_free(ENGINE, (st), (free_func))
709 #define sk_ENGINE_shift(st) SKM_sk_shift(ENGINE, (st))
710 #define sk_ENGINE_pop(st) SKM_sk_pop(ENGINE, (st))
711 #define sk_ENGINE_sort(st) SKM_sk_sort(ENGINE, (st))
712 #define sk_ENGINE_is_sorted(st) SKM_sk_is_sorted(ENGINE, (st))

714 #define sk_ENGINECLEANUPITEM_new(cmp) SKM_sk_new(ENGINECLEANUPITEM, (cmp))
715 #define sk_ENGINECLEANUPITEM_new_null() SKM_sk_new_null(ENGINECLEANUPITEM)
716 #define sk_ENGINECLEANUPITEM_free(st) SKM_sk_free(ENGINECLEANUPITEM, (st))
717 #define sk_ENGINECLEANUPITEM_num(st) SKM_sk_num(ENGINECLEANUPITEM, (st))
718 #define sk_ENGINECLEANUPITEM_value(st, i) SKM_sk_value(ENGINECLEANUPITEM, (st), (i))
719 #define sk_ENGINECLEANUPITEM_set(st, i, val) SKM_sk_set(ENGINECLEANUPITEM, (st), (i), (val))
720 #define sk_ENGINECLEANUPITEM_zero(st) SKM_sk_zero(ENGINECLEANUPITEM, (st))
721 #define sk_ENGINECLEANUPITEM_push(st, val) SKM_sk_push(ENGINECLEANUPITEM, (st), (val))

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722 #define sk_ENGINECLEANUPITEM_unshift(st, val) SKM_sk_unshift(ENGINECLEANUPITEM, (st), (val))
723 #define sk_ENGINECLEANUPITEM_find(st, val) SKM_sk_find(ENGINECLEANUPITEM, (st), (val))
724 #define sk_ENGINECLEANUPITEM_find_ex(st, val) SKM_sk_find_ex(ENGINECLEANUPITEM, (st), (val))
725 #define sk_ENGINECLEANUPITEM_delete(st, i) SKM_sk_delete(ENGINECLEANUPITEM, (st), (i))
726 #define sk_ENGINECLEANUPITEM_delete_ptr(st, ptr) SKM_sk_delete_ptr(ENGINECLEANUPITEM, (st), (ptr))
727 #define sk_ENGINECLEANUPITEM_insert(st, val, i) SKM_sk_insert(ENGINECLEANUPITEM, (st), (val), (i))
728 #define sk_ENGINECLEANUPITEM_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ENGINECLEANUPITEM, (st), (cmp))
729 #define sk_ENGINECLEANUPITEM_dup(st) SKM_sk_dup(ENGINECLEANUPITEM, (st))
730 #define sk_ENGINECLEANUPITEM_pop_free(st, free_func) SKM_sk_pop_free(ENGINECLEANUPITEM, (st), (free_func))
731 #define sk_ENGINECLEANUPITEM_shift(st) SKM_sk_shift(ENGINECLEANUPITEM, (st))
732 #define sk_ENGINECLEANUPITEM_pop(st) SKM_sk_pop(ENGINECLEANUPITEM, (st))
733 #define sk_ENGINECLEANUPITEM_sort(st) SKM_sk_sort(ENGINECLEANUPITEM, (st))
734 #define sk_ENGINECLEANUPITEM_is_sorted(st) SKM_sk_is_sorted(ENGINECLEANUPITEM, (st))

736 #define sk_ESSCERTID_new(cmp) SKM_sk_new(ESSCERTID, (cmp))
737 #define sk_ESSCERTID_new_null() SKM_sk_new_null(ESSCERTID)
738 #define sk_ESSCERTID_free(st) SKM_sk_free(ESSCERTID, (st))
739 #define sk_ESSCERTID_num(st) SKM_sk_num(ESSCERTID, (st))
740 #define sk_ESSCERTID_value(st, i) SKM_sk_value(ESSCERTID, (st), (i))
741 #define sk_ESSCERTID_set(st, i, val) SKM_sk_set(ESSCERTID, (st), (i), (val))
742 #define sk_ESSCERTID_zero(st) SKM_sk_zero(ESSCERTID, (st))
743 #define sk_ESSCERTID_push(st, val) SKM_sk_push(ESSCERTID, (st), (val))
744 #define sk_ESSCERTID_unshift(st, val) SKM_sk_unshift(ESSCERTID, (st), (val))
745 #define sk_ESSCERTID_find(st, val) SKM_sk_find(ESSCERTID, (st), (val))
746 #define sk_ESSCERTID_find_ex(st, val) SKM_sk_find_ex(ESSCERTID, (st), (val))
747 #define sk_ESSCERTID_delete(st, i) SKM_sk_delete(ESSCERTID, (st), (i))
748 #define sk_ESSCERTID_delete_ptr(st, ptr) SKM_sk_delete_ptr(ESSCERTID, (st), (ptr))
749 #define sk_ESSCERTID_insert(st, val, i) SKM_sk_insert(ESSCERTID, (st), (val), (i))
750 #define sk_ESSCERTID_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ESSCERTID, (st), (cmp))
751 #define sk_ESSCERTID_dup(st) SKM_sk_dup(ESSCERTID, (st))
752 #define sk_ESSCERTID_pop_free(st, free_func) SKM_sk_pop_free(ESSCERTID, (st), (free_func))
753 #define sk_ESSCERTID_shift(st) SKM_sk_shift(ESSCERTID, (st))
754 #define sk_ESSCERTID_pop(st) SKM_sk_pop(ESSCERTID, (st))
755 #define sk_ESSCERTID_sort(st) SKM_sk_sort(ESSCERTID, (st))
756 #define sk_ESSCERTID_is_sorted(st) SKM_sk_is_sorted(ESSCERTID, (st))

758 #define sk_EVPMD_new(cmp) SKM_sk_new(EVPMD, (cmp))
759 #define sk_EVPMD_new_null() SKM_sk_new_null(EVPMD)
760 #define sk_EVPMD_free(st) SKM_sk_free(EVPMD, (st))
761 #define sk_EVPMD_num(st) SKM_sk_num(EVPMD, (st))
762 #define sk_EVPMD_value(st, i) SKM_sk_value(EVPMD, (st), (i))
763 #define sk_EVPMD_set(st, i, val) SKM_sk_set(EVPMD, (st), (i), (val))
764 #define sk_EVPMD_zero(st) SKM_sk_zero(EVPMD, (st))
765 #define sk_EVPMD_push(st, val) SKM_sk_push(EVPMD, (st), (val))
766 #define sk_EVPMD_unshift(st, val) SKM_sk_unshift(EVPMD, (st), (val))
767 #define sk_EVPMD_find(st, val) SKM_sk_find(EVPMD, (st), (val))
768 #define sk_EVPMD_find_ex(st, val) SKM_sk_find_ex(EVPMD, (st), (val))
769 #define sk_EVPMD_delete(st, i) SKM_sk_delete(EVPMD, (st), (i))
770 #define sk_EVPMD_delete_ptr(st, ptr) SKM_sk_delete_ptr(EVPMD, (st), (ptr))
771 #define sk_EVPMD_insert(st, val, i) SKM_sk_insert(EVPMD, (st), (val), (i))
772 #define sk_EVPMD_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(EVPMD, (st), (cmp))
773 #define sk_EVPMD_dup(st) SKM_sk_dup(EVPMD, (st))
774 #define sk_EVPMD_pop_free(st, free_func) SKM_sk_pop_free(EVPMD, (st), (free_func))
775 #define sk_EVPMD_shift(st) SKM_sk_shift(EVPMD, (st))
776 #define sk_EVPMD_pop(st) SKM_sk_pop(EVPMD, (st))
777 #define sk_EVPMD_sort(st) SKM_sk_sort(EVPMD, (st))
778 #define sk_EVPMD_is_sorted(st) SKM_sk_is_sorted(EVPMD, (st))

780 #define sk_EVPPBECTL_new(cmp) SKM_sk_new(EVPPBECTL, (cmp))
781 #define sk_EVPPBECTL_new_null() SKM_sk_new_null(EVPPBECTL)
782 #define sk_EVPPBECTL_free(st) SKM_sk_free(EVPPBECTL, (st))
783 #define sk_EVPPBECTL_num(st) SKM_sk_num(EVPPBECTL, (st))
784 #define sk_EVPPBECTL_value(st, i) SKM_sk_value(EVPPBECTL, (st), (i))
785 #define sk_EVPPBECTL_set(st, i, val) SKM_sk_set(EVPPBECTL, (st), (i), (val))
786 #define sk_EVPPBECTL_zero(st) SKM_sk_zero(EVPPBECTL, (st))
787 #define sk_EVPPBECTL_push(st, val) SKM_sk_push(EVPPBECTL, (st), (val))

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788 #define sk_EVP_PBE_CTL_unshift(st, val) SKM_sk_unshift(EVP_PBE_CTL, (st), (val))
789 #define sk_EVP_PBE_CTL_find(st, val) SKM_sk_find(EVP_PBE_CTL, (st), (val))
790 #define sk_EVP_PBE_CTL_find_ex(st, val) SKM_sk_find_ex(EVP_PBE_CTL, (st), (val))
791 #define sk_EVP_PBE_CTL_delete(st, i) SKM_sk_delete(EVP_PBE_CTL, (st), (i))
792 #define sk_EVP_PBE_CTL_delete_ptr(st, ptr) SKM_sk_delete_ptr(EVP_PBE_CTL, (st), (ptr))
793 #define sk_EVP_PBE_CTL_insert(st, val, i) SKM_sk_insert(EVP_PBE_CTL, (st), (val), (i))
794 #define sk_EVP_PBE_CTL_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(EVP_PBE_CTL, (st), (cmp))
795 #define sk_EVP_PBE_CTL_dup(st) SKM_sk_dup(EVP_PBE_CTL, (st))
796 #define sk_EVP_PBE_CTL_pop_free(st, free_func) SKM_sk_pop_free(EVP_PBE_CTL, (st), (free_func))
797 #define sk_EVP_PBE_CTL_shift(st) SKM_sk_shift(EVP_PBE_CTL, (st))
798 #define sk_EVP_PBE_CTL_pop(st) SKM_sk_pop(EVP_PBE_CTL, (st))
799 #define sk_EVP_PBE_CTL_sort(st) SKM_sk_sort(EVP_PBE_CTL, (st))
800 #define sk_EVP_PBE_CTL_is_sorted(st) SKM_sk_is_sorted(EVP_PBE_CTL, (st))

802 #define sk_EVP_PKEY_ASN1_METHOD_new(cmp) SKM_sk_new(EVP_PKEY_ASN1_METHOD, (cmp))
803 #define sk_EVP_PKEY_ASN1_METHOD_new_null() SKM_sk_new_null(EVP_PKEY_ASN1_METHOD)
804 #define sk_EVP_PKEY_ASN1_METHOD_free(st) SKM_sk_free(EVP_PKEY_ASN1_METHOD, (st))
805 #define sk_EVP_PKEY_ASN1_METHOD_num(st) SKM_sk_num(EVP_PKEY_ASN1_METHOD, (st))
806 #define sk_EVP_PKEY_ASN1_METHOD_value(st, i) SKM_sk_value(EVP_PKEY_ASN1_METHOD, (st), (i))
807 #define sk_EVP_PKEY_ASN1_METHOD_set(st, i, val) SKM_sk_set(EVP_PKEY_ASN1_METHOD, (st), (i), (val))
808 #define sk_EVP_PKEY_ASN1_METHOD_zero(st) SKM_sk_zero(EVP_PKEY_ASN1_METHOD, (st))
809 #define sk_EVP_PKEY_ASN1_METHOD_push(st, val) SKM_sk_push(EVP_PKEY_ASN1_METHOD, (st), (val))
810 #define sk_EVP_PKEY_ASN1_METHOD_unshift(st, val) SKM_sk_unshift(EVP_PKEY_ASN1_METHOD, (st), (val))
811 #define sk_EVP_PKEY_ASN1_METHOD_find(st, val) SKM_sk_find(EVP_PKEY_ASN1_METHOD, (st), (val))
812 #define sk_EVP_PKEY_ASN1_METHOD_find_ex(st, val) SKM_sk_find_ex(EVP_PKEY_ASN1_METHOD, (st), (val))
813 #define sk_EVP_PKEY_ASN1_METHOD_delete(st, i) SKM_sk_delete(EVP_PKEY_ASN1_METHOD, (st), (i))
814 #define sk_EVP_PKEY_ASN1_METHOD_delete_ptr(st, ptr) SKM_sk_delete_ptr(EVP_PKEY_ASN1_METHOD, (st), (ptr))
815 #define sk_EVP_PKEY_ASN1_METHOD_insert(st, val, i) SKM_sk_insert(EVP_PKEY_ASN1_METHOD, (st), (val), (i))
816 #define sk_EVP_PKEY_ASN1_METHOD_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(EVP_PKEY_ASN1_METHOD, (st), (cmp))
817 #define sk_EVP_PKEY_ASN1_METHOD_dup(st) SKM_sk_dup(EVP_PKEY_ASN1_METHOD, (st))
818 #define sk_EVP_PKEY_ASN1_METHOD_pop_free(st, free_func) SKM_sk_pop_free(EVP_PKEY_ASN1_METHOD, (st), (free_func))
819 #define sk_EVP_PKEY_ASN1_METHOD_shift(st) SKM_sk_shift(EVP_PKEY_ASN1_METHOD, (st))
820 #define sk_EVP_PKEY_ASN1_METHOD_pop(st) SKM_sk_pop(EVP_PKEY_ASN1_METHOD, (st))
821 #define sk_EVP_PKEY_ASN1_METHOD_sort(st) SKM_sk_sort(EVP_PKEY_ASN1_METHOD, (st))
822 #define sk_EVP_PKEY_ASN1_METHOD_is_sorted(st) SKM_sk_is_sorted(EVP_PKEY_ASN1_METHOD, (st))

824 #define sk_EVP_PKEY_METHOD_new(cmp) SKM_sk_new(EVP_PKEY_METHOD, (cmp))
825 #define sk_EVP_PKEY_METHOD_new_null() SKM_sk_new_null(EVP_PKEY_METHOD)
826 #define sk_EVP_PKEY_METHOD_free(st) SKM_sk_free(EVP_PKEY_METHOD, (st))
827 #define sk_EVP_PKEY_METHOD_num(st) SKM_sk_num(EVP_PKEY_METHOD, (st))
828 #define sk_EVP_PKEY_METHOD_value(st, i) SKM_sk_value(EVP_PKEY_METHOD, (st), (i))
829 #define sk_EVP_PKEY_METHOD_set(st, i, val) SKM_sk_set(EVP_PKEY_METHOD, (st), (i), (val))
830 #define sk_EVP_PKEY_METHOD_zero(st) SKM_sk_zero(EVP_PKEY_METHOD, (st))
831 #define sk_EVP_PKEY_METHOD_push(st, val) SKM_sk_push(EVP_PKEY_METHOD, (st), (val))
832 #define sk_EVP_PKEY_METHOD_unshift(st, val) SKM_sk_unshift(EVP_PKEY_METHOD, (st), (val))
833 #define sk_EVP_PKEY_METHOD_find(st, val) SKM_sk_find(EVP_PKEY_METHOD, (st), (val))
834 #define sk_EVP_PKEY_METHOD_find_ex(st, val) SKM_sk_find_ex(EVP_PKEY_METHOD, (st), (val))
835 #define sk_EVP_PKEY_METHOD_delete(st, i) SKM_sk_delete(EVP_PKEY_METHOD, (st), (i))
836 #define sk_EVP_PKEY_METHOD_delete_ptr(st, ptr) SKM_sk_delete_ptr(EVP_PKEY_METHOD, (st), (ptr))
837 #define sk_EVP_PKEY_METHOD_insert(st, val, i) SKM_sk_insert(EVP_PKEY_METHOD, (st), (val), (i))
838 #define sk_EVP_PKEY_METHOD_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(EVP_PKEY_METHOD, (st), (cmp))
839 #define sk_EVP_PKEY_METHOD_dup(st) SKM_sk_dup(EVP_PKEY_METHOD, (st))
840 #define sk_EVP_PKEY_METHOD_pop_free(st, free_func) SKM_sk_pop_free(EVP_PKEY_METHOD, (st), (free_func))
841 #define sk_EVP_PKEY_METHOD_shift(st) SKM_sk_shift(EVP_PKEY_METHOD, (st))
842 #define sk_EVP_PKEY_METHOD_pop(st) SKM_sk_pop(EVP_PKEY_METHOD, (st))
843 #define sk_EVP_PKEY_METHOD_sort(st) SKM_sk_sort(EVP_PKEY_METHOD, (st))
844 #define sk_EVP_PKEY_METHOD_is_sorted(st) SKM_sk_is_sorted(EVP_PKEY_METHOD, (st))

846 #define sk_GENERAL_NAME_new(cmp) SKM_sk_new(GENERAL_NAME, (cmp))
847 #define sk_GENERAL_NAME_new_null() SKM_sk_new_null(GENERAL_NAME)
848 #define sk_GENERAL_NAME_free(st) SKM_sk_free(GENERAL_NAME, (st))
849 #define sk_GENERAL_NAME_num(st) SKM_sk_num(GENERAL_NAME, (st))
850 #define sk_GENERAL_NAME_value(st, i) SKM_sk_value(GENERAL_NAME, (st), (i))
851 #define sk_GENERAL_NAME_set(st, i, val) SKM_sk_set(GENERAL_NAME, (st), (i), (val))
852 #define sk_GENERAL_NAME_zero(st) SKM_sk_zero(GENERAL_NAME, (st))
853 #define sk_GENERAL_NAME_push(st, val) SKM_sk_push(GENERAL_NAME, (st), (val))

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854 #define sk_GENERAL_NAME_unshift(st, val) SKM_sk_unshift(GENERAL_NAME, (st), (val))
855 #define sk_GENERAL_NAME_find(st, val) SKM_sk_find(GENERAL_NAME, (st), (val))
856 #define sk_GENERAL_NAME_find_ex(st, val) SKM_sk_find_ex(GENERAL_NAME, (st), (val))
857 #define sk_GENERAL_NAME_delete(st, i) SKM_sk_delete(GENERAL_NAME, (st), (i))
858 #define sk_GENERAL_NAME_delete_ptr(st, ptr) SKM_sk_delete_ptr(GENERAL_NAME, (st), (ptr))
859 #define sk_GENERAL_NAME_insert(st, val, i) SKM_sk_insert(GENERAL_NAME, (st), (val), (i))
860 #define sk_GENERAL_NAME_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(GENERAL_NAME, (st), (cmp))
861 #define sk_GENERAL_NAME_dup(st) SKM_sk_dup(GENERAL_NAME, (st))
862 #define sk_GENERAL_NAME_pop_free(st, free_func) SKM_sk_pop_free(GENERAL_NAME, (st), (free_func))
863 #define sk_GENERAL_NAME_shift(st) SKM_sk_shift(GENERAL_NAME, (st))
864 #define sk_GENERAL_NAME_pop(st) SKM_sk_pop(GENERAL_NAME, (st))
865 #define sk_GENERAL_NAME_sort(st) SKM_sk_sort(GENERAL_NAME, (st))
866 #define sk_GENERAL_NAME_is_sorted(st) SKM_sk_is_sorted(GENERAL_NAME, (st))

868 #define sk_GENERAL_NAMES_new(cmp) SKM_sk_new(GENERAL_NAMES, (cmp))
869 #define sk_GENERAL_NAMES_new_null() SKM_sk_new_null(GENERAL_NAMES)
870 #define sk_GENERAL_NAMES_free(st) SKM_sk_free(GENERAL_NAMES, (st))
871 #define sk_GENERAL_NAMES_num(st) SKM_sk_num(GENERAL_NAMES, (st))
872 #define sk_GENERAL_NAMES_value(st, i) SKM_sk_value(GENERAL_NAMES, (st), (i))
873 #define sk_GENERAL_NAMES_set(st, i, val) SKM_sk_set(GENERAL_NAMES, (st), (i), (val))
874 #define sk_GENERAL_NAMES_zero(st) SKM_sk_zero(GENERAL_NAMES, (st))
875 #define sk_GENERAL_NAMES_push(st, val) SKM_sk_push(GENERAL_NAMES, (st), (val))
876 #define sk_GENERAL_NAMES_unshift(st, val) SKM_sk_unshift(GENERAL_NAMES, (st), (val))
877 #define sk_GENERAL_NAMES_find(st, val) SKM_sk_find(GENERAL_NAMES, (st), (val))
878 #define sk_GENERAL_NAMES_find_ex(st, val) SKM_sk_find_ex(GENERAL_NAMES, (st), (val))
879 #define sk_GENERAL_NAMES_delete(st, i) SKM_sk_delete(GENERAL_NAMES, (st), (i))
880 #define sk_GENERAL_NAMES_delete_ptr(st, ptr) SKM_sk_delete_ptr(GENERAL_NAMES, (st), (ptr))
881 #define sk_GENERAL_NAMES_insert(st, val, i) SKM_sk_insert(GENERAL_NAMES, (st), (val), (i))
882 #define sk_GENERAL_NAMES_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(GENERAL_NAMES, (st), (cmp))
883 #define sk_GENERAL_NAMES_dup(st) SKM_sk_dup(GENERAL_NAMES, (st))
884 #define sk_GENERAL_NAMES_pop_free(st, free_func) SKM_sk_pop_free(GENERAL_NAMES, (st), (free_func))
885 #define sk_GENERAL_NAMES_shift(st) SKM_sk_shift(GENERAL_NAMES, (st))
886 #define sk_GENERAL_NAMES_pop(st) SKM_sk_pop(GENERAL_NAMES, (st))
887 #define sk_GENERAL_NAMES_sort(st) SKM_sk_sort(GENERAL_NAMES, (st))
888 #define sk_GENERAL_NAMES_is_sorted(st) SKM_sk_is_sorted(GENERAL_NAMES, (st))

890 #define sk_GENERAL_SUBTREE_new(cmp) SKM_sk_new(GENERAL_SUBTREE, (cmp))
891 #define sk_GENERAL_SUBTREE_new_null() SKM_sk_new_null(GENERAL_SUBTREE)
892 #define sk_GENERAL_SUBTREE_free(st) SKM_sk_free(GENERAL_SUBTREE, (st))
893 #define sk_GENERAL_SUBTREE_num(st) SKM_sk_num(GENERAL_SUBTREE, (st))
894 #define sk_GENERAL_SUBTREE_value(st, i) SKM_sk_value(GENERAL_SUBTREE, (st), (i))
895 #define sk_GENERAL_SUBTREE_set(st, i, val) SKM_sk_set(GENERAL_SUBTREE, (st), (i), (val))
896 #define sk_GENERAL_SUBTREE_zero(st) SKM_sk_zero(GENERAL_SUBTREE, (st))
897 #define sk_GENERAL_SUBTREE_push(st, val) SKM_sk_push(GENERAL_SUBTREE, (st), (val))
898 #define sk_GENERAL_SUBTREE_unshift(st, val) SKM_sk_unshift(GENERAL_SUBTREE, (st), (val))
899 #define sk_GENERAL_SUBTREE_find(st, val) SKM_sk_find(GENERAL_SUBTREE, (st), (val))
900 #define sk_GENERAL_SUBTREE_find_ex(st, val) SKM_sk_find_ex(GENERAL_SUBTREE, (st), (val))
901 #define sk_GENERAL_SUBTREE_delete(st, i) SKM_sk_delete(GENERAL_SUBTREE, (st), (i))
902 #define sk_GENERAL_SUBTREE_delete_ptr(st, ptr) SKM_sk_delete_ptr(GENERAL_SUBTREE, (st), (ptr))
903 #define sk_GENERAL_SUBTREE_insert(st, val, i) SKM_sk_insert(GENERAL_SUBTREE, (st), (val), (i))
904 #define sk_GENERAL_SUBTREE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(GENERAL_SUBTREE, (st), (cmp))
905 #define sk_GENERAL_SUBTREE_dup(st) SKM_sk_dup(GENERAL_SUBTREE, (st))
906 #define sk_GENERAL_SUBTREE_pop_free(st, free_func) SKM_sk_pop_free(GENERAL_SUBTREE, (st), (free_func))
907 #define sk_GENERAL_SUBTREE_shift(st) SKM_sk_shift(GENERAL_SUBTREE, (st))
908 #define sk_GENERAL_SUBTREE_pop(st) SKM_sk_pop(GENERAL_SUBTREE, (st))
909 #define sk_GENERAL_SUBTREE_sort(st) SKM_sk_sort(GENERAL_SUBTREE, (st))
910 #define sk_GENERAL_SUBTREE_is_sorted(st) SKM_sk_is_sorted(GENERAL_SUBTREE, (st))

912 #define sk_IPAddressFamily_new(cmp) SKM_sk_new(IPAddressFamily, (cmp))
913 #define sk_IPAddressFamily_new_null() SKM_sk_new_null(IPAddressFamily)
914 #define sk_IPAddressFamily_free(st) SKM_sk_free(IPAddressFamily, (st))
915 #define sk_IPAddressFamily_num(st) SKM_sk_num(IPAddressFamily, (st))
916 #define sk_IPAddressFamily_value(st, i) SKM_sk_value(IPAddressFamily, (st), (i))
917 #define sk_IPAddressFamily_set(st, i, val) SKM_sk_set(IPAddressFamily, (st), (i), (val))
918 #define sk_IPAddressFamily_zero(st) SKM_sk_zero(IPAddressFamily, (st))
919 #define sk_IPAddressFamily_push(st, val) SKM_sk_push(IPAddressFamily, (st), (val))

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920 #define sk_IPAddressFamily_unshift(st, val) SKM_sk_unshift(IPAddressFamily, (st)
921 #define sk_IPAddressFamily_find(st, val) SKM_sk_find(IPAddressFamily, (st), (val)
922 #define sk_IPAddressFamily_find_ex(st, val) SKM_sk_find_ex(IPAddressFamily, (st)
923 #define sk_IPAddressFamily_delete(st, i) SKM_sk_delete(IPAddressFamily, (st), (i)
924 #define sk_IPAddressFamily_delete_ptr(st, ptr) SKM_sk_delete_ptr(IPAddressFamily
925 #define sk_IPAddressFamily_insert(st, val, i) SKM_sk_insert(IPAddressFamily, (st)
926 #define sk_IPAddressFamily_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(IPAddressFa
927 #define sk_IPAddressFamily_dup(st) SKM_sk_dup(IPAddressFamily, (st))
928 #define sk_IPAddressFamily_pop_free(st, free_func) SKM_sk_pop_free(IPAddressFami
929 #define sk_IPAddressFamily_shift(st) SKM_sk_shift(IPAddressFamily, (st))
930 #define sk_IPAddressFamily_pop(st) SKM_sk_pop(IPAddressFamily, (st))
931 #define sk_IPAddressFamily_sort(st) SKM_sk_sort(IPAddressFamily, (st))
932 #define sk_IPAddressFamily_is_sorted(st) SKM_sk_is_sorted(IPAddressFamily, (st))

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934 #define sk_IPAddressOrRange_new(cmp) SKM_sk_new(IPAddressOrRange, (cmp))
935 #define sk_IPAddressOrRange_new_null() SKM_sk_new_null(IPAddressOrRange)
936 #define sk_IPAddressOrRange_free(st) SKM_sk_free(IPAddressOrRange, (st))
937 #define sk_IPAddressOrRange_num(st) SKM_sk_num(IPAddressOrRange, (st))
938 #define sk_IPAddressOrRange_value(st, i) SKM_sk_value(IPAddressOrRange, (st), (i)
939 #define sk_IPAddressOrRange_set(st, i, val) SKM_sk_set(IPAddressOrRange, (st), (
940 #define sk_IPAddressOrRange_zero(st) SKM_sk_zero(IPAddressOrRange, (st))
941 #define sk_IPAddressOrRange_push(st, val) SKM_sk_push(IPAddressOrRange, (st), (v
942 #define sk_IPAddressOrRange_unshift(st, val) SKM_sk_unshift(IPAddressOrRange, (s
943 #define sk_IPAddressOrRange_find(st, val) SKM_sk_find(IPAddressOrRange, (st), (v
944 #define sk_IPAddressOrRange_find_ex(st, val) SKM_sk_find_ex(IPAddressOrRange, (s
945 #define sk_IPAddressOrRange_delete(st, i) SKM_sk_delete(IPAddressOrRange, (st),
946 #define sk_IPAddressOrRange_delete_ptr(st, ptr) SKM_sk_delete_ptr(IPAddressOrRan
947 #define sk_IPAddressOrRange_insert(st, val, i) SKM_sk_insert(IPAddressOrRange, (
948 #define sk_IPAddressOrRange_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(IPAddressO
949 #define sk_IPAddressOrRange_dup(st) SKM_sk_dup(IPAddressOrRange, (st))
950 #define sk_IPAddressOrRange_pop_free(st, free_func) SKM_sk_pop_free(IPAddressOrR
951 #define sk_IPAddressOrRange_shift(st) SKM_sk_shift(IPAddressOrRange, (st))
952 #define sk_IPAddressOrRange_pop(st) SKM_sk_pop(IPAddressOrRange, (st))
953 #define sk_IPAddressOrRange_sort(st) SKM_sk_sort(IPAddressOrRange, (st))
954 #define sk_IPAddressOrRange_is_sorted(st) SKM_sk_is_sorted(IPAddressOrRange, (st)

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956 #define sk_KRB5_APREQBODY_new(cmp) SKM_sk_new(KRB5_APREQBODY, (cmp))
957 #define sk_KRB5_APREQBODY_new_null() SKM_sk_new_null(KRB5_APREQBODY)
958 #define sk_KRB5_APREQBODY_free(st) SKM_sk_free(KRB5_APREQBODY, (st))
959 #define sk_KRB5_APREQBODY_num(st) SKM_sk_num(KRB5_APREQBODY, (st))
960 #define sk_KRB5_APREQBODY_value(st, i) SKM_sk_value(KRB5_APREQBODY, (st), (i))
961 #define sk_KRB5_APREQBODY_set(st, i, val) SKM_sk_set(KRB5_APREQBODY, (st), (i),
962 #define sk_KRB5_APREQBODY_zero(st) SKM_sk_zero(KRB5_APREQBODY, (st))
963 #define sk_KRB5_APREQBODY_push(st, val) SKM_sk_push(KRB5_APREQBODY, (st), (val))
964 #define sk_KRB5_APREQBODY_unshift(st, val) SKM_sk_unshift(KRB5_APREQBODY, (st),
965 #define sk_KRB5_APREQBODY_find(st, val) SKM_sk_find(KRB5_APREQBODY, (st), (val))
966 #define sk_KRB5_APREQBODY_find_ex(st, val) SKM_sk_find_ex(KRB5_APREQBODY, (st),
967 #define sk_KRB5_APREQBODY_delete(st, i) SKM_sk_delete(KRB5_APREQBODY, (st), (i))
968 #define sk_KRB5_APREQBODY_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_APREQBODY,
969 #define sk_KRB5_APREQBODY_insert(st, val, i) SKM_sk_insert(KRB5_APREQBODY, (st),
970 #define sk_KRB5_APREQBODY_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_APREQBO
971 #define sk_KRB5_APREQBODY_dup(st) SKM_sk_dup(KRB5_APREQBODY, (st))
972 #define sk_KRB5_APREQBODY_pop_free(st, free_func) SKM_sk_pop_free(KRB5_APREQBODY
973 #define sk_KRB5_APREQBODY_shift(st) SKM_sk_shift(KRB5_APREQBODY, (st))
974 #define sk_KRB5_APREQBODY_pop(st) SKM_sk_pop(KRB5_APREQBODY, (st))
975 #define sk_KRB5_APREQBODY_sort(st) SKM_sk_sort(KRB5_APREQBODY, (st))
976 #define sk_KRB5_APREQBODY_is_sorted(st) SKM_sk_is_sorted(KRB5_APREQBODY, (st))

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978 #define sk_KRB5_AUTHDATA_new(cmp) SKM_sk_new(KRB5_AUTHDATA, (cmp))
979 #define sk_KRB5_AUTHDATA_new_null() SKM_sk_new_null(KRB5_AUTHDATA)
980 #define sk_KRB5_AUTHDATA_free(st) SKM_sk_free(KRB5_AUTHDATA, (st))
981 #define sk_KRB5_AUTHDATA_num(st) SKM_sk_num(KRB5_AUTHDATA, (st))
982 #define sk_KRB5_AUTHDATA_value(st, i) SKM_sk_value(KRB5_AUTHDATA, (st), (i))
983 #define sk_KRB5_AUTHDATA_set(st, i, val) SKM_sk_set(KRB5_AUTHDATA, (st), (i), (v
984 #define sk_KRB5_AUTHDATA_zero(st) SKM_sk_zero(KRB5_AUTHDATA, (st))
985 #define sk_KRB5_AUTHDATA_push(st, val) SKM_sk_push(KRB5_AUTHDATA, (st), (val))

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986 #define sk_KRB5_AUTHDATA_unshift(st, val) SKM_sk_unshift(KRB5_AUTHDATA, (st), (v
987 #define sk_KRB5_AUTHDATA_find(st, val) SKM_sk_find(KRB5_AUTHDATA, (st), (val))
988 #define sk_KRB5_AUTHDATA_find_ex(st, val) SKM_sk_find_ex(KRB5_AUTHDATA, (st), (v
989 #define sk_KRB5_AUTHDATA_delete(st, i) SKM_sk_delete(KRB5_AUTHDATA, (st), (i))
990 #define sk_KRB5_AUTHDATA_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_AUTHDATA, (s
991 #define sk_KRB5_AUTHDATA_insert(st, val, i) SKM_sk_insert(KRB5_AUTHDATA, (st), (
992 #define sk_KRB5_AUTHDATA_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_AUTHDATA
993 #define sk_KRB5_AUTHDATA_dup(st) SKM_sk_dup(KRB5_AUTHDATA, (st))
994 #define sk_KRB5_AUTHDATA_pop_free(st, free_func) SKM_sk_pop_free(KRB5_AUTHDATA,
995 #define sk_KRB5_AUTHDATA_shift(st) SKM_sk_shift(KRB5_AUTHDATA, (st))
996 #define sk_KRB5_AUTHDATA_pop(st) SKM_sk_pop(KRB5_AUTHDATA, (st))
997 #define sk_KRB5_AUTHDATA_sort(st) SKM_sk_sort(KRB5_AUTHDATA, (st))
998 #define sk_KRB5_AUTHDATA_is_sorted(st) SKM_sk_is_sorted(KRB5_AUTHDATA, (st))

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1000 #define sk_KRB5_AUTHENTBODY_new(cmp) SKM_sk_new(KRB5_AUTHENTBODY, (cmp))
1001 #define sk_KRB5_AUTHENTBODY_new_null() SKM_sk_new_null(KRB5_AUTHENTBODY)
1002 #define sk_KRB5_AUTHENTBODY_free(st) SKM_sk_free(KRB5_AUTHENTBODY, (st))
1003 #define sk_KRB5_AUTHENTBODY_num(st) SKM_sk_num(KRB5_AUTHENTBODY, (st))
1004 #define sk_KRB5_AUTHENTBODY_value(st, i) SKM_sk_value(KRB5_AUTHENTBODY, (st), (i)
1005 #define sk_KRB5_AUTHENTBODY_set(st, i, val) SKM_sk_set(KRB5_AUTHENTBODY, (st), (
1006 #define sk_KRB5_AUTHENTBODY_zero(st) SKM_sk_zero(KRB5_AUTHENTBODY, (st))
1007 #define sk_KRB5_AUTHENTBODY_push(st, val) SKM_sk_push(KRB5_AUTHENTBODY, (st), (v
1008 #define sk_KRB5_AUTHENTBODY_unshift(st, val) SKM_sk_unshift(KRB5_AUTHENTBODY, (s
1009 #define sk_KRB5_AUTHENTBODY_find(st, val) SKM_sk_find(KRB5_AUTHENTBODY, (st), (v
1010 #define sk_KRB5_AUTHENTBODY_find_ex(st, val) SKM_sk_find_ex(KRB5_AUTHENTBODY, (s
1011 #define sk_KRB5_AUTHENTBODY_delete(st, i) SKM_sk_delete(KRB5_AUTHENTBODY, (st),
1012 #define sk_KRB5_AUTHENTBODY_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_AUTHENTBO
1013 #define sk_KRB5_AUTHENTBODY_insert(st, val, i) SKM_sk_insert(KRB5_AUTHENTBODY, (
1014 #define sk_KRB5_AUTHENTBODY_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_AUTHTE
1015 #define sk_KRB5_AUTHENTBODY_dup(st) SKM_sk_dup(KRB5_AUTHENTBODY, (st))
1016 #define sk_KRB5_AUTHENTBODY_pop_free(st, free_func) SKM_sk_pop_free(KRB5_AUTHENT
1017 #define sk_KRB5_AUTHENTBODY_shift(st) SKM_sk_shift(KRB5_AUTHENTBODY, (st))
1018 #define sk_KRB5_AUTHENTBODY_pop(st) SKM_sk_pop(KRB5_AUTHENTBODY, (st))
1019 #define sk_KRB5_AUTHENTBODY_sort(st) SKM_sk_sort(KRB5_AUTHENTBODY, (st))
1020 #define sk_KRB5_AUTHENTBODY_is_sorted(st) SKM_sk_is_sorted(KRB5_AUTHENTBODY, (st)

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1022 #define sk_KRB5_CHECKSUM_new(cmp) SKM_sk_new(KRB5_CHECKSUM, (cmp))
1023 #define sk_KRB5_CHECKSUM_new_null() SKM_sk_new_null(KRB5_CHECKSUM)
1024 #define sk_KRB5_CHECKSUM_free(st) SKM_sk_free(KRB5_CHECKSUM, (st))
1025 #define sk_KRB5_CHECKSUM_num(st) SKM_sk_num(KRB5_CHECKSUM, (st))
1026 #define sk_KRB5_CHECKSUM_value(st, i) SKM_sk_value(KRB5_CHECKSUM, (st), (i))
1027 #define sk_KRB5_CHECKSUM_set(st, i, val) SKM_sk_set(KRB5_CHECKSUM, (st), (i), (v
1028 #define sk_KRB5_CHECKSUM_zero(st) SKM_sk_zero(KRB5_CHECKSUM, (st))
1029 #define sk_KRB5_CHECKSUM_push(st, val) SKM_sk_push(KRB5_CHECKSUM, (st), (val))
1030 #define sk_KRB5_CHECKSUM_unshift(st, val) SKM_sk_unshift(KRB5_CHECKSUM, (st), (v
1031 #define sk_KRB5_CHECKSUM_find(st, val) SKM_sk_find(KRB5_CHECKSUM, (st), (val))
1032 #define sk_KRB5_CHECKSUM_find_ex(st, val) SKM_sk_find_ex(KRB5_CHECKSUM, (st), (v
1033 #define sk_KRB5_CHECKSUM_delete(st, i) SKM_sk_delete(KRB5_CHECKSUM, (st), (i))
1034 #define sk_KRB5_CHECKSUM_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_CHECKSUM, (s
1035 #define sk_KRB5_CHECKSUM_insert(st, val, i) SKM_sk_insert(KRB5_CHECKSUM, (st), (
1036 #define sk_KRB5_CHECKSUM_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_CHECKSUM
1037 #define sk_KRB5_CHECKSUM_dup(st) SKM_sk_dup(KRB5_CHECKSUM, (st))
1038 #define sk_KRB5_CHECKSUM_pop_free(st, free_func) SKM_sk_pop_free(KRB5_CHECKSUM,
1039 #define sk_KRB5_CHECKSUM_shift(st) SKM_sk_shift(KRB5_CHECKSUM, (st))
1040 #define sk_KRB5_CHECKSUM_pop(st) SKM_sk_pop(KRB5_CHECKSUM, (st))
1041 #define sk_KRB5_CHECKSUM_sort(st) SKM_sk_sort(KRB5_CHECKSUM, (st))
1042 #define sk_KRB5_CHECKSUM_is_sorted(st) SKM_sk_is_sorted(KRB5_CHECKSUM, (st))

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1044 #define sk_KRB5_ENCDATA_new(cmp) SKM_sk_new(KRB5_ENCDATA, (cmp))
1045 #define sk_KRB5_ENCDATA_new_null() SKM_sk_new_null(KRB5_ENCDATA)
1046 #define sk_KRB5_ENCDATA_free(st) SKM_sk_free(KRB5_ENCDATA, (st))
1047 #define sk_KRB5_ENCDATA_num(st) SKM_sk_num(KRB5_ENCDATA, (st))
1048 #define sk_KRB5_ENCDATA_value(st, i) SKM_sk_value(KRB5_ENCDATA, (st), (i))
1049 #define sk_KRB5_ENCDATA_set(st, i, val) SKM_sk_set(KRB5_ENCDATA, (st), (i), (val
1050 #define sk_KRB5_ENCDATA_zero(st) SKM_sk_zero(KRB5_ENCDATA, (st))
1051 #define sk_KRB5_ENCDATA_push(st, val) SKM_sk_push(KRB5_ENCDATA, (st), (val))

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1052 #define sk_KRB5_ENCDATA_unshift(st, val) SKM_sk_unshift(KRB5_ENCDATA, (st), (val))
1053 #define sk_KRB5_ENCDATA_find(st, val) SKM_sk_find(KRB5_ENCDATA, (st), (val))
1054 #define sk_KRB5_ENCDATA_find_ex(st, val) SKM_sk_find_ex(KRB5_ENCDATA, (st), (val))
1055 #define sk_KRB5_ENCDATA_delete(st, i) SKM_sk_delete(KRB5_ENCDATA, (st), (i))
1056 #define sk_KRB5_ENCDATA_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_ENCDATA, (st))
1057 #define sk_KRB5_ENCDATA_insert(st, val, i) SKM_sk_insert(KRB5_ENCDATA, (st), (val), (i))
1058 #define sk_KRB5_ENCDATA_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_ENCDATA, (cmp))
1059 #define sk_KRB5_ENCDATA_dup(st) SKM_sk_dup(KRB5_ENCDATA, (st))
1060 #define sk_KRB5_ENCDATA_pop_free(st, free_func) SKM_sk_pop_free(KRB5_ENCDATA, (st), (free_func))
1061 #define sk_KRB5_ENCDATA_shift(st) SKM_sk_shift(KRB5_ENCDATA, (st))
1062 #define sk_KRB5_ENCDATA_pop(st) SKM_sk_pop(KRB5_ENCDATA, (st))
1063 #define sk_KRB5_ENCDATA_sort(st) SKM_sk_sort(KRB5_ENCDATA, (st))
1064 #define sk_KRB5_ENCDATA_is_sorted(st) SKM_sk_is_sorted(KRB5_ENCDATA, (st))

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1066 #define sk_KRB5_ENCKEY_new(cmp) SKM_sk_new(KRB5_ENCKEY, (cmp))
1067 #define sk_KRB5_ENCKEY_new_null() SKM_sk_new_null(KRB5_ENCKEY)
1068 #define sk_KRB5_ENCKEY_free(st) SKM_sk_free(KRB5_ENCKEY, (st))
1069 #define sk_KRB5_ENCKEY_num(st) SKM_sk_num(KRB5_ENCKEY, (st))
1070 #define sk_KRB5_ENCKEY_value(st, i) SKM_sk_value(KRB5_ENCKEY, (st), (i))
1071 #define sk_KRB5_ENCKEY_set(st, i, val) SKM_sk_set(KRB5_ENCKEY, (st), (i), (val))
1072 #define sk_KRB5_ENCKEY_zero(st) SKM_sk_zero(KRB5_ENCKEY, (st))
1073 #define sk_KRB5_ENCKEY_push(st, val) SKM_sk_push(KRB5_ENCKEY, (st), (val))
1074 #define sk_KRB5_ENCKEY_unshift(st, val) SKM_sk_unshift(KRB5_ENCKEY, (st), (val))
1075 #define sk_KRB5_ENCKEY_find(st, val) SKM_sk_find(KRB5_ENCKEY, (st), (val))
1076 #define sk_KRB5_ENCKEY_find_ex(st, val) SKM_sk_find_ex(KRB5_ENCKEY, (st), (val))
1077 #define sk_KRB5_ENCKEY_delete(st, i) SKM_sk_delete(KRB5_ENCKEY, (st), (i))
1078 #define sk_KRB5_ENCKEY_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_ENCKEY, (st), (ptr))
1079 #define sk_KRB5_ENCKEY_insert(st, val, i) SKM_sk_insert(KRB5_ENCKEY, (st), (val), (i))
1080 #define sk_KRB5_ENCKEY_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_ENCKEY, (st), (cmp))
1081 #define sk_KRB5_ENCKEY_dup(st) SKM_sk_dup(KRB5_ENCKEY, (st))
1082 #define sk_KRB5_ENCKEY_pop_free(st, free_func) SKM_sk_pop_free(KRB5_ENCKEY, (st), (free_func))
1083 #define sk_KRB5_ENCKEY_shift(st) SKM_sk_shift(KRB5_ENCKEY, (st))
1084 #define sk_KRB5_ENCKEY_pop(st) SKM_sk_pop(KRB5_ENCKEY, (st))
1085 #define sk_KRB5_ENCKEY_sort(st) SKM_sk_sort(KRB5_ENCKEY, (st))
1086 #define sk_KRB5_ENCKEY_is_sorted(st) SKM_sk_is_sorted(KRB5_ENCKEY, (st))

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1088 #define sk_KRB5_PRINCNAME_new(cmp) SKM_sk_new(KRB5_PRINCNAME, (cmp))
1089 #define sk_KRB5_PRINCNAME_new_null() SKM_sk_new_null(KRB5_PRINCNAME)
1090 #define sk_KRB5_PRINCNAME_free(st) SKM_sk_free(KRB5_PRINCNAME, (st))
1091 #define sk_KRB5_PRINCNAME_num(st) SKM_sk_num(KRB5_PRINCNAME, (st))
1092 #define sk_KRB5_PRINCNAME_value(st, i) SKM_sk_value(KRB5_PRINCNAME, (st), (i))
1093 #define sk_KRB5_PRINCNAME_set(st, i, val) SKM_sk_set(KRB5_PRINCNAME, (st), (i), (val))
1094 #define sk_KRB5_PRINCNAME_zero(st) SKM_sk_zero(KRB5_PRINCNAME, (st))
1095 #define sk_KRB5_PRINCNAME_push(st, val) SKM_sk_push(KRB5_PRINCNAME, (st), (val))
1096 #define sk_KRB5_PRINCNAME_unshift(st, val) SKM_sk_unshift(KRB5_PRINCNAME, (st), (val))
1097 #define sk_KRB5_PRINCNAME_find(st, val) SKM_sk_find(KRB5_PRINCNAME, (st), (val))
1098 #define sk_KRB5_PRINCNAME_find_ex(st, val) SKM_sk_find_ex(KRB5_PRINCNAME, (st), (val))
1099 #define sk_KRB5_PRINCNAME_delete(st, i) SKM_sk_delete(KRB5_PRINCNAME, (st), (i))
1100 #define sk_KRB5_PRINCNAME_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_PRINCNAME, (st), (ptr))
1101 #define sk_KRB5_PRINCNAME_insert(st, val, i) SKM_sk_insert(KRB5_PRINCNAME, (st), (val), (i))
1102 #define sk_KRB5_PRINCNAME_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_PRINCNAME, (st), (cmp))
1103 #define sk_KRB5_PRINCNAME_dup(st) SKM_sk_dup(KRB5_PRINCNAME, (st))
1104 #define sk_KRB5_PRINCNAME_pop_free(st, free_func) SKM_sk_pop_free(KRB5_PRINCNAME, (st), (free_func))
1105 #define sk_KRB5_PRINCNAME_shift(st) SKM_sk_shift(KRB5_PRINCNAME, (st))
1106 #define sk_KRB5_PRINCNAME_pop(st) SKM_sk_pop(KRB5_PRINCNAME, (st))
1107 #define sk_KRB5_PRINCNAME_sort(st) SKM_sk_sort(KRB5_PRINCNAME, (st))
1108 #define sk_KRB5_PRINCNAME_is_sorted(st) SKM_sk_is_sorted(KRB5_PRINCNAME, (st))

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1110 #define sk_KRB5_TKTBODY_new(cmp) SKM_sk_new(KRB5_TKTBODY, (cmp))
1111 #define sk_KRB5_TKTBODY_new_null() SKM_sk_new_null(KRB5_TKTBODY)
1112 #define sk_KRB5_TKTBODY_free(st) SKM_sk_free(KRB5_TKTBODY, (st))
1113 #define sk_KRB5_TKTBODY_num(st) SKM_sk_num(KRB5_TKTBODY, (st))
1114 #define sk_KRB5_TKTBODY_value(st, i) SKM_sk_value(KRB5_TKTBODY, (st), (i))
1115 #define sk_KRB5_TKTBODY_set(st, i, val) SKM_sk_set(KRB5_TKTBODY, (st), (i), (val))
1116 #define sk_KRB5_TKTBODY_zero(st) SKM_sk_zero(KRB5_TKTBODY, (st))
1117 #define sk_KRB5_TKTBODY_push(st, val) SKM_sk_push(KRB5_TKTBODY, (st), (val))

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1118 #define sk_KRB5_TKTBODY_unshift(st, val) SKM_sk_unshift(KRB5_TKTBODY, (st), (val))
1119 #define sk_KRB5_TKTBODY_find(st, val) SKM_sk_find(KRB5_TKTBODY, (st), (val))
1120 #define sk_KRB5_TKTBODY_find_ex(st, val) SKM_sk_find_ex(KRB5_TKTBODY, (st), (val))
1121 #define sk_KRB5_TKTBODY_delete(st, i) SKM_sk_delete(KRB5_TKTBODY, (st), (i))
1122 #define sk_KRB5_TKTBODY_delete_ptr(st, ptr) SKM_sk_delete_ptr(KRB5_TKTBODY, (st), (ptr))
1123 #define sk_KRB5_TKTBODY_insert(st, val, i) SKM_sk_insert(KRB5_TKTBODY, (st), (val), (i))
1124 #define sk_KRB5_TKTBODY_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(KRB5_TKTBODY, (st), (cmp))
1125 #define sk_KRB5_TKTBODY_dup(st) SKM_sk_dup(KRB5_TKTBODY, (st))
1126 #define sk_KRB5_TKTBODY_pop_free(st, free_func) SKM_sk_pop_free(KRB5_TKTBODY, (st), (free_func))
1127 #define sk_KRB5_TKTBODY_shift(st) SKM_sk_shift(KRB5_TKTBODY, (st))
1128 #define sk_KRB5_TKTBODY_pop(st) SKM_sk_pop(KRB5_TKTBODY, (st))
1129 #define sk_KRB5_TKTBODY_sort(st) SKM_sk_sort(KRB5_TKTBODY, (st))
1130 #define sk_KRB5_TKTBODY_is_sorted(st) SKM_sk_is_sorted(KRB5_TKTBODY, (st))

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1132 #define sk_MEM_OBJECT_DATA_new(cmp) SKM_sk_new(MEM_OBJECT_DATA, (cmp))
1133 #define sk_MEM_OBJECT_DATA_new_null() SKM_sk_new_null(MEM_OBJECT_DATA)
1134 #define sk_MEM_OBJECT_DATA_free(st) SKM_sk_free(MEM_OBJECT_DATA, (st))
1135 #define sk_MEM_OBJECT_DATA_num(st) SKM_sk_num(MEM_OBJECT_DATA, (st))
1136 #define sk_MEM_OBJECT_DATA_value(st, i) SKM_sk_value(MEM_OBJECT_DATA, (st), (i))
1137 #define sk_MEM_OBJECT_DATA_set(st, i, val) SKM_sk_set(MEM_OBJECT_DATA, (st), (i), (val))
1138 #define sk_MEM_OBJECT_DATA_zero(st) SKM_sk_zero(MEM_OBJECT_DATA, (st))
1139 #define sk_MEM_OBJECT_DATA_push(st, val) SKM_sk_push(MEM_OBJECT_DATA, (st), (val))
1140 #define sk_MEM_OBJECT_DATA_unshift(st, val) SKM_sk_unshift(MEM_OBJECT_DATA, (st), (val))
1141 #define sk_MEM_OBJECT_DATA_find(st, val) SKM_sk_find(MEM_OBJECT_DATA, (st), (val))
1142 #define sk_MEM_OBJECT_DATA_find_ex(st, val) SKM_sk_find_ex(MEM_OBJECT_DATA, (st), (val))
1143 #define sk_MEM_OBJECT_DATA_delete(st, i) SKM_sk_delete(MEM_OBJECT_DATA, (st), (i))
1144 #define sk_MEM_OBJECT_DATA_delete_ptr(st, ptr) SKM_sk_delete_ptr(MEM_OBJECT_DATA, (st), (ptr))
1145 #define sk_MEM_OBJECT_DATA_insert(st, val, i) SKM_sk_insert(MEM_OBJECT_DATA, (st), (val), (i))
1146 #define sk_MEM_OBJECT_DATA_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(MEM_OBJECT_DATA, (st), (cmp))
1147 #define sk_MEM_OBJECT_DATA_dup(st) SKM_sk_dup(MEM_OBJECT_DATA, (st))
1148 #define sk_MEM_OBJECT_DATA_pop_free(st, free_func) SKM_sk_pop_free(MEM_OBJECT_DATA, (st), (free_func))
1149 #define sk_MEM_OBJECT_DATA_shift(st) SKM_sk_shift(MEM_OBJECT_DATA, (st))
1150 #define sk_MEM_OBJECT_DATA_pop(st) SKM_sk_pop(MEM_OBJECT_DATA, (st))
1151 #define sk_MEM_OBJECT_DATA_sort(st) SKM_sk_sort(MEM_OBJECT_DATA, (st))
1152 #define sk_MEM_OBJECT_DATA_is_sorted(st) SKM_sk_is_sorted(MEM_OBJECT_DATA, (st))

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1154 #define sk_MIME_HEADER_new(cmp) SKM_sk_new(MIME_HEADER, (cmp))
1155 #define sk_MIME_HEADER_new_null() SKM_sk_new_null(MIME_HEADER)
1156 #define sk_MIME_HEADER_free(st) SKM_sk_free(MIME_HEADER, (st))
1157 #define sk_MIME_HEADER_num(st) SKM_sk_num(MIME_HEADER, (st))
1158 #define sk_MIME_HEADER_value(st, i) SKM_sk_value(MIME_HEADER, (st), (i))
1159 #define sk_MIME_HEADER_set(st, i, val) SKM_sk_set(MIME_HEADER, (st), (i), (val))
1160 #define sk_MIME_HEADER_zero(st) SKM_sk_zero(MIME_HEADER, (st))
1161 #define sk_MIME_HEADER_push(st, val) SKM_sk_push(MIME_HEADER, (st), (val))
1162 #define sk_MIME_HEADER_unshift(st, val) SKM_sk_unshift(MIME_HEADER, (st), (val))
1163 #define sk_MIME_HEADER_find(st, val) SKM_sk_find(MIME_HEADER, (st), (val))
1164 #define sk_MIME_HEADER_find_ex(st, val) SKM_sk_find_ex(MIME_HEADER, (st), (val))
1165 #define sk_MIME_HEADER_delete(st, i) SKM_sk_delete(MIME_HEADER, (st), (i))
1166 #define sk_MIME_HEADER_delete_ptr(st, ptr) SKM_sk_delete_ptr(MIME_HEADER, (st), (ptr))
1167 #define sk_MIME_HEADER_insert(st, val, i) SKM_sk_insert(MIME_HEADER, (st), (val), (i))
1168 #define sk_MIME_HEADER_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(MIME_HEADER, (st), (cmp))
1169 #define sk_MIME_HEADER_dup(st) SKM_sk_dup(MIME_HEADER, (st))
1170 #define sk_MIME_HEADER_pop_free(st, free_func) SKM_sk_pop_free(MIME_HEADER, (st), (free_func))
1171 #define sk_MIME_HEADER_shift(st) SKM_sk_shift(MIME_HEADER, (st))
1172 #define sk_MIME_HEADER_pop(st) SKM_sk_pop(MIME_HEADER, (st))
1173 #define sk_MIME_HEADER_sort(st) SKM_sk_sort(MIME_HEADER, (st))
1174 #define sk_MIME_HEADER_is_sorted(st) SKM_sk_is_sorted(MIME_HEADER, (st))

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1176 #define sk_MIME_PARAM_new(cmp) SKM_sk_new(MIME_PARAM, (cmp))
1177 #define sk_MIME_PARAM_new_null() SKM_sk_new_null(MIME_PARAM)
1178 #define sk_MIME_PARAM_free(st) SKM_sk_free(MIME_PARAM, (st))
1179 #define sk_MIME_PARAM_num(st) SKM_sk_num(MIME_PARAM, (st))
1180 #define sk_MIME_PARAM_value(st, i) SKM_sk_value(MIME_PARAM, (st), (i))
1181 #define sk_MIME_PARAM_set(st, i, val) SKM_sk_set(MIME_PARAM, (st), (i), (val))
1182 #define sk_MIME_PARAM_zero(st) SKM_sk_zero(MIME_PARAM, (st))
1183 #define sk_MIME_PARAM_push(st, val) SKM_sk_push(MIME_PARAM, (st), (val))

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1184 #define sk_MIME_PARAM_unshift(st, val) SKM_sk_unshift(MIME_PARAM, (st), (val))
1185 #define sk_MIME_PARAM_find(st, val) SKM_sk_find(MIME_PARAM, (st), (val))
1186 #define sk_MIME_PARAM_find_ex(st, val) SKM_sk_find_ex(MIME_PARAM, (st), (val))
1187 #define sk_MIME_PARAM_delete(st, i) SKM_sk_delete(MIME_PARAM, (st), (i))
1188 #define sk_MIME_PARAM_delete_ptr(st, ptr) SKM_sk_delete_ptr(MIME_PARAM, (st), (ptr))
1189 #define sk_MIME_PARAM_insert(st, val, i) SKM_sk_insert(MIME_PARAM, (st), (val), (i))
1190 #define sk_MIME_PARAM_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(MIME_PARAM, (st), (cmp))
1191 #define sk_MIME_PARAM_dup(st) SKM_sk_dup(MIME_PARAM, (st))
1192 #define sk_MIME_PARAM_pop_free(st, free_func) SKM_sk_pop_free(MIME_PARAM, (st), (free_func))
1193 #define sk_MIME_PARAM_shift(st) SKM_sk_shift(MIME_PARAM, (st))
1194 #define sk_MIME_PARAM_pop(st) SKM_sk_pop(MIME_PARAM, (st))
1195 #define sk_MIME_PARAM_sort(st) SKM_sk_sort(MIME_PARAM, (st))
1196 #define sk_MIME_PARAM_is_sorted(st) SKM_sk_is_sorted(MIME_PARAM, (st))

1198 #define sk_NAME_FUNCS_new(cmp) SKM_sk_new(NAME_FUNCS, (cmp))
1199 #define sk_NAME_FUNCS_new_null() SKM_sk_new_null(NAME_FUNCS)
1200 #define sk_NAME_FUNCS_free(st) SKM_sk_free(NAME_FUNCS, (st))
1201 #define sk_NAME_FUNCS_num(st) SKM_sk_num(NAME_FUNCS, (st))
1202 #define sk_NAME_FUNCS_value(st, i) SKM_sk_value(NAME_FUNCS, (st), (i))
1203 #define sk_NAME_FUNCS_set(st, i, val) SKM_sk_set(NAME_FUNCS, (st), (i), (val))
1204 #define sk_NAME_FUNCS_zero(st) SKM_sk_zero(NAME_FUNCS, (st))
1205 #define sk_NAME_FUNCS_push(st, val) SKM_sk_push(NAME_FUNCS, (st), (val))
1206 #define sk_NAME_FUNCS_unshift(st, val) SKM_sk_unshift(NAME_FUNCS, (st), (val))
1207 #define sk_NAME_FUNCS_find(st, val) SKM_sk_find(NAME_FUNCS, (st), (val))
1208 #define sk_NAME_FUNCS_find_ex(st, val) SKM_sk_find_ex(NAME_FUNCS, (st), (val))
1209 #define sk_NAME_FUNCS_delete(st, i) SKM_sk_delete(NAME_FUNCS, (st), (i))
1210 #define sk_NAME_FUNCS_delete_ptr(st, ptr) SKM_sk_delete_ptr(NAME_FUNCS, (st), (ptr))
1211 #define sk_NAME_FUNCS_insert(st, val, i) SKM_sk_insert(NAME_FUNCS, (st), (val), (i))
1212 #define sk_NAME_FUNCS_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(NAME_FUNCS, (st), (cmp))
1213 #define sk_NAME_FUNCS_dup(st) SKM_sk_dup(NAME_FUNCS, (st))
1214 #define sk_NAME_FUNCS_pop_free(st, free_func) SKM_sk_pop_free(NAME_FUNCS, (st), (free_func))
1215 #define sk_NAME_FUNCS_shift(st) SKM_sk_shift(NAME_FUNCS, (st))
1216 #define sk_NAME_FUNCS_pop(st) SKM_sk_pop(NAME_FUNCS, (st))
1217 #define sk_NAME_FUNCS_sort(st) SKM_sk_sort(NAME_FUNCS, (st))
1218 #define sk_NAME_FUNCS_is_sorted(st) SKM_sk_is_sorted(NAME_FUNCS, (st))

1220 #define sk_OCSP_CERTID_new(cmp) SKM_sk_new(OCSP_CERTID, (cmp))
1221 #define sk_OCSP_CERTID_new_null() SKM_sk_new_null(OCSP_CERTID)
1222 #define sk_OCSP_CERTID_free(st) SKM_sk_free(OCSP_CERTID, (st))
1223 #define sk_OCSP_CERTID_num(st) SKM_sk_num(OCSP_CERTID, (st))
1224 #define sk_OCSP_CERTID_value(st, i) SKM_sk_value(OCSP_CERTID, (st), (i))
1225 #define sk_OCSP_CERTID_set(st, i, val) SKM_sk_set(OCSP_CERTID, (st), (i), (val))
1226 #define sk_OCSP_CERTID_zero(st) SKM_sk_zero(OCSP_CERTID, (st))
1227 #define sk_OCSP_CERTID_push(st, val) SKM_sk_push(OCSP_CERTID, (st), (val))
1228 #define sk_OCSP_CERTID_unshift(st, val) SKM_sk_unshift(OCSP_CERTID, (st), (val))
1229 #define sk_OCSP_CERTID_find(st, val) SKM_sk_find(OCSP_CERTID, (st), (val))
1230 #define sk_OCSP_CERTID_find_ex(st, val) SKM_sk_find_ex(OCSP_CERTID, (st), (val))
1231 #define sk_OCSP_CERTID_delete(st, i) SKM_sk_delete(OCSP_CERTID, (st), (i))
1232 #define sk_OCSP_CERTID_delete_ptr(st, ptr) SKM_sk_delete_ptr(OCSP_CERTID, (st), (ptr))
1233 #define sk_OCSP_CERTID_insert(st, val, i) SKM_sk_insert(OCSP_CERTID, (st), (val), (i))
1234 #define sk_OCSP_CERTID_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(OCSP_CERTID, (st), (cmp))
1235 #define sk_OCSP_CERTID_dup(st) SKM_sk_dup(OCSP_CERTID, (st))
1236 #define sk_OCSP_CERTID_pop_free(st, free_func) SKM_sk_pop_free(OCSP_CERTID, (st), (free_func))
1237 #define sk_OCSP_CERTID_shift(st) SKM_sk_shift(OCSP_CERTID, (st))
1238 #define sk_OCSP_CERTID_pop(st) SKM_sk_pop(OCSP_CERTID, (st))
1239 #define sk_OCSP_CERTID_sort(st) SKM_sk_sort(OCSP_CERTID, (st))
1240 #define sk_OCSP_CERTID_is_sorted(st) SKM_sk_is_sorted(OCSP_CERTID, (st))

1242 #define sk_OCSP_ONEREQ_new(cmp) SKM_sk_new(OCSP_ONEREQ, (cmp))
1243 #define sk_OCSP_ONEREQ_new_null() SKM_sk_new_null(OCSP_ONEREQ)
1244 #define sk_OCSP_ONEREQ_free(st) SKM_sk_free(OCSP_ONEREQ, (st))
1245 #define sk_OCSP_ONEREQ_num(st) SKM_sk_num(OCSP_ONEREQ, (st))
1246 #define sk_OCSP_ONEREQ_value(st, i) SKM_sk_value(OCSP_ONEREQ, (st), (i))
1247 #define sk_OCSP_ONEREQ_set(st, i, val) SKM_sk_set(OCSP_ONEREQ, (st), (i), (val))
1248 #define sk_OCSP_ONEREQ_zero(st) SKM_sk_zero(OCSP_ONEREQ, (st))
1249 #define sk_OCSP_ONEREQ_push(st, val) SKM_sk_push(OCSP_ONEREQ, (st), (val))

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1250 #define sk_OCSP_ONEREQ_unshift(st, val) SKM_sk_unshift(OCSP_ONEREQ, (st), (val))
1251 #define sk_OCSP_ONEREQ_find(st, val) SKM_sk_find(OCSP_ONEREQ, (st), (val))
1252 #define sk_OCSP_ONEREQ_find_ex(st, val) SKM_sk_find_ex(OCSP_ONEREQ, (st), (val))
1253 #define sk_OCSP_ONEREQ_delete(st, i) SKM_sk_delete(OCSP_ONEREQ, (st), (i))
1254 #define sk_OCSP_ONEREQ_delete_ptr(st, ptr) SKM_sk_delete_ptr(OCSP_ONEREQ, (st), (ptr))
1255 #define sk_OCSP_ONEREQ_insert(st, val, i) SKM_sk_insert(OCSP_ONEREQ, (st), (val), (i))
1256 #define sk_OCSP_ONEREQ_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(OCSP_ONEREQ, (st), (cmp))
1257 #define sk_OCSP_ONEREQ_dup(st) SKM_sk_dup(OCSP_ONEREQ, (st))
1258 #define sk_OCSP_ONEREQ_pop_free(st, free_func) SKM_sk_pop_free(OCSP_ONEREQ, (st), (free_func))
1259 #define sk_OCSP_ONEREQ_shift(st) SKM_sk_shift(OCSP_ONEREQ, (st))
1260 #define sk_OCSP_ONEREQ_pop(st) SKM_sk_pop(OCSP_ONEREQ, (st))
1261 #define sk_OCSP_ONEREQ_sort(st) SKM_sk_sort(OCSP_ONEREQ, (st))
1262 #define sk_OCSP_ONEREQ_is_sorted(st) SKM_sk_is_sorted(OCSP_ONEREQ, (st))

1264 #define sk_OCSP_RESPID_new(cmp) SKM_sk_new(OCSP_RESPID, (cmp))
1265 #define sk_OCSP_RESPID_new_null() SKM_sk_new_null(OCSP_RESPID)
1266 #define sk_OCSP_RESPID_free(st) SKM_sk_free(OCSP_RESPID, (st))
1267 #define sk_OCSP_RESPID_num(st) SKM_sk_num(OCSP_RESPID, (st))
1268 #define sk_OCSP_RESPID_value(st, i) SKM_sk_value(OCSP_RESPID, (st), (i))
1269 #define sk_OCSP_RESPID_set(st, i, val) SKM_sk_set(OCSP_RESPID, (st), (i), (val))
1270 #define sk_OCSP_RESPID_zero(st) SKM_sk_zero(OCSP_RESPID, (st))
1271 #define sk_OCSP_RESPID_push(st, val) SKM_sk_push(OCSP_RESPID, (st), (val))
1272 #define sk_OCSP_RESPID_unshift(st, val) SKM_sk_unshift(OCSP_RESPID, (st), (val))
1273 #define sk_OCSP_RESPID_find(st, val) SKM_sk_find(OCSP_RESPID, (st), (val))
1274 #define sk_OCSP_RESPID_find_ex(st, val) SKM_sk_find_ex(OCSP_RESPID, (st), (val))
1275 #define sk_OCSP_RESPID_delete(st, i) SKM_sk_delete(OCSP_RESPID, (st), (i))
1276 #define sk_OCSP_RESPID_delete_ptr(st, ptr) SKM_sk_delete_ptr(OCSP_RESPID, (st), (ptr))
1277 #define sk_OCSP_RESPID_insert(st, val, i) SKM_sk_insert(OCSP_RESPID, (st), (val), (i))
1278 #define sk_OCSP_RESPID_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(OCSP_RESPID, (st), (cmp))
1279 #define sk_OCSP_RESPID_dup(st) SKM_sk_dup(OCSP_RESPID, (st))
1280 #define sk_OCSP_RESPID_pop_free(st, free_func) SKM_sk_pop_free(OCSP_RESPID, (st), (free_func))
1281 #define sk_OCSP_RESPID_shift(st) SKM_sk_shift(OCSP_RESPID, (st))
1282 #define sk_OCSP_RESPID_pop(st) SKM_sk_pop(OCSP_RESPID, (st))
1283 #define sk_OCSP_RESPID_sort(st) SKM_sk_sort(OCSP_RESPID, (st))
1284 #define sk_OCSP_RESPID_is_sorted(st) SKM_sk_is_sorted(OCSP_RESPID, (st))

1286 #define sk_OCSP_SINGLERESP_new(cmp) SKM_sk_new(OCSP_SINGLERESP, (cmp))
1287 #define sk_OCSP_SINGLERESP_new_null() SKM_sk_new_null(OCSP_SINGLERESP)
1288 #define sk_OCSP_SINGLERESP_free(st) SKM_sk_free(OCSP_SINGLERESP, (st))
1289 #define sk_OCSP_SINGLERESP_num(st) SKM_sk_num(OCSP_SINGLERESP, (st))
1290 #define sk_OCSP_SINGLERESP_value(st, i) SKM_sk_value(OCSP_SINGLERESP, (st), (i))
1291 #define sk_OCSP_SINGLERESP_set(st, i, val) SKM_sk_set(OCSP_SINGLERESP, (st), (i), (val))
1292 #define sk_OCSP_SINGLERESP_zero(st) SKM_sk_zero(OCSP_SINGLERESP, (st))
1293 #define sk_OCSP_SINGLERESP_push(st, val) SKM_sk_push(OCSP_SINGLERESP, (st), (val))
1294 #define sk_OCSP_SINGLERESP_unshift(st, val) SKM_sk_unshift(OCSP_SINGLERESP, (st), (val))
1295 #define sk_OCSP_SINGLERESP_find(st, val) SKM_sk_find(OCSP_SINGLERESP, (st), (val))
1296 #define sk_OCSP_SINGLERESP_find_ex(st, val) SKM_sk_find_ex(OCSP_SINGLERESP, (st), (val))
1297 #define sk_OCSP_SINGLERESP_delete(st, i) SKM_sk_delete(OCSP_SINGLERESP, (st), (i))
1298 #define sk_OCSP_SINGLERESP_delete_ptr(st, ptr) SKM_sk_delete_ptr(OCSP_SINGLERESP, (st), (ptr))
1299 #define sk_OCSP_SINGLERESP_insert(st, val, i) SKM_sk_insert(OCSP_SINGLERESP, (st), (val), (i))
1300 #define sk_OCSP_SINGLERESP_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(OCSP_SINGLERESP, (st), (cmp))
1301 #define sk_OCSP_SINGLERESP_dup(st) SKM_sk_dup(OCSP_SINGLERESP, (st))
1302 #define sk_OCSP_SINGLERESP_pop_free(st, free_func) SKM_sk_pop_free(OCSP_SINGLERESP, (st), (free_func))
1303 #define sk_OCSP_SINGLERESP_shift(st) SKM_sk_shift(OCSP_SINGLERESP, (st))
1304 #define sk_OCSP_SINGLERESP_pop(st) SKM_sk_pop(OCSP_SINGLERESP, (st))
1305 #define sk_OCSP_SINGLERESP_sort(st) SKM_sk_sort(OCSP_SINGLERESP, (st))
1306 #define sk_OCSP_SINGLERESP_is_sorted(st) SKM_sk_is_sorted(OCSP_SINGLERESP, (st))

1308 #define sk_PKCS12_SAFEBAG_new(cmp) SKM_sk_new(PKCS12_SAFEBAG, (cmp))
1309 #define sk_PKCS12_SAFEBAG_new_null() SKM_sk_new_null(PKCS12_SAFEBAG)
1310 #define sk_PKCS12_SAFEBAG_free(st) SKM_sk_free(PKCS12_SAFEBAG, (st))
1311 #define sk_PKCS12_SAFEBAG_num(st) SKM_sk_num(PKCS12_SAFEBAG, (st))
1312 #define sk_PKCS12_SAFEBAG_value(st, i) SKM_sk_value(PKCS12_SAFEBAG, (st), (i))
1313 #define sk_PKCS12_SAFEBAG_set(st, i, val) SKM_sk_set(PKCS12_SAFEBAG, (st), (i), (val))
1314 #define sk_PKCS12_SAFEBAG_zero(st) SKM_sk_zero(PKCS12_SAFEBAG, (st))
1315 #define sk_PKCS12_SAFEBAG_push(st, val) SKM_sk_push(PKCS12_SAFEBAG, (st), (val))

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1316 #define sk_PKCS12_SAFEBAG_unshift(st, val) SKM_sk_unshift(PKCS12_SAFEBAG, (st),
1317 #define sk_PKCS12_SAFEBAG_find(st, val) SKM_sk_find(PKCS12_SAFEBAG, (st), (val))
1318 #define sk_PKCS12_SAFEBAG_find_ex(st, val) SKM_sk_find_ex(PKCS12_SAFEBAG, (st),
1319 #define sk_PKCS12_SAFEBAG_delete(st, i) SKM_sk_delete(PKCS12_SAFEBAG, (st), (i))
1320 #define sk_PKCS12_SAFEBAG_delete_ptr(st, ptr) SKM_sk_delete_ptr(PKCS12_SAFEBAG,
1321 #define sk_PKCS12_SAFEBAG_insert(st, val, i) SKM_sk_insert(PKCS12_SAFEBAG, (st),
1322 #define sk_PKCS12_SAFEBAG_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(PKCS12_SAFEB
1323 #define sk_PKCS12_SAFEBAG_dup(st) SKM_sk_dup(PKCS12_SAFEBAG, st)
1324 #define sk_PKCS12_SAFEBAG_pop_free(st, free_func) SKM_sk_pop_free(PKCS12_SAFEBAG
1325 #define sk_PKCS12_SAFEBAG_shift(st) SKM_sk_shift(PKCS12_SAFEBAG, (st))
1326 #define sk_PKCS12_SAFEBAG_pop(st) SKM_sk_pop(PKCS12_SAFEBAG, (st))
1327 #define sk_PKCS12_SAFEBAG_sort(st) SKM_sk_sort(PKCS12_SAFEBAG, (st))
1328 #define sk_PKCS12_SAFEBAG_is_sorted(st) SKM_sk_is_sorted(PKCS12_SAFEBAG, (st))

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1330 #define sk_PKCS7_new(cmp) SKM_sk_new(PKCS7, (cmp))
1331 #define sk_PKCS7_new_null() SKM_sk_new_null(PKCS7)
1332 #define sk_PKCS7_free(st) SKM_sk_free(PKCS7, (st))
1333 #define sk_PKCS7_num(st) SKM_sk_num(PKCS7, (st))
1334 #define sk_PKCS7_value(st, i) SKM_sk_value(PKCS7, (st), (i))
1335 #define sk_PKCS7_set(st, i, val) SKM_sk_set(PKCS7, (st), (i), (val))
1336 #define sk_PKCS7_zero(st) SKM_sk_zero(PKCS7, (st))
1337 #define sk_PKCS7_push(st, val) SKM_sk_push(PKCS7, (st), (val))
1338 #define sk_PKCS7_unshift(st, val) SKM_sk_unshift(PKCS7, (st), (val))
1339 #define sk_PKCS7_find(st, val) SKM_sk_find(PKCS7, (st), (val))
1340 #define sk_PKCS7_find_ex(st, val) SKM_sk_find_ex(PKCS7, (st), (val))
1341 #define sk_PKCS7_delete(st, i) SKM_sk_delete(PKCS7, (st), (i))
1342 #define sk_PKCS7_delete_ptr(st, ptr) SKM_sk_delete_ptr(PKCS7, (st), (ptr))
1343 #define sk_PKCS7_insert(st, val, i) SKM_sk_insert(PKCS7, (st), (val), (i))
1344 #define sk_PKCS7_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(PKCS7, (st), (cmp))
1345 #define sk_PKCS7_dup(st) SKM_sk_dup(PKCS7, st)
1346 #define sk_PKCS7_pop_free(st, free_func) SKM_sk_pop_free(PKCS7, (st), (free_func
1347 #define sk_PKCS7_shift(st) SKM_sk_shift(PKCS7, (st))
1348 #define sk_PKCS7_pop(st) SKM_sk_pop(PKCS7, (st))
1349 #define sk_PKCS7_sort(st) SKM_sk_sort(PKCS7, (st))
1350 #define sk_PKCS7_is_sorted(st) SKM_sk_is_sorted(PKCS7, (st))

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1352 #define sk_PKCS7_RECIP_INFO_new(cmp) SKM_sk_new(PKCS7_RECIP_INFO, (cmp))
1353 #define sk_PKCS7_RECIP_INFO_new_null() SKM_sk_new_null(PKCS7_RECIP_INFO)
1354 #define sk_PKCS7_RECIP_INFO_free(st) SKM_sk_free(PKCS7_RECIP_INFO, (st))
1355 #define sk_PKCS7_RECIP_INFO_num(st) SKM_sk_num(PKCS7_RECIP_INFO, (st))
1356 #define sk_PKCS7_RECIP_INFO_value(st, i) SKM_sk_value(PKCS7_RECIP_INFO, (st), (i
1357 #define sk_PKCS7_RECIP_INFO_set(st, i, val) SKM_sk_set(PKCS7_RECIP_INFO, (st), (
1358 #define sk_PKCS7_RECIP_INFO_zero(st) SKM_sk_zero(PKCS7_RECIP_INFO, (st))
1359 #define sk_PKCS7_RECIP_INFO_push(st, val) SKM_sk_push(PKCS7_RECIP_INFO, (st), (v
1360 #define sk_PKCS7_RECIP_INFO_unshift(st, val) SKM_sk_unshift(PKCS7_RECIP_INFO, (s
1361 #define sk_PKCS7_RECIP_INFO_find(st, val) SKM_sk_find(PKCS7_RECIP_INFO, (st), (v
1362 #define sk_PKCS7_RECIP_INFO_find_ex(st, val) SKM_sk_find_ex(PKCS7_RECIP_INFO, (s
1363 #define sk_PKCS7_RECIP_INFO_delete(st, i) SKM_sk_delete(PKCS7_RECIP_INFO, (st),
1364 #define sk_PKCS7_RECIP_INFO_delete_ptr(st, ptr) SKM_sk_delete_ptr(PKCS7_RECIP_IN
1365 #define sk_PKCS7_RECIP_INFO_insert(st, val, i) SKM_sk_insert(PKCS7_RECIP_INFO, (
1366 #define sk_PKCS7_RECIP_INFO_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(PKCS7_RECIP
1367 #define sk_PKCS7_RECIP_INFO_dup(st) SKM_sk_dup(PKCS7_RECIP_INFO, st)
1368 #define sk_PKCS7_RECIP_INFO_pop_free(st, free_func) SKM_sk_pop_free(PKCS7_RECIP_
1369 #define sk_PKCS7_RECIP_INFO_shift(st) SKM_sk_shift(PKCS7_RECIP_INFO, (st))
1370 #define sk_PKCS7_RECIP_INFO_pop(st) SKM_sk_pop(PKCS7_RECIP_INFO, (st))
1371 #define sk_PKCS7_RECIP_INFO_sort(st) SKM_sk_sort(PKCS7_RECIP_INFO, (st))
1372 #define sk_PKCS7_RECIP_INFO_is_sorted(st) SKM_sk_is_sorted(PKCS7_RECIP_INFO, (st)

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1374 #define sk_PKCS7_SIGNER_INFO_new(cmp) SKM_sk_new(PKCS7_SIGNER_INFO, (cmp))
1375 #define sk_PKCS7_SIGNER_INFO_new_null() SKM_sk_new_null(PKCS7_SIGNER_INFO)
1376 #define sk_PKCS7_SIGNER_INFO_free(st) SKM_sk_free(PKCS7_SIGNER_INFO, (st))
1377 #define sk_PKCS7_SIGNER_INFO_num(st) SKM_sk_num(PKCS7_SIGNER_INFO, (st))
1378 #define sk_PKCS7_SIGNER_INFO_value(st, i) SKM_sk_value(PKCS7_SIGNER_INFO, (st),
1379 #define sk_PKCS7_SIGNER_INFO_set(st, i, val) SKM_sk_set(PKCS7_SIGNER_INFO, (st),
1380 #define sk_PKCS7_SIGNER_INFO_zero(st) SKM_sk_zero(PKCS7_SIGNER_INFO, (st))
1381 #define sk_PKCS7_SIGNER_INFO_push(st, val) SKM_sk_push(PKCS7_SIGNER_INFO, (st),

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1382 #define sk_PKCS7_SIGNER_INFO_unshift(st, val) SKM_sk_unshift(PKCS7_SIGNER_INFO,
1383 #define sk_PKCS7_SIGNER_INFO_find(st, val) SKM_sk_find(PKCS7_SIGNER_INFO, (st),
1384 #define sk_PKCS7_SIGNER_INFO_find_ex(st, val) SKM_sk_find_ex(PKCS7_SIGNER_INFO,
1385 #define sk_PKCS7_SIGNER_INFO_delete(st, i) SKM_sk_delete(PKCS7_SIGNER_INFO, (st)
1386 #define sk_PKCS7_SIGNER_INFO_delete_ptr(st, ptr) SKM_sk_delete_ptr(PKCS7_SIGNER_
1387 #define sk_PKCS7_SIGNER_INFO_insert(st, val, i) SKM_sk_insert(PKCS7_SIGNER_INFO,
1388 #define sk_PKCS7_SIGNER_INFO_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(PKCS7_SIG
1389 #define sk_PKCS7_SIGNER_INFO_dup(st) SKM_sk_dup(PKCS7_SIGNER_INFO, st)
1390 #define sk_PKCS7_SIGNER_INFO_pop_free(st, free_func) SKM_sk_pop_free(PKCS7_SIGNE
1391 #define sk_PKCS7_SIGNER_INFO_shift(st) SKM_sk_shift(PKCS7_SIGNER_INFO, (st))
1392 #define sk_PKCS7_SIGNER_INFO_pop(st) SKM_sk_pop(PKCS7_SIGNER_INFO, (st))
1393 #define sk_PKCS7_SIGNER_INFO_sort(st) SKM_sk_sort(PKCS7_SIGNER_INFO, (st))
1394 #define sk_PKCS7_SIGNER_INFO_is_sorted(st) SKM_sk_is_sorted(PKCS7_SIGNER_INFO, (

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1396 #define sk_POLICYINFO_new(cmp) SKM_sk_new(POLICYINFO, (cmp))
1397 #define sk_POLICYINFO_new_null() SKM_sk_new_null(POLICYINFO)
1398 #define sk_POLICYINFO_free(st) SKM_sk_free(POLICYINFO, (st))
1399 #define sk_POLICYINFO_num(st) SKM_sk_num(POLICYINFO, (st))
1400 #define sk_POLICYINFO_value(st, i) SKM_sk_value(POLICYINFO, (st), (i))
1401 #define sk_POLICYINFO_set(st, i, val) SKM_sk_set(POLICYINFO, (st), (i), (val))
1402 #define sk_POLICYINFO_zero(st) SKM_sk_zero(POLICYINFO, (st))
1403 #define sk_POLICYINFO_push(st, val) SKM_sk_push(POLICYINFO, (st), (val))
1404 #define sk_POLICYINFO_unshift(st, val) SKM_sk_unshift(POLICYINFO, (st), (val))
1405 #define sk_POLICYINFO_find(st, val) SKM_sk_find(POLICYINFO, (st), (val))
1406 #define sk_POLICYINFO_find_ex(st, val) SKM_sk_find_ex(POLICYINFO, (st), (val))
1407 #define sk_POLICYINFO_delete(st, i) SKM_sk_delete(POLICYINFO, (st), (i))
1408 #define sk_POLICYINFO_delete_ptr(st, ptr) SKM_sk_delete_ptr(POLICYINFO, (st), (p
1409 #define sk_POLICYINFO_insert(st, val, i) SKM_sk_insert(POLICYINFO, (st), (val),
1410 #define sk_POLICYINFO_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(POLICYINFO, (st)
1411 #define sk_POLICYINFO_dup(st) SKM_sk_dup(POLICYINFO, st)
1412 #define sk_POLICYINFO_pop_free(st, free_func) SKM_sk_pop_free(POLICYINFO, (st),
1413 #define sk_POLICYINFO_shift(st) SKM_sk_shift(POLICYINFO, (st))
1414 #define sk_POLICYINFO_pop(st) SKM_sk_pop(POLICYINFO, (st))
1415 #define sk_POLICYINFO_sort(st) SKM_sk_sort(POLICYINFO, (st))
1416 #define sk_POLICYINFO_is_sorted(st) SKM_sk_is_sorted(POLICYINFO, (st))

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1418 #define sk_POLICYQUALINFO_new(cmp) SKM_sk_new(POLICYQUALINFO, (cmp))
1419 #define sk_POLICYQUALINFO_new_null() SKM_sk_new_null(POLICYQUALINFO)
1420 #define sk_POLICYQUALINFO_free(st) SKM_sk_free(POLICYQUALINFO, (st))
1421 #define sk_POLICYQUALINFO_num(st) SKM_sk_num(POLICYQUALINFO, (st))
1422 #define sk_POLICYQUALINFO_value(st, i) SKM_sk_value(POLICYQUALINFO, (st), (i))
1423 #define sk_POLICYQUALINFO_set(st, i, val) SKM_sk_set(POLICYQUALINFO, (st), (i),
1424 #define sk_POLICYQUALINFO_zero(st) SKM_sk_zero(POLICYQUALINFO, (st))
1425 #define sk_POLICYQUALINFO_push(st, val) SKM_sk_push(POLICYQUALINFO, (st), (val))
1426 #define sk_POLICYQUALINFO_unshift(st, val) SKM_sk_unshift(POLICYQUALINFO, (st),
1427 #define sk_POLICYQUALINFO_find(st, val) SKM_sk_find(POLICYQUALINFO, (st), (val))
1428 #define sk_POLICYQUALINFO_find_ex(st, val) SKM_sk_find_ex(POLICYQUALINFO, (st),
1429 #define sk_POLICYQUALINFO_delete(st, i) SKM_sk_delete(POLICYQUALINFO, (st), (i))
1430 #define sk_POLICYQUALINFO_delete_ptr(st, ptr) SKM_sk_delete_ptr(POLICYQUALINFO,
1431 #define sk_POLICYQUALINFO_insert(st, val, i) SKM_sk_insert(POLICYQUALINFO, (st),
1432 #define sk_POLICYQUALINFO_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(POLICYQUALIN
1433 #define sk_POLICYQUALINFO_dup(st) SKM_sk_dup(POLICYQUALINFO, st)
1434 #define sk_POLICYQUALINFO_pop_free(st, free_func) SKM_sk_pop_free(POLICYQUALINFO
1435 #define sk_POLICYQUALINFO_shift(st) SKM_sk_shift(POLICYQUALINFO, (st))
1436 #define sk_POLICYQUALINFO_pop(st) SKM_sk_pop(POLICYQUALINFO, (st))
1437 #define sk_POLICYQUALINFO_sort(st) SKM_sk_sort(POLICYQUALINFO, (st))
1438 #define sk_POLICYQUALINFO_is_sorted(st) SKM_sk_is_sorted(POLICYQUALINFO, (st))

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1440 #define sk_POLICY_MAPPING_new(cmp) SKM_sk_new(POLICY_MAPPING, (cmp))
1441 #define sk_POLICY_MAPPING_new_null() SKM_sk_new_null(POLICY_MAPPING)
1442 #define sk_POLICY_MAPPING_free(st) SKM_sk_free(POLICY_MAPPING, (st))
1443 #define sk_POLICY_MAPPING_num(st) SKM_sk_num(POLICY_MAPPING, (st))
1444 #define sk_POLICY_MAPPING_value(st, i) SKM_sk_value(POLICY_MAPPING, (st), (i))
1445 #define sk_POLICY_MAPPING_set(st, i, val) SKM_sk_set(POLICY_MAPPING, (st), (i),
1446 #define sk_POLICY_MAPPING_zero(st) SKM_sk_zero(POLICY_MAPPING, (st))
1447 #define sk_POLICY_MAPPING_push(st, val) SKM_sk_push(POLICY_MAPPING, (st), (val))

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1448 #define sk_POLICY_MAPPING_unshift(st, val) SKM_sk_unshift(POLICY_MAPPING, (st), (val))
1449 #define sk_POLICY_MAPPING_find(st, val) SKM_sk_find(POLICY_MAPPING, (st), (val))
1450 #define sk_POLICY_MAPPING_find_ex(st, val) SKM_sk_find_ex(POLICY_MAPPING, (st), (val))
1451 #define sk_POLICY_MAPPING_delete(st, i) SKM_sk_delete(POLICY_MAPPING, (st), (i))
1452 #define sk_POLICY_MAPPING_delete_ptr(st, ptr) SKM_sk_delete_ptr(POLICY_MAPPING, (st), (ptr))
1453 #define sk_POLICY_MAPPING_insert(st, val, i) SKM_sk_insert(POLICY_MAPPING, (st), (val), (i))
1454 #define sk_POLICY_MAPPING_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(POLICY_MAPPING, (st), (cmp))
1455 #define sk_POLICY_MAPPING_dup(st) SKM_sk_dup(POLICY_MAPPING, (st))
1456 #define sk_POLICY_MAPPING_pop_free(st, free_func) SKM_sk_pop_free(POLICY_MAPPING, (st), (free_func))
1457 #define sk_POLICY_MAPPING_shift(st) SKM_sk_shift(POLICY_MAPPING, (st))
1458 #define sk_POLICY_MAPPING_pop(st) SKM_sk_pop(POLICY_MAPPING, (st))
1459 #define sk_POLICY_MAPPING_sort(st) SKM_sk_sort(POLICY_MAPPING, (st))
1460 #define sk_POLICY_MAPPING_is_sorted(st) SKM_sk_is_sorted(POLICY_MAPPING, (st))

1462 #define sk_SRP_gN_new(cmp) SKM_sk_new(SRP_gN, (cmp))
1463 #define sk_SRP_gN_new_null() SKM_sk_new_null(SRP_gN)
1464 #define sk_SRP_gN_free(st) SKM_sk_free(SRP_gN, (st))
1465 #define sk_SRP_gN_num(st) SKM_sk_num(SRP_gN, (st))
1466 #define sk_SRP_gN_value(st, i) SKM_sk_value(SRP_gN, (st), (i))
1467 #define sk_SRP_gN_set(st, i, val) SKM_sk_set(SRP_gN, (st), (i), (val))
1468 #define sk_SRP_gN_zero(st) SKM_sk_zero(SRP_gN, (st))
1469 #define sk_SRP_gN_push(st, val) SKM_sk_push(SRP_gN, (st), (val))
1470 #define sk_SRP_gN_unshift(st, val) SKM_sk_unshift(SRP_gN, (st), (val))
1471 #define sk_SRP_gN_find(st, val) SKM_sk_find(SRP_gN, (st), (val))
1472 #define sk_SRP_gN_find_ex(st, val) SKM_sk_find_ex(SRP_gN, (st), (val))
1473 #define sk_SRP_gN_delete(st, i) SKM_sk_delete(SRP_gN, (st), (i))
1474 #define sk_SRP_gN_delete_ptr(st, ptr) SKM_sk_delete_ptr(SRP_gN, (st), (ptr))
1475 #define sk_SRP_gN_insert(st, val, i) SKM_sk_insert(SRP_gN, (st), (val), (i))
1476 #define sk_SRP_gN_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(SRP_gN, (st), (cmp))
1477 #define sk_SRP_gN_dup(st) SKM_sk_dup(SRP_gN, (st))
1478 #define sk_SRP_gN_pop_free(st, free_func) SKM_sk_pop_free(SRP_gN, (st), (free_func))
1479 #define sk_SRP_gN_shift(st) SKM_sk_shift(SRP_gN, (st))
1480 #define sk_SRP_gN_pop(st) SKM_sk_pop(SRP_gN, (st))
1481 #define sk_SRP_gN_sort(st) SKM_sk_sort(SRP_gN, (st))
1482 #define sk_SRP_gN_is_sorted(st) SKM_sk_is_sorted(SRP_gN, (st))

1484 #define sk_SRP_gN_cache_new(cmp) SKM_sk_new(SRP_gN_cache, (cmp))
1485 #define sk_SRP_gN_cache_new_null() SKM_sk_new_null(SRP_gN_cache)
1486 #define sk_SRP_gN_cache_free(st) SKM_sk_free(SRP_gN_cache, (st))
1487 #define sk_SRP_gN_cache_num(st) SKM_sk_num(SRP_gN_cache, (st))
1488 #define sk_SRP_gN_cache_value(st, i) SKM_sk_value(SRP_gN_cache, (st), (i))
1489 #define sk_SRP_gN_cache_set(st, i, val) SKM_sk_set(SRP_gN_cache, (st), (i), (val))
1490 #define sk_SRP_gN_cache_zero(st) SKM_sk_zero(SRP_gN_cache, (st))
1491 #define sk_SRP_gN_cache_push(st, val) SKM_sk_push(SRP_gN_cache, (st), (val))
1492 #define sk_SRP_gN_cache_unshift(st, val) SKM_sk_unshift(SRP_gN_cache, (st), (val))
1493 #define sk_SRP_gN_cache_find(st, val) SKM_sk_find(SRP_gN_cache, (st), (val))
1494 #define sk_SRP_gN_cache_find_ex(st, val) SKM_sk_find_ex(SRP_gN_cache, (st), (val))
1495 #define sk_SRP_gN_cache_delete(st, i) SKM_sk_delete(SRP_gN_cache, (st), (i))
1496 #define sk_SRP_gN_cache_delete_ptr(st, ptr) SKM_sk_delete_ptr(SRP_gN_cache, (st), (ptr))
1497 #define sk_SRP_gN_cache_insert(st, val, i) SKM_sk_insert(SRP_gN_cache, (st), (val), (i))
1498 #define sk_SRP_gN_cache_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(SRP_gN_cache, (st), (cmp))
1499 #define sk_SRP_gN_cache_dup(st) SKM_sk_dup(SRP_gN_cache, (st))
1500 #define sk_SRP_gN_cache_pop_free(st, free_func) SKM_sk_pop_free(SRP_gN_cache, (st), (free_func))
1501 #define sk_SRP_gN_cache_shift(st) SKM_sk_shift(SRP_gN_cache, (st))
1502 #define sk_SRP_gN_cache_pop(st) SKM_sk_pop(SRP_gN_cache, (st))
1503 #define sk_SRP_gN_cache_sort(st) SKM_sk_sort(SRP_gN_cache, (st))
1504 #define sk_SRP_gN_cache_is_sorted(st) SKM_sk_is_sorted(SRP_gN_cache, (st))

1506 #define sk_SRP_user_pwd_new(cmp) SKM_sk_new(SRP_user_pwd, (cmp))
1507 #define sk_SRP_user_pwd_new_null() SKM_sk_new_null(SRP_user_pwd)
1508 #define sk_SRP_user_pwd_free(st) SKM_sk_free(SRP_user_pwd, (st))
1509 #define sk_SRP_user_pwd_num(st) SKM_sk_num(SRP_user_pwd, (st))
1510 #define sk_SRP_user_pwd_value(st, i) SKM_sk_value(SRP_user_pwd, (st), (i))
1511 #define sk_SRP_user_pwd_set(st, i, val) SKM_sk_set(SRP_user_pwd, (st), (i), (val))
1512 #define sk_SRP_user_pwd_zero(st) SKM_sk_zero(SRP_user_pwd, (st))
1513 #define sk_SRP_user_pwd_push(st, val) SKM_sk_push(SRP_user_pwd, (st), (val))

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1514 #define sk_SRP_user_pwd_unshift(st, val) SKM_sk_unshift(SRP_user_pwd, (st), (val))
1515 #define sk_SRP_user_pwd_find(st, val) SKM_sk_find(SRP_user_pwd, (st), (val))
1516 #define sk_SRP_user_pwd_find_ex(st, val) SKM_sk_find_ex(SRP_user_pwd, (st), (val))
1517 #define sk_SRP_user_pwd_delete(st, i) SKM_sk_delete(SRP_user_pwd, (st), (i))
1518 #define sk_SRP_user_pwd_delete_ptr(st, ptr) SKM_sk_delete_ptr(SRP_user_pwd, (st), (ptr))
1519 #define sk_SRP_user_pwd_insert(st, val, i) SKM_sk_insert(SRP_user_pwd, (st), (val), (i))
1520 #define sk_SRP_user_pwd_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(SRP_user_pwd, (st), (cmp))
1521 #define sk_SRP_user_pwd_dup(st) SKM_sk_dup(SRP_user_pwd, (st))
1522 #define sk_SRP_user_pwd_pop_free(st, free_func) SKM_sk_pop_free(SRP_user_pwd, (st), (free_func))
1523 #define sk_SRP_user_pwd_shift(st) SKM_sk_shift(SRP_user_pwd, (st))
1524 #define sk_SRP_user_pwd_pop(st) SKM_sk_pop(SRP_user_pwd, (st))
1525 #define sk_SRP_user_pwd_sort(st) SKM_sk_sort(SRP_user_pwd, (st))
1526 #define sk_SRP_user_pwd_is_sorted(st) SKM_sk_is_sorted(SRP_user_pwd, (st))

1528 #define sk_SRTTP_PROTECTION_PROFILE_new(cmp) SKM_sk_new(SRTTP_PROTECTION_PROFILE, (cmp))
1529 #define sk_SRTTP_PROTECTION_PROFILE_new_null() SKM_sk_new_null(SRTTP_PROTECTION_PROFILE)
1530 #define sk_SRTTP_PROTECTION_PROFILE_free(st) SKM_sk_free(SRTTP_PROTECTION_PROFILE, (st))
1531 #define sk_SRTTP_PROTECTION_PROFILE_num(st) SKM_sk_num(SRTTP_PROTECTION_PROFILE, (st))
1532 #define sk_SRTTP_PROTECTION_PROFILE_value(st, i) SKM_sk_value(SRTTP_PROTECTION_PROFILE, (st), (i))
1533 #define sk_SRTTP_PROTECTION_PROFILE_set(st, i, val) SKM_sk_set(SRTTP_PROTECTION_PROFILE, (st), (i), (val))
1534 #define sk_SRTTP_PROTECTION_PROFILE_zero(st) SKM_sk_zero(SRTTP_PROTECTION_PROFILE, (st))
1535 #define sk_SRTTP_PROTECTION_PROFILE_push(st, val) SKM_sk_push(SRTTP_PROTECTION_PROFILE, (st), (val))
1536 #define sk_SRTTP_PROTECTION_PROFILE_unshift(st, val) SKM_sk_unshift(SRTTP_PROTECTION_PROFILE, (st), (val))
1537 #define sk_SRTTP_PROTECTION_PROFILE_find(st, val) SKM_sk_find(SRTTP_PROTECTION_PROFILE, (st), (val))
1538 #define sk_SRTTP_PROTECTION_PROFILE_find_ex(st, val) SKM_sk_find_ex(SRTTP_PROTECTION_PROFILE, (st), (val))
1539 #define sk_SRTTP_PROTECTION_PROFILE_delete(st, i) SKM_sk_delete(SRTTP_PROTECTION_PROFILE, (st), (i))
1540 #define sk_SRTTP_PROTECTION_PROFILE_delete_ptr(st, ptr) SKM_sk_delete_ptr(SRTTP_PROTECTION_PROFILE, (st), (ptr))
1541 #define sk_SRTTP_PROTECTION_PROFILE_insert(st, val, i) SKM_sk_insert(SRTTP_PROTECTION_PROFILE, (st), (val), (i))
1542 #define sk_SRTTP_PROTECTION_PROFILE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(SRTTP_PROTECTION_PROFILE, (st), (cmp))
1543 #define sk_SRTTP_PROTECTION_PROFILE_dup(st) SKM_sk_dup(SRTTP_PROTECTION_PROFILE, (st))
1544 #define sk_SRTTP_PROTECTION_PROFILE_pop_free(st, free_func) SKM_sk_pop_free(SRTTP_PROTECTION_PROFILE, (st), (free_func))
1545 #define sk_SRTTP_PROTECTION_PROFILE_shift(st) SKM_sk_shift(SRTTP_PROTECTION_PROFILE, (st))
1546 #define sk_SRTTP_PROTECTION_PROFILE_pop(st) SKM_sk_pop(SRTTP_PROTECTION_PROFILE, (st))
1547 #define sk_SRTTP_PROTECTION_PROFILE_sort(st) SKM_sk_sort(SRTTP_PROTECTION_PROFILE, (st))
1548 #define sk_SRTTP_PROTECTION_PROFILE_is_sorted(st) SKM_sk_is_sorted(SRTTP_PROTECTION_PROFILE, (st))

1550 #define sk_SSL_CIPHER_new(cmp) SKM_sk_new(SSL_CIPHER, (cmp))
1551 #define sk_SSL_CIPHER_new_null() SKM_sk_new_null(SSL_CIPHER)
1552 #define sk_SSL_CIPHER_free(st) SKM_sk_free(SSL_CIPHER, (st))
1553 #define sk_SSL_CIPHER_num(st) SKM_sk_num(SSL_CIPHER, (st))
1554 #define sk_SSL_CIPHER_value(st, i) SKM_sk_value(SSL_CIPHER, (st), (i))
1555 #define sk_SSL_CIPHER_set(st, i, val) SKM_sk_set(SSL_CIPHER, (st), (i), (val))
1556 #define sk_SSL_CIPHER_zero(st) SKM_sk_zero(SSL_CIPHER, (st))
1557 #define sk_SSL_CIPHER_push(st, val) SKM_sk_push(SSL_CIPHER, (st), (val))
1558 #define sk_SSL_CIPHER_unshift(st, val) SKM_sk_unshift(SSL_CIPHER, (st), (val))
1559 #define sk_SSL_CIPHER_find(st, val) SKM_sk_find(SSL_CIPHER, (st), (val))
1560 #define sk_SSL_CIPHER_find_ex(st, val) SKM_sk_find_ex(SSL_CIPHER, (st), (val))
1561 #define sk_SSL_CIPHER_delete(st, i) SKM_sk_delete(SSL_CIPHER, (st), (i))
1562 #define sk_SSL_CIPHER_delete_ptr(st, ptr) SKM_sk_delete_ptr(SSL_CIPHER, (st), (ptr))
1563 #define sk_SSL_CIPHER_insert(st, val, i) SKM_sk_insert(SSL_CIPHER, (st), (val), (i))
1564 #define sk_SSL_CIPHER_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(SSL_CIPHER, (st), (cmp))
1565 #define sk_SSL_CIPHER_dup(st) SKM_sk_dup(SSL_CIPHER, (st))
1566 #define sk_SSL_CIPHER_pop_free(st, free_func) SKM_sk_pop_free(SSL_CIPHER, (st), (free_func))
1567 #define sk_SSL_CIPHER_shift(st) SKM_sk_shift(SSL_CIPHER, (st))
1568 #define sk_SSL_CIPHER_pop(st) SKM_sk_pop(SSL_CIPHER, (st))
1569 #define sk_SSL_CIPHER_sort(st) SKM_sk_sort(SSL_CIPHER, (st))
1570 #define sk_SSL_CIPHER_is_sorted(st) SKM_sk_is_sorted(SSL_CIPHER, (st))

1572 #define sk_SSL_COMP_new(cmp) SKM_sk_new(SSL_COMP, (cmp))
1573 #define sk_SSL_COMP_new_null() SKM_sk_new_null(SSL_COMP)
1574 #define sk_SSL_COMP_free(st) SKM_sk_free(SSL_COMP, (st))
1575 #define sk_SSL_COMP_num(st) SKM_sk_num(SSL_COMP, (st))
1576 #define sk_SSL_COMP_value(st, i) SKM_sk_value(SSL_COMP, (st), (i))
1577 #define sk_SSL_COMP_set(st, i, val) SKM_sk_set(SSL_COMP, (st), (i), (val))
1578 #define sk_SSL_COMP_zero(st) SKM_sk_zero(SSL_COMP, (st))
1579 #define sk_SSL_COMP_push(st, val) SKM_sk_push(SSL_COMP, (st), (val))

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1580 #define sk_SSL_COMP_unshift(st, val) SKM_sk_unshift(SSL_COMP, (st), (val))
1581 #define sk_SSL_COMP_find(st, val) SKM_sk_find(SSL_COMP, (st), (val))
1582 #define sk_SSL_COMP_find_ex(st, val) SKM_sk_find_ex(SSL_COMP, (st), (val))
1583 #define sk_SSL_COMP_delete(st, i) SKM_sk_delete(SSL_COMP, (st), (i))
1584 #define sk_SSL_COMP_delete_ptr(st, ptr) SKM_sk_delete_ptr(SSL_COMP, (st), (ptr))
1585 #define sk_SSL_COMP_insert(st, val, i) SKM_sk_insert(SSL_COMP, (st), (val), (i))
1586 #define sk_SSL_COMP_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(SSL_COMP, (st), (c
1587 #define sk_SSL_COMP_dup(st) SKM_sk_dup(SSL_COMP, st)
1588 #define sk_SSL_COMP_pop_free(st, free_func) SKM_sk_pop_free(SSL_COMP, (st), (fre
1589 #define sk_SSL_COMP_shift(st) SKM_sk_shift(SSL_COMP, (st))
1590 #define sk_SSL_COMP_pop(st) SKM_sk_pop(SSL_COMP, (st))
1591 #define sk_SSL_COMP_sort(st) SKM_sk_sort(SSL_COMP, (st))
1592 #define sk_SSL_COMP_is_sorted(st) SKM_sk_is_sorted(SSL_COMP, (st))

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1594 #define sk_STACK_OF_X509_NAME_ENTRY_new(cmp) SKM_sk_new(STACK_OF_X509_NAME_ENTRY
1595 #define sk_STACK_OF_X509_NAME_ENTRY_new_null() SKM_sk_new_null(STACK_OF_X509_NAM
1596 #define sk_STACK_OF_X509_NAME_ENTRY_free(st) SKM_sk_free(STACK_OF_X509_NAME_ENTR
1597 #define sk_STACK_OF_X509_NAME_ENTRY_num(st) SKM_sk_num(STACK_OF_X509_NAME_ENTRY,
1598 #define sk_STACK_OF_X509_NAME_ENTRY_value(st, i) SKM_sk_value(STACK_OF_X509_NAME
1599 #define sk_STACK_OF_X509_NAME_ENTRY_set(st, i, val) SKM_sk_set(STACK_OF_X509_NAM
1600 #define sk_STACK_OF_X509_NAME_ENTRY_zero(st) SKM_sk_zero(STACK_OF_X509_NAME_ENTR
1601 #define sk_STACK_OF_X509_NAME_ENTRY_push(st, val) SKM_sk_push(STACK_OF_X509_NAME
1602 #define sk_STACK_OF_X509_NAME_ENTRY_unshift(st, val) SKM_sk_unshift(STACK_OF_X50
1603 #define sk_STACK_OF_X509_NAME_ENTRY_find(st, val) SKM_sk_find(STACK_OF_X509_NAME
1604 #define sk_STACK_OF_X509_NAME_ENTRY_find_ex(st, val) SKM_sk_find_ex(STACK_OF_X50
1605 #define sk_STACK_OF_X509_NAME_ENTRY_delete(st, i) SKM_sk_delete(STACK_OF_X509_NA
1606 #define sk_STACK_OF_X509_NAME_ENTRY_delete_ptr(st, ptr) SKM_sk_delete_ptr(STACK_
1607 #define sk_STACK_OF_X509_NAME_ENTRY_insert(st, val, i) SKM_sk_insert(STACK_OF_X5
1608 #define sk_STACK_OF_X509_NAME_ENTRY_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(ST
1609 #define sk_STACK_OF_X509_NAME_ENTRY_dup(st) SKM_sk_dup(STACK_OF_X509_NAME_ENTRY,
1610 #define sk_STACK_OF_X509_NAME_ENTRY_pop_free(st, free_func) SKM_sk_pop_free(STAC
1611 #define sk_STACK_OF_X509_NAME_ENTRY_shift(st) SKM_sk_shift(STACK_OF_X509_NAME_EN
1612 #define sk_STACK_OF_X509_NAME_ENTRY_pop(st) SKM_sk_pop(STACK_OF_X509_NAME_ENTRY,
1613 #define sk_STACK_OF_X509_NAME_ENTRY_sort(st) SKM_sk_sort(STACK_OF_X509_NAME_ENTR
1614 #define sk_STACK_OF_X509_NAME_ENTRY_is_sorted(st) SKM_sk_is_sorted(STACK_OF_X509

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1616 #define sk_STORE_ATTR_INFO_new(cmp) SKM_sk_new(STORE_ATTR_INFO, (cmp))
1617 #define sk_STORE_ATTR_INFO_new_null() SKM_sk_new_null(STORE_ATTR_INFO)
1618 #define sk_STORE_ATTR_INFO_free(st) SKM_sk_free(STORE_ATTR_INFO, (st))
1619 #define sk_STORE_ATTR_INFO_num(st) SKM_sk_num(STORE_ATTR_INFO, (st))
1620 #define sk_STORE_ATTR_INFO_value(st, i) SKM_sk_value(STORE_ATTR_INFO, (st), (i))
1621 #define sk_STORE_ATTR_INFO_set(st, i, val) SKM_sk_set(STORE_ATTR_INFO, (st), (i)
1622 #define sk_STORE_ATTR_INFO_zero(st) SKM_sk_zero(STORE_ATTR_INFO, (st))
1623 #define sk_STORE_ATTR_INFO_push(st, val) SKM_sk_push(STORE_ATTR_INFO, (st), (val
1624 #define sk_STORE_ATTR_INFO_unshift(st, val) SKM_sk_unshift(STORE_ATTR_INFO, (st)
1625 #define sk_STORE_ATTR_INFO_find(st, val) SKM_sk_find(STORE_ATTR_INFO, (st), (val
1626 #define sk_STORE_ATTR_INFO_find_ex(st, val) SKM_sk_find_ex(STORE_ATTR_INFO, (st)
1627 #define sk_STORE_ATTR_INFO_delete(st, i) SKM_sk_delete(STORE_ATTR_INFO, (st), (i
1628 #define sk_STORE_ATTR_INFO_delete_ptr(st, ptr) SKM_sk_delete_ptr(STORE_ATTR_INFO
1629 #define sk_STORE_ATTR_INFO_insert(st, val, i) SKM_sk_insert(STORE_ATTR_INFO, (st
1630 #define sk_STORE_ATTR_INFO_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(STORE_ATTR_
1631 #define sk_STORE_ATTR_INFO_dup(st) SKM_sk_dup(STORE_ATTR_INFO, st)
1632 #define sk_STORE_ATTR_INFO_pop_free(st, free_func) SKM_sk_pop_free(STORE_ATTR_IN
1633 #define sk_STORE_ATTR_INFO_shift(st) SKM_sk_shift(STORE_ATTR_INFO, (st))
1634 #define sk_STORE_ATTR_INFO_pop(st) SKM_sk_pop(STORE_ATTR_INFO, (st))
1635 #define sk_STORE_ATTR_INFO_sort(st) SKM_sk_sort(STORE_ATTR_INFO, (st))
1636 #define sk_STORE_ATTR_INFO_is_sorted(st) SKM_sk_is_sorted(STORE_ATTR_INFO, (st))

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1638 #define sk_STORE_OBJECT_new(cmp) SKM_sk_new(STORE_OBJECT, (cmp))
1639 #define sk_STORE_OBJECT_new_null() SKM_sk_new_null(STORE_OBJECT)
1640 #define sk_STORE_OBJECT_free(st) SKM_sk_free(STORE_OBJECT, (st))
1641 #define sk_STORE_OBJECT_num(st) SKM_sk_num(STORE_OBJECT, (st))
1642 #define sk_STORE_OBJECT_value(st, i) SKM_sk_value(STORE_OBJECT, (st), (i))
1643 #define sk_STORE_OBJECT_set(st, i, val) SKM_sk_set(STORE_OBJECT, (st), (i), (val
1644 #define sk_STORE_OBJECT_zero(st) SKM_sk_zero(STORE_OBJECT, (st))
1645 #define sk_STORE_OBJECT_push(st, val) SKM_sk_push(STORE_OBJECT, (st), (val))

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1646 #define sk_STORE_OBJECT_unshift(st, val) SKM_sk_unshift(STORE_OBJECT, (st), (val
1647 #define sk_STORE_OBJECT_find(st, val) SKM_sk_find(STORE_OBJECT, (st), (val))
1648 #define sk_STORE_OBJECT_find_ex(st, val) SKM_sk_find_ex(STORE_OBJECT, (st), (val
1649 #define sk_STORE_OBJECT_delete(st, i) SKM_sk_delete(STORE_OBJECT, (st), (i))
1650 #define sk_STORE_OBJECT_delete_ptr(st, ptr) SKM_sk_delete_ptr(STORE_OBJECT, (st)
1651 #define sk_STORE_OBJECT_insert(st, val, i) SKM_sk_insert(STORE_OBJECT, (st), (va
1652 #define sk_STORE_OBJECT_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(STORE_OBJECT,
1653 #define sk_STORE_OBJECT_dup(st) SKM_sk_dup(STORE_OBJECT, st)
1654 #define sk_STORE_OBJECT_pop_free(st, free_func) SKM_sk_pop_free(STORE_OBJECT, (s
1655 #define sk_STORE_OBJECT_shift(st) SKM_sk_shift(STORE_OBJECT, (st))
1656 #define sk_STORE_OBJECT_pop(st) SKM_sk_pop(STORE_OBJECT, (st))
1657 #define sk_STORE_OBJECT_sort(st) SKM_sk_sort(STORE_OBJECT, (st))
1658 #define sk_STORE_OBJECT_is_sorted(st) SKM_sk_is_sorted(STORE_OBJECT, (st))

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1660 #define sk_SXNETID_new(cmp) SKM_sk_new(SXNETID, (cmp))
1661 #define sk_SXNETID_new_null() SKM_sk_new_null(SXNETID)
1662 #define sk_SXNETID_free(st) SKM_sk_free(SXNETID, (st))
1663 #define sk_SXNETID_num(st) SKM_sk_num(SXNETID, (st))
1664 #define sk_SXNETID_value(st, i) SKM_sk_value(SXNETID, (st), (i))
1665 #define sk_SXNETID_set(st, i, val) SKM_sk_set(SXNETID, (st), (i), (val))
1666 #define sk_SXNETID_zero(st) SKM_sk_zero(SXNETID, (st))
1667 #define sk_SXNETID_push(st, val) SKM_sk_push(SXNETID, (st), (val))
1668 #define sk_SXNETID_unshift(st, val) SKM_sk_unshift(SXNETID, (st), (val))
1669 #define sk_SXNETID_find(st, val) SKM_sk_find(SXNETID, (st), (val))
1670 #define sk_SXNETID_find_ex(st, val) SKM_sk_find_ex(SXNETID, (st), (val))
1671 #define sk_SXNETID_delete(st, i) SKM_sk_delete(SXNETID, (st), (i))
1672 #define sk_SXNETID_delete_ptr(st, ptr) SKM_sk_delete_ptr(SXNETID, (st), (ptr))
1673 #define sk_SXNETID_insert(st, val, i) SKM_sk_insert(SXNETID, (st), (val), (i))
1674 #define sk_SXNETID_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(SXNETID, (st), (cmp
1675 #define sk_SXNETID_dup(st) SKM_sk_dup(SXNETID, st)
1676 #define sk_SXNETID_pop_free(st, free_func) SKM_sk_pop_free(SXNETID, (st), (free_
1677 #define sk_SXNETID_shift(st) SKM_sk_shift(SXNETID, (st))
1678 #define sk_SXNETID_pop(st) SKM_sk_pop(SXNETID, (st))
1679 #define sk_SXNETID_sort(st) SKM_sk_sort(SXNETID, (st))
1680 #define sk_SXNETID_is_sorted(st) SKM_sk_is_sorted(SXNETID, (st))

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1682 #define sk_UI_STRING_new(cmp) SKM_sk_new(UI_STRING, (cmp))
1683 #define sk_UI_STRING_new_null() SKM_sk_new_null(UI_STRING)
1684 #define sk_UI_STRING_free(st) SKM_sk_free(UI_STRING, (st))
1685 #define sk_UI_STRING_num(st) SKM_sk_num(UI_STRING, (st))
1686 #define sk_UI_STRING_value(st, i) SKM_sk_value(UI_STRING, (st), (i))
1687 #define sk_UI_STRING_set(st, i, val) SKM_sk_set(UI_STRING, (st), (i), (val))
1688 #define sk_UI_STRING_zero(st) SKM_sk_zero(UI_STRING, (st))
1689 #define sk_UI_STRING_push(st, val) SKM_sk_push(UI_STRING, (st), (val))
1690 #define sk_UI_STRING_unshift(st, val) SKM_sk_unshift(UI_STRING, (st), (val))
1691 #define sk_UI_STRING_find(st, val) SKM_sk_find(UI_STRING, (st), (val))
1692 #define sk_UI_STRING_find_ex(st, val) SKM_sk_find_ex(UI_STRING, (st), (val))
1693 #define sk_UI_STRING_delete(st, i) SKM_sk_delete(UI_STRING, (st), (i))
1694 #define sk_UI_STRING_delete_ptr(st, ptr) SKM_sk_delete_ptr(UI_STRING, (st), (ptr
1695 #define sk_UI_STRING_insert(st, val, i) SKM_sk_insert(UI_STRING, (st), (val), (i
1696 #define sk_UI_STRING_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(UI_STRING, (st),
1697 #define sk_UI_STRING_dup(st) SKM_sk_dup(UI_STRING, st)
1698 #define sk_UI_STRING_pop_free(st, free_func) SKM_sk_pop_free(UI_STRING, (st), (f
1699 #define sk_UI_STRING_shift(st) SKM_sk_shift(UI_STRING, (st))
1700 #define sk_UI_STRING_pop(st) SKM_sk_pop(UI_STRING, (st))
1701 #define sk_UI_STRING_sort(st) SKM_sk_sort(UI_STRING, (st))
1702 #define sk_UI_STRING_is_sorted(st) SKM_sk_is_sorted(UI_STRING, (st))

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1704 #define sk_X509_new(cmp) SKM_sk_new(X509, (cmp))
1705 #define sk_X509_new_null() SKM_sk_new_null(X509)
1706 #define sk_X509_free(st) SKM_sk_free(X509, (st))
1707 #define sk_X509_num(st) SKM_sk_num(X509, (st))
1708 #define sk_X509_value(st, i) SKM_sk_value(X509, (st), (i))
1709 #define sk_X509_set(st, i, val) SKM_sk_set(X509, (st), (i), (val))
1710 #define sk_X509_zero(st) SKM_sk_zero(X509, (st))
1711 #define sk_X509_push(st, val) SKM_sk_push(X509, (st), (val))

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1712 #define sk_X509_unshift(st, val) SKM_sk_unshift(X509, (st), (val))
1713 #define sk_X509_find(st, val) SKM_sk_find(X509, (st), (val))
1714 #define sk_X509_find_ex(st, val) SKM_sk_find_ex(X509, (st), (val))
1715 #define sk_X509_delete(st, i) SKM_sk_delete(X509, (st), (i))
1716 #define sk_X509_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509, (st), (ptr))
1717 #define sk_X509_insert(st, val, i) SKM_sk_insert(X509, (st), (val), (i))
1718 #define sk_X509_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509, (st), (cmp))
1719 #define sk_X509_dup(st) SKM_sk_dup(X509, st)
1720 #define sk_X509_pop_free(st, free_func) SKM_sk_pop_free(X509, (st), (free_func))
1721 #define sk_X509_shift(st) SKM_sk_shift(X509, (st))
1722 #define sk_X509_pop(st) SKM_sk_pop(X509, (st))
1723 #define sk_X509_sort(st) SKM_sk_sort(X509, (st))
1724 #define sk_X509_is_sorted(st) SKM_sk_is_sorted(X509, (st))

1726 #define sk_X509V3_EXT_METHOD_new(cmp) SKM_sk_new(X509V3_EXT_METHOD, (cmp))
1727 #define sk_X509V3_EXT_METHOD_new_null() SKM_sk_new_null(X509V3_EXT_METHOD)
1728 #define sk_X509V3_EXT_METHOD_free(st) SKM_sk_free(X509V3_EXT_METHOD, (st))
1729 #define sk_X509V3_EXT_METHOD_num(st) SKM_sk_num(X509V3_EXT_METHOD, (st))
1730 #define sk_X509V3_EXT_METHOD_value(st, i) SKM_sk_value(X509V3_EXT_METHOD, (st), (i))
1731 #define sk_X509V3_EXT_METHOD_set(st, i, val) SKM_sk_set(X509V3_EXT_METHOD, (st), (i), (val))
1732 #define sk_X509V3_EXT_METHOD_zero(st) SKM_sk_zero(X509V3_EXT_METHOD, (st))
1733 #define sk_X509V3_EXT_METHOD_push(st, val) SKM_sk_push(X509V3_EXT_METHOD, (st), (val))
1734 #define sk_X509V3_EXT_METHOD_unshift(st, val) SKM_sk_unshift(X509V3_EXT_METHOD, (st), (val))
1735 #define sk_X509V3_EXT_METHOD_find(st, val) SKM_sk_find(X509V3_EXT_METHOD, (st), (val))
1736 #define sk_X509V3_EXT_METHOD_find_ex(st, val) SKM_sk_find_ex(X509V3_EXT_METHOD, (st), (val))
1737 #define sk_X509V3_EXT_METHOD_delete(st, i) SKM_sk_delete(X509V3_EXT_METHOD, (st), (i))
1738 #define sk_X509V3_EXT_METHOD_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509V3_EXT_METHOD, (st), (ptr))
1739 #define sk_X509V3_EXT_METHOD_insert(st, val, i) SKM_sk_insert(X509V3_EXT_METHOD, (st), (val), (i))
1740 #define sk_X509V3_EXT_METHOD_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509V3_EXT_METHOD, (st), (cmp))
1741 #define sk_X509V3_EXT_METHOD_dup(st) SKM_sk_dup(X509V3_EXT_METHOD, (st))
1742 #define sk_X509V3_EXT_METHOD_pop_free(st, free_func) SKM_sk_pop_free(X509V3_EXT_METHOD, (st), (free_func))
1743 #define sk_X509V3_EXT_METHOD_shift(st) SKM_sk_shift(X509V3_EXT_METHOD, (st))
1744 #define sk_X509V3_EXT_METHOD_pop(st) SKM_sk_pop(X509V3_EXT_METHOD, (st))
1745 #define sk_X509V3_EXT_METHOD_sort(st) SKM_sk_sort(X509V3_EXT_METHOD, (st))
1746 #define sk_X509V3_EXT_METHOD_is_sorted(st) SKM_sk_is_sorted(X509V3_EXT_METHOD, (st))

1748 #define sk_X509_ALGOR_new(cmp) SKM_sk_new(X509_ALGOR, (cmp))
1749 #define sk_X509_ALGOR_new_null() SKM_sk_new_null(X509_ALGOR)
1750 #define sk_X509_ALGOR_free(st) SKM_sk_free(X509_ALGOR, (st))
1751 #define sk_X509_ALGOR_num(st) SKM_sk_num(X509_ALGOR, (st))
1752 #define sk_X509_ALGOR_value(st, i) SKM_sk_value(X509_ALGOR, (st), (i))
1753 #define sk_X509_ALGOR_set(st, i, val) SKM_sk_set(X509_ALGOR, (st), (i), (val))
1754 #define sk_X509_ALGOR_zero(st) SKM_sk_zero(X509_ALGOR, (st))
1755 #define sk_X509_ALGOR_push(st, val) SKM_sk_push(X509_ALGOR, (st), (val))
1756 #define sk_X509_ALGOR_unshift(st, val) SKM_sk_unshift(X509_ALGOR, (st), (val))
1757 #define sk_X509_ALGOR_find(st, val) SKM_sk_find(X509_ALGOR, (st), (val))
1758 #define sk_X509_ALGOR_find_ex(st, val) SKM_sk_find_ex(X509_ALGOR, (st), (val))
1759 #define sk_X509_ALGOR_delete(st, i) SKM_sk_delete(X509_ALGOR, (st), (i))
1760 #define sk_X509_ALGOR_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_ALGOR, (st), (ptr))
1761 #define sk_X509_ALGOR_insert(st, val, i) SKM_sk_insert(X509_ALGOR, (st), (val), (i))
1762 #define sk_X509_ALGOR_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_ALGOR, (st), (cmp))
1763 #define sk_X509_ALGOR_dup(st) SKM_sk_dup(X509_ALGOR, (st))
1764 #define sk_X509_ALGOR_pop_free(st, free_func) SKM_sk_pop_free(X509_ALGOR, (st), (free_func))
1765 #define sk_X509_ALGOR_shift(st) SKM_sk_shift(X509_ALGOR, (st))
1766 #define sk_X509_ALGOR_pop(st) SKM_sk_pop(X509_ALGOR, (st))
1767 #define sk_X509_ALGOR_sort(st) SKM_sk_sort(X509_ALGOR, (st))
1768 #define sk_X509_ALGOR_is_sorted(st) SKM_sk_is_sorted(X509_ALGOR, (st))

1770 #define sk_X509_ATTRIBUTE_new(cmp) SKM_sk_new(X509_ATTRIBUTE, (cmp))
1771 #define sk_X509_ATTRIBUTE_new_null() SKM_sk_new_null(X509_ATTRIBUTE)
1772 #define sk_X509_ATTRIBUTE_free(st) SKM_sk_free(X509_ATTRIBUTE, (st))
1773 #define sk_X509_ATTRIBUTE_num(st) SKM_sk_num(X509_ATTRIBUTE, (st))
1774 #define sk_X509_ATTRIBUTE_value(st, i) SKM_sk_value(X509_ATTRIBUTE, (st), (i))
1775 #define sk_X509_ATTRIBUTE_set(st, i, val) SKM_sk_set(X509_ATTRIBUTE, (st), (i), (val))
1776 #define sk_X509_ATTRIBUTE_zero(st) SKM_sk_zero(X509_ATTRIBUTE, (st))
1777 #define sk_X509_ATTRIBUTE_push(st, val) SKM_sk_push(X509_ATTRIBUTE, (st), (val))
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1778 #define sk_X509_ATTRIBUTE_unshift(st, val) SKM_sk_unshift(X509_ATTRIBUTE, (st), (val))
1779 #define sk_X509_ATTRIBUTE_find(st, val) SKM_sk_find(X509_ATTRIBUTE, (st), (val))
1780 #define sk_X509_ATTRIBUTE_find_ex(st, val) SKM_sk_find_ex(X509_ATTRIBUTE, (st), (val))
1781 #define sk_X509_ATTRIBUTE_delete(st, i) SKM_sk_delete(X509_ATTRIBUTE, (st), (i))
1782 #define sk_X509_ATTRIBUTE_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_ATTRIBUTE, (st), (ptr))
1783 #define sk_X509_ATTRIBUTE_insert(st, val, i) SKM_sk_insert(X509_ATTRIBUTE, (st), (val), (i))
1784 #define sk_X509_ATTRIBUTE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_ATTRIBUTE, (st), (cmp))
1785 #define sk_X509_ATTRIBUTE_dup(st) SKM_sk_dup(X509_ATTRIBUTE, (st))
1786 #define sk_X509_ATTRIBUTE_pop_free(st, free_func) SKM_sk_pop_free(X509_ATTRIBUTE, (st), (free_func))
1787 #define sk_X509_ATTRIBUTE_shift(st) SKM_sk_shift(X509_ATTRIBUTE, (st))
1788 #define sk_X509_ATTRIBUTE_pop(st) SKM_sk_pop(X509_ATTRIBUTE, (st))
1789 #define sk_X509_ATTRIBUTE_sort(st) SKM_sk_sort(X509_ATTRIBUTE, (st))
1790 #define sk_X509_ATTRIBUTE_is_sorted(st) SKM_sk_is_sorted(X509_ATTRIBUTE, (st))

1792 #define sk_X509_CRL_new(cmp) SKM_sk_new(X509_CRL, (cmp))
1793 #define sk_X509_CRL_new_null() SKM_sk_new_null(X509_CRL)
1794 #define sk_X509_CRL_free(st) SKM_sk_free(X509_CRL, (st))
1795 #define sk_X509_CRL_num(st) SKM_sk_num(X509_CRL, (st))
1796 #define sk_X509_CRL_value(st, i) SKM_sk_value(X509_CRL, (st), (i))
1797 #define sk_X509_CRL_set(st, i, val) SKM_sk_set(X509_CRL, (st), (i), (val))
1798 #define sk_X509_CRL_zero(st) SKM_sk_zero(X509_CRL, (st))
1799 #define sk_X509_CRL_push(st, val) SKM_sk_push(X509_CRL, (st), (val))
1800 #define sk_X509_CRL_unshift(st, val) SKM_sk_unshift(X509_CRL, (st), (val))
1801 #define sk_X509_CRL_find(st, val) SKM_sk_find(X509_CRL, (st), (val))
1802 #define sk_X509_CRL_find_ex(st, val) SKM_sk_find_ex(X509_CRL, (st), (val))
1803 #define sk_X509_CRL_delete(st, i) SKM_sk_delete(X509_CRL, (st), (i))
1804 #define sk_X509_CRL_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_CRL, (st), (ptr))
1805 #define sk_X509_CRL_insert(st, val, i) SKM_sk_insert(X509_CRL, (st), (val), (i))
1806 #define sk_X509_CRL_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_CRL, (st), (cmp))
1807 #define sk_X509_CRL_dup(st) SKM_sk_dup(X509_CRL, (st))
1808 #define sk_X509_CRL_pop_free(st, free_func) SKM_sk_pop_free(X509_CRL, (st), (free_func))
1809 #define sk_X509_CRL_shift(st) SKM_sk_shift(X509_CRL, (st))
1810 #define sk_X509_CRL_pop(st) SKM_sk_pop(X509_CRL, (st))
1811 #define sk_X509_CRL_sort(st) SKM_sk_sort(X509_CRL, (st))
1812 #define sk_X509_CRL_is_sorted(st) SKM_sk_is_sorted(X509_CRL, (st))

1814 #define sk_X509_EXTENSION_new(cmp) SKM_sk_new(X509_EXTENSION, (cmp))
1815 #define sk_X509_EXTENSION_new_null() SKM_sk_new_null(X509_EXTENSION)
1816 #define sk_X509_EXTENSION_free(st) SKM_sk_free(X509_EXTENSION, (st))
1817 #define sk_X509_EXTENSION_num(st) SKM_sk_num(X509_EXTENSION, (st))
1818 #define sk_X509_EXTENSION_value(st, i) SKM_sk_value(X509_EXTENSION, (st), (i))
1819 #define sk_X509_EXTENSION_set(st, i, val) SKM_sk_set(X509_EXTENSION, (st), (i), (val))
1820 #define sk_X509_EXTENSION_zero(st) SKM_sk_zero(X509_EXTENSION, (st))
1821 #define sk_X509_EXTENSION_push(st, val) SKM_sk_push(X509_EXTENSION, (st), (val))
1822 #define sk_X509_EXTENSION_unshift(st, val) SKM_sk_unshift(X509_EXTENSION, (st), (val))
1823 #define sk_X509_EXTENSION_find(st, val) SKM_sk_find(X509_EXTENSION, (st), (val))
1824 #define sk_X509_EXTENSION_find_ex(st, val) SKM_sk_find_ex(X509_EXTENSION, (st), (val))
1825 #define sk_X509_EXTENSION_delete(st, i) SKM_sk_delete(X509_EXTENSION, (st), (i))
1826 #define sk_X509_EXTENSION_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_EXTENSION, (st), (ptr))
1827 #define sk_X509_EXTENSION_insert(st, val, i) SKM_sk_insert(X509_EXTENSION, (st), (val), (i))
1828 #define sk_X509_EXTENSION_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_EXTENSION, (st), (cmp))
1829 #define sk_X509_EXTENSION_dup(st) SKM_sk_dup(X509_EXTENSION, (st))
1830 #define sk_X509_EXTENSION_pop_free(st, free_func) SKM_sk_pop_free(X509_EXTENSION, (st), (free_func))
1831 #define sk_X509_EXTENSION_shift(st) SKM_sk_shift(X509_EXTENSION, (st))
1832 #define sk_X509_EXTENSION_pop(st) SKM_sk_pop(X509_EXTENSION, (st))
1833 #define sk_X509_EXTENSION_sort(st) SKM_sk_sort(X509_EXTENSION, (st))
1834 #define sk_X509_EXTENSION_is_sorted(st) SKM_sk_is_sorted(X509_EXTENSION, (st))

1836 #define sk_X509_INFO_new(cmp) SKM_sk_new(X509_INFO, (cmp))
1837 #define sk_X509_INFO_new_null() SKM_sk_new_null(X509_INFO)
1838 #define sk_X509_INFO_free(st) SKM_sk_free(X509_INFO, (st))
1839 #define sk_X509_INFO_num(st) SKM_sk_num(X509_INFO, (st))
1840 #define sk_X509_INFO_value(st, i) SKM_sk_value(X509_INFO, (st), (i))
1841 #define sk_X509_INFO_set(st, i, val) SKM_sk_set(X509_INFO, (st), (i), (val))
1842 #define sk_X509_INFO_zero(st) SKM_sk_zero(X509_INFO, (st))
1843 #define sk_X509_INFO_push(st, val) SKM_sk_push(X509_INFO, (st), (val))
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1844 #define sk_X509_INFO_unshift(st, val) SKM_sk_unshift(X509_INFO, (st), (val))
1845 #define sk_X509_INFO_find(st, val) SKM_sk_find(X509_INFO, (st), (val))
1846 #define sk_X509_INFO_find_ex(st, val) SKM_sk_find_ex(X509_INFO, (st), (val))
1847 #define sk_X509_INFO_delete(st, i) SKM_sk_delete(X509_INFO, (st), (i))
1848 #define sk_X509_INFO_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_INFO, (st), (ptr))
1849 #define sk_X509_INFO_insert(st, val, i) SKM_sk_insert(X509_INFO, (st), (val), (i))
1850 #define sk_X509_INFO_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_INFO, (st), (cmp))
1851 #define sk_X509_INFO_dup(st) SKM_sk_dup(X509_INFO, (st))
1852 #define sk_X509_INFO_pop_free(st, free_func) SKM_sk_pop_free(X509_INFO, (st), (free_func))
1853 #define sk_X509_INFO_shift(st) SKM_sk_shift(X509_INFO, (st))
1854 #define sk_X509_INFO_pop(st) SKM_sk_pop(X509_INFO, (st))
1855 #define sk_X509_INFO_sort(st) SKM_sk_sort(X509_INFO, (st))
1856 #define sk_X509_INFO_is_sorted(st) SKM_sk_is_sorted(X509_INFO, (st))
```

```
1858 #define sk_X509_LOOKUP_new(cmp) SKM_sk_new(X509_LOOKUP, (cmp))
1859 #define sk_X509_LOOKUP_new_null() SKM_sk_new_null(X509_LOOKUP)
1860 #define sk_X509_LOOKUP_free(st) SKM_sk_free(X509_LOOKUP, (st))
1861 #define sk_X509_LOOKUP_num(st) SKM_sk_num(X509_LOOKUP, (st))
1862 #define sk_X509_LOOKUP_value(st, i) SKM_sk_value(X509_LOOKUP, (st), (i))
1863 #define sk_X509_LOOKUP_set(st, i, val) SKM_sk_set(X509_LOOKUP, (st), (i), (val))
1864 #define sk_X509_LOOKUP_zero(st) SKM_sk_zero(X509_LOOKUP, (st))
1865 #define sk_X509_LOOKUP_push(st, val) SKM_sk_push(X509_LOOKUP, (st), (val))
1866 #define sk_X509_LOOKUP_unshift(st, val) SKM_sk_unshift(X509_LOOKUP, (st), (val))
1867 #define sk_X509_LOOKUP_find(st, val) SKM_sk_find(X509_LOOKUP, (st), (val))
1868 #define sk_X509_LOOKUP_find_ex(st, val) SKM_sk_find_ex(X509_LOOKUP, (st), (val))
1869 #define sk_X509_LOOKUP_delete(st, i) SKM_sk_delete(X509_LOOKUP, (st), (i))
1870 #define sk_X509_LOOKUP_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_LOOKUP, (st), (ptr))
1871 #define sk_X509_LOOKUP_insert(st, val, i) SKM_sk_insert(X509_LOOKUP, (st), (val), (i))
1872 #define sk_X509_LOOKUP_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_LOOKUP, (st), (cmp))
1873 #define sk_X509_LOOKUP_dup(st) SKM_sk_dup(X509_LOOKUP, (st))
1874 #define sk_X509_LOOKUP_pop_free(st, free_func) SKM_sk_pop_free(X509_LOOKUP, (st), (free_func))
1875 #define sk_X509_LOOKUP_shift(st) SKM_sk_shift(X509_LOOKUP, (st))
1876 #define sk_X509_LOOKUP_pop(st) SKM_sk_pop(X509_LOOKUP, (st))
1877 #define sk_X509_LOOKUP_sort(st) SKM_sk_sort(X509_LOOKUP, (st))
1878 #define sk_X509_LOOKUP_is_sorted(st) SKM_sk_is_sorted(X509_LOOKUP, (st))
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1880 #define sk_X509_NAME_new(cmp) SKM_sk_new(X509_NAME, (cmp))
1881 #define sk_X509_NAME_new_null() SKM_sk_new_null(X509_NAME)
1882 #define sk_X509_NAME_free(st) SKM_sk_free(X509_NAME, (st))
1883 #define sk_X509_NAME_num(st) SKM_sk_num(X509_NAME, (st))
1884 #define sk_X509_NAME_value(st, i) SKM_sk_value(X509_NAME, (st), (i))
1885 #define sk_X509_NAME_set(st, i, val) SKM_sk_set(X509_NAME, (st), (i), (val))
1886 #define sk_X509_NAME_zero(st) SKM_sk_zero(X509_NAME, (st))
1887 #define sk_X509_NAME_push(st, val) SKM_sk_push(X509_NAME, (st), (val))
1888 #define sk_X509_NAME_unshift(st, val) SKM_sk_unshift(X509_NAME, (st), (val))
1889 #define sk_X509_NAME_find(st, val) SKM_sk_find(X509_NAME, (st), (val))
1890 #define sk_X509_NAME_find_ex(st, val) SKM_sk_find_ex(X509_NAME, (st), (val))
1891 #define sk_X509_NAME_delete(st, i) SKM_sk_delete(X509_NAME, (st), (i))
1892 #define sk_X509_NAME_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_NAME, (st), (ptr))
1893 #define sk_X509_NAME_insert(st, val, i) SKM_sk_insert(X509_NAME, (st), (val), (i))
1894 #define sk_X509_NAME_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_NAME, (st), (cmp))
1895 #define sk_X509_NAME_dup(st) SKM_sk_dup(X509_NAME, (st))
1896 #define sk_X509_NAME_pop_free(st, free_func) SKM_sk_pop_free(X509_NAME, (st), (free_func))
1897 #define sk_X509_NAME_shift(st) SKM_sk_shift(X509_NAME, (st))
1898 #define sk_X509_NAME_pop(st) SKM_sk_pop(X509_NAME, (st))
1899 #define sk_X509_NAME_sort(st) SKM_sk_sort(X509_NAME, (st))
1900 #define sk_X509_NAME_is_sorted(st) SKM_sk_is_sorted(X509_NAME, (st))
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1902 #define sk_X509_NAME_ENTRY_new(cmp) SKM_sk_new(X509_NAME_ENTRY, (cmp))
1903 #define sk_X509_NAME_ENTRY_new_null() SKM_sk_new_null(X509_NAME_ENTRY)
1904 #define sk_X509_NAME_ENTRY_free(st) SKM_sk_free(X509_NAME_ENTRY, (st))
1905 #define sk_X509_NAME_ENTRY_num(st) SKM_sk_num(X509_NAME_ENTRY, (st))
1906 #define sk_X509_NAME_ENTRY_value(st, i) SKM_sk_value(X509_NAME_ENTRY, (st), (i))
1907 #define sk_X509_NAME_ENTRY_set(st, i, val) SKM_sk_set(X509_NAME_ENTRY, (st), (i), (val))
1908 #define sk_X509_NAME_ENTRY_zero(st) SKM_sk_zero(X509_NAME_ENTRY, (st))
1909 #define sk_X509_NAME_ENTRY_push(st, val) SKM_sk_push(X509_NAME_ENTRY, (st), (val))
```

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1910 #define sk_X509_NAME_ENTRY_unshift(st, val) SKM_sk_unshift(X509_NAME_ENTRY, (st), (val))
1911 #define sk_X509_NAME_ENTRY_find(st, val) SKM_sk_find(X509_NAME_ENTRY, (st), (val))
1912 #define sk_X509_NAME_ENTRY_find_ex(st, val) SKM_sk_find_ex(X509_NAME_ENTRY, (st), (val))
1913 #define sk_X509_NAME_ENTRY_delete(st, i) SKM_sk_delete(X509_NAME_ENTRY, (st), (i))
1914 #define sk_X509_NAME_ENTRY_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_NAME_ENTRY, (st), (ptr))
1915 #define sk_X509_NAME_ENTRY_insert(st, val, i) SKM_sk_insert(X509_NAME_ENTRY, (st), (val), (i))
1916 #define sk_X509_NAME_ENTRY_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_NAME_ENTRY, (st), (cmp))
1917 #define sk_X509_NAME_ENTRY_dup(st) SKM_sk_dup(X509_NAME_ENTRY, (st))
1918 #define sk_X509_NAME_ENTRY_pop_free(st, free_func) SKM_sk_pop_free(X509_NAME_ENTRY, (st), (free_func))
1919 #define sk_X509_NAME_ENTRY_shift(st) SKM_sk_shift(X509_NAME_ENTRY, (st))
1920 #define sk_X509_NAME_ENTRY_pop(st) SKM_sk_pop(X509_NAME_ENTRY, (st))
1921 #define sk_X509_NAME_ENTRY_sort(st) SKM_sk_sort(X509_NAME_ENTRY, (st))
1922 #define sk_X509_NAME_ENTRY_is_sorted(st) SKM_sk_is_sorted(X509_NAME_ENTRY, (st))
```

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1924 #define sk_X509_OBJECT_new(cmp) SKM_sk_new(X509_OBJECT, (cmp))
1925 #define sk_X509_OBJECT_new_null() SKM_sk_new_null(X509_OBJECT)
1926 #define sk_X509_OBJECT_free(st) SKM_sk_free(X509_OBJECT, (st))
1927 #define sk_X509_OBJECT_num(st) SKM_sk_num(X509_OBJECT, (st))
1928 #define sk_X509_OBJECT_value(st, i) SKM_sk_value(X509_OBJECT, (st), (i))
1929 #define sk_X509_OBJECT_set(st, i, val) SKM_sk_set(X509_OBJECT, (st), (i), (val))
1930 #define sk_X509_OBJECT_zero(st) SKM_sk_zero(X509_OBJECT, (st))
1931 #define sk_X509_OBJECT_push(st, val) SKM_sk_push(X509_OBJECT, (st), (val))
1932 #define sk_X509_OBJECT_unshift(st, val) SKM_sk_unshift(X509_OBJECT, (st), (val))
1933 #define sk_X509_OBJECT_find(st, val) SKM_sk_find(X509_OBJECT, (st), (val))
1934 #define sk_X509_OBJECT_find_ex(st, val) SKM_sk_find_ex(X509_OBJECT, (st), (val))
1935 #define sk_X509_OBJECT_delete(st, i) SKM_sk_delete(X509_OBJECT, (st), (i))
1936 #define sk_X509_OBJECT_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_OBJECT, (st), (ptr))
1937 #define sk_X509_OBJECT_insert(st, val, i) SKM_sk_insert(X509_OBJECT, (st), (val), (i))
1938 #define sk_X509_OBJECT_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_OBJECT, (st), (cmp))
1939 #define sk_X509_OBJECT_dup(st) SKM_sk_dup(X509_OBJECT, (st))
1940 #define sk_X509_OBJECT_pop_free(st, free_func) SKM_sk_pop_free(X509_OBJECT, (st), (free_func))
1941 #define sk_X509_OBJECT_shift(st) SKM_sk_shift(X509_OBJECT, (st))
1942 #define sk_X509_OBJECT_pop(st) SKM_sk_pop(X509_OBJECT, (st))
1943 #define sk_X509_OBJECT_sort(st) SKM_sk_sort(X509_OBJECT, (st))
1944 #define sk_X509_OBJECT_is_sorted(st) SKM_sk_is_sorted(X509_OBJECT, (st))
```

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1946 #define sk_X509_POLICY_DATA_new(cmp) SKM_sk_new(X509_POLICY_DATA, (cmp))
1947 #define sk_X509_POLICY_DATA_new_null() SKM_sk_new_null(X509_POLICY_DATA)
1948 #define sk_X509_POLICY_DATA_free(st) SKM_sk_free(X509_POLICY_DATA, (st))
1949 #define sk_X509_POLICY_DATA_num(st) SKM_sk_num(X509_POLICY_DATA, (st))
1950 #define sk_X509_POLICY_DATA_value(st, i) SKM_sk_value(X509_POLICY_DATA, (st), (i))
1951 #define sk_X509_POLICY_DATA_set(st, i, val) SKM_sk_set(X509_POLICY_DATA, (st), (i), (val))
1952 #define sk_X509_POLICY_DATA_zero(st) SKM_sk_zero(X509_POLICY_DATA, (st))
1953 #define sk_X509_POLICY_DATA_push(st, val) SKM_sk_push(X509_POLICY_DATA, (st), (val))
1954 #define sk_X509_POLICY_DATA_unshift(st, val) SKM_sk_unshift(X509_POLICY_DATA, (st), (val))
1955 #define sk_X509_POLICY_DATA_find(st, val) SKM_sk_find(X509_POLICY_DATA, (st), (val))
1956 #define sk_X509_POLICY_DATA_find_ex(st, val) SKM_sk_find_ex(X509_POLICY_DATA, (st), (val))
1957 #define sk_X509_POLICY_DATA_delete(st, i) SKM_sk_delete(X509_POLICY_DATA, (st), (i))
1958 #define sk_X509_POLICY_DATA_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_POLICY_DATA, (st), (ptr))
1959 #define sk_X509_POLICY_DATA_insert(st, val, i) SKM_sk_insert(X509_POLICY_DATA, (st), (val), (i))
1960 #define sk_X509_POLICY_DATA_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_POLICY_DATA, (st), (cmp))
1961 #define sk_X509_POLICY_DATA_dup(st) SKM_sk_dup(X509_POLICY_DATA, (st))
1962 #define sk_X509_POLICY_DATA_pop_free(st, free_func) SKM_sk_pop_free(X509_POLICY_DATA, (st), (free_func))
1963 #define sk_X509_POLICY_DATA_shift(st) SKM_sk_shift(X509_POLICY_DATA, (st))
1964 #define sk_X509_POLICY_DATA_pop(st) SKM_sk_pop(X509_POLICY_DATA, (st))
1965 #define sk_X509_POLICY_DATA_sort(st) SKM_sk_sort(X509_POLICY_DATA, (st))
1966 #define sk_X509_POLICY_DATA_is_sorted(st) SKM_sk_is_sorted(X509_POLICY_DATA, (st))
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1968 #define sk_X509_POLICY_NODE_new(cmp) SKM_sk_new(X509_POLICY_NODE, (cmp))
1969 #define sk_X509_POLICY_NODE_new_null() SKM_sk_new_null(X509_POLICY_NODE)
1970 #define sk_X509_POLICY_NODE_free(st) SKM_sk_free(X509_POLICY_NODE, (st))
1971 #define sk_X509_POLICY_NODE_num(st) SKM_sk_num(X509_POLICY_NODE, (st))
1972 #define sk_X509_POLICY_NODE_value(st, i) SKM_sk_value(X509_POLICY_NODE, (st), (i))
1973 #define sk_X509_POLICY_NODE_set(st, i, val) SKM_sk_set(X509_POLICY_NODE, (st), (i), (val))
1974 #define sk_X509_POLICY_NODE_zero(st) SKM_sk_zero(X509_POLICY_NODE, (st))
1975 #define sk_X509_POLICY_NODE_push(st, val) SKM_sk_push(X509_POLICY_NODE, (st), (val))
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1976 #define sk_X509_POLICY_NODE_unshift(st, val) SKM_sk_unshift(X509_POLICY_NODE, (s
1977 #define sk_X509_POLICY_NODE_find(st, val) SKM_sk_find(X509_POLICY_NODE, (st), (v
1978 #define sk_X509_POLICY_NODE_find_ex(st, val) SKM_sk_find_ex(X509_POLICY_NODE, (s
1979 #define sk_X509_POLICY_NODE_delete(st, i) SKM_sk_delete(X509_POLICY_NODE, (st),
1980 #define sk_X509_POLICY_NODE_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_POLICY_NO
1981 #define sk_X509_POLICY_NODE_insert(st, val, i) SKM_sk_insert(X509_POLICY_NODE, (
1982 #define sk_X509_POLICY_NODE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_POLIC
1983 #define sk_X509_POLICY_NODE_dup(st) SKM_sk_dup(X509_POLICY_NODE, (st))
1984 #define sk_X509_POLICY_NODE_pop_free(st, free_func) SKM_sk_pop_free(X509_POLICY_
1985 #define sk_X509_POLICY_NODE_shift(st) SKM_sk_shift(X509_POLICY_NODE, (st))
1986 #define sk_X509_POLICY_NODE_pop(st) SKM_sk_pop(X509_POLICY_NODE, (st))
1987 #define sk_X509_POLICY_NODE_sort(st) SKM_sk_sort(X509_POLICY_NODE, (st))
1988 #define sk_X509_POLICY_NODE_is_sorted(st) SKM_sk_is_sorted(X509_POLICY_NODE, (st)

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1990 #define sk_X509_PURPOSE_new(cmp) SKM_sk_new(X509_PURPOSE, (cmp))
1991 #define sk_X509_PURPOSE_new_null() SKM_sk_new_null(X509_PURPOSE)
1992 #define sk_X509_PURPOSE_free(st) SKM_sk_free(X509_PURPOSE, (st))
1993 #define sk_X509_PURPOSE_num(st) SKM_sk_num(X509_PURPOSE, (st))
1994 #define sk_X509_PURPOSE_value(st, i) SKM_sk_value(X509_PURPOSE, (st), (i))
1995 #define sk_X509_PURPOSE_set(st, i, val) SKM_sk_set(X509_PURPOSE, (st), (i), (val)
1996 #define sk_X509_PURPOSE_zero(st) SKM_sk_zero(X509_PURPOSE, (st))
1997 #define sk_X509_PURPOSE_push(st, val) SKM_sk_push(X509_PURPOSE, (st), (val))
1998 #define sk_X509_PURPOSE_unshift(st, val) SKM_sk_unshift(X509_PURPOSE, (st), (val)
1999 #define sk_X509_PURPOSE_find(st, val) SKM_sk_find(X509_PURPOSE, (st), (val))
2000 #define sk_X509_PURPOSE_find_ex(st, val) SKM_sk_find_ex(X509_PURPOSE, (st), (val)
2001 #define sk_X509_PURPOSE_delete(st, i) SKM_sk_delete(X509_PURPOSE, (st), (i))
2002 #define sk_X509_PURPOSE_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_PURPOSE, (st)
2003 #define sk_X509_PURPOSE_insert(st, val, i) SKM_sk_insert(X509_PURPOSE, (st), (va
2004 #define sk_X509_PURPOSE_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_PURPOSE,
2005 #define sk_X509_PURPOSE_dup(st) SKM_sk_dup(X509_PURPOSE, (st))
2006 #define sk_X509_PURPOSE_pop_free(st, free_func) SKM_sk_pop_free(X509_PURPOSE, (s
2007 #define sk_X509_PURPOSE_shift(st) SKM_sk_shift(X509_PURPOSE, (st))
2008 #define sk_X509_PURPOSE_pop(st) SKM_sk_pop(X509_PURPOSE, (st))
2009 #define sk_X509_PURPOSE_sort(st) SKM_sk_sort(X509_PURPOSE, (st))
2010 #define sk_X509_PURPOSE_is_sorted(st) SKM_sk_is_sorted(X509_PURPOSE, (st))

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2012 #define sk_X509_REVOKED_new(cmp) SKM_sk_new(X509_REVOKED, (cmp))
2013 #define sk_X509_REVOKED_new_null() SKM_sk_new_null(X509_REVOKED)
2014 #define sk_X509_REVOKED_free(st) SKM_sk_free(X509_REVOKED, (st))
2015 #define sk_X509_REVOKED_num(st) SKM_sk_num(X509_REVOKED, (st))
2016 #define sk_X509_REVOKED_value(st, i) SKM_sk_value(X509_REVOKED, (st), (i))
2017 #define sk_X509_REVOKED_set(st, i, val) SKM_sk_set(X509_REVOKED, (st), (i), (val)
2018 #define sk_X509_REVOKED_zero(st) SKM_sk_zero(X509_REVOKED, (st))
2019 #define sk_X509_REVOKED_push(st, val) SKM_sk_push(X509_REVOKED, (st), (val))
2020 #define sk_X509_REVOKED_unshift(st, val) SKM_sk_unshift(X509_REVOKED, (st), (val)
2021 #define sk_X509_REVOKED_find(st, val) SKM_sk_find(X509_REVOKED, (st), (val))
2022 #define sk_X509_REVOKED_find_ex(st, val) SKM_sk_find_ex(X509_REVOKED, (st), (val)
2023 #define sk_X509_REVOKED_delete(st, i) SKM_sk_delete(X509_REVOKED, (st), (i))
2024 #define sk_X509_REVOKED_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_REVOKED, (st)
2025 #define sk_X509_REVOKED_insert(st, val, i) SKM_sk_insert(X509_REVOKED, (st), (va
2026 #define sk_X509_REVOKED_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_REVOKED,
2027 #define sk_X509_REVOKED_dup(st) SKM_sk_dup(X509_REVOKED, (st))
2028 #define sk_X509_REVOKED_pop_free(st, free_func) SKM_sk_pop_free(X509_REVOKED, (s
2029 #define sk_X509_REVOKED_shift(st) SKM_sk_shift(X509_REVOKED, (st))
2030 #define sk_X509_REVOKED_pop(st) SKM_sk_pop(X509_REVOKED, (st))
2031 #define sk_X509_REVOKED_sort(st) SKM_sk_sort(X509_REVOKED, (st))
2032 #define sk_X509_REVOKED_is_sorted(st) SKM_sk_is_sorted(X509_REVOKED, (st))

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2034 #define sk_X509_TRUST_new(cmp) SKM_sk_new(X509_TRUST, (cmp))
2035 #define sk_X509_TRUST_new_null() SKM_sk_new_null(X509_TRUST)
2036 #define sk_X509_TRUST_free(st) SKM_sk_free(X509_TRUST, (st))
2037 #define sk_X509_TRUST_num(st) SKM_sk_num(X509_TRUST, (st))
2038 #define sk_X509_TRUST_value(st, i) SKM_sk_value(X509_TRUST, (st), (i))
2039 #define sk_X509_TRUST_set(st, i, val) SKM_sk_set(X509_TRUST, (st), (i), (val))
2040 #define sk_X509_TRUST_zero(st) SKM_sk_zero(X509_TRUST, (st))
2041 #define sk_X509_TRUST_push(st, val) SKM_sk_push(X509_TRUST, (st), (val))

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2042 #define sk_X509_TRUST_unshift(st, val) SKM_sk_unshift(X509_TRUST, (st), (val))
2043 #define sk_X509_TRUST_find(st, val) SKM_sk_find(X509_TRUST, (st), (val))
2044 #define sk_X509_TRUST_find_ex(st, val) SKM_sk_find_ex(X509_TRUST, (st), (val))
2045 #define sk_X509_TRUST_delete(st, i) SKM_sk_delete(X509_TRUST, (st), (i))
2046 #define sk_X509_TRUST_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_TRUST, (st), (p
2047 #define sk_X509_TRUST_insert(st, val, i) SKM_sk_insert(X509_TRUST, (st), (val),
2048 #define sk_X509_TRUST_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_TRUST, (st)
2049 #define sk_X509_TRUST_dup(st) SKM_sk_dup(X509_TRUST, (st))
2050 #define sk_X509_TRUST_pop_free(st, free_func) SKM_sk_pop_free(X509_TRUST, (st),
2051 #define sk_X509_TRUST_shift(st) SKM_sk_shift(X509_TRUST, (st))
2052 #define sk_X509_TRUST_pop(st) SKM_sk_pop(X509_TRUST, (st))
2053 #define sk_X509_TRUST_sort(st) SKM_sk_sort(X509_TRUST, (st))
2054 #define sk_X509_TRUST_is_sorted(st) SKM_sk_is_sorted(X509_TRUST, (st))

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2056 #define sk_X509_VERIFY_PARAM_new(cmp) SKM_sk_new(X509_VERIFY_PARAM, (cmp))
2057 #define sk_X509_VERIFY_PARAM_new_null() SKM_sk_new_null(X509_VERIFY_PARAM)
2058 #define sk_X509_VERIFY_PARAM_free(st) SKM_sk_free(X509_VERIFY_PARAM, (st))
2059 #define sk_X509_VERIFY_PARAM_num(st) SKM_sk_num(X509_VERIFY_PARAM, (st))
2060 #define sk_X509_VERIFY_PARAM_value(st, i) SKM_sk_value(X509_VERIFY_PARAM, (st),
2061 #define sk_X509_VERIFY_PARAM_set(st, i, val) SKM_sk_set(X509_VERIFY_PARAM, (st),
2062 #define sk_X509_VERIFY_PARAM_zero(st) SKM_sk_zero(X509_VERIFY_PARAM, (st))
2063 #define sk_X509_VERIFY_PARAM_push(st, val) SKM_sk_push(X509_VERIFY_PARAM, (st),
2064 #define sk_X509_VERIFY_PARAM_unshift(st, val) SKM_sk_unshift(X509_VERIFY_PARAM,
2065 #define sk_X509_VERIFY_PARAM_find(st, val) SKM_sk_find(X509_VERIFY_PARAM, (st),
2066 #define sk_X509_VERIFY_PARAM_find_ex(st, val) SKM_sk_find_ex(X509_VERIFY_PARAM,
2067 #define sk_X509_VERIFY_PARAM_delete(st, i) SKM_sk_delete(X509_VERIFY_PARAM, (st)
2068 #define sk_X509_VERIFY_PARAM_delete_ptr(st, ptr) SKM_sk_delete_ptr(X509_VERIFY_P
2069 #define sk_X509_VERIFY_PARAM_insert(st, val, i) SKM_sk_insert(X509_VERIFY_PARAM,
2070 #define sk_X509_VERIFY_PARAM_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(X509_VERI
2071 #define sk_X509_VERIFY_PARAM_dup(st) SKM_sk_dup(X509_VERIFY_PARAM, (st))
2072 #define sk_X509_VERIFY_PARAM_pop_free(st, free_func) SKM_sk_pop_free(X509_VERIFY
2073 #define sk_X509_VERIFY_PARAM_shift(st) SKM_sk_shift(X509_VERIFY_PARAM, (st))
2074 #define sk_X509_VERIFY_PARAM_pop(st) SKM_sk_pop(X509_VERIFY_PARAM, (st))
2075 #define sk_X509_VERIFY_PARAM_sort(st) SKM_sk_sort(X509_VERIFY_PARAM, (st))
2076 #define sk_X509_VERIFY_PARAM_is_sorted(st) SKM_sk_is_sorted(X509_VERIFY_PARAM, (

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2078 #define sk_nid_triple_new(cmp) SKM_sk_new(nid_triple, (cmp))
2079 #define sk_nid_triple_new_null() SKM_sk_new_null(nid_triple)
2080 #define sk_nid_triple_free(st) SKM_sk_free(nid_triple, (st))
2081 #define sk_nid_triple_num(st) SKM_sk_num(nid_triple, (st))
2082 #define sk_nid_triple_value(st, i) SKM_sk_value(nid_triple, (st), (i))
2083 #define sk_nid_triple_set(st, i, val) SKM_sk_set(nid_triple, (st), (i), (val))
2084 #define sk_nid_triple_zero(st) SKM_sk_zero(nid_triple, (st))
2085 #define sk_nid_triple_push(st, val) SKM_sk_push(nid_triple, (st), (val))
2086 #define sk_nid_triple_unshift(st, val) SKM_sk_unshift(nid_triple, (st), (val))
2087 #define sk_nid_triple_find(st, val) SKM_sk_find(nid_triple, (st), (val))
2088 #define sk_nid_triple_find_ex(st, val) SKM_sk_find_ex(nid_triple, (st), (val))
2089 #define sk_nid_triple_delete(st, i) SKM_sk_delete(nid_triple, (st), (i))
2090 #define sk_nid_triple_delete_ptr(st, ptr) SKM_sk_delete_ptr(nid_triple, (st), (p
2091 #define sk_nid_triple_insert(st, val, i) SKM_sk_insert(nid_triple, (st), (val),
2092 #define sk_nid_triple_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(nid_triple, (st)
2093 #define sk_nid_triple_dup(st) SKM_sk_dup(nid_triple, (st))
2094 #define sk_nid_triple_pop_free(st, free_func) SKM_sk_pop_free(nid_triple, (st),
2095 #define sk_nid_triple_shift(st) SKM_sk_shift(nid_triple, (st))
2096 #define sk_nid_triple_pop(st) SKM_sk_pop(nid_triple, (st))
2097 #define sk_nid_triple_sort(st) SKM_sk_sort(nid_triple, (st))
2098 #define sk_nid_triple_is_sorted(st) SKM_sk_is_sorted(nid_triple, (st))

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2100 #define sk_void_new(cmp) SKM_sk_new(void, (cmp))
2101 #define sk_void_new_null() SKM_sk_new_null(void)
2102 #define sk_void_free(st) SKM_sk_free(void, (st))
2103 #define sk_void_num(st) SKM_sk_num(void, (st))
2104 #define sk_void_value(st, i) SKM_sk_value(void, (st), (i))
2105 #define sk_void_set(st, i, val) SKM_sk_set(void, (st), (i), (val))
2106 #define sk_void_zero(st) SKM_sk_zero(void, (st))
2107 #define sk_void_push(st, val) SKM_sk_push(void, (st), (val))

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2108 #define sk_void_unshift(st, val) SKM_sk_unshift(void, (st), (val))
2109 #define sk_void_find(st, val) SKM_sk_find(void, (st), (val))
2110 #define sk_void_find_ex(st, val) SKM_sk_find_ex(void, (st), (val))
2111 #define sk_void_delete(st, i) SKM_sk_delete(void, (st), (i))
2112 #define sk_void_delete_ptr(st, ptr) SKM_sk_delete_ptr(void, (st), (ptr))
2113 #define sk_void_insert(st, val, i) SKM_sk_insert(void, (st), (val), (i))
2114 #define sk_void_set_cmp_func(st, cmp) SKM_sk_set_cmp_func(void, (st), (cmp))
2115 #define sk_void_dup(st) SKM_sk_dup(void, st)
2116 #define sk_void_pop_free(st, free_func) SKM_sk_pop_free(void, (st), (free_func))
2117 #define sk_void_shift(st) SKM_sk_shift(void, (st))
2118 #define sk_void_pop(st) SKM_sk_pop(void, (st))
2119 #define sk_void_sort(st) SKM_sk_sort(void, (st))
2120 #define sk_void_is_sorted(st) SKM_sk_is_sorted(void, (st))

2122 #define sk_OPENSSL_STRING_new(cmp) ((STACK_OF(OPENSLL_STRING) *)sk_new(CHECKED_S
2123 #define sk_OPENSSL_STRING_new_null() ((STACK_OF(OPENSLL_STRING) *)sk_new_null())
2124 #define sk_OPENSSL_STRING_push(st, val) sk_push(CHECKED_STACK_OF(OPENSLL_STRING,
2125 #define sk_OPENSSL_STRING_find(st, val) sk_find(CHECKED_STACK_OF(OPENSLL_STRING,
2126 #define sk_OPENSSL_STRING_value(st, i) ((OPENSLL_STRING)sk_value(CHECKED_STACK_0
2127 #define sk_OPENSSL_STRING_num(st) SKM_sk_num(OPENSLL_STRING, st)
2128 #define sk_OPENSSL_STRING_pop_free(st, free_func) sk_pop_free(CHECKED_STACK_OF(0
2129 #define sk_OPENSSL_STRING_insert(st, val, i) sk_insert(CHECKED_STACK_OF(OPENSLL_
2130 #define sk_OPENSSL_STRING_free(st) SKM_sk_free(OPENSLL_STRING, st)
2131 #define sk_OPENSSL_STRING_set(st, i, val) sk_set(CHECKED_STACK_OF(OPENSLL_STRING
2132 #define sk_OPENSSL_STRING_zero(st) SKM_sk_zero(OPENSLL_STRING, (st))
2133 #define sk_OPENSSL_STRING_unshift(st, val) sk_unshift(CHECKED_STACK_OF(OPENSLL_S
2134 #define sk_OPENSSL_STRING_find_ex(st, val) sk_find_ex((STACK *)CHECKED_CONST_PT
2135 #define sk_OPENSSL_STRING_delete(st, i) SKM_sk_delete(OPENSLL_STRING, (st), (i))
2136 #define sk_OPENSSL_STRING_delete_ptr(st, ptr) (OPENSLL_STRING *)sk_delete_ptr(CH
2137 #define sk_OPENSSL_STRING_set_cmp_func(st, cmp) \
2138     ((int (*)(const char * const *, const char * const *)) \
2139     sk_set_cmp_func(CHECKED_STACK_OF(OPENSLL_STRING, st), CHECKED_SK_CMP_FUN
2140 #define sk_OPENSSL_STRING_dup(st) SKM_sk_dup(OPENSLL_STRING, st)
2141 #define sk_OPENSSL_STRING_shift(st) SKM_sk_shift(OPENSLL_STRING, (st))
2142 #define sk_OPENSSL_STRING_pop(st) (char *)sk_pop(CHECKED_STACK_OF(OPENSLL_STRING
2143 #define sk_OPENSSL_STRING_sort(st) SKM_sk_sort(OPENSLL_STRING, (st))
2144 #define sk_OPENSSL_STRING_is_sorted(st) SKM_sk_is_sorted(OPENSLL_STRING, (st))

2147 #define sk_OPENSSL_BLOCK_new(cmp) ((STACK_OF(OPENSLL_BLOCK) *)sk_new(CHECKED_SK_
2148 #define sk_OPENSSL_BLOCK_new_null() ((STACK_OF(OPENSLL_BLOCK) *)sk_new_null())
2149 #define sk_OPENSSL_BLOCK_push(st, val) sk_push(CHECKED_STACK_OF(OPENSLL_BLOCK, s
2150 #define sk_OPENSSL_BLOCK_find(st, val) sk_find(CHECKED_STACK_OF(OPENSLL_BLOCK, s
2151 #define sk_OPENSSL_BLOCK_value(st, i) ((OPENSLL_BLOCK)sk_value(CHECKED_STACK_OF(
2152 #define sk_OPENSSL_BLOCK_num(st) SKM_sk_num(OPENSLL_BLOCK, st)
2153 #define sk_OPENSSL_BLOCK_pop_free(st, free_func) sk_pop_free(CHECKED_STACK_OF(OP
2154 #define sk_OPENSSL_BLOCK_insert(st, val, i) sk_insert(CHECKED_STACK_OF(OPENSLL_B
2155 #define sk_OPENSSL_BLOCK_free(st) SKM_sk_free(OPENSLL_BLOCK, st)
2156 #define sk_OPENSSL_BLOCK_set(st, i, val) sk_set(CHECKED_STACK_OF(OPENSLL_BLOCK,
2157 #define sk_OPENSSL_BLOCK_zero(st) SKM_sk_zero(OPENSLL_BLOCK, (st))
2158 #define sk_OPENSSL_BLOCK_unshift(st, val) sk_unshift(CHECKED_STACK_OF(OPENSLL_BL
2159 #define sk_OPENSSL_BLOCK_find_ex(st, val) sk_find_ex((STACK *)CHECKED_CONST_PTR
2160 #define sk_OPENSSL_BLOCK_delete(st, i) SKM_sk_delete(OPENSLL_BLOCK, (st), (i))
2161 #define sk_OPENSSL_BLOCK_delete_ptr(st, ptr) (OPENSLL_BLOCK *)sk_delete_ptr(CHEC
2162 #define sk_OPENSSL_BLOCK_set_cmp_func(st, cmp) \
2163     ((int (*)(const void * const *, const void * const *)) \
2164     sk_set_cmp_func(CHECKED_STACK_OF(OPENSLL_BLOCK, st), CHECKED_SK_CMP_FUNC
2165 #define sk_OPENSSL_BLOCK_dup(st) SKM_sk_dup(OPENSLL_BLOCK, st)
2166 #define sk_OPENSSL_BLOCK_shift(st) SKM_sk_shift(OPENSLL_BLOCK, (st))
2167 #define sk_OPENSSL_BLOCK_pop(st) (void *)sk_pop(CHECKED_STACK_OF(OPENSLL_BLOCK,
2168 #define sk_OPENSSL_BLOCK_sort(st) SKM_sk_sort(OPENSLL_BLOCK, (st))
2169 #define sk_OPENSSL_BLOCK_is_sorted(st) SKM_sk_is_sorted(OPENSLL_BLOCK, (st))

2172 #define sk_OPENSSL_PSTRING_new(cmp) ((STACK_OF(OPENSLL_PSTRING) *)sk_new(CHECKED
2173 #define sk_OPENSSL_PSTRING_new_null() ((STACK_OF(OPENSLL_PSTRING) *)sk_new_null(

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2174 #define sk_OPENSSL_PSTRING_push(st, val) sk_push(CHECKED_STACK_OF(OPENSLL_PSTRIN
2175 #define sk_OPENSSL_PSTRING_find(st, val) sk_find(CHECKED_STACK_OF(OPENSLL_PSTRIN
2176 #define sk_OPENSSL_PSTRING_value(st, i) ((OPENSLL_PSTRING)sk_value(CHECKED_STACK
2177 #define sk_OPENSSL_PSTRING_num(st) SKM_sk_num(OPENSLL_PSTRING, st)
2178 #define sk_OPENSSL_PSTRING_pop_free(st, free_func) sk_pop_free(CHECKED_STACK_OF(
2179 #define sk_OPENSSL_PSTRING_insert(st, val, i) sk_insert(CHECKED_STACK_OF(OPENSLL
2180 #define sk_OPENSSL_PSTRING_free(st) SKM_sk_free(OPENSLL_PSTRING, st)
2181 #define sk_OPENSSL_PSTRING_set(st, i, val) sk_set(CHECKED_STACK_OF(OPENSLL_PSTR
2182 #define sk_OPENSSL_PSTRING_zero(st) SKM_sk_zero(OPENSLL_PSTRING, (st))
2183 #define sk_OPENSSL_PSTRING_unshift(st, val) sk_unshift(CHECKED_STACK_OF(OPENSLL_
2184 #define sk_OPENSSL_PSTRING_find_ex(st, val) sk_find_ex((STACK *)CHECKED_CONST_P
2185 #define sk_OPENSSL_PSTRING_delete(st, i) SKM_sk_delete(OPENSLL_PSTRING, (st), (i
2186 #define sk_OPENSSL_PSTRING_delete_ptr(st, ptr) (OPENSLL_PSTRING *)sk_delete_ptr(
2187 #define sk_OPENSSL_PSTRING_set_cmp_func(st, cmp) \
2188     ((int (*)(const OPENSLL_STRING * const *, const OPENSLL_STRING * const *)
2189     sk_set_cmp_func(CHECKED_STACK_OF(OPENSLL_PSTRING, st), CHECKED_SK_CMP_FU
2190 #define sk_OPENSSL_PSTRING_dup(st) SKM_sk_dup(OPENSLL_PSTRING, st)
2191 #define sk_OPENSSL_PSTRING_shift(st) SKM_sk_shift(OPENSLL_PSTRING, (st))
2192 #define sk_OPENSSL_PSTRING_pop(st) (OPENSLL_STRING *)sk_pop(CHECKED_STACK_OF(OPE
2193 #define sk_OPENSSL_PSTRING_sort(st) SKM_sk_sort(OPENSLL_PSTRING, (st))
2194 #define sk_OPENSSL_PSTRING_is_sorted(st) SKM_sk_is_sorted(OPENSLL_PSTRING, (st))

2197 #define d2i_ASN1_SET_OF_ACCESS_DESCRIPTION(st, pp, length, d2i_func, free_func,
2198     SKM_ASN1_SET_OF_d2i(ACCESS_DESCRIPTION, (st), (pp), (length), (d2i_func)
2199 #define i2d_ASN1_SET_OF_ACCESS_DESCRIPTION(st, pp, i2d_func, ex_tag, ex_class, i
2200     SKM_ASN1_SET_OF_i2d(ACCESS_DESCRIPTION, (st), (pp), (i2d_func), (ex_tag)
2201 #define ASN1_seq_pack_ACCESS_DESCRIPTION(st, i2d_func, buf, len) \
2202     SKM_ASN1_seq_pack(ACCESS_DESCRIPTION, (st), (i2d_func), (buf), (len))
2203 #define ASN1_seq_unpack_ACCESS_DESCRIPTION(buf, len, d2i_func, free_func) \
2204     SKM_ASN1_seq_unpack(ACCESS_DESCRIPTION, (buf), (len), (d2i_func), (free_

2206 #define d2i_ASN1_SET_OF_ASN1_INTEGER(st, pp, length, d2i_func, free_func, ex_tag
2207     SKM_ASN1_SET_OF_d2i(ASN1_INTEGER, (st), (pp), (length), (d2i_func), (fre
2208 #define i2d_ASN1_SET_OF_ASN1_INTEGER(st, pp, i2d_func, ex_tag, ex_class, is_set)
2209     SKM_ASN1_SET_OF_i2d(ASN1_INTEGER, (st), (pp), (i2d_func), (ex_tag), (ex_
2210 #define ASN1_seq_pack_ASN1_INTEGER(st, i2d_func, buf, len) \
2211     SKM_ASN1_seq_pack(ASN1_INTEGER, (st), (i2d_func), (buf), (len))
2212 #define ASN1_seq_unpack_ASN1_INTEGER(buf, len, d2i_func, free_func) \
2213     SKM_ASN1_seq_unpack(ASN1_INTEGER, (buf), (len), (d2i_func), (free_func))

2215 #define d2i_ASN1_SET_OF_ASN1_OBJECT(st, pp, length, d2i_func, free_func, ex_tag,
2216     SKM_ASN1_SET_OF_d2i(ASN1_OBJECT, (st), (pp), (length), (d2i_func), (free
2217 #define i2d_ASN1_SET_OF_ASN1_OBJECT(st, pp, i2d_func, ex_tag, ex_class, is_set)
2218     SKM_ASN1_SET_OF_i2d(ASN1_OBJECT, (st), (pp), (i2d_func), (ex_tag), (ex_c
2219 #define ASN1_seq_pack_ASN1_OBJECT(st, i2d_func, buf, len) \
2220     SKM_ASN1_seq_pack(ASN1_OBJECT, (st), (i2d_func), (buf), (len))
2221 #define ASN1_seq_unpack_ASN1_OBJECT(buf, len, d2i_func, free_func) \
2222     SKM_ASN1_seq_unpack(ASN1_OBJECT, (buf), (len), (d2i_func), (free_func))

2224 #define d2i_ASN1_SET_OF_ASN1_TYPE(st, pp, length, d2i_func, free_func, ex_tag, e
2225     SKM_ASN1_SET_OF_d2i(ASN1_TYPE, (st), (pp), (length), (d2i_func), (free_f
2226 #define i2d_ASN1_SET_OF_ASN1_TYPE(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2227     SKM_ASN1_SET_OF_i2d(ASN1_TYPE, (st), (pp), (i2d_func), (ex_tag), (ex_cla
2228 #define ASN1_seq_pack_ASN1_TYPE(st, i2d_func, buf, len) \
2229     SKM_ASN1_seq_pack(ASN1_TYPE, (st), (i2d_func), (buf), (len))
2230 #define ASN1_seq_unpack_ASN1_TYPE(buf, len, d2i_func, free_func) \
2231     SKM_ASN1_seq_unpack(ASN1_TYPE, (buf), (len), (d2i_func), (free_func))

2233 #define d2i_ASN1_SET_OF_ASN1_UTF8STRING(st, pp, length, d2i_func, free_func, ex_
2234     SKM_ASN1_SET_OF_d2i(ASN1_UTF8STRING, (st), (pp), (length), (d2i_func), (
2235 #define i2d_ASN1_SET_OF_ASN1_UTF8STRING(st, pp, i2d_func, ex_tag, ex_class, is_s
2236     SKM_ASN1_SET_OF_i2d(ASN1_UTF8STRING, (st), (pp), (i2d_func), (ex_tag), (
2237 #define ASN1_seq_pack_ASN1_UTF8STRING(st, i2d_func, buf, len) \
2238     SKM_ASN1_seq_pack(ASN1_UTF8STRING, (st), (i2d_func), (buf), (len))
2239 #define ASN1_seq_unpack_ASN1_UTF8STRING(buf, len, d2i_func, free_func) \

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2240 SKM_ASN1_seq_unpack(ASN1_UTF8STRING, (buf), (len), (d2i_func), (free_fun

2242 #define d2i_ASN1_SET_OF_DIST_POINT(st, pp, length, d2i_func, free_func, ex_tag,
2243 SKM_ASN1_SET_OF_DIST_POINT(st, (st), (pp), (length), (d2i_func), (free_
2244 #define i2d_ASN1_SET_OF_DIST_POINT(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2245 SKM_ASN1_SET_OF_i2d(DIST_POINT, (st), (pp), (i2d_func), (ex_tag), (ex_cl
2246 #define ASN1_seq_pack_DIST_POINT(st, i2d_func, buf, len) \
2247 SKM_ASN1_seq_pack(DIST_POINT, (st), (i2d_func), (buf), (len))
2248 #define ASN1_seq_unpack_DIST_POINT(buf, len, d2i_func, free_func) \
2249 SKM_ASN1_seq_unpack(DIST_POINT, (buf), (len), (d2i_func), (free_func))

2251 #define d2i_ASN1_SET_OF_ESS_CERT_ID(st, pp, length, d2i_func, free_func, ex_tag,
2252 SKM_ASN1_SET_OF_d2i(ESS_CERT_ID, (st), (pp), (length), (d2i_func), (free
2253 #define i2d_ASN1_SET_OF_ESS_CERT_ID(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2254 SKM_ASN1_SET_OF_i2d(ESS_CERT_ID, (st), (pp), (i2d_func), (ex_tag), (ex_c
2255 #define ASN1_seq_pack_ESS_CERT_ID(st, i2d_func, buf, len) \
2256 SKM_ASN1_seq_pack(ESS_CERT_ID, (st), (i2d_func), (buf), (len))
2257 #define ASN1_seq_unpack_ESS_CERT_ID(buf, len, d2i_func, free_func) \
2258 SKM_ASN1_seq_unpack(ESS_CERT_ID, (buf), (len), (d2i_func), (free_func))

2260 #define d2i_ASN1_SET_OF_EVP_MD(st, pp, length, d2i_func, free_func, ex_tag, ex_c
2261 SKM_ASN1_SET_OF_d2i(EVP_MD, (st), (pp), (length), (d2i_func), (free_func
2262 #define i2d_ASN1_SET_OF_EVP_MD(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2263 SKM_ASN1_SET_OF_i2d(EVP_MD, (st), (pp), (i2d_func), (ex_tag), (ex_class)
2264 #define ASN1_seq_pack_EVP_MD(st, i2d_func, buf, len) \
2265 SKM_ASN1_seq_pack(EVP_MD, (st), (i2d_func), (buf), (len))
2266 #define ASN1_seq_unpack_EVP_MD(buf, len, d2i_func, free_func) \
2267 SKM_ASN1_seq_unpack(EVP_MD, (buf), (len), (d2i_func), (free_func))

2269 #define d2i_ASN1_SET_OF_GENERAL_NAME(st, pp, length, d2i_func, free_func, ex_tag
2270 SKM_ASN1_SET_OF_d2i(GENERAL_NAME, (st), (pp), (length), (d2i_func), (fre
2271 #define i2d_ASN1_SET_OF_GENERAL_NAME(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2272 SKM_ASN1_SET_OF_i2d(GENERAL_NAME, (st), (pp), (i2d_func), (ex_tag), (ex_
2273 #define ASN1_seq_pack_GENERAL_NAME(st, i2d_func, buf, len) \
2274 SKM_ASN1_seq_pack(GENERAL_NAME, (st), (i2d_func), (buf), (len))
2275 #define ASN1_seq_unpack_GENERAL_NAME(buf, len, d2i_func, free_func) \
2276 SKM_ASN1_seq_unpack(GENERAL_NAME, (buf), (len), (d2i_func), (free_func))

2278 #define d2i_ASN1_SET_OF_OCSP_ONEREQ(st, pp, length, d2i_func, free_func, ex_tag,
2279 SKM_ASN1_SET_OF_d2i(OCSP_ONEREQ, (st), (pp), (length), (d2i_func), (free
2280 #define i2d_ASN1_SET_OF_OCSP_ONEREQ(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2281 SKM_ASN1_SET_OF_i2d(OCSP_ONEREQ, (st), (pp), (i2d_func), (ex_tag), (ex_c
2282 #define ASN1_seq_pack_OCSP_ONEREQ(st, i2d_func, buf, len) \
2283 SKM_ASN1_seq_pack(OCSP_ONEREQ, (st), (i2d_func), (buf), (len))
2284 #define ASN1_seq_unpack_OCSP_ONEREQ(buf, len, d2i_func, free_func) \
2285 SKM_ASN1_seq_unpack(OCSP_ONEREQ, (buf), (len), (d2i_func), (free_func))

2287 #define d2i_ASN1_SET_OF_OCSP_SINGLERESP(st, pp, length, d2i_func, free_func, ex_
2288 SKM_ASN1_SET_OF_d2i(OCSP_SINGLERESP, (st), (pp), (length), (d2i_func), (
2289 #define i2d_ASN1_SET_OF_OCSP_SINGLERESP(st, pp, i2d_func, ex_tag, ex_class, is_s
2290 SKM_ASN1_SET_OF_i2d(OCSP_SINGLERESP, (st), (pp), (i2d_func), (ex_tag), (
2291 #define ASN1_seq_pack_OCSP_SINGLERESP(st, i2d_func, buf, len) \
2292 SKM_ASN1_seq_pack(OCSP_SINGLERESP, (st), (i2d_func), (buf), (len))
2293 #define ASN1_seq_unpack_OCSP_SINGLERESP(buf, len, d2i_func, free_func) \
2294 SKM_ASN1_seq_unpack(OCSP_SINGLERESP, (buf), (len), (d2i_func), (free_fun

2296 #define d2i_ASN1_SET_OF_PKCS12_SAFEBAG(st, pp, length, d2i_func, free_func, ex_t
2297 SKM_ASN1_SET_OF_d2i(PKCS12_SAFEBAG, (st), (pp), (length), (d2i_func), (f
2298 #define i2d_ASN1_SET_OF_PKCS12_SAFEBAG(st, pp, i2d_func, ex_tag, ex_class, is_se
2299 SKM_ASN1_SET_OF_i2d(PKCS12_SAFEBAG, (st), (pp), (i2d_func), (ex_tag), (e
2300 #define ASN1_seq_pack_PKCS12_SAFEBAG(st, i2d_func, buf, len) \
2301 SKM_ASN1_seq_pack(PKCS12_SAFEBAG, (st), (i2d_func), (buf), (len))
2302 #define ASN1_seq_unpack_PKCS12_SAFEBAG(buf, len, d2i_func, free_func) \
2303 SKM_ASN1_seq_unpack(PKCS12_SAFEBAG, (buf), (len), (d2i_func), (free_func)

2305 #define d2i_ASN1_SET_OF_PKCS7(st, pp, length, d2i_func, free_func, ex_tag, ex_cl
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2306 SKM_ASN1_SET_OF_d2i(PKCS7, (st), (pp), (length), (d2i_func), (free_func)
2307 #define i2d_ASN1_SET_OF_PKCS7(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2308 SKM_ASN1_SET_OF_i2d(PKCS7, (st), (pp), (i2d_func), (ex_tag), (ex_class),
2309 #define ASN1_seq_pack_PKCS7(st, i2d_func, buf, len) \
2310 SKM_ASN1_seq_pack(PKCS7, (st), (i2d_func), (buf), (len))
2311 #define ASN1_seq_unpack_PKCS7(buf, len, d2i_func, free_func) \
2312 SKM_ASN1_seq_unpack(PKCS7, (buf), (len), (d2i_func), (free_func))

2314 #define d2i_ASN1_SET_OF_PKCS7_RECIP_INFO(st, pp, length, d2i_func, free_func, ex
2315 SKM_ASN1_SET_OF_d2i(PKCS7_RECIP_INFO, (st), (pp), (length), (d2i_func),
2316 #define i2d_ASN1_SET_OF_PKCS7_RECIP_INFO(st, pp, i2d_func, ex_tag, ex_class, is_
2317 SKM_ASN1_SET_OF_i2d(PKCS7_RECIP_INFO, (st), (pp), (i2d_func), (ex_tag),
2318 #define ASN1_seq_pack_PKCS7_RECIP_INFO(st, i2d_func, buf, len) \
2319 SKM_ASN1_seq_pack(PKCS7_RECIP_INFO, (st), (i2d_func), (buf), (len))
2320 #define ASN1_seq_unpack_PKCS7_RECIP_INFO(buf, len, d2i_func, free_func) \
2321 SKM_ASN1_seq_unpack(PKCS7_RECIP_INFO, (buf), (len), (d2i_func), (free_fu

2323 #define d2i_ASN1_SET_OF_PKCS7_SIGNER_INFO(st, pp, length, d2i_func, free_func, e
2324 SKM_ASN1_SET_OF_d2i(PKCS7_SIGNER_INFO, (st), (pp), (length), (d2i_func),
2325 #define i2d_ASN1_SET_OF_PKCS7_SIGNER_INFO(st, pp, i2d_func, ex_tag, ex_class, is
2326 SKM_ASN1_SET_OF_i2d(PKCS7_SIGNER_INFO, (st), (pp), (i2d_func), (ex_tag),
2327 #define ASN1_seq_pack_PKCS7_SIGNER_INFO(st, i2d_func, buf, len) \
2328 SKM_ASN1_seq_pack(PKCS7_SIGNER_INFO, (st), (i2d_func), (buf), (len))
2329 #define ASN1_seq_unpack_PKCS7_SIGNER_INFO(buf, len, d2i_func, free_func) \
2330 SKM_ASN1_seq_unpack(PKCS7_SIGNER_INFO, (buf), (len), (d2i_func), (free_f

2332 #define d2i_ASN1_SET_OF_POLICYINFO(st, pp, length, d2i_func, free_func, ex_tag,
2333 SKM_ASN1_SET_OF_d2i(POLICYINFO, (st), (pp), (length), (d2i_func), (free_
2334 #define i2d_ASN1_SET_OF_POLICYINFO(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2335 SKM_ASN1_SET_OF_i2d(POLICYINFO, (st), (pp), (i2d_func), (ex_tag), (ex_cl
2336 #define ASN1_seq_pack_POLICYINFO(st, i2d_func, buf, len) \
2337 SKM_ASN1_seq_pack(POLICYINFO, (st), (i2d_func), (buf), (len))
2338 #define ASN1_seq_unpack_POLICYINFO(buf, len, d2i_func, free_func) \
2339 SKM_ASN1_seq_unpack(POLICYINFO, (buf), (len), (d2i_func), (free_func))

2341 #define d2i_ASN1_SET_OF_POLICYQUALINFO(st, pp, length, d2i_func, free_func, ex_t
2342 SKM_ASN1_SET_OF_d2i(POLICYQUALINFO, (st), (pp), (length), (d2i_func), (f
2343 #define i2d_ASN1_SET_OF_POLICYQUALINFO(st, pp, i2d_func, ex_tag, ex_class, is_se
2344 SKM_ASN1_SET_OF_i2d(POLICYQUALINFO, (st), (pp), (i2d_func), (ex_tag), (e
2345 #define ASN1_seq_pack_POLICYQUALINFO(st, i2d_func, buf, len) \
2346 SKM_ASN1_seq_pack(POLICYQUALINFO, (st), (i2d_func), (buf), (len))
2347 #define ASN1_seq_unpack_POLICYQUALINFO(buf, len, d2i_func, free_func) \
2348 SKM_ASN1_seq_unpack(POLICYQUALINFO, (buf), (len), (d2i_func), (free_func

2350 #define d2i_ASN1_SET_OF_SXNETID(st, pp, length, d2i_func, free_func, ex_tag, ex_
2351 SKM_ASN1_SET_OF_d2i(SXNETID, (st), (pp), (length), (d2i_func), (free_fun
2352 #define i2d_ASN1_SET_OF_SXNETID(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2353 SKM_ASN1_SET_OF_i2d(SXNETID, (st), (pp), (i2d_func), (ex_tag), (ex_class
2354 #define ASN1_seq_pack_SXNETID(st, i2d_func, buf, len) \
2355 SKM_ASN1_seq_pack(SXNETID, (st), (i2d_func), (buf), (len))
2356 #define ASN1_seq_unpack_SXNETID(buf, len, d2i_func, free_func) \
2357 SKM_ASN1_seq_unpack(SXNETID, (buf), (len), (d2i_func), (free_func))

2359 #define d2i_ASN1_SET_OF_X509(st, pp, length, d2i_func, free_func, ex_tag, ex_cla
2360 SKM_ASN1_SET_OF_d2i(X509, (st), (pp), (length), (d2i_func), (free_func),
2361 #define i2d_ASN1_SET_OF_X509(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2362 SKM_ASN1_SET_OF_i2d(X509, (st), (pp), (i2d_func), (ex_tag), (ex_class),
2363 #define ASN1_seq_pack_X509(st, i2d_func, buf, len) \
2364 SKM_ASN1_seq_pack(X509, (st), (i2d_func), (buf), (len))
2365 #define ASN1_seq_unpack_X509(buf, len, d2i_func, free_func) \
2366 SKM_ASN1_seq_unpack(X509, (buf), (len), (d2i_func), (free_func))

2368 #define d2i_ASN1_SET_OF_X509_ALGOR(st, pp, length, d2i_func, free_func, ex_tag,
2369 SKM_ASN1_SET_OF_d2i(X509_ALGOR, (st), (pp), (length), (d2i_func), (free_
2370 #define i2d_ASN1_SET_OF_X509_ALGOR(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2371 SKM_ASN1_SET_OF_i2d(X509_ALGOR, (st), (pp), (i2d_func), (ex_tag), (ex_cl
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2372 #define ASN1_seq_pack_X509_ALGOR(st, i2d_func, buf, len) \
2373 SKM_ASN1_seq_pack(X509_ALGOR, (st), (i2d_func), (buf), (len))
2374 #define ASN1_seq_unpack_X509_ALGOR(buf, len, d2i_func, free_func) \
2375 SKM_ASN1_seq_unpack(X509_ALGOR, (buf), (len), (d2i_func), (free_func))

2377 #define d2i_ASN1_SET_OF_X509_ATTRIBUTE(st, pp, length, d2i_func, free_func, ex_t
2378 SKM_ASN1_SET_OF_X509_ATTRIBUTE, (st), (pp), (length), (d2i_func), (f
2379 #define i2d_ASN1_SET_OF_X509_ATTRIBUTE(st, pp, i2d_func, ex_tag, ex_class, is_se
2380 SKM_ASN1_SET_OF_X509_ATTRIBUTE, (st), (pp), (i2d_func), (ex_tag), (e
2381 #define ASN1_seq_pack_X509_ATTRIBUTE(st, i2d_func, buf, len) \
2382 SKM_ASN1_seq_pack(X509_ATTRIBUTE, (st), (i2d_func), (buf), (len))
2383 #define ASN1_seq_unpack_X509_ATTRIBUTE(buf, len, d2i_func, free_func) \
2384 SKM_ASN1_seq_unpack(X509_ATTRIBUTE, (buf), (len), (d2i_func), (free_func)

2386 #define d2i_ASN1_SET_OF_X509_CRL(st, pp, length, d2i_func, free_func, ex_tag, ex
2387 SKM_ASN1_SET_OF_X509_CRL, (st), (pp), (length), (d2i_func), (free_fu
2388 #define i2d_ASN1_SET_OF_X509_CRL(st, pp, i2d_func, ex_tag, ex_class, is_set) \
2389 SKM_ASN1_SET_OF_X509_CRL, (st), (pp), (i2d_func), (ex_tag), (ex_clas
2390 #define ASN1_seq_pack_X509_CRL(st, i2d_func, buf, len) \
2391 SKM_ASN1_seq_pack(X509_CRL, (st), (i2d_func), (buf), (len))
2392 #define ASN1_seq_unpack_X509_CRL(buf, len, d2i_func, free_func) \
2393 SKM_ASN1_seq_unpack(X509_CRL, (buf), (len), (d2i_func), (free_func))

2395 #define d2i_ASN1_SET_OF_X509_EXTENSION(st, pp, length, d2i_func, free_func, ex_t
2396 SKM_ASN1_SET_OF_X509_EXTENSION, (st), (pp), (length), (d2i_func), (f
2397 #define i2d_ASN1_SET_OF_X509_EXTENSION(st, pp, i2d_func, ex_tag, ex_class, is_se
2398 SKM_ASN1_SET_OF_X509_EXTENSION, (st), (pp), (i2d_func), (ex_tag), (e
2399 #define ASN1_seq_pack_X509_EXTENSION(st, i2d_func, buf, len) \
2400 SKM_ASN1_seq_pack(X509_EXTENSION, (st), (i2d_func), (buf), (len))
2401 #define ASN1_seq_unpack_X509_EXTENSION(buf, len, d2i_func, free_func) \
2402 SKM_ASN1_seq_unpack(X509_EXTENSION, (buf), (len), (d2i_func), (free_func)

2404 #define d2i_ASN1_SET_OF_X509_NAME_ENTRY(st, pp, length, d2i_func, free_func, ex_
2405 SKM_ASN1_SET_OF_X509_NAME_ENTRY, (st), (pp), (length), (d2i_func), (
2406 #define i2d_ASN1_SET_OF_X509_NAME_ENTRY(st, pp, i2d_func, ex_tag, ex_class, is_s
2407 SKM_ASN1_SET_OF_X509_NAME_ENTRY, (st), (pp), (i2d_func), (ex_tag), (
2408 #define ASN1_seq_pack_X509_NAME_ENTRY(st, i2d_func, buf, len) \
2409 SKM_ASN1_seq_pack(X509_NAME_ENTRY, (st), (i2d_func), (buf), (len))
2410 #define ASN1_seq_unpack_X509_NAME_ENTRY(buf, len, d2i_func, free_func) \
2411 SKM_ASN1_seq_unpack(X509_NAME_ENTRY, (buf), (len), (d2i_func), (free_fun

2413 #define d2i_ASN1_SET_OF_X509_REVOKED(st, pp, length, d2i_func, free_func, ex_tag
2414 SKM_ASN1_SET_OF_X509_REVOKED, (st), (pp), (length), (d2i_func), (fre
2415 #define i2d_ASN1_SET_OF_X509_REVOKED(st, pp, i2d_func, ex_tag, ex_class, is_set)
2416 SKM_ASN1_SET_OF_X509_REVOKED, (st), (pp), (i2d_func), (ex_tag), (ex_
2417 #define ASN1_seq_pack_X509_REVOKED(st, i2d_func, buf, len) \
2418 SKM_ASN1_seq_pack(X509_REVOKED, (st), (i2d_func), (buf), (len))
2419 #define ASN1_seq_unpack_X509_REVOKED(buf, len, d2i_func, free_func) \
2420 SKM_ASN1_seq_unpack(X509_REVOKED, (buf), (len), (d2i_func), (free_func))

2422 #define PKCS12_decrypt_d2i_PKCS12_SAFEBAG(algor, d2i_func, free_func, pass, pass
2423 SKM_PKCS12_decrypt_d2i(PKCS12_SAFEBAG, (algor), (d2i_func), (free_func),

2425 #define PKCS12_decrypt_d2i_PKCS7(algor, d2i_func, free_func, pass, passlen, oct,
2426 SKM_PKCS12_decrypt_d2i(PKCS7, (algor), (d2i_func), (free_func), (pass),

2428 #define lh_ADDED_OBJ_new() LHM_lh_new(ADDED_OBJ, added_obj)
2429 #define lh_ADDED_OBJ_insert(lh, inst) LHM_lh_insert(ADDED_OBJ, lh, inst)
2430 #define lh_ADDED_OBJ_retrieve(lh, inst) LHM_lh_retrieve(ADDED_OBJ, lh, inst)
2431 #define lh_ADDED_OBJ_delete(lh, inst) LHM_lh_delete(ADDED_OBJ, lh, inst)
2432 #define lh_ADDED_OBJ_doall(lh, fn) LHM_lh_doall(ADDED_OBJ, lh, fn)
2433 #define lh_ADDED_OBJ_doall_arg(lh, fn, arg_type, arg) \
2434 LHM_lh_doall_arg(ADDED_OBJ, lh, fn, arg_type, arg)
2435 #define lh_ADDED_OBJ_error(lh) LHM_lh_error(ADDED_OBJ, lh)
2436 #define lh_ADDED_OBJ_num_items(lh) LHM_lh_num_items(ADDED_OBJ, lh)
2437 #define lh_ADDED_OBJ_down_load(lh) LHM_lh_down_load(ADDED_OBJ, lh)
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2438 #define lh_ADDED_OBJ_node_stats_bio(lh, out) \
2439 LHM_lh_node_stats_bio(ADDED_OBJ, lh, out)
2440 #define lh_ADDED_OBJ_node_usage_stats_bio(lh, out) \
2441 LHM_lh_node_usage_stats_bio(ADDED_OBJ, lh, out)
2442 #define lh_ADDED_OBJ_stats_bio(lh, out) \
2443 LHM_lh_stats_bio(ADDED_OBJ, lh, out)
2444 #define lh_ADDED_OBJ_free(lh) LHM_lh_free(ADDED_OBJ, lh)

2446 #define lh_APP_INFO_new() LHM_lh_new(APP_INFO, app_info)
2447 #define lh_APP_INFO_insert(lh, inst) LHM_lh_insert(APP_INFO, lh, inst)
2448 #define lh_APP_INFO_retrieve(lh, inst) LHM_lh_retrieve(APP_INFO, lh, inst)
2449 #define lh_APP_INFO_delete(lh, inst) LHM_lh_delete(APP_INFO, lh, inst)
2450 #define lh_APP_INFO_doall(lh, fn) LHM_lh_doall(APP_INFO, lh, fn)
2451 #define lh_APP_INFO_doall_arg(lh, fn, arg_type, arg) \
2452 LHM_lh_doall_arg(APP_INFO, lh, fn, arg_type, arg)
2453 #define lh_APP_INFO_error(lh) LHM_lh_error(APP_INFO, lh)
2454 #define lh_APP_INFO_num_items(lh) LHM_lh_num_items(APP_INFO, lh)
2455 #define lh_APP_INFO_down_load(lh) LHM_lh_down_load(APP_INFO, lh)
2456 #define lh_APP_INFO_node_stats_bio(lh, out) \
2457 LHM_lh_node_stats_bio(APP_INFO, lh, out)
2458 #define lh_APP_INFO_node_usage_stats_bio(lh, out) \
2459 LHM_lh_node_usage_stats_bio(APP_INFO, lh, out)
2460 #define lh_APP_INFO_stats_bio(lh, out) \
2461 LHM_lh_stats_bio(APP_INFO, lh, out)
2462 #define lh_APP_INFO_free(lh) LHM_lh_free(APP_INFO, lh)

2464 #define lh_CONF_VALUE_new() LHM_lh_new(CONF_VALUE, conf_value)
2465 #define lh_CONF_VALUE_insert(lh, inst) LHM_lh_insert(CONF_VALUE, lh, inst)
2466 #define lh_CONF_VALUE_retrieve(lh, inst) LHM_lh_retrieve(CONF_VALUE, lh, inst)
2467 #define lh_CONF_VALUE_delete(lh, inst) LHM_lh_delete(CONF_VALUE, lh, inst)
2468 #define lh_CONF_VALUE_doall(lh, fn) LHM_lh_doall(CONF_VALUE, lh, fn)
2469 #define lh_CONF_VALUE_doall_arg(lh, fn, arg_type, arg) \
2470 LHM_lh_doall_arg(CONF_VALUE, lh, fn, arg_type, arg)
2471 #define lh_CONF_VALUE_error(lh) LHM_lh_error(CONF_VALUE, lh)
2472 #define lh_CONF_VALUE_num_items(lh) LHM_lh_num_items(CONF_VALUE, lh)
2473 #define lh_CONF_VALUE_down_load(lh) LHM_lh_down_load(CONF_VALUE, lh)
2474 #define lh_CONF_VALUE_node_stats_bio(lh, out) \
2475 LHM_lh_node_stats_bio(CONF_VALUE, lh, out)
2476 #define lh_CONF_VALUE_node_usage_stats_bio(lh, out) \
2477 LHM_lh_node_usage_stats_bio(CONF_VALUE, lh, out)
2478 #define lh_CONF_VALUE_stats_bio(lh, out) \
2479 LHM_lh_stats_bio(CONF_VALUE, lh, out)
2480 #define lh_CONF_VALUE_free(lh) LHM_lh_free(CONF_VALUE, lh)

2482 #define lh_ENGINE_PILE_new() LHM_lh_new(ENGINE_PILE, engine_pile)
2483 #define lh_ENGINE_PILE_insert(lh, inst) LHM_lh_insert(ENGINE_PILE, lh, inst)
2484 #define lh_ENGINE_PILE_retrieve(lh, inst) LHM_lh_retrieve(ENGINE_PILE, lh, inst)
2485 #define lh_ENGINE_PILE_delete(lh, inst) LHM_lh_delete(ENGINE_PILE, lh, inst)
2486 #define lh_ENGINE_PILE_doall(lh, fn) LHM_lh_doall(ENGINE_PILE, lh, fn)
2487 #define lh_ENGINE_PILE_doall_arg(lh, fn, arg_type, arg) \
2488 LHM_lh_doall_arg(ENGINE_PILE, lh, fn, arg_type, arg)
2489 #define lh_ENGINE_PILE_error(lh) LHM_lh_error(ENGINE_PILE, lh)
2490 #define lh_ENGINE_PILE_num_items(lh) LHM_lh_num_items(ENGINE_PILE, lh)
2491 #define lh_ENGINE_PILE_down_load(lh) LHM_lh_down_load(ENGINE_PILE, lh)
2492 #define lh_ENGINE_PILE_node_stats_bio(lh, out) \
2493 LHM_lh_node_stats_bio(ENGINE_PILE, lh, out)
2494 #define lh_ENGINE_PILE_node_usage_stats_bio(lh, out) \
2495 LHM_lh_node_usage_stats_bio(ENGINE_PILE, lh, out)
2496 #define lh_ENGINE_PILE_stats_bio(lh, out) \
2497 LHM_lh_stats_bio(ENGINE_PILE, lh, out)
2498 #define lh_ENGINE_PILE_free(lh) LHM_lh_free(ENGINE_PILE, lh)

2500 #define lh_ERR_STATE_new() LHM_lh_new(ERR_STATE, err_state)
2501 #define lh_ERR_STATE_insert(lh, inst) LHM_lh_insert(ERR_STATE, lh, inst)
2502 #define lh_ERR_STATE_retrieve(lh, inst) LHM_lh_retrieve(ERR_STATE, lh, inst)
2503 #define lh_ERR_STATE_delete(lh, inst) LHM_lh_delete(ERR_STATE, lh, inst)
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2504 #define lh_ERR_STATE_doall(lh,fn) LHM_lh_doall(ERR_STATE, lh,fn)
2505 #define lh_ERR_STATE_doall_arg(lh,fn,arg_type,arg) \
2506     LHM_lh_doall_arg(ERR_STATE, lh,fn,arg_type,arg)
2507 #define lh_ERR_STATE_error(lh) LHM_lh_error(ERR_STATE, lh)
2508 #define lh_ERR_STATE_num_items(lh) LHM_lh_num_items(ERR_STATE, lh)
2509 #define lh_ERR_STATE_down_load(lh) LHM_lh_down_load(ERR_STATE, lh)
2510 #define lh_ERR_STATE_node_stats_bio(lh,out) \
2511     LHM_lh_node_stats_bio(ERR_STATE, lh,out)
2512 #define lh_ERR_STATE_node_usage_stats_bio(lh,out) \
2513     LHM_lh_node_usage_stats_bio(ERR_STATE, lh,out)
2514 #define lh_ERR_STATE_stats_bio(lh,out) \
2515     LHM_lh_stats_bio(ERR_STATE, lh,out)
2516 #define lh_ERR_STATE_free(lh) LHM_lh_free(ERR_STATE, lh)

2518 #define lh_ERR_STRING_DATA_new() LHM_lh_new(ERR_STRING_DATA, err_string_data)
2519 #define lh_ERR_STRING_DATA_insert(lh,inst) LHM_lh_insert(ERR_STRING_DATA, lh,inst)
2520 #define lh_ERR_STRING_DATA_retrieve(lh,inst) LHM_lh_retrieve(ERR_STRING_DATA, lh,inst)
2521 #define lh_ERR_STRING_DATA_delete(lh,inst) LHM_lh_delete(ERR_STRING_DATA, lh,inst)
2522 #define lh_ERR_STRING_DATA_doall(lh,fn) LHM_lh_doall(ERR_STRING_DATA, lh,fn)
2523 #define lh_ERR_STRING_DATA_doall_arg(lh,fn,arg_type,arg) \
2524     LHM_lh_doall_arg(ERR_STRING_DATA, lh,fn,arg_type,arg)
2525 #define lh_ERR_STRING_DATA_error(lh) LHM_lh_error(ERR_STRING_DATA, lh)
2526 #define lh_ERR_STRING_DATA_num_items(lh) LHM_lh_num_items(ERR_STRING_DATA, lh)
2527 #define lh_ERR_STRING_DATA_down_load(lh) LHM_lh_down_load(ERR_STRING_DATA, lh)
2528 #define lh_ERR_STRING_DATA_node_stats_bio(lh,out) \
2529     LHM_lh_node_stats_bio(ERR_STRING_DATA, lh,out)
2530 #define lh_ERR_STRING_DATA_node_usage_stats_bio(lh,out) \
2531     LHM_lh_node_usage_stats_bio(ERR_STRING_DATA, lh,out)
2532 #define lh_ERR_STRING_DATA_stats_bio(lh,out) \
2533     LHM_lh_stats_bio(ERR_STRING_DATA, lh,out)
2534 #define lh_ERR_STRING_DATA_free(lh) LHM_lh_free(ERR_STRING_DATA, lh)

2536 #define lh_EX_CLASS_ITEM_new() LHM_lh_new(EX_CLASS_ITEM, ex_class_item)
2537 #define lh_EX_CLASS_ITEM_insert(lh,inst) LHM_lh_insert(EX_CLASS_ITEM, lh,inst)
2538 #define lh_EX_CLASS_ITEM_retrieve(lh,inst) LHM_lh_retrieve(EX_CLASS_ITEM, lh,inst)
2539 #define lh_EX_CLASS_ITEM_delete(lh,inst) LHM_lh_delete(EX_CLASS_ITEM, lh,inst)
2540 #define lh_EX_CLASS_ITEM_doall(lh,fn) LHM_lh_doall(EX_CLASS_ITEM, lh,fn)
2541 #define lh_EX_CLASS_ITEM_doall_arg(lh,fn,arg_type,arg) \
2542     LHM_lh_doall_arg(EX_CLASS_ITEM, lh,fn,arg_type,arg)
2543 #define lh_EX_CLASS_ITEM_error(lh) LHM_lh_error(EX_CLASS_ITEM, lh)
2544 #define lh_EX_CLASS_ITEM_num_items(lh) LHM_lh_num_items(EX_CLASS_ITEM, lh)
2545 #define lh_EX_CLASS_ITEM_down_load(lh) LHM_lh_down_load(EX_CLASS_ITEM, lh)
2546 #define lh_EX_CLASS_ITEM_node_stats_bio(lh,out) \
2547     LHM_lh_node_stats_bio(EX_CLASS_ITEM, lh,out)
2548 #define lh_EX_CLASS_ITEM_node_usage_stats_bio(lh,out) \
2549     LHM_lh_node_usage_stats_bio(EX_CLASS_ITEM, lh,out)
2550 #define lh_EX_CLASS_ITEM_stats_bio(lh,out) \
2551     LHM_lh_stats_bio(EX_CLASS_ITEM, lh,out)
2552 #define lh_EX_CLASS_ITEM_free(lh) LHM_lh_free(EX_CLASS_ITEM, lh)

2554 #define lh_FUNCTION_new() LHM_lh_new(FUNCTION, function)
2555 #define lh_FUNCTION_insert(lh,inst) LHM_lh_insert(FUNCTION, lh,inst)
2556 #define lh_FUNCTION_retrieve(lh,inst) LHM_lh_retrieve(FUNCTION, lh,inst)
2557 #define lh_FUNCTION_delete(lh,inst) LHM_lh_delete(FUNCTION, lh,inst)
2558 #define lh_FUNCTION_doall(lh,fn) LHM_lh_doall(FUNCTION, lh,fn)
2559 #define lh_FUNCTION_doall_arg(lh,fn,arg_type,arg) \
2560     LHM_lh_doall_arg(FUNCTION, lh,fn,arg_type,arg)
2561 #define lh_FUNCTION_error(lh) LHM_lh_error(FUNCTION, lh)
2562 #define lh_FUNCTION_num_items(lh) LHM_lh_num_items(FUNCTION, lh)
2563 #define lh_FUNCTION_down_load(lh) LHM_lh_down_load(FUNCTION, lh)
2564 #define lh_FUNCTION_node_stats_bio(lh,out) \
2565     LHM_lh_node_stats_bio(FUNCTION, lh,out)
2566 #define lh_FUNCTION_node_usage_stats_bio(lh,out) \
2567     LHM_lh_node_usage_stats_bio(FUNCTION, lh,out)
2568 #define lh_FUNCTION_stats_bio(lh,out) \
2569     LHM_lh_stats_bio(FUNCTION, lh,out)

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2570 #define lh_FUNCTION_free(lh) LHM_lh_free(FUNCTION, lh)

2572 #define lh_MEM_new() LHM_lh_new(MEM, mem)
2573 #define lh_MEM_insert(lh,inst) LHM_lh_insert(MEM, lh,inst)
2574 #define lh_MEM_retrieve(lh,inst) LHM_lh_retrieve(MEM, lh,inst)
2575 #define lh_MEM_delete(lh,inst) LHM_lh_delete(MEM, lh,inst)
2576 #define lh_MEM_doall(lh,fn) LHM_lh_doall(MEM, lh,fn)
2577 #define lh_MEM_doall_arg(lh,fn,arg_type,arg) \
2578     LHM_lh_doall_arg(MEM, lh,fn,arg_type,arg)
2579 #define lh_MEM_error(lh) LHM_lh_error(MEM, lh)
2580 #define lh_MEM_num_items(lh) LHM_lh_num_items(MEM, lh)
2581 #define lh_MEM_down_load(lh) LHM_lh_down_load(MEM, lh)
2582 #define lh_MEM_node_stats_bio(lh,out) \
2583     LHM_lh_node_stats_bio(MEM, lh,out)
2584 #define lh_MEM_node_usage_stats_bio(lh,out) \
2585     LHM_lh_node_usage_stats_bio(MEM, lh,out)
2586 #define lh_MEM_stats_bio(lh,out) \
2587     LHM_lh_stats_bio(MEM, lh,out)
2588 #define lh_MEM_free(lh) LHM_lh_free(MEM, lh)

2590 #define lh_OBJ_NAME_new() LHM_lh_new(OBJ_NAME, obj_name)
2591 #define lh_OBJ_NAME_insert(lh,inst) LHM_lh_insert(OBJ_NAME, lh,inst)
2592 #define lh_OBJ_NAME_retrieve(lh,inst) LHM_lh_retrieve(OBJ_NAME, lh,inst)
2593 #define lh_OBJ_NAME_delete(lh,inst) LHM_lh_delete(OBJ_NAME, lh,inst)
2594 #define lh_OBJ_NAME_doall(lh,fn) LHM_lh_doall(OBJ_NAME, lh,fn)
2595 #define lh_OBJ_NAME_doall_arg(lh,fn,arg_type,arg) \
2596     LHM_lh_doall_arg(OBJ_NAME, lh,fn,arg_type,arg)
2597 #define lh_OBJ_NAME_error(lh) LHM_lh_error(OBJ_NAME, lh)
2598 #define lh_OBJ_NAME_num_items(lh) LHM_lh_num_items(OBJ_NAME, lh)
2599 #define lh_OBJ_NAME_down_load(lh) LHM_lh_down_load(OBJ_NAME, lh)
2600 #define lh_OBJ_NAME_node_stats_bio(lh,out) \
2601     LHM_lh_node_stats_bio(OBJ_NAME, lh,out)
2602 #define lh_OBJ_NAME_node_usage_stats_bio(lh,out) \
2603     LHM_lh_node_usage_stats_bio(OBJ_NAME, lh,out)
2604 #define lh_OBJ_NAME_stats_bio(lh,out) \
2605     LHM_lh_stats_bio(OBJ_NAME, lh,out)
2606 #define lh_OBJ_NAME_free(lh) LHM_lh_free(OBJ_NAME, lh)

2608 #define lh_OPENSSL_CSTRING_new() LHM_lh_new(OPENSSL_CSTRING, openssl_cstring)
2609 #define lh_OPENSSL_CSTRING_insert(lh,inst) LHM_lh_insert(OPENSSL_CSTRING, lh,inst)
2610 #define lh_OPENSSL_CSTRING_retrieve(lh,inst) LHM_lh_retrieve(OPENSSL_CSTRING, lh,inst)
2611 #define lh_OPENSSL_CSTRING_delete(lh,inst) LHM_lh_delete(OPENSSL_CSTRING, lh,inst)
2612 #define lh_OPENSSL_CSTRING_doall(lh,fn) LHM_lh_doall(OPENSSL_CSTRING, lh,fn)
2613 #define lh_OPENSSL_CSTRING_doall_arg(lh,fn,arg_type,arg) \
2614     LHM_lh_doall_arg(OPENSSL_CSTRING, lh,fn,arg_type,arg)
2615 #define lh_OPENSSL_CSTRING_error(lh) LHM_lh_error(OPENSSL_CSTRING, lh)
2616 #define lh_OPENSSL_CSTRING_num_items(lh) LHM_lh_num_items(OPENSSL_CSTRING, lh)
2617 #define lh_OPENSSL_CSTRING_down_load(lh) LHM_lh_down_load(OPENSSL_CSTRING, lh)
2618 #define lh_OPENSSL_CSTRING_node_stats_bio(lh,out) \
2619     LHM_lh_node_stats_bio(OPENSSL_CSTRING, lh,out)
2620 #define lh_OPENSSL_CSTRING_node_usage_stats_bio(lh,out) \
2621     LHM_lh_node_usage_stats_bio(OPENSSL_CSTRING, lh,out)
2622 #define lh_OPENSSL_CSTRING_stats_bio(lh,out) \
2623     LHM_lh_stats_bio(OPENSSL_CSTRING, lh,out)
2624 #define lh_OPENSSL_CSTRING_free(lh) LHM_lh_free(OPENSSL_CSTRING, lh)

2626 #define lh_OPENSSL_STRING_new() LHM_lh_new(OPENSSL_STRING, openssl_string)
2627 #define lh_OPENSSL_STRING_insert(lh,inst) LHM_lh_insert(OPENSSL_STRING, lh,inst)
2628 #define lh_OPENSSL_STRING_retrieve(lh,inst) LHM_lh_retrieve(OPENSSL_STRING, lh,inst)
2629 #define lh_OPENSSL_STRING_delete(lh,inst) LHM_lh_delete(OPENSSL_STRING, lh,inst)
2630 #define lh_OPENSSL_STRING_doall(lh,fn) LHM_lh_doall(OPENSSL_STRING, lh,fn)
2631 #define lh_OPENSSL_STRING_doall_arg(lh,fn,arg_type,arg) \
2632     LHM_lh_doall_arg(OPENSSL_STRING, lh,fn,arg_type,arg)
2633 #define lh_OPENSSL_STRING_error(lh) LHM_lh_error(OPENSSL_STRING, lh)
2634 #define lh_OPENSSL_STRING_num_items(lh) LHM_lh_num_items(OPENSSL_STRING, lh)
2635 #define lh_OPENSSL_STRING_down_load(lh) LHM_lh_down_load(OPENSSL_STRING, lh)

```

```
2636 #define lh_OPENSSL_STRING_node_stats_bio(lh,out) \
2637     LHM_lh_node_stats_bio(OPENSLL_STRING, lh,out)
2638 #define lh_OPENSSL_STRING_node_usage_stats_bio(lh,out) \
2639     LHM_lh_node_usage_stats_bio(OPENSLL_STRING, lh,out)
2640 #define lh_OPENSSL_STRING_stats_bio(lh,out) \
2641     LHM_lh_stats_bio(OPENSLL_STRING, lh,out)
2642 #define lh_OPENSSL_STRING_free(lh) LHM_lh_free(OPENSLL_STRING, lh)

2644 #define lh_SSL_SESSION_new() LHM_lh_new(SSL_SESSION,ssl_session)
2645 #define lh_SSL_SESSION_insert(lh,inst) LHM_lh_insert(SSL_SESSION, lh,inst)
2646 #define lh_SSL_SESSION_retrieve(lh,inst) LHM_lh_retrieve(SSL_SESSION, lh,inst)
2647 #define lh_SSL_SESSION_delete(lh,inst) LHM_lh_delete(SSL_SESSION, lh,inst)
2648 #define lh_SSL_SESSION_doall(lh,fn) LHM_lh_doall(SSL_SESSION, lh,fn)
2649 #define lh_SSL_SESSION_doall_arg(lh,fn,arg_type,arg) \
2650     LHM_lh_doall_arg(SSL_SESSION, lh,fn,arg_type,arg)
2651 #define lh_SSL_SESSION_error(lh) LHM_lh_error(SSL_SESSION, lh)
2652 #define lh_SSL_SESSION_num_items(lh) LHM_lh_num_items(SSL_SESSION, lh)
2653 #define lh_SSL_SESSION_down_load(lh) LHM_lh_down_load(SSL_SESSION, lh)
2654 #define lh_SSL_SESSION_node_stats_bio(lh,out) \
2655     LHM_lh_node_stats_bio(SSL_SESSION, lh,out)
2656 #define lh_SSL_SESSION_node_usage_stats_bio(lh,out) \
2657     LHM_lh_node_usage_stats_bio(SSL_SESSION, lh,out)
2658 #define lh_SSL_SESSION_stats_bio(lh,out) \
2659     LHM_lh_stats_bio(SSL_SESSION, lh,out)
2660 #define lh_SSL_SESSION_free(lh) LHM_lh_free(SSL_SESSION, lh)
2661 /* End of util/mkstack.pl block, you may now edit :-) */

2663 #endif /* !defined HEADER_SAFESTACK_H */
```

new/usr/src/lib/openssl/include/openssl/sha.h

1

7636 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/sha.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/sha/sha.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
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57 */
```

```
59 #ifndef HEADER_SHA_H
60 #define HEADER_SHA_H
```

new/usr/src/lib/openssl/include/openssl/sha.h

2

```
62 #include <openssl/e_os2.h>
63 #include <stddef.h>

65 #ifdef __cplusplus
66 extern "C" {
67 #endif

69 #if defined(OPENSSL_NO_SHA) || (defined(OPENSSL_NO_SHA0) && defined(OPENSSL_NO_S
70 #error SHA is disabled.
71 #endif

73 #if defined(OPENSSL_FIPS)
74 #define FIPS_SHA_SIZE_T size_t
75 #endif

77 /*
78 * !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
79 * ! SHA_LONG has to be at least 32 bits wide. If it's wider, then !
80 * ! SHA_LONG_LONG2 has to be defined along. !
81 * ! !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
82 */

84 #if defined(__LP32__)
85 #define SHA_LONG unsigned long
86 #elif defined(OPENSSL_SYS_CRAY) || defined(__ILP64__)
87 #define SHA_LONG unsigned long
88 #define SHA_LONG_LONG2 3
89 #else
90 #define SHA_LONG unsigned int
91 #endif

93 #define SHA_LBLOCK 16
94 #define SHA_CBLOCK (SHA_LBLOCK*4) /* SHA treats input data as a
95 * contiguous array of 32 bit
96 * wide big-endian values. */
97 #define SHA_LAST_BLOCK (SHA_CBLOCK-8)
98 #define SHA_DIGEST_LENGTH 20

100 typedef struct SHAstate_st
101 {
102     SHA_LONG h0,h1,h2,h3,h4;
103     SHA_LONG Nl,Nh;
104     SHA_LONG data[SHA_LBLOCK];
105     unsigned int num;
106 } SHA_CTX;

108 #ifndef OPENSSL_NO_SHA0
109 #ifndef OPENSSL_FIPS
110 int private_SHA_Init(SHA_CTX *c);
111 #endif
112 int SHA_Init(SHA_CTX *c);
113 int SHA_Update(SHA_CTX *c, const void *data, size_t len);
114 int SHA_Final(unsigned char *md, SHA_CTX *c);
115 unsigned char *SHA(const unsigned char *d, size_t n, unsigned char *md);
116 void SHA_Transform(SHA_CTX *c, const unsigned char *data);
117 #endif
118 #ifndef OPENSSL_NO_SHA1
119 #ifndef OPENSSL_FIPS
120 int private_SHA1_Init(SHA_CTX *c);
121 #endif
122 int SHA1_Init(SHA_CTX *c);
123 int SHA1_Update(SHA_CTX *c, const void *data, size_t len);
124 int SHA1_Final(unsigned char *md, SHA_CTX *c);
125 unsigned char *SHA1(const unsigned char *d, size_t n, unsigned char *md);
126 void SHA1_Transform(SHA_CTX *c, const unsigned char *data);
127 #endif
```

```

129 #define SHA256_CBLOCK    (SHA_LBLOCK*4) /* SHA-256 treats input data as a
130      * contiguous array of 32 bit
131      * wide big-endian values. */
132 #define SHA224_DIGEST_LENGTH    28
133 #define SHA256_DIGEST_LENGTH    32

135 typedef struct SHA256state_st
136 {
137     SHA_LONG h[8];
138     SHA_LONG Nl,Nh;
139     SHA_LONG data[SHA_LBLOCK];
140     unsigned int num,md_len;
141 } SHA256_CTX;

143 #ifndef OPENSSL_NO_SHA256
144 #ifdef OPENSSL_FIPS
145 int private_SHA224_Init(SHA256_CTX *c);
146 int private_SHA256_Init(SHA256_CTX *c);
147 #endif
148 int SHA224_Init(SHA256_CTX *c);
149 int SHA224_Update(SHA256_CTX *c, const void *data, size_t len);
150 int SHA224_Final(unsigned char *md, SHA256_CTX *c);
151 unsigned char *SHA224(const unsigned char *d, size_t n,unsigned char *md);
152 int SHA256_Init(SHA256_CTX *c);
153 int SHA256_Update(SHA256_CTX *c, const void *data, size_t len);
154 int SHA256_Final(unsigned char *md, SHA256_CTX *c);
155 unsigned char *SHA256(const unsigned char *d, size_t n,unsigned char *md);
156 void SHA256_Transform(SHA256_CTX *c, const unsigned char *data);
157 #endif

159 #define SHA384_DIGEST_LENGTH    48
160 #define SHA512_DIGEST_LENGTH    64

162 #ifndef OPENSSL_NO_SHA512
163 /*
164  * Unlike 32-bit digest algorithms, SHA-512 *relies* on SHA_LONG64
165  * being exactly 64-bit wide. See Implementation Notes in sha512.c
166  * for further details.
167  */
168 #define SHA512_CBLOCK    (SHA_LBLOCK*8) /* SHA-512 treats input data as a
169      * contiguous array of 64 bit
170      * wide big-endian values. */
171 #if (defined(_WIN32) || defined(_WIN64)) && !defined(__MINGW32__)
172 #define SHA_LONG64 unsigned __int64
173 #define U64(C)        C##UI64
174 #elif defined(__arch64__)
175 #define SHA_LONG64 unsigned long
176 #define U64(C)        C##UL
177 #else
178 #define SHA_LONG64 unsigned long long
179 #define U64(C)        C##ULL
180 #endif

182 typedef struct SHA512state_st
183 {
184     SHA_LONG64 h[8];
185     SHA_LONG64 Nl,Nh;
186     union {
187         SHA_LONG64    d[SHA_LBLOCK];
188         unsigned char  p[SHA512_CBLOCK];
189     } u;
190     unsigned int num,md_len;
191 } SHA512_CTX;
192 #endif

```

```

194 #ifndef OPENSSL_NO_SHA512
195 #ifdef OPENSSL_FIPS
196 int private_SHA384_Init(SHA512_CTX *c);
197 int private_SHA512_Init(SHA512_CTX *c);
198 #endif
199 int SHA384_Init(SHA512_CTX *c);
200 int SHA384_Update(SHA512_CTX *c, const void *data, size_t len);
201 int SHA384_Final(unsigned char *md, SHA512_CTX *c);
202 unsigned char *SHA384(const unsigned char *d, size_t n,unsigned char *md);
203 int SHA512_Init(SHA512_CTX *c);
204 int SHA512_Update(SHA512_CTX *c, const void *data, size_t len);
205 int SHA512_Final(unsigned char *md, SHA512_CTX *c);
206 unsigned char *SHA512(const unsigned char *d, size_t n,unsigned char *md);
207 void SHA512_Transform(SHA512_CTX *c, const unsigned char *data);
208 #endif

210 #ifdef __cplusplus
211 }
212 #endif

214 #endif

```

new/usr/src/lib/openssl/include/openssl/srp.h

1

```
*****
5378 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/srp.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/srp/srp.h */
2 /* Written by Christophe Renou (christophe.renou@edelweb.fr) with
3  * the precious help of Peter Sylvester (peter.sylvester@edelweb.fr)
4  * for the EdelKey project and contributed to the OpenSSL project 2004.
5  */
6 /* =====
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52 * =====
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */
59 #ifndef __SRP_H__
60 #define __SRP_H__
```

new/usr/src/lib/openssl/include/openssl/srp.h

2

```
62 #ifndef OPENSSL_NO_SRP

64 #include <stdio.h>
65 #include <string.h>

67 #ifdef __cplusplus
68 extern "C" {
69 #endif

71 #include <openssl/safestack.h>
72 #include <openssl/bn.h>
73 #include <openssl/crypto.h>

75 typedef struct SRP_gN_cache_st
76 {
77     char *b64_bn;
78     BIGNUM *bn;
79 } SRP_gN_cache;

82 DECLARE_STACK_OF(SRP_gN_cache)

84 typedef struct SRP_user_pwd_st
85 {
86     char *id;
87     BIGNUM *s;
88     BIGNUM *v;
89     const BIGNUM *g;
90     const BIGNUM *N;
91     char *info;
92 } SRP_user_pwd;

94 DECLARE_STACK_OF(SRP_user_pwd)

96 typedef struct SRP_VBASE_st
97 {
98     STACK_OF(SRP_user_pwd) *users_pwd;
99     STACK_OF(SRP_gN_cache) *gN_cache;
100 /* to simulate a user */
101     char *seed_key;
102     BIGNUM *default_g;
103     BIGNUM *default_N;
104 } SRP_VBASE;

107 /*Structure interne pour retenir les couples N et g*/
108 typedef struct SRP_gN_st
109 {
110     char *id;
111     BIGNUM *g;
112     BIGNUM *N;
113 } SRP_gN;

115 DECLARE_STACK_OF(SRP_gN)

117 SRP_VBASE *SRP_VBASE_new(char *seed_key);
118 int SRP_VBASE_free(SRP_VBASE *vb);
119 int SRP_VBASE_init(SRP_VBASE *vb, char * verifier_file);
120 SRP_user_pwd *SRP_VBASE_get_by_user(SRP_VBASE *vb, char *username);
121 char *SRP_create_verifier(const char *user, const char *pass, char **salt,
122                           char **verifier, const char *N, const char *g);
123 int SRP_create_verifier_BN(const char *user, const char *pass, BIGNUM **salt, BI

126 #define SRP_NO_ERROR 0
127 #define SRP_ERR_VBASE_INCOMPLETE_FILE 1
```

```
128 #define SRP_ERR_VBASE_BN_LIB 2
129 #define SRP_ERR_OPEN_FILE 3
130 #define SRP_ERR_MEMORY 4

132 #define DB_srptype      0
133 #define DB_srpverifier  1
134 #define DB_srpsalt      2
135 #define DB_srpid        3
136 #define DB_srpqN        4
137 #define DB_srpinfo      5
138 #undef DB_NUMBER
139 #define DB_NUMBER      6

141 #define DB_SRP_INDEX    'I'
142 #define DB_SRP_VALID    'V'
143 #define DB_SRP_REVOKED  'R'
144 #define DB_SRP_MODIF    'v'

147 /* see srp.c */
148 char * SRP_check_known_gN_param(BIGNUM* g, BIGNUM* N);
149 SRP_gN *SRP_get_default_gN(const char * id) ;

151 /* server side .... */
152 BIGNUM *SRP_Calc_server_key(BIGNUM *A, BIGNUM *v, BIGNUM *u, BIGNUM *b, BIGNUM *
153 BIGNUM *SRP_Calc_B(BIGNUM *b, BIGNUM *N, BIGNUM *g, BIGNUM *v);
154 int SRP_Verify_A_mod_N(BIGNUM *A, BIGNUM *N);
155 BIGNUM *SRP_Calc_u(BIGNUM *A, BIGNUM *B, BIGNUM *N) ;

159 /* client side .... */
160 BIGNUM *SRP_Calc_x(BIGNUM *s, const char *user, const char *pass);
161 BIGNUM *SRP_Calc_A(BIGNUM *a, BIGNUM *N, BIGNUM *g);
162 BIGNUM *SRP_Calc_client_key(BIGNUM *N, BIGNUM *B, BIGNUM *g, BIGNUM *x, BIGNUM *
163 int SRP_Verify_B_mod_N(BIGNUM *B, BIGNUM *N);

165 #define SRP_MINIMAL_N 1024

167 #ifdef __cplusplus
168 }
169 #endif

171 #endif
172 #endif
```

new/usr/src/lib/openssl/include/openssl/srtp.h

1

```
*****
6644 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/srtp.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/tls1.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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35 * The word 'cryptographic' can be left out if the rouines from the library
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56 * [including the GNU Public Licence.]
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```

new/usr/src/lib/openssl/include/openssl/srtp.h

2

```
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108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /*
112  * DTLS code by Eric Rescorla <ekr@rtfm.com>
113  *
114  * Copyright (C) 2006, Network Resonance, Inc.
115  * Copyright (C) 2011, RTFM, Inc.
116 */
117
118 #ifndef HEADER_D1_SRTP_H
119 #define HEADER_D1_SRTP_H
120
121 #ifdef __cplusplus
122 extern "C" {
123 #endif
124
125
126 #define SRTP_AES128_CM_SHA1_80 0x0001
127 #define SRTP_AES128_CM_SHA1_32 0x0002
```

```
128 #define SRTP_AES128_F8_SHA1_80 0x0003
129 #define SRTP_AES128_F8_SHA1_32 0x0004
130 #define SRTP_NULL_SHA1_80      0x0005
131 #define SRTP_NULL_SHA1_32      0x0006

133 int SSL_CTX_set_tlsext_use_srtp(SSL_CTX *ctx, const char *profiles);
134 int SSL_set_tlsext_use_srtp(SSL *ctx, const char *profiles);
135 SRTP_PROTECTION_PROFILE *SSL_get_selected_srtp_profile(SSL *s);

137 STACK_OF(SRTP_PROTECTION_PROFILE) *SSL_get_srtp_profiles(SSL *ssl);
138 SRTP_PROTECTION_PROFILE *SSL_get_selected_srtp_profile(SSL *s);

140 #ifdef __cplusplus
141 }
142 #endif

144 #endif
```



```

*****
103768 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/ssl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/ssl.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright (c) 1998-2007 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without

```

```

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72 *
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101 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
102 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 * ECC cipher suite support in OpenSSL originally developed by
114 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
115 */
116 /* =====
117 * Copyright 2005 Nokia. All rights reserved.
118 *
119 * The portions of the attached software ("Contribution") is developed by
120 * Nokia Corporation and is licensed pursuant to the OpenSSL open source
121 * license.
122 *
123 * The Contribution, originally written by Mika Kousa and Pasi Eronen of
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125 * support (see RFC 4279) to OpenSSL.
126 *
127 * No patent licenses or other rights except those expressly stated in

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138 * SPECIFICALLY DISCLAIMS ANY LIABILITY FOR CLAIMS BROUGHT BY YOU OR ANY
139 * OTHER ENTITY BASED ON INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR
140 * OTHERWISE.
141 */

143 #ifndef HEADER_SSL_H
144 #define HEADER_SSL_H

146 #include <openssl/e_os2.h>

148 #ifndef OPENSSSL_NO_COMP
149 #include <openssl/comp.h>
150 #endif
151 #ifndef OPENSSSL_NO_BIO
152 #include <openssl/bio.h>
153 #endif
154 #ifndef OPENSSSL_NO_DEPRECATED
155 #ifndef OPENSSSL_NO_X509
156 #include <openssl/x509.h>
157 #endif
158 #include <openssl/crypto.h>
159 #include <openssl/lhash.h>
160 #include <openssl/buffer.h>
161 #endif
162 #include <openssl/pem.h>
163 #include <openssl/hmac.h>

165 #include <openssl/kssl.h>
166 #include <openssl/safestack.h>
167 #include <openssl/symhacks.h>

169 #ifdef __cplusplus
170 extern "C" {
171 #endif

173 /* SSLeay version number for ASN.1 encoding of the session information */
174 /* Version 0 - initial version
175  * Version 1 - added the optional peer certificate
176  */
177 #define SSL_SESSION_ASN1_VERSION 0x0001

179 /* text strings for the ciphers */
180 #define SSL_TXT_NULL_WITH_MD5 SSL2_TXT_NULL_WITH_MD5
181 #define SSL_TXT_RC4_128_WITH_MD5 SSL2_TXT_RC4_128_WITH_MD5
182 #define SSL_TXT_RC4_128_EXPORT40_WITH_MD5 SSL2_TXT_RC4_128_EXPORT40_WITH_MD5
183 #define SSL_TXT_RC2_128_CBC_WITH_MD5 SSL2_TXT_RC2_128_CBC_WITH_MD5
184 #define SSL_TXT_RC2_128_CBC_EXPORT40_WITH_MD5 SSL2_TXT_RC2_128_CBC_EXPORT40_WITH_MD5
185 #define SSL_TXT_IDEA_128_CBC_WITH_MD5 SSL2_TXT_IDEA_128_CBC_WITH_MD5
186 #define SSL_TXT_DES_64_CBC_WITH_MD5 SSL2_TXT_DES_64_CBC_WITH_MD5
187 #define SSL_TXT_DES_64_CBC_WITH_SHA SSL2_TXT_DES_64_CBC_WITH_SHA
188 #define SSL_TXT_DES_192_EDE3_CBC_WITH_MD5 SSL2_TXT_DES_192_EDE3_CBC_WITH_MD5
189 #define SSL_TXT_DES_192_EDE3_CBC_WITH_SHA SSL2_TXT_DES_192_EDE3_CBC_WITH_SHA

191 /* VRS Additional Kerberos5 entries
192 */
193 #define SSL_TXT_KRB5_DES_64_CBC_SHA SSL3_TXT_KRB5_DES_64_CBC_SHA

```

```

194 #define SSL_TXT_KRB5_DES_192_CBC3_SHA SSL3_TXT_KRB5_DES_192_CBC3_SHA
195 #define SSL_TXT_KRB5_RC4_128_SHA SSL3_TXT_KRB5_RC4_128_SHA
196 #define SSL_TXT_KRB5_IDEA_128_CBC_SHA SSL3_TXT_KRB5_IDEA_128_CBC_SHA
197 #define SSL_TXT_KRB5_DES_64_CBC_MD5 SSL3_TXT_KRB5_DES_64_CBC_MD5
198 #define SSL_TXT_KRB5_DES_192_CBC3_MD5 SSL3_TXT_KRB5_DES_192_CBC3_MD5
199 #define SSL_TXT_KRB5_RC4_128_MD5 SSL3_TXT_KRB5_RC4_128_MD5
200 #define SSL_TXT_KRB5_IDEA_128_CBC_MD5 SSL3_TXT_KRB5_IDEA_128_CBC_MD5

202 #define SSL_TXT_KRB5_DES_40_CBC_SHA SSL3_TXT_KRB5_DES_40_CBC_SHA
203 #define SSL_TXT_KRB5_RC2_40_CBC_SHA SSL3_TXT_KRB5_RC2_40_CBC_SHA
204 #define SSL_TXT_KRB5_RC4_40_SHA SSL3_TXT_KRB5_RC4_40_SHA
205 #define SSL_TXT_KRB5_DES_40_CBC_MD5 SSL3_TXT_KRB5_DES_40_CBC_MD5
206 #define SSL_TXT_KRB5_RC2_40_CBC_MD5 SSL3_TXT_KRB5_RC2_40_CBC_MD5
207 #define SSL_TXT_KRB5_RC4_40_MD5 SSL3_TXT_KRB5_RC4_40_MD5

209 #define SSL_TXT_KRB5_DES_40_CBC_SHA SSL3_TXT_KRB5_DES_40_CBC_SHA
210 #define SSL_TXT_KRB5_DES_40_CBC_MD5 SSL3_TXT_KRB5_DES_40_CBC_MD5
211 #define SSL_TXT_KRB5_DES_64_CBC_SHA SSL3_TXT_KRB5_DES_64_CBC_SHA
212 #define SSL_TXT_KRB5_DES_64_CBC_MD5 SSL3_TXT_KRB5_DES_64_CBC_MD5
213 #define SSL_TXT_KRB5_DES_192_CBC3_SHA SSL3_TXT_KRB5_DES_192_CBC3_SHA
214 #define SSL_TXT_KRB5_DES_192_CBC3_MD5 SSL3_TXT_KRB5_DES_192_CBC3_MD5
215 #define SSL_MAX_KRB5_PRINCIPAL_LENGTH 256

217 #define SSL_MAX_SSL_SESSION_ID_LENGTH 32
218 #define SSL_MAX_SID_CTX_LENGTH 32

220 #define SSL_MIN_RSA_MODULUS_LENGTH_IN_BYTES (512/8)
221 #define SSL_MAX_KEY_ARG_LENGTH 8
222 #define SSL_MAX_MASTER_KEY_LENGTH 48

225 /* These are used to specify which ciphers to use and not to use */

227 #define SSL_TXT_EXP40 "EXPORT40"
228 #define SSL_TXT_EXP56 "EXPORT56"
229 #define SSL_TXT_LOW "LOW"
230 #define SSL_TXT_MEDIUM "MEDIUM"
231 #define SSL_TXT_HIGH "HIGH"
232 #define SSL_TXT_FIPS "FIPS"

234 #define SSL_TXT_kFZA "kFZA" /* unused! */
235 #define SSL_TXT_aFZA "aFZA" /* unused! */
236 #define SSL_TXT_eFZA "eFZA" /* unused! */
237 #define SSL_TXT_FZA "FZA" /* unused! */

239 #define SSL_TXT_aNULL "aNULL"
240 #define SSL_TXT_eNULL "eNULL"
241 #define SSL_TXT_NULL "NULL"

243 #define SSL_TXT_kRSA "kRSA"
244 #define SSL_TXT_kDhR "kDhR" /* no such ciphersuites supported! */
245 #define SSL_TXT_kDhD "kDhD" /* no such ciphersuites supported! */
246 #define SSL_TXT_kDh "kDh" /* no such ciphersuites supported! */
247 #define SSL_TXT_kEDH "kEDH"
248 #define SSL_TXT_kKRB5 "kKRB5"
249 #define SSL_TXT_kECDHr "kECDHr"
250 #define SSL_TXT_kECDHe "kECDHe"
251 #define SSL_TXT_kECDH "kECDH"
252 #define SSL_TXT_kEECDH "kEECDH"
253 #define SSL_TXT_kPSK "kPSK"
254 #define SSL_TXT_kGOST "kGOST"
255 #define SSL_TXT_kSRP "kSRP"

257 #define SSL_TXT_aRSA "aRSA"
258 #define SSL_TXT_aDSS "aDSS"
259 #define SSL_TXT_aDH "aDH" /* no such ciphersuites supported! */

```

```

260 #define SSL_TXT_aECDH      "aECDH"
261 #define SSL_TXT_aKRB5      "aKRB5"
262 #define SSL_TXT_aECDSA     "aECDSA"
263 #define SSL_TXT_aPSK       "aPSK"
264 #define SSL_TXT_aGOST94    "aGOST94"
265 #define SSL_TXT_aGOST01    "aGOST01"
266 #define SSL_TXT_aGOST      "aGOST"

268 #define SSL_TXT_DSS        "DSS"
269 #define SSL_TXT_DH         "DH"
270 #define SSL_TXT_EDH        "EDH" /* same as "kEDH:-ADH" */
271 #define SSL_TXT_ADH        "ADH"
272 #define SSL_TXT_RSA        "RSA"
273 #define SSL_TXT_ECDH       "ECDH"
274 #define SSL_TXT_EECDH      "EECDH" /* same as "kEECDH:-AECDH" */
275 #define SSL_TXT_AECDH      "AECDH"
276 #define SSL_TXT_ECDSA      "ECDSA"
277 #define SSL_TXT_KRB5       "KRB5"
278 #define SSL_TXT_PSK        "PSK"
279 #define SSL_TXT_SRP        "SRP"

281 #define SSL_TXT_DES        "DES"
282 #define SSL_TXT_3DES       "3DES"
283 #define SSL_TXT_RC4        "RC4"
284 #define SSL_TXT_RC2        "RC2"
285 #define SSL_TXT_IDEA       "IDEA"
286 #define SSL_TXT_SEED       "SEED"
287 #define SSL_TXT_AES128     "AES128"
288 #define SSL_TXT_AES256     "AES256"
289 #define SSL_TXT_AES        "AES"
290 #define SSL_TXT_AES_GCM    "AESGCM"
291 #define SSL_TXT_CAMELLIA128 "CAMELLIA128"
292 #define SSL_TXT_CAMELLIA256 "CAMELLIA256"
293 #define SSL_TXT_CAMELLIA   "CAMELLIA"

295 #define SSL_TXT_MD5        "MD5"
296 #define SSL_TXT_SHA1       "SHA1"
297 #define SSL_TXT_SHA        "SHA" /* same as "SHA1" */
298 #define SSL_TXT_GOST94     "GOST94"
299 #define SSL_TXT_GOST89MAC  "GOST89MAC"
300 #define SSL_TXT_SHA256     "SHA256"
301 #define SSL_TXT_SHA384     "SHA384"

303 #define SSL_TXT_SSLV2      "SSLv2"
304 #define SSL_TXT_SSLV3      "SSLv3"
305 #define SSL_TXT_TLSV1      "TLSv1"
306 #define SSL_TXT_TLSV1_1    "TLSv1.1"
307 #define SSL_TXT_TLSV1_2    "TLSv1.2"

309 #define SSL_TXT_EXP        "EXP"
310 #define SSL_TXT_EXPORT     "EXPORT"

312 #define SSL_TXT_ALL        "ALL"

314 /*
315  * COMPLEMENTOF* definitions. These identifiers are used to (de-select)
316  * ciphers normally not being used.
317  * Example: "RC4" will activate all ciphers using RC4 including ciphers
318  * without authentication, which would normally be disabled by DEFAULT (due
319  * to the "ADH" being part of default). Therefore "RC4:!COMPLEMENTOFDEFAULT"
320  * will make sure that it is also disabled in the specific selection.
321  * COMPLEMENTOF* identifiers are portable between version, as adjustments
322  * to the default cipher setup will also be included here.
323  *
324  * COMPLEMENTOFDEFAULT does not experience the same special treatment that
325  * DEFAULT gets, as only selection is being done and no sorting as needed

```

```

326 * for DEFAULT.
327 */
328 #define SSL_TXT_CMPALL      "COMPLEMENTOFALL"
329 #define SSL_TXT_CMPDEF      "COMPLEMENTOFDEFAULT"

331 /* The following cipher list is used by default.
332  * It also is substituted when an application-defined cipher list string
333  * starts with 'DEFAULT'. */
334 #define SSL_DEFAULT_CIPHER_LIST "ALL:!aNULL:!eNULL:!SSLv2"
335 /* As of OpenSSL 1.0.0, ssl_create_cipher_list() in ssl/ssl_ciph.c always
336  * starts with a reasonable order, and all we have to do for DEFAULT is
337  * throwing out anonymous and unencrypted ciphersuites!
338  * (The latter are not actually enabled by ALL, but "ALL:RSA" would enable
339  * some of them.)
340 */

342 /* Used in SSL_set_shutdown()/SSL_get_shutdown(); */
343 #define SSL_SENT_SHUTDOWN    1
344 #define SSL_RECEIVED_SHUTDOWN 2

346 #ifdef __cplusplus
347 }
348 #endif

350 #ifdef __cplusplus
351 extern "C" {
352 #endif

354 #if (defined(OPENSSL_NO_RSA) || defined(OPENSSL_NO_MD5)) && !defined(OPENSSL_NO_
355 #define OPENSSL_NO_SSL2
356 #endif

358 #define SSL_FILETYPE_ASN1    X509_FILETYPE_ASN1
359 #define SSL_FILETYPE_PEM     X509_FILETYPE_PEM

361 /* This is needed to stop compilers complaining about the
362  * 'struct ssl_st *' function parameters used to prototype callbacks
363  * in SSL_CTX. */
364 typedef struct ssl_st *ssl_crock_st;
365 typedef struct tls_session_ticket_ext_st TLS_SESSION_TICKET_EXT;
366 typedef struct ssl_method_st SSL_METHOD;
367 typedef struct ssl_cipher_st SSL_CIPHER;
368 typedef struct ssl_session_st SSL_SESSION;

370 DECLARE_STACK_OF(SSL_CIPHER)

372 /* SRTP protection profiles for use with the use_srtp extension (RFC 5764)*/
373 typedef struct srtp_protection_profile_st
374 {
375     const char *name;
376     unsigned long id;
377 } SRTP_PROTECTION_PROFILE;

379 DECLARE_STACK_OF(SRTP_PROTECTION_PROFILE)

381 typedef int (*tls_session_ticket_ext_cb_fn)(SSL *s, const unsigned char *data, i
382 typedef int (*tls_session_secret_cb_fn)(SSL *s, void *secret, int *secret_len, S

385 #ifndef OPENSSL_NO_SSL_INTERN

387 /* used to hold info on the particular ciphers used */
388 struct ssl_cipher_st
389 {
390     int valid;
391     const char *name; /* text name */

```



```

524     STACK_OF(SSL_CIPHER) *ciphers; /* shared ciphers? */

526     CRYPTO_EX_DATA ex_data; /* application specific data */

528     /* These are used to make removal of session-ids more
529      * efficient and to implement a maximum cache size. */
530     struct ssl_session_st *prev, *next;
531 #ifndef OPENSSL_NO_TLSEXT
532     char *tlsext_hostname;
533 #ifndef OPENSSL_NO_EC
534     size_t tlsext_ecpointformatlist_length;
535     unsigned char *tlsext_ecpointformatlist; /* peer's list */
536     size_t tlsext_ellipticcurvelist_length;
537     unsigned char *tlsext_ellipticcurvelist; /* peer's list */
538 #endif /* OPENSSL_NO_EC */
539     /* RFC4507 info */
540     unsigned char *tlsext_tick; /* Session ticket */
541     size_t tlsext_ticklen; /* Session ticket length */
542     long tlsext_tick_lifetime_hint; /* Session lifetime hint in seconds */
543 #endif
544 #ifndef OPENSSL_NO_SRP
545     char *srp_username;
546 #endif
547 };

549 #endif

551 #define SSL_OP_MICROSOFT_SESS_ID_BUG 0x00000001L
552 #define SSL_OP_NETSCAPE_CHALLENGE_BUG 0x00000002L
553 /* Allow initial connection to servers that don't support RI */
554 #define SSL_OP_LEGACY_SERVER_CONNECT 0x00000004L
555 #define SSL_OP_NETSCAPE_REUSE_CIPHER_CHANGE_BUG 0x00000008L
556 #define SSL_OP_SSLREF2_REUSE_CERT_TYPE_BUG 0x00000010L
557 #define SSL_OP_MICROSOFT_BIG_SSLV3_BUFFER 0x00000020L
558 #define SSL_OP_SAFARI_ECDHE_ECDSA_BUG 0x00000040L
559 #define SSL_OP_SSLEAY_080_CLIENT_DH_BUG 0x00000080L
560 #define SSL_OP_TLS_BLOCK_BUG 0x00000100L
561 #define SSL_OP_TLS_BLOCK_PADDING_BUG 0x00000200L

563 /* Hasn't done anything since OpenSSL 0.9.7h, retained for compatibility */
564 #define SSL_OP_MSIE_SSLV2_RSA_PADDING 0x0

566 /* Disable SSL 3.0/TLS 1.0 CBC vulnerability workaround that was added
567  * in OpenSSL 0.9.6d. Usually (depending on the application protocol)
568  * the workaround is not needed. Unfortunately some broken SSL/TLS
569  * implementations cannot handle it at all, which is why we include
570  * it in SSL_OP_ALL. */
571 #define SSL_OP_DONT_INSERT_EMPTY_FRAGMENTS 0x00000800L /* added in

573 /* SSL_OP_ALL: various bug workarounds that should be rather harmless.
574  * This used to be 0x000FFFFFL before 0.9.7. */
575 #define SSL_OP_ALL 0x80000BFFL

577 /* DTLS options */
578 #define SSL_OP_NO_QUERY_MTU 0x00001000L
579 /* Turn on Cookie Exchange (on relevant for servers) */
580 #define SSL_OP_COOKIE_EXCHANGE 0x00002000L
581 /* Don't use RFC4507 ticket extension */
582 #define SSL_OP_NO_TICKET 0x00004000L
583 /* Use Cisco's "speshul" version of DTLS_BAD_VER (as client) */
584 #define SSL_OP_CISCO_ANYCONNECT 0x00008000L

586 /* As server, disallow session resumption on renegotiation */
587 #define SSL_OP_NO_SESSION_RESUMPTION_ON_RENEGOTIATION 0x00010000L
588 /* Don't use compression even if supported */
589 #define SSL_OP_NO_COMPRESSION 0x00020000L

```

```

590 /* Permit unsafe legacy renegotiation */
591 #define SSL_OP_ALLOW_UNSAFE_LEGACY_RENEGOTIATION 0x00040000L
592 /* If set, always create a new key when using tmp_ecdh parameters */
593 #define SSL_OP_SINGLE_ECDH_USE 0x00080000L
594 /* If set, always create a new key when using tmp_dh parameters */
595 #define SSL_OP_SINGLE_DH_USE 0x00100000L
596 /* Set to always use the tmp_rsa key when doing RSA operations,
597  * even when this violates protocol specs */
598 #define SSL_OP_EPHEMERAL_RSA 0x00200000L
599 /* Set on servers to choose the cipher according to the server's
600  * preferences */
601 #define SSL_OP_CIPHER_SERVER_PREFERENCE 0x00400000L
602 /* If set, a server will allow a client to issue a SSLv3.0 version number
603  * as latest version supported in the premaster secret, even when TLSv1.0
604  * (version 3.1) was announced in the client hello. Normally this is
605  * forbidden to prevent version rollback attacks. */
606 #define SSL_OP_TLS_ROLLBACK_BUG 0x00800000L

608 #define SSL_OP_NO_SSLv2 0x01000000L
609 #define SSL_OP_NO_SSLv3 0x02000000L
610 #define SSL_OP_NO_TLSv1 0x04000000L
611 #define SSL_OP_NO_TLSv1_2 0x08000000L
612 #define SSL_OP_NO_TLSv1_1 0x10000000L

614 /* These next two were never actually used for anything since SSLeay
615  * zap so we have some more flags.
616  */
617 /* The next flag deliberately changes the ciphertest, this is a check
618  * for the PKCS#1 attack */
619 #define SSL_OP_PKCS1_CHECK_1 0x0
620 #define SSL_OP_PKCS1_CHECK_2 0x0

622 #define SSL_OP_NETSCAPE_CA_DN_BUG 0x20000000L
623 #define SSL_OP_NETSCAPE_DEMO_CIPHER_CHANGE_BUG 0x40000000L
624 /* Make server add server-hello extension from early version of
625  * cryptopro draft, when GOST ciphersuite is negotiated.
626  * Required for interoperability with CryptoPro CSP 3.x
627  */
628 #define SSL_OP_CRYPTOPRO_TLSEXT_BUG 0x80000000L

630 /* Allow SSL_write(..., n) to return r with 0 < r < n (i.e. report success
631  * when just a single record has been written): */
632 #define SSL_MODE_ENABLE_PARTIAL_WRITE 0x00000001L
633 /* Make it possible to retry SSL_write() with changed buffer location
634  * (buffer contents must stay the same!); this is not the default to avoid
635  * the misconception that non-blocking SSL_write() behaves like
636  * non-blocking write(): */
637 #define SSL_MODE_ACCEPT_MOVING_WRITE_BUFFER 0x00000002L
638 /* Never bother the application with retries if the transport
639  * is blocking: */
640 #define SSL_MODE_AUTO_RETRY 0x00000004L
641 /* Don't attempt to automatically build certificate chain */
642 #define SSL_MODE_NO_AUTO_CHAIN 0x00000008L
643 /* Save RAM by releasing read and write buffers when they're empty. (SSL3 and
644  * TLS only.) "Released" buffers are put onto a free-list in the context
645  * or just freed (depending on the context's setting for freelist_max_len). */
646 #define SSL_MODE_RELEASE_BUFFERS 0x00000010L
647 /* Send the current time in the Random fields of the ClientHello and
648  * ServerHello records for compatibility with hypothetical implementations
649  * that require it.
650  */
651 #define SSL_MODE_SEND_CLIENTHELLO_TIME 0x00000020L
652 #define SSL_MODE_SEND_SERVERHELLO_TIME 0x00000040L

654 /* Note: SSL_[CTX]_set_{options,mode} use |= op on the previous value,
655  * they cannot be used to clear bits. */

```

```

657 #define SSL_CTX_set_options(ctx,op) \
658     SSL_CTX_ctrl((ctx),SSL_CTRL_OPTIONS,(op),NULL)
659 #define SSL_CTX_clear_options(ctx,op) \
660     SSL_CTX_ctrl((ctx),SSL_CTRL_CLEAR_OPTIONS,(op),NULL)
661 #define SSL_CTX_get_options(ctx) \
662     SSL_CTX_ctrl((ctx),SSL_CTRL_OPTIONS,0,NULL)
663 #define SSL_set_options(ssl,op) \
664     SSL_ctrl((ssl),SSL_CTRL_OPTIONS,(op),NULL)
665 #define SSL_clear_options(ssl,op) \
666     SSL_ctrl((ssl),SSL_CTRL_CLEAR_OPTIONS,(op),NULL)
667 #define SSL_get_options(ssl) \
668     SSL_ctrl((ssl),SSL_CTRL_OPTIONS,0,NULL)
669
670 #define SSL_CTX_set_mode(ctx,op) \
671     SSL_CTX_ctrl((ctx),SSL_CTRL_MODE,(op),NULL)
672 #define SSL_CTX_clear_mode(ctx,op) \
673     SSL_CTX_ctrl((ctx),SSL_CTRL_CLEAR_MODE,(op),NULL)
674 #define SSL_CTX_get_mode(ctx) \
675     SSL_CTX_ctrl((ctx),SSL_CTRL_MODE,0,NULL)
676 #define SSL_clear_mode(ssl,op) \
677     SSL_ctrl((ssl),SSL_CTRL_CLEAR_MODE,(op),NULL)
678 #define SSL_set_mode(ssl,op) \
679     SSL_ctrl((ssl),SSL_CTRL_MODE,(op),NULL)
680 #define SSL_get_mode(ssl) \
681     SSL_ctrl((ssl),SSL_CTRL_MODE,0,NULL)
682 #define SSL_set_mtu(ssl, mtu) \
683     SSL_ctrl((ssl),SSL_CTRL_SET_MTU,(mtu),NULL)
684
685 #define SSL_get_secure_renegotiation_support(ssl) \
686     SSL_ctrl((ssl), SSL_CTRL_GET_RI_SUPPORT, 0, NULL)
687
688 #ifndef OPENSSL_NO_HEARTBEATS
689 #define SSL_heartbeat(ssl) \
690     SSL_ctrl((ssl),SSL_CTRL_TLS_EXT_SEND_HEARTBEAT,0,NULL)
691 #endif
692
693 void SSL_CTX_set_msg_callback(SSL_CTX *ctx, void (*cb)(int write_p, int version,
694 void SSL_set_msg_callback(SSL *ssl, void (*cb)(int write_p, int version, int con
695 #define SSL_CTX_set_msg_callback_arg(ctx, arg) SSL_CTX_ctrl((ctx), SSL_CTRL_SET_
696 #define SSL_set_msg_callback_arg(ssl, arg) SSL_ctrl((ssl), SSL_CTRL_SET_MSG_CALL
697
698 #ifndef OPENSSL_NO_SRP
699
700 #ifndef OPENSSL_NO_SSL_INTERN
701
702 typedef struct srp_ctx_st
703 {
704     /* param for all the callbacks */
705     void *SRP_cb_arg;
706     /* set client Hello login callback */
707     int (*TLS_ext_srp_username_callback)(SSL *, int *, void *);
708     /* set SRP N/g param callback for verification */
709     int (*SRP_verify_param_callback)(SSL *, void *);
710     /* set SRP client passwd callback */
711     char *(*SRP_give_srp_client_pwd_callback)(SSL *, void *);
712
713     char *login;
714     BIGNUM *N,*g,*s,*B,*A;
715     BIGNUM *a,*b,*v;
716     char *info;
717     int strength;
718
719     unsigned long srp_mask;
720 } SRP_CTX;

```

```

722 #endif
723
724 /* see tls_srp.c */
725 int SSL_SRP_CTX_init(SSL *s);
726 int SSL_CTX_SRP_CTX_init(SSL_CTX *ctx);
727 int SSL_SRP_CTX_free(SSL *s);
728 int SSL_CTX_SRP_CTX_free(SSL_CTX *ctx);
729 int SSL_srp_server_param_with_username(SSL *s, int *ad);
730 int SRP_generate_server_master_secret(SSL *s,unsigned char *master_key);
731 int SRP_Calc_A_param(SSL *s);
732 int SRP_generate_client_master_secret(SSL *s,unsigned char *master_key);
733
734 #endif
735
736 #if defined(OPENSSL_SYS_MSDOS) && !defined(OPENSSL_SYS_WIN32)
737 #define SSL_MAX_CERT_LIST_DEFAULT 1024*30 /* 30k max cert list :) */
738 #else
739 #define SSL_MAX_CERT_LIST_DEFAULT 1024*100 /* 100k max cert list :) */
740 #endif
741
742 #define SSL_SESSION_CACHE_MAX_SIZE_DEFAULT (1024*20)
743
744 /* This callback type is used inside SSL_CTX, SSL, and in the functions that set
745 * them. It is used to override the generation of SSL/TLS session IDs in a
746 * server. Return value should be zero on an error, non-zero to proceed. Also,
747 * callbacks should themselves check if the id they generate is unique otherwise
748 * the SSL handshake will fail with an error - callbacks can do this using the
749 * 'ssl' value they're passed by;
750 *     SSL_has_matching_session_id(ssl, id, *id_len)
751 * The length value passed in is set at the maximum size the session ID can be.
752 * In SSLv2 this is 16 bytes, whereas SSLv3/TLSv1 it is 32 bytes. The callback
753 * can alter this length to be less if desired, but under SSLv2 session IDs are
754 * supposed to be fixed at 16 bytes so the id will be padded after the callback
755 * returns in this case. It is also an error for the callback to set the size to
756 * zero. */
757 typedef int (*GEN_SESSION_CB)(const SSL *ssl, unsigned char *id,
758                               unsigned int *id_len);
759
760 typedef struct ssl_comp_st SSL_COMP;
761
762 #ifndef OPENSSL_NO_SSL_INTERN
763
764 struct ssl_comp_st
765 {
766     int id;
767     const char *name;
768 #ifndef OPENSSL_NO_COMP
769     COMP_METHOD *method;
770 #else
771     char *method;
772 #endif
773 };
774
775 DECLARE_STACK_OF(SSL_COMP)
776 DECLARE_LHASH_OF(SSL_SESSION);
777
778 struct ssl_ctx_st
779 {
780     const SSL_METHOD *method;
781
782     STACK_OF(SSL_CIPHER) *cipher_list;
783     /* same as above but sorted for lookup */
784     STACK_OF(SSL_CIPHER) *cipher_list_by_id;
785
786     struct x509_store_st /* X509_STORE */ *cert_store;
787     LHASH_OF(SSL_SESSION) *sessions;

```

```

788 /* Most session-ids that will be cached, default is
789  * SSL_SESSION_CACHE_MAX_SIZE_DEFAULT. 0 is unlimited. */
790 unsigned long session_cache_size;
791 struct ssl_session_st *session_cache_head;
792 struct ssl_session_st *session_cache_tail;

794 /* This can have one of 2 values, ored together,
795  * SSL_SESS_CACHE_CLIENT,
796  * SSL_SESS_CACHE_SERVER,
797  * Default is SSL_SESSION_CACHE_SERVER, which means only
798  * SSL_accept which cache SSL_SESSIONS. */
799 int session_cache_mode;

801 /* If timeout is not 0, it is the default timeout value set
802  * when SSL_new() is called. This has been put in to make
803  * life easier to set things up */
804 long session_timeout;

806 /* If this callback is not null, it will be called each
807  * time a session id is added to the cache. If this function
808  * returns 1, it means that the callback will do a
809  * SSL_SESSION_free() when it has finished using it. Otherwise,
810  * on 0, it means the callback has finished with it.
811  * If remove_session_cb is not null, it will be called when
812  * a session-id is removed from the cache. After the call,
813  * OpenSSL will SSL_SESSION_free() it. */
814 int (*new_session_cb)(struct ssl_st *ssl, SSL_SESSION *sess);
815 void (*remove_session_cb)(struct ssl_ctx_st *ctx, SSL_SESSION *sess);
816 SSL_SESSION *(*get_session_cb)(struct ssl_st *ssl,
817                                unsigned char *data, int len, int *copy);

819 struct
820 {
821     int sess_connect; /* SSL new conn - started */
822     int sess_connect_renegotiate; /* SSL renegot - requested */
823     int sess_connect_good; /* SSL new conn/renege - finished */
824     int sess_accept; /* SSL new accept - started */
825     int sess_accept_renegotiate; /* SSL renegot - requested */
826     int sess_accept_good; /* SSL accept/renege - finished */
827     int sess_miss; /* session lookup misses */
828     int sess_timeout; /* reuse attempt on timedout session */
829     int sess_cache_full; /* session removed due to full cache */
830     int sess_hit; /* session reuse actually done */
831     int sess_cb_hit; /* session-id that was not
832                      * in the cache was
833                      * passed back via the callback. This
834                      * indicates that the application is
835                      * supplying session-ids from other
836                      * processes - spooky :- ) */
837 } stats;

839 int references;

841 /* if defined, these override the X509_verify_cert() calls */
842 int (*app_verify_callback)(X509_STORE_CTX *, void *);
843 void *app_verify_arg;
844 /* before OpenSSL 0.9.7, 'app_verify_arg' was ignored
845  * ('app_verify_callback' was called with just one argument) */

847 /* Default password callback. */
848 pem_password_cb *default_passwd_callback;

850 /* Default password callback user data. */
851 void *default_passwd_callback_userdata;

853 /* get client cert callback */

```

```

854 int (*client_cert_cb)(SSL *ssl, X509 **x509, EVP_PKEY **pkey);

856 /* cookie generate callback */
857 int (*app_gen_cookie_cb)(SSL *ssl, unsigned char *cookie,
858                          unsigned int *cookie_len);

860 /* verify cookie callback */
861 int (*app_verify_cookie_cb)(SSL *ssl, unsigned char *cookie,
862                             unsigned int *cookie_len);

864 CRYPTO_EX_DATA ex_data;

866 const EVP_MD *rsa_md5; /* For SSLv2 - name is 'ssl2-md5' */
867 const EVP_MD *md5; /* For SSLv3/TLSv1 'ssl3-md5' */
868 const EVP_MD *sha1; /* For SSLv3/TLSv1 'ssl3-sha1' */

870 STACK_OF(X509) *extra_certs;
871 STACK_OF(SSL_COMP) *comp_methods; /* stack of SSL_COMP, SSLv3/TLSv1 */

874 /* Default values used when no per-SSL value is defined follow */

876 void (*info_callback)(const SSL *ssl, int type, int val); /* used if SSL's
877 /* what we put in client cert requests */
878 STACK_OF(X509_NAME) *client_CA;

882 /* Default values to use in SSL structures follow (these are copied by S
884 unsigned long options;
885 unsigned long mode;
886 long max_cert_list;

888 struct cert_st /* CERT */ *cert;
889 int read_ahead;

891 /* callback that allows applications to peek at protocol messages */
892 void (*msg_callback)(int write_p, int version, int content_type, const v
893 void *msg_callback_arg);

895 int verify_mode;
896 unsigned int sid_ctx_length;
897 unsigned char sid_ctx[SSL_MAX_SID_CTX_LENGTH];
898 int (*default_verify_callback)(int ok, X509_STORE_CTX *ctx); /* called 'v

900 /* Default generate session ID callback. */
901 GEN_SESSION_CB generate_session_id;

903 X509_VERIFY_PARAM *param;

905 #if 0
906 int purpose; /* Purpose setting */
907 int trust; /* Trust setting */
908 #endif

910 int quiet_shutdown;

912 /* Maximum amount of data to send in one fragment.
913  * actual record size can be more than this due to
914  * padding and MAC overheads.
915  */
916 unsigned int max_send_fragment;

918 #ifndef OPENSSL_NO_ENGINE
919 /* Engine to pass requests for client certs to

```

```

920      /*
921      ENGINE *client_cert_engine;
922  #endif

924  #ifndef OPENSSL_NO_TLSEXT
925      /* TLS extensions servername callback */
926      int (*tlsext_servername_callback)(SSL *, int *, void *);
927      void *tlsext_servername_arg;
928      /* RFC 4507 session ticket keys */
929      unsigned char tlsext_tick_key_name[16];
930      unsigned char tlsext_tick_hmac_key[16];
931      unsigned char tlsext_tick_aes_key[16];
932      /* Callback to support customisation of ticket key setting */
933      int (*tlsext_ticket_key_cb)(SSL *ssl,
934      unsigned char *name, unsigned char *iv,
935      EVP_CIPHER_CTX *ectx,
936      HMAC_CTX *hctx, int enc);

938      /* certificate status request info */
939      /* Callback for status request */
940      int (*tlsext_status_cb)(SSL *ssl, void *arg);
941      void *tlsext_status_arg;

943      /* draft-rescorla-tls-opaque-prf-input-00.txt information */
944      int (*tlsext_opaque_prf_input_callback)(SSL *, void *peerinput, size_t l
945      void *tlsext_opaque_prf_input_callback_arg;
946  #endif

948  #ifndef OPENSSL_NO_PSK
949      char *psk_identity_hint;
950      unsigned int (*psk_client_callback)(SSL *ssl, const char *hint, char *id
951      unsigned int max_identity_len, unsigned char *psk,
952      unsigned int max_psk_len);
953      unsigned int (*psk_server_callback)(SSL *ssl, const char *identity,
954      unsigned char *psk, unsigned int max_psk_len);
955  #endif

957  #ifndef OPENSSL_NO_BUF_FREELISTS
958  #define SSL_MAX_BUF_FREELIST_LEN_DEFAULT 32
959      unsigned int freelist_max_len;
960      struct ssl3_buf_freelist_st *wbuf_freelist;
961      struct ssl3_buf_freelist_st *rbuf_freelist;
962  #endif
963  #ifndef OPENSSL_NO_SRP
964      SRP_CTX srp_ctx; /* ctx for SRP authentication */
965  #endif

967  #ifndef OPENSSL_NO_TLSEXT

969  #ifndef OPENSSL_NO_NEXTPROTONEG
970      /* Next protocol negotiation information */
971      /* (for experimental NPN extension). */

973      /* For a server, this contains a callback function by which the set of
974      * advertised protocols can be provided. */
975      int (*next_protos_advertised_cb)(SSL *s, const unsigned char **buf,
976      unsigned int *len, void *arg);
977      void *next_protos_advertised_cb_arg;
978      /* For a client, this contains a callback function that selects the
979      * next protocol from the list provided by the server. */
980      int (*next_proto_select_cb)(SSL *s, unsigned char **out,
981      unsigned char *outlen,
982      const unsigned char *in,
983      unsigned int inlen,
984      void *arg);
985      void *next_proto_select_cb_arg;

```

```

986  # endif
987      /* SRTP profiles we are willing to do from RFC 5764 */
988      STACK_OF(SRTP_PROTECTION_PROFILE) *srtp_profiles;
989  #endif
990  };

992  #endif

994  #define SSL_SESS_CACHE_OFF 0x0000
995  #define SSL_SESS_CACHE_CLIENT 0x0001
996  #define SSL_SESS_CACHE_SERVER 0x0002
997  #define SSL_SESS_CACHE_BOTH (SSL_SESS_CACHE_CLIENT|SSL_SESS_CACHE_SERVER)
998  #define SSL_SESS_CACHE_NO_AUTO_CLEAR 0x0080
999  /* enough comments already ... see SSL_CTX_set_session_cache_mode(3) */
1000  #define SSL_SESS_CACHE_NO_INTERNAL_LOOKUP 0x0100
1001  #define SSL_SESS_CACHE_NO_INTERNAL_STORE 0x0200
1002  #define SSL_SESS_CACHE_NO_INTERNAL \
1003      (SSL_SESS_CACHE_NO_INTERNAL_LOOKUP|SSL_SESS_CACHE_NO_INTERNAL_STORE)

1005  LHASH_OF(SSL_SESSION) *SSL_CTX_sessions(SSL_CTX *ctx);
1006  #define SSL_CTX_sess_number(ctx) \
1007      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_NUMBER,0,NULL)
1008  #define SSL_CTX_sess_connect(ctx) \
1009      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_CONNECT,0,NULL)
1010  #define SSL_CTX_sess_connect_good(ctx) \
1011      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_CONNECT_GOOD,0,NULL)
1012  #define SSL_CTX_sess_connect_renegotiate(ctx) \
1013      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_CONNECT_RENEGOTIATE,0,NULL)
1014  #define SSL_CTX_sess_accept(ctx) \
1015      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_ACCEPT,0,NULL)
1016  #define SSL_CTX_sess_accept_renegotiate(ctx) \
1017      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_ACCEPT_RENEGOTIATE,0,NULL)
1018  #define SSL_CTX_sess_accept_good(ctx) \
1019      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_ACCEPT_GOOD,0,NULL)
1020  #define SSL_CTX_sess_hits(ctx) \
1021      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_HIT,0,NULL)
1022  #define SSL_CTX_sess_cb_hits(ctx) \
1023      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_CB_HIT,0,NULL)
1024  #define SSL_CTX_sess_misses(ctx) \
1025      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_MISSES,0,NULL)
1026  #define SSL_CTX_sess_timeouts(ctx) \
1027      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_TIMEOUTS,0,NULL)
1028  #define SSL_CTX_sess_cache_full(ctx) \
1029      SSL_CTX_ctrl(ctx,SSL_CTRL_SESS_CACHE_FULL,0,NULL)

1031  void SSL_CTX_sess_set_new_cb(SSL_CTX *ctx, int (*new_session_cb)(struct ssl_st *
1032  int (*SSL_CTX_sess_get_new_cb(SSL_CTX *ctx))(struct ssl_st *ssl, SSL_SESSION *se
1033  void SSL_CTX_sess_set_remove_cb(SSL_CTX *ctx, void (*remove_session_cb)(struct s
1034  void (*SSL_CTX_sess_get_remove_cb(SSL_CTX *ctx))(struct ssl_ctx_st *ctx, SSL_SES
1035  void SSL_CTX_sess_set_get_cb(SSL_CTX *ctx, SSL_SESSION *(*get_session_cb)(struct
1036  SSL_SESSION *(*SSL_CTX_sess_get_get_cb(SSL_CTX *ctx))(struct ssl_st *ssl, unsign
1037  void SSL_CTX_set_info_callback(SSL_CTX *ctx, void (*cb)(const SSL *ssl,int type,
1038  void (*SSL_CTX_get_info_callback(SSL_CTX *ctx))(const SSL *ssl,int type,int val)
1039  void SSL_CTX_set_client_cert_cb(SSL_CTX *ctx, int (*client_cert_cb)(SSL *ssl, X5
1040  int (*SSL_CTX_get_client_cert_cb(SSL_CTX *ctx))(SSL *ssl, X509 **x509, EVP_PKEY
1041  #ifndef OPENSSL_NO_ENGINE
1042  int SSL_CTX_set_client_cert_engine(SSL_CTX *ctx, ENGINE *e);
1043  #endif
1044  void SSL_CTX_set_cookie_generate_cb(SSL_CTX *ctx, int (*app_gen_cookie_cb)(SSL *
1045  void SSL_CTX_set_cookie_verify_cb(SSL_CTX *ctx, int (*app_verify_cookie_cb)(SSL
1046  #ifndef OPENSSL_NO_NEXTPROTONEG
1047  void SSL_CTX_set_next_protos_advertised_cb(SSL_CTX *s,
1048      int (*cb)(SSL *ssl,
1049      const unsigned char **out,
1050      unsigned int *outlen,
1051      void *arg),

```



```

1052         void *arg);
1053 void SSL_CTX_set_next_proto_select_cb(SSL_CTX *s,
1054         int (*cb) (SSL *ssl,
1055         unsigned char **out,
1056         unsigned char *outlen,
1057         const unsigned char *in,
1058         unsigned int inlen,
1059         void *arg),
1060         void *arg);
1062 int SSL_select_next_proto(unsigned char **out, unsigned char *outlen,
1063         const unsigned char *in, unsigned int inlen,
1064         const unsigned char *client, unsigned int client_len);
1065 void SSL_get0_next_proto_negotiated(const SSL *s,
1066         const unsigned char **data, unsigned *len);
1068 #define OPENSSSL_NPN_UNSUPPORTED 0
1069 #define OPENSSSL_NPN_NEGOTIATED 1
1070 #define OPENSSSL_NPN_NO_OVERLAP 2
1071 #endif
1073 #ifndef OPENSSSL_NO_PSK
1074 /* the maximum length of the buffer given to callbacks containing the
1075  * resulting identity/psk */
1076 #define PSK_MAX_IDENTITY_LEN 128
1077 #define PSK_MAX_PSK_LEN 256
1078 void SSL_CTX_set_psk_client_callback(SSL_CTX *ctx,
1079         unsigned int (*psk_client_callback)(SSL *ssl, const char *hint,
1080         char *identity, unsigned int max_identity_len, unsigned char *psk,
1081         unsigned int max_psk_len));
1082 void SSL_set_psk_client_callback(SSL *ssl,
1083         unsigned int (*psk_client_callback)(SSL *ssl, const char *hint,
1084         char *identity, unsigned int max_identity_len, unsigned char *psk,
1085         unsigned int max_psk_len));
1086 void SSL_CTX_set_psk_server_callback(SSL_CTX *ctx,
1087         unsigned int (*psk_server_callback)(SSL *ssl, const char *identity,
1088         unsigned char *psk, unsigned int max_psk_len));
1089 void SSL_set_psk_server_callback(SSL *ssl,
1090         unsigned int (*psk_server_callback)(SSL *ssl, const char *identity,
1091         unsigned char *psk, unsigned int max_psk_len));
1092 int SSL_CTX_use_psk_identity_hint(SSL_CTX *ctx, const char *identity_hint);
1093 int SSL_use_psk_identity_hint(SSL *s, const char *identity_hint);
1094 const char *SSL_get_psk_identity_hint(const SSL *s);
1095 const char *SSL_get_psk_identity(const SSL *s);
1096 #endif
1098 #define SSL_NOTHING 1
1099 #define SSL_WRITING 2
1100 #define SSL_READING 3
1101 #define SSL_X509_LOOKUP 4
1103 /* These will only be used when doing non-blocking IO */
1104 #define SSL_want_nothing(s) (SSL_want(s) == SSL_NOTHING)
1105 #define SSL_want_read(s) (SSL_want(s) == SSL_READING)
1106 #define SSL_want_write(s) (SSL_want(s) == SSL_WRITING)
1107 #define SSL_want_x509_lookup(s) (SSL_want(s) == SSL_X509_LOOKUP)
1109 #define SSL_MAC_FLAG_READ_MAC_STREAM 1
1110 #define SSL_MAC_FLAG_WRITE_MAC_STREAM 2
1112 #ifndef OPENSSSL_NO_SSL_INTERN
1114 struct ssl_st
1115 {
1116     /* protocol version
1117      * (one of SSL2_VERSION, SSL3_VERSION, TLS1_VERSION, DTLS1_VERSION)

```

```

1118     */
1119     int version;
1120     int type; /* SSL_ST_CONNECT or SSL_ST_ACCEPT */
1122     const SSL_METHOD *method; /* SSLv3 */
1124     /* There are 2 BIO's even though they are normally both the
1125      * same. This is so data can be read and written to different
1126      * handlers */
1128 #ifndef OPENSSSL_NO_BIO
1129     BIO *rbio; /* used by SSL_read */
1130     BIO *wbio; /* used by SSL_write */
1131     BIO *bbio; /* used during session-id reuse to concatenate
1132      * messages */
1133 #else
1134     char *rbio; /* used by SSL_read */
1135     char *wbio; /* used by SSL_write */
1136     char *bbio;
1137 #endif
1138     /* This holds a variable that indicates what we were doing
1139      * when a 0 or -1 is returned. This is needed for
1140      * non-blocking IO so we know what request needs re-doing when
1141      * in SSL_accept or SSL_connect */
1142     int rwstate;
1144     /* true when we are actually in SSL_accept() or SSL_connect() */
1145     int in_handshake;
1146     int (*handshake_func)(SSL *);
1148     /* Imagine that here's a boolean member "init" that is
1149      * switched as soon as SSL_set_{accept/connect}_state
1150      * is called for the first time, so that "state" and
1151      * "handshake_func" are properly initialized. But as
1152      * handshake_func is == 0 until then, we use this
1153      * test instead of an "init" member.
1154     */
1156     int server; /* are we the server side? - mostly used by SSL_clear*/
1158     int new_session; /* Generate a new session or reuse an old one.
1159      * NB: For servers, the 'new' session may actually be a
1160      * cached session or even the previous session unless
1161      * SSL_OP_NO_SESSION_RESUMPTION_ON_RENEGOTIATION is set
1162     int quiet_shutdown; /* don't send shutdown packets */
1163     int shutdown; /* we have shut things down, 0x01 sent, 0x02
1164      * for received */
1165     int state; /* where we are */
1166     int rstate; /* where we are when reading */
1168     BUF_MEM *init_buf; /* buffer used during init */
1169     void *init_msg; /* pointer to handshake message body, set by ssl
1170     int init_num; /* amount read/written */
1171     int init_off; /* amount read/written */
1173     /* used internally to point at a raw packet */
1174     unsigned char *packet;
1175     unsigned int packet_length;
1177     struct ssl2_state_st *s2; /* SSLv2 variables */
1178     struct ssl3_state_st *s3; /* SSLv3 variables */
1179     struct dtls1_state_st *d1; /* DTLSv1 variables */
1181     int read_ahead; /* Read as many input bytes as possible
1182      * (for non-blocking reads) */

```

```

1184 /* callback that allows applications to peek at protocol messages */
1185 void (*msg_callback)(int write_p, int version, int content_type, const v
1186 void *msg_callback_arg;

1188 int hit; /* reusing a previous session */

1190 X509_VERIFY_PARAM *param;

1192 #if 0
1193 int purpose; /* Purpose setting */
1194 int trust; /* Trust setting */
1195 #endif

1197 /* crypto */
1198 STACK_OF(SSL_CIPHER) *cipher_list;
1199 STACK_OF(SSL_CIPHER) *cipher_list_by_id;

1201 /* These are the ones being used, the ones in SSL_SESSION are
1202 * the ones to be 'copied' into these ones */
1203 int mac_flags;
1204 EVP_CIPHER_CTX *enc_read_ctx; /* cryptographic state */
1205 EVP_MD_CTX *read_hash; /* used for mac generation */
1206 #ifndef OPENSSL_NO_COMP
1207 COMP_CTX *expand; /* uncompress */
1208 #else
1209 char *expand;
1210 #endif

1212 EVP_CIPHER_CTX *enc_write_ctx; /* cryptographic state */
1213 EVP_MD_CTX *write_hash; /* used for mac generation */
1214 #ifndef OPENSSL_NO_COMP
1215 COMP_CTX *compress; /* compression */
1216 #else
1217 char *compress;
1218 #endif

1220 /* session info */

1222 /* client cert? */
1223 /* This is used to hold the server certificate used */
1224 struct cert_st /* CERT */ *cert;

1226 /* the session_id_context is used to ensure sessions are only reused
1227 * in the appropriate context */
1228 unsigned int sid_ctx_length;
1229 unsigned char sid_ctx[SSL_MAX_SID_CTX_LENGTH];

1231 /* This can also be in the session once a session is established */
1232 SSL_SESSION *session;

1234 /* Default generate session ID callback. */
1235 GEN_SESSION_CB generate_session_id;

1237 /* Used in SSL2 and SSL3 */
1238 int verify_mode; /* 0 don't care about verify failure.
1239 * 1 fail if verify fails */
1240 int (*verify_callback)(int ok, X509_STORE_CTX *ctx); /* fail if callback

1242 void (*info_callback)(const SSL *ssl, int type, int val); /* optional info

1244 int error; /* error bytes to be written */
1245 int error_code; /* actual code */

1247 #ifndef OPENSSL_NO_KRB5
1248 KSSL_CTX *kssl_ctx; /* Kerberos 5 context */
1249 #endif

```

```

1251 #ifndef OPENSSL_NO_PSK
1252 unsigned int (*psk_client_callback)(SSL *ssl, const char *hint, char *id
1253 unsigned int max_identity_len, unsigned char *psk,
1254 unsigned int max_psk_len);
1255 unsigned int (*psk_server_callback)(SSL *ssl, const char *identity,
1256 unsigned char *psk, unsigned int max_psk_len);
1257 #endif

1259 SSL_CTX *ctx;
1260 /* set this flag to 1 and a sleep(1) is put into all SSL_read()
1261 * and SSL_write() calls, good for nbio debugging :- */
1262 int debug;

1264 /* extra application data */
1265 long verify_result;
1266 CRYPTO_EX_DATA ex_data;

1268 /* for server side, keep the list of CA_dn we can use */
1269 STACK_OF(X509_NAME) *client_CA;

1271 int references;
1272 unsigned long options; /* protocol behaviour */
1273 unsigned long mode; /* API behaviour */
1274 long max_cert_list;
1275 int first_packet;
1276 int client_version; /* what was passed, used for
1277 * SSLv3/TLS rollback check */
1278 unsigned int max_send_fragment;
1279 #ifndef OPENSSL_NO_TLSEXT
1280 /* TLS extension debug callback */
1281 void (*tlsext_debug_cb)(SSL *s, int client_server, int type,
1282 unsigned char *data, int len,
1283 void *arg);
1284 void *tlsext_debug_arg;
1285 char *tlsext_hostname;
1286 int servername_done; /* no further mod of servername
1287 0 : call the servername extension callback.
1288 1 : prepare 2, allow last ack just after in se
1289 2 : don't call servername callback, no ack in
1290 */
1291 /* certificate status request info */
1292 /* Status type or -1 if no status type */
1293 int tlsext_status_type;
1294 /* Expect OCSF CertificateStatus message */
1295 int tlsext_status_expected;
1296 /* OCSF status request only */
1297 STACK_OF(OCSP_RESPID) *tlsext_ocsp_ids;
1298 X509_EXTENSIONS *tlsext_ocsp_exts;
1299 /* OCSF response received or to be sent */
1300 unsigned char *tlsext_ocsp_resp;
1301 int tlsext_ocsp_resplen;

1303 /* RFC4507 session ticket expected to be received or sent */
1304 int tlsext_ticket_expected;
1305 #ifndef OPENSSL_NO_EC
1306 size_t tlsext_ecpointformatlist_length;
1307 unsigned char *tlsext_ecpointformatlist; /* our list */
1308 size_t tlsext_ellipticcurvelist_length;
1309 unsigned char *tlsext_ellipticcurvelist; /* our list */
1310 #endif /* OPENSSL_NO_EC */

1312 /* draft-rescorla-tls-opaque-prf-input-00.txt information to be used for
1313 void *tlsext_opaque_prf_input;
1314 size_t tlsext_opaque_prf_input_len;

```

```

1316 /* TLS Session Ticket extension override */
1317 TLS_SESSION_TICKET_EXT *tlsext_session_ticket;

1319 /* TLS Session Ticket extension callback */
1320 tls_session_ticket_ext_cb_fn tls_session_ticket_ext_cb;
1321 void *tls_session_ticket_ext_cb_arg;

1323 /* TLS pre-shared secret session resumption */
1324 tls_session_secret_cb_fn tls_session_secret_cb;
1325 void *tls_session_secret_cb_arg;

1327 SSL_CTX * initial_ctx; /* initial ctx, used to store sessions */

1329 #ifndef OPENSSL_NO_NEXTPROTONEG
1330 /* Next protocol negotiation. For the client, this is the protocol that
1331  * we sent in NextProtocol and is set when handling ServerHello
1332  * extensions.
1333  * For a server, this is the client's selected_protocol from
1334  * NextProtocol and is set when handling the NextProtocol message,
1335  * before the Finished message. */
1336 unsigned char *next_proto_negotiated;
1337 unsigned char next_proto_negotiated_len;
1338 #endif

1341 #define session_ctx initial_ctx

1343 STACK_OF(SRTP_PROTECTION_PROFILE) *srtp_profiles; /* What we'll do */
1344 SRTP_PROTECTION_PROFILE *srtp_profile; /* What's been chosen

1346 unsigned int tlsext_heartbeat; /* Is use of the Heartbeat extension neg
1347 0: disabled
1348 1: enabled
1349 2: enabled, but not allowed to send R
1350 */
1351 unsigned int tlsext_hb_pending; /* Indicates if a HeartbeatRequest is in
1352 unsigned int tlsext_hb_seq; /* HeartbeatRequest sequence number */
1353 #else
1354 #define session_ctx ctx
1355 #endif /* OPENSSL_NO_TLSEXT */

1357 int renegotiate; /* 1 if we are renegotiating.
1358 * 2 if we are a server and are inside a handshake
1359 * (i.e. not just sending a HelloRequest) */

1361 #ifndef OPENSSL_NO_SRP
1362 SRP_CTX srp_ctx; /* ctx for SRP authentication */
1363 #endif
1364 };

1366 #endif

1368 #ifdef __cplusplus
1369 }
1370 #endif

1372 #include <openssl/ssl2.h>
1373 #include <openssl/ssl3.h>
1374 #include <openssl/tls1.h> /* This is mostly sslv3 with a few tweaks */
1375 #include <openssl/dtls1.h> /* Datagram TLS */
1376 #include <openssl/ssl23.h>
1377 #include <openssl/srtp.h> /* Support for the use_srtp extension */

1379 #ifdef __cplusplus
1380 extern "C" {
1381 #endif

```

```

1383 /* compatibility */
1384 #define SSL_set_app_data(s,arg) (SSL_set_ex_data(s,0,(char *)arg))
1385 #define SSL_get_app_data(s) (SSL_get_ex_data(s,0))
1386 #define SSL_SESSION_set_app_data(s,a) (SSL_SESSION_set_ex_data(s,0,(char *)a))
1387 #define SSL_SESSION_get_app_data(s) (SSL_SESSION_get_ex_data(s,0))
1388 #define SSL_CTX_get_app_data(ctx) (SSL_CTX_get_ex_data(ctx,0))
1389 #define SSL_CTX_set_app_data(ctx,arg) (SSL_CTX_set_ex_data(ctx,0,(char *)arg))

1391 /* The following are the possible values for ssl->state are are
1392  * used to indicate where we are up to in the SSL connection establishment.
1393  * The macros that follow are about the only things you should need to use
1394  * and even then, only when using non-blocking IO.
1395  * It can also be useful to work out where you were when the connection
1396  * failed */

1398 #define SSL_ST_CONNECT 0x1000
1399 #define SSL_ST_ACCEPT 0x2000
1400 #define SSL_ST_MASK 0x0FFF
1401 #define SSL_ST_INIT (SSL_ST_CONNECT|SSL_ST_ACCEPT)
1402 #define SSL_ST_BEFORE 0x4000
1403 #define SSL_ST_OK 0x03
1404 #define SSL_ST_RENEGOTIATE (0x04|SSL_ST_INIT)

1406 #define SSL_CB_LOOP 0x01
1407 #define SSL_CB_EXIT 0x02
1408 #define SSL_CB_READ 0x04
1409 #define SSL_CB_WRITE 0x08
1410 #define SSL_CB_ALERT 0x4000 /* used in callback */
1411 #define SSL_CB_READ_ALERT (SSL_CB_ALERT|SSL_CB_READ)
1412 #define SSL_CB_WRITE_ALERT (SSL_CB_ALERT|SSL_CB_WRITE)
1413 #define SSL_CB_ACCEPT_LOOP (SSL_ST_ACCEPT|SSL_CB_LOOP)
1414 #define SSL_CB_ACCEPT_EXIT (SSL_ST_ACCEPT|SSL_CB_EXIT)
1415 #define SSL_CB_CONNECT_LOOP (SSL_ST_CONNECT|SSL_CB_LOOP)
1416 #define SSL_CB_CONNECT_EXIT (SSL_ST_CONNECT|SSL_CB_EXIT)
1417 #define SSL_CB_HANDSHAKE_START 0x10
1418 #define SSL_CB_HANDSHAKE_DONE 0x20

1420 /* Is the SSL connection established? */
1421 #define SSL_get_state(a) SSL_state(a)
1422 #define SSL_is_init_finished(a) (SSL_state(a) == SSL_ST_OK)
1423 #define SSL_in_init(a) (SSL_state(a)&SSL_ST_INIT)
1424 #define SSL_in_before(a) (SSL_state(a)&SSL_ST_BEFORE)
1425 #define SSL_in_connect_init(a) (SSL_state(a)&SSL_ST_CONNECT)
1426 #define SSL_in_accept_init(a) (SSL_state(a)&SSL_ST_ACCEPT)

1428 /* The following 2 states are kept in ssl->rstate when reads fail,
1429  * you should not need these */
1430 #define SSL_ST_READ_HEADER 0xF0
1431 #define SSL_ST_READ_BODY 0xF1
1432 #define SSL_ST_READ_DONE 0xF2

1434 /* Obtain latest Finished message
1435  * -- that we sent (SSL_get_finished)
1436  * -- that we expected from peer (SSL_get_peer_finished).
1437  * Returns length (0 == no Finished so far), copies up to 'count' bytes. */
1438 size_t SSL_get_finished(const SSL *s, void *buf, size_t count);
1439 size_t SSL_get_peer_finished(const SSL *s, void *buf, size_t count);

1441 /* use either SSL_VERIFY_NONE or SSL_VERIFY_PEER, the last 2 options
1442  * are 'ored' with SSL_VERIFY_PEER if they are desired */
1443 #define SSL_VERIFY_NONE 0x00
1444 #define SSL_VERIFY_PEER 0x01
1445 #define SSL_VERIFY_FAIL_IF_NO_PEER_CERT 0x02
1446 #define SSL_VERIFY_CLIENT_ONCE 0x04

```

```

1448 #define OpenSSL_add_ssl_algorithms()    SSL_library_init()
1449 #define SSLeay_add_ssl_algorithms()     SSL_library_init()

1451 /* this is for backward compatibility */
1452 #if 0 /* NEW_SSLEAY */
1453 #define SSL_CTX_set_default_verify(a,b,c) SSL_CTX_set_verify(a,b,c)
1454 #define SSL_set_pref_cipher(c,n)         SSL_set_cipher_list(c,n)
1455 #define SSL_add_session(a,b)             SSL_CTX_add_session((a),(b))
1456 #define SSL_remove_session(a,b)         SSL_CTX_remove_session((a),(b))
1457 #define SSL_flush_sessions(a,b)         SSL_CTX_flush_sessions((a),(b))
1458 #endif
1459 /* More backward compatibility */
1460 #define SSL_get_cipher(s) \
1461     SSL_CIPHER_get_name(SSL_get_current_cipher(s))
1462 #define SSL_get_cipher_bits(s,np) \
1463     SSL_CIPHER_get_bits(SSL_get_current_cipher(s),np)
1464 #define SSL_get_cipher_version(s) \
1465     SSL_CIPHER_get_version(SSL_get_current_cipher(s))
1466 #define SSL_get_cipher_name(s) \
1467     SSL_CIPHER_get_name(SSL_get_current_cipher(s))
1468 #define SSL_get_time(a) \
1469     SSL_SESSION_get_time((a),(b))
1470 #define SSL_set_time(a,b) \
1471     SSL_SESSION_set_time((a),(b))
1472 #define SSL_get_timeout(a) \
1473     SSL_SESSION_get_timeout((a),(b))
1474 #define SSL_set_timeout(a,b) \
1475     SSL_SESSION_set_timeout((a),(b))

1473 #define d2i_SSL_SESSION_bio(bp,s_id) ASN1_d2i_bio_of(SSL_SESSION,SSL_SESSION_new
1474 #define i2d_SSL_SESSION_bio(bp,s_id) ASN1_i2d_bio_of(SSL_SESSION,i2d_SSL_SESSION

1476 DECLARE_PEM_rw(SSL_SESSION, SSL_SESSION)

1478 #define SSL_AD_REASON_OFFSET            1000 /* offset to get SSL_R... value fr

1480 /* These alert types are for SSLv3 and TLSv1 */
1481 #define SSL_AD_CLOSE_NOTIFY            SSL3_AD_CLOSE_NOTIFY
1482 #define SSL_AD_UNEXPECTED_MESSAGE      SSL3_AD_UNEXPECTED_MESSAGE /* fatal */
1483 #define SSL_AD_BAD_RECORD_MAC          SSL3_AD_BAD_RECORD_MAC /* fatal */
1484 #define SSL_AD_DECRYPTION_FAILED       TLS1_AD_DECRYPTION_FAILED
1485 #define SSL_AD_RECORD_OVERFLOW         TLS1_AD_RECORD_OVERFLOW
1486 #define SSL_AD_DECOMPRESSION_FAILURE  SSL3_AD_DECOMPRESSION_FAILURE /* fatal */
1487 #define SSL_AD_HANDSHAKE_FAILURE       SSL3_AD_HANDSHAKE_FAILURE /* fatal */
1488 #define SSL_AD_NO_CERTIFICATE          SSL3_AD_NO_CERTIFICATE /* Not for TLS */
1489 #define SSL_AD_BAD_CERTIFICATE         SSL3_AD_BAD_CERTIFICATE
1490 #define SSL_AD_UNSUPPORTED_CERTIFICATE SSL3_AD_UNSUPPORTED_CERTIFICATE
1491 #define SSL_AD_CERTIFICATE_REVOKED     SSL3_AD_CERTIFICATE_REVOKED
1492 #define SSL_AD_CERTIFICATE_EXPIRED     SSL3_AD_CERTIFICATE_EXPIRED
1493 #define SSL_AD_CERTIFICATE_UNKNOWN     SSL3_AD_CERTIFICATE_UNKNOWN
1494 #define SSL_AD_ILLEGAL_PARAMETER       SSL3_AD_ILLEGAL_PARAMETER /* fatal */
1495 #define SSL_AD_UNKNOWN_CA              TLS1_AD_UNKNOWN_CA /* fatal */
1496 #define SSL_AD_ACCESS_DENIED           TLS1_AD_ACCESS_DENIED /* fatal */
1497 #define SSL_AD_DECODE_ERROR            TLS1_AD_DECODE_ERROR /* fatal */
1498 #define SSL_AD_DECRYPT_ERROR            TLS1_AD_DECRYPT_ERROR
1499 #define SSL_AD_EXPORT_RESTRICTION       TLS1_AD_EXPORT_RESTRICTION /* fatal */
1500 #define SSL_AD_PROTOCOL_VERSION         TLS1_AD_PROTOCOL_VERSION /* fatal */
1501 #define SSL_AD_INSUFFICIENT_SECURITY   TLS1_AD_INSUFFICIENT_SECURITY /* fatal */
1502 #define SSL_AD_INTERNAL_ERROR          TLS1_AD_INTERNAL_ERROR /* fatal */
1503 #define SSL_AD_USER_CANCELLED          TLS1_AD_USER_CANCELLED
1504 #define SSL_AD_NO_RENEGOTIATION         TLS1_AD_NO_RENEGOTIATION
1505 #define SSL_AD_UNSUPPORTED_EXTENSION   TLS1_AD_UNSUPPORTED_EXTENSION
1506 #define SSL_AD_CERTIFICATE_UNOBTAINABLE TLS1_AD_CERTIFICATE_UNOBTAINABLE
1507 #define SSL_AD_UNRECOGNIZED_NAME       TLS1_AD_UNRECOGNIZED_NAME
1508 #define SSL_AD_BAD_CERTIFICATE_STATUS_RESPONSE TLS1_AD_BAD_CERTIFICATE_STATUS_RE
1509 #define SSL_AD_BAD_CERTIFICATE_HASH_VALUE TLS1_AD_BAD_CERTIFICATE_HASH_VALUE
1510 #define SSL_AD_UNKNOWN_PSK_IDENTITY    TLS1_AD_UNKNOWN_PSK_IDENTITY /* fatal */

1512 #define SSL_ERROR_NONE                  0
1513 #define SSL_ERROR_SSL                   1

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```

1514 #define SSL_ERROR_WANT_READ             2
1515 #define SSL_ERROR_WANT_WRITE            3
1516 #define SSL_ERROR_WANT_X509_LOOKUP      4
1517 #define SSL_ERROR_SYSCALL                5 /* look at error stack/return value/er
1518 #define SSL_ERROR_ZERO_RETURN           6
1519 #define SSL_ERROR_WANT_CONNECT           7
1520 #define SSL_ERROR_WANT_ACCEPT           8

1522 #define SSL_CTRL_NEED_TMP_RSA            1
1523 #define SSL_CTRL_SET_TMP_RSA            2
1524 #define SSL_CTRL_SET_TMP_DH             3
1525 #define SSL_CTRL_SET_TMP_ECDH           4
1526 #define SSL_CTRL_SET_TMP_RSA_CB         5
1527 #define SSL_CTRL_SET_TMP_DH_CB          6
1528 #define SSL_CTRL_SET_TMP_ECDH_CB        7

1530 #define SSL_CTRL_GET_SESSION_REUSED     8
1531 #define SSL_CTRL_GET_CLIENT_CERT_REQUEST 9
1532 #define SSL_CTRL_GET_NUM_RENEGOTIATIONS 10
1533 #define SSL_CTRL_CLEAR_NUM_RENEGOTIATIONS 11
1534 #define SSL_CTRL_GET_TOTAL_RENEGOTIATIONS 12
1535 #define SSL_CTRL_GET_FLAGS              13
1536 #define SSL_CTRL_EXTRA_CHAIN_CERT       14

1538 #define SSL_CTRL_SET_MSG_CALLBACK        15
1539 #define SSL_CTRL_SET_MSG_CALLBACK_ARG    16

1541 /* only applies to datagram connections */
1542 #define SSL_CTRL_SET_MTU                 17
1543 /* Stats */
1544 #define SSL_CTRL_SESS_NUMBER              20
1545 #define SSL_CTRL_SESS_CONNECT            21
1546 #define SSL_CTRL_SESS_CONNECT_GOOD       22
1547 #define SSL_CTRL_SESS_CONNECT_RENEGOTIATE 23
1548 #define SSL_CTRL_SESS_ACCEPT            24
1549 #define SSL_CTRL_SESS_ACCEPT_GOOD        25
1550 #define SSL_CTRL_SESS_ACCEPT_RENEGOTIATE 26
1551 #define SSL_CTRL_SESS_HIT                27
1552 #define SSL_CTRL_SESS_CB_HIT             28
1553 #define SSL_CTRL_SESS_MISSES             29
1554 #define SSL_CTRL_SESS_TIMEOUTS           30
1555 #define SSL_CTRL_SESS_CACHE_FULL         31
1556 #define SSL_CTRL_OPTIONS                 32
1557 #define SSL_CTRL_MODE                    33

1559 #define SSL_CTRL_GET_READ_AHEAD          40
1560 #define SSL_CTRL_SET_READ_AHEAD          41
1561 #define SSL_CTRL_SET_SESS_CACHE_SIZE     42
1562 #define SSL_CTRL_GET_SESS_CACHE_SIZE     43
1563 #define SSL_CTRL_SET_SESS_CACHE_MODE     44
1564 #define SSL_CTRL_GET_SESS_CACHE_MODE     45

1566 #define SSL_CTRL_GET_MAX_CERT_LIST       50
1567 #define SSL_CTRL_SET_MAX_CERT_LIST       51

1569 #define SSL_CTRL_SET_MAX_SEND_FRAGMENT   52

1571 /* see tls1.h for macros based on these */
1572 #ifndef OPENSSL_NO_TLSEXT
1573 #define SSL_CTRL_SET_TLSEXT_SERVERNAME_CB 53
1574 #define SSL_CTRL_SET_TLSEXT_SERVERNAME_ARG 54
1575 #define SSL_CTRL_SET_TLSEXT_HOSTNAME      55
1576 #define SSL_CTRL_SET_TLSEXT_DEBUG_CB      56
1577 #define SSL_CTRL_SET_TLSEXT_DEBUG_ARG     57
1578 #define SSL_CTRL_GET_TLSEXT_TICKET_KEYS   58
1579 #define SSL_CTRL_SET_TLSEXT_TICKET_KEYS   59

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1580 #define SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT 60
1581 #define SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT_CB 61
1582 #define SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT_CB_ARG 62
1583 #define SSL_CTRL_SET_TLSEXT_STATUS_REQ_CB 63
1584 #define SSL_CTRL_SET_TLSEXT_STATUS_REQ_CB_ARG 64
1585 #define SSL_CTRL_SET_TLSEXT_STATUS_REQ_TYPE 65
1586 #define SSL_CTRL_GET_TLSEXT_STATUS_REQ_EXTS 66
1587 #define SSL_CTRL_SET_TLSEXT_STATUS_REQ_EXTS 67
1588 #define SSL_CTRL_GET_TLSEXT_STATUS_REQ_IDS 68
1589 #define SSL_CTRL_SET_TLSEXT_STATUS_REQ_IDS 69
1590 #define SSL_CTRL_GET_TLSEXT_STATUS_REQ_OCSP_RESP 70
1591 #define SSL_CTRL_SET_TLSEXT_STATUS_REQ_OCSP_RESP 71

1593 #define SSL_CTRL_SET_TLSEXT_TICKET_KEY_CB 72

1595 #define SSL_CTRL_SET_TLS_EXT_SRP_USERNAME_CB 75
1596 #define SSL_CTRL_SET_SRP_VERIFY_PARAM_CB 76
1597 #define SSL_CTRL_SET_SRP_GIVE_CLIENT_PWD_CB 77

1599 #define SSL_CTRL_SET_SRP_ARG 78
1600 #define SSL_CTRL_SET_TLS_EXT_SRP_USERNAME 79
1601 #define SSL_CTRL_SET_TLS_EXT_SRP_STRENGTH 80
1602 #define SSL_CTRL_SET_TLS_EXT_SRP_PASSWORD 81
1603 #ifndef OPENSSL_NO_HEARTBEATS
1604 #define SSL_CTRL_TLS_EXT_SEND_HEARTBEAT 85
1605 #define SSL_CTRL_GET_TLS_EXT_HEARTBEAT_PENDING 86
1606 #define SSL_CTRL_SET_TLS_EXT_HEARTBEAT_NO_REQUESTS 87
1607 #endif
1608 #endif

1610 #define DTLS_CTRL_GET_TIMEOUT 73
1611 #define DTLS_CTRL_HANDLE_TIMEOUT 74
1612 #define DTLS_CTRL_LISTEN 75

1614 #define SSL_CTRL_GET_RI_SUPPORT 76
1615 #define SSL_CTRL_CLEAR_OPTIONS 77
1616 #define SSL_CTRL_CLEAR_MODE 78

1618 #define SSL_CTRL_GET_EXTRA_CHAIN_CERTS 82
1619 #define SSL_CTRL_CLEAR_EXTRA_CHAIN_CERTS 83

1621 #define DTLSv1_get_timeout(ssl, arg) \
1622     SSL_ctrl(ssl,DTLS_CTRL_GET_TIMEOUT,0, (void *)arg)
1623 #define DTLSv1_handle_timeout(ssl) \
1624     SSL_ctrl(ssl,DTLS_CTRL_HANDLE_TIMEOUT,0, NULL)
1625 #define DTLSv1_listen(ssl, peer) \
1626     SSL_ctrl(ssl,DTLS_CTRL_LISTEN,0, (void *)peer)

1628 #define SSL_session_reused(ssl) \
1629     SSL_ctrl(ssl,SSL_CTRL_GET_SESSION_REUSED,0,NULL)
1630 #define SSL_num_renegotiations(ssl) \
1631     SSL_ctrl(ssl,SSL_CTRL_GET_NUM_RENEGOTIATIONS,0,NULL)
1632 #define SSL_clear_num_renegotiations(ssl) \
1633     SSL_ctrl(ssl,SSL_CTRL_CLEAR_NUM_RENEGOTIATIONS,0,NULL)
1634 #define SSL_total_renegotiations(ssl) \
1635     SSL_ctrl(ssl,SSL_CTRL_GET_TOTAL_RENEGOTIATIONS,0,NULL)

1637 #define SSL_CTX_need_tmp_RSA(ctx) \
1638     SSL_CTX_ctrl(ctx,SSL_CTRL_NEED_TMP_RSA,0,NULL)
1639 #define SSL_CTX_set_tmp_rsa(ctx,rsa) \
1640     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_TMP_RSA,0,(char *)rsa)
1641 #define SSL_CTX_set_tmp_dh(ctx,dh) \
1642     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_TMP_DH,0,(char *)dh)
1643 #define SSL_CTX_set_tmp_ecdh(ctx,ecdh) \
1644     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_TMP_ECDH,0,(char *)ecdh)

```

```

1646 #define SSL_need_tmp_RSA(ssl) \
1647     SSL_ctrl(ssl,SSL_CTRL_NEED_TMP_RSA,0,NULL)
1648 #define SSL_set_tmp_rsa(ssl,rsa) \
1649     SSL_ctrl(ssl,SSL_CTRL_SET_TMP_RSA,0,(char *)rsa)
1650 #define SSL_set_tmp_dh(ssl,dh) \
1651     SSL_ctrl(ssl,SSL_CTRL_SET_TMP_DH,0,(char *)dh)
1652 #define SSL_set_tmp_ecdh(ssl,ecdh) \
1653     SSL_ctrl(ssl,SSL_CTRL_SET_TMP_ECDH,0,(char *)ecdh)

1655 #define SSL_CTX_add_extra_chain_cert(ctx,x509) \
1656     SSL_CTX_ctrl(ctx,SSL_CTRL_EXTRA_CHAIN_CERT,0,(char *)x509)
1657 #define SSL_CTX_get_extra_chain_certs(ctx,px509) \
1658     SSL_CTX_ctrl(ctx,SSL_CTRL_GET_EXTRA_CHAIN_CERTS,0,px509)
1659 #define SSL_CTX_clear_extra_chain_certs(ctx) \
1660     SSL_CTX_ctrl(ctx,SSL_CTRL_CLEAR_EXTRA_CHAIN_CERTS,0,NULL)

1662 #ifndef OPENSSL_NO_BIO
1663 BIO_METHOD *BIO_f_ssl(void);
1664 BIO *BIO_new_ssl(SSL_CTX *ctx,int client);
1665 BIO *BIO_new_ssl_connect(SSL_CTX *ctx);
1666 BIO *BIO_new_buffer_ssl_connect(SSL_CTX *ctx);
1667 int BIO_ssl_copy_session_id(BIO *to,BIO *from);
1668 void BIO_ssl_shutdown(BIO *ssl_bio);

1670 #endif

1672 int SSL_CTX_set_cipher_list(SSL_CTX *,const char *str);
1673 SSL_CTX *SSL_CTX_new(const SSL_METHOD *meth);
1674 void SSL_CTX_free(SSL_CTX *);
1675 long SSL_CTX_set_timeout(SSL_CTX *ctx,long t);
1676 long SSL_CTX_get_timeout(const SSL_CTX *ctx);
1677 X509_STORE *SSL_CTX_get_cert_store(const SSL_CTX *);
1678 void SSL_CTX_set_cert_store(SSL_CTX *,X509_STORE *);
1679 int SSL_want(const SSL *s);
1680 int SSL_clear(SSL *s);

1682 void SSL_CTX_flush_sessions(SSL_CTX *ctx,long tm);

1684 const SSL_CIPHER *SSL_get_current_cipher(const SSL *s);
1685 int SSL_CIPHER_get_bits(const SSL_CIPHER *c,int *alg_bits);
1686 char * SSL_CIPHER_get_version(const SSL_CIPHER *c);
1687 const char * SSL_CIPHER_get_name(const SSL_CIPHER *c);
1688 unsigned long SSL_CIPHER_get_id(const SSL_CIPHER *c);

1690 int SSL_get_fd(const SSL *s);
1691 int SSL_get_rfd(const SSL *s);
1692 int SSL_get_wfd(const SSL *s);
1693 const char * SSL_get_cipher_list(const SSL *s,int n);
1694 char * SSL_get_shared_ciphers(const SSL *s, char *buf, int len);
1695 int SSL_get_read_ahead(const SSL *s);
1696 int SSL_pending(const SSL *s);
1697 #ifndef OPENSSL_NO_SOCKET
1698 int SSL_set_fd(SSL *s, int fd);
1699 int SSL_set_rfd(SSL *s, int fd);
1700 int SSL_set_wfd(SSL *s, int fd);
1701 #endif
1702 #ifndef OPENSSL_NO_BIO
1703 void SSL_set_bio(SSL *s, BIO *rbio,BIO *wbio);
1704 BIO * SSL_get_rbio(const SSL *s);
1705 BIO * SSL_get_wbio(const SSL *s);
1706 #endif
1707 int SSL_set_cipher_list(SSL *s, const char *str);
1708 void SSL_set_read_ahead(SSL *s, int yes);
1709 int SSL_get_verify_mode(const SSL *s);
1710 int SSL_get_verify_depth(const SSL *s);
1711 int (*SSL_get_verify_callback(const SSL *s))(int,X509_STORE_CTX *);

```

```

1712 void      SSL_set_verify(SSL *s, int mode,
1713                          int (*callback)(int ok,X509_STORE_CTX *ctx));
1714 void      SSL_set_verify_depth(SSL *s, int depth);
1715 #ifndef OPENSSL_NO_RSA
1716 int      SSL_use_RSAPrivateKey(SSL *ssl, RSA *rsa);
1717 #endif
1718 int      SSL_use_RSAPrivateKey_ASN1(SSL *ssl, unsigned char *d, long len);
1719 int      SSL_use_PrivateKey(SSL *ssl, EVP_PKEY *pkey);
1720 int      SSL_use_PrivateKey_ASN1(int pk,SSL *ssl, const unsigned char *d, long le
1721 int      SSL_use_certificate(SSL *ssl, X509 *x);
1722 int      SSL_use_certificate_ASN1(SSL *ssl, const unsigned char *d, int len);

1724 #ifndef OPENSSL_NO_STDIO
1725 int      SSL_use_RSAPrivateKey_file(SSL *ssl, const char *file, int type);
1726 int      SSL_use_PrivateKey_file(SSL *ssl, const char *file, int type);
1727 int      SSL_use_certificate_file(SSL *ssl, const char *file, int type);
1728 int      SSL_CTX_use_RSAPrivateKey_file(SSL_CTX *ctx, const char *file, int type)
1729 int      SSL_CTX_use_PrivateKey_file(SSL_CTX *ctx, const char *file, int type);
1730 int      SSL_CTX_use_certificate_file(SSL_CTX *ctx, const char *file, int type);
1731 int      SSL_CTX_use_certificate_chain_file(SSL_CTX *ctx, const char *file); /* P
1732 STACK_OF(X509_NAME) *SSL_load_client_CA_file(const char *file);
1733 int      SSL_add_file_cert_subjects_to_stack(STACK_OF(X509_NAME) *stackCAs,
1734                                             const char *file);
1735 #ifndef OPENSSL_SYS_VMS
1736 #ifndef OPENSSL_SYS_MACINTOSH_CLASSIC /* XXXXX: Better scheme needed! [was: #ifn
1737 int      SSL_add_dir_cert_subjects_to_stack(STACK_OF(X509_NAME) *stackCAs,
1738                                             const char *dir);
1739 #endif
1740 #endif

1742 #endif

1744 void      SSL_load_error_strings(void );
1745 const char *SSL_state_string(const SSL *s);
1746 const char *SSL_rstate_string(const SSL *s);
1747 const char *SSL_state_string_long(const SSL *s);
1748 const char *SSL_rstate_string_long(const SSL *s);
1749 long      SSL_SESSION_get_time(const SSL_SESSION *s);
1750 long      SSL_SESSION_set_time(SSL_SESSION *s, long t);
1751 long      SSL_SESSION_get_timeout(const SSL_SESSION *s);
1752 long      SSL_SESSION_set_timeout(SSL_SESSION *s, long t);
1753 void      SSL_copy_session_id(SSL *to,const SSL *from);
1754 X509 *SSL_SESSION_get0_peer(SSL_SESSION *s);
1755 int      SSL_SESSION_set1_id_context(SSL_SESSION *s,const unsigned char *sid_ctx,
1756                                     unsigned int sid_ctx_len);

1758 SSL_SESSION *SSL_SESSION_new(void);
1759 const unsigned char *SSL_SESSION_get_id(const SSL_SESSION *s,
1760                                         unsigned int *len);
1761 unsigned int SSL_SESSION_get_compress_id(const SSL_SESSION *s);
1762 #ifndef OPENSSL_NO_FP_API
1763 int      SSL_SESSION_print_fp(FILE *fp,const SSL_SESSION *ses);
1764 #endif
1765 #ifndef OPENSSL_NO_BIO
1766 int      SSL_SESSION_print(BIO *fp,const SSL_SESSION *ses);
1767 #endif
1768 void      SSL_SESSION_free(SSL_SESSION *ses);
1769 int      idd_SSL_SESSION(SSL_SESSION *in,unsigned char **pp);
1770 int      SSL_set_session(SSL *to, SSL_SESSION *session);
1771 int      SSL_CTX_add_session(SSL_CTX *s, SSL_SESSION *c);
1772 int      SSL_CTX_remove_session(SSL_CTX *s, SSL_SESSION *c);
1773 int      SSL_CTX_set_generate_session_id(SSL_CTX *s, GEN_SESSION_CB);
1774 int      SSL_set_generate_session_id(SSL *s, GEN_SESSION_CB);
1775 int      SSL_has_matching_session_id(const SSL *ssl, const unsigned char *id,
1776                                     unsigned int id_len);
1777 SSL_SESSION *d2i_SSL_SESSION(SSL_SESSION **a,const unsigned char **pp,

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1778                                     long length);

1780 #ifndef HEADER_X509_H
1781 X509 * SSL_get_peer_certificate(const SSL *s);
1782 #endif

1784 STACK_OF(X509) *SSL_get_peer_cert_chain(const SSL *s);

1786 int      SSL_CTX_get_verify_mode(const SSL_CTX *ctx);
1787 int      SSL_CTX_get_verify_depth(const SSL_CTX *ctx);
1788 int      (*SSL_CTX_get_verify_callback(const SSL_CTX *ctx))(int,X509_STORE_CTX *);
1789 void      SSL_CTX_set_verify(SSL_CTX *ctx,int mode,
1790                             int (*callback)(int, X509_STORE_CTX *));
1791 void      SSL_CTX_set_verify_depth(SSL_CTX *ctx,int depth);
1792 void      SSL_CTX_set_cert_verify_callback(SSL_CTX *ctx, int (*cb)(X509_STORE_CTX *,v
1793 #ifndef OPENSSL_NO_RSA
1794 int      SSL_CTX_use_RSAPrivateKey(SSL_CTX *ctx, RSA *rsa);
1795 #endif
1796 int      SSL_CTX_use_RSAPrivateKey_ASN1(SSL_CTX *ctx, const unsigned char *d, long le
1797 int      SSL_CTX_use_PrivateKey(SSL_CTX *ctx, EVP_PKEY *pkey);
1798 int      SSL_CTX_use_PrivateKey_ASN1(int pk,SSL_CTX *ctx,
1799                                     const unsigned char *d, long len);
1800 int      SSL_CTX_use_certificate(SSL_CTX *ctx,X509 *x);
1801 int      SSL_CTX_use_certificate_ASN1(SSL_CTX *ctx, int len, const unsigned char *d);

1803 void      SSL_CTX_set_default_passwd_cb(SSL_CTX *ctx, pem_password_cb *cb);
1804 void      SSL_CTX_set_default_passwd_cb_userdata(SSL_CTX *ctx, void *u);

1806 int      SSL_CTX_check_private_key(const SSL_CTX *ctx);
1807 int      SSL_check_private_key(const SSL *ctx);

1809 int      SSL_CTX_set_session_id_context(SSL_CTX *ctx,const unsigned char *sid_ctx
1810                                     unsigned int sid_ctx_len);

1812 SSL *      SSL_new(SSL_CTX *ctx);
1813 int      SSL_set_session_id_context(SSL *ssl,const unsigned char *sid_ctx,
1814                                     unsigned int sid_ctx_len);

1816 int      SSL_CTX_set_purpose(SSL_CTX *s, int purpose);
1817 int      SSL_set_purpose(SSL *s, int purpose);
1818 int      SSL_CTX_set_trust(SSL_CTX *s, int trust);
1819 int      SSL_set_trust(SSL *s, int trust);

1821 int      SSL_CTX_set1_param(SSL_CTX *ctx, X509_VERIFY_PARAM *vpm);
1822 int      SSL_set1_param(SSL *ssl, X509_VERIFY_PARAM *vpm);

1824 #ifndef OPENSSL_NO_SRP
1825 int      SSL_CTX_set_srp_username(SSL_CTX *ctx,char *name);
1826 int      SSL_CTX_set_srp_password(SSL_CTX *ctx,char *password);
1827 int      SSL_CTX_set_srp_strength(SSL_CTX *ctx, int strength);
1828 int      SSL_CTX_set_srp_client_pwd_callback(SSL_CTX *ctx,
1829                                             char *(*cb)(SSL *,void *));
1830 int      SSL_CTX_set_srp_verify_param_callback(SSL_CTX *ctx,
1831                                             int (*cb)(SSL *,void *));
1832 int      SSL_CTX_set_srp_username_callback(SSL_CTX *ctx,
1833                                             int (*cb)(SSL *,int *,void *));
1834 int      SSL_CTX_set_srp_cb_arg(SSL_CTX *ctx, void *arg);

1836 int      SSL_set_srp_server_param(SSL *s, const BIGNUM *N, const BIGNUM *g,
1837                                   BIGNUM *sa, BIGNUM *v, char *info);
1838 int      SSL_set_srp_server_param_pw(SSL *s, const char *user, const char *pass,
1839                                       const char *grp);

1841 BIGNUM *SSL_get_srp_g(SSL *s);
1842 BIGNUM *SSL_get_srp_N(SSL *s);

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```

1844 char *SSL_get_srp_username(SSL *s);
1845 char *SSL_get_srp_userinfo(SSL *s);
1846 #endif

1848 void    SSL_free(SSL *ssl);
1849 int     SSL_accept(SSL *ssl);
1850 int     SSL_connect(SSL *ssl);
1851 int     SSL_read(SSL *ssl,void *buf,int num);
1852 int     SSL_peek(SSL *ssl,void *buf,int num);
1853 int     SSL_write(SSL *ssl,const void *buf,int num);
1854 long    SSL_ctrl(SSL *ssl,int cmd, long larg, void *parg);
1855 long    SSL_callback_ctrl(SSL *, int, void (*)(void));
1856 long    SSL_CTX_ctrl(SSL_CTX *ctx,int cmd, long larg, void *parg);
1857 long    SSL_CTX_callback_ctrl(SSL_CTX *, int, void (*)(void));

1859 int     SSL_get_error(const SSL *s,int ret_code);
1860 const char *SSL_get_version(const SSL *s);

1862 /* This sets the 'default' SSL version that SSL_new() will create */
1863 int     SSL_CTX_set_ssl_version(SSL_CTX *ctx, const SSL_METHOD *meth);

1865 #ifndef OPENSSL_NO_SSL2
1866 const SSL_METHOD *SSLv2_method(void);          /* SSLv2 */
1867 const SSL_METHOD *SSLv2_server_method(void);   /* SSLv2 */
1868 const SSL_METHOD *SSLv2_client_method(void);   /* SSLv2 */
1869 #endif

1871 const SSL_METHOD *SSLv3_method(void);          /* SSLv3 */
1872 const SSL_METHOD *SSLv3_server_method(void);   /* SSLv3 */
1873 const SSL_METHOD *SSLv3_client_method(void);   /* SSLv3 */

1875 const SSL_METHOD *SSLv23_method(void); /* SSLv3 but can rollback to v2 */
1876 const SSL_METHOD *SSLv23_server_method(void); /* SSLv3 but can rollback to v2 */
1877 const SSL_METHOD *SSLv23_client_method(void); /* SSLv3 but can rollback to v2 */

1879 const SSL_METHOD *TLSv1_method(void);          /* TLSv1.0 */
1880 const SSL_METHOD *TLSv1_server_method(void);   /* TLSv1.0 */
1881 const SSL_METHOD *TLSv1_client_method(void);   /* TLSv1.0 */

1883 const SSL_METHOD *TLSv1_1_method(void);        /* TLSv1.1 */
1884 const SSL_METHOD *TLSv1_1_server_method(void); /* TLSv1.1 */
1885 const SSL_METHOD *TLSv1_1_client_method(void); /* TLSv1.1 */

1887 const SSL_METHOD *TLSv1_2_method(void);        /* TLSv1.2 */
1888 const SSL_METHOD *TLSv1_2_server_method(void); /* TLSv1.2 */
1889 const SSL_METHOD *TLSv1_2_client_method(void); /* TLSv1.2 */

1892 const SSL_METHOD *DTLSv1_method(void);          /* DTLSv1.0 */
1893 const SSL_METHOD *DTLSv1_server_method(void);   /* DTLSv1.0 */
1894 const SSL_METHOD *DTLSv1_client_method(void);   /* DTLSv1.0 */

1896 STACK_OF(SSL_CIPHER) *SSL_get_ciphers(const SSL *s);

1898 int     SSL_do_handshake(SSL *s);
1899 int     SSL_renegotiate(SSL *s);
1900 int     SSL_renegotiate_abbreviated(SSL *s);
1901 int     SSL_renegotiate_pending(SSL *s);
1902 int     SSL_shutdown(SSL *s);

1904 const SSL_METHOD *SSL_get_ssl_method(SSL *s);
1905 int     SSL_set_ssl_method(SSL *s, const SSL_METHOD *method);
1906 const char *SSL_alert_type_string_long(int value);
1907 const char *SSL_alert_type_string(int value);
1908 const char *SSL_alert_desc_string_long(int value);
1909 const char *SSL_alert_desc_string(int value);

```

```

1911 void     SSL_set_client_CA_list(SSL *s, STACK_OF(X509_NAME) *name_list);
1912 void     SSL_CTX_set_client_CA_list(SSL_CTX *ctx, STACK_OF(X509_NAME) *name_list);
1913 STACK_OF(X509_NAME) *SSL_get_client_CA_list(const SSL *s);
1914 STACK_OF(X509_NAME) *SSL_CTX_get_client_CA_list(const SSL_CTX *s);
1915 int     SSL_add_client_CA(SSL *ssl,X509 *x);
1916 int     SSL_CTX_add_client_CA(SSL_CTX *ctx,X509 *x);

1918 void     SSL_set_connect_state(SSL *s);
1919 void     SSL_set_accept_state(SSL *s);

1921 long     SSL_get_default_timeout(const SSL *s);

1923 int     SSL_library_init(void );

1925 char *SSL_CIPHER_description(const SSL_CIPHER *,char *buf,int size);
1926 STACK_OF(X509_NAME) *SSL_dup_CA_list(STACK_OF(X509_NAME) *sk);

1928 SSL *SSL_dup(SSL *ssl);

1930 X509 *SSL_get_certificate(const SSL *ssl);
1931 /* EVP_PKEY */ struct evp_pkey_st *SSL_get_privatekey(SSL *ssl);

1933 void     SSL_CTX_set_quiet_shutdown(SSL_CTX *ctx,int mode);
1934 int     SSL_CTX_get_quiet_shutdown(const SSL_CTX *ctx);
1935 void     SSL_set_quiet_shutdown(SSL *ssl,int mode);
1936 int     SSL_get_quiet_shutdown(const SSL *ssl);
1937 void     SSL_set_shutdown(SSL *ssl,int mode);
1938 int     SSL_get_shutdown(const SSL *ssl);
1939 int     SSL_version(const SSL *ssl);
1940 int     SSL_CTX_set_default_verify_paths(SSL_CTX *ctx);
1941 int     SSL_CTX_load_verify_locations(SSL_CTX *ctx, const char *CAfile,
1942                                     const char *CApath);
1943 #define SSL_get0_session SSL_get_session /* just peek at pointer */
1944 SSL_SESSION *SSL_get_session(const SSL *ssl);
1945 SSL_SESSION *SSL_get1_session(SSL *ssl); /* obtain a reference count */
1946 SSL_CTX *SSL_get_SSL_CTX(const SSL *ssl);
1947 SSL_CTX *SSL_set_SSL_CTX(SSL *ssl, SSL_CTX * ctx);
1948 void     SSL_set_info_callback(SSL *ssl,
1949                               void (*cb)(const SSL *ssl,int type,int val));
1950 void (*SSL_get_info_callback(const SSL *ssl))(const SSL *ssl,int type,int val);
1951 int     SSL_state(const SSL *ssl);
1952 void     SSL_set_state(SSL *ssl, int state);

1954 void     SSL_set_verify_result(SSL *ssl,long v);
1955 long     SSL_get_verify_result(const SSL *ssl);

1957 int     SSL_set_ex_data(SSL *ssl,int idx,void *data);
1958 void *SSL_get_ex_data(const SSL *ssl,int idx);
1959 int     SSL_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
1960                             CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);

1962 int     SSL_SESSION_set_ex_data(SSL_SESSION *ss,int idx,void *data);
1963 void *SSL_SESSION_get_ex_data(const SSL_SESSION *ss,int idx);
1964 int     SSL_SESSION_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
1965                                     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);

1967 int     SSL_CTX_set_ex_data(SSL_CTX *ssl,int idx,void *data);
1968 void *SSL_CTX_get_ex_data(const SSL_CTX *ssl,int idx);
1969 int     SSL_CTX_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
1970                                 CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);

1972 int     SSL_get_ex_data_X509_STORE_CTX_idx(void );

1974 #define SSL_CTX_sess_set_cache_size(ctx,t) \
1975     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_SESS_CACHE_SIZE,t,NULL)

```

```

1976 #define SSL_CTX_sess_get_cache_size(ctx) \
1977     SSL_CTX_ctrl(ctx,SSL_CTRL_GET_SESS_CACHE_SIZE,0,NULL)
1978 #define SSL_CTX_set_session_cache_mode(ctx,m) \
1979     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_SESS_CACHE_MODE,m,NULL)
1980 #define SSL_CTX_get_session_cache_mode(ctx) \
1981     SSL_CTX_ctrl(ctx,SSL_CTRL_GET_SESS_CACHE_MODE,0,NULL)
1982
1983 #define SSL_CTX_get_default_read_ahead(ctx) SSL_CTX_get_read_ahead(ctx)
1984 #define SSL_CTX_set_default_read_ahead(ctx,m) SSL_CTX_set_read_ahead(ctx,m)
1985 #define SSL_CTX_get_read_ahead(ctx) \
1986     SSL_CTX_ctrl(ctx,SSL_CTRL_GET_READ_AHEAD,0,NULL)
1987 #define SSL_CTX_set_read_ahead(ctx,m) \
1988     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_READ_AHEAD,m,NULL)
1989 #define SSL_CTX_get_max_cert_list(ctx) \
1990     SSL_CTX_ctrl(ctx,SSL_CTRL_GET_MAX_CERT_LIST,0,NULL)
1991 #define SSL_CTX_set_max_cert_list(ctx,m) \
1992     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_MAX_CERT_LIST,m,NULL)
1993 #define SSL_get_max_cert_list(ssl) \
1994     SSL_ctrl(ssl,SSL_CTRL_GET_MAX_CERT_LIST,0,NULL)
1995 #define SSL_set_max_cert_list(ssl,m) \
1996     SSL_ctrl(ssl,SSL_CTRL_SET_MAX_CERT_LIST,m,NULL)
1997
1998 #define SSL_CTX_set_max_send_fragment(ctx,m) \
1999     SSL_CTX_ctrl(ctx,SSL_CTRL_SET_MAX_SEND_FRAGMENT,m,NULL)
2000 #define SSL_set_max_send_fragment(ssl,m) \
2001     SSL_ctrl(ssl,SSL_CTRL_SET_MAX_SEND_FRAGMENT,m,NULL)
2002
2003     /* NB: the keylength is only applicable when is_export is true */
2004 #ifndef OPENSSL_NO_RSA
2005 void SSL_CTX_set_tmp_rsa_callback(SSL_CTX *ctx,
2006     RSA *(*cb)(SSL *ssl,int is_export,
2007     int keylength));
2008
2009 void SSL_set_tmp_rsa_callback(SSL *ssl,
2010     RSA *(*cb)(SSL *ssl,int is_export,
2011     int keylength));
2012 #endif
2013 #ifndef OPENSSL_NO_DH
2014 void SSL_CTX_set_tmp_dh_callback(SSL_CTX *ctx,
2015     DH *(*dh)(SSL *ssl,int is_export,
2016     int keylength));
2017 void SSL_set_tmp_dh_callback(SSL *ssl,
2018     DH *(*dh)(SSL *ssl,int is_export,
2019     int keylength));
2020 #endif
2021 #ifndef OPENSSL_NO_ECDH
2022 void SSL_CTX_set_tmp_ecdh_callback(SSL_CTX *ctx,
2023     EC_KEY *(*ecdh)(SSL *ssl,int is_export,
2024     int keylength));
2025 void SSL_set_tmp_ecdh_callback(SSL *ssl,
2026     EC_KEY *(*ecdh)(SSL *ssl,int is_export,
2027     int keylength));
2028 #endif
2029
2030 #ifndef OPENSSL_NO_COMP
2031 const COMP_METHOD *SSL_get_current_compression(SSL *s);
2032 const COMP_METHOD *SSL_get_current_expansion(SSL *s);
2033 const char *SSL_COMP_get_name(const COMP_METHOD *comp);
2034 STACK_OF(SSL_COMP) *SSL_COMP_get_compression_methods(void);
2035 int SSL_COMP_add_compression_method(int id,COMP_METHOD *cm);
2036 #else
2037 const void *SSL_get_current_compression(SSL *s);
2038 const void *SSL_get_current_expansion(SSL *s);
2039 const char *SSL_COMP_get_name(const void *comp);
2040 void *SSL_COMP_get_compression_methods(void);
2041 int SSL_COMP_add_compression_method(int id,void *cm);

```

```

2042 #endif
2043
2044 /* TLS extensions functions */
2045 int SSL_set_session_ticket_ext(SSL *s, void *ext_data, int ext_len);
2046
2047 int SSL_set_session_ticket_ext_cb(SSL *s, tls_session_ticket_ext_cb_fn cb,
2048     void *arg);
2049
2050 /* Pre-shared secret session resumption functions */
2051 int SSL_set_session_secret_cb(SSL *s, tls_session_secret_cb_fn tls_session_secre
2052
2053 void SSL_set_debug(SSL *s, int debug);
2054 int SSL_cache_hit(SSL *s);
2055
2056 /* BEGIN ERROR CODES */
2057 /* The following lines are auto generated by the script mkerr.pl. Any changes
2058 * made after this point may be overwritten when the script is next run.
2059 */
2060 void ERR_load_SSL_strings(void);
2061
2062 /* Error codes for the SSL functions. */
2063
2064 /* Function codes. */
2065 #define SSL_F_CLIENT_CERTIFICATE 100
2066 #define SSL_F_CLIENT_FINISHED 167
2067 #define SSL_F_CLIENT_HELLO 101
2068 #define SSL_F_CLIENT_MASTER_KEY 102
2069 #define SSL_F_D2I_SSL_SESSION 103
2070 #define SSL_F_DO_DTLS1_WRITE 245
2071 #define SSL_F_DO_SSL3_WRITE 104
2072 #define SSL_F_DTLS1_ACCEPT 246
2073 #define SSL_F_DTLS1_ADD_CERT_TO_BUF 295
2074 #define SSL_F_DTLS1_BUFFER_RECORD 247
2075 #define SSL_F_DTLS1_CHECK_TIMEOUT_NUM 316
2076 #define SSL_F_DTLS1_CLIENT_HELLO 248
2077 #define SSL_F_DTLS1_CONNECT 249
2078 #define SSL_F_DTLS1_ENC 250
2079 #define SSL_F_DTLS1_GET_HELLO_VERIFY 251
2080 #define SSL_F_DTLS1_GET_MESSAGE 252
2081 #define SSL_F_DTLS1_GET_MESSAGE_FRAGMENT 253
2082 #define SSL_F_DTLS1_GET_RECORD 254
2083 #define SSL_F_DTLS1_HANDLE_TIMEOUT 297
2084 #define SSL_F_DTLS1_HEARTBEAT 305
2085 #define SSL_F_DTLS1_OUTPUT_CERT_CHAIN 255
2086 #define SSL_F_DTLS1_PREPROCESS_FRAGMENT 288
2087 #define SSL_F_DTLS1_PROCESS_OUT_OF_SEQ_MESSAGE 256
2088 #define SSL_F_DTLS1_PROCESS_RECORD 257
2089 #define SSL_F_DTLS1_READ_BYTES 258
2090 #define SSL_F_DTLS1_READ_FAILED 259
2091 #define SSL_F_DTLS1_SEND_CERTIFICATE_REQUEST 260
2092 #define SSL_F_DTLS1_SEND_CLIENT_CERTIFICATE 261
2093 #define SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE 262
2094 #define SSL_F_DTLS1_SEND_CLIENT_VERIFY 263
2095 #define SSL_F_DTLS1_SEND_HELLO_VERIFY_REQUEST 264
2096 #define SSL_F_DTLS1_SEND_SERVER_CERTIFICATE 265
2097 #define SSL_F_DTLS1_SEND_SERVER_HELLO 266
2098 #define SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE 267
2099 #define SSL_F_DTLS1_WRITE_APP_DATA_BYTES 268
2100 #define SSL_F_GET_CLIENT_FINISHED 105
2101 #define SSL_F_GET_CLIENT_HELLO 106
2102 #define SSL_F_GET_CLIENT_MASTER_KEY 107
2103 #define SSL_F_GET_SERVER_FINISHED 108
2104 #define SSL_F_GET_SERVER_HELLO 109
2105 #define SSL_F_GET_SERVER_VERIFY 110
2106 #define SSL_F_I2D_SSL_SESSION 111
2107 #define SSL_F_READ_N 112

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2108 #define SSL_F_REQUEST_CERTIFICATE 113
2109 #define SSL_F_SERVER_FINISH 239
2110 #define SSL_F_SERVER_HELLO 114
2111 #define SSL_F_SERVER_VERIFY 240
2112 #define SSL_F_SSL23_ACCEPT 115
2113 #define SSL_F_SSL23_CLIENT_HELLO 116
2114 #define SSL_F_SSL23_CONNECT 117
2115 #define SSL_F_SSL23_GET_CLIENT_HELLO 118
2116 #define SSL_F_SSL23_GET_SERVER_HELLO 119
2117 #define SSL_F_SSL23_PEEK 237
2118 #define SSL_F_SSL23_READ 120
2119 #define SSL_F_SSL23_WRITE 121
2120 #define SSL_F_SSL2_ACCEPT 122
2121 #define SSL_F_SSL2_CONNECT 123
2122 #define SSL_F_SSL2_ENC_INIT 124
2123 #define SSL_F_SSL2_GENERATE_KEY_MATERIAL 241
2124 #define SSL_F_SSL2_PEEK 234
2125 #define SSL_F_SSL2_READ 125
2126 #define SSL_F_SSL2_READ_INTERNAL 236
2127 #define SSL_F_SSL2_SET_CERTIFICATE 126
2128 #define SSL_F_SSL2_WRITE 127
2129 #define SSL_F_SSL3_ACCEPT 128
2130 #define SSL_F_SSL3_ADD_CERT_TO_BUF 296
2131 #define SSL_F_SSL3_CALLBACK_CTRL 233
2132 #define SSL_F_SSL3_CHANGE_CIPHER_STATE 129
2133 #define SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM 130
2134 #define SSL_F_SSL3_CHECK_CLIENT_HELLO 304
2135 #define SSL_F_SSL3_CLIENT_HELLO 131
2136 #define SSL_F_SSL3_CONNECT 132
2137 #define SSL_F_SSL3_CTRL 213
2138 #define SSL_F_SSL3_CTX_CTRL 133
2139 #define SSL_F_SSL3_DIGEST_CACHED_RECORDS 293
2140 #define SSL_F_SSL3_DO_CHANGE_CIPHER_SPEC 292
2141 #define SSL_F_SSL3_ENC 134
2142 #define SSL_F_SSL3_GENERATE_KEY_BLOCK 238
2143 #define SSL_F_SSL3_GET_CERTIFICATE_REQUEST 135
2144 #define SSL_F_SSL3_GET_CERT_STATUS 289
2145 #define SSL_F_SSL3_GET_CERT_VERIFY 136
2146 #define SSL_F_SSL3_GET_CLIENT_CERTIFICATE 137
2147 #define SSL_F_SSL3_GET_CLIENT_HELLO 138
2148 #define SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE 139
2149 #define SSL_F_SSL3_GET_FINISHED 140
2150 #define SSL_F_SSL3_GET_KEY_EXCHANGE 141
2151 #define SSL_F_SSL3_GET_MESSAGE 142
2152 #define SSL_F_SSL3_GET_NEW_SESSION_TICKET 283
2153 #define SSL_F_SSL3_GET_NEXT_PROTO 306
2154 #define SSL_F_SSL3_GET_RECORD 143
2155 #define SSL_F_SSL3_GET_SERVER_CERTIFICATE 144
2156 #define SSL_F_SSL3_GET_SERVER_DONE 145
2157 #define SSL_F_SSL3_GET_SERVER_HELLO 146
2158 #define SSL_F_SSL3_HANDSHAKE_MAC 285
2159 #define SSL_F_SSL3_NEW_SESSION_TICKET 287
2160 #define SSL_F_SSL3_OUTPUT_CERT_CHAIN 147
2161 #define SSL_F_SSL3_PEEK 235
2162 #define SSL_F_SSL3_READ_BYTES 148
2163 #define SSL_F_SSL3_READ_N 149
2164 #define SSL_F_SSL3_SEND_CERTIFICATE_REQUEST 150
2165 #define SSL_F_SSL3_SEND_CLIENT_CERTIFICATE 151
2166 #define SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE 152
2167 #define SSL_F_SSL3_SEND_CLIENT_VERIFY 153
2168 #define SSL_F_SSL3_SEND_SERVER_CERTIFICATE 154
2169 #define SSL_F_SSL3_SEND_SERVER_HELLO 242
2170 #define SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE 155
2171 #define SSL_F_SSL3_SETUP_KEY_BLOCK 157
2172 #define SSL_F_SSL3_SETUP_READ_BUFFER 156
2173 #define SSL_F_SSL3_SETUP_WRITE_BUFFER 291
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2174 #define SSL_F_SSL3_WRITE_BYTES 158
2175 #define SSL_F_SSL3_WRITE_PENDING 159
2176 #define SSL_F_SSL_ADD_CLIENTHELLO_RENEGOTIATE_EXT 298
2177 #define SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT 277
2178 #define SSL_F_SSL_ADD_CLIENTHELLO_USE_SRTP_EXT 307
2179 #define SSL_F_SSL_ADD_DIR_CERT_SUBJECTS_TO_STACK 215
2180 #define SSL_F_SSL_ADD_FILE_CERT_SUBJECTS_TO_STACK 216
2181 #define SSL_F_SSL_ADD_SERVERHELLO_RENEGOTIATE_EXT 299
2182 #define SSL_F_SSL_ADD_SERVERHELLO_TLSEXT 278
2183 #define SSL_F_SSL_ADD_SERVERHELLO_USE_SRTP_EXT 308
2184 #define SSL_F_SSL_BAD_METHOD 160
2185 #define SSL_F_SSL_BYTES_TO_CIPHER_LIST 161
2186 #define SSL_F_SSL_CERT_DUP 221
2187 #define SSL_F_SSL_CERT_INST 222
2188 #define SSL_F_SSL_CERT_INSTANTIATE 214
2189 #define SSL_F_SSL_CERT_NEW 162
2190 #define SSL_F_SSL_CHECK_PRIVATE_KEY 163
2191 #define SSL_F_SSL_CHECK_SERVERHELLO_TLSEXT 280
2192 #define SSL_F_SSL_CHECK_SRVR_ECC_CERT_AND_ALG 279
2193 #define SSL_F_SSL_CIPHER_PROCESS_RULESTR 230
2194 #define SSL_F_SSL_CIPHER_STRENGTH_SORT 231
2195 #define SSL_F_SSL_CLEAR 164
2196 #define SSL_F_SSL_COMP_ADD_COMPRESSION_METHOD 165
2197 #define SSL_F_SSL_CREATE_CIPHER_LIST 166
2198 #define SSL_F_SSL_CTRL 232
2199 #define SSL_F_SSL_CTX_CHECK_PRIVATE_KEY 168
2200 #define SSL_F_SSL_CTX_MAKE_PROFILES 309
2201 #define SSL_F_SSL_CTX_NEW 169
2202 #define SSL_F_SSL_CTX_SET_CIPHER_LIST 269
2203 #define SSL_F_SSL_CTX_SET_CLIENT_CERT_ENGINE 290
2204 #define SSL_F_SSL_CTX_SET_PURPOSE 226
2205 #define SSL_F_SSL_CTX_SET_SESSION_ID_CONTEXT 219
2206 #define SSL_F_SSL_CTX_SET_SSL_VERSION 170
2207 #define SSL_F_SSL_CTX_SET_TRUST 229
2208 #define SSL_F_SSL_CTX_USE_CERTIFICATE 171
2209 #define SSL_F_SSL_CTX_USE_CERTIFICATE_ASN1 172
2210 #define SSL_F_SSL_CTX_USE_CERTIFICATE_CHAIN_FILE 220
2211 #define SSL_F_SSL_CTX_USE_CERTIFICATE_FILE 173
2212 #define SSL_F_SSL_CTX_USE_PRIVATEKEY 174
2213 #define SSL_F_SSL_CTX_USE_PRIVATEKEY_ASN1 175
2214 #define SSL_F_SSL_CTX_USE_PRIVATEKEY_FILE 176
2215 #define SSL_F_SSL_CTX_USE_PSK_IDENTITY_HINT 272
2216 #define SSL_F_SSL_CTX_USE_RSAPRIVATEKEY 177
2217 #define SSL_F_SSL_CTX_USE_RSAPRIVATEKEY_ASN1 178
2218 #define SSL_F_SSL_CTX_USE_RSAPRIVATEKEY_FILE 179
2219 #define SSL_F_SSL_DO_HANDSHAKE 180
2220 #define SSL_F_SSL_GET_NEW_SESSION 181
2221 #define SSL_F_SSL_GET_PREV_SESSION 217
2222 #define SSL_F_SSL_GET_SERVER_SEND_CERT 182
2223 #define SSL_F_SSL_GET_SERVER_SEND_PKEY 317
2224 #define SSL_F_SSL_GET_SIGN_PKEY 183
2225 #define SSL_F_SSL_INIT_WBIO_BUFFER 184
2226 #define SSL_F_SSL_LOAD_CLIENT_CA_FILE 185
2227 #define SSL_F_SSL_NEW 186
2228 #define SSL_F_SSL_PARSE_CLIENTHELLO_RENEGOTIATE_EXT 300
2229 #define SSL_F_SSL_PARSE_CLIENTHELLO_TLSEXT 302
2230 #define SSL_F_SSL_PARSE_CLIENTHELLO_USE_SRTP_EXT 310
2231 #define SSL_F_SSL_PARSE_SERVERHELLO_RENEGOTIATE_EXT 301
2232 #define SSL_F_SSL_PARSE_SERVERHELLO_TLSEXT 303
2233 #define SSL_F_SSL_PARSE_SERVERHELLO_USE_SRTP_EXT 311
2234 #define SSL_F_SSL_PEEK 270
2235 #define SSL_F_SSL_PREPARE_CLIENTHELLO_TLSEXT 281
2236 #define SSL_F_SSL_PREPARE_SERVERHELLO_TLSEXT 282
2237 #define SSL_F_SSL_READ 223
2238 #define SSL_F_SSL_RSA_PRIVATE_DECRYPT 187
2239 #define SSL_F_SSL_RSA_PUBLIC_ENCRYPT 188
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2240 #define SSL_F_SSL_SESSION_NEW 189
2241 #define SSL_F_SSL_SESSION_PRINT_FP 190
2242 #define SSL_F_SSL_SESSION_SET1_ID_CONTEXT 312
2243 #define SSL_F_SSL_SESS_CERT_NEW 225
2244 #define SSL_F_SSL_SET_CERT 191
2245 #define SSL_F_SSL_SET_CIPHER_LIST 271
2246 #define SSL_F_SSL_SET_FD 192
2247 #define SSL_F_SSL_SET_PKEY 193
2248 #define SSL_F_SSL_SET_PURPOSE 227
2249 #define SSL_F_SSL_SET_RFD 194
2250 #define SSL_F_SSL_SET_SESSION 195
2251 #define SSL_F_SSL_SET_SESSION_ID_CONTEXT 218
2252 #define SSL_F_SSL_SET_SESSION_TICKET_EXT 294
2253 #define SSL_F_SSL_SET_TRUST 228
2254 #define SSL_F_SSL_SET_WFD 196
2255 #define SSL_F_SSL_SHUTDOWN 224
2256 #define SSL_F_SSL_SRP_CTX_INIT 313
2257 #define SSL_F_SSL_UNDEFINED_CONST_FUNCTION 243
2258 #define SSL_F_SSL_UNDEFINED_FUNCTION 197
2259 #define SSL_F_SSL_UNDEFINED_VOID_FUNCTION 244
2260 #define SSL_F_SSL_USE_CERTIFICATE 198
2261 #define SSL_F_SSL_USE_CERTIFICATE_ASN1 199
2262 #define SSL_F_SSL_USE_CERTIFICATE_FILE 200
2263 #define SSL_F_SSL_USE_PRIVATEKEY 201
2264 #define SSL_F_SSL_USE_PRIVATEKEY_ASN1 202
2265 #define SSL_F_SSL_USE_PRIVATEKEY_FILE 203
2266 #define SSL_F_SSL_USE_PSK_IDENTITY_HINT 273
2267 #define SSL_F_SSL_USE_RSAPRIVATEKEY 204
2268 #define SSL_F_SSL_USE_RSAPRIVATEKEY_ASN1 205
2269 #define SSL_F_SSL_USE_RSAPRIVATEKEY_FILE 206
2270 #define SSL_F_SSL_VERIFY_CERT_CHAIN 207
2271 #define SSL_F_SSL_WRITE 208
2272 #define SSL_F_TLS1_CERT_VERIFY_MAC 286
2273 #define SSL_F_TLS1_CHANGE_CIPHER_STATE 209
2274 #define SSL_F_TLS1_CHECK_SERVERHELLO_TLSEXT 274
2275 #define SSL_F_TLS1_ENC 210
2276 #define SSL_F_TLS1_EXPORT_KEYING_MATERIAL 314
2277 #define SSL_F_TLS1_HEARTBEAT 315
2278 #define SSL_F_TLS1_PREPARE_CLIENTHELLO_TLSEXT 275
2279 #define SSL_F_TLS1_PREPARE_SERVERHELLO_TLSEXT 276
2280 #define SSL_F_TLS1_PRF 284
2281 #define SSL_F_TLS1_SETUP_KEY_BLOCK 211
2282 #define SSL_F_WRITE_PENDING 212

2284 /* Reason codes. */
2285 #define SSL_R_APP_DATA_IN_HANDSHAKE 100
2286 #define SSL_R_ATTEMPT_TO_REUSE_SESSION_IN_DIFFERENT_CONTEXT 272
2287 #define SSL_R_BAD_ALERT_RECORD 101
2288 #define SSL_R_BAD_AUTHENTICATION_TYPE 102
2289 #define SSL_R_BAD_CHANGE_CIPHER_SPEC 103
2290 #define SSL_R_BAD_CHECKSUM 104
2291 #define SSL_R_BAD_DATA_RETURNED_BY_CALLBACK 106
2292 #define SSL_R_BAD_DECOMPRESSION 107
2293 #define SSL_R_BAD_DH_G_LENGTH 108
2294 #define SSL_R_BAD_DH_PUB_KEY_LENGTH 109
2295 #define SSL_R_BAD_DH_P_LENGTH 110
2296 #define SSL_R_BAD_DIGEST_LENGTH 111
2297 #define SSL_R_BAD_DSA_SIGNATURE 112
2298 #define SSL_R_BAD_ECC_CERT 304
2299 #define SSL_R_BAD_ECDSA_SIGNATURE 305
2300 #define SSL_R_BAD_ECPOINT 306
2301 #define SSL_R_BAD_HANDSHAKE_LENGTH 332
2302 #define SSL_R_BAD_HELLO_REQUEST 105
2303 #define SSL_R_BAD_LENGTH 271
2304 #define SSL_R_BAD_MAC_DECODE 113
2305 #define SSL_R_BAD_MAC_LENGTH 333
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2306 #define SSL_R_BAD_MESSAGE_TYPE 114
2307 #define SSL_R_BAD_PACKET_LENGTH 115
2308 #define SSL_R_BAD_PROTOCOL_VERSION_NUMBER 116
2309 #define SSL_R_BAD_PSK_IDENTITY_HINT_LENGTH 316
2310 #define SSL_R_BAD_RESPONSE_ARGUMENT 117
2311 #define SSL_R_BAD_RSA_DECRYPT 118
2312 #define SSL_R_BAD_RSA_ENCRYPT 119
2313 #define SSL_R_BAD_RSA_E_LENGTH 120
2314 #define SSL_R_BAD_RSA_MODULUS_LENGTH 121
2315 #define SSL_R_BAD_RSA_SIGNATURE 122
2316 #define SSL_R_BAD_SIGNATURE 123
2317 #define SSL_R_BAD_SRP_A_LENGTH 347
2318 #define SSL_R_BAD_SRP_B_LENGTH 348
2319 #define SSL_R_BAD_SRP_G_LENGTH 349
2320 #define SSL_R_BAD_SRP_N_LENGTH 350
2321 #define SSL_R_BAD_SRP_S_LENGTH 351
2322 #define SSL_R_BAD_SRTM_KI_VALUE 352
2323 #define SSL_R_BAD_SRTM_PROTECTION_PROFILE_LIST 353
2324 #define SSL_R_BAD_SSL_FILETYPE 124
2325 #define SSL_R_BAD_SSL_SESSION_ID_LENGTH 125
2326 #define SSL_R_BAD_STATE 126
2327 #define SSL_R_BAD_WRITE_RETRY 127
2328 #define SSL_R_BIO_NOT_SET 128
2329 #define SSL_R_BLOCK_CIPHER_PAD_IS_WRONG 129
2330 #define SSL_R_BN_LIB 130
2331 #define SSL_R_CA_DN_LENGTH_MISMATCH 131
2332 #define SSL_R_CA_DN_TOO_LONG 132
2333 #define SSL_R_CCS_RECEIVED_EARLY 133
2334 #define SSL_R_CERTIFICATE_VERIFY_FAILED 134
2335 #define SSL_R_CERT_LENGTH_MISMATCH 135
2336 #define SSL_R_CHALLENGE_IS_DIFFERENT 136
2337 #define SSL_R_CIPHER_CODE_WRONG_LENGTH 137
2338 #define SSL_R_CIPHER_OR_HASH_UNAVAILABLE 138
2339 #define SSL_R_CIPHER_TABLE_SRC_ERROR 139
2340 #define SSL_R_CLIENTHELLO_TLSEXT 226
2341 #define SSL_R_COMPRESSED_LENGTH_TOO_LONG 140
2342 #define SSL_R_COMPRESSION_DISABLED 343
2343 #define SSL_R_COMPRESSION_FAILURE 141
2344 #define SSL_R_COMPRESSION_ID_NOT_WITHIN_PRIVATE_RANGE 307
2345 #define SSL_R_COMPRESSION_LIBRARY_ERROR 142
2346 #define SSL_R_CONNECTION_ID_IS_DIFFERENT 143
2347 #define SSL_R_CONNECTION_TYPE_NOT_SET 144
2348 #define SSL_R_COOKIE_MISMATCH 308
2349 #define SSL_R_DATA_BETWEEN_CCS_AND_FINISHED 145
2350 #define SSL_R_DATA_LENGTH_TOO_LONG 146
2351 #define SSL_R_DECRYPTION_FAILED 147
2352 #define SSL_R_DECRYPTION_FAILED_OR_BAD_RECORD_MAC 281
2353 #define SSL_R_DH_PUBLIC_VALUE_LENGTH_IS_WRONG 148
2354 #define SSL_R_DIGEST_CHECK_FAILED 149
2355 #define SSL_R_DTLS_MESSAGE_TOO_BIG 334
2356 #define SSL_R_DUPLICATE_COMPRESSION_ID 309
2357 #define SSL_R_ECC_CERT_NOT_FOR_KEY_AGREEMENT 317
2358 #define SSL_R_ECC_CERT_NOT_FOR_SIGNING 318
2359 #define SSL_R_ECC_CERT_SHOULD_HAVE_RSA_SIGNATURE 322
2360 #define SSL_R_ECC_CERT_SHOULD_HAVE_SHA1_SIGNATURE 323
2361 #define SSL_R_ECGROUP_TOO_LARGE_FOR_CIPHER 310
2362 #define SSL_R_EMPTY_SRTM_PROTECTION_PROFILE_LIST 354
2363 #define SSL_R_ENCRYPTED_LENGTH_TOO_LONG 150
2364 #define SSL_R_ERROR_GENERATING_TMP_RSA_KEY 282
2365 #define SSL_R_ERROR_IN_RECEIVED_CIPHER_LIST 151
2366 #define SSL_R_EXCESSIVE_MESSAGE_SIZE 152
2367 #define SSL_R_EXTRA_DATA_IN_MESSAGE 153
2368 #define SSL_R_GOT_A_FIN_BEFORE_A_CCS 154
2369 #define SSL_R_GOT_NEXT_PROTO_BEFORE_A_CCS 355
2370 #define SSL_R_GOT_NEXT_PROTO_WITHOUT_EXTENSION 356
2371 #define SSL_R_HTTPS_PROXY_REQUEST 155
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2372 #define SSL_R_HTTP_REQUEST 156
2373 #define SSL_R_ILLEGAL_PADDING 283
2374 #define SSL_R_INCONSISTENT_COMPRESSION 340
2375 #define SSL_R_INVALID_CHALLENGE_LENGTH 158
2376 #define SSL_R_INVALID_COMMAND 280
2377 #define SSL_R_INVALID_COMPRESSION_ALGORITHM 341
2378 #define SSL_R_INVALID_PURPOSE 278
2379 #define SSL_R_INVALID_SRP_USERNAME 357
2380 #define SSL_R_INVALID_STATUS_RESPONSE 328
2381 #define SSL_R_INVALID_TICKET_KEYS_LENGTH 325
2382 #define SSL_R_INVALID_TRUST 279
2383 #define SSL_R_KEY_ARG_TOO_LONG 284
2384 #define SSL_R_KRB5 285
2385 #define SSL_R_KRB5_C_CC_PRINC 286
2386 #define SSL_R_KRB5_C_GET_CRED 287
2387 #define SSL_R_KRB5_C_INIT 288
2388 #define SSL_R_KRB5_C_MK_REQ 289
2389 #define SSL_R_KRB5_S_BAD_TICKET 290
2390 #define SSL_R_KRB5_S_INIT 291
2391 #define SSL_R_KRB5_S_RD_REQ 292
2392 #define SSL_R_KRB5_S_TKT_EXPIRED 293
2393 #define SSL_R_KRB5_S_TKT_NTV 294
2394 #define SSL_R_KRB5_S_TKT_SKEW 295
2395 #define SSL_R_LENGTH_MISMATCH 159
2396 #define SSL_R_LENGTH_TOO_SHORT 160
2397 #define SSL_R_LIBRARY_BUG 274
2398 #define SSL_R_LIBRARY_HAS_NO_CIPHERS 161
2399 #define SSL_R_MESSAGE_TOO_LONG 296
2400 #define SSL_R_MISSING_DH_DSA_CERT 162
2401 #define SSL_R_MISSING_DH_KEY 163
2402 #define SSL_R_MISSING_DH_RSA_CERT 164
2403 #define SSL_R_MISSING_DSA_SIGNING_CERT 165
2404 #define SSL_R_MISSING_EXPORT_TMP_DH_KEY 166
2405 #define SSL_R_MISSING_EXPORT_TMP_RSA_KEY 167
2406 #define SSL_R_MISSING_RSA_CERTIFICATE 168
2407 #define SSL_R_MISSING_RSA_ENCRYPTING_CERT 169
2408 #define SSL_R_MISSING_RSA_SIGNING_CERT 170
2409 #define SSL_R_MISSING_SRP_PARAM 358
2410 #define SSL_R_MISSING_TMP_DH_KEY 171
2411 #define SSL_R_MISSING_TMP_ECDH_KEY 311
2412 #define SSL_R_MISSING_TMP_RSA_KEY 172
2413 #define SSL_R_MISSING_TMP_RSA_PKEY 173
2414 #define SSL_R_MISSING_VERIFY_MESSAGE 174
2415 #define SSL_R_MULTIPLE_SGC_RESTARTS 346
2416 #define SSL_R_NON_SSLV2_INITIAL_PACKET 175
2417 #define SSL_R_NO_CERTIFICATES_RETURNED 176
2418 #define SSL_R_NO_CERTIFICATE_ASSIGNED 177
2419 #define SSL_R_NO_CERTIFICATE_RETURNED 178
2420 #define SSL_R_NO_CERTIFICATE_SET 179
2421 #define SSL_R_NO_CERTIFICATE_SPECIFIED 180
2422 #define SSL_R_NO_CIPHERS_AVAILABLE 181
2423 #define SSL_R_NO_CIPHERS_PASSED 182
2424 #define SSL_R_NO_CIPHERS_SPECIFIED 183
2425 #define SSL_R_NO_CIPHER_LIST 184
2426 #define SSL_R_NO_CIPHER_MATCH 185
2427 #define SSL_R_NO_CLIENT_CERT_METHOD 331
2428 #define SSL_R_NO_CLIENT_CERT_RECEIVED 186
2429 #define SSL_R_NO_COMPRESSION_SPECIFIED 187
2430 #define SSL_R_NO_GOST_CERTIFICATE_SENT_BY_PEER 330
2431 #define SSL_R_NO_METHOD_SPECIFIED 188
2432 #define SSL_R_NO_PRIVATEKEY 189
2433 #define SSL_R_NO_PRIVATE_KEY_ASSIGNED 190
2434 #define SSL_R_NO_PROTOCOLS_AVAILABLE 191
2435 #define SSL_R_NO_PUBLICKEY 192
2436 #define SSL_R_NO_RENEGOTIATION 339
2437 #define SSL_R_NO_REQUIRED_DIGEST 324
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2439 #define SSL_R_NO_SRP_PROFILES 359
2440 #define SSL_R_NO_VERIFY_CALLBACK 194
2441 #define SSL_R_NULL_SSL_CTX 195
2442 #define SSL_R_NULL_SSL_METHOD_PASSED 196
2443 #define SSL_R_OLD_SESSION_CIPHER_NOT_RETURNED 197
2444 #define SSL_R_OLD_SESSION_COMPRESSION_ALGORITHM_NOT_RETURNED 344
2445 #define SSL_R_ONLY_TLS_ALLOWED_IN_FIPS_MODE 297
2446 #define SSL_R_OPAQUE_PRF_INPUT_TOO_LONG 327
2447 #define SSL_R_PACKET_LENGTH_TOO_LONG 198
2448 #define SSL_R_PARSE_TLSEXT 227
2449 #define SSL_R_PATH_TOO_LONG 270
2450 #define SSL_R_PEER_DID_NOT_RETURN_A_CERTIFICATE 199
2451 #define SSL_R_PEER_ERROR 200
2452 #define SSL_R_PEER_ERROR_CERTIFICATE 201
2453 #define SSL_R_PEER_ERROR_NO_CERTIFICATE 202
2454 #define SSL_R_PEER_ERROR_NO_CIPHER 203
2455 #define SSL_R_PEER_ERROR_UNSUPPORTED_CERTIFICATE_TYPE 204
2456 #define SSL_R_PRE_MAC_LENGTH_TOO_LONG 205
2457 #define SSL_R_PROBLEMS_MAPPING_CIPHER_FUNCTIONS 206
2458 #define SSL_R_PROTOCOL_IS_SHUTDOWN 207
2459 #define SSL_R_PSK_IDENTITY_NOT_FOUND 223
2460 #define SSL_R_PSK_NO_CLIENT_CB 224
2461 #define SSL_R_PSK_NO_SERVER_CB 225
2462 #define SSL_R_PUBLIC_KEY_ENCRYPT_ERROR 208
2463 #define SSL_R_PUBLIC_KEY_IS_NOT_RSA 209
2464 #define SSL_R_PUBLIC_KEY_NOT_RSA 210
2465 #define SSL_R_READ_BIO_NOT_SET 211
2466 #define SSL_R_READ_TIMEOUT_EXPIRED 312
2467 #define SSL_R_READ_WRONG_PACKET_TYPE 212
2468 #define SSL_R_RECORD_LENGTH_MISMATCH 213
2469 #define SSL_R_RECORD_TOO_LARGE 214
2470 #define SSL_R_RECORD_TOO_SMALL 298
2471 #define SSL_R_RENEGOTIATE_EXT_TOO_LONG 335
2472 #define SSL_R_RENEGOTIATION_ENCODING_ERR 336
2473 #define SSL_R_RENEGOTIATION_MISMATCH 337
2474 #define SSL_R_REQUIRED_CIPHER_MISSING 215
2475 #define SSL_R_REQUIRED_COMPRESSION_ALGORITHM_MISSING 342
2476 #define SSL_R_REUSE_CERT_LENGTH_NOT_ZERO 216
2477 #define SSL_R_REUSE_CERT_TYPE_NOT_ZERO 217
2478 #define SSL_R_REUSE_CIPHER_LIST_NOT_ZERO 218
2479 #define SSL_R_SCSV_RECEIVED_WHEN_RENEGOTIATING 345
2480 #define SSL_R_SERVERHELLO_TLSEXT 275
2481 #define SSL_R_SESSION_ID_CONTEXT_UNINITIALIZED 277
2482 #define SSL_R_SHORT_READ 219
2483 #define SSL_R_SIGNATURE_ALGORITHMS_ERROR 360
2484 #define SSL_R_SIGNATURE_FOR_NON_SIGNING_CERTIFICATE 220
2485 #define SSL_R_SRP_A_CALC 361
2486 #define SSL_R_SRP_COULD_NOT_ALLOCATE_PROFILES 362
2487 #define SSL_R_SRP_PROTECTION_PROFILE_LIST_TOO_LONG 363
2488 #define SSL_R_SRP_UNKNOWN_PROTECTION_PROFILE 364
2489 #define SSL_R_SSL23_DOING_SESSION_ID_REUSE 221
2490 #define SSL_R_SSL2_CONNECTION_ID_TOO_LONG 299
2491 #define SSL_R_SSL3_EXT_INVALID_ECPOINTFORMAT 321
2492 #define SSL_R_SSL3_EXT_INVALID_SERVERNAME 319
2493 #define SSL_R_SSL3_EXT_INVALID_SERVERNAME_TYPE 320
2494 #define SSL_R_SSL3_SESSION_ID_TOO_LONG 300
2495 #define SSL_R_SSL3_SESSION_ID_TOO_SHORT 222
2496 #define SSL_R_SSLV3_ALERT_BAD_CERTIFICATE 1042
2497 #define SSL_R_SSLV3_ALERT_BAD_RECORD_MAC 1020
2498 #define SSL_R_SSLV3_ALERT_CERTIFICATE_EXPIRED 1045
2499 #define SSL_R_SSLV3_ALERT_CERTIFICATE_REVOKED 1044
2500 #define SSL_R_SSLV3_ALERT_CERTIFICATE_UNKNOWN 1046
2501 #define SSL_R_SSLV3_ALERT_DECOMPRESSION_FAILURE 1030
2502 #define SSL_R_SSLV3_ALERT_HANDSHAKE_FAILURE 1040
2503 #define SSL_R_SSLV3_ALERT_ILLEGAL_PARAMETER 1047
```

```
2504 #define SSL_R_SSLV3_ALERT_NO_CERTIFICATE 1041
2505 #define SSL_R_SSLV3_ALERT_UNEXPECTED_MESSAGE 1010
2506 #define SSL_R_SSLV3_ALERT_UNSUPPORTED_CERTIFICATE 1043
2507 #define SSL_R_SSL_CTX_HAS_NO_DEFAULT_SSL_VERSION 228
2508 #define SSL_R_SSL_HANDSHAKE_FAILURE 229
2509 #define SSL_R_SSL_LIBRARY_HAS_NO_CIPHERS 230
2510 #define SSL_R_SSL_SESSION_ID_CALLBACK_FAILED 301
2511 #define SSL_R_SSL_SESSION_ID_CONFLICT 302
2512 #define SSL_R_SSL_SESSION_ID_CONTEXT_TOO_LONG 273
2513 #define SSL_R_SSL_SESSION_ID_HAS_BAD_LENGTH 303
2514 #define SSL_R_SSL_SESSION_ID_IS_DIFFERENT 231
2515 #define SSL_R_TLSV1_ALERT_ACCESS_DENIED 1049
2516 #define SSL_R_TLSV1_ALERT_DECODE_ERROR 1050
2517 #define SSL_R_TLSV1_ALERT_DECRYPTION_FAILED 1021
2518 #define SSL_R_TLSV1_ALERT_DECRYPT_ERROR 1051
2519 #define SSL_R_TLSV1_ALERT_EXPORT_RESTRICTION 1060
2520 #define SSL_R_TLSV1_ALERT_INSUFFICIENT_SECURITY 1071
2521 #define SSL_R_TLSV1_ALERT_INTERNAL_ERROR 1080
2522 #define SSL_R_TLSV1_ALERT_NO_RENEGOTIATION 1100
2523 #define SSL_R_TLSV1_ALERT_PROTOCOL_VERSION 1070
2524 #define SSL_R_TLSV1_ALERT_RECORD_OVERFLOW 1022
2525 #define SSL_R_TLSV1_ALERT_UNKNOWN_CA 1048
2526 #define SSL_R_TLSV1_ALERT_USER_CANCELLED 1090
2527 #define SSL_R_TLSV1_BAD_CERTIFICATE_HASH_VALUE 1114
2528 #define SSL_R_TLSV1_BAD_CERTIFICATE_STATUS_RESPONSE 1113
2529 #define SSL_R_TLSV1_CERTIFICATE_UNOBTAINABLE 1111
2530 #define SSL_R_TLSV1_UNRECOGNIZED_NAME 1112
2531 #define SSL_R_TLSV1_UNSUPPORTED_EXTENSION 1110
2532 #define SSL_R_TLS_CLIENT_CERT_REQ_WITH_ANON_CIPHER 232
2533 #define SSL_R_TLS_HEARTBEAT_PEER_DOESNT_ACCEPT 365
2534 #define SSL_R_TLS_HEARTBEAT_PENDING 366
2535 #define SSL_R_TLS_ILLEGAL_EXPORTER_LABEL 367
2536 #define SSL_R_TLS_INVALID_ECPOINTFORMAT_LIST 157
2537 #define SSL_R_TLS_PEER_DID_NOT_RESPOND_WITH_CERTIFICATE_LIST 233
2538 #define SSL_R_TLS_RSA_ENCRYPTED_VALUE_LENGTH_IS_WRONG 234
2539 #define SSL_R_TRIED_TO_USE_UNSUPPORTED_CIPHER 235
2540 #define SSL_R_UNABLE_TO_DECODE_DH_CERTS 236
2541 #define SSL_R_UNABLE_TO_DECODE_ECDH_CERTS 313
2542 #define SSL_R_UNABLE_TO_EXTRACT_PUBLIC_KEY 237
2543 #define SSL_R_UNABLE_TO_FIND_DH_PARAMETERS 238
2544 #define SSL_R_UNABLE_TO_FIND_ECDH_PARAMETERS 314
2545 #define SSL_R_UNABLE_TO_FIND_PUBLIC_KEY_PARAMETERS 239
2546 #define SSL_R_UNABLE_TO_FIND_SSL_METHOD 240
2547 #define SSL_R_UNABLE_TO_LOAD_SSL2_MD5_ROUTINES 241
2548 #define SSL_R_UNABLE_TO_LOAD_SSL3_MD5_ROUTINES 242
2549 #define SSL_R_UNABLE_TO_LOAD_SSL3_SHA1_ROUTINES 243
2550 #define SSL_R_UNEXPECTED_MESSAGE 244
2551 #define SSL_R_UNEXPECTED_RECORD 245
2552 #define SSL_R_UNINITIALIZED 276
2553 #define SSL_R_UNKNOWN_ALERT_TYPE 246
2554 #define SSL_R_UNKNOWN_CERTIFICATE_TYPE 247
2555 #define SSL_R_UNKNOWN_CIPHER_RETURNED 248
2556 #define SSL_R_UNKNOWN_CIPHER_TYPE 249
2557 #define SSL_R_UNKNOWN_DIGEST 368
2558 #define SSL_R_UNKNOWN_KEY_EXCHANGE_TYPE 250
2559 #define SSL_R_UNKNOWN_PKEY_TYPE 251
2560 #define SSL_R_UNKNOWN_PROTOCOL 252
2561 #define SSL_R_UNKNOWN_REMOTE_ERROR_TYPE 253
2562 #define SSL_R_UNKNOWN_SSL_VERSION 254
2563 #define SSL_R_UNKNOWN_STATE 255
2564 #define SSL_R_UNSAFE_LEGACY_RENEGOTIATION_DISABLED 338
2565 #define SSL_R_UNSUPPORTED_CIPHER 256
2566 #define SSL_R_UNSUPPORTED_COMPRESSION_ALGORITHM 257
2567 #define SSL_R_UNSUPPORTED_DIGEST_TYPE 326
2568 #define SSL_R_UNSUPPORTED_ELLIPTIC_CURVE 315
2569 #define SSL_R_UNSUPPORTED_PROTOCOL 258
```

```
2570 #define SSL_R_UNSUPPORTED_SSL_VERSION 259
2571 #define SSL_R_UNSUPPORTED_STATUS_TYPE 329
2572 #define SSL_R_USE_SRTP_NOT_NEGOTIATED 369
2573 #define SSL_R_WRITE_BIO_NOT_SET 260
2574 #define SSL_R_WRONG_CIPHER_RETURNED 261
2575 #define SSL_R_WRONG_MESSAGE_TYPE 262
2576 #define SSL_R_WRONG_NUMBER_OF_KEY_BITS 263
2577 #define SSL_R_WRONG_SIGNATURE_LENGTH 264
2578 #define SSL_R_WRONG_SIGNATURE_SIZE 265
2579 #define SSL_R_WRONG_SIGNATURE_TYPE 370
2580 #define SSL_R_WRONG_SSL_VERSION 266
2581 #define SSL_R_WRONG_VERSION_NUMBER 267
2582 #define SSL_R_X509_LIB 268
2583 #define SSL_R_X509_VERIFICATION_SETUP_PROBLEMS 269

2585 #ifdef __cplusplus
2586 }
2587 #endif
2588 #endif
```

new/usr/src/lib/openssl/include/openssl/ssl2.h

1

10755 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/ssl2.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* ssl/ssl2.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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34 * Eric Young (eay@cryptsoft.com)"
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37 * 4. If you include any Windows specific code (or a derivative thereof) from
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_SSL2_H
60 #define HEADER_SSL2_H
```

new/usr/src/lib/openssl/include/openssl/ssl2.h

2

```
62 #ifdef __cplusplus
63 extern "C" {
64 #endif
65
66 /* Protocol Version Codes */
67 #define SSL2_VERSION 0x0002
68 #define SSL2_VERSION_MAJOR 0x00
69 #define SSL2_VERSION_MINOR 0x02
70 /* #define SSL2_CLIENT_VERSION 0x0002 */
71 /* #define SSL2_SERVER_VERSION 0x0002 */
72
73 /* Protocol Message Codes */
74 #define SSL2_MT_ERROR 0
75 #define SSL2_MT_CLIENT_HELLO 1
76 #define SSL2_MT_CLIENT_MASTER_KEY 2
77 #define SSL2_MT_CLIENT_FINISHED 3
78 #define SSL2_MT_SERVER_HELLO 4
79 #define SSL2_MT_SERVER_VERIFY 5
80 #define SSL2_MT_SERVER_FINISHED 6
81 #define SSL2_MT_REQUEST_CERTIFICATE 7
82 #define SSL2_MT_CLIENT_CERTIFICATE 8
83
84 /* Error Message Codes */
85 #define SSL2_PE_UNDEFINED_ERROR 0x0000
86 #define SSL2_PE_NO_CIPHER 0x0001
87 #define SSL2_PE_NO_CERTIFICATE 0x0002
88 #define SSL2_PE_BAD_CERTIFICATE 0x0004
89 #define SSL2_PE_UNSUPPORTED_CERTIFICATE_TYPE 0x0006
90
91 /* Cipher Kind Values */
92 #define SSL2_CK_NULL_WITH_MD5 0x02000000 /* v3 */
93 #define SSL2_CK_RC4_128_WITH_MD5 0x02010000
94 #define SSL2_CK_RC4_128_EXPORT40_WITH_MD5 0x02020000
95 #define SSL2_CK_RC2_128_CBC_WITH_MD5 0x02030000
96 #define SSL2_CK_RC2_128_CBC_EXPORT40_WITH_MD5 0x02040000
97 #define SSL2_CK_IDEA_128_CBC_WITH_MD5 0x02050000
98 #define SSL2_CK_DES_64_CBC_WITH_MD5 0x02060000
99 #define SSL2_CK_DES_64_CBC_WITH_SHA 0x02060100 /* v3 */
100 #define SSL2_CK_DES_192_EDE3_CBC_WITH_MD5 0x020700c0
101 #define SSL2_CK_DES_192_EDE3_CBC_WITH_SHA 0x020701c0 /* v3 */
102 #define SSL2_CK_RC4_64_WITH_MD5 0x02080000 /* MS hack */
103
104 #define SSL2_CK_DES_64_CFB64_WITH_MD5_1 0x02ff0800 /* SSLeay */
105 #define SSL2_CK_NULL 0x02ff0810 /* SSLeay */
106
107 #define SSL2_TXT_DES_64_CFB64_WITH_MD5_1 "DES-CFB-M1"
108 #define SSL2_TXT_NULL_WITH_MD5 "NULL-MD5"
109 #define SSL2_TXT_RC4_128_WITH_MD5 "RC4-MD5"
110 #define SSL2_TXT_RC4_128_EXPORT40_WITH_MD5 "EXP-RC4-MD5"
111 #define SSL2_TXT_RC2_128_CBC_WITH_MD5 "RC2-CBC-MD5"
112 #define SSL2_TXT_RC2_128_CBC_EXPORT40_WITH_MD5 "EXP-RC2-CBC-MD5"
113 #define SSL2_TXT_IDEA_128_CBC_WITH_MD5 "IDEA-CBC-MD5"
114 #define SSL2_TXT_DES_64_CBC_WITH_MD5 "DES-CBC-MD5"
115 #define SSL2_TXT_DES_64_CBC_WITH_SHA "DES-CBC-SHA"
116 #define SSL2_TXT_DES_192_EDE3_CBC_WITH_MD5 "DES-CBC3-MD5"
117 #define SSL2_TXT_DES_192_EDE3_CBC_WITH_SHA "DES-CBC3-SHA"
118 #define SSL2_TXT_RC4_64_WITH_MD5 "RC4-64-MD5"
119
120 #define SSL2_TXT_NULL "NULL"
121
122 /* Flags for the SSL_CIPHER.algorithm2 field */
123 #define SSL2_CF_5_BYTE_ENC 0x01
124 #define SSL2_CF_8_BYTE_ENC 0x02
125
126 /* Certificate Type Codes */
127 #define SSL2_CT_X509_CERTIFICATE 0x01
```

```

129 /* Authentication Type Code */
130 #define SSL2_AT_MD5_WITH_RSA_ENCRYPTION      0x01

132 #define SSL2_MAX_SSL_SESSION_ID_LENGTH        32

134 /* Upper/Lower Bounds */
135 #define SSL2_MAX_MASTER_KEY_LENGTH_IN_BITS    256
136 #ifdef OPENSSL_SYS_MPE
137 #define SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER  29998u
138 #else
139 #define SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER  32767u /* 2^15-1 */
140 #endif
141 #define SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER  16383 /* 2^14-1 */

143 #define SSL2_CHALLENGE_LENGTH 16
144 /*#define SSL2_CHALLENGE_LENGTH 32 */
145 #define SSL2_MIN_CHALLENGE_LENGTH 16
146 #define SSL2_MAX_CHALLENGE_LENGTH 32
147 #define SSL2_CONNECTION_ID_LENGTH 16
148 #define SSL2_MAX_CONNECTION_ID_LENGTH 16
149 #define SSL2_SSL_SESSION_ID_LENGTH 16
150 #define SSL2_MAX_CERT_CHALLENGE_LENGTH 32
151 #define SSL2_MIN_CERT_CHALLENGE_LENGTH 16
152 #define SSL2_MAX_KEY_MATERIAL_LENGTH 24

154 #ifndef HEADER_SSL_LOCL_H
155 #define CERT          char
156 #endif

158 #ifndef OPENSSL_NO_SSL_INTERN

160 typedef struct ssl2_state_st
161 {
162     int three_byte_header;
163     int clear_text; /* clear text */
164     int escape; /* not used in SSLv2 */
165     int ssl2_rollback; /* used if SSLv23 rolled back to SSLv2 */

167     /* non-blocking io info, used to make sure the same
168      * args were passwd */
169     unsigned int wnum; /* number of bytes sent so far */
170     int wpend_tot;
171     const unsigned char *wpend_buf;

173     int wpend_off; /* offset to data to write */
174     int wpend_len; /* number of bytes passwd to write */
175     int wpend_ret; /* number of bytes to return to caller */

177     /* buffer raw data */
178     int rbuf_left;
179     int rbuf_offs;
180     unsigned char *rbuf;
181     unsigned char *wbuf;

183     unsigned char *write_ptr; /* used to point to the start due to
184      * 2/3 byte header. */

186     unsigned int padding;
187     unsigned int rlength; /* passed to ssl2_enc */
188     int ract_data_length; /* Set when things are encrypted. */
189     unsigned int wlength; /* passed to ssl2_enc */
190     int wact_data_length; /* Set when things are decrypted. */
191     unsigned char *ract_data;
192     unsigned char *wact_data;
193     unsigned char *mac_data;

```

```

195     unsigned char *read_key;
196     unsigned char *write_key;

198     /* Stuff specifically to do with this SSL session */
199     unsigned int challenge_length;
200     unsigned char challenge[SSL2_MAX_CHALLENGE_LENGTH];
201     unsigned int conn_id_length;
202     unsigned char conn_id[SSL2_MAX_CONNECTION_ID_LENGTH];
203     unsigned int key_material_length;
204     unsigned char key_material[SSL2_MAX_KEY_MATERIAL_LENGTH*2];

206     unsigned long read_sequence;
207     unsigned long write_sequence;

209     struct {
210         unsigned int conn_id_length;
211         unsigned int cert_type;
212         unsigned int cert_length;
213         unsigned int csl;
214         unsigned int clear;
215         unsigned int enc;
216         unsigned char ccl[SSL2_MAX_CERT_CHALLENGE_LENGTH];
217         unsigned int cipher_spec_length;
218         unsigned int session_id_length;
219         unsigned int clen;
220         unsigned int rlen;
221     } tmp;
222 } SSL2_STATE;

224 #endif

226 /* SSLv2 */
227 /* client */
228 #define SSL2_ST_SEND_CLIENT_HELLO_A (0x10|SSL_ST_CONNECT)
229 #define SSL2_ST_SEND_CLIENT_HELLO_B (0x11|SSL_ST_CONNECT)
230 #define SSL2_ST_GET_SERVER_HELLO_A (0x20|SSL_ST_CONNECT)
231 #define SSL2_ST_GET_SERVER_HELLO_B (0x21|SSL_ST_CONNECT)
232 #define SSL2_ST_SEND_CLIENT_MASTER_KEY_A (0x30|SSL_ST_CONNECT)
233 #define SSL2_ST_SEND_CLIENT_MASTER_KEY_B (0x31|SSL_ST_CONNECT)
234 #define SSL2_ST_SEND_CLIENT_FINISHED_A (0x40|SSL_ST_CONNECT)
235 #define SSL2_ST_SEND_CLIENT_FINISHED_B (0x41|SSL_ST_CONNECT)
236 #define SSL2_ST_SEND_CLIENT_CERTIFICATE_A (0x50|SSL_ST_CONNECT)
237 #define SSL2_ST_SEND_CLIENT_CERTIFICATE_B (0x51|SSL_ST_CONNECT)
238 #define SSL2_ST_SEND_CLIENT_CERTIFICATE_C (0x52|SSL_ST_CONNECT)
239 #define SSL2_ST_SEND_CLIENT_CERTIFICATE_D (0x53|SSL_ST_CONNECT)
240 #define SSL2_ST_GET_SERVER_VERIFY_A (0x60|SSL_ST_CONNECT)
241 #define SSL2_ST_GET_SERVER_VERIFY_B (0x61|SSL_ST_CONNECT)
242 #define SSL2_ST_GET_SERVER_FINISHED_A (0x70|SSL_ST_CONNECT)
243 #define SSL2_ST_GET_SERVER_FINISHED_B (0x71|SSL_ST_CONNECT)
244 #define SSL2_ST_CLIENT_START_ENCRYPTION (0x80|SSL_ST_CONNECT)
245 #define SSL2_ST_X509_GET_CLIENT_CERTIFICATE (0x90|SSL_ST_CONNECT)
246 /* server */
247 #define SSL2_ST_GET_CLIENT_HELLO_A (0x10|SSL_ST_ACCEPT)
248 #define SSL2_ST_GET_CLIENT_HELLO_B (0x11|SSL_ST_ACCEPT)
249 #define SSL2_ST_GET_CLIENT_HELLO_C (0x12|SSL_ST_ACCEPT)
250 #define SSL2_ST_SEND_SERVER_HELLO_A (0x20|SSL_ST_ACCEPT)
251 #define SSL2_ST_SEND_SERVER_HELLO_B (0x21|SSL_ST_ACCEPT)
252 #define SSL2_ST_GET_CLIENT_MASTER_KEY_A (0x30|SSL_ST_ACCEPT)
253 #define SSL2_ST_GET_CLIENT_MASTER_KEY_B (0x31|SSL_ST_ACCEPT)
254 #define SSL2_ST_SEND_SERVER_VERIFY_A (0x40|SSL_ST_ACCEPT)
255 #define SSL2_ST_SEND_SERVER_VERIFY_B (0x41|SSL_ST_ACCEPT)
256 #define SSL2_ST_SEND_SERVER_VERIFY_C (0x42|SSL_ST_ACCEPT)
257 #define SSL2_ST_GET_CLIENT_FINISHED_A (0x50|SSL_ST_ACCEPT)
258 #define SSL2_ST_GET_CLIENT_FINISHED_B (0x51|SSL_ST_ACCEPT)
259 #define SSL2_ST_SEND_SERVER_FINISHED_A (0x60|SSL_ST_ACCEPT)

```

new/usr/src/lib/openssl/include/openssl/ssl2.h

5

```
260 #define SSL2_ST_SEND_SERVER_FINISHED_B (0x61|SSL_ST_ACCEPT)
261 #define SSL2_ST_SEND_REQUEST_CERTIFICATE_A (0x70|SSL_ST_ACCEPT)
262 #define SSL2_ST_SEND_REQUEST_CERTIFICATE_B (0x71|SSL_ST_ACCEPT)
263 #define SSL2_ST_SEND_REQUEST_CERTIFICATE_C (0x72|SSL_ST_ACCEPT)
264 #define SSL2_ST_SEND_REQUEST_CERTIFICATE_D (0x73|SSL_ST_ACCEPT)
265 #define SSL2_ST_SERVER_START_ENCRYPTION (0x80|SSL_ST_ACCEPT)
266 #define SSL2_ST_X509_GET_SERVER_CERTIFICATE (0x90|SSL_ST_ACCEPT)

268 #ifdef __cplusplus
269 }
270 #endif
271 #endif
```

new/usr/src/lib/openssl/include/openssl/ssl23.h

1

3744 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/ssl23.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* ssl/ssl23.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #ifndef HEADER_SSL23_H
60 #define HEADER_SSL23_H
```

new/usr/src/lib/openssl/include/openssl/ssl23.h

2

```
62 #ifdef __cplusplus
63 extern "C" {
64 #endif
65
66 /*client */
67 /* write to server */
68 #define SSL23_ST_CW_CLNT_HELLO_A (0x210|SSL_ST_CONNECT)
69 #define SSL23_ST_CW_CLNT_HELLO_B (0x211|SSL_ST_CONNECT)
70 /* read from server */
71 #define SSL23_ST_CR_SRVR_HELLO_A (0x220|SSL_ST_CONNECT)
72 #define SSL23_ST_CR_SRVR_HELLO_B (0x221|SSL_ST_CONNECT)
73
74 /* server */
75 /* read from client */
76 #define SSL23_ST_SR_CLNT_HELLO_A (0x210|SSL_ST_ACCEPT)
77 #define SSL23_ST_SR_CLNT_HELLO_B (0x211|SSL_ST_ACCEPT)
78
79 #ifdef __cplusplus
80 }
81 #endif
82 #endif
```



```

*****
27080 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/ssl3.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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4  *
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6  * by Eric Young (eay@cryptsoft.com).
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8  *
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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 * ECC cipher suite support in OpenSSL originally developed by
114 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
115 */
116
117 #ifndef HEADER_SSL3_H
118 #define HEADER_SSL3_H
119
120 #ifndef OPENSSL_NO_COMP
121 #include <openssl/comp.h>
122 #endif
123 #include <openssl/buffer.h>
124 #include <openssl/evp.h>
125 #include <openssl/ssl.h>
126
127 #ifdef __cplusplus

```

```

128 extern "C" {
129 #endif

131 /* Signalling cipher suite value: from draft-ietf-tls-renegotiation-03.txt */
132 #define SSL3_CK_SCSV 0x030000FF

134 #define SSL3_CK_RSA_NULL_MD5 0x03000001
135 #define SSL3_CK_RSA_NULL_SHA 0x03000002
136 #define SSL3_CK_RSA_RC4_40_MD5 0x03000003
137 #define SSL3_CK_RSA_RC4_128_MD5 0x03000004
138 #define SSL3_CK_RSA_RC4_128_SHA 0x03000005
139 #define SSL3_CK_RSA_RC2_40_MD5 0x03000006
140 #define SSL3_CK_RSA_IDEA_128_SHA 0x03000007
141 #define SSL3_CK_RSA_DES_40_CBC_SHA 0x03000008
142 #define SSL3_CK_RSA_DES_64_CBC_SHA 0x03000009
143 #define SSL3_CK_RSA_DES_192_CBC3_SHA 0x0300000A

145 #define SSL3_CK_DH_DSS_DES_40_CBC_SHA 0x0300000B
146 #define SSL3_CK_DH_DSS_DES_64_CBC_SHA 0x0300000C
147 #define SSL3_CK_DH_DSS_DES_192_CBC3_SHA 0x0300000D
148 #define SSL3_CK_DH_RSA_DES_40_CBC_SHA 0x0300000E
149 #define SSL3_CK_DH_RSA_DES_64_CBC_SHA 0x0300000F
150 #define SSL3_CK_DH_RSA_DES_192_CBC3_SHA 0x03000010

152 #define SSL3_CK_EDH_DSS_DES_40_CBC_SHA 0x03000011
153 #define SSL3_CK_EDH_DSS_DES_64_CBC_SHA 0x03000012
154 #define SSL3_CK_EDH_DSS_DES_192_CBC3_SHA 0x03000013
155 #define SSL3_CK_EDH_RSA_DES_40_CBC_SHA 0x03000014
156 #define SSL3_CK_EDH_RSA_DES_64_CBC_SHA 0x03000015
157 #define SSL3_CK_EDH_RSA_DES_192_CBC3_SHA 0x03000016

159 #define SSL3_CK_ADH_RC4_40_MD5 0x03000017
160 #define SSL3_CK_ADH_RC4_128_MD5 0x03000018
161 #define SSL3_CK_ADH_DES_40_CBC_SHA 0x03000019
162 #define SSL3_CK_ADH_DES_64_CBC_SHA 0x0300001A
163 #define SSL3_CK_ADH_DES_192_CBC3_SHA 0x0300001B

165 #if 0
166 #define SSL3_CK_FZA_DMS_NULL_SHA 0x0300001C
167 #define SSL3_CK_FZA_DMS_FZA_SHA 0x0300001D
168 #if 0 /* Because it clashes with KRB5, is never used any more, and is sa
169         to remove according to David Hopwood <david.hopwood@zetnet.co.uk>
170         of the ietf-tls list */
171 #define SSL3_CK_FZA_DMS_RC4_SHA 0x0300001E
172 #endif
173 #endif

175 /* VRS Additional Kerberos5 entries
176 */
177 #define SSL3_CK_KRB5_DES_64_CBC_SHA 0x0300001E
178 #define SSL3_CK_KRB5_DES_192_CBC3_SHA 0x0300001F
179 #define SSL3_CK_KRB5_RC4_128_SHA 0x03000020
180 #define SSL3_CK_KRB5_IDEA_128_CBC_SHA 0x03000021
181 #define SSL3_CK_KRB5_DES_64_CBC_MD5 0x03000022
182 #define SSL3_CK_KRB5_DES_192_CBC3_MD5 0x03000023
183 #define SSL3_CK_KRB5_RC4_128_MD5 0x03000024
184 #define SSL3_CK_KRB5_IDEA_128_CBC_MD5 0x03000025

186 #define SSL3_CK_KRB5_DES_40_CBC_SHA 0x03000026
187 #define SSL3_CK_KRB5_RC2_40_CBC_SHA 0x03000027
188 #define SSL3_CK_KRB5_RC4_40_SHA 0x03000028
189 #define SSL3_CK_KRB5_DES_40_CBC_MD5 0x03000029
190 #define SSL3_CK_KRB5_RC2_40_CBC_MD5 0x0300002A
191 #define SSL3_CK_KRB5_RC4_40_MD5 0x0300002B

193 #define SSL3_TXT_RSA_NULL_MD5 "NULL-MD5"

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194 #define SSL3_TXT_RSA_NULL_SHA "NULL-SHA"
195 #define SSL3_TXT_RSA_RC4_40_MD5 "EXP-RC4-MD5"
196 #define SSL3_TXT_RSA_RC4_128_MD5 "RC4-MD5"
197 #define SSL3_TXT_RSA_RC4_128_SHA "RC4-SHA"
198 #define SSL3_TXT_RSA_RC2_40_MD5 "EXP-RC2-CBC-MD5"
199 #define SSL3_TXT_RSA_IDEA_128_SHA "IDEA-CBC-SHA"
200 #define SSL3_TXT_RSA_DES_40_CBC_SHA "EXP-DES-CBC-SHA"
201 #define SSL3_TXT_RSA_DES_64_CBC_SHA "DES-CBC-SHA"
202 #define SSL3_TXT_RSA_DES_192_CBC3_SHA "DES-CBC3-SHA"

204 #define SSL3_TXT_DH_DSS_DES_40_CBC_SHA "EXP-DH-DSS-DES-CBC-SHA"
205 #define SSL3_TXT_DH_DSS_DES_64_CBC_SHA "DH-DSS-DES-CBC-SHA"
206 #define SSL3_TXT_DH_DSS_DES_192_CBC3_SHA "DH-DSS-DES-CBC3-SHA"
207 #define SSL3_TXT_DH_RSA_DES_40_CBC_SHA "EXP-DH-RSA-DES-CBC-SHA"
208 #define SSL3_TXT_DH_RSA_DES_64_CBC_SHA "DH-RSA-DES-CBC-SHA"
209 #define SSL3_TXT_DH_RSA_DES_192_CBC3_SHA "DH-RSA-DES-CBC3-SHA"

211 #define SSL3_TXT_EDH_DSS_DES_40_CBC_SHA "EXP-EDH-DSS-DES-CBC-SHA"
212 #define SSL3_TXT_EDH_DSS_DES_64_CBC_SHA "EDH-DSS-DES-CBC-SHA"
213 #define SSL3_TXT_EDH_DSS_DES_192_CBC3_SHA "EDH-DSS-DES-CBC3-SHA"
214 #define SSL3_TXT_EDH_RSA_DES_40_CBC_SHA "EXP-EDH-RSA-DES-CBC-SHA"
215 #define SSL3_TXT_EDH_RSA_DES_64_CBC_SHA "EDH-RSA-DES-CBC-SHA"
216 #define SSL3_TXT_EDH_RSA_DES_192_CBC3_SHA "EDH-RSA-DES-CBC3-SHA"

218 #define SSL3_TXT_ADH_RC4_40_MD5 "EXP-ADH-RC4-MD5"
219 #define SSL3_TXT_ADH_RC4_128_MD5 "ADH-RC4-MD5"
220 #define SSL3_TXT_ADH_DES_40_CBC_SHA "EXP-ADH-DES-CBC-SHA"
221 #define SSL3_TXT_ADH_DES_64_CBC_SHA "ADH-DES-CBC-SHA"
222 #define SSL3_TXT_ADH_DES_192_CBC3_SHA "ADH-DES-CBC3-SHA"

224 #if 0
225 #define SSL3_TXT_FZA_DMS_NULL_SHA "FZA-NULL-SHA"
226 #define SSL3_TXT_FZA_DMS_FZA_SHA "FZA-FZA-CBC-SHA"
227 #define SSL3_TXT_FZA_DMS_RC4_SHA "FZA-RC4-SHA"
228 #endif

230 #define SSL3_TXT_KRB5_DES_64_CBC_SHA "KRB5-DES-CBC-SHA"
231 #define SSL3_TXT_KRB5_DES_192_CBC3_SHA "KRB5-DES-CBC3-SHA"
232 #define SSL3_TXT_KRB5_RC4_128_SHA "KRB5-RC4-SHA"
233 #define SSL3_TXT_KRB5_IDEA_128_CBC_SHA "KRB5-IDEA-CBC-SHA"
234 #define SSL3_TXT_KRB5_DES_64_CBC_MD5 "KRB5-DES-CBC-MD5"
235 #define SSL3_TXT_KRB5_DES_192_CBC3_MD5 "KRB5-DES-CBC3-MD5"
236 #define SSL3_TXT_KRB5_RC4_128_MD5 "KRB5-RC4-MD5"
237 #define SSL3_TXT_KRB5_IDEA_128_CBC_MD5 "KRB5-IDEA-CBC-MD5"

239 #define SSL3_TXT_KRB5_DES_40_CBC_SHA "EXP-KRB5-DES-CBC-SHA"
240 #define SSL3_TXT_KRB5_RC2_40_CBC_SHA "EXP-KRB5-RC2-CBC-SHA"
241 #define SSL3_TXT_KRB5_RC4_40_SHA "EXP-KRB5-RC4-SHA"
242 #define SSL3_TXT_KRB5_DES_40_CBC_MD5 "EXP-KRB5-DES-CBC-MD5"
243 #define SSL3_TXT_KRB5_RC2_40_CBC_MD5 "EXP-KRB5-RC2-CBC-MD5"
244 #define SSL3_TXT_KRB5_RC4_40_MD5 "EXP-KRB5-RC4-MD5"

246 #define SSL3_SSL_SESSION_ID_LENGTH 32
247 #define SSL3_MAX_SSL_SESSION_ID_LENGTH 32

249 #define SSL3_MASTER_SECRET_SIZE 48
250 #define SSL3_RANDOM_SIZE 32
251 #define SSL3_SESSION_ID_SIZE 32
252 #define SSL3_RT_HEADER_LENGTH 5

254 #ifndef SSL3_ALIGN_PAYLOAD
255 /* Some will argue that this increases memory footprint, but it's
256  * not actually true. Point is that malloc has to return at least
257  * 64-bit aligned pointers, meaning that allocating 5 bytes wastes
258  * 3 bytes in either case. Suggested pre-gaping simply moves these
259  * wasted bytes from the end of allocated region to its front,

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260  * but makes data payload aligned, which improves performance:-) */
261  # define SSL3_ALIGN_PAYLOAD          8
262  #else
263  # if (SSL3_ALIGN_PAYLOAD&(SSL3_ALIGN_PAYLOAD-1))!=0
264  #  error "insane SSL3_ALIGN_PAYLOAD"
265  #  undef SSL3_ALIGN_PAYLOAD
266  # endif
267  #endif

269  /* This is the maximum MAC (digest) size used by the SSL library.
270   * Currently maximum of 20 is used by SHA1, but we reserve for
271   * future extension for 512-bit hashes.
272   */

274  #define SSL3_RT_MAX_MD_SIZE          64

276  /* Maximum block size used in all ciphersuites. Currently 16 for AES.
277   */

279  #define SSL_RT_MAX_CIPHER_BLOCK_SIZE 16

281  #define SSL3_RT_MAX_EXTRA            (16384)

283  /* Maximum plaintext length: defined by SSL/TLS standards */
284  #define SSL3_RT_MAX_PLAIN_LENGTH     16384
285  /* Maximum compression overhead: defined by SSL/TLS standards */
286  #define SSL3_RT_MAX_COMPRESSED_OVERHEAD 1024

288  /* The standards give a maximum encryption overhead of 1024 bytes.
289   * In practice the value is lower than this. The overhead is the maximum
290   * number of padding bytes (256) plus the mac size.
291   */
292  #define SSL3_RT_MAX_ENCRYPTED_OVERHEAD (256 + SSL3_RT_MAX_MD_SIZE)

294  /* OpenSSL currently only uses a padding length of at most one block so
295   * the send overhead is smaller.
296   */

298  #define SSL3_RT_SEND_MAX_ENCRYPTED_OVERHEAD \
299      (SSL_RT_MAX_CIPHER_BLOCK_SIZE + SSL3_RT_MAX_MD_SIZE)

301  /* If compression isn't used don't include the compression overhead */

303  #ifdef OPENSSL_NO_COMP
304  #define SSL3_RT_MAX_COMPRESSED_LENGTH     SSL3_RT_MAX_PLAIN_LENGTH
305  #else
306  #define SSL3_RT_MAX_COMPRESSED_LENGTH     \
307      (SSL3_RT_MAX_PLAIN_LENGTH+SSL3_RT_MAX_COMPRESSED_OVERHEAD)
308  #endif
309  #define SSL3_RT_MAX_ENCRYPTED_LENGTH     \
310      (SSL3_RT_MAX_ENCRYPTED_OVERHEAD+SSL3_RT_MAX_COMPRESSED_LENGTH)
311  #define SSL3_RT_MAX_PACKET_SIZE         \
312      (SSL3_RT_MAX_ENCRYPTED_LENGTH+SSL3_RT_HEADER_LENGTH)

314  #define SSL3_MD_CLIENT_FINISHED_CONST   "\x43\x4c\x4e\x54"
315  #define SSL3_MD_SERVER_FINISHED_CONST   "\x53\x52\x56\x52"

317  #define SSL3_VERSION                    0x0300
318  #define SSL3_VERSION_MAJOR              0x03
319  #define SSL3_VERSION_MINOR              0x00

321  #define SSL3_RT_CHANGE_CIPHER_SPEC      20
322  #define SSL3_RT_ALERT                   21
323  #define SSL3_RT_HANDSHAKE               22
324  #define SSL3_RT_APPLICATION_DATA        23
325  #define TLS1_RT_HEARTBEAT                24

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327  #define SSL3_AL_WARNING                 1
328  #define SSL3_AL_FATAL                   2

330  #define SSL3_AD_CLOSE_NOTIFY             0
331  #define SSL3_AD_UNEXPECTED_MESSAGE      10 /* fatal */
332  #define SSL3_AD_BAD_RECORD_MAC          20 /* fatal */
333  #define SSL3_AD_DECOMPRESSION_FAILURE  30 /* fatal */
334  #define SSL3_AD_HANDSHAKE_FAILURE       40 /* fatal */
335  #define SSL3_AD_NO_CERTIFICATE          41
336  #define SSL3_AD_BAD_CERTIFICATE         42
337  #define SSL3_AD_UNSUPPORTED_CERTIFICATE 43
338  #define SSL3_AD_CERTIFICATE_REVOKED     44
339  #define SSL3_AD_CERTIFICATE_EXPIRED     45
340  #define SSL3_AD_CERTIFICATE_UNKNOWN     46
341  #define SSL3_AD_ILLEGAL_PARAMETER       47 /* fatal */

343  #define TLS1_HB_REQUEST                  1
344  #define TLS1_HB_RESPONSE                 2
345
346  #ifndef OPENSSL_NO_SSL_INTERN

348  typedef struct ssl3_record_st
349  {
350      /*r */ int type; /* type of record */
351      /*rw*/ unsigned int length; /* How many bytes available */
352      /*r */ unsigned int off; /* read/write offset into 'buf' */
353      /*rw*/ unsigned char *data; /* pointer to the record data */
354      /*rw*/ unsigned char *input; /* where the decode bytes are */
355      /*r */ unsigned char *comp; /* only used with decompression - malloc()ed */
356      /*r */ unsigned long epoch; /* epoch number, needed by DTLS1 */
357      /*r */ unsigned char seq_num[8]; /* sequence number, needed by DTLS1 */
358  } SSL3_RECORD;

360  typedef struct ssl3_buffer_st
361  {
362      unsigned char *buf; /* at least SSL3_RT_MAX_PACKET_SIZE bytes,
363                          * see ssl3_setup_buffers() */
364      size_t len; /* buffer size */
365      int offset; /* where to 'copy from' */
366      int left; /* how many bytes left */
367  } SSL3_BUFFER;

369  #endif

371  #define SSL3_CT_RSA_SIGN                 1
372  #define SSL3_CT_DSS_SIGN                 2
373  #define SSL3_CT_RSA_FIXED_DH             3
374  #define SSL3_CT_DSS_FIXED_DH            4
375  #define SSL3_CT_RSA_EPHEMERAL_DH         5
376  #define SSL3_CT_DSS_EPHEMERAL_DH         6
377  #define SSL3_CT_FORTEZZA_DMS             20
378  /* SSL3_CT_NUMBER is used to size arrays and it must be large
379   * enough to contain all of the cert types defined either for
380   * SSLv3 and TLSv1.
381   */
382  #define SSL3_CT_NUMBER                    9

385  #define SSL3_FLAGS_NO_RENEGOTIATE_CIPHERS 0x0001
386  #define SSL3_FLAGS_DELAY_CLIENT_FINISHED 0x0002
387  #define SSL3_FLAGS_POP_BUFFER            0x0004
388  #define TLS1_FLAGS_TLS_PADDING_BUG       0x0008
389  #define TLS1_FLAGS_SKIP_CERT_VERIFY      0x0010
390  #define TLS1_FLAGS_KEEP_HANDSHAKE        0x0020
391

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392 /* SSL3_FLAGS_SGC_RESTART_DONE is set when we
393 * restart a handshake because of MS SGC and so prevents us
394 * from restarting the handshake in a loop. It's reset on a
395 * renegotiation, so effectively limits the client to one restart
396 * per negotiation. This limits the possibility of a DDoS
397 * attack where the client handshakes in a loop using SGC to
398 * restart. Servers which permit renegotiation can still be
399 * effected, but we can't prevent that.
400 */
401 #define SSL3_FLAGS_SGC_RESTART_DONE          0x0040
402
403 #ifndef OPENSSL_NO_SSL_INTERN
404
405 typedef struct ssl3_state_st
406 {
407     long flags;
408     int delay_buf_pop_ret;
409
410     unsigned char read_sequence[8];
411     int read_mac_secret_size;
412     unsigned char read_mac_secret[EVP_MAX_MD_SIZE];
413     unsigned char write_sequence[8];
414     int write_mac_secret_size;
415     unsigned char write_mac_secret[EVP_MAX_MD_SIZE];
416
417     unsigned char server_random[SSL3_RANDOM_SIZE];
418     unsigned char client_random[SSL3_RANDOM_SIZE];
419
420     /* flags for countermeasure against known-IV weakness */
421     int need_empty_fragments;
422     int empty_fragment_done;
423
424     /* The value of 'extra' when the buffers were initialized */
425     int init_extra;
426
427     SSL3_BUFFER rbuf;      /* read IO goes into here */
428     SSL3_BUFFER wbuf;      /* write IO goes into here */
429
430     SSL3_RECORD rrec;      /* each decoded record goes in here */
431     SSL3_RECORD wrec;      /* goes out from here */
432
433     /* storage for Alert/Handshake protocol data received but not
434      * yet processed by ssl3_read_bytes: */
435     unsigned char alert_fragment[2];
436     unsigned int alert_fragment_len;
437     unsigned char handshake_fragment[4];
438     unsigned int handshake_fragment_len;
439
440     /* partial write - check the numbers match */
441     unsigned int wnum;      /* number of bytes sent so far */
442     int wpend_tot;          /* number bytes written */
443     int wpend_type;
444     int wpend_ret;          /* number of bytes submitted */
445     const unsigned char *wpend_buf;
446
447     /* used during startup, digest all incoming/outgoing packets */
448     BIO *handshake_buffer;
449     /* When set of handshake digests is determined, buffer is hashed
450      * and freed and MD_CTX-es for all required digests are stored in
451      * this array */
452     EVP_MD_CTX **handshake_dgst;
453     /* this is set whenever we see a change_cipher_spec message
454      * come in when we are not looking for one */
455     int change_cipher_spec;
456
457     int warn_alert;

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458     int fatal_alert;
459     /* we allow one fatal and one warning alert to be outstanding,
460      * send close alert via the warning alert */
461     int alert_dispatch;
462     unsigned char send_alert[2];
463
464     /* This flag is set when we should renegotiate ASAP, basically when
465      * there is no more data in the read or write buffers */
466     int renegotiate;
467     int total_renegotiations;
468     int num_renegotiations;
469
470     int in_read_app_data;
471
472     /* Opaque PRF input as used for the current handshake.
473      * These fields are used only if TLSEXT_TYPE_opaque_prf_input is defined
474      * (otherwise, they are merely present to improve binary compatibility)
475      void *client_opaque_prf_input;
476      size_t client_opaque_prf_input_len;
477      void *server_opaque_prf_input;
478      size_t server_opaque_prf_input_len;
479
480     struct {
481         /* actually only needs to be 16+20 */
482         unsigned char cert_verify_md[EVP_MAX_MD_SIZE*2];
483
484         /* actually only need to be 16+20 for SSLv3 and 12 for TLS */
485         unsigned char finish_md[EVP_MAX_MD_SIZE*2];
486         int finish_md_len;
487         unsigned char peer_finish_md[EVP_MAX_MD_SIZE*2];
488         int peer_finish_md_len;
489
490         unsigned long message_size;
491         int message_type;
492
493         /* used to hold the new cipher we are going to use */
494         const SSL_CIPHER *new_cipher;
495 #ifndef OPENSSL_NO_DH
496         DH *dh;
497 #endif
498
499 #ifndef OPENSSL_NO_ECDH
500         EC_KEY *ecdh; /* holds short lived ECDH key */
501 #endif
502
503         /* used when SSL_ST_FLUSH_DATA is entered */
504         int next_state;
505
506         int reuse_message;
507
508         /* used for certificate requests */
509         int cert_req;
510         int ctype_num;
511         char ctype[SSL3_CT_NUMBER];
512         STACK_OF(X509_NAME) *ca_names;
513
514         int use_rsa_tmp;
515
516         int key_block_length;
517         unsigned char *key_block;
518
519         const EVP_CIPHER *new_sym_enc;
520         const EVP_MD *new_hash;
521         int new_mac_pkey_type;
522         int new_mac_secret_size;
523 #ifndef OPENSSL_NO_COMP

```

```

524         const SSL_COMP *new_compression;
525 #else
526         char *new_compression;
527 #endif
528         int cert_request;
529     } tmp;

531     /* Connection binding to prevent renegotiation attacks */
532     unsigned char previous_client_finished[EVP_MAX_MD_SIZE];
533     unsigned char previous_client_finished_len;
534     unsigned char previous_server_finished[EVP_MAX_MD_SIZE];
535     unsigned char previous_server_finished_len;
536     int send_connection_binding; /* TODOEKR */

538 #ifndef OPENSSL_NO_NEXTPROTONEG
539     /* Set if we saw the Next Protocol Negotiation extension from our peer. */
540     int next_proto_neg_seen;
541 #endif

543 #ifndef OPENSSL_NO_TLSEXT
544 #ifndef OPENSSL_NO_EC
545     /* This is set to true if we believe that this is a version of Safari
546        * running on OS X 10.6 or newer. We wish to know this because Safari
547        * on 10.8 .. 10.8.3 has broken ECDHE-ECDSA support. */
548     char is_probably_safari;
549 #endif /* !OPENSSL_NO_EC */
550 #endif /* !OPENSSL_NO_TLSEXT */
551     } SSL3_STATE;

553 #endif

555 /* SSLv3 */
556 /* client */
557 /* extra state */
558 #define SSL3_ST_SW_FLUSH (0x100|SSL_ST_CONNECT)
559 #ifndef OPENSSL_NO_SCTP
560 #define DTLS1_SCTP_ST_SW_WRITE_SOCK (0x310|SSL_ST_CONNECT)
561 #define DTLS1_SCTP_ST_CR_READ_SOCK (0x320|SSL_ST_CONNECT)
562 #endif
563 /* write to server */
564 #define SSL3_ST_SW_CLNT_HELLO_A (0x110|SSL_ST_CONNECT)
565 #define SSL3_ST_SW_CLNT_HELLO_B (0x111|SSL_ST_CONNECT)
566 /* read from server */
567 #define SSL3_ST_CR_SRVR_HELLO_A (0x120|SSL_ST_CONNECT)
568 #define SSL3_ST_CR_SRVR_HELLO_B (0x121|SSL_ST_CONNECT)
569 #define DTLS1_ST_CR_HELLO_VERIFY_REQUEST_A (0x126|SSL_ST_CONNECT)
570 #define DTLS1_ST_CR_HELLO_VERIFY_REQUEST_B (0x127|SSL_ST_CONNECT)
571 #define SSL3_ST_CR_CERT_A (0x130|SSL_ST_CONNECT)
572 #define SSL3_ST_CR_CERT_B (0x131|SSL_ST_CONNECT)
573 #define SSL3_ST_CR_KEY_EXCH_A (0x140|SSL_ST_CONNECT)
574 #define SSL3_ST_CR_KEY_EXCH_B (0x141|SSL_ST_CONNECT)
575 #define SSL3_ST_CR_CERT_REQ_A (0x150|SSL_ST_CONNECT)
576 #define SSL3_ST_CR_CERT_REQ_B (0x151|SSL_ST_CONNECT)
577 #define SSL3_ST_CR_SRVR_DONE_A (0x160|SSL_ST_CONNECT)
578 #define SSL3_ST_CR_SRVR_DONE_B (0x161|SSL_ST_CONNECT)
579 /* write to server */
580 #define SSL3_ST_SW_CERT_A (0x170|SSL_ST_CONNECT)
581 #define SSL3_ST_SW_CERT_B (0x171|SSL_ST_CONNECT)
582 #define SSL3_ST_SW_CERT_C (0x172|SSL_ST_CONNECT)
583 #define SSL3_ST_SW_CERT_D (0x173|SSL_ST_CONNECT)
584 #define SSL3_ST_SW_KEY_EXCH_A (0x180|SSL_ST_CONNECT)
585 #define SSL3_ST_SW_KEY_EXCH_B (0x181|SSL_ST_CONNECT)
586 #define SSL3_ST_SW_CERT_VRFY_A (0x190|SSL_ST_CONNECT)
587 #define SSL3_ST_SW_CERT_VRFY_B (0x191|SSL_ST_CONNECT)
588 #define SSL3_ST_SW_CHANGE_A (0x1A0|SSL_ST_CONNECT)
589 #define SSL3_ST_SW_CHANGE_B (0x1A1|SSL_ST_CONNECT)

```

```

590 #ifndef OPENSSL_NO_NEXTPROTONEG
591 #define SSL3_ST_SW_NEXT_PROTO_A (0x200|SSL_ST_CONNECT)
592 #define SSL3_ST_SW_NEXT_PROTO_B (0x201|SSL_ST_CONNECT)
593 #endif
594 #define SSL3_ST_SW_FINISHED_A (0x1B0|SSL_ST_CONNECT)
595 #define SSL3_ST_SW_FINISHED_B (0x1B1|SSL_ST_CONNECT)
596 /* read from server */
597 #define SSL3_ST_CR_CHANGE_A (0x1C0|SSL_ST_CONNECT)
598 #define SSL3_ST_CR_CHANGE_B (0x1C1|SSL_ST_CONNECT)
599 #define SSL3_ST_CR_FINISHED_A (0x1D0|SSL_ST_CONNECT)
600 #define SSL3_ST_CR_FINISHED_B (0x1D1|SSL_ST_CONNECT)
601 #define SSL3_ST_CR_SESSION_TICKET_A (0x1E0|SSL_ST_CONNECT)
602 #define SSL3_ST_CR_SESSION_TICKET_B (0x1E1|SSL_ST_CONNECT)
603 #define SSL3_ST_CR_CERT_STATUS_A (0x1F0|SSL_ST_CONNECT)
604 #define SSL3_ST_CR_CERT_STATUS_B (0x1F1|SSL_ST_CONNECT)

606 /* server */
607 /* extra state */
608 #define SSL3_ST_SW_FLUSH (0x100|SSL_ST_ACCEPT)
609 #ifndef OPENSSL_NO_SCTP
610 #define DTLS1_SCTP_ST_SW_WRITE_SOCK (0x310|SSL_ST_ACCEPT)
611 #define DTLS1_SCTP_ST_SR_READ_SOCK (0x320|SSL_ST_ACCEPT)
612 #endif
613 /* read from client */
614 /* Do not change the number values, they do matter */
615 #define SSL3_ST_SR_CLNT_HELLO_A (0x110|SSL_ST_ACCEPT)
616 #define SSL3_ST_SR_CLNT_HELLO_B (0x111|SSL_ST_ACCEPT)
617 #define SSL3_ST_SR_CLNT_HELLO_C (0x112|SSL_ST_ACCEPT)
618 /* write to client */
619 #define DTLS1_ST_SW_HELLO_VERIFY_REQUEST_A (0x113|SSL_ST_ACCEPT)
620 #define DTLS1_ST_SW_HELLO_VERIFY_REQUEST_B (0x114|SSL_ST_ACCEPT)
621 #define SSL3_ST_SW_HELLO_REQ_A (0x120|SSL_ST_ACCEPT)
622 #define SSL3_ST_SW_HELLO_REQ_B (0x121|SSL_ST_ACCEPT)
623 #define SSL3_ST_SW_HELLO_REQ_C (0x122|SSL_ST_ACCEPT)
624 #define SSL3_ST_SW_SRVR_HELLO_A (0x130|SSL_ST_ACCEPT)
625 #define SSL3_ST_SW_SRVR_HELLO_B (0x131|SSL_ST_ACCEPT)
626 #define SSL3_ST_SW_CERT_A (0x140|SSL_ST_ACCEPT)
627 #define SSL3_ST_SW_CERT_B (0x141|SSL_ST_ACCEPT)
628 #define SSL3_ST_SW_KEY_EXCH_A (0x150|SSL_ST_ACCEPT)
629 #define SSL3_ST_SW_KEY_EXCH_B (0x151|SSL_ST_ACCEPT)
630 #define SSL3_ST_SW_CERT_REQ_A (0x160|SSL_ST_ACCEPT)
631 #define SSL3_ST_SW_CERT_REQ_B (0x161|SSL_ST_ACCEPT)
632 #define SSL3_ST_SW_SRVR_DONE_A (0x170|SSL_ST_ACCEPT)
633 #define SSL3_ST_SW_SRVR_DONE_B (0x171|SSL_ST_ACCEPT)
634 /* read from client */
635 #define SSL3_ST_SR_CERT_A (0x180|SSL_ST_ACCEPT)
636 #define SSL3_ST_SR_CERT_B (0x181|SSL_ST_ACCEPT)
637 #define SSL3_ST_SR_KEY_EXCH_A (0x190|SSL_ST_ACCEPT)
638 #define SSL3_ST_SR_KEY_EXCH_B (0x191|SSL_ST_ACCEPT)
639 #define SSL3_ST_SR_CERT_VRFY_A (0x1A0|SSL_ST_ACCEPT)
640 #define SSL3_ST_SR_CERT_VRFY_B (0x1A1|SSL_ST_ACCEPT)
641 #define SSL3_ST_SR_CHANGE_A (0x1B0|SSL_ST_ACCEPT)
642 #define SSL3_ST_SR_CHANGE_B (0x1B1|SSL_ST_ACCEPT)
643 #ifndef OPENSSL_NO_NEXTPROTONEG
644 #define SSL3_ST_SR_NEXT_PROTO_A (0x210|SSL_ST_ACCEPT)
645 #define SSL3_ST_SR_NEXT_PROTO_B (0x211|SSL_ST_ACCEPT)
646 #endif
647 #define SSL3_ST_SR_FINISHED_A (0x1C0|SSL_ST_ACCEPT)
648 #define SSL3_ST_SR_FINISHED_B (0x1C1|SSL_ST_ACCEPT)
649 /* write to client */
650 #define SSL3_ST_SW_CHANGE_A (0x1D0|SSL_ST_ACCEPT)
651 #define SSL3_ST_SW_CHANGE_B (0x1D1|SSL_ST_ACCEPT)
652 #define SSL3_ST_SW_FINISHED_A (0x1E0|SSL_ST_ACCEPT)
653 #define SSL3_ST_SW_FINISHED_B (0x1E1|SSL_ST_ACCEPT)
654 #define SSL3_ST_SW_SESSION_TICKET_A (0x1F0|SSL_ST_ACCEPT)
655 #define SSL3_ST_SW_SESSION_TICKET_B (0x1F1|SSL_ST_ACCEPT)

```

```
656 #define SSL3_ST_SW_CERT_STATUS_A      (0x200|SSL_ST_ACCEPT)
657 #define SSL3_ST_SW_CERT_STATUS_B      (0x201|SSL_ST_ACCEPT)

659 #define SSL3_MT_HELLO_REQUEST          0
660 #define SSL3_MT_CLIENT_HELLO          1
661 #define SSL3_MT_SERVER_HELLO          2
662 #define SSL3_MT_NEWSESSION_TICKET     4
663 #define SSL3_MT_CERTIFICATE           11
664 #define SSL3_MT_SERVER_KEY_EXCHANGE   12
665 #define SSL3_MT_CERTIFICATE_REQUEST   13
666 #define SSL3_MT_SERVER_DONE           14
667 #define SSL3_MT_CERTIFICATE_VERIFY     15
668 #define SSL3_MT_CLIENT_KEY_EXCHANGE    16
669 #define SSL3_MT_FINISHED               20
670 #define SSL3_MT_CERTIFICATE_STATUS     22
671 #ifndef OPENSSL_NO_NEXTPROTONEG
672 #define SSL3_MT_NEXT_PROTO              67
673 #endif
674 #define DTLS1_MT_HELLO_VERIFY_REQUEST  3

677 #define SSL3_MT_CCS                    1

679 /* These are used when changing over to a new cipher */
680 #define SSL3_CC_READ                    0x01
681 #define SSL3_CC_WRITE                   0x02
682 #define SSL3_CC_CLIENT                  0x10
683 #define SSL3_CC_SERVER                  0x20
684 #define SSL3_CHANGE_CIPHER_CLIENT_WRITE (SSL3_CC_CLIENT|SSL3_CC_WRITE)
685 #define SSL3_CHANGE_CIPHER_SERVER_READ  (SSL3_CC_SERVER|SSL3_CC_READ)
686 #define SSL3_CHANGE_CIPHER_CLIENT_READ  (SSL3_CC_CLIENT|SSL3_CC_READ)
687 #define SSL3_CHANGE_CIPHER_SERVER_WRITE (SSL3_CC_SERVER|SSL3_CC_WRITE)

689 #ifdef __cplusplus
690 }
691 #endif
692 #endif
```

```

*****
4412 Fri May 30 18:31:22 2014
new/usr/src/lib/openssl/include/openssl/stack.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/stack/stack.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ''AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef HEADER_STACK_H
60 #define HEADER_STACK_H

```

```

62 #ifdef __cplusplus
63 extern "C" {
64 #endif
65
66 typedef struct stack_st
67 {
68     int num;
69     char **data;
70     int sorted;
71
72     int num_alloc;
73     int (*comp)(const void *, const void *);
74 } _STACK; /* Use STACK_OF(...) instead */
75
76 #define M_sk_num(sk) ((sk) ? (sk)->num:-1)
77 #define M_sk_value(sk,n) ((sk) ? (sk)->data[n] : NULL)
78
79 int sk_num(const _STACK *);
80 void *sk_value(const _STACK *, int);
81
82 void sk_set(_STACK *, int, void *);
83
84 _STACK *sk_new(int (*cmp)(const void *, const void *));
85 _STACK *sk_new_null(void);
86 void sk_free(_STACK *);
87 void sk_pop_free(_STACK *st, void (*func)(void *));
88 int sk_insert(_STACK *sk, void *data, int where);
89 void *sk_delete(_STACK *sk, int loc);
90 void *sk_delete_ptr(_STACK *sk, void *p);
91 int sk_find(_STACK *sk, void *data);
92 int sk_find_ex(_STACK *sk, void *data);
93 int sk_push(_STACK *sk, void *data);
94 int sk_unshift(_STACK *sk, void *data);
95 void *sk_shift(_STACK *sk);
96 void *sk_pop(_STACK *sk);
97 void sk_zero(_STACK *sk);
98 int (*sk_set_cmp_func(_STACK *sk, int (*c)(const void *, const void *)))
99     (const void *, const void *);
100 _STACK *sk_dup(_STACK *sk);
101 void sk_sort(_STACK *sk);
102 int sk_is_sorted(const _STACK *sk);
103
104 #ifdef __cplusplus
105 }
106 #endif
107
108 #endif

```

```

*****
292168 Fri May 30 18:31:23 2014
new/usr/src/lib/openssl/include/openssl/sunw_prefix.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 #ifndef _SUNW_PREFIX_H
2 #define _SUNW_PREFIX_H

3
4 #pragma redefine_extname      _CONF_add_string sunw_CONF_add_string
5 #pragma redefine_extname      _CONF_free_data sunw_CONF_free_data
6 #pragma redefine_extname      _CONF_get_section sunw_CONF_get_section
7 #pragma redefine_extname      _CONF_get_section_values sunw_CONF_get_section_
8 #pragma redefine_extname      _CONF_get_string sunw_CONF_get_string
9 #pragma redefine_extname      _CONF_new_data sunw_CONF_new_data
10 #pragma redefine_extname      _CONF_new_section sunw_CONF_new_section
11 #pragma redefine_extname      _des_crypt sunw_des_crypt
12 #pragma redefine_extname      _ossl_096_des_random_seed sunw_ossl_096_des_ran
13 #pragma redefine_extname      _ossl_old_crypt sunw_ossl_old_crypt
14 #pragma redefine_extname      _ossl_old_des_cbc_cksum sunw_ossl_old_des_cbc_c
15 #pragma redefine_extname      _ossl_old_des_cbc_encrypt sunw_ossl_old_des_cbc
16 #pragma redefine_extname      _ossl_old_des_cfb_encrypt sunw_ossl_old_des_cfb
17 #pragma redefine_extname      _ossl_old_des_cfb64_encrypt sunw_ossl_old_des_c
18 #pragma redefine_extname      _ossl_old_des_crypt sunw_ossl_old_des_crypt
19 #pragma redefine_extname      _ossl_old_des_decrypt3 sunw_ossl_old_des_decrypt
20 #pragma redefine_extname      _ossl_old_des_ecb_encrypt sunw_ossl_old_des_ecb
21 #pragma redefine_extname      _ossl_old_des_ecb3_encrypt sunw_ossl_old_des_ec
22 #pragma redefine_extname      _ossl_old_des_ede3_cbc_encrypt sunw_ossl_old_de
23 #pragma redefine_extname      _ossl_old_des_ede3_cfb64_encrypt sunw_ossl_old_
24 #pragma redefine_extname      _ossl_old_des_ede3_ofb64_encrypt sunw_ossl_old_
25 #pragma redefine_extname      _ossl_old_des_enc_read sunw_ossl_old_des_enc_re
26 #pragma redefine_extname      _ossl_old_des_enc_write sunw_ossl_old_des_enc_w
27 #pragma redefine_extname      _ossl_old_des_encrypt sunw_ossl_old_des_encrypt
28 #pragma redefine_extname      _ossl_old_des_encrypt2 sunw_ossl_old_des_encrypt
29 #pragma redefine_extname      _ossl_old_des_encrypt3 sunw_ossl_old_des_encrypt
30 #pragma redefine_extname      _ossl_old_des_fcrypt sunw_ossl_old_des_fcrypt
31 #pragma redefine_extname      _ossl_old_des_is_weak_key sunw_ossl_old_des_is_
32 #pragma redefine_extname      _ossl_old_des_key_sched sunw_ossl_old_des_key_s
33 #pragma redefine_extname      _ossl_old_des_ncbc_encrypt sunw_ossl_old_des_nc
34 #pragma redefine_extname      _ossl_old_des_ofb_encrypt sunw_ossl_old_des_ofb
35 #pragma redefine_extname      _ossl_old_des_ofb64_encrypt sunw_ossl_old_des_o
36 #pragma redefine_extname      _ossl_old_des_options sunw_ossl_old_des_options
37 #pragma redefine_extname      _ossl_old_des_pcbc_encrypt sunw_ossl_old_des_pc
38 #pragma redefine_extname      _ossl_old_des_quad_cksum sunw_ossl_old_des_quad
39 #pragma redefine_extname      _ossl_old_des_random_key sunw_ossl_old_des_rand
40 #pragma redefine_extname      _ossl_old_des_random_seed sunw_ossl_old_des_ran
41 #pragma redefine_extname      _ossl_old_des_read_2passwords sunw_ossl_old_des
42 #pragma redefine_extname      _ossl_old_des_read_password sunw_ossl_old_des_r
43 #pragma redefine_extname      _ossl_old_des_read_pw sunw_ossl_old_des_read_pw
44 #pragma redefine_extname      _ossl_old_des_read_pw_string sunw_ossl_old_des_
45 #pragma redefine_extname      _ossl_old_des_set_key sunw_ossl_old_des_set_key
46 #pragma redefine_extname      _ossl_old_des_set_odd_parity sunw_ossl_old_des_
47 #pragma redefine_extname      _ossl_old_des_string_to_2keys sunw_ossl_old_des
48 #pragma redefine_extname      _ossl_old_des_string_to_key sunw_ossl_old_des_s
49 #pragma redefine_extname      _ossl_old_des_xcbc_encrypt sunw_ossl_old_des_xc
50 #pragma redefine_extname      _shadow_DES_rw_mode sunw_shadow_DES_rw_mode
51 #pragma redefine_extname      a2d_ASN1_OBJECT sunw_a2d_ASN1_OBJECT
52 #pragma redefine_extname      a2i_ASN1_ENUMERATED sunw_a2i_ASN1_ENUMERATED
53 #pragma redefine_extname      a2i_ASN1_INTEGER sunw_a2i_ASN1_INTEGER
54 #pragma redefine_extname      a2i_ASN1_STRING sunw_a2i_ASN1_STRING
55 #pragma redefine_extname      a2i_GENERAL_NAME sunw_a2i_GENERAL_NAME
56 #pragma redefine_extname      a2i_ipadd sunw_a2i_ipadd
57 #pragma redefine_extname      a2i_IPADDRESS sunw_a2i_IPADDRESS
58 #pragma redefine_extname      a2i_IPADDRESS_NC sunw_a2i_IPADDRESS_NC
59 #pragma redefine_extname      ACCESS_DESCRIPTION_free sunw_ACCESS_DESCRIPTION_
60 #pragma redefine_extname      ACCESS_DESCRIPTION_it sunw_ACCESS_DESCRIPTION_it
61 #pragma redefine_extname      ACCESS_DESCRIPTION_new sunw_ACCESS_DESCRIPTION_n

```

```

62 #pragma redefine_extname      AES_bi_ige_encrypt sunw_AES_bi_ige_encrypt
63 #pragma redefine_extname      AES_cbc_encrypt sunw_AES_cbc_encrypt
64 #pragma redefine_extname      AES_cfb1_encrypt sunw_AES_cfb1_encrypt
65 #pragma redefine_extname      AES_cfb128_encrypt sunw_AES_cfb128_encrypt
66 #pragma redefine_extname      AES_cfb8_encrypt sunw_AES_cfb8_encrypt
67 #pragma redefine_extname      AES_ctr128_encrypt sunw_AES_ctr128_encrypt
68 #pragma redefine_extname      AES_decrypt sunw_AES_decrypt
69 #pragma redefine_extname      AES_ecb_encrypt sunw_AES_ecb_encrypt
70 #pragma redefine_extname      AES_encrypt sunw_AES_encrypt
71 #pragma redefine_extname      AES_ige_encrypt sunw_AES_ige_encrypt
72 #pragma redefine_extname      AES_ofb128_encrypt sunw_AES_ofb128_encrypt
73 #pragma redefine_extname      AES_options sunw_AES_options
74 #pragma redefine_extname      AES_set_decrypt_key sunw_AES_set_decrypt_key
75 #pragma redefine_extname      AES_set_encrypt_key sunw_AES_set_encrypt_key
76 #pragma redefine_extname      AES_unwrap_key sunw_AES_unwrap_key
77 #pragma redefine_extname      AES_version sunw_AES_version
78 #pragma redefine_extname      AES_wrap_key sunw_AES_wrap_key
79 #pragma redefine_extname      aesni_cbc_encrypt sunw_aesni_cbc_encrypt
80 #pragma redefine_extname      aesni_cbc_sha1_enc sunw_aesni_cbc_sha1_enc
81 #pragma redefine_extname      aesni_ccm64_decrypt_blocks sunw_aesni_ccm64_decr
82 #pragma redefine_extname      aesni_ccm64_encrypt_blocks sunw_aesni_ccm64_encr
83 #pragma redefine_extname      aesni_ctr32_encrypt_blocks sunw_aesni_ctr32_encr
84 #pragma redefine_extname      aesni_decrypt sunw_aesni_decrypt
85 #pragma redefine_extname      aesni_ecb_encrypt sunw_aesni_ecb_encrypt
86 #pragma redefine_extname      aesni_encrypt sunw_aesni_encrypt
87 #pragma redefine_extname      aesni_set_decrypt_key sunw_aesni_set_decrypt_key
88 #pragma redefine_extname      aesni_set_encrypt_key sunw_aesni_set_encrypt_key
89 #pragma redefine_extname      aesni_xts_decrypt sunw_aesni_xts_decrypt
90 #pragma redefine_extname      aesni_xts_encrypt sunw_aesni_xts_encrypt
91 #pragma redefine_extname      asn1_add_error sunw_asn1_add_error
92 #pragma redefine_extname      ASN1_add_oid_module sunw_ASN1_add_oid_module
93 #pragma redefine_extname      ASN1_ANY_it sunw_ASN1_ANY_it
94 #pragma redefine_extname      ASN1_BIT_STRING_check sunw_ASN1_BIT_STRING_check
95 #pragma redefine_extname      ASN1_BIT_STRING_free sunw_ASN1_BIT_STRING_free
96 #pragma redefine_extname      ASN1_BIT_STRING_get_bit sunw_ASN1_BIT_STRING_get
97 #pragma redefine_extname      ASN1_BIT_STRING_it sunw_ASN1_BIT_STRING_it
98 #pragma redefine_extname      ASN1_BIT_STRING_name_print sunw_ASN1_BIT_STRING_
99 #pragma redefine_extname      ASN1_BIT_STRING_new sunw_ASN1_BIT_STRING_new
100 #pragma redefine_extname      ASN1_BIT_STRING_num_asc sunw_ASN1_BIT_STRING_num
101 #pragma redefine_extname      ASN1_BIT_STRING_set sunw_ASN1_BIT_STRING_set
102 #pragma redefine_extname      ASN1_BIT_STRING_set_asc sunw_ASN1_BIT_STRING_set
103 #pragma redefine_extname      ASN1_BIT_STRING_set_bit sunw_ASN1_BIT_STRING_set
104 #pragma redefine_extname      ASN1_BMPSTRING_free sunw_ASN1_BMPSTRING_free
105 #pragma redefine_extname      ASN1_BMPSTRING_it sunw_ASN1_BMPSTRING_it
106 #pragma redefine_extname      ASN1_BMPSTRING_new sunw_ASN1_BMPSTRING_new
107 #pragma redefine_extname      ASN1_bn_print sunw_ASN1_bn_print
108 #pragma redefine_extname      ASN1_BOOLEAN_it sunw_ASN1_BOOLEAN_it
109 #pragma redefine_extname      ASN1_check_infinite_end sunw_ASN1_check_infinite
110 #pragma redefine_extname      ASN1_const_check_infinite_end sunw_ASN1_const_ch
111 #pragma redefine_extname      asn1_const_Finish sunw_asn1_const_Finish
112 #pragma redefine_extname      ASN1_d2i_bio sunw_ASN1_d2i_bio
113 #pragma redefine_extname      ASN1_d2i_fp sunw_ASN1_d2i_fp
114 #pragma redefine_extname      ASN1_digest sunw_ASN1_digest
115 #pragma redefine_extname      asn1_do_adb sunw_asn1_do_adb
116 #pragma redefine_extname      asn1_do_lock sunw_asn1_do_lock
117 #pragma redefine_extname      ASN1_dup sunw_ASN1_dup
118 #pragma redefine_extname      asn1_enc_free sunw_asn1_enc_free
119 #pragma redefine_extname      asn1_enc_init sunw_asn1_enc_init
120 #pragma redefine_extname      asn1_enc_restore sunw_asn1_enc_restore
121 #pragma redefine_extname      asn1_enc_save sunw_asn1_enc_save
122 #pragma redefine_extname      ASN1_ENUMERATED_free sunw_ASN1_ENUMERATED_free
123 #pragma redefine_extname      ASN1_ENUMERATED_get sunw_ASN1_ENUMERATED_get
124 #pragma redefine_extname      ASN1_ENUMERATED_it sunw_ASN1_ENUMERATED_it
125 #pragma redefine_extname      ASN1_ENUMERATED_new sunw_ASN1_ENUMERATED_new
126 #pragma redefine_extname      ASN1_ENUMERATED_set sunw_ASN1_ENUMERATED_set
127 #pragma redefine_extname      ASN1_ENUMERATED_to_BN sunw_ASN1_ENUMERATED_to_BN

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128 #pragma redefine_extname      asn1_ex_c2i sunw_asn1_ex_c2i
129 #pragma redefine_extname      asn1_ex_i2c sunw_asn1_ex_i2c
130 #pragma redefine_extname      ASN1_FBOOLEAN_it sunw_ASN1_FBOOLEAN_it
131 #pragma redefine_extname      asn1_Finish sunw_asn1_Finish
132 #pragma redefine_extname      ASN1_GENERALIZEDTIME_adj sunw_ASN1_GENERALIZEDTI
133 #pragma redefine_extname      ASN1_GENERALIZEDTIME_check sunw_ASN1_GENERALIZED
134 #pragma redefine_extname      ASN1_GENERALIZEDTIME_free sunw_ASN1_GENERALIZEDT
135 #pragma redefine_extname      ASN1_GENERALIZEDTIME_it sunw_ASN1_GENERALIZEDTIM
136 #pragma redefine_extname      ASN1_GENERALIZEDTIME_new sunw_ASN1_GENERALIZEDTI
137 #pragma redefine_extname      ASN1_GENERALIZEDTIME_print sunw_ASN1_GENERALIZED
138 #pragma redefine_extname      ASN1_GENERALIZEDTIME_set sunw_ASN1_GENERALIZEDTI
139 #pragma redefine_extname      ASN1_GENERALIZEDTIME_set_string sunw_ASN1_GENERA
140 #pragma redefine_extname      ASN1_GENERALSTRING_free sunw_ASN1_GENERALSTRING
141 #pragma redefine_extname      ASN1_GENERALSTRING_it sunw_ASN1_GENERALSTRING_it
142 #pragma redefine_extname      ASN1_GENERALSTRING_new sunw_ASN1_GENERALSTRING_n
143 #pragma redefine_extname      ASN1_generate_nconf sunw_ASN1_generate_nconf
144 #pragma redefine_extname      ASN1_generate_v3 sunw_ASN1_generate_v3
145 #pragma redefine_extname      asn1_get_choice_selector sunw_asn1_get_choice_se
146 #pragma redefine_extname      asn1_get_field_ptr sunw_asn1_get_field_ptr
147 #pragma redefine_extname      ASN1_get_object sunw_ASN1_get_object
148 #pragma redefine_extname      asn1_GetSequence sunw_asn1_GetSequence
149 #pragma redefine_extname      ASN1_i2d_bio sunw_ASN1_i2d_bio
150 #pragma redefine_extname      ASN1_i2d_fp sunw_ASN1_i2d_fp
151 #pragma redefine_extname      ASN1_IA5STRING_free sunw_ASN1_IA5STRING_free
152 #pragma redefine_extname      ASN1_IA5STRING_it sunw_ASN1_IA5STRING_it
153 #pragma redefine_extname      ASN1_IA5STRING_new sunw_ASN1_IA5STRING_new
154 #pragma redefine_extname      ASN1_INTEGER_cmp sunw_ASN1_INTEGER_cmp
155 #pragma redefine_extname      ASN1_INTEGER_dup sunw_ASN1_INTEGER_dup
156 #pragma redefine_extname      ASN1_INTEGER_free sunw_ASN1_INTEGER_free
157 #pragma redefine_extname      ASN1_INTEGER_get sunw_ASN1_INTEGER_get
158 #pragma redefine_extname      ASN1_INTEGER_it sunw_ASN1_INTEGER_it
159 #pragma redefine_extname      ASN1_INTEGER_new sunw_ASN1_INTEGER_new
160 #pragma redefine_extname      ASN1_INTEGER_set sunw_ASN1_INTEGER_set
161 #pragma redefine_extname      ASN1_INTEGER_to_BN sunw_ASN1_INTEGER_to_BN
162 #pragma redefine_extname      ASN1_item_d2i sunw_ASN1_item_d2i
163 #pragma redefine_extname      ASN1_item_d2i_bio sunw_ASN1_item_d2i_bio
164 #pragma redefine_extname      ASN1_item_d2i_fp sunw_ASN1_item_d2i_fp
165 #pragma redefine_extname      ASN1_item_digest sunw_ASN1_item_digest
166 #pragma redefine_extname      ASN1_item_dup sunw_ASN1_item_dup
167 #pragma redefine_extname      ASN1_item_ex_d2i sunw_ASN1_item_ex_d2i
168 #pragma redefine_extname      ASN1_item_ex_free sunw_ASN1_item_ex_free
169 #pragma redefine_extname      ASN1_item_ex_i2d sunw_ASN1_item_ex_i2d
170 #pragma redefine_extname      ASN1_item_ex_new sunw_ASN1_item_ex_new
171 #pragma redefine_extname      ASN1_item_free sunw_ASN1_item_free
172 #pragma redefine_extname      ASN1_item_i2d sunw_ASN1_item_i2d
173 #pragma redefine_extname      ASN1_item_i2d_bio sunw_ASN1_item_i2d_bio
174 #pragma redefine_extname      ASN1_item_i2d_fp sunw_ASN1_item_i2d_fp
175 #pragma redefine_extname      ASN1_item_ndef_i2d sunw_ASN1_item_ndef_i2d
176 #pragma redefine_extname      ASN1_item_new sunw_ASN1_item_new
177 #pragma redefine_extname      ASN1_item_pack sunw_ASN1_item_pack
178 #pragma redefine_extname      ASN1_item_print sunw_ASN1_item_print
179 #pragma redefine_extname      ASN1_item_sign sunw_ASN1_item_sign
180 #pragma redefine_extname      ASN1_item_sign_ctx sunw_ASN1_item_sign_ctx
181 #pragma redefine_extname      ASN1_item_unpack sunw_ASN1_item_unpack
182 #pragma redefine_extname      ASN1_item_verify sunw_ASN1_item_verify
183 #pragma redefine_extname      ASN1_mbstring_copy sunw_ASN1_mbstring_copy
184 #pragma redefine_extname      ASN1_mbstring_ncopy sunw_ASN1_mbstring_ncopy
185 #pragma redefine_extname      ASN1_NULL_free sunw_ASN1_NULL_free
186 #pragma redefine_extname      ASN1_NULL_it sunw_ASN1_NULL_it
187 #pragma redefine_extname      ASN1_NULL_new sunw_ASN1_NULL_new
188 #pragma redefine_extname      ASN1_OBJECT_create sunw_ASN1_OBJECT_create
189 #pragma redefine_extname      ASN1_OBJECT_free sunw_ASN1_OBJECT_free
190 #pragma redefine_extname      ASN1_OBJECT_it sunw_ASN1_OBJECT_it
191 #pragma redefine_extname      ASN1_OBJECT_new sunw_ASN1_OBJECT_new
192 #pragma redefine_extname      ASN1_object_size sunw_ASN1_object_size
193 #pragma redefine_extname      ASN1_OCTET_STRING_cmp sunw_ASN1_OCTET_STRING_cmp

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194 #pragma redefine_extname      ASN1_OCTET_STRING_dup sunw_ASN1_OCTET_STRING_dup
195 #pragma redefine_extname      ASN1_OCTET_STRING_free sunw_ASN1_OCTET_STRING_fr
196 #pragma redefine_extname      ASN1_OCTET_STRING_it sunw_ASN1_OCTET_STRING_it
197 #pragma redefine_extname      ASN1_OCTET_STRING_NDEF_it sunw_ASN1_OCTET_STRING
198 #pragma redefine_extname      ASN1_OCTET_STRING_new sunw_ASN1_OCTET_STRING_new
199 #pragma redefine_extname      ASN1_OCTET_STRING_set sunw_ASN1_OCTET_STRING_set
200 #pragma redefine_extname      ASN1_pack_string sunw_ASN1_pack_string
201 #pragma redefine_extname      ASN1_parse sunw_ASN1_parse
202 #pragma redefine_extname      ASN1_parse_dump sunw_ASN1_parse_dump
203 #pragma redefine_extname      ASN1_PCTX_free sunw_ASN1_PCTX_free
204 #pragma redefine_extname      ASN1_PCTX_get_cert_flags sunw_ASN1_PCTX_get_cert
205 #pragma redefine_extname      ASN1_PCTX_get_flags sunw_ASN1_PCTX_get_flags
206 #pragma redefine_extname      ASN1_PCTX_get_nm_flags sunw_ASN1_PCTX_get_nm fla
207 #pragma redefine_extname      ASN1_PCTX_get_oid_flags sunw_ASN1_PCTX_get_oid_f
208 #pragma redefine_extname      ASN1_PCTX_get_str_flags sunw_ASN1_PCTX_get_str_f
209 #pragma redefine_extname      ASN1_PCTX_new sunw_ASN1_PCTX_new
210 #pragma redefine_extname      ASN1_PCTX_set_cert_flags sunw_ASN1_PCTX_set_cert
211 #pragma redefine_extname      ASN1_PCTX_set_flags sunw_ASN1_PCTX_set_flags
212 #pragma redefine_extname      ASN1_PCTX_set_nm_flags sunw_ASN1_PCTX_set_nm fla
213 #pragma redefine_extname      ASN1_PCTX_set_oid_flags sunw_ASN1_PCTX_set_oid_f
214 #pragma redefine_extname      ASN1_PCTX_set_str_flags sunw_ASN1_PCTX_set_str_f
215 #pragma redefine_extname      ASN1_primitive_free sunw_ASN1_primitive_free
216 #pragma redefine_extname      ASN1_primitive_new sunw_ASN1_primitive_new
217 #pragma redefine_extname      ASN1_PRINTABLE_free sunw_ASN1_PRINTABLE_free
218 #pragma redefine_extname      ASN1_PRINTABLE_it sunw_ASN1_PRINTABLE_it
219 #pragma redefine_extname      ASN1_PRINTABLE_new sunw_ASN1_PRINTABLE_new
220 #pragma redefine_extname      ASN1_PRINTABLE_type sunw_ASN1_PRINTABLE_type
221 #pragma redefine_extname      ASN1_PRINTABLESTRING_free sunw_ASN1_PRINTABLESTR
222 #pragma redefine_extname      ASN1_PRINTABLESTRING_it sunw_ASN1_PRINTABLESTRIN
223 #pragma redefine_extname      ASN1_PRINTABLESTRING_new sunw_ASN1_PRINTABLESTRIN
224 #pragma redefine_extname      ASN1_put_eoc sunw_ASN1_put_eoc
225 #pragma redefine_extname      ASN1_put_object sunw_ASN1_put_object
226 #pragma redefine_extname      ASN1_seq_pack sunw_ASN1_seq_pack
227 #pragma redefine_extname      ASN1_seq_unpack sunw_ASN1_seq_unpack
228 #pragma redefine_extname      ASN1_SEQUENCE_ANY_it sunw_ASN1_SEQUENCE_ANY_it
229 #pragma redefine_extname      ASN1_SEQUENCE_it sunw_ASN1_SEQUENCE_it
230 #pragma redefine_extname      ASN1_SET_ANY_it sunw_ASN1_SET_ANY_it
231 #pragma redefine_extname      asn1_set_choice_selector sunw_asn1_set_choice_se
232 #pragma redefine_extname      ASN1_sign sunw_ASN1_sign
233 #pragma redefine_extname      ASN1_STRING_cmp sunw_ASN1_STRING_cmp
234 #pragma redefine_extname      ASN1_STRING_copy sunw_ASN1_STRING_copy
235 #pragma redefine_extname      ASN1_STRING_data sunw_ASN1_STRING_data
236 #pragma redefine_extname      ASN1_STRING_dup sunw_ASN1_STRING_dup
237 #pragma redefine_extname      ASN1_STRING_free sunw_ASN1_STRING_free
238 #pragma redefine_extname      ASN1_STRING_get_default_mask sunw_ASN1_STRING_ge
239 #pragma redefine_extname      ASN1_STRING_length sunw_ASN1_STRING_length
240 #pragma redefine_extname      ASN1_STRING_length_set sunw_ASN1_STRING_length_s
241 #pragma redefine_extname      ASN1_STRING_new sunw_ASN1_STRING_new
242 #pragma redefine_extname      ASN1_STRING_print sunw_ASN1_STRING_print
243 #pragma redefine_extname      ASN1_STRING_print_ex sunw_ASN1_STRING_print_ex
244 #pragma redefine_extname      ASN1_STRING_print_ex_fp sunw_ASN1_STRING_print_e
245 #pragma redefine_extname      ASN1_STRING_set sunw_ASN1_STRING_set
246 #pragma redefine_extname      ASN1_STRING_set_by_NID sunw_ASN1_STRING_set_by_N
247 #pragma redefine_extname      ASN1_STRING_set_default_mask sunw_ASN1_STRING_se
248 #pragma redefine_extname      ASN1_STRING_set_default_mask_asc sunw_ASN1_STRIN
249 #pragma redefine_extname      ASN1_STRING_set0 sunw_ASN1_STRING_set0
250 #pragma redefine_extname      ASN1_STRING_TABLE_add sunw_ASN1_STRING_TABLE_add
251 #pragma redefine_extname      ASN1_STRING_TABLE_cleanup sunw_ASN1_STRING_TABLE
252 #pragma redefine_extname      ASN1_STRING_TABLE_get sunw_ASN1_STRING_TABLE_get
253 #pragma redefine_extname      ASN1_STRING_to_UTF8 sunw_ASN1_STRING_to_UTF8
254 #pragma redefine_extname      ASN1_STRING_type sunw_ASN1_STRING_type
255 #pragma redefine_extname      ASN1_STRING_type_new sunw_ASN1_STRING_type_new
256 #pragma redefine_extname      ASN1_T61STRING_free sunw_ASN1_T61STRING_free
257 #pragma redefine_extname      ASN1_T61STRING_it sunw_ASN1_T61STRING_it
258 #pragma redefine_extname      ASN1_T61STRING_new sunw_ASN1_T61STRING_new
259 #pragma redefine_extname      ASN1_tag2bit sunw_ASN1_tag2bit

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260 #pragma redefine_extname ASN1_tag2str sunw_ASN1_tag2str
261 #pragma redefine_extname ASN1_TB0OLEAN_it sunw_ASN1_TB0OLEAN_it
262 #pragma redefine_extname ASN1_template_d2i sunw_ASN1_template_d2i
263 #pragma redefine_extname ASN1_template_free sunw_ASN1_template_free
264 #pragma redefine_extname ASN1_template_i2d sunw_ASN1_template_i2d
265 #pragma redefine_extname ASN1_template_new sunw_ASN1_template_new
266 #pragma redefine_extname asn1_template_print_ctx sunw_asn1_template_print
267 #pragma redefine_extname ASN1_TIME_adj sunw_ASN1_TIME_adj
268 #pragma redefine_extname ASN1_TIME_check sunw_ASN1_TIME_check
269 #pragma redefine_extname ASN1_TIME_free sunw_ASN1_TIME_free
270 #pragma redefine_extname ASN1_TIME_it sunw_ASN1_TIME_it
271 #pragma redefine_extname ASN1_TIME_new sunw_ASN1_TIME_new
272 #pragma redefine_extname ASN1_TIME_print sunw_ASN1_TIME_print
273 #pragma redefine_extname ASN1_TIME_set sunw_ASN1_TIME_set
274 #pragma redefine_extname ASN1_TIME_set_string sunw_ASN1_TIME_set_string
275 #pragma redefine_extname ASN1_TIME_to_generalizedtime sunw_ASN1_TIME_to_g
276 #pragma redefine_extname ASN1_TYPE_cmp sunw_ASN1_TYPE_cmp
277 #pragma redefine_extname ASN1_TYPE_free sunw_ASN1_TYPE_free
278 #pragma redefine_extname ASN1_TYPE_get sunw_ASN1_TYPE_get
279 #pragma redefine_extname ASN1_TYPE_get_int_octetstring sunw_ASN1_TYPE_get
280 #pragma redefine_extname ASN1_TYPE_get_octetstring sunw_ASN1_TYPE_get_oct
281 #pragma redefine_extname ASN1_TYPE_new sunw_ASN1_TYPE_new
282 #pragma redefine_extname ASN1_TYPE_set sunw_ASN1_TYPE_set
283 #pragma redefine_extname ASN1_TYPE_set_int_octetstring sunw_ASN1_TYPE_set
284 #pragma redefine_extname ASN1_TYPE_set_octetstring sunw_ASN1_TYPE_set_oct
285 #pragma redefine_extname ASN1_TYPE_set1 sunw_ASN1_TYPE_set1
286 #pragma redefine_extname ASN1_UNIVERSALSTRING_free sunw_ASN1_UNIVERSALSTR
287 #pragma redefine_extname ASN1_UNIVERSALSTRING_it sunw_ASN1_UNIVERSALSTRIN
288 #pragma redefine_extname ASN1_UNIVERSALSTRING_new sunw_ASN1_UNIVERSALSTRIN
289 #pragma redefine_extname ASN1_UNIVERSALSTRING_to_string sunw_ASN1_UNIVERS
290 #pragma redefine_extname ASN1_unpack_string sunw_ASN1_unpack_string
291 #pragma redefine_extname ASN1_UTCTIME_adj sunw_ASN1_UTCTIME_adj
292 #pragma redefine_extname ASN1_UTCTIME_check sunw_ASN1_UTCTIME_check
293 #pragma redefine_extname ASN1_UTCTIME_cmp_time_t sunw_ASN1_UTCTIME_cmp_ti
294 #pragma redefine_extname ASN1_UTCTIME_free sunw_ASN1_UTCTIME_free
295 #pragma redefine_extname ASN1_UTCTIME_it sunw_ASN1_UTCTIME_it
296 #pragma redefine_extname ASN1_UTCTIME_new sunw_ASN1_UTCTIME_new
297 #pragma redefine_extname ASN1_UTCTIME_print sunw_ASN1_UTCTIME_print
298 #pragma redefine_extname ASN1_UTCTIME_set sunw_ASN1_UTCTIME_set
299 #pragma redefine_extname ASN1_UTCTIME_set_string sunw_ASN1_UTCTIME_set_st
300 #pragma redefine_extname ASN1_UTF8STRING_free sunw_ASN1_UTF8STRING_free
301 #pragma redefine_extname ASN1_UTF8STRING_it sunw_ASN1_UTF8STRING_it
302 #pragma redefine_extname ASN1_UTF8STRING_new sunw_ASN1_UTF8STRING_new
303 #pragma redefine_extname ASN1_verify sunw_ASN1_verify
304 #pragma redefine_extname ASN1_version sunw_ASN1_version
305 #pragma redefine_extname ASN1_VISIBLESTRING_free sunw_ASN1_VISIBLESTRING
306 #pragma redefine_extname ASN1_VISIBLESTRING_it sunw_ASN1_VISIBLESTRING_it
307 #pragma redefine_extname ASN1_VISIBLESTRING_new sunw_ASN1_VISIBLESTRING_n
308 #pragma redefine_extname AUTHORITY_INFO_ACCESS_free sunw_AUTHORITY_INFO_A
309 #pragma redefine_extname AUTHORITY_INFO_ACCESS_it sunw_AUTHORITY_INFO_ACC
310 #pragma redefine_extname AUTHORITY_INFO_ACCESS_new sunw_AUTHORITY_INFO_AC
311 #pragma redefine_extname AUTHORITY_KEYID_free sunw_AUTHORITY_KEYID_free
312 #pragma redefine_extname AUTHORITY_KEYID_it sunw_AUTHORITY_KEYID_it
313 #pragma redefine_extname AUTHORITY_KEYID_new sunw_AUTHORITY_KEYID_new
314 #pragma redefine_extname b2i_PrivateKey sunw_b2i_PrivateKey
315 #pragma redefine_extname b2i_PrivateKey_bio sunw_b2i_PrivateKey_bio
316 #pragma redefine_extname b2i_PublicKey sunw_b2i_PublicKey
317 #pragma redefine_extname b2i_PublicKey_bio sunw_b2i_PublicKey_bio
318 #pragma redefine_extname b2i_PVK_bio sunw_b2i_PVK_bio
319 #pragma redefine_extname BASIC_CONSTRAINTS_free sunw_BASIC_CONSTRAINTS_fr
320 #pragma redefine_extname BASIC_CONSTRAINTS_it sunw_BASIC_CONSTRAINTS_it
321 #pragma redefine_extname BASIC_CONSTRAINTS_new sunw_BASIC_CONSTRAINTS_new
322 #pragma redefine_extname BF_cbc_encrypt sunw_BF_cbc_encrypt
323 #pragma redefine_extname BF_cfb64_encrypt sunw_BF_cfb64_encrypt
324 #pragma redefine_extname BF_decrypt sunw_BF_decrypt
325 #pragma redefine_extname BF_ecb_encrypt sunw_BF_ecb_encrypt

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326 #pragma redefine_extname BF_encrypt sunw_BF_encrypt
327 #pragma redefine_extname BF_ofb64_encrypt sunw_BF_ofb64_encrypt
328 #pragma redefine_extname BF_options sunw_BF_options
329 #pragma redefine_extname BF_set_key sunw_BF_set_key
330 #pragma redefine_extname BF_version sunw_BF_version
331 #pragma redefine_extname BIGNUM_it sunw_BIGNUM_it
332 #pragma redefine_extname BIO_accept sunw_BIO_accept
333 #pragma redefine_extname BIO_asn1_get_prefix sunw_BIO_asn1_get_prefix
334 #pragma redefine_extname BIO_asn1_get_suffix sunw_BIO_asn1_get_suffix
335 #pragma redefine_extname BIO_asn1_set_prefix sunw_BIO_asn1_set_prefix
336 #pragma redefine_extname BIO_asn1_set_suffix sunw_BIO_asn1_set_suffix
337 #pragma redefine_extname BIO_callback_ctrl sunw_BIO_callback_ctrl
338 #pragma redefine_extname BIO_clear_flags sunw_BIO_clear_flags
339 #pragma redefine_extname BIO_CONNECT_free sunw_BIO_CONNECT_free
340 #pragma redefine_extname BIO_CONNECT_new sunw_BIO_CONNECT_new
341 #pragma redefine_extname BIO_copy_next_retry sunw_BIO_copy_next_retry
342 #pragma redefine_extname BIO_ctrl sunw_BIO_ctrl
343 #pragma redefine_extname BIO_ctrl_get_read_request sunw_BIO_ctrl_get_read
344 #pragma redefine_extname BIO_ctrl_get_write_guarantee sunw_BIO_ctrl_get_w
345 #pragma redefine_extname BIO_ctrl_pending sunw_BIO_ctrl_pending
346 #pragma redefine_extname BIO_ctrl_reset_read_request sunw_BIO_ctrl_reset_
347 #pragma redefine_extname BIO_ctrl_wpending sunw_BIO_ctrl_wpending
348 #pragma redefine_extname BIO_debug_callback sunw_BIO_debug_callback
349 #pragma redefine_extname BIO_dgram_non_fatal_error sunw_BIO_dgram_non_fat
350 #pragma redefine_extname BIO_dump sunw_BIO_dump
351 #pragma redefine_extname BIO_dump_cb sunw_BIO_dump_cb
352 #pragma redefine_extname BIO_dump_fp sunw_BIO_dump_fp
353 #pragma redefine_extname BIO_dump_indent sunw_BIO_dump_indent
354 #pragma redefine_extname BIO_dump_indent_cb sunw_BIO_dump_indent_cb
355 #pragma redefine_extname BIO_dump_indent_fp sunw_BIO_dump_indent_fp
356 #pragma redefine_extname BIO_dup_chain sunw_BIO_dup_chain
357 #pragma redefine_extname BIO_f_asn1 sunw_BIO_f_asn1
358 #pragma redefine_extname BIO_f_base64 sunw_BIO_f_base64
359 #pragma redefine_extname BIO_f_buffer sunw_BIO_f_buffer
360 #pragma redefine_extname BIO_f_cipher sunw_BIO_f_cipher
361 #pragma redefine_extname BIO_f_md sunw_BIO_f_md
362 #pragma redefine_extname BIO_f_nbio_test sunw_BIO_f_nbio_test
363 #pragma redefine_extname BIO_f_null sunw_BIO_f_null
364 #pragma redefine_extname BIO_f_reliable sunw_BIO_f_reliable
365 #pragma redefine_extname BIO_fd_non_fatal_error sunw_BIO_fd_non_fatal_err
366 #pragma redefine_extname BIO_fd_should_retry sunw_BIO_fd_should_retry
367 #pragma redefine_extname BIO_find_type sunw_BIO_find_type
368 #pragma redefine_extname BIO_free sunw_BIO_free
369 #pragma redefine_extname BIO_free_all sunw_BIO_free_all
370 #pragma redefine_extname BIO_get_accept_socket sunw_BIO_get_accept_socket
371 #pragma redefine_extname BIO_get_callback sunw_BIO_get_callback
372 #pragma redefine_extname BIO_get_callback_arg sunw_BIO_get_callback_arg
373 #pragma redefine_extname BIO_get_ex_data sunw_BIO_get_ex_data
374 #pragma redefine_extname BIO_get_ex_new_index sunw_BIO_get_ex_new_index
375 #pragma redefine_extname BIO_get_host_ip sunw_BIO_get_host_ip
376 #pragma redefine_extname BIO_get_port sunw_BIO_get_port
377 #pragma redefine_extname BIO_get_retry_BIO sunw_BIO_get_retry_BIO
378 #pragma redefine_extname BIO_get_retry_reason sunw_BIO_get_retry_reason
379 #pragma redefine_extname BIO_gethostbyname sunw_BIO_gethostbyname
380 #pragma redefine_extname BIO_gets sunw_BIO_gets
381 #pragma redefine_extname BIO_indent sunw_BIO_indent
382 #pragma redefine_extname BIO_int_ctrl sunw_BIO_int_ctrl
383 #pragma redefine_extname BIO_method_name sunw_BIO_method_name
384 #pragma redefine_extname BIO_method_type sunw_BIO_method_type
385 #pragma redefine_extname BIO_new sunw_BIO_new
386 #pragma redefine_extname BIO_new_accept sunw_BIO_new_accept
387 #pragma redefine_extname BIO_new_bio_pair sunw_BIO_new_bio_pair
388 #pragma redefine_extname BIO_new_CMS sunw_BIO_new_CMS
389 #pragma redefine_extname BIO_new_connect sunw_BIO_new_connect
390 #pragma redefine_extname BIO_new_dgram sunw_BIO_new_dgram
391 #pragma redefine_extname BIO_new_fd sunw_BIO_new_fd

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392 #pragma redefine_extname BIO_new_file sunw_BIO_new_file
393 #pragma redefine_extname BIO_new_fp sunw_BIO_new_fp
394 #pragma redefine_extname BIO_new_mem_buf sunw_BIO_new_mem_buf
395 #pragma redefine_extname BIO_new_NDEF sunw_BIO_new_NDEF
396 #pragma redefine_extname BIO_new_PKCS7 sunw_BIO_new_PKCS7
397 #pragma redefine_extname BIO_new_socket sunw_BIO_new_socket
398 #pragma redefine_extname BIO_next sunw_BIO_next
399 #pragma redefine_extname BIO_nread sunw_BIO_nread
400 #pragma redefine_extname BIO_nread0 sunw_BIO_nread0
401 #pragma redefine_extname BIO_number_read sunw_BIO_number_read
402 #pragma redefine_extname BIO_number_written sunw_BIO_number_written
403 #pragma redefine_extname BIO_nwrite sunw_BIO_nwrite
404 #pragma redefine_extname BIO_nwrite0 sunw_BIO_nwrite0
405 #pragma redefine_extname BIO_pop sunw_BIO_pop
406 #pragma redefine_extname BIO_printf sunw_BIO_printf
407 #pragma redefine_extname BIO_ptr_ctrl sunw_BIO_ptr_ctrl
408 #pragma redefine_extname BIO_push sunw_BIO_push
409 #pragma redefine_extname BIO_puts sunw_BIO_puts
410 #pragma redefine_extname BIO_read sunw_BIO_read
411 #pragma redefine_extname BIO_s_accept sunw_BIO_s_accept
412 #pragma redefine_extname BIO_s_bio sunw_BIO_s_bio
413 #pragma redefine_extname BIO_s_connect sunw_BIO_s_connect
414 #pragma redefine_extname BIO_s_datagram sunw_BIO_s_datagram
415 #pragma redefine_extname BIO_s_fd sunw_BIO_s_fd
416 #pragma redefine_extname BIO_s_file sunw_BIO_s_file
417 #pragma redefine_extname BIO_s_log sunw_BIO_s_log
418 #pragma redefine_extname BIO_s_mem sunw_BIO_s_mem
419 #pragma redefine_extname BIO_s_null sunw_BIO_s_null
420 #pragma redefine_extname BIO_s_socket sunw_BIO_s_socket
421 #pragma redefine_extname BIO_set sunw_BIO_set
422 #pragma redefine_extname BIO_set_callback sunw_BIO_set_callback
423 #pragma redefine_extname BIO_set_callback_arg sunw_BIO_set_callback_arg
424 #pragma redefine_extname BIO_set_cipher sunw_BIO_set_cipher
425 #pragma redefine_extname BIO_set_ex_data sunw_BIO_set_ex_data
426 #pragma redefine_extname BIO_set_flags sunw_BIO_set_flags
427 #pragma redefine_extname BIO_set_tcp_ndelay sunw_BIO_set_tcp_ndelay
428 #pragma redefine_extname BIO_snprintf sunw_BIO_snprintf
429 #pragma redefine_extname BIO_sock_cleanup sunw_BIO_sock_cleanup
430 #pragma redefine_extname BIO_sock_error sunw_BIO_sock_error
431 #pragma redefine_extname BIO_sock_init sunw_BIO_sock_init
432 #pragma redefine_extname BIO_sock_non_fatal_error sunw_BIO_sock_non_fatal
433 #pragma redefine_extname BIO_sock_should_retry sunw_BIO_sock_should_retry
434 #pragma redefine_extname BIO_socket_ioctl sunw_BIO_socket_ioctl
435 #pragma redefine_extname BIO_socket_nbio sunw_BIO_socket_nbio
436 #pragma redefine_extname BIO_test_flags sunw_BIO_test_flags
437 #pragma redefine_extname BIO_vfree sunw_BIO_vfree
438 #pragma redefine_extname BIO_vprintf sunw_BIO_vprintf
439 #pragma redefine_extname BIO_vsnprintf sunw_BIO_vsnprintf
440 #pragma redefine_extname BIO_write sunw_BIO_write
441 #pragma redefine_extname BN_add sunw_BN_add
442 #pragma redefine_extname bn_add_part_words sunw_bn_add_part_words
443 #pragma redefine_extname BN_add_word sunw_BN_add_word
444 #pragma redefine_extname bn_add_words sunw_bn_add_words
445 #pragma redefine_extname BN_asc2bn sunw_BN_asc2bn
446 #pragma redefine_extname BN_bin2bn sunw_BN_bin2bn
447 #pragma redefine_extname BN_BLINDING_convert sunw_BN_BLINDING_convert
448 #pragma redefine_extname BN_BLINDING_convert_ex sunw_BN_BLINDING_convert_ex
449 #pragma redefine_extname BN_BLINDING_create_param sunw_BN_BLINDING_create_param
450 #pragma redefine_extname BN_BLINDING_free sunw_BN_BLINDING_free
451 #pragma redefine_extname BN_BLINDING_get_flags sunw_BN_BLINDING_get_flags
452 #pragma redefine_extname BN_BLINDING_get_thread_id sunw_BN_BLINDING_get_t
453 #pragma redefine_extname BN_BLINDING_invert sunw_BN_BLINDING_invert
454 #pragma redefine_extname BN_BLINDING_invert_ex sunw_BN_BLINDING_invert_ex
455 #pragma redefine_extname BN_BLINDING_new sunw_BN_BLINDING_new
456 #pragma redefine_extname BN_BLINDING_set_flags sunw_BN_BLINDING_set_flags
457 #pragma redefine_extname BN_BLINDING_set_thread_id sunw_BN_BLINDING_set_t

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458 #pragma redefine_extname BN_BLINDING_thread_id sunw_BN_BLINDING_thread_id
459 #pragma redefine_extname BN_BLINDING_update sunw_BN_BLINDING_update
460 #pragma redefine_extname BN_bn2bin sunw_BN_bn2bin
461 #pragma redefine_extname BN_bn2dec sunw_BN_bn2dec
462 #pragma redefine_extname BN_bn2hex sunw_BN_bn2hex
463 #pragma redefine_extname BN_bn2mpi sunw_BN_bn2mpi
464 #pragma redefine_extname BN_bntest_rand sunw_BN_bntest_rand
465 #pragma redefine_extname BN_clear sunw_BN_clear
466 #pragma redefine_extname BN_clear_bit sunw_BN_clear_bit
467 #pragma redefine_extname BN_clear_free sunw_BN_clear_free
468 #pragma redefine_extname BN_cmp sunw_BN_cmp
469 #pragma redefine_extname bn_cmp_part_words sunw_bn_cmp_part_words
470 #pragma redefine_extname bn_cmp_words sunw_bn_cmp_words
471 #pragma redefine_extname BN_consttime_swap sunw_BN_consttime_swap
472 #pragma redefine_extname BN_copy sunw_BN_copy
473 #pragma redefine_extname BN_CTX_end sunw_BN_CTX_end
474 #pragma redefine_extname BN_CTX_free sunw_BN_CTX_free
475 #pragma redefine_extname BN_CTX_get sunw_BN_CTX_get
476 #pragma redefine_extname BN_CTX_init sunw_BN_CTX_init
477 #pragma redefine_extname BN_CTX_new sunw_BN_CTX_new
478 #pragma redefine_extname BN_CTX_start sunw_BN_CTX_start
479 #pragma redefine_extname BN_dec2bn sunw_BN_dec2bn
480 #pragma redefine_extname BN_div sunw_BN_div
481 #pragma redefine_extname BN_div_recp sunw_BN_div_recp
482 #pragma redefine_extname BN_div_word sunw_BN_div_word
483 #pragma redefine_extname bn_div_words sunw_bn_div_words
484 #pragma redefine_extname BN_dup sunw_BN_dup
485 #pragma redefine_extname bn_dup_expand sunw_bn_dup_expand
486 #pragma redefine_extname BN_exp sunw_BN_exp
487 #pragma redefine_extname bn_expand2 sunw_bn_expand2
488 #pragma redefine_extname BN_free sunw_BN_free
489 #pragma redefine_extname BN_from_montgomery sunw_BN_from_montgomery
490 #pragma redefine_extname bn_gather5 sunw_bn_gather5
491 #pragma redefine_extname BN_gcd sunw_BN_gcd
492 #pragma redefine_extname BN_GENCB_call sunw_BN_GENCB_call
493 #pragma redefine_extname BN_generate_prime sunw_BN_generate_prime
494 #pragma redefine_extname BN_generate_prime_ex sunw_BN_generate_prime_ex
495 #pragma redefine_extname BN_get_params sunw_BN_get_params
496 #pragma redefine_extname BN_get_word sunw_BN_get_word
497 #pragma redefine_extname BN_get0_nist_prime_192 sunw_BN_get0_nist_prime_1
498 #pragma redefine_extname BN_get0_nist_prime_224 sunw_BN_get0_nist_prime_2
499 #pragma redefine_extname BN_get0_nist_prime_256 sunw_BN_get0_nist_prime_2
500 #pragma redefine_extname BN_get0_nist_prime_384 sunw_BN_get0_nist_prime_3
501 #pragma redefine_extname BN_get0_nist_prime_521 sunw_BN_get0_nist_prime_5
502 #pragma redefine_extname BN_GF2m_add sunw_BN_GF2m_add
503 #pragma redefine_extname BN_GF2m_arr2poly sunw_BN_GF2m_arr2poly
504 #pragma redefine_extname BN_GF2m_mod sunw_BN_GF2m_mod
505 #pragma redefine_extname BN_GF2m_mod_arr sunw_BN_GF2m_mod_arr
506 #pragma redefine_extname BN_GF2m_mod_div sunw_BN_GF2m_mod_div
507 #pragma redefine_extname BN_GF2m_mod_div_arr sunw_BN_GF2m_mod_div_arr
508 #pragma redefine_extname BN_GF2m_mod_exp sunw_BN_GF2m_mod_exp
509 #pragma redefine_extname BN_GF2m_mod_exp_arr sunw_BN_GF2m_mod_exp_arr
510 #pragma redefine_extname BN_GF2m_mod_inv sunw_BN_GF2m_mod_inv
511 #pragma redefine_extname BN_GF2m_mod_inv_arr sunw_BN_GF2m_mod_inv_arr
512 #pragma redefine_extname BN_GF2m_mod_mul sunw_BN_GF2m_mod_mul
513 #pragma redefine_extname BN_GF2m_mod_mul_arr sunw_BN_GF2m_mod_mul_arr
514 #pragma redefine_extname BN_GF2m_mod_solve_quad sunw_BN_GF2m_mod_solve_qu
515 #pragma redefine_extname BN_GF2m_mod_solve_quad_arr sunw_BN_GF2m_mod_solv
516 #pragma redefine_extname BN_GF2m_mod_sqr sunw_BN_GF2m_mod_sqr
517 #pragma redefine_extname BN_GF2m_mod_sqrt_arr sunw_BN_GF2m_mod_sqrt_arr
518 #pragma redefine_extname BN_GF2m_mod_sqrt sunw_BN_GF2m_mod_sqrt
519 #pragma redefine_extname BN_GF2m_mod_sqrt_arr sunw_BN_GF2m_mod_sqrt_arr
520 #pragma redefine_extname bn_GF2m_mul_2x2 sunw_bn_GF2m_mul_2x2
521 #pragma redefine_extname BN_GF2m_poly2arr sunw_BN_GF2m_poly2arr
522 #pragma redefine_extname BN_hex2bn sunw_BN_hex2bn
523 #pragma redefine_extname BN_init sunw_BN_init

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524 #pragma redefine_extname BN_is_bit_set sunw_BN_is_bit_set
525 #pragma redefine_extname BN_is_prime sunw_BN_is_prime
526 #pragma redefine_extname BN_is_prime_ex sunw_BN_is_prime_ex
527 #pragma redefine_extname BN_is_prime_fasttest sunw_BN_is_prime_fasttest
528 #pragma redefine_extname BN_is_prime_fasttest_ex sunw_BN_is_prime_fasttest
529 #pragma redefine_extname BN_kronecker sunw_BN_kronecker
530 #pragma redefine_extname BN_lshift sunw_BN_lshift
531 #pragma redefine_extname BN_lshift1 sunw_BN_lshift1
532 #pragma redefine_extname BN_mask_bits sunw_BN_mask_bits
533 #pragma redefine_extname BN_mod_add sunw_BN_mod_add
534 #pragma redefine_extname BN_mod_add_quick sunw_BN_mod_add_quick
535 #pragma redefine_extname BN_mod_exp sunw_BN_mod_exp
536 #pragma redefine_extname BN_mod_exp_mont sunw_BN_mod_exp_mont
537 #pragma redefine_extname BN_mod_exp_mont_consttime sunw_BN_mod_exp_mont_c
538 #pragma redefine_extname BN_mod_exp_mont_word sunw_BN_mod_exp_mont_word
539 #pragma redefine_extname BN_mod_exp_recip sunw_BN_mod_exp_recip
540 #pragma redefine_extname BN_mod_exp_simple sunw_BN_mod_exp_simple
541 #pragma redefine_extname BN_mod_exp2_mont sunw_BN_mod_exp2_mont
542 #pragma redefine_extname BN_mod_inverse sunw_BN_mod_inverse
543 #pragma redefine_extname BN_mod_lshift sunw_BN_mod_lshift
544 #pragma redefine_extname BN_mod_lshift_quick sunw_BN_mod_lshift_quick
545 #pragma redefine_extname BN_mod_lshift1 sunw_BN_mod_lshift1
546 #pragma redefine_extname BN_mod_lshift1_quick sunw_BN_mod_lshift1_quick
547 #pragma redefine_extname BN_mod_mul sunw_BN_mod_mul
548 #pragma redefine_extname BN_mod_mul_montgomery sunw_BN_mod_mul_montgomery
549 #pragma redefine_extname BN_mod_mul_reciprocal sunw_BN_mod_mul_reciprocal
550 #pragma redefine_extname BN_mod_sqr sunw_BN_mod_sqr
551 #pragma redefine_extname BN_mod_sqrt sunw_BN_mod_sqrt
552 #pragma redefine_extname BN_mod_sub sunw_BN_mod_sub
553 #pragma redefine_extname BN_mod_sub_quick sunw_BN_mod_sub_quick
554 #pragma redefine_extname BN_mod_word sunw_BN_mod_word
555 #pragma redefine_extname BN_MONT_CTX_copy sunw_BN_MONT_CTX_copy
556 #pragma redefine_extname BN_MONT_CTX_free sunw_BN_MONT_CTX_free
557 #pragma redefine_extname BN_MONT_CTX_init sunw_BN_MONT_CTX_init
558 #pragma redefine_extname BN_MONT_CTX_new sunw_BN_MONT_CTX_new
559 #pragma redefine_extname BN_MONT_CTX_set sunw_BN_MONT_CTX_set
560 #pragma redefine_extname BN_MONT_CTX_set_locked sunw_BN_MONT_CTX_set_lock
561 #pragma redefine_extname BN_mpi2bn sunw_BN_mpi2bn
562 #pragma redefine_extname BN_mul sunw_BN_mul
563 #pragma redefine_extname bn_mul_add_words sunw_bn_mul_add_words
564 #pragma redefine_extname bn_mul_comba4 sunw_bn_mul_comba4
565 #pragma redefine_extname bn_mul_comba8 sunw_bn_mul_comba8
566 #pragma redefine_extname bn_mul_high sunw_bn_mul_high
567 #pragma redefine_extname bn_mul_low_normal sunw_bn_mul_low_normal
568 #pragma redefine_extname bn_mul_low_recursive sunw_bn_mul_low_recursive
569 #pragma redefine_extname bn_mul_mont sunw_bn_mul_mont
570 #pragma redefine_extname bn_mul_mont_gather5 sunw_bn_mul_mont_gather5
571 #pragma redefine_extname bn_mul_normal sunw_bn_mul_normal
572 #pragma redefine_extname bn_mul_part_recursive sunw_bn_mul_part_recursive
573 #pragma redefine_extname bn_mul_recursive sunw_bn_mul_recursive
574 #pragma redefine_extname BN_mul_word sunw_BN_mul_word
575 #pragma redefine_extname bn_mul_words sunw_bn_mul_words
576 #pragma redefine_extname BN_new sunw_BN_new
577 #pragma redefine_extname BN_nist_mod_192 sunw_BN_nist_mod_192
578 #pragma redefine_extname BN_nist_mod_224 sunw_BN_nist_mod_224
579 #pragma redefine_extname BN_nist_mod_256 sunw_BN_nist_mod_256
580 #pragma redefine_extname BN_nist_mod_384 sunw_BN_nist_mod_384
581 #pragma redefine_extname BN_nist_mod_521 sunw_BN_nist_mod_521
582 #pragma redefine_extname BN_nnmod sunw_BN_nnmod
583 #pragma redefine_extname BN_num_bits sunw_BN_num_bits
584 #pragma redefine_extname BN_num_bits_word sunw_BN_num_bits_word
585 #pragma redefine_extname BN_options sunw_BN_options
586 #pragma redefine_extname BN_print sunw_BN_print
587 #pragma redefine_extname BN_print_fp sunw_BN_print_fp
588 #pragma redefine_extname BN_pseudo_rand sunw_BN_pseudo_rand
589 #pragma redefine_extname BN_pseudo_rand_range sunw_BN_pseudo_rand_range

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590 #pragma redefine_extname BN_rand sunw_BN_rand
591 #pragma redefine_extname BN_rand_range sunw_BN_rand_range
592 #pragma redefine_extname BN_reciprocal sunw_BN_reciprocal
593 #pragma redefine_extname BN_RECP_CTX_free sunw_BN_RECP_CTX_free
594 #pragma redefine_extname BN_RECP_CTX_init sunw_BN_RECP_CTX_init
595 #pragma redefine_extname BN_RECP_CTX_new sunw_BN_RECP_CTX_new
596 #pragma redefine_extname BN_RECP_CTX_set sunw_BN_RECP_CTX_set
597 #pragma redefine_extname BN_rshift sunw_BN_rshift
598 #pragma redefine_extname BN_rshift1 sunw_BN_rshift1
599 #pragma redefine_extname bn_scatter5 sunw_bn_scatter5
600 #pragma redefine_extname BN_set_bit sunw_BN_set_bit
601 #pragma redefine_extname BN_set_negative sunw_BN_set_negative
602 #pragma redefine_extname BN_set_params sunw_BN_set_params
603 #pragma redefine_extname BN_set_word sunw_BN_set_word
604 #pragma redefine_extname BN_sqr sunw_BN_sqr
605 #pragma redefine_extname bn_sqr_comba4 sunw_bn_sqr_comba4
606 #pragma redefine_extname bn_sqr_comba8 sunw_bn_sqr_comba8
607 #pragma redefine_extname bn_sqr_normal sunw_bn_sqr_normal
608 #pragma redefine_extname bn_sqr_recursive sunw_bn_sqr_recursive
609 #pragma redefine_extname bn_sqr_words sunw_bn_sqr_words
610 #pragma redefine_extname BN_sub sunw_BN_sub
611 #pragma redefine_extname bn_sub_part_words sunw_bn_sub_part_words
612 #pragma redefine_extname BN_sub_word sunw_BN_sub_word
613 #pragma redefine_extname bn_sub_words sunw_bn_sub_words
614 #pragma redefine_extname BN_swap sunw_BN_swap
615 #pragma redefine_extname BN_to_ASN1_ENUMERATED sunw_BN_to_ASN1_ENUMERATED
616 #pragma redefine_extname BN_to_ASN1_INTEGER sunw_BN_to_ASN1_INTEGER
617 #pragma redefine_extname BN_uadd sunw_BN_uadd
618 #pragma redefine_extname BN_ucmp sunw_BN_ucmp
619 #pragma redefine_extname BN_usub sunw_BN_usub
620 #pragma redefine_extname BN_value_one sunw_BN_value_one
621 #pragma redefine_extname BN_version sunw_BN_version
622 #pragma redefine_extname BN_X931_derive_prime_ex sunw_BN_X931_derive_prim
623 #pragma redefine_extname BN_X931_generate_prime_ex sunw_BN_X931_generate
624 #pragma redefine_extname BN_X931_generate_Xpq sunw_BN_X931_generate_Xpq
625 #pragma redefine_extname bsaes_cbc_encrypt sunw_bsaes_cbc_encrypt
626 #pragma redefine_extname bsaes_ctr32_encrypt_blocks sunw_bsaes_ctr32_encr
627 #pragma redefine_extname bsaes_xts_decrypt sunw_bsaes_xts_decrypt
628 #pragma redefine_extname bsaes_xts_encrypt sunw_bsaes_xts_encrypt
629 #pragma redefine_extname BUF_MEM_free sunw_BUF_MEM_free
630 #pragma redefine_extname BUF_MEM_grow sunw_BUF_MEM_grow
631 #pragma redefine_extname BUF_MEM_grow_clean sunw_BUF_MEM_grow_clean
632 #pragma redefine_extname BUF_MEM_new sunw_BUF_MEM_new
633 #pragma redefine_extname BUF_memdup sunw_BUF_memdup
634 #pragma redefine_extname BUF_reverse sunw_BUF_reverse
635 #pragma redefine_extname BUF_strdup sunw_BUF_strdup
636 #pragma redefine_extname BUF_strlcat sunw_BUF_strlcat
637 #pragma redefine_extname BUF_strncpy sunw_BUF_strncpy
638 #pragma redefine_extname BUF_strndup sunw_BUF_strndup
639 #pragma redefine_extname c2i_ASN1_BIT_STRING sunw_c2i_ASN1_BIT_STRING
640 #pragma redefine_extname c2i_ASN1_INTEGER sunw_c2i_ASN1_INTEGER
641 #pragma redefine_extname c2i_ASN1_OBJECT sunw_c2i_ASN1_OBJECT
642 #pragma redefine_extname Camellia_cbc_encrypt sunw_Camellia_cbc_encrypt
643 #pragma redefine_extname Camellia_cfb1_encrypt sunw_Camellia_cfb1_encrypt
644 #pragma redefine_extname Camellia_cfb128_encrypt sunw_Camellia_cfb128_enc
645 #pragma redefine_extname Camellia_cfb8_encrypt sunw_Camellia_cfb8_encrypt
646 #pragma redefine_extname Camellia_ctr128_encrypt sunw_Camellia_ctr128_enc
647 #pragma redefine_extname Camellia_decrypt sunw_Camellia_decrypt
648 #pragma redefine_extname Camellia_DecryptBlock sunw_Camellia_DecryptBlock
649 #pragma redefine_extname Camellia_DecryptBlock_Rounds sunw_Camellia_Decry
650 #pragma redefine_extname Camellia_ecb_encrypt sunw_Camellia_ecb_encrypt
651 #pragma redefine_extname Camellia_Ekeygen sunw_Camellia_Ekeygen
652 #pragma redefine_extname Camellia_encrypt sunw_Camellia_encrypt
653 #pragma redefine_extname Camellia_EncryptBlock sunw_Camellia_EncryptBlock
654 #pragma redefine_extname Camellia_EncryptBlock_Rounds sunw_Camellia_Encry
655 #pragma redefine_extname Camellia_ofb128_encrypt sunw_Camellia_ofb128_enc

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656 #pragma redefine_extname Camellia_set_key sunw_Camellia_set_key
657 #pragma redefine_extname CAMELLIA_version sunw_CAMELLIA_version
658 #pragma redefine_extname CAST_cbc_encrypt sunw_CAST_cbc_encrypt
659 #pragma redefine_extname CAST_cfb64_encrypt sunw_CAST_cfb64_encrypt
660 #pragma redefine_extname CAST_decrypt sunw_CAST_decrypt
661 #pragma redefine_extname CAST_ecb_encrypt sunw_CAST_ecb_encrypt
662 #pragma redefine_extname CAST_encrypt sunw_CAST_encrypt
663 #pragma redefine_extname CAST_ofb64_encrypt sunw_CAST_ofb64_encrypt
664 #pragma redefine_extname CAST_S_table0 sunw_CAST_S_table0
665 #pragma redefine_extname CAST_S_table1 sunw_CAST_S_table1
666 #pragma redefine_extname CAST_S_table2 sunw_CAST_S_table2
667 #pragma redefine_extname CAST_S_table3 sunw_CAST_S_table3
668 #pragma redefine_extname CAST_S_table4 sunw_CAST_S_table4
669 #pragma redefine_extname CAST_S_table5 sunw_CAST_S_table5
670 #pragma redefine_extname CAST_S_table6 sunw_CAST_S_table6
671 #pragma redefine_extname CAST_S_table7 sunw_CAST_S_table7
672 #pragma redefine_extname CAST_set_key sunw_CAST_set_key
673 #pragma redefine_extname CAST_version sunw_CAST_version
674 #pragma redefine_extname CBIGNUM_it sunw_CBIGNUM_it
675 #pragma redefine_extname CERTIFICATEPOLICIES_free sunw_CERTIFICATEPOLICIES_free
676 #pragma redefine_extname CERTIFICATEPOLICIES_it sunw_CERTIFICATEPOLICIES_it
677 #pragma redefine_extname CERTIFICATEPOLICIES_new sunw_CERTIFICATEPOLICIES_new
678 #pragma redefine_extname check_defer sunw_check_defer
679 #pragma redefine_extname cmac_asn1_meth sunw_cmac_asn1_meth
680 #pragma redefine_extname CMAC_CTX_cleanup sunw_CMAC_CTX_cleanup
681 #pragma redefine_extname CMAC_CTX_copy sunw_CMAC_CTX_copy
682 #pragma redefine_extname CMAC_CTX_free sunw_CMAC_CTX_free
683 #pragma redefine_extname CMAC_CTX_get0_cipher_ctx sunw_CMAC_CTX_get0_cipher_ctx
684 #pragma redefine_extname CMAC_CTX_new sunw_CMAC_CTX_new
685 #pragma redefine_extname CMAC_Final sunw_CMAC_Final
686 #pragma redefine_extname CMAC_Init sunw_CMAC_Init
687 #pragma redefine_extname cmac_pkey_meth sunw_cmac_pkey_meth
688 #pragma redefine_extname CMAC_resume sunw_CMAC_resume
689 #pragma redefine_extname CMAC_Update sunw_CMAC_Update
690 #pragma redefine_extname CMS_add_simple_smimecap sunw_CMS_add_simple_smimecap
691 #pragma redefine_extname CMS_add_smimecap sunw_CMS_add_smimecap
692 #pragma redefine_extname CMS_add_standard_smimecap sunw_CMS_add_standard_smimecap
693 #pragma redefine_extname CMS_add0_cert sunw_CMS_add0_cert
694 #pragma redefine_extname CMS_add0_CertificateChoices sunw_CMS_add0_CertificateChoices
695 #pragma redefine_extname CMS_add0_crl sunw_CMS_add0_crl
696 #pragma redefine_extname CMS_add0_recipient_key sunw_CMS_add0_recipient_key
697 #pragma redefine_extname CMS_add0_recipient_password sunw_CMS_add0_recipient_password
698 #pragma redefine_extname CMS_add0_RevocationInfoChoice sunw_CMS_add0_RevocationInfoChoice
699 #pragma redefine_extname CMS_add1_cert sunw_CMS_add1_cert
700 #pragma redefine_extname CMS_add1_crl sunw_CMS_add1_crl
701 #pragma redefine_extname CMS_add1_ReceiptRequest sunw_CMS_add1_ReceiptRequest
702 #pragma redefine_extname CMS_add1_recipient_cert sunw_CMS_add1_recipient_cert
703 #pragma redefine_extname CMS_add1_signer sunw_CMS_add1_signer
704 #pragma redefine_extname CMS_Attributes_Sign_it sunw_CMS_Attributes_Sign_it
705 #pragma redefine_extname CMS_Attributes_Verify_it sunw_CMS_Attributes_Verify_it
706 #pragma redefine_extname CMS_AuthenticatedData_it sunw_CMS_AuthenticatedData_it
707 #pragma redefine_extname CMS_CertificateChoices_it sunw_CMS_CertificateChoices_it
708 #pragma redefine_extname CMS_compress sunw_CMS_compress
709 #pragma redefine_extname CMS_CompressedData_it sunw_CMS_CompressedData_it
710 #pragma redefine_extname cms_content_bio sunw_cms_content_bio
711 #pragma redefine_extname CMS_ContentInfo_free sunw_CMS_ContentInfo_free
712 #pragma redefine_extname CMS_ContentInfo_it sunw_CMS_ContentInfo_it
713 #pragma redefine_extname CMS_ContentInfo_new sunw_CMS_ContentInfo_new
714 #pragma redefine_extname CMS_ContentInfo_print_ctx sunw_CMS_ContentInfo_print_ctx
715 #pragma redefine_extname CMS_data sunw_CMS_data
716 #pragma redefine_extname cms_data_create sunw_cms_data_create
717 #pragma redefine_extname CMS_data_create sunw_CMS_data_create
718 #pragma redefine_extname CMS_dataFinal sunw_CMS_dataFinal
719 #pragma redefine_extname CMS_dataInit sunw_CMS_dataInit
720 #pragma redefine_extname CMS_decrypt sunw_CMS_decrypt
721 #pragma redefine_extname CMS_decrypt_set1_key sunw_CMS_decrypt_set1_key

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722 #pragma redefine_extname CMS_decrypt_set1_password sunw_CMS_decrypt_set1_password
723 #pragma redefine_extname CMS_decrypt_set1_pkey sunw_CMS_decrypt_set1_pkey
724 #pragma redefine_extname CMS_digest_create sunw_CMS_digest_create
725 #pragma redefine_extname CMS_digest_verify sunw_CMS_digest_verify
726 #pragma redefine_extname cms_DigestAlgorithm_find_ctx sunw_cms_DigestAlgorithm_find_ctx
727 #pragma redefine_extname cms_DigestAlgorithm_init_bio sunw_cms_DigestAlgorithm_init_bio
728 #pragma redefine_extname cms_DigestAlgorithm_set sunw_cms_DigestAlgorithm_set
729 #pragma redefine_extname cms_DigestedData_create sunw_cms_DigestedData_create
730 #pragma redefine_extname cms_DigestedData_do_final sunw_cms_DigestedData_do_final
731 #pragma redefine_extname cms_DigestedData_init_bio sunw_cms_DigestedData_init_bio
732 #pragma redefine_extname CMS_DigestedData_it sunw_CMS_DigestedData_it
733 #pragma redefine_extname CMS_EncapsulatedContentInfo_it sunw_CMS_EncapsulatedContentInfo_it
734 #pragma redefine_extname cms_encode_Receipt sunw_cms_encode_Receipt
735 #pragma redefine_extname CMS_encrypt sunw_CMS_encrypt
736 #pragma redefine_extname cms_EncryptedContent_init sunw_cms_EncryptedContent_init
737 #pragma redefine_extname CMS_EncryptedContent_init_bio sunw_CMS_EncryptedContent_init_bio
738 #pragma redefine_extname CMS_EncryptedContentInfo_it sunw_CMS_EncryptedContentInfo_it
739 #pragma redefine_extname CMS_EncryptedData_decrypt sunw_CMS_EncryptedData_decrypt
740 #pragma redefine_extname CMS_EncryptedData_encrypt sunw_CMS_EncryptedData_encrypt
741 #pragma redefine_extname cms_EncryptedData_init_bio sunw_cms_EncryptedData_init_bio
742 #pragma redefine_extname CMS_EncryptedData_it sunw_CMS_EncryptedData_it
743 #pragma redefine_extname CMS_EncryptedData_set1_key sunw_CMS_EncryptedData_set1_key
744 #pragma redefine_extname CMS_EnvelopedData_create sunw_CMS_EnvelopedData_create
745 #pragma redefine_extname cms_EnvelopedData_init_bio sunw_cms_EnvelopedData_init_bio
746 #pragma redefine_extname CMS_EnvelopedData_it sunw_CMS_EnvelopedData_it
747 #pragma redefine_extname CMS_final sunw_CMS_final
748 #pragma redefine_extname CMS_get0_content sunw_CMS_get0_content
749 #pragma redefine_extname CMS_get0_eContentType sunw_CMS_get0_eContentType
750 #pragma redefine_extname cms_get0_enveloped sunw_cms_get0_enveloped
751 #pragma redefine_extname CMS_get0_RecipientInfos sunw_CMS_get0_RecipientInfos
752 #pragma redefine_extname CMS_get0_SignerInfos sunw_CMS_get0_SignerInfos
753 #pragma redefine_extname CMS_get0_signers sunw_CMS_get0_signers
754 #pragma redefine_extname CMS_get0_type sunw_CMS_get0_type
755 #pragma redefine_extname CMS_get1_certs sunw_CMS_get1_certs
756 #pragma redefine_extname CMS_get1_crls sunw_CMS_get1_crls
757 #pragma redefine_extname CMS_get1_ReceiptRequest sunw_CMS_get1_ReceiptRequest
758 #pragma redefine_extname CMS_is_detached sunw_CMS_is_detached
759 #pragma redefine_extname CMS_IssuerAndSerialNumber_it sunw_CMS_IssuerAndSerialNumber_it
760 #pragma redefine_extname CMS_KEKIdentifier_it sunw_CMS_KEKIdentifier_it
761 #pragma redefine_extname CMS_KEKRecipientInfo_it sunw_CMS_KEKRecipientInfo_it
762 #pragma redefine_extname CMS_KeyAgreeRecipientIdentifier_it sunw_CMS_KeyAgreeRecipientIdentifier_it
763 #pragma redefine_extname CMS_KeyAgreeRecipientInfo_it sunw_CMS_KeyAgreeRecipientInfo_it
764 #pragma redefine_extname CMS_KeyTransRecipientInfo_it sunw_CMS_KeyTransRecipientInfo_it
765 #pragma redefine_extname cms_msgSigDigest_add1 sunw_cms_msgSigDigest_add1
766 #pragma redefine_extname CMS_OriginatorIdentifierOrKey_it sunw_CMS_OriginatorIdentifierOrKey_it
767 #pragma redefine_extname CMS_OriginatorInfo_it sunw_CMS_OriginatorInfo_it
768 #pragma redefine_extname CMS_OriginatorPublicKey_it sunw_CMS_OriginatorPublicKey_it
769 #pragma redefine_extname CMS_OtherCertificateFormat_it sunw_CMS_OtherCertificateFormat_it
770 #pragma redefine_extname CMS_OtherKeyAttribute_it sunw_CMS_OtherKeyAttribute_it
771 #pragma redefine_extname CMS_OtherRecipientInfo_it sunw_CMS_OtherRecipientInfo_it
772 #pragma redefine_extname CMS_OtherRevocationInfoFormat_it sunw_CMS_OtherRevocationInfoFormat_it
773 #pragma redefine_extname CMS_PasswordRecipientInfo_it sunw_CMS_PasswordRecipientInfo_it
774 #pragma redefine_extname CMS_Receipt_it sunw_CMS_Receipt_it
775 #pragma redefine_extname cms_Receipt_verify sunw_cms_Receipt_verify
776 #pragma redefine_extname CMS_ReceiptRequest_create0 sunw_CMS_ReceiptRequest_create0
777 #pragma redefine_extname CMS_ReceiptRequest_free sunw_CMS_ReceiptRequest_free
778 #pragma redefine_extname CMS_ReceiptRequest_get0_values sunw_CMS_ReceiptRequest_get0_values
779 #pragma redefine_extname CMS_ReceiptRequest_it sunw_CMS_ReceiptRequest_it
780 #pragma redefine_extname CMS_ReceiptRequest_new sunw_CMS_ReceiptRequest_new
781 #pragma redefine_extname CMS_ReceiptsFrom_it sunw_CMS_ReceiptsFrom_it
782 #pragma redefine_extname CMS_RecipientEncryptedKey_it sunw_CMS_RecipientEncryptedKey_it
783 #pragma redefine_extname CMS_RecipientInfo_decrypt sunw_CMS_RecipientInfo_decrypt
784 #pragma redefine_extname CMS_RecipientInfo_it sunw_CMS_RecipientInfo_it
785 #pragma redefine_extname CMS_RecipientInfo_kekri_get0_id sunw_CMS_RecipientInfo_kekri_get0_id
786 #pragma redefine_extname CMS_RecipientInfo_kekri_id_cmp sunw_CMS_RecipientInfo_kekri_id_cmp
787 #pragma redefine_extname CMS_RecipientInfo_ktri_cert_cmp sunw_CMS_RecipientInfo_ktri_cert_cmp

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788 #pragma redefine_extname CMS_RecipientInfo_ktri_get0_algs sunw_CMS_Recipi
789 #pragma redefine_extname CMS_RecipientInfo_ktri_get0_signer_id sunw_CMS_R
790 #pragma redefine_extname cms_RecipientInfo_pwri_crypt sunw_CMS_RecipientI
791 #pragma redefine_extname CMS_RecipientInfo_set0_key sunw_CMS_RecipientInf
792 #pragma redefine_extname CMS_RecipientInfo_set0_password sunw_CMS_Recipie
793 #pragma redefine_extname CMS_RecipientInfo_set0_pkey sunw_CMS_RecipientIn
794 #pragma redefine_extname CMS_RecipientInfo_type sunw_CMS_RecipientInfo_ty
795 #pragma redefine_extname CMS_RecipientKeyIdentifier_it sunw_CMS_Recipient
796 #pragma redefine_extname CMS_RevocationInfoChoice_it sunw_CMS_RevocationI
797 #pragma redefine_extname CMS_set_detached sunw_CMS_set_detached
798 #pragma redefine_extname CMS_set1_eContentType sunw_CMS_set1_eContentType
799 #pragma redefine_extname cms_set1_SignerIdentifier sunw_cms_set1_SignerId
800 #pragma redefine_extname CMS_set1_signers_certs sunw_CMS_set1_signers_cer
801 #pragma redefine_extname CMS_sign sunw_CMS_sign
802 #pragma redefine_extname CMS_sign_receipt sunw_CMS_sign_receipt
803 #pragma redefine_extname CMS_signed_add1_attr sunw_CMS_signed_add1_attr
804 #pragma redefine_extname CMS_signed_add1_attr_by_NID sunw_CMS_signed_add1
805 #pragma redefine_extname CMS_signed_add1_attr_by_OBJ sunw_CMS_signed_add1
806 #pragma redefine_extname CMS_signed_add1_attr_by_txt sunw_CMS_signed_add1
807 #pragma redefine_extname CMS_signed_delete_attr sunw_CMS_signed_delete_at
808 #pragma redefine_extname CMS_signed_get_attr sunw_CMS_signed_get_attr
809 #pragma redefine_extname CMS_signed_get_attr_by_NID sunw_CMS_signed_get_a
810 #pragma redefine_extname CMS_signed_get_attr_by_OBJ sunw_CMS_signed_get_a
811 #pragma redefine_extname CMS_signed_get_attr_count sunw_CMS_signed_get_at
812 #pragma redefine_extname CMS_signed_get0_data_by_OBJ sunw_CMS_signed_get0
813 #pragma redefine_extname cms_SignedData_final sunw_CMS_SignedData_final
814 #pragma redefine_extname CMS_SignedData_init sunw_CMS_SignedData_init
815 #pragma redefine_extname cms_SignedData_init_bio sunw_CMS_SignedData_init
816 #pragma redefine_extname CMS_SignedData_it sunw_CMS_SignedData_it
817 #pragma redefine_extname cms_SignerIdentifier_cert_cmp sunw_CMS_SignerIde
818 #pragma redefine_extname cms_SignerIdentifier_get0_signer_id sunw_CMS_Sig
819 #pragma redefine_extname CMS_SignerIdentifier_it sunw_CMS_SignerIdentifie
820 #pragma redefine_extname CMS_SignerInfo_cert_cmp sunw_CMS_SignerInfo_cert
821 #pragma redefine_extname CMS_SignerInfo_get0_algs sunw_CMS_SignerInfo_get
822 #pragma redefine_extname CMS_SignerInfo_get0_signer_id sunw_CMS_SignerInf
823 #pragma redefine_extname CMS_SignerInfo_it sunw_CMS_SignerInfo_it
824 #pragma redefine_extname CMS_SignerInfo_set1_signer_cert sunw_CMS_SignerI
825 #pragma redefine_extname CMS_SignerInfo_sign sunw_CMS_SignerInfo_sign
826 #pragma redefine_extname CMS_SignerInfo_verify sunw_CMS_SignerInfo_verify
827 #pragma redefine_extname CMS_SignerInfo_verify_content sunw_CMS_SignerInf
828 #pragma redefine_extname CMS_stream sunw_CMS_stream
829 #pragma redefine_extname CMS_uncompress sunw_CMS_uncompress
830 #pragma redefine_extname CMS_unsigned_add1_attr sunw_CMS_unsigned_add1_at
831 #pragma redefine_extname CMS_unsigned_add1_attr_by_NID sunw_CMS_unsigned_
832 #pragma redefine_extname CMS_unsigned_add1_attr_by_OBJ sunw_CMS_unsigned_
833 #pragma redefine_extname CMS_unsigned_add1_attr_by_txt sunw_CMS_unsigned_
834 #pragma redefine_extname CMS_unsigned_delete_attr sunw_CMS_unsigned_delet
835 #pragma redefine_extname CMS_unsigned_get_attr sunw_CMS_unsigned_get_attr
836 #pragma redefine_extname CMS_unsigned_get_attr_by_NID sunw_CMS_unsigned_g
837 #pragma redefine_extname CMS_unsigned_get_attr_by_OBJ sunw_CMS_unsigned_g
838 #pragma redefine_extname CMS_unsigned_get_attr_count sunw_CMS_unsigned_ge
839 #pragma redefine_extname CMS_unsigned_get0_data_by_OBJ sunw_CMS_unsigned_
840 #pragma redefine_extname CMS_verify sunw_CMS_verify
841 #pragma redefine_extname CMS_verify_receipt sunw_CMS_verify_receipt
842 #pragma redefine_extname COMP_compress_block sunw_COMP_compress_block
843 #pragma redefine_extname COMP_CTX_free sunw_COMP_CTX_free
844 #pragma redefine_extname COMP_CTX_new sunw_COMP_CTX_new
845 #pragma redefine_extname COMP_expand_block sunw_COMP_expand_block
846 #pragma redefine_extname COMP_rle sunw_COMP_rle
847 #pragma redefine_extname COMP_zlib sunw_COMP_zlib
848 #pragma redefine_extname COMP_zlib_cleanup sunw_COMP_zlib_cleanup
849 #pragma redefine_extname CONF_def_version sunw_CONF_def_version
850 #pragma redefine_extname CONF_dump_bio sunw_CONF_dump_bio
851 #pragma redefine_extname CONF_dump_fp sunw_CONF_dump_fp
852 #pragma redefine_extname CONF_free sunw_CONF_free
853 #pragma redefine_extname CONF_get_number sunw_CONF_get_number

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854 #pragma redefine_extname CONF_get_section sunw_CONF_get_section
855 #pragma redefine_extname CONF_get_string sunw_CONF_get_string
856 #pragma redefine_extname CONF_get1_default_config_file sunw_CONF_get1_def
857 #pragma redefine_extname CONF_imodule_get_flags sunw_CONF_imodule_get fla
858 #pragma redefine_extname CONF_imodule_get_module sunw_CONF_imodule_get mo
859 #pragma redefine_extname CONF_imodule_get_name sunw_CONF_imodule_get_name
860 #pragma redefine_extname CONF_imodule_get_usr_data sunw_CONF_imodule_get_
861 #pragma redefine_extname CONF_imodule_get_value sunw_CONF_imodule_get_val
862 #pragma redefine_extname CONF_imodule_set_flags sunw_CONF_imodule_set fla
863 #pragma redefine_extname CONF_imodule_set_usr_data sunw_CONF_imodule_set_
864 #pragma redefine_extname CONF_load sunw_CONF_load
865 #pragma redefine_extname CONF_load_bio sunw_CONF_load_bio
866 #pragma redefine_extname CONF_load_fp sunw_CONF_load_fp
867 #pragma redefine_extname CONF_module_add sunw_CONF_module_add
868 #pragma redefine_extname CONF_module_get_usr_data sunw_CONF_module_get_us
869 #pragma redefine_extname CONF_module_set_usr_data sunw_CONF_module_set_us
870 #pragma redefine_extname CONF_modules_finish sunw_CONF_modules_finish
871 #pragma redefine_extname CONF_modules_free sunw_CONF_modules_free
872 #pragma redefine_extname CONF_modules_load sunw_CONF_modules_load
873 #pragma redefine_extname CONF_modules_load_file sunw_CONF_modules_load fi
874 #pragma redefine_extname CONF_modules_unload sunw_CONF_modules_unload
875 #pragma redefine_extname CONF_parse_list sunw_CONF_parse_list
876 #pragma redefine_extname CONF_set_default_method sunw_CONF_set_default_me
877 #pragma redefine_extname CONF_set_nconf sunw_CONF_set_nconf
878 #pragma redefine_extname CONF_version sunw_CONF_version
879 #pragma redefine_extname CRL_DIST_POINTS_free sunw_CRL_DIST_POINTS_free
880 #pragma redefine_extname CRL_DIST_POINTS_it sunw_CRL_DIST_POINTS_it
881 #pragma redefine_extname CRL_DIST_POINTS_new sunw_CRL_DIST_POINTS_new
882 #pragma redefine_extname CRYPTO_add_lock sunw_CRYPTO_add_lock
883 #pragma redefine_extname CRYPTO_cbc128_decrypt sunw_CRYPTO_cbc128_decrypt
884 #pragma redefine_extname CRYPTO_cbc128_encrypt sunw_CRYPTO_cbc128_encrypt
885 #pragma redefine_extname CRYPTO_ccm128_aad sunw_CRYPTO_ccm128_aad
886 #pragma redefine_extname CRYPTO_ccm128_decrypt sunw_CRYPTO_ccm128_decrypt
887 #pragma redefine_extname CRYPTO_ccm128_decrypt_ccm64 sunw_CRYPTO_ccm128_d
888 #pragma redefine_extname CRYPTO_ccm128_encrypt sunw_CRYPTO_ccm128_encrypt
889 #pragma redefine_extname CRYPTO_ccm128_encrypt_ccm64 sunw_CRYPTO_ccm128_e
890 #pragma redefine_extname CRYPTO_ccm128_init sunw_CRYPTO_ccm128_init
891 #pragma redefine_extname CRYPTO_ccm128_setiv sunw_CRYPTO_ccm128_setiv
892 #pragma redefine_extname CRYPTO_ccm128_tag sunw_CRYPTO_ccm128_tag
893 #pragma redefine_extname CRYPTO_cfb128_1_encrypt sunw_CRYPTO_cfb128_1_enc
894 #pragma redefine_extname CRYPTO_cfb128_8_encrypt sunw_CRYPTO_cfb128_8_enc
895 #pragma redefine_extname CRYPTO_cfb128_encrypt sunw_CRYPTO_cfb128_encrypt
896 #pragma redefine_extname CRYPTO_cleanup_all_ex_data sunw_CRYPTO_cleanup_a
897 #pragma redefine_extname CRYPTO_ctr128_encrypt sunw_CRYPTO_ctr128_encrypt
898 #pragma redefine_extname CRYPTO_ctr128_encrypt_ctr32 sunw_CRYPTO_ctr128_e
899 #pragma redefine_extname CRYPTO_cts128_decrypt sunw_CRYPTO_cts128_decrypt
900 #pragma redefine_extname CRYPTO_cts128_decrypt_block sunw_CRYPTO_cts128_d
901 #pragma redefine_extname CRYPTO_cts128_encrypt sunw_CRYPTO_cts128_encrypt
902 #pragma redefine_extname CRYPTO_cts128_encrypt_block sunw_CRYPTO_cts128_e
903 #pragma redefine_extname CRYPTO_dbg_free sunw_CRYPTO_dbg_free
904 #pragma redefine_extname CRYPTO_dbg_get_options sunw_CRYPTO_dbg_get_optio
905 #pragma redefine_extname CRYPTO_dbg_malloc sunw_CRYPTO_dbg_malloc
906 #pragma redefine_extname CRYPTO_dbg_realloc sunw_CRYPTO_dbg_realloc
907 #pragma redefine_extname CRYPTO_dbg_set_options sunw_CRYPTO_dbg_set_optio
908 #pragma redefine_extname CRYPTO_destroy_dynlockid sunw_CRYPTO_destroy_dyn
909 #pragma redefine_extname CRYPTO_dup_ex_data sunw_CRYPTO_dup_ex_data
910 #pragma redefine_extname CRYPTO_ex_data_new_class sunw_CRYPTO_ex_data_new
911 #pragma redefine_extname CRYPTO_free sunw_CRYPTO_free
912 #pragma redefine_extname CRYPTO_free_ex_data sunw_CRYPTO_free_ex_data
913 #pragma redefine_extname CRYPTO_free_locked sunw_CRYPTO_free_locked
914 #pragma redefine_extname CRYPTO_gcm128_aad sunw_CRYPTO_gcm128_aad
915 #pragma redefine_extname CRYPTO_gcm128_decrypt sunw_CRYPTO_gcm128_decrypt
916 #pragma redefine_extname CRYPTO_gcm128_decrypt_ctr32 sunw_CRYPTO_gcm128_d
917 #pragma redefine_extname CRYPTO_gcm128_encrypt sunw_CRYPTO_gcm128_encrypt
918 #pragma redefine_extname CRYPTO_gcm128_encrypt_ctr32 sunw_CRYPTO_gcm128_e
919 #pragma redefine_extname CRYPTO_gcm128_finish sunw_CRYPTO_gcm128_finish

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920 #pragma redefine_extname CRYPTO_gcm128_init sunw_CRYPT0_gcm128_init
921 #pragma redefine_extname CRYPTO_gcm128_new sunw_CRYPT0_gcm128_new
922 #pragma redefine_extname CRYPTO_gcm128_release sunw_CRYPT0_gcm128_release
923 #pragma redefine_extname CRYPTO_gcm128_setiv sunw_CRYPT0_gcm128_setiv
924 #pragma redefine_extname CRYPTO_gcm128_tag sunw_CRYPT0_gcm128_tag
925 #pragma redefine_extname CRYPTO_get_add_lock_callback sunw_CRYPT0_get_add
926 #pragma redefine_extname CRYPTO_get_dynlock_create_callback sunw_CRYPT0_g
927 #pragma redefine_extname CRYPTO_get_dynlock_destroy_callback sunw_CRYPT0_
928 #pragma redefine_extname CRYPTO_get_dynlock_lock_callback sunw_CRYPT0_get
929 #pragma redefine_extname CRYPTO_get_dynlock_value sunw_CRYPT0_get_dynlock
930 #pragma redefine_extname CRYPTO_get_ex_data sunw_CRYPT0_get_ex_data
931 #pragma redefine_extname CRYPTO_get_ex_data_implementation sunw_CRYPT0_ge
932 #pragma redefine_extname CRYPTO_get_ex_new_index sunw_CRYPT0_get_ex_new_i
933 #pragma redefine_extname CRYPTO_get_id_callback sunw_CRYPT0_get_id_calba
934 #pragma redefine_extname CRYPTO_get_lock_name sunw_CRYPT0_get_lock_name
935 #pragma redefine_extname CRYPTO_get_locked_mem_ex_functions sunw_CRYPT0_g
936 #pragma redefine_extname CRYPTO_get_locked_mem_functions sunw_CRYPT0_get_
937 #pragma redefine_extname CRYPTO_get_locking_callback sunw_CRYPT0_get_lock
938 #pragma redefine_extname CRYPTO_get_mem_debug_functions sunw_CRYPT0_get_m
939 #pragma redefine_extname CRYPTO_get_mem_debug_options sunw_CRYPT0_get_mem
940 #pragma redefine_extname CRYPTO_get_mem_ex_functions sunw_CRYPT0_get_mem_
941 #pragma redefine_extname CRYPTO_get_mem_functions sunw_CRYPT0_get_mem_fun
942 #pragma redefine_extname CRYPTO_get_new_dynlockid sunw_CRYPT0_get_new_dyn
943 #pragma redefine_extname CRYPTO_get_new_lockid sunw_CRYPT0_get_new_lockid
944 #pragma redefine_extname CRYPTO_is_mem_check_on sunw_CRYPT0_is_mem_check_
945 #pragma redefine_extname CRYPTO_lock sunw_CRYPT0_lock
946 #pragma redefine_extname CRYPTO_malloc sunw_CRYPT0_malloc
947 #pragma redefine_extname CRYPTO_malloc_locked sunw_CRYPT0_malloc_locked
948 #pragma redefine_extname CRYPTO_mem_ctrl sunw_CRYPT0_mem_ctrl
949 #pragma redefine_extname CRYPTO_mem_leaks sunw_CRYPT0_mem_leaks
950 #pragma redefine_extname CRYPTO_mem_leaks_cb sunw_CRYPT0_mem_leaks_cb
951 #pragma redefine_extname CRYPTO_mem_leaks_fp sunw_CRYPT0_mem_leaks_fp
952 #pragma redefine_extname CRYPTO_memcmp sunw_CRYPT0_memcmp
953 #pragma redefine_extname CRYPTO_new_ex_data sunw_CRYPT0_new_ex_data
954 #pragma redefine_extname CRYPTO_nistcts128_decrypt sunw_CRYPT0_nistcts128
955 #pragma redefine_extname CRYPTO_nistcts128_decrypt_block sunw_CRYPT0_nist
956 #pragma redefine_extname CRYPTO_nistcts128_encrypt sunw_CRYPT0_nistcts128
957 #pragma redefine_extname CRYPTO_nistcts128_encrypt_block sunw_CRYPT0_nist
958 #pragma redefine_extname CRYPTO_num_locks sunw_CRYPT0_num_locks
959 #pragma redefine_extname CRYPTO_ofb128_encrypt sunw_CRYPT0_ofb128_encrypt
960 #pragma redefine_extname CRYPTO_pop_info sunw_CRYPT0_pop_info
961 #pragma redefine_extname CRYPTO_push_info_ sunw_CRYPT0_push_info_
962 #pragma redefine_extname CRYPTO_realloc sunw_CRYPT0_realloc
963 #pragma redefine_extname CRYPTO_realloc_clean sunw_CRYPT0_realloc_clean
964 #pragma redefine_extname CRYPTO_remalloc sunw_CRYPT0_remalloc
965 #pragma redefine_extname CRYPTO_remove_all_info sunw_CRYPT0_remove_all_in
966 #pragma redefine_extname CRYPTO_set_add_lock_callback sunw_CRYPT0_set_add
967 #pragma redefine_extname CRYPTO_set_dynlock_create_callback sunw_CRYPT0_s
968 #pragma redefine_extname CRYPTO_set_dynlock_destroy_callback sunw_CRYPT0_
969 #pragma redefine_extname CRYPTO_set_dynlock_lock_callback sunw_CRYPT0_set
970 #pragma redefine_extname CRYPTO_set_ex_data sunw_CRYPT0_set_ex_data
971 #pragma redefine_extname CRYPTO_set_ex_data_implementation sunw_CRYPT0_se
972 #pragma redefine_extname CRYPTO_set_id_callback sunw_CRYPT0_set_id_calba
973 #pragma redefine_extname CRYPTO_set_locked_mem_ex_functions sunw_CRYPT0_s
974 #pragma redefine_extname CRYPTO_set_locked_mem_functions sunw_CRYPT0_set_
975 #pragma redefine_extname CRYPTO_set_locking_callback sunw_CRYPT0_set_lock
976 #pragma redefine_extname CRYPTO_set_mem_debug_functions sunw_CRYPT0_set_m
977 #pragma redefine_extname CRYPTO_set_mem_debug_options sunw_CRYPT0_set_mem
978 #pragma redefine_extname CRYPTO_set_mem_ex_functions sunw_CRYPT0_set_mem_
979 #pragma redefine_extname CRYPTO_set_mem_functions sunw_CRYPT0_set_mem_fun
980 #pragma redefine_extname CRYPTO_strdup sunw_CRYPT0_strdup
981 #pragma redefine_extname CRYPTO_thread_id sunw_CRYPT0_thread_id
982 #pragma redefine_extname CRYPTO_THREADID_cmp sunw_CRYPT0_THREADID_cmp
983 #pragma redefine_extname CRYPTO_THREADID_cpy sunw_CRYPT0_THREADID_cpy
984 #pragma redefine_extname CRYPTO_THREADID_current sunw_CRYPT0_THREADID_cur
985 #pragma redefine_extname CRYPTO_THREADID_get_callback sunw_CRYPT0_THREADID

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986 #pragma redefine_extname CRYPTO_THREADID_hash sunw_CRYPT0_THREADID_hash
987 #pragma redefine_extname CRYPTO_THREADID_set_callback sunw_CRYPT0_THREADID
988 #pragma redefine_extname CRYPTO_THREADID_set_numeric sunw_CRYPT0_THREADID
989 #pragma redefine_extname CRYPTO_THREADID_set_pointer sunw_CRYPT0_THREADID
990 #pragma redefine_extname CRYPTO_xts128_encrypt sunw_CRYPT0_xts128_encrypt
991 #pragma redefine_extname d2i_ACCESS_DESCRIPTION sunw_d2i_ACCESS_DESCRIPTOR
992 #pragma redefine_extname d2i_ASN1_BIT_STRING sunw_d2i_ASN1_BIT_STRING
993 #pragma redefine_extname d2i_ASN1_BMPSTRING sunw_d2i_ASN1_BMPSTRING
994 #pragma redefine_extname d2i_ASN1_BOOLEAN sunw_d2i_ASN1_BOOLEAN
995 #pragma redefine_extname d2i_ASN1_bytes sunw_d2i_ASN1_bytes
996 #pragma redefine_extname d2i_ASN1_ENUMERATED sunw_d2i_ASN1_ENUMERATED
997 #pragma redefine_extname d2i_ASN1_GENERALIZEDTIME sunw_d2i_ASN1_GENERALIZ
998 #pragma redefine_extname d2i_ASN1_GENERALSTRING sunw_d2i_ASN1_GENERALSTRI
999 #pragma redefine_extname d2i_ASN1_IA5STRING sunw_d2i_ASN1_IA5STRING
1000 #pragma redefine_extname d2i_ASN1_INTEGER sunw_d2i_ASN1_INTEGER
1001 #pragma redefine_extname d2i_ASN1_NULL sunw_d2i_ASN1_NULL
1002 #pragma redefine_extname d2i_ASN1_OBJECT sunw_d2i_ASN1_OBJECT
1003 #pragma redefine_extname d2i_ASN1_OCTET_STRING sunw_d2i_ASN1_OCTET_STRING
1004 #pragma redefine_extname d2i_ASN1_PRINTABLE sunw_d2i_ASN1_PRINTABLE
1005 #pragma redefine_extname d2i_ASN1_PRINTABLESTRING sunw_d2i_ASN1_PRINTABLE
1006 #pragma redefine_extname d2i_ASN1_SEQUENCE ANY sunw_d2i_ASN1_SEQUENCE ANY
1007 #pragma redefine_extname d2i_ASN1_SET sunw_d2i_ASN1_SET
1008 #pragma redefine_extname d2i_ASN1_SET_ANY sunw_d2i_ASN1_SET_ANY
1009 #pragma redefine_extname d2i_ASN1_T61STRING sunw_d2i_ASN1_T61STRING
1010 #pragma redefine_extname d2i_ASN1_TIME sunw_d2i_ASN1_TIME
1011 #pragma redefine_extname d2i_ASN1_TYPE sunw_d2i_ASN1_TYPE
1012 #pragma redefine_extname d2i_ASN1_type_bytes sunw_d2i_ASN1_type_bytes
1013 #pragma redefine_extname d2i_ASN1_INTEGER sunw_d2i_ASN1_INTEGER
1014 #pragma redefine_extname d2i_ASN1_UNIVERSALSTRING sunw_d2i_ASN1_UNIVERSAL
1015 #pragma redefine_extname d2i_ASN1_UTCTIME sunw_d2i_ASN1_UTCTIME
1016 #pragma redefine_extname d2i_ASN1_UTF8STRING sunw_d2i_ASN1_UTF8STRING
1017 #pragma redefine_extname d2i_ASN1_VISIBLESTRING sunw_d2i_ASN1_VISIBLESTRI
1018 #pragma redefine_extname d2i_AUTHORITY_INFO_ACCESS sunw_d2i_AUTHORITY_INF
1019 #pragma redefine_extname d2i_AUTHORITY_KEYID sunw_d2i_AUTHORITY_KEYID
1020 #pragma redefine_extname d2i_AutoPrivateKey sunw_d2i_AutoPrivateKey
1021 #pragma redefine_extname d2i_BASIC_CONSTRAINTS sunw_d2i_BASIC_CONSTRAINTS
1022 #pragma redefine_extname d2i_CERTIFICATEPOLICIES sunw_d2i_CERTIFICATEPOLI
1023 #pragma redefine_extname d2i_CMS_bio sunw_d2i_CMS_bio
1024 #pragma redefine_extname d2i_CMS_ContentInfo sunw_d2i_CMS_ContentInfo
1025 #pragma redefine_extname d2i_CMS_ReceiptRequest sunw_d2i_CMS_ReceiptReque
1026 #pragma redefine_extname d2i_CRL_DIST_POINTS sunw_d2i_CRL_DIST_POINTS
1027 #pragma redefine_extname d2i_DHparams sunw_d2i_DHparams
1028 #pragma redefine_extname d2i_DIRECTORYSTRING sunw_d2i_DIRECTORYSTRING
1029 #pragma redefine_extname d2i_DISPLAYTEXT sunw_d2i_DISPLAYTEXT
1030 #pragma redefine_extname d2i_DIST_POINT sunw_d2i_DIST_POINT
1031 #pragma redefine_extname d2i_DIST_POINT_NAME sunw_d2i_DIST_POINT_NAME
1032 #pragma redefine_extname d2i_DSA_PUBKEY sunw_d2i_DSA_PUBKEY
1033 #pragma redefine_extname d2i_DSA_PUBKEY_bio sunw_d2i_DSA_PUBKEY_bio
1034 #pragma redefine_extname d2i_DSA_PUBKEY_fp sunw_d2i_DSA_PUBKEY_fp
1035 #pragma redefine_extname d2i_DSA_SIG sunw_d2i_DSA_SIG
1036 #pragma redefine_extname d2i_DSAParams sunw_d2i_DSAParams
1037 #pragma redefine_extname d2i_DSAPrivateKey sunw_d2i_DSAPrivateKey
1038 #pragma redefine_extname d2i_DSAPrivateKey_bio sunw_d2i_DSAPrivateKey_bio
1039 #pragma redefine_extname d2i_DSAPrivateKey_fp sunw_d2i_DSAPrivateKey_fp
1040 #pragma redefine_extname d2i_DSAPublicKey sunw_d2i_DSAPublicKey
1041 #pragma redefine_extname d2i_EDIPARTYNAME sunw_d2i_EDIPARTYNAME
1042 #pragma redefine_extname d2i_ESS_CERT_ID sunw_d2i_ESS_CERT_ID
1043 #pragma redefine_extname d2i_ESS_ISSUER_SERIAL sunw_d2i_ESS_ISSUER_SERIAL
1044 #pragma redefine_extname d2i_ESS_SIGNING_CERT sunw_d2i_ESS_SIGNING_CERT
1045 #pragma redefine_extname d2i_EXTENDED_KEY_USAGE sunw_d2i_EXTENDED_KEY_USA
1046 #pragma redefine_extname d2i_GENERAL_NAME sunw_d2i_GENERAL_NAME
1047 #pragma redefine_extname d2i_GENERAL_NAMES sunw_d2i_GENERAL_NAMES
1048 #pragma redefine_extname d2i_ISSUING_DIST_POINT sunw_d2i_ISSUING_DIST_POI
1049 #pragma redefine_extname d2i_KRB5_APREQ sunw_d2i_KRB5_APREQ
1050 #pragma redefine_extname d2i_KRB5_APREQBODY sunw_d2i_KRB5_APREQBODY
1051 #pragma redefine_extname d2i_KRB5_AUTHDATA sunw_d2i_KRB5_AUTHDATA

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1052 #pragma redefine_extname      d2i_KRB5_AUTHENT sunw_d2i_KRB5_AUTHENT
1053 #pragma redefine_extname      d2i_KRB5_AUTHENTBODY sunw_d2i_KRB5_AUTHENTBODY
1054 #pragma redefine_extname      d2i_KRB5_CHECKSUM sunw_d2i_KRB5_CHECKSUM
1055 #pragma redefine_extname      d2i_KRB5_ENCDATA sunw_d2i_KRB5_ENCDATA
1056 #pragma redefine_extname      d2i_KRB5_ENCKEY sunw_d2i_KRB5_ENCKEY
1057 #pragma redefine_extname      d2i_KRB5_PRINCNAME sunw_d2i_KRB5_PRINCNAME
1058 #pragma redefine_extname      d2i_KRB5_TICKET sunw_d2i_KRB5_TICKET
1059 #pragma redefine_extname      d2i_KRB5_TKTBODY sunw_d2i_KRB5_TKTBODY
1060 #pragma redefine_extname      d2i_NETSCAPE_CERT_SEQUENCE sunw_d2i_NETSCAPE_CERT
1061 #pragma redefine_extname      d2i_NETSCAPE_ENCRYPTED_PKEY sunw_d2i_NETSCAPE_EN
1062 #pragma redefine_extname      d2i_NETSCAPE_PKEY sunw_d2i_NETSCAPE_PKEY
1063 #pragma redefine_extname      d2i_Netscape_RSA sunw_d2i_Netscape_RSA
1064 #pragma redefine_extname      d2i_NETSCAPE_SPKAC sunw_d2i_NETSCAPE_SPKAC
1065 #pragma redefine_extname      d2i_NETSCAPE_SPKI sunw_d2i_NETSCAPE_SPKI
1066 #pragma redefine_extname      d2i_NETSCAPE_X509 sunw_d2i_NETSCAPE_X509
1067 #pragma redefine_extname      d2i_NOTICEREF sunw_d2i_NOTICEREF
1068 #pragma redefine_extname      d2i_OCSP_BASICRESP sunw_d2i_OCSP_BASICRESP
1069 #pragma redefine_extname      d2i_OCSP_CERTID sunw_d2i_OCSP_CERTID
1070 #pragma redefine_extname      d2i_OCSP_CERTSTATUS sunw_d2i_OCSP_CERTSTATUS
1071 #pragma redefine_extname      d2i_OCSP_CLRID sunw_d2i_OCSP_CLRID
1072 #pragma redefine_extname      d2i_OCSP_ONEREQ sunw_d2i_OCSP_ONEREQ
1073 #pragma redefine_extname      d2i_OCSP_REQINFO sunw_d2i_OCSP_REQINFO
1074 #pragma redefine_extname      d2i_OCSP_REQUEST sunw_d2i_OCSP_REQUEST
1075 #pragma redefine_extname      d2i_OCSP_RESPBYTES sunw_d2i_OCSP_RESPBYTES
1076 #pragma redefine_extname      d2i_OCSP_RESPDATA sunw_d2i_OCSP_RESPDATA
1077 #pragma redefine_extname      d2i_OCSP_RESPID sunw_d2i_OCSP_RESPID
1078 #pragma redefine_extname      d2i_OCSP_RESPONSE sunw_d2i_OCSP_RESPONSE
1079 #pragma redefine_extname      d2i_OCSP_REVOKEDINFO sunw_d2i_OCSP_REVOKEDINFO
1080 #pragma redefine_extname      d2i_OCSP_SERVICELOC sunw_d2i_OCSP_SERVICELOC
1081 #pragma redefine_extname      d2i_OCSP_SIGNATURE sunw_d2i_OCSP_SIGNATURE
1082 #pragma redefine_extname      d2i_OCSP_SINGLERESP sunw_d2i_OCSP_SINGLERESP
1083 #pragma redefine_extname      d2i_OTHERNAME sunw_d2i_OTHERNAME
1084 #pragma redefine_extname      d2i_PBE2PARAM sunw_d2i_PBE2PARAM
1085 #pragma redefine_extname      d2i_PBEPARAM sunw_d2i_PBEPARAM
1086 #pragma redefine_extname      d2i_PBKDF2PARAM sunw_d2i_PBKDF2PARAM
1087 #pragma redefine_extname      d2i_PKCS12 sunw_d2i_PKCS12
1088 #pragma redefine_extname      d2i_PKCS12_BAGS sunw_d2i_PKCS12_BAGS
1089 #pragma redefine_extname      d2i_PKCS12_bio sunw_d2i_PKCS12_bio
1090 #pragma redefine_extname      d2i_PKCS12_fp sunw_d2i_PKCS12_fp
1091 #pragma redefine_extname      d2i_PKCS12_MAC_DATA sunw_d2i_PKCS12_MAC_DATA
1092 #pragma redefine_extname      d2i_PKCS12_SAFEBAK sunw_d2i_PKCS12_SAFEBAK
1093 #pragma redefine_extname      d2i_PKCS7 sunw_d2i_PKCS7
1094 #pragma redefine_extname      d2i_PKCS7_bio sunw_d2i_PKCS7_bio
1095 #pragma redefine_extname      d2i_PKCS7_DIGEST sunw_d2i_PKCS7_DIGEST
1096 #pragma redefine_extname      d2i_PKCS7_ENC_CONTENT sunw_d2i_PKCS7_ENC_CONTENT
1097 #pragma redefine_extname      d2i_PKCS7_ENCRYPT sunw_d2i_PKCS7_ENCRYPT
1098 #pragma redefine_extname      d2i_PKCS7_ENVELOPE sunw_d2i_PKCS7_ENVELOPE
1099 #pragma redefine_extname      d2i_PKCS7_fp sunw_d2i_PKCS7_fp
1100 #pragma redefine_extname      d2i_PKCS7_ISSUER_AND_SERIAL sunw_d2i_PKCS7_ISSUE
1101 #pragma redefine_extname      d2i_PKCS7_RECIP_INFO sunw_d2i_PKCS7_RECIP_INFO
1102 #pragma redefine_extname      d2i_PKCS7_SIGN_ENVELOPE sunw_d2i_PKCS7_SIGN_ENVE
1103 #pragma redefine_extname      d2i_PKCS7_SIGNED sunw_d2i_PKCS7_SIGNED
1104 #pragma redefine_extname      d2i_PKCS7_SIGNER_INFO sunw_d2i_PKCS7_SIGNER_INFO
1105 #pragma redefine_extname      d2i_PKCS8_bio sunw_d2i_PKCS8_bio
1106 #pragma redefine_extname      d2i_PKCS8_fp sunw_d2i_PKCS8_fp
1107 #pragma redefine_extname      d2i_PKCS8_PRIV_KEY_INFO sunw_d2i_PKCS8_PRIV_KEY
1108 #pragma redefine_extname      d2i_PKCS8_PRIV_KEY_INFO_bio sunw_d2i_PKCS8_PRIV
1109 #pragma redefine_extname      d2i_PKCS8_PRIV_KEY_INFO_fp sunw_d2i_PKCS8_PRIV_K
1110 #pragma redefine_extname      d2i_PKCS8PrivateKey_bio sunw_d2i_PKCS8PrivateKey
1111 #pragma redefine_extname      d2i_PKCS8PrivateKey_fp sunw_d2i_PKCS8PrivateKey
1112 #pragma redefine_extname      d2i_PKEY_USAGE_PERIOD sunw_d2i_PKEY_USAGE_PERIOD
1113 #pragma redefine_extname      d2i_POLICYINFO sunw_d2i_POLICYINFO
1114 #pragma redefine_extname      d2i_POLICYQUALINFO sunw_d2i_POLICYQUALINFO
1115 #pragma redefine_extname      d2i_PrivateKey sunw_d2i_PrivateKey
1116 #pragma redefine_extname      d2i_PrivateKey_bio sunw_d2i_PrivateKey_bio
1117 #pragma redefine_extname      d2i_PrivateKey_fp sunw_d2i_PrivateKey_fp

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1118 #pragma redefine_extname      d2i_PROXY_CERT_INFO_EXTENSION sunw_d2i_PROXY_CERT
1119 #pragma redefine_extname      d2i_PROXY_POLICY sunw_d2i_PROXY_POLICY
1120 #pragma redefine_extname      d2i_PUBKEY sunw_d2i_PUBKEY
1121 #pragma redefine_extname      d2i_PUBKEY_bio sunw_d2i_PUBKEY_bio
1122 #pragma redefine_extname      d2i_PUBKEY_fp sunw_d2i_PUBKEY_fp
1123 #pragma redefine_extname      d2i_PublicKey sunw_d2i_PublicKey
1124 #pragma redefine_extname      d2i_RSA_NET sunw_d2i_RSA_NET
1125 #pragma redefine_extname      d2i_RSA_PSS_PARAMS sunw_d2i_RSA_PSS_PARAMS
1126 #pragma redefine_extname      d2i_RSA_PUBKEY sunw_d2i_RSA_PUBKEY
1127 #pragma redefine_extname      d2i_RSA_PUBKEY_bio sunw_d2i_RSA_PUBKEY_bio
1128 #pragma redefine_extname      d2i_RSA_PUBKEY_fp sunw_d2i_RSA_PUBKEY_fp
1129 #pragma redefine_extname      d2i_RSAPrivateKey sunw_d2i_RSAPrivateKey
1130 #pragma redefine_extname      d2i_RSAPrivateKey_bio sunw_d2i_RSAPrivateKey_bio
1131 #pragma redefine_extname      d2i_RSAPrivateKey_fp sunw_d2i_RSAPrivateKey_fp
1132 #pragma redefine_extname      d2i_RSAPublicKey sunw_d2i_RSAPublicKey
1133 #pragma redefine_extname      d2i_RSAPublicKey_bio sunw_d2i_RSAPublicKey_bio
1134 #pragma redefine_extname      d2i_RSAPublicKey_fp sunw_d2i_RSAPublicKey_fp
1135 #pragma redefine_extname      d2i_SXNET sunw_d2i_SXNET
1136 #pragma redefine_extname      d2i_SXNETID sunw_d2i_SXNETID
1137 #pragma redefine_extname      d2i_TS_ACCURACY sunw_d2i_TS_ACCURACY
1138 #pragma redefine_extname      d2i_TS_MSG_IMPRINT sunw_d2i_TS_MSG_IMPRINT
1139 #pragma redefine_extname      d2i_TS_MSG_IMPRINT_bio sunw_d2i_TS_MSG_IMPRINT_b
1140 #pragma redefine_extname      d2i_TS_MSG_IMPRINT_fp sunw_d2i_TS_MSG_IMPRINT_fp
1141 #pragma redefine_extname      d2i_TS_REQ sunw_d2i_TS_REQ
1142 #pragma redefine_extname      d2i_TS_REQ_bio sunw_d2i_TS_REQ_bio
1143 #pragma redefine_extname      d2i_TS_REQ_fp sunw_d2i_TS_REQ_fp
1144 #pragma redefine_extname      d2i_TS_RESP sunw_d2i_TS_RESP
1145 #pragma redefine_extname      d2i_TS_RESP_bio sunw_d2i_TS_RESP_bio
1146 #pragma redefine_extname      d2i_TS_RESP_fp sunw_d2i_TS_RESP_fp
1147 #pragma redefine_extname      d2i_TS_STATUS_INFO sunw_d2i_TS_STATUS_INFO
1148 #pragma redefine_extname      d2i_TS_TST_INFO sunw_d2i_TS_TST_INFO
1149 #pragma redefine_extname      d2i_TS_TST_INFO_bio sunw_d2i_TS_TST_INFO_bio
1150 #pragma redefine_extname      d2i_TS_TST_INFO_fp sunw_d2i_TS_TST_INFO_fp
1151 #pragma redefine_extname      d2i_USERNOTICE sunw_d2i_USERNOTICE
1152 #pragma redefine_extname      d2i_X509 sunw_d2i_X509
1153 #pragma redefine_extname      d2i_X509_ALGOR sunw_d2i_X509_ALGOR
1154 #pragma redefine_extname      d2i_X509_ALGORS sunw_d2i_X509_ALGORS
1155 #pragma redefine_extname      d2i_X509_ATTRIBUTE sunw_d2i_X509_ATTRIBUTE
1156 #pragma redefine_extname      d2i_X509_AUX sunw_d2i_X509_AUX
1157 #pragma redefine_extname      d2i_X509_bio sunw_d2i_X509_bio
1158 #pragma redefine_extname      d2i_X509_CERT_AUX sunw_d2i_X509_CERT_AUX
1159 #pragma redefine_extname      d2i_X509_CERT_PAIR sunw_d2i_X509_CERT_PAIR
1160 #pragma redefine_extname      d2i_X509_CINF sunw_d2i_X509_CINF
1161 #pragma redefine_extname      d2i_X509_CRL sunw_d2i_X509_CRL
1162 #pragma redefine_extname      d2i_X509_CRL_bio sunw_d2i_X509_CRL_bio
1163 #pragma redefine_extname      d2i_X509_CRL_fp sunw_d2i_X509_CRL_fp
1164 #pragma redefine_extname      d2i_X509_CRL_INFO sunw_d2i_X509_CRL_INFO
1165 #pragma redefine_extname      d2i_X509_EXTENSION sunw_d2i_X509_EXTENSION
1166 #pragma redefine_extname      d2i_X509_EXTENSIONS sunw_d2i_X509_EXTENSIONS
1167 #pragma redefine_extname      d2i_X509_fp sunw_d2i_X509_fp
1168 #pragma redefine_extname      d2i_X509_NAME sunw_d2i_X509_NAME
1169 #pragma redefine_extname      d2i_X509_NAME_ENTRY sunw_d2i_X509_NAME_ENTRY
1170 #pragma redefine_extname      d2i_X509_PKEY sunw_d2i_X509_PKEY
1171 #pragma redefine_extname      d2i_X509_PUBKEY sunw_d2i_X509_PUBKEY
1172 #pragma redefine_extname      d2i_X509_REQ sunw_d2i_X509_REQ
1173 #pragma redefine_extname      d2i_X509_REQ_bio sunw_d2i_X509_REQ_bio
1174 #pragma redefine_extname      d2i_X509_REQ_fp sunw_d2i_X509_REQ_fp
1175 #pragma redefine_extname      d2i_X509_REQ_INFO sunw_d2i_X509_REQ_INFO
1176 #pragma redefine_extname      d2i_X509_REVOKED sunw_d2i_X509_REVOKED
1177 #pragma redefine_extname      d2i_X509_SIG sunw_d2i_X509_SIG
1178 #pragma redefine_extname      d2i_X509_VAL sunw_d2i_X509_VAL
1179 #pragma redefine_extname      default_pctx sunw_default_pctx
1180 #pragma redefine_extname      DES_cbc_cksum sunw_DES_cbc_cksum
1181 #pragma redefine_extname      DES_cbc_encrypt sunw_DES_cbc_encrypt
1182 #pragma redefine_extname      DES_cfb_encrypt sunw_DES_cfb_encrypt
1183 #pragma redefine_extname      DES_cfb64_encrypt sunw_DES_cfb64_encrypt

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1184 #pragma redefine_extname DES_check_key_parity sunw_DES_check_key_parity
1185 #pragma redefine_extname DES_crypt sunw_DES_crypt
1186 #pragma redefine_extname DES_decrypt3 sunw_DES_decrypt3
1187 #pragma redefine_extname DES_ecb_encrypt sunw_DES_ecb_encrypt
1188 #pragma redefine_extname DES_ecb3_encrypt sunw_DES_ecb3_encrypt
1189 #pragma redefine_extname DES_edec3_encrypt sunw_DES_edec3_encrypt
1190 #pragma redefine_extname DES_edec3_cbc_encrypt sunw_DES_edec3_cbc_encrypt
1191 #pragma redefine_extname DES_edec3_cfb_encrypt sunw_DES_edec3_cfb_encrypt
1192 #pragma redefine_extname DES_edec3_cfb64_encrypt sunw_DES_edec3_cfb64_encrypt
1193 #pragma redefine_extname DES_edec3_ofb64_encrypt sunw_DES_edec3_ofb64_encrypt
1194 #pragma redefine_extname DES_enc_read sunw_DES_enc_read
1195 #pragma redefine_extname DES_enc_write sunw_DES_enc_write
1196 #pragma redefine_extname DES_encrypt1 sunw_DES_encrypt1
1197 #pragma redefine_extname DES_encrypt2 sunw_DES_encrypt2
1198 #pragma redefine_extname DES_encrypt3 sunw_DES_encrypt3
1199 #pragma redefine_extname DES_fcrypt sunw_DES_fcrypt
1200 #pragma redefine_extname DES_is_weak_key sunw_DES_is_weak_key
1201 #pragma redefine_extname DES_key_sched sunw_DES_key_sched
1202 #pragma redefine_extname DES_ncbc_encrypt sunw_DES_ncbc_encrypt
1203 #pragma redefine_extname DES_ofb_encrypt sunw_DES_ofb_encrypt
1204 #pragma redefine_extname DES_ofb64_encrypt sunw_DES_ofb64_encrypt
1205 #pragma redefine_extname DES_options sunw_DES_options
1206 #pragma redefine_extname DES_pcbc_encrypt sunw_DES_pcbc_encrypt
1207 #pragma redefine_extname DES_quad_cksum sunw_DES_quad_cksum
1208 #pragma redefine_extname DES_random_key sunw_DES_random_key
1209 #pragma redefine_extname DES_read_2passwords sunw_DES_read_2passwords
1210 #pragma redefine_extname DES_read_password sunw_DES_read_password
1211 #pragma redefine_extname DES_set_key sunw_DES_set_key
1212 #pragma redefine_extname DES_set_key_checked sunw_DES_set_key_checked
1213 #pragma redefine_extname DES_set_key_unchecked sunw_DES_set_key_unchecked
1214 #pragma redefine_extname DES_set_odd_parity sunw_DES_set_odd_parity
1215 #pragma redefine_extname DES_SPtrans sunw_DES_SPtrans
1216 #pragma redefine_extname DES_string_to_2keys sunw_DES_string_to_2keys
1217 #pragma redefine_extname DES_string_to_key sunw_DES_string_to_key
1218 #pragma redefine_extname DES_xcbc_encrypt sunw_DES_xcbc_encrypt
1219 #pragma redefine_extname dh_asn1_meth sunw_dh_asn1_meth
1220 #pragma redefine_extname DH_check sunw_DH_check
1221 #pragma redefine_extname DH_check_pub_key sunw_DH_check_pub_key
1222 #pragma redefine_extname DH_compute_key sunw_DH_compute_key
1223 #pragma redefine_extname DH_free sunw_DH_free
1224 #pragma redefine_extname DH_generate_key sunw_DH_generate_key
1225 #pragma redefine_extname DH_generate_parameters sunw_DH_generate_parameters
1226 #pragma redefine_extname DH_generate_parameters_ex sunw_DH_generate_parameters_ex
1227 #pragma redefine_extname DH_get_default_method sunw_DH_get_default_method
1228 #pragma redefine_extname DH_get_ex_data sunw_DH_get_ex_data
1229 #pragma redefine_extname DH_get_ex_new_index sunw_DH_get_ex_new_index
1230 #pragma redefine_extname DH_new sunw_DH_new
1231 #pragma redefine_extname DH_new_method sunw_DH_new_method
1232 #pragma redefine_extname DH_OpenSSL sunw_DH_OpenSSL
1233 #pragma redefine_extname dh_pkey_meth sunw_dh_pkey_meth
1234 #pragma redefine_extname DH_set_default_method sunw_DH_set_default_method
1235 #pragma redefine_extname DH_set_ex_data sunw_DH_set_ex_data
1236 #pragma redefine_extname DH_set_method sunw_DH_set_method
1237 #pragma redefine_extname DH_size sunw_DH_size
1238 #pragma redefine_extname DH_up_ref sunw_DH_up_ref
1239 #pragma redefine_extname DH_version sunw_DH_version
1240 #pragma redefine_extname DHparams_dup sunw_DHparams_dup
1241 #pragma redefine_extname DHparams_it sunw_DHparams_it
1242 #pragma redefine_extname DHparams_print sunw_DHparams_print
1243 #pragma redefine_extname DHparams_print_fp sunw_DHparams_print_fp
1244 #pragma redefine_extname DIRECTORYSTRING_free sunw_DIRECTORYSTRING_free
1245 #pragma redefine_extname DIRECTORYSTRING_it sunw_DIRECTORYSTRING_it
1246 #pragma redefine_extname DIRECTORYSTRING_new sunw_DIRECTORYSTRING_new
1247 #pragma redefine_extname DISPLAYTEXT_free sunw_DISPLAYTEXT_free
1248 #pragma redefine_extname DISPLAYTEXT_it sunw_DISPLAYTEXT_it
1249 #pragma redefine_extname DISPLAYTEXT_new sunw_DISPLAYTEXT_new

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1250 #pragma redefine_extname DIST_POINT_free sunw_DIST_POINT_free
1251 #pragma redefine_extname DIST_POINT_it sunw_DIST_POINT_it
1252 #pragma redefine_extname DIST_POINT_NAME_free sunw_DIST_POINT_NAME_free
1253 #pragma redefine_extname DIST_POINT_NAME_it sunw_DIST_POINT_NAME_it
1254 #pragma redefine_extname DIST_POINT_NAME_new sunw_DIST_POINT_NAME_new
1255 #pragma redefine_extname DIST_POINT_new sunw_DIST_POINT_new
1256 #pragma redefine_extname DIST_POINT_set_dpname sunw_DIST_POINT_set_dpname
1257 #pragma redefine_extname dsa_asn1_meths sunw_dsa_asn1_meths
1258 #pragma redefine_extname dsa_builtin_paramgen sunw_dsa_builtin_paramgen
1259 #pragma redefine_extname DSA_do_sign sunw_DSA_do_sign
1260 #pragma redefine_extname DSA_do_verify sunw_DSA_do_verify
1261 #pragma redefine_extname DSA_dup_DH sunw_DSA_dup_DH
1262 #pragma redefine_extname DSA_free sunw_DSA_free
1263 #pragma redefine_extname DSA_generate_key sunw_DSA_generate_key
1264 #pragma redefine_extname DSA_generate_parameters sunw_DSA_generate_parameters
1265 #pragma redefine_extname DSA_generate_parameters_ex sunw_DSA_generate_parameters_ex
1266 #pragma redefine_extname DSA_get_default_method sunw_DSA_get_default_method
1267 #pragma redefine_extname DSA_get_ex_data sunw_DSA_get_ex_data
1268 #pragma redefine_extname DSA_get_ex_new_index sunw_DSA_get_ex_new_index
1269 #pragma redefine_extname DSA_new sunw_DSA_new
1270 #pragma redefine_extname DSA_new_method sunw_DSA_new_method
1271 #pragma redefine_extname DSA_OpenSSL sunw_DSA_OpenSSL
1272 #pragma redefine_extname dsa_pkey_meth sunw_dsa_pkey_meth
1273 #pragma redefine_extname DSA_print sunw_DSA_print
1274 #pragma redefine_extname DSA_print_fp sunw_DSA_print_fp
1275 #pragma redefine_extname dsa_pub_internal_it sunw_dsa_pub_internal_it
1276 #pragma redefine_extname DSA_set_default_method sunw_DSA_set_default_method
1277 #pragma redefine_extname DSA_set_ex_data sunw_DSA_set_ex_data
1278 #pragma redefine_extname DSA_set_method sunw_DSA_set_method
1279 #pragma redefine_extname DSA_SIG_free sunw_DSA_SIG_free
1280 #pragma redefine_extname DSA_SIG_it sunw_DSA_SIG_it
1281 #pragma redefine_extname DSA_SIG_new sunw_DSA_SIG_new
1282 #pragma redefine_extname DSA_sign sunw_DSA_sign
1283 #pragma redefine_extname DSA_sign_setup sunw_DSA_sign_setup
1284 #pragma redefine_extname DSA_size sunw_DSA_size
1285 #pragma redefine_extname DSA_up_ref sunw_DSA_up_ref
1286 #pragma redefine_extname DSA_verify sunw_DSA_verify
1287 #pragma redefine_extname DSA_version sunw_DSA_version
1288 #pragma redefine_extname DSAParams_dup sunw_DSAParams_dup
1289 #pragma redefine_extname DSAParams_it sunw_DSAParams_it
1290 #pragma redefine_extname DSAParams_print sunw_DSAParams_print
1291 #pragma redefine_extname DSAParams_print_fp sunw_DSAParams_print_fp
1292 #pragma redefine_extname DSAPrivateKey_it sunw_DSAPrivateKey_it
1293 #pragma redefine_extname DSAPublicKey_it sunw_DSAPublicKey_it
1294 #pragma redefine_extname DSO_bind_func sunw_DSO_bind_func
1295 #pragma redefine_extname DSO_bind_var sunw_DSO_bind_var
1296 #pragma redefine_extname DSO_convert_filename sunw_DSO_convert_filename
1297 #pragma redefine_extname DSO_ctrl sunw_DSO_ctrl
1298 #pragma redefine_extname DSO_flags sunw_DSO_flags
1299 #pragma redefine_extname DSO_free sunw_DSO_free
1300 #pragma redefine_extname DSO_get_default_method sunw_DSO_get_default_method
1301 #pragma redefine_extname DSO_get_filename sunw_DSO_get_filename
1302 #pragma redefine_extname DSO_get_loaded_filename sunw_DSO_get_loaded_filename
1303 #pragma redefine_extname DSO_get_method sunw_DSO_get_method
1304 #pragma redefine_extname DSO_global_lookup sunw_DSO_global_lookup
1305 #pragma redefine_extname DSO_load sunw_DSO_load
1306 #pragma redefine_extname DSO_merge sunw_DSO_merge
1307 #pragma redefine_extname DSO_METHOD_beos sunw_DSO_METHOD_beos
1308 #pragma redefine_extname DSO_METHOD_dl sunw_DSO_METHOD_dl
1309 #pragma redefine_extname DSO_METHOD_dlfcn sunw_DSO_METHOD_dlfcn
1310 #pragma redefine_extname DSO_METHOD_null sunw_DSO_METHOD_null
1311 #pragma redefine_extname DSO_METHOD_openssl sunw_DSO_METHOD_openssl
1312 #pragma redefine_extname DSO_METHOD_vms sunw_DSO_METHOD_vms
1313 #pragma redefine_extname DSO_METHOD_win32 sunw_DSO_METHOD_win32
1314 #pragma redefine_extname DSO_new sunw_DSO_new
1315 #pragma redefine_extname DSO_new_method sunw_DSO_new_method

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1316 #pragma redefine_extname DSO_pathbyaddr sunw_DSO_pathbyaddr
1317 #pragma redefine_extname DSO_set_default_method sunw_DSO_set_default_meth
1318 #pragma redefine_extname DSO_set_filename sunw_DSO_set_filename
1319 #pragma redefine_extname DSO_set_method sunw_DSO_set_method
1320 #pragma redefine_extname DSO_set_name_converter sunw_DSO_set_name_convert
1321 #pragma redefine_extname DSO_up_ref sunw_DSO_up_ref
1322 #pragma redefine_extname EDIPARTYNAME_free sunw_EDIPARTYNAME_free
1323 #pragma redefine_extname EDIPARTYNAME_it sunw_EDIPARTYNAME_it
1324 #pragma redefine_extname EDIPARTYNAME_new sunw_EDIPARTYNAME_new
1325 #pragma redefine_extname ENGINE_add sunw_ENGINE_add
1326 #pragma redefine_extname ENGINE_add_conf_module sunw_ENGINE_add_conf_modu
1327 #pragma redefine_extname ENGINE_by_id sunw_ENGINE_by_id
1328 #pragma redefine_extname ENGINE_cleanup sunw_ENGINE_cleanup
1329 #pragma redefine_extname engine_cleanup_add_first sunw_engine_cleanup_add
1330 #pragma redefine_extname engine_cleanup_add_last sunw_engine_cleanup_add_
1331 #pragma redefine_extname ENGINE_cmd_is_executable sunw_ENGINE_cmd_is_exec
1332 #pragma redefine_extname ENGINE_ctrl sunw_ENGINE_ctrl
1333 #pragma redefine_extname ENGINE_ctrl_cmd sunw_ENGINE_ctrl_cmd
1334 #pragma redefine_extname ENGINE_ctrl_cmd_string sunw_ENGINE_ctrl_cmd_stri
1335 #pragma redefine_extname ENGINE_finish sunw_ENGINE_finish
1336 #pragma redefine_extname ENGINE_free sunw_ENGINE_free
1337 #pragma redefine_extname engine_free_util sunw_engine_free_util
1338 #pragma redefine_extname ENGINE_get_cipher sunw_ENGINE_get_cipher
1339 #pragma redefine_extname ENGINE_get_cipher_engine sunw_ENGINE_get_cipher_
1340 #pragma redefine_extname ENGINE_get_ciphers sunw_ENGINE_get_ciphers
1341 #pragma redefine_extname ENGINE_get_cmd_defns sunw_ENGINE_get_cmd_defns
1342 #pragma redefine_extname ENGINE_get_ctrl_function sunw_ENGINE_get_ctrl_fu
1343 #pragma redefine_extname ENGINE_get_default_DH sunw_ENGINE_get_default_DH
1344 #pragma redefine_extname ENGINE_get_default_DSA sunw_ENGINE_get_default_D
1345 #pragma redefine_extname ENGINE_get_default_ECDH sunw_ENGINE_get_default_
1346 #pragma redefine_extname ENGINE_get_default_ECDSA sunw_ENGINE_get_default_
1347 #pragma redefine_extname ENGINE_get_default_RAND sunw_ENGINE_get_default_
1348 #pragma redefine_extname ENGINE_get_default_RSA sunw_ENGINE_get_default_R
1349 #pragma redefine_extname ENGINE_get_destroy_function sunw_ENGINE_get_dest
1350 #pragma redefine_extname ENGINE_get_DH sunw_ENGINE_get_DH
1351 #pragma redefine_extname ENGINE_get_digest sunw_ENGINE_get_digest
1352 #pragma redefine_extname ENGINE_get_digest_engine sunw_ENGINE_get_digest_
1353 #pragma redefine_extname ENGINE_get_digests sunw_ENGINE_get_digests
1354 #pragma redefine_extname ENGINE_get_DSA sunw_ENGINE_get_DSA
1355 #pragma redefine_extname ENGINE_get_ECDH sunw_ENGINE_get_ECDH
1356 #pragma redefine_extname ENGINE_get_ECDSA sunw_ENGINE_get_ECDSA
1357 #pragma redefine_extname ENGINE_get_ex_data sunw_ENGINE_get_ex_data
1358 #pragma redefine_extname ENGINE_get_ex_new_index sunw_ENGINE_get_ex_new_i
1359 #pragma redefine_extname ENGINE_get_finish_function sunw_ENGINE_get_finis
1360 #pragma redefine_extname ENGINE_get_first sunw_ENGINE_get_first
1361 #pragma redefine_extname ENGINE_get_flags sunw_ENGINE_get_flags
1362 #pragma redefine_extname ENGINE_get_id sunw_ENGINE_get_id
1363 #pragma redefine_extname ENGINE_get_init_function sunw_ENGINE_get_init_fu
1364 #pragma redefine_extname ENGINE_get_last sunw_ENGINE_get_last
1365 #pragma redefine_extname ENGINE_get_load_privkey_function sunw_ENGINE_get
1366 #pragma redefine_extname ENGINE_get_load_pubkey_function sunw_ENGINE_get_
1367 #pragma redefine_extname ENGINE_get_name sunw_ENGINE_get_name
1368 #pragma redefine_extname ENGINE_get_next sunw_ENGINE_get_next
1369 #pragma redefine_extname ENGINE_get_pkey_asn1_meth sunw_ENGINE_get_pkey_a
1370 #pragma redefine_extname ENGINE_get_pkey_asn1_meth_engine sunw_ENGINE_get
1371 #pragma redefine_extname ENGINE_get_pkey_asn1_meth_str sunw_ENGINE_get_pk
1372 #pragma redefine_extname ENGINE_get_pkey_asn1_meths sunw_ENGINE_get_pkey_
1373 #pragma redefine_extname ENGINE_get_pkey_meth sunw_ENGINE_get_pkey_meth
1374 #pragma redefine_extname ENGINE_get_pkey_meth_engine sunw_ENGINE_get_pkey_
1375 #pragma redefine_extname ENGINE_get_pkey_meths sunw_ENGINE_get_pkey_meths
1376 #pragma redefine_extname ENGINE_get_prev sunw_ENGINE_get_prev
1377 #pragma redefine_extname ENGINE_get_RAND sunw_ENGINE_get_RAND
1378 #pragma redefine_extname ENGINE_get_RSA sunw_ENGINE_get_RSA
1379 #pragma redefine_extname ENGINE_get_ssl_client_cert_function sunw_ENGINE_
1380 #pragma redefine_extname ENGINE_get_static_state sunw_ENGINE_get_static_s
1381 #pragma redefine_extname ENGINE_get_STORE sunw_ENGINE_get_STORE

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1382 #pragma redefine_extname ENGINE_get_table_flags sunw_ENGINE_get_table_fla
1383 #pragma redefine_extname ENGINE_init sunw_ENGINE_init
1384 #pragma redefine_extname ENGINE_load_builtin_engines sunw_ENGINE_load_bui
1385 #pragma redefine_extname ENGINE_load_cryptodev sunw_ENGINE_load_cryptodev
1386 #pragma redefine_extname ENGINE_load_dynamic sunw_ENGINE_load_dynamic
1387 #pragma redefine_extname ENGINE_load_openssl sunw_ENGINE_load_openssl
1388 #pragma redefine_extname ENGINE_load_pk11 sunw_ENGINE_load_pk11
1389 #pragma redefine_extname ENGINE_load_private_key sunw_ENGINE_load_private
1390 #pragma redefine_extname ENGINE_load_public_key sunw_ENGINE_load_public_k
1391 #pragma redefine_extname ENGINE_load_rdrand sunw_ENGINE_load_rdrand
1392 #pragma redefine_extname ENGINE_load_rsax sunw_ENGINE_load_rsax
1393 #pragma redefine_extname ENGINE_load_ssl_client_cert sunw_ENGINE_load_ssl
1394 #pragma redefine_extname ENGINE_new sunw_ENGINE_new
1395 #pragma redefine_extname ENGINE_pkey_asn1_find_str sunw_ENGINE_pkey_asn1_
1396 #pragma redefine_extname engine_pkey_asn1_meths_free sunw_engine_pkey_asn
1397 #pragma redefine_extname engine_pkey_meths_free sunw_engine_pkey_meths_fr
1398 #pragma redefine_extname ENGINE_register_all_ciphers sunw_ENGINE_register
1399 #pragma redefine_extname ENGINE_register_all_complete sunw_ENGINE_registe
1400 #pragma redefine_extname ENGINE_register_all_DH sunw_ENGINE_register_all_
1401 #pragma redefine_extname ENGINE_register_all_digests sunw_ENGINE_register
1402 #pragma redefine_extname ENGINE_register_all_DSA sunw_ENGINE_register_all_
1403 #pragma redefine_extname ENGINE_register_all_ECDH sunw_ENGINE_register_al
1404 #pragma redefine_extname ENGINE_register_all_ECDSA sunw_ENGINE_register_a
1405 #pragma redefine_extname ENGINE_register_all_pkey_asn1_meths sunw_ENGINE_
1406 #pragma redefine_extname ENGINE_register_all_pkey_meths sunw_ENGINE_regis
1407 #pragma redefine_extname ENGINE_register_all_RAND sunw_ENGINE_register_all_
1408 #pragma redefine_extname ENGINE_register_all_RSA sunw_ENGINE_register_all_
1409 #pragma redefine_extname ENGINE_register_all_STORE sunw_ENGINE_register_a
1410 #pragma redefine_extname ENGINE_register_ciphers sunw_ENGINE_register_cip
1411 #pragma redefine_extname ENGINE_register_complete sunw_ENGINE_register_co
1412 #pragma redefine_extname ENGINE_register_DH sunw_ENGINE_register_DH
1413 #pragma redefine_extname ENGINE_register_digests sunw_ENGINE_register_dig
1414 #pragma redefine_extname ENGINE_register_DSA sunw_ENGINE_register_DSA
1415 #pragma redefine_extname ENGINE_register_ECDH sunw_ENGINE_register_ECDH
1416 #pragma redefine_extname ENGINE_register_ECDSA sunw_ENGINE_register_ECDSA
1417 #pragma redefine_extname ENGINE_register_pkey_asn1_meths sunw_ENGINE_regi
1418 #pragma redefine_extname ENGINE_register_pkey_meths sunw_ENGINE_register_
1419 #pragma redefine_extname ENGINE_register_RAND sunw_ENGINE_register_RAND
1420 #pragma redefine_extname ENGINE_register_RSA sunw_ENGINE_register_RSA
1421 #pragma redefine_extname ENGINE_register_STORE sunw_ENGINE_register_STORE
1422 #pragma redefine_extname ENGINE_remove sunw_ENGINE_remove
1423 #pragma redefine_extname engine_set_all_null sunw_engine_set_all_null
1424 #pragma redefine_extname ENGINE_set_ciphers sunw_ENGINE_set_ciphers
1425 #pragma redefine_extname ENGINE_set_cmd_defns sunw_ENGINE_set_cmd_defns
1426 #pragma redefine_extname ENGINE_set_ctrl_function sunw_ENGINE_set_ctrl_fu
1427 #pragma redefine_extname ENGINE_set_default sunw_ENGINE_set_default
1428 #pragma redefine_extname ENGINE_set_default_ciphers sunw_ENGINE_set_defau
1429 #pragma redefine_extname ENGINE_set_default_DH sunw_ENGINE_set_default_DH
1430 #pragma redefine_extname ENGINE_set_default_digests sunw_ENGINE_set_defau
1431 #pragma redefine_extname ENGINE_set_default_DSA sunw_ENGINE_set_default_D
1432 #pragma redefine_extname ENGINE_set_default_ECDH sunw_ENGINE_set_default_
1433 #pragma redefine_extname ENGINE_set_default_ECDSA sunw_ENGINE_set_default_
1434 #pragma redefine_extname ENGINE_set_default_pkey_asn1_meths sunw_ENGINE_s
1435 #pragma redefine_extname ENGINE_set_default_pkey_meths sunw_ENGINE_set_de
1436 #pragma redefine_extname ENGINE_set_default_RAND sunw_ENGINE_set_default_
1437 #pragma redefine_extname ENGINE_set_default_RSA sunw_ENGINE_set_default_R
1438 #pragma redefine_extname ENGINE_set_default_string sunw_ENGINE_set_defaul
1439 #pragma redefine_extname ENGINE_set_destroy_function sunw_ENGINE_set_dest
1440 #pragma redefine_extname ENGINE_set_DH sunw_ENGINE_set_DH
1441 #pragma redefine_extname ENGINE_set_digests sunw_ENGINE_set_digests
1442 #pragma redefine_extname ENGINE_set_DSA sunw_ENGINE_set_DSA
1443 #pragma redefine_extname ENGINE_set_ECDH sunw_ENGINE_set_ECDH
1444 #pragma redefine_extname ENGINE_set_ECDSA sunw_ENGINE_set_ECDSA
1445 #pragma redefine_extname ENGINE_set_ex_data sunw_ENGINE_set_ex_data
1446 #pragma redefine_extname ENGINE_set_finish_function sunw_ENGINE_set_finis
1447 #pragma redefine_extname ENGINE_set_flags sunw_ENGINE_set_flags

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1448 #pragma redefine_extname ENGINE_set_id sunw_ENGINE_set_id
1449 #pragma redefine_extname ENGINE_set_init_function sunw_ENGINE_set_init_fu
1450 #pragma redefine_extname ENGINE_set_load_privkey_function sunw_ENGINE_set
1451 #pragma redefine_extname ENGINE_set_load_pubkey_function sunw_ENGINE_set_
1452 #pragma redefine_extname ENGINE_set_load_ssl_client_cert_function sunw_EN
1453 #pragma redefine_extname ENGINE_set_name sunw_ENGINE_set_name
1454 #pragma redefine_extname ENGINE_set_pkey_asn1_meths sunw_ENGINE_set_pkey_
1455 #pragma redefine_extname ENGINE_set_pkey_meths sunw_ENGINE_set_pkey_meths
1456 #pragma redefine_extname ENGINE_set_RAND sunw_ENGINE_set_RAND
1457 #pragma redefine_extname ENGINE_set_RSA sunw_ENGINE_set_RSA
1458 #pragma redefine_extname ENGINE_set_STORE sunw_ENGINE_set_STORE
1459 #pragma redefine_extname ENGINE_set_table_flags sunw_ENGINE_set_table fla
1460 #pragma redefine_extname engine_table_cleanup sunw_engine_table_cleanup
1461 #pragma redefine_extname engine_table_doall sunw_engine_table_doall
1462 #pragma redefine_extname engine_table_register sunw_engine_table_register
1463 #pragma redefine_extname engine_table_select sunw_engine_table_select
1464 #pragma redefine_extname engine_table_unregister sunw_engine_table_unregi
1465 #pragma redefine_extname engine_unlocked_finish sunw_engine_unlocked_fini
1466 #pragma redefine_extname engine_unlocked_init sunw_engine_unlocked_init
1467 #pragma redefine_extname ENGINE_unregister_ciphers sunw_ENGINE_unregister
1468 #pragma redefine_extname ENGINE_unregister_DH sunw_ENGINE_unregister_DH
1469 #pragma redefine_extname ENGINE_unregister_digests sunw_ENGINE_unregister
1470 #pragma redefine_extname ENGINE_unregister_DSA sunw_ENGINE_unregister_DSA
1471 #pragma redefine_extname ENGINE_unregister_ECDH sunw_ENGINE_unregister_EC
1472 #pragma redefine_extname ENGINE_unregister_ECDSA sunw_ENGINE_unregister_E
1473 #pragma redefine_extname ENGINE_unregister_pkey_asn1_meths sunw_ENGINE_un
1474 #pragma redefine_extname ENGINE_unregister_pkey_meths sunw_ENGINE_unregis
1475 #pragma redefine_extname ENGINE_unregister_RAND sunw_ENGINE_unregister_RA
1476 #pragma redefine_extname ENGINE_unregister_RSA sunw_ENGINE_unregister_RSA
1477 #pragma redefine_extname ENGINE_unregister_STORE sunw_ENGINE_unregister_S
1478 #pragma redefine_extname ENGINE_up_ref sunw_ENGINE_up_ref
1479 #pragma redefine_extname ERR_add_error_data sunw_ERR_add_error_data
1480 #pragma redefine_extname ERR_add_error_vdata sunw_ERR_add_error_vdata
1481 #pragma redefine_extname ERR_clear_error sunw_ERR_clear_error
1482 #pragma redefine_extname ERR_error_string sunw_ERR_error_string
1483 #pragma redefine_extname ERR_error_string_n sunw_ERR_error_string_n
1484 #pragma redefine_extname ERR_free_strings sunw_ERR_free_strings
1485 #pragma redefine_extname ERR_func_error_string sunw_ERR_func_error_string
1486 #pragma redefine_extname ERR_get_err_state_table sunw_ERR_get_err_state_t
1487 #pragma redefine_extname ERR_get_error sunw_ERR_get_error
1488 #pragma redefine_extname ERR_get_error_line sunw_ERR_get_error_line
1489 #pragma redefine_extname ERR_get_error_line_data sunw_ERR_get_error_line_
1490 #pragma redefine_extname ERR_get_implementation sunw_ERR_get_implementation
1491 #pragma redefine_extname ERR_get_next_error_library sunw_ERR_get_next_err
1492 #pragma redefine_extname ERR_get_state sunw_ERR_get_state
1493 #pragma redefine_extname ERR_get_string_table sunw_ERR_get_string_table
1494 #pragma redefine_extname ERR_lib_error_string sunw_ERR_lib_error_string
1495 #pragma redefine_extname ERR_load_ASN1_strings sunw_ERR_load_ASN1_strings
1496 #pragma redefine_extname ERR_load_BIO_strings sunw_ERR_load_BIO_strings
1497 #pragma redefine_extname ERR_load_BN_strings sunw_ERR_load_BN_strings
1498 #pragma redefine_extname ERR_load_BUF_strings sunw_ERR_load_BUF_strings
1499 #pragma redefine_extname ERR_load_CMS_strings sunw_ERR_load_CMS_strings
1500 #pragma redefine_extname ERR_load_COMP_strings sunw_ERR_load_COMP_strings
1501 #pragma redefine_extname ERR_load_CONF_strings sunw_ERR_load_CONF_strings
1502 #pragma redefine_extname ERR_load_crypto_strings sunw_ERR_load_crypto_str
1503 #pragma redefine_extname ERR_load_CRYPT0_strings sunw_ERR_load_CRYPT0_str
1504 #pragma redefine_extname ERR_load_DH_strings sunw_ERR_load_DH_strings
1505 #pragma redefine_extname ERR_load_DSA_strings sunw_ERR_load_DSA_strings
1506 #pragma redefine_extname ERR_load_DSO_strings sunw_ERR_load_DSO_strings
1507 #pragma redefine_extname ERR_load_ENGINE_strings sunw_ERR_load_ENGINE_str
1508 #pragma redefine_extname ERR_load_ERR_strings sunw_ERR_load_ERR_strings
1509 #pragma redefine_extname ERR_load_EVP_strings sunw_ERR_load_EVP_strings
1510 #pragma redefine_extname ERR_load_OBJ_strings sunw_ERR_load_OBJ_strings
1511 #pragma redefine_extname ERR_load_OCSP_strings sunw_ERR_load_OCSP_strings
1512 #pragma redefine_extname ERR_load_PEM_strings sunw_ERR_load_PEM_strings
1513 #pragma redefine_extname ERR_load_PKCS12_strings sunw_ERR_load_PKCS12_str

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1514 #pragma redefine_extname ERR_load_PKCS7_strings sunw_ERR_load_PKCS7_strin
1515 #pragma redefine_extname ERR_load_RAND_strings sunw_ERR_load_RAND_strings
1516 #pragma redefine_extname ERR_load_RSA_strings sunw_ERR_load_RSA_strings
1517 #pragma redefine_extname ERR_load_strings sunw_ERR_load_strings
1518 #pragma redefine_extname ERR_load_TS_strings sunw_ERR_load_TS_strings
1519 #pragma redefine_extname ERR_load_UI_strings sunw_ERR_load_UI_strings
1520 #pragma redefine_extname ERR_load_X509_strings sunw_ERR_load_X509_strings
1521 #pragma redefine_extname ERR_load_X509V3_strings sunw_ERR_load_X509V3_str
1522 #pragma redefine_extname ERR_peek_error sunw_ERR_peek_error
1523 #pragma redefine_extname ERR_peek_error_line sunw_ERR_peek_error_line
1524 #pragma redefine_extname ERR_peek_error_line_data sunw_ERR_peek_error_lin
1525 #pragma redefine_extname ERR_peek_last_error sunw_ERR_peek_last_error
1526 #pragma redefine_extname ERR_peek_last_error_line sunw_ERR_peek_last_erro
1527 #pragma redefine_extname ERR_peek_last_error_line_data sunw_ERR_peek_last
1528 #pragma redefine_extname ERR_pk11_error sunw_ERR_pk11_error
1529 #pragma redefine_extname ERR_pop_to_mark sunw_ERR_pop_to_mark
1530 #pragma redefine_extname ERR_print_errors sunw_ERR_print_errors
1531 #pragma redefine_extname ERR_print_errors_cb sunw_ERR_print_errors_cb
1532 #pragma redefine_extname ERR_print_errors_fp sunw_ERR_print_errors_fp
1533 #pragma redefine_extname ERR_put_error sunw_ERR_put_error
1534 #pragma redefine_extname ERR_reason_error_string sunw_ERR_reason_error_st
1535 #pragma redefine_extname ERR_release_err_state_table sunw_ERR_release_err
1536 #pragma redefine_extname ERR_remove_state sunw_ERR_remove_state
1537 #pragma redefine_extname ERR_remove_thread_state sunw_ERR_remove_thread_s
1538 #pragma redefine_extname ERR_set_error_data sunw_ERR_set_error_data
1539 #pragma redefine_extname ERR_set_implementation sunw_ERR_set_implementation
1540 #pragma redefine_extname ERR_set_mark sunw_ERR_set_mark
1541 #pragma redefine_extname ERR_unload_strings sunw_ERR_unload_strings
1542 #pragma redefine_extname ESS_CERT_ID_dup sunw_ESS_CERT_ID_dup
1543 #pragma redefine_extname ESS_CERT_ID_free sunw_ESS_CERT_ID_free
1544 #pragma redefine_extname ESS_CERT_ID_it sunw_ESS_CERT_ID_it
1545 #pragma redefine_extname ESS_CERT_ID_new sunw_ESS_CERT_ID_new
1546 #pragma redefine_extname ESS_ISSUER_SERIAL_dup sunw_ESS_ISSUER_SERIAL_dup
1547 #pragma redefine_extname ESS_ISSUER_SERIAL_free sunw_ESS_ISSUER_SERIAL_fr
1548 #pragma redefine_extname ESS_ISSUER_SERIAL_it sunw_ESS_ISSUER_SERIAL_it
1549 #pragma redefine_extname ESS_ISSUER_SERIAL_new sunw_ESS_ISSUER_SERIAL_new
1550 #pragma redefine_extname ESS_SIGNING_CERT_dup sunw_ESS_SIGNING_CERT_dup
1551 #pragma redefine_extname ESS_SIGNING_CERT_free sunw_ESS_SIGNING_CERT_free
1552 #pragma redefine_extname ESS_SIGNING_CERT_it sunw_ESS_SIGNING_CERT_it
1553 #pragma redefine_extname ESS_SIGNING_CERT_new sunw_ESS_SIGNING_CERT_new
1554 #pragma redefine_extname EVP_add_alg_module sunw_EVP_add_alg_module
1555 #pragma redefine_extname EVP_add_cipher sunw_EVP_add_cipher
1556 #pragma redefine_extname EVP_add_digest sunw_EVP_add_digest
1557 #pragma redefine_extname EVP_aes_128_cbc sunw_EVP_aes_128_cbc
1558 #pragma redefine_extname EVP_aes_128_cbc_hmac_sha1 sunw_EVP_aes_128_cbc_h
1559 #pragma redefine_extname EVP_aes_128_ccm sunw_EVP_aes_128_ccm
1560 #pragma redefine_extname EVP_aes_128_cfb sunw_EVP_aes_128_cfb
1561 #pragma redefine_extname EVP_aes_128_cfb1 sunw_EVP_aes_128_cfb1
1562 #pragma redefine_extname EVP_aes_128_cfb128 sunw_EVP_aes_128_cfb128
1563 #pragma redefine_extname EVP_aes_128_cfb8 sunw_EVP_aes_128_cfb8
1564 #pragma redefine_extname EVP_aes_128_ctr sunw_EVP_aes_128_ctr
1565 #pragma redefine_extname EVP_aes_128_ecb sunw_EVP_aes_128_ecb
1566 #pragma redefine_extname EVP_aes_128_gcm sunw_EVP_aes_128_gcm
1567 #pragma redefine_extname EVP_aes_128_ofb sunw_EVP_aes_128_ofb
1568 #pragma redefine_extname EVP_aes_128_xts sunw_EVP_aes_128_xts
1569 #pragma redefine_extname EVP_aes_192_cbc sunw_EVP_aes_192_cbc
1570 #pragma redefine_extname EVP_aes_192_ccm sunw_EVP_aes_192_ccm
1571 #pragma redefine_extname EVP_aes_192_cfb sunw_EVP_aes_192_cfb
1572 #pragma redefine_extname EVP_aes_192_cfb1 sunw_EVP_aes_192_cfb1
1573 #pragma redefine_extname EVP_aes_192_cfb128 sunw_EVP_aes_192_cfb128
1574 #pragma redefine_extname EVP_aes_192_cfb8 sunw_EVP_aes_192_cfb8
1575 #pragma redefine_extname EVP_aes_192_ctr sunw_EVP_aes_192_ctr
1576 #pragma redefine_extname EVP_aes_192_ecb sunw_EVP_aes_192_ecb
1577 #pragma redefine_extname EVP_aes_192_gcm sunw_EVP_aes_192_gcm
1578 #pragma redefine_extname EVP_aes_192_ofb sunw_EVP_aes_192_ofb
1579 #pragma redefine_extname EVP_aes_256_cbc sunw_EVP_aes_256_cbc

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1580 #pragma redefine_extname EVP_aes_256_cbc_hmac_sha1 sunw_EVP_aes_256_cbc_h
1581 #pragma redefine_extname EVP_aes_256_ccm sunw_EVP_aes_256_ccm
1582 #pragma redefine_extname EVP_aes_256_cfb sunw_EVP_aes_256_cfb
1583 #pragma redefine_extname EVP_aes_256_cfb1 sunw_EVP_aes_256_cfb1
1584 #pragma redefine_extname EVP_aes_256_cfb128 sunw_EVP_aes_256_cfb128
1585 #pragma redefine_extname EVP_aes_256_cfb8 sunw_EVP_aes_256_cfb8
1586 #pragma redefine_extname EVP_aes_256_ctr sunw_EVP_aes_256_ctr
1587 #pragma redefine_extname EVP_aes_256_ecb sunw_EVP_aes_256_ecb
1588 #pragma redefine_extname EVP_aes_256_gcm sunw_EVP_aes_256_gcm
1589 #pragma redefine_extname EVP_aes_256_ofb sunw_EVP_aes_256_ofb
1590 #pragma redefine_extname EVP_aes_256_xts sunw_EVP_aes_256_xts
1591 #pragma redefine_extname EVP_bf_cbc sunw_EVP_bf_cbc
1592 #pragma redefine_extname EVP_bf_cfb sunw_EVP_bf_cfb
1593 #pragma redefine_extname EVP_bf_cfb64 sunw_EVP_bf_cfb64
1594 #pragma redefine_extname EVP_bf_ecb sunw_EVP_bf_ecb
1595 #pragma redefine_extname EVP_bf_ofb sunw_EVP_bf_ofb
1596 #pragma redefine_extname EVP_BytesToKey sunw_EVP_BytesToKey
1597 #pragma redefine_extname EVP_camellia_128_cbc sunw_EVP_camellia_128_cbc
1598 #pragma redefine_extname EVP_camellia_128_cfb1 sunw_EVP_camellia_128_cfb1
1599 #pragma redefine_extname EVP_camellia_128_cfb128 sunw_EVP_camellia_128_cf
1600 #pragma redefine_extname EVP_camellia_128_cfb8 sunw_EVP_camellia_128_cfb8
1601 #pragma redefine_extname EVP_camellia_128_ecb sunw_EVP_camellia_128_ecb
1602 #pragma redefine_extname EVP_camellia_128_ofb sunw_EVP_camellia_128_ofb
1603 #pragma redefine_extname EVP_camellia_192_cbc sunw_EVP_camellia_192_cbc
1604 #pragma redefine_extname EVP_camellia_192_cfb1 sunw_EVP_camellia_192_cfb1
1605 #pragma redefine_extname EVP_camellia_192_cfb128 sunw_EVP_camellia_192_cf
1606 #pragma redefine_extname EVP_camellia_192_cfb8 sunw_EVP_camellia_192_cfb8
1607 #pragma redefine_extname EVP_camellia_192_ecb sunw_EVP_camellia_192_ecb
1608 #pragma redefine_extname EVP_camellia_192_ofb sunw_EVP_camellia_192_ofb
1609 #pragma redefine_extname EVP_camellia_256_cbc sunw_EVP_camellia_256_cbc
1610 #pragma redefine_extname EVP_camellia_256_cfb1 sunw_EVP_camellia_256_cfb1
1611 #pragma redefine_extname EVP_camellia_256_cfb128 sunw_EVP_camellia_256_cf
1612 #pragma redefine_extname EVP_camellia_256_cfb8 sunw_EVP_camellia_256_cfb8
1613 #pragma redefine_extname EVP_camellia_256_ecb sunw_EVP_camellia_256_ecb
1614 #pragma redefine_extname EVP_camellia_256_ofb sunw_EVP_camellia_256_ofb
1615 #pragma redefine_extname EVP_cast5_cbc sunw_EVP_cast5_cbc
1616 #pragma redefine_extname EVP_cast5_cfb sunw_EVP_cast5_cfb
1617 #pragma redefine_extname EVP_cast5_cfb64 sunw_EVP_cast5_cfb64
1618 #pragma redefine_extname EVP_cast5_ecb sunw_EVP_cast5_ecb
1619 #pragma redefine_extname EVP_cast5_ofb sunw_EVP_cast5_ofb
1620 #pragma redefine_extname EVP_Cipher sunw_EVP_Cipher
1621 #pragma redefine_extname EVP_CIPHER_asn1_to_param sunw_EVP_CIPHER_asn1_to
1622 #pragma redefine_extname EVP_CIPHER_block_size sunw_EVP_CIPHER_block_size
1623 #pragma redefine_extname EVP_CIPHER_CTX_block_size sunw_EVP_CIPHER_CTX_bl
1624 #pragma redefine_extname EVP_CIPHER_CTX_cipher sunw_EVP_CIPHER_CTX_cipher
1625 #pragma redefine_extname EVP_CIPHER_CTX_cleanup sunw_EVP_CIPHER_CTX_clean
1626 #pragma redefine_extname EVP_CIPHER_CTX_clear_flags sunw_EVP_CIPHER_CTX_c
1627 #pragma redefine_extname EVP_CIPHER_CTX_copy sunw_EVP_CIPHER_CTX_copy
1628 #pragma redefine_extname EVP_CIPHER_CTX_ctrl sunw_EVP_CIPHER_CTX_ctrl
1629 #pragma redefine_extname EVP_CIPHER_CTX_flags sunw_EVP_CIPHER_CTX_flags
1630 #pragma redefine_extname EVP_CIPHER_CTX_free sunw_EVP_CIPHER_CTX_free
1631 #pragma redefine_extname EVP_CIPHER_CTX_get_app_data sunw_EVP_CIPHER_CTX_
1632 #pragma redefine_extname EVP_CIPHER_CTX_init sunw_EVP_CIPHER_CTX_init
1633 #pragma redefine_extname EVP_CIPHER_CTX_iv_length sunw_EVP_CIPHER_CTX_iv_
1634 #pragma redefine_extname EVP_CIPHER_CTX_key_length sunw_EVP_CIPHER_CTX_ke
1635 #pragma redefine_extname EVP_CIPHER_CTX_new sunw_EVP_CIPHER_CTX_new
1636 #pragma redefine_extname EVP_CIPHER_CTX_nid sunw_EVP_CIPHER_CTX_nid
1637 #pragma redefine_extname EVP_CIPHER_CTX_rand_key sunw_EVP_CIPHER_CTX_rand
1638 #pragma redefine_extname EVP_CIPHER_CTX_set_app_data sunw_EVP_CIPHER_CTX_
1639 #pragma redefine_extname EVP_CIPHER_CTX_set_flags sunw_EVP_CIPHER_CTX_set
1640 #pragma redefine_extname EVP_CIPHER_CTX_set_key_length sunw_EVP_CIPHER_CT
1641 #pragma redefine_extname EVP_CIPHER_CTX_set_padding sunw_EVP_CIPHER_CTX_s
1642 #pragma redefine_extname EVP_CIPHER_CTX_test_flags sunw_EVP_CIPHER_CTX_te
1643 #pragma redefine_extname EVP_CIPHER_do_all sunw_EVP_CIPHER_do_all
1644 #pragma redefine_extname EVP_CIPHER_do_all_sorted sunw_EVP_CIPHER_do_all_
1645 #pragma redefine_extname EVP_CIPHER_flags sunw_EVP_CIPHER_flags

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1646 #pragma redefine_extname EVP_CIPHER_get_asn1_iv sunw_EVP_CIPHER_get_asn1_
1647 #pragma redefine_extname EVP_CIPHER_iv_length sunw_EVP_CIPHER_iv_length
1648 #pragma redefine_extname EVP_CIPHER_key_length sunw_EVP_CIPHER_key_length
1649 #pragma redefine_extname EVP_CIPHER_nid sunw_EVP_CIPHER_nid
1650 #pragma redefine_extname EVP_CIPHER_param_to_asn1 sunw_EVP_CIPHER_param_t
1651 #pragma redefine_extname EVP_CIPHER_set_asn1_iv sunw_EVP_CIPHER_set_asn1_
1652 #pragma redefine_extname EVP_CIPHER_type sunw_EVP_CIPHER_type
1653 #pragma redefine_extname EVP_CipherFinal sunw_EVP_CipherFinal
1654 #pragma redefine_extname EVP_CipherFinal_ex sunw_EVP_CipherFinal_ex
1655 #pragma redefine_extname EVP_CipherInit sunw_EVP_CipherInit
1656 #pragma redefine_extname EVP_CipherInit_ex sunw_EVP_CipherInit_ex
1657 #pragma redefine_extname EVP_CipherUpdate sunw_EVP_CipherUpdate
1658 #pragma redefine_extname EVP_cleanup sunw_EVP_cleanup
1659 #pragma redefine_extname EVP_DecodeBlock sunw_EVP_DecodeBlock
1660 #pragma redefine_extname EVP_DecodeFinal sunw_EVP_DecodeFinal
1661 #pragma redefine_extname EVP_DecodeInit sunw_EVP_DecodeInit
1662 #pragma redefine_extname EVP_DecodeUpdate sunw_EVP_DecodeUpdate
1663 #pragma redefine_extname EVP_DecryptFinal sunw_EVP_DecryptFinal
1664 #pragma redefine_extname EVP_DecryptFinal_ex sunw_EVP_DecryptFinal_ex
1665 #pragma redefine_extname EVP_DecryptInit sunw_EVP_DecryptInit
1666 #pragma redefine_extname EVP_DecryptInit_ex sunw_EVP_DecryptInit_ex
1667 #pragma redefine_extname EVP_DecryptUpdate sunw_EVP_DecryptUpdate
1668 #pragma redefine_extname EVP_des_cbc sunw_EVP_des_cbc
1669 #pragma redefine_extname EVP_des_cfb sunw_EVP_des_cfb
1670 #pragma redefine_extname EVP_des_cfb1 sunw_EVP_des_cfb1
1671 #pragma redefine_extname EVP_des_cfb64 sunw_EVP_des_cfb64
1672 #pragma redefine_extname EVP_des_cfb8 sunw_EVP_des_cfb8
1673 #pragma redefine_extname EVP_des_ecb sunw_EVP_des_ecb
1674 #pragma redefine_extname EVP_des_ede sunw_EVP_des_ede
1675 #pragma redefine_extname EVP_des_ede_cbc sunw_EVP_des_ede_cbc
1676 #pragma redefine_extname EVP_des_ede_cfb sunw_EVP_des_ede_cfb
1677 #pragma redefine_extname EVP_des_ede_cfb64 sunw_EVP_des_ede_cfb64
1678 #pragma redefine_extname EVP_des_ede_ecb sunw_EVP_des_ede_ecb
1679 #pragma redefine_extname EVP_des_ede_ofb sunw_EVP_des_ede_ofb
1680 #pragma redefine_extname EVP_des_ede3 sunw_EVP_des_ede3
1681 #pragma redefine_extname EVP_des_ede3_cbc sunw_EVP_des_ede3_cbc
1682 #pragma redefine_extname EVP_des_ede3_cfb sunw_EVP_des_ede3_cfb
1683 #pragma redefine_extname EVP_des_ede3_cfb1 sunw_EVP_des_ede3_cfb1
1684 #pragma redefine_extname EVP_des_ede3_cfb64 sunw_EVP_des_ede3_cfb64
1685 #pragma redefine_extname EVP_des_ede3_cfb8 sunw_EVP_des_ede3_cfb8
1686 #pragma redefine_extname EVP_des_ede3_ecb sunw_EVP_des_ede3_ecb
1687 #pragma redefine_extname EVP_des_ede3_ofb sunw_EVP_des_ede3_ofb
1688 #pragma redefine_extname EVP_des_ofb sunw_EVP_des_ofb
1689 #pragma redefine_extname EVP_desx_cbc sunw_EVP_desx_cbc
1690 #pragma redefine_extname EVP_Digest sunw_EVP_Digest
1691 #pragma redefine_extname EVP_DigestFinal sunw_EVP_DigestFinal
1692 #pragma redefine_extname EVP_DigestFinal_ex sunw_EVP_DigestFinal_ex
1693 #pragma redefine_extname EVP_DigestInit sunw_EVP_DigestInit
1694 #pragma redefine_extname EVP_DigestInit_ex sunw_EVP_DigestInit_ex
1695 #pragma redefine_extname EVP_DigestSignFinal sunw_EVP_DigestSignFinal
1696 #pragma redefine_extname EVP_DigestSignInit sunw_EVP_DigestSignInit
1697 #pragma redefine_extname EVP_DigestUpdate sunw_EVP_DigestUpdate
1698 #pragma redefine_extname EVP_DigestVerifyFinal sunw_EVP_DigestVerifyFinal
1699 #pragma redefine_extname EVP_DigestVerifyInit sunw_EVP_DigestVerifyInit
1700 #pragma redefine_extname EVP_dss sunw_EVP_dss
1701 #pragma redefine_extname EVP_dss1 sunw_EVP_dss1
1702 #pragma redefine_extname EVP_ecdsa sunw_EVP_ecdsa
1703 #pragma redefine_extname EVP_enc_null sunw_EVP_enc_null
1704 #pragma redefine_extname EVP_EncodeBlock sunw_EVP_EncodeBlock
1705 #pragma redefine_extname EVP_EncodeFinal sunw_EVP_EncodeFinal
1706 #pragma redefine_extname EVP_EncodeInit sunw_EVP_EncodeInit
1707 #pragma redefine_extname EVP_EncodeUpdate sunw_EVP_EncodeUpdate
1708 #pragma redefine_extname EVP_EncryptFinal sunw_EVP_EncryptFinal
1709 #pragma redefine_extname EVP_EncryptFinal_ex sunw_EVP_EncryptFinal_ex
1710 #pragma redefine_extname EVP_EncryptInit sunw_EVP_EncryptInit
1711 #pragma redefine_extname EVP_EncryptInit_ex sunw_EVP_EncryptInit_ex

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1712 #pragma redefine_extname EVP_EncryptUpdate sunw_EVP_EncryptUpdate
1713 #pragma redefine_extname EVP_get_cipherbyname sunw_EVP_get_cipherbyname
1714 #pragma redefine_extname EVP_get_digestbyname sunw_EVP_get_digestbyname
1715 #pragma redefine_extname EVP_get_pw_prompt sunw_EVP_get_pw_prompt
1716 #pragma redefine_extname EVP_MD_block_size sunw_EVP_MD_block_size
1717 #pragma redefine_extname EVP_MD_CTX_cleanup sunw_EVP_MD_CTX_cleanup
1718 #pragma redefine_extname EVP_MD_CTX_clear_flags sunw_EVP_MD_CTX_clear_flg
1719 #pragma redefine_extname EVP_MD_CTX_copy sunw_EVP_MD_CTX_copy
1720 #pragma redefine_extname EVP_MD_CTX_copy_ex sunw_EVP_MD_CTX_copy_ex
1721 #pragma redefine_extname EVP_MD_CTX_create sunw_EVP_MD_CTX_create
1722 #pragma redefine_extname EVP_MD_CTX_destroy sunw_EVP_MD_CTX_destroy
1723 #pragma redefine_extname EVP_MD_CTX_init sunw_EVP_MD_CTX_init
1724 #pragma redefine_extname EVP_MD_CTX_md sunw_EVP_MD_CTX_md
1725 #pragma redefine_extname EVP_MD_CTX_set_flags sunw_EVP_MD_CTX_set_flags
1726 #pragma redefine_extname EVP_MD_CTX_test_flags sunw_EVP_MD_CTX_test_flags
1727 #pragma redefine_extname EVP_MD_do_all sunw_EVP_MD_do_all
1728 #pragma redefine_extname EVP_MD_do_all_sorted sunw_EVP_MD_do_all_sorted
1729 #pragma redefine_extname EVP_MD_flags sunw_EVP_MD_flags
1730 #pragma redefine_extname EVP_md_null sunw_EVP_md_null
1731 #pragma redefine_extname EVP_MD_pkey_type sunw_EVP_MD_pkey_type
1732 #pragma redefine_extname EVP_MD_size sunw_EVP_MD_size
1733 #pragma redefine_extname EVP_MD_type sunw_EVP_MD_type
1734 #pragma redefine_extname EVP_md2 sunw_EVP_md2
1735 #pragma redefine_extname EVP_md4 sunw_EVP_md4
1736 #pragma redefine_extname EVP_md5 sunw_EVP_md5
1737 #pragma redefine_extname EVP_OpenFinal sunw_EVP_OpenFinal
1738 #pragma redefine_extname EVP_OpenInit sunw_EVP_OpenInit
1739 #pragma redefine_extname EVP_PBE_alg_add sunw_EVP_PBE_alg_add
1740 #pragma redefine_extname EVP_PBE_alg_add_type sunw_EVP_PBE_alg_add_type
1741 #pragma redefine_extname EVP_PBE_CipherInit sunw_EVP_PBE_CipherInit
1742 #pragma redefine_extname EVP_PBE_cleanup sunw_EVP_PBE_cleanup
1743 #pragma redefine_extname EVP_PBE_find sunw_EVP_PBE_find
1744 #pragma redefine_extname EVP_PKCS82PKEY sunw_EVP_PKCS82PKEY
1745 #pragma redefine_extname EVP_PKEY_add1_attr sunw_EVP_PKEY_add1_attr
1746 #pragma redefine_extname EVP_PKEY_add1_attr_by_NID sunw_EVP_PKEY_add1_att
1747 #pragma redefine_extname EVP_PKEY_add1_attr_by_OBJ sunw_EVP_PKEY_add1_att
1748 #pragma redefine_extname EVP_PKEY_add1_attr_by_txt sunw_EVP_PKEY_add1_att
1749 #pragma redefine_extname EVP_PKEY_asn1_add_alias sunw_EVP_PKEY_asn1_add_a
1750 #pragma redefine_extname EVP_PKEY_asn1_add0 sunw_EVP_PKEY_asn1_add0
1751 #pragma redefine_extname EVP_PKEY_asn1_copy sunw_EVP_PKEY_asn1_copy
1752 #pragma redefine_extname EVP_PKEY_asn1_find sunw_EVP_PKEY_asn1_find
1753 #pragma redefine_extname EVP_PKEY_asn1_find_str sunw_EVP_PKEY_asn1_find_s
1754 #pragma redefine_extname EVP_PKEY_asn1_free sunw_EVP_PKEY_asn1_free
1755 #pragma redefine_extname EVP_PKEY_asn1_get_count sunw_EVP_PKEY_asn1_get_c
1756 #pragma redefine_extname EVP_PKEY_asn1_get0 sunw_EVP_PKEY_asn1_get0
1757 #pragma redefine_extname EVP_PKEY_asn1_get0_info sunw_EVP_PKEY_asn1_get0_
1758 #pragma redefine_extname EVP_PKEY_asn1_new sunw_EVP_PKEY_asn1_new
1759 #pragma redefine_extname EVP_PKEY_asn1_set_ctrl sunw_EVP_PKEY_asn1_set_ct
1760 #pragma redefine_extname EVP_PKEY_asn1_set_free sunw_EVP_PKEY_asn1_set_fr
1761 #pragma redefine_extname EVP_PKEY_asn1_set_param sunw_EVP_PKEY_asn1_set_p
1762 #pragma redefine_extname EVP_PKEY_asn1_set_private sunw_EVP_PKEY_asn1_set
1763 #pragma redefine_extname EVP_PKEY_asn1_set_public sunw_EVP_PKEY_asn1_set_
1764 #pragma redefine_extname EVP_PKEY_assign sunw_EVP_PKEY_assign
1765 #pragma redefine_extname EVP_PKEY_base_id sunw_EVP_PKEY_base_id
1766 #pragma redefine_extname EVP_PKEY_bits sunw_EVP_PKEY_bits
1767 #pragma redefine_extname EVP_PKEY_cmp sunw_EVP_PKEY_cmp
1768 #pragma redefine_extname EVP_PKEY_cmp_parameters sunw_EVP_PKEY_cmp_parame
1769 #pragma redefine_extname EVP_PKEY_copy_parameters sunw_EVP_PKEY_copy_para
1770 #pragma redefine_extname EVP_PKEY_CTX_ctrl sunw_EVP_PKEY_CTX_ctrl
1771 #pragma redefine_extname EVP_PKEY_CTX_ctrl_str sunw_EVP_PKEY_CTX_ctrl_str
1772 #pragma redefine_extname EVP_PKEY_CTX_dup sunw_EVP_PKEY_CTX_dup
1773 #pragma redefine_extname EVP_PKEY_CTX_free sunw_EVP_PKEY_CTX_free
1774 #pragma redefine_extname EVP_PKEY_CTX_get_app_data sunw_EVP_PKEY_CTX_get_
1775 #pragma redefine_extname EVP_PKEY_CTX_get_cb sunw_EVP_PKEY_CTX_get_cb
1776 #pragma redefine_extname EVP_PKEY_CTX_get_data sunw_EVP_PKEY_CTX_get_data
1777 #pragma redefine_extname EVP_PKEY_CTX_get_keygen_info sunw_EVP_PKEY_CTX_g

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1778 #pragma redefine_extname EVP_PKEY_CTX_get_operation sunw_EVP_PKEY_CTX_get
1779 #pragma redefine_extname EVP_PKEY_CTX_get0_peerkey sunw_EVP_PKEY_CTX_get0
1780 #pragma redefine_extname EVP_PKEY_CTX_get0_pkey sunw_EVP_PKEY_CTX_get0_pk
1781 #pragma redefine_extname EVP_PKEY_CTX_new sunw_EVP_PKEY_CTX_new
1782 #pragma redefine_extname EVP_PKEY_CTX_new_id sunw_EVP_PKEY_CTX_new_id
1783 #pragma redefine_extname EVP_PKEY_CTX_set_app_data sunw_EVP_PKEY_CTX_set_
1784 #pragma redefine_extname EVP_PKEY_CTX_set_cb sunw_EVP_PKEY_CTX_set_cb
1785 #pragma redefine_extname EVP_PKEY_CTX_set_data sunw_EVP_PKEY_CTX_set_data
1786 #pragma redefine_extname EVP_PKEY_CTX_set0_keygen_info sunw_EVP_PKEY_CTX_
1787 #pragma redefine_extname EVP_PKEY_decrypt sunw_EVP_PKEY_decrypt
1788 #pragma redefine_extname EVP_PKEY_decrypt_init sunw_EVP_PKEY_decrypt_init
1789 #pragma redefine_extname EVP_PKEY_decrypt_old sunw_EVP_PKEY_decrypt_old
1790 #pragma redefine_extname EVP_PKEY_delete_attr sunw_EVP_PKEY_delete_attr
1791 #pragma redefine_extname EVP_PKEY_derive sunw_EVP_PKEY_derive
1792 #pragma redefine_extname EVP_PKEY_derive_init sunw_EVP_PKEY_derive_init
1793 #pragma redefine_extname EVP_PKEY_derive_set_peer sunw_EVP_PKEY_derive_se
1794 #pragma redefine_extname EVP_PKEY_encrypt sunw_EVP_PKEY_encrypt
1795 #pragma redefine_extname EVP_PKEY_encrypt_init sunw_EVP_PKEY_encrypt_init
1796 #pragma redefine_extname EVP_PKEY_encrypt_old sunw_EVP_PKEY_encrypt_old
1797 #pragma redefine_extname EVP_PKEY_free sunw_EVP_PKEY_free
1798 #pragma redefine_extname EVP_PKEY_get_attr sunw_EVP_PKEY_get_attr
1799 #pragma redefine_extname EVP_PKEY_get_attr_by_NID sunw_EVP_PKEY_get_attr_
1800 #pragma redefine_extname EVP_PKEY_get_attr_by_OBJ sunw_EVP_PKEY_get_attr_c
1801 #pragma redefine_extname EVP_PKEY_get_attr_count sunw_EVP_PKEY_get_attr_c
1802 #pragma redefine_extname EVP_PKEY_get_default_digest_nid sunw_EVP_PKEY_ge
1803 #pragma redefine_extname EVP_PKEY_get0 sunw_EVP_PKEY_get0
1804 #pragma redefine_extname EVP_PKEY_get0_asn1 sunw_EVP_PKEY_get0_asn1
1805 #pragma redefine_extname EVP_PKEY_get1_DH sunw_EVP_PKEY_get1_DH
1806 #pragma redefine_extname EVP_PKEY_get1_DSA sunw_EVP_PKEY_get1_DSA
1807 #pragma redefine_extname EVP_PKEY_get1_RSA sunw_EVP_PKEY_get1_RSA
1808 #pragma redefine_extname EVP_PKEY_id sunw_EVP_PKEY_id
1809 #pragma redefine_extname EVP_PKEY_keygen sunw_EVP_PKEY_keygen
1810 #pragma redefine_extname EVP_PKEY_keygen_init sunw_EVP_PKEY_keygen_init
1811 #pragma redefine_extname EVP_PKEY_meth_add0 sunw_EVP_PKEY_meth_add0
1812 #pragma redefine_extname EVP_PKEY_meth_copy sunw_EVP_PKEY_meth_copy
1813 #pragma redefine_extname EVP_PKEY_meth_find sunw_EVP_PKEY_meth_find
1814 #pragma redefine_extname EVP_PKEY_meth_free sunw_EVP_PKEY_meth_free
1815 #pragma redefine_extname EVP_PKEY_meth_get0_info sunw_EVP_PKEY_meth_get0_
1816 #pragma redefine_extname EVP_PKEY_meth_new sunw_EVP_PKEY_meth_new
1817 #pragma redefine_extname EVP_PKEY_meth_set_cleanup sunw_EVP_PKEY_meth_set
1818 #pragma redefine_extname EVP_PKEY_meth_set_copy sunw_EVP_PKEY_meth_set_co
1819 #pragma redefine_extname EVP_PKEY_meth_set_ctrl sunw_EVP_PKEY_meth_set_ct
1820 #pragma redefine_extname EVP_PKEY_meth_set_decrypt sunw_EVP_PKEY_meth_set
1821 #pragma redefine_extname EVP_PKEY_meth_set_derive sunw_EVP_PKEY_meth_set_
1822 #pragma redefine_extname EVP_PKEY_meth_set_encrypt sunw_EVP_PKEY_meth_set
1823 #pragma redefine_extname EVP_PKEY_meth_set_init sunw_EVP_PKEY_meth_set_in
1824 #pragma redefine_extname EVP_PKEY_meth_set_keygen sunw_EVP_PKEY_meth_set_
1825 #pragma redefine_extname EVP_PKEY_meth_set_paramgen sunw_EVP_PKEY_meth_se
1826 #pragma redefine_extname EVP_PKEY_meth_set_sign sunw_EVP_PKEY_meth_set_si
1827 #pragma redefine_extname EVP_PKEY_meth_set_signctx sunw_EVP_PKEY_meth_set
1828 #pragma redefine_extname EVP_PKEY_meth_set_verify sunw_EVP_PKEY_meth_set_
1829 #pragma redefine_extname EVP_PKEY_meth_set_verify_recover sunw_EVP_PKEY_m
1830 #pragma redefine_extname EVP_PKEY_meth_set_verifyctx sunw_EVP_PKEY_meth_s
1831 #pragma redefine_extname EVP_PKEY_missing_parameters sunw_EVP_PKEY_missin
1832 #pragma redefine_extname EVP_PKEY_new sunw_EVP_PKEY_new
1833 #pragma redefine_extname EVP_PKEY_new_mac_key sunw_EVP_PKEY_new_mac_key
1834 #pragma redefine_extname EVP_PKEY_paramgen sunw_EVP_PKEY_paramgen
1835 #pragma redefine_extname EVP_PKEY_paramgen_init sunw_EVP_PKEY_paramgen_in
1836 #pragma redefine_extname EVP_PKEY_print_params sunw_EVP_PKEY_print_params
1837 #pragma redefine_extname EVP_PKEY_print_private sunw_EVP_PKEY_print_priva
1838 #pragma redefine_extname EVP_PKEY_print_public sunw_EVP_PKEY_print_public
1839 #pragma redefine_extname EVP_PKEY_save_parameters sunw_EVP_PKEY_save_para
1840 #pragma redefine_extname evp_pkey_set_cb_translate sunw_evp_pkey_set_cb_t
1841 #pragma redefine_extname EVP_PKEY_set_type sunw_EVP_PKEY_set_type
1842 #pragma redefine_extname EVP_PKEY_set_type_str sunw_EVP_PKEY_set_type_str
1843 #pragma redefine_extname EVP_PKEY_set1_DH sunw_EVP_PKEY_set1_DH

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1844 #pragma redefine_extname EVP_PKEY_set1_DSA sunw_EVP_PKEY_set1_DSA
1845 #pragma redefine_extname EVP_PKEY_set1_RSA sunw_EVP_PKEY_set1_RSA
1846 #pragma redefine_extname EVP_PKEY_sign sunw_EVP_PKEY_sign
1847 #pragma redefine_extname EVP_PKEY_sign_init sunw_EVP_PKEY_sign_init
1848 #pragma redefine_extname EVP_PKEY_size sunw_EVP_PKEY_size
1849 #pragma redefine_extname EVP_PKEY_type sunw_EVP_PKEY_type
1850 #pragma redefine_extname EVP_PKEY_verify sunw_EVP_PKEY_verify
1851 #pragma redefine_extname EVP_PKEY_verify_init sunw_EVP_PKEY_verify_init
1852 #pragma redefine_extname EVP_PKEY_verify_recover sunw_EVP_PKEY_verify_rec
1853 #pragma redefine_extname EVP_PKEY_verify_recover_init sunw_EVP_PKEY_verif
1854 #pragma redefine_extname EVP_PKEY2PKCS8 sunw_EVP_PKEY2PKCS8
1855 #pragma redefine_extname EVP_PKEY2PKCS8_broken sunw_EVP_PKEY2PKCS8_broken
1856 #pragma redefine_extname EVP_rc2_40_cbc sunw_EVP_rc2_40_cbc
1857 #pragma redefine_extname EVP_rc2_64_cbc sunw_EVP_rc2_64_cbc
1858 #pragma redefine_extname EVP_rc2_cbc sunw_EVP_rc2_cbc
1859 #pragma redefine_extname EVP_rc2_cfb sunw_EVP_rc2_cfb
1860 #pragma redefine_extname EVP_rc2_cfb64 sunw_EVP_rc2_cfb64
1861 #pragma redefine_extname EVP_rc2_ecb sunw_EVP_rc2_ecb
1862 #pragma redefine_extname EVP_rc2_ofb sunw_EVP_rc2_ofb
1863 #pragma redefine_extname EVP_rc4 sunw_EVP_rc4
1864 #pragma redefine_extname EVP_rc4_40 sunw_EVP_rc4_40
1865 #pragma redefine_extname EVP_rc4_hmac_md5 sunw_EVP_rc4_hmac_md5
1866 #pragma redefine_extname EVP_read_pw_string sunw_EVP_read_pw_string
1867 #pragma redefine_extname EVP_read_pw_string_min sunw_EVP_read_pw_string_m
1868 #pragma redefine_extname EVP_ripemd160 sunw_EVP_ripemd160
1869 #pragma redefine_extname EVP_SealFinal sunw_EVP_SealFinal
1870 #pragma redefine_extname EVP_SealInit sunw_EVP_SealInit
1871 #pragma redefine_extname EVP_set_pw_prompt sunw_EVP_set_pw_prompt
1872 #pragma redefine_extname EVP_sha sunw_EVP_sha
1873 #pragma redefine_extname EVP_sha1 sunw_EVP_sha1
1874 #pragma redefine_extname EVP_sha224 sunw_EVP_sha224
1875 #pragma redefine_extname EVP_sha256 sunw_EVP_sha256
1876 #pragma redefine_extname EVP_sha384 sunw_EVP_sha384
1877 #pragma redefine_extname EVP_sha512 sunw_EVP_sha512
1878 #pragma redefine_extname EVP_SignFinal sunw_EVP_SignFinal
1879 #pragma redefine_extname EVP_VerifyFinal sunw_EVP_VerifyFinal
1880 #pragma redefine_extname EVP_version sunw_EVP_version
1881 #pragma redefine_extname EXTENDED_KEY_USAGE_free sunw_EXTENDED_KEY_USAGE
1882 #pragma redefine_extname EXTENDED_KEY_USAGE_it sunw_EXTENDED_KEY_USAGE_it
1883 #pragma redefine_extname EXTENDED_KEY_USAGE_new sunw_EXTENDED_KEY_USAGE_n
1884 #pragma redefine_extname fcrypt_body sunw_fcrypt_body
1885 #pragma redefine_extname FIPS_mode sunw_FIPS_mode
1886 #pragma redefine_extname FIPS_mode_set sunw_FIPS_mode_set
1887 #pragma redefine_extname gcm_ghash_4bit sunw_gcm_ghash_4bit
1888 #pragma redefine_extname gcm_ghash_4bit_mmx sunw_gcm_ghash_4bit_mmx
1889 #pragma redefine_extname gcm_ghash_4bit_x86 sunw_gcm_ghash_4bit_x86
1890 #pragma redefine_extname gcm_ghash_clmul sunw_gcm_ghash_clmul
1891 #pragma redefine_extname gcm_gmult_4bit sunw_gcm_gmult_4bit
1892 #pragma redefine_extname gcm_gmult_4bit_mmx sunw_gcm_gmult_4bit_mmx
1893 #pragma redefine_extname gcm_gmult_4bit_x86 sunw_gcm_gmult_4bit_x86
1894 #pragma redefine_extname gcm_gmult_clmul sunw_gcm_gmult_clmul
1895 #pragma redefine_extname gcm_init_clmul sunw_gcm_init_clmul
1896 #pragma redefine_extname GENERAL_NAME_cmp sunw_GENERAL_NAME_cmp
1897 #pragma redefine_extname GENERAL_NAME_dup sunw_GENERAL_NAME_dup
1898 #pragma redefine_extname GENERAL_NAME_free sunw_GENERAL_NAME_free
1899 #pragma redefine_extname GENERAL_NAME_get0_otherName sunw_GENERAL_NAME_ge
1900 #pragma redefine_extname GENERAL_NAME_get0_value sunw_GENERAL_NAME_get0_v
1901 #pragma redefine_extname GENERAL_NAME_it sunw_GENERAL_NAME_it
1902 #pragma redefine_extname GENERAL_NAME_new sunw_GENERAL_NAME_new
1903 #pragma redefine_extname GENERAL_NAME_print sunw_GENERAL_NAME_print
1904 #pragma redefine_extname GENERAL_NAME_set0_otherName sunw_GENERAL_NAME_se
1905 #pragma redefine_extname GENERAL_NAME_set0_value sunw_GENERAL_NAME_set0_v
1906 #pragma redefine_extname GENERAL_NAMES_free sunw_GENERAL_NAMES_free
1907 #pragma redefine_extname GENERAL_NAMES_it sunw_GENERAL_NAMES_it
1908 #pragma redefine_extname GENERAL_NAMES_new sunw_GENERAL_NAMES_new
1909 #pragma redefine_extname GENERAL_SUBTREE_free sunw_GENERAL_SUBTREE_free

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1910 #pragma redefine_extname GENERAL_SUBTREE_it sunw_GENERAL_SUBTREE_it
1911 #pragma redefine_extname GENERAL_SUBTREE_new sunw_GENERAL_SUBTREE_new
1912 #pragma redefine_extname get_rfc2409_prime_1024 sunw_get_rfc2409_prime_10
1913 #pragma redefine_extname get_rfc2409_prime_768 sunw_get_rfc2409_prime_768
1914 #pragma redefine_extname get_rfc3526_prime_1536 sunw_get_rfc3526_prime_15
1915 #pragma redefine_extname get_rfc3526_prime_2048 sunw_get_rfc3526_prime_20
1916 #pragma redefine_extname get_rfc3526_prime_3072 sunw_get_rfc3526_prime_30
1917 #pragma redefine_extname get_rfc3526_prime_4096 sunw_get_rfc3526_prime_40
1918 #pragma redefine_extname get_rfc3526_prime_6144 sunw_get_rfc3526_prime_61
1919 #pragma redefine_extname get_rfc3526_prime_8192 sunw_get_rfc3526_prime_81
1920 #pragma redefine_extname hex_to_string sunw_hex_to_string
1921 #pragma redefine_extname HMAC sunw_HMAC
1922 #pragma redefine_extname hmac_asn1_meth sunw_hmac_asn1_meth
1923 #pragma redefine_extname HMAC_CTX_cleanup sunw_HMAC_CTX_cleanup
1924 #pragma redefine_extname HMAC_CTX_copy sunw_HMAC_CTX_copy
1925 #pragma redefine_extname HMAC_CTX_init sunw_HMAC_CTX_init
1926 #pragma redefine_extname HMAC_CTX_set_flags sunw_HMAC_CTX_set_flags
1927 #pragma redefine_extname HMAC_Final sunw_HMAC_Final
1928 #pragma redefine_extname HMAC_Init sunw_HMAC_Init
1929 #pragma redefine_extname HMAC_Init_ex sunw_HMAC_Init_ex
1930 #pragma redefine_extname hmac_pkey_meth sunw_hmac_pkey_meth
1931 #pragma redefine_extname HMAC_Update sunw_HMAC_Update
1932 #pragma redefine_extname i2a_ACCESS_DESCRIPTION sunw_i2a_ACCESS_DESCRIPTOR
1933 #pragma redefine_extname i2a_ASN1_ENUMERATED sunw_i2a_ASN1_ENUMERATED
1934 #pragma redefine_extname i2a_ASN1_INTEGER sunw_i2a_ASN1_INTEGER
1935 #pragma redefine_extname i2a_ASN1_OBJECT sunw_i2a_ASN1_OBJECT
1936 #pragma redefine_extname i2a_ASN1_STRING sunw_i2a_ASN1_STRING
1937 #pragma redefine_extname i2b_PrivateKey_bio sunw_i2b_PrivateKey_bio
1938 #pragma redefine_extname i2b_PublicKey_bio sunw_i2b_PublicKey_bio
1939 #pragma redefine_extname i2b_PVK_bio sunw_i2b_PVK_bio
1940 #pragma redefine_extname i2c_ASN1_BIT_STRING sunw_i2c_ASN1_BIT_STRING
1941 #pragma redefine_extname i2c_ASN1_INTEGER sunw_i2c_ASN1_INTEGER
1942 #pragma redefine_extname i2d_ACCESS_DESCRIPTION sunw_i2d_ACCESS_DESCRIPTOR
1943 #pragma redefine_extname i2d_ASN1_bio_stream sunw_i2d_ASN1_bio_stream
1944 #pragma redefine_extname i2d_ASN1_BIT_STRING sunw_i2d_ASN1_BIT_STRING
1945 #pragma redefine_extname i2d_ASN1_BMPSTRING sunw_i2d_ASN1_BMPSTRING
1946 #pragma redefine_extname i2d_ASN1_BOOLEAN sunw_i2d_ASN1_BOOLEAN
1947 #pragma redefine_extname i2d_ASN1_bytes sunw_i2d_ASN1_bytes
1948 #pragma redefine_extname i2d_ASN1_ENUMERATED sunw_i2d_ASN1_ENUMERATED
1949 #pragma redefine_extname i2d_ASN1_GENERALIZEDTIME sunw_i2d_ASN1_GENERALIZ
1950 #pragma redefine_extname i2d_ASN1_GENERALSTRING sunw_i2d_ASN1_GENERALSTRI
1951 #pragma redefine_extname i2d_ASN1_IA5STRING sunw_i2d_ASN1_IA5STRING
1952 #pragma redefine_extname i2d_ASN1_INTEGER sunw_i2d_ASN1_INTEGER
1953 #pragma redefine_extname i2d_ASN1_NULL sunw_i2d_ASN1_NULL
1954 #pragma redefine_extname i2d_ASN1_OBJECT sunw_i2d_ASN1_OBJECT
1955 #pragma redefine_extname i2d_ASN1_OCTET_STRING sunw_i2d_ASN1_OCTET_STRING
1956 #pragma redefine_extname i2d_ASN1_PRINTABLE sunw_i2d_ASN1_PRINTABLE
1957 #pragma redefine_extname i2d_ASN1_PRINTABLESTRING sunw_i2d_ASN1_PRINTABLE
1958 #pragma redefine_extname i2d_ASN1_SEQUENCE_ANY sunw_i2d_ASN1_SEQUENCE_ANY
1959 #pragma redefine_extname i2d_ASN1_SET sunw_i2d_ASN1_SET
1960 #pragma redefine_extname i2d_ASN1_SET_ANY sunw_i2d_ASN1_SET_ANY
1961 #pragma redefine_extname i2d_ASN1_T61STRING sunw_i2d_ASN1_T61STRING
1962 #pragma redefine_extname i2d_ASN1_TIME sunw_i2d_ASN1_TIME
1963 #pragma redefine_extname i2d_ASN1_TYPE sunw_i2d_ASN1_TYPE
1964 #pragma redefine_extname i2d_ASN1_UNIVERSALSTRING sunw_i2d_ASN1_UNIVERSAL
1965 #pragma redefine_extname i2d_ASN1_UTCTIME sunw_i2d_ASN1_UTCTIME
1966 #pragma redefine_extname i2d_ASN1_UTF8STRING sunw_i2d_ASN1_UTF8STRING
1967 #pragma redefine_extname i2d_ASN1_VISIBLESTRING sunw_i2d_ASN1_VISIBLESTRI
1968 #pragma redefine_extname i2d_AUTHORITY_INFO_ACCESS sunw_i2d_AUTHORITY_INF
1969 #pragma redefine_extname i2d_AUTHORITY_KEYID sunw_i2d_AUTHORITY_KEYID
1970 #pragma redefine_extname i2d_BASIC_CONSTRAINTS sunw_i2d_BASIC_CONSTRAINTS
1971 #pragma redefine_extname i2d_CERTIFICATEPOLICIES sunw_i2d_CERTIFICATEPOLI
1972 #pragma redefine_extname i2d_CMS_bio sunw_i2d_CMS_bio
1973 #pragma redefine_extname i2d_CMS_bio_stream sunw_i2d_CMS_bio_stream
1974 #pragma redefine_extname i2d_CMS_ContentInfo sunw_i2d_CMS_ContentInfo
1975 #pragma redefine_extname i2d_CMS_ReceiptRequest sunw_i2d_CMS_ReceiptReque

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1976 #pragma redefine_extname i2d_CRL_DIST_POINTS sunw_i2d_CRL_DIST_POINTS
1977 #pragma redefine_extname i2d_DHparams sunw_i2d_DHparams
1978 #pragma redefine_extname i2d_DIRECTORSTRING sunw_i2d_DIRECTORSTRING
1979 #pragma redefine_extname i2d_DISPLAYTEXT sunw_i2d_DISPLAYTEXT
1980 #pragma redefine_extname i2d_DIST_POINT sunw_i2d_DIST_POINT
1981 #pragma redefine_extname i2d_DIST_POINT_NAME sunw_i2d_DIST_POINT_NAME
1982 #pragma redefine_extname i2d_DSA_PUBKEY sunw_i2d_DSA_PUBKEY
1983 #pragma redefine_extname i2d_DSA_PUBKEY_bio sunw_i2d_DSA_PUBKEY_bio
1984 #pragma redefine_extname i2d_DSA_PUBKEY_fp sunw_i2d_DSA_PUBKEY_fp
1985 #pragma redefine_extname i2d_DSA_SIG sunw_i2d_DSA_SIG
1986 #pragma redefine_extname i2d_DSAParams sunw_i2d_DSAParams
1987 #pragma redefine_extname i2d_DSAPrivateKey sunw_i2d_DSAPrivateKey
1988 #pragma redefine_extname i2d_DSAPrivateKey_bio sunw_i2d_DSAPrivateKey_bio
1989 #pragma redefine_extname i2d_DSAPrivateKey_fp sunw_i2d_DSAPrivateKey_fp
1990 #pragma redefine_extname i2d_DSAPublicKey sunw_i2d_DSAPublicKey
1991 #pragma redefine_extname i2d_EDIPARTYNAME sunw_i2d_EDIPARTYNAME
1992 #pragma redefine_extname i2d_ESS_CERT_ID sunw_i2d_ESS_CERT_ID
1993 #pragma redefine_extname i2d_ESS_ISSUER_SERIAL sunw_i2d_ESS_ISSUER_SERIAL
1994 #pragma redefine_extname i2d_ESS_SIGNING_CERT sunw_i2d_ESS_SIGNING_CERT
1995 #pragma redefine_extname i2d_EXTENDED_KEY_USAGE sunw_i2d_EXTENDED_KEY_USA
1996 #pragma redefine_extname i2d_GENERAL_NAME sunw_i2d_GENERAL_NAME
1997 #pragma redefine_extname i2d_GENERAL_NAMES sunw_i2d_GENERAL_NAMES
1998 #pragma redefine_extname i2d_ISSUING_DIST_POINT sunw_i2d_ISSUING_DIST_POI
1999 #pragma redefine_extname i2d_KRB5_APREQ sunw_i2d_KRB5_APREQ
2000 #pragma redefine_extname i2d_KRB5_APREQBODY sunw_i2d_KRB5_APREQBODY
2001 #pragma redefine_extname i2d_KRB5_AUTHDATA sunw_i2d_KRB5_AUTHDATA
2002 #pragma redefine_extname i2d_KRB5_AUTHENT sunw_i2d_KRB5_AUTHENT
2003 #pragma redefine_extname i2d_KRB5_AUTHENTBODY sunw_i2d_KRB5_AUTHENTBODY
2004 #pragma redefine_extname i2d_KRB5_CHECKSUM sunw_i2d_KRB5_CHECKSUM
2005 #pragma redefine_extname i2d_KRB5_ENCDATA sunw_i2d_KRB5_ENCDATA
2006 #pragma redefine_extname i2d_KRB5_ENCKEY sunw_i2d_KRB5_ENCKEY
2007 #pragma redefine_extname i2d_KRB5_PRINCNAME sunw_i2d_KRB5_PRINCNAME
2008 #pragma redefine_extname i2d_KRB5_TICKET sunw_i2d_KRB5_TICKET
2009 #pragma redefine_extname i2d_KRB5_TKTBODY sunw_i2d_KRB5_TKTBODY
2010 #pragma redefine_extname i2d_NETSCAPE_CERT_SEQUENCE sunw_i2d_NETSCAPE_CER
2011 #pragma redefine_extname i2d_NETSCAPE_ENCRYPTED_PKEY sunw_i2d_NETSCAPE_EN
2012 #pragma redefine_extname i2d_NETSCAPE_PKEY sunw_i2d_NETSCAPE_PKEY
2013 #pragma redefine_extname i2d_Netscape_RSA sunw_i2d_Netscape_RSA
2014 #pragma redefine_extname i2d_NETSCAPE_SPKAC sunw_i2d_NETSCAPE_SPKAC
2015 #pragma redefine_extname i2d_NETSCAPE_SPKI sunw_i2d_NETSCAPE_SPKI
2016 #pragma redefine_extname i2d_NETSCAPE_X509 sunw_i2d_NETSCAPE_X509
2017 #pragma redefine_extname i2d_NOTICEREF sunw_i2d_NOTICEREF
2018 #pragma redefine_extname i2d_OCSP_BASICRESP sunw_i2d_OCSP_BASICRESP
2019 #pragma redefine_extname i2d_OCSP_CERTID sunw_i2d_OCSP_CERTID
2020 #pragma redefine_extname i2d_OCSP_CERTSTATUS sunw_i2d_OCSP_CERTSTATUS
2021 #pragma redefine_extname i2d_OCSP_CRLID sunw_i2d_OCSP_CRLID
2022 #pragma redefine_extname i2d_OCSP_ONEREQ sunw_i2d_OCSP_ONEREQ
2023 #pragma redefine_extname i2d_OCSP_REQINFO sunw_i2d_OCSP_REQINFO
2024 #pragma redefine_extname i2d_OCSP_REQUEST sunw_i2d_OCSP_REQUEST
2025 #pragma redefine_extname i2d_OCSP_RESPBYTES sunw_i2d_OCSP_RESPBYTES
2026 #pragma redefine_extname i2d_OCSP_RESPDATA sunw_i2d_OCSP_RESPDATA
2027 #pragma redefine_extname i2d_OCSP_RESPID sunw_i2d_OCSP_RESPID
2028 #pragma redefine_extname i2d_OCSP_RESPONSE sunw_i2d_OCSP_RESPONSE
2029 #pragma redefine_extname i2d_OCSP_REVOKEDINFO sunw_i2d_OCSP_REVOKEDINFO
2030 #pragma redefine_extname i2d_OCSP_SERVICELC sunw_i2d_OCSP_SERVICELC
2031 #pragma redefine_extname i2d_OCSP_SIGNATURE sunw_i2d_OCSP_SIGNATURE
2032 #pragma redefine_extname i2d_OCSP_SINGLERESP sunw_i2d_OCSP_SINGLERESP
2033 #pragma redefine_extname i2d_OTHERNAME sunw_i2d_OTHERNAME
2034 #pragma redefine_extname i2d_PBE2PARAM sunw_i2d_PBE2PARAM
2035 #pragma redefine_extname i2d_PBEPARAM sunw_i2d_PBEPARAM
2036 #pragma redefine_extname i2d_PBKDF2PARAM sunw_i2d_PBKDF2PARAM
2037 #pragma redefine_extname i2d_PKCS12 sunw_i2d_PKCS12
2038 #pragma redefine_extname i2d_PKCS12_BAGS sunw_i2d_PKCS12_BAGS
2039 #pragma redefine_extname i2d_PKCS12_bio sunw_i2d_PKCS12_bio
2040 #pragma redefine_extname i2d_PKCS12_fp sunw_i2d_PKCS12_fp
2041 #pragma redefine_extname i2d_PKCS12_MAC_DATA sunw_i2d_PKCS12_MAC_DATA

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2042 #pragma redefine_extname i2d_PKCS12_SAFEABAG sunw_i2d_PKCS12_SAFEABAG
2043 #pragma redefine_extname i2d_PKCS7 sunw_i2d_PKCS7
2044 #pragma redefine_extname i2d_PKCS7_bio sunw_i2d_PKCS7_bio
2045 #pragma redefine_extname i2d_PKCS7_bio_stream sunw_i2d_PKCS7_bio_stream
2046 #pragma redefine_extname i2d_PKCS7_DIGEST sunw_i2d_PKCS7_DIGEST
2047 #pragma redefine_extname i2d_PKCS7_ENC_CONTENT sunw_i2d_PKCS7_ENC_CONTENT
2048 #pragma redefine_extname i2d_PKCS7_ENCRYPT sunw_i2d_PKCS7_ENCRYPT
2049 #pragma redefine_extname i2d_PKCS7_ENVELOPE sunw_i2d_PKCS7_ENVELOPE
2050 #pragma redefine_extname i2d_PKCS7_fp sunw_i2d_PKCS7_fp
2051 #pragma redefine_extname i2d_PKCS7_ISSUER_AND_SERIAL sunw_i2d_PKCS7_ISSUE
2052 #pragma redefine_extname i2d_PKCS7_NDEF sunw_i2d_PKCS7_NDEF
2053 #pragma redefine_extname i2d_PKCS7_RECIP_INFO sunw_i2d_PKCS7_RECIP_INFO
2054 #pragma redefine_extname i2d_PKCS7_SIGN_ENVELOPE sunw_i2d_PKCS7_SIGN_ENVE
2055 #pragma redefine_extname i2d_PKCS7_SIGNED sunw_i2d_PKCS7_SIGNED
2056 #pragma redefine_extname i2d_PKCS7_SIGNER_INFO sunw_i2d_PKCS7_SIGNER_INFO
2057 #pragma redefine_extname i2d_PKCS8 bio sunw_i2d_PKCS8_bio
2058 #pragma redefine_extname i2d_PKCS8_fp sunw_i2d_PKCS8_fp
2059 #pragma redefine_extname i2d_PKCS8_PRIV_KEY_INFO sunw_i2d_PKCS8_PRIV_KEY_
2060 #pragma redefine_extname i2d_PKCS8_PRIV_KEY_INFO_bio sunw_i2d_PKCS8_PRIV
2061 #pragma redefine_extname i2d_PKCS8_PRIV_KEY_INFO_fp sunw_i2d_PKCS8_PRIV_K
2062 #pragma redefine_extname i2d_PKCS8PrivateKey bio sunw_i2d_PKCS8PrivateKey
2063 #pragma redefine_extname i2d_PKCS8PrivateKey_fp sunw_i2d_PKCS8PrivateKey
2064 #pragma redefine_extname i2d_PKCS8PrivateKey_nid bio sunw_i2d_PKCS8Privat
2065 #pragma redefine_extname i2d_PKCS8PrivateKey_nid_fp sunw_i2d_PKCS8Private
2066 #pragma redefine_extname i2d_PKCS8PrivateKeyInfo bio sunw_i2d_PKCS8Privat
2067 #pragma redefine_extname i2d_PKCS8PrivateKeyInfo_fp sunw_i2d_PKCS8Private
2068 #pragma redefine_extname i2d_PKEY_USAGE_PERIOD sunw_i2d_PKEY_USAGE_PERIOD
2069 #pragma redefine_extname i2d_POLICYINFO sunw_i2d_POLICYINFO
2070 #pragma redefine_extname i2d_POLICYQUALINFO sunw_i2d_POLICYQUALINFO
2071 #pragma redefine_extname i2d_PrivateKey sunw_i2d_PrivateKey
2072 #pragma redefine_extname i2d_PrivateKey_bio sunw_i2d_PrivateKey_bio
2073 #pragma redefine_extname i2d_PrivateKey_fp sunw_i2d_PrivateKey_fp
2074 #pragma redefine_extname i2d_PROXY_CERT_INFO_EXTENSION sunw_i2d_PROXY_CER
2075 #pragma redefine_extname i2d_PROXY_POLICY sunw_i2d_PROXY_POLICY
2076 #pragma redefine_extname i2d_PUBKEY sunw_i2d_PUBKEY
2077 #pragma redefine_extname i2d_PUBKEY_bio sunw_i2d_PUBKEY_bio
2078 #pragma redefine_extname i2d_PUBKEY_fp sunw_i2d_PUBKEY_fp
2079 #pragma redefine_extname i2d_PublicKey sunw_i2d_PublicKey
2080 #pragma redefine_extname i2d_RSA_NET sunw_i2d_RSA_NET
2081 #pragma redefine_extname i2d_RSA_PSS_PARAMS sunw_i2d_RSA_PSS_PARAMS
2082 #pragma redefine_extname i2d_RSA_PUBKEY sunw_i2d_RSA_PUBKEY
2083 #pragma redefine_extname i2d_RSA_PUBKEY_bio sunw_i2d_RSA_PUBKEY_bio
2084 #pragma redefine_extname i2d_RSA_PUBKEY_fp sunw_i2d_RSA_PUBKEY_fp
2085 #pragma redefine_extname i2d_RSAPrivateKey sunw_i2d_RSAPrivateKey
2086 #pragma redefine_extname i2d_RSAPrivateKey_bio sunw_i2d_RSAPrivateKey_bio
2087 #pragma redefine_extname i2d_RSAPrivateKey_fp sunw_i2d_RSAPrivateKey_fp
2088 #pragma redefine_extname i2d_RSAPublicKey sunw_i2d_RSAPublicKey
2089 #pragma redefine_extname i2d_RSAPublicKey_bio sunw_i2d_RSAPublicKey_bio
2090 #pragma redefine_extname i2d_RSAPublicKey_fp sunw_i2d_RSAPublicKey_fp
2091 #pragma redefine_extname i2d_SXNET sunw_i2d_SXNET
2092 #pragma redefine_extname i2d_SXNETID sunw_i2d_SXNETID
2093 #pragma redefine_extname i2d_TS_ACCURACY sunw_i2d_TS_ACCURACY
2094 #pragma redefine_extname i2d_TS_MSG_IMPRINT sunw_i2d_TS_MSG_IMPRINT
2095 #pragma redefine_extname i2d_TS_MSG_IMPRINT_bio sunw_i2d_TS_MSG_IMPRINT_b
2096 #pragma redefine_extname i2d_TS_MSG_IMPRINT_fp sunw_i2d_TS_MSG_IMPRINT_fp
2097 #pragma redefine_extname i2d_TS_REQ sunw_i2d_TS_REQ
2098 #pragma redefine_extname i2d_TS_REQ_bio sunw_i2d_TS_REQ_bio
2099 #pragma redefine_extname i2d_TS_REQ_fp sunw_i2d_TS_REQ_fp
2100 #pragma redefine_extname i2d_TS_RESP sunw_i2d_TS_RESP
2101 #pragma redefine_extname i2d_TS_RESP_bio sunw_i2d_TS_RESP_bio
2102 #pragma redefine_extname i2d_TS_RESP_fp sunw_i2d_TS_RESP_fp
2103 #pragma redefine_extname i2d_TS_STATUS_INFO sunw_i2d_TS_STATUS_INFO
2104 #pragma redefine_extname i2d_TS_TST_INFO sunw_i2d_TS_TST_INFO
2105 #pragma redefine_extname i2d_TS_TST_INFO_bio sunw_i2d_TS_TST_INFO_bio
2106 #pragma redefine_extname i2d_TS_TST_INFO_fp sunw_i2d_TS_TST_INFO_fp
2107 #pragma redefine_extname i2d_USERNOTICE sunw_i2d_USERNOTICE

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2108 #pragma redefine_extname i2d_X509 sunw_i2d_X509
2109 #pragma redefine_extname i2d_X509_ALGOR sunw_i2d_X509_ALGOR
2110 #pragma redefine_extname i2d_X509_ALGORS sunw_i2d_X509_ALGORS
2111 #pragma redefine_extname i2d_X509_ATTRIBUTE sunw_i2d_X509_ATTRIBUTE
2112 #pragma redefine_extname i2d_X509_AUX sunw_i2d_X509_AUX
2113 #pragma redefine_extname i2d_X509_bio sunw_i2d_X509_bio
2114 #pragma redefine_extname i2d_X509_CERT_AUX sunw_i2d_X509_CERT_AUX
2115 #pragma redefine_extname i2d_X509_CERT_PAIR sunw_i2d_X509_CERT_PAIR
2116 #pragma redefine_extname i2d_X509_CINF sunw_i2d_X509_CINF
2117 #pragma redefine_extname i2d_X509_CRL sunw_i2d_X509_CRL
2118 #pragma redefine_extname i2d_X509_CRL_bio sunw_i2d_X509_CRL_bio
2119 #pragma redefine_extname i2d_X509_CRL_fp sunw_i2d_X509_CRL_fp
2120 #pragma redefine_extname i2d_X509_CRL_INFO sunw_i2d_X509_CRL_INFO
2121 #pragma redefine_extname i2d_X509_EXTENSION sunw_i2d_X509_EXTENSION
2122 #pragma redefine_extname i2d_X509_EXTENSIONS sunw_i2d_X509_EXTENSIONS
2123 #pragma redefine_extname i2d_X509_fp sunw_i2d_X509_fp
2124 #pragma redefine_extname i2d_X509_NAME sunw_i2d_X509_NAME
2125 #pragma redefine_extname i2d_X509_NAME_ENTRY sunw_i2d_X509_NAME_ENTRY
2126 #pragma redefine_extname i2d_X509_PKEY sunw_i2d_X509_PKEY
2127 #pragma redefine_extname i2d_X509_PUBKEY sunw_i2d_X509_PUBKEY
2128 #pragma redefine_extname i2d_X509_REQ sunw_i2d_X509_REQ
2129 #pragma redefine_extname i2d_X509_REQ_bio sunw_i2d_X509_REQ_bio
2130 #pragma redefine_extname i2d_X509_REQ_fp sunw_i2d_X509_REQ_fp
2131 #pragma redefine_extname i2d_X509_REQ_INFO sunw_i2d_X509_REQ_INFO
2132 #pragma redefine_extname i2d_X509_REVOKED sunw_i2d_X509_REVOKED
2133 #pragma redefine_extname i2d_X509_SIG sunw_i2d_X509_SIG
2134 #pragma redefine_extname i2d_X509_VAL sunw_i2d_X509_VAL
2135 #pragma redefine_extname i2s_ASN1_ENUMERATED sunw_i2s_ASN1_ENUMERATED
2136 #pragma redefine_extname i2s_ASN1_ENUMERATED_TABLE sunw_i2s_ASN1_ENUMERATED
2137 #pragma redefine_extname i2s_ASN1_INTEGER sunw_i2s_ASN1_INTEGER
2138 #pragma redefine_extname i2s_ASN1_OCTET_STRING sunw_i2s_ASN1_OCTET_STRING
2139 #pragma redefine_extname i2t_ASN1_OBJECT sunw_i2t_ASN1_OBJECT
2140 #pragma redefine_extname i2v_ASN1_BIT_STRING sunw_i2v_ASN1_BIT_STRING
2141 #pragma redefine_extname i2v_GENERAL_NAME sunw_i2v_GENERAL_NAME
2142 #pragma redefine_extname i2v_GENERAL_NAMES sunw_i2v_GENERAL_NAMES
2143 #pragma redefine_extname int_rsa_verify sunw_int_rsa_verify
2144 #pragma redefine_extname ISSUING_DIST_POINT_free sunw_ISSUING_DIST_POINT_
2145 #pragma redefine_extname ISSUING_DIST_POINT_it sunw_ISSUING_DIST_POINT_it
2146 #pragma redefine_extname ISSUING_DIST_POINT_new sunw_ISSUING_DIST_POINT_n
2147 #pragma redefine_extname KRB5_APREQ_free sunw_KRB5_APREQ_free
2148 #pragma redefine_extname KRB5_APREQ_it sunw_KRB5_APREQ_it
2149 #pragma redefine_extname KRB5_APREQ_new sunw_KRB5_APREQ_new
2150 #pragma redefine_extname KRB5_APREQBODY_free sunw_KRB5_APREQBODY_free
2151 #pragma redefine_extname KRB5_APREQBODY_it sunw_KRB5_APREQBODY_it
2152 #pragma redefine_extname KRB5_APREQBODY_new sunw_KRB5_APREQBODY_new
2153 #pragma redefine_extname KRB5_AUTHDATA_free sunw_KRB5_AUTHDATA_free
2154 #pragma redefine_extname KRB5_AUTHDATA_it sunw_KRB5_AUTHDATA_it
2155 #pragma redefine_extname KRB5_AUTHDATA_new sunw_KRB5_AUTHDATA_new
2156 #pragma redefine_extname KRB5_AUTHENT_free sunw_KRB5_AUTHENT_free
2157 #pragma redefine_extname KRB5_AUTHENT_it sunw_KRB5_AUTHENT_it
2158 #pragma redefine_extname KRB5_AUTHENT_new sunw_KRB5_AUTHENT_new
2159 #pragma redefine_extname KRB5_AUTHENTBODY_free sunw_KRB5_AUTHENTBODY_free
2160 #pragma redefine_extname KRB5_AUTHENTBODY_it sunw_KRB5_AUTHENTBODY_it
2161 #pragma redefine_extname KRB5_AUTHENTBODY_new sunw_KRB5_AUTHENTBODY_new
2162 #pragma redefine_extname KRB5_CHECKSUM_free sunw_KRB5_CHECKSUM_free
2163 #pragma redefine_extname KRB5_CHECKSUM_it sunw_KRB5_CHECKSUM_it
2164 #pragma redefine_extname KRB5_CHECKSUM_new sunw_KRB5_CHECKSUM_new
2165 #pragma redefine_extname KRB5_ENCDATA_free sunw_KRB5_ENCDATA_free
2166 #pragma redefine_extname KRB5_ENCDATA_it sunw_KRB5_ENCDATA_it
2167 #pragma redefine_extname KRB5_ENCDATA_new sunw_KRB5_ENCDATA_new
2168 #pragma redefine_extname KRB5_ENCKEY_free sunw_KRB5_ENCKEY_free
2169 #pragma redefine_extname KRB5_ENCKEY_it sunw_KRB5_ENCKEY_it
2170 #pragma redefine_extname KRB5_ENCKEY_new sunw_KRB5_ENCKEY_new
2171 #pragma redefine_extname KRB5_PRINCNAME_free sunw_KRB5_PRINCNAME_free
2172 #pragma redefine_extname KRB5_PRINCNAME_it sunw_KRB5_PRINCNAME_it
2173 #pragma redefine_extname KRB5_PRINCNAME_new sunw_KRB5_PRINCNAME_new

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2174 #pragma redefine_extname KRB5_TICKET_free sunw_KRB5_TICKET_free
2175 #pragma redefine_extname KRB5_TICKET_it sunw_KRB5_TICKET_it
2176 #pragma redefine_extname KRB5_TICKET_new sunw_KRB5_TICKET_new
2177 #pragma redefine_extname KRB5_TKTBODY_free sunw_KRB5_TKTBODY_free
2178 #pragma redefine_extname KRB5_TKTBODY_it sunw_KRB5_TKTBODY_it
2179 #pragma redefine_extname KRB5_TKTBODY_new sunw_KRB5_TKTBODY_new
2180 #pragma redefine_extname level_add_node sunw_level_add_node
2181 #pragma redefine_extname level_find_node sunw_level_find_node
2182 #pragma redefine_extname lh_delete sunw_lh_delete
2183 #pragma redefine_extname lh_doall sunw_lh_doall
2184 #pragma redefine_extname lh_doall_arg sunw_lh_doall_arg
2185 #pragma redefine_extname lh_free sunw_lh_free
2186 #pragma redefine_extname lh_insert sunw_lh_insert
2187 #pragma redefine_extname lh_new sunw_lh_new
2188 #pragma redefine_extname lh_node_stats sunw_lh_node_stats
2189 #pragma redefine_extname lh_node_stats_bio sunw_lh_node_stats_bio
2190 #pragma redefine_extname lh_node_usage_stats sunw_lh_node_usage_stats
2191 #pragma redefine_extname lh_node_usage_stats_bio sunw_lh_node_usage_stats
2192 #pragma redefine_extname lh_num_items sunw_lh_num_items
2193 #pragma redefine_extname lh_retrieve sunw_lh_retrieve
2194 #pragma redefine_extname lh_stats sunw_lh_stats
2195 #pragma redefine_extname lh_stats_bio sunw_lh_stats_bio
2196 #pragma redefine_extname lh_strhash sunw_lh_strhash
2197 #pragma redefine_extname lh_version sunw_lh_version
2198 #pragma redefine_extname LONG_it sunw_LONG_it
2199 #pragma redefine_extname MD2 sunw_MD2
2200 #pragma redefine_extname MD2_Final sunw_MD2_Final
2201 #pragma redefine_extname MD2_Init sunw_MD2_Init
2202 #pragma redefine_extname MD2_options sunw_MD2_options
2203 #pragma redefine_extname MD2_Update sunw_MD2_Update
2204 #pragma redefine_extname MD2_version sunw_MD2_version
2205 #pragma redefine_extname MD4 sunw_MD4
2206 #pragma redefine_extname md4_block_data_order sunw_md4_block_data_order
2207 #pragma redefine_extname MD4_Final sunw_MD4_Final
2208 #pragma redefine_extname MD4_Init sunw_MD4_Init
2209 #pragma redefine_extname MD4_Transform sunw_MD4_Transform
2210 #pragma redefine_extname MD4_Update sunw_MD4_Update
2211 #pragma redefine_extname MD4_version sunw_MD4_version
2212 #pragma redefine_extname MD5 sunw_MD5
2213 #pragma redefine_extname md5_block_asm_data_order sunw_md5_block_asm_data
2214 #pragma redefine_extname MD5_Final sunw_MD5_Final
2215 #pragma redefine_extname MD5_Init sunw_MD5_Init
2216 #pragma redefine_extname MD5_Transform sunw_MD5_Transform
2217 #pragma redefine_extname MD5_Update sunw_MD5_Update
2218 #pragma redefine_extname MD5_version sunw_MD5_version
2219 #pragma redefine_extname mod_exp_512 sunw_mod_exp_512
2220 #pragma redefine_extname name_cmp sunw_name_cmp
2221 #pragma redefine_extname NAME_CONSTRAINTS_check sunw_NAME_CONSTRAINTS_che
2222 #pragma redefine_extname NAME_CONSTRAINTS_free sunw_NAME_CONSTRAINTS_free
2223 #pragma redefine_extname NAME_CONSTRAINTS_it sunw_NAME_CONSTRAINTS_it
2224 #pragma redefine_extname NAME_CONSTRAINTS_new sunw_NAME_CONSTRAINTS_new
2225 #pragma redefine_extname NCONF_default sunw_NCONF_default
2226 #pragma redefine_extname NCONF_dump_bio sunw_NCONF_dump_bio
2227 #pragma redefine_extname NCONF_dump_fp sunw_NCONF_dump_fp
2228 #pragma redefine_extname NCONF_free sunw_NCONF_free
2229 #pragma redefine_extname NCONF_free_data sunw_NCONF_free_data
2230 #pragma redefine_extname NCONF_get_number_e sunw_NCONF_get_number_e
2231 #pragma redefine_extname NCONF_get_section sunw_NCONF_get_section
2232 #pragma redefine_extname NCONF_get_string sunw_NCONF_get_string
2233 #pragma redefine_extname NCONF_load sunw_NCONF_load
2234 #pragma redefine_extname NCONF_load_bio sunw_NCONF_load_bio
2235 #pragma redefine_extname NCONF_load_fp sunw_NCONF_load_fp
2236 #pragma redefine_extname NCONF_new sunw_NCONF_new
2237 #pragma redefine_extname NCONF_WIN32 sunw_NCONF_WIN32
2238 #pragma redefine_extname NETSCAPE_CERT_SEQUENCE_free sunw_NETSCAPE_CERT_S
2239 #pragma redefine_extname NETSCAPE_CERT_SEQUENCE_it sunw_NETSCAPE_CERT_SEQ

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2240 #pragma redefine_extname NETSCAPE_CERT_SEQUENCE_new sunw_NETSCAPE_CERT_SE
2241 #pragma redefine_extname NETSCAPE_ENCRYPTED_PKEY_free sunw_NETSCAPE_ENCRY
2242 #pragma redefine_extname NETSCAPE_ENCRYPTED_PKEY_it sunw_NETSCAPE_ENCRYPT
2243 #pragma redefine_extname NETSCAPE_ENCRYPTED_PKEY_new sunw_NETSCAPE_ENCRYPT
2244 #pragma redefine_extname NETSCAPE_PKEY_free sunw_NETSCAPE_PKEY_free
2245 #pragma redefine_extname NETSCAPE_PKEY_it sunw_NETSCAPE_PKEY_it
2246 #pragma redefine_extname NETSCAPE_PKEY_new sunw_NETSCAPE_PKEY_new
2247 #pragma redefine_extname NETSCAPE_SPKAC_free sunw_NETSCAPE_SPKAC_free
2248 #pragma redefine_extname NETSCAPE_SPKAC_it sunw_NETSCAPE_SPKAC_it
2249 #pragma redefine_extname NETSCAPE_SPKAC_new sunw_NETSCAPE_SPKAC_new
2250 #pragma redefine_extname NETSCAPE_SPKI_b64_decode sunw_NETSCAPE_SPKI_b64_
2251 #pragma redefine_extname NETSCAPE_SPKI_b64_encode sunw_NETSCAPE_SPKI_b64_
2252 #pragma redefine_extname NETSCAPE_SPKI_free sunw_NETSCAPE_SPKI_free
2253 #pragma redefine_extname NETSCAPE_SPKI_get_pubkey sunw_NETSCAPE_SPKI_get_
2254 #pragma redefine_extname NETSCAPE_SPKI_it sunw_NETSCAPE_SPKI_it
2255 #pragma redefine_extname NETSCAPE_SPKI_new sunw_NETSCAPE_SPKI_new
2256 #pragma redefine_extname NETSCAPE_SPKI_print sunw_NETSCAPE_SPKI_print
2257 #pragma redefine_extname NETSCAPE_SPKI_set_pubkey sunw_NETSCAPE_SPKI_set_
2258 #pragma redefine_extname NETSCAPE_SPKI_sign sunw_NETSCAPE_SPKI_sign
2259 #pragma redefine_extname NETSCAPE_SPKI_verify sunw_NETSCAPE_SPKI_verify
2260 #pragma redefine_extname NETSCAPE_X509_free sunw_NETSCAPE_X509_free
2261 #pragma redefine_extname NETSCAPE_X509_it sunw_NETSCAPE_X509_it
2262 #pragma redefine_extname NETSCAPE_X509_new sunw_NETSCAPE_X509_new
2263 #pragma redefine_extname NOTICEREF_free sunw_NOTICEREF_free
2264 #pragma redefine_extname NOTICEREF_it sunw_NOTICEREF_it
2265 #pragma redefine_extname NOTICEREF_new sunw_NOTICEREF_new
2266 #pragma redefine_extname OBJ_add_object sunw_OBJ_add_object
2267 #pragma redefine_extname OBJ_add_sigid sunw_OBJ_add_sigid
2268 #pragma redefine_extname OBJ_bsearch_sunw OBJ_bsearch_
2269 #pragma redefine_extname OBJ_bsearch_ex_sunw OBJ_bsearch_ex_
2270 #pragma redefine_extname OBJ_cleanup_sunw OBJ_cleanup
2271 #pragma redefine_extname OBJ_cmp_sunw OBJ_cmp
2272 #pragma redefine_extname OBJ_create_sunw OBJ_create
2273 #pragma redefine_extname OBJ_create_objects_sunw OBJ_create_objects
2274 #pragma redefine_extname OBJ_dup_sunw OBJ_dup
2275 #pragma redefine_extname OBJ_find_sigid_algs_sunw OBJ_find_sigid_algs
2276 #pragma redefine_extname OBJ_find_sigid_by_algs_sunw OBJ_find_sigid_by_al
2277 #pragma redefine_extname OBJ_ln2nid_sunw OBJ_ln2nid
2278 #pragma redefine_extname OBJ_NAME_add_sunw OBJ_NAME_add
2279 #pragma redefine_extname OBJ_NAME_cleanup_sunw OBJ_NAME_cleanup
2280 #pragma redefine_extname OBJ_NAME_do_all_sunw OBJ_NAME_do_all
2281 #pragma redefine_extname OBJ_NAME_do_all_sorted_sunw OBJ_NAME_do_all_sort
2282 #pragma redefine_extname OBJ_NAME_get_sunw OBJ_NAME_get
2283 #pragma redefine_extname OBJ_NAME_init_sunw OBJ_NAME_init
2284 #pragma redefine_extname OBJ_NAME_new_index_sunw OBJ_NAME_new_index
2285 #pragma redefine_extname OBJ_NAME_remove_sunw OBJ_NAME_remove
2286 #pragma redefine_extname OBJ_new_nid_sunw OBJ_new_nid
2287 #pragma redefine_extname OBJ_nid2ln_sunw OBJ_nid2ln
2288 #pragma redefine_extname OBJ_nid2obj_sunw OBJ_nid2obj
2289 #pragma redefine_extname OBJ_nid2sn_sunw OBJ_nid2sn
2290 #pragma redefine_extname OBJ_obj2nid_sunw OBJ_obj2nid
2291 #pragma redefine_extname OBJ_obj2txt_sunw OBJ_obj2txt
2292 #pragma redefine_extname OBJ_sigid_free_sunw OBJ_sigid_free
2293 #pragma redefine_extname OBJ_sn2nid_sunw OBJ_sn2nid
2294 #pragma redefine_extname OBJ_txt2nid_sunw OBJ_txt2nid
2295 #pragma redefine_extname OBJ_txt2obj_sunw OBJ_txt2obj
2296 #pragma redefine_extname OCSF_accept_responses_new sunw_OCSF_accept_respo
2297 #pragma redefine_extname OCSF_archive_cutoff_new sunw_OCSF_archive_cutoff
2298 #pragma redefine_extname OCSF_basic_add1_cert_sunw OCSF_basic_add1_cert
2299 #pragma redefine_extname OCSF_basic_add1_nonce_sunw OCSF_basic_add1_nonce
2300 #pragma redefine_extname OCSF_basic_add1_status_sunw OCSF_basic_add1_stat
2301 #pragma redefine_extname OCSF_basic_sign_sunw OCSF_basic_sign
2302 #pragma redefine_extname OCSF_basic_verify_sunw OCSF_basic_verify
2303 #pragma redefine_extname OCSF_BASICRESP_add_ext_sunw OCSF_BASICRESP_add_e
2304 #pragma redefine_extname OCSF_BASICRESP_add1_ext_i2d_sunw OCSF_BASICRESP_
2305 #pragma redefine_extname OCSF_BASICRESP_delete_ext_sunw OCSF_BASICRESP_de

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2306 #pragma redefine_extname OCSF_BASICRESP_free_sunw OCSF_BASICRESP_free
2307 #pragma redefine_extname OCSF_BASICRESP_get_ext_sunw OCSF_BASICRESP_get_e
2308 #pragma redefine_extname OCSF_BASICRESP_get_ext_by_critical_sunw OCSF_BAS
2309 #pragma redefine_extname OCSF_BASICRESP_get_ext_by_NID_sunw OCSF_BASICRES
2310 #pragma redefine_extname OCSF_BASICRESP_get_ext_by_OBJ_sunw OCSF_BASICRES
2311 #pragma redefine_extname OCSF_BASICRESP_get_ext_count_sunw OCSF_BASICRESP
2312 #pragma redefine_extname OCSF_BASICRESP_get1_ext_d2i_sunw OCSF_BASICRESP_
2313 #pragma redefine_extname OCSF_BASICRESP_it_sunw OCSF_BASICRESP_it
2314 #pragma redefine_extname OCSF_BASICRESP_new_sunw OCSF_BASICRESP_new
2315 #pragma redefine_extname OCSF_cert_id_new_sunw OCSF_cert_id_new
2316 #pragma redefine_extname OCSF_cert_status_str_sunw OCSF_cert_status_str
2317 #pragma redefine_extname OCSF_cert_to_id_sunw OCSF_cert_to_id
2318 #pragma redefine_extname OCSF_CERTID_dup_sunw OCSF_CERTID_dup
2319 #pragma redefine_extname OCSF_CERTID_free_sunw OCSF_CERTID_free
2320 #pragma redefine_extname OCSF_CERTID_it_sunw OCSF_CERTID_it
2321 #pragma redefine_extname OCSF_CERTID_new_sunw OCSF_CERTID_new
2322 #pragma redefine_extname OCSF_CERTSTATUS_free_sunw OCSF_CERTSTATUS_free
2323 #pragma redefine_extname OCSF_CERTSTATUS_it_sunw OCSF_CERTSTATUS_it
2324 #pragma redefine_extname OCSF_CERTSTATUS_new_sunw OCSF_CERTSTATUS_new
2325 #pragma redefine_extname OCSF_check_nonce_sunw OCSF_check_nonce
2326 #pragma redefine_extname OCSF_check_validity_sunw OCSF_check_validity
2327 #pragma redefine_extname OCSF_copy_nonce_sunw OCSF_copy_nonce
2328 #pragma redefine_extname OCSF_crl_reason_str_sunw OCSF_crl_reason_str
2329 #pragma redefine_extname OCSF_CRLID_free_sunw OCSF_CRLID_free
2330 #pragma redefine_extname OCSF_CRLID_it_sunw OCSF_CRLID_it
2331 #pragma redefine_extname OCSF_crlid_new_sunw OCSF_crlid_new
2332 #pragma redefine_extname OCSF_CRLID_new_sunw OCSF_CRLID_new
2333 #pragma redefine_extname OCSF_id_cmp_sunw OCSF_id_cmp
2334 #pragma redefine_extname OCSF_id_get0_info_sunw OCSF_id_get0_info
2335 #pragma redefine_extname OCSF_id_issuer_cmp_sunw OCSF_id_issuer_cmp
2336 #pragma redefine_extname OCSF_ONEREQ_add_ext_sunw OCSF_ONEREQ_add_ext
2337 #pragma redefine_extname OCSF_ONEREQ_add1_ext_i2d_sunw OCSF_ONEREQ_add1_e
2338 #pragma redefine_extname OCSF_ONEREQ_delete_ext_sunw OCSF_ONEREQ_delete_e
2339 #pragma redefine_extname OCSF_ONEREQ_free_sunw OCSF_ONEREQ_free
2340 #pragma redefine_extname OCSF_ONEREQ_get_ext_sunw OCSF_ONEREQ_get_ext
2341 #pragma redefine_extname OCSF_ONEREQ_get_ext_by_critical_sunw OCSF_ONEREQ
2342 #pragma redefine_extname OCSF_ONEREQ_get_ext_by_NID_sunw OCSF_ONEREQ_get_
2343 #pragma redefine_extname OCSF_ONEREQ_get_ext_by_OBJ_sunw OCSF_ONEREQ_get_
2344 #pragma redefine_extname OCSF_ONEREQ_get_ext_count_sunw OCSF_ONEREQ_get_e
2345 #pragma redefine_extname OCSF_onereq_get0_id_sunw OCSF_onereq_get0_id
2346 #pragma redefine_extname OCSF_ONEREQ_get1_ext_d2i_sunw OCSF_ONEREQ_get1_e
2347 #pragma redefine_extname OCSF_ONEREQ_it_sunw OCSF_ONEREQ_it
2348 #pragma redefine_extname OCSF_ONEREQ_new_sunw OCSF_ONEREQ_new
2349 #pragma redefine_extname OCSF_parse_url_sunw OCSF_parse_url
2350 #pragma redefine_extname OCSF_REQ_CTX_add1_header_sunw OCSF_REQ_CTX_add1_
2351 #pragma redefine_extname OCSF_REQ_CTX_free_sunw OCSF_REQ_CTX_free
2352 #pragma redefine_extname OCSF_REQ_CTX_set1_req_sunw OCSF_REQ_CTX_set1_req
2353 #pragma redefine_extname OCSF_REQINFO_free_sunw OCSF_REQINFO_free
2354 #pragma redefine_extname OCSF_REQINFO_it_sunw OCSF_REQINFO_it
2355 #pragma redefine_extname OCSF_REQINFO_new_sunw OCSF_REQINFO_new
2356 #pragma redefine_extname OCSF_REQUEST_add_ext_sunw OCSF_REQUEST_add_ext
2357 #pragma redefine_extname OCSF_request_add0_id_sunw OCSF_request_add0_id
2358 #pragma redefine_extname OCSF_request_add1_cert_sunw OCSF_request_add1_ce
2359 #pragma redefine_extname OCSF_REQUEST_add1_ext_i2d_sunw OCSF_REQUEST_add1
2360 #pragma redefine_extname OCSF_request_add1_nonce_sunw OCSF_request_add1_n
2361 #pragma redefine_extname OCSF_REQUEST_delete_ext_sunw OCSF_REQUEST_delete
2362 #pragma redefine_extname OCSF_REQUEST_free_sunw OCSF_REQUEST_free
2363 #pragma redefine_extname OCSF_REQUEST_get_ext_sunw OCSF_REQUEST_get_ext
2364 #pragma redefine_extname OCSF_REQUEST_get_ext_by_critical_sunw OCSF_REQUE
2365 #pragma redefine_extname OCSF_REQUEST_get_ext_by_NID_sunw OCSF_REQUEST_ge
2366 #pragma redefine_extname OCSF_REQUEST_get_ext_by_OBJ_sunw OCSF_REQUEST_ge
2367 #pragma redefine_extname OCSF_REQUEST_get_ext_count_sunw OCSF_REQUEST_get
2368 #pragma redefine_extname OCSF_REQUEST_get1_ext_d2i_sunw OCSF_REQUEST_get1
2369 #pragma redefine_extname OCSF_request_is_signed_sunw OCSF_request_is_sign
2370 #pragma redefine_extname OCSF_REQUEST_it_sunw OCSF_REQUEST_it
2371 #pragma redefine_extname OCSF_REQUEST_new_sunw OCSF_REQUEST_new

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2372 #pragma redefine_extname OCSPP_request_onereq_count sunw_OCSPP_request_onereq_count
2373 #pragma redefine_extname OCSPP_request_onereq_get0 sunw_OCSPP_request_onereq_get0
2374 #pragma redefine_extname OCSPP_REQUEST_print sunw_OCSPP_REQUEST_print
2375 #pragma redefine_extname OCSPP_request_set1_name sunw_OCSPP_request_set1_name
2376 #pragma redefine_extname OCSPP_request_sign sunw_OCSPP_request_sign
2377 #pragma redefine_extname OCSPP_request_verify sunw_OCSPP_request_verify
2378 #pragma redefine_extname OCSPP_resp_count sunw_OCSPP_resp_count
2379 #pragma redefine_extname OCSPP_resp_find sunw_OCSPP_resp_find
2380 #pragma redefine_extname OCSPP_resp_find_status sunw_OCSPP_resp_find_status
2381 #pragma redefine_extname OCSPP_resp_get0 sunw_OCSPP_resp_get0
2382 #pragma redefine_extname OCSPP_RESPBYTES_free sunw_OCSPP_RESPBYTES_free
2383 #pragma redefine_extname OCSPP_RESPBYTES_it sunw_OCSPP_RESPBYTES_it
2384 #pragma redefine_extname OCSPP_RESPBYTES_new sunw_OCSPP_RESPBYTES_new
2385 #pragma redefine_extname OCSPP_RESPDATA_free sunw_OCSPP_RESPDATA_free
2386 #pragma redefine_extname OCSPP_RESPDATA_it sunw_OCSPP_RESPDATA_it
2387 #pragma redefine_extname OCSPP_RESPDATA_new sunw_OCSPP_RESPDATA_new
2388 #pragma redefine_extname OCSPP_RESPID_free sunw_OCSPP_RESPID_free
2389 #pragma redefine_extname OCSPP_RESPID_it sunw_OCSPP_RESPID_it
2390 #pragma redefine_extname OCSPP_RESPID_new sunw_OCSPP_RESPID_new
2391 #pragma redefine_extname OCSPP_response_create sunw_OCSPP_response_create
2392 #pragma redefine_extname OCSPP_RESPONSE_free sunw_OCSPP_RESPONSE_free
2393 #pragma redefine_extname OCSPP_response_get1_basic sunw_OCSPP_response_get1_basic
2394 #pragma redefine_extname OCSPP_RESPONSE_it sunw_OCSPP_RESPONSE_it
2395 #pragma redefine_extname OCSPP_RESPONSE_new sunw_OCSPP_RESPONSE_new
2396 #pragma redefine_extname OCSPP_RESPONSE_print sunw_OCSPP_RESPONSE_print
2397 #pragma redefine_extname OCSPP_response_status sunw_OCSPP_response_status
2398 #pragma redefine_extname OCSPP_response_status_str sunw_OCSPP_response_status_str
2399 #pragma redefine_extname OCSPP_REVOKEDINFO_free sunw_OCSPP_REVOKEDINFO_free
2400 #pragma redefine_extname OCSPP_REVOKEDINFO_it sunw_OCSPP_REVOKEDINFO_it
2401 #pragma redefine_extname OCSPP_REVOKEDINFO_new sunw_OCSPP_REVOKEDINFO_new
2402 #pragma redefine_extname OCSPP_sendreq_bio sunw_OCSPP_sendreq_bio
2403 #pragma redefine_extname OCSPP_sendreq_nbio sunw_OCSPP_sendreq_nbio
2404 #pragma redefine_extname OCSPP_sendreq_new sunw_OCSPP_sendreq_new
2405 #pragma redefine_extname OCSPP_SERVICELOC_free sunw_OCSPP_SERVICELOC_free
2406 #pragma redefine_extname OCSPP_SERVICELOC_it sunw_OCSPP_SERVICELOC_it
2407 #pragma redefine_extname OCSPP_SERVICELOC_new sunw_OCSPP_SERVICELOC_new
2408 #pragma redefine_extname OCSPP_SIGNATURE_free sunw_OCSPP_SIGNATURE_free
2409 #pragma redefine_extname OCSPP_SIGNATURE_it sunw_OCSPP_SIGNATURE_it
2410 #pragma redefine_extname OCSPP_SIGNATURE_new sunw_OCSPP_SIGNATURE_new
2411 #pragma redefine_extname OCSPP_single_get0_status sunw_OCSPP_single_get0_status
2412 #pragma redefine_extname OCSPP_SINGLERESP_add_ext sunw_OCSPP_SINGLERESP_add_ext
2413 #pragma redefine_extname OCSPP_SINGLERESP_add1_ext i2d sunw_OCSPP_SINGLERESP_add1_ext
2414 #pragma redefine_extname OCSPP_SINGLERESP_delete_ext sunw_OCSPP_SINGLERESP_delete_ext
2415 #pragma redefine_extname OCSPP_SINGLERESP_free sunw_OCSPP_SINGLERESP_free
2416 #pragma redefine_extname OCSPP_SINGLERESP_get_ext sunw_OCSPP_SINGLERESP_get_ext
2417 #pragma redefine_extname OCSPP_SINGLERESP_get_ext_by_critical sunw_OCSPP_SINGLERESP_get_ext_by_critical
2418 #pragma redefine_extname OCSPP_SINGLERESP_get_ext_by_NID sunw_OCSPP_SINGLERESP_get_ext_by_NID
2419 #pragma redefine_extname OCSPP_SINGLERESP_get_ext_by_OBJ sunw_OCSPP_SINGLERESP_get_ext_by_OBJ
2420 #pragma redefine_extname OCSPP_SINGLERESP_get_ext_count sunw_OCSPP_SINGLERESP_get_ext_count
2421 #pragma redefine_extname OCSPP_SINGLERESP_get1_ext d2i sunw_OCSPP_SINGLERESP_get1_ext
2422 #pragma redefine_extname OCSPP_SINGLERESP_it sunw_OCSPP_SINGLERESP_it
2423 #pragma redefine_extname OCSPP_SINGLERESP_new sunw_OCSPP_SINGLERESP_new
2424 #pragma redefine_extname OCSPP_url_svcloc_new sunw_OCSPP_url_svcloc_new
2425 #pragma redefine_extname OPENSSL_add_all_algorithms_conf sunw_OPENSSL_add_all_algorithms_conf
2426 #pragma redefine_extname OPENSSL_add_all_algorithms_noconf sunw_OPENSSL_add_all_algorithms_noconf
2427 #pragma redefine_extname OPENSSL_add_all_ciphers sunw_OPENSSL_add_all_ciphers
2428 #pragma redefine_extname OPENSSL_add_all_digests sunw_OPENSSL_add_all_digests
2429 #pragma redefine_extname OPENSSL_asc2uni sunw_OPENSSL_asc2uni
2430 #pragma redefine_extname OPENSSL_atomic_add sunw_OPENSSL_atomic_add
2431 #pragma redefine_extname OPENSSL_cleanse sunw_OPENSSL_cleanse
2432 #pragma redefine_extname OPENSSL_config sunw_OPENSSL_config
2433 #pragma redefine_extname OPENSSL_cpuid_setup sunw_OPENSSL_cpuid_setup
2434 #pragma redefine_extname OPENSSL_DIR_end sunw_OPENSSL_DIR_end
2435 #pragma redefine_extname OPENSSL_DIR_read sunw_OPENSSL_DIR_read
2436 #pragma redefine_extname OPENSSL_far_spin sunw_OPENSSL_far_spin
2437 #pragma redefine_extname OPENSSL_gmtime sunw_OPENSSL_gmtime

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2438 #pragma redefine_extname OPENSSL_gmtime_adj sunw_OPENSSL_gmtime_adj
2439 #pragma redefine_extname OPENSSL_ia32cap_P sunw_OPENSSL_ia32cap_P
2440 #pragma redefine_extname OPENSSL_ia32_cpuid sunw_OPENSSL_ia32_cpuid
2441 #pragma redefine_extname OPENSSL_ia32_rdrand sunw_OPENSSL_ia32_rdrand
2442 #pragma redefine_extname OPENSSL_ia32cap_loc sunw_OPENSSL_ia32cap_loc
2443 #pragma redefine_extname OPENSSL_indirect_call sunw_OPENSSL_indirect_call
2444 #pragma redefine_extname OPENSSL_init sunw_OPENSSL_init
2445 #pragma redefine_extname OPENSSL_instrument_halt sunw_OPENSSL_instrument_halt
2446 #pragma redefine_extname OPENSSL_isservice sunw_OPENSSL_isservice
2447 #pragma redefine_extname OPENSSL_issetugid sunw_OPENSSL_issetugid
2448 #pragma redefine_extname OPENSSL_load_builtin_modules sunw_OPENSSL_load_builtin_modules
2449 #pragma redefine_extname OPENSSL_memcmp sunw_OPENSSL_memcmp
2450 #pragma redefine_extname OPENSSL_no_config sunw_OPENSSL_no_config
2451 #pragma redefine_extname OPENSSL_rdtsc sunw_OPENSSL_rdtsc
2452 #pragma redefine_extname OPENSSL_showfatal sunw_OPENSSL_showfatal
2453 #pragma redefine_extname OPENSSL_stderrr sunw_OPENSSL_stderrr
2454 #pragma redefine_extname OPENSSL_strcasecmp sunw_OPENSSL_strcasecmp
2455 #pragma redefine_extname OPENSSL_strncasecmp sunw_OPENSSL_strncasecmp
2456 #pragma redefine_extname OPENSSL_uni2asc sunw_OPENSSL_uni2asc
2457 #pragma redefine_extname OPENSSL_wipe_cpu sunw_OPENSSL_wipe_cpu
2458 #pragma redefine_extname OPENSSLDie sunw_OPENSSLDie
2459 #pragma redefine_extname OSSL_DES_version sunw_OSSL_DES_version
2460 #pragma redefine_extname OSSL_libdes_version sunw_OSSL_libdes_version
2461 #pragma redefine_extname OTHERNAME_cmp sunw_OTHERNAME_cmp
2462 #pragma redefine_extname OTHERNAME_free sunw_OTHERNAME_free
2463 #pragma redefine_extname OTHERNAME_it sunw_OTHERNAME_it
2464 #pragma redefine_extname OTHERNAME_new sunw_OTHERNAME_new
2465 #pragma redefine_extname PBE2PARAM_free sunw_PBE2PARAM_free
2466 #pragma redefine_extname PBE2PARAM_it sunw_PBE2PARAM_it
2467 #pragma redefine_extname PBE2PARAM_new sunw_PBE2PARAM_new
2468 #pragma redefine_extname PBEPARAM_free sunw_PBEPARAM_free
2469 #pragma redefine_extname PBEPARAM_it sunw_PBEPARAM_it
2470 #pragma redefine_extname PBEPARAM_new sunw_PBEPARAM_new
2471 #pragma redefine_extname PBKDF2PARAM_free sunw_PBKDF2PARAM_free
2472 #pragma redefine_extname PBKDF2PARAM_it sunw_PBKDF2PARAM_it
2473 #pragma redefine_extname PBKDF2PARAM_new sunw_PBKDF2PARAM_new
2474 #pragma redefine_extname PEM_ASN1_read sunw_PEM_ASN1_read
2475 #pragma redefine_extname PEM_ASN1_read_bio sunw_PEM_ASN1_read_bio
2476 #pragma redefine_extname PEM_ASN1_write sunw_PEM_ASN1_write
2477 #pragma redefine_extname PEM_ASN1_write_bio sunw_PEM_ASN1_write_bio
2478 #pragma redefine_extname PEM_bytes_read_bio sunw_PEM_bytes_read_bio
2479 #pragma redefine_extname pem_check_suffix sunw_pem_check_suffix
2480 #pragma redefine_extname PEM_def_callback sunw_PEM_def_callback
2481 #pragma redefine_extname PEM_deri_info sunw_PEM_deri_info
2482 #pragma redefine_extname PEM_do_header sunw_PEM_do_header
2483 #pragma redefine_extname PEM_get_EVP_CIPHER_INFO sunw_PEM_get_EVP_CIPHER_INFO
2484 #pragma redefine_extname PEM_proc_type sunw_PEM_proc_type
2485 #pragma redefine_extname PEM_read sunw_PEM_read
2486 #pragma redefine_extname PEM_read_bio sunw_PEM_read_bio
2487 #pragma redefine_extname PEM_read_bio_CMS sunw_PEM_read_bio_CMS
2488 #pragma redefine_extname PEM_read_bio_DHparams sunw_PEM_read_bio_DHparams
2489 #pragma redefine_extname PEM_read_bio_DSA_PUBKEY sunw_PEM_read_bio_DSA_PUBKEY
2490 #pragma redefine_extname PEM_read_bio_DSAParams sunw_PEM_read_bio_DSAParams
2491 #pragma redefine_extname PEM_read_bio_DSAPrivateKey sunw_PEM_read_bio_DSAPrivateKey
2492 #pragma redefine_extname PEM_read_bio_NETSCAPE_CERT_SEQUENCE sunw_PEM_read_bio_NETSCAPE_CERT_SEQUENCE
2493 #pragma redefine_extname PEM_read_bio_Parameters sunw_PEM_read_bio_Parameters
2494 #pragma redefine_extname PEM_read_bio_PKCS7 sunw_PEM_read_bio_PKCS7
2495 #pragma redefine_extname PEM_read_bio_PKCS8 sunw_PEM_read_bio_PKCS8
2496 #pragma redefine_extname PEM_read_bio_PKCS8_PRIV_KEY_INFO sunw_PEM_read_bio_PKCS8_PRIV_KEY_INFO
2497 #pragma redefine_extname PEM_read_bio_PrivateKey sunw_PEM_read_bio_PrivateKey
2498 #pragma redefine_extname PEM_read_bio_PUBKEY sunw_PEM_read_bio_PUBKEY
2499 #pragma redefine_extname PEM_read_bio_RSA_PUBKEY sunw_PEM_read_bio_RSA_PUBKEY
2500 #pragma redefine_extname PEM_read_bio_RSAPrivateKey sunw_PEM_read_bio_RSAPrivateKey
2501 #pragma redefine_extname PEM_read_bio_RSAPublicKey sunw_PEM_read_bio_RSAPublicKey
2502 #pragma redefine_extname PEM_read_bio_X509 sunw_PEM_read_bio_X509
2503 #pragma redefine_extname PEM_read_bio_X509_AUX sunw_PEM_read_bio_X509_AUX

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2504 #pragma redefine_extname PEM_read_bio_X509_CERT_PAIR sunw_PEM_read_bio_X5
2505 #pragma redefine_extname PEM_read_bio_X509_CRL sunw_PEM_read_bio_X509_CRL
2506 #pragma redefine_extname PEM_read_bio_X509_REQ sunw_PEM_read_bio_X509_REQ
2507 #pragma redefine_extname PEM_read_CMS sunw_PEM_read_CMS
2508 #pragma redefine_extname PEM_read_DHparams sunw_PEM_read_DHparams
2509 #pragma redefine_extname PEM_read_DSA_PUBKEY sunw_PEM_read_DSA_PUBKEY
2510 #pragma redefine_extname PEM_read_DSAParams sunw_PEM_read_DSAParams
2511 #pragma redefine_extname PEM_read_DSAPrivateKey sunw_PEM_read_DSAPrivateK
2512 #pragma redefine_extname PEM_read_NETSCAPE_CERT_SEQUENCE sunw_PEM_read_NE
2513 #pragma redefine_extname PEM_read_PKCS7 sunw_PEM_read_PKCS7
2514 #pragma redefine_extname PEM_read_PKCS8 sunw_PEM_read_PKCS8
2515 #pragma redefine_extname PEM_read_PKCS8_PRIV_KEY_INFO sunw_PEM_read_PKCS8
2516 #pragma redefine_extname PEM_read_PrivateKey sunw_PEM_read_PrivateKey
2517 #pragma redefine_extname PEM_read_PUBKEY sunw_PEM_read_PUBKEY
2518 #pragma redefine_extname PEM_read_RSA_PUBKEY sunw_PEM_read_RSA_PUBKEY
2519 #pragma redefine_extname PEM_read_RSAPrivateKey sunw_PEM_read_RSAPrivateK
2520 #pragma redefine_extname PEM_read_RSAPublicKey sunw_PEM_read_RSAPublicKey
2521 #pragma redefine_extname PEM_read_X509 sunw_PEM_read_X509
2522 #pragma redefine_extname PEM_read_X509_AUX sunw_PEM_read_X509_AUX
2523 #pragma redefine_extname PEM_read_X509_CERT_PAIR sunw_PEM_read_X509_CERT_
2524 #pragma redefine_extname PEM_read_X509_CRL sunw_PEM_read_X509_CRL
2525 #pragma redefine_extname PEM_read_X509_REQ sunw_PEM_read_X509_REQ
2526 #pragma redefine_extname PEM_SealFinal sunw_PEM_SealFinal
2527 #pragma redefine_extname PEM_SealInit sunw_PEM_SealInit
2528 #pragma redefine_extname PEM_SealUpdate sunw_PEM_SealUpdate
2529 #pragma redefine_extname PEM_SignFinal sunw_PEM_SignFinal
2530 #pragma redefine_extname PEM_SignInit sunw_PEM_SignInit
2531 #pragma redefine_extname PEM_SignUpdate sunw_PEM_SignUpdate
2532 #pragma redefine_extname PEM_version sunw_PEM_version
2533 #pragma redefine_extname PEM_write sunw_PEM_write
2534 #pragma redefine_extname PEM_write_bio sunw_PEM_write_bio
2535 #pragma redefine_extname PEM_write_bio_ASN1_stream sunw_PEM_write_bio_ASN
2536 #pragma redefine_extname PEM_write_bio_CMS sunw_PEM_write_bio_CMS
2537 #pragma redefine_extname PEM_write_bio_CMS_stream sunw_PEM_write_bio_CMS_
2538 #pragma redefine_extname PEM_write_bio_DHparams sunw_PEM_write_bio_DHpara
2539 #pragma redefine_extname PEM_write_bio_DSA_PUBKEY sunw_PEM_write_bio_DSA_
2540 #pragma redefine_extname PEM_write_bio_DSAParams sunw_PEM_write_bio_DSAPA
2541 #pragma redefine_extname PEM_write_bio_DSAPrivateKey sunw_PEM_write_bio_D
2542 #pragma redefine_extname PEM_write_bio_NETSCAPE_CERT_SEQUENCE sunw_PEM_wr
2543 #pragma redefine_extname PEM_write_bio_Parameters sunw_PEM_write_bio_Para
2544 #pragma redefine_extname PEM_write_bio_PKCS7 sunw_PEM_write_bio_PKCS7
2545 #pragma redefine_extname PEM_write_bio_PKCS7_stream sunw_PEM_write_bio_PK
2546 #pragma redefine_extname PEM_write_bio_PKCS8 sunw_PEM_write_bio_PKCS8
2547 #pragma redefine_extname PEM_write_bio_PKCS8_PRIV_KEY_INFO sunw_PEM_write
2548 #pragma redefine_extname PEM_write_bio_PKCS8PrivateKey sunw_PEM_write_bio
2549 #pragma redefine_extname PEM_write_bio_PKCS8PrivateKey_nid sunw_PEM_write
2550 #pragma redefine_extname PEM_write_bio_PrivateKey sunw_PEM_write_bio_Priv
2551 #pragma redefine_extname PEM_write_bio_PUBKEY sunw_PEM_write_bio_PUBKEY
2552 #pragma redefine_extname PEM_write_bio_RSA_PUBKEY sunw_PEM_write_bio_RSA_
2553 #pragma redefine_extname PEM_write_bio_RSAPrivateKey sunw_PEM_write_bio_R
2554 #pragma redefine_extname PEM_write_bio_RSAPublicKey sunw_PEM_write_bio_RS
2555 #pragma redefine_extname PEM_write_bio_X509 sunw_PEM_write_bio_X509
2556 #pragma redefine_extname PEM_write_bio_X509_AUX sunw_PEM_write_bio_X509_A
2557 #pragma redefine_extname PEM_write_bio_X509_CERT_PAIR sunw_PEM_write_bio_
2558 #pragma redefine_extname PEM_write_bio_X509_CRL sunw_PEM_write_bio_X509_C
2559 #pragma redefine_extname PEM_write_bio_X509_REQ sunw_PEM_write_bio_X509_R
2560 #pragma redefine_extname PEM_write_bio_X509_REQ_NEW sunw_PEM_write_bio_X5
2561 #pragma redefine_extname PEM_write_CMS sunw_PEM_write_CMS
2562 #pragma redefine_extname PEM_write_DHparams sunw_PEM_write_DHparams
2563 #pragma redefine_extname PEM_write_DSA_PUBKEY sunw_PEM_write_DSA_PUBKEY
2564 #pragma redefine_extname PEM_write_DSAParams sunw_PEM_write_DSAParams
2565 #pragma redefine_extname PEM_write_DSAPrivateKey sunw_PEM_write_DSAPrivat
2566 #pragma redefine_extname PEM_write_NETSCAPE_CERT_SEQUENCE sunw_PEM_write_
2567 #pragma redefine_extname PEM_write_PKCS7 sunw_PEM_write_PKCS7
2568 #pragma redefine_extname PEM_write_PKCS8 sunw_PEM_write_PKCS8
2569 #pragma redefine_extname PEM_write_PKCS8_PRIV_KEY_INFO sunw_PEM_write_PKC

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2570 #pragma redefine_extname PEM_write_PKCS8PrivateKey sunw_PEM_write_PKCS8Pr
2571 #pragma redefine_extname PEM_write_PKCS8PrivateKey_nid sunw_PEM_write_PKC
2572 #pragma redefine_extname PEM_write_PrivateKey sunw_PEM_write_PrivateKey
2573 #pragma redefine_extname PEM_write_PUBKEY sunw_PEM_write_PUBKEY
2574 #pragma redefine_extname PEM_write_RSA_PUBKEY sunw_PEM_write_RSA_PUBKEY
2575 #pragma redefine_extname PEM_write_RSAPrivateKey sunw_PEM_write_RSAPrivat
2576 #pragma redefine_extname PEM_write_RSAPublicKey sunw_PEM_write_RSAPublick
2577 #pragma redefine_extname PEM_write_X509 sunw_PEM_write_X509
2578 #pragma redefine_extname PEM_write_X509_AUX sunw_PEM_write_X509_AUX
2579 #pragma redefine_extname PEM_write_X509_CERT_PAIR sunw_PEM_write_X509_CER
2580 #pragma redefine_extname PEM_write_X509_CRL sunw_PEM_write_X509_CRL
2581 #pragma redefine_extname PEM_write_X509_REQ sunw_PEM_write_X509_REQ
2582 #pragma redefine_extname PEM_write_X509_REQ_NEW sunw_PEM_write_X509_REQ_N
2583 #pragma redefine_extname PEM_X509_INFO_read sunw_PEM_X509_INFO_read
2584 #pragma redefine_extname PEM_X509_INFO_read_bio sunw_PEM_X509_INFO_read_b
2585 #pragma redefine_extname PEM_X509_INFO_write_bio sunw_PEM_X509_INFO_write
2586 #pragma redefine_extname pitem_free sunw_pitem_free
2587 #pragma redefine_extname pitem_new sunw_pitem_new
2588 #pragma redefine_extname PK11_DH sunw_PK11_DH
2589 #pragma redefine_extname PK11_DSA sunw_PK11_DSA
2590 #pragma redefine_extname PK11_RSA sunw_PK11_RSA
2591 #pragma redefine_extname PK11err_add_data sunw_PK11err_add_data
2592 #pragma redefine_extname pk11_active_add sunw_pk11_active_add
2593 #pragma redefine_extname pk11_active_delete sunw_pk11_active_delete
2594 #pragma redefine_extname pk11_active_remove sunw_pk11_active_remove
2595 #pragma redefine_extname pk11_destroy_dh_key_objects sunw_pk11_destroy_dh
2596 #pragma redefine_extname pk11_destroy_dh_object sunw_pk11_destroy_dh_obje
2597 #pragma redefine_extname pk11_destroy_dsa_key_objects sunw_pk11_destroy_d
2598 #pragma redefine_extname pk11_destroy_dsa_object_priv sunw_pk11_destroy_d
2599 #pragma redefine_extname pk11_destroy_dsa_object_pub sunw_pk11_destroy_ds
2600 #pragma redefine_extname pk11_destroy_rsa_key_objects sunw_pk11_destroy_r
2601 #pragma redefine_extname pk11_destroy_rsa_object_priv sunw_pk11_destroy_r
2602 #pragma redefine_extname pk11_destroy_rsa_object_pub sunw_pk11_destroy_rs
2603 #pragma redefine_extname pk11_free_active_list sunw_pk11_free_active_list
2604 #pragma redefine_extname pk11_get_session sunw_pk11_get_session
2605 #pragma redefine_extname pk11_load_privkey sunw_pk11_load_privkey
2606 #pragma redefine_extname pk11_load_pubkey sunw_pk11_load_pubkey
2607 #pragma redefine_extname pk11_return_session sunw_pk11_return_session
2608 #pragma redefine_extname PKCS1_MGF1 sunw_PKCS1_MGF1
2609 #pragma redefine_extname PKCS12_add_cert sunw_PKCS12_add_cert
2610 #pragma redefine_extname PKCS12_add_CSPName_asc sunw_PKCS12_add_CSPName_a
2611 #pragma redefine_extname PKCS12_add_friendlyname_asc sunw_PKCS12_add_frie
2612 #pragma redefine_extname PKCS12_add_friendlyname_uni sunw_PKCS12_add_frie
2613 #pragma redefine_extname PKCS12_add_key sunw_PKCS12_add_key
2614 #pragma redefine_extname PKCS12_add_localkeyid sunw_PKCS12_add_localkeyid
2615 #pragma redefine_extname PKCS12_add_safe sunw_PKCS12_add_safe
2616 #pragma redefine_extname PKCS12_add_safes sunw_PKCS12_add_safes
2617 #pragma redefine_extname PKCS12_AUTHSAFES_it sunw_PKCS12_AUTHSAFES_it
2618 #pragma redefine_extname PKCS12_BAGS_free sunw_PKCS12_BAGS_free
2619 #pragma redefine_extname PKCS12_BAGS_it sunw_PKCS12_BAGS_it
2620 #pragma redefine_extname PKCS12_BAGS_new sunw_PKCS12_BAGS_new
2621 #pragma redefine_extname PKCS12_certbag2x509 sunw_PKCS12_certbag2x509
2622 #pragma redefine_extname PKCS12_certbag2x509crl sunw_PKCS12_certbag2x509c
2623 #pragma redefine_extname PKCS12_create sunw_PKCS12_create
2624 #pragma redefine_extname PKCS12_decrypt_skey sunw_PKCS12_decrypt_skey
2625 #pragma redefine_extname PKCS12_free sunw_PKCS12_free
2626 #pragma redefine_extname PKCS12_gen_mac sunw_PKCS12_gen_mac
2627 #pragma redefine_extname PKCS12_get_attr_gen sunw_PKCS12_get_attr_gen
2628 #pragma redefine_extname PKCS12_get_friendlyname sunw_PKCS12_get_friendly
2629 #pragma redefine_extname PKCS12_init sunw_PKCS12_init
2630 #pragma redefine_extname PKCS12_it sunw_PKCS12_it
2631 #pragma redefine_extname PKCS12_item_decrypt_d2i sunw_PKCS12_item_decrypt
2632 #pragma redefine_extname PKCS12_item_i2d_encrypt sunw_PKCS12_item_i2d_enc
2633 #pragma redefine_extname PKCS12_item_pack_safefrag sunw_PKCS12_item_pack_s
2634 #pragma redefine_extname PKCS12_key_gen_asc sunw_PKCS12_key_gen_asc
2635 #pragma redefine_extname PKCS12_key_gen_uni sunw_PKCS12_key_gen_uni

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2636 #pragma redefine_extname PKCS12_MAC_DATA_free sunw_PKCS12_MAC_DATA_free
2637 #pragma redefine_extname PKCS12_MAC_DATA_it sunw_PKCS12_MAC_DATA_it
2638 #pragma redefine_extname PKCS12_MAC_DATA_new sunw_PKCS12_MAC_DATA_new
2639 #pragma redefine_extname PKCS12_MAKE_KEYBAG sunw_PKCS12_MAKE_KEYBAG
2640 #pragma redefine_extname PKCS12_MAKE_SHKEYBAG sunw_PKCS12_MAKE_SHKEYBAG
2641 #pragma redefine_extname PKCS12_new sunw_PKCS12_new
2642 #pragma redefine_extname PKCS12_newpass sunw_PKCS12_newpass
2643 #pragma redefine_extname PKCS12_pack_authsafes sunw_PKCS12_pack_authsafes
2644 #pragma redefine_extname PKCS12_pack_p7data sunw_PKCS12_pack_p7data
2645 #pragma redefine_extname PKCS12_pack_p7encdata sunw_PKCS12_pack_p7encdata
2646 #pragma redefine_extname PKCS12_parse sunw_PKCS12_parse
2647 #pragma redefine_extname PKCS12_PBE_add sunw_PKCS12_PBE_add
2648 #pragma redefine_extname PKCS12_pbe_crypt sunw_PKCS12_pbe_crypt
2649 #pragma redefine_extname PKCS12_PBE_keyivgen sunw_PKCS12_PBE_keyivgen
2650 #pragma redefine_extname PKCS12_SAFEBAG_free sunw_PKCS12_SAFEBAG_free
2651 #pragma redefine_extname PKCS12_SAFEBAG_it sunw_PKCS12_SAFEBAG_it
2652 #pragma redefine_extname PKCS12_SAFEBAG_new sunw_PKCS12_SAFEBAG_new
2653 #pragma redefine_extname PKCS12_SAFEBAGS_it sunw_PKCS12_SAFEBAGS_it
2654 #pragma redefine_extname PKCS12_set_mac sunw_PKCS12_set_mac
2655 #pragma redefine_extname PKCS12_setup_mac sunw_PKCS12_setup_mac
2656 #pragma redefine_extname PKCS12_unpack_authsafes sunw_PKCS12_unpack_auths
2657 #pragma redefine_extname PKCS12_unpack_p7data sunw_PKCS12_unpack_p7data
2658 #pragma redefine_extname PKCS12_unpack_p7encdata sunw_PKCS12_unpack_p7enc
2659 #pragma redefine_extname PKCS12_verify_mac sunw_PKCS12_verify_mac
2660 #pragma redefine_extname PKCS12_x5092certbag sunw_PKCS12_x5092certbag
2661 #pragma redefine_extname PKCS12_x509crl2certbag sunw_PKCS12_x509crl2certb
2662 #pragma redefine_extname PKCS5_PBE_add sunw_PKCS5_PBE_add
2663 #pragma redefine_extname PKCS5_PBE_keyivgen sunw_PKCS5_PBE_keyivgen
2664 #pragma redefine_extname PKCS5_pbe_set sunw_PKCS5_pbe_set
2665 #pragma redefine_extname PKCS5_pbe_set0_algor sunw_PKCS5_pbe_set0_algor
2666 #pragma redefine_extname PKCS5_pbe2_set sunw_PKCS5_pbe2_set
2667 #pragma redefine_extname PKCS5_pbe2_set_iv sunw_PKCS5_pbe2_set_iv
2668 #pragma redefine_extname PKCS5_PBKDF2_HMAC sunw_PKCS5_PBKDF2_HMAC
2669 #pragma redefine_extname PKCS5_PBKDF2_HMAC_SHA1 sunw_PKCS5_PBKDF2_HMAC_SH
2670 #pragma redefine_extname PKCS5_pbkdf2_set sunw_PKCS5_pbkdf2_set
2671 #pragma redefine_extname PKCS5_v2_PBE_keyivgen sunw_PKCS5_v2_PBE_keyivgen
2672 #pragma redefine_extname PKCS5_v2_PBKDF2_keyivgen sunw_PKCS5_v2_PBKDF2_ke
2673 #pragma redefine_extname PKCS7_add_attrib_content_type sunw_PKCS7_add_att
2674 #pragma redefine_extname PKCS7_add_attrib_smimecap sunw_PKCS7_add_attrib
2675 #pragma redefine_extname PKCS7_add_attribute sunw_PKCS7_add_attribute
2676 #pragma redefine_extname PKCS7_add_certificate sunw_PKCS7_add_certificate
2677 #pragma redefine_extname PKCS7_add_crl sunw_PKCS7_add_crl
2678 #pragma redefine_extname PKCS7_add_recipient sunw_PKCS7_add_recipient
2679 #pragma redefine_extname PKCS7_add_recipient_info sunw_PKCS7_add_recipien
2680 #pragma redefine_extname PKCS7_add_signature sunw_PKCS7_add_signature
2681 #pragma redefine_extname PKCS7_add_signed_attribute sunw_PKCS7_add_signed
2682 #pragma redefine_extname PKCS7_add_signer sunw_PKCS7_add_signer
2683 #pragma redefine_extname PKCS7_add0_attrib_signing_time sunw_PKCS7_add0_a
2684 #pragma redefine_extname PKCS7_add1_attrib_digest sunw_PKCS7_add1_attrib
2685 #pragma redefine_extname PKCS7_ATTR_SIGN_it sunw_PKCS7_ATTR_SIGN_it
2686 #pragma redefine_extname PKCS7_ATTR_VERIFY_it sunw_PKCS7_ATTR_VERIFY_it
2687 #pragma redefine_extname PKCS7_cert_from_signer_info sunw_PKCS7_cert_from
2688 #pragma redefine_extname PKCS7_content_new sunw_PKCS7_content_new
2689 #pragma redefine_extname PKCS7_ctrl sunw_PKCS7_ctrl
2690 #pragma redefine_extname PKCS7_dataDecode sunw_PKCS7_dataDecode
2691 #pragma redefine_extname PKCS7_dataFinal sunw_PKCS7_dataFinal
2692 #pragma redefine_extname PKCS7_dataInit sunw_PKCS7_dataInit
2693 #pragma redefine_extname PKCS7_dataVerify sunw_PKCS7_dataVerify
2694 #pragma redefine_extname PKCS7_decrypt sunw_PKCS7_decrypt
2695 #pragma redefine_extname PKCS7_DIGEST_free sunw_PKCS7_DIGEST_free
2696 #pragma redefine_extname PKCS7_digest_from_attributes sunw_PKCS7_digest_f
2697 #pragma redefine_extname PKCS7_DIGEST_it sunw_PKCS7_DIGEST_it
2698 #pragma redefine_extname PKCS7_DIGEST_new sunw_PKCS7_DIGEST_new
2699 #pragma redefine_extname PKCS7_dup sunw_PKCS7_dup
2700 #pragma redefine_extname PKCS7_ENC_CONTENT_free sunw_PKCS7_ENC_CONTENT_fr
2701 #pragma redefine_extname PKCS7_ENC_CONTENT_it sunw_PKCS7_ENC_CONTENT_it

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2702 #pragma redefine_extname PKCS7_ENC_CONTENT_new sunw_PKCS7_ENC_CONTENT_new
2703 #pragma redefine_extname PKCS7_encrypt sunw_PKCS7_encrypt
2704 #pragma redefine_extname PKCS7_ENCRYPT_free sunw_PKCS7_ENCRYPT_free
2705 #pragma redefine_extname PKCS7_ENCRYPT_it sunw_PKCS7_ENCRYPT_it
2706 #pragma redefine_extname PKCS7_ENCRYPT_new sunw_PKCS7_ENCRYPT_new
2707 #pragma redefine_extname PKCS7_ENVELOPE_free sunw_PKCS7_ENVELOPE_free
2708 #pragma redefine_extname PKCS7_ENVELOPE_it sunw_PKCS7_ENVELOPE_it
2709 #pragma redefine_extname PKCS7_ENVELOPE_new sunw_PKCS7_ENVELOPE_new
2710 #pragma redefine_extname PKCS7_final sunw_PKCS7_final
2711 #pragma redefine_extname PKCS7_free sunw_PKCS7_free
2712 #pragma redefine_extname PKCS7_get_attribute sunw_PKCS7_get_attribute
2713 #pragma redefine_extname PKCS7_get_issuer_and_serial sunw_PKCS7_get_issuer
2714 #pragma redefine_extname PKCS7_get_signed_attribute sunw_PKCS7_get_signed
2715 #pragma redefine_extname PKCS7_get_signer_info sunw_PKCS7_get_signer_info
2716 #pragma redefine_extname PKCS7_get_smimecap sunw_PKCS7_get_smimecap
2717 #pragma redefine_extname PKCS7_get0_signers sunw_PKCS7_get0_signers
2718 #pragma redefine_extname PKCS7_ISSUER_AND_SERIAL_digest sunw_PKCS7_ISSUER
2719 #pragma redefine_extname PKCS7_ISSUER_AND_SERIAL_free sunw_PKCS7_ISSUER_A
2720 #pragma redefine_extname PKCS7_ISSUER_AND_SERIAL_it sunw_PKCS7_ISSUER_AND
2721 #pragma redefine_extname PKCS7_ISSUER_AND_SERIAL_new sunw_PKCS7_ISSUER_AN
2722 #pragma redefine_extname PKCS7_it sunw_PKCS7_it
2723 #pragma redefine_extname PKCS7_new sunw_PKCS7_new
2724 #pragma redefine_extname PKCS7_print_ctx sunw_PKCS7_print_ctx
2725 #pragma redefine_extname PKCS7_RECIP_INFO_free sunw_PKCS7_RECIP_INFO_free
2726 #pragma redefine_extname PKCS7_RECIP_INFO_get0_alg sunw_PKCS7_RECIP_INFO
2727 #pragma redefine_extname PKCS7_RECIP_INFO_it sunw_PKCS7_RECIP_INFO_it
2728 #pragma redefine_extname PKCS7_RECIP_INFO_new sunw_PKCS7_RECIP_INFO_new
2729 #pragma redefine_extname PKCS7_RECIP_INFO_set sunw_PKCS7_RECIP_INFO_set
2730 #pragma redefine_extname PKCS7_set_attributes sunw_PKCS7_set_attributes
2731 #pragma redefine_extname PKCS7_set_cipher sunw_PKCS7_set_cipher
2732 #pragma redefine_extname PKCS7_set_content sunw_PKCS7_set_content
2733 #pragma redefine_extname PKCS7_set_digest sunw_PKCS7_set_digest
2734 #pragma redefine_extname PKCS7_set_signed_attributes sunw_PKCS7_set_signe
2735 #pragma redefine_extname PKCS7_set_type sunw_PKCS7_set_type
2736 #pragma redefine_extname PKCS7_set0_type_other sunw_PKCS7_set0_type_other
2737 #pragma redefine_extname PKCS7_sign sunw_PKCS7_sign
2738 #pragma redefine_extname PKCS7_sign_add_signer sunw_PKCS7_sign_add_signer
2739 #pragma redefine_extname PKCS7_SIGN_ENVELOPE_free sunw_PKCS7_SIGN_ENVELOP
2740 #pragma redefine_extname PKCS7_SIGN_ENVELOPE_it sunw_PKCS7_SIGN_ENVELOPE
2741 #pragma redefine_extname PKCS7_SIGN_ENVELOPE_new sunw_PKCS7_SIGN_ENVELOPE
2742 #pragma redefine_extname PKCS7_signatureVerify sunw_PKCS7_signatureVerify
2743 #pragma redefine_extname PKCS7_SIGNED_free sunw_PKCS7_SIGNED_free
2744 #pragma redefine_extname PKCS7_SIGNED_it sunw_PKCS7_SIGNED_it
2745 #pragma redefine_extname PKCS7_SIGNED_new sunw_PKCS7_SIGNED_new
2746 #pragma redefine_extname PKCS7_SIGNER_INFO_free sunw_PKCS7_SIGNER_INFO_fr
2747 #pragma redefine_extname PKCS7_SIGNER_INFO_get0_algs sunw_PKCS7_SIGNER_IN
2748 #pragma redefine_extname PKCS7_SIGNER_INFO_it sunw_PKCS7_SIGNER_INFO_it
2749 #pragma redefine_extname PKCS7_SIGNER_INFO_new sunw_PKCS7_SIGNER_INFO_new
2750 #pragma redefine_extname PKCS7_SIGNER_INFO_set sunw_PKCS7_SIGNER_INFO_set
2751 #pragma redefine_extname PKCS7_SIGNER_INFO_sign sunw_PKCS7_SIGNER_INFO_si
2752 #pragma redefine_extname PKCS7_simple_smimecap sunw_PKCS7_simple_smimecap
2753 #pragma redefine_extname PKCS7_stream sunw_PKCS7_stream
2754 #pragma redefine_extname PKCS7_to_TS_TST_INFO sunw_PKCS7_to_TS_TST_INFO
2755 #pragma redefine_extname PKCS7_verify sunw_PKCS7_verify
2756 #pragma redefine_extname PKCS8_add_keyusage sunw_PKCS8_add_keyusage
2757 #pragma redefine_extname PKCS8_decrypt sunw_PKCS8_decrypt
2758 #pragma redefine_extname PKCS8_encrypt sunw_PKCS8_encrypt
2759 #pragma redefine_extname PKCS8_pkey_get0 sunw_PKCS8_pkey_get0
2760 #pragma redefine_extname PKCS8_pkey_set0 sunw_PKCS8_pkey_set0
2761 #pragma redefine_extname PKCS8_PRIV_KEY_INFO_free sunw_PKCS8_PRIV_KEY_INF
2762 #pragma redefine_extname PKCS8_PRIV_KEY_INFO_it sunw_PKCS8_PRIV_KEY_INFO
2763 #pragma redefine_extname PKCS8_PRIV_KEY_INFO_new sunw_PKCS8_PRIV_KEY_INFO
2764 #pragma redefine_extname PKCS8_set_broken sunw_PKCS8_set_broken
2765 #pragma redefine_extname PKEY_USAGE_PERIOD_free sunw_PKEY_USAGE_PERIOD_fr
2766 #pragma redefine_extname PKEY_USAGE_PERIOD_it sunw_PKEY_USAGE_PERIOD_it
2767 #pragma redefine_extname PKEY_USAGE_PERIOD_new sunw_PKEY_USAGE_PERIOD_new

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2768 #pragma redefine_extname policy_cache_find_data sunw_policy_cache_find_data
2769 #pragma redefine_extname policy_cache_free sunw_policy_cache_free
2770 #pragma redefine_extname policy_cache_set sunw_policy_cache_set
2771 #pragma redefine_extname policy_cache_set_mapping sunw_policy_cache_set_mapping
2772 #pragma redefine_extname POLICY_CONSTRAINTS_free sunw_POLICY_CONSTRAINTS_free
2773 #pragma redefine_extname POLICY_CONSTRAINTS_it sunw_POLICY_CONSTRAINTS_it
2774 #pragma redefine_extname POLICY_CONSTRAINTS_new sunw_POLICY_CONSTRAINTS_new
2775 #pragma redefine_extname policy_data_free sunw_policy_data_free
2776 #pragma redefine_extname policy_data_new sunw_policy_data_new
2777 #pragma redefine_extname POLICY_MAPPING_free sunw_POLICY_MAPPING_free
2778 #pragma redefine_extname POLICY_MAPPING_it sunw_POLICY_MAPPING_it
2779 #pragma redefine_extname POLICY_MAPPING_new sunw_POLICY_MAPPING_new
2780 #pragma redefine_extname POLICY_MAPPINGS_it sunw_POLICY_MAPPINGS_it
2781 #pragma redefine_extname policy_node_cmp_new sunw_policy_node_cmp_new
2782 #pragma redefine_extname policy_node_free sunw_policy_node_free
2783 #pragma redefine_extname policy_node_match sunw_policy_node_match
2784 #pragma redefine_extname POLICYINFO_free sunw_POLICYINFO_free
2785 #pragma redefine_extname POLICYINFO_it sunw_POLICYINFO_it
2786 #pragma redefine_extname POLICYINFO_new sunw_POLICYINFO_new
2787 #pragma redefine_extname POLICYQUALINFO_free sunw_POLICYQUALINFO_free
2788 #pragma redefine_extname POLICYQUALINFO_it sunw_POLICYQUALINFO_it
2789 #pragma redefine_extname POLICYQUALINFO_new sunw_POLICYQUALINFO_new
2790 #pragma redefine_extname pqueue_find sunw_pqueue_find
2791 #pragma redefine_extname pqueue_free sunw_pqueue_free
2792 #pragma redefine_extname pqueue_insert sunw_pqueue_insert
2793 #pragma redefine_extname pqueue_iterator sunw_pqueue_iterator
2794 #pragma redefine_extname pqueue_new sunw_pqueue_new
2795 #pragma redefine_extname pqueue_next sunw_pqueue_next
2796 #pragma redefine_extname pqueue_peek sunw_pqueue_peek
2797 #pragma redefine_extname pqueue_pop sunw_pqueue_pop
2798 #pragma redefine_extname pqueue_print sunw_pqueue_print
2799 #pragma redefine_extname pqueue_size sunw_pqueue_size
2800 #pragma redefine_extname private_AES_set_decrypt_key sunw_private_AES_set_decrypt_key
2801 #pragma redefine_extname private_AES_set_encrypt_key sunw_private_AES_set_encrypt_key
2802 #pragma redefine_extname private_Camellia_set_key sunw_private_Camellia_set_key
2803 #pragma redefine_extname private_RC4_set_key sunw_private_RC4_set_key
2804 #pragma redefine_extname PROXY_CERT_INFO_EXTENSION_free sunw_PROXY_CERT_INFO_EXTENSION_free
2805 #pragma redefine_extname PROXY_CERT_INFO_EXTENSION_it sunw_PROXY_CERT_INFO_EXTENSION_it
2806 #pragma redefine_extname PROXY_CERT_INFO_EXTENSION_new sunw_PROXY_CERT_INFO_EXTENSION_new
2807 #pragma redefine_extname PROXY_POLICY_free sunw_PROXY_POLICY_free
2808 #pragma redefine_extname PROXY_POLICY_it sunw_PROXY_POLICY_it
2809 #pragma redefine_extname PROXY_POLICY_new sunw_PROXY_POLICY_new
2810 #pragma redefine_extname RAND_add sunw_RAND_add
2811 #pragma redefine_extname RAND_bytes sunw_RAND_bytes
2812 #pragma redefine_extname RAND_cleanup sunw_RAND_cleanup
2813 #pragma redefine_extname RAND_egd sunw_RAND_egd
2814 #pragma redefine_extname RAND_egd_bytes sunw_RAND_egd_bytes
2815 #pragma redefine_extname RAND_file_name sunw_RAND_file_name
2816 #pragma redefine_extname RAND_get_rand_method sunw_RAND_get_rand_method
2817 #pragma redefine_extname RAND_load_file sunw_RAND_load_file
2818 #pragma redefine_extname RAND_poll sunw_RAND_poll
2819 #pragma redefine_extname RAND_pseudo_bytes sunw_RAND_pseudo_bytes
2820 #pragma redefine_extname RAND_query_egd_bytes sunw_RAND_query_egd_bytes
2821 #pragma redefine_extname RAND_seed sunw_RAND_seed
2822 #pragma redefine_extname RAND_set_rand_engine sunw_RAND_set_rand_engine
2823 #pragma redefine_extname RAND_set_rand_method sunw_RAND_set_rand_method
2824 #pragma redefine_extname RAND_SSLeay sunw_RAND_SSLeay
2825 #pragma redefine_extname rand_ssleay_meth sunw_rand_ssleay_meth
2826 #pragma redefine_extname RAND_status sunw_RAND_status
2827 #pragma redefine_extname RAND_version sunw_RAND_version
2828 #pragma redefine_extname RAND_write_file sunw_RAND_write_file
2829 #pragma redefine_extname RC2_cbc_encrypt sunw_RC2_cbc_encrypt
2830 #pragma redefine_extname RC2_cfb64_encrypt sunw_RC2_cfb64_encrypt
2831 #pragma redefine_extname RC2_decrypt sunw_RC2_decrypt
2832 #pragma redefine_extname RC2_ecb_encrypt sunw_RC2_ecb_encrypt
2833 #pragma redefine_extname RC2_encrypt sunw_RC2_encrypt

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2834 #pragma redefine_extname RC2_ofb64_encrypt sunw_RC2_ofb64_encrypt
2835 #pragma redefine_extname RC2_set_key sunw_RC2_set_key
2836 #pragma redefine_extname RC2_version sunw_RC2_version
2837 #pragma redefine_extname RC4 sunw_RC4
2838 #pragma redefine_extname rc4_md5_enc sunw_rc4_md5_enc
2839 #pragma redefine_extname RC4_options sunw_RC4_options
2840 #pragma redefine_extname RC4_set_key sunw_RC4_set_key
2841 #pragma redefine_extname RIPEMD160 sunw_RIPEMD160
2842 #pragma redefine_extname ripemd160_block_asm_data_order sunw_ripemd160_block_asm_data_order
2843 #pragma redefine_extname ripemd160_block_data_order sunw_ripemd160_block_data_order
2844 #pragma redefine_extname RIPEMD160_Final sunw_RIPEMD160_Final
2845 #pragma redefine_extname RIPEMD160_Init sunw_RIPEMD160_Init
2846 #pragma redefine_extname RIPEMD160_Transform sunw_RIPEMD160_Transform
2847 #pragma redefine_extname RIPEMD160_Update sunw_RIPEMD160_Update
2848 #pragma redefine_extname RMD160_version sunw_RMD160_version
2849 #pragma redefine_extname rsa_asn1_meths sunw_rsa_asn1_meths
2850 #pragma redefine_extname RSA_blinding_off sunw_RSA_blinding_off
2851 #pragma redefine_extname RSA_blinding_on sunw_RSA_blinding_on
2852 #pragma redefine_extname RSA_check_key sunw_RSA_check_key
2853 #pragma redefine_extname RSA_flags sunw_RSA_flags
2854 #pragma redefine_extname RSA_free sunw_RSA_free
2855 #pragma redefine_extname RSA_generate_key sunw_RSA_generate_key
2856 #pragma redefine_extname RSA_generate_key_ex sunw_RSA_generate_key_ex
2857 #pragma redefine_extname RSA_get_default_method sunw_RSA_get_default_method
2858 #pragma redefine_extname RSA_get_ex_data sunw_RSA_get_ex_data
2859 #pragma redefine_extname RSA_get_ex_new_index sunw_RSA_get_ex_new_index
2860 #pragma redefine_extname RSA_get_method sunw_RSA_get_method
2861 #pragma redefine_extname RSA_memory_lock sunw_RSA_memory_lock
2862 #pragma redefine_extname RSA_new sunw_RSA_new
2863 #pragma redefine_extname RSA_new_method sunw_RSA_new_method
2864 #pragma redefine_extname RSA_null_method sunw_RSA_null_method
2865 #pragma redefine_extname RSA_padding_add_none sunw_RSA_padding_add_none
2866 #pragma redefine_extname RSA_padding_add_PKCS1_OAEP sunw_RSA_padding_add_PKCS1_OAEP
2867 #pragma redefine_extname RSA_padding_add_PKCS1_PSS sunw_RSA_padding_add_PKCS1_PSS
2868 #pragma redefine_extname RSA_padding_add_PKCS1_PSS_mgf1 sunw_RSA_padding_add_PKCS1_PSS_mgf1
2869 #pragma redefine_extname RSA_padding_add_PKCS1_type_1 sunw_RSA_padding_add_PKCS1_type_1
2870 #pragma redefine_extname RSA_padding_add_PKCS1_type_2 sunw_RSA_padding_add_PKCS1_type_2
2871 #pragma redefine_extname RSA_padding_add_SSLv23 sunw_RSA_padding_add_SSLv23
2872 #pragma redefine_extname RSA_padding_add_X931 sunw_RSA_padding_add_X931
2873 #pragma redefine_extname RSA_padding_check_none sunw_RSA_padding_check_none
2874 #pragma redefine_extname RSA_padding_check_PKCS1_OAEP sunw_RSA_padding_check_PKCS1_OAEP
2875 #pragma redefine_extname RSA_padding_check_PKCS1_type_1 sunw_RSA_padding_check_PKCS1_type_1
2876 #pragma redefine_extname RSA_padding_check_PKCS1_type_2 sunw_RSA_padding_check_PKCS1_type_2
2877 #pragma redefine_extname RSA_padding_check_SSLv23 sunw_RSA_padding_check_SSLv23
2878 #pragma redefine_extname RSA_padding_check_X931 sunw_RSA_padding_check_X931
2879 #pragma redefine_extname RSA_PKCS1_SSLeay sunw_RSA_PKCS1_SSLeay
2880 #pragma redefine_extname rsa_pkey_meth sunw_rsa_pkey_meth
2881 #pragma redefine_extname RSA_print sunw_RSA_print
2882 #pragma redefine_extname RSA_print_fp sunw_RSA_print_fp
2883 #pragma redefine_extname RSA_private_decrypt sunw_RSA_private_decrypt
2884 #pragma redefine_extname RSA_private_encrypt sunw_RSA_private_encrypt
2885 #pragma redefine_extname RSA_PSS_PARAMS_free sunw_RSA_PSS_PARAMS_free
2886 #pragma redefine_extname RSA_PSS_PARAMS_it sunw_RSA_PSS_PARAMS_it
2887 #pragma redefine_extname RSA_PSS_PARAMS_new sunw_RSA_PSS_PARAMS_new
2888 #pragma redefine_extname RSA_public_decrypt sunw_RSA_public_decrypt
2889 #pragma redefine_extname RSA_public_encrypt sunw_RSA_public_encrypt
2890 #pragma redefine_extname RSA_set_default_method sunw_RSA_set_default_method
2891 #pragma redefine_extname RSA_set_ex_data sunw_RSA_set_ex_data
2892 #pragma redefine_extname RSA_set_method sunw_RSA_set_method
2893 #pragma redefine_extname RSA_setup_blinding sunw_RSA_setup_blinding
2894 #pragma redefine_extname RSA_sign sunw_RSA_sign
2895 #pragma redefine_extname RSA_sign_ASN1_OCTET_STRING sunw_RSA_sign_ASN1_OCTET_STRING
2896 #pragma redefine_extname RSA_size sunw_RSA_size
2897 #pragma redefine_extname RSA_up_ref sunw_RSA_up_ref
2898 #pragma redefine_extname RSA_verify sunw_RSA_verify
2899 #pragma redefine_extname RSA_verify_ASN1_OCTET_STRING sunw_RSA_verify_ASN1_OCTET_STRING

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2900 #pragma redefine_extname RSA_verify_PKCS1_PSS sunw_RSA_verify_PKCS1_PSS
2901 #pragma redefine_extname RSA_verify_PKCS1_PSS_mgf1 sunw_RSA_verify_PKCS1_
2902 #pragma redefine_extname RSA_version sunw_RSA_version
2903 #pragma redefine_extname RSA_X931_hash_id sunw_RSA_X931_hash_id
2904 #pragma redefine_extname RSAPrivateKey_dup sunw_RSAPrivateKey_dup
2905 #pragma redefine_extname RSAPrivateKey_it sunw_RSAPrivateKey_it
2906 #pragma redefine_extname RSAPublicKey_dup sunw_RSAPublicKey_dup
2907 #pragma redefine_extname RSAPublicKey_it sunw_RSAPublicKey_it
2908 #pragma redefine_extname s2i_ASN1_INTEGER sunw_s2i_ASN1_INTEGER
2909 #pragma redefine_extname s2i_ASN1_OCTET_STRING sunw_s2i_ASN1_OCTET_STRING
2910 #pragma redefine_extname SHA sunw_SHA
2911 #pragma redefine_extname SHA_Final sunw_SHA_Final
2912 #pragma redefine_extname SHA_Init sunw_SHA_Init
2913 #pragma redefine_extname SHA_Transform sunw_SHA_Transform
2914 #pragma redefine_extname SHA_Update sunw_SHA_Update
2915 #pragma redefine_extname SHA_version sunw_SHA_version
2916 #pragma redefine_extname SHA1 sunw_SHA1
2917 #pragma redefine_extname sha1_block_data_order sunw_sha1_block_data_order
2918 #pragma redefine_extname SHA1_Final sunw_SHA1_Final
2919 #pragma redefine_extname SHA1_Init sunw_SHA1_Init
2920 #pragma redefine_extname SHA1_Transform sunw_SHA1_Transform
2921 #pragma redefine_extname SHA1_Update sunw_SHA1_Update
2922 #pragma redefine_extname SHA1_version sunw_SHA1_version
2923 #pragma redefine_extname SHA224 sunw_SHA224
2924 #pragma redefine_extname SHA224_Final sunw_SHA224_Final
2925 #pragma redefine_extname SHA224_Init sunw_SHA224_Init
2926 #pragma redefine_extname SHA224_Update sunw_SHA224_Update
2927 #pragma redefine_extname SHA256 sunw_SHA256
2928 #pragma redefine_extname sha256_block_data_order sunw_sha256_block_data_o
2929 #pragma redefine_extname SHA256_Final sunw_SHA256_Final
2930 #pragma redefine_extname SHA256_Init sunw_SHA256_Init
2931 #pragma redefine_extname SHA256_Transform sunw_SHA256_Transform
2932 #pragma redefine_extname SHA256_Update sunw_SHA256_Update
2933 #pragma redefine_extname SHA256_version sunw_SHA256_version
2934 #pragma redefine_extname SHA384 sunw_SHA384
2935 #pragma redefine_extname SHA384_Final sunw_SHA384_Final
2936 #pragma redefine_extname SHA384_Init sunw_SHA384_Init
2937 #pragma redefine_extname SHA384_Update sunw_SHA384_Update
2938 #pragma redefine_extname SHA512 sunw_SHA512
2939 #pragma redefine_extname sha512_block_data_order sunw_sha512_block_data_o
2940 #pragma redefine_extname SHA512_Final sunw_SHA512_Final
2941 #pragma redefine_extname SHA512_Init sunw_SHA512_Init
2942 #pragma redefine_extname SHA512_Transform sunw_SHA512_Transform
2943 #pragma redefine_extname SHA512_Update sunw_SHA512_Update
2944 #pragma redefine_extname SHA512_version sunw_SHA512_version
2945 #pragma redefine_extname sk_delete sunw_sk_delete
2946 #pragma redefine_extname sk_delete_ptr sunw_sk_delete_ptr
2947 #pragma redefine_extname sk_dup sunw_sk_dup
2948 #pragma redefine_extname sk_find sunw_sk_find
2949 #pragma redefine_extname sk_find_ex sunw_sk_find_ex
2950 #pragma redefine_extname sk_free sunw_sk_free
2951 #pragma redefine_extname sk_insert sunw_sk_insert
2952 #pragma redefine_extname sk_is_sorted sunw_sk_is_sorted
2953 #pragma redefine_extname sk_new sunw_sk_new
2954 #pragma redefine_extname sk_new_null sunw_sk_new_null
2955 #pragma redefine_extname sk_num sunw_sk_num
2956 #pragma redefine_extname sk_pop sunw_sk_pop
2957 #pragma redefine_extname sk_pop_free sunw_sk_pop_free
2958 #pragma redefine_extname sk_push sunw_sk_push
2959 #pragma redefine_extname sk_set sunw_sk_set
2960 #pragma redefine_extname sk_set_cmp_func sunw_sk_set_cmp_func
2961 #pragma redefine_extname sk_shift sunw_sk_shift
2962 #pragma redefine_extname sk_sort sunw_sk_sort
2963 #pragma redefine_extname sk_unshift sunw_sk_unshift
2964 #pragma redefine_extname sk_value sunw_sk_value
2965 #pragma redefine_extname sk_zero sunw_sk_zero

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2966 #pragma redefine_extname SMIME_crlf_copy sunw_SMIME_crlf_copy
2967 #pragma redefine_extname SMIME_read_ASN1 sunw_SMIME_read_ASN1
2968 #pragma redefine_extname SMIME_read_CMS sunw_SMIME_read_CMS
2969 #pragma redefine_extname SMIME_read_PKCS7 sunw_SMIME_read_PKCS7
2970 #pragma redefine_extname SMIME_text sunw_SMIME_text
2971 #pragma redefine_extname SMIME_write_ASN1 sunw_SMIME_write_ASN1
2972 #pragma redefine_extname SMIME_write_CMS sunw_SMIME_write_CMS
2973 #pragma redefine_extname SMIME_write_PKCS7 sunw_SMIME_write_PKCS7
2974 #pragma redefine_extname solaris_locking_setup sunw_solaris_locking_setup
2975 #pragma redefine_extname SRP_Calc_A sunw_SRP_Calc_A
2976 #pragma redefine_extname SRP_Calc_B sunw_SRP_Calc_B
2977 #pragma redefine_extname SRP_Calc_client_key sunw_SRP_Calc_client_key
2978 #pragma redefine_extname SRP_Calc_server_key sunw_SRP_Calc_server_key
2979 #pragma redefine_extname SRP_Calc_u sunw_SRP_Calc_u
2980 #pragma redefine_extname SRP_Calc_x sunw_SRP_Calc_x
2981 #pragma redefine_extname SRP_check_known_gN_param sunw_SRP_check_known_gN
2982 #pragma redefine_extname SRP_create_verifier sunw_SRP_create_verifier
2983 #pragma redefine_extname SRP_create_verifier_BN sunw_SRP_create_verifier_
2984 #pragma redefine_extname SRP_get_default_gN sunw_SRP_get_default_gN
2985 #pragma redefine_extname SRP_VBASE_free sunw_SRP_VBASE_free
2986 #pragma redefine_extname SRP_VBASE_get_by_user sunw_SRP_VBASE_get_by_user
2987 #pragma redefine_extname SRP_VBASE_init sunw_SRP_VBASE_init
2988 #pragma redefine_extname SRP_VBASE_new sunw_SRP_VBASE_new
2989 #pragma redefine_extname SRP_Verify_A_mod_N sunw_SRP_Verify_A_mod_N
2990 #pragma redefine_extname SRP_Verify_B_mod_N sunw_SRP_Verify_B_mod_N
2991 #pragma redefine_extname SSLeay sunw_SSLeay
2992 #pragma redefine_extname SSLeay_version sunw_SSLeay_version
2993 #pragma redefine_extname STACK_version sunw_STACK_version
2994 #pragma redefine_extname string_to_hex sunw_string_to_hex
2995 #pragma redefine_extname SXNET_add_id_asc sunw_SXNET_add_id_asc
2996 #pragma redefine_extname SXNET_add_id_INTEGER sunw_SXNET_add_id_INTEGER
2997 #pragma redefine_extname SXNET_add_id_ulong sunw_SXNET_add_id_ulong
2998 #pragma redefine_extname SXNET_free sunw_SXNET_free
2999 #pragma redefine_extname SXNET_get_id_asc sunw_SXNET_get_id_asc
3000 #pragma redefine_extname SXNET_get_id_INTEGER sunw_SXNET_get_id_INTEGER
3001 #pragma redefine_extname SXNET_get_id_ulong sunw_SXNET_get_id_ulong
3002 #pragma redefine_extname SXNET_it sunw_SXNET_it
3003 #pragma redefine_extname SXNET_new sunw_SXNET_new
3004 #pragma redefine_extname SXNETID_free sunw_SXNETID_free
3005 #pragma redefine_extname SXNETID_it sunw_SXNETID_it
3006 #pragma redefine_extname SXNETID_new sunw_SXNETID_new
3007 #pragma redefine_extname tree_find_sk sunw_tree_find_sk
3008 #pragma redefine_extname TS_ACCURACY_dup sunw_TS_ACCURACY_dup
3009 #pragma redefine_extname TS_ACCURACY_free sunw_TS_ACCURACY_free
3010 #pragma redefine_extname TS_ACCURACY_get_micros sunw_TS_ACCURACY_get_micr
3011 #pragma redefine_extname TS_ACCURACY_get_millis sunw_TS_ACCURACY_get_mill
3012 #pragma redefine_extname TS_ACCURACY_get_seconds sunw_TS_ACCURACY_get_sec
3013 #pragma redefine_extname TS_ACCURACY_it sunw_TS_ACCURACY_it
3014 #pragma redefine_extname TS_ACCURACY_new sunw_TS_ACCURACY_new
3015 #pragma redefine_extname TS_ACCURACY_set_micros sunw_TS_ACCURACY_set_micr
3016 #pragma redefine_extname TS_ACCURACY_set_millis sunw_TS_ACCURACY_set_mill
3017 #pragma redefine_extname TS_ACCURACY_set_seconds sunw_TS_ACCURACY_set_sec
3018 #pragma redefine_extname TS_ASN1_INTEGER_print_bio sunw_TS_ASN1_INTEGER_p
3019 #pragma redefine_extname TS_CONF_get_tsa_section sunw_TS_CONF_get_tsa_sec
3020 #pragma redefine_extname TS_CONF_load_cert sunw_TS_CONF_load_cert
3021 #pragma redefine_extname TS_CONF_load_certs sunw_TS_CONF_load_certs
3022 #pragma redefine_extname TS_CONF_load_key sunw_TS_CONF_load_key
3023 #pragma redefine_extname TS_CONF_set_accuracy sunw_TS_CONF_set_accuracy
3024 #pragma redefine_extname TS_CONF_set_certs sunw_TS_CONF_set_certs
3025 #pragma redefine_extname TS_CONF_set_clock_precision_digits sunw_TS_CONF_
3026 #pragma redefine_extname TS_CONF_set_crypto_device sunw_TS_CONF_set_crypt
3027 #pragma redefine_extname TS_CONF_set_def_policy sunw_TS_CONF_set_def_poli
3028 #pragma redefine_extname TS_CONF_set_default_engine sunw_TS_CONF_set_defa
3029 #pragma redefine_extname TS_CONF_set_digests sunw_TS_CONF_set_digests
3030 #pragma redefine_extname TS_CONF_set_ess_cert_id_chain sunw_TS_CONF_set_e
3031 #pragma redefine_extname TS_CONF_set_ordering sunw_TS_CONF_set_ordering

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3032 #pragma redefine_extname TS_CONF_set_policies sunw_TS_CONF_set_policies
3033 #pragma redefine_extname TS_CONF_set_serial sunw_TS_CONF_set_serial
3034 #pragma redefine_extname TS_CONF_set_signer_cert sunw_TS_CONF_set_signer
3035 #pragma redefine_extname TS_CONF_set_signer_key sunw_TS_CONF_set_signer_k
3036 #pragma redefine_extname TS_CONF_set_tsa_name sunw_TS_CONF_set_tsa_name
3037 #pragma redefine_extname TS_ext_print_bio sunw_TS_ext_print_bio
3038 #pragma redefine_extname TS_MSG_IMPRINT_dup sunw_TS_MSG_IMPRINT_dup
3039 #pragma redefine_extname TS_MSG_IMPRINT_free sunw_TS_MSG_IMPRINT_free
3040 #pragma redefine_extname TS_MSG_IMPRINT_get_algo sunw_TS_MSG_IMPRINT_get
3041 #pragma redefine_extname TS_MSG_IMPRINT_get_msg sunw_TS_MSG_IMPRINT_get_m
3042 #pragma redefine_extname TS_MSG_IMPRINT_it sunw_TS_MSG_IMPRINT_it
3043 #pragma redefine_extname TS_MSG_IMPRINT_new sunw_TS_MSG_IMPRINT_new
3044 #pragma redefine_extname TS_MSG_IMPRINT_print_bio sunw_TS_MSG_IMPRINT_pri
3045 #pragma redefine_extname TS_MSG_IMPRINT_set_algo sunw_TS_MSG_IMPRINT_set
3046 #pragma redefine_extname TS_MSG_IMPRINT_set_msg sunw_TS_MSG_IMPRINT_set_m
3047 #pragma redefine_extname TS_OBJ_print_bio sunw_TS_OBJ_print_bio
3048 #pragma redefine_extname TS_REQ_add_ext sunw_TS_REQ_add_ext
3049 #pragma redefine_extname TS_REQ_delete_ext sunw_TS_REQ_delete_ext
3050 #pragma redefine_extname TS_REQ_dup sunw_TS_REQ_dup
3051 #pragma redefine_extname TS_REQ_ext_free sunw_TS_REQ_ext_free
3052 #pragma redefine_extname TS_REQ_free sunw_TS_REQ_free
3053 #pragma redefine_extname TS_REQ_get_cert_req sunw_TS_REQ_get_cert_req
3054 #pragma redefine_extname TS_REQ_get_ext sunw_TS_REQ_get_ext
3055 #pragma redefine_extname TS_REQ_get_ext_by_critical sunw_TS_REQ_get_ext_b
3056 #pragma redefine_extname TS_REQ_get_ext_by_NID sunw_TS_REQ_get_ext_by_NID
3057 #pragma redefine_extname TS_REQ_get_ext_by_OBJ sunw_TS_REQ_get_ext_by_OBJ
3058 #pragma redefine_extname TS_REQ_get_ext_count sunw_TS_REQ_get_ext_count
3059 #pragma redefine_extname TS_REQ_get_ext_d2i sunw_TS_REQ_get_ext_d2i
3060 #pragma redefine_extname TS_REQ_get_exts sunw_TS_REQ_get_exts
3061 #pragma redefine_extname TS_REQ_get_msg_imprint sunw_TS_REQ_get_msg_impri
3062 #pragma redefine_extname TS_REQ_get_nonce sunw_TS_REQ_get_nonce
3063 #pragma redefine_extname TS_REQ_get_policy_id sunw_TS_REQ_get_policy_id
3064 #pragma redefine_extname TS_REQ_get_version sunw_TS_REQ_get_version
3065 #pragma redefine_extname TS_REQ_it sunw_TS_REQ_it
3066 #pragma redefine_extname TS_REQ_new sunw_TS_REQ_new
3067 #pragma redefine_extname TS_REQ_print_bio sunw_TS_REQ_print_bio
3068 #pragma redefine_extname TS_REQ_set_cert_req sunw_TS_REQ_set_cert_req
3069 #pragma redefine_extname TS_REQ_set_msg_imprint sunw_TS_REQ_set_msg_impri
3070 #pragma redefine_extname TS_REQ_set_nonce sunw_TS_REQ_set_nonce
3071 #pragma redefine_extname TS_REQ_set_policy_id sunw_TS_REQ_set_policy_id
3072 #pragma redefine_extname TS_REQ_set_version sunw_TS_REQ_set_version
3073 #pragma redefine_extname TS_REQ_to_TS_VERIFY_CTX sunw_TS_REQ_to_TS_VERIFY
3074 #pragma redefine_extname TS_RESP_create_response sunw_TS_RESP_create_resp
3075 #pragma redefine_extname TS_RESP_CTX_add_failure_info sunw_TS_RESP_CTX_ad
3076 #pragma redefine_extname TS_RESP_CTX_add_flags sunw_TS_RESP_CTX_add_flags
3077 #pragma redefine_extname TS_RESP_CTX_add_md sunw_TS_RESP_CTX_add_md
3078 #pragma redefine_extname TS_RESP_CTX_add_policy sunw_TS_RESP_CTX_add_poli
3079 #pragma redefine_extname TS_RESP_CTX_free sunw_TS_RESP_CTX_free
3080 #pragma redefine_extname TS_RESP_CTX_get_request sunw_TS_RESP_CTX_get_req
3081 #pragma redefine_extname TS_RESP_CTX_get_tst_info sunw_TS_RESP_CTX_get_ts
3082 #pragma redefine_extname TS_RESP_CTX_new sunw_TS_RESP_CTX_new
3083 #pragma redefine_extname TS_RESP_CTX_set_accuracy sunw_TS_RESP_CTX_set_ac
3084 #pragma redefine_extname TS_RESP_CTX_set_certs sunw_TS_RESP_CTX_set_certs
3085 #pragma redefine_extname TS_RESP_CTX_set_clock_precision_digits sunw_TS_R
3086 #pragma redefine_extname TS_RESP_CTX_set_def_policy sunw_TS_RESP_CTX_set
3087 #pragma redefine_extname TS_RESP_CTX_set_extension_cb sunw_TS_RESP_CTX_se
3088 #pragma redefine_extname TS_RESP_CTX_set_serial_cb sunw_TS_RESP_CTX_set_s
3089 #pragma redefine_extname TS_RESP_CTX_set_signer_cert sunw_TS_RESP_CTX_set
3090 #pragma redefine_extname TS_RESP_CTX_set_signer_key sunw_TS_RESP_CTX_set
3091 #pragma redefine_extname TS_RESP_CTX_set_status_info sunw_TS_RESP_CTX_set
3092 #pragma redefine_extname TS_RESP_CTX_set_status_info_cond sunw_TS_RESP_CT
3093 #pragma redefine_extname TS_RESP_CTX_set_time_cb sunw_TS_RESP_CTX_set_tim
3094 #pragma redefine_extname TS_RESP_dup sunw_TS_RESP_dup
3095 #pragma redefine_extname TS_RESP_free sunw_TS_RESP_free
3096 #pragma redefine_extname TS_RESP_get_status_info sunw_TS_RESP_get_status
3097 #pragma redefine_extname TS_RESP_get_token sunw_TS_RESP_get_token

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3098 #pragma redefine_extname TS_RESP_get_tst_info sunw_TS_RESP_get_tst_info
3099 #pragma redefine_extname TS_RESP_it sunw_TS_RESP_it
3100 #pragma redefine_extname TS_RESP_new sunw_TS_RESP_new
3101 #pragma redefine_extname TS_RESP_print_bio sunw_TS_RESP_print_bio
3102 #pragma redefine_extname TS_RESP_set_status_info sunw_TS_RESP_set_status
3103 #pragma redefine_extname TS_RESP_set_tst_info sunw_TS_RESP_set_tst_info
3104 #pragma redefine_extname TS_RESP_verify_response sunw_TS_RESP_verify_resp
3105 #pragma redefine_extname TS_RESP_verify_signature sunw_TS_RESP_verify_sig
3106 #pragma redefine_extname TS_RESP_verify_token sunw_TS_RESP_verify_token
3107 #pragma redefine_extname TS_STATUS_INFO_dup sunw_TS_STATUS_INFO_dup
3108 #pragma redefine_extname TS_STATUS_INFO_free sunw_TS_STATUS_INFO_free
3109 #pragma redefine_extname TS_STATUS_INFO_it sunw_TS_STATUS_INFO_it
3110 #pragma redefine_extname TS_STATUS_INFO_new sunw_TS_STATUS_INFO_new
3111 #pragma redefine_extname TS_STATUS_INFO_print_bio sunw_TS_STATUS_INFO_pri
3112 #pragma redefine_extname TS_TST_INFO_add_ext sunw_TS_TST_INFO_add_ext
3113 #pragma redefine_extname TS_TST_INFO_delete_ext sunw_TS_TST_INFO_delete_e
3114 #pragma redefine_extname TS_TST_INFO_dup sunw_TS_TST_INFO_dup
3115 #pragma redefine_extname TS_TST_INFO_ext_free sunw_TS_TST_INFO_ext_free
3116 #pragma redefine_extname TS_TST_INFO_free sunw_TS_TST_INFO_free
3117 #pragma redefine_extname TS_TST_INFO_get_accuracy sunw_TS_TST_INFO_get_ac
3118 #pragma redefine_extname TS_TST_INFO_get_ext sunw_TS_TST_INFO_get_ext
3119 #pragma redefine_extname TS_TST_INFO_get_ext_by_critical sunw_TS_TST_INFO
3120 #pragma redefine_extname TS_TST_INFO_get_ext_by_NID sunw_TS_TST_INFO_get
3121 #pragma redefine_extname TS_TST_INFO_get_ext_by_OBJ sunw_TS_TST_INFO_get
3122 #pragma redefine_extname TS_TST_INFO_get_ext_count sunw_TS_TST_INFO_get_e
3123 #pragma redefine_extname TS_TST_INFO_get_ext_d2i sunw_TS_TST_INFO_get_ext
3124 #pragma redefine_extname TS_TST_INFO_get_exts sunw_TS_TST_INFO_get_exts
3125 #pragma redefine_extname TS_TST_INFO_get_msg_imprint sunw_TS_TST_INFO_get
3126 #pragma redefine_extname TS_TST_INFO_get_nonce sunw_TS_TST_INFO_get_nonce
3127 #pragma redefine_extname TS_TST_INFO_get_ordering sunw_TS_TST_INFO_get_or
3128 #pragma redefine_extname TS_TST_INFO_get_policy_id sunw_TS_TST_INFO_get_p
3129 #pragma redefine_extname TS_TST_INFO_get_serial sunw_TS_TST_INFO_get_seri
3130 #pragma redefine_extname TS_TST_INFO_get_time sunw_TS_TST_INFO_get_time
3131 #pragma redefine_extname TS_TST_INFO_get_tsa sunw_TS_TST_INFO_get_tsa
3132 #pragma redefine_extname TS_TST_INFO_get_version sunw_TS_TST_INFO_get_ver
3133 #pragma redefine_extname TS_TST_INFO_it sunw_TS_TST_INFO_it
3134 #pragma redefine_extname TS_TST_INFO_new sunw_TS_TST_INFO_new
3135 #pragma redefine_extname TS_TST_INFO_print_bio sunw_TS_TST_INFO_print_bio
3136 #pragma redefine_extname TS_TST_INFO_set_accuracy sunw_TS_TST_INFO_set_ac
3137 #pragma redefine_extname TS_TST_INFO_set_msg_imprint sunw_TS_TST_INFO_set
3138 #pragma redefine_extname TS_TST_INFO_set_nonce sunw_TS_TST_INFO_set_nonce
3139 #pragma redefine_extname TS_TST_INFO_set_ordering sunw_TS_TST_INFO_set_or
3140 #pragma redefine_extname TS_TST_INFO_set_policy_id sunw_TS_TST_INFO_set_p
3141 #pragma redefine_extname TS_TST_INFO_set_serial sunw_TS_TST_INFO_set_seri
3142 #pragma redefine_extname TS_TST_INFO_set_time sunw_TS_TST_INFO_set_time
3143 #pragma redefine_extname TS_TST_INFO_set_tsa sunw_TS_TST_INFO_set_tsa
3144 #pragma redefine_extname TS_TST_INFO_set_version sunw_TS_TST_INFO_set_ver
3145 #pragma redefine_extname TS_VERIFY_CTX_cleanup sunw_TS_VERIFY_CTX_cleanup
3146 #pragma redefine_extname TS_VERIFY_CTX_free sunw_TS_VERIFY_CTX_free
3147 #pragma redefine_extname TS_VERIFY_CTX_init sunw_TS_VERIFY_CTX_init
3148 #pragma redefine_extname TS_VERIFY_CTX_new sunw_TS_VERIFY_CTX_new
3149 #pragma redefine_extname TS_X509_ALGOR_print_bio sunw_TS_X509_ALGOR_print
3150 #pragma redefine_extname TXT_DB_create_index sunw_TXT_DB_create_index
3151 #pragma redefine_extname TXT_DB_free sunw_TXT_DB_free
3152 #pragma redefine_extname TXT_DB_get_by_index sunw_TXT_DB_get_by_index
3153 #pragma redefine_extname TXT_DB_insert sunw_TXT_DB_insert
3154 #pragma redefine_extname TXT_DB_read sunw_TXT_DB_read
3155 #pragma redefine_extname TXT_DB_version sunw_TXT_DB_version
3156 #pragma redefine_extname TXT_DB_write sunw_TXT_DB_write
3157 #pragma redefine_extname UI_add_error_string sunw_UI_add_error_string
3158 #pragma redefine_extname UI_add_info_string sunw_UI_add_info_string
3159 #pragma redefine_extname UI_add_input_boolean sunw_UI_add_input_boolean
3160 #pragma redefine_extname UI_add_input_string sunw_UI_add_input_string
3161 #pragma redefine_extname UI_add_user_data sunw_UI_add_user_data
3162 #pragma redefine_extname UI_add_verify_string sunw_UI_add_verify_string
3163 #pragma redefine_extname UI_construct_prompt sunw_UI_construct_prompt

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3164 #pragma redefine_extname UI_create_method sunw_UI_create_method
3165 #pragma redefine_extname UI_ctrl sunw_UI_ctrl
3166 #pragma redefine_extname UI_destroy_method sunw_UI_destroy_method
3167 #pragma redefine_extname UI_dup_error_string sunw_UI_dup_error_string
3168 #pragma redefine_extname UI_dup_info_string sunw_UI_dup_info_string
3169 #pragma redefine_extname UI_dup_input_boolean sunw_UI_dup_input_boolean
3170 #pragma redefine_extname UI_dup_input_string sunw_UI_dup_input_string
3171 #pragma redefine_extname UI_dup_verify_string sunw_UI_dup_verify_string
3172 #pragma redefine_extname UI_free sunw_UI_free
3173 #pragma redefine_extname UI_get_default_method sunw_UI_get_default_method
3174 #pragma redefine_extname UI_get_ex_data sunw_UI_get_ex_data
3175 #pragma redefine_extname UI_get_ex_new_index sunw_UI_get_ex_new_index
3176 #pragma redefine_extname UI_get_input_flags sunw_UI_get_input_flags
3177 #pragma redefine_extname UI_get_method sunw_UI_get_method
3178 #pragma redefine_extname UI_get_result_maxsize sunw_UI_get_result_maxsize
3179 #pragma redefine_extname UI_get_result_minsize sunw_UI_get_result_minsize
3180 #pragma redefine_extname UI_get_string_type sunw_UI_get_string_type
3181 #pragma redefine_extname UI_get0_action_string sunw_UI_get0_action_string
3182 #pragma redefine_extname UI_get0_output_string sunw_UI_get0_output_string
3183 #pragma redefine_extname UI_get0_result_string sunw_UI_get0_result_string
3184 #pragma redefine_extname UI_get0_result_string sunw_UI_get0_result_string
3185 #pragma redefine_extname UI_get0_test_string sunw_UI_get0_test_string
3186 #pragma redefine_extname UI_get0_user_data sunw_UI_get0_user_data
3187 #pragma redefine_extname UI_method_get_closer sunw_UI_method_get_closer
3188 #pragma redefine_extname UI_method_get_flusher sunw_UI_method_get_flusher
3189 #pragma redefine_extname UI_method_get_opener sunw_UI_method_get_opener
3190 #pragma redefine_extname UI_method_get_prompt_constructor sunw_UI_method_
3191 #pragma redefine_extname UI_method_get_reader sunw_UI_method_get_reader
3192 #pragma redefine_extname UI_method_get_writer sunw_UI_method_get_writer
3193 #pragma redefine_extname UI_method_set_closer sunw_UI_method_set_closer
3194 #pragma redefine_extname UI_method_set_flusher sunw_UI_method_set_flusher
3195 #pragma redefine_extname UI_method_set_opener sunw_UI_method_set_opener
3196 #pragma redefine_extname UI_method_set_prompt_constructor sunw_UI_method_
3197 #pragma redefine_extname UI_method_set_reader sunw_UI_method_set_reader
3198 #pragma redefine_extname UI_method_set_writer sunw_UI_method_set_writer
3199 #pragma redefine_extname UI_new sunw_UI_new
3200 #pragma redefine_extname UI_new_method sunw_UI_new_method
3201 #pragma redefine_extname UI_OpenSSL sunw_UI_OpenSSL
3202 #pragma redefine_extname UI_process sunw_UI_process
3203 #pragma redefine_extname UI_set_default_method sunw_UI_set_default_method
3204 #pragma redefine_extname UI_set_ex_data sunw_UI_set_ex_data
3205 #pragma redefine_extname UI_set_method sunw_UI_set_method
3206 #pragma redefine_extname UI_set_result sunw_UI_set_result
3207 #pragma redefine_extname UI_UTIL_read_pw sunw_UI_UTIL_read_pw
3208 #pragma redefine_extname UI_UTIL_read_pw_string sunw_UI_UTIL_read_pw_stri
3209 #pragma redefine_extname USERNOTICE_free sunw_USERNOTICE_free
3210 #pragma redefine_extname USERNOTICE_it sunw_USERNOTICE_it
3211 #pragma redefine_extname USERNOTICE_new sunw_USERNOTICE_new
3212 #pragma redefine_extname UTF8_getc sunw_UTF8_getc
3213 #pragma redefine_extname UTF8_putc sunw_UTF8_putc
3214 #pragma redefine_extname v2i_ASN1_BIT_STRING sunw_v2i_ASN1_BIT_STRING
3215 #pragma redefine_extname v2i_GENERAL_NAME sunw_v2i_GENERAL_NAME
3216 #pragma redefine_extname v2i_GENERAL_NAME_ex sunw_v2i_GENERAL_NAME_ex
3217 #pragma redefine_extname v2i_GENERAL_NAMES sunw_v2i_GENERAL_NAMES
3218 #pragma redefine_extname v3_akey_id sunw_v3_akey_id
3219 #pragma redefine_extname v3_alt sunw_v3_alt
3220 #pragma redefine_extname v3_bcons sunw_v3_bcons
3221 #pragma redefine_extname v3_cpols sunw_v3_cpols
3222 #pragma redefine_extname v3_crl_hold sunw_v3_crl_hold
3223 #pragma redefine_extname v3_crl_invdate sunw_v3_crl_invdate
3224 #pragma redefine_extname v3_crl_num sunw_v3_crl_num
3225 #pragma redefine_extname v3_crl_reason sunw_v3_crl_reason
3226 #pragma redefine_extname v3_crlid sunw_v3_crlid
3227 #pragma redefine_extname v3_delta_crl sunw_v3_delta_crl
3228 #pragma redefine_extname v3_ext_ku sunw_v3_ext_ku
3229 #pragma redefine_extname v3_freshest_crl sunw_v3_freshest_crl

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3230 #pragma redefine_extname v3_idp sunw_v3_idp
3231 #pragma redefine_extname v3_info sunw_v3_info
3232 #pragma redefine_extname v3_inhibit_anyp sunw_v3_inhibit_anyp
3233 #pragma redefine_extname v3_key_usage sunw_v3_key_usage
3234 #pragma redefine_extname v3_name_constraints sunw_v3_name_constraints
3235 #pragma redefine_extname v3_ns_ia5_list sunw_v3_ns_ia5_list
3236 #pragma redefine_extname v3_nscert sunw_v3_nscert
3237 #pragma redefine_extname v3_ocsp_accresp sunw_v3_ocsp_accresp
3238 #pragma redefine_extname v3_ocsp_acutoff sunw_v3_ocsp_acutoff
3239 #pragma redefine_extname v3_ocsp_crlid sunw_v3_ocsp_crlid
3240 #pragma redefine_extname v3_ocsp_noccheck sunw_v3_ocsp_noccheck
3241 #pragma redefine_extname v3_ocsp_nonce sunw_v3_ocsp_nonce
3242 #pragma redefine_extname v3_ocsp_serviceloc sunw_v3_ocsp_serviceloc
3243 #pragma redefine_extname v3_pci sunw_v3_pci
3244 #pragma redefine_extname v3_pkey_usage_period sunw_v3_pkey_usage_period
3245 #pragma redefine_extname v3_policy_constraints sunw_v3_policy_constraints
3246 #pragma redefine_extname v3_policy_mappings sunw_v3_policy_mappings
3247 #pragma redefine_extname v3_sinfo sunw_v3_sinfo
3248 #pragma redefine_extname v3_skey_id sunw_v3_skey_id
3249 #pragma redefine_extname v3_sxnet sunw_v3_sxnet
3250 #pragma redefine_extname vpaes_cbc_encrypt sunw_vpaes_cbc_encrypt
3251 #pragma redefine_extname vpaes_decrypt sunw_vpaes_decrypt
3252 #pragma redefine_extname vpaes_encrypt sunw_vpaes_encrypt
3253 #pragma redefine_extname vpaes_set_decrypt_key sunw_vpaes_set_decrypt_key
3254 #pragma redefine_extname vpaes_set_encrypt_key sunw_vpaes_set_encrypt_key
3255 #pragma redefine_extname X509_add_ext sunw_X509_add_ext
3256 #pragma redefine_extname X509_add1_ext_i2d sunw_X509_add1_ext_i2d
3257 #pragma redefine_extname X509_add1_reject_object sunw_X509_add1_reject_ob
3258 #pragma redefine_extname X509_add1_trust_object sunw_X509_add1_trust_obje
3259 #pragma redefine_extname X509_ALGOR_dup sunw_X509_ALGOR_dup
3260 #pragma redefine_extname X509_ALGOR_free sunw_X509_ALGOR_free
3261 #pragma redefine_extname X509_ALGOR_get0 sunw_X509_ALGOR_get0
3262 #pragma redefine_extname X509_ALGOR_it sunw_X509_ALGOR_it
3263 #pragma redefine_extname X509_ALGOR_new sunw_X509_ALGOR_new
3264 #pragma redefine_extname X509_ALGOR_set_md sunw_X509_ALGOR_set_md
3265 #pragma redefine_extname X509_ALGOR_set0 sunw_X509_ALGOR_set0
3266 #pragma redefine_extname X509_ALGORS_it sunw_X509_ALGORS_it
3267 #pragma redefine_extname X509_alias_get0 sunw_X509_alias_get0
3268 #pragma redefine_extname X509_alias_set1 sunw_X509_alias_set1
3269 #pragma redefine_extname X509_ATTRIBUTE_count sunw_X509_ATTRIBUTE_count
3270 #pragma redefine_extname X509_ATTRIBUTE_create sunw_X509_ATTRIBUTE_create
3271 #pragma redefine_extname X509_ATTRIBUTE_create_by_NID sunw_X509_ATTRIBUTE
3272 #pragma redefine_extname X509_ATTRIBUTE_create_by_OBJ sunw_X509_ATTRIBUTE
3273 #pragma redefine_extname X509_ATTRIBUTE_create_by_txt sunw_X509_ATTRIBUTE
3274 #pragma redefine_extname X509_ATTRIBUTE_dup sunw_X509_ATTRIBUTE_dup
3275 #pragma redefine_extname X509_ATTRIBUTE_free sunw_X509_ATTRIBUTE_free
3276 #pragma redefine_extname X509_ATTRIBUTE_get0_data sunw_X509_ATTRIBUTE_get
3277 #pragma redefine_extname X509_ATTRIBUTE_get0_object sunw_X509_ATTRIBUTE_g
3278 #pragma redefine_extname X509_ATTRIBUTE_get0_type sunw_X509_ATTRIBUTE_get
3279 #pragma redefine_extname X509_ATTRIBUTE_it sunw_X509_ATTRIBUTE_it
3280 #pragma redefine_extname X509_ATTRIBUTE_new sunw_X509_ATTRIBUTE_new
3281 #pragma redefine_extname X509_ATTRIBUTE_SET_it sunw_X509_ATTRIBUTE_SET_it
3282 #pragma redefine_extname X509_ATTRIBUTE_set1_data sunw_X509_ATTRIBUTE_set
3283 #pragma redefine_extname X509_ATTRIBUTE_set1_object sunw_X509_ATTRIBUTE_s
3284 #pragma redefine_extname X509_CERT_AUX_free sunw_X509_CERT_AUX_free
3285 #pragma redefine_extname X509_CERT_AUX_it sunw_X509_CERT_AUX_it
3286 #pragma redefine_extname X509_CERT_AUX_new sunw_X509_CERT_AUX_new
3287 #pragma redefine_extname X509_CERT_AUX_print sunw_X509_CERT_AUX_print
3288 #pragma redefine_extname X509_CERT_PAIR_free sunw_X509_CERT_PAIR_free
3289 #pragma redefine_extname X509_CERT_PAIR_it sunw_X509_CERT_PAIR_it
3290 #pragma redefine_extname X509_CERT_PAIR_new sunw_X509_CERT_PAIR_new
3291 #pragma redefine_extname X509_certificate_type sunw_X509_certificate_type
3292 #pragma redefine_extname X509_check_akid sunw_X509_check_akid
3293 #pragma redefine_extname X509_check_ca sunw_X509_check_ca
3294 #pragma redefine_extname X509_check_issued sunw_X509_check_issued
3295 #pragma redefine_extname X509_check_private_key sunw_X509_check_private_k

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3296 #pragma redefine_extname X509_check_purpose sunw_X509_check_purpose
3297 #pragma redefine_extname X509_check_trust sunw_X509_check_trust
3298 #pragma redefine_extname X509_CINF_free sunw_X509_CINF_free
3299 #pragma redefine_extname X509_CINF_it sunw_X509_CINF_it
3300 #pragma redefine_extname X509_CINF_new sunw_X509_CINF_new
3301 #pragma redefine_extname X509_cmp sunw_X509_cmp
3302 #pragma redefine_extname X509_cmp_current_time sunw_X509_cmp_current_time
3303 #pragma redefine_extname X509_cmp_time sunw_X509_cmp_time
3304 #pragma redefine_extname X509_CRL_add_ext sunw_X509_CRL_add_ext
3305 #pragma redefine_extname X509_CRL_add0_revoked sunw_X509_CRL_add0_revoked
3306 #pragma redefine_extname X509_CRL_add1_ext_i2d sunw_X509_CRL_add1_ext_i2d
3307 #pragma redefine_extname X509_CRL_cmp sunw_X509_CRL_cmp
3308 #pragma redefine_extname X509_CRL_delete_ext sunw_X509_CRL_delete_ext
3309 #pragma redefine_extname X509_CRL_digest sunw_X509_CRL_digest
3310 #pragma redefine_extname X509_CRL_dup sunw_X509_CRL_dup
3311 #pragma redefine_extname X509_CRL_free sunw_X509_CRL_free
3312 #pragma redefine_extname X509_CRL_get_ext sunw_X509_CRL_get_ext
3313 #pragma redefine_extname X509_CRL_get_ext_by_critical sunw_X509_CRL_get_e
3314 #pragma redefine_extname X509_CRL_get_ext_by_NID sunw_X509_CRL_get_ext_by
3315 #pragma redefine_extname X509_CRL_get_ext_by_OBJ sunw_X509_CRL_get_ext_by
3316 #pragma redefine_extname X509_CRL_get_ext_count sunw_X509_CRL_get_ext_cou
3317 #pragma redefine_extname X509_CRL_get_ext_d2i sunw_X509_CRL_get_ext_d2i
3318 #pragma redefine_extname X509_CRL_get_meth data sunw_X509_CRL_get_meth_da
3319 #pragma redefine_extname X509_CRL_get0_by_cert sunw_X509_CRL_get0_by_cert
3320 #pragma redefine_extname X509_CRL_get0_by_serial sunw_X509_CRL_get0_by_se
3321 #pragma redefine_extname X509_CRL_INFO_free sunw_X509_CRL_INFO_free
3322 #pragma redefine_extname X509_CRL_INFO_it sunw_X509_CRL_INFO_it
3323 #pragma redefine_extname X509_CRL_INFO_new sunw_X509_CRL_INFO_new
3324 #pragma redefine_extname X509_CRL_it sunw_X509_CRL_it
3325 #pragma redefine_extname X509_CRL_match sunw_X509_CRL_match
3326 #pragma redefine_extname X509_CRL_METHOD_free sunw_X509_CRL_METHOD_free
3327 #pragma redefine_extname X509_CRL_METHOD_new sunw_X509_CRL_METHOD_new
3328 #pragma redefine_extname X509_CRL_new sunw_X509_CRL_new
3329 #pragma redefine_extname X509_CRL_print sunw_X509_CRL_print
3330 #pragma redefine_extname X509_CRL_print_fp sunw_X509_CRL_print_fp
3331 #pragma redefine_extname X509_CRL_set_default_method sunw_X509_CRL_set_de
3332 #pragma redefine_extname X509_CRL_set_issuer_name sunw_X509_CRL_set_issuer
3333 #pragma redefine_extname X509_CRL_set_lastUpdate sunw_X509_CRL_set_lastUp
3334 #pragma redefine_extname X509_CRL_set_meth data sunw_X509_CRL_set_meth_da
3335 #pragma redefine_extname X509_CRL_set_nextUpdate sunw_X509_CRL_set_nextUp
3336 #pragma redefine_extname X509_CRL_set_version sunw_X509_CRL_set_version
3337 #pragma redefine_extname X509_CRL_sign sunw_X509_CRL_sign
3338 #pragma redefine_extname X509_CRL_sign_ctx sunw_X509_CRL_sign_ctx
3339 #pragma redefine_extname X509_CRL_sort sunw_X509_CRL_sort
3340 #pragma redefine_extname X509_CRL_verify sunw_X509_CRL_verify
3341 #pragma redefine_extname X509_delete_ext sunw_X509_delete_ext
3342 #pragma redefine_extname X509_digest sunw_X509_digest
3343 #pragma redefine_extname X509_dir_lookup sunw_X509_dir_lookup
3344 #pragma redefine_extname X509_dup sunw_X509_dup
3345 #pragma redefine_extname X509_email_free sunw_X509_email_free
3346 #pragma redefine_extname X509_EXTENSION_create_by_NID sunw_X509_EXTENSION
3347 #pragma redefine_extname X509_EXTENSION_create_by_OBJ sunw_X509_EXTENSION
3348 #pragma redefine_extname X509_EXTENSION_dup sunw_X509_EXTENSION_dup
3349 #pragma redefine_extname X509_EXTENSION_free sunw_X509_EXTENSION_free
3350 #pragma redefine_extname X509_EXTENSION_get_critical sunw_X509_EXTENSION_
3351 #pragma redefine_extname X509_EXTENSION_get_data sunw_X509_EXTENSION_get_
3352 #pragma redefine_extname X509_EXTENSION_get_object sunw_X509_EXTENSION_ge
3353 #pragma redefine_extname X509_EXTENSION_it sunw_X509_EXTENSION_it
3354 #pragma redefine_extname X509_EXTENSION_new sunw_X509_EXTENSION_new
3355 #pragma redefine_extname X509_EXTENSION_set_critical sunw_X509_EXTENSION_
3356 #pragma redefine_extname X509_EXTENSION_set_data sunw_X509_EXTENSION_set_
3357 #pragma redefine_extname X509_EXTENSION_set_object sunw_X509_EXTENSION_se
3358 #pragma redefine_extname X509_EXTENSIONS_it sunw_X509_EXTENSIONS_it
3359 #pragma redefine_extname X509_file_lookup sunw_X509_file_lookup
3360 #pragma redefine_extname X509_find_by_issuer_and_serial sunw_X509_find_by
3361 #pragma redefine_extname X509_find_by_subject sunw_X509_find_by_subject
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3362 #pragma redefine_extname X509_free sunw_X509_free
3363 #pragma redefine_extname X509_get_default_cert_area sunw_X509_get_default
3364 #pragma redefine_extname X509_get_default_cert_dir sunw_X509_get_default_
3365 #pragma redefine_extname X509_get_default_cert_dir_env sunw_X509_get_defa
3366 #pragma redefine_extname X509_get_default_cert_file sunw_X509_get_default
3367 #pragma redefine_extname X509_get_default_cert_file_env sunw_X509_get_def
3368 #pragma redefine_extname X509_get_default_private_dir sunw_X509_get_defau
3369 #pragma redefine_extname X509_get_ex_data sunw_X509_get_ex_data
3370 #pragma redefine_extname X509_get_ex_new_index sunw_X509_get_ex_new_index
3371 #pragma redefine_extname X509_get_ext sunw_X509_get_ext
3372 #pragma redefine_extname X509_get_ext_by_critical sunw_X509_get_ext_by_cr
3373 #pragma redefine_extname X509_get_ext_by_NID sunw_X509_get_ext_by_NID
3374 #pragma redefine_extname X509_get_ext_by_OBJ sunw_X509_get_ext_by_OBJ
3375 #pragma redefine_extname X509_get_ext_count sunw_X509_get_ext_count
3376 #pragma redefine_extname X509_get_ext_d2i sunw_X509_get_ext_d2i
3377 #pragma redefine_extname X509_get_issuer_name sunw_X509_get_issuer_name
3378 #pragma redefine_extname X509_get_pubkey sunw_X509_get_pubkey
3379 #pragma redefine_extname X509_get_pubkey_parameters sunw_X509_get_pubkey_
3380 #pragma redefine_extname X509_get_serialNumber sunw_X509_get_serialNumber
3381 #pragma redefine_extname X509_get_subject_name sunw_X509_get_subject_name
3382 #pragma redefine_extname X509_get0_pubkey_bitstr sunw_X509_get0_pubkey_bi
3383 #pragma redefine_extname X509_get1_email sunw_X509_get1_email
3384 #pragma redefine_extname X509_get1_ocsp sunw_X509_get1_ocsp
3385 #pragma redefine_extname X509_gmtime_adj sunw_X509_gmtime_adj
3386 #pragma redefine_extname X509_INFO_free sunw_X509_INFO_free
3387 #pragma redefine_extname X509_INFO_new sunw_X509_INFO_new
3388 #pragma redefine_extname X509_issuer_and_serial_cmp sunw_X509_issuer_and
3389 #pragma redefine_extname X509_issuer_and_serial_hash sunw_X509_issuer_and
3390 #pragma redefine_extname X509_issuer_name_cmp sunw_X509_issuer_name_cmp
3391 #pragma redefine_extname X509_issuer_name_hash sunw_X509_issuer_name_hash
3392 #pragma redefine_extname X509_issuer_name_hash_old sunw_X509_issuer_name_
3393 #pragma redefine_extname X509_it sunw_X509_it
3394 #pragma redefine_extname X509_keyid_get0 sunw_X509_keyid_get0
3395 #pragma redefine_extname X509_keyid_set1 sunw_X509_keyid_set1
3396 #pragma redefine_extname X509_load_cert_crl_file sunw_X509_load_cert_crl_
3397 #pragma redefine_extname X509_load_cert_file sunw_X509_load_cert_file
3398 #pragma redefine_extname X509_load_crl_file sunw_X509_load_crl_file
3399 #pragma redefine_extname X509_LOOKUP_by_alias sunw_X509_LOOKUP_by_alias
3400 #pragma redefine_extname X509_LOOKUP_by_fingerprint sunw_X509_LOOKUP_by_f
3401 #pragma redefine_extname X509_LOOKUP_by_issuer_serial sunw_X509_LOOKUP_by_
3402 #pragma redefine_extname X509_LOOKUP_by_subject sunw_X509_LOOKUP_by_subje
3403 #pragma redefine_extname X509_LOOKUP_ctrl sunw_X509_LOOKUP_ctrl
3404 #pragma redefine_extname X509_LOOKUP_file sunw_X509_LOOKUP_file
3405 #pragma redefine_extname X509_LOOKUP_free sunw_X509_LOOKUP_free
3406 #pragma redefine_extname X509_LOOKUP_hash_dir sunw_X509_LOOKUP_hash_dir
3407 #pragma redefine_extname X509_LOOKUP_init sunw_X509_LOOKUP_init
3408 #pragma redefine_extname X509_LOOKUP_new sunw_X509_LOOKUP_new
3409 #pragma redefine_extname X509_LOOKUP_shutdown sunw_X509_LOOKUP_shutdown
3410 #pragma redefine_extname X509_NAME_add_entry sunw_X509_NAME_add_entry
3411 #pragma redefine_extname X509_NAME_add_entry_by_NID sunw_X509_NAME_add_en
3412 #pragma redefine_extname X509_NAME_add_entry_by_OBJ sunw_X509_NAME_add_en
3413 #pragma redefine_extname X509_NAME_add_entry_by_txt sunw_X509_NAME_add_en
3414 #pragma redefine_extname X509_NAME_cmp sunw_X509_NAME_cmp
3415 #pragma redefine_extname X509_NAME_delete_entry sunw_X509_NAME_delete_ent
3416 #pragma redefine_extname X509_NAME_digest sunw_X509_NAME_digest
3417 #pragma redefine_extname X509_NAME_dup sunw_X509_NAME_dup
3418 #pragma redefine_extname X509_NAME_ENTRIES_it sunw_X509_NAME_ENTRIES_it
3419 #pragma redefine_extname X509_NAME_entry_count sunw_X509_NAME_entry_count
3420 #pragma redefine_extname X509_NAME_ENTRY_create_by_NID sunw_X509_NAME_ENT
3421 #pragma redefine_extname X509_NAME_ENTRY_create_by_OBJ sunw_X509_NAME_ENT
3422 #pragma redefine_extname X509_NAME_ENTRY_create_by_txt sunw_X509_NAME_ENT
3423 #pragma redefine_extname X509_NAME_ENTRY_dup sunw_X509_NAME_ENTRY_dup
3424 #pragma redefine_extname X509_NAME_ENTRY_free sunw_X509_NAME_ENTRY_free
3425 #pragma redefine_extname X509_NAME_ENTRY_get_data sunw_X509_NAME_ENTRY_ge
3426 #pragma redefine_extname X509_NAME_ENTRY_get_object sunw_X509_NAME_ENTRY_
3427 #pragma redefine_extname X509_NAME_ENTRY_it sunw_X509_NAME_ENTRY_it
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3428 #pragma redefine_extname X509_NAME_ENTRY_new sunw_X509_NAME_ENTRY_new
3429 #pragma redefine_extname X509_NAME_ENTRY_set_data sunw_X509_NAME_ENTRY_se
3430 #pragma redefine_extname X509_NAME_ENTRY_set_object sunw_X509_NAME_ENTRY_
3431 #pragma redefine_extname x509_name_ff sunw_x509_name_ff
3432 #pragma redefine_extname X509_NAME_free sunw_X509_NAME_free
3433 #pragma redefine_extname X509_NAME_get_entry sunw_X509_NAME_get_entry
3434 #pragma redefine_extname X509_NAME_get_index_by_NID sunw_X509_NAME_get_in
3435 #pragma redefine_extname X509_NAME_get_index_by_OBJ sunw_X509_NAME_get_in
3436 #pragma redefine_extname X509_NAME_get_text_by_NID sunw_X509_NAME_get_tex
3437 #pragma redefine_extname X509_NAME_get_text_by_OBJ sunw_X509_NAME_get_tex
3438 #pragma redefine_extname X509_NAME_hash sunw_X509_NAME_hash
3439 #pragma redefine_extname X509_NAME_hash_old sunw_X509_NAME_hash_old
3440 #pragma redefine_extname X509_NAME_INTERNAL_it sunw_X509_NAME_INTERNAL_it
3441 #pragma redefine_extname X509_NAME_it sunw_X509_NAME_it
3442 #pragma redefine_extname X509_NAME_new sunw_X509_NAME_new
3443 #pragma redefine_extname X509_NAME_oneline sunw_X509_NAME_oneline
3444 #pragma redefine_extname X509_NAME_print sunw_X509_NAME_print
3445 #pragma redefine_extname X509_NAME_print_ex sunw_X509_NAME_print_ex
3446 #pragma redefine_extname X509_NAME_print_ex_fp sunw_X509_NAME_print_ex_fp
3447 #pragma redefine_extname X509_NAME_set sunw_X509_NAME_set
3448 #pragma redefine_extname X509_new sunw_X509_new
3449 #pragma redefine_extname X509_OBJECT_free_contents sunw_X509_OBJECT_free_
3450 #pragma redefine_extname X509_OBJECT_idx_by_subject sunw_X509_OBJECT_idx_
3451 #pragma redefine_extname X509_OBJECT_retrieve_by_subject sunw_X509_OBJECT_
3452 #pragma redefine_extname X509_OBJECT_retrieve_match sunw_X509_OBJECT_retr
3453 #pragma redefine_extname X509_OBJECT_up_ref_count sunw_X509_OBJECT_up_ref
3454 #pragma redefine_extname X509_ocspid_print sunw_X509_ocspid_print
3455 #pragma redefine_extname X509_PKEY_free sunw_X509_PKEY_free
3456 #pragma redefine_extname X509_PKEY_new sunw_X509_PKEY_new
3457 #pragma redefine_extname X509_policy_check sunw_X509_policy_check
3458 #pragma redefine_extname X509_policy_level_get0_node sunw_X509_policy_lev
3459 #pragma redefine_extname X509_policy_level_node_count sunw_X509_policy_le
3460 #pragma redefine_extname X509_policy_node_get0_parent sunw_X509_policy_no
3461 #pragma redefine_extname X509_policy_node_get0_policy sunw_X509_policy_no
3462 #pragma redefine_extname X509_policy_node_get0_qualifiers sunw_X509_polic
3463 #pragma redefine_extname X509_POLICY_NODE_print sunw_X509_POLICY_NODE_pri
3464 #pragma redefine_extname X509_policy_tree_free sunw_X509_policy_tree_free
3465 #pragma redefine_extname X509_policy_tree_get0_level sunw_X509_policy_tre
3466 #pragma redefine_extname X509_policy_tree_get0_policies sunw_X509_policy_
3467 #pragma redefine_extname X509_policy_tree_get0_user_policies sunw_X509_po
3468 #pragma redefine_extname X509_policy_tree_level_count sunw_X509_policy_tr
3469 #pragma redefine_extname X509_print sunw_X509_print
3470 #pragma redefine_extname X509_print_ex sunw_X509_print_ex
3471 #pragma redefine_extname X509_print_ex_fp sunw_X509_print_ex_fp
3472 #pragma redefine_extname X509_print_fp sunw_X509_print_fp
3473 #pragma redefine_extname X509_pubkey_digest sunw_X509_pubkey_digest
3474 #pragma redefine_extname X509_PUBKEY_free sunw_X509_PUBKEY_free
3475 #pragma redefine_extname X509_PUBKEY_get sunw_X509_PUBKEY_get
3476 #pragma redefine_extname X509_PUBKEY_get0_param sunw_X509_PUBKEY_get0_par
3477 #pragma redefine_extname X509_PUBKEY_it sunw_X509_PUBKEY_it
3478 #pragma redefine_extname X509_PUBKEY_new sunw_X509_PUBKEY_new
3479 #pragma redefine_extname X509_PUBKEY_set sunw_X509_PUBKEY_set
3480 #pragma redefine_extname X509_PUBKEY_set0_param sunw_X509_PUBKEY_set0_par
3481 #pragma redefine_extname X509_PURPOSE_add sunw_X509_PURPOSE_add
3482 #pragma redefine_extname X509_PURPOSE_cleanup sunw_X509_PURPOSE_cleanup
3483 #pragma redefine_extname X509_PURPOSE_get_by_id sunw_X509_PURPOSE_get_by_
3484 #pragma redefine_extname X509_PURPOSE_get_by_sname sunw_X509_PURPOSE_get_
3485 #pragma redefine_extname X509_PURPOSE_get_count sunw_X509_PURPOSE_get_cou
3486 #pragma redefine_extname X509_PURPOSE_get_id sunw_X509_PURPOSE_get_id
3487 #pragma redefine_extname X509_PURPOSE_get_trust sunw_X509_PURPOSE_get_tru
3488 #pragma redefine_extname X509_PURPOSE_get0 sunw_X509_PURPOSE_get0
3489 #pragma redefine_extname X509_PURPOSE_get0_name sunw_X509_PURPOSE_get0_na
3490 #pragma redefine_extname X509_PURPOSE_get0_sname sunw_X509_PURPOSE_get0_s
3491 #pragma redefine_extname X509_PURPOSE_set sunw_X509_PURPOSE_set
3492 #pragma redefine_extname X509_reject_clear sunw_X509_reject_clear
3493 #pragma redefine_extname X509_REQ_add_extensions sunw_X509_REQ_add_extens
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3494 #pragma redefine_extname X509_REQ_add_extensions_nid sunw_X509_REQ_add_ex
3495 #pragma redefine_extname X509_REQ_add1_attr sunw_X509_REQ_add1_attr
3496 #pragma redefine_extname X509_REQ_add1_attr_by_NID sunw_X509_REQ_add1_att
3497 #pragma redefine_extname X509_REQ_add1_attr_by_OBJ sunw_X509_REQ_add1_att
3498 #pragma redefine_extname X509_REQ_add1_attr_by_txt sunw_X509_REQ_add1_att
3499 #pragma redefine_extname X509_REQ_check_private_key sunw_X509_REQ_check_p
3500 #pragma redefine_extname X509_REQ_delete_attr sunw_X509_REQ_delete_attr
3501 #pragma redefine_extname X509_REQ_digest sunw_X509_REQ_digest
3502 #pragma redefine_extname X509_REQ_dup sunw_X509_REQ_dup
3503 #pragma redefine_extname X509_REQ_extension_nid sunw_X509_REQ_extension_n
3504 #pragma redefine_extname X509_REQ_free sunw_X509_REQ_free
3505 #pragma redefine_extname X509_REQ_get_attr sunw_X509_REQ_get_attr
3506 #pragma redefine_extname X509_REQ_get_attr_by_NID sunw_X509_REQ_get_attr_
3507 #pragma redefine_extname X509_REQ_get_attr_by_OBJ sunw_X509_REQ_get_attr_
3508 #pragma redefine_extname X509_REQ_get_attr_count sunw_X509_REQ_get_attr_c
3509 #pragma redefine_extname X509_REQ_get_extension_nids sunw_X509_REQ_get_ex
3510 #pragma redefine_extname X509_REQ_get_extensions sunw_X509_REQ_get_extens
3511 #pragma redefine_extname X509_REQ_get_pubkey sunw_X509_REQ_get_pubkey
3512 #pragma redefine_extname X509_REQ_get1_email sunw_X509_REQ_get1_email
3513 #pragma redefine_extname X509_REQ_INFO_free sunw_X509_REQ_INFO_free
3514 #pragma redefine_extname X509_REQ_INFO_it sunw_X509_REQ_INFO_it
3515 #pragma redefine_extname X509_REQ_INFO_new sunw_X509_REQ_INFO_new
3516 #pragma redefine_extname X509_REQ_it sunw_X509_REQ_it
3517 #pragma redefine_extname X509_REQ_new sunw_X509_REQ_new
3518 #pragma redefine_extname X509_REQ_print sunw_X509_REQ_print
3519 #pragma redefine_extname X509_REQ_print_ex sunw_X509_REQ_print_ex
3520 #pragma redefine_extname X509_REQ_print_fp sunw_X509_REQ_print_fp
3521 #pragma redefine_extname X509_REQ_set_extension_nids sunw_X509_REQ_set_ex
3522 #pragma redefine_extname X509_REQ_set_pubkey sunw_X509_REQ_set_pubkey
3523 #pragma redefine_extname X509_REQ_set_subject_name sunw_X509_REQ_set_subj
3524 #pragma redefine_extname X509_REQ_set_version sunw_X509_REQ_set_version
3525 #pragma redefine_extname X509_REQ_sign sunw_X509_REQ_sign
3526 #pragma redefine_extname X509_REQ_sign_ctx sunw_X509_REQ_sign_ctx
3527 #pragma redefine_extname X509_REQ_to_X509 sunw_X509_REQ_to_X509
3528 #pragma redefine_extname X509_REQ_verify sunw_X509_REQ_verify
3529 #pragma redefine_extname X509_REVOKED_add_ext sunw_X509_REVOKED_add_ext
3530 #pragma redefine_extname X509_REVOKED_add1_ext_i2d sunw_X509_REVOKED_add1
3531 #pragma redefine_extname X509_REVOKED_delete_ext sunw_X509_REVOKED_delete
3532 #pragma redefine_extname X509_REVOKED_free sunw_X509_REVOKED_free
3533 #pragma redefine_extname X509_REVOKED_get_ext sunw_X509_REVOKED_get_ext
3534 #pragma redefine_extname X509_REVOKED_get_ext_by_critical sunw_X509_REVOK
3535 #pragma redefine_extname X509_REVOKED_get_ext_by_NID sunw_X509_REVOKED_ge
3536 #pragma redefine_extname X509_REVOKED_get_ext_by_OBJ sunw_X509_REVOKED_ge
3537 #pragma redefine_extname X509_REVOKED_get_ext_count sunw_X509_REVOKED_get
3538 #pragma redefine_extname X509_REVOKED_get_ext_d2i sunw_X509_REVOKED_get_e
3539 #pragma redefine_extname X509_REVOKED_it sunw_X509_REVOKED_it
3540 #pragma redefine_extname X509_REVOKED_new sunw_X509_REVOKED_new
3541 #pragma redefine_extname X509_REVOKED_set_revocationDate sunw_X509_REVOKED
3542 #pragma redefine_extname X509_REVOKED_set_serialNumber sunw_X509_REVOKED_
3543 #pragma redefine_extname X509_set_ex_data sunw_X509_set_ex_data
3544 #pragma redefine_extname X509_set_issuer_name sunw_X509_set_issuer_name
3545 #pragma redefine_extname X509_set_notAfter sunw_X509_set_notAfter
3546 #pragma redefine_extname X509_set_notBefore sunw_X509_set_notBefore
3547 #pragma redefine_extname X509_set_pubkey sunw_X509_set_pubkey
3548 #pragma redefine_extname X509_set_serialNumber sunw_X509_set_serialNumber
3549 #pragma redefine_extname X509_set_subject_name sunw_X509_set_subject_name
3550 #pragma redefine_extname X509_set_version sunw_X509_set_version
3551 #pragma redefine_extname X509_SIG_free sunw_X509_SIG_free
3552 #pragma redefine_extname X509_SIG_it sunw_X509_SIG_it
3553 #pragma redefine_extname X509_SIG_new sunw_X509_SIG_new
3554 #pragma redefine_extname X509_sign sunw_X509_sign
3555 #pragma redefine_extname X509_sign_ctx sunw_X509_sign_ctx
3556 #pragma redefine_extname X509_signature_dump sunw_X509_signature_dump
3557 #pragma redefine_extname X509_signature_print sunw_X509_signature_print
3558 #pragma redefine_extname X509_STORE_add_cert sunw_X509_STORE_add_cert
3559 #pragma redefine_extname X509_STORE_add_crl sunw_X509_STORE_add_crl
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3560 #pragma redefine_extname X509_STORE_add_lookup sunw_X509_STORE_add_lookup
3561 #pragma redefine_extname X509_STORE_CTX_cleanup sunw_X509_STORE_CTX_clean
3562 #pragma redefine_extname X509_STORE_CTX_free sunw_X509_STORE_CTX_free
3563 #pragma redefine_extname X509_STORE_CTX_get_chain sunw_X509_STORE_CTX_get
3564 #pragma redefine_extname X509_STORE_CTX_get_current_cert sunw_X509_STORE_
3565 #pragma redefine_extname X509_STORE_CTX_get_error sunw_X509_STORE_CTX_get
3566 #pragma redefine_extname X509_STORE_CTX_get_error_depth sunw_X509_STORE_C
3567 #pragma redefine_extname X509_STORE_CTX_get_ex_data sunw_X509_STORE_CTX_g
3568 #pragma redefine_extname X509_STORE_CTX_get_ex_new_index sunw_X509_STORE_
3569 #pragma redefine_extname X509_STORE_CTX_get_explicit_policy sunw_X509_STO
3570 #pragma redefine_extname X509_STORE_CTX_get0_current_crl sunw_X509_STORE_
3571 #pragma redefine_extname X509_STORE_CTX_get0_current_issuer sunw_X509_STO
3572 #pragma redefine_extname X509_STORE_CTX_get0_param sunw_X509_STORE_CTX_ge
3573 #pragma redefine_extname X509_STORE_CTX_get0_parent_ctx sunw_X509_STORE_C
3574 #pragma redefine_extname X509_STORE_CTX_get0_policy_tree sunw_X509_STORE_
3575 #pragma redefine_extname X509_STORE_CTX_get1_chain sunw_X509_STORE_CTX_ge
3576 #pragma redefine_extname X509_STORE_CTX_get1_issuer sunw_X509_STORE_CTX_g
3577 #pragma redefine_extname X509_STORE_CTX_init sunw_X509_STORE_CTX_init
3578 #pragma redefine_extname X509_STORE_CTX_new sunw_X509_STORE_CTX_new
3579 #pragma redefine_extname X509_STORE_CTX_purpose_inherit sunw_X509_STORE_C
3580 #pragma redefine_extname X509_STORE_CTX_set_cert sunw_X509_STORE_CTX_set_
3581 #pragma redefine_extname X509_STORE_CTX_set_chain sunw_X509_STORE_CTX_set
3582 #pragma redefine_extname X509_STORE_CTX_set_default sunw_X509_STORE_CTX_s
3583 #pragma redefine_extname X509_STORE_CTX_set_depth sunw_X509_STORE_CTX_set
3584 #pragma redefine_extname X509_STORE_CTX_set_error sunw_X509_STORE_CTX_set
3585 #pragma redefine_extname X509_STORE_CTX_set_ex_data sunw_X509_STORE_CTX_s
3586 #pragma redefine_extname X509_STORE_CTX_set_flags sunw_X509_STORE_CTX_set
3587 #pragma redefine_extname X509_STORE_CTX_set_purpose sunw_X509_STORE_CTX_s
3588 #pragma redefine_extname X509_STORE_CTX_set_time sunw_X509_STORE_CTX_set_
3589 #pragma redefine_extname X509_STORE_CTX_set_trust sunw_X509_STORE_CTX_set
3590 #pragma redefine_extname X509_STORE_CTX_set_verify_cb sunw_X509_STORE_CTX
3591 #pragma redefine_extname X509_STORE_CTX_set0_crls sunw_X509_STORE_CTX_set
3592 #pragma redefine_extname X509_STORE_CTX_set0_param sunw_X509_STORE_CTX_se
3593 #pragma redefine_extname X509_STORE_CTX_trusted_stack sunw_X509_STORE_CTX
3594 #pragma redefine_extname X509_STORE_free sunw_X509_STORE_free
3595 #pragma redefine_extname X509_STORE_get_by_subject sunw_X509_STORE_get_by
3596 #pragma redefine_extname X509_STORE_get1_certs sunw_X509_STORE_get1_certs
3597 #pragma redefine_extname X509_STORE_get1_crls sunw_X509_STORE_get1_crls
3598 #pragma redefine_extname X509_STORE_load_locations sunw_X509_STORE_load_l
3599 #pragma redefine_extname X509_STORE_new sunw_X509_STORE_new
3600 #pragma redefine_extname X509_STORE_set_default_paths sunw_X509_STORE_set
3601 #pragma redefine_extname X509_STORE_set_depth sunw_X509_STORE_set_depth
3602 #pragma redefine_extname X509_STORE_set_flags sunw_X509_STORE_set_flags
3603 #pragma redefine_extname X509_STORE_set_purpose sunw_X509_STORE_set_purpo
3604 #pragma redefine_extname X509_STORE_set_trust sunw_X509_STORE_set_trust
3605 #pragma redefine_extname X509_STORE_set_verify_cb sunw_X509_STORE_set_ver
3606 #pragma redefine_extname X509_STORE_set1_param sunw_X509_STORE_set1_param
3607 #pragma redefine_extname X509_subject_name_cmp sunw_X509_subject_name_cmp
3608 #pragma redefine_extname X509_subject_name_hash sunw_X509_subject_name_ha
3609 #pragma redefine_extname X509_subject_name_hash_old sunw_X509_subject_nam
3610 #pragma redefine_extname X509_supported_extension sunw_X509_supported_ext
3611 #pragma redefine_extname X509_time_adj sunw_X509_time_adj
3612 #pragma redefine_extname X509_time_adj_ex sunw_X509_time_adj_ex
3613 #pragma redefine_extname X509_to_X509_REQ sunw_X509_to_X509_REQ
3614 #pragma redefine_extname X509_TRUST_add sunw_X509_TRUST_add
3615 #pragma redefine_extname X509_TRUST_cleanup sunw_X509_TRUST_cleanup
3616 #pragma redefine_extname X509_trust_clear sunw_X509_trust_clear
3617 #pragma redefine_extname X509_TRUST_get_by_id sunw_X509_TRUST_get_by_id
3618 #pragma redefine_extname X509_TRUST_get_count sunw_X509_TRUST_get_count
3619 #pragma redefine_extname X509_TRUST_get_flags sunw_X509_TRUST_get_flags
3620 #pragma redefine_extname X509_TRUST_get_trust sunw_X509_TRUST_get_trust
3621 #pragma redefine_extname X509_TRUST_get0 sunw_X509_TRUST_get0
3622 #pragma redefine_extname X509_TRUST_get0_name sunw_X509_TRUST_get0_name
3623 #pragma redefine_extname X509_TRUST_set sunw_X509_TRUST_set
3624 #pragma redefine_extname X509_TRUST_set_default sunw_X509_TRUST_set_defau
3625 #pragma redefine_extname X509_VAL_free sunw_X509_VAL_free

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3626 #pragma redefine_extname X509_VAL_it sunw_X509_VAL_it
3627 #pragma redefine_extname X509_VAL_new sunw_X509_VAL_new
3628 #pragma redefine_extname X509_verify sunw_X509_verify
3629 #pragma redefine_extname X509_verify_cert sunw_X509_verify_cert
3630 #pragma redefine_extname X509_verify_cert_error_string sunw_X509_verify_c
3631 #pragma redefine_extname X509_VERIFY_PARAM_add0_policy sunw_X509_VERIFY_P
3632 #pragma redefine_extname X509_VERIFY_PARAM_add0_table sunw_X509_VERIFY_PA
3633 #pragma redefine_extname X509_VERIFY_PARAM_clear_flags sunw_X509_VERIFY_P
3634 #pragma redefine_extname X509_VERIFY_PARAM_free sunw_X509_VERIFY_PARAM_fr
3635 #pragma redefine_extname X509_VERIFY_PARAM_get_depth sunw_X509_VERIFY_PAR
3636 #pragma redefine_extname X509_VERIFY_PARAM_get_flags sunw_X509_VERIFY_PAR
3637 #pragma redefine_extname X509_VERIFY_PARAM_inherit sunw_X509_VERIFY_PARAM
3638 #pragma redefine_extname X509_VERIFY_PARAM_lookup sunw_X509_VERIFY_PARAM_
3639 #pragma redefine_extname X509_VERIFY_PARAM_new sunw_X509_VERIFY_PARAM_new
3640 #pragma redefine_extname X509_VERIFY_PARAM_set_depth sunw_X509_VERIFY_PAR
3641 #pragma redefine_extname X509_VERIFY_PARAM_set_flags sunw_X509_VERIFY_PAR
3642 #pragma redefine_extname X509_VERIFY_PARAM_set_purpose sunw_X509_VERIFY_P
3643 #pragma redefine_extname X509_VERIFY_PARAM_set_time sunw_X509_VERIFY_PARA
3644 #pragma redefine_extname X509_VERIFY_PARAM_set_trust sunw_X509_VERIFY_PAR
3645 #pragma redefine_extname X509_VERIFY_PARAM_set1 sunw_X509_VERIFY_PARAM_se
3646 #pragma redefine_extname X509_VERIFY_PARAM_set1_name sunw_X509_VERIFY_PAR
3647 #pragma redefine_extname X509_VERIFY_PARAM_set1_policies sunw_X509_VERIFY
3648 #pragma redefine_extname X509_VERIFY_PARAM_table_cleanup sunw_X509_VERIFY
3649 #pragma redefine_extname X509_version sunw_X509_version
3650 #pragma redefine_extname X509at_add1_attr sunw_X509at_add1_attr
3651 #pragma redefine_extname X509at_add1_attr_by_NID sunw_X509at_add1_attr_by
3652 #pragma redefine_extname X509at_add1_attr_by_OBJ sunw_X509at_add1_attr_by
3653 #pragma redefine_extname X509at_add1_attr_by_txt sunw_X509at_add1_attr_by
3654 #pragma redefine_extname X509at_delete_attr sunw_X509at_delete_attr
3655 #pragma redefine_extname X509at_get_attr sunw_X509at_get_attr
3656 #pragma redefine_extname X509at_get_attr_by_NID sunw_X509at_get_attr_by_N
3657 #pragma redefine_extname X509at_get_attr_by_OBJ sunw_X509at_get_attr_by_O
3658 #pragma redefine_extname X509at_get_attr_count sunw_X509at_get_attr_count
3659 #pragma redefine_extname X509at_get0_data_by_OBJ sunw_X509at_get0_data_by
3660 #pragma redefine_extname X509v3_add_ext sunw_X509v3_add_ext
3661 #pragma redefine_extname X509v3_add_standard_extensions sunw_X509v3_add_s
3662 #pragma redefine_extname X509v3_add_value sunw_X509v3_add_value
3663 #pragma redefine_extname X509v3_add_value_bool sunw_X509v3_add_value_bool
3664 #pragma redefine_extname X509v3_add_value_bool_nf sunw_X509v3_add_value_b
3665 #pragma redefine_extname X509v3_add_value_int sunw_X509v3_add_value_int
3666 #pragma redefine_extname X509v3_add_value_uchar sunw_X509v3_add_value_uch
3667 #pragma redefine_extname X509v3_add1_i2d sunw_X509v3_add1_i2d
3668 #pragma redefine_extname X509v3_conf_free sunw_X509v3_conf_free
3669 #pragma redefine_extname X509v3_delete_ext sunw_X509v3_delete_ext
3670 #pragma redefine_extname X509v3_EXT_add sunw_X509v3_EXT_add
3671 #pragma redefine_extname X509v3_EXT_add_alias sunw_X509v3_EXT_add_alias
3672 #pragma redefine_extname X509v3_EXT_add_conf sunw_X509v3_EXT_add_conf
3673 #pragma redefine_extname X509v3_EXT_add_list sunw_X509v3_EXT_add_list
3674 #pragma redefine_extname X509v3_EXT_add_nconf sunw_X509v3_EXT_add_nconf
3675 #pragma redefine_extname X509v3_EXT_add_nconf_sk sunw_X509v3_EXT_add_ncon
3676 #pragma redefine_extname X509v3_EXT_cleanup sunw_X509v3_EXT_cleanup
3677 #pragma redefine_extname X509v3_EXT_conf sunw_X509v3_EXT_conf
3678 #pragma redefine_extname X509v3_EXT_conf_nid sunw_X509v3_EXT_conf_nid
3679 #pragma redefine_extname X509v3_EXT_CRL_add_conf sunw_X509v3_EXT_CRL_add
3680 #pragma redefine_extname X509v3_EXT_CRL_add_nconf sunw_X509v3_EXT_CRL_add
3681 #pragma redefine_extname X509v3_EXT_d2i sunw_X509v3_EXT_d2i
3682 #pragma redefine_extname X509v3_EXT_get sunw_X509v3_EXT_get
3683 #pragma redefine_extname X509v3_EXT_get_nid sunw_X509v3_EXT_get_nid
3684 #pragma redefine_extname X509v3_EXT_i2d sunw_X509v3_EXT_i2d
3685 #pragma redefine_extname X509v3_EXT_nconf sunw_X509v3_EXT_nconf
3686 #pragma redefine_extname X509v3_EXT_nconf_nid sunw_X509v3_EXT_nconf_nid
3687 #pragma redefine_extname X509v3_EXT_print sunw_X509v3_EXT_print
3688 #pragma redefine_extname X509v3_EXT_print_fp sunw_X509v3_EXT_print_fp
3689 #pragma redefine_extname X509v3_EXT_REQ_add_conf sunw_X509v3_EXT_REQ_add
3690 #pragma redefine_extname X509v3_EXT_REQ_add_nconf sunw_X509v3_EXT_REQ_add
3691 #pragma redefine_extname X509v3_EXT_val_prn sunw_X509v3_EXT_val_prn

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3692 #pragma redefine_extname X509V3_extensions_print sunw_X509V3_extensions_p
3693 #pragma redefine_extname X509V3_get_d2i sunw_X509V3_get_d2i
3694 #pragma redefine_extname X509V3_get_ext sunw_X509V3_get_ext
3695 #pragma redefine_extname X509V3_get_ext_by_critical sunw_X509V3_get_ext_b
3696 #pragma redefine_extname X509V3_get_ext_by_NID sunw_X509V3_get_ext_by_NID
3697 #pragma redefine_extname X509V3_get_ext_by_OBJ sunw_X509V3_get_ext_by_OBJ
3698 #pragma redefine_extname X509V3_get_ext_count sunw_X509V3_get_ext_count
3699 #pragma redefine_extname X509V3_get_section sunw_X509V3_get_section
3700 #pragma redefine_extname X509V3_get_string sunw_X509V3_get_string
3701 #pragma redefine_extname X509V3_get_value_bool sunw_X509V3_get_value_bool
3702 #pragma redefine_extname X509V3_get_value_int sunw_X509V3_get_value_int
3703 #pragma redefine_extname X509V3_NAME_from_section sunw_X509V3_NAME_from_s
3704 #pragma redefine_extname X509V3_parse_list sunw_X509V3_parse_list
3705 #pragma redefine_extname X509V3_section_free sunw_X509V3_section_free
3706 #pragma redefine_extname X509V3_set_conf_lhash sunw_X509V3_set_conf_lhash
3707 #pragma redefine_extname X509V3_set_ctx sunw_X509V3_set_ctx
3708 #pragma redefine_extname X509V3_set_nconf sunw_X509V3_set_nconf
3709 #pragma redefine_extname X509V3_string_free sunw_X509V3_string_free
3710 #pragma redefine_extname ZLONG_it sunw_ZLONG_it
3711 #pragma redefine_extname BIO_f_ssl sunw_BIO_f_ssl
3712 #pragma redefine_extname BIO_new_buffer_ssl_connect sunw_BIO_new_buffer_s
3713 #pragma redefine_extname BIO_new_ssl sunw_BIO_new_ssl
3714 #pragma redefine_extname BIO_new_ssl_connect sunw_BIO_new_ssl_connect
3715 #pragma redefine_extname BIO_ssl_copy_session_id sunw_BIO_ssl_copy_sessio
3716 #pragma redefine_extname BIO_ssl_shutdown sunw_BIO_ssl_shutdown
3717 #pragma redefine_extname d2i_SSL_SESSION sunw_d2i_SSL_SESSION
3718 #pragma redefine_extname do_dtls1_write sunw_do_dtls1_write
3719 #pragma redefine_extname dtls1_accept sunw_dtls1_accept
3720 #pragma redefine_extname dtls1_buffer_message sunw_dtls1_buffer_message
3721 #pragma redefine_extname dtls1_check_timeout_num sunw_dtls1_check_timeout
3722 #pragma redefine_extname dtls1_clear sunw_dtls1_clear
3723 #pragma redefine_extname dtls1_clear_record_buffer sunw_dtls1_clear_recor
3724 #pragma redefine_extname dtls1_client_hello sunw_dtls1_client_hello
3725 #pragma redefine_extname dtls1_connect sunw_dtls1_connect
3726 #pragma redefine_extname dtls1_ctrl sunw_dtls1_ctrl
3727 #pragma redefine_extname dtls1_default_timeout sunw_dtls1_default_timeout
3728 #pragma redefine_extname dtls1_dispatch_alert sunw_dtls1_dispatch_alert
3729 #pragma redefine_extname dtls1_do_write sunw_dtls1_do_write
3730 #pragma redefine_extname dtls1_double_timeout sunw_dtls1_double_timeout
3731 #pragma redefine_extname dtls1_enc sunw_dtls1_enc
3732 #pragma redefine_extname dtls1_free sunw_dtls1_free
3733 #pragma redefine_extname dtls1_get_ccs_header sunw_dtls1_get_ccs_header
3734 #pragma redefine_extname dtls1_get_cipher sunw_dtls1_get_cipher
3735 #pragma redefine_extname dtls1_get_message sunw_dtls1_get_message
3736 #pragma redefine_extname dtls1_get_message_header sunw_dtls1_get_message_
3737 #pragma redefine_extname dtls1_get_queue_priority sunw_dtls1_get_queue_pr
3738 #pragma redefine_extname dtls1_get_record sunw_dtls1_get_record
3739 #pragma redefine_extname dtls1_get_timeout sunw_dtls1_get_timeout
3740 #pragma redefine_extname dtls1_handle_timeout sunw_dtls1_handle_timeout
3741 #pragma redefine_extname dtls1_heartbeat sunw_dtls1_heartbeat
3742 #pragma redefine_extname dtls1_is_timer_expired sunw_dtls1_is_timer_expir
3743 #pragma redefine_extname dtls1_listen sunw_dtls1_listen
3744 #pragma redefine_extname dtls1_min_mtu sunw_dtls1_min_mtu
3745 #pragma redefine_extname dtls1_new sunw_dtls1_new
3746 #pragma redefine_extname dtls1_output_cert_chain sunw_dtls1_output_cert_c
3747 #pragma redefine_extname dtls1_process_heartbeat sunw_dtls1_process_heart
3748 #pragma redefine_extname dtls1_read_bytes sunw_dtls1_read_bytes
3749 #pragma redefine_extname dtls1_read_failed sunw_dtls1_read_failed
3750 #pragma redefine_extname dtls1_reset_seq_numbers sunw_dtls1_reset_seq_num
3751 #pragma redefine_extname dtls1_retransmit_buffered_messages sunw_dtls1_re
3752 #pragma redefine_extname dtls1_retransmit_message sunw_dtls1_retransmit_m
3753 #pragma redefine_extname dtls1_send_certificate_request sunw_dtls1_send_c
3754 #pragma redefine_extname dtls1_send_change_cipher_spec sunw_dtls1_send_ch
3755 #pragma redefine_extname dtls1_send_client_certificate sunw_dtls1_send_cl
3756 #pragma redefine_extname dtls1_send_client_key_exchange sunw_dtls1_send_c
3757 #pragma redefine_extname dtls1_send_client_verify sunw_dtls1_send_client_

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3758 #pragma redefine_extname dtls1_send_finished sunw_dtls1_send_finished
3759 #pragma redefine_extname dtls1_send_hello_request sunw_dtls1_send_hello_r
3760 #pragma redefine_extname dtls1_send_newsession_ticket sunw_dtls1_send_new
3761 #pragma redefine_extname dtls1_send_server_certificate sunw_dtls1_send_se
3762 #pragma redefine_extname dtls1_send_server_done sunw_dtls1_send_server_do
3763 #pragma redefine_extname dtls1_send_server_hello sunw_dtls1_send_server_h
3764 #pragma redefine_extname dtls1_send_server_key_exchange sunw_dtls1_send_s
3765 #pragma redefine_extname dtls1_set_message_header sunw_dtls1_set_message_
3766 #pragma redefine_extname dtls1_shutdown sunw_dtls1_shutdown
3767 #pragma redefine_extname dtls1_start_timer sunw_dtls1_start_timer
3768 #pragma redefine_extname dtls1_stop_timer sunw_dtls1_stop_timer
3769 #pragma redefine_extname dtls1_version_str sunw_dtls1_version_str
3770 #pragma redefine_extname dtls1_write_app_data_bytes sunw_dtls1_write_app_
3771 #pragma redefine_extname dtls1_write_bytes sunw_dtls1_write_bytes
3772 #pragma redefine_extname DTLSv1_client_method sunw_DTLSv1_client_method
3773 #pragma redefine_extname DTLSv1_enc_data sunw_DTLSv1_enc_data
3774 #pragma redefine_extname DTLSv1_method sunw_DTLSv1_method
3775 #pragma redefine_extname DTLSv1_server_method sunw_DTLSv1_server_method
3776 #pragma redefine_extname ERR_load_SSL_strings sunw_ERR_load_SSL_strings
3777 #pragma redefine_extname i2d_SSL_SESSION sunw_i2d_SSL_SESSION
3778 #pragma redefine_extname n_ssl3_mac sunw_n_ssl3_mac
3779 #pragma redefine_extname OBJ_bsearch_ssl_cipher_id sunw_OBJ_bsearch_ssl_c
3780 #pragma redefine_extname PEM_read_bio_SSL_SESSION sunw_PEM_read_bio_SSL_S
3781 #pragma redefine_extname PEM_read_SSL_SESSION sunw_PEM_read_SSL_SESSION
3782 #pragma redefine_extname PEM_write_bio_SSL_SESSION sunw_PEM_write_bio_SSL
3783 #pragma redefine_extname PEM_write_SSL_SESSION sunw_PEM_write_SSL_SESSION
3784 #pragma redefine_extname SRP_Calc_A_param sunw_SRP_Calc_A_param
3785 #pragma redefine_extname SRP_generate_client_master_secret sunw_SRP_gener
3786 #pragma redefine_extname SRP_generate_server_master_secret sunw_SRP_gener
3787 #pragma redefine_extname SSL_accept sunw_SSL_accept
3788 #pragma redefine_extname SSL_add_client_CA sunw_SSL_add_client_CA
3789 #pragma redefine_extname ssl_add_clienthello_renegotiate_ext sunw_ssl_add
3790 #pragma redefine_extname ssl_add_clienthello_tlsext sunw_ssl_add_clienthe
3791 #pragma redefine_extname ssl_add_clienthello_use_srtp_ext sunw_ssl_add_cl
3792 #pragma redefine_extname SSL_add_dir_cert_subjects_to_stack sunw_SSL_add_
3793 #pragma redefine_extname SSL_add_file_cert_subjects_to_stack sunw_SSL_add
3794 #pragma redefine_extname ssl_add_serverhello_renegotiate_ext sunw_ssl_add
3795 #pragma redefine_extname ssl_add_serverhello_tlsext sunw_ssl_add_serverhe
3796 #pragma redefine_extname ssl_add_serverhello_use_srtp_ext sunw_ssl_add_se
3797 #pragma redefine_extname SSL_alert_desc_string sunw_SSL_alert_desc_string
3798 #pragma redefine_extname SSL_alert_desc_string_long sunw_SSL_alert_desc_s
3799 #pragma redefine_extname SSL_alert_type_string sunw_SSL_alert_type_string
3800 #pragma redefine_extname SSL_alert_type_string_long sunw_SSL_alert_type_s
3801 #pragma redefine_extname ssl_bad_method sunw_ssl_bad_method
3802 #pragma redefine_extname ssl_bytes_to_cipher_list sunw_ssl_bytes_to_ciphe
3803 #pragma redefine_extname SSL_cache_hit sunw_SSL_cache_hit
3804 #pragma redefine_extname SSL_callback_ctrl sunw_SSL_callback_ctrl
3805 #pragma redefine_extname ssl_cert_dup sunw_ssl_cert_dup
3806 #pragma redefine_extname ssl_cert_free sunw_ssl_cert_free
3807 #pragma redefine_extname ssl_cert_inst sunw_ssl_cert_inst
3808 #pragma redefine_extname ssl_cert_new sunw_ssl_cert_new
3809 #pragma redefine_extname ssl_cert_type sunw_ssl_cert_type
3810 #pragma redefine_extname ssl_check_clienthello_tlsext_early sunw_ssl_chec
3811 #pragma redefine_extname ssl_check_clienthello_tlsext_late sunw_ssl_check
3812 #pragma redefine_extname SSL_check_private_key sunw_SSL_check_private_key
3813 #pragma redefine_extname ssl_check_serverhello_tlsext sunw_ssl_check_serv
3814 #pragma redefine_extname SSL_CIPHER_description sunw_SSL_CIPHER_descripti
3815 #pragma redefine_extname SSL_CIPHER_get_bits sunw_SSL_CIPHER_get_bits
3816 #pragma redefine_extname ssl_cipher_get_evp sunw_ssl_cipher_get_evp
3817 #pragma redefine_extname SSL_CIPHER_get_id sunw_SSL_CIPHER_get_id
3818 #pragma redefine_extname SSL_CIPHER_get_name sunw_SSL_CIPHER_get_name
3819 #pragma redefine_extname SSL_CIPHER_get_version sunw_SSL_CIPHER_get_versi
3820 #pragma redefine_extname ssl_cipher_id_cmp sunw_ssl_cipher_id_cmp
3821 #pragma redefine_extname ssl_cipher_list_to_bytes sunw_ssl_cipher_list_to
3822 #pragma redefine_extname ssl_cipher_ptr_id_cmp sunw_ssl_cipher_ptr_id_cmp
3823 #pragma redefine_extname SSL_clear sunw_SSL_clear

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3824 #pragma redefine_extname ssl_clear_bad_session sunw_ssl_clear_bad_session
3825 #pragma redefine_extname ssl_clear_cipher_ctx sunw_ssl_clear_cipher_ctx
3826 #pragma redefine_extname ssl_clear_hash_ctx sunw_ssl_clear_hash_ctx
3827 #pragma redefine_extname SSL_COMP_add_compression_method sunw_SSL_COMP_ad
3828 #pragma redefine_extname SSL_COMP_get_compression_methods sunw_SSL_COMP_g
3829 #pragma redefine_extname SSL_COMP_get_name sunw_SSL_COMP_get_name
3830 #pragma redefine_extname SSL_connect sunw_SSL_connect
3831 #pragma redefine_extname SSL_copy_session_id sunw_SSL_copy_session_id
3832 #pragma redefine_extname ssl_create_cipher_list sunw_ssl_create_cipher_li
3833 #pragma redefine_extname SSL_ctrl sunw_SSL_ctrl
3834 #pragma redefine_extname SSL_CTX_add_client_CA sunw_SSL_CTX_add_client_CA
3835 #pragma redefine_extname SSL_CTX_add_session sunw_SSL_CTX_add_session
3836 #pragma redefine_extname SSL_CTX_callback_ctrl sunw_SSL_CTX_callback_ctrl
3837 #pragma redefine_extname SSL_CTX_check_private_key sunw_SSL_CTX_check_pri
3838 #pragma redefine_extname SSL_CTX_ctrl sunw_SSL_CTX_ctrl
3839 #pragma redefine_extname SSL_CTX_flush_sessions sunw_SSL_CTX_flush_sessio
3840 #pragma redefine_extname SSL_CTX_free sunw_SSL_CTX_free
3841 #pragma redefine_extname SSL_CTX_get_cert_store sunw_SSL_CTX_get_cert_sto
3842 #pragma redefine_extname SSL_CTX_get_client_CA_list sunw_SSL_CTX_get_clie
3843 #pragma redefine_extname SSL_CTX_get_client_cert_cb sunw_SSL_CTX_get_clie
3844 #pragma redefine_extname SSL_CTX_get_ex_data sunw_SSL_CTX_get_ex_data
3845 #pragma redefine_extname SSL_CTX_get_ex_new_index sunw_SSL_CTX_get_ex_new
3846 #pragma redefine_extname SSL_CTX_get_info_callback sunw_SSL_CTX_get_info
3847 #pragma redefine_extname SSL_CTX_get_quiet_shutdown sunw_SSL_CTX_get_quie
3848 #pragma redefine_extname SSL_CTX_get_timeout sunw_SSL_CTX_get_timeout
3849 #pragma redefine_extname SSL_CTX_get_verify_callback sunw_SSL_CTX_get_ver
3850 #pragma redefine_extname SSL_CTX_get_verify_depth sunw_SSL_CTX_get_verify
3851 #pragma redefine_extname SSL_CTX_get_verify_mode sunw_SSL_CTX_get_verify
3852 #pragma redefine_extname SSL_CTX_load_verify_locations sunw_SSL_CTX_load
3853 #pragma redefine_extname SSL_CTX_new sunw_SSL_CTX_new
3854 #pragma redefine_extname SSL_CTX_remove_session sunw_SSL_CTX_remove_sessi
3855 #pragma redefine_extname SSL_CTX_sess_get_get_cb sunw_SSL_CTX_sess_get_ge
3856 #pragma redefine_extname SSL_CTX_sess_get_new_cb sunw_SSL_CTX_sess_get_ne
3857 #pragma redefine_extname SSL_CTX_sess_get_remove_cb sunw_SSL_CTX_sess_get
3858 #pragma redefine_extname SSL_CTX_sess_set_get_cb sunw_SSL_CTX_sess_set_ge
3859 #pragma redefine_extname SSL_CTX_sess_set_new_cb sunw_SSL_CTX_sess_set_ne
3860 #pragma redefine_extname SSL_CTX_sess_set_remove_cb sunw_SSL_CTX_sess_set
3861 #pragma redefine_extname SSL_CTX_sessions sunw_SSL_CTX_sessions
3862 #pragma redefine_extname SSL_CTX_set_cert_store sunw_SSL_CTX_set_cert_sto
3863 #pragma redefine_extname SSL_CTX_set_cert_verify_callback sunw_SSL_CTX_se
3864 #pragma redefine_extname SSL_CTX_set_cipher_list sunw_SSL_CTX_set_cipher_
3865 #pragma redefine_extname SSL_CTX_set_client_CA_list sunw_SSL_CTX_set_clie
3866 #pragma redefine_extname SSL_CTX_set_client_cert_cb sunw_SSL_CTX_set_clie
3867 #pragma redefine_extname SSL_CTX_set_client_cert_engine sunw_SSL_CTX_set_
3868 #pragma redefine_extname SSL_CTX_set_cookie_generate_cb sunw_SSL_CTX_set_
3869 #pragma redefine_extname SSL_CTX_set_cookie_verify_cb sunw_SSL_CTX_set_co
3870 #pragma redefine_extname SSL_CTX_set_default_passwd_cb sunw_SSL_CTX_set_d
3871 #pragma redefine_extname SSL_CTX_set_default_passwd_cb_userdata sunw_SSL_
3872 #pragma redefine_extname SSL_CTX_set_default_verify_paths sunw_SSL_CTX_se
3873 #pragma redefine_extname SSL_CTX_set_ex_data sunw_SSL_CTX_set_ex_data
3874 #pragma redefine_extname SSL_CTX_set_generate_session_id sunw_SSL_CTX_set
3875 #pragma redefine_extname SSL_CTX_set_info_callback sunw_SSL_CTX_set_info_
3876 #pragma redefine_extname SSL_CTX_set_msg_callback sunw_SSL_CTX_set_msg_ca
3877 #pragma redefine_extname SSL_CTX_set_next_proto_select_cb sunw_SSL_CTX_se
3878 #pragma redefine_extname SSL_CTX_set_next_protos_advertised_cb sunw_SSL_C
3879 #pragma redefine_extname SSL_CTX_set_psk_client_callback sunw_SSL_CTX_set
3880 #pragma redefine_extname SSL_CTX_set_psk_server_callback sunw_SSL_CTX_set
3881 #pragma redefine_extname SSL_CTX_set_purpose sunw_SSL_CTX_set_purpose
3882 #pragma redefine_extname SSL_CTX_set_quiet_shutdown sunw_SSL_CTX_set_quie
3883 #pragma redefine_extname SSL_CTX_set_session_id_context sunw_SSL_CTX_set_
3884 #pragma redefine_extname SSL_CTX_set_srp_cb_arg sunw_SSL_CTX_set_srp_cb_a
3885 #pragma redefine_extname SSL_CTX_set_srp_client_pwd_callback sunw_SSL_CTX
3886 #pragma redefine_extname SSL_CTX_set_srp_password sunw_SSL_CTX_set_srp_pa
3887 #pragma redefine_extname SSL_CTX_set_srp_strength sunw_SSL_CTX_set_srp.st
3888 #pragma redefine_extname SSL_CTX_set_srp_username sunw_SSL_CTX_set_srp.us
3889 #pragma redefine_extname SSL_CTX_set_srp_username_callback sunw_SSL_CTX_s

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3890 #pragma redefine_extname SSL_CTX_set_srp_verify_param_callback sunw_SSL_C
3891 #pragma redefine_extname SSL_CTX_set_ssl_version sunw_SSL_CTX_set_ssl_ver
3892 #pragma redefine_extname SSL_CTX_set_timeout sunw_SSL_CTX_set_timeout
3893 #pragma redefine_extname SSL_CTX_set_tlsext_use_srtp sunw_SSL_CTX_set_tls
3894 #pragma redefine_extname SSL_CTX_set_tmp_dh_callback sunw_SSL_CTX_set_tmp
3895 #pragma redefine_extname SSL_CTX_set_tmp_rsa_callback sunw_SSL_CTX_set_tm
3896 #pragma redefine_extname SSL_CTX_set_trust sunw_SSL_CTX_set_trust
3897 #pragma redefine_extname SSL_CTX_set_verify sunw_SSL_CTX_set_verify
3898 #pragma redefine_extname SSL_CTX_set_verify_depth sunw_SSL_CTX_set_verify
3899 #pragma redefine_extname SSL_CTX_set1_param sunw_SSL_CTX_set1_param
3900 #pragma redefine_extname SSL_CTX_SRP_CTX_free sunw_SSL_CTX_SRP_CTX_free
3901 #pragma redefine_extname SSL_CTX_SRP_CTX_init sunw_SSL_CTX_SRP_CTX_init
3902 #pragma redefine_extname SSL_CTX_use_certificate sunw_SSL_CTX_use_certifi
3903 #pragma redefine_extname SSL_CTX_use_certificate_ASN1 sunw_SSL_CTX_use_ce
3904 #pragma redefine_extname SSL_CTX_use_certificate_chain_file sunw_SSL_CTX_
3905 #pragma redefine_extname SSL_CTX_use_certificate_file sunw_SSL_CTX_use_ce
3906 #pragma redefine_extname SSL_CTX_use_PrivateKey sunw_SSL_CTX_use_PrivateK
3907 #pragma redefine_extname SSL_CTX_use_PrivateKey_ASN1 sunw_SSL_CTX_use_Pri
3908 #pragma redefine_extname SSL_CTX_use_PrivateKey_file sunw_SSL_CTX_use_Pri
3909 #pragma redefine_extname SSL_CTX_use_psk_identity_hint sunw_SSL_CTX_use_p
3910 #pragma redefine_extname SSL_CTX_use_RSAPrivateKey sunw_SSL_CTX_use_RSAPR
3911 #pragma redefine_extname SSL_CTX_use_RSAPrivateKey_ASN1 sunw_SSL_CTX_use_
3912 #pragma redefine_extname SSL_CTX_use_RSAPrivateKey_file sunw_SSL_CTX_use_
3913 #pragma redefine_extname ssl_do_client_cert_cb sunw_ssl_do_client_cert_cb
3914 #pragma redefine_extname SSL_do_handshake sunw_SSL_do_handshake
3915 #pragma redefine_extname SSL_dup sunw_SSL_dup
3916 #pragma redefine_extname SSL_dup_CA_list sunw_SSL_dup_CA_list
3917 #pragma redefine_extname SSL_export_keying_material sunw_SSL_export_keyin
3918 #pragma redefine_extname ssl_fill_hello_random sunw_ssl_fill_hello_random
3919 #pragma redefine_extname SSL_free sunw_SSL_free
3920 #pragma redefine_extname ssl_free_wbio_buffer sunw_ssl_free_wbio_buffer
3921 #pragma redefine_extname ssl_get_algorithm2 sunw_ssl_get_algorithm2
3922 #pragma redefine_extname SSL_get_certificate sunw_SSL_get_certificate
3923 #pragma redefine_extname SSL_get_cipher_list sunw_SSL_get_cipher_list
3924 #pragma redefine_extname SSL_get_ciphers sunw_SSL_get_ciphers
3925 #pragma redefine_extname ssl_get_ciphers_by_id sunw_ssl_get_ciphers_by_id
3926 #pragma redefine_extname SSL_get_client_CA_list sunw_SSL_get_client_CA_li
3927 #pragma redefine_extname SSL_get_current_cipher sunw_SSL_get_current_ciph
3928 #pragma redefine_extname SSL_get_current_compression sunw_SSL_get_current
3929 #pragma redefine_extname SSL_get_current_expansion sunw_SSL_get_current_e
3930 #pragma redefine_extname SSL_get_default_timeout sunw_SSL_get_default_tim
3931 #pragma redefine_extname SSL_get_error sunw_SSL_get_error
3932 #pragma redefine_extname SSL_get_ex_data sunw_SSL_get_ex_data
3933 #pragma redefine_extname SSL_get_ex_data_X509_STORE_CTX_idx sunw_SSL_get_
3934 #pragma redefine_extname SSL_get_ex_new_index sunw_SSL_get_ex_new_index
3935 #pragma redefine_extname SSL_get_fd sunw_SSL_get_fd
3936 #pragma redefine_extname SSL_get_finished sunw_SSL_get_finished
3937 #pragma redefine_extname ssl_get_handshake_digest sunw_ssl_get_handshake
3938 #pragma redefine_extname SSL_get_info_callback sunw_SSL_get_info_callback
3939 #pragma redefine_extname ssl_get_new_session sunw_ssl_get_new_session
3940 #pragma redefine_extname SSL_get_peer_cert_chain sunw_SSL_get_peer_cert_c
3941 #pragma redefine_extname SSL_get_peer_certificate sunw_SSL_get_peer_certi
3942 #pragma redefine_extname SSL_get_peer_finished sunw_SSL_get_peer_finished
3943 #pragma redefine_extname ssl_get_prev_session sunw_ssl_get_prev_session
3944 #pragma redefine_extname SSL_get_privatekey sunw_SSL_get_privatekey
3945 #pragma redefine_extname SSL_get_psk_identity sunw_SSL_get_psk_identity
3946 #pragma redefine_extname SSL_get_psk_identity_hint sunw_SSL_get_psk_ident
3947 #pragma redefine_extname SSL_get_quiet_shutdown sunw_SSL_get_quiet_shutdo
3948 #pragma redefine_extname SSL_get_rbio sunw_SSL_get_rbio
3949 #pragma redefine_extname SSL_get_read_ahead sunw_SSL_get_read_ahead
3950 #pragma redefine_extname SSL_get_rfd sunw_SSL_get_rfd
3951 #pragma redefine_extname SSL_get_selected_srtp_profile sunw_SSL_get_selec
3952 #pragma redefine_extname ssl_get_server_send_cert sunw_ssl_get_server_sen
3953 #pragma redefine_extname ssl_get_server_send_pkey sunw_ssl_get_server_sen
3954 #pragma redefine_extname SSL_get_servername sunw_SSL_get_servername
3955 #pragma redefine_extname SSL_get_servername_type sunw_SSL_get_servername_

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3956 #pragma redefine_extname SSL_get_session sunw_SSL_get_session
3957 #pragma redefine_extname SSL_get_shared_ciphers sunw_SSL_get_shared_ciphe
3958 #pragma redefine_extname SSL_get_shutdown sunw_SSL_get_shutdown
3959 #pragma redefine_extname ssl_get_sign_pkey sunw_ssl_get_sign_pkey
3960 #pragma redefine_extname SSL_get_srp_g sunw_SSL_get_srp_g
3961 #pragma redefine_extname SSL_get_srp_N sunw_SSL_get_srp_N
3962 #pragma redefine_extname SSL_get_srp_userinfo sunw_SSL_get_srp_userinfo
3963 #pragma redefine_extname SSL_get_srp_username sunw_SSL_get_srp_username
3964 #pragma redefine_extname SSL_get_srtp_profiles sunw_SSL_get_srtp_profiles
3965 #pragma redefine_extname SSL_get_SSL_CTX sunw_SSL_get_SSL_CTX
3966 #pragma redefine_extname SSL_get_ssl_method sunw_SSL_get_ssl_method
3967 #pragma redefine_extname SSL_get_verify_callback sunw_SSL_get_verify_call
3968 #pragma redefine_extname SSL_get_verify_depth sunw_SSL_get_verify_depth
3969 #pragma redefine_extname SSL_get_verify_mode sunw_SSL_get_verify_mode
3970 #pragma redefine_extname SSL_get_verify_result sunw_SSL_get_verify_result
3971 #pragma redefine_extname SSL_get_version sunw_SSL_get_version
3972 #pragma redefine_extname SSL_get_wbio sunw_SSL_get_wbio
3973 #pragma redefine_extname SSL_get_wfd sunw_SSL_get_wfd
3974 #pragma redefine_extname SSL_get0_next_proto_negotiated sunw_SSL_get0_nex
3975 #pragma redefine_extname SSL_get1_session sunw_SSL_get1_session
3976 #pragma redefine_extname SSL_has_matching_session_id sunw_SSL_has_matchin
3977 #pragma redefine_extname ssl_init_wbio_buffer sunw_ssl_init_wbio_buffer
3978 #pragma redefine_extname SSL_library_init sunw_SSL_library_init
3979 #pragma redefine_extname ssl_load_ciphers sunw_ssl_load_ciphers
3980 #pragma redefine_extname SSL_load_client_CA_file sunw_SSL_load_client_CA
3981 #pragma redefine_extname SSL_load_error_strings sunw_SSL_load_error_strin
3982 #pragma redefine_extname SSL_new sunw_SSL_new
3983 #pragma redefine_extname ssl_ok sunw_ssl_ok
3984 #pragma redefine_extname ssl_parse_clienthello_renegotiate_ext sunw_ssl_p
3985 #pragma redefine_extname ssl_parse_clienthello_tlsext sunw_ssl_parse_clie
3986 #pragma redefine_extname ssl_parse_clienthello_use_srtp_ext sunw_ssl_pars
3987 #pragma redefine_extname ssl_parse_serverhello_renegotiate_ext sunw_ssl_p
3988 #pragma redefine_extname ssl_parse_serverhello_tlsext sunw_ssl_parse_serv
3989 #pragma redefine_extname ssl_parse_serverhello_use_srtp_ext sunw_ssl_pars
3990 #pragma redefine_extname SSL_peek sunw_SSL_peek
3991 #pragma redefine_extname SSL_pending sunw_SSL_pending
3992 #pragma redefine_extname ssl_prepare_clienthello_tlsext sunw_ssl_prepare
3993 #pragma redefine_extname ssl_prepare_serverhello_tlsext sunw_ssl_prepare
3994 #pragma redefine_extname SSL_read sunw_SSL_read
3995 #pragma redefine_extname SSL_renegotiate sunw_SSL_renegotiate
3996 #pragma redefine_extname SSL_renegotiate_abbreviated sunw_SSL_renegotiate
3997 #pragma redefine_extname SSL_renegotiate_pending sunw_SSL_renegotiate_pen
3998 #pragma redefine_extname ssl_replace_hash sunw_ssl_replace_hash
3999 #pragma redefine_extname SSL_rstate_string sunw_SSL_rstate_string
4000 #pragma redefine_extname SSL_rstate_string_long sunw_SSL_rstate_string_lo
4001 #pragma redefine_extname SSL_select_next_proto sunw_SSL_select_next_proto
4002 #pragma redefine_extname ssl_sess_cert_free sunw_ssl_sess_cert_free
4003 #pragma redefine_extname ssl_sess_cert_new sunw_ssl_sess_cert_new
4004 #pragma redefine_extname SSL_SESSION_free sunw_SSL_SESSION_free
4005 #pragma redefine_extname SSL_SESSION_get_compress_id sunw_SSL_SESSION_get
4006 #pragma redefine_extname SSL_SESSION_get_ex_data sunw_SSL_SESSION_get_ex
4007 #pragma redefine_extname SSL_SESSION_get_ex_new_index sunw_SSL_SESSION_ge
4008 #pragma redefine_extname SSL_SESSION_get_id sunw_SSL_SESSION_get_id
4009 #pragma redefine_extname SSL_SESSION_get_time sunw_SSL_SESSION_get_time
4010 #pragma redefine_extname SSL_SESSION_get_timeout sunw_SSL_SESSION_get_tim
4011 #pragma redefine_extname SSL_SESSION_get0_peer sunw_SSL_SESSION_get0_peer
4012 #pragma redefine_extname SSL_SESSION_new sunw_SSL_SESSION_new
4013 #pragma redefine_extname SSL_SESSION_print sunw_SSL_SESSION_print
4014 #pragma redefine_extname SSL_SESSION_print_fp sunw_SSL_SESSION_print_fp
4015 #pragma redefine_extname SSL_SESSION_set_ex_data sunw_SSL_SESSION_set_ex
4016 #pragma redefine_extname SSL_SESSION_set_time sunw_SSL_SESSION_set_time
4017 #pragma redefine_extname SSL_SESSION_set_timeout sunw_SSL_SESSION_set_tim
4018 #pragma redefine_extname SSL_SESSION_set1_id_context sunw_SSL_SESSION_set
4019 #pragma redefine_extname SSL_set_accept_state sunw_SSL_set_accept_state
4020 #pragma redefine_extname SSL_set_bio sunw_SSL_set_bio
4021 #pragma redefine_extname ssl_set_cert_masks sunw_ssl_set_cert_masks

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4022 #pragma redefine_extname SSL_set_cipher_list sunw_SSL_set_cipher_list
4023 #pragma redefine_extname SSL_set_client_CA_list sunw_SSL_set_client_CA_li
4024 #pragma redefine_extname SSL_set_connect_state sunw_SSL_set_connect_state
4025 #pragma redefine_extname SSL_set_debug sunw_SSL_set_debug
4026 #pragma redefine_extname SSL_set_ex_data sunw_SSL_set_ex_data
4027 #pragma redefine_extname SSL_set_fd sunw_SSL_set_fd
4028 #pragma redefine_extname SSL_set_generate_session_id sunw_SSL_set_generat
4029 #pragma redefine_extname SSL_set_info_callback sunw_SSL_set_info_callback
4030 #pragma redefine_extname SSL_set_msg_callback sunw_SSL_set_msg_callback
4031 #pragma redefine_extname ssl_set_peer_cert_type sunw_ssl_set_peer_cert_ty
4032 #pragma redefine_extname SSL_set_psk_client_callback sunw_SSL_set_psk_cli
4033 #pragma redefine_extname SSL_set_psk_server_callback sunw_SSL_set_psk_ser
4034 #pragma redefine_extname SSL_set_purpose sunw_SSL_set_purpose
4035 #pragma redefine_extname SSL_set_quiet_shutdown sunw_SSL_set_quiet_shutdo
4036 #pragma redefine_extname SSL_set_read_ahead sunw_SSL_set_read_ahead
4037 #pragma redefine_extname SSL_set_rfd sunw_SSL_set_rfd
4038 #pragma redefine_extname SSL_set_session sunw_SSL_set_session
4039 #pragma redefine_extname SSL_set_session_id_context sunw_SSL_set_session
4040 #pragma redefine_extname SSL_set_session_secret_cb sunw_SSL_set_session_s
4041 #pragma redefine_extname SSL_set_session_ticket_ext sunw_SSL_set_session
4042 #pragma redefine_extname SSL_set_session_ticket_ext_cb sunw_SSL_set_sessi
4043 #pragma redefine_extname SSL_set_shutdown sunw_SSL_set_shutdown
4044 #pragma redefine_extname SSL_set_srp_server_param sunw_SSL_set_srp_server
4045 #pragma redefine_extname SSL_set_srp_server_param_pw sunw_SSL_set_srp_ser
4046 #pragma redefine_extname SSL_set_SSL_CTX sunw_SSL_set_SSL_CTX
4047 #pragma redefine_extname SSL_set_ssl_method sunw_SSL_set_ssl_method
4048 #pragma redefine_extname SSL_set_state sunw_SSL_set_state
4049 #pragma redefine_extname SSL_set_tlsext_use_srtp sunw_SSL_set_tlsext_use
4050 #pragma redefine_extname SSL_set_tmp_dh_callback sunw_SSL_set_tmp_dh_call
4051 #pragma redefine_extname SSL_set_tmp_rsa_callback sunw_SSL_set_tmp_rsa_ca
4052 #pragma redefine_extname SSL_set_trust sunw_SSL_set_trust
4053 #pragma redefine_extname SSL_set_verify sunw_SSL_set_verify
4054 #pragma redefine_extname SSL_set_verify_depth sunw_SSL_set_verify_depth
4055 #pragma redefine_extname SSL_set_verify_result sunw_SSL_set_verify_result
4056 #pragma redefine_extname SSL_set_wfd sunw_SSL_set_wfd
4057 #pragma redefine_extname SSL_set1_param sunw_SSL_set1_param
4058 #pragma redefine_extname SSL_shutdown sunw_SSL_shutdown
4059 #pragma redefine_extname SSL_SRP_CTX_free sunw_SSL_SRP_CTX_free
4060 #pragma redefine_extname SSL_SRP_CTX_init sunw_SSL_SRP_CTX_init
4061 #pragma redefine_extname SSL_srp_server_param_with_username sunw_SSL_srp
4062 #pragma redefine_extname SSL_state sunw_SSL_state
4063 #pragma redefine_extname SSL_state_string sunw_SSL_state_string
4064 #pragma redefine_extname SSL_state_string_long sunw_SSL_state_string_long
4065 #pragma redefine_extname ssl_undefined_const_function sunw_ssl_undefined
4066 #pragma redefine_extname ssl_undefined_function sunw_ssl_undefined_functi
4067 #pragma redefine_extname ssl_undefined_void_function sunw_ssl_undefined_v
4068 #pragma redefine_extname ssl_update_cache sunw_ssl_update_cache
4069 #pragma redefine_extname SSL_use_certificate sunw_SSL_use_certificate
4070 #pragma redefine_extname SSL_use_certificate_ASN1 sunw_SSL_use_certificat
4071 #pragma redefine_extname SSL_use_certificate_file sunw_SSL_use_certificat
4072 #pragma redefine_extname SSL_use_PrivateKey sunw_SSL_use_PrivateKey
4073 #pragma redefine_extname SSL_use_PrivateKey_ASN1 sunw_SSL_use_PrivateKey
4074 #pragma redefine_extname SSL_use_PrivateKey_file sunw_SSL_use_PrivateKey
4075 #pragma redefine_extname SSL_use_psk_identity_hint sunw_SSL_use_psk_ident
4076 #pragma redefine_extname SSL_use_RSAPrivateKey sunw_SSL_use_RSAPrivateKey
4077 #pragma redefine_extname SSL_use_RSAPrivateKey_ASN1 sunw_SSL_use_RSAPriva
4078 #pragma redefine_extname SSL_use_RSAPrivateKey_file sunw_SSL_use_RSAPriva
4079 #pragma redefine_extname ssl_verify_alarm_type sunw_ssl_verify_alarm_type
4080 #pragma redefine_extname ssl_verify_cert_chain sunw_ssl_verify_cert_chain
4081 #pragma redefine_extname SSL_version sunw_SSL_version
4082 #pragma redefine_extname SSL_version_str sunw_SSL_version_str
4083 #pragma redefine_extname SSL_want sunw_SSL_want
4084 #pragma redefine_extname SSL_write sunw_SSL_write
4085 #pragma redefine_extname ssl2_accept sunw_ssl2_accept
4086 #pragma redefine_extname ssl2_callback_ctrl sunw_ssl2_callback_ctrl
4087 #pragma redefine_extname ssl2_ciphers sunw_ssl2_ciphers

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4088 #pragma redefine_extname      ssl2_clear sunw_ssl2_clear
4089 #pragma redefine_extname      ssl2_connect sunw_ssl2_connect
4090 #pragma redefine_extname      ssl2_ctrl sunw_ssl2_ctrl
4091 #pragma redefine_extname      ssl2_ctx_callback_ctrl sunw_ssl2_ctx_callback_ct
4092 #pragma redefine_extname      ssl2_ctx_ctrl sunw_ssl2_ctx_ctrl
4093 #pragma redefine_extname      ssl2_default_timeout sunw_ssl2_default_timeout
4094 #pragma redefine_extname      ssl2_do_write sunw_ssl2_do_write
4095 #pragma redefine_extname      ssl2_enc sunw_ssl2_enc
4096 #pragma redefine_extname      ssl2_enc_init sunw_ssl2_enc_init
4097 #pragma redefine_extname      ssl2_free sunw_ssl2_free
4098 #pragma redefine_extname      ssl2_generate_key_material sunw_ssl2_generate_ke
4099 #pragma redefine_extname      ssl2_get_cipher sunw_ssl2_get_cipher
4100 #pragma redefine_extname      ssl2_get_cipher_by_char sunw_ssl2_get_cipher_by_
4101 #pragma redefine_extname      ssl2_mac sunw_ssl2_mac
4102 #pragma redefine_extname      ssl2_new sunw_ssl2_new
4103 #pragma redefine_extname      ssl2_num_ciphers sunw_ssl2_num_ciphers
4104 #pragma redefine_extname      ssl2_part_read sunw_ssl2_part_read
4105 #pragma redefine_extname      ssl2_peek sunw_ssl2_peek
4106 #pragma redefine_extname      ssl2_pending sunw_ssl2_pending
4107 #pragma redefine_extname      ssl2_put_cipher_by_char sunw_ssl2_put_cipher_by_
4108 #pragma redefine_extname      ssl2_read sunw_ssl2_read
4109 #pragma redefine_extname      ssl2_return_error sunw_ssl2_return_error
4110 #pragma redefine_extname      ssl2_set_certificate sunw_ssl2_set_certificate
4111 #pragma redefine_extname      ssl2_shutdown sunw_ssl2_shutdown
4112 #pragma redefine_extname      ssl2_version_str sunw_ssl2_version_str
4113 #pragma redefine_extname      ssl2_write sunw_ssl2_write
4114 #pragma redefine_extname      ssl2_write_error sunw_ssl2_write_error
4115 #pragma redefine_extname      ssl23_accept sunw_ssl23_accept
4116 #pragma redefine_extname      ssl23_connect sunw_ssl23_connect
4117 #pragma redefine_extname      ssl23_default_timeout sunw_ssl23_default_timeout
4118 #pragma redefine_extname      ssl23_get_cipher sunw_ssl23_get_cipher
4119 #pragma redefine_extname      ssl23_get_cipher_by_char sunw_ssl23_get_cipher_b
4120 #pragma redefine_extname      ssl23_get_client_hello sunw_ssl23_get_client_hel
4121 #pragma redefine_extname      ssl23_num_ciphers sunw_ssl23_num_ciphers
4122 #pragma redefine_extname      ssl23_peek sunw_ssl23_peek
4123 #pragma redefine_extname      ssl23_put_cipher_by_char sunw_ssl23_put_cipher_b
4124 #pragma redefine_extname      ssl23_read sunw_ssl23_read
4125 #pragma redefine_extname      ssl23_read_bytes sunw_ssl23_read_bytes
4126 #pragma redefine_extname      ssl23_write sunw_ssl23_write
4127 #pragma redefine_extname      ssl23_write_bytes sunw_ssl23_write_bytes
4128 #pragma redefine_extname      ssl3_accept sunw_ssl3_accept
4129 #pragma redefine_extname      ssl3_alert_code sunw_ssl3_alert_code
4130 #pragma redefine_extname      ssl3_callback_ctrl sunw_ssl3_callback_ctrl
4131 #pragma redefine_extname      ssl3_cbc_copy_mac sunw_ssl3_cbc_copy_mac
4132 #pragma redefine_extname      ssl3_cbc_digest_record sunw_ssl3_cbc_digest_reco
4133 #pragma redefine_extname      ssl3_cbc_record_digest_supported sunw_ssl3_cbc_r
4134 #pragma redefine_extname      ssl3_cbc_remove_padding sunw_ssl3_cbc_remove_pad
4135 #pragma redefine_extname      ssl3_cert_verify_mac sunw_ssl3_cert_verify_mac
4136 #pragma redefine_extname      ssl3_change_cipher_state sunw_ssl3_change_cipher
4137 #pragma redefine_extname      ssl3_check_cert_and_algorithm sunw_ssl3_check_ce
4138 #pragma redefine_extname      ssl3_check_client_hello sunw_ssl3_check_client_h
4139 #pragma redefine_extname      ssl3_check_finished sunw_ssl3_check_finished
4140 #pragma redefine_extname      ssl3_choose_cipher sunw_ssl3_choose_cipher
4141 #pragma redefine_extname      ssl3_ciphers sunw_ssl3_ciphers
4142 #pragma redefine_extname      ssl3_cleanup_key_block sunw_ssl3_cleanup_key_blo
4143 #pragma redefine_extname      ssl3_clear sunw_ssl3_clear
4144 #pragma redefine_extname      ssl3_client_hello sunw_ssl3_client_hello
4145 #pragma redefine_extname      ssl3_comp_find sunw_ssl3_comp_find
4146 #pragma redefine_extname      ssl3_connect sunw_ssl3_connect
4147 #pragma redefine_extname      ssl3_ctrl sunw_ssl3_ctrl
4148 #pragma redefine_extname      ssl3_ctx_callback_ctrl sunw_ssl3_ctx_callback_ct
4149 #pragma redefine_extname      ssl3_ctx_ctrl sunw_ssl3_ctx_ctrl
4150 #pragma redefine_extname      ssl3_default_timeout sunw_ssl3_default_timeout
4151 #pragma redefine_extname      ssl3_digest_cached_records sunw_ssl3_digest_cach
4152 #pragma redefine_extname      ssl3_dispatch_alert sunw_ssl3_dispatch_alert
4153 #pragma redefine_extname      ssl3_do_change_cipher_spec sunw_ssl3_do_change_c

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4154 #pragma redefine_extname      ssl3_do_compress sunw_ssl3_do_compress
4155 #pragma redefine_extname      ssl3_do_uncompress sunw_ssl3_do_uncompress
4156 #pragma redefine_extname      ssl3_do_write sunw_ssl3_do_write
4157 #pragma redefine_extname      ssl3_enc sunw_ssl3_enc
4158 #pragma redefine_extname      ssl3_final_finish_mac sunw_ssl3_final_finish_mac
4159 #pragma redefine_extname      ssl3_finish_mac sunw_ssl3_finish_mac
4160 #pragma redefine_extname      ssl3_free sunw_ssl3_free
4161 #pragma redefine_extname      ssl3_free_digest_list sunw_ssl3_free_digest_list
4162 #pragma redefine_extname      ssl3_generate_master_secret sunw_ssl3_generate_m
4163 #pragma redefine_extname      ssl3_get_cert_status sunw_ssl3_get_cert_status
4164 #pragma redefine_extname      ssl3_get_cert_verify sunw_ssl3_get_cert_verify
4165 #pragma redefine_extname      ssl3_get_certificate_request sunw_ssl3_get_certi
4166 #pragma redefine_extname      ssl3_get_cipher sunw_ssl3_get_cipher
4167 #pragma redefine_extname      ssl3_get_cipher_by_char sunw_ssl3_get_cipher_by_
4168 #pragma redefine_extname      ssl3_get_client_certificate sunw_ssl3_get_client
4169 #pragma redefine_extname      ssl3_get_client_hello sunw_ssl3_get_client_hello
4170 #pragma redefine_extname      ssl3_get_client_key_exchange sunw_ssl3_get_clie
4171 #pragma redefine_extname      ssl3_get_finished sunw_ssl3_get_finished
4172 #pragma redefine_extname      ssl3_get_key_exchange sunw_ssl3_get_key_exchange
4173 #pragma redefine_extname      ssl3_get_message sunw_ssl3_get_message
4174 #pragma redefine_extname      ssl3_get_new_session_ticket sunw_ssl3_get_new_se
4175 #pragma redefine_extname      ssl3_get_next_proto sunw_ssl3_get_next_proto
4176 #pragma redefine_extname      ssl3_get_req_cert_type sunw_ssl3_get_req_cert_ty
4177 #pragma redefine_extname      ssl3_get_server_certificate sunw_ssl3_get_server
4178 #pragma redefine_extname      ssl3_get_server_done sunw_ssl3_get_server_done
4179 #pragma redefine_extname      ssl3_get_server_hello sunw_ssl3_get_server_hello
4180 #pragma redefine_extname      ssl3_init_finished_mac sunw_ssl3_init_finished_m
4181 #pragma redefine_extname      ssl3_new sunw_ssl3_new
4182 #pragma redefine_extname      ssl3_num_ciphers sunw_ssl3_num_ciphers
4183 #pragma redefine_extname      ssl3_output_cert_chain sunw_ssl3_output_cert_cha
4184 #pragma redefine_extname      ssl3_peek sunw_ssl3_peek
4185 #pragma redefine_extname      ssl3_pending sunw_ssl3_pending
4186 #pragma redefine_extname      ssl3_put_cipher_by_char sunw_ssl3_put_cipher_by_
4187 #pragma redefine_extname      ssl3_read sunw_ssl3_read
4188 #pragma redefine_extname      ssl3_read_bytes sunw_ssl3_read_bytes
4189 #pragma redefine_extname      ssl3_read_n sunw_ssl3_read_n
4190 #pragma redefine_extname      ssl3_record_sequence_update sunw_ssl3_record_seq
4191 #pragma redefine_extname      ssl3_release_read_buffer sunw_ssl3_release_read_
4192 #pragma redefine_extname      ssl3_release_write_buffer sunw_ssl3_release_writ
4193 #pragma redefine_extname      ssl3_renegotiate sunw_ssl3_renegotiate
4194 #pragma redefine_extname      ssl3_renegotiate_check sunw_ssl3_renegotiate_che
4195 #pragma redefine_extname      ssl3_send_alert sunw_ssl3_send_alert
4196 #pragma redefine_extname      ssl3_send_cert_status sunw_ssl3_send_cert_status
4197 #pragma redefine_extname      ssl3_send_certificate_request sunw_ssl3_send_cer
4198 #pragma redefine_extname      ssl3_send_change_cipher_spec sunw_ssl3_send_chan
4199 #pragma redefine_extname      ssl3_send_client_certificate sunw_ssl3_send_clie
4200 #pragma redefine_extname      ssl3_send_client_key_exchange sunw_ssl3_send_cli
4201 #pragma redefine_extname      ssl3_send_client_verify sunw_ssl3_send_client_ve
4202 #pragma redefine_extname      ssl3_send_finished sunw_ssl3_send_finished
4203 #pragma redefine_extname      ssl3_send_hello_request sunw_ssl3_send_hello_req
4204 #pragma redefine_extname      ssl3_send_newsession_ticket sunw_ssl3_send_newse
4205 #pragma redefine_extname      ssl3_send_next_proto sunw_ssl3_send_next_proto
4206 #pragma redefine_extname      ssl3_send_server_certificate sunw_ssl3_send_serv
4207 #pragma redefine_extname      ssl3_send_server_done sunw_ssl3_send_server_done
4208 #pragma redefine_extname      ssl3_send_server_hello sunw_ssl3_send_server_hel
4209 #pragma redefine_extname      ssl3_send_server_key_exchange sunw_ssl3_send_ser
4210 #pragma redefine_extname      ssl3_setup_buffers sunw_ssl3_setup_buffers
4211 #pragma redefine_extname      ssl3_setup_key_block sunw_ssl3_setup_key_block
4212 #pragma redefine_extname      ssl3_setup_read_buffer sunw_ssl3_setup_read_buff
4213 #pragma redefine_extname      ssl3_setup_write_buffer sunw_ssl3_setup_write_bu
4214 #pragma redefine_extname      ssl3_shutdown sunw_ssl3_shutdown
4215 #pragma redefine_extname      ssl3 undef_enc_method sunw_ssl3 undef_enc_method
4216 #pragma redefine_extname      ssl3_version_str sunw_ssl3_version_str
4217 #pragma redefine_extname      ssl3_write sunw_ssl3_write
4218 #pragma redefine_extname      ssl3_write_bytes sunw_ssl3_write_bytes
4219 #pragma redefine_extname      ssl3_write_pending sunw_ssl3_write_pending

```

```
4220 #pragma redefine_extname      SSLv2_client_method sunw_SSLv2_client_method
4221 #pragma redefine_extname      SSLv2_method sunw_SSLv2_method
4222 #pragma redefine_extname      SSLv2_server_method sunw_SSLv2_server_method
4223 #pragma redefine_extname      SSLv23_client_method sunw_SSLv23_client_method
4224 #pragma redefine_extname      SSLv23_method sunw_SSLv23_method
4225 #pragma redefine_extname      SSLv23_server_method sunw_SSLv23_server_method
4226 #pragma redefine_extname      SSLv3_client_method sunw_SSLv3_client_method
4227 #pragma redefine_extname      SSLv3_enc_data sunw_SSLv3_enc_data
4228 #pragma redefine_extname      SSLv3_method sunw_SSLv3_method
4229 #pragma redefine_extname      SSLv3_server_method sunw_SSLv3_server_method
4230 #pragma redefine_extname      tls1_alert_code sunw_tls1_alert_code
4231 #pragma redefine_extname      tls1_cbc_remove_padding sunw_tls1_cbc_remove_pad
4232 #pragma redefine_extname      tls1_cert_verify_mac sunw_tls1_cert_verify_mac
4233 #pragma redefine_extname      tls1_change_cipher_state sunw_tls1_change_cipher
4234 #pragma redefine_extname      tls1_clear sunw_tls1_clear
4235 #pragma redefine_extname      tls1_default_timeout sunw_tls1_default_timeout
4236 #pragma redefine_extname      tls1_enc sunw_tls1_enc
4237 #pragma redefine_extname      tls1_export_keying_material sunw_tls1_export_key
4238 #pragma redefine_extname      tls1_final_finish_mac sunw_tls1_final_finish_mac
4239 #pragma redefine_extname      tls1_free sunw_tls1_free
4240 #pragma redefine_extname      tls1_generate_master_secret sunw_tls1_generate_m
4241 #pragma redefine_extname      tls1_heartbeat sunw_tls1_heartbeat
4242 #pragma redefine_extname      tls1_mac sunw_tls1_mac
4243 #pragma redefine_extname      tls1_new sunw_tls1_new
4244 #pragma redefine_extname      tls1_process_heartbeat sunw_tls1_process_heartbe
4245 #pragma redefine_extname      tls1_process_sigalgs sunw_tls1_process_sigalgs
4246 #pragma redefine_extname      tls1_process_ticket sunw_tls1_process_ticket
4247 #pragma redefine_extname      tls1_setup_key_block sunw_tls1_setup_key_block
4248 #pragma redefine_extname      tls1_version_str sunw_tls1_version_str
4249 #pragma redefine_extname      tls12_get_hash sunw_tls12_get_hash
4250 #pragma redefine_extname      tls12_get_req_sig_algs sunw_tls12_get_req_sig_al
4251 #pragma redefine_extname      tls12_get_sigandhash sunw_tls12_get_sigandhash
4252 #pragma redefine_extname      tls12_get_sigid sunw_tls12_get_sigid
4253 #pragma redefine_extname      TLSv1_1_client_method sunw_TLSv1_1_client_method
4254 #pragma redefine_extname      TLSv1_1_method sunw_TLSv1_1_method
4255 #pragma redefine_extname      TLSv1_1_server_method sunw_TLSv1_1_server_method
4256 #pragma redefine_extname      TLSv1_2_client_method sunw_TLSv1_2_client_method
4257 #pragma redefine_extname      TLSv1_2_method sunw_TLSv1_2_method
4258 #pragma redefine_extname      TLSv1_2_server_method sunw_TLSv1_2_server_method
4259 #pragma redefine_extname      TLSv1_client_method sunw_TLSv1_client_method
4260 #pragma redefine_extname      TLSv1_enc_data sunw_TLSv1_enc_data
4261 #pragma redefine_extname      TLSv1_method sunw_TLSv1_method
4262 #pragma redefine_extname      TLSv1_server_method sunw_TLSv1_server_method

4264 #endif /* _SUNW_PREFIX_H */
```



```

*****
24302 Fri May 30 18:31:23 2014
new/usr/src/lib/openssl/include/openssl/symhacks.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
19 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
22 * endorse or promote products derived from this software without
23 * prior written permission. For written permission, please contact
24 * openssl-core@openssl.org.
25 *
26 * 5. Products derived from this software may not be called "OpenSSL"
27 * nor may "OpenSSL" appear in their names without prior written
28 * permission of the OpenSSL Project.
29 *
30 * 6. Redistributions of any form whatsoever must retain the following
31 * acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
34 *
35 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
37 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
38 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
39 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
40 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
41 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
42 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #ifndef HEADER_SYMHACKS_H
56 #define HEADER_SYMHACKS_H

58 #include <openssl/e_os2.h>

60 /* Hacks to solve the problem with linkers incapable of handling very long
61  symbol names. In the case of VMS, the limit is 31 characters on VMS for

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62 VAX. */
63 /* Note that this affects util/libeay.num and util/ssleay.num... you may
64 change those manually, but that's not recommended, as those files are
65 controlled centrally and updated on Unix, and the central definition
66 may disagree with yours, which in turn may come with shareable library
67 incompatibilities. */
68 #ifdef OPENSSL_SYS_VMS

70 /* Hack a long name in crypto/ex_data.c */
71 #undef CRYPTO_get_ex_data_implementation
72 #define CRYPTO_get_ex_data_implementation CRYPTO_get_ex_data_impl
73 #undef CRYPTO_set_ex_data_implementation
74 #define CRYPTO_set_ex_data_implementation CRYPTO_set_ex_data_impl

76 /* Hack a long name in crypto/asn1/a_mbstr.c */
77 #undef ASN1_STRING_set_default_mask_asc
78 #define ASN1_STRING_set_default_mask_asc ASN1_STRING_set_def_mask_asc

80 #if 0 /* No longer needed, since safestack macro magic does the job */
81 /* Hack the names created with DECLARE_ASN1_SET_OF(PKCS7_SIGNER_INFO) */
82 #undef i2d_ASN1_SET_OF_PKCS7_SIGNER_INFO
83 #define i2d_ASN1_SET_OF_PKCS7_SIGNER_INFO i2d_ASN1_SET_OF_PKCS7_SIGINF
84 #undef d2i_ASN1_SET_OF_PKCS7_SIGNER_INFO
85 #define d2i_ASN1_SET_OF_PKCS7_SIGNER_INFO d2i_ASN1_SET_OF_PKCS7_SIGINF
86 #endif

88 #if 0 /* No longer needed, since safestack macro magic does the job */
89 /* Hack the names created with DECLARE_ASN1_SET_OF(PKCS7_RECIP_INFO) */
90 #undef i2d_ASN1_SET_OF_PKCS7_RECIP_INFO
91 #define i2d_ASN1_SET_OF_PKCS7_RECIP_INFO i2d_ASN1_SET_OF_PKCS7_RECINF
92 #undef d2i_ASN1_SET_OF_PKCS7_RECIP_INFO
93 #define d2i_ASN1_SET_OF_PKCS7_RECIP_INFO d2i_ASN1_SET_OF_PKCS7_RECINF
94 #endif

96 #if 0 /* No longer needed, since safestack macro magic does the job */
97 /* Hack the names created with DECLARE_ASN1_SET_OF(ACCESS_DESCRIPTION) */
98 #undef i2d_ASN1_SET_OF_ACCESS_DESCRIPTION
99 #define i2d_ASN1_SET_OF_ACCESS_DESCRIPTION i2d_ASN1_SET_OF_ACC_DESC
100 #undef d2i_ASN1_SET_OF_ACCESS_DESCRIPTION
101 #define d2i_ASN1_SET_OF_ACCESS_DESCRIPTION d2i_ASN1_SET_OF_ACC_DESC
102 #endif

104 /* Hack the names created with DECLARE_PEM_rw(NETSCAPE_CERT_SEQUENCE) */
105 #undef PEM_read_NETSCAPE_CERT_SEQUENCE
106 #define PEM_read_NETSCAPE_CERT_SEQUENCE PEM_read_NS_CERT_SEQ
107 #undef PEM_write_NETSCAPE_CERT_SEQUENCE
108 #define PEM_write_NETSCAPE_CERT_SEQUENCE PEM_write_NS_CERT_SEQ
109 #undef PEM_read_bio_NETSCAPE_CERT_SEQUENCE
110 #define PEM_read_bio_NETSCAPE_CERT_SEQUENCE PEM_read_bio_NS_CERT_SEQ
111 #undef PEM_write_bio_NETSCAPE_CERT_SEQUENCE
112 #define PEM_write_bio_NETSCAPE_CERT_SEQUENCE PEM_write_bio_NS_CERT_SEQ
113 #undef PEM_write_cb_bio_NETSCAPE_CERT_SEQUENCE
114 #define PEM_write_cb_bio_NETSCAPE_CERT_SEQUENCE PEM_write_cb_bio_NS_CERT_SEQ

116 /* Hack the names created with DECLARE_PEM_rw(PKCS8_PRIV_KEY_INFO) */
117 #undef PEM_read_PKCS8_PRIV_KEY_INFO
118 #define PEM_read_PKCS8_PRIV_KEY_INFO PEM_read_P8_PRIV_KEY_INFO
119 #undef PEM_write_PKCS8_PRIV_KEY_INFO
120 #define PEM_write_PKCS8_PRIV_KEY_INFO PEM_write_P8_PRIV_KEY_INFO
121 #undef PEM_read_bio_PKCS8_PRIV_KEY_INFO
122 #define PEM_read_bio_PKCS8_PRIV_KEY_INFO PEM_read_bio_P8_PRIV_KEY_INFO
123 #undef PEM_write_bio_PKCS8_PRIV_KEY_INFO
124 #define PEM_write_bio_PKCS8_PRIV_KEY_INFO PEM_write_bio_P8_PRIV_KEY_INFO
125 #undef PEM_write_cb_bio_PKCS8_PRIV_KEY_INFO
126 #define PEM_write_cb_bio_PKCS8_PRIV_KEY_INFO PEM_wrt_cb_bio_P8_PRIV_KEY_INFO

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128 /* Hack other PEM names */
129 #undef PEM_write_bio_PKCS8PrivateKey_nid
130 #define PEM_write_bio_PKCS8PrivateKey_nid PEM_write_bio_PKCS8PrivKey_nid

132 /* Hack some long X509 names */
133 #undef X509_REVOKED_get_ext_by_critical
134 #define X509_REVOKED_get_ext_by_critical X509_REVOKED_get_ext_by_critic
135 #undef X509_policy_tree_get0_user_policies
136 #define X509_policy_tree_get0_user_policies X509_pcy_tree_get0_usr_policies
137 #undef X509_policy_node_get0_qualifiers
138 #define X509_policy_node_get0_qualifiers X509_pcy_node_get0_qualifiers
139 #undef X509_STORE_CTX_get_explicit_policy
140 #define X509_STORE_CTX_get_explicit_policy X509_STORE_CTX_get_expl_policy
141 #undef X509_STORE_CTX_get0_current_issuer
142 #define X509_STORE_CTX_get0_current_issuer X509_STORE_CTX_get0_cur_issuer

144 /* Hack some long CRYPTO names */
145 #undef CRYPTO_set_dynlock_destroy_callback
146 #define CRYPTO_set_dynlock_destroy_callback CRYPTO_set_dynlock_destroy_cb
147 #undef CRYPTO_set_dynlock_create_callback
148 #define CRYPTO_set_dynlock_create_callback CRYPTO_set_dynlock_create_cb
149 #undef CRYPTO_set_dynlock_lock_callback
150 #define CRYPTO_set_dynlock_lock_callback CRYPTO_set_dynlock_lock_cb
151 #undef CRYPTO_get_dynlock_lock_callback
152 #define CRYPTO_get_dynlock_lock_callback CRYPTO_get_dynlock_lock_cb
153 #undef CRYPTO_get_dynlock_destroy_callback
154 #define CRYPTO_get_dynlock_destroy_callback CRYPTO_get_dynlock_destroy_cb
155 #undef CRYPTO_get_dynlock_create_callback
156 #define CRYPTO_get_dynlock_create_callback CRYPTO_get_dynlock_create_cb
157 #undef CRYPTO_set_locked_mem_ex_functions
158 #define CRYPTO_set_locked_mem_ex_functions CRYPTO_set_locked_mem_ex_funcs
159 #undef CRYPTO_get_locked_mem_ex_functions
160 #define CRYPTO_get_locked_mem_ex_functions CRYPTO_get_locked_mem_ex_funcs

162 /* Hack some long SSL names */
163 #undef SSL_CTX_set_default_verify_paths
164 #define SSL_CTX_set_default_verify_paths SSL_CTX_set_def_verify_paths
165 #undef SSL_get_ex_data_X509_STORE_CTX_idx
166 #define SSL_get_ex_data_X509_STORE_CTX_idx SSL_get_ex_d_X509_STORE_CTX_idx
167 #undef SSL_add_file_cert_subjects_to_stack
168 #define SSL_add_file_cert_subjects_to_stack SSL_add_file_cert_subjs_to_stk
169 #undef SSL_add_dir_cert_subjects_to_stack
170 #define SSL_add_dir_cert_subjects_to_stack SSL_add_dir_cert_subjs_to_stk
171 #undef SSL_CTX_use_certificate_chain_file
172 #define SSL_CTX_use_certificate_chain_file SSL_CTX_use_cert_chain_file
173 #undef SSL_CTX_set_cert_verify_callback
174 #define SSL_CTX_set_cert_verify_callback SSL_CTX_set_cert_verify_cb
175 #undef SSL_CTX_set_default_passwd_cb_userdata
176 #define SSL_CTX_set_default_passwd_cb_userdata SSL_CTX_set_def_passwd_cb_ud
177 #undef SSL_COMP_get_compression_methods
178 #define SSL_COMP_get_compression_methods SSL_COMP_get_compress_methods
179 #undef ssl_add_clienthello_renegotiate_ext
180 #define ssl_add_clienthello_renegotiate_ext ssl_add_clienthello_reneg_ext
181 #undef ssl_add_serverhello_renegotiate_ext
182 #define ssl_add_serverhello_renegotiate_ext ssl_add_serverhello_reneg_ext
183 #undef ssl_parse_clienthello_renegotiate_ext
184 #define ssl_parse_clienthello_renegotiate_ext ssl_parse_clienthello_reneg_ext
185 #undef ssl_parse_serverhello_renegotiate_ext
186 #define ssl_parse_serverhello_renegotiate_ext ssl_parse_serverhello_reneg_ext
187 #undef SSL_srp_server_param_with_username
188 #define SSL_srp_server_param_with_username SSL_srp_server_param_with_un
189 #undef SSL_CTX_set_srp_client_pwd_callback
190 #define SSL_CTX_set_srp_client_pwd_callback SSL_CTX_set_srp_client_pwd_cb
191 #undef SSL_CTX_set_srp_verify_param_callback
192 #define SSL_CTX_set_srp_verify_param_callback SSL_CTX_set_srp_vfy_param_cb
193 #undef SSL_CTX_set_srp_username_callback

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194 #define SSL_CTX_set_srp_username_callback SSL_CTX_set_srp_un_cb
195 #undef ssl_add_clienthello_use_srtp_ext
196 #define ssl_add_clienthello_use_srtp_ext ssl_add_clihello_use_srtp_ext
197 #undef ssl_add_serverhello_use_srtp_ext
198 #define ssl_add_serverhello_use_srtp_ext ssl_add_serhello_use_srtp_ext
199 #undef ssl_parse_clienthello_use_srtp_ext
200 #define ssl_parse_clienthello_use_srtp_ext ssl_parse_clihello_use_srtp_ext
201 #undef ssl_parse_serverhello_use_srtp_ext
202 #define ssl_parse_serverhello_use_srtp_ext ssl_parse_serhello_use_srtp_ext
203 #undef SSL_CTX_set_next_protos_advertised_cb
204 #define SSL_CTX_set_next_protos_advertised_cb SSL_CTX_set_next_protos_adv_cb
205 #undef SSL_CTX_set_next_proto_select_cb
206 #define SSL_CTX_set_next_proto_select_cb SSL_CTX_set_next_proto_sel_cb
207 #undef ssl3_cbc_record_digest_supported
208 #define ssl3_cbc_record_digest_supported ssl3_cbc_record_digest_support
209 #undef ssl_check_clienthello_tlsext_late
210 #define ssl_check_clienthello_tlsext_late ssl_check_clihello_tlsext_late
211 #undef ssl_check_clienthello_tlsext_early
212 #define ssl_check_clienthello_tlsext_early ssl_check_clihello_tlsext_early

214 /* Hack some long ENGINE names */
215 #undef ENGINE_get_default_BN_mod_exp_crt
216 #define ENGINE_get_default_BN_mod_exp_crt ENGINE_get_def_BN_mod_exp_crt
217 #undef ENGINE_set_default_BN_mod_exp_crt
218 #define ENGINE_set_default_BN_mod_exp_crt ENGINE_set_def_BN_mod_exp_crt
219 #undef ENGINE_set_load_privkey_function
220 #define ENGINE_set_load_privkey_function ENGINE_set_load_privkey_fn
221 #undef ENGINE_get_load_privkey_function
222 #define ENGINE_get_load_privkey_function ENGINE_get_load_privkey_fn
223 #undef ENGINE_unregister_pkey_asn1_meths
224 #define ENGINE_unregister_pkey_asn1_meths ENGINE_unreg_pkey_asn1_meths
225 #undef ENGINE_register_all_pkey_asn1_meths
226 #define ENGINE_register_all_pkey_asn1_meths ENGINE_reg_all_pkey_asn1_meths
227 #undef ENGINE_set_default_pkey_asn1_meths
228 #define ENGINE_set_default_pkey_asn1_meths ENGINE_set_def_pkey_asn1_meths
229 #undef ENGINE_get_pkey_asn1_meth_engine
230 #define ENGINE_get_pkey_asn1_meth_engine ENGINE_get_pkey_asn1_meth_eng
231 #undef ENGINE_set_load_ssl_client_cert_function
232 #define ENGINE_set_load_ssl_client_cert_function \
233 ENGINE_set_ld_ssl_clnt_cert_fn
234 #undef ENGINE_get_ssl_client_cert_function
235 #define ENGINE_get_ssl_client_cert_function ENGINE_get_ssl_client_cert_fn

237 /* Hack some long OSCP names */
238 #undef OSCP_REQUEST_get_ext_by_critical
239 #define OSCP_REQUEST_get_ext_by_critical OSCP_REQUEST_get_ext_by_crit
240 #undef OSCP_BASICRESP_get_ext_by_critical
241 #define OSCP_BASICRESP_get_ext_by_critical OSCP_BASICRESP_get_ext_by_crit
242 #undef OSCP_SINGLERESP_get_ext_by_critical
243 #define OSCP_SINGLERESP_get_ext_by_critical OSCP_SINGLERESP_get_ext_by_crit

245 /* Hack some long DES names */
246 #undef _ossl_old_des_ede3_cfb64_encrypt
247 #define _ossl_old_des_ede3_cfb64_encrypt _ossl_odes_ede3_cfb64_encrypt
248 #undef _ossl_old_des_ede3_ofb64_encrypt
249 #define _ossl_old_des_ede3_ofb64_encrypt _ossl_odes_ede3_ofb64_encrypt

251 /* Hack some long EVP names */
252 #undef OPENSSL_add_all_algorithms_noconf
253 #define OPENSSL_add_all_algorithms_noconf OPENSSL_add_all_algo_noconf
254 #undef OPENSSL_add_all_algorithms_conf
255 #define OPENSSL_add_all_algorithms_conf OPENSSL_add_all_algo_conf
256 #undef EVP_PKEY_meth_set_verify_recover
257 #define EVP_PKEY_meth_set_verify_recover EVP_PKEY_meth_set_vrfy_recover

259 /* Hack some long EC names */

```

```

260 #undef EC_GROUP_set_point_conversion_form
261 #define EC_GROUP_set_point_conversion_form EC_GROUP_set_point_conv_form
262 #undef EC_GROUP_get_point_conversion_form
263 #define EC_GROUP_get_point_conversion_form EC_GROUP_get_point_conv_form
264 #undef EC_GROUP_clear_free_all_extra_data
265 #define EC_GROUP_clear_free_all_extra_data EC_GROUP_clr_free_all_xtra_data
266 #undef EC_KEY_set_public_key_affine_coordinates
267 #define EC_KEY_set_public_key_affine_coordinates \
268     EC_KEY_set_pub_key_aff_coords
269 #undef EC_POINT_set_Jprojective_coordinates_GFp
270 #define EC_POINT_set_Jprojective_coordinates_GFp \
271     EC_POINT_set_Jproj_coords_GFp
272 #undef EC_POINT_get_Jprojective_coordinates_GFp
273 #define EC_POINT_get_Jprojective_coordinates_GFp \
274     EC_POINT_get_Jproj_coords_GFp
275 #undef EC_POINT_set_affine_coordinates_GFp
276 #define EC_POINT_set_affine_coordinates_GFp EC_POINT_set_affine_coords_GFp
277 #undef EC_POINT_get_affine_coordinates_GFp
278 #define EC_POINT_get_affine_coordinates_GFp EC_POINT_get_affine_coords_GFp
279 #undef EC_POINT_set_compressed_coordinates_GFp
280 #define EC_POINT_set_compressed_coordinates_GFp EC_POINT_set_compr_coords_GFp
281 #undef EC_POINT_set_affine_coordinates_GF2m
282 #define EC_POINT_set_affine_coordinates_GF2m EC_POINT_set_affine_coords_GF2m
283 #undef EC_POINT_get_affine_coordinates_GF2m
284 #define EC_POINT_get_affine_coordinates_GF2m EC_POINT_get_affine_coords_GF2m
285 #undef EC_POINT_set_compressed_coordinates_GF2m
286 #define EC_POINT_set_compressed_coordinates_GF2m \
287     EC_POINT_set_compr_coords_GF2m
288 #undef ec_GF2m_simple_group_clear_finish
289 #define ec_GF2m_simple_group_clear_finish ec_GF2m_simple_grp_clr_finish
290 #undef ec_GF2m_simple_group_check_discriminant
291 #define ec_GF2m_simple_group_check_discriminant ec_GF2m_simple_grp_chk_discrim
292 #undef ec_GF2m_simple_point_clear_finish
293 #define ec_GF2m_simple_point_clear_finish ec_GF2m_simple_pt_clr_finish
294 #undef ec_GF2m_simple_point_set_to_infinity
295 #define ec_GF2m_simple_point_set_to_infinity ec_GF2m_simple_pt_set_to_inf
296 #undef ec_GF2m_simple_points_make_affine
297 #define ec_GF2m_simple_points_make_affine ec_GF2m_simple_pts_make_affine
298 #undef ec_GF2m_simple_point_set_affine_coordinates
299 #define ec_GF2m_simple_point_set_affine_coordinates \
300     ec_GF2m_smp_pt_set_af_coords
301 #undef ec_GF2m_simple_point_get_affine_coordinates
302 #define ec_GF2m_simple_point_get_affine_coordinates \
303     ec_GF2m_smp_pt_get_af_coords
304 #undef ec_GF2m_simple_set_compressed_coordinates
305 #define ec_GF2m_simple_set_compressed_coordinates \
306     ec_GF2m_smp_set_compr_coords
307 #undef ec_GFp_simple_group_set_curve_GFp
308 #define ec_GFp_simple_group_set_curve_GFp ec_GFp_simple_grp_set_curve_GFp
309 #undef ec_GFp_simple_group_get_curve_GFp
310 #define ec_GFp_simple_group_get_curve_GFp ec_GFp_simple_grp_get_curve_GFp
311 #undef ec_GFp_simple_group_clear_finish
312 #define ec_GFp_simple_group_clear_finish ec_GFp_simple_grp_clear_finish
313 #undef ec_GFp_simple_group_set_generator
314 #define ec_GFp_simple_group_set_generator ec_GFp_simple_grp_set_generator
315 #undef ec_GFp_simple_group_get0_generator
316 #define ec_GFp_simple_group_get0_generator ec_GFp_simple_grp_gt0_generator
317 #undef ec_GFp_simple_group_get_cofactor
318 #define ec_GFp_simple_group_get_cofactor ec_GFp_simple_grp_get_cofactor
319 #undef ec_GFp_simple_point_clear_finish
320 #define ec_GFp_simple_point_clear_finish ec_GFp_simple_pt_clear_finish
321 #undef ec_GFp_simple_point_set_to_infinity
322 #define ec_GFp_simple_point_set_to_infinity ec_GFp_simple_pt_set_to_inf
323 #undef ec_GFp_simple_points_make_affine
324 #define ec_GFp_simple_points_make_affine ec_GFp_simple_pts_make_affine
325 #undef ec_GFp_simple_set_Jprojective_coordinates_GFp

```

```

326 #define ec_GFp_simple_set_Jprojective_coordinates_GFp \
327     ec_GFp_smp_set_Jproj_coords_GFp
328 #undef ec_GFp_simple_get_Jprojective_coordinates_GFp
329 #define ec_GFp_simple_get_Jprojective_coordinates_GFp \
330     ec_GFp_smp_get_Jproj_coords_GFp
331 #undef ec_GFp_simple_point_set_affine_coordinates_GFp
332 #define ec_GFp_simple_point_set_affine_coordinates_GFp \
333     ec_GFp_smp_pt_set_af_coords_GFp
334 #undef ec_GFp_simple_point_get_affine_coordinates_GFp
335 #define ec_GFp_simple_point_get_affine_coordinates_GFp \
336     ec_GFp_smp_pt_get_af_coords_GFp
337 #undef ec_GFp_simple_set_compressed_coordinates_GFp
338 #define ec_GFp_simple_set_compressed_coordinates_GFp \
339     ec_GFp_smp_set_compr_coords_GFp
340 #undef ec_GFp_simple_point_set_affine_coordinates
341 #define ec_GFp_simple_point_set_affine_coordinates \
342     ec_GFp_smp_pt_set_af_coords
343 #undef ec_GFp_simple_point_get_affine_coordinates
344 #define ec_GFp_simple_point_get_affine_coordinates \
345     ec_GFp_smp_pt_get_af_coords
346 #undef ec_GFp_simple_set_compressed_coordinates
347 #define ec_GFp_simple_set_compressed_coordinates \
348     ec_GFp_smp_set_compr_coords
349 #undef ec_GFp_simple_group_check_discriminant
350 #define ec_GFp_simple_group_check_discriminant ec_GFp_simple_grp_chk_discrim

352 /* Hack som long STORE names */
353 #undef STORE_method_set_initialise_function
354 #define STORE_method_set_initialise_function STORE_meth_set_initialise_fn
355 #undef STORE_method_set_cleanup_function
356 #define STORE_method_set_cleanup_function STORE_meth_set_cleanup_fn
357 #undef STORE_method_set_generate_function
358 #define STORE_method_set_generate_function STORE_meth_set_generate_fn
359 #undef STORE_method_set_modify_function
360 #define STORE_method_set_modify_function STORE_meth_set_modify_fn
361 #undef STORE_method_set_revoke_function
362 #define STORE_method_set_revoke_function STORE_meth_set_revoke_fn
363 #undef STORE_method_set_delete_function
364 #define STORE_method_set_delete_function STORE_meth_set_delete_fn
365 #undef STORE_method_set_list_start_function
366 #define STORE_method_set_list_start_function STORE_meth_set_list_start_fn
367 #undef STORE_method_set_list_next_function
368 #define STORE_method_set_list_next_function STORE_meth_set_list_next_fn
369 #undef STORE_method_set_list_end_function
370 #define STORE_method_set_list_end_function STORE_meth_set_list_end_fn
371 #undef STORE_method_set_update_store_function
372 #define STORE_method_set_update_store_function STORE_meth_set_update_store_fn
373 #undef STORE_method_set_lock_store_function
374 #define STORE_method_set_lock_store_function STORE_meth_set_lock_store_fn
375 #undef STORE_method_set_unlock_store_function
376 #define STORE_method_set_unlock_store_function STORE_meth_set_unlock_store_fn
377 #undef STORE_method_get_initialise_function
378 #define STORE_method_get_initialise_function STORE_meth_get_initialise_fn
379 #undef STORE_method_get_cleanup_function
380 #define STORE_method_get_cleanup_function STORE_meth_get_cleanup_fn
381 #undef STORE_method_get_generate_function
382 #define STORE_method_get_generate_function STORE_meth_get_generate_fn
383 #undef STORE_method_get_modify_function
384 #define STORE_method_get_modify_function STORE_meth_get_modify_fn
385 #undef STORE_method_get_revoke_function
386 #define STORE_method_get_revoke_function STORE_meth_get_revoke_fn
387 #undef STORE_method_get_delete_function
388 #define STORE_method_get_delete_function STORE_meth_get_delete_fn
389 #undef STORE_method_get_list_start_function
390 #define STORE_method_get_list_start_function STORE_meth_get_list_start_fn
391 #undef STORE_method_get_list_next_function

```

```

392 #define STORE_method_get_list_next_function STORE_meth_get_list_next_fn
393 #undef STORE_method_get_list_end_function
394 #define STORE_method_get_list_end_function STORE_meth_get_list_end_fn
395 #undef STORE_method_get_update_store_function
396 #define STORE_method_get_update_store_function STORE_meth_get_update_store_fn
397 #undef STORE_method_get_lock_store_function
398 #define STORE_method_get_lock_store_function STORE_meth_get_lock_store_fn
399 #undef STORE_method_get_unlock_store_function
400 #define STORE_method_get_unlock_store_function STORE_meth_get_unlock_store_fn

402 /* Hack some long TS names */
403 #undef TS_RESP_CTX_set_status_info_cond
404 #define TS_RESP_CTX_set_status_info_cond TS_RESP_CTX_set_stat_info_cond
405 #undef TS_RESP_CTX_set_clock_precision_digits
406 #define TS_RESP_CTX_set_clock_precision_digits TS_RESP_CTX_set_clk_prec_digits
407 #undef TS_CONF_set_clock_precision_digits
408 #define TS_CONF_set_clock_precision_digits TS_CONF_set_clk_prec_digits

410 /* Hack some long CMS names */
411 #undef CMS_RecipientInfo_ktri_get0_algs
412 #define CMS_RecipientInfo_ktri_get0_algs CMS_RecipInfo_ktri_get0_algs
413 #undef CMS_RecipientInfo_ktri_get0_signer_id
414 #define CMS_RecipientInfo_ktri_get0_signer_id CMS_RecipInfo_ktri_get0_sigr_id
415 #undef CMS_OtherRevocationInfoFormat_it
416 #define CMS_OtherRevocationInfoFormat_it CMS_OtherRevocInfoFormat_it
417 #undef CMS_KeyAgreeRecipientIdentifier_it
418 #define CMS_KeyAgreeRecipientIdentifier_it CMS_KeyAgreeRecipIdentifier_it
419 #undef CMS_OriginatorIdentifierOrKey_it
420 #define CMS_OriginatorIdentifierOrKey_it CMS_OriginatorIdOrKey_it
421 #undef cms_SignerIdentifier_get0_signer_id
422 #define cms_SignerIdentifier_get0_signer_id cms_SignerId_get0_signer_id

424 /* Hack some long DTLS1 names */
425 #undef dtls1_retransmit_buffered_messages
426 #define dtls1_retransmit_buffered_messages dtls1_retransmit_buffered_msgs

428 /* Hack some long SRP names */
429 #undef SRP_generate_server_master_secret
430 #define SRP_generate_server_master_secret SRP_gen_server_master_secret
431 #undef SRP_generate_client_master_secret
432 #define SRP_generate_client_master_secret SRP_gen_client_master_secret

434 /* Hack some long UI names */
435 #undef UI_method_get_prompt_constructor
436 #define UI_method_get_prompt_constructor UI_method_get_prompt_constructr
437 #undef UI_method_set_prompt_constructor
438 #define UI_method_set_prompt_constructor UI_method_set_prompt_constructr

440 #endif /* defined OPENSSL_SYS_VMS */

443 /* Case insensitive linking causes problems... */
444 #if defined(OPENSSL_SYS_VMS) || defined(OPENSSL_SYS_OS2)
445 #undef ERR_load_CRYPT0_strings
446 #define ERR_load_CRYPT0_strings ERR_load_CRYPT0lib_strings
447 #undef OCSP_crlID_new
448 #define OCSP_crlID_new OCSP_crlID2_new

450 #undef d2i_ECPARAMETERS
451 #define d2i_ECPARAMETERS d2i_UC_ECPARAMETERS
452 #undef i2d_ECPARAMETERS
453 #define i2d_ECPARAMETERS i2d_UC_ECPARAMETERS
454 #undef d2i_ECPKPARAMETERS
455 #define d2i_ECPKPARAMETERS d2i_UC_ECPKPARAMETERS
456 #undef i2d_ECPKPARAMETERS
457 #define i2d_ECPKPARAMETERS i2d_UC_ECPKPARAMETERS

```

```

459 /* These functions do not seem to exist! However, I'm paranoid...
460 Original command in x509v3.h:
461 These functions are being redefined in another directory,
462 and clash when the linker is case-insensitive, so let's
463 hide them a little, by giving them an extra 'o' at the
464 beginning of the name... */
465 #undef X509v3_cleanup_extensions
466 #define X509v3_cleanup_extensions oX509v3_cleanup_extensions
467 #undef X509v3_add_extension
468 #define X509v3_add_extension oX509v3_add_extension
469 #undef X509v3_add_netscape_extensions
470 #define X509v3_add_netscape_extensions oX509v3_add_netscape_extensions
471 #undef X509v3_add_standard_extensions
472 #define X509v3_add_standard_extensions oX509v3_add_standard_extensions

474 /* This one clashes with CMS_data_create */
475 #undef cms_Data_create
476 #define cms_Data_create priv_cms_Data_create

478 #endif

481 #endif /* ! defined HEADER_VMS_IDHACKS_H */

```

new/usr/src/lib/openssl/include/openssl/tls1.h

1

35294 Fri May 30 18:31:23 2014
new/usr/src/lib/openssl/include/openssl/tls1.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* ssl/tls1.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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35 * The word 'cryptographic' can be left out if the rouines from the library
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright (c) 1998-2006 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without
```

new/usr/src/lib/openssl/include/openssl/tls1.h

2

```
62 * modification, are permitted provided that the following conditions
63 * are met:
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67 *
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70 * the documentation and/or other materials provided with the
71 * distribution.
72 *
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101 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
102 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 *
114 * Portions of the attached software ("Contribution") are developed by
115 * SUN MICROSYSTEMS, INC., and are contributed to the OpenSSL project.
116 *
117 * The Contribution is licensed pursuant to the OpenSSL open source
118 * license provided above.
119 *
120 * ECC cipher suite support in OpenSSL originally written by
121 * Vipul Gupta and Sumit Gupta of Sun Microsystems Laboratories.
122 *
123 */
124 /* =====
125 * Copyright 2005 Nokia. All rights reserved.
126 *
127 * The portions of the attached software ("Contribution") is developed by
```

```

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129 * license.
130 *
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133 * support (see RFC 4279) to OpenSSL.
134 *
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146 * SPECIFICALLY DISCLAIMS ANY LIABILITY FOR CLAIMS BROUGHT BY YOU OR ANY
147 * OTHER ENTITY BASED ON INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR
148 * OTHERWISE.
149 */

151 #ifndef HEADER_TLS1_H
152 #define HEADER_TLS1_H

154 #include <openssl/buffer.h>

156 #ifdef __cplusplus
157 extern "C" {
158 #endif

160 #define TLS1_ALLOW_EXPERIMENTAL_CIPHERSUITES 0

162 #define TLS1_2_VERSION 0x0303
163 #define TLS1_2_VERSION_MAJOR 0x03
164 #define TLS1_2_VERSION_MINOR 0x03

166 #define TLS1_1_VERSION 0x0302
167 #define TLS1_1_VERSION_MAJOR 0x03
168 #define TLS1_1_VERSION_MINOR 0x02

170 #define TLS1_VERSION 0x0301
171 #define TLS1_VERSION_MAJOR 0x03
172 #define TLS1_VERSION_MINOR 0x01

174 #define TLS1_get_version(s) \
175     ((s->version >> 8) == TLS1_VERSION_MAJOR ? s->version : 0)

177 #define TLS1_get_client_version(s) \
178     ((s->client_version >> 8) == TLS1_VERSION_MAJOR ? s->client_version : 0)

180 #define TLS1_AD_DECRYPTION_FAILED 21
181 #define TLS1_AD_RECORD_OVERFLOW 22
182 #define TLS1_AD_UNKNOWN_CA 48 /* fatal */
183 #define TLS1_AD_ACCESS_DENIED 49 /* fatal */
184 #define TLS1_AD_DECODE_ERROR 50 /* fatal */
185 #define TLS1_AD_DECRYPT_ERROR 51
186 #define TLS1_AD_EXPORT_RESTRICTION 60 /* fatal */
187 #define TLS1_AD_PROTOCOL_VERSION 70 /* fatal */
188 #define TLS1_AD_INSUFFICIENT_SECURITY 71 /* fatal */
189 #define TLS1_AD_INTERNAL_ERROR 80 /* fatal */
190 #define TLS1_AD_USER_CANCELLED 90
191 #define TLS1_AD_NO_RENEGOTIATION 100
192 /* codes 110-114 are from RFC3546 */
193 #define TLS1_AD_UNSUPPORTED_EXTENSION 110

```

```

194 #define TLS1_AD_CERTIFICATE_UNOBTAINABLE 111
195 #define TLS1_AD_UNRECOGNIZED_NAME 112
196 #define TLS1_AD_BAD_CERTIFICATE_STATUS_RESPONSE 113
197 #define TLS1_AD_BAD_CERTIFICATE_HASH_VALUE 114
198 #define TLS1_AD_UNKNOWN_PSK_IDENTITY 115 /* fatal */

200 /* ExtensionType values from RFC3546 / RFC4366 / RFC6066 */
201 #define TLSEXT_TYPE_server_name 0
202 #define TLSEXT_TYPE_max_fragment_length 1
203 #define TLSEXT_TYPE_client_certificate_url 2
204 #define TLSEXT_TYPE_trusted_ca_keys 3
205 #define TLSEXT_TYPE_truncated_hmac 4
206 #define TLSEXT_TYPE_status_request 5
207 /* ExtensionType values from RFC4681 */
208 #define TLSEXT_TYPE_user_mapping 6

210 /* ExtensionType values from RFC5878 */
211 #define TLSEXT_TYPE_client_authz 7
212 #define TLSEXT_TYPE_server_authz 8

214 /* ExtensionType values from RFC6091 */
215 #define TLSEXT_TYPE_cert_type 9

217 /* ExtensionType values from RFC4492 */
218 #define TLSEXT_TYPE_elliptic_curves 10
219 #define TLSEXT_TYPE_ec_point_formats 11

221 /* ExtensionType value from RFC5054 */
222 #define TLSEXT_TYPE_srp 12

224 /* ExtensionType values from RFC5246 */
225 #define TLSEXT_TYPE_signature_algorithms 13

227 /* ExtensionType value from RFC5764 */
228 #define TLSEXT_TYPE_use_srtp 14

230 /* ExtensionType value from RFC5620 */
231 #define TLSEXT_TYPE_heartbeat 15

233 /* ExtensionType value for TLS padding extension.
234 * http://www.iana.org/assignments/tls-extensiontype-values/tls-extensiontype-values.xhtml#padding-03
235 * http://tools.ietf.org/html/draft-agl-tls-padding-03
236 */
237 #define TLSEXT_TYPE_padding 21

239 /* ExtensionType value from RFC4507 */
240 #define TLSEXT_TYPE_session_ticket 35

242 /* ExtensionType value from draft-rescorla-tls-opaque-prf-input-00.txt */
243 #if 0 /* will have to be provided externally for now,
244 * i.e. build with -DTLSEXT_TYPE_opaque_prf_input=38183
245 * using whatever extension number you'd like to try */
246 #define TLSEXT_TYPE_opaque_prf_input ?? /*
247 #endif

249 /* Temporary extension type */
250 #define TLSEXT_TYPE_renegotiate 0xff01

252 #ifndef OPENSSL_NO_NEXTPROTONEG
253 /* This is not an IANA defined extension number */
254 #define TLSEXT_TYPE_next_proto_neg 13172
255 #endif

257 /* NameType value from RFC 3546 */
258 #define TLSEXT_NAME_TYPE_host_name 0
259 /* status request value from RFC 3546 */

```

```

260 #define TLSEXT_STATUSTYPE_ocsp 1

262 /* ECPointFormat values from draft-ietf-tls-ecc-12 */
263 #define TLSEXT_ECPOINTFORMAT_first 0
264 #define TLSEXT_ECPOINTFORMAT_uncompressed 0
265 #define TLSEXT_ECPOINTFORMAT_anxi962_compressed_prime 1
266 #define TLSEXT_ECPOINTFORMAT_anxi962_compressed_char2 2
267 #define TLSEXT_ECPOINTFORMAT_last 2

269 /* Signature and hash algorithms from RFC 5246 */

271 #define TLSEXT_signature_anonymous 0
272 #define TLSEXT_signature_rsa 1
273 #define TLSEXT_signature_dsa 2
274 #define TLSEXT_signature_ecdsa 3

276 #define TLSEXT_hash_none 0
277 #define TLSEXT_hash_md5 1
278 #define TLSEXT_hash_sha1 2
279 #define TLSEXT_hash_sha224 3
280 #define TLSEXT_hash_sha256 4
281 #define TLSEXT_hash_sha384 5
282 #define TLSEXT_hash_sha512 6

284 #ifndef OPENSSL_NO_TLSEXT

286 #define TLSEXT_MAXLEN_host_name 255

288 const char *SSL_get_servername(const SSL *s, const int type);
289 int SSL_get_servername_type(const SSL *s);
290 /* SSL_export_keying_material exports a value derived from the master secret,
291  * as specified in RFC 5705. It writes |olen| bytes to |out| given a label and
292  * optional context. (Since a zero length context is allowed, the |use_context|
293  * flag controls whether a context is included.)
294  *
295  * It returns 1 on success and zero otherwise.
296  */
297 int SSL_export_keying_material(SSL *s, unsigned char *out, size_t olen,
298     const char *label, size_t llen, const unsigned char *p, size_t plen,
299     int use_context);

301 #define SSL_set_tlsext_host_name(s,name) \
302 SSL_ctrl(s,SSL_CTRL_SET_TLSEXT_HOSTNAME,TLSEXT_NAMETYPE_host_name,(char *)name)

304 #define SSL_set_tlsext_debug_callback(ssl, cb) \
305 SSL_callback_ctrl(ssl,SSL_CTRL_SET_TLSEXT_DEBUG_CB,(void (*)(void))cb)

307 #define SSL_set_tlsext_debug_arg(ssl, arg) \
308 SSL_ctrl(ssl,SSL_CTRL_SET_TLSEXT_DEBUG_ARG,0,(void *)arg)

310 #define SSL_set_tlsext_status_type(ssl, type) \
311 SSL_ctrl(ssl,SSL_CTRL_SET_TLSEXT_STATUS_REQ_TYPE,type, NULL)

313 #define SSL_get_tlsext_status_exts(ssl, arg) \
314 SSL_ctrl(ssl,SSL_CTRL_GET_TLSEXT_STATUS_REQ_EXT,0,(void *)arg)

316 #define SSL_set_tlsext_status_exts(ssl, arg) \
317 SSL_ctrl(ssl,SSL_CTRL_SET_TLSEXT_STATUS_REQ_EXT,0,(void *)arg)

319 #define SSL_get_tlsext_status_ids(ssl, arg) \
320 SSL_ctrl(ssl,SSL_CTRL_GET_TLSEXT_STATUS_REQ_IDS,0,(void *)arg)

322 #define SSL_set_tlsext_status_ids(ssl, arg) \
323 SSL_ctrl(ssl,SSL_CTRL_SET_TLSEXT_STATUS_REQ_IDS,0,(void *)arg)

325 #define SSL_get_tlsext_status_ocsp_resp(ssl, arg) \

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326 SSL_ctrl(ssl,SSL_CTRL_GET_TLSEXT_STATUS_REQ_OCSP_RESP,0,(void *)arg)

328 #define SSL_set_tlsext_status_ocsp_resp(ssl, arg, arglen) \
329 SSL_ctrl(ssl,SSL_CTRL_SET_TLSEXT_STATUS_REQ_OCSP_RESP,arglen,(void *)arg)

331 #define SSL_CTX_set_tlsext_servername_callback(ctx, cb) \
332 SSL_CTX_callback_ctrl(ctx,SSL_CTRL_SET_TLSEXT_SERVERNAME_CB,(void (*)(void))cb)

334 #define SSL_TLSEXT_ERR_OK 0
335 #define SSL_TLSEXT_ERR_ALERT_WARNING 1
336 #define SSL_TLSEXT_ERR_ALERT_FATAL 2
337 #define SSL_TLSEXT_ERR_NOACK 3

339 #define SSL_CTX_set_tlsext_servername_arg(ctx, arg) \
340 SSL_CTX_ctrl(ctx,SSL_CTRL_SET_TLSEXT_SERVERNAME_ARG,0,(void *)arg)

342 #define SSL_CTX_get_tlsext_ticket_keys(ctx, keys, keylen) \
343 SSL_CTX_ctrl((ctx),SSL_CTRL_GET_TLSEXT_TICKET_KEYS,(keylen),(keys))
344 #define SSL_CTX_set_tlsext_ticket_keys(ctx, keys, keylen) \
345 SSL_CTX_ctrl((ctx),SSL_CTRL_SET_TLSEXT_TICKET_KEYS,(keylen),(keys))

347 #define SSL_CTX_set_tlsext_status_cb(ssl, cb) \
348 SSL_CTX_callback_ctrl(ssl,SSL_CTRL_SET_TLSEXT_STATUS_REQ_CB,(void (*)(void))cb)

350 #define SSL_CTX_set_tlsext_status_arg(ssl, arg) \
351 SSL_CTX_ctrl(ssl,SSL_CTRL_SET_TLSEXT_STATUS_REQ_CB_ARG,0,(void *)arg)

353 #define SSL_set_tlsext_opaque_prf_input(s, src, len) \
354 SSL_ctrl(s,SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT,len,src)
355 #define SSL_CTX_set_tlsext_opaque_prf_input_callback(ctx, cb) \
356 SSL_CTX_callback_ctrl(ctx,SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT_CB,(void (*)(void))cb)
357 #define SSL_CTX_set_tlsext_opaque_prf_input_callback_arg(ctx, arg) \
358 SSL_CTX_ctrl(ctx,SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT_CB_ARG,0,arg)

360 #define SSL_CTX_set_tlsext_ticket_key_cb(ssl, cb) \
361 SSL_CTX_callback_ctrl(ssl,SSL_CTRL_SET_TLSEXT_TICKET_KEY_CB,(void (*)(void))cb)

363 #ifndef OPENSSL_NO_HEARTBEATS
364 #define SSL_TLSEXT_HB_ENABLED 0x01
365 #define SSL_TLSEXT_HB_DONT_SEND_REQUESTS 0x02
366 #define SSL_TLSEXT_HB_DONT_RECV_REQUESTS 0x04

368 #define SSL_get_tlsextheartbeat_pending(ssl) \
369 SSL_ctrl((ssl),SSL_CTRL_GET_TLSEXT_HEARTBEAT_PENDING,0,NULL)
370 #define SSL_set_tlsextheartbeat_no_requests(ssl, arg) \
371 SSL_ctrl((ssl),SSL_CTRL_SET_TLSEXT_HEARTBEAT_NO_REQUESTS,arg,NULL)
372 #endif
373 #endif

375 /* PSK ciphersuites from 4279 */
376 #define TLS1_CK_PSK_WITH_RC4_128_SHA 0x0300008A
377 #define TLS1_CK_PSK_WITH_3DES_EDE_CBC_SHA 0x0300008B
378 #define TLS1_CK_PSK_WITH_AES_128_CBC_SHA 0x0300008C
379 #define TLS1_CK_PSK_WITH_AES_256_CBC_SHA 0x0300008D

381 /* Additional TLS ciphersuites from expired Internet Draft
382  * draft-ietf-tls-56-bit-ciphersuites-01.txt
383  * (available if TLS1_ALLOW_EXPERIMENTAL_CIPHERSUITES is defined, see
384  * s3_lib.c). We actually treat them like SSL 3.0 ciphers, which we probably
385  * shouldn't. Note that the first two are actually not in the IDs. */
386 #define TLS1_CK_RSA_EXPORT1024_WITH_RC4_56_MD5 0x03000060 /* not in ID
387 #define TLS1_CK_RSA_EXPORT1024_WITH_RC2_CBC_56_MD5 0x03000061 /* not in ID
388 #define TLS1_CK_RSA_EXPORT1024_WITH_DES_CBC_SHA 0x03000062
389 #define TLS1_CK_DHE_DSS_EXPORT1024_WITH_DES_CBC_SHA 0x03000063
390 #define TLS1_CK_RSA_EXPORT1024_WITH_RC4_56_SHA 0x03000064
391 #define TLS1_CK_DHE_DSS_EXPORT1024_WITH_RC4_56_SHA 0x03000065

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392 #define TLS1 CK_DHE_DSS_WITH_RC4_128_SHA 0x03000066

394 /* AES ciphersuites from RFC3268 */

396 #define TLS1 CK_RSA_WITH_AES_128_SHA 0x0300002F
397 #define TLS1 CK_DH_DSS_WITH_AES_128_SHA 0x03000030
398 #define TLS1 CK_DH_RSA_WITH_AES_128_SHA 0x03000031
399 #define TLS1 CK_DHE_DSS_WITH_AES_128_SHA 0x03000032
400 #define TLS1 CK_DHE_RSA_WITH_AES_128_SHA 0x03000033
401 #define TLS1 CK_ADH_WITH_AES_128_SHA 0x03000034

403 #define TLS1 CK_RSA_WITH_AES_256_SHA 0x03000035
404 #define TLS1 CK_DH_DSS_WITH_AES_256_SHA 0x03000036
405 #define TLS1 CK_DH_RSA_WITH_AES_256_SHA 0x03000037
406 #define TLS1 CK_DHE_DSS_WITH_AES_256_SHA 0x03000038
407 #define TLS1 CK_DHE_RSA_WITH_AES_256_SHA 0x03000039
408 #define TLS1 CK_ADH_WITH_AES_256_SHA 0x0300003A

410 /* TLS v1.2 ciphersuites */
411 #define TLS1 CK_RSA_WITH_NULL_SHA256 0x0300003B
412 #define TLS1 CK_RSA_WITH_AES_128_SHA256 0x0300003C
413 #define TLS1 CK_RSA_WITH_AES_256_SHA256 0x0300003D
414 #define TLS1 CK_DH_DSS_WITH_AES_128_SHA256 0x0300003E
415 #define TLS1 CK_DH_RSA_WITH_AES_128_SHA256 0x0300003F
416 #define TLS1 CK_DHE_DSS_WITH_AES_128_SHA256 0x03000040

418 /* Camellia ciphersuites from RFC4132 */
419 #define TLS1 CK_RSA_WITH_CAMELLIA_128_CBC_SHA 0x03000041
420 #define TLS1 CK_DH_DSS_WITH_CAMELLIA_128_CBC_SHA 0x03000042
421 #define TLS1 CK_DH_RSA_WITH_CAMELLIA_128_CBC_SHA 0x03000043
422 #define TLS1 CK_DHE_DSS_WITH_CAMELLIA_128_CBC_SHA 0x03000044
423 #define TLS1 CK_DHE_RSA_WITH_CAMELLIA_128_CBC_SHA 0x03000045
424 #define TLS1 CK_ADH_WITH_CAMELLIA_128_CBC_SHA 0x03000046

426 /* TLS v1.2 ciphersuites */
427 #define TLS1 CK_DHE_RSA_WITH_AES_128_SHA256 0x03000067
428 #define TLS1 CK_DH_DSS_WITH_AES_256_SHA256 0x03000068
429 #define TLS1 CK_DH_RSA_WITH_AES_256_SHA256 0x03000069
430 #define TLS1 CK_DHE_DSS_WITH_AES_256_SHA256 0x0300006A
431 #define TLS1 CK_DHE_RSA_WITH_AES_256_SHA256 0x0300006B
432 #define TLS1 CK_ADH_WITH_AES_128_SHA256 0x0300006C
433 #define TLS1 CK_ADH_WITH_AES_256_SHA256 0x0300006D

435 /* Camellia ciphersuites from RFC4132 */
436 #define TLS1 CK_RSA_WITH_CAMELLIA_256_CBC_SHA 0x03000084
437 #define TLS1 CK_DH_DSS_WITH_CAMELLIA_256_CBC_SHA 0x03000085
438 #define TLS1 CK_DH_RSA_WITH_CAMELLIA_256_CBC_SHA 0x03000086
439 #define TLS1 CK_DHE_DSS_WITH_CAMELLIA_256_CBC_SHA 0x03000087
440 #define TLS1 CK_DHE_RSA_WITH_CAMELLIA_256_CBC_SHA 0x03000088
441 #define TLS1 CK_ADH_WITH_CAMELLIA_256_CBC_SHA 0x03000089

443 /* SEED ciphersuites from RFC4162 */
444 #define TLS1 CK_RSA_WITH_SEED_SHA 0x03000096
445 #define TLS1 CK_DH_DSS_WITH_SEED_SHA 0x03000097
446 #define TLS1 CK_DH_RSA_WITH_SEED_SHA 0x03000098
447 #define TLS1 CK_DHE_DSS_WITH_SEED_SHA 0x03000099
448 #define TLS1 CK_DHE_RSA_WITH_SEED_SHA 0x0300009A
449 #define TLS1 CK_ADH_WITH_SEED_SHA 0x0300009B

451 /* TLS v1.2 GCM ciphersuites from RFC5288 */
452 #define TLS1 CK_RSA_WITH_AES_128_GCM_SHA256 0x0300009C
453 #define TLS1 CK_RSA_WITH_AES_256_GCM_SHA384 0x0300009D
454 #define TLS1 CK_DHE_RSA_WITH_AES_128_GCM_SHA256 0x0300009E
455 #define TLS1 CK_DHE_RSA_WITH_AES_256_GCM_SHA384 0x0300009F
456 #define TLS1 CK_DH_RSA_WITH_AES_128_GCM_SHA256 0x030000A0
457 #define TLS1 CK_DH_RSA_WITH_AES_256_GCM_SHA384 0x030000A1
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458 #define TLS1 CK_DHE_DSS_WITH_AES_128_GCM_SHA256 0x030000A2
459 #define TLS1 CK_DHE_DSS_WITH_AES_256_GCM_SHA384 0x030000A3
460 #define TLS1 CK_DH_DSS_WITH_AES_128_GCM_SHA256 0x030000A4
461 #define TLS1 CK_DH_DSS_WITH_AES_256_GCM_SHA384 0x030000A5
462 #define TLS1 CK_ADH_WITH_AES_128_GCM_SHA256 0x030000A6
463 #define TLS1 CK_ADH_WITH_AES_256_GCM_SHA384 0x030000A7

465 /* ECC ciphersuites from draft-ietf-tls-ecc-12.txt with changes soon to be in dr
466 #define TLS1 CK_ECDH_ECDSA_WITH_NULL_SHA 0x0300C001
467 #define TLS1 CK_ECDH_ECDSA_WITH_RC4_128_SHA 0x0300C002
468 #define TLS1 CK_ECDH_ECDSA_WITH_DES_192_CBC3_SHA 0x0300C003
469 #define TLS1 CK_ECDH_ECDSA_WITH_AES_128_CBC_SHA 0x0300C004
470 #define TLS1 CK_ECDH_ECDSA_WITH_AES_256_CBC_SHA 0x0300C005

472 #define TLS1 CK_ECDHE_ECDSA_WITH_NULL_SHA 0x0300C006
473 #define TLS1 CK_ECDHE_ECDSA_WITH_RC4_128_SHA 0x0300C007
474 #define TLS1 CK_ECDHE_ECDSA_WITH_DES_192_CBC3_SHA 0x0300C008
475 #define TLS1 CK_ECDHE_ECDSA_WITH_AES_128_CBC_SHA 0x0300C009
476 #define TLS1 CK_ECDHE_ECDSA_WITH_AES_256_CBC_SHA 0x0300C00A

478 #define TLS1 CK_ECDH_RSA_WITH_NULL_SHA 0x0300C00B
479 #define TLS1 CK_ECDH_RSA_WITH_RC4_128_SHA 0x0300C00C
480 #define TLS1 CK_ECDH_RSA_WITH_DES_192_CBC3_SHA 0x0300C00D
481 #define TLS1 CK_ECDH_RSA_WITH_AES_128_CBC_SHA 0x0300C00E
482 #define TLS1 CK_ECDH_RSA_WITH_AES_256_CBC_SHA 0x0300C00F

484 #define TLS1 CK_ECDHE_RSA_WITH_NULL_SHA 0x0300C010
485 #define TLS1 CK_ECDHE_RSA_WITH_RC4_128_SHA 0x0300C011
486 #define TLS1 CK_ECDHE_RSA_WITH_DES_192_CBC3_SHA 0x0300C012
487 #define TLS1 CK_ECDHE_RSA_WITH_AES_128_CBC_SHA 0x0300C013
488 #define TLS1 CK_ECDHE_RSA_WITH_AES_256_CBC_SHA 0x0300C014

490 #define TLS1 CK_ECDH_anon_WITH_NULL_SHA 0x0300C015
491 #define TLS1 CK_ECDH_anon_WITH_RC4_128_SHA 0x0300C016
492 #define TLS1 CK_ECDH_anon_WITH_DES_192_CBC3_SHA 0x0300C017
493 #define TLS1 CK_ECDH_anon_WITH_AES_128_CBC_SHA 0x0300C018
494 #define TLS1 CK_ECDH_anon_WITH_AES_256_CBC_SHA 0x0300C019

496 /* SRP ciphersuites from RFC 5054 */
497 #define TLS1 CK_SRP_SHA_WITH_3DES_EDE_CBC_SHA 0x0300C01A
498 #define TLS1 CK_SRP_SHA_RSA_WITH_3DES_EDE_CBC_SHA 0x0300C01B
499 #define TLS1 CK_SRP_SHA_DSS_WITH_3DES_EDE_CBC_SHA 0x0300C01C
500 #define TLS1 CK_SRP_SHA_WITH_AES_128_CBC_SHA 0x0300C01D
501 #define TLS1 CK_SRP_SHA_RSA_WITH_AES_128_CBC_SHA 0x0300C01E
502 #define TLS1 CK_SRP_SHA_DSS_WITH_AES_128_CBC_SHA 0x0300C01F
503 #define TLS1 CK_SRP_SHA_WITH_AES_256_CBC_SHA 0x0300C020
504 #define TLS1 CK_SRP_SHA_RSA_WITH_AES_256_CBC_SHA 0x0300C021
505 #define TLS1 CK_SRP_SHA_DSS_WITH_AES_256_CBC_SHA 0x0300C022

507 /* ECDH HMAC based ciphersuites from RFC5289 */

509 #define TLS1 CK_ECDHE_ECDSA_WITH_AES_128_SHA256 0x0300C023
510 #define TLS1 CK_ECDHE_ECDSA_WITH_AES_256_SHA384 0x0300C024
511 #define TLS1 CK_ECDH_ECDSA_WITH_AES_128_SHA256 0x0300C025
512 #define TLS1 CK_ECDH_ECDSA_WITH_AES_256_SHA384 0x0300C026
513 #define TLS1 CK_ECDHE_RSA_WITH_AES_128_SHA256 0x0300C027
514 #define TLS1 CK_ECDHE_RSA_WITH_AES_256_SHA384 0x0300C028
515 #define TLS1 CK_ECDH_RSA_WITH_AES_128_SHA256 0x0300C029
516 #define TLS1 CK_ECDH_RSA_WITH_AES_256_SHA384 0x0300C02A

518 /* ECDH GCM based ciphersuites from RFC5289 */
519 #define TLS1 CK_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 0x0300C02B
520 #define TLS1 CK_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 0x0300C02C
521 #define TLS1 CK_ECDH_ECDSA_WITH_AES_128_GCM_SHA256 0x0300C02D
522 #define TLS1 CK_ECDH_ECDSA_WITH_AES_256_GCM_SHA384 0x0300C02E
523 #define TLS1 CK_ECDHE_RSA_WITH_AES_128_GCM_SHA256 0x0300C02F
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524 #define TLS1_CK_ECDHE_RSA_WITH_AES_256_GCM_SHA384 0x0300C030
525 #define TLS1_CK_ECDH_RSA_WITH_AES_128_GCM_SHA256 0x0300C031
526 #define TLS1_CK_ECDH_RSA_WITH_AES_256_GCM_SHA384 0x0300C032

528 /* XXX
529  * Inconsistency alert:
530  * The OpenSSL names of ciphers with ephemeral DH here include the string
531  * "DHE", while elsewhere it has always been "EDH".
532  * (The alias for the list of all such ciphers also is "EDH".)
533  * The specifications speak of "EDH"; maybe we should allow both forms
534  * for everything. */
535 #define TLS1_TXT_RSA_EXPORT1024_WITH_RC4_56_MD5 "EXP1024-RC4-MD5"
536 #define TLS1_TXT_RSA_EXPORT1024_WITH_RC2_CBC_56_MD5 "EXP1024-RC2-CBC-MD5"
537 #define TLS1_TXT_RSA_EXPORT1024_WITH_DES_CBC_SHA "EXP1024-DES-CBC-SHA"
538 #define TLS1_TXT_DHE_DSS_EXPORT1024_WITH_DES_CBC_SHA "EXP1024-DHE-DSS-DES-CBC"
539 #define TLS1_TXT_RSA_EXPORT1024_WITH_RC4_56_SHA "EXP1024-RC4-SHA"
540 #define TLS1_TXT_DHE_DSS_EXPORT1024_WITH_RC4_56_SHA "EXP1024-DHE-DSS-RC4-SHA"
541 #define TLS1_TXT_DHE_DSS_WITH_RC4_128_SHA "DHE-DSS-RC4-SHA"

543 /* AES ciphersuites from RFC3268 */
544 #define TLS1_TXT_RSA_WITH_AES_128_SHA "AES128-SHA"
545 #define TLS1_TXT_DH_DSS_WITH_AES_128_SHA "DH-DSS-AES128-SHA"
546 #define TLS1_TXT_DH_RSA_WITH_AES_128_SHA "DH-RSA-AES128-SHA"
547 #define TLS1_TXT_DHE_DSS_WITH_AES_128_SHA "DHE-DSS-AES128-SHA"
548 #define TLS1_TXT_DHE_RSA_WITH_AES_128_SHA "DHE-RSA-AES128-SHA"
549 #define TLS1_TXT_ADH_WITH_AES_128_SHA "ADH-AES128-SHA"

551 #define TLS1_TXT_RSA_WITH_AES_256_SHA "AES256-SHA"
552 #define TLS1_TXT_DH_DSS_WITH_AES_256_SHA "DH-DSS-AES256-SHA"
553 #define TLS1_TXT_DH_RSA_WITH_AES_256_SHA "DH-RSA-AES256-SHA"
554 #define TLS1_TXT_DHE_DSS_WITH_AES_256_SHA "DHE-DSS-AES256-SHA"
555 #define TLS1_TXT_DHE_RSA_WITH_AES_256_SHA "DHE-RSA-AES256-SHA"
556 #define TLS1_TXT_ADH_WITH_AES_256_SHA "ADH-AES256-SHA"

558 /* ECC ciphersuites from draft-ietf-tls-ecc-01.txt (Mar 15, 2001) */
559 #define TLS1_TXT_ECDH_ECDSA_WITH_NULL_SHA "ECDH-ECDSA-NULL-SHA"
560 #define TLS1_TXT_ECDH_ECDSA_WITH_RC4_128_SHA "ECDH-ECDSA-RC4-SHA"
561 #define TLS1_TXT_ECDH_ECDSA_WITH_DES_192_CBC3_SHA "ECDH-ECDSA-DES-CBC3-SHA"
562 #define TLS1_TXT_ECDH_ECDSA_WITH_AES_128_CBC_SHA "ECDH-ECDSA-AES128-SHA"
563 #define TLS1_TXT_ECDH_ECDSA_WITH_AES_256_CBC_SHA "ECDH-ECDSA-AES256-SHA"

565 #define TLS1_TXT_ECDHE_ECDSA_WITH_NULL_SHA "ECDHE-ECDSA-NULL-SHA"
566 #define TLS1_TXT_ECDHE_ECDSA_WITH_RC4_128_SHA "ECDHE-ECDSA-RC4-SHA"
567 #define TLS1_TXT_ECDHE_ECDSA_WITH_DES_192_CBC3_SHA "ECDHE-ECDSA-DES-CBC3-SH"
568 #define TLS1_TXT_ECDHE_ECDSA_WITH_AES_128_CBC_SHA "ECDHE-ECDSA-AES128-SHA"
569 #define TLS1_TXT_ECDHE_ECDSA_WITH_AES_256_CBC_SHA "ECDHE-ECDSA-AES256-SHA"

571 #define TLS1_TXT_ECDH_RSA_WITH_NULL_SHA "ECDH-RSA-NULL-SHA"
572 #define TLS1_TXT_ECDH_RSA_WITH_RC4_128_SHA "ECDH-RSA-RC4-SHA"
573 #define TLS1_TXT_ECDH_RSA_WITH_DES_192_CBC3_SHA "ECDH-RSA-DES-CBC3-SHA"
574 #define TLS1_TXT_ECDH_RSA_WITH_AES_128_CBC_SHA "ECDH-RSA-AES128-SHA"
575 #define TLS1_TXT_ECDH_RSA_WITH_AES_256_CBC_SHA "ECDH-RSA-AES256-SHA"

577 #define TLS1_TXT_ECDHE_RSA_WITH_NULL_SHA "ECDHE-RSA-NULL-SHA"
578 #define TLS1_TXT_ECDHE_RSA_WITH_RC4_128_SHA "ECDHE-RSA-RC4-SHA"
579 #define TLS1_TXT_ECDHE_RSA_WITH_DES_192_CBC3_SHA "ECDHE-RSA-DES-CBC3-SHA"
580 #define TLS1_TXT_ECDHE_RSA_WITH_AES_128_CBC_SHA "ECDHE-RSA-AES128-SHA"
581 #define TLS1_TXT_ECDHE_RSA_WITH_AES_256_CBC_SHA "ECDHE-RSA-AES256-SHA"

583 #define TLS1_TXT_ECDH_anon_WITH_NULL_SHA "AECDH-NULL-SHA"
584 #define TLS1_TXT_ECDH_anon_WITH_RC4_128_SHA "AECDH-RC4-SHA"
585 #define TLS1_TXT_ECDH_anon_WITH_DES_192_CBC3_SHA "AECDH-DES-CBC3-SHA"
586 #define TLS1_TXT_ECDH_anon_WITH_AES_128_CBC_SHA "AECDH-AES128-SHA"
587 #define TLS1_TXT_ECDH_anon_WITH_AES_256_CBC_SHA "AECDH-AES256-SHA"

589 /* PSK ciphersuites from RFC 4279 */

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590 #define TLS1_TXT_PSK_WITH_RC4_128_SHA "PSK-RC4-SHA"
591 #define TLS1_TXT_PSK_WITH_3DES_EDE_CBC_SHA "PSK-3DES-EDE-CBC-SHA"
592 #define TLS1_TXT_PSK_WITH_AES_128_CBC_SHA "PSK-AES128-CBC-SHA"
593 #define TLS1_TXT_PSK_WITH_AES_256_CBC_SHA "PSK-AES256-CBC-SHA"

595 /* SRP ciphersuite from RFC 5054 */
596 #define TLS1_TXT_SRP_SHA_WITH_3DES_EDE_CBC_SHA "SRP-3DES-EDE-CBC-SHA"
597 #define TLS1_TXT_SRP_SHA_RSA_WITH_3DES_EDE_CBC_SHA "SRP-RSA-3DES-EDE-CBC-SH"
598 #define TLS1_TXT_SRP_SHA_DSS_WITH_3DES_EDE_CBC_SHA "SRP-DSS-3DES-EDE-CBC-SH"
599 #define TLS1_TXT_SRP_SHA_WITH_AES_128_CBC_SHA "SRP-AES-128-CBC-SHA"
600 #define TLS1_TXT_SRP_SHA_RSA_WITH_AES_128_CBC_SHA "SRP-RSA-AES-128-CBC-SHA"
601 #define TLS1_TXT_SRP_SHA_DSS_WITH_AES_128_CBC_SHA "SRP-DSS-AES-128-CBC-SHA"
602 #define TLS1_TXT_SRP_SHA_WITH_AES_256_CBC_SHA "SRP-AES-256-CBC-SHA"
603 #define TLS1_TXT_SRP_SHA_RSA_WITH_AES_256_CBC_SHA "SRP-RSA-AES-256-CBC-SHA"
604 #define TLS1_TXT_SRP_SHA_DSS_WITH_AES_256_CBC_SHA "SRP-DSS-AES-256-CBC-SHA"

606 /* Camellia ciphersuites from RFC4132 */
607 #define TLS1_TXT_RSA_WITH_CAMELLIA_128_CBC_SHA "CAMELLIA128-SHA"
608 #define TLS1_TXT_DH_DSS_WITH_CAMELLIA_128_CBC_SHA "DH-DSS-CAMELLIA128-SHA"
609 #define TLS1_TXT_DH_RSA_WITH_CAMELLIA_128_CBC_SHA "DH-RSA-CAMELLIA128-SHA"
610 #define TLS1_TXT_DHE_DSS_WITH_CAMELLIA_128_CBC_SHA "DHE-DSS-CAMELLIA128-SHA"
611 #define TLS1_TXT_DHE_RSA_WITH_CAMELLIA_128_CBC_SHA "DHE-RSA-CAMELLIA128-SHA"
612 #define TLS1_TXT_ADH_WITH_CAMELLIA_128_CBC_SHA "ADH-CAMELLIA128-SHA"

614 #define TLS1_TXT_RSA_WITH_CAMELLIA_256_CBC_SHA "CAMELLIA256-SHA"
615 #define TLS1_TXT_DH_DSS_WITH_CAMELLIA_256_CBC_SHA "DH-DSS-CAMELLIA256-SHA"
616 #define TLS1_TXT_DH_RSA_WITH_CAMELLIA_256_CBC_SHA "DH-RSA-CAMELLIA256-SHA"
617 #define TLS1_TXT_DHE_DSS_WITH_CAMELLIA_256_CBC_SHA "DHE-DSS-CAMELLIA256-SHA"
618 #define TLS1_TXT_DHE_RSA_WITH_CAMELLIA_256_CBC_SHA "DHE-RSA-CAMELLIA256-SHA"
619 #define TLS1_TXT_ADH_WITH_CAMELLIA_256_CBC_SHA "ADH-CAMELLIA256-SHA"

621 /* SEED ciphersuites from RFC4162 */
622 #define TLS1_TXT_RSA_WITH_SEED_SHA "SEED-SHA"
623 #define TLS1_TXT_DH_DSS_WITH_SEED_SHA "DH-DSS-SEED-SHA"
624 #define TLS1_TXT_DH_RSA_WITH_SEED_SHA "DH-RSA-SEED-SHA"
625 #define TLS1_TXT_DHE_DSS_WITH_SEED_SHA "DHE-DSS-SEED-SHA"
626 #define TLS1_TXT_DHE_RSA_WITH_SEED_SHA "DHE-RSA-SEED-SHA"
627 #define TLS1_TXT_ADH_WITH_SEED_SHA "ADH-SEED-SHA"

629 /* TLS v1.2 ciphersuites */
630 #define TLS1_TXT_RSA_WITH_NULL_SHA256 "NULL-SHA256"
631 #define TLS1_TXT_RSA_WITH_AES_128_SHA256 "AES128-SHA256"
632 #define TLS1_TXT_RSA_WITH_AES_256_SHA256 "AES256-SHA256"
633 #define TLS1_TXT_DH_DSS_WITH_AES_128_SHA256 "DH-DSS-AES128-SHA256"
634 #define TLS1_TXT_DH_RSA_WITH_AES_128_SHA256 "DH-RSA-AES128-SHA256"
635 #define TLS1_TXT_DHE_DSS_WITH_AES_128_SHA256 "DHE-DSS-AES128-SHA256"
636 #define TLS1_TXT_DHE_RSA_WITH_AES_128_SHA256 "DHE-RSA-AES128-SHA256"
637 #define TLS1_TXT_DH_DSS_WITH_AES_256_SHA256 "DH-DSS-AES256-SHA256"
638 #define TLS1_TXT_DH_RSA_WITH_AES_256_SHA256 "DH-RSA-AES256-SHA256"
639 #define TLS1_TXT_DHE_DSS_WITH_AES_256_SHA256 "DHE-DSS-AES256-SHA256"
640 #define TLS1_TXT_DHE_RSA_WITH_AES_256_SHA256 "DHE-RSA-AES256-SHA256"
641 #define TLS1_TXT_ADH_WITH_AES_128_SHA256 "ADH-AES128-SHA256"
642 #define TLS1_TXT_ADH_WITH_AES_256_SHA256 "ADH-AES256-SHA256"

644 /* TLS v1.2 GCM ciphersuites from RFC5288 */
645 #define TLS1_TXT_RSA_WITH_AES_128_GCM_SHA256 "AES128-GCM-SHA256"
646 #define TLS1_TXT_RSA_WITH_AES_256_GCM_SHA384 "AES256-GCM-SHA384"
647 #define TLS1_TXT_DHE_RSA_WITH_AES_128_GCM_SHA256 "DHE-RSA-AES128-GCM-SHA2"
648 #define TLS1_TXT_DHE_RSA_WITH_AES_256_GCM_SHA384 "DHE-RSA-AES256-GCM-SHA3"
649 #define TLS1_TXT_DH_RSA_WITH_AES_128_GCM_SHA256 "DH-RSA-AES128-GCM-SHA25"
650 #define TLS1_TXT_DH_RSA_WITH_AES_256_GCM_SHA384 "DH-RSA-AES256-GCM-SHA38"
651 #define TLS1_TXT_DHE_DSS_WITH_AES_128_GCM_SHA256 "DHE-DSS-AES128-GCM-SHA25"
652 #define TLS1_TXT_DHE_DSS_WITH_AES_256_GCM_SHA384 "DHE-DSS-AES256-GCM-SHA3"
653 #define TLS1_TXT_DH_DSS_WITH_AES_128_GCM_SHA256 "DH-DSS-AES128-GCM-SHA25"
654 #define TLS1_TXT_DH_DSS_WITH_AES_256_GCM_SHA384 "DH-DSS-AES256-GCM-SHA38"
655 #define TLS1_TXT_ADH_WITH_AES_128_GCM_SHA256 "ADH-AES128-GCM-SHA256"

```

```

656 #define TLS1_TXT_ADH_WITH_AES_256_GCM_SHA384 "ADH-AES256-GCM-SHA384"
658 /* ECDH HMAC based ciphersuites from RFC5289 */
660 #define TLS1_TXT_ECDHE_ECDSA_WITH_AES_128_SHA256 "ECDHE-ECDSA-AES128-SHA256"
661 #define TLS1_TXT_ECDHE_ECDSA_WITH_AES_256_SHA384 "ECDHE-ECDSA-AES256-SHA384"
662 #define TLS1_TXT_ECDH_ECDSA_WITH_AES_128_SHA256 "ECDH-ECDSA-AES128-SHA256"
663 #define TLS1_TXT_ECDH_ECDSA_WITH_AES_256_SHA384 "ECDH-ECDSA-AES256-SHA384"
664 #define TLS1_TXT_ECDHE_RSA_WITH_AES_128_SHA256 "ECDHE-RSA-AES128-SHA256"
665 #define TLS1_TXT_ECDHE_RSA_WITH_AES_256_SHA384 "ECDHE-RSA-AES256-SHA384"
666 #define TLS1_TXT_ECDH_RSA_WITH_AES_128_SHA256 "ECDH-RSA-AES128-SHA256"
667 #define TLS1_TXT_ECDH_RSA_WITH_AES_256_SHA384 "ECDH-RSA-AES256-SHA384"
669 /* ECDH GCM based ciphersuites from RFC5289 */
670 #define TLS1_TXT_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 "ECDHE-ECDSA-AES128-GCM-SHA256"
671 #define TLS1_TXT_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 "ECDHE-ECDSA-AES256-GCM-SHA384"
672 #define TLS1_TXT_ECDH_ECDSA_WITH_AES_128_GCM_SHA256 "ECDH-ECDSA-AES128-GCM-SHA256"
673 #define TLS1_TXT_ECDH_ECDSA_WITH_AES_256_GCM_SHA384 "ECDH-ECDSA-AES256-GCM-SHA384"
674 #define TLS1_TXT_ECDHE_RSA_WITH_AES_128_GCM_SHA256 "ECDHE-RSA-AES128-GCM-SHA256"
675 #define TLS1_TXT_ECDHE_RSA_WITH_AES_256_GCM_SHA384 "ECDHE-RSA-AES256-GCM-SHA384"
676 #define TLS1_TXT_ECDH_RSA_WITH_AES_128_GCM_SHA256 "ECDH-RSA-AES128-GCM-SHA256"
677 #define TLS1_TXT_ECDH_RSA_WITH_AES_256_GCM_SHA384 "ECDH-RSA-AES256-GCM-SHA384"
679 #define TLS_CT_RSA_SIGN 1
680 #define TLS_CT_DSS_SIGN 2
681 #define TLS_CT_RSA_FIXED_DH 3
682 #define TLS_CT_DSS_FIXED_DH 4
683 #define TLS_CT_ECDSA_SIGN 64
684 #define TLS_CT_RSA_FIXED_ECDH 65
685 #define TLS_CT_ECDSA_FIXED_ECDH 66
686 #define TLS_CT_GOST94_SIGN 21
687 #define TLS_CT_GOST01_SIGN 22
688 /* when correcting this number, correct also SSL3_CT_NUMBER in ssl3.h (see
689  * comment there) */
690 #define TLS_CT_NUMBER 9
692 #define TLS1_FINISH_MAC_LENGTH 12
694 #define TLS_MD_MAX_CONST_SIZE 20
695 #define TLS_MD_CLIENT_FINISH_CONST "client finished"
696 #define TLS_MD_CLIENT_FINISH_CONST_SIZE 15
697 #define TLS_MD_SERVER_FINISH_CONST "server finished"
698 #define TLS_MD_SERVER_FINISH_CONST_SIZE 15
699 #define TLS_MD_SERVER_WRITE_KEY_CONST "server write key"
700 #define TLS_MD_SERVER_WRITE_KEY_CONST_SIZE 16
701 #define TLS_MD_KEY_EXPANSION_CONST "key expansion"
702 #define TLS_MD_KEY_EXPANSION_CONST_SIZE 13
703 #define TLS_MD_CLIENT_WRITE_KEY_CONST "client write key"
704 #define TLS_MD_CLIENT_WRITE_KEY_CONST_SIZE 16
705 #define TLS_MD_SERVER_WRITE_KEY_CONST "server write key"
706 #define TLS_MD_SERVER_WRITE_KEY_CONST_SIZE 16
707 #define TLS_MD_IV_BLOCK_CONST "IV block"
708 #define TLS_MD_IV_BLOCK_CONST_SIZE 8
709 #define TLS_MD_MASTER_SECRET_CONST "master secret"
710 #define TLS_MD_MASTER_SECRET_CONST_SIZE 13
712 #ifdef CHARSET_EBCDIC
713 #undef TLS_MD_CLIENT_FINISH_CONST
714 #define TLS_MD_CLIENT_FINISH_CONST "\x63\x6c\x69\x65\x6e\x74\x20\x66\x69\x6e\x"
715 #undef TLS_MD_SERVER_FINISH_CONST
716 #define TLS_MD_SERVER_FINISH_CONST "\x73\x65\x72\x76\x65\x72\x20\x66\x69\x6e\x"
717 #undef TLS_MD_SERVER_WRITE_KEY_CONST
718 #define TLS_MD_SERVER_WRITE_KEY_CONST "\x73\x65\x72\x76\x65\x72\x20\x77\x72\x69\x"
719 #undef TLS_MD_KEY_EXPANSION_CONST
720 #define TLS_MD_KEY_EXPANSION_CONST "\x6b\x65\x79\x20\x65\x78\x70\x61\x6e\x73\x"
721 #undef TLS_MD_CLIENT_WRITE_KEY_CONST

```

```

722 #define TLS_MD_CLIENT_WRITE_KEY_CONST "\x63\x6c\x69\x65\x6e\x74\x20\x77\x72\x69\x"
723 #undef TLS_MD_SERVER_WRITE_KEY_CONST
724 #define TLS_MD_SERVER_WRITE_KEY_CONST "\x73\x65\x72\x76\x65\x72\x20\x77\x72\x69\x"
725 #undef TLS_MD_IV_BLOCK_CONST
726 #define TLS_MD_IV_BLOCK_CONST "\x49\x56\x20\x62\x6c\x6f\x63\x6b" /*IV block*/
727 #undef TLS_MD_MASTER_SECRET_CONST
728 #define TLS_MD_MASTER_SECRET_CONST "\x6d\x61\x73\x74\x65\x72\x20\x73\x65\x63\x"
729 #endif
731 /* TLS Session Ticket extension struct */
732 struct tls_session_ticket_ext_st
733 {
734     unsigned short length;
735     void *data;
736 };
738 #ifdef __cplusplus
739 }
740 #endif
741 #endif

```

new/usr/src/lib/openssl/include/openssl/ts.h

1

```
*****
31006 Fri May 30 18:31:23 2014
new/usr/src/lib/openssl/include/openssl/ts.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ts/ts.h */
2 /* Written by Zoltan Glozik (zglozik@opentsa.org) for the OpenSSL
3  * project 2002, 2003, 2004.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
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17  * the documentation and/or other materials provided with the
18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
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34  * 6. Redistributions of any form whatsoever must retain the following
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38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #ifndef HEADER_TS_H
60 #define HEADER_TS_H
```

new/usr/src/lib/openssl/include/openssl/ts.h

2

```
62 #include <openssl/opensslconf.h>
63 #include <openssl/symhacks.h>
64 #ifndef OPENSSL_NO_BUFFER
65 #include <openssl/buffer.h>
66 #endif
67 #ifndef OPENSSL_NO_EVP
68 #include <openssl/evp.h>
69 #endif
70 #ifndef OPENSSL_NO_BIO
71 #include <openssl/bio.h>
72 #endif
73 #include <openssl/stack.h>
74 #include <openssl/asn1.h>
75 #include <openssl/safestack.h>
76
77 #ifndef OPENSSL_NO_RSA
78 #include <openssl/rsa.h>
79 #endif
80
81 #ifndef OPENSSL_NO_DSA
82 #include <openssl/dsa.h>
83 #endif
84
85 #ifndef OPENSSL_NO_DH
86 #include <openssl/dh.h>
87 #endif
88
89 #ifdef __cplusplus
90 extern "C" {
91 #endif
92
93 #ifdef WIN32
94 /* Under Win32 this is defined in wincrypt.h */
95 #undef X509_NAME
96 #endif
97
98 #include <openssl/x509.h>
99 #include <openssl/x509v3.h>
100
101 /*
102 MessageImprint ::= SEQUENCE {
103     hashAlgorithm          AlgorithmIdentifier,
104     hashedMessage           OCTET STRING }
105 */
106
107 typedef struct TS_msg_imprint_st
108 {
109     X509_ALGOR *hash_algo;
110     ASN1_OCTET_STRING *hashed_msg;
111 } TS_MSG_IMPRINT;
112
113 /*
114 TimeStampReq ::= SEQUENCE {
115     version                 INTEGER { v1(1) },
116     messageImprint          MessageImprint,
117     --a hash algorithm OID and the hash value of the data to be
118     --time-stamped
119     reqPolicy               TSAPolicyId OPTIONAL,
120     nonce                   INTEGER OPTIONAL,
121     certReq                 BOOLEAN DEFAULT FALSE,
122     extensions              [0] IMPLICIT Extensions OPTIONAL }
123 */
124
125 typedef struct TS_req_st
126 {
127     ASN1_INTEGER *version;
```

```

128     TS_MSG_IMPRINT *msg_imprint;
129     ASN1_OBJECT *policy_id;          /* OPTIONAL */
130     ASN1_INTEGER *nonce;             /* OPTIONAL */
131     ASN1_BOOLEAN cert_req;          /* DEFAULT FALSE */
132     STACK_OF(X509_EXTENSION) *extensions; /* [0] OPTIONAL */
133     } TS_REQ;

135 /*
136 Accuracy ::= SEQUENCE {
137     seconds      INTEGER OPTIONAL,
138     millis       [0] INTEGER (1..999) OPTIONAL,
139     micros       [1] INTEGER (1..999) OPTIONAL }
140 */

142 typedef struct TS_accuracy_st
143 {
144     ASN1_INTEGER *seconds;
145     ASN1_INTEGER *millis;
146     ASN1_INTEGER *micros;
147     } TS_ACCURACY;

149 /*
150 TSTInfo ::= SEQUENCE {
151     version          INTEGER { v1(1) },
152     policy            TSAPolicyId,
153     messageImprint    MessageImprint,
154     -- MUST have the same value as the similar field in
155     -- TimeStampReq
156     serialNumber      INTEGER,
157     -- Time-Stamping users MUST be ready to accommodate integers
158     -- up to 160 bits.
159     genTime           GeneralizedTime,
160     accuracy          Accuracy OPTIONAL,
161     ordering          BOOLEAN DEFAULT FALSE,
162     nonce             INTEGER OPTIONAL,
163     -- MUST be present if the similar field was present
164     -- in TimeStampReq. In that case it MUST have the same value.
165     tsa               [0] GeneralName OPTIONAL,
166     extensions        [1] IMPLICIT Extensions OPTIONAL }
167 */

169 typedef struct TS_tst_info_st
170 {
171     ASN1_INTEGER *version;
172     ASN1_OBJECT *policy_id;
173     TS_MSG_IMPRINT *msg_imprint;
174     ASN1_INTEGER *serial;
175     ASN1_GENERALIZEDTIME *time;
176     TS_ACCURACY *accuracy;
177     ASN1_BOOLEAN ordering;
178     ASN1_INTEGER *nonce;
179     GENERAL_NAME *tsa;
180     STACK_OF(X509_EXTENSION) *extensions;
181     } TS_TST_INFO;

183 /*
184 PKIStatusInfo ::= SEQUENCE {
185     status          PKIStatus,
186     statusString    PKIFreeText OPTIONAL,
187     failInfo        PKIFailureInfo OPTIONAL }

189 From RFC 1510 - section 3.1.1:
190 PKIFreeText ::= SEQUENCE SIZE (1..MAX) OF UTF8String
191 -- text encoded as UTF-8 String (note: each UTF8String SHOULD
192 -- include an RFC 1766 language tag to indicate the language
193 -- of the contained text)

```

```

194 */

196 /* Possible values for status. See ts_resp_print.c && ts_resp_verify.c */

198 #define TS_STATUS_GRANTED          0
199 #define TS_STATUS_GRANTED_WITH_MODS 1
200 #define TS_STATUS_REJECTION        2
201 #define TS_STATUS_WAITING          3
202 #define TS_STATUS_REVOCATION_WARNING 4
203 #define TS_STATUS_REVOCATION_NOTIFICATION 5

205 /* Possible values for failure_info. See ts_resp_print.c && ts_resp_verify.c */

207 #define TS_INFO_BAD_ALG          0
208 #define TS_INFO_BAD_REQUEST      2
209 #define TS_INFO_BAD_DATA_FORMAT 5
210 #define TS_INFO_TIME_NOT_AVAILABLE 14
211 #define TS_INFO_UNACCEPTED_POLICY 15
212 #define TS_INFO_UNACCEPTED_EXTENSION 16
213 #define TS_INFO_ADD_INFO_NOT_AVAILABLE 17
214 #define TS_INFO_SYSTEM_FAILURE 25

216 typedef struct TS_status_info_st
217 {
218     ASN1_INTEGER *status;
219     STACK_OF(ASN1_UTF8STRING) *text;
220     ASN1_BIT_STRING *failure_info;
221     } TS_STATUS_INFO;

223 DECLARE_STACK_OF(ASN1_UTF8STRING)
224 DECLARE_ASN1_SET_OF(ASN1_UTF8STRING)

226 /*
227 TimeStampResp ::= SEQUENCE {
228     status          PKIStatusInfo,
229     timeStampToken   TimeStampToken OPTIONAL }
230 */

232 typedef struct TS_resp_st
233 {
234     TS_STATUS_INFO *status_info;
235     PKCS7 *token;
236     TS_TST_INFO *tst_info;
237     } TS_RESP;

239 /* The structure below would belong to the ESS component. */

241 /*
242 IssuerSerial ::= SEQUENCE {
243     issuer          GeneralNames,
244     serialNumber    CertificateSerialNumber
245     }
246 */

248 typedef struct ESS_issuer_serial
249 {
250     STACK_OF(GENERAL_NAME) *issuer;
251     ASN1_INTEGER *serial;
252     } ESS_ISSUER_SERIAL;

254 /*
255 ESSCertID ::= SEQUENCE {
256     certHash          Hash,
257     issuerSerial      IssuerSerial OPTIONAL
258     }
259 */

```

```

261 typedef struct ESS_cert_id
262 {
263     ASN1_OCTET_STRING *hash; /* Always SHA-1 digest. */
264     ESS_ISSUER_SERIAL *issuer_serial;
265 } ESS_CERT_ID;

267 DECLARE_STACK_OF(ESS_CERT_ID)
268 DECLARE_ASN1_SET_OF(ESS_CERT_ID)

270 /*
271 SigningCertificate ::= SEQUENCE {
272     certs SEQUENCE OF ESSCertID,
273     policies SEQUENCE OF PolicyInformation OPTIONAL
274 }
275 */

277 typedef struct ESS_signing_cert
278 {
279     STACK_OF(ESS_CERT_ID) *cert_ids;
280     STACK_OF(POLICYINFO) *policy_info;
281 } ESS_SIGNING_CERT;

284 TS_REQ *TS_REQ_new(void);
285 void TS_REQ_free(TS_REQ *a);
286 int i2d_TS_REQ(const TS_REQ *a, unsigned char **pp);
287 TS_REQ *d2i_TS_REQ(TS_REQ **a, const unsigned char **pp, long length);

289 TS_REQ *TS_REQ_dup(TS_REQ *a);

291 TS_REQ *d2i_TS_REQ_fp(FILE *fp, TS_REQ **a);
292 int i2d_TS_REQ_fp(FILE *fp, TS_REQ *a);
293 TS_REQ *d2i_TS_REQ_bio(BIO *fp, TS_REQ **a);
294 int i2d_TS_REQ_bio(BIO *fp, TS_REQ *a);

296 TS_MSG_IMPRINT *TS_MSG_IMPRINT_new(void);
297 void TS_MSG_IMPRINT_free(TS_MSG_IMPRINT *a);
298 int i2d_TS_MSG_IMPRINT(const TS_MSG_IMPRINT *a, unsigned char **pp);
299 TS_MSG_IMPRINT *d2i_TS_MSG_IMPRINT(TS_MSG_IMPRINT **a,
300     const unsigned char **pp, long length);

302 TS_MSG_IMPRINT *TS_MSG_IMPRINT_dup(TS_MSG_IMPRINT *a);

304 TS_MSG_IMPRINT *d2i_TS_MSG_IMPRINT_fp(FILE *fp, TS_MSG_IMPRINT **a);
305 int i2d_TS_MSG_IMPRINT_fp(FILE *fp, TS_MSG_IMPRINT *a);
306 TS_MSG_IMPRINT *d2i_TS_MSG_IMPRINT_bio(BIO *fp, TS_MSG_IMPRINT **a);
307 int i2d_TS_MSG_IMPRINT_bio(BIO *fp, TS_MSG_IMPRINT *a);

309 TS_RESP *TS_RESP_new(void);
310 void TS_RESP_free(TS_RESP *a);
311 int i2d_TS_RESP(const TS_RESP *a, unsigned char **pp);
312 TS_RESP *d2i_TS_RESP(TS_RESP **a, const unsigned char **pp, long length);
313 TS_TST_INFO *PKCS7_to_TS_TST_INFO(PKCS7 *token);
314 TS_RESP *TS_RESP_dup(TS_RESP *a);

316 TS_RESP *d2i_TS_RESP_fp(FILE *fp, TS_RESP **a);
317 int i2d_TS_RESP_fp(FILE *fp, TS_RESP *a);
318 TS_RESP *d2i_TS_RESP_bio(BIO *fp, TS_RESP **a);
319 int i2d_TS_RESP_bio(BIO *fp, TS_RESP *a);

321 TS_STATUS_INFO *TS_STATUS_INFO_new(void);
322 void TS_STATUS_INFO_free(TS_STATUS_INFO *a);
323 int i2d_TS_STATUS_INFO(const TS_STATUS_INFO *a, unsigned char **pp);
324 TS_STATUS_INFO *d2i_TS_STATUS_INFO(TS_STATUS_INFO **a,
325     const unsigned char **pp, long length);

```

```

326 TS_STATUS_INFO *TS_STATUS_INFO_dup(TS_STATUS_INFO *a);

328 TS_TST_INFO *TS_TST_INFO_new(void);
329 void TS_TST_INFO_free(TS_TST_INFO *a);
330 int i2d_TS_TST_INFO(const TS_TST_INFO *a, unsigned char **pp);
331 TS_TST_INFO *d2i_TS_TST_INFO(TS_TST_INFO **a, const unsigned char **pp,
332     long length);
333 TS_TST_INFO *TS_TST_INFO_dup(TS_TST_INFO *a);

335 TS_TST_INFO *d2i_TS_TST_INFO_fp(FILE *fp, TS_TST_INFO **a);
336 int i2d_TS_TST_INFO_fp(FILE *fp, TS_TST_INFO *a);
337 TS_TST_INFO *d2i_TS_TST_INFO_bio(BIO *fp, TS_TST_INFO **a);
338 int i2d_TS_TST_INFO_bio(BIO *fp, TS_TST_INFO *a);

340 TS_ACCURACY *TS_ACCURACY_new(void);
341 void TS_ACCURACY_free(TS_ACCURACY *a);
342 int i2d_TS_ACCURACY(const TS_ACCURACY *a, unsigned char **pp);
343 TS_ACCURACY *d2i_TS_ACCURACY(TS_ACCURACY **a, const unsigned char **pp,
344     long length);
345 TS_ACCURACY *TS_ACCURACY_dup(TS_ACCURACY *a);

347 ESS_ISSUER_SERIAL *ESS_ISSUER_SERIAL_new(void);
348 void ESS_ISSUER_SERIAL_free(ESS_ISSUER_SERIAL *a);
349 int i2d_ESS_ISSUER_SERIAL(const ESS_ISSUER_SERIAL *a,
350     unsigned char **pp);
351 ESS_ISSUER_SERIAL *d2i_ESS_ISSUER_SERIAL(ESS_ISSUER_SERIAL **a,
352     const unsigned char **pp, long length);
353 ESS_ISSUER_SERIAL *ESS_ISSUER_SERIAL_dup(ESS_ISSUER_SERIAL *a);

355 ESS_CERT_ID *ESS_CERT_ID_new(void);
356 void ESS_CERT_ID_free(ESS_CERT_ID *a);
357 int i2d_ESS_CERT_ID(const ESS_CERT_ID *a, unsigned char **pp);
358 ESS_CERT_ID *d2i_ESS_CERT_ID(ESS_CERT_ID **a, const unsigned char **pp,
359     long length);
360 ESS_CERT_ID *ESS_CERT_ID_dup(ESS_CERT_ID *a);

362 ESS_SIGNING_CERT *ESS_SIGNING_CERT_new(void);
363 void ESS_SIGNING_CERT_free(ESS_SIGNING_CERT *a);
364 int i2d_ESS_SIGNING_CERT(const ESS_SIGNING_CERT *a,
365     unsigned char **pp);
366 ESS_SIGNING_CERT *d2i_ESS_SIGNING_CERT(ESS_SIGNING_CERT **a,
367     const unsigned char **pp, long length);
368 ESS_SIGNING_CERT *ESS_SIGNING_CERT_dup(ESS_SIGNING_CERT *a);

370 void ERR_load_TS_strings(void);

372 int TS_REQ_set_version(TS_REQ *a, long version);
373 long TS_REQ_get_version(const TS_REQ *a);

375 int TS_REQ_set_msg_imprint(TS_REQ *a, TS_MSG_IMPRINT *msg_imprint);
376 TS_MSG_IMPRINT *TS_REQ_get_msg_imprint(TS_REQ *a);

378 int TS_MSG_IMPRINT_set_algo(TS_MSG_IMPRINT *a, X509_ALGOR *alg);
379 X509_ALGOR *TS_MSG_IMPRINT_get_algo(TS_MSG_IMPRINT *a);

381 int TS_MSG_IMPRINT_set_msg(TS_MSG_IMPRINT *a, unsigned char *d, int len);
382 ASN1_OCTET_STRING *TS_MSG_IMPRINT_get_msg(TS_MSG_IMPRINT *a);

384 int TS_REQ_set_policy_id(TS_REQ *a, ASN1_OBJECT *policy);
385 ASN1_OBJECT *TS_REQ_get_policy_id(TS_REQ *a);

387 int TS_REQ_set_nonce(TS_REQ *a, const ASN1_INTEGER *nonce);
388 const ASN1_INTEGER *TS_REQ_get_nonce(const TS_REQ *a);

390 int TS_REQ_set_cert_req(TS_REQ *a, int cert_req);
391 int TS_REQ_get_cert_req(const TS_REQ *a);

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393 STACK_OF(X509_EXTENSION) *TS_REQ_get_exts(TS_REQ *a);
394 void TS_REQ_ext_free(TS_REQ *a);
395 int TS_REQ_get_ext_count(TS_REQ *a);
396 int TS_REQ_get_ext_by_NID(TS_REQ *a, int nid, int lastpos);
397 int TS_REQ_get_ext_by_OBJ(TS_REQ *a, ASN1_OBJECT *obj, int lastpos);
398 int TS_REQ_get_ext_by_critical(TS_REQ *a, int crit, int lastpos);
399 X509_EXTENSION *TS_REQ_get_ext(TS_REQ *a, int loc);
400 X509_EXTENSION *TS_REQ_delete_ext(TS_REQ *a, int loc);
401 int TS_REQ_add_ext(TS_REQ *a, X509_EXTENSION *ex, int loc);
402 void *TS_REQ_get_ext_d2i(TS_REQ *a, int nid, int *crit, int *idx);

404 /* Function declarations for TS_REQ defined in ts/ts_req_print.c */

406 int TS_REQ_print_bio(BIO *bio, TS_REQ *a);

408 /* Function declarations for TS_RESP defined in ts/ts_resp_utils.c */

410 int TS_RESP_set_status_info(TS_RESP *a, TS_STATUS_INFO *info);
411 TS_STATUS_INFO *TS_RESP_get_status_info(TS_RESP *a);

413 /* Caller loses ownership of PKCS7 and TS_TST_INFO objects. */
414 void TS_RESP_set_tst_info(TS_RESP *a, PKCS7 *p7, TS_TST_INFO *tst_info);
415 PKCS7 *TS_RESP_get_token(TS_RESP *a);
416 TS_TST_INFO *TS_RESP_get_tst_info(TS_RESP *a);

418 int TS_TST_INFO_set_version(TS_TST_INFO *a, long version);
419 long TS_TST_INFO_get_version(const TS_TST_INFO *a);

421 int TS_TST_INFO_set_policy_id(TS_TST_INFO *a, ASN1_OBJECT *policy_id);
422 ASN1_OBJECT *TS_TST_INFO_get_policy_id(TS_TST_INFO *a);

424 int TS_TST_INFO_set_msg_imprint(TS_TST_INFO *a, TS_MSG_IMPRINT *msg_imprint);
425 TS_MSG_IMPRINT *TS_TST_INFO_get_msg_imprint(TS_TST_INFO *a);

427 int TS_TST_INFO_set_serial(TS_TST_INFO *a, const ASN1_INTEGER *serial);
428 const ASN1_INTEGER *TS_TST_INFO_get_serial(const TS_TST_INFO *a);

430 int TS_TST_INFO_set_time(TS_TST_INFO *a, const ASN1_GENERALIZEDTIME *gtime);
431 const ASN1_GENERALIZEDTIME *TS_TST_INFO_get_time(const TS_TST_INFO *a);

433 int TS_TST_INFO_set_accuracy(TS_TST_INFO *a, TS_ACCURACY *accuracy);
434 TS_ACCURACY *TS_TST_INFO_get_accuracy(TS_TST_INFO *a);

436 int TS_ACCURACY_set_seconds(TS_ACCURACY *a, const ASN1_INTEGER *seconds);
437 const ASN1_INTEGER *TS_ACCURACY_get_seconds(const TS_ACCURACY *a);

439 int TS_ACCURACY_set_millis(TS_ACCURACY *a, const ASN1_INTEGER *millis);
440 const ASN1_INTEGER *TS_ACCURACY_get_millis(const TS_ACCURACY *a);

442 int TS_ACCURACY_set_micros(TS_ACCURACY *a, const ASN1_INTEGER *micros);
443 const ASN1_INTEGER *TS_ACCURACY_get_micros(const TS_ACCURACY *a);

445 int TS_TST_INFO_set_ordering(TS_TST_INFO *a, int ordering);
446 int TS_TST_INFO_get_ordering(const TS_TST_INFO *a);

448 int TS_TST_INFO_set_nonce(TS_TST_INFO *a, const ASN1_INTEGER *nonce);
449 const ASN1_INTEGER *TS_TST_INFO_get_nonce(const TS_TST_INFO *a);

451 int TS_TST_INFO_set_tsa(TS_TST_INFO *a, GENERAL_NAME *tsa);
452 GENERAL_NAME *TS_TST_INFO_get_tsa(TS_TST_INFO *a);

454 STACK_OF(X509_EXTENSION) *TS_TST_INFO_get_exts(TS_TST_INFO *a);
455 void TS_TST_INFO_ext_free(TS_TST_INFO *a);
456 int TS_TST_INFO_get_ext_count(TS_TST_INFO *a);
457 int TS_TST_INFO_get_ext_by_NID(TS_TST_INFO *a, int nid, int lastpos);

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458 int TS_TST_INFO_get_ext_by_OBJ(TS_TST_INFO *a, ASN1_OBJECT *obj, int lastpos);
459 int TS_TST_INFO_get_ext_by_critical(TS_TST_INFO *a, int crit, int lastpos);
460 X509_EXTENSION *TS_TST_INFO_get_ext(TS_TST_INFO *a, int loc);
461 X509_EXTENSION *TS_TST_INFO_delete_ext(TS_TST_INFO *a, int loc);
462 int TS_TST_INFO_add_ext(TS_TST_INFO *a, X509_EXTENSION *ex, int loc);
463 void *TS_TST_INFO_get_ext_d2i(TS_TST_INFO *a, int nid, int *crit, int *idx);

465 /* Declarations related to response generation, defined in ts/ts_resp_sign.c. */

467 /* Optional flags for response generation. */

469 /* Don't include the TSA name in response. */
470 #define TS_TSA_NAME 0x01

472 /* Set ordering to true in response. */
473 #define TS_ORDERING 0x02

475 /*
476  * Include the signer certificate and the other specified certificates in
477  * the ESS signing certificate attribute beside the PKCS7 signed data.
478  * Only the signer certificates is included by default.
479  */
480 #define TS_ESS_CERT_ID_CHAIN 0x04

482 /* Forward declaration. */
483 struct TS_resp_ctx;

485 /* This must return a unique number less than 160 bits long. */
486 typedef ASN1_INTEGER *(*TS_serial_cb)(struct TS_resp_ctx *, void *);

488 /* This must return the seconds and microseconds since Jan 1, 1970 in
489  * the sec and usec variables allocated by the caller.
490  * Return non-zero for success and zero for failure. */
491 typedef int (*TS_time_cb)(struct TS_resp_ctx *, void *, long *sec, long *usec);

493 /* This must process the given extension.
494  * It can modify the TS_TST_INFO object of the context.
495  * Return values: !0 (processed), 0 (error, it must set the
496  * status info/failure info of the response).
497  */
498 typedef int (*TS_extension_cb)(struct TS_resp_ctx *, X509_EXTENSION *, void *);

500 typedef struct TS_resp_ctx
501 {
502     X509 *signer_cert;
503     EVP_PKEY *signer_key;
504     STACK_OF(X509) *certs; /* Certs to include in signed data. */
505     STACK_OF(ASN1_OBJECT) *policies; /* Acceptable policies. */
506     ASN1_OBJECT *default_policy; /* It may appear in policies, too. */
507     STACK_OF(EVP_MD) *mds; /* Acceptable message digests. */
508     ASN1_INTEGER *seconds; /* accuracy, 0 means not specified. */
509     ASN1_INTEGER *millis; /* accuracy, 0 means not specified. */
510     ASN1_INTEGER *micros; /* accuracy, 0 means not specified. */
511     unsigned clock_precision_digits; /* fraction of seconds in
512                                     * time stamp token. */
513     unsigned flags; /* Optional info, see values above. */

515     /* Callback functions. */
516     TS_serial_cb serial_cb;
517     void *serial_cb_data; /* User data for serial_cb. */

518     TS_time_cb time_cb;
519     void *time_cb_data; /* User data for time_cb. */

520     TS_extension_cb extension_cb;
521     void *extension_cb_data; /* User data for extension_cb. */

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525     /* These members are used only while creating the response. */
526     TS_REQ      *request;
527     TS_RESP     *response;
528     TS_TST_INFO *tst_info;
529 } TS_RESP_CTX;

531 DECLARE_STACK_OF(EVP_MD)
532 DECLARE_ASN1_SET_OF(EVP_MD)

534 /* Creates a response context that can be used for generating responses. */
535 TS_RESP_CTX *TS_RESP_CTX_new(void);
536 void TS_RESP_CTX_free(TS_RESP_CTX *ctx);

538 /* This parameter must be set. */
539 int TS_RESP_CTX_set_signer_cert(TS_RESP_CTX *ctx, X509 *signer);

541 /* This parameter must be set. */
542 int TS_RESP_CTX_set_signer_key(TS_RESP_CTX *ctx, EVP_PKEY *key);

544 /* This parameter must be set. */
545 int TS_RESP_CTX_set_def_policy(TS_RESP_CTX *ctx, ASN1_OBJECT *def_policy);

547 /* No additional certs are included in the response by default. */
548 int TS_RESP_CTX_set_certs(TS_RESP_CTX *ctx, STACK_OF(X509) *certs);

550 /* Adds a new acceptable policy, only the default policy
551    is accepted by default. */
552 int TS_RESP_CTX_add_policy(TS_RESP_CTX *ctx, ASN1_OBJECT *policy);

554 /* Adds a new acceptable message digest. Note that no message digests
555    are accepted by default. The md argument is shared with the caller. */
556 int TS_RESP_CTX_add_md(TS_RESP_CTX *ctx, const EVP_MD *md);

558 /* Accuracy is not included by default. */
559 int TS_RESP_CTX_set_accuracy(TS_RESP_CTX *ctx,
560                             int secs, int millis, int micros);

562 /* Clock precision digits, i.e. the number of decimal digits:
563    '0' means sec, '3' msec, '6' usec, and so on. Default is 0. */
564 int TS_RESP_CTX_set_clock_precision_digits(TS_RESP_CTX *ctx,
565                                           unsigned clock_precision_digits);
566 /* At most we accept usec precision. */
567 #define TS_MAX_CLOCK_PRECISION_DIGITS 6

569 /* No flags are set by default. */
570 void TS_RESP_CTX_add_flags(TS_RESP_CTX *ctx, int flags);

572 /* Default callback always returns a constant. */
573 void TS_RESP_CTX_set_serial_cb(TS_RESP_CTX *ctx, TS_serial_cb cb, void *data);

575 /* Default callback uses the gettimeofday() and gmtime() system calls. */
576 void TS_RESP_CTX_set_time_cb(TS_RESP_CTX *ctx, TS_time_cb cb, void *data);

578 /* Default callback rejects all extensions. The extension callback is called
579    * when the TS_TST_INFO object is already set up and not signed yet. */
580 /* FIXME: extension handling is not tested yet. */
581 void TS_RESP_CTX_set_extension_cb(TS_RESP_CTX *ctx,
582                                  TS_extension_cb cb, void *data);

584 /* The following methods can be used in the callbacks. */
585 int TS_RESP_CTX_set_status_info(TS_RESP_CTX *ctx,
586                                int status, const char *text);

588 /* Sets the status info only if it is still TS_STATUS_GRANTED. */
589 int TS_RESP_CTX_set_status_info_cond(TS_RESP_CTX *ctx,

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590     int status, const char *text);

592 int TS_RESP_CTX_add_failure_info(TS_RESP_CTX *ctx, int failure);

594 /* The get methods below can be used in the extension callback. */
595 TS_REQ *TS_RESP_CTX_get_request(TS_RESP_CTX *ctx);

597 TS_TST_INFO *TS_RESP_CTX_get_tst_info(TS_RESP_CTX *ctx);

599 /*
600  * Creates the signed TS_TST_INFO and puts it in TS_RESP.
601  * In case of errors it sets the status info properly.
602  * Returns NULL only in case of memory allocation/fatal error.
603  */
604 TS_RESP *TS_RESP_create_response(TS_RESP_CTX *ctx, BIO *req_bio);

606 /*
607  * Declarations related to response verification,
608  * they are defined in ts/ts_resp_verify.c.
609  */

611 int TS_RESP_verify_signature(PKCS7 *token, STACK_OF(X509) *certs,
612                             X509_STORE *store, X509 **signer_out);

614 /* Context structure for the generic verify method. */

616 /* Verify the signer's certificate and the signature of the response. */
617 #define TS_VFY_SIGNATURE (1u << 0)
618 /* Verify the version number of the response. */
619 #define TS_VFY_VERSION (1u << 1)
620 /* Verify if the policy supplied by the user matches the policy of the TSA. */
621 #define TS_VFY_POLICY (1u << 2)
622 /* Verify the message imprint provided by the user. This flag should not be
623    specified with TS_VFY_DATA. */
624 #define TS_VFY_IMPRINT (1u << 3)
625 /* Verify the message imprint computed by the verify method from the user
626    provided data and the MD algorithm of the response. This flag should not be
627    specified with TS_VFY_IMPRINT. */
628 #define TS_VFY_DATA (1u << 4)
629 /* Verify the nonce value. */
630 #define TS_VFY_NONCE (1u << 5)
631 /* Verify if the TSA name field matches the signer certificate. */
632 #define TS_VFY_SIGNER (1u << 6)
633 /* Verify if the TSA name field equals to the user provided name. */
634 #define TS_VFY_TSA_NAME (1u << 7)

636 /* You can use the following convenience constants. */
637 #define TS_VFY_ALL_IMPRINT (TS_VFY_SIGNATURE |
638                             TS_VFY_VERSION |
639                             TS_VFY_POLICY |
640                             TS_VFY_IMPRINT |
641                             TS_VFY_NONCE |
642                             TS_VFY_SIGNER |
643                             TS_VFY_TSA_NAME)
644 #define TS_VFY_ALL_DATA (TS_VFY_SIGNATURE |
645                           TS_VFY_VERSION |
646                           TS_VFY_POLICY |
647                           TS_VFY_DATA |
648                           TS_VFY_NONCE |
649                           TS_VFY_SIGNER |
650                           TS_VFY_TSA_NAME)

652 typedef struct TS_verify_ctx
653 {
654     /* Set this to the union of TS_VFY... flags you want to carry out. */
655     unsigned flags;

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657     /* Must be set only with TS_VFY_SIGNATURE. certs is optional. */
658     X509_STORE      *store;
659     STACK_OF(X509)  *certs;

661     /* Must be set only with TS_VFY_POLICY. */
662     ASN1_OBJECT     *policy;

664     /* Must be set only with TS_VFY_IMPRINT. If md_alg is NULL,
665      the algorithm from the response is used. */
666     X509_ALGOR      *md_alg;
667     unsigned char    *imprint;
668     unsigned         imprint_len;

670     /* Must be set only with TS_VFY_DATA. */
671     BIO              *data;

673     /* Must be set only with TS_VFY_TSA_NAME. */
674     ASN1_INTEGER     *nonce;

676     /* Must be set only with TS_VFY_TSA_NAME. */
677     GENERAL_NAME     *tsa_name;
678     } TS_VERIFY_CTX;

680 int TS_RESP_verify_response(TS_VERIFY_CTX *ctx, TS_RESP *response);
681 int TS_RESP_verify_token(TS_VERIFY_CTX *ctx, PKCS7 *token);

683 /*
684  * Declarations related to response verification context,
685  * they are defined in ts/ts_verify_ctx.c.
686  */

688 /* Set all fields to zero. */
689 TS_VERIFY_CTX *TS_VERIFY_CTX_new(void);
690 void TS_VERIFY_CTX_init(TS_VERIFY_CTX *ctx);
691 void TS_VERIFY_CTX_free(TS_VERIFY_CTX *ctx);
692 void TS_VERIFY_CTX_cleanup(TS_VERIFY_CTX *ctx);

694 /*
695  * If ctx is NULL, it allocates and returns a new object, otherwise
696  * it returns ctx. It initialises all the members as follows:
697  * flags = TS_VFY_ALL_IMPRINT & ~(TS_VFY_TSA_NAME | TS_VFY_SIGNATURE)
698  * certs = NULL
699  * store = NULL
700  * policy = policy from the request or NULL if absent (in this case
701  *   TS_VFY_POLICY is cleared from flags as well)
702  * md_alg = MD algorithm from request
703  * imprint, imprint_len = imprint from request
704  * data = NULL
705  * nonce, nonce_len = nonce from the request or NULL if absent (in this case
706  *   TS_VFY_NONCE is cleared from flags as well)
707  * tsa_name = NULL
708  * Important: after calling this method TS_VFY_SIGNATURE should be added!
709  */
710 TS_VERIFY_CTX *TS_REQ_to_TS_VERIFY_CTX(TS_REQ *req, TS_VERIFY_CTX *ctx);

712 /* Function declarations for TS_RESP defined in ts/ts_resp_print.c */

714 int TS_RESP_print_bio(BIO *bio, TS_RESP *a);
715 int TS_STATUS_INFO_print_bio(BIO *bio, TS_STATUS_INFO *a);
716 int TS_TST_INFO_print_bio(BIO *bio, TS_TST_INFO *a);

718 /* Common utility functions defined in ts/ts_lib.c */

720 int TS_ASN1_INTEGER_print_bio(BIO *bio, const ASN1_INTEGER *num);
721 int TS_OBJ_print_bio(BIO *bio, const ASN1_OBJECT *obj);

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722 int TS_ext_print_bio(BIO *bio, const STACK_OF(X509_EXTENSION) *extensions);
723 int TS_X509_ALGOR_print_bio(BIO *bio, const X509_ALGOR *alg);
724 int TS_MSG_IMPRINT_print_bio(BIO *bio, TS_MSG_IMPRINT *msg);

726 /* Function declarations for handling configuration options,
727    defined in ts/ts_conf.c */

729 X509 *TS_CONF_load_cert(const char *file);
730 STACK_OF(X509) *TS_CONF_load_certs(const char *file);
731 EVP_PKEY *TS_CONF_load_key(const char *file, const char *pass);
732 const char *TS_CONF_get_tsa_section(CONF *conf, const char *section);
733 int TS_CONF_set_serial(CONF *conf, const char *section, TS_serial_cb cb,
734                        TS_RESP_CTX *ctx);
735 int TS_CONF_set_crypto_device(CONF *conf, const char *section,
736                               const char *device);
737 int TS_CONF_set_default_engine(const char *name);
738 int TS_CONF_set_signer_cert(CONF *conf, const char *section,
739                             const char *cert, TS_RESP_CTX *ctx);
740 int TS_CONF_set_certs(CONF *conf, const char *section, const char *certs,
741                       TS_RESP_CTX *ctx);
742 int TS_CONF_set_signer_key(CONF *conf, const char *section,
743                             const char *key, const char *pass, TS_RESP_CTX *ctx);
744 int TS_CONF_set_def_policy(CONF *conf, const char *section,
745                             const char *policy, TS_RESP_CTX *ctx);
746 int TS_CONF_set_policies(CONF *conf, const char *section, TS_RESP_CTX *ctx);
747 int TS_CONF_set_digests(CONF *conf, const char *section, TS_RESP_CTX *ctx);
748 int TS_CONF_set_accuracy(CONF *conf, const char *section, TS_RESP_CTX *ctx);
749 int TS_CONF_set_clock_precision_digits(CONF *conf, const char *section,
750                                         TS_RESP_CTX *ctx);
751 int TS_CONF_set_ordering(CONF *conf, const char *section, TS_RESP_CTX *ctx);
752 int TS_CONF_set_tsa_name(CONF *conf, const char *section, TS_RESP_CTX *ctx);
753 int TS_CONF_set_ess_cert_id_chain(CONF *conf, const char *section,
754                                    TS_RESP_CTX *ctx);

756 /* ----- */
757 /* BEGIN ERROR CODES */
758 /* The following lines are auto generated by the script mkerr.pl. Any changes
759  * made after this point may be overwritten when the script is next run.
760  */
761 void ERR_load_TS_strings(void);

763 /* Error codes for the TS functions. */

765 /* Function codes. */
766 #define TS_F_D2I_TS_RESP 147
767 #define TS_F_DEF_SERIAL_CB 110
768 #define TS_F_DEF_TIME_CB 111
769 #define TS_F_ESS_ADD_SIGNING_CERT 112
770 #define TS_F_ESS_CERT_ID_NEW_INIT 113
771 #define TS_F_ESS_SIGNING_CERT_NEW_INIT 114
772 #define TS_F_INT_TS_RESP_VERIFY_TOKEN 149
773 #define TS_F_PKCS7_TO_TS_TST_INFO 148
774 #define TS_F_TS_ACCURACY_SET_MICROS 115
775 #define TS_F_TS_ACCURACY_SET_MILLIS 116
776 #define TS_F_TS_ACCURACY_SET_SECONDS 117
777 #define TS_F_TS_CHECK_IMPRINTS 100
778 #define TS_F_TS_CHECK_NONCES 101
779 #define TS_F_TS_CHECK_POLICY 102
780 #define TS_F_TS_CHECK_SIGNING_CERTS 103
781 #define TS_F_TS_CHECK_STATUS_INFO 104
782 #define TS_F_TS_COMPUTE_IMPRINT 145
783 #define TS_F_TS_CONF_SET_DEFAULT_ENGINE 146
784 #define TS_F_TS_GET_STATUS_TEXT 105
785 #define TS_F_TS_MSG_IMPRINT_SET_ALGO 118
786 #define TS_F_TS_REQ_SET_MSG_IMPRINT 119
787 #define TS_F_TS_REQ_SET_NONCE 120

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788 #define TS_F_TS_REQ_SET_POLICY_ID 121
789 #define TS_F_TS_RESP_CREATE_RESPONSE 122
790 #define TS_F_TS_RESP_CREATE_TST_INFO 123
791 #define TS_F_TS_RESP_CTX_ADD_FAILURE_INFO 124
792 #define TS_F_TS_RESP_CTX_ADD_MD 125
793 #define TS_F_TS_RESP_CTX_ADD_POLICY 126
794 #define TS_F_TS_RESP_CTX_NEW 127
795 #define TS_F_TS_RESP_CTX_SET_ACCURACY 128
796 #define TS_F_TS_RESP_CTX_SET_CERTS 129
797 #define TS_F_TS_RESP_CTX_SET_DEF_POLICY 130
798 #define TS_F_TS_RESP_CTX_SET_SIGNER_CERT 131
799 #define TS_F_TS_RESP_CTX_SET_STATUS_INFO 132
800 #define TS_F_TS_RESP_GET_POLICY 133
801 #define TS_F_TS_RESP_SET_GENTIME_WITH_PRECISION 134
802 #define TS_F_TS_RESP_SET_STATUS_INFO 135
803 #define TS_F_TS_RESP_SET_TST_INFO 150
804 #define TS_F_TS_RESP_SIGN 136
805 #define TS_F_TS_RESP_VERIFY_SIGNATURE 106
806 #define TS_F_TS_RESP_VERIFY_TOKEN 107
807 #define TS_F_TS_TST_INFO_SET_ACCURACY 137
808 #define TS_F_TS_TST_INFO_SET_MSG_IMPRINT 138
809 #define TS_F_TS_TST_INFO_SET_NONCE 139
810 #define TS_F_TS_TST_INFO_SET_POLICY_ID 140
811 #define TS_F_TS_TST_INFO_SET_SERIAL 141
812 #define TS_F_TS_TST_INFO_SET_TIME 142
813 #define TS_F_TS_TST_INFO_SET_TSA 143
814 #define TS_F_TS_VERIFY 108
815 #define TS_F_TS_VERIFY_CERT 109
816 #define TS_F_TS_VERIFY_CTX_NEW 144

818 /* Reason codes. */
819 #define TS_R_BAD_PKCS7_TYPE 132
820 #define TS_R_BAD_TYPE 133
821 #define TS_R_CERTIFICATE_VERIFY_ERROR 100
822 #define TS_R_COULD_NOT_SET_ENGINE 127
823 #define TS_R_COULD_NOT_SET_TIME 115
824 #define TS_R_D2I_TS_RESP_INT_FAILED 128
825 #define TS_R_DETACHED_CONTENT 134
826 #define TS_R_ESS_ADD_SIGNING_CERT_ERROR 116
827 #define TS_R_ESS_SIGNING_CERTIFICATE_ERROR 101
828 #define TS_R_INVALID_NULL_POINTER 102
829 #define TS_R_INVALID_SIGNER_CERTIFICATE_PURPOSE 117
830 #define TS_R_MESSAGE_IMPRINT_MISMATCH 103
831 #define TS_R_NONCE_MISMATCH 104
832 #define TS_R_NONCE_NOT_RETURNED 105
833 #define TS_R_NO_CONTENT 106
834 #define TS_R_NO_TIME_STAMP_TOKEN 107
835 #define TS_R_PKCS7_ADD_SIGNATURE_ERROR 118
836 #define TS_R_PKCS7_ADD_SIGNED_ATTR_ERROR 119
837 #define TS_R_PKCS7_TO_TS_TST_INFO_FAILED 129
838 #define TS_R_POLICY_MISMATCH 108
839 #define TS_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE 120
840 #define TS_R_RESPONSE_SETUP_ERROR 121
841 #define TS_R_SIGNATURE_FAILURE 109
842 #define TS_R_THERE_MUST_BE_ONE_SIGNER 110
843 #define TS_R_TIME_SYSCALL_ERROR 122
844 #define TS_R_TOKEN_NOT_PRESENT 130
845 #define TS_R_TOKEN_PRESENT 131
846 #define TS_R_TSA_NAME_MISMATCH 111
847 #define TS_R_TSA_UNTRUSTED 112
848 #define TS_R_TST_INFO_SETUP_ERROR 123
849 #define TS_R_TS_DATASIGN 124
850 #define TS_R_UNACCEPTABLE_POLICY 125
851 #define TS_R_UNSUPPORTED_MD_ALGORITHM 126
852 #define TS_R_UNSUPPORTED_VERSION 113
853 #define TS_R_WRONG_CONTENT_TYPE 114
```

```
855 #ifdef __cplusplus
856 }
857 #endif
858 #endif
```

new/usr/src/lib/openssl/include/openssl/txt_db.h

1

4481 Fri May 30 18:31:23 2014
new/usr/src/lib/openssl/include/openssl/txt_db.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/txt_db/txt_db.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef HEADER_TXT_DB_H
60 #define HEADER_TXT_DB_H
```

new/usr/src/lib/openssl/include/openssl/txt_db.h

2

```
62 #include <openssl/opensslconf.h>
63 #ifndef OPENSSL_NO_BIO
64 #include <openssl/bio.h>
65 #endif
66 #include <openssl/stack.h>
67 #include <openssl/lhash.h>
68
69 #define DB_ERROR_OK 0
70 #define DB_ERROR_MALLOC 1
71 #define DB_ERROR_INDEX_CLASH 2
72 #define DB_ERROR_INDEX_OUT_OF_RANGE 3
73 #define DB_ERROR_NO_INDEX 4
74 #define DB_ERROR_INSERT_INDEX_CLASH 5
75
76 #ifdef __cplusplus
77 extern "C" {
78 #endif
79
80 typedef OPENSSL_STRING *OPENSSL_PSTRING;
81 DECLARE_SPECIAL_STACK_OF(OPENSSL_PSTRING, OPENSSL_STRING)
82
83 typedef struct txt_db_st
84 {
85     int num_fields;
86     STACK_OF(OPENSSL_PSTRING) *data;
87     LHASH_OF(OPENSSL_STRING) **index;
88     int (**qual)(OPENSSL_STRING *);
89     long error;
90     long arg1;
91     long arg2;
92     OPENSSL_STRING *arg_row;
93 } TXT_DB;
94
95 #ifndef OPENSSL_NO_BIO
96 TXT_DB *TXT_DB_read(BIO *in, int num);
97 long TXT_DB_write(BIO *out, TXT_DB *db);
98 #else
99 TXT_DB *TXT_DB_read(char *in, int num);
100 long TXT_DB_write(char *out, TXT_DB *db);
101 #endif
102 int TXT_DB_create_index(TXT_DB *db, int field, int (*qual)(OPENSSL_STRING *),
103                        LHASH_HASH_FN_TYPE hash, LHASH_COMP_FN_TYPE cmp);
104 void TXT_DB_free(TXT_DB *db);
105 OPENSSL_STRING *TXT_DB_get_by_index(TXT_DB *db, int idx, OPENSSL_STRING *value);
106 int TXT_DB_insert(TXT_DB *db, OPENSSL_STRING *value);
107
108 #ifdef __cplusplus
109 }
110 #endif
111
112 #endif
```

```

*****
16656 Fri May 30 18:31:23 2014
new/usr/src/lib/openssl/include/openssl/ui.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ui/ui.h -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
16 * notice, this list of conditions and the following disclaimer in
17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
23 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26 * endorse or promote products derived from this software without
27 * prior written permission. For written permission, please contact
28 * openssl-core@openssl.org.
29 *
30 * 5. Products derived from this software may not be called "OpenSSL"
31 * nor may "OpenSSL" appear in their names without prior written
32 * permission of the OpenSSL Project.
33 *
34 * 6. Redistributions of any form whatsoever must retain the following
35 * acknowledgment:
36 * "This product includes software developed by the OpenSSL Project
37 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #ifndef HEADER_UI_H
60 #define HEADER_UI_H

```

```

62 #ifndef OPENSSL_NO_DEPRECATED
63 #include <openssl/crypto.h>
64 #endif
65 #include <openssl/safestack.h>
66 #include <openssl/ssl_typ.h>

68 #ifdef __cplusplus
69 extern "C" {
70 #endif

72 /* Declared already in ssl_typ.h */
73 /* typedef struct ui_st UI; */
74 /* typedef struct ui_method_st UI_METHOD; */

77 /* All the following functions return -1 or NULL on error and in some cases
78 (UI_process()) -2 if interrupted or in some other way cancelled.
79 When everything is fine, they return 0, a positive value or a non-NULL
80 pointer, all depending on their purpose. */

82 /* Creators and destructor. */
83 UI *UI_new(void);
84 UI *UI_new_method(const UI_METHOD *method);
85 void UI_free(UI *ui);

87 /* The following functions are used to add strings to be printed and prompt
88 strings to prompt for data. The names are UI_{add,dup}_{function}_string
89 and UI_{add,dup}_input_boolean.

91 UI_{add,dup}_{function}_string have the following meanings:
92 add add a text or prompt string. The pointers given to these
93 functions are used verbatim, no copying is done.
94 dup make a copy of the text or prompt string, then add the copy
95 to the collection of strings in the user interface.
96 <function>
97 The function is a name for the functionality that the given
98 string shall be used for. It can be one of:
99 input use the string as data prompt.
100 verify use the string as verification prompt. This
101 is used to verify a previous input.
102 info use the string for informational output.
103 error use the string for error output.
104 Honestly, there's currently no difference between info and error for the
105 moment.

107 UI_{add,dup}_input_boolean have the same semantics for "add" and "dup",
108 and are typically used when one wants to prompt for a yes/no response.

111 All of the functions in this group take a UI and a prompt string.
112 The string input and verify addition functions also take a flag argument,
113 a buffer for the result to end up with, a minimum input size and a maximum
114 input size (the result buffer MUST be large enough to be able to contain
115 the maximum number of characters). Additionally, the verify addition
116 functions takes another buffer to compare the result against.
117 The boolean input functions take an action description string (which should
118 be safe to ignore if the expected user action is obvious, for example with
119 a dialog box with an OK button and a Cancel button), a string of acceptable
120 characters to mean OK and to mean Cancel. The two last strings are checked
121 to make sure they don't have common characters. Additionally, the same
122 flag argument as for the string input is taken, as well as a result buffer.
123 The result buffer is required to be at least one byte long. Depending on
124 the answer, the first character from the OK or the Cancel character strings
125 will be stored in the first byte of the result buffer. No NUL will be
126 added, so the result is *not* a string.

```

```

128 On success, the all return an index of the added information. That index
129 is usefull when retrieving results with UI_get0_result(). */
130 int UI_add_input_string(UI *ui, const char *prompt, int flags,
131     char *result_buf, int minsize, int maxsize);
132 int UI_dup_input_string(UI *ui, const char *prompt, int flags,
133     char *result_buf, int minsize, int maxsize);
134 int UI_add_verify_string(UI *ui, const char *prompt, int flags,
135     char *result_buf, int minsize, int maxsize, const char *test_buf);
136 int UI_dup_verify_string(UI *ui, const char *prompt, int flags,
137     char *result_buf, int minsize, int maxsize, const char *test_buf);
138 int UI_add_input_boolean(UI *ui, const char *prompt, const char *action_desc,
139     const char *ok_chars, const char *cancel_chars,
140     int flags, char *result_buf);
141 int UI_dup_input_boolean(UI *ui, const char *prompt, const char *action_desc,
142     const char *ok_chars, const char *cancel_chars,
143     int flags, char *result_buf);
144 int UI_add_info_string(UI *ui, const char *text);
145 int UI_dup_info_string(UI *ui, const char *text);
146 int UI_add_error_string(UI *ui, const char *text);
147 int UI_dup_error_string(UI *ui, const char *text);

149 /* These are the possible flags. They can be or'ed together. */
150 /* Use to have echoing of input */
151 #define UI_INPUT_FLAG_ECHO 0x01
152 /* Use a default password. Where that password is found is completely
153 up to the application, it might for example be in the user data set
154 with UI_add_user_data(). It is not recommended to have more than
155 one input in each UI being marked with this flag, or the application
156 might get confused. */
157 #define UI_INPUT_FLAG_DEFAULT_PWD 0x02

159 /* The user of these routines may want to define flags of their own. The core
160 UI won't look at those, but will pass them on to the method routines. They
161 must use higher bits so they don't get confused with the UI bits above.
162 UI_INPUT_FLAG_USER_BASE tells which is the lowest bit to use. A good
163 example of use is this:

165     #define MY_UI_FLAG1 (0x01 << UI_INPUT_FLAG_USER_BASE)

167 */
168 #define UI_INPUT_FLAG_USER_BASE 16

171 /* The following function helps construct a prompt. object_desc is a
172 textual short description of the object, for example "pass phrase",
173 and object_name is the name of the object (might be a card name or
174 a file name.
175 The returned string shall always be allocated on the heap with
176 OPENSSL_malloc(), and need to be free'd with OPENSSL_free().

178 If the ui_method doesn't contain a pointer to a user-defined prompt
179 constructor, a default string is built, looking like this:

181     "Enter {object_desc} for {object_name}:"

183 So, if object_desc has the value "pass phrase" and object_name has
184 the value "foo.key", the resulting string is:

186     "Enter pass phrase for foo.key:"
187 */
188 char *UI_construct_prompt(UI *ui_method,
189     const char *object_desc, const char *object_name);

192 /* The following function is used to store a pointer to user-specific data.
193 Any previous such pointer will be returned and replaced.
```

```

195 For callback purposes, this function makes a lot more sense than using
196 ex_data, since the latter requires that different parts of OpenSSL or
197 applications share the same ex_data index.

199 Note that the UI_OpenSSL() method completely ignores the user data.
200 Other methods may not, however. */
201 void *UI_add_user_data(UI *ui, void *user_data);
202 /* We need a user data retrieving function as well. */
203 void *UI_get0_user_data(UI *ui);

205 /* Return the result associated with a prompt given with the index i. */
206 const char *UI_get0_result(UI *ui, int i);

208 /* When all strings have been added, process the whole thing. */
209 int UI_process(UI *ui);

211 /* Give a user interface parametrised control commands. This can be used to
212 send down an integer, a data pointer or a function pointer, as well as
213 be used to get information from a UI. */
214 int UI_ctrl(UI *ui, int cmd, long i, void *p, void (*f)(void));

216 /* The commands */
217 /* Use UI_CONTROL_PRINT_ERRORS with the value 1 to have UI_process print the
218 OpenSSL error stack before printing any info or added error messages and
219 before any prompting. */
220 #define UI_CTRL_PRINT_ERRORS 1
221 /* Check if a UI_process() is possible to do again with the same instance of
222 a user interface. This makes UI_ctrl() return 1 if it is redoable, and 0
223 if not. */
224 #define UI_CTRL_IS_REDOABLE 2

227 /* Some methods may use extra data */
228 #define UI_set_app_data(s, arg) UI_set_ex_data(s, 0, arg)
229 #define UI_get_app_data(s) UI_get_ex_data(s, 0)
230 int UI_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
231     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
232 int UI_set_ex_data(UI *u, int idx, void *arg);
233 void *UI_get_ex_data(UI *u, int idx);

235 /* Use specific methods instead of the built-in one */
236 void UI_set_default_method(const UI_METHOD *meth);
237 const UI_METHOD *UI_get_default_method(void);
238 const UI_METHOD *UI_get_method(UI *ui);
239 const UI_METHOD *UI_set_method(UI *ui, const UI_METHOD *meth);

241 /* The method with all the built-in thingies */
242 UI_METHOD *UI_OpenSSL(void);

245 /* ----- For method writers ----- */
246 /* A method contains a number of functions that implement the low level
247 of the User Interface. The functions are:

249 an opener This function starts a session, maybe by opening
250 a channel to a tty, or by opening a window.
251 a writer This function is called to write a given string,
252 maybe to the tty, maybe as a field label in a
253 window.
254 a flusher This function is called to flush everything that
255 has been output so far. It can be used to actually
256 display a dialog box after it has been built.
257 a reader This function is called to read a given prompt,
258 maybe from the tty, maybe from a field in a
259 window. Note that it's called with all string
```

```

260     structures, not only the prompt ones, so it must
261     check such things itself.
262     a closer    This function closes the session, maybe by closing
263                 the channel to the tty, or closing the window.

265     All these functions are expected to return:

267         0        on error.
268         1        on success.
269        -1        on out-of-band events, for example if some prompting has
270                  been canceled (by pressing Ctrl-C, for example). This is
271                  only checked when returned by the flusher or the reader.

273     The way this is used, the opener is first called, then the writer for all
274     strings, then the flusher, then the reader for all strings and finally the
275     closer. Note that if you want to prompt from a terminal or other command
276     line interface, the best is to have the reader also write the prompts
277     instead of having the writer do it. If you want to prompt from a dialog
278     box, the writer can be used to build up the contents of the box, and the
279     flusher to actually display the box and run the event loop until all data
280     has been given, after which the reader only grabs the given data and puts
281     them back into the UI strings.

283     All method functions take a UI as argument. Additionally, the writer and
284     the reader take a UI_STRING.
285 */

287 /* The UI_STRING type is the data structure that contains all the needed info
288    about a string or a prompt, including test data for a verification prompt.
289 */
290 typedef struct ui_string_st UI_STRING;
291 DECLARE_STACK_OF(UI_STRING)

293 /* The different types of strings that are currently supported.
294    This is only needed by method authors. */
295 enum UI_string_types
296 {
297     UIT_NONE=0,
298     UIT_PROMPT,           /* Prompt for a string */
299     UIT_VERIFY,           /* Prompt for a string and verify */
300     UIT_BOOLEAN,         /* Prompt for a yes/no response */
301     UIT_INFO,            /* Send info to the user */
302     UIT_ERROR            /* Send an error message to the user */
303 };

305 /* Create and manipulate methods */
306 UI_METHOD *UI_create_method(char *name);
307 void UI_destroy_method(UI_METHOD *ui_method);
308 int UI_method_set_opener(UI_METHOD *method, int (*opener)(UI *ui));
309 int UI_method_set_writer(UI_METHOD *method, int (*writer)(UI *ui, UI_STRING *uis);
310 int UI_method_set_flusher(UI_METHOD *method, int (*flusher)(UI *ui));
311 int UI_method_set_reader(UI_METHOD *method, int (*reader)(UI *ui, UI_STRING *uis);
312 int UI_method_set_closer(UI_METHOD *method, int (*closer)(UI *ui));
313 int UI_method_set_prompt_constructor(UI_METHOD *method, char *(*prompt_construct
314 int (*UI_method_get_opener(UI_METHOD *method))(UI *);
315 int (*UI_method_get_writer(UI_METHOD *method))(UI *, UI_STRING *);
316 int (*UI_method_get_flusher(UI_METHOD *method))(UI *);
317 int (*UI_method_get_reader(UI_METHOD *method))(UI *, UI_STRING *);
318 int (*UI_method_get_closer(UI_METHOD *method))(UI *);
319 char * (*UI_method_get_prompt_constructor(UI_METHOD *method))(UI *, const char*,

321 /* The following functions are helpers for method writers to access relevant
322    data from a UI_STRING. */

324 /* Return type of the UI_STRING */
325 enum UI_string_types UI_get_string_type(UI_STRING *uis);

```

```

326 /* Return input flags of the UI_STRING */
327 int UI_get_input_flags(UI_STRING *uis);
328 /* Return the actual string to output (the prompt, info or error) */
329 const char *UI_get0_output_string(UI_STRING *uis);
330 /* Return the optional action string to output (the boolean prompt instruction)
331 const char *UI_get0_action_string(UI_STRING *uis);
332 /* Return the result of a prompt */
333 const char *UI_get0_result_string(UI_STRING *uis);
334 /* Return the string to test the result against. Only useful with verifies. */
335 const char *UI_get0_test_string(UI_STRING *uis);
336 /* Return the required minimum size of the result */
337 int UI_get_result_minsize(UI_STRING *uis);
338 /* Return the required maximum size of the result */
339 int UI_get_result_maxsize(UI_STRING *uis);
340 /* Set the result of a UI_STRING. */
341 int UI_set_result(UI *ui, UI_STRING *uis, const char *result);

344 /* A couple of popular utility functions */
345 int UI_UTIL_read_pw_string(char *buf,int length,const char *prompt,int verify);
346 int UI_UTIL_read_pw(char *buf,char *buff,int size,const char *prompt,int verify)

349 /* BEGIN ERROR CODES */
350 /* The following lines are auto generated by the script mkerr.pl. Any changes
351    * made after this point may be overwritten when the script is next run.
352 */
353 void ERR_load_UI_strings(void);

355 /* Error codes for the UI functions. */

357 /* Function codes. */
358 #define UI_F_GENERAL_ALLOCATE_BOOLEAN 108
359 #define UI_F_GENERAL_ALLOCATE_PROMPT 109
360 #define UI_F_GENERAL_ALLOCATE_STRING 100
361 #define UI_F_UI_CTRL 111
362 #define UI_F_UI_DUP_ERROR_STRING 101
363 #define UI_F_UI_DUP_INFO_STRING 102
364 #define UI_F_UI_DUP_INPUT_BOOLEAN 110
365 #define UI_F_UI_DUP_INPUT_STRING 103
366 #define UI_F_UI_DUP_VERIFY_STRING 106
367 #define UI_F_UI_GET0_RESULT 107
368 #define UI_F_UI_NEW_METHOD 104
369 #define UI_F_UI_SET_RESULT 105

371 /* Reason codes. */
372 #define UI_R_COMMON_OK_AND_CANCEL_CHARACTERS 104
373 #define UI_R_INDEX_TOO_LARGE 102
374 #define UI_R_INDEX_TOO_SMALL 103
375 #define UI_R_NO_RESULT_BUFFER 105
376 #define UI_R_RESULT_TOO_LARGE 100
377 #define UI_R_RESULT_TOO_SMALL 101
378 #define UI_R_UNKNOWN_CONTROL_COMMAND 106

380 #ifdef __cplusplus
381 }
382 #endif
383 #endif

```

new/usr/src/lib/openssl/include/openssl/ui_compat.h

1

```
*****
3439 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/openssl/ui_compat.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ui/ui.h -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
16  * notice, this list of conditions and the following disclaimer in
17  * the documentation and/or other materials provided with the
18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
23  * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
24  *
25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26  * endorse or promote products derived from this software without
27  * prior written permission. For written permission, please contact
28  * openssl-core@openssl.org.
29  *
30  * 5. Products derived from this software may not be called "OpenSSL"
31  * nor may "OpenSSL" appear in their names without prior written
32  * permission of the OpenSSL Project.
33  *
34  * 6. Redistributions of any form whatsoever must retain the following
35  * acknowledgment:
36  * "This product includes software developed by the OpenSSL Project
37  * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #ifndef HEADER_UI_COMPAT_H
60 #define HEADER_UI_COMPAT_H
```

new/usr/src/lib/openssl/include/openssl/ui_compat.h

2

```
62 #include <openssl/opensslconf.h>
63 #include <openssl/ui.h>

65 #ifdef __cplusplus
66 extern "C" {
67 #endif

69 /* The following functions were previously part of the DES section,
70  * and are provided here for backward compatibility reasons. */

72 #define des_read_pw_string(b,l,p,v) \
73  _ossl_old_des_read_pw_string((b),(l),(p),(v))
74 #define des_read_pw(b,bf,s,p,v) \
75  _ossl_old_des_read_pw((b),(bf),(s),(p),(v))

77 int _ossl_old_des_read_pw_string(char *buf,int length,const char *prompt,int ver
78 int _ossl_old_des_read_pw(char *buf,char *buff,int size,const char *prompt,int v

80 #ifdef __cplusplus
81 }
82 #endif
83 #endif
```

new/usr/src/lib/openssl/include/openssl/x509.h

1

```
*****
45041 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/openssl/x509.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
60 * ECDH support in OpenSSL originally developed by
61 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
```

new/usr/src/lib/openssl/include/openssl/x509.h

2

```
62 */
63
64 #ifndef HEADER_X509_H
65 #define HEADER_X509_H
66
67 #include <openssl/e_os2.h>
68 #include <openssl/symhacks.h>
69 #ifndef OPENSSL_NO_BUFFER
70 #include <openssl/buffer.h>
71 #endif
72 #ifndef OPENSSL_NO_EVP
73 #include <openssl/evp.h>
74 #endif
75 #ifndef OPENSSL_NO_BIO
76 #include <openssl/bio.h>
77 #endif
78 #include <openssl/stack.h>
79 #include <openssl/asn1.h>
80 #include <openssl/safestack.h>
81
82 #ifndef OPENSSL_NO_EC
83 #include <openssl/ec.h>
84 #endif
85
86 #ifndef OPENSSL_NO_ECDSA
87 #include <openssl/ecdsa.h>
88 #endif
89
90 #ifndef OPENSSL_NO_ECDH
91 #include <openssl/ecdh.h>
92 #endif
93
94 #ifndef OPENSSL_NO_DEPRECATED
95 #ifndef OPENSSL_NO_RSA
96 #include <openssl/rsa.h>
97 #endif
98 #ifndef OPENSSL_NO_DSA
99 #include <openssl/dsa.h>
100 #endif
101 #ifndef OPENSSL_NO_DH
102 #include <openssl/dh.h>
103 #endif
104 #endif
105
106 #ifndef OPENSSL_NO_SHA
107 #include <openssl/sha.h>
108 #endif
109 #include <openssl/openssl_typ.h>
110
111 #ifdef __cplusplus
112 extern "C" {
113 #endif
114
115 #ifndef OPENSSL_SYS_WIN32
116 /* Under win32 these are defined in wincrypt.h */
117 #undef X509_NAME
118 #undef X509_CERT_PAIR
119 #undef X509_EXTENSIONS
120 #endif
121
122 #define X509_FILETYPE_PEM 1
123 #define X509_FILETYPE_ASN1 2
124 #define X509_FILETYPE_DEFAULT 3
125
126 #define X509v3_KU_DIGITAL_SIGNATURE 0x0080
127 #define X509v3_KU_NON_REPUDIATION 0x0040
```

```

128 #define X509v3_KU_KEY_ENCIPHERMENT 0x0020
129 #define X509v3_KU_DATA_ENCIPHERMENT 0x0010
130 #define X509v3_KU_KEY_AGREEMENT 0x0008
131 #define X509v3_KU_KEY_CERT_SIGN 0x0004
132 #define X509v3_KU_CRL_SIGN 0x0002
133 #define X509v3_KU_ENCIPHER_ONLY 0x0001
134 #define X509v3_KU_DECIPHER_ONLY 0x8000
135 #define X509v3_KU_UNDEF 0xffff

137 typedef struct X509_objects_st
138 {
139     int nid;
140     int (*a2i)(void);
141     int (*i2a)(void);
142 } X509_OBJECTS;

144 struct X509_algor_st
145 {
146     ASN1_OBJECT *algorithm;
147     ASN1_TYPE *parameter;
148 } /* X509_ALGOR */;

150 DECLARE_STACK_OF(X509_ALGOR)

152 typedef STACK_OF(X509_ALGOR) X509_ALGORS;

154 typedef struct X509_val_st
155 {
156     ASN1_TIME *notBefore;
157     ASN1_TIME *notAfter;
158 } X509_VAL;

160 struct X509_pubkey_st
161 {
162     X509_ALGOR *algor;
163     ASN1_BIT_STRING *public_key;
164     EVP_PKEY *pkey;
165 };

167 typedef struct X509_sig_st
168 {
169     X509_ALGOR *algor;
170     ASN1_OCTET_STRING *digest;
171 } X509_SIG;

173 typedef struct X509_name_entry_st
174 {
175     ASN1_OBJECT *object;
176     ASN1_STRING *value;
177     int set;
178     int size; /* temp variable */
179 } X509_NAME_ENTRY;

181 DECLARE_STACK_OF(X509_NAME_ENTRY)
182 DECLARE_STACK_OF(X509_NAME_ENTRY)

184 /* we always keep X509_NAMES in 2 forms. */
185 struct X509_name_st
186 {
187     STACK_OF(X509_NAME_ENTRY) *entries;
188     int modified; /* true if 'bytes' needs to be built */
189 #ifndef OPENSSL_NO_BUFFER
190     BUF_MEM *bytes;
191 #else
192     char *bytes;
193 #endif

```

```

194 /* unsigned long hash; Keep the hash around for lookups */
195 unsigned char *canon_enc;
196 int canon_enclen;
197 } /* X509_NAME */;

199 DECLARE_STACK_OF(X509_NAME)

201 #define X509_EX_V_NETSCAPE_HACK 0x8000
202 #define X509_EX_V_INIT 0x0001
203 typedef struct X509_extension_st
204 {
205     ASN1_OBJECT *object;
206     ASN1_BOOLEAN critical;
207     ASN1_OCTET_STRING *value;
208 } X509_EXTENSION;

210 typedef STACK_OF(X509_EXTENSION) X509_EXTENSIONS;

212 DECLARE_STACK_OF(X509_EXTENSION)
213 DECLARE_STACK_OF(X509_EXTENSION)

215 /* a sequence of these are used */
216 typedef struct x509_attributes_st
217 {
218     ASN1_OBJECT *object;
219     int single; /* 0 for a set, 1 for a single item (which is wrong) */
220     union {
221         char *ptr;
222         STACK_OF(X509_ATTRIBUTE) *set;
223         ASN1_TYPE *single;
224     } value;
225 } X509_ATTRIBUTE;

227 DECLARE_STACK_OF(X509_ATTRIBUTE)
228 DECLARE_STACK_OF(X509_ATTRIBUTE)

231 typedef struct X509_req_info_st
232 {
233     ASN1_ENCODING enc;
234     ASN1_INTEGER *version;
235     X509_NAME *subject;
236     X509_PUBKEY *pubkey;
237     /* d=2 hl=2 l= 0 cons: cont: 00 */
238     STACK_OF(X509_ATTRIBUTE) *attributes; /* [ 0 ] */
239 } X509_REQ_INFO;

241 typedef struct X509_req_st
242 {
243     X509_REQ_INFO *req_info;
244     X509_ALGOR *sig_alg;
245     ASN1_BIT_STRING *signature;
246     int references;
247 } X509_REQ;

249 typedef struct x509_cinf_st
250 {
251     ASN1_INTEGER *version; /* [ 0 ] default of v1 */
252     ASN1_INTEGER *serialNumber;
253     X509_ALGOR *signature;
254     X509_NAME *issuer;
255     X509_VAL *validity;
256     X509_NAME *subject;
257     X509_PUBKEY *key;
258     ASN1_BIT_STRING *issuerUID; /* [ 1 ] optional in v2 */
259     ASN1_BIT_STRING *subjectUID; /* [ 2 ] optional in v2 */

```



```

260     STACK_OF(X509_EXTENSION) *extensions; /* [ 3 ] optional in v3 */
261     ASN1_ENCODING enc;
262     } X509_CINF;

264 /* This stuff is certificate "auxiliary info"
265  * it contains details which are useful in certificate
266  * stores and databases. When used this is tagged onto
267  * the end of the certificate itself
268  */

270 typedef struct x509_cert_aux_st
271 {
272     STACK_OF(ASN1_OBJECT) *trust; /* trusted uses */
273     STACK_OF(ASN1_OBJECT) *reject; /* rejected uses */
274     ASN1_UTF8STRING *alias; /* "friendly name" */
275     ASN1_OCTET_STRING *keyid; /* key id of private key */
276     STACK_OF(X509_ALGOR) *other; /* other unspecified info */
277     } X509_CERT_AUX;

279 struct x509_st
280 {
281     X509_CINF *cert_info;
282     X509_ALGOR *sig_alg;
283     ASN1_BIT_STRING *signature;
284     int valid;
285     int references;
286     char *name;
287     CRYPTO_EX_DATA ex_data;
288     /* These contain copies of various extension values */
289     long ex_pathlen;
290     long ex_pcpathlen;
291     unsigned long ex_flags;
292     unsigned long ex_kusage;
293     unsigned long ex_xkusage;
294     unsigned long ex_nscert;
295     ASN1_OCTET_STRING *skid;
296     AUTHORITY_KEYID *akid;
297     X509_POLICY_CACHE *policy_cache;
298     STACK_OF(DIST_POINT) *crl_dp;
299     STACK_OF(GENERAL_NAME) *altname;
300     NAME_CONSTRAINTS *nc;
301 #ifndef OPENSSL_NO_RFC3779
302     STACK_OF(IPAddressFamily) *rfc3779_addr;
303     struct ASIdentifiers_st *rfc3779_asid;
304 #endif
305 #ifndef OPENSSL_NO_SHA
306     unsigned char sha1_hash[SHA_DIGEST_LENGTH];
307 #endif
308     X509_CERT_AUX *aux;
309     } /* X509 */;

311 DECLARE_STACK_OF(X509)
312 DECLARE_ASN1_SET_OF(X509)

314 /* This is used for a table of trust checking functions */

316 typedef struct x509_trust_st {
317     int trust;
318     int flags;
319     int (*check_trust)(struct x509_trust_st *, X509 *, int);
320     char *name;
321     int arg1;
322     void *arg2;
323 } X509_TRUST;

325 DECLARE_STACK_OF(X509_TRUST)

```

```

327 typedef struct x509_cert_pair_st {
328     X509 *forward;
329     X509 *reverse;
330 } X509_CERT_PAIR;

332 /* standard trust ids */

334 #define X509_TRUST_DEFAULT -1 /* Only valid in purpose settings */

336 #define X509_TRUST_COMPAT 1
337 #define X509_TRUST_SSL_CLIENT 2
338 #define X509_TRUST_SSL_SERVER 3
339 #define X509_TRUST_EMAIL 4
340 #define X509_TRUST_OBJECT_SIGN 5
341 #define X509_TRUST_OCSP_SIGN 6
342 #define X509_TRUST_OCSP_REQUEST 7
343 #define X509_TRUST_TSA 8

345 /* Keep these up to date! */
346 #define X509_TRUST_MIN 1
347 #define X509_TRUST_MAX 8

350 /* trust_flags values */
351 #define X509_TRUST_DYNAMIC 1
352 #define X509_TRUST_DYNAMIC_NAME 2

354 /* check_trust return codes */

356 #define X509_TRUST_TRUSTED 1
357 #define X509_TRUST_REJECTED 2
358 #define X509_TRUST_UNTRUSTED 3

360 /* Flags for X509_print_ex() */

362 #define X509_FLAG_COMPAT 0
363 #define X509_FLAG_NO_HEADER 1L
364 #define X509_FLAG_NO_VERSION (1L << 1)
365 #define X509_FLAG_NO_SERIAL (1L << 2)
366 #define X509_FLAG_NO_SIGNATURE (1L << 3)
367 #define X509_FLAG_NO_ISSUER (1L << 4)
368 #define X509_FLAG_NO_VALIDITY (1L << 5)
369 #define X509_FLAG_NO_SUBJECT (1L << 6)
370 #define X509_FLAG_NO_PUBKEY (1L << 7)
371 #define X509_FLAG_NO_EXTENSIONS (1L << 8)
372 #define X509_FLAG_NO_SIGDUMP (1L << 9)
373 #define X509_FLAG_NO_AUX (1L << 10)
374 #define X509_FLAG_NO_ATTRIBUTES (1L << 11)

376 /* Flags specific to X509_NAME_print_ex() */

378 /* The field separator information */

380 #define XN_FLAG_SEP_MASK (0xf << 16)

382 #define XN_FLAG_COMPAT 0 /* Traditional SSLeay: use old X
383 #define XN_FLAG_SEP_COMMA_PLUS (1 << 16) /* RFC2253 ,+ */
384 #define XN_FLAG_SEP_CPLUS_SPC (2 << 16) /* ,+ spaced: more readable */
385 #define XN_FLAG_SEP_SPLUS_SPC (3 << 16) /* ;+ spaced */
386 #define XN_FLAG_SEP_MULTILINE (4 << 16) /* One line per field */

388 #define XN_FLAG_DN_REV (1 << 20) /* Reverse DN order */

390 /* How the field name is shown */

```

```

392 #define XN_FLAG_FN_MASK      (0x3 << 21)

394 #define XN_FLAG_FN_SN        0          /* Object short name */
395 #define XN_FLAG_FN_LN        (1 << 21)  /* Object long name */
396 #define XN_FLAG_FN_OID        (2 << 21)  /* Always use OIDs */
397 #define XN_FLAG_FN_NONE      (3 << 21)  /* No field names */

399 #define XN_FLAG_SPC_EQ        (1 << 23)  /* Put spaces round '=' */

401 /* This determines if we dump fields we don't recognise:
402  * RFC2253 requires this.
403  */

405 #define XN_FLAG_DUMP_UNKNOWN_FIELDS (1 << 24)

407 #define XN_FLAG_FN_ALIGN      (1 << 25)  /* Align field names to 20 chara

409 /* Complete set of RFC2253 flags */

411 #define XN_FLAG_RFC2253 (ASN1_STRFLGS_RFC2253 | \
412     XN_FLAG_SEP_COMMA_PLUS | \
413     XN_FLAG_DN_REV | \
414     XN_FLAG_FN_SN | \
415     XN_FLAG_DUMP_UNKNOWN_FIELDS)

417 /* readable oneline form */

419 #define XN_FLAG_ONELINE (ASN1_STRFLGS_RFC2253 | \
420     ASN1_STRFLGS_ESC_QUOTE | \
421     XN_FLAG_SEP_CPLUS_SPC | \
422     XN_FLAG_SPC_EQ | \
423     XN_FLAG_FN_SN)

425 /* readable multiline form */

427 #define XN_FLAG_MULTILINE (ASN1_STRFLGS_ESC_CTRL | \
428     ASN1_STRFLGS_ESC_MSB | \
429     XN_FLAG_SEP_MULTILINE | \
430     XN_FLAG_SPC_EQ | \
431     XN_FLAG_FN_LN | \
432     XN_FLAG_FN_ALIGN)

434 struct x509_revoked_st
435 {
436     ASN1_INTEGER *serialNumber;
437     ASN1_TIME *revocationDate;
438     STACK_OF(X509_EXTENSION) /* optional */ *extensions;
439     /* Set up if indirect CRL */
440     STACK_OF(GENERAL_NAME) *issuer;
441     /* Revocation reason */
442     int reason;
443     int sequence; /* load sequence */
444 };

446 DECLARE_STACK_OF(X509_REVOKED)
447 DECLARE_ASN1_SET_OF(X509_REVOKED)

449 typedef struct X509_crl_info_st
450 {
451     ASN1_INTEGER *version;
452     X509_ALGOR *sig_alg;
453     X509_NAME *issuer;
454     ASN1_TIME *lastUpdate;
455     ASN1_TIME *nextUpdate;
456     STACK_OF(X509_REVOKED) *revoked;
457     STACK_OF(X509_EXTENSION) /* [0] */ *extensions;

```

```

458     ASN1_ENCODING enc;
459 } X509_CRL_INFO;

461 struct X509_crl_st
462 {
463     /* actual signature */
464     X509_CRL_INFO *crl;
465     X509_ALGOR *sig_alg;
466     ASN1_BIT_STRING *signature;
467     int references;
468     int flags;
469     /* Copies of various extensions */
470     AUTHORITY_KEYID *akid;
471     ISSUING_DIST_POINT *idp;
472     /* Convenient breakdown of IDP */
473     int idp_flags;
474     int idp_reasons;
475     /* CRL and base CRL numbers for delta processing */
476     ASN1_INTEGER *crl_number;
477     ASN1_INTEGER *base_crl_number;
478 #ifndef OPENSSL_NO_SHA
479     unsigned char sha1_hash[SHA_DIGEST_LENGTH];
480 #endif
481     STACK_OF(GENERAL_NAMES) *issuers;
482     const X509_CRL_METHOD *meth;
483     void *meth_data;
484 } /* X509_CRL */;

486 DECLARE_STACK_OF(X509_CRL)
487 DECLARE_ASN1_SET_OF(X509_CRL)

489 typedef struct private_key_st
490 {
491     int version;
492     /* The PKCS#8 data types */
493     X509_ALGOR *enc_algor;
494     ASN1_OCTET_STRING *enc_pkey; /* encrypted pub key */

496     /* When decrypted, the following will not be NULL */
497     EVP_PKEY *dec_pkey;

499     /* used to encrypt and decrypt */
500     int key_length;
501     char *key_data;
502     int key_free; /* true if we should auto free key_data */

504     /* expanded version of 'enc_algor' */
505     EVP_CIPHER_INFO cipher;

507     int references;
508 } X509_PKEY;

510 #ifndef OPENSSL_NO_EVP
511 typedef struct X509_info_st
512 {
513     X509 *x509;
514     X509_CRL *crl;
515     X509_PKEY *x_pkey;

517     EVP_CIPHER_INFO enc_cipher;
518     int enc_len;
519     char *enc_data;

521     int references;
522 } X509_INFO;

```

```

524 DECLARE_STACK_OF(X509_INFO)
525 #endif

527 /* The next 2 structures and their 8 routines were sent to me by
528 * Pat Richard <patr@x509.com> and are used to manipulate
529 * Netscapes spki structures - useful if you are writing a CA web page
530 */
531 typedef struct Netscape_spkac_st
532 {
533     X509_PUBKEY *pubkey;
534     ASN1_IA5STRING *challenge; /* challenge sent in atlas >= PR2 */
535 } NETSCAPE_SPKAC;

537 typedef struct Netscape_spki_st
538 {
539     NETSCAPE_SPKAC *spkac; /* signed public key and challenge */
540     X509_ALGOR *sig_algor;
541     ASN1_BIT_STRING *signature;
542 } NETSCAPE_SPKI;

544 /* Netscape certificate sequence structure */
545 typedef struct Netscape_certificate_sequence
546 {
547     ASN1_OBJECT *type;
548     STACK_OF(X509) *certs;
549 } NETSCAPE_CERT_SEQUENCE;

551 /* Unused (and iv length is wrong)
552 typedef struct CBCParameter_st
553 {
554     unsigned char iv[8];
555 } CBC_PARAM;
556 */

558 /* Password based encryption structure */

560 typedef struct PBEPARAM_st {
561     ASN1_OCTET_STRING *salt;
562     ASN1_INTEGER *iter;
563 } PBEPARAM;

565 /* Password based encryption V2 structures */

567 typedef struct PBE2PARAM_st {
568     X509_ALGOR *keyfunc;
569     X509_ALGOR *encryption;
570 } PBE2PARAM;

572 typedef struct PBKDF2PARAM_st {
573     ASN1_TYPE *salt; /* Usually OCTET STRING but could be anything */
574     ASN1_INTEGER *iter;
575     ASN1_INTEGER *keylength;
576     X509_ALGOR *prf;
577 } PBKDF2PARAM;

580 /* PKCS#8 private key info structure */

582 struct pkcs8_priv_key_info_st
583 {
584     int broken; /* Flag for various broken formats */
585 #define PKCS8_OK 0
586 #define PKCS8_NO_OCTET 1
587 #define PKCS8_EMBEDDED_PARAM 2
588 #define PKCS8_NS_DB 3
589 #define PKCS8_NEG_PRIVKEY 4

```

```

590     ASN1_INTEGER *version;
591     X509_ALGOR *pkeyalg;
592     ASN1_TYPE *pkey; /* Should be OCTET STRING but some are broken */
593     STACK_OF(X509_ATTRIBUTE) *attributes;
594 };

596 #ifdef __cplusplus
597 }
598 #endif

600 #include <openssl/x509_vfy.h>
601 #include <openssl/pkcs7.h>

603 #ifdef __cplusplus
604 extern "C" {
605 #endif

607 #define X509_EXT_PACK_UNKNOWN 1
608 #define X509_EXT_PACK_STRING 2

610 #define X509_get_version(x) ASN1_INTEGER_get((x)->cert_info->version)
611 /* #define X509_get_serialNumber(x) ((x)->cert_info->serialNumber) */
612 #define X509_get_notBefore(x) ((x)->cert_info->validity->notBefore)
613 #define X509_get_notAfter(x) ((x)->cert_info->validity->notAfter)
614 #define X509_extract_key(x) X509_get_pubkey(x) /*****/
615 #define X509_REQ_get_version(x) ASN1_INTEGER_get((x)->req_info->version)
616 #define X509_REQ_get_subject_name(x) ((x)->req_info->subject)
617 #define X509_REQ_extract_key(a) X509_REQ_get_pubkey(a)
618 #define X509_name_cmp(a,b) X509_NAME_cmp((a),(b))
619 #define X509_get_signature_type(x) EVP_PKEY_type(OBJ_obj2nid((x)->sig_al

621 #define X509_CRL_get_version(x) ASN1_INTEGER_get((x)->crl->version)
622 #define X509_CRL_get_lastUpdate(x) ((x)->crl->lastUpdate)
623 #define X509_CRL_get_nextUpdate(x) ((x)->crl->nextUpdate)
624 #define X509_CRL_get_issuer(x) ((x)->crl->issuer)
625 #define X509_CRL_get_REVOKED(x) ((x)->crl->revoked)

627 void X509_CRL_set_default_method(const X509_CRL_METHOD *meth);
628 X509_CRL_METHOD *X509_CRL_METHOD_new(
629     int (*crl_init)(X509_CRL *crl),
630     int (*crl_free)(X509_CRL *crl),
631     int (*crl_lookup)(X509_CRL *crl, X509_REVOKED **ret,
632         ASN1_INTEGER *ser, X509_NAME *issuer),
633     int (*crl_verify)(X509_CRL *crl, EVP_PKEY *pk));
634 void X509_CRL_METHOD_free(X509_CRL_METHOD *m);

636 void X509_CRL_set_meth_data(X509_CRL *crl, void *dat);
637 void *X509_CRL_get_meth_data(X509_CRL *crl);

639 /* This one is only used so that a binary form can output, as in
640 * i2d_X509_NAME(X509_get_X509_PUBKEY(x), &buf) */
641 #define X509_get_X509_PUBKEY(x) ((x)->cert_info->key)

644 const char *X509_verify_cert_error_string(long n);

646 #ifndef OPENSSL_NO_EVP
647 int X509_verify(X509 *a, EVP_PKEY *r);

649 int X509_REQ_verify(X509_REQ *a, EVP_PKEY *r);
650 int X509_CRL_verify(X509_CRL *a, EVP_PKEY *r);
651 int NETSCAPE_SPKI_verify(NETSCAPE_SPKI *a, EVP_PKEY *r);

653 NETSCAPE_SPKI *NETSCAPE_SPKI_b64_decode(const char *str, int len);
654 char *NETSCAPE_SPKI_b64_encode(NETSCAPE_SPKI *x);
655 EVP_PKEY *NETSCAPE_SPKI_get_pubkey(NETSCAPE_SPKI *x);

```

```

656 int NETSCAPE_SPKI_set_pubkey(NETSCAPE_SPKI *x, EVP_PKEY *pkey);

658 int NETSCAPE_SPKI_print(BIO *out, NETSCAPE_SPKI *spki);

660 int X509_signature_dump(BIO *bp, const ASN1_STRING *sig, int indent);
661 int X509_signature_print(BIO *bp, X509_ALGOR *alg, ASN1_STRING *sig);

663 int X509_sign(X509 *x, EVP_PKEY *pkey, const EVP_MD *md);
664 int X509_sign_ctx(X509 *x, EVP_MD_CTX *ctx);
665 int X509_REQ_sign(X509_REQ *x, EVP_PKEY *pkey, const EVP_MD *md);
666 int X509_REQ_sign_ctx(X509_REQ *x, EVP_MD_CTX *ctx);
667 int X509_CRL_sign(X509_CRL *x, EVP_PKEY *pkey, const EVP_MD *md);
668 int X509_CRL_sign_ctx(X509_CRL *x, EVP_MD_CTX *ctx);
669 int NETSCAPE_SPKI_sign(NETSCAPE_SPKI *x, EVP_PKEY *pkey, const EVP_MD *md);

671 int X509_pubkey_digest(const X509 *data, const EVP_MD *type,
672     unsigned char *md, unsigned int *len);
673 int X509_digest(const X509 *data, const EVP_MD *type,
674     unsigned char *md, unsigned int *len);
675 int X509_CRL_digest(const X509_CRL *data, const EVP_MD *type,
676     unsigned char *md, unsigned int *len);
677 int X509_REQ_digest(const X509_REQ *data, const EVP_MD *type,
678     unsigned char *md, unsigned int *len);
679 int X509_NAME_digest(const X509_NAME *data, const EVP_MD *type,
680     unsigned char *md, unsigned int *len);
681 #endif

683 #ifndef OPENSSL_NO_FP_API
684 X509 *d2i_X509_fp(FILE *fp, X509 **x509);
685 int i2d_X509_fp(FILE *fp, X509 *x509);
686 X509_CRL *d2i_X509_CRL_fp(FILE *fp, X509_CRL **crl);
687 int i2d_X509_CRL_fp(FILE *fp, X509_CRL *crl);
688 X509_REQ *d2i_X509_REQ_fp(FILE *fp, X509_REQ **req);
689 int i2d_X509_REQ_fp(FILE *fp, X509_REQ *req);
690 #ifndef OPENSSL_NO_RSA
691 RSA *d2i_RSAPrivateKey_fp(FILE *fp, RSA **rsa);
692 int i2d_RSAPrivateKey_fp(FILE *fp, RSA *rsa);
693 RSA *d2i_RSAPublicKey_fp(FILE *fp, RSA **rsa);
694 int i2d_RSAPublicKey_fp(FILE *fp, RSA *rsa);
695 RSA *d2i_RSA_PUBKEY_fp(FILE *fp, RSA **rsa);
696 int i2d_RSA_PUBKEY_fp(FILE *fp, RSA *rsa);
697 #endif
698 #ifndef OPENSSL_NO_DSA
699 DSA *d2i_DSA_PUBKEY_fp(FILE *fp, DSA **dsa);
700 int i2d_DSA_PUBKEY_fp(FILE *fp, DSA *dsa);
701 DSA *d2i_DSAPrivateKey_fp(FILE *fp, DSA **dsa);
702 int i2d_DSAPrivateKey_fp(FILE *fp, DSA *dsa);
703 #endif
704 #ifndef OPENSSL_NO_EC
705 EC_KEY *d2i_EC_PUBKEY_fp(FILE *fp, EC_KEY **eckey);
706 int i2d_EC_PUBKEY_fp(FILE *fp, EC_KEY *eckey);
707 EC_KEY *d2i_ECPrivateKey_fp(FILE *fp, EC_KEY **eckey);
708 int i2d_ECPrivateKey_fp(FILE *fp, EC_KEY *eckey);
709 #endif
710 X509_SIG *d2i_PKCS8_fp(FILE *fp, X509_SIG **p8);
711 int i2d_PKCS8_fp(FILE *fp, X509_SIG *p8);
712 PKCS8_PRIV_KEY_INFO *d2i_PKCS8_PRIV_KEY_INFO_fp(FILE *fp,
713     PKCS8_PRIV_KEY_INFO **p8inf);
714 int i2d_PKCS8_PRIV_KEY_INFO_fp(FILE *fp, PKCS8_PRIV_KEY_INFO *p8inf);
715 int i2d_PKCS8PrivateKeyInfo_fp(FILE *fp, EVP_PKEY *key);
716 int i2d_PrivateKey_fp(FILE *fp, EVP_PKEY *pkey);
717 EVP_PKEY *d2i_PrivateKey_fp(FILE *fp, EVP_PKEY **a);
718 int i2d_PUBKEY_fp(FILE *fp, EVP_PKEY *pkey);
719 EVP_PKEY *d2i_PUBKEY_fp(FILE *fp, EVP_PKEY **a);
720 #endif

```

```

722 #ifndef OPENSSL_NO_BIO
723 X509 *d2i_X509_bio(BIO *bp, X509 **x509);
724 int i2d_X509_bio(BIO *bp, X509 *x509);
725 X509_CRL *d2i_X509_CRL_bio(BIO *bp, X509_CRL **crl);
726 int i2d_X509_CRL_bio(BIO *bp, X509_CRL *crl);
727 X509_REQ *d2i_X509_REQ_bio(BIO *bp, X509_REQ **req);
728 int i2d_X509_REQ_bio(BIO *bp, X509_REQ *req);
729 #ifndef OPENSSL_NO_RSA
730 RSA *d2i_RSAPrivateKey_bio(BIO *bp, RSA **rsa);
731 int i2d_RSAPrivateKey_bio(BIO *bp, RSA *rsa);
732 RSA *d2i_RSAPublicKey_bio(BIO *bp, RSA **rsa);
733 int i2d_RSAPublicKey_bio(BIO *bp, RSA *rsa);
734 RSA *d2i_RSA_PUBKEY_bio(BIO *bp, RSA **rsa);
735 int i2d_RSA_PUBKEY_bio(BIO *bp, RSA *rsa);
736 #endif
737 #ifndef OPENSSL_NO_DSA
738 DSA *d2i_DSA_PUBKEY_bio(BIO *bp, DSA **dsa);
739 int i2d_DSA_PUBKEY_bio(BIO *bp, DSA *dsa);
740 DSA *d2i_DSAPrivateKey_bio(BIO *bp, DSA **dsa);
741 int i2d_DSAPrivateKey_bio(BIO *bp, DSA *dsa);
742 #endif
743 #ifndef OPENSSL_NO_EC
744 EC_KEY *d2i_EC_PUBKEY_bio(BIO *bp, EC_KEY **eckey);
745 int i2d_EC_PUBKEY_bio(BIO *bp, EC_KEY *eckey);
746 EC_KEY *d2i_ECPrivateKey_bio(BIO *bp, EC_KEY **eckey);
747 int i2d_ECPrivateKey_bio(BIO *bp, EC_KEY *eckey);
748 #endif
749 X509_SIG *d2i_PKCS8_bio(BIO *bp, X509_SIG **p8);
750 int i2d_PKCS8_bio(BIO *bp, X509_SIG *p8);
751 PKCS8_PRIV_KEY_INFO *d2i_PKCS8_PRIV_KEY_INFO_bio(BIO *bp,
752     PKCS8_PRIV_KEY_INFO **p8inf);
753 int i2d_PKCS8_PRIV_KEY_INFO_bio(BIO *bp, PKCS8_PRIV_KEY_INFO *p8inf);
754 int i2d_PKCS8PrivateKeyInfo_bio(BIO *bp, EVP_PKEY *key);
755 int i2d_PrivateKey_bio(BIO *bp, EVP_PKEY *pkey);
756 EVP_PKEY *d2i_PrivateKey_bio(BIO *bp, EVP_PKEY **a);
757 int i2d_PUBKEY_bio(BIO *bp, EVP_PKEY *pkey);
758 EVP_PKEY *d2i_PUBKEY_bio(BIO *bp, EVP_PKEY **a);
759 #endif

761 X509 *X509_dup(X509 *x509);
762 X509_ATTRIBUTE *X509_ATTRIBUTE_dup(X509_ATTRIBUTE *xa);
763 X509_EXTENSION *X509_EXTENSION_dup(X509_EXTENSION *ex);
764 X509_CRL *X509_CRL_dup(X509_CRL *crl);
765 X509_REQ *X509_REQ_dup(X509_REQ *req);
766 X509_ALGOR *X509_ALGOR_dup(X509_ALGOR *xn);
767 int X509_ALGOR_set0(X509_ALGOR *alg, ASN1_OBJECT *aobj, int ptype, void *pval);
768 void X509_ALGOR_get0(ASN1_OBJECT **paobj, int *pptype, void **ppval,
769     X509_ALGOR *algor);
770 void X509_ALGOR_set_md(X509_ALGOR *alg, const EVP_MD *md);

772 X509_NAME *X509_NAME_dup(X509_NAME *xn);
773 X509_NAME_ENTRY *X509_NAME_ENTRY_dup(X509_NAME_ENTRY *ne);

775 int X509_cmp_time(const ASN1_TIME *s, time_t *t);
776 int X509_cmp_current_time(const ASN1_TIME *s);
777 ASN1_TIME *X509_time_adj(ASN1_TIME *s, long adj, time_t *t);
778 ASN1_TIME *X509_time_adj_ex(ASN1_TIME *s,
779     int offset_day, long offset_sec, time_t *t);
780 ASN1_TIME *X509_gmtime_adj(ASN1_TIME *s, long adj);

782 const char *X509_get_default_cert_area(void);
783 const char *X509_get_default_cert_dir(void);
784 const char *X509_get_default_cert_file(void);
785 const char *X509_get_default_cert_dir_env(void);
786 const char *X509_get_default_cert_file_env(void);
787 const char *X509_get_default_private_dir(void);

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789 X509_REQ *      X509_to_X509_REQ(X509 *x, EVP_PKEY *pkey, const EVP_MD *md);
790 X509 *           X509_REQ_to_X509(X509_REQ *r, int days,EVP_PKEY *pkey);

792 DECLARE_ASN1_FUNCTIONS(X509_ALGOR)
793 DECLARE_ASN1_ENCODE_FUNCTIONS(X509_ALGORS, X509_ALGORS, X509_ALGORS)
794 DECLARE_ASN1_FUNCTIONS(X509_VAL)

796 DECLARE_ASN1_FUNCTIONS(X509_PUBKEY)

798 int             X509_PUBKEY_set(X509_PUBKEY **x, EVP_PKEY *pkey);
799 EVP_PKEY *      X509_PUBKEY_get(X509_PUBKEY *key);
800 int             X509_get_pubkey_parameters(EVP_PKEY *pkey,
801                                             STACK_OF(X509) *chain);
802 int             i2d_PUBKEY(EVP_PKEY *a,unsigned char **pp);
803 EVP_PKEY *      d2i_PUBKEY(EVP_PKEY **a,const unsigned char **pp,
804                             long length);
805 #ifndef OPENSSL_NO_RSA
806 int             i2d_RSA_PUBKEY(RSA *a,unsigned char **pp);
807 RSA *           d2i_RSA_PUBKEY(RSA **a,const unsigned char **pp,
808                             long length);
809 #endif
810 #ifndef OPENSSL_NO_DSA
811 int             i2d_DSA_PUBKEY(DSA *a,unsigned char **pp);
812 DSA *           d2i_DSA_PUBKEY(DSA **a,const unsigned char **pp,
813                             long length);
814 #endif
815 #ifndef OPENSSL_NO_EC
816 int             i2d_EC_PUBKEY(EC_KEY *a, unsigned char **pp);
817 EC_KEY *        d2i_EC_PUBKEY(EC_KEY **a, const unsigned char **pp,
818                             long length);
819 #endif

821 DECLARE_ASN1_FUNCTIONS(X509_SIG)
822 DECLARE_ASN1_FUNCTIONS(X509_REQ_INFO)
823 DECLARE_ASN1_FUNCTIONS(X509_REQ)

825 DECLARE_ASN1_FUNCTIONS(X509_ATTRIBUTE)
826 X509_ATTRIBUTE *X509_ATTRIBUTE_create(int nid, int atrtype, void *value);

828 DECLARE_ASN1_FUNCTIONS(X509_EXTENSION)
829 DECLARE_ASN1_ENCODE_FUNCTIONS(X509_EXTENSIONS, X509_EXTENSIONS, X509_EXTENSIONS)

831 DECLARE_ASN1_FUNCTIONS(X509_NAME_ENTRY)

833 DECLARE_ASN1_FUNCTIONS(X509_NAME)

835 int             X509_NAME_set(X509_NAME **xn, X509_NAME *name);

837 DECLARE_ASN1_FUNCTIONS(X509_CINF)

839 DECLARE_ASN1_FUNCTIONS(X509)
840 DECLARE_ASN1_FUNCTIONS(X509_CERT_AUX)

842 DECLARE_ASN1_FUNCTIONS(X509_CERT_PAIR)

844 int X509_get_ex_new_index(long arg1, void *argp, CRYPTO_EX_new *new_func,
845                           CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
846 int X509_set_ex_data(X509 *r, int idx, void *arg);
847 void *X509_get_ex_data(X509 *r, int idx);
848 int             i2d_X509_AUX(X509 *a,unsigned char **pp);
849 X509 *          d2i_X509_AUX(X509 **a,const unsigned char **pp,long length);

851 int X509_alias_set1(X509 *x, unsigned char *name, int len);
852 int X509_keyid_set1(X509 *x, unsigned char *id, int len);
853 unsigned char * X509_alias_get0(X509 *x, int *len);

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854 unsigned char * X509_keyid_get0(X509 *x, int *len);
855 int (*X509_TRUST_set_default(int (*trust)(int, X509 *, int)))(int, X509 *, int)
856 int X509_TRUST_set(int *t, int trust);
857 int X509_add1_trust_object(X509 *x, ASN1_OBJECT *obj);
858 int X509_add1_reject_object(X509 *x, ASN1_OBJECT *obj);
859 void X509_trust_clear(X509 *x);
860 void X509_reject_clear(X509 *x);

862 DECLARE_ASN1_FUNCTIONS(X509_REVOKED)
863 DECLARE_ASN1_FUNCTIONS(X509_CRL_INFO)
864 DECLARE_ASN1_FUNCTIONS(X509_CRL)

866 int X509_CRL_add0_revoked(X509_CRL *crl, X509_REVOKED *rev);
867 int X509_CRL_get0_by_serial(X509_CRL *crl,
868                             X509_REVOKED **ret, ASN1_INTEGER *serial);
869 int X509_CRL_get0_by_cert(X509_CRL *crl, X509_REVOKED **ret, X509 *x);

871 X509_PKEY *      X509_PKEY_new(void );
872 void             X509_PKEY_free(X509_PKEY *a);
873 int             i2d_X509_PKEY(X509_PKEY *a,unsigned char **pp);
874 X509_PKEY *      d2i_X509_PKEY(X509_PKEY **a,const unsigned char **pp,long length)

876 DECLARE_ASN1_FUNCTIONS(NETSCAPE_SPKI)
877 DECLARE_ASN1_FUNCTIONS(NETSCAPE_SPKAC)
878 DECLARE_ASN1_FUNCTIONS(NETSCAPE_CERT_SEQUENCE)

880 #ifndef OPENSSL_NO_EVP
881 X509_INFO *      X509_INFO_new(void);
882 void             X509_INFO_free(X509_INFO *a);
883 char *           X509_NAME_oneline(X509_NAME *a,char *buf,int size);

885 int ASN1_verify(i2d_of_void *i2d, X509_ALGOR *algor1,
886                ASN1_BIT_STRING *signature,char *data,EVP_PKEY *pkey);

888 int ASN1_digest(i2d_of_void *i2d,const EVP_MD *type,char *data,
889                unsigned char *md,unsigned int *len);

891 int ASN1_sign(i2d_of_void *i2d, X509_ALGOR *algor1,
892              X509_ALGOR *algor2, ASN1_BIT_STRING *signature,
893              char *data,EVP_PKEY *pkey, const EVP_MD *type);

895 int ASN1_item_digest(const ASN1_ITEM *it,const EVP_MD *type,void *data,
896                     unsigned char *md,unsigned int *len);

898 int ASN1_item_verify(const ASN1_ITEM *it, X509_ALGOR *algor1,
899                     ASN1_BIT_STRING *signature,void *data,EVP_PKEY *pkey);

901 int ASN1_item_sign(const ASN1_ITEM *it, X509_ALGOR *algor1, X509_ALGOR *algor2,
902                   ASN1_BIT_STRING *signature,
903                   void *data, EVP_PKEY *pkey, const EVP_MD *type);
904 int ASN1_item_sign_ctx(const ASN1_ITEM *it,
905                       X509_ALGOR *algor1, X509_ALGOR *algor2,
906                       ASN1_BIT_STRING *signature, void *asn, EVP_MD_CTX *ctx);
907 #endif

909 int             X509_set_version(X509 *x,long version);
910 int             X509_set_serialNumber(X509 *x, ASN1_INTEGER *serial);
911 ASN1_INTEGER *  X509_get_serialNumber(X509 *x);
912 int             X509_set_issuer_name(X509 *x, X509_NAME *name);
913 X509_NAME *      X509_get_issuer_name(X509 *a);
914 int             X509_set_subject_name(X509 *x, X509_NAME *name);
915 X509_NAME *      X509_get_subject_name(X509 *a);
916 int             X509_set_notBefore(X509 *x, const ASN1_TIME *tm);
917 int             X509_set_notAfter(X509 *x, const ASN1_TIME *tm);
918 int             X509_set_pubkey(X509 *x, EVP_PKEY *pkey);
919 EVP_PKEY *      X509_get_pubkey(X509 *x);

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920 ASN1_BIT_STRING * X509_get0_pubkey_bitstr(const X509 *x);
921 int X509_certificate_type(X509 *x,EVP_PKEY *pubkey /* optional */);

923 int X509_REQ_set_version(X509_REQ *x,long version);
924 int X509_REQ_set_subject_name(X509_REQ *req,X509_NAME *name);
925 int X509_REQ_set_pubkey(X509_REQ *x, EVP_PKEY *pkey);
926 EVP_PKEY * X509_REQ_get_pubkey(X509_REQ *req);
927 int X509_REQ_extension_nid(int nid);
928 int * X509_REQ_get_extension_nids(void);
929 void X509_REQ_set_extension_nids(int *nids);
930 STACK_OF(X509_EXTENSION) *X509_REQ_get_extensions(X509_REQ *req);
931 int X509_REQ_add_extensions_nid(X509_REQ *req, STACK_OF(X509_EXTENSION) *exts,
932 int nid);
933 int X509_REQ_add_extensions(X509_REQ *req, STACK_OF(X509_EXTENSION) *exts);
934 int X509_REQ_get_attr_count(const X509_REQ *req);
935 int X509_REQ_get_attr_by_NID(const X509_REQ *req, int nid,
936 int lastpos);
937 int X509_REQ_get_attr_by_OBJ(const X509_REQ *req, ASN1_OBJECT *obj,
938 int lastpos);
939 X509_ATTRIBUTE *X509_REQ_get_attr(const X509_REQ *req, int loc);
940 X509_ATTRIBUTE *X509_REQ_delete_attr(X509_REQ *req, int loc);
941 int X509_REQ_add1_attr(X509_REQ *req, X509_ATTRIBUTE *attr);
942 int X509_REQ_add1_attr_by_OBJ(X509_REQ *req,
943 const ASN1_OBJECT *obj, int type,
944 const unsigned char *bytes, int len);
945 int X509_REQ_add1_attr_by_NID(X509_REQ *req,
946 int nid, int type,
947 const unsigned char *bytes, int len);
948 int X509_REQ_add1_attr_by_txt(X509_REQ *req,
949 const char *attrname, int type,
950 const unsigned char *bytes, int len);

952 int X509_CRL_set_version(X509_CRL *x, long version);
953 int X509_CRL_set_issuer_name(X509_CRL *x, X509_NAME *name);
954 int X509_CRL_set_lastUpdate(X509_CRL *x, const ASN1_TIME *tm);
955 int X509_CRL_set_nextUpdate(X509_CRL *x, const ASN1_TIME *tm);
956 int X509_CRL_sort(X509_CRL *crl);

958 int X509_REVOKED_set_serialNumber(X509_REVOKED *x, ASN1_INTEGER *serial);
959 int X509_REVOKED_set_revocationDate(X509_REVOKED *r, ASN1_TIME *tm);

961 int X509_REQ_check_private_key(X509_REQ *x509,EVP_PKEY *pkey);

963 int X509_check_private_key(X509 *x509,EVP_PKEY *pkey);

965 int X509_issuer_and_serial_cmp(const X509 *a, const X509 *b);
966 unsigned long X509_issuer_and_serial_hash(X509 *a);

968 int X509_issuer_name_cmp(const X509 *a, const X509 *b);
969 unsigned long X509_issuer_name_hash(X509 *a);

971 int X509_subject_name_cmp(const X509 *a, const X509 *b);
972 unsigned long X509_subject_name_hash(X509 *x);

974 #ifndef OPENSSL_NO_MD5
975 unsigned long X509_issuer_name_hash_old(X509 *a);
976 unsigned long X509_subject_name_hash_old(X509 *x);
977 #endif

979 int X509_cmp(const X509 *a, const X509 *b);
980 int X509_NAME_cmp(const X509_NAME *a, const X509_NAME *b);
981 unsigned long X509_NAME_hash(X509_NAME *x);
982 unsigned long X509_NAME_hash_old(X509_NAME *x);

984 int X509_CRL_cmp(const X509_CRL *a, const X509_CRL *b);
985 int X509_CRL_match(const X509_CRL *a, const X509_CRL *b);

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986 #ifndef OPENSSL_NO_FP_API
987 int X509_print_ex_fp(FILE *fp,X509 *x, unsigned long nmflag, unsigne
988 int X509_print_fp(FILE *fp,X509 *x);
989 int X509_CRL_print_fp(FILE *fp,X509_CRL *x);
990 int X509_REQ_print_fp(FILE *fp,X509_REQ *req);
991 int X509_NAME_print_ex_fp(FILE *fp, X509_NAME *nm, int indent, unsigned long fla
992 #endif

994 #ifndef OPENSSL_NO_BIO
995 int X509_NAME_print(BIO *bp, X509_NAME *name, int obase);
996 int X509_NAME_print_ex(BIO *out, X509_NAME *nm, int indent, unsigned long flags)
997 int X509_print_ex(BIO *bp,X509 *x, unsigned long nmflag, unsigned lo
998 int X509_print(BIO *bp,X509 *x);
999 int X509_ocspid_print(BIO *bp,X509 *x);
1000 int X509_CERT_AUX_print(BIO *bp,X509_CERT_AUX *x, int indent);
1001 int X509_CRL_print(BIO *bp,X509_CRL *x);
1002 int X509_REQ_print_ex(BIO *bp, X509_REQ *x, unsigned long nmflag, un
1003 int X509_REQ_print(BIO *bp,X509_REQ *req);
1004 #endif

1006 int X509_NAME_entry_count(X509_NAME *name);
1007 int X509_NAME_get_text_by_NID(X509_NAME *name, int nid,
1008 char *buf,int len);
1009 int X509_NAME_get_text_by_OBJ(X509_NAME *name, ASN1_OBJECT *obj,
1010 char *buf,int len);

1012 /* NOTE: you should be passing -1, not 0 as lastpos. The functions that use
1013 * lastpos, search after that position on. */
1014 int X509_NAME_get_index_by_NID(X509_NAME *name,int nid,int lastpos);
1015 int X509_NAME_get_index_by_OBJ(X509_NAME *name,ASN1_OBJECT *obj,
1016 int lastpos);
1017 X509_NAME_ENTRY *X509_NAME_get_entry(X509_NAME *name, int loc);
1018 X509_NAME_ENTRY *X509_NAME_delete_entry(X509_NAME *name, int loc);
1019 int X509_NAME_add_entry(X509_NAME *name,X509_NAME_ENTRY *ne,
1020 int loc, int set);
1021 int X509_NAME_add_entry_by_OBJ(X509_NAME *name, ASN1_OBJECT *obj, int type,
1022 unsigned char *bytes, int len, int loc, int set);
1023 int X509_NAME_add_entry_by_NID(X509_NAME *name, int nid, int type,
1024 unsigned char *bytes, int len, int loc, int set);
1025 X509_NAME_ENTRY *X509_NAME_ENTRY_create_by_txt(X509_NAME_ENTRY **ne,
1026 const char *field, int type, const unsigned char *bytes, int len
1027 X509_NAME_ENTRY *X509_NAME_ENTRY_create_by_NID(X509_NAME_ENTRY **ne, int nid,
1028 int type,unsigned char *bytes, int len);
1029 int X509_NAME_add_entry_by_txt(X509_NAME *name, const char *field, int type,
1030 const unsigned char *bytes, int len, int loc, int set);
1031 X509_NAME_ENTRY *X509_NAME_ENTRY_create_by_OBJ(X509_NAME_ENTRY **ne,
1032 ASN1_OBJECT *obj, int type,const unsigned char *bytes,
1033 int len);
1034 int X509_NAME_ENTRY_set_object(X509_NAME_ENTRY *ne,
1035 ASN1_OBJECT *obj);
1036 int X509_NAME_ENTRY_set_data(X509_NAME_ENTRY *ne, int type,
1037 const unsigned char *bytes, int len);
1038 ASN1_OBJECT * X509_NAME_ENTRY_get_object(X509_NAME_ENTRY *ne);
1039 ASN1_STRING * X509_NAME_ENTRY_get_data(X509_NAME_ENTRY *ne);

1041 int X509v3_get_ext_count(const STACK_OF(X509_EXTENSION) *x);
1042 int X509v3_get_ext_by_NID(const STACK_OF(X509_EXTENSION) *x,
1043 int nid, int lastpos);
1044 int X509v3_get_ext_by_OBJ(const STACK_OF(X509_EXTENSION) *x,
1045 ASN1_OBJECT *obj,int lastpos);
1046 int X509v3_get_ext_by_critical(const STACK_OF(X509_EXTENSION) *x,
1047 int crit, int lastpos);
1048 X509_EXTENSION *X509v3_get_ext(const STACK_OF(X509_EXTENSION) *x, int loc);
1049 X509_EXTENSION *X509v3_delete_ext(STACK_OF(X509_EXTENSION) *x, int loc);
1050 STACK_OF(X509_EXTENSION) *X509v3_add_ext(STACK_OF(X509_EXTENSION) **x,
1051 X509_EXTENSION *ex, int loc);

```

```

1053 int      X509_get_ext_count(X509 *x);
1054 int      X509_get_ext_by_NID(X509 *x, int nid, int lastpos);
1055 int      X509_get_ext_by_OBJ(X509 *x, ASN1_OBJECT *obj, int lastpos);
1056 int      X509_get_ext_by_critical(X509 *x, int crit, int lastpos);
1057 X509_EXTENSION *X509_get_ext(X509 *x, int loc);
1058 X509_EXTENSION *X509_delete_ext(X509 *x, int loc);
1059 int      X509_add_ext(X509 *x, X509_EXTENSION *ex, int loc);
1060 void      *X509_get_ext_d2i(X509 *x, int nid, int *crit, int *idx);
1061 int      X509_add1_ext_i2d(X509 *x, int nid, void *value, int crit,
1062                          unsigned long flags);

1064 int      X509_CRL_get_ext_count(X509_CRL *x);
1065 int      X509_CRL_get_ext_by_NID(X509_CRL *x, int nid, int lastpos);
1066 int      X509_CRL_get_ext_by_OBJ(X509_CRL *x, ASN1_OBJECT *obj, int lastpos);
1067 int      X509_CRL_get_ext_by_critical(X509_CRL *x, int crit, int lastpos);
1068 X509_EXTENSION *X509_CRL_get_ext(X509_CRL *x, int loc);
1069 X509_EXTENSION *X509_CRL_delete_ext(X509_CRL *x, int loc);
1070 int      X509_CRL_add_ext(X509_CRL *x, X509_EXTENSION *ex, int loc);
1071 void      *X509_CRL_get_ext_d2i(X509_CRL *x, int nid, int *crit, int *idx);
1072 int      X509_CRL_add1_ext_i2d(X509_CRL *x, int nid, void *value, int crit,
1073                          unsigned long flags);

1075 int      X509_REVOKED_get_ext_count(X509_REVOKED *x);
1076 int      X509_REVOKED_get_ext_by_NID(X509_REVOKED *x, int nid, int lastpos);
1077 int      X509_REVOKED_get_ext_by_OBJ(X509_REVOKED *x, ASN1_OBJECT *obj, int lastpos);
1078 int      X509_REVOKED_get_ext_by_critical(X509_REVOKED *x, int crit, int lastpos);
1079 X509_EXTENSION *X509_REVOKED_get_ext(X509_REVOKED *x, int loc);
1080 X509_EXTENSION *X509_REVOKED_delete_ext(X509_REVOKED *x, int loc);
1081 int      X509_REVOKED_add_ext(X509_REVOKED *x, X509_EXTENSION *ex, int loc);
1082 void      *X509_REVOKED_get_ext_d2i(X509_REVOKED *x, int nid, int *crit, int *idx);
1083 int      X509_REVOKED_add1_ext_i2d(X509_REVOKED *x, int nid, void *value, int crit,
1084                          unsigned long flags);

1086 X509_EXTENSION *X509_EXTENSION_create_by_NID(X509_EXTENSION *ex,
1087 int nid, int crit, ASN1_OCTET_STRING *data);
1088 X509_EXTENSION *X509_EXTENSION_create_by_OBJ(X509_EXTENSION *ex,
1089 ASN1_OBJECT *obj, int crit, ASN1_OCTET_STRING *data);
1090 int      X509_EXTENSION_set_object(X509_EXTENSION *ex, ASN1_OBJECT *obj);
1091 int      X509_EXTENSION_set_critical(X509_EXTENSION *ex, int crit);
1092 int      X509_EXTENSION_set_data(X509_EXTENSION *ex,
1093 ASN1_OCTET_STRING *data);
1094 ASN1_OBJECT *X509_EXTENSION_get_object(X509_EXTENSION *ex);
1095 ASN1_OCTET_STRING *X509_EXTENSION_get_data(X509_EXTENSION *ex);
1096 int      X509_EXTENSION_get_critical(X509_EXTENSION *ex);

1098 int X509at_get_attr_count(const STACK_OF(X509_ATTRIBUTE) *x);
1099 int X509at_get_attr_by_NID(const STACK_OF(X509_ATTRIBUTE) *x, int nid,
1100 int lastpos);
1101 int X509at_get_attr_by_OBJ(const STACK_OF(X509_ATTRIBUTE) *x, ASN1_OBJECT *obj,
1102 int lastpos);
1103 X509_ATTRIBUTE *X509at_get_attr(const STACK_OF(X509_ATTRIBUTE) *x, int loc);
1104 X509_ATTRIBUTE *X509at_delete_attr(STACK_OF(X509_ATTRIBUTE) *x, int loc);
1105 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr(STACK_OF(X509_ATTRIBUTE) **x,
1106 X509_ATTRIBUTE *attr);
1107 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr_by_OBJ(STACK_OF(X509_ATTRIBUTE) **x,
1108 const ASN1_OBJECT *obj, int type,
1109 const unsigned char *bytes, int len);
1110 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr_by_NID(STACK_OF(X509_ATTRIBUTE) **x,
1111 int nid, int type,
1112 const unsigned char *bytes, int len);
1113 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr_by_txt(STACK_OF(X509_ATTRIBUTE) **x,
1114 const char *attrname, int type,
1115 const unsigned char *bytes, int len);
1116 void *X509at_get0_data_by_OBJ(STACK_OF(X509_ATTRIBUTE) *x,
1117 ASN1_OBJECT *obj, int lastpos, int type);

```

```

1118 X509_ATTRIBUTE *X509_ATTRIBUTE_create_by_NID(X509_ATTRIBUTE **attr, int nid,
1119 int atrtype, const void *data, int len);
1120 X509_ATTRIBUTE *X509_ATTRIBUTE_create_by_OBJ(X509_ATTRIBUTE **attr,
1121 const ASN1_OBJECT *obj, int atrtype, const void *data, int len);
1122 X509_ATTRIBUTE *X509_ATTRIBUTE_create_by_txt(X509_ATTRIBUTE **attr,
1123 const char *attrname, int type, const unsigned char *bytes, int len);
1124 int X509_ATTRIBUTE_set1_object(X509_ATTRIBUTE *attr, const ASN1_OBJECT *obj);
1125 int X509_ATTRIBUTE_set1_data(X509_ATTRIBUTE *attr, int atrtype, const void *data,
1126 int idx,
1127 int atrtype, void *data);
1128 int X509_ATTRIBUTE_count(X509_ATTRIBUTE *attr);
1129 ASN1_OBJECT *X509_ATTRIBUTE_get0_object(X509_ATTRIBUTE *attr);
1130 ASN1_TYPE *X509_ATTRIBUTE_get0_type(X509_ATTRIBUTE *attr, int idx);

1132 int EVP_PKEY_get_attr_count(const EVP_PKEY *key);
1133 int EVP_PKEY_get_attr_by_NID(const EVP_PKEY *key, int nid,
1134 int lastpos);
1135 int EVP_PKEY_get_attr_by_OBJ(const EVP_PKEY *key, ASN1_OBJECT *obj,
1136 int lastpos);
1137 X509_ATTRIBUTE *EVP_PKEY_get_attr(const EVP_PKEY *key, int loc);
1138 X509_ATTRIBUTE *EVP_PKEY_delete_attr(EVP_PKEY *key, int loc);
1139 int EVP_PKEY_add1_attr(EVP_PKEY *key, X509_ATTRIBUTE *attr);
1140 int EVP_PKEY_add1_attr_by_OBJ(EVP_PKEY *key,
1141 const ASN1_OBJECT *obj, int type,
1142 const unsigned char *bytes, int len);
1143 int EVP_PKEY_add1_attr_by_NID(EVP_PKEY *key,
1144 int nid, int type,
1145 const unsigned char *bytes, int len);
1146 int EVP_PKEY_add1_attr_by_txt(EVP_PKEY *key,
1147 const char *attrname, int type,
1148 const unsigned char *bytes, int len);

1150 int      X509_verify_cert(X509_STORE_CTX *ctx);

1152 /* lookup a cert from a X509 STACK */
1153 X509 *X509_find_by_issuer_and_serial(STACK_OF(X509) *sk, X509_NAME *name,
1154 ASN1_INTEGER *serial);
1155 X509 *X509_find_by_subject(STACK_OF(X509) *sk, X509_NAME *name);

1157 DECLARE_ASN1_FUNCTIONS(PBEPARAM)
1158 DECLARE_ASN1_FUNCTIONS(PBE2PARAM)
1159 DECLARE_ASN1_FUNCTIONS(PBKDF2PARAM)

1161 int PKCS5_pbe_set0_algor(X509_ALGOR *algor, int alg, int iter,
1162 const unsigned char *salt, int saltlen);

1164 X509_ALGOR *PKCS5_pbe_set(int alg, int iter,
1165 const unsigned char *salt, int saltlen);
1166 X509_ALGOR *PKCS5_pbe2_set(const EVP_CIPHER *cipher, int iter,
1167 const unsigned char *salt, int saltlen);
1168 X509_ALGOR *PKCS5_pbe2_set_iv(const EVP_CIPHER *cipher, int iter,
1169 const unsigned char *salt, int saltlen,
1170 const unsigned char *aiv, int prf_nid);

1172 X509_ALGOR *PKCS5_pbkdf2_set(int iter, const unsigned char *salt, int saltlen,
1173 int prf_nid, int keylen);

1175 /* PKCS#8 utilities */

1177 DECLARE_ASN1_FUNCTIONS(PKCS8_PRIV_KEY_INFO)

1179 EVP_PKEY *EVP_PKCS82PKEY(PKCS8_PRIV_KEY_INFO *p8);
1180 PKCS8_PRIV_KEY_INFO *EVP_PKEY2PKCS8(EVP_PKEY *pkey);
1181 PKCS8_PRIV_KEY_INFO *EVP_PKEY2PKCS8_broken(EVP_PKEY *pkey, int broken);
1182 PKCS8_PRIV_KEY_INFO *PKCS8_set_broken(PKCS8_PRIV_KEY_INFO *p8, int broken);

```

```

1184 int PKCS8_pkey_set0(PKCS8_PRIV_KEY_INFO *priv, ASN1_OBJECT *aobj,
1185                     int version, int ptype, void *pval,
1186                     unsigned char *penc, int penclen);
1187 int PKCS8_pkey_get0(ASN1_OBJECT **ppkalg,
1188                     const unsigned char **pk, int *ppklen,
1189                     X509_ALGOR **pa,
1190                     PKCS8_PRIV_KEY_INFO *p8);

1192 int X509_PUBKEY_set0_param(X509_PUBKEY *pub, ASN1_OBJECT *aobj,
1193                           int ptype, void *pval,
1194                           unsigned char *penc, int penclen);
1195 int X509_PUBKEY_get0_param(ASN1_OBJECT **ppkalg,
1196                           const unsigned char **pk, int *ppklen,
1197                           X509_ALGOR **pa,
1198                           X509_PUBKEY *pub);

1200 int X509_check_trust(X509 *x, int id, int flags);
1201 int X509_TRUST_get_count(void);
1202 X509_TRUST * X509_TRUST_get0(int idx);
1203 int X509_TRUST_get_by_id(int id);
1204 int X509_TRUST_add(int id, int flags, int (*ck)(X509_TRUST *, X509 *, int),
1205                  char *name, int arg1, void *arg2);
1206 void X509_TRUST_cleanup(void);
1207 int X509_TRUST_get_flags(X509_TRUST *xp);
1208 char *X509_TRUST_get0_name(X509_TRUST *xp);
1209 int X509_TRUST_get_trust(X509_TRUST *xp);

1211 /* BEGIN ERROR CODES */
1212 /* The following lines are auto generated by the script mkerr.pl. Any changes
1213  * made after this point may be overwritten when the script is next run.
1214  */
1215 void ERR_load_X509_strings(void);

1217 /* Error codes for the X509 functions. */

1219 /* Function codes. */
1220 #define X509_F_ADD_CERT_DIR 100
1221 #define X509_F_BY_FILE_CTRL 101
1222 #define X509_F_CHECK_POLICY 145
1223 #define X509_F_DIR_CTRL 102
1224 #define X509_F_GET_CERT_BY_SUBJECT 103
1225 #define X509_F_NETSCAPE_SPKI_B64_DECODE 129
1226 #define X509_F_NETSCAPE_SPKI_B64_ENCODE 130
1227 #define X509_F_X509AT_ADD1_ATTR 135
1228 #define X509_F_X509V3_ADD_EXT 104
1229 #define X509_F_X509_ATTRIBUTE_CREATE_BY_NID 136
1230 #define X509_F_X509_ATTRIBUTE_CREATE_BY_OBJ 137
1231 #define X509_F_X509_ATTRIBUTE_CREATE_BY_TXT 140
1232 #define X509_F_X509_ATTRIBUTE_GET0_DATA 139
1233 #define X509_F_X509_ATTRIBUTE_SET1_DATA 138
1234 #define X509_F_X509_CHECK_PRIVATE_KEY 128
1235 #define X509_F_X509_CRL_PRINT_FP 147
1236 #define X509_F_X509_EXTENSION_CREATE_BY_NID 108
1237 #define X509_F_X509_EXTENSION_CREATE_BY_OBJ 109
1238 #define X509_F_X509_GET_PUBKEY_PARAMETERS 110
1239 #define X509_F_X509_LOAD_CERT_CRL_FILE 132
1240 #define X509_F_X509_LOAD_CERT_FILE 111
1241 #define X509_F_X509_LOAD_CRL_FILE 112
1242 #define X509_F_X509_NAME_ADD_ENTRY 113
1243 #define X509_F_X509_NAME_ENTRY_CREATE_BY_NID 114
1244 #define X509_F_X509_NAME_ENTRY_CREATE_BY_TXT 131
1245 #define X509_F_X509_NAME_ENTRY_SET_OBJECT 115
1246 #define X509_F_X509_NAME_ONELINE 116
1247 #define X509_F_X509_NAME_PRINT 117
1248 #define X509_F_X509_PRINT_EX_FP 118
1249 #define X509_F_X509_PUBKEY_GET 119

```

```

1250 #define X509_F_X509_PUBKEY_SET 120
1251 #define X509_F_X509_REQ_CHECK_PRIVATE_KEY 144
1252 #define X509_F_X509_REQ_PRINT_EX 121
1253 #define X509_F_X509_REQ_PRINT_FP 122
1254 #define X509_F_X509_REQ_TO_X509 123
1255 #define X509_F_X509_STORE_ADD_CERT 124
1256 #define X509_F_X509_STORE_ADD_CRL 125
1257 #define X509_F_X509_STORE_CTX_GET1_ISSUER 146
1258 #define X509_F_X509_STORE_CTX_INIT 143
1259 #define X509_F_X509_STORE_CTX_NEW 142
1260 #define X509_F_X509_STORE_CTX_PURPOSE_INHERIT 134
1261 #define X509_F_X509_TO_X509_REQ 126
1262 #define X509_F_X509_TRUST_ADD 133
1263 #define X509_F_X509_TRUST_SET 141
1264 #define X509_F_X509_VERIFY_CERT 127

1266 /* Reason codes. */
1267 #define X509_R_BAD_X509_FILETYPE 100
1268 #define X509_R_BASE64_DECODE_ERROR 118
1269 #define X509_R_CANT_CHECK_DH_KEY 114
1270 #define X509_R_CERT_ALREADY_IN_HASH_TABLE 101
1271 #define X509_R_ERR_ASN1_LIB 102
1272 #define X509_R_INVALID_DIRECTORY 113
1273 #define X509_R_INVALID_FIELD_NAME 119
1274 #define X509_R_INVALID_TRUST 123
1275 #define X509_R_KEY_TYPE_MISMATCH 115
1276 #define X509_R_KEY_VALUES_MISMATCH 116
1277 #define X509_R_LOADING_CERT_DIR 103
1278 #define X509_R_LOADING_DEFAULTS 104
1279 #define X509_R_METHOD_NOT_SUPPORTED 124
1280 #define X509_R_NO_CERT_SET_FOR_US_TO_VERIFY 105
1281 #define X509_R_PUBLIC_KEY_DECODE_ERROR 125
1282 #define X509_R_PUBLIC_KEY_ENCODE_ERROR 126
1283 #define X509_R_SHOULD_RETRY 106
1284 #define X509_R_UNABLE_TO_FIND_PARAMETERS_IN_CHAIN 107
1285 #define X509_R_UNABLE_TO_GET_CERTS_PUBLIC_KEY 108
1286 #define X509_R_UNKNOWN_KEY_TYPE 117
1287 #define X509_R_UNKNOWN_NID 109
1288 #define X509_R_UNKNOWN_PURPOSE_ID 121
1289 #define X509_R_UNKNOWN_TRUST_ID 120
1290 #define X509_R_UNSUPPORTED_ALGORITHM 111
1291 #define X509_R_WRONG_LOOKUP_TYPE 112
1292 #define X509_R_WRONG_TYPE 122

1294 #ifdef __cplusplus
1295 }
1296 #endif
1297 #endif

```


new/usr/src/lib/openssl/include/openssl/x509_vfy.h

1

```
*****
22526 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/openssl/x509_vfy.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/x509/x509_vfy.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ''AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #ifndef HEADER_X509_H
60 #include <openssl/x509.h>
61 /* openssl/x509.h ends up #include-ing this file at about the only
```

new/usr/src/lib/openssl/include/openssl/x509_vfy.h

2

```
62  * appropriate moment. */
63 #endif

65 #ifndef HEADER_X509_VFY_H
66 #define HEADER_X509_VFY_H

68 #include <openssl/opensslconf.h>
69 #ifndef OPENSSL_NO_LHASH
70 #include <openssl/lhash.h>
71 #endif
72 #include <openssl/bio.h>
73 #include <openssl/crypto.h>
74 #include <openssl/symhacks.h>

76 #ifdef __cplusplus
77 extern "C" {
78 #endif

80 #if 0
81 /* Outer object */
82 typedef struct x509_hash_dir_st
83 {
84     int num_dirs;
85     char **dirs;
86     int *dirs_type;
87     int num_dirs_allocated;
88 } X509_HASH_DIR_CTX;
89 #endif

91 typedef struct x509_file_st
92 {
93     int num_paths; /* number of paths to files or directories */
94     int num_allocated;
95     char **paths; /* the list of paths or directories */
96     int *path_type;
97 } X509_CERT_FILE_CTX;

99 /*****
100  *
101  * SSL_CTX -> X509_STORE
102  *          -> X509_LOOKUP
103  *          -> X509_LOOKUP_METHOD
104  *          -> X509_LOOKUP
105  *          -> X509_LOOKUP_METHOD
106  *
107  * SSL      -> X509_STORE_CTX
108  *          -> X509_STORE

110 The X509_STORE holds the tables etc for verification stuff.
111 A X509_STORE_CTX is used while validating a single certificate.
112 The X509_STORE has X509_LOOKUPS for looking up certs.
113 The X509_STORE then calls a function to actually verify the
114 certificate chain.
115 */

117 #define X509_LU_RETRY          -1
118 #define X509_LU_FAIL           0
119 #define X509_LU_X509           1
120 #define X509_LU_CRL            2
121 #define X509_LU_PKEY           3

123 typedef struct x509_object_st
124 {
125     /* one of the above types */
126     int type;
127     union {
```

```

128     char *ptr;
129     X509 *x509;
130     X509_CRL *crl;
131     EVP_PKEY *pkey;
132     } data;
133 } X509_OBJECT;

135 typedef struct x509_lookup_st X509_LOOKUP;

137 DECLARE_STACK_OF(X509_LOOKUP)
138 DECLARE_STACK_OF(X509_OBJECT)

140 /* This is a static that defines the function interface */
141 typedef struct x509_lookup_method_st
142 {
143     const char *name;
144     int (*new_item)(X509_LOOKUP *ctx);
145     void (*free)(X509_LOOKUP *ctx);
146     int (*init)(X509_LOOKUP *ctx);
147     int (*shutdown)(X509_LOOKUP *ctx);
148     int (*ctrl)(X509_LOOKUP *ctx, int cmd, const char *argc, long argl,
149               char **ret);
150     int (*get_by_subject)(X509_LOOKUP *ctx, int type, X509_NAME *name,
151                          X509_OBJECT *ret);
152     int (*get_by_issuer_serial)(X509_LOOKUP *ctx, int type, X509_NAME *name,
153                                ASN1_INTEGER *serial, X509_OBJECT *ret);
154     int (*get_by_fingerprint)(X509_LOOKUP *ctx, int type,
155                               unsigned char *bytes, int len,
156                               X509_OBJECT *ret);
157     int (*get_by_alias)(X509_LOOKUP *ctx, int type, char *str, int len,
158                        X509_OBJECT *ret);
159 } X509_LOOKUP_METHOD;

161 /* This structure hold all parameters associated with a verify operation
162  * by including an X509_VERIFY_PARAM structure in related structures the
163  * parameters used can be customized
164  */

166 typedef struct X509_VERIFY_PARAM_st
167 {
168     char *name;
169     time_t check_time; /* Time to use */
170     unsigned long inh_flags; /* Inheritance flags */
171     unsigned long flags; /* Various verify flags */
172     int purpose; /* purpose to check untrusted certificates */
173     int trust; /* trust setting to check */
174     int depth; /* Verify depth */
175     STACK_OF(ASN1_OBJECT) *policies; /* Permissible policies */
176 } X509_VERIFY_PARAM;

178 DECLARE_STACK_OF(X509_VERIFY_PARAM)

180 /* This is used to hold everything. It is used for all certificate
181  * validation. Once we have a certificate chain, the 'verify'
182  * function is then called to actually check the cert chain. */
183 struct x509_store_st
184 {
185     /* The following is a cache of trusted certs */
186     int cache; /* if true, stash any hits */
187     STACK_OF(X509_OBJECT) *objs; /* Cache of all objects */

188     /* These are external lookup methods */
189     STACK_OF(X509_LOOKUP) *get_cert_methods;

192     X509_VERIFY_PARAM *param;

```

```

194     /* Callbacks for various operations */
195     int (*verify)(X509_STORE_CTX *ctx); /* called to verify a certificat
196     int (*verify_cb)(int ok, X509_STORE_CTX *ctx); /* error callback */
197     int (*get_issuer)(X509 **issuer, X509_STORE_CTX *ctx, X509 *x); /* get i
198     int (*check_issued)(X509_STORE_CTX *ctx, X509 *x, X509 *issuer); /* chec
199     int (*check_revocation)(X509_STORE_CTX *ctx); /* Check revocation status
200     int (*get_crl)(X509_STORE_CTX *ctx, X509_CRL **crl, X509 *x); /* retriev
201     int (*check_crl)(X509_STORE_CTX *ctx, X509_CRL *crl); /* Check CRL valid
202     int (*cert_crl)(X509_STORE_CTX *ctx, X509_CRL *crl, X509 *x); /* Check c
203     STACK_OF(X509) * (*lookup_certs)(X509_STORE_CTX *ctx, X509_NAME *nm);
204     STACK_OF(X509_CRL) * (*lookup_crls)(X509_STORE_CTX *ctx, X509_NAME *nm);
205     int (*cleanup)(X509_STORE_CTX *ctx);

207     CRYPTO_EX_DATA ex_data;
208     int references;
209 } /* X509_STORE */;

211 int X509_STORE_set_depth(X509_STORE *store, int depth);

213 #define X509_STORE_set_verify_cb_func(ctx, func) ((ctx)->verify_cb=(func))
214 #define X509_STORE_set_verify_func(ctx, func) ((ctx)->verify=(func))

216 /* This is the functions plus an instance of the local variables. */
217 struct x509_lookup_st
218 {
219     int init; /* have we been started */
220     int skip; /* don't use us. */
221     X509_LOOKUP_METHOD *method; /* the functions */
222     char *method_data; /* method data */

224     X509_STORE *store_ctx; /* who owns us */
225 } /* X509_LOOKUP */;

227 /* This is a used when verifying cert chains. Since the
228  * gathering of the cert chain can take some time (and have to be
229  * 'retrieved', this needs to be kept and passed around. */
230 struct x509_store_ctx_st /* X509_STORE_CTX */
231 {
232     X509_STORE *ctx;
233     int current_method; /* used when looking up certs */

235     /* The following are set by the caller */
236     X509 *cert; /* The cert to check */
237     STACK_OF(X509) *untrusted; /* chain of X509s - untrusted - passed i
238     STACK_OF(X509_CRL) *crls; /* set of CRLs passed in */

240     X509_VERIFY_PARAM *param;
241     void *other_ctx; /* Other info for use with get_issuer() */

243     /* Callbacks for various operations */
244     int (*verify)(X509_STORE_CTX *ctx); /* called to verify a certificat
245     int (*verify_cb)(int ok, X509_STORE_CTX *ctx); /* error callbac
246     int (*get_issuer)(X509 **issuer, X509_STORE_CTX *ctx, X509 *x); /* get i
247     int (*check_issued)(X509_STORE_CTX *ctx, X509 *x, X509 *issuer); /* chec
248     int (*check_revocation)(X509_STORE_CTX *ctx); /* Check revocation status
249     int (*get_crl)(X509_STORE_CTX *ctx, X509_CRL **crl, X509 *x); /* retriev
250     int (*check_crl)(X509_STORE_CTX *ctx, X509_CRL *crl, X509 *x); /* Check c
251     int (*cert_crl)(X509_STORE_CTX *ctx, X509_CRL *crl, X509 *x); /* Check c
252     int (*check_policy)(X509_STORE_CTX *ctx);
253     STACK_OF(X509) * (*lookup_certs)(X509_STORE_CTX *ctx, X509_NAME *nm);
254     STACK_OF(X509_CRL) * (*lookup_crls)(X509_STORE_CTX *ctx, X509_NAME *nm);
255     int (*cleanup)(X509_STORE_CTX *ctx);

257     /* The following is built up */
258     int valid; /* if 0, rebuild chain */
259     int last_untrusted; /* index of last untrusted cert */

```

```

260     STACK_OF(X509) *chain; /* chain of X509s - built up and trusted
261     X509_POLICY_TREE *tree; /* Valid policy tree */

263     int explicit_policy; /* Require explicit policy value */

265     /* When something goes wrong, this is why */
266     int error_depth;
267     int error;
268     X509 *current_cert;
269     X509 *current_issuer; /* cert currently being tested as valid issuer */
270     X509_CRL *current_crl; /* current CRL */

272     int current_crl_score; /* score of current CRL */
273     unsigned int current_reasons; /* Reason mask */

275     X509_STORE_CTX *parent; /* For CRL path validation: parent context */

277     CRYPTO_EX_DATA ex_data;
278     } /* X509_STORE_CTX */;

280 void X509_STORE_CTX_set_depth(X509_STORE_CTX *ctx, int depth);

282 #define X509_STORE_CTX_set_app_data(ctx,data) \
283     X509_STORE_CTX_set_ex_data(ctx,0,data)
284 #define X509_STORE_CTX_get_app_data(ctx) \
285     X509_STORE_CTX_get_ex_data(ctx,0)

287 #define X509_L_FILE_LOAD      1
288 #define X509_L_ADD_DIR       2

290 #define X509_LOOKUP_load_file(x,name,type) \
291     X509_LOOKUP_ctrl((x),X509_L_FILE_LOAD,(name),(long)(type),NULL)

293 #define X509_LOOKUP_add_dir(x,name,type) \
294     X509_LOOKUP_ctrl((x),X509_L_ADD_DIR,(name),(long)(type),NULL)

296 #define X509_V_OK              0
297 /* illegal error (for uninitialized values, to avoid X509_V_OK): 1 */

299 #define X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT      2
300 #define X509_V_ERR_UNABLE_TO_GET_CRL            3
301 #define X509_V_ERR_UNABLE_TO_DECRYPT_CERT_SIGNATURE 4
302 #define X509_V_ERR_UNABLE_TO_DECRYPT_CRL_SIGNATURE 5
303 #define X509_V_ERR_UNABLE_TO_DECODE_ISSUER_PUBLIC_KEY 6
304 #define X509_V_ERR_CERT_SIGNATURE_FAILURE       7
305 #define X509_V_ERR_CRL_SIGNATURE_FAILURE        8
306 #define X509_V_ERR_CERT_NOT_YET_VALID           9
307 #define X509_V_ERR_CERT_HAS_EXPIRED            10
308 #define X509_V_ERR_CRL_NOT_YET_VALID           11
309 #define X509_V_ERR_CRL_HAS_EXPIRED            12
310 #define X509_V_ERR_ERROR_IN_CERT_NOT_BEFORE_FIELD 13
311 #define X509_V_ERR_ERROR_IN_CERT_NOT_AFTER_FIELD 14
312 #define X509_V_ERR_ERROR_IN_CRL_LAST_UPDATE_FIELD 15
313 #define X509_V_ERR_ERROR_IN_CRL_NEXT_UPDATE_FIELD 16
314 #define X509_V_ERR_OUT_OF_MEM                 17
315 #define X509_V_ERR_DEPTH_ZERO_SELF_SIGNED_CERT 18
316 #define X509_V_ERR_SELF_SIGNED_CERT_IN_CHAIN  19
317 #define X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT_LOCALLY 20
318 #define X509_V_ERR_UNABLE_TO_VERIFY_LEAF_SIGNATURE 21
319 #define X509_V_ERR_CERT_CHAIN_TOO_LONG        22
320 #define X509_V_ERR_CERT_REVOKED               23
321 #define X509_V_ERR_INVALID_CA                 24
322 #define X509_V_ERR_PATH_LENGTH_EXCEEDED      25
323 #define X509_V_ERR_INVALID_PURPOSE           26
324 #define X509_V_ERR_CERT_UNTRUSTED           27
325 #define X509_V_ERR_CERT_REJECTED            28

```

```

326 /* These are 'informational' when looking for issuer cert */
327 #define X509_V_ERR_SUBJECT_ISSUER_MISMATCH      29
328 #define X509_V_ERR_AKID_SKID_MISMATCH          30
329 #define X509_V_ERR_AKID_ISSUER_SERIAL_MISMATCH 31
330 #define X509_V_ERR_KEYUSAGE_NO_CERTSIGN        32

332 #define X509_V_ERR_UNABLE_TO_GET_CRL_ISSUER     33
333 #define X509_V_ERR_UNHANDLED_CRITICAL_EXTENSION 34
334 #define X509_V_ERR_KEYUSAGE_NO_CRL_SIGN        35
335 #define X509_V_ERR_UNHANDLED_CRITICAL_CRL_EXTENSION 36
336 #define X509_V_ERR_INVALID_NON_CA              37
337 #define X509_V_ERR_PROXY_PATH_LENGTH_EXCEEDED  38
338 #define X509_V_ERR_KEYUSAGE_NO_DIGITAL_SIGNATURE 39
339 #define X509_V_ERR_PROXY_CERTIFICATES_NOT_ALLOWED 40

341 #define X509_V_ERR_INVALID_EXTENSION           41
342 #define X509_V_ERR_INVALID_POLICY_EXTENSION    42
343 #define X509_V_ERR_NO_EXPLICIT_POLICY          43
344 #define X509_V_ERR_DIFFERENT_CRL_SCOPE         44
345 #define X509_V_ERR_UNSUPPORTED_EXTENSION_FEATURE 45

347 #define X509_V_ERR_UNNESTED_RESOURCE            46

349 #define X509_V_ERR_PERMITTED_VIOLATION         47
350 #define X509_V_ERR_EXCLUDED_VIOLATION         48
351 #define X509_V_ERR_SUBTREE_MINMAX             49
352 #define X509_V_ERR_UNSUPPORTED_CONSTRAINT_TYPE 51
353 #define X509_V_ERR_UNSUPPORTED_CONSTRAINT_SYNTAX 52
354 #define X509_V_ERR_UNSUPPORTED_NAME_SYNTAX    53
355 #define X509_V_ERR_CRL_PATH_VALIDATION_ERROR  54

357 /* The application is not happy */
358 #define X509_V_ERR_APPLICATION_VERIFICATION    50

360 /* Certificate verify flags */

362 /* Send issuer+subject checks to verify_cb */
363 #define X509_V_FLAG_CB_ISSUER_CHECK           0x1
364 /* Use check time instead of current time */
365 #define X509_V_FLAG_USE_CHECK_TIME            0x2
366 /* Lookup CRLs */
367 #define X509_V_FLAG_CRL_CHECK                 0x4
368 /* Lookup CRLs for whole chain */
369 #define X509_V_FLAG_CRL_CHECK_ALL             0x8
370 /* Ignore unhandled critical extensions */
371 #define X509_V_FLAG_IGNORE_CRITICAL           0x10
372 /* Disable workarounds for broken certificates */
373 #define X509_V_FLAG_X509_STRICT               0x20
374 /* Enable proxy certificate validation */
375 #define X509_V_FLAG_ALLOW_PROXY_CERTS        0x40
376 /* Enable policy checking */
377 #define X509_V_FLAG_POLICY_CHECK              0x80
378 /* Policy variable require-explicit-policy */
379 #define X509_V_FLAG_EXPLICIT_POLICY           0x100
380 /* Policy variable inhibit-any-policy */
381 #define X509_V_FLAG_INHIBIT_ANY              0x200
382 /* Policy variable inhibit-policy-mapping */
383 #define X509_V_FLAG_INHIBIT_MAP              0x400
384 /* Notify callback that policy is OK */
385 #define X509_V_FLAG_NOTIFY_POLICY            0x800
386 /* Extended CRL features such as indirect CRLs, alternate CRL signing keys */
387 #define X509_V_FLAG_EXTENDED_CRL_SUPPORT     0x1000
388 /* Delta CRL support */
389 #define X509_V_FLAG_USE_DELTAS               0x2000
390 /* Check selfsigned CA signature */
391 #define X509_V_FLAG_CHECK_SS_SIGNATURE       0x4000

```

```

393 /* Allow partial chains if at least one certificate is in trusted store */
394 #define X509_V_FLAG_PARTIAL_CHAIN      0x80000

396 #define X509_VP_FLAG_DEFAULT          0x1
397 #define X509_VP_FLAG_OVERWRITE        0x2
398 #define X509_VP_FLAG_RESET_FLAGS      0x4
399 #define X509_VP_FLAG_LOCKED           0x8
400 #define X509_VP_FLAG_ONCE              0x10

402 /* Internal use: mask of policy related options */
403 #define X509_V_FLAG_POLICY_MASK (X509_V_FLAG_POLICY_CHECK \
404                                  | X509_V_FLAG_EXPLICIT_POLICY \
405                                  | X509_V_FLAG_INHIBIT_ANY \
406                                  | X509_V_FLAG_INHIBIT_MAP)

408 int X509_OBJECT_idx_by_subject(STACK_OF(X509_OBJECT) *h, int type,
409                               X509_NAME *name);
410 X509_OBJECT *X509_OBJECT_retrieve_by_subject(STACK_OF(X509_OBJECT) *h, int type, X
411 X509_OBJECT *X509_OBJECT_retrieve_match(STACK_OF(X509_OBJECT) *h, X509_OBJECT *x
412 void X509_OBJECT_up_ref_count(X509_OBJECT *a);
413 void X509_OBJECT_free_contents(X509_OBJECT *a);
414 X509_STORE *X509_STORE_new(void);
415 void X509_STORE_free(X509_STORE *v);

417 STACK_OF(X509) *X509_STORE_get1_certs(X509_STORE_CTX *st, X509_NAME *nm);
418 STACK_OF(X509_CRL) *X509_STORE_get1_crls(X509_STORE_CTX *st, X509_NAME *nm);
419 int X509_STORE_set_flags(X509_STORE *ctx, unsigned long flags);
420 int X509_STORE_set_purpose(X509_STORE *ctx, int purpose);
421 int X509_STORE_set_trust(X509_STORE *ctx, int trust);
422 int X509_STORE_set1_param(X509_STORE *ctx, X509_VERIFY_PARAM *pm);

424 void X509_STORE_set_verify_cb(X509_STORE *ctx,
425                               int (*verify_cb)(int, X509_STORE_CTX *));

427 X509_STORE_CTX *X509_STORE_CTX_new(void);

429 int X509_STORE_CTX_get1_issuer(X509 **issuer, X509_STORE_CTX *ctx, X509 *x);

431 void X509_STORE_CTX_free(X509_STORE_CTX *ctx);
432 int X509_STORE_CTX_init(X509_STORE_CTX *ctx, X509_STORE *store,
433                        X509 *x509, STACK_OF(X509) *chain);
434 void X509_STORE_CTX_trusted_stack(X509_STORE_CTX *ctx, STACK_OF(X509) *sk);
435 void X509_STORE_CTX_cleanup(X509_STORE_CTX *ctx);

437 X509_LOOKUP *X509_STORE_add_lookup(X509_STORE *v, X509_LOOKUP_METHOD *m);

439 X509_LOOKUP_METHOD *X509_LOOKUP_hash_dir(void);
440 X509_LOOKUP_METHOD *X509_LOOKUP_file(void);

442 int X509_STORE_add_cert(X509_STORE *ctx, X509 *x);
443 int X509_STORE_add_crl(X509_STORE *ctx, X509_CRL *x);

445 int X509_STORE_get_by_subject(X509_STORE_CTX *vs, int type, X509_NAME *name,
446                              X509_OBJECT *ret);

448 int X509_LOOKUP_ctrl(X509_LOOKUP *ctx, int cmd, const char *argc,
449                     long argl, char **ret);

451 #ifndef OPENSSL_NO_STDIO
452 int X509_load_cert_file(X509_LOOKUP *ctx, const char *file, int type);
453 int X509_load_crl_file(X509_LOOKUP *ctx, const char *file, int type);
454 int X509_load_cert_crl_file(X509_LOOKUP *ctx, const char *file, int type);
455 #endif

```

```

458 X509_LOOKUP *X509_LOOKUP_new(X509_LOOKUP_METHOD *method);
459 void X509_LOOKUP_free(X509_LOOKUP *ctx);
460 int X509_LOOKUP_init(X509_LOOKUP *ctx);
461 int X509_LOOKUP_by_subject(X509_LOOKUP *ctx, int type, X509_NAME *name,
462                           X509_OBJECT *ret);
463 int X509_LOOKUP_by_issuer_serial(X509_LOOKUP *ctx, int type, X509_NAME *name,
464                                  ASN1_INTEGER *serial, X509_OBJECT *ret);
465 int X509_LOOKUP_by_fingerprint(X509_LOOKUP *ctx, int type,
466                                unsigned char *bytes, int len, X509_OBJECT *ret);
467 int X509_LOOKUP_by_alias(X509_LOOKUP *ctx, int type, char *str,
468                          int len, X509_OBJECT *ret);
469 int X509_LOOKUP_shutdown(X509_LOOKUP *ctx);

471 #ifndef OPENSSL_NO_STDIO
472 int X509_STORE_load_locations(X509_STORE *ctx,
473                              const char *file, const char *dir);
474 int X509_STORE_set_default_paths(X509_STORE *ctx);
475 #endif

477 int X509_STORE_CTX_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_fu
478 CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func);
479 int X509_STORE_CTX_set_ex_data(X509_STORE_CTX *ctx, int idx, void *data);
480 void *X509_STORE_CTX_get_ex_data(X509_STORE_CTX *ctx, int idx);
481 int X509_STORE_CTX_get_error(X509_STORE_CTX *ctx);
482 void X509_STORE_CTX_set_error(X509_STORE_CTX *ctx, int s);
483 int X509_STORE_CTX_get_error_depth(X509_STORE_CTX *ctx);
484 X509 *X509_STORE_CTX_get_current_cert(X509_STORE_CTX *ctx);
485 X509 *X509_STORE_CTX_get0_current_issuer(X509_STORE_CTX *ctx);
486 X509_CRL *X509_STORE_CTX_get0_current_crl(X509_STORE_CTX *ctx);
487 X509_STORE_CTX *X509_STORE_CTX_get0_parent_ctx(X509_STORE_CTX *ctx);
488 STACK_OF(X509) *X509_STORE_CTX_get_chain(X509_STORE_CTX *ctx);
489 STACK_OF(X509) *X509_STORE_CTX_get1_chain(X509_STORE_CTX *ctx);
490 void X509_STORE_CTX_set_cert(X509_STORE_CTX *c, X509 *x);
491 void X509_STORE_CTX_set_chain(X509_STORE_CTX *c, STACK_OF(X509) *sk);
492 void X509_STORE_CTX_set0_crls(X509_STORE_CTX *c, STACK_OF(X509_CRL) *sk);
493 int X509_STORE_CTX_set_purpose(X509_STORE_CTX *ctx, int purpose);
494 int X509_STORE_CTX_set_trust(X509_STORE_CTX *ctx, int trust);
495 int X509_STORE_CTX_purpose_inherit(X509_STORE_CTX *ctx, int def_purpose,
496                                 int purpose, int trust);
497 void X509_STORE_CTX_set_flags(X509_STORE_CTX *ctx, unsigned long flags);
498 void X509_STORE_CTX_set_time(X509_STORE_CTX *ctx, unsigned long flags,
499                             time_t t);
500 void X509_STORE_CTX_set_verify_cb(X509_STORE_CTX *ctx,
501                                   int (*verify_cb)(int, X509_STORE_CTX *));
502
503 X509_POLICY_TREE *X509_STORE_CTX_get0_policy_tree(X509_STORE_CTX *ctx);
504 int X509_STORE_CTX_get_explicit_policy(X509_STORE_CTX *ctx);

506 X509_VERIFY_PARAM *X509_STORE_CTX_get0_param(X509_STORE_CTX *ctx);
507 void X509_STORE_CTX_set0_param(X509_STORE_CTX *ctx, X509_VERIFY_PARAM *param);
508 int X509_STORE_CTX_set_default(X509_STORE_CTX *ctx, const char *name);

510 /* X509_VERIFY_PARAM functions */

512 X509_VERIFY_PARAM *X509_VERIFY_PARAM_new(void);
513 void X509_VERIFY_PARAM_free(X509_VERIFY_PARAM *param);
514 int X509_VERIFY_PARAM_inherit(X509_VERIFY_PARAM *to,
515                               const X509_VERIFY_PARAM *from);
516 int X509_VERIFY_PARAM_set1(X509_VERIFY_PARAM *to,
517                             const X509_VERIFY_PARAM *from);
518 int X509_VERIFY_PARAM_set1_name(X509_VERIFY_PARAM *param, const char *name);
519 int X509_VERIFY_PARAM_set_flags(X509_VERIFY_PARAM *param, unsigned long flags);
520 int X509_VERIFY_PARAM_clear_flags(X509_VERIFY_PARAM *param,
521                                   unsigned long flags);
522 unsigned long X509_VERIFY_PARAM_get_flags(X509_VERIFY_PARAM *param);
523 int X509_VERIFY_PARAM_set_purpose(X509_VERIFY_PARAM *param, int purpose);

```

```
524 int X509_VERIFY_PARAM_set_trust(X509_VERIFY_PARAM *param, int trust);
525 void X509_VERIFY_PARAM_set_depth(X509_VERIFY_PARAM *param, int depth);
526 void X509_VERIFY_PARAM_set_time(X509_VERIFY_PARAM *param, time_t t);
527 int X509_VERIFY_PARAM_add0_policy(X509_VERIFY_PARAM *param,
528                                   ASN1_OBJECT *policy);
529 int X509_VERIFY_PARAM_set1_policies(X509_VERIFY_PARAM *param,
530                                     STACK_OF(ASN1_OBJECT) *policies);
531 int X509_VERIFY_PARAM_get_depth(const X509_VERIFY_PARAM *param);

533 int X509_VERIFY_PARAM_add0_table(X509_VERIFY_PARAM *param);
534 const X509_VERIFY_PARAM *X509_VERIFY_PARAM_lookup(const char *name);
535 void X509_VERIFY_PARAM_table_cleanup(void);

537 int X509_policy_check(X509_POLICY_TREE **ptree, int *pexplicit_policy,
538                      STACK_OF(X509) *certs,
539                      STACK_OF(ASN1_OBJECT) *policy_oids,
540                      unsigned int flags);

542 void X509_policy_tree_free(X509_POLICY_TREE *tree);

544 int X509_policy_tree_level_count(const X509_POLICY_TREE *tree);
545 X509_POLICY_LEVEL *
546     X509_policy_tree_get0_level(const X509_POLICY_TREE *tree, int i);

548 STACK_OF(X509_POLICY_NODE) *
549     X509_policy_tree_get0_policies(const X509_POLICY_TREE *tree);

551 STACK_OF(X509_POLICY_NODE) *
552     X509_policy_tree_get0_user_policies(const X509_POLICY_TREE *tree);

554 int X509_policy_level_node_count(X509_POLICY_LEVEL *level);

556 X509_POLICY_NODE *X509_policy_level_get0_node(X509_POLICY_LEVEL *level, int i);

558 const ASN1_OBJECT *X509_policy_node_get0_policy(const X509_POLICY_NODE *node);

560 STACK_OF(POLICYQUALINFO) *
561     X509_policy_node_get0_qualifiers(const X509_POLICY_NODE *node);
562 const X509_POLICY_NODE *
563     X509_policy_node_get0_parent(const X509_POLICY_NODE *node);

565 #ifdef __cplusplus
566 }
567 #endif
568 #endif
```

new/usr/src/lib/openssl/include/openssl/x509v3.h

1

```
*****
32713 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/openssl/x509v3.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* x509v3.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999-2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
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18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
23  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
24  *
25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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33  *
34  * 6. Redistributions of any form whatsoever must retain the following
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38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57 #ifndef HEADER_X509V3_H
58 #define HEADER_X509V3_H
59
61 #include <openssl/bio.h>
```

new/usr/src/lib/openssl/include/openssl/x509v3.h

2

```
62 #include <openssl/x509.h>
63 #include <openssl/conf.h>

65 #ifdef __cplusplus
66 extern "C" {
67 #endif

69 /* Forward reference */
70 struct v3_ext_method;
71 struct v3_ext_ctx;

73 /* Useful typedefs */

75 typedef void * (*X509V3_EXT_NEW)(void);
76 typedef void (*X509V3_EXT_FREE)(void *);
77 typedef void * (*X509V3_EXT_D2I)(void *, const unsigned char **, long);
78 typedef int (*X509V3_EXT_I2D)(void *, unsigned char **);
79 typedef STACK_OF(CONF_VALUE) *
80 (*X509V3_EXT_I2V)(const struct v3_ext_method *method, void *ext,
81 STACK_OF(CONF_VALUE) *extlist);
82 typedef void * (*X509V3_EXT_V2I)(const struct v3_ext_method *method,
83 struct v3_ext_ctx *ctx,
84 STACK_OF(CONF_VALUE) *values);
85 typedef char * (*X509V3_EXT_I2S)(const struct v3_ext_method *method, void *ext);
86 typedef void * (*X509V3_EXT_S2I)(const struct v3_ext_method *method,
87 struct v3_ext_ctx *ctx, const char *str);
88 typedef int (*X509V3_EXT_I2R)(const struct v3_ext_method *method, void *ext,
89 BIO *out, int indent);
90 typedef void * (*X509V3_EXT_R2I)(const struct v3_ext_method *method,
91 struct v3_ext_ctx *ctx, const char *str);

93 /* V3 extension structure */

95 struct v3_ext_method {
96 int ext_nid;
97 int ext_flags;
98 /* If this is set the following four fields are ignored */
99 ASN1_ITEM_EXP *it;
100 /* Old style ASN1 calls */
101 X509V3_EXT_NEW ext_new;
102 X509V3_EXT_FREE ext_free;
103 X509V3_EXT_D2I d2i;
104 X509V3_EXT_I2D i2d;

106 /* The following pair is used for string extensions */
107 X509V3_EXT_I2S i2s;
108 X509V3_EXT_S2I s2i;

110 /* The following pair is used for multi-valued extensions */
111 X509V3_EXT_I2V i2v;
112 X509V3_EXT_V2I v2i;

114 /* The following are used for raw extensions */
115 X509V3_EXT_I2R i2r;
116 X509V3_EXT_R2I r2i;

118 void *usr_data; /* Any extension specific data */
119 };

121 typedef struct X509V3_CONF_METHOD_st {
122 char * (*get_string)(void *db, char *section, char *value);
123 STACK_OF(CONF_VALUE) * (*get_section)(void *db, char *section);
124 void (*free_string)(void *db, char *string);
125 void (*free_section)(void *db, STACK_OF(CONF_VALUE) *section);
126 } X509V3_CONF_METHOD;
```

```

128 /* Context specific info */
129 struct v3_ext_ctx {
130 #define CTX_TEST 0x1
131 int flags;
132 X509 *issuer_cert;
133 X509 *subject_cert;
134 X509_REQ *subject_req;
135 X509_CRL *crl;
136 X509V3_CONF_METHOD *db_meth;
137 void *db;
138 /* Maybe more here */
139 };

141 typedef struct v3_ext_method X509V3_EXT_METHOD;

143 DECLARE_STACK_OF(X509V3_EXT_METHOD)

145 /* ext_flags values */
146 #define X509V3_EXT_DYNAMIC      0x1
147 #define X509V3_EXT_CTX_DEP     0x2
148 #define X509V3_EXT_MULTILINE   0x4

150 typedef BIT_STRING_BITNAME ENUMERATED_NAMES;

152 typedef struct BASIC_CONSTRAINTS_st {
153 int ca;
154 ASN1_INTEGER *pathlen;
155 } BASIC_CONSTRAINTS;

158 typedef struct PKEY_USAGE_PERIOD_st {
159 ASN1_GENERALIZEDTIME *notBefore;
160 ASN1_GENERALIZEDTIME *notAfter;
161 } PKEY_USAGE_PERIOD;

163 typedef struct otherName_st {
164 ASN1_OBJECT *type_id;
165 ASN1_TYPE *value;
166 } OTHERNAME;

168 typedef struct EDIPartyName_st {
169     ASN1_STRING *nameAssigner;
170     ASN1_STRING *partyName;
171 } EDIPARTYNAME;

173 typedef struct GENERAL_NAME_st {

175 #define GEN_OTHERNAME      0
176 #define GEN_EMAIL         1
177 #define GEN_DNS            2
178 #define GEN_X400          3
179 #define GEN_DIRNAME       4
180 #define GEN_EDIPARTY      5
181 #define GEN_URI           6
182 #define GEN_IPADD         7
183 #define GEN_RID           8

185 int type;
186 union {
187     char *ptr;
188     OTHERNAME *otherName; /* otherName */
189     ASN1_IA5STRING *rfc822Name;
190     ASN1_IA5STRING *dNSName;
191     ASN1_TYPE *x400Address;
192     X509_NAME *directoryName;
193     EDIPARTYNAME *ediPartyName;

```

```

194     ASN1_IA5STRING *uniformResourceIdentifier;
195     ASN1_OCTET_STRING *iPAddress;
196     ASN1_OBJECT *registeredID;

198     /* Old names */
199     ASN1_OCTET_STRING *ip; /* iPAddress */
200     X509_NAME *dirn; /* dirn */
201     ASN1_IA5STRING *ia5; /* rfc822Name, dNSName, uniformResourceIdentifier */
202     ASN1_OBJECT *rid; /* registeredID */
203     ASN1_TYPE *other; /* x400Address */
204 } d;
205 } GENERAL_NAME;

207 typedef STACK_OF(GENERAL_NAME) GENERAL_NAMES;

209 typedef struct ACCESS_DESCRIPTION_st {
210     ASN1_OBJECT *method;
211     GENERAL_NAME *location;
212 } ACCESS_DESCRIPTION;

214 typedef STACK_OF(ACCESS_DESCRIPTION) AUTHORITY_INFO_ACCESS;

216 typedef STACK_OF(ASN1_OBJECT) EXTENDED_KEY_USAGE;

218 DECLARE_STACK_OF(GENERAL_NAME)
219 DECLARE_ASN1_SET_OF(GENERAL_NAME)

221 DECLARE_STACK_OF(ACCESS_DESCRIPTION)
222 DECLARE_ASN1_SET_OF(ACCESS_DESCRIPTION)

224 typedef struct DIST_POINT_NAME_st {
225 int type;
226 union {
227     GENERAL_NAMES *fullname;
228     STACK_OF(X509_NAME_ENTRY) *relativename;
229 } name;
230 /* If relativename then this contains the full distribution point name */
231 X509_NAME *dpname;
232 } DIST_POINT_NAME;
233 /* All existing reasons */
234 #define CRLDP_ALL_REASONS      0x807f

236 #define CRL_REASON_NONE              -1
237 #define CRL_REASON_UNSPECIFIED       0
238 #define CRL_REASON_KEY_COMPROMISE   1
239 #define CRL_REASON_CA_COMPROMISE    2
240 #define CRL_REASON_AFFILIATION_CHANGED 3
241 #define CRL_REASON_SUPERSEDED       4
242 #define CRL_REASON_CESSATION_OF_OPERATION 5
243 #define CRL_REASON_CERTIFICATE_HOLD 6
244 #define CRL_REASON_REMOVE_FROM_CRL  8
245 #define CRL_REASON_PRIVILEGE_WITHDRAWN 9
246 #define CRL_REASON_AA_COMPROMISE    10

248 struct DIST_POINT_st {
249     DIST_POINT_NAME *distpoint;
250     ASN1_BIT_STRING *reasons;
251     GENERAL_NAMES *CRLissuer;
252     int dp_reasons;
253 };

255 typedef STACK_OF(DIST_POINT) CRL_DIST_POINTS;

257 DECLARE_STACK_OF(DIST_POINT)
258 DECLARE_ASN1_SET_OF(DIST_POINT)

```

```

260 struct AUTHORITY_KEYID_st {
261     ASN1_OCTET_STRING *keyid;
262     GENERAL_NAMES *issuer;
263     ASN1_INTEGER *serial;
264 };

266 /* Strong extranet structures */

268 typedef struct SXNET_ID_st {
269     ASN1_INTEGER *zone;
270     ASN1_OCTET_STRING *user;
271 } SXNETID;

273 DECLARE_STACK_OF(SXNETID)
274 DECLARE_ASN1_SET_OF(SXNETID)

276 typedef struct SXNET_st {
277     ASN1_INTEGER *version;
278     STACK_OF(SXNETID) *ids;
279 } SXNET;

281 typedef struct NOTICEREF_st {
282     ASN1_STRING *organization;
283     STACK_OF(ASN1_INTEGER) *noticenos;
284 } NOTICEREF;

286 typedef struct USERNOTICE_st {
287     NOTICEREF *noticeref;
288     ASN1_STRING *exptext;
289 } USERNOTICE;

291 typedef struct POLICYQUALINFO_st {
292     ASN1_OBJECT *pqualid;
293     union {
294         ASN1_IA5STRING *cpsuri;
295         USERNOTICE *usertnotice;
296         ASN1_TYPE *other;
297     } d;
298 } POLICYQUALINFO;

300 DECLARE_STACK_OF(POLICYQUALINFO)
301 DECLARE_ASN1_SET_OF(POLICYQUALINFO)

303 typedef struct POLICYINFO_st {
304     ASN1_OBJECT *policyid;
305     STACK_OF(POLICYQUALINFO) *qualifiers;
306 } POLICYINFO;

308 typedef STACK_OF(POLICYINFO) CERTIFICATEPOLICIES;

310 DECLARE_STACK_OF(POLICYINFO)
311 DECLARE_ASN1_SET_OF(POLICYINFO)

313 typedef struct POLICY_MAPPING_st {
314     ASN1_OBJECT *issuerDomainPolicy;
315     ASN1_OBJECT *subjectDomainPolicy;
316 } POLICY_MAPPING;

318 DECLARE_STACK_OF(POLICY_MAPPING)

320 typedef STACK_OF(POLICY_MAPPING) POLICY_MAPPINGS;

322 typedef struct GENERAL_SUBTREE_st {
323     GENERAL_NAME *base;
324     ASN1_INTEGER *minimum;
325     ASN1_INTEGER *maximum;

```

```

326 } GENERAL_SUBTREE;

328 DECLARE_STACK_OF(GENERAL_SUBTREE)

330 struct NAME_CONSTRAINTS_st {
331     STACK_OF(GENERAL_SUBTREE) *permittedSubtrees;
332     STACK_OF(GENERAL_SUBTREE) *excludedSubtrees;
333 };

335 typedef struct POLICY_CONSTRAINTS_st {
336     ASN1_INTEGER *requireExplicitPolicy;
337     ASN1_INTEGER *inhibitPolicyMapping;
338 } POLICY_CONSTRAINTS;

340 /* Proxy certificate structures, see RFC 3820 */
341 typedef struct PROXY_POLICY_st
342 {
343     ASN1_OBJECT *policyLanguage;
344     ASN1_OCTET_STRING *policy;
345 } PROXY_POLICY;

347 typedef struct PROXY_CERT_INFO_EXTENSION_st
348 {
349     ASN1_INTEGER *pcPathLengthConstraint;
350     PROXY_POLICY *proxyPolicy;
351 } PROXY_CERT_INFO_EXTENSION;

353 DECLARE_ASN1_FUNCTIONS(PROXY_POLICY)
354 DECLARE_ASN1_FUNCTIONS(PROXY_CERT_INFO_EXTENSION)

356 struct ISSUING_DIST_POINT_st
357 {
358     DIST_POINT_NAME *distpoint;
359     int onlyuser;
360     int onlyCA;
361     ASN1_BIT_STRING *onlysomereasons;
362     int indirectCRL;
363     int onlyattr;
364 };

366 /* Values in idp.flags field */
367 /* IDP present */
368 #define IDP_PRESENT 0x1
369 /* IDP values inconsistent */
370 #define IDP_INVALID 0x2
371 /* onlyuser true */
372 #define IDP_ONLYUSER 0x4
373 /* onlyCA true */
374 #define IDP_ONLYCA 0x8
375 /* onlyattr true */
376 #define IDP_ONLYATTR 0x10
377 /* indirectCRL true */
378 #define IDP_INDIRECT 0x20
379 /* onlysomereasons present */
380 #define IDP_REASONS 0x40

382 #define X509V3_conf_err(val) ERR_add_error_data(6, "section:", val->section, \
383     ",name:", val->name, ",value:", val->value);

385 #define X509V3_set_ctx_test(ctx) \
386     X509V3_set_ctx(ctx, NULL, NULL, NULL, NULL, CTX_TEST)
387 #define X509V3_set_ctx_nodb(ctx) (ctx)->db = NULL;

389 #define EXT_BITSTRING(nid, table) { nid, 0, ASN1_ITEM_ref(ASN1_BIT_STRING), \
390     0,0,0,0, \
391     0,0, \

```



```

392         (X509V3_EXT_I2V)i2v_ASN1_BIT_STRING, \
393         (X509V3_EXT_V2I)v2i_ASN1_BIT_STRING, \
394         NULL, NULL, \
395         table}

397 #define EXT_IA5STRING(nid) { nid, 0, ASN1_ITEM_ref(ASN1_IA5STRING), \
398     0,0,0,0, \
399     (X509V3_EXT_I2S)i2s_ASN1_IA5STRING, \
400     (X509V3_EXT_S2I)s2i_ASN1_IA5STRING, \
401     0,0,0,0, \
402     NULL}

404 #define EXT_END { -1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0 }

407 /* X509_PURPOSE stuff */

409 #define EXFLAG_BCONS          0x1
410 #define EXFLAG_KUSAGE        0x2
411 #define EXFLAG_XKUSAGE       0x4
412 #define EXFLAG_NSCERT        0x8

414 #define EXFLAG_CA             0x10
415 /* Really self issued not necessarily self signed */
416 #define EXFLAG_SI             0x20
417 #define EXFLAG_SS             0x20
418 #define EXFLAG_V1            0x40
419 #define EXFLAG_INVALID       0x80
420 #define EXFLAG_SET           0x100
421 #define EXFLAG_CRITICAL      0x200
422 #define EXFLAG_PROXY         0x400

424 #define EXFLAG_INVALID_POLICY 0x800
425 #define EXFLAG_FRESHEST      0x1000

427 #define KU_DIGITAL_SIGNATURE 0x0080
428 #define KU_NON_REPUDIATION   0x0040
429 #define KU_KEY_ENCIPHERMENT 0x0020
430 #define KU_DATA_ENCIPHERMENT 0x0010
431 #define KU_KEY_AGREEMENT     0x0008
432 #define KU_KEY_CERT_SIGN     0x0004
433 #define KU_CRL_SIGN          0x0002
434 #define KU_ENCIPHER_ONLY     0x0001
435 #define KU_DECIPHER_ONLY     0x8000

437 #define NS_SSL_CLIENT         0x80
438 #define NS_SSL_SERVER         0x40
439 #define NS_SMIME              0x20
440 #define NS_OBJSIGN           0x10
441 #define NS_SSL_CA             0x04
442 #define NS_SMIME_CA           0x02
443 #define NS_OBJSIGN_CA         0x01
444 #define NS_ANY_CA             (NS_SSL_CA|NS_SMIME_CA|NS_OBJSIGN_CA)

446 #define XKU_SSL_SERVER        0x1
447 #define XKU_SSL_CLIENT        0x2
448 #define XKU_SMIME             0x4
449 #define XKU_CODE_SIGN         0x8
450 #define XKU_SGC               0x10
451 #define XKU_OCSP_SIGN         0x20
452 #define XKU_TIMESTAMP         0x40
453 #define XKU_DVCS              0x80

455 #define X509_PURPOSE_DYNAMIC  0x1
456 #define X509_PURPOSE_DYNAMIC_NAME 0x2

```

```

458 typedef struct x509_purpose_st {
459     int purpose;
460     int trust; /* Default trust ID */
461     int flags;
462     int (*check_purpose)(const struct x509_purpose_st *,
463         const X509 *, int);
464     char *name;
465     char *sname;
466     void *usr_data;
467 } X509_PURPOSE;

469 #define X509_PURPOSE_SSL_CLIENT 1
470 #define X509_PURPOSE_SSL_SERVER 2
471 #define X509_PURPOSE_NS_SSL_SERVER 3
472 #define X509_PURPOSE_SMIME_SIGN 4
473 #define X509_PURPOSE_SMIME_ENCRYPT 5
474 #define X509_PURPOSE_CRL_SIGN 6
475 #define X509_PURPOSE_ANY 7
476 #define X509_PURPOSE_OCSP_HELPER 8
477 #define X509_PURPOSE_TIMESTAMP_SIGN 9

479 #define X509_PURPOSE_MIN 1
480 #define X509_PURPOSE_MAX 9

482 /* Flags for X509V3_EXT_print() */

484 #define X509V3_EXT_UNKNOWN_MASK (0xfL << 16)
485 /* Return error for unknown extensions */
486 #define X509V3_EXT_DEFAULT 0
487 /* Print error for unknown extensions */
488 #define X509V3_EXT_ERROR_UNKNOWN (1L << 16)
489 /* ASN1 parse unknown extensions */
490 #define X509V3_EXT_PARSE_UNKNOWN (2L << 16)
491 /* BIO_dump unknown extensions */
492 #define X509V3_EXT_DUMP_UNKNOWN (3L << 16)

494 /* Flags for X509V3_add1_i2d */

496 #define X509V3_ADD_OP_MASK 0xfL
497 #define X509V3_ADD_DEFAULT 0L
498 #define X509V3_ADD_APPEND 1L
499 #define X509V3_ADD_REPLACE 2L
500 #define X509V3_ADD_REPLACE_EXISTING 3L
501 #define X509V3_ADD_KEEP_EXISTING 4L
502 #define X509V3_ADD_DELETE 5L
503 #define X509V3_ADD_SILENT 0x10

505 DECLARE_STACK_OF(X509_PURPOSE)

507 DECLARE_ASN1_FUNCTIONS(BASIC_CONSTRAINTS)

509 DECLARE_ASN1_FUNCTIONS(SXNET)
510 DECLARE_ASN1_FUNCTIONS(SXNETID)

512 int SXNET_add_id_asc(SXNET **psx, char *zone, char *user, int userlen);
513 int SXNET_add_id_ulong(SXNET **psx, unsigned long lzone, char *user, int userlen)
514 int SXNET_add_id_INTEGER(SXNET **psx, ASN1_INTEGER *izone, char *user, int userlen)

516 ASN1_OCTET_STRING *SXNET_get_id_asc(SXNET *sx, char *zone);
517 ASN1_OCTET_STRING *SXNET_get_id_ulong(SXNET *sx, unsigned long lzone);
518 ASN1_OCTET_STRING *SXNET_get_id_INTEGER(SXNET *sx, ASN1_INTEGER *zone);

520 DECLARE_ASN1_FUNCTIONS(AUTHORITY_KEYID)

522 DECLARE_ASN1_FUNCTIONS(PKEY_USAGE_PERIOD)

```

```

524 DECLARE_ASN1_FUNCTIONS(GENERAL_NAME)
525 GENERAL_NAME *GENERAL_NAME_dup(GENERAL_NAME *a);
526 int GENERAL_NAME_cmp(GENERAL_NAME *a, GENERAL_NAME *b);

530 ASN1_BIT_STRING *v2i_ASN1_BIT_STRING(X509V3_EXT_METHOD *method,
531                                       X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval);
532 STACK_OF(CONF_VALUE) *i2v_ASN1_BIT_STRING(X509V3_EXT_METHOD *method,
533                                             ASN1_BIT_STRING *bits,
534                                             STACK_OF(CONF_VALUE) *extlist);

536 STACK_OF(CONF_VALUE) *i2v_GENERAL_NAME(X509V3_EXT_METHOD *method, GENERAL_NAME *
537 int GENERAL_NAME_print(BIO *out, GENERAL_NAME *gen);

539 DECLARE_ASN1_FUNCTIONS(GENERAL_NAMES)

541 STACK_OF(CONF_VALUE) *i2v_GENERAL_NAMES(X509V3_EXT_METHOD *method,
542                                           GENERAL_NAMES *gen, STACK_OF(CONF_VALUE) *extlist);
543 GENERAL_NAMES *v2i_GENERAL_NAMES(const X509V3_EXT_METHOD *method,
544                                   X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval);

546 DECLARE_ASN1_FUNCTIONS(OTHERNAME)
547 DECLARE_ASN1_FUNCTIONS(EDIPARTYNAME)
548 int OTHERNAME_cmp(OTHERNAME *a, OTHERNAME *b);
549 void GENERAL_NAME_set0_value(GENERAL_NAME *a, int type, void *value);
550 void *GENERAL_NAME_get0_value(GENERAL_NAME *a, int *ptype);
551 int GENERAL_NAME_set0_othername(GENERAL_NAME *gen,
552                                 ASN1_OBJECT *oid, ASN1_TYPE *value);
553 int GENERAL_NAME_get0_otherName(GENERAL_NAME *gen,
554                                 ASN1_OBJECT **poid, ASN1_TYPE **pvalue);

556 char *i2s_ASN1_OCTET_STRING(X509V3_EXT_METHOD *method, ASN1_OCTET_STRING *ia5);
557 ASN1_OCTET_STRING *s2i_ASN1_OCTET_STRING(X509V3_EXT_METHOD *method, X509V3_CTX *

559 DECLARE_ASN1_FUNCTIONS(EXTENDED_KEY_USAGE)
560 int i2a_ACCESS_DESCRIPTION(BIO *bp, ACCESS_DESCRIPTION *a);

562 DECLARE_ASN1_FUNCTIONS(CERTIFICATEPOLICIES)
563 DECLARE_ASN1_FUNCTIONS(POLICYINFO)
564 DECLARE_ASN1_FUNCTIONS(POLICYQUALINFO)
565 DECLARE_ASN1_FUNCTIONS(USERNOTICE)
566 DECLARE_ASN1_FUNCTIONS(NOTICEREF)

568 DECLARE_ASN1_FUNCTIONS(CRL_DIST_POINTS)
569 DECLARE_ASN1_FUNCTIONS(DIST_POINT)
570 DECLARE_ASN1_FUNCTIONS(DIST_POINT_NAME)
571 DECLARE_ASN1_FUNCTIONS(ISSUING_DIST_POINT)

573 int DIST_POINT_set_dpname(DIST_POINT_NAME *dpn, X509_NAME *iname);

575 int NAME_CONSTRAINTS_check(X509 *x, NAME_CONSTRAINTS *nc);

577 DECLARE_ASN1_FUNCTIONS(ACCESS_DESCRIPTION)
578 DECLARE_ASN1_FUNCTIONS(AUTHORITY_INFO_ACCESS)

580 DECLARE_ASN1_ITEM(POLICY_MAPPING)
581 DECLARE_ASN1_ALLOC_FUNCTIONS(POLICY_MAPPING)
582 DECLARE_ASN1_ITEM(POLICY_MAPPINGS)

584 DECLARE_ASN1_ITEM(GENERAL_SUBTREE)
585 DECLARE_ASN1_ALLOC_FUNCTIONS(GENERAL_SUBTREE)

587 DECLARE_ASN1_ITEM(NAME_CONSTRAINTS)
588 DECLARE_ASN1_ALLOC_FUNCTIONS(NAME_CONSTRAINTS)

```

```

590 DECLARE_ASN1_ALLOC_FUNCTIONS(POLICY_CONSTRAINTS)
591 DECLARE_ASN1_ITEM(POLICY_CONSTRAINTS)

593 GENERAL_NAME *a2i_GENERAL_NAME(GENERAL_NAME *out,
594                                 const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
595                                 int gen_type, char *value, int is_nc);

597 #ifdef HEADER_CONF_H
598 GENERAL_NAME *v2i_GENERAL_NAME(const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
599                                 CONF_VALUE *cnf);
600 GENERAL_NAME *v2i_GENERAL_NAME_ex(GENERAL_NAME *out,
601                                    const X509V3_EXT_METHOD *method,
602                                    X509V3_CTX *ctx, CONF_VALUE *cnf, int is_nc);
603 void X509V3_conf_free(CONF_VALUE *val);

605 X509_EXTENSION *X509V3_EXT_nconf_nid(CONF *conf, X509V3_CTX *ctx, int ext_nid, c
606 X509_EXTENSION *X509V3_EXT_nconf(CONF *conf, X509V3_CTX *ctx, char *name, char *
607 int X509V3_EXT_add_nconf_sk(CONF *conf, X509V3_CTX *ctx, char *section, STACK_OF
608 int X509V3_EXT_add_nconf(CONF *conf, X509V3_CTX *ctx, char *section, X509 *cert)
609 int X509V3_EXT_REQ_add_nconf(CONF *conf, X509V3_CTX *ctx, char *section, X509_RE
610 int X509V3_EXT_CRL_add_nconf(CONF *conf, X509V3_CTX *ctx, char *section, X509_CR

612 X509_EXTENSION *X509V3_EXT_conf_nid(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
613                                       int ext_nid, char *value);
614 X509_EXTENSION *X509V3_EXT_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
615                                 char *name, char *value);
616 int X509V3_EXT_add_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
617                          char *section, X509 *cert);
618 int X509V3_EXT_REQ_add_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
619                             char *section, X509_REQ *req);
620 int X509V3_EXT_CRL_add_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
621                             char *section, X509_CRL *crl);

623 int X509V3_add_value_bool_nf(char *name, int asn1_bool,
624                              STACK_OF(CONF_VALUE) **extlist);
625 int X509V3_get_value_bool(CONF_VALUE *value, int *asn1_bool);
626 int X509V3_get_value_int(CONF_VALUE *value, ASN1_INTEGER **aint);
627 void X509V3_set_nconf(X509V3_CTX *ctx, CONF *conf);
628 void X509V3_set_conf_lhash(X509V3_CTX *ctx, LHASH_OF(CONF_VALUE) *lhash);
629 #endif

631 char * X509V3_get_string(X509V3_CTX *ctx, char *name, char *section);
632 STACK_OF(CONF_VALUE) * X509V3_get_section(X509V3_CTX *ctx, char *section);
633 void X509V3_string_free(X509V3_CTX *ctx, char *str);
634 void X509V3_section_free(X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *section);
635 void X509V3_set_ctx(X509V3_CTX *ctx, X509 *issuer, X509 *subject,
636                    X509_REQ *req, X509_CRL *crl, int flags);

638 int X509V3_add_value(const char *name, const char *value,
639                      STACK_OF(CONF_VALUE) **extlist);
640 int X509V3_add_value_uchar(const char *name, const unsigned char *value,
641                             STACK_OF(CONF_VALUE) **extlist);
642 int X509V3_add_value_bool(const char *name, int asn1_bool,
643                            STACK_OF(CONF_VALUE) **extlist);
644 int X509V3_add_value_int(const char *name, ASN1_INTEGER *aint,
645                           STACK_OF(CONF_VALUE) **extlist);
646 char * i2s_ASN1_INTEGER(X509V3_EXT_METHOD *meth, ASN1_INTEGER *aint);
647 ASN1_INTEGER * s2i_ASN1_INTEGER(X509V3_EXT_METHOD *meth, char *value);
648 char * i2s_ASN1_ENUMERATED(X509V3_EXT_METHOD *meth, ASN1_ENUMERATED *aint);
649 char * i2s_ASN1_ENUMERATED_TABLE(X509V3_EXT_METHOD *meth, ASN1_ENUMERATED *aint)
650 int X509V3_EXT_add(X509V3_EXT_METHOD *ext);
651 int X509V3_EXT_add_list(X509V3_EXT_METHOD *extlist);
652 int X509V3_EXT_add_alias(int nid_to, int nid_from);
653 void X509V3_EXT_cleanup(void);

655 const X509V3_EXT_METHOD *X509V3_EXT_get(X509_EXTENSION *ext);

```

```

656 const X509V3_EXT_METHOD *X509V3_EXT_get_nid(int nid);
657 int X509V3_add_standard_extensions(void);
658 STACK_OF(CONF_VALUE) *X509V3_parse_list(const char *line);
659 void *X509V3_EXT_d2i(X509_EXTENSION *ext);
660 void *X509V3_get_d2i(STACK_OF(X509_EXTENSION) *x, int nid, int *crit, int *idx);

663 X509_EXTENSION *X509V3_EXT_i2d(int ext_nid, int crit, void *ext_struct);
664 int X509V3_add1_i2d(STACK_OF(X509_EXTENSION) **x, int nid, void *value, int crit);

666 char *hex_to_string(const unsigned char *buffer, long len);
667 unsigned char *string_to_hex(const char *str, long *len);
668 int name_cmp(const char *name, const char *cmp);

670 void X509V3_EXT_val_prn(BIO *out, STACK_OF(CONF_VALUE) *val, int indent,
671                        int ml);
672 int X509V3_EXT_print(BIO *out, X509_EXTENSION *ext, unsigned long flag, int indent);
673 int X509V3_EXT_print_fp(FILE *out, X509_EXTENSION *ext, int flag, int indent);

675 int X509V3_extensions_print(BIO *out, char *title, STACK_OF(X509_EXTENSION) *ext);

677 int X509_check_ca(X509 *x);
678 int X509_check_purpose(X509 *x, int id, int ca);
679 int X509_supported_extension(X509_EXTENSION *ex);
680 int X509_PURPOSE_set(int *p, int purpose);
681 int X509_check_issued(X509 *issuer, X509 *subject);
682 int X509_check_aki(X509 *issuer, AUTHORITY_KEYID *akid);
683 int X509_PURPOSE_get_count(void);
684 X509_PURPOSE *X509_PURPOSE_get0(int idx);
685 int X509_PURPOSE_get_by_sname(char *sname);
686 int X509_PURPOSE_get_by_id(int id);
687 int X509_PURPOSE_add(int id, int trust, int flags,
688                     int (*ck)(const X509_PURPOSE *, const X509 *, int),
689                     char *name, char *sname, void *arg);
690 char *X509_PURPOSE_get0_name(X509_PURPOSE *xp);
691 char *X509_PURPOSE_get0_sname(X509_PURPOSE *xp);
692 int X509_PURPOSE_get_trust(X509_PURPOSE *xp);
693 void X509_PURPOSE_cleanup(void);
694 int X509_PURPOSE_get_id(X509_PURPOSE *);

696 STACK_OF(OPENSAL_STRING) *X509_get1_email(X509 *x);
697 STACK_OF(OPENSAL_STRING) *X509_REQ_get1_email(X509_REQ *x);
698 void X509_email_free(STACK_OF(OPENSAL_STRING) *sk);
699 STACK_OF(OPENSAL_STRING) *X509_get1_ocsp(X509 *x);

701 ASN1_OCTET_STRING *a2i_IPADDRESS(const char *ipasc);
702 ASN1_OCTET_STRING *a2i_IPADDRESS_NC(const char *ipasc);
703 int a2i_ipadd(unsigned char *ipout, const char *ipasc);
704 int X509V3_NAME_from_section(X509_NAME *nm, STACK_OF(CONF_VALUE)*dn_sk,
705                             unsigned long ctype);

707 void X509_POLICY_NODE_print(BIO *out, X509_POLICY_NODE *node, int indent);
708 DECLARE_STACK_OF(X509_POLICY_NODE)

710 #ifndef OPENSAL_NO_RFC3779

712 typedef struct ASRange_st {
713     ASN1_INTEGER *min, *max;
714 } ASRange;

716 #define ASIdOrRange_id 0
717 #define ASIdOrRange_range 1

719 typedef struct ASIdOrRange_st {
720     int type;
721     union {

```

```

722     ASN1_INTEGER *id;
723     ASRange *range;
724 } u;
725 } ASIdOrRange;

727 typedef STACK_OF(ASIdOrRange) ASIdOrRanges;
728 DECLARE_STACK_OF(ASIdOrRange)

730 #define ASIdentifierChoice_inherit 0
731 #define ASIdentifierChoice_asIdsOrRanges 1

733 typedef struct ASIdentifierChoice_st {
734     int type;
735     union {
736         ASN1_NULL *inherit;
737         ASIdOrRanges *asIdsOrRanges;
738     } u;
739 } ASIdentifierChoice;

741 typedef struct ASIdentifiers_st {
742     ASIdentifierChoice *asnum, *rdi;
743 } ASIdentifiers;

745 DECLARE_AS1_FUNCTIONS(ASRange)
746 DECLARE_AS1_FUNCTIONS(ASIdOrRange)
747 DECLARE_AS1_FUNCTIONS(ASIdentifierChoice)
748 DECLARE_AS1_FUNCTIONS(ASIdentifiers)

751 typedef struct IPAddressRange_st {
752     ASN1_BIT_STRING *min, *max;
753 } IPAddressRange;

755 #define IPAddressOrRange_addressPrefix 0
756 #define IPAddressOrRange_addressRange 1

758 typedef struct IPAddressOrRange_st {
759     int type;
760     union {
761         ASN1_BIT_STRING *addressPrefix;
762         IPAddressRange *addressRange;
763     } u;
764 } IPAddressOrRange;

766 typedef STACK_OF(IPAddressOrRange) IPAddressOrRanges;
767 DECLARE_STACK_OF(IPAddressOrRange)

769 #define IPAddressChoice_inherit 0
770 #define IPAddressChoice_addressesOrRanges 1

772 typedef struct IPAddressChoice_st {
773     int type;
774     union {
775         ASN1_NULL *inherit;
776         IPAddressOrRanges *addressesOrRanges;
777     } u;
778 } IPAddressChoice;

780 typedef struct IPAddressFamily_st {
781     ASN1_OCTET_STRING *addressFamily;
782     IPAddressChoice *ipAddressChoice;
783 } IPAddressFamily;

785 typedef STACK_OF(IPAddressFamily) IPAddrBlocks;
786 DECLARE_STACK_OF(IPAddressFamily)

```

```

788 DECLARE_ASN1_FUNCTIONS(IPAddressRange)
789 DECLARE_ASN1_FUNCTIONS(IPAddressOrRange)
790 DECLARE_ASN1_FUNCTIONS(IPAddressChoice)
791 DECLARE_ASN1_FUNCTIONS(IPAddressFamily)

793 /*
794  * API tag for elements of the ASIdentifier SEQUENCE.
795  */
796 #define V3_ASID_ASNUM    0
797 #define V3_ASID_RDI      1

799 /*
800  * AFI values, assigned by IANA. It'd be nice to make the AFI
801  * handling code totally generic, but there are too many little things
802  * that would need to be defined for other address families for it to
803  * be worth the trouble.
804  */
805 #define IANA_AFI_IPV4    1
806 #define IANA_AFI_IPV6    2

808 /*
809  * Utilities to construct and extract values from RFC3779 extensions,
810  * since some of the encodings (particularly for IP address prefixes
811  * and ranges) are a bit tedious to work with directly.
812  */
813 int v3_asid_add_inherit(ASIdentifiers *asid, int which);
814 int v3_asid_add_id_or_range(ASIdentifiers *asid, int which,
815                             ASN1_INTEGER *min, ASN1_INTEGER *max);
816 int v3_addr_add_inherit(IPAddrBlocks *addr,
817                         const unsigned afi, const unsigned *safi);
818 int v3_addr_add_prefix(IPAddrBlocks *addr,
819                        const unsigned afi, const unsigned *safi,
820                        unsigned char *a, const int prefixlen);
821 int v3_addr_add_range(IPAddrBlocks *addr,
822                       const unsigned afi, const unsigned *safi,
823                       unsigned char *min, unsigned char *max);
824 unsigned v3_addr_get_afi(const IPAddressFamily *f);
825 int v3_addr_get_range(IPAddressOrRange *aor, const unsigned afi,
826                      unsigned char *min, unsigned char *max,
827                      const int length);

829 /*
830  * Canonical forms.
831  */
832 int v3_asid_is_canonical(ASIdentifiers *asid);
833 int v3_addr_is_canonical(IPAddrBlocks *addr);
834 int v3_asid_canonize(ASIdentifiers *asid);
835 int v3_addr_canonize(IPAddrBlocks *addr);

837 /*
838  * Tests for inheritance and containment.
839  */
840 int v3_asid_inherits(ASIdentifiers *asid);
841 int v3_addr_inherits(IPAddrBlocks *addr);
842 int v3_asid_subset(ASIdentifiers *a, ASIdentifiers *b);
843 int v3_addr_subset(IPAddrBlocks *a, IPAddrBlocks *b);

845 /*
846  * Check whether RFC 3779 extensions nest properly in chains.
847  */
848 int v3_asid_validate_path(X509_STORE_CTX *);
849 int v3_addr_validate_path(X509_STORE_CTX *);
850 int v3_asid_validate_resource_set(STACK_OF(X509) *chain,
851                                  ASIdentifiers *ext,
852                                  int allow_inheritance);
853 int v3_addr_validate_resource_set(STACK_OF(X509) *chain,

```

```

854 IPAddrBlocks *ext,
855 int allow_inheritance);

857 #endif /* OPENSSSL_NO_RFC3779 */

859 /* BEGIN ERROR CODES */
860 /* The following lines are auto generated by the script mkerr.pl. Any changes
861  * made after this point may be overwritten when the script is next run.
862  */
863 void ERR_load_X509V3_strings(void);

865 /* Error codes for the X509V3 functions. */

867 /* Function codes. */
868 #define X509V3_F_A2I_GENERAL_NAME 164
869 #define X509V3_F_ASIDENTIFIERCHOICE_CANONIZE 161
870 #define X509V3_F_ASIDENTIFIERCHOICE_IS_CANONICAL 162
871 #define X509V3_F_COPY_EMAIL 122
872 #define X509V3_F_COPY_ISSUER 123
873 #define X509V3_F_DO_DIRNAME 144
874 #define X509V3_F_DO_EXT_CONF 124
875 #define X509V3_F_DO_EXT_I2D 135
876 #define X509V3_F_DO_EXT_NCONF 151
877 #define X509V3_F_DO_I2V_NAME_CONSTRAINTS 148
878 #define X509V3_F_GNAMES_FROM_SECTNAME 156
879 #define X509V3_F_HEX_TO_STRING 111
880 #define X509V3_F_I2S_ASN1_ENUMERATED 121
881 #define X509V3_F_I2S_ASN1_IA5STRING 149
882 #define X509V3_F_I2S_ASN1_INTEGER 120
883 #define X509V3_F_I2V_AUTHORITY_INFO_ACCESS 138
884 #define X509V3_F_NOTICE_SECTION 132
885 #define X509V3_F_NREF_NOS 133
886 #define X509V3_F_POLICY_SECTION 131
887 #define X509V3_F_PROCESS_PCI_VALUE 150
888 #define X509V3_F_R2I_CERTPOL 130
889 #define X509V3_F_R2I_PCI 155
890 #define X509V3_F_S2I_ASN1_IA5STRING 100
891 #define X509V3_F_S2I_ASN1_INTEGER 108
892 #define X509V3_F_S2I_ASN1_OCTET_STRING 112
893 #define X509V3_F_S2I_ASN1_SKEY_ID 114
894 #define X509V3_F_S2I_SKEY_ID 115
895 #define X509V3_F_SET_DIST_POINT_NAME 158
896 #define X509V3_F_STRING_TO_HEX 113
897 #define X509V3_F_SXNET_ADD_ID_ASC 125
898 #define X509V3_F_SXNET_ADD_ID_INTEGER 126
899 #define X509V3_F_SXNET_ADD_ID_ULONG 127
900 #define X509V3_F_SXNET_GET_ID_ASC 128
901 #define X509V3_F_SXNET_GET_ID_ULONG 129
902 #define X509V3_F_V2I_ASIDENTIFIERS 163
903 #define X509V3_F_V2I_ASN1_BIT_STRING 101
904 #define X509V3_F_V2I_AUTHORITY_INFO_ACCESS 139
905 #define X509V3_F_V2I_AUTHORITY_KEYID 119
906 #define X509V3_F_V2I_BASIC_CONSTRAINTS 102
907 #define X509V3_F_V2I_CRLD 134
908 #define X509V3_F_V2I_EXTENDED_KEY_USAGE 103
909 #define X509V3_F_V2I_GENERAL_NAMES 118
910 #define X509V3_F_V2I_GENERAL_NAME_EX 117
911 #define X509V3_F_V2I_IDP 157
912 #define X509V3_F_V2I_IPADDRBLOCKS 159
913 #define X509V3_F_V2I_ISSUER_ALT 153
914 #define X509V3_F_V2I_NAME_CONSTRAINTS 147
915 #define X509V3_F_V2I_POLICY_CONSTRAINTS 146
916 #define X509V3_F_V2I_POLICY_MAPPINGS 145
917 #define X509V3_F_V2I_SUBJECT_ALT 154
918 #define X509V3_F_V3_ADDR_VALIDATE_PATH_INTERNAL 160
919 #define X509V3_F_V3_GENERIC_EXTENSION 116

```

```

920 #define X509V3_F_X509V3_ADD1_I2D      140
921 #define X509V3_F_X509V3_ADD_VALUE      105
922 #define X509V3_F_X509V3_EXT_ADD        104
923 #define X509V3_F_X509V3_EXT_ADD_ALIAS  106
924 #define X509V3_F_X509V3_EXT_CONF      107
925 #define X509V3_F_X509V3_EXT_I2D        136
926 #define X509V3_F_X509V3_EXT_NCONF      152
927 #define X509V3_F_X509V3_GET_SECTION    142
928 #define X509V3_F_X509V3_GET_STRING     143
929 #define X509V3_F_X509V3_GET_VALUE_BOOL  110
930 #define X509V3_F_X509V3_PARSE_LIST     109
931 #define X509V3_F_X509_PURPOSE_ADD      137
932 #define X509V3_F_X509_PURPOSE_SET      141

934 /* Reason codes. */
935 #define X509V3_R_BAD_IP_ADDRESS         118
936 #define X509V3_R_BAD_OBJECT             119
937 #define X509V3_R_BN_DEC2BN_ERROR        100
938 #define X509V3_R_BN_TO_ASN1_INTEGER_ERROR 101
939 #define X509V3_R_DIRNAME_ERROR          149
940 #define X509V3_R_DISTPOINT_ALREADY_SET  160
941 #define X509V3_R_DUPLICATE_ZONE_ID      133
942 #define X509V3_R_ERROR_CONVERTING_ZONE  131
943 #define X509V3_R_ERROR_CREATING_EXTENSION 144
944 #define X509V3_R_ERROR_IN_EXTENSION     128
945 #define X509V3_R_EXPECTED_A_SECTION_NAME 137
946 #define X509V3_R_EXTENSION_EXISTS       145
947 #define X509V3_R_EXTENSION_NAME_ERROR   115
948 #define X509V3_R_EXTENSION_NOT_FOUND    102
949 #define X509V3_R_EXTENSION_SETTING_NOT_SUPPORTED 103
950 #define X509V3_R_EXTENSION_VALUE_ERROR  116
951 #define X509V3_R_ILLEGAL_EMPTY_EXTENSION 151
952 #define X509V3_R_ILLEGAL_HEX_DIGIT      113
953 #define X509V3_R_INCORRECT_POLICY_SYNTAX_TAG 152
954 #define X509V3_R_INVALID_MULTIPLE_RDNS  161
955 #define X509V3_R_INVALID_ASNUMBER        162
956 #define X509V3_R_INVALID_ASRANGE        163
957 #define X509V3_R_INVALID_BOOLEAN_STRING  104
958 #define X509V3_R_INVALID_EXTENSION_STRING 105
959 #define X509V3_R_INVALID_INHERITANCE     165
960 #define X509V3_R_INVALID_IPADDRESS       166
961 #define X509V3_R_INVALID_NAME            106
962 #define X509V3_R_INVALID_NULL_ARGUMENT   107
963 #define X509V3_R_INVALID_NULL_NAME       108
964 #define X509V3_R_INVALID_NULL_VALUE      109
965 #define X509V3_R_INVALID_NUMBER          140
966 #define X509V3_R_INVALID_NUMBERS         141
967 #define X509V3_R_INVALID_OBJECT_IDENTIFIER 110
968 #define X509V3_R_INVALID_OPTION          138
969 #define X509V3_R_INVALID_POLICY_IDENTIFIER 134
970 #define X509V3_R_INVALID_PROXY_POLICY_SETTING 153
971 #define X509V3_R_INVALID_PURPOSE         146
972 #define X509V3_R_INVALID_SAFI            164
973 #define X509V3_R_INVALID_SECTION         135
974 #define X509V3_R_INVALID_SYNTAX          143
975 #define X509V3_R_ISSUER_DECODE_ERROR     126
976 #define X509V3_R_MISSING_VALUE           124
977 #define X509V3_R_NEED_ORGANIZATION_AND_NUMBERS 142
978 #define X509V3_R_NO_CONFIG_DATABASE      136
979 #define X509V3_R_NO_ISSUER_CERTIFICATE    121
980 #define X509V3_R_NO_ISSUER_DETAILS       127
981 #define X509V3_R_NO_POLICY_IDENTIFIER    139
982 #define X509V3_R_NO_PROXY_CERT_POLICY_LANGUAGE_DEFINED 154
983 #define X509V3_R_NO_PUBLIC_KEY           114
984 #define X509V3_R_NO_SUBJECT_DETAILS      125
985 #define X509V3_R_ODD_NUMBER_OF_DIGITS    112

```

```

986 #define X509V3_R_OPERATION_NOT_DEFINED  148
987 #define X509V3_R_OTHERNAME_ERROR        147
988 #define X509V3_R_POLICY_LANGUAGE_ALREADY_DEFINED 155
989 #define X509V3_R_POLICY_PATH_LENGTH     156
990 #define X509V3_R_POLICY_PATH_LENGTH_ALREADY_DEFINED 157
991 #define X509V3_R_POLICY_SYNTAX_NOT_CURRENTLY_SUPPORTED 158
992 #define X509V3_R_POLICY_WHEN_PROXY_LANGUAGE_REQUIRES_NO_POLICY 159
993 #define X509V3_R_SECTION_NOT_FOUND      150
994 #define X509V3_R_UNABLE_TO_GET_ISSUER_DETAILS 122
995 #define X509V3_R_UNABLE_TO_GET_ISSUER_KEYID 123
996 #define X509V3_R_UNKNOWN_BIT_STRING_ARGUMENT 111
997 #define X509V3_R_UNKNOWN_EXTENSION      129
998 #define X509V3_R_UNKNOWN_EXTENSION_NAME  130
999 #define X509V3_R_UNKNOWN_OPTION          120
1000 #define X509V3_R_UNSUPPORTED_OPTION      117
1001 #define X509V3_R_UNSUPPORTED_TYPE        167
1002 #define X509V3_R_USER_TOO_LONG           132

1004 #ifdef __cplusplus
1005 }
1006 #endif
1007 #endif

```

new/usr/src/lib/openssl/include/pcy_int.h

1

```
*****
7003 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/pcy_int.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pcy_int.h */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2004.
4  */
5 /* =====
6  * Copyright (c) 2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
16  * notice, this list of conditions and the following disclaimer in
17  * the documentation and/or other materials provided with the
18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
23  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
24  *
25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26  * endorse or promote products derived from this software without
27  * prior written permission. For written permission, please contact
28  * licensing@OpenSSL.org.
29  *
30  * 5. Products derived from this software may not be called "OpenSSL"
31  * nor may "OpenSSL" appear in their names without prior written
32  * permission of the OpenSSL Project.
33  *
34  * 6. Redistributions of any form whatsoever must retain the following
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36  * "This product includes software developed by the OpenSSL Project
37  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
```

```
60 typedef struct X509_POLICY_DATA_st X509_POLICY_DATA;
```

new/usr/src/lib/openssl/include/pcy_int.h

2

```
62 DECLARE_STACK_OF(X509_POLICY_DATA)

64 /* Internal structures */

66 /* This structure and the field names correspond to the Policy 'node' of
67  * RFC3280. NB this structure contains no pointers to parent or child
68  * data: X509_POLICY_NODE contains that. This means that the main policy data
69  * can be kept static and cached with the certificate.
70  */

72 struct X509_POLICY_DATA_st
73 {
74     unsigned int flags;
75     /* Policy OID and qualifiers for this data */
76     ASN1_OBJECT *valid_policy;
77     STACK_OF(POLICYQUALINFO) *qualifier_set;
78     STACK_OF(ASN1_OBJECT) *expected_policy_set;
79 };

81 /* X509_POLICY_DATA flags values */

83 /* This flag indicates the structure has been mapped using a policy mapping
84  * extension. If policy mapping is not active its references get deleted.
85  */

87 #define POLICY_DATA_FLAG_MAPPED 0x1

89 /* This flag indicates the data doesn't correspond to a policy in Certificate
90  * Policies: it has been mapped to any policy.
91  */

93 #define POLICY_DATA_FLAG_MAPPED_ANY 0x2

95 /* AND with flags to see if any mapping has occurred */

97 #define POLICY_DATA_FLAG_MAP_MASK 0x3

99 /* qualifiers are shared and shouldn't be freed */

101 #define POLICY_DATA_FLAG_SHARED_QUALIFIERS 0x4

103 /* Parent node is an extra node and should be freed */

105 #define POLICY_DATA_FLAG_EXTRA_NODE 0x8

107 /* Corresponding CertificatePolicies is critical */

109 #define POLICY_DATA_FLAG_CRITICAL 0x10

111 /* This structure is cached with a certificate */

113 struct X509_POLICY_CACHE_st {
114     /* anyPolicy data or NULL if no anyPolicy */
115     X509_POLICY_DATA *anyPolicy;
116     /* other policy data */
117     STACK_OF(X509_POLICY_DATA) *data;
118     /* If InhibitAnyPolicy present this is its value or -1 if absent. */
119     long any_skip;
120     /* If policyConstraints and requireExplicitPolicy present this is its
121      * value or -1 if absent.
122      */
123     long explicit_skip;
124     /* If policyConstraints and policyMapping present this is its
125      * value or -1 if absent.
126      */
127     long map_skip;
```

```

128     };
130  /*#define POLICY_CACHE_FLAG_CRITICAL      POLICY_DATA_FLAG_CRITICAL*/
132  /* This structure represents the relationship between nodes */
134  struct X509_POLICY_NODE_st
135  {
136      /* node data this refers to */
137      const X509_POLICY_DATA *data;
138      /* Parent node */
139      X509_POLICY_NODE *parent;
140      /* Number of child nodes */
141      int nchild;
142  };
144  struct X509_POLICY_LEVEL_st
145  {
146      /* Cert for this level */
147      X509 *cert;
148      /* nodes at this level */
149      STACK_OF(X509_POLICY_NODE) *nodes;
150      /* anyPolicy node */
151      X509_POLICY_NODE *anyPolicy;
152      /* Extra data */
153      /*STACK_OF(X509_POLICY_DATA) *extra_data;*/
154      unsigned int flags;
155  };
157  struct X509_POLICY_TREE_st
158  {
159      /* This is the tree 'level' data */
160      X509_POLICY_LEVEL *levels;
161      int nlevel;
162      /* Extra policy data when additional nodes (not from the certificate)
163       * are required.
164       */
165      STACK_OF(X509_POLICY_DATA) *extra_data;
166      /* This is the authority constained policy set */
167      STACK_OF(X509_POLICY_NODE) *auth_policies;
168      STACK_OF(X509_POLICY_NODE) *user_policies;
169      unsigned int flags;
170  };
172  /* Set if anyPolicy present in user policies */
173  #define POLICY_FLAG_ANY_POLICY      0x2
175  /* Useful macros */
177  #define node_data_critical(data) (data->flags & POLICY_DATA_FLAG_CRITICAL)
178  #define node_critical(node) node_data_critical(node->data)
180  /* Internal functions */
182  X509_POLICY_DATA *policy_data_new(POLICYINFO *policy, const ASN1_OBJECT *id,
183                                   int crit);
184  void policy_data_free(X509_POLICY_DATA *data);
186  X509_POLICY_DATA *policy_cache_find_data(const X509_POLICY_CACHE *cache,
187                                           const ASN1_OBJECT *id);
188  int policy_cache_set_mapping(X509 *x, POLICY_MAPPINGS *maps);
191  STACK_OF(X509_POLICY_NODE) *policy_node_cmp_new(void);
193  void policy_cache_init(void);

```

```

195  void policy_cache_free(X509_POLICY_CACHE *cache);
197  X509_POLICY_NODE *level_find_node(const X509_POLICY_LEVEL *level,
198                                   const X509_POLICY_NODE *parent,
199                                   const ASN1_OBJECT *id);
201  X509_POLICY_NODE *tree_find_sk(STACK_OF(X509_POLICY_NODE) *sk,
202                                 const ASN1_OBJECT *id);
204  X509_POLICY_NODE *level_add_node(X509_POLICY_LEVEL *level,
205                                   const X509_POLICY_DATA *data,
206                                   X509_POLICY_NODE *parent,
207                                   X509_POLICY_TREE *tree);
208  void policy_node_free(X509_POLICY_NODE *node);
209  int policy_node_match(const X509_POLICY_LEVEL *lvl,
210                       const X509_POLICY_NODE *node, const ASN1_OBJECT *oid);
212  const X509_POLICY_CACHE *policy_cache_set(X509 *x);

```

new/usr/src/lib/openssl/include/pkcs11.h

1

```
*****
9279 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/pkcs11.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pkcs11.h include file for PKCS #11. */
2 /* $Revision: 1.4 $ */

4 /* License to copy and use this software is granted provided that it is
5  * identified as "RSA Security Inc. PKCS #11 Cryptographic Token Interface
6  * (Cryptoki)" in all material mentioning or referencing this software.

8  * License is also granted to make and use derivative works provided that
9  * such works are identified as "derived from the RSA Security Inc. PKCS #11
10 * Cryptographic Token Interface (Cryptoki)" in all material mentioning or
11 * referencing the derived work.

13 * RSA Security Inc. makes no representations concerning either the
14 * merchantability of this software or the suitability of this software for
15 * any particular purpose. It is provided "as is" without express or implied
16 * warranty of any kind.
17 */

19 #ifndef _PKCS11_H_
20 #define _PKCS11_H_ 1

22 #ifdef __cplusplus
23 extern "C" {
24 #endif

26 /* Before including this file (pkcs11.h) (or pkcs11t.h by
27  * itself), 6 platform-specific macros must be defined. These
28  * macros are described below, and typical definitions for them
29  * are also given. Be advised that these definitions can depend
30  * on both the platform and the compiler used (and possibly also
31  * on whether a Cryptoki library is linked statically or
32  * dynamically).
33  *
34  * In addition to defining these 6 macros, the packing convention
35  * for Cryptoki structures should be set. The Cryptoki
36  * convention on packing is that structures should be 1-byte
37  * aligned.
38  *
39  * If you're using Microsoft Developer Studio 5.0 to produce
40  * Win32 stuff, this might be done by using the following
41  * preprocessor directive before including pkcs11.h or pkcs11t.h:
42  *
43  * #pragma pack(push, cryptoki, 1)
44  *
45  * and using the following preprocessor directive after including
46  * pkcs11.h or pkcs11t.h:
47  *
48  * #pragma pack(pop, cryptoki)
49  *
50  * If you're using an earlier version of Microsoft Developer
51  * Studio to produce Win16 stuff, this might be done by using
52  * the following preprocessor directive before including
53  * pkcs11.h or pkcs11t.h:
54  *
55  * #pragma pack(1)
56  *
57  * In a UNIX environment, you're on your own for this. You might
58  * not need to do (or be able to do!) anything.
59  *
60  *
61  * Now for the macros:
```

new/usr/src/lib/openssl/include/pkcs11.h

2

```
62 *
63 *
64 * 1. CK_PTR: The indirection string for making a pointer to an
65 * object. It can be used like this:
66 *
67 * typedef CK_BYTE CK_PTR CK_BYTE_PTR;
68 *
69 * If you're using Microsoft Developer Studio 5.0 to produce
70 * Win32 stuff, it might be defined by:
71 *
72 * #define CK_PTR *
73 *
74 * If you're using an earlier version of Microsoft Developer
75 * Studio to produce Win16 stuff, it might be defined by:
76 *
77 * #define CK_PTR far *
78 *
79 * In a typical UNIX environment, it might be defined by:
80 *
81 * #define CK_PTR *
82 *
83 *
84 * 2. CK_DECLARE_FUNCTION(returnType, name): A macro which makes
85 * an exportable Cryptoki library function definition out of a
86 * return type and a function name. It should be used in the
87 * following fashion to define the exposed Cryptoki functions in
88 * a Cryptoki library:
89 *
90 * CK_DECLARE_FUNCTION(CK_RV, C_Initialize)(
91 *     CK_VOID_PTR pReserved
92 * )
93 * {
94 *     ...
95 * }
96 *
97 * If you're using Microsoft Developer Studio 5.0 to define a
98 * function in a Win32 Cryptoki .dll, it might be defined by:
99 *
100 * #define CK_DECLARE_FUNCTION(returnType, name) \
101 *     returnType __declspec(dllexport) name
102 *
103 * If you're using an earlier version of Microsoft Developer
104 * Studio to define a function in a Win16 Cryptoki .dll, it
105 * might be defined by:
106 *
107 * #define CK_DECLARE_FUNCTION(returnType, name) \
108 *     returnType __export _far _pascal name
109 *
110 * In a UNIX environment, it might be defined by:
111 *
112 * #define CK_DECLARE_FUNCTION(returnType, name) \
113 *     returnType name
114 *
115 *
116 * 3. CK_DECLARE_FUNCTION(returnType, name): A macro which makes
117 * an importable Cryptoki library function declaration out of a
118 * return type and a function name. It should be used in the
119 * following fashion:
120 *
121 * extern CK_DECLARE_FUNCTION(CK_RV, C_Initialize)(
122 *     CK_VOID_PTR pReserved
123 * );
124 *
125 * If you're using Microsoft Developer Studio 5.0 to declare a
126 * function in a Win32 Cryptoki .dll, it might be defined by:
127 *
```



```

128 * #define CK_DECLARE_FUNCTION(returnType, name) \
129 *     returnType __declspec(dllimport) name
130 *
131 * If you're using an earlier version of Microsoft Developer
132 * Studio to declare a function in a Win16 Cryptoki .dll, it
133 * might be defined by:
134 *
135 * #define CK_DECLARE_FUNCTION(returnType, name) \
136 *     returnType __export _far _pascal name
137 *
138 * In a UNIX environment, it might be defined by:
139 *
140 * #define CK_DECLARE_FUNCTION(returnType, name) \
141 *     returnType name
142 *
143 *
144 * 4. CK_DECLARE_FUNCTION_POINTER(returnType, name): A macro
145 * which makes a Cryptoki API function pointer declaration or
146 * function pointer type declaration out of a return type and a
147 * function name. It should be used in the following fashion:
148 *
149 * // Define funcPtr to be a pointer to a Cryptoki API function
150 * // taking arguments args and returning CK_RV.
151 * CK_DECLARE_FUNCTION_POINTER(CK_RV, funcPtr)(args);
152 *
153 * or
154 *
155 * // Define funcPtrType to be the type of a pointer to a
156 * // Cryptoki API function taking arguments args and returning
157 * // CK_RV, and then define funcPtr to be a variable of type
158 * // funcPtrType.
159 * typedef CK_DECLARE_FUNCTION_POINTER(CK_RV, funcPtrType)(args);
160 * funcPtrType funcPtr;
161 *
162 * If you're using Microsoft Developer Studio 5.0 to access
163 * functions in a Win32 Cryptoki .dll, it might be defined by:
164 *
165 * #define CK_DECLARE_FUNCTION_POINTER(returnType, name) \
166 *     returnType __declspec(dllimport) (* name)
167 *
168 * If you're using an earlier version of Microsoft Developer
169 * Studio to access functions in a Win16 Cryptoki .dll, it might
170 * be defined by:
171 *
172 * #define CK_DECLARE_FUNCTION_POINTER(returnType, name) \
173 *     returnType __export _far _pascal (* name)
174 *
175 * In a UNIX environment, it might be defined by:
176 *
177 * #define CK_DECLARE_FUNCTION_POINTER(returnType, name) \
178 *     returnType (* name)
179 *
180 *
181 * 5. CK_CALLBACK_FUNCTION(returnType, name): A macro which makes
182 * a function pointer type for an application callback out of
183 * a return type for the callback and a name for the callback.
184 * It should be used in the following fashion:
185 *
186 * CK_CALLBACK_FUNCTION(CK_RV, myCallback)(args);
187 *
188 * to declare a function pointer, myCallback, to a callback
189 * which takes arguments args and returns a CK_RV. It can also
190 * be used like this:
191 *
192 * typedef CK_CALLBACK_FUNCTION(CK_RV, myCallbackType)(args);
193 * myCallbackType myCallback;

```

```

194 *
195 * If you're using Microsoft Developer Studio 5.0 to do Win32
196 * Cryptoki development, it might be defined by:
197 *
198 * #define CK_CALLBACK_FUNCTION(returnType, name) \
199 *     returnType (* name)
200 *
201 * If you're using an earlier version of Microsoft Developer
202 * Studio to do Win16 development, it might be defined by:
203 *
204 * #define CK_CALLBACK_FUNCTION(returnType, name) \
205 *     returnType _far _pascal (* name)
206 *
207 * In a UNIX environment, it might be defined by:
208 *
209 * #define CK_CALLBACK_FUNCTION(returnType, name) \
210 *     returnType (* name)
211 *
212 *
213 * 6. NULL_PTR: This macro is the value of a NULL pointer.
214 *
215 * In any ANSI/ISO C environment (and in many others as well),
216 * this should best be defined by
217 *
218 * #ifndef NULL_PTR
219 * #define NULL_PTR 0
220 * #endif
221 */
222
223
224 /* All the various Cryptoki types and #define'd values are in the
225 * file pkcs11t.h. */
226 #include "pkcs11t.h"
227
228 #define __PASTE(x,y)      x##y
229
230
231 /* =====
232 * Define the "extern" form of all the entry points.
233 * =====
234 */
235
236 #define CK_NEED_ARG_LIST 1
237 #define CK_PKCS11_FUNCTION_INFO(name) \
238     extern CK_DECLARE_FUNCTION(CK_RV, name)
239
240 /* pkcs11f.h has all the information about the Cryptoki
241 * function prototypes. */
242 #include "pkcs11f.h"
243
244 #undef CK_NEED_ARG_LIST
245 #undef CK_PKCS11_FUNCTION_INFO
246
247
248 /* =====
249 * Define the typedef form of all the entry points. That is, for
250 * each Cryptoki function C_XXX, define a type CK_C_XXX which is
251 * a pointer to that kind of function.
252 * =====
253 */
254
255 #define CK_NEED_ARG_LIST 1
256 #define CK_PKCS11_FUNCTION_INFO(name) \
257     typedef CK_DECLARE_FUNCTION_POINTER(CK_RV, __PASTE(CK_,name))
258
259 /* pkcs11f.h has all the information about the Cryptoki

```

```
260 * function prototypes. */
261 #include "pkcs11f.h"

263 #undef CK_NEED_ARG_LIST
264 #undef CK_PKCS11_FUNCTION_INFO

267 /* =====
268 * Define structured vector of entry points. A CK_FUNCTION_LIST
269 * contains a CK_VERSION indicating a library's Cryptoki version
270 * and then a whole slew of function pointers to the routines in
271 * the library. This type was declared, but not defined, in
272 * pkcs11t.h.
273 * =====
274 */

276 #define CK_PKCS11_FUNCTION_INFO(name) \
277     __PASTE(CK_,name) name;
278
279 struct CK_FUNCTION_LIST {
281     CK_VERSION    version; /* Cryptoki version */

283 /* Pile all the function pointers into the CK_FUNCTION_LIST. */
284 /* pkcs11f.h has all the information about the Cryptoki
285 * function prototypes. */
286 #include "pkcs11f.h"

288 };

290 #undef CK_PKCS11_FUNCTION_INFO

293 #undef __PASTE

295 #ifdef __cplusplus
296 }
297 #endif

299 #endif
```

new/usr/src/lib/openssl/include/pkcs11f.h

1

28346 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/pkcs11f.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* pkcs11f.h include file for PKCS #11. */
2 /* $Revision: 1.4 $ */

4 /* License to copy and use this software is granted provided that it is
5  * identified as "RSA Security Inc. PKCS #11 Cryptographic Token Interface
6  * (Cryptoki)" in all material mentioning or referencing this software.

8  * License is also granted to make and use derivative works provided that
9  * such works are identified as "derived from the RSA Security Inc. PKCS #11
10 * Cryptographic Token Interface (Cryptoki)" in all material mentioning or
11 * referencing the derived work.

13 * RSA Security Inc. makes no representations concerning either the
14 * merchantability of this software or the suitability of this software for
15 * any particular purpose. It is provided "as is" without express or implied
16 * warranty of any kind.
17 */

19 /* This header file contains pretty much everything about all the */
20 /* Cryptoki function prototypes. Because this information is */
21 /* used for more than just declaring function prototypes, the */
22 /* order of the functions appearing herein is important, and */
23 /* should not be altered. */

25 /* General-purpose */

27 /* C_Initialize initializes the Cryptoki library. */
28 CK_PKCS11_FUNCTION_INFO(C_Initialize)
29 #ifdef CK_NEED_ARG_LIST
30 {
31     CK_VOID_PTR    pInitArgs /* if this is not NULL_PTR, it gets
32                               * cast to CK_C_INITIALIZE_ARGS_PTR
33                               * and dereferenced */
34 };
35 #endif

38 /* C_Finalize indicates that an application is done with the
39  * Cryptoki library. */
40 CK_PKCS11_FUNCTION_INFO(C_Finalize)
41 #ifdef CK_NEED_ARG_LIST
42 {
43     CK_VOID_PTR    pReserved /* reserved. Should be NULL_PTR */
44 };
45 #endif

48 /* C_GetInfo returns general information about Cryptoki. */
49 CK_PKCS11_FUNCTION_INFO(C_GetInfo)
50 #ifdef CK_NEED_ARG_LIST
51 {
52     CK_INFO_PTR    pInfo /* location that receives information */
53 };
54 #endif

57 /* C_GetFunctionList returns the function list. */
58 CK_PKCS11_FUNCTION_INFO(C_GetFunctionList)
59 #ifdef CK_NEED_ARG_LIST
60 {
61     CK_FUNCTION_LIST_PTR_PTR ppFunctionList /* receives pointer to
```

new/usr/src/lib/openssl/include/pkcs11f.h

2

```
62                                     * function list */
63 );
64 #endif

68 /* Slot and token management */

70 /* C_GetSlotList obtains a list of slots in the system. */
71 CK_PKCS11_FUNCTION_INFO(C_GetSlotList)
72 #ifdef CK_NEED_ARG_LIST
73 {
74     CK_BB00L        tokenPresent, /* only slots with tokens? */
75     CK_SLOT_ID_PTR  pSlotList,    /* receives array of slot IDs */
76     CK_ULONG_PTR    pulCount,      /* receives number of slots */
77 };
78 #endif

81 /* C_GetSlotInfo obtains information about a particular slot in
82  * the system. */
83 CK_PKCS11_FUNCTION_INFO(C_GetSlotInfo)
84 #ifdef CK_NEED_ARG_LIST
85 {
86     CK_SLOT_ID        slotID, /* the ID of the slot */
87     CK_SLOT_INFO_PTR  pInfo    /* receives the slot information */
88 };
89 #endif

92 /* C_GetTokenInfo obtains information about a particular token
93  * in the system. */
94 CK_PKCS11_FUNCTION_INFO(C_GetTokenInfo)
95 #ifdef CK_NEED_ARG_LIST
96 {
97     CK_SLOT_ID        slotID, /* ID of the token's slot */
98     CK_TOKEN_INFO_PTR pInfo    /* receives the token information */
99 };
100 #endif

103 /* C_GetMechanismList obtains a list of mechanism types
104  * supported by a token. */
105 CK_PKCS11_FUNCTION_INFO(C_GetMechanismList)
106 #ifdef CK_NEED_ARG_LIST
107 {
108     CK_SLOT_ID        slotID, /* ID of token's slot */
109     CK_MECHANISM_TYPE_PTR pMechanismList, /* gets mech. array */
110     CK_ULONG_PTR        pulCount /* gets # of mechs. */
111 };
112 #endif

115 /* C_GetMechanismInfo obtains information about a particular
116  * mechanism possibly supported by a token. */
117 CK_PKCS11_FUNCTION_INFO(C_GetMechanismInfo)
118 #ifdef CK_NEED_ARG_LIST
119 {
120     CK_SLOT_ID        slotID, /* ID of the token's slot */
121     CK_MECHANISM_TYPE type,    /* type of mechanism */
122     CK_MECHANISM_INFO_PTR pInfo /* receives mechanism info */
123 };
124 #endif

127 /* C_InitToken initializes a token. */
```

```

128 CK_PKCS11_FUNCTION_INFO(C_InitToken)
129 #ifdef CK_NEED_ARG_LIST
130 /* pLabel changed from CK_CHAR_PTR to CK_UTF8CHAR_PTR for v2.10 */
131 (
132     CK_SLOT_ID      slotID,      /* ID of the token's slot */
133     CK_UTF8CHAR_PTR pPin,        /* the SO's initial PIN */
134     CK_ULONG         ulPinLen,   /* length in bytes of the PIN */
135     CK_UTF8CHAR_PTR pLabel      /* 32-byte token label (blank padded) */
136 );
137 #endif

140 /* C_InitPIN initializes the normal user's PIN. */
141 CK_PKCS11_FUNCTION_INFO(C_InitPIN)
142 #ifdef CK_NEED_ARG_LIST
143 (
144     CK_SESSION_HANDLE hSession, /* the session's handle */
145     CK_UTF8CHAR_PTR  pPin,      /* the normal user's PIN */
146     CK_ULONG         ulPinLen   /* length in bytes of the PIN */
147 );
148 #endif

151 /* C_SetPIN modifies the PIN of the user who is logged in. */
152 CK_PKCS11_FUNCTION_INFO(C_SetPIN)
153 #ifdef CK_NEED_ARG_LIST
154 (
155     CK_SESSION_HANDLE hSession, /* the session's handle */
156     CK_UTF8CHAR_PTR  pOldPin,   /* the old PIN */
157     CK_ULONG         ulOldLen,  /* length of the old PIN */
158     CK_UTF8CHAR_PTR  pNewPin,  /* the new PIN */
159     CK_ULONG         ulNewLen   /* length of the new PIN */
160 );
161 #endif

165 /* Session management */

167 /* C_OpenSession opens a session between an application and a
168 * token. */
169 CK_PKCS11_FUNCTION_INFO(C_OpenSession)
170 #ifdef CK_NEED_ARG_LIST
171 (
172     CK_SLOT_ID      slotID,      /* the slot's ID */
173     CK_FLAGS        flags,       /* from CK_SESSION_INFO */
174     CK_VOID_PTR     pApplication, /* passed to callback */
175     CK_NOTIFY       Notify,      /* callback function */
176     CK_SESSION_HANDLE_PTR phSession /* gets session handle */
177 );
178 #endif

181 /* C_CloseSession closes a session between an application and a
182 * token. */
183 CK_PKCS11_FUNCTION_INFO(C_CloseSession)
184 #ifdef CK_NEED_ARG_LIST
185 (
186     CK_SESSION_HANDLE hSession /* the session's handle */
187 );
188 #endif

191 /* C_CloseAllSessions closes all sessions with a token. */
192 CK_PKCS11_FUNCTION_INFO(C_CloseAllSessions)
193 #ifdef CK_NEED_ARG_LIST

```

```

194 (
195     CK_SLOT_ID      slotID /* the token's slot */
196 );
197 #endif

200 /* C_GetSessionInfo obtains information about the session. */
201 CK_PKCS11_FUNCTION_INFO(C_GetSessionInfo)
202 #ifdef CK_NEED_ARG_LIST
203 (
204     CK_SESSION_HANDLE hSession, /* the session's handle */
205     CK_SESSION_INFO_PTR pInfo    /* receives session info */
206 );
207 #endif

210 /* C_GetOperationState obtains the state of the cryptographic operation
211 * in a session. */
212 CK_PKCS11_FUNCTION_INFO(C_GetOperationState)
213 #ifdef CK_NEED_ARG_LIST
214 (
215     CK_SESSION_HANDLE hSession, /* session's handle */
216     CK_BYTE_PTR       pOperationState, /* gets state */
217     CK_ULONG_PTR      pulOperationStateLen /* gets state length */
218 );
219 #endif

222 /* C_SetOperationState restores the state of the cryptographic
223 * operation in a session. */
224 CK_PKCS11_FUNCTION_INFO(C_SetOperationState)
225 #ifdef CK_NEED_ARG_LIST
226 (
227     CK_SESSION_HANDLE hSession, /* session's handle */
228     CK_BYTE_PTR       pOperationState, /* holds state */
229     CK_ULONG         ulOperationStateLen, /* holds state length */
230     CK_OBJECT_HANDLE  hEncryptionKey, /* en/decryption key */
231     CK_OBJECT_HANDLE  hAuthenticationKey /* sign/verify key */
232 );
233 #endif

236 /* C_Login logs a user into a token. */
237 CK_PKCS11_FUNCTION_INFO(C_Login)
238 #ifdef CK_NEED_ARG_LIST
239 (
240     CK_SESSION_HANDLE hSession, /* the session's handle */
241     CK_USER_TYPE      userType, /* the user type */
242     CK_UTF8CHAR_PTR  pPin,      /* the user's PIN */
243     CK_ULONG         ulPinLen   /* the length of the PIN */
244 );
245 #endif

248 /* C_Logout logs a user out from a token. */
249 CK_PKCS11_FUNCTION_INFO(C_Logout)
250 #ifdef CK_NEED_ARG_LIST
251 (
252     CK_SESSION_HANDLE hSession /* the session's handle */
253 );
254 #endif

258 /* Object management */

```

```

260 /* C_CreateObject creates a new object. */
261 CK_PKCS11_FUNCTION_INFO(C_CreateObject)
262 #ifdef CK_NEED_ARG_LIST
263 {
264     CK_SESSION_HANDLE hSession, /* the session's handle */
265     CK_ATTRIBUTE_PTR pTemplate, /* the object's template */
266     CK_ULONG ulCount, /* attributes in template */
267     CK_OBJECT_HANDLE_PTR phObject /* gets new object's handle. */
268 };
269 #endif

272 /* C_CopyObject copies an object, creating a new object for the
273  * copy. */
274 CK_PKCS11_FUNCTION_INFO(C_CopyObject)
275 #ifdef CK_NEED_ARG_LIST
276 {
277     CK_SESSION_HANDLE hSession, /* the session's handle */
278     CK_OBJECT_HANDLE hObject, /* the object's handle */
279     CK_ATTRIBUTE_PTR pTemplate, /* template for new object */
280     CK_ULONG ulCount, /* attributes in template */
281     CK_OBJECT_HANDLE_PTR phNewObject /* receives handle of copy */
282 };
283 #endif

286 /* C_DestroyObject destroys an object. */
287 CK_PKCS11_FUNCTION_INFO(C_DestroyObject)
288 #ifdef CK_NEED_ARG_LIST
289 {
290     CK_SESSION_HANDLE hSession, /* the session's handle */
291     CK_OBJECT_HANDLE hObject /* the object's handle */
292 };
293 #endif

296 /* C_GetObjectSize gets the size of an object in bytes. */
297 CK_PKCS11_FUNCTION_INFO(C_GetObjectSize)
298 #ifdef CK_NEED_ARG_LIST
299 {
300     CK_SESSION_HANDLE hSession, /* the session's handle */
301     CK_OBJECT_HANDLE hObject, /* the object's handle */
302     CK_ULONG_PTR pulSize /* receives size of object */
303 };
304 #endif

307 /* C_GetAttributeValue obtains the value of one or more object
308  * attributes. */
309 CK_PKCS11_FUNCTION_INFO(C_GetAttributeValue)
310 #ifdef CK_NEED_ARG_LIST
311 {
312     CK_SESSION_HANDLE hSession, /* the session's handle */
313     CK_OBJECT_HANDLE hObject, /* the object's handle */
314     CK_ATTRIBUTE_PTR pTemplate, /* specifies attrs; gets vals */
315     CK_ULONG ulCount /* attributes in template */
316 };
317 #endif

320 /* C_SetAttributeValue modifies the value of one or more object
321  * attributes */
322 CK_PKCS11_FUNCTION_INFO(C_SetAttributeValue)
323 #ifdef CK_NEED_ARG_LIST
324 {
325     CK_SESSION_HANDLE hSession, /* the session's handle */

```

```

326 CK_OBJECT_HANDLE hObject, /* the object's handle */
327 CK_ATTRIBUTE_PTR pTemplate, /* specifies attrs and values */
328 CK_ULONG ulCount /* attributes in template */
329 };
330 #endif

333 /* C_FindObjectsInit initializes a search for token and session
334  * objects that match a template. */
335 CK_PKCS11_FUNCTION_INFO(C_FindObjectsInit)
336 #ifdef CK_NEED_ARG_LIST
337 {
338     CK_SESSION_HANDLE hSession, /* the session's handle */
339     CK_ATTRIBUTE_PTR pTemplate, /* attribute values to match */
340     CK_ULONG ulCount /* attrs in search template */
341 };
342 #endif

345 /* C_FindObjects continues a search for token and session
346  * objects that match a template, obtaining additional object
347  * handles. */
348 CK_PKCS11_FUNCTION_INFO(C_FindObjects)
349 #ifdef CK_NEED_ARG_LIST
350 {
351     CK_SESSION_HANDLE hSession, /* session's handle */
352     CK_OBJECT_HANDLE_PTR phObject, /* gets obj. handles */
353     CK_ULONG ulMaxObjectCount, /* max handles to get */
354     CK_ULONG_PTR pulObjectCount /* actual # returned */
355 };
356 #endif

359 /* C_FindObjectsFinal finishes a search for token and session
360  * objects. */
361 CK_PKCS11_FUNCTION_INFO(C_FindObjectsFinal)
362 #ifdef CK_NEED_ARG_LIST
363 {
364     CK_SESSION_HANDLE hSession /* the session's handle */
365 };
366 #endif

370 /* Encryption and decryption */

372 /* C_EncryptInit initializes an encryption operation. */
373 CK_PKCS11_FUNCTION_INFO(C_EncryptInit)
374 #ifdef CK_NEED_ARG_LIST
375 {
376     CK_SESSION_HANDLE hSession, /* the session's handle */
377     CK_MECHANISM_PTR pMechanism, /* the encryption mechanism */
378     CK_OBJECT_HANDLE hKey /* handle of encryption key */
379 };
380 #endif

383 /* C_Encrypt encrypts single-part data. */
384 CK_PKCS11_FUNCTION_INFO(C_Encrypt)
385 #ifdef CK_NEED_ARG_LIST
386 {
387     CK_SESSION_HANDLE hSession, /* session's handle */
388     CK_BYTE_PTR pData, /* the plaintext data */
389     CK_ULONG ulDataLen, /* bytes of plaintext */
390     CK_BYTE_PTR pEncryptedData, /* gets ciphertext */
391     CK_ULONG_PTR pulEncryptedDataLen /* gets c-text size */

```

```

392 );
393 #endif

396 /* C_EncryptUpdate continues a multiple-part encryption
397  * operation. */
398 CK_PKCS11_FUNCTION_INFO(C_EncryptUpdate)
399 #ifdef CK_NEED_ARG_LIST
400 (
401     CK_SESSION_HANDLE hSession,      /* session's handle */
402     CK_BYTE_PTR       pPart,         /* the plaintext data */
403     CK_ULONG           ulPartLen,     /* plaintext data len */
404     CK_BYTE_PTR       pEncryptedPart, /* gets ciphertext */
405     CK_ULONG_PTR       pulEncryptedPartLen /* gets c-text size */
406 );
407 #endif

410 /* C_EncryptFinal finishes a multiple-part encryption
411  * operation. */
412 CK_PKCS11_FUNCTION_INFO(C_EncryptFinal)
413 #ifdef CK_NEED_ARG_LIST
414 (
415     CK_SESSION_HANDLE hSession,      /* session handle */
416     CK_BYTE_PTR       pLastEncryptedPart, /* last c-text */
417     CK_ULONG_PTR       pulLastEncryptedPartLen /* gets last size */
418 );
419 #endif

422 /* C_DecryptInit initializes a decryption operation. */
423 CK_PKCS11_FUNCTION_INFO(C_DecryptInit)
424 #ifdef CK_NEED_ARG_LIST
425 (
426     CK_SESSION_HANDLE hSession,      /* the session's handle */
427     CK_MECHANISM_PTR  pMechanism,    /* the decryption mechanism */
428     CK_OBJECT_HANDLE  hKey           /* handle of decryption key */
429 );
430 #endif

433 /* C_Decrypt decrypts encrypted data in a single part. */
434 CK_PKCS11_FUNCTION_INFO(C_Decrypt)
435 #ifdef CK_NEED_ARG_LIST
436 (
437     CK_SESSION_HANDLE hSession,      /* session's handle */
438     CK_BYTE_PTR       pEncryptedData, /* ciphertext */
439     CK_ULONG           ulEncryptedDataLen, /* ciphertext length */
440     CK_BYTE_PTR       pData,         /* gets plaintext */
441     CK_ULONG_PTR       pulDataLen     /* gets p-text size */
442 );
443 #endif

446 /* C_DecryptUpdate continues a multiple-part decryption
447  * operation. */
448 CK_PKCS11_FUNCTION_INFO(C_DecryptUpdate)
449 #ifdef CK_NEED_ARG_LIST
450 (
451     CK_SESSION_HANDLE hSession,      /* session's handle */
452     CK_BYTE_PTR       pEncryptedPart, /* encrypted data */
453     CK_ULONG           ulEncryptedPartLen, /* input length */
454     CK_BYTE_PTR       pPart,         /* gets plaintext */
455     CK_ULONG_PTR       pulPartLen     /* p-text size */
456 );
457 #endif

```

```

460 /* C_DecryptFinal finishes a multiple-part decryption
461  * operation. */
462 CK_PKCS11_FUNCTION_INFO(C_DecryptFinal)
463 #ifdef CK_NEED_ARG_LIST
464 (
465     CK_SESSION_HANDLE hSession,      /* the session's handle */
466     CK_BYTE_PTR       pLastPart,     /* gets plaintext */
467     CK_ULONG_PTR       pulLastPartLen /* p-text size */
468 );
469 #endif

473 /* Message digesting */

475 /* C_DigestInit initializes a message-digesting operation. */
476 CK_PKCS11_FUNCTION_INFO(C_DigestInit)
477 #ifdef CK_NEED_ARG_LIST
478 (
479     CK_SESSION_HANDLE hSession,      /* the session's handle */
480     CK_MECHANISM_PTR  pMechanism     /* the digesting mechanism */
481 );
482 #endif

485 /* C_Digest digests data in a single part. */
486 CK_PKCS11_FUNCTION_INFO(C_Digest)
487 #ifdef CK_NEED_ARG_LIST
488 (
489     CK_SESSION_HANDLE hSession,      /* the session's handle */
490     CK_BYTE_PTR       pData,         /* data to be digested */
491     CK_ULONG           ulDataLen,     /* bytes of data to digest */
492     CK_BYTE_PTR       pDigest,       /* gets the message digest */
493     CK_ULONG_PTR       pulDigestLen  /* gets digest length */
494 );
495 #endif

498 /* C_DigestUpdate continues a multiple-part message-digesting
499  * operation. */
500 CK_PKCS11_FUNCTION_INFO(C_DigestUpdate)
501 #ifdef CK_NEED_ARG_LIST
502 (
503     CK_SESSION_HANDLE hSession,      /* the session's handle */
504     CK_BYTE_PTR       pPart,         /* data to be digested */
505     CK_ULONG           ulPartLen     /* bytes of data to be digested */
506 );
507 #endif

510 /* C_DigestKey continues a multi-part message-digesting
511  * operation, by digesting the value of a secret key as part of
512  * the data already digested. */
513 CK_PKCS11_FUNCTION_INFO(C_DigestKey)
514 #ifdef CK_NEED_ARG_LIST
515 (
516     CK_SESSION_HANDLE hSession,      /* the session's handle */
517     CK_OBJECT_HANDLE  hKey           /* secret key to digest */
518 );
519 #endif

522 /* C_DigestFinal finishes a multiple-part message-digesting
523  * operation. */

```

```

524 CK_PKCS11_FUNCTION_INFO(C_DigestFinal)
525 #ifdef CK_NEED_ARG_LIST
526 (
527     CK_SESSION_HANDLE hSession, /* the session's handle */
528     CK_BYTE_PTR       pDigest,   /* gets the message digest */
529     CK_ULONG_PTR       pulDigestLen /* gets byte count of digest */
530 );
531 #endif

```

```

535 /* Signing and MACing */

```

```

537 /* C_SignInit initializes a signature (private key encryption)
538 * operation, where the signature is (will be) an appendix to
539 * the data, and plaintext cannot be recovered from the
540 * signature. */
541 CK_PKCS11_FUNCTION_INFO(C_SignInit)
542 #ifdef CK_NEED_ARG_LIST
543 (
544     CK_SESSION_HANDLE hSession, /* the session's handle */
545     CK_MECHANISM_PTR  pMechanism, /* the signature mechanism */
546     CK_OBJECT_HANDLE  hKey        /* handle of signature key */
547 );
548 #endif

```

```

551 /* C_Sign signs (encrypts with private key) data in a single
552 * part, where the signature is (will be) an appendix to the
553 * data, and plaintext cannot be recovered from the signature. */
554 CK_PKCS11_FUNCTION_INFO(C_Sign)
555 #ifdef CK_NEED_ARG_LIST
556 (
557     CK_SESSION_HANDLE hSession, /* the session's handle */
558     CK_BYTE_PTR       pData,     /* the data to sign */
559     CK_ULONG           ulDataLen, /* count of bytes to sign */
560     CK_BYTE_PTR       pSignature, /* gets the signature */
561     CK_ULONG_PTR       pulSignatureLen /* gets signature length */
562 );
563 #endif

```

```

566 /* C_SignUpdate continues a multiple-part signature operation,
567 * where the signature is (will be) an appendix to the data,
568 * and plaintext cannot be recovered from the signature. */
569 CK_PKCS11_FUNCTION_INFO(C_SignUpdate)
570 #ifdef CK_NEED_ARG_LIST
571 (
572     CK_SESSION_HANDLE hSession, /* the session's handle */
573     CK_BYTE_PTR       pPart,     /* the data to sign */
574     CK_ULONG           ulPartLen /* count of bytes to sign */
575 );
576 #endif

```

```

579 /* C_SignFinal finishes a multiple-part signature operation,
580 * returning the signature. */
581 CK_PKCS11_FUNCTION_INFO(C_SignFinal)
582 #ifdef CK_NEED_ARG_LIST
583 (
584     CK_SESSION_HANDLE hSession, /* the session's handle */
585     CK_BYTE_PTR       pSignature, /* gets the signature */
586     CK_ULONG_PTR       pulSignatureLen /* gets signature length */
587 );
588 #endif

```

```

591 /* C_SignRecoverInit initializes a signature operation, where
592 * the data can be recovered from the signature. */
593 CK_PKCS11_FUNCTION_INFO(C_SignRecoverInit)
594 #ifdef CK_NEED_ARG_LIST
595 (
596     CK_SESSION_HANDLE hSession, /* the session's handle */
597     CK_MECHANISM_PTR  pMechanism, /* the signature mechanism */
598     CK_OBJECT_HANDLE  hKey        /* handle of the signature key */
599 );
600 #endif

```

```

603 /* C_SignRecover signs data in a single operation, where the
604 * data can be recovered from the signature. */
605 CK_PKCS11_FUNCTION_INFO(C_SignRecover)
606 #ifdef CK_NEED_ARG_LIST
607 (
608     CK_SESSION_HANDLE hSession, /* the session's handle */
609     CK_BYTE_PTR       pData,     /* the data to sign */
610     CK_ULONG           ulDataLen, /* count of bytes to sign */
611     CK_BYTE_PTR       pSignature, /* gets the signature */
612     CK_ULONG_PTR       pulSignatureLen /* gets signature length */
613 );
614 #endif

```

```

618 /* Verifying signatures and MACs */

```

```

620 /* C_VerifyInit initializes a verification operation, where the
621 * signature is an appendix to the data, and plaintext cannot
622 * be recovered from the signature (e.g. DSA). */
623 CK_PKCS11_FUNCTION_INFO(C_VerifyInit)
624 #ifdef CK_NEED_ARG_LIST
625 (
626     CK_SESSION_HANDLE hSession, /* the session's handle */
627     CK_MECHANISM_PTR  pMechanism, /* the verification mechanism */
628     CK_OBJECT_HANDLE  hKey        /* verification key */
629 );
630 #endif

```

```

633 /* C_Verify verifies a signature in a single-part operation,
634 * where the signature is an appendix to the data, and plaintext
635 * cannot be recovered from the signature. */
636 CK_PKCS11_FUNCTION_INFO(C_Verify)
637 #ifdef CK_NEED_ARG_LIST
638 (
639     CK_SESSION_HANDLE hSession, /* the session's handle */
640     CK_BYTE_PTR       pData,     /* signed data */
641     CK_ULONG           ulDataLen, /* length of signed data */
642     CK_BYTE_PTR       pSignature, /* signature */
643     CK_ULONG           ulSignatureLen /* signature length */
644 );
645 #endif

```

```

648 /* C_VerifyUpdate continues a multiple-part verification
649 * operation, where the signature is an appendix to the data,
650 * and plaintext cannot be recovered from the signature. */
651 CK_PKCS11_FUNCTION_INFO(C_VerifyUpdate)
652 #ifdef CK_NEED_ARG_LIST
653 (
654     CK_SESSION_HANDLE hSession, /* the session's handle */
655     CK_BYTE_PTR       pPart,     /* signed data */

```

```

656 CK_ULONG          ulPartLen /* length of signed data */
657 };
658 #endif

661 /* C_VerifyFinal finishes a multiple-part verification
662  * operation, checking the signature. */
663 CK_PKCS11_FUNCTION_INFO(C_VerifyFinal)
664 #ifdef CK_NEED_ARG_LIST
665 (
666     CK_SESSION_HANDLE hSession, /* the session's handle */
667     CK_BYTE_PTR       pSignature, /* signature to verify */
668     CK_ULONG          ulSignatureLen /* signature length */
669 );
670 #endif

673 /* C_VerifyRecoverInit initializes a signature verification
674  * operation, where the data is recovered from the signature. */
675 CK_PKCS11_FUNCTION_INFO(C_VerifyRecoverInit)
676 #ifdef CK_NEED_ARG_LIST
677 (
678     CK_SESSION_HANDLE hSession, /* the session's handle */
679     CK_MECHANISM_PTR  pMechanism, /* the verification mechanism */
680     CK_OBJECT_HANDLE  hKey /* verification key */
681 );
682 #endif

685 /* C_VerifyRecover verifies a signature in a single-part
686  * operation, where the data is recovered from the signature. */
687 CK_PKCS11_FUNCTION_INFO(C_VerifyRecover)
688 #ifdef CK_NEED_ARG_LIST
689 (
690     CK_SESSION_HANDLE hSession, /* the session's handle */
691     CK_BYTE_PTR       pSignature, /* signature to verify */
692     CK_ULONG          ulSignatureLen, /* signature length */
693     CK_BYTE_PTR       pData, /* gets signed data */
694     CK_ULONG_PTR      pulDataLen /* gets signed data len */
695 );
696 #endif

700 /* Dual-function cryptographic operations */

702 /* C_DigestEncryptUpdate continues a multiple-part digesting
703  * and encryption operation. */
704 CK_PKCS11_FUNCTION_INFO(C_DigestEncryptUpdate)
705 #ifdef CK_NEED_ARG_LIST
706 (
707     CK_SESSION_HANDLE hSession, /* session's handle */
708     CK_BYTE_PTR       pPart, /* the plaintext data */
709     CK_ULONG          ulPartLen, /* plaintext length */
710     CK_BYTE_PTR       pEncryptedPart, /* gets ciphertext */
711     CK_ULONG_PTR      pulEncryptedPartLen /* gets c-text length */
712 );
713 #endif

716 /* C_DecryptDigestUpdate continues a multiple-part decryption and
717  * digesting operation. */
718 CK_PKCS11_FUNCTION_INFO(C_DecryptDigestUpdate)
719 #ifdef CK_NEED_ARG_LIST
720 (
721     CK_SESSION_HANDLE hSession, /* session's handle */

```

```

722 CK_BYTE_PTR       pEncryptedPart, /* ciphertext */
723 CK_ULONG          ulEncryptedPartLen, /* ciphertext length */
724 CK_BYTE_PTR       pPart, /* gets plaintext */
725 CK_ULONG_PTR      pulPartLen /* gets plaintext len */
726 );
727 #endif

730 /* C_SignEncryptUpdate continues a multiple-part signing and
731  * encryption operation. */
732 CK_PKCS11_FUNCTION_INFO(C_SignEncryptUpdate)
733 #ifdef CK_NEED_ARG_LIST
734 (
735     CK_SESSION_HANDLE hSession, /* session's handle */
736     CK_BYTE_PTR       pPart, /* the plaintext data */
737     CK_ULONG          ulPartLen, /* plaintext length */
738     CK_BYTE_PTR       pEncryptedPart, /* gets ciphertext */
739     CK_ULONG_PTR      pulEncryptedPartLen /* gets c-text length */
740 );
741 #endif

744 /* C_DecryptVerifyUpdate continues a multiple-part decryption and
745  * verify operation. */
746 CK_PKCS11_FUNCTION_INFO(C_DecryptVerifyUpdate)
747 #ifdef CK_NEED_ARG_LIST
748 (
749     CK_SESSION_HANDLE hSession, /* session's handle */
750     CK_BYTE_PTR       pEncryptedPart, /* ciphertext */
751     CK_ULONG          ulEncryptedPartLen, /* ciphertext length */
752     CK_BYTE_PTR       pPart, /* gets plaintext */
753     CK_ULONG_PTR      pulPartLen /* gets p-text length */
754 );
755 #endif

759 /* Key management */

761 /* C_GenerateKey generates a secret key, creating a new key
762  * object. */
763 CK_PKCS11_FUNCTION_INFO(C_GenerateKey)
764 #ifdef CK_NEED_ARG_LIST
765 (
766     CK_SESSION_HANDLE hSession, /* the session's handle */
767     CK_MECHANISM_PTR  pMechanism, /* key generation mech. */
768     CK_ATTRIBUTE_PTR  pTemplate, /* template for new key */
769     CK_ULONG          ulCount, /* # of attrs in template */
770     CK_OBJECT_HANDLE_PTR phKey /* gets handle of new key */
771 );
772 #endif

775 /* C_GenerateKeyPair generates a public-key/private-key pair,
776  * creating new key objects. */
777 CK_PKCS11_FUNCTION_INFO(C_GenerateKeyPair)
778 #ifdef CK_NEED_ARG_LIST
779 (
780     CK_SESSION_HANDLE hSession, /* session
781     * handle */
782     CK_MECHANISM_PTR  pMechanism, /* key-gen
783     * mech. */
784     CK_ATTRIBUTE_PTR  pPublicKeyTemplate, /* template
785     * for pub.
786     * key */
787     CK_ULONG          ulPublicKeyAttributeCount, /* # pub.

```



```

788             * attrs. */
789     CK_ATTRIBUTE_PTR    pPrivateKeyTemplate, /* template
790             * for priv.
791             * key */
792     CK_ULONG            ulPrivateKeyAttributeCount, /* # priv.
793             * attrs. */
794     CK_OBJECT_HANDLE_PTR phPublicKey, /* gets pub.
795             * key
796             * handle */
797     CK_OBJECT_HANDLE_PTR phPrivateKey /* gets
798             * priv. key
799             * handle */
800 );
801 #endif

804 /* C_WrapKey wraps (i.e., encrypts) a key. */
805 CK_PKCS11_FUNCTION_INFO(C_WrapKey)
806 #ifdef CK_NEED_ARG_LIST
807 (
808     CK_SESSION_HANDLE hSession, /* the session's handle */
809     CK_MECHANISM_PTR  pMechanism, /* the wrapping mechanism */
810     CK_OBJECT_HANDLE  hWrappingKey, /* wrapping key */
811     CK_OBJECT_HANDLE  hKey, /* key to be wrapped */
812     CK_BYTE_PTR       pWrappedKey, /* gets wrapped key */
813     CK_ULONG_PTR      pulWrappedKeyLen /* gets wrapped key size */
814 );
815 #endif

818 /* C_UnwrapKey unwraps (decrypts) a wrapped key, creating a new
819 * key object. */
820 CK_PKCS11_FUNCTION_INFO(C_UnwrapKey)
821 #ifdef CK_NEED_ARG_LIST
822 (
823     CK_SESSION_HANDLE hSession, /* session's handle */
824     CK_MECHANISM_PTR  pMechanism, /* unwrapping mech. */
825     CK_OBJECT_HANDLE  hUnwrappingKey, /* unwrapping key */
826     CK_BYTE_PTR       pWrappedKey, /* the wrapped key */
827     CK_ULONG           ulWrappedKeyLen, /* wrapped key len */
828     CK_ATTRIBUTE_PTR   pTemplate, /* new key template */
829     CK_ULONG           ulAttributeCount, /* template length */
830     CK_OBJECT_HANDLE_PTR phKey /* gets new handle */
831 );
832 #endif

835 /* C_DeriveKey derives a key from a base key, creating a new key
836 * object. */
837 CK_PKCS11_FUNCTION_INFO(C_DeriveKey)
838 #ifdef CK_NEED_ARG_LIST
839 (
840     CK_SESSION_HANDLE hSession, /* session's handle */
841     CK_MECHANISM_PTR  pMechanism, /* key deriv. mech. */
842     CK_OBJECT_HANDLE  hBaseKey, /* base key */
843     CK_ATTRIBUTE_PTR   pTemplate, /* new key template */
844     CK_ULONG           ulAttributeCount, /* template length */
845     CK_OBJECT_HANDLE_PTR phKey /* gets new handle */
846 );
847 #endif

```

```
851 /* Random number generation */
```

```
853 /* C_SeedRandom mixes additional seed material into the token's
```

```

854 * random number generator. */
855 CK_PKCS11_FUNCTION_INFO(C_SeedRandom)
856 #ifdef CK_NEED_ARG_LIST
857 (
858     CK_SESSION_HANDLE hSession, /* the session's handle */
859     CK_BYTE_PTR       pSeed, /* the seed material */
860     CK_ULONG           ulSeedLen /* length of seed material */
861 );
862 #endif

865 /* C_GenerateRandom generates random data. */
866 CK_PKCS11_FUNCTION_INFO(C_GenerateRandom)
867 #ifdef CK_NEED_ARG_LIST
868 (
869     CK_SESSION_HANDLE hSession, /* the session's handle */
870     CK_BYTE_PTR       RandomData, /* receives the random data */
871     CK_ULONG           ulRandomLen /* # of bytes to generate */
872 );
873 #endif

877 /* Parallel function management */

879 /* C_GetFunctionStatus is a legacy function; it obtains an
880 * updated status of a function running in parallel with an
881 * application. */
882 CK_PKCS11_FUNCTION_INFO(C_GetFunctionStatus)
883 #ifdef CK_NEED_ARG_LIST
884 (
885     CK_SESSION_HANDLE hSession /* the session's handle */
886 );
887 #endif

890 /* C_CancelFunction is a legacy function; it cancels a function
891 * running in parallel. */
892 CK_PKCS11_FUNCTION_INFO(C_CancelFunction)
893 #ifdef CK_NEED_ARG_LIST
894 (
895     CK_SESSION_HANDLE hSession /* the session's handle */
896 );
897 #endif

901 /* Functions added in for Cryptoki Version 2.01 or later */

903 /* C_WaitForSlotEvent waits for a slot event (token insertion,
904 * removal, etc.) to occur. */
905 CK_PKCS11_FUNCTION_INFO(C_WaitForSlotEvent)
906 #ifdef CK_NEED_ARG_LIST
907 (
908     CK_FLAGS flags, /* blocking/nonblocking flag */
909     CK_SLOT_ID_PTR pSlot, /* location that receives the slot ID */
910     CK_VOID_PTR pReserved /* reserved. Should be NULL_PTR */
911 );
912 #endif

```

new/usr/src/lib/openssl/include/pkcs11t.h

1

69057 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/pkcs11t.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* pkcs11t.h include file for PKCS #11. */
2 /* $Revision: 1.10 $ */

4 /* License to copy and use this software is granted provided that it is
5  * identified as "RSA Security Inc. PKCS #11 Cryptographic Token Interface
6  * (Cryptoki)" in all material mentioning or referencing this software.

8  * License is also granted to make and use derivative works provided that
9  * such works are identified as "derived from the RSA Security Inc. PKCS #11
10 * Cryptographic Token Interface (Cryptoki)" in all material mentioning or
11 * referencing the derived work.

13 * RSA Security Inc. makes no representations concerning either the
14 * merchantability of this software or the suitability of this software for
15 * any particular purpose. It is provided "as is" without express or implied
16 * warranty of any kind.
17 */

19 /* See top of pkcs11.h for information about the macros that
20  * must be defined and the structure-packing conventions that
21  * must be set before including this file. */

23 #ifndef _PKCS11T_H_
24 #define _PKCS11T_H_ 1

26 #define CRYPTOKI_VERSION_MAJOR 2
27 #define CRYPTOKI_VERSION_MINOR 20
28 #define CRYPTOKI_VERSION_AMENDMENT 3

30 #define CK_TRUE 1
31 #define CK_FALSE 0

33 #ifndef CK_DISABLE_TRUE_FALSE
34 #ifndef FALSE
35 #define FALSE CK_FALSE
36 #endif

38 #ifndef TRUE
39 #define TRUE CK_TRUE
40 #endif
41 #endif

43 /* an unsigned 8-bit value */
44 typedef unsigned char CK_BYTE;

46 /* an unsigned 8-bit character */
47 typedef CK_BYTE CK_CHAR;

49 /* an 8-bit UTF-8 character */
50 typedef CK_BYTE CK_UTF8CHAR;

52 /* a BYTE-sized Boolean flag */
53 typedef CK_BYTE CK_BBOOL;

55 /* an unsigned value, at least 32 bits long */
56 typedef unsigned long int CK_ULONG;

58 /* a signed value, the same size as a CK_ULONG */
59 /* CK_LONG is new for v2.0 */
60 typedef long int CK_LONG;
```

new/usr/src/lib/openssl/include/pkcs11t.h

2

```
62 /* at least 32 bits; each bit is a Boolean flag */
63 typedef CK_ULONG CK_FLAGS;

66 /* some special values for certain CK_ULONG variables */
67 #define CK_UNAVAILABLE_INFORMATION (~0UL)
68 #define CK_EFFECTIVELY_INFINITE 0

71 typedef CK_BYTE CK_PTR CK_BYTE_PTR;
72 typedef CK_CHAR CK_PTR CK_CHAR_PTR;
73 typedef CK_UTF8CHAR CK_PTR CK_UTF8CHAR_PTR;
74 typedef CK_ULONG CK_PTR CK_ULONG_PTR;
75 typedef void CK_PTR CK_VOID_PTR;

77 /* Pointer to a CK_VOID_PTR-- i.e., pointer to pointer to void */
78 typedef CK_VOID_PTR CK_PTR CK_VOID_PTR_PTR;

81 /* The following value is always invalid if used as a session */
82 /* handle or object handle */
83 #define CK_INVALID_HANDLE 0

86 typedef struct CK_VERSION {
87     CK_BYTE major; /* integer portion of version number */
88     CK_BYTE minor; /* 1/100ths portion of version number */
89 } CK_VERSION;

91 typedef CK_VERSION CK_PTR CK_VERSION_PTR;

94 typedef struct CK_INFO {
95     /* manufacturerID and libraryDescription have been changed from
96      * CK_CHAR to CK_UTF8CHAR for v2.10 */
97     CK_VERSION cryptokiVersion; /* Cryptoki interface ver */
98     CK_UTF8CHAR manufacturerID[32]; /* blank padded */
99     CK_FLAGS flags; /* must be zero */

101     /* libraryDescription and libraryVersion are new for v2.0 */
102     CK_UTF8CHAR libraryDescription[32]; /* blank padded */
103     CK_VERSION libraryVersion; /* version of library */
104 } CK_INFO;

106 typedef CK_INFO CK_PTR CK_INFO_PTR;

109 /* CK_NOTIFICATION enumerates the types of notifications that
110  * Cryptoki provides to an application */
111 /* CK_NOTIFICATION has been changed from an enum to a CK_ULONG
112  * for v2.0 */
113 typedef CK_ULONG CK_NOTIFICATION;
114 #define KKN_SURRENDER 0

116 /* The following notification is new for PKCS #11 v2.20 amendment 3 */
117 #define KKN_OTP_CHANGED 1

120 typedef CK_ULONG CK_SLOT_ID;

122 typedef CK_SLOT_ID CK_PTR CK_SLOT_ID_PTR;

125 /* CK_SLOT_INFO provides information about a slot */
126 typedef struct CK_SLOT_INFO {
127     /* slotDescription and manufacturerID have been changed from
```

```

128  * CK_CHAR to CK_UTF8CHAR for v2.10 */
129  CK_UTF8CHAR slotDescription[64]; /* blank padded */
130  CK_UTF8CHAR manufacturerID[32]; /* blank padded */
131  CK_FLAGS    flags;

133  /* hardwareVersion and firmwareVersion are new for v2.0 */
134  CK_VERSION  hardwareVersion; /* version of hardware */
135  CK_VERSION  firmwareVersion; /* version of firmware */
136 } CK_SLOT_INFO;

138 /* flags: bit flags that provide capabilities of the slot
139  *      Bit Flag      Mask      Meaning
140  */
141 #define CKF_TOKEN_PRESENT      0x00000001 /* a token is there */
142 #define CKF_REMOVABLE_DEVICE   0x00000002 /* removable devices */
143 #define CKF_HW_SLOT           0x00000004 /* hardware slot */

145 typedef CK_SLOT_INFO CK_PTR CK_SLOT_INFO_PTR;

148 /* CK_TOKEN_INFO provides information about a token */
149 typedef struct CK_TOKEN_INFO {
150     /* label, manufacturerID, and model have been changed from
151     * CK_CHAR to CK_UTF8CHAR for v2.10 */
152     CK_UTF8CHAR label[32]; /* blank padded */
153     CK_UTF8CHAR manufacturerID[32]; /* blank padded */
154     CK_UTF8CHAR model[16]; /* blank padded */
155     CK_CHAR serialNumber[16]; /* blank padded */
156     CK_FLAGS flags; /* see below */

158     /* ulMaxSessionCount, ulSessionCount, ulMaxRwSessionCount,
159     * ulRwSessionCount, ulMaxPinLen, and ulMinPinLen have all been
160     * changed from CK_ULONG to CK_ULONG for v2.0 */
161     CK_ULONG ulMaxSessionCount; /* max open sessions */
162     CK_ULONG ulSessionCount; /* sess. now open */
163     CK_ULONG ulMaxRwSessionCount; /* max R/W sessions */
164     CK_ULONG ulRwSessionCount; /* R/W sess. now open */
165     CK_ULONG ulMaxPinLen; /* in bytes */
166     CK_ULONG ulMinPinLen; /* in bytes */
167     CK_ULONG ulTotalPublicMemory; /* in bytes */
168     CK_ULONG ulFreePublicMemory; /* in bytes */
169     CK_ULONG ulTotalPrivateMemory; /* in bytes */
170     CK_ULONG ulFreePrivateMemory; /* in bytes */

172     /* hardwareVersion, firmwareVersion, and time are new for
173     * v2.0 */
174     CK_VERSION hardwareVersion; /* version of hardware */
175     CK_VERSION firmwareVersion; /* version of firmware */
176     CK_CHAR utcTime[16]; /* time */
177 } CK_TOKEN_INFO;

179 /* The flags parameter is defined as follows:
180  *      Bit Flag      Mask      Meaning
181  */
182 #define CKF_RNG              0x00000001 /* has random #
183                                     * generator */
184 #define CKF_WRITE_PROTECTED   0x00000002 /* token is
185                                     * write-
186                                     * protected */
187 #define CKF_LOGIN_REQUIRED    0x00000004 /* user must
188                                     * login */
189 #define CKF_USER_PIN_INITIALIZED 0x00000008 /* normal user's
190                                     * PIN is set */

192 /* CKF_RESTORE_KEY_NOT_NEEDED is new for v2.0. If it is set,
193  * that means that *every* time the state of cryptographic

```

```

194  * operations of a session is successfully saved, all keys
195  * needed to continue those operations are stored in the state */
196 #define CKF_RESTORE_KEY_NOT_NEEDED 0x00000020

198 /* CKF_CLOCK_ON_TOKEN is new for v2.0. If it is set, that means
199  * that the token has some sort of clock. The time on that
200  * clock is returned in the token info structure */
201 #define CKF_CLOCK_ON_TOKEN      0x00000040

203 /* CKF_PROTECTED_AUTHENTICATION_PATH is new for v2.0. If it is
204  * set, that means that there is some way for the user to login
205  * without sending a PIN through the Cryptoki library itself */
206 #define CKF_PROTECTED_AUTHENTICATION_PATH 0x00000100

208 /* CKF_DUAL_CRYPT_OPERATIONS is new for v2.0. If it is true,
209  * that means that a single session with the token can perform
210  * dual simultaneous cryptographic operations (digest and
211  * encrypt; decrypt and digest; sign and encrypt; and decrypt
212  * and sign) */
213 #define CKF_DUAL_CRYPT_OPERATIONS 0x00000200

215 /* CKF_TOKEN_INITIALIZED if new for v2.10. If it is true, the
216  * token has been initialized using C_InitializeToken or an
217  * equivalent mechanism outside the scope of PKCS #11.
218  * Calling C_InitializeToken when this flag is set will cause
219  * the token to be reinitialized. */
220 #define CKF_TOKEN_INITIALIZED      0x00000400

222 /* CKF_SECONDARY_AUTHENTICATION if new for v2.10. If it is
223  * true, the token supports secondary authentication for
224  * private key objects. This flag is deprecated in v2.11 and
225  * onwards. */
226 #define CKF_SECONDARY_AUTHENTICATION 0x00000800

228 /* CKF_USER_PIN_COUNT_LOW if new for v2.10. If it is true, an
229  * incorrect user login PIN has been entered at least once
230  * since the last successful authentication. */
231 #define CKF_USER_PIN_COUNT_LOW      0x00010000

233 /* CKF_USER_PIN_FINAL_TRY if new for v2.10. If it is true,
234  * supplying an incorrect user PIN will it to become locked. */
235 #define CKF_USER_PIN_FINAL_TRY      0x00020000

237 /* CKF_USER_PIN_LOCKED if new for v2.10. If it is true, the
238  * user PIN has been locked. User login to the token is not
239  * possible. */
240 #define CKF_USER_PIN_LOCKED          0x00040000

242 /* CKF_USER_PIN_TO_BE_CHANGED if new for v2.10. If it is true,
243  * the user PIN value is the default value set by token
244  * initialization or manufacturing, or the PIN has been
245  * expired by the card. */
246 #define CKF_USER_PIN_TO_BE_CHANGED 0x00080000

248 /* CKF_SO_PIN_COUNT_LOW if new for v2.10. If it is true, an
249  * incorrect SO login PIN has been entered at least once since
250  * the last successful authentication. */
251 #define CKF_SO_PIN_COUNT_LOW         0x00100000

253 /* CKF_SO_PIN_FINAL_TRY if new for v2.10. If it is true,
254  * supplying an incorrect SO PIN will it to become locked. */
255 #define CKF_SO_PIN_FINAL_TRY         0x00200000

257 /* CKF_SO_PIN_LOCKED if new for v2.10. If it is true, the SO
258  * PIN has been locked. SO login to the token is not possible.
259  */

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260 #define CKF_SO_PIN_LOCKED          0x00400000

262 /* CKF_SO_PIN_TO_BE_CHANGED if new for v2.10. If it is true,
263  * the SO PIN value is the default value set by token
264  * initialization or manufacturing, or the PIN has been
265  * expired by the card. */
266 #define CKF_SO_PIN_TO_BE_CHANGED    0x00800000

268 typedef CK_TOKEN_INFO CK_PTR CK_TOKEN_INFO_PTR;

271 /* CK_SESSION_HANDLE is a Cryptoki-assigned value that
272  * identifies a session */
273 typedef CK_ULONG          CK_SESSION_HANDLE;

275 typedef CK_SESSION_HANDLE CK_PTR CK_SESSION_HANDLE_PTR;

278 /* CK_USER_TYPE enumerates the types of Cryptoki users */
279 /* CK_USER_TYPE has been changed from an enum to a CK_ULONG for
280  * v2.0 */
281 typedef CK_ULONG          CK_USER_TYPE;
282 /* Security Officer */
283 #define CKU_SO            0
284 /* Normal user */
285 #define CKU_USER          1
286 /* Context specific (added in v2.20) */
287 #define CKU_CONTEXT_SPECIFIC 2

289 /* CK_STATE enumerates the session states */
290 /* CK_STATE has been changed from an enum to a CK_ULONG for
291  * v2.0 */
292 typedef CK_ULONG          CK_STATE;
293 #define CKS_RO_PUBLIC_SESSION 0
294 #define CKS_RO_USER_FUNCTIONS 1
295 #define CKS_RW_PUBLIC_SESSION 2
296 #define CKS_RW_USER_FUNCTIONS 3
297 #define CKS_RW_SO_FUNCTIONS 4

300 /* CK_SESSION_INFO provides information about a session */
301 typedef struct CK_SESSION_INFO {
302     CK_SLOT_ID    slotID;
303     CK_STATE      state;
304     CK_FLAGS      flags;          /* see below */

306     /* ulDeviceError was changed from CK_USHORT to CK_ULONG for
307      * v2.0 */
308     CK_ULONG      ulDeviceError; /* device-dependent error code */
309 } CK_SESSION_INFO;

311 /* The flags are defined in the following table:
312  *      Bit Flag      Mask      Meaning
313  */
314 #define CKF_RW_SESSION    0x00000002 /* session is r/w */
315 #define CKF_SERIAL_SESSION 0x00000004 /* no parallel */

317 typedef CK_SESSION_INFO CK_PTR CK_SESSION_INFO_PTR;

320 /* CK_OBJECT_HANDLE is a token-specific identifier for an
321  * object */
322 typedef CK_ULONG          CK_OBJECT_HANDLE;

324 typedef CK_OBJECT_HANDLE CK_PTR CK_OBJECT_HANDLE_PTR;

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```

327 /* CK_OBJECT_CLASS is a value that identifies the classes (or
328  * types) of objects that Cryptoki recognizes. It is defined
329  * as follows: */
330 /* CK_OBJECT_CLASS was changed from CK_USHORT to CK_ULONG for
331  * v2.0 */
332 typedef CK_ULONG          CK_OBJECT_CLASS;

334 /* The following classes of objects are defined: */
335 /* CKO_HW_FEATURE is new for v2.10 */
336 /* CKO_DOMAIN_PARAMETERS is new for v2.11 */
337 /* CKO_MECHANISM is new for v2.20 */
338 #define CKO_DATA            0x00000000
339 #define CKO_CERTIFICATE     0x00000001
340 #define CKO_PUBLIC_KEY      0x00000002
341 #define CKO_PRIVATE_KEY     0x00000003
342 #define CKO_SECRET_KEY      0x00000004
343 #define CKO_HW_FEATURE      0x00000005
344 #define CKO_DOMAIN_PARAMETERS 0x00000006
345 #define CKO_MECHANISM       0x00000007

347 /* CKO_OTP_KEY is new for PKCS #11 v2.20 amendment 1 */
348 #define CKO_OTP_KEY         0x00000008

350 #define CKO_VENDOR_DEFINED  0x80000000

352 typedef CK_OBJECT_CLASS CK_PTR CK_OBJECT_CLASS_PTR;

354 /* CK_HW_FEATURE_TYPE is new for v2.10. CK_HW_FEATURE_TYPE is a
355  * value that identifies the hardware feature type of an object
356  * with CK_OBJECT_CLASS equal to CKO_HW_FEATURE. */
357 typedef CK_ULONG          CK_HW_FEATURE_TYPE;

359 /* The following hardware feature types are defined */
360 /* CKH_USER_INTERFACE is new for v2.20 */
361 #define CKH_MONOTONIC_COUNTER 0x00000001
362 #define CKH_CLOCK             0x00000002
363 #define CKH_USER_INTERFACE    0x00000003
364 #define CKH_VENDOR_DEFINED    0x80000000

366 /* CK_KEY_TYPE is a value that identifies a key type */
367 /* CK_KEY_TYPE was changed from CK_USHORT to CK_ULONG for v2.0 */
368 typedef CK_ULONG          CK_KEY_TYPE;

370 /* the following key types are defined: */
371 #define CKK_RSA              0x00000000
372 #define CKK_DSA              0x00000001
373 #define CKK_DH               0x00000002

375 /* CKK_ECDSA and CKK_KEA are new for v2.0 */
376 /* CKK_ECDSA is deprecated in v2.11, CKK_EC is preferred. */
377 #define CKK_ECDSA            0x00000003
378 #define CKK_EC               0x00000003
379 #define CKK_X9_42_DH         0x00000004
380 #define CKK_KEA              0x00000005

382 #define CKK_GENERIC_SECRET    0x00000010
383 #define CKK_RC2              0x00000011
384 #define CKK_RC4              0x00000012
385 #define CKK_DES              0x00000013
386 #define CKK_DES2             0x00000014
387 #define CKK_DES3             0x00000015

389 /* all these key types are new for v2.0 */
390 #define CKK_CAST              0x00000016
391 #define CKK_CAST3            0x00000017

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392 /* CKK_CAST5 is deprecated in v2.11, CKK_CAST128 is preferred. */
393 #define CKK_CAST5 0x00000018
394 #define CKK_CAST128 0x00000018
395 #define CKK_RC5 0x00000019
396 #define CKK_IDEA 0x0000001A
397 #define CKK_SKIPJACK 0x0000001B
398 #define CKK_BATON 0x0000001C
399 #define CKK_JUNIPER 0x0000001D
400 #define CKK_CDMF 0x0000001E
401 #define CKK_AES 0x0000001F

403 /* BlowFish and TwoFish are new for v2.20 */
404 #define CKK_BLOWFISH 0x00000020
405 #define CKK_TWOFISH 0x00000021

407 /* SecurID, HOTP, and ACTI are new for PKCS #11 v2.20 amendment 1 */
408 #define CKK_SECURID 0x00000022
409 #define CKK_HOTP 0x00000023
410 #define CKK_ACTI 0x00000024

412 /* Camellia is new for PKCS #11 v2.20 amendment 3 */
413 #define CKK_CAMELLIA 0x00000025
414 /* ARIA is new for PKCS #11 v2.20 amendment 3 */
415 #define CKK_ARIA 0x00000026

418 #define CKK_VENDOR_DEFINED 0x80000000

421 /* CK_CERTIFICATE_TYPE is a value that identifies a certificate
422  * type */
423 /* CK_CERTIFICATE_TYPE was changed from CK_USHORT to CK_ULONG
424  * for v2.0 */
425 typedef CK_ULONG CK_CERTIFICATE_TYPE;

427 /* The following certificate types are defined: */
428 /* CKC_X_509_ATTR_CERT is new for v2.10 */
429 /* CKC_WTLS is new for v2.20 */
430 #define CKC_X_509 0x00000000
431 #define CKC_X_509_ATTR_CERT 0x00000001
432 #define CKC_WTLS 0x00000002
433 #define CKC_VENDOR_DEFINED 0x80000000

436 /* CK_ATTRIBUTE_TYPE is a value that identifies an attribute
437  * type */
438 /* CK_ATTRIBUTE_TYPE was changed from CK_USHORT to CK_ULONG for
439  * v2.0 */
440 typedef CK_ULONG CK_ATTRIBUTE_TYPE;

442 /* The CKF_ARRAY_ATTRIBUTE flag identifies an attribute which
443  * consists of an array of values. */
444 #define CKF_ARRAY_ATTRIBUTE 0x40000000

446 /* The following OTP-related defines are new for PKCS #11 v2.20 amendment 1
447  * and relates to the CKA_OTP_FORMAT attribute */
448 #define CK_OTP_FORMAT_DECIMAL 0
449 #define CK_OTP_FORMAT_HEXADecimal 1
450 #define CK_OTP_FORMAT_ALPHANUMERIC 2
451 #define CK_OTP_FORMAT_BINARY 3

453 /* The following OTP-related defines are new for PKCS #11 v2.20 amendment 1
454  * and relates to the CKA_OTP_..._REQUIREMENT attributes */
455 #define CK_OTP_PARAM_IGNORED 0
456 #define CK_OTP_PARAM_OPTIONAL 1
457 #define CK_OTP_PARAM_MANDATORY 2
```

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459 /* The following attribute types are defined: */
460 #define CKA_CLASS 0x00000000
461 #define CKA_TOKEN 0x00000001
462 #define CKA_PRIVATE 0x00000002
463 #define CKA_LABEL 0x00000003
464 #define CKA_APPLICATION 0x00000010
465 #define CKA_VALUE 0x00000011

467 /* CKA_OBJECT_ID is new for v2.10 */
468 #define CKA_OBJECT_ID 0x00000012

470 #define CKA_CERTIFICATE_TYPE 0x00000080
471 #define CKA_ISSUER 0x00000081
472 #define CKA_SERIAL_NUMBER 0x00000082

474 /* CKA_AC_ISSUER, CKA_OWNER, and CKA_ATTR_TYPES are new
475  * for v2.10 */
476 #define CKA_AC_ISSUER 0x00000083
477 #define CKA_OWNER 0x00000084
478 #define CKA_ATTR_TYPES 0x00000085

480 /* CKA_TRUSTED is new for v2.11 */
481 #define CKA_TRUSTED 0x00000086

483 /* CKA_CERTIFICATE_CATEGORY ...
484  * CKA_CHECK_VALUE are new for v2.20 */
485 #define CKA_CERTIFICATE_CATEGORY 0x00000087
486 #define CKA_JAVA_MIDP_SECURITY_DOMAIN 0x00000088
487 #define CKA_URL 0x00000089
488 #define CKA_HASH_OF_SUBJECT_PUBLIC_KEY 0x0000008A
489 #define CKA_HASH_OF_ISSUER_PUBLIC_KEY 0x0000008B
490 #define CKA_CHECK_VALUE 0x00000090

492 #define CKA_KEY_TYPE 0x00000100
493 #define CKA_SUBJECT 0x00000101
494 #define CKA_ID 0x00000102
495 #define CKA_SENSITIVE 0x00000103
496 #define CKA_ENCRYPT 0x00000104
497 #define CKA_DECRYPT 0x00000105
498 #define CKA_WRAP 0x00000106
499 #define CKA_UNWRAP 0x00000107
500 #define CKA_SIGN 0x00000108
501 #define CKA_SIGN_RECOVER 0x00000109
502 #define CKA_VERIFY 0x0000010A
503 #define CKA_VERIFY_RECOVER 0x0000010B
504 #define CKA_DERIVE 0x0000010C
505 #define CKA_START_DATE 0x00000110
506 #define CKA_END_DATE 0x00000111
507 #define CKA_MODULUS 0x00000120
508 #define CKA_MODULUS_BITS 0x00000121
509 #define CKA_PUBLIC_EXPONENT 0x00000122
510 #define CKA_PRIVATE_EXPONENT 0x00000123
511 #define CKA_PRIME_1 0x00000124
512 #define CKA_PRIME_2 0x00000125
513 #define CKA_EXPONENT_1 0x00000126
514 #define CKA_EXPONENT_2 0x00000127
515 #define CKA_COEFFICIENT 0x00000128
516 #define CKA_PRIME 0x00000130
517 #define CKA_SUBPRIME 0x00000131
518 #define CKA_BASE 0x00000132

520 /* CKA_PRIME_BITS and CKA_SUBPRIME_BITS are new for v2.11 */
521 #define CKA_PRIME_BITS 0x00000133
522 #define CKA_SUBPRIME_BITS 0x00000134
523 #define CKA_SUBPRIME_BITS CKA_SUBPRIME_BITS
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524 /* (To retain backwards-compatibility) */

526 #define CKA_VALUE_BITS      0x00000160
527 #define CKA_VALUE_LEN      0x00000161

529 /* CKA_EXTRACTABLE, CKA_LOCAL, CKA_NEVER_EXTRACTABLE,
530  * CKA_ALWAYS_SENSITIVE, CKA_MODIFIABLE, CKA_ECDSA_PARAMS,
531  * and CKA_EC_POINT are new for v2.0 */
532 #define CKA_EXTRACTABLE      0x00000162
533 #define CKA_LOCAL            0x00000163
534 #define CKA_NEVER_EXTRACTABLE 0x00000164
535 #define CKA_ALWAYS_SENSITIVE 0x00000165

537 /* CKA_KEY_GEN_MECHANISM is new for v2.11 */
538 #define CKA_KEY_GEN_MECHANISM 0x00000166

540 #define CKA_MODIFIABLE        0x00000170

542 /* CKA_ECDSA_PARAMS is deprecated in v2.11,
543  * CKA_EC_PARAMS is preferred. */
544 #define CKA_ECDSA_PARAMS      0x00000180
545 #define CKA_EC_PARAMS         0x00000180

547 #define CKA_EC_POINT          0x00000181

549 /* CKA_SECONDARY_AUTH, CKA_AUTH_PIN_FLAGS,
550  * are new for v2.10. Deprecated in v2.11 and onwards. */
551 #define CKA_SECONDARY_AUTH    0x00000200
552 #define CKA_AUTH_PIN_FLAGS    0x00000201

554 /* CKA_ALWAYS_AUTHENTICATE ...
555  * CKA_UNWRAP_TEMPLATE are new for v2.20 */
556 #define CKA_ALWAYS_AUTHENTICATE 0x00000202

558 #define CKA_WRAP_WITH_TRUSTED 0x00000210
559 #define CKA_WRAP_TEMPLATE      (CKF_ARRAY_ATTRIBUTE|0x00000211)
560 #define CKA_UNWRAP_TEMPLATE    (CKF_ARRAY_ATTRIBUTE|0x00000212)

562 /* CKA_OTP... attributes are new for PKCS #11 v2.20 amendment 3. */
563 #define CKA_OTP_FORMAT         0x00000220
564 #define CKA_OTP_LENGTH         0x00000221
565 #define CKA_OTP_TIME_INTERVAL 0x00000222
566 #define CKA_OTP_USER_FRIENDLY_MODE 0x00000223
567 #define CKA_OTP_CHALLENGE_REQUIREMENT 0x00000224
568 #define CKA_OTP_TIME_REQUIREMENT 0x00000225
569 #define CKA_OTP_COUNTER_REQUIREMENT 0x00000226
570 #define CKA_OTP_PIN_REQUIREMENT 0x00000227
571 #define CKA_OTP_COUNTER        0x0000022E
572 #define CKA_OTP_TIME           0x0000022F
573 #define CKA_OTP_USER_IDENTIFIER 0x0000022A
574 #define CKA_OTP_SERVICE_IDENTIFIER 0x0000022B
575 #define CKA_OTP_SERVICE_LOGO    0x0000022C
576 #define CKA_OTP_SERVICE_LOGO_TYPE 0x0000022D

579 /* CKA_HW_FEATURE_TYPE, CKA_RESET_ON_INIT, and CKA_HAS_RESET
580  * are new for v2.10 */
581 #define CKA_HW_FEATURE_TYPE    0x00000300
582 #define CKA_RESET_ON_INIT      0x00000301
583 #define CKA_HAS_RESET          0x00000302

585 /* The following attributes are new for v2.20 */
586 #define CKA_PIXEL_X            0x00000400
587 #define CKA_PIXEL_Y            0x00000401
588 #define CKA_RESOLUTION         0x00000402
589 #define CKA_CHAR_ROWS          0x00000403

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590 #define CKA_CHAR_COLUMNS      0x00000404
591 #define CKA_COLOR              0x00000405
592 #define CKA_BITS_PER_PIXEL    0x00000406
593 #define CKA_CHAR_SETS         0x00000480
594 #define CKA_ENCODING_METHODS  0x00000481
595 #define CKA_MIME_TYPES         0x00000482
596 #define CKA_MECHANISM_TYPE     0x00000500
597 #define CKA_REQUIRED_CMS_ATTRIBUTES 0x00000501
598 #define CKA_DEFAULT_CMS_ATTRIBUTES 0x00000502
599 #define CKA_SUPPORTED_CMS_ATTRIBUTES 0x00000503
600 #define CKA_ALLOWED_MECHANISMS (CKF_ARRAY_ATTRIBUTE|0x00000600)

602 #define CKA_VENDOR_DEFINED     0x80000000

604 /* CK_ATTRIBUTE is a structure that includes the type, length
605  * and value of an attribute */
606 typedef struct CK_ATTRIBUTE {
607     CK_ATTRIBUTE_TYPE type;
608     CK_VOID_PTR pValue;

610     /* ulValueLen went from CK_USHORT to CK_ULONG for v2.0 */
611     CK_ULONG ulValueLen; /* in bytes */
612 } CK_ATTRIBUTE;

614 typedef CK_ATTRIBUTE CK_PTR CK_ATTRIBUTE_PTR;

617 /* CK_DATE is a structure that defines a date */
618 typedef struct CK_DATE {
619     CK_CHAR year[4]; /* the year ("1900" - "9999") */
620     CK_CHAR month[2]; /* the month ("01" - "12") */
621     CK_CHAR day[2]; /* the day ("01" - "31") */
622 } CK_DATE;

625 /* CK_MECHANISM_TYPE is a value that identifies a mechanism
626  * type */
627 /* CK_MECHANISM_TYPE was changed from CK_USHORT to CK_ULONG for
628  * v2.0 */
629 typedef CK_ULONG CK_MECHANISM_TYPE;

631 /* the following mechanism types are defined: */
632 #define CKM_RSA_PKCS_KEY_PAIR_GEN 0x00000000
633 #define CKM_RSA_PKCS 0x00000001
634 #define CKM_RSA_9796 0x00000002
635 #define CKM_RSA_X_509 0x00000003

637 /* CKM_MD2_RSA_PKCS, CKM_MD5_RSA_PKCS, and CKM_SHA1_RSA_PKCS
638  * are new for v2.0. They are mechanisms which hash and sign */
639 #define CKM_MD2_RSA_PKCS 0x00000004
640 #define CKM_MD5_RSA_PKCS 0x00000005
641 #define CKM_SHA1_RSA_PKCS 0x00000006

643 /* CKM_RIPEMD128_RSA_PKCS, CKM_RIPEMD160_RSA_PKCS, and
644  * CKM_RSA_PKCS_OAEP are new for v2.10 */
645 #define CKM_RIPEMD128_RSA_PKCS 0x00000007
646 #define CKM_RIPEMD160_RSA_PKCS 0x00000008
647 #define CKM_RSA_PKCS_OAEP 0x00000009

649 /* CKM_RSA_X9_31_KEY_PAIR_GEN, CKM_RSA_X9_31, CKM_SHA1_RSA_X9_31,
650  * CKM_RSA_PKCS_PSS, and CKM_SHA1_RSA_PKCS_PSS are new for v2.11 */
651 #define CKM_RSA_X9_31_KEY_PAIR_GEN 0x0000000A
652 #define CKM_RSA_X9_31 0x0000000B
653 #define CKM_SHA1_RSA_X9_31 0x0000000C
654 #define CKM_RSA_PKCS_PSS 0x0000000D
655 #define CKM_SHA1_RSA_PKCS_PSS 0x0000000E

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657 #define CKM_DSA_KEY_PAIR_GEN          0x00000010
658 #define CKM_DSA                        0x00000011
659 #define CKM_DSA_SHA1                   0x00000012
660 #define CKM_DH_PKCS_KEY_PAIR_GEN       0x00000020
661 #define CKM_DH_PKCS_DERIVE              0x00000021

663 /* CKM_X9_42_DH_KEY_PAIR_GEN, CKM_X9_42_DH_DERIVE,
664  * CKM_X9_42_DH_HYBRID_DERIVE, and CKM_X9_42_MQV_DERIVE are new for
665  * v2.11 */
666 #define CKM_X9_42_DH_KEY_PAIR_GEN       0x00000030
667 #define CKM_X9_42_DH_DERIVE              0x00000031
668 #define CKM_X9_42_DH_HYBRID_DERIVE      0x00000032
669 #define CKM_X9_42_MQV_DERIVE            0x00000033

671 /* CKM_SHA256/384/512 are new for v2.20 */
672 #define CKM_SHA256_RSA_PKCS             0x00000040
673 #define CKM_SHA384_RSA_PKCS             0x00000041
674 #define CKM_SHA512_RSA_PKCS            0x00000042
675 #define CKM_SHA256_RSA_PKCS_PSS        0x00000043
676 #define CKM_SHA384_RSA_PKCS_PSS        0x00000044
677 #define CKM_SHA512_RSA_PKCS_PSS        0x00000045

679 /* SHA-224 RSA mechanisms are new for PKCS #11 v2.20 amendment 3 */
680 #define CKM_SHA224_RSA_PKCS             0x00000046
681 #define CKM_SHA224_RSA_PKCS_PSS        0x00000047

683 #define CKM_RC2_KEY_GEN                  0x00000100
684 #define CKM_RC2_ECB                     0x00000101
685 #define CKM_RC2_CBC                     0x00000102
686 #define CKM_RC2_MAC                     0x00000103

688 /* CKM_RC2_MAC_GENERAL and CKM_RC2_CBC_PAD are new for v2.0 */
689 #define CKM_RC2_MAC_GENERAL              0x00000104
690 #define CKM_RC2_CBC_PAD                  0x00000105

692 #define CKM_RC4_KEY_GEN                  0x00000110
693 #define CKM_RC4                          0x00000111
694 #define CKM_DES_KEY_GEN                  0x00000120
695 #define CKM_DES_ECB                     0x00000121
696 #define CKM_DES_CBC                     0x00000122
697 #define CKM_DES_MAC                     0x00000123

699 /* CKM_DES_MAC_GENERAL and CKM_DES_CBC_PAD are new for v2.0 */
700 #define CKM_DES_MAC_GENERAL              0x00000124
701 #define CKM_DES_CBC_PAD                  0x00000125

703 #define CKM_DES2_KEY_GEN                  0x00000130
704 #define CKM_DES3_KEY_GEN                  0x00000131
705 #define CKM_DES3_ECB                     0x00000132
706 #define CKM_DES3_CBC                     0x00000133
707 #define CKM_DES3_MAC                     0x00000134

709 /* CKM_DES3_MAC_GENERAL, CKM_DES3_CBC_PAD, CKM_CDMF_KEY_GEN,
710  * CKM_CDMF_ECB, CKM_CDMF_CBC, CKM_CDMF_MAC,
711  * CKM_CDMF_MAC_GENERAL, and CKM_CDMF_CBC_PAD are new for v2.0 */
712 #define CKM_DES3_MAC_GENERAL              0x00000135
713 #define CKM_DES3_CBC_PAD                  0x00000136
714 #define CKM_CDMF_KEY_GEN                  0x00000140
715 #define CKM_CDMF_ECB                     0x00000141
716 #define CKM_CDMF_CBC                     0x00000142
717 #define CKM_CDMF_MAC                     0x00000143
718 #define CKM_CDMF_MAC_GENERAL              0x00000144
719 #define CKM_CDMF_CBC_PAD                  0x00000145

721 /* the following four DES mechanisms are new for v2.20 */

```

```

722 #define CKM_DES_OFB64                    0x00000150
723 #define CKM_DES_OFB8                     0x00000151
724 #define CKM_DES_CFB64                    0x00000152
725 #define CKM_DES_CFB8                     0x00000153

727 #define CKM_MD2                          0x00000200

729 /* CKM_MD2_HMAC and CKM_MD2_HMAC_GENERAL are new for v2.0 */
730 #define CKM_MD2_HMAC                     0x00000201
731 #define CKM_MD2_HMAC_GENERAL              0x00000202

733 #define CKM_MD5                          0x00000210

735 /* CKM_MD5_HMAC and CKM_MD5_HMAC_GENERAL are new for v2.0 */
736 #define CKM_MD5_HMAC                     0x00000211
737 #define CKM_MD5_HMAC_GENERAL              0x00000212

739 #define CKM_SHA_1                        0x00000220

741 /* CKM_SHA_1_HMAC and CKM_SHA_1_HMAC_GENERAL are new for v2.0 */
742 #define CKM_SHA_1_HMAC                   0x00000221
743 #define CKM_SHA_1_HMAC_GENERAL            0x00000222

745 /* CKM_RIPEMD128, CKM_RIPEMD128_HMAC,
746  * CKM_RIPEMD128_HMAC_GENERAL, CKM_RIPEMD160, CKM_RIPEMD160_HMAC,
747  * and CKM_RIPEMD160_HMAC_GENERAL are new for v2.10 */
748 #define CKM_RIPEMD128                    0x00000230
749 #define CKM_RIPEMD128_HMAC               0x00000231
750 #define CKM_RIPEMD128_HMAC_GENERAL        0x00000232
751 #define CKM_RIPEMD160                    0x00000240
752 #define CKM_RIPEMD160_HMAC               0x00000241
753 #define CKM_RIPEMD160_HMAC_GENERAL        0x00000242

755 /* CKM_SHA256/384/512 are new for v2.20 */
756 #define CKM_SHA256                       0x00000250
757 #define CKM_SHA256_HMAC                  0x00000251
758 #define CKM_SHA256_HMAC_GENERAL           0x00000252

760 /* SHA-224 is new for PKCS #11 v2.20 amendment 3 */
761 #define CKM_SHA224                       0x00000255
762 #define CKM_SHA224_HMAC                  0x00000256
763 #define CKM_SHA224_HMAC_GENERAL           0x00000257

765 #define CKM_SHA384                       0x00000260
766 #define CKM_SHA384_HMAC                  0x00000261
767 #define CKM_SHA384_HMAC_GENERAL           0x00000262
768 #define CKM_SHA512                       0x00000270
769 #define CKM_SHA512_HMAC                  0x00000271
770 #define CKM_SHA512_HMAC_GENERAL           0x00000272

772 /* SecurID is new for PKCS #11 v2.20 amendment 1 */
773 #define CKM_SECURID_KEY_GEN               0x00000280
774 #define CKM_SECURID                       0x00000282

776 /* HOTP is new for PKCS #11 v2.20 amendment 1 */
777 #define CKM_HOTP_KEY_GEN                  0x00000290
778 #define CKM_HOTP                          0x00000291

780 /* ACTI is new for PKCS #11 v2.20 amendment 1 */
781 #define CKM_ACTI                          0x000002A0
782 #define CKM_ACTI_KEY_GEN                  0x000002A1

784 /* All of the following mechanisms are new for v2.0 */
785 /* Note that CAST128 and CAST5 are the same algorithm */
786 #define CKM_CAST_KEY_GEN                  0x00000300
787 #define CKM_CAST_ECB                      0x00000301

```

```
788 #define CKM_CAST_CBC 0x00000302
789 #define CKM_CAST_MAC 0x00000303
790 #define CKM_CAST_MAC_GENERAL 0x00000304
791 #define CKM_CAST_CBC_PAD 0x00000305
792 #define CKM_CAST3_KEY_GEN 0x00000310
793 #define CKM_CAST3_ECB 0x00000311
794 #define CKM_CAST3_CBC 0x00000312
795 #define CKM_CAST3_MAC 0x00000313
796 #define CKM_CAST3_MAC_GENERAL 0x00000314
797 #define CKM_CAST3_CBC_PAD 0x00000315
798 #define CKM_CAST5_KEY_GEN 0x00000320
799 #define CKM_CAST128_KEY_GEN 0x00000320
800 #define CKM_CAST5_ECB 0x00000321
801 #define CKM_CAST128_ECB 0x00000321
802 #define CKM_CAST5_CBC 0x00000322
803 #define CKM_CAST128_CBC 0x00000322
804 #define CKM_CAST5_MAC 0x00000323
805 #define CKM_CAST128_MAC 0x00000323
806 #define CKM_CAST5_MAC_GENERAL 0x00000324
807 #define CKM_CAST128_MAC_GENERAL 0x00000324
808 #define CKM_CAST5_CBC_PAD 0x00000325
809 #define CKM_CAST128_CBC_PAD 0x00000325
810 #define CKM_RC5_KEY_GEN 0x00000330
811 #define CKM_RC5_ECB 0x00000331
812 #define CKM_RC5_CBC 0x00000332
813 #define CKM_RC5_MAC 0x00000333
814 #define CKM_RC5_MAC_GENERAL 0x00000334
815 #define CKM_RC5_CBC_PAD 0x00000335
816 #define CKM_IDEA_KEY_GEN 0x00000340
817 #define CKM_IDEA_ECB 0x00000341
818 #define CKM_IDEA_CBC 0x00000342
819 #define CKM_IDEA_MAC 0x00000343
820 #define CKM_IDEA_MAC_GENERAL 0x00000344
821 #define CKM_IDEA_CBC_PAD 0x00000345
822 #define CKM_GENERIC_SECRET_KEY_GEN 0x00000350
823 #define CKM_CONCATENATE_BASE_AND_KEY 0x00000360
824 #define CKM_CONCATENATE_BASE_AND_DATA 0x00000362
825 #define CKM_CONCATENATE_DATA_AND_BASE 0x00000363
826 #define CKM_XOR_BASE_AND_DATA 0x00000364
827 #define CKM_EXTRACT_KEY_FROM_KEY 0x00000365
828 #define CKM_SSL3_PRE_MASTER_KEY_GEN 0x00000370
829 #define CKM_SSL3_MASTER_KEY_DERIVE 0x00000371
830 #define CKM_SSL3_KEY_AND_MAC_DERIVE 0x00000372

832 /* CKM_SSL3_MASTER_KEY_DERIVE_DH, CKM_TLS_PRE_MASTER_KEY_GEN,
833  * CKM_TLS_MASTER_KEY_DERIVE, CKM_TLS_KEY_AND_MAC_DERIVE, and
834  * CKM_TLS_MASTER_KEY_DERIVE_DH are new for v2.11 */
835 #define CKM_SSL3_MASTER_KEY_DERIVE_DH 0x00000373
836 #define CKM_TLS_PRE_MASTER_KEY_GEN 0x00000374
837 #define CKM_TLS_MASTER_KEY_DERIVE 0x00000375
838 #define CKM_TLS_KEY_AND_MAC_DERIVE 0x00000376
839 #define CKM_TLS_MASTER_KEY_DERIVE_DH 0x00000377

841 /* CKM_TLS_PRFF is new for v2.20 */
842 #define CKM_TLS_PRFF 0x00000378

844 #define CKM_SSL3_MD5_MAC 0x00000380
845 #define CKM_SSL3_SHA1_MAC 0x00000381
846 #define CKM_MD5_KEY_DERIVATION 0x00000390
847 #define CKM_MD2_KEY_DERIVATION 0x00000391
848 #define CKM_SHA1_KEY_DERIVATION 0x00000392

850 /* CKM_SHA256/384/512 are new for v2.20 */
851 #define CKM_SHA256_KEY_DERIVATION 0x00000393
852 #define CKM_SHA384_KEY_DERIVATION 0x00000394
853 #define CKM_SHA512_KEY_DERIVATION 0x00000395
```

```
855 /* SHA-224 key derivation is new for PKCS #11 v2.20 amendment 3 */
856 #define CKM_SHA224_KEY_DERIVATION 0x00000396

858 #define CKM_PBE_MD2_DES_CBC 0x000003A0
859 #define CKM_PBE_MD5_DES_CBC 0x000003A1
860 #define CKM_PBE_MD5_CAST_CBC 0x000003A2
861 #define CKM_PBE_MD5_CAST3_CBC 0x000003A3
862 #define CKM_PBE_MD5_CAST5_CBC 0x000003A4
863 #define CKM_PBE_MD5_CAST128_CBC 0x000003A4
864 #define CKM_PBE_SHA1_CAST5_CBC 0x000003A5
865 #define CKM_PBE_SHA1_CAST128_CBC 0x000003A5
866 #define CKM_PBE_SHA1_RC4_128 0x000003A6
867 #define CKM_PBE_SHA1_RC4_40 0x000003A7
868 #define CKM_PBE_SHA1_DES3_EDE_CBC 0x000003A8
869 #define CKM_PBE_SHA1_DES2_EDE_CBC 0x000003A9
870 #define CKM_PBE_SHA1_RC2_128_CBC 0x000003AA
871 #define CKM_PBE_SHA1_RC2_40_CBC 0x000003AB

873 /* CKM_PKCS5_PBKDF2 is new for v2.10 */
874 #define CKM_PKCS5_PBKDF2 0x000003B0

876 #define CKM_PBA_SHA1_WITH_SHA1_HMAC 0x000003C0

878 /* WTLS mechanisms are new for v2.20 */
879 #define CKM_WTLS_PRE_MASTER_KEY_GEN 0x000003D0
880 #define CKM_WTLS_MASTER_KEY_DERIVE 0x000003D1
881 #define CKM_WTLS_MASTER_KEY_DERIVE_DH_ECC 0x000003D2
882 #define CKM_WTLS_PRFF 0x000003D3
883 #define CKM_WTLS_SERVER_KEY_AND_MAC_DERIVE 0x000003D4
884 #define CKM_WTLS_CLIENT_KEY_AND_MAC_DERIVE 0x000003D5

886 #define CKM_KEY_WRAP_LYNKS 0x00000400
887 #define CKM_KEY_WRAP_SET_OAEP 0x00000401

889 /* CKM_CMS_SIG is new for v2.20 */
890 #define CKM_CMS_SIG 0x00000500

892 /* CKM_KIP mechanisms are new for PKCS #11 v2.20 amendment 2 */
893 #define CKM_KIP_DERIVE 0x00000510
894 #define CKM_KIP_WRAP 0x00000511
895 #define CKM_KIP_MAC 0x00000512

897 /* Camellia is new for PKCS #11 v2.20 amendment 3 */
898 #define CKM_CAMELLIA_KEY_GEN 0x00000550
899 #define CKM_CAMELLIA_ECB 0x00000551
900 #define CKM_CAMELLIA_CBC 0x00000552
901 #define CKM_CAMELLIA_MAC 0x00000553
902 #define CKM_CAMELLIA_MAC_GENERAL 0x00000554
903 #define CKM_CAMELLIA_CBC_PAD 0x00000555
904 #define CKM_CAMELLIA_ECB_ENCRYPT_DATA 0x00000556
905 #define CKM_CAMELLIA_CBC_ENCRYPT_DATA 0x00000557
906 #define CKM_CAMELLIA_CTR 0x00000558

908 /* ARIA is new for PKCS #11 v2.20 amendment 3 */
909 #define CKM_ARIA_KEY_GEN 0x00000560
910 #define CKM_ARIA_ECB 0x00000561
911 #define CKM_ARIA_CBC 0x00000562
912 #define CKM_ARIA_MAC 0x00000563
913 #define CKM_ARIA_MAC_GENERAL 0x00000564
914 #define CKM_ARIA_CBC_PAD 0x00000565
915 #define CKM_ARIA_ECB_ENCRYPT_DATA 0x00000566
916 #define CKM_ARIA_CBC_ENCRYPT_DATA 0x00000567

918 /* Fortezza mechanisms */
919 #define CKM_SKIPJACK_KEY_GEN 0x00001000
```



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920 #define CKM_SKIPJACK_ECB64      0x00001001
921 #define CKM_SKIPJACK_CBC64      0x00001002
922 #define CKM_SKIPJACK_OFB64      0x00001003
923 #define CKM_SKIPJACK_CFB64      0x00001004
924 #define CKM_SKIPJACK_CFB32      0x00001005
925 #define CKM_SKIPJACK_CFB16      0x00001006
926 #define CKM_SKIPJACK_CFB8       0x00001007
927 #define CKM_SKIPJACK_WRAP       0x00001008
928 #define CKM_SKIPJACK_PRIVATE_WRAP 0x00001009
929 #define CKM_SKIPJACK_RELAYX      0x0000100a
930 #define CKM_KEA_KEY_PAIR_GEN     0x00001010
931 #define CKM_KEA_KEY_DERIVE       0x00001011
932 #define CKM_FORTEZZA_TIMESTAMP  0x00001020
933 #define CKM_BATON_KEY_GEN        0x00001030
934 #define CKM_BATON_ECB128        0x00001031
935 #define CKM_BATON_ECB96         0x00001032
936 #define CKM_BATON_CBC128        0x00001033
937 #define CKM_BATON_COUNTER        0x00001034
938 #define CKM_BATON_SHUFFLE        0x00001035
939 #define CKM_BATON_WRAP          0x00001036

941 /* CKM_ECDSA_KEY_PAIR_GEN is deprecated in v2.11,
942  * CKM_EC_KEY_PAIR_GEN is preferred */
943 #define CKM_ECDSA_KEY_PAIR_GEN   0x00001040
944 #define CKM_EC_KEY_PAIR_GEN      0x00001040

946 #define CKM_ECDSA                0x00001041
947 #define CKM_ECDSA_SHA1           0x00001042

949 /* CKM_ECDH1_DERIVE, CKM_ECDH1_COFACTOR_DERIVE, and CKM_ECMQV_DERIVE
950  * are new for v2.11 */
951 #define CKM_ECDH1_DERIVE         0x00001050
952 #define CKM_ECDH1_COFACTOR_DERIVE 0x00001051
953 #define CKM_ECMQV_DERIVE         0x00001052

955 #define CKM_JUNIPER_KEY_GEN      0x00001060
956 #define CKM_JUNIPER_ECB128      0x00001061
957 #define CKM_JUNIPER_CBC128      0x00001062
958 #define CKM_JUNIPER_COUNTER      0x00001063
959 #define CKM_JUNIPER_SHUFFLE      0x00001064
960 #define CKM_JUNIPER_WRAP         0x00001065
961 #define CKM_FASTHASH             0x00001070

963 /* CKM_AES_KEY_GEN, CKM_AES_ECB, CKM_AES_CBC, CKM_AES_MAC,
964  * CKM_AES_MAC_GENERAL, CKM_AES_CBC_PAD, CKM_DSA_PARAMETER_GEN,
965  * CKM_DH_PKCS_PARAMETER_GEN, and CKM_X9_42_DH_PARAMETER_GEN are
966  * new for v2.11 */
967 #define CKM_AES_KEY_GEN          0x00001080
968 #define CKM_AES_ECB              0x00001081
969 #define CKM_AES_CBC              0x00001082
970 #define CKM_AES_MAC              0x00001083
971 #define CKM_AES_MAC_GENERAL      0x00001084
972 #define CKM_AES_CBC_PAD          0x00001085

974 /* AES counter mode is new for PKCS #11 v2.20 amendment 3 */
975 #define CKM_AES_CTR              0x00001086

977 /* BlowFish and TwoFish are new for v2.20 */
978 #define CKM_BLOWFISH_KEY_GEN     0x00001090
979 #define CKM_BLOWFISH_CBC         0x00001091
980 #define CKM_TWOFISH_KEY_GEN      0x00001092
981 #define CKM_TWOFISH_CBC          0x00001093

984 /* CKM_xxx_ENCRYPT_DATA mechanisms are new for v2.20 */
985 #define CKM_DES_ECB_ENCRYPT_DATA  0x00001100

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986 #define CKM_DES_CBC_ENCRYPT_DATA 0x00001101
987 #define CKM_DES3_ECB_ENCRYPT_DATA 0x00001102
988 #define CKM_DES3_CBC_ENCRYPT_DATA 0x00001103
989 #define CKM_AES_ECB_ENCRYPT_DATA 0x00001104
990 #define CKM_AES_CBC_ENCRYPT_DATA 0x00001105

992 #define CKM_DSA_PARAMETER_GEN    0x00002000
993 #define CKM_DH_PKCS_PARAMETER_GEN 0x00002001
994 #define CKM_X9_42_DH_PARAMETER_GEN 0x00002002

996 #define CKM_VENDOR_DEFINED       0x80000000

998 typedef CK_MECHANISM_TYPE CK_PTR CK_MECHANISM_TYPE_PTR;

1001 /* CK_MECHANISM is a structure that specifies a particular
1002  * mechanism */
1003 typedef struct CK_MECHANISM {
1004     CK_MECHANISM_TYPE mechanism;
1005     CK_VOID_PTR          pParameter;

1007     /* ulParameterLen was changed from CK_USHORT to CK_ULONG for
1008      * v2.0 */
1009     CK_ULONG              ulParameterLen; /* in bytes */
1010 } CK_MECHANISM;

1012 typedef CK_MECHANISM CK_PTR CK_MECHANISM_PTR;

1015 /* CK_MECHANISM_INFO provides information about a particular
1016  * mechanism */
1017 typedef struct CK_MECHANISM_INFO {
1018     CK_ULONG              ulMinKeySize;
1019     CK_ULONG              ulMaxKeySize;
1020     CK_FLAGS              flags;
1021 } CK_MECHANISM_INFO;

1023 /* The flags are defined as follows:
1024  * Bit Flag      Mask      Meaning */
1025 #define CKF_HW    0x00000001 /* performed by HW */

1027 /* The flags CKF_ENCRYPT, CKF_DECRYPT, CKF_DIGEST, CKF_SIGN,
1028  * CKG_SIGN_RECOVER, CKF_VERIFY, CKF_VERIFY_RECOVER,
1029  * CKF_GENERATE, CKF_GENERATE_KEY_PAIR, CKF_WRAP, CKF_UNWRAP,
1030  * and CKF_DERIVE are new for v2.0. They specify whether or not
1031  * a mechanism can be used for a particular task */
1032 #define CKF_ENCRYPT      0x00000100
1033 #define CKF_DECRYPT      0x00000200
1034 #define CKF_DIGEST      0x00000400
1035 #define CKF_SIGN        0x00000800
1036 #define CKF_SIGN_RECOVER 0x00001000
1037 #define CKF_VERIFY      0x00002000
1038 #define CKF_VERIFY_RECOVER 0x00004000
1039 #define CKF_GENERATE     0x00008000
1040 #define CKF_GENERATE_KEY_PAIR 0x00010000
1041 #define CKF_WRAP         0x00020000
1042 #define CKF_UNWRAP      0x00040000
1043 #define CKF_DERIVE       0x00080000

1045 /* CKF_EC_F_P, CKF_EC_F_2M, CKF_EC_ECPARAMETERS, CKF_EC_NAMEDCURVE,
1046  * CKF_EC_UNCOMPRESS, and CKF_EC_COMPRESS are new for v2.11. They
1047  * describe a token's EC capabilities not available in mechanism
1048  * information. */
1049 #define CKF_EC_F_P      0x00100000
1050 #define CKF_EC_F_2M     0x00200000
1051 #define CKF_EC_ECPARAMETERS 0x00400000

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1052 #define CKF_EC_NAMEDCURVE      0x00800000
1053 #define CKF_EC_UNCOMPRESS      0x01000000
1054 #define CKF_EC_COMPRESS        0x02000000

1056 #define CKF_EXTENSION            0x80000000 /* FALSE for this version */

1058 typedef CK_MECHANISM_INFO CK_PTR CK_MECHANISM_INFO_PTR;

1061 /* CK_RV is a value that identifies the return value of a
1062  * Cryptoki function */
1063 /* CK_RV was changed from CK_USHORT to CK_ULONG for v2.0 */
1064 typedef CK_ULONG CK_RV;

1066 #define CKR_OK                    0x00000000
1067 #define CKR_CANCEL                0x00000001
1068 #define CKR_HOST_MEMORY           0x00000002
1069 #define CKR_SLOT_ID_INVALID       0x00000003

1071 /* CKR_FLAGS_INVALID was removed for v2.0 */

1073 /* CKR_GENERAL_ERROR and CKR_FUNCTION_FAILED are new for v2.0 */
1074 #define CKR_GENERAL_ERROR         0x00000005
1075 #define CKR_FUNCTION_FAILED       0x00000006

1077 /* CKR_ARGUMENTS_BAD, CKR_NO_EVENT, CKR_NEED_TO_CREATE_THREADS,
1078  * and CKR_CANT_LOCK are new for v2.01 */
1079 #define CKR_ARGUMENTS_BAD         0x00000007
1080 #define CKR_NO_EVENT              0x00000008
1081 #define CKR_NEED_TO_CREATE_THREADS 0x00000009
1082 #define CKR_CANT_LOCK             0x0000000A

1084 #define CKR_ATTRIBUTE_READ_ONLY   0x00000010
1085 #define CKR_ATTRIBUTE_SENSITIVE   0x00000011
1086 #define CKR_ATTRIBUTE_TYPE_INVALID 0x00000012
1087 #define CKR_ATTRIBUTE_VALUE_INVALID 0x00000013
1088 #define CKR_DATA_INVALID          0x00000020
1089 #define CKR_DATA_LEN_RANGE        0x00000021
1090 #define CKR_DEVICE_ERROR          0x00000030
1091 #define CKR_DEVICE_MEMORY         0x00000031
1092 #define CKR_DEVICE_REMOVED        0x00000032
1093 #define CKR_ENCRYPTED_DATA_INVALID 0x00000040
1094 #define CKR_ENCRYPTED_DATA_LEN_RANGE 0x00000041
1095 #define CKR_FUNCTION_CANCELED     0x00000050
1096 #define CKR_FUNCTION_NOT_PARALLEL 0x00000051

1098 /* CKR_FUNCTION_NOT_SUPPORTED is new for v2.0 */
1099 #define CKR_FUNCTION_NOT_SUPPORTED 0x00000054

1101 #define CKR_KEY_HANDLE_INVALID     0x00000060

1103 /* CKR_KEY_SENSITIVE was removed for v2.0 */

1105 #define CKR_KEY_SIZE_RANGE         0x00000062
1106 #define CKR_KEY_TYPE_INCONSISTENT 0x00000063

1108 /* CKR_KEY_NOT_NEEDED, CKR_KEY_CHANGED, CKR_KEY_NEEDED,
1109  * CKR_KEY_INDIGESTIBLE, CKR_KEY_FUNCTION_NOT_PERMITTED,
1110  * CKR_KEY_NOT_WRAPPABLE, and CKR_KEY_UNEXTRACTABLE are new for
1111  * v2.0 */
1112 #define CKR_KEY_NOT_NEEDED         0x00000064
1113 #define CKR_KEY_CHANGED            0x00000065
1114 #define CKR_KEY_NEEDED             0x00000066
1115 #define CKR_KEY_INDIGESTIBLE       0x00000067
1116 #define CKR_KEY_FUNCTION_NOT_PERMITTED 0x00000068
1117 #define CKR_KEY_NOT_WRAPPABLE     0x00000069
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1118 #define CKR_KEY_UNEXTRACTABLE     0x0000006A

1120 #define CKR_MECHANISM_INVALID      0x00000070
1121 #define CKR_MECHANISM_PARAM_INVALID 0x00000071

1123 /* CKR_OBJECT_CLASS_INCONSISTENT and CKR_OBJECT_CLASS_INVALID
1124  * were removed for v2.0 */
1125 #define CKR_OBJECT_HANDLE_INVALID  0x00000082
1126 #define CKR_OPERATION_ACTIVE        0x00000090
1127 #define CKR_OPERATION_NOT_INITIALIZED 0x00000091
1128 #define CKR_PIN_INCORRECT          0x000000A0
1129 #define CKR_PIN_INVALID             0x000000A1
1130 #define CKR_PIN_LEN_RANGE          0x000000A2

1132 /* CKR_PIN_EXPIRED and CKR_PIN_LOCKED are new for v2.0 */
1133 #define CKR_PIN_EXPIRED             0x000000A3
1134 #define CKR_PIN_LOCKED              0x000000A4

1136 #define CKR_SESSION_CLOSED          0x000000B0
1137 #define CKR_SESSION_COUNT           0x000000B1
1138 #define CKR_SESSION_HANDLE_INVALID  0x000000B3
1139 #define CKR_SESSION_PARALLEL_NOT_SUPPORTED 0x000000B4
1140 #define CKR_SESSION_READ_ONLY       0x000000B5
1141 #define CKR_SESSION_EXISTS          0x000000B6

1143 /* CKR_SESSION_READ_ONLY_EXISTS and
1144  * CKR_SESSION_READ_WRITE_SO_EXISTS are new for v2.0 */
1145 #define CKR_SESSION_READ_ONLY_EXISTS 0x000000B7
1146 #define CKR_SESSION_READ_WRITE_SO_EXISTS 0x000000B8

1148 #define CKR_SIGNATURE_INVALID        0x000000C0
1149 #define CKR_SIGNATURE_LEN_RANGE      0x000000C1
1150 #define CKR_TEMPLATE_INCOMPLETE     0x000000D0
1151 #define CKR_TEMPLATE_INCONSISTENT   0x000000D1
1152 #define CKR_TOKEN_NOT_PRESENT        0x000000E0
1153 #define CKR_TOKEN_NOT_RECOGNIZED     0x000000E1
1154 #define CKR_TOKEN_WRITE_PROTECTED    0x000000E2
1155 #define CKR_UNWRAPPING_KEY_HANDLE_INVALID 0x000000F0
1156 #define CKR_UNWRAPPING_KEY_SIZE_RANGE 0x000000F1
1157 #define CKR_UNWRAPPING_KEY_TYPE_INCONSISTENT 0x000000F2
1158 #define CKR_USER_ALREADY_LOGGED_IN  0x00000100
1159 #define CKR_USER_NOT_LOGGED_IN       0x00000101
1160 #define CKR_USER_PIN_NOT_INITIALIZED 0x00000102
1161 #define CKR_USER_TYPE_INVALID        0x00000103

1163 /* CKR_USER_ANOTHER_ALREADY_LOGGED_IN and CKR_USER_TOO_MANY_TYPES
1164  * are new to v2.01 */
1165 #define CKR_USER_ANOTHER_ALREADY_LOGGED_IN 0x00000104
1166 #define CKR_USER_TOO_MANY_TYPES         0x00000105

1168 #define CKR_WRAPPED_KEY_INVALID      0x00000110
1169 #define CKR_WRAPPED_KEY_LEN_RANGE    0x00000112
1170 #define CKR_WRAPPING_KEY_HANDLE_INVALID 0x00000113
1171 #define CKR_WRAPPING_KEY_SIZE_RANGE  0x00000114
1172 #define CKR_WRAPPING_KEY_TYPE_INCONSISTENT 0x00000115
1173 #define CKR_RANDOM_SEED_NOT_SUPPORTED 0x00000120

1175 /* These are new to v2.0 */
1176 #define CKR_RANDOM_NO_RNG            0x00000121

1178 /* These are new to v2.11 */
1179 #define CKR_DOMAIN_PARAMS_INVALID    0x00000130

1181 /* These are new to v2.0 */
1182 #define CKR_BUFFER_TOO_SMALL         0x00000150
1183 #define CKR_SAVED_STATE_INVALID      0x00000160
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1184 #define CKR_INFORMATION_SENSITIVE      0x00000170
1185 #define CKR_STATE_UNSAVEABLE            0x00000180

1187 /* These are new to v2.01 */
1188 #define CKR_CRYPTOKI_NOT_INITIALIZED      0x00000190
1189 #define CKR_CRYPTOKI_ALREADY_INITIALIZED  0x00000191
1190 #define CKR_MUTEX_BAD                     0x000001A0
1191 #define CKR_MUTEX_NOT_LOCKED              0x000001A1

1193 /* The following return values are new for PKCS #11 v2.20 amendment 3 */
1194 #define CKR_NEW_PIN_MODE                   0x000001B0
1195 #define CKR_NEXT_OTP                      0x000001B1

1197 /* This is new to v2.20 */
1198 #define CKR_FUNCTION_REJECTED              0x00000200

1200 #define CKR_VENDOR_DEFINED                 0x80000000

1203 /* CK_NOTIFY is an application callback that processes events */
1204 typedef CK_CALLBACK_FUNCTION(CK_RV, CK_NOTIFY)(
1205     CK_SESSION_HANDLE hSession, /* the session's handle */
1206     CK_NOTIFICATION event,
1207     CK_VOID_PTR pApplication /* passed to C_OpenSession */
1208 );

1211 /* CK_FUNCTION_LIST is a structure holding a Cryptoki spec
1212  * version and pointers of appropriate types to all the
1213  * Cryptoki functions */
1214 /* CK_FUNCTION_LIST is new for v2.0 */
1215 typedef struct CK_FUNCTION_LIST CK_FUNCTION_LIST;

1217 typedef CK_FUNCTION_LIST CK_PTR CK_FUNCTION_LIST_PTR;

1219 typedef CK_FUNCTION_LIST_PTR CK_PTR CK_FUNCTION_LIST_PTR_PTR;

1222 /* CK_CREATEMUTEX is an application callback for creating a
1223  * mutex object */
1224 typedef CK_CALLBACK_FUNCTION(CK_RV, CK_CREATEMUTEX)(
1225     CK_VOID_PTR_PTR ppMutex /* location to receive ptr to mutex */
1226 );

1229 /* CK_DESTROYMUTEX is an application callback for destroying a
1230  * mutex object */
1231 typedef CK_CALLBACK_FUNCTION(CK_RV, CK_DESTROYMUTEX)(
1232     CK_VOID_PTR pMutex /* pointer to mutex */
1233 );

1236 /* CK_LOCKMUTEX is an application callback for locking a mutex */
1237 typedef CK_CALLBACK_FUNCTION(CK_RV, CK_LOCKMUTEX)(
1238     CK_VOID_PTR pMutex /* pointer to mutex */
1239 );

1242 /* CK_UNLOCKMUTEX is an application callback for unlocking a
1243  * mutex */
1244 typedef CK_CALLBACK_FUNCTION(CK_RV, CK_UNLOCKMUTEX)(
1245     CK_VOID_PTR pMutex /* pointer to mutex */
1246 );

1249 /* CK_C_INITIALIZE_ARGS provides the optional arguments to

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1250 * C_Initialize */
1251 typedef struct CK_C_INITIALIZE_ARGS {
1252     CK_CREATEMUTEX CreateMutex;
1253     CK_DESTROYMUTEX DestroyMutex;
1254     CK_LOCKMUTEX LockMutex;
1255     CK_UNLOCKMUTEX UnlockMutex;
1256     CK_FLAGS flags;
1257     CK_VOID_PTR pReserved;
1258 } CK_C_INITIALIZE_ARGS;

1260 /* flags: bit flags that provide capabilities of the slot
1261  *      Bit Flag                                Mask      Meaning
1262  */
1263 #define CKF_LIBRARY_CANT_CREATE_OS_THREADS 0x00000001
1264 #define CKF_OS_LOCKING_OK                  0x00000002

1266 typedef CK_C_INITIALIZE_ARGS CK_PTR CK_C_INITIALIZE_ARGS_PTR;

1269 /* additional flags for parameters to functions */

1271 /* CKF_DONT_BLOCK is for the function C_WaitForSlotEvent */
1272 #define CKF_DONT_BLOCK 1

1274 /* CK_RSA_PKCS_OAEP_MGF_TYPE is new for v2.10.
1275  * CK_RSA_PKCS_OAEP_MGF_TYPE is used to indicate the Message
1276  * Generation Function (MGF) applied to a message block when
1277  * formatting a message block for the PKCS #1 OAEP encryption
1278  * scheme. */
1279 typedef CK_ULONG CK_RSA_PKCS_MGF_TYPE;

1281 typedef CK_RSA_PKCS_MGF_TYPE CK_PTR CK_RSA_PKCS_MGF_TYPE_PTR;

1283 /* The following MGFs are defined */
1284 /* CKG_MGF1_SHA256, CKG_MGF1_SHA384, and CKG_MGF1_SHA512
1285  * are new for v2.20 */
1286 #define CKG_MGF1_SHA1      0x00000001
1287 #define CKG_MGF1_SHA256    0x00000002
1288 #define CKG_MGF1_SHA384    0x00000003
1289 #define CKG_MGF1_SHA512    0x00000004
1290 /* SHA-224 is new for PKCS #11 v2.20 amendment 3 */
1291 #define CKG_MGF1_SHA224    0x00000005

1293 /* CK_RSA_PKCS_OAEP_SOURCE_TYPE is new for v2.10.
1294  * CK_RSA_PKCS_OAEP_SOURCE_TYPE is used to indicate the source
1295  * of the encoding parameter when formatting a message block
1296  * for the PKCS #1 OAEP encryption scheme. */
1297 typedef CK_ULONG CK_RSA_PKCS_OAEP_SOURCE_TYPE;

1299 typedef CK_RSA_PKCS_OAEP_SOURCE_TYPE CK_PTR CK_RSA_PKCS_OAEP_SOURCE_TYPE_PTR;

1301 /* The following encoding parameter sources are defined */
1302 #define CKZ_DATA_SPECIFIED 0x00000001

1304 /* CK_RSA_PKCS_OAEP_PARAMS is new for v2.10.
1305  * CK_RSA_PKCS_OAEP_PARAMS provides the parameters to the
1306  * CKM_RSA_PKCS_OAEP mechanism. */
1307 typedef struct CK_RSA_PKCS_OAEP_PARAMS {
1308     CK_MECHANISM_TYPE hashAlg;
1309     CK_RSA_PKCS_MGF_TYPE mgf;
1310     CK_RSA_PKCS_OAEP_SOURCE_TYPE source;
1311     CK_VOID_PTR pSourceData;
1312     CK_ULONG ulSourceDataLen;
1313 } CK_RSA_PKCS_OAEP_PARAMS;

1315 typedef CK_RSA_PKCS_OAEP_PARAMS CK_PTR CK_RSA_PKCS_OAEP_PARAMS_PTR;

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1317 /* CK_RSA_PKCS_PSS_PARAMS is new for v2.11.
1318 * CK_RSA_PKCS_PSS_PARAMS provides the parameters to the
1319 * CKM_RSA_PKCS_PSS mechanism(s). */
1320 typedef struct CK_RSA_PKCS_PSS_PARAMS {
1321     CK_MECHANISM_TYPE hashAlg;
1322     CK_RSA_PKCS_MGF_TYPE mgf;
1323     CK_ULONG sLen;
1324 } CK_RSA_PKCS_PSS_PARAMS;

1326 typedef CK_RSA_PKCS_PSS_PARAMS CK_PTR CK_RSA_PKCS_PSS_PARAMS_PTR;

1328 /* CK_EC_KDF_TYPE is new for v2.11. */
1329 typedef CK_ULONG CK_EC_KDF_TYPE;

1331 /* The following EC Key Derivation Functions are defined */
1332 #define CKD_NULL 0x00000001
1333 #define CKD_SHA1_KDF 0x00000002

1335 /* CK_ECDH1_DERIVE_PARAMS is new for v2.11.
1336 * CK_ECDH1_DERIVE_PARAMS provides the parameters to the
1337 * CKM_ECDH1_DERIVE and CKM_ECDH1_COFACTOR_DERIVE mechanisms,
1338 * where each party contributes one key pair.
1339 */
1340 typedef struct CK_ECDH1_DERIVE_PARAMS {
1341     CK_EC_KDF_TYPE kdf;
1342     CK_ULONG ulSharedDataLen;
1343     CK_BYTE_PTR pSharedData;
1344     CK_ULONG ulPublicDataLen;
1345     CK_BYTE_PTR pPublicData;
1346 } CK_ECDH1_DERIVE_PARAMS;

1348 typedef CK_ECDH1_DERIVE_PARAMS CK_PTR CK_ECDH1_DERIVE_PARAMS_PTR;

1351 /* CK_ECDH2_DERIVE_PARAMS is new for v2.11.
1352 * CK_ECDH2_DERIVE_PARAMS provides the parameters to the
1353 * CKM_ECMQV_DERIVE mechanism, where each party contributes two key pairs. */
1354 typedef struct CK_ECDH2_DERIVE_PARAMS {
1355     CK_EC_KDF_TYPE kdf;
1356     CK_ULONG ulSharedDataLen;
1357     CK_BYTE_PTR pSharedData;
1358     CK_ULONG ulPublicDataLen;
1359     CK_BYTE_PTR pPublicData;
1360     CK_ULONG ulPrivateDataLen;
1361     CK_OBJECT_HANDLE hPrivateData;
1362     CK_ULONG ulPublicDataLen2;
1363     CK_BYTE_PTR pPublicData2;
1364 } CK_ECDH2_DERIVE_PARAMS;

1366 typedef CK_ECDH2_DERIVE_PARAMS CK_PTR CK_ECDH2_DERIVE_PARAMS_PTR;

1368 typedef struct CK_ECMQV_DERIVE_PARAMS {
1369     CK_EC_KDF_TYPE kdf;
1370     CK_ULONG ulSharedDataLen;
1371     CK_BYTE_PTR pSharedData;
1372     CK_ULONG ulPublicDataLen;
1373     CK_BYTE_PTR pPublicData;
1374     CK_ULONG ulPrivateDataLen;
1375     CK_OBJECT_HANDLE hPrivateData;
1376     CK_ULONG ulPublicDataLen2;
1377     CK_BYTE_PTR pPublicData2;
1378     CK_OBJECT_HANDLE publicKey;
1379 } CK_ECMQV_DERIVE_PARAMS;

1381 typedef CK_ECMQV_DERIVE_PARAMS CK_PTR CK_ECMQV_DERIVE_PARAMS_PTR;

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1383 /* Typedefs and defines for the CKM_X9_42_DH_KEY_PAIR_GEN and the
1384 * CKM_X9_42_DH_PARAMETER_GEN mechanisms (new for PKCS #11 v2.11) */
1385 typedef CK_ULONG CK_X9_42_DH_KDF_TYPE;
1386 typedef CK_X9_42_DH_KDF_TYPE CK_PTR CK_X9_42_DH_KDF_TYPE_PTR;

1388 /* The following X9.42 DH key derivation functions are defined
1389 (besides CKD_NULL already defined : */
1390 #define CKD_SHA1_KDF_ASN1 0x00000003
1391 #define CKD_SHA1_KDF_CONCATENATE 0x00000004

1393 /* CK_X9_42_DH1_DERIVE_PARAMS is new for v2.11.
1394 * CK_X9_42_DH1_DERIVE_PARAMS provides the parameters to the
1395 * CKM_X9_42_DH_DERIVE key derivation mechanism, where each party
1396 * contributes one key pair */
1397 typedef struct CK_X9_42_DH1_DERIVE_PARAMS {
1398     CK_X9_42_DH_KDF_TYPE kdf;
1399     CK_ULONG ulOtherInfoLen;
1400     CK_BYTE_PTR pOtherInfo;
1401     CK_ULONG ulPublicDataLen;
1402     CK_BYTE_PTR pPublicData;
1403 } CK_X9_42_DH1_DERIVE_PARAMS;

1405 typedef struct CK_X9_42_DH1_DERIVE_PARAMS CK_PTR CK_X9_42_DH1_DERIVE_PARAMS_PTR;

1407 /* CK_X9_42_DH2_DERIVE_PARAMS is new for v2.11.
1408 * CK_X9_42_DH2_DERIVE_PARAMS provides the parameters to the
1409 * CKM_X9_42_DH_HYBRID_DERIVE and CKM_X9_42_MQV_DERIVE key derivation
1410 * mechanisms, where each party contributes two key pairs */
1411 typedef struct CK_X9_42_DH2_DERIVE_PARAMS {
1412     CK_X9_42_DH_KDF_TYPE kdf;
1413     CK_ULONG ulOtherInfoLen;
1414     CK_BYTE_PTR pOtherInfo;
1415     CK_ULONG ulPublicDataLen;
1416     CK_BYTE_PTR pPublicData;
1417     CK_ULONG ulPrivateDataLen;
1418     CK_OBJECT_HANDLE hPrivateData;
1419     CK_ULONG ulPublicDataLen2;
1420     CK_BYTE_PTR pPublicData2;
1421 } CK_X9_42_DH2_DERIVE_PARAMS;

1423 typedef CK_X9_42_DH2_DERIVE_PARAMS CK_PTR CK_X9_42_DH2_DERIVE_PARAMS_PTR;

1425 typedef struct CK_X9_42_MQV_DERIVE_PARAMS {
1426     CK_X9_42_DH_KDF_TYPE kdf;
1427     CK_ULONG ulOtherInfoLen;
1428     CK_BYTE_PTR pOtherInfo;
1429     CK_ULONG ulPublicDataLen;
1430     CK_BYTE_PTR pPublicData;
1431     CK_ULONG ulPrivateDataLen;
1432     CK_OBJECT_HANDLE hPrivateData;
1433     CK_ULONG ulPublicDataLen2;
1434     CK_BYTE_PTR pPublicData2;
1435     CK_OBJECT_HANDLE publicKey;
1436 } CK_X9_42_MQV_DERIVE_PARAMS;

1438 typedef CK_X9_42_MQV_DERIVE_PARAMS CK_PTR CK_X9_42_MQV_DERIVE_PARAMS_PTR;

1440 /* CK_KEA_DERIVE_PARAMS provides the parameters to the
1441 * CKM_KEA_DERIVE mechanism */
1442 /* CK_KEA_DERIVE_PARAMS is new for v2.0 */
1443 typedef struct CK_KEA_DERIVE_PARAMS {
1444     CK_BBOOL isSender;
1445     CK_ULONG ulRandomLen;
1446     CK_BYTE_PTR pRandomA;
1447     CK_BYTE_PTR pRandomB;

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1448 CK_ULONG      ulPublicDataLen;
1449 CK_BYTE_PTR    pPublicData;
1450 } CK_KEA_DERIVE_PARAMS;

1452 typedef CK_KEA_DERIVE_PARAMS CK_PTR CK_KEA_DERIVE_PARAMS_PTR;

1455 /* CK_RC2_PARAMS provides the parameters to the CKM_RC2_ECB and
1456  * CKM_RC2_MAC mechanisms. An instance of CK_RC2_PARAMS just
1457  * holds the effective keysize */
1458 typedef CK_ULONG      CK_RC2_PARAMS;

1460 typedef CK_RC2_PARAMS CK_PTR CK_RC2_PARAMS_PTR;

1463 /* CK_RC2_CBC_PARAMS provides the parameters to the CKM_RC2_CBC
1464  * mechanism */
1465 typedef struct CK_RC2_CBC_PARAMS {
1466     /* uEffectiveBits was changed from CK_USHORT to CK_ULONG for
1467      * v2.0 */
1468     CK_ULONG      uEffectiveBits; /* effective bits (1-1024) */

1470     CK_BYTE      iv[8];          /* IV for CBC mode */
1471 } CK_RC2_CBC_PARAMS;

1473 typedef CK_RC2_CBC_PARAMS CK_PTR CK_RC2_CBC_PARAMS_PTR;

1476 /* CK_RC2_MAC_GENERAL_PARAMS provides the parameters for the
1477  * CKM_RC2_MAC_GENERAL mechanism */
1478 /* CK_RC2_MAC_GENERAL_PARAMS is new for v2.0 */
1479 typedef struct CK_RC2_MAC_GENERAL_PARAMS {
1480     CK_ULONG      uEffectiveBits; /* effective bits (1-1024) */
1481     CK_ULONG      ulMacLength;    /* Length of MAC in bytes */
1482 } CK_RC2_MAC_GENERAL_PARAMS;

1484 typedef CK_RC2_MAC_GENERAL_PARAMS CK_PTR \
1485     CK_RC2_MAC_GENERAL_PARAMS_PTR;

1488 /* CK_RC5_PARAMS provides the parameters to the CKM_RC5_ECB and
1489  * CKM_RC5_MAC mechanisms */
1490 /* CK_RC5_PARAMS is new for v2.0 */
1491 typedef struct CK_RC5_PARAMS {
1492     CK_ULONG      ulWordsize; /* wordsize in bits */
1493     CK_ULONG      ulRounds;   /* number of rounds */
1494 } CK_RC5_PARAMS;

1496 typedef CK_RC5_PARAMS CK_PTR CK_RC5_PARAMS_PTR;

1499 /* CK_RC5_CBC_PARAMS provides the parameters to the CKM_RC5_CBC
1500  * mechanism */
1501 /* CK_RC5_CBC_PARAMS is new for v2.0 */
1502 typedef struct CK_RC5_CBC_PARAMS {
1503     CK_ULONG      ulWordsize; /* wordsize in bits */
1504     CK_ULONG      ulRounds;   /* number of rounds */
1505     CK_BYTE_PTR    pIv;       /* pointer to IV */
1506     CK_ULONG      ulIvLen;    /* length of IV in bytes */
1507 } CK_RC5_CBC_PARAMS;

1509 typedef CK_RC5_CBC_PARAMS CK_PTR CK_RC5_CBC_PARAMS_PTR;

1512 /* CK_RC5_MAC_GENERAL_PARAMS provides the parameters for the
1513  * CKM_RC5_MAC_GENERAL mechanism */

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1514 /* CK_RC5_MAC_GENERAL_PARAMS is new for v2.0 */
1515 typedef struct CK_RC5_MAC_GENERAL_PARAMS {
1516     CK_ULONG      ulWordsize; /* wordsize in bits */
1517     CK_ULONG      ulRounds;   /* number of rounds */
1518     CK_ULONG      ulMacLength; /* Length of MAC in bytes */
1519 } CK_RC5_MAC_GENERAL_PARAMS;

1521 typedef CK_RC5_MAC_GENERAL_PARAMS CK_PTR \
1522     CK_RC5_MAC_GENERAL_PARAMS_PTR;

1525 /* CK_MAC_GENERAL_PARAMS provides the parameters to most block
1526  * ciphers' MAC_GENERAL mechanisms. Its value is the length of
1527  * the MAC */
1528 /* CK_MAC_GENERAL_PARAMS is new for v2.0 */
1529 typedef CK_ULONG      CK_MAC_GENERAL_PARAMS;

1531 typedef CK_MAC_GENERAL_PARAMS CK_PTR CK_MAC_GENERAL_PARAMS_PTR;

1533 /* CK_DES/AES_ECB/CBC_ENCRYPT_DATA_PARAMS are new for v2.20 */
1534 typedef struct CK_DES_CBC_ENCRYPT_DATA_PARAMS {
1535     CK_BYTE      iv[8];
1536     CK_BYTE_PTR  pData;
1537     CK_ULONG      length;
1538 } CK_DES_CBC_ENCRYPT_DATA_PARAMS;

1540 typedef CK_DES_CBC_ENCRYPT_DATA_PARAMS CK_PTR CK_DES_CBC_ENCRYPT_DATA_PARAMS_PTR

1542 typedef struct CK_AES_CBC_ENCRYPT_DATA_PARAMS {
1543     CK_BYTE      iv[16];
1544     CK_BYTE_PTR  pData;
1545     CK_ULONG      length;
1546 } CK_AES_CBC_ENCRYPT_DATA_PARAMS;

1548 typedef CK_AES_CBC_ENCRYPT_DATA_PARAMS CK_PTR CK_AES_CBC_ENCRYPT_DATA_PARAMS_PTR

1550 /* CK_SKIPJACK_PRIVATE_WRAP_PARAMS provides the parameters to the
1551  * CKM_SKIPJACK_PRIVATE_WRAP mechanism */
1552 /* CK_SKIPJACK_PRIVATE_WRAP_PARAMS is new for v2.0 */
1553 typedef struct CK_SKIPJACK_PRIVATE_WRAP_PARAMS {
1554     CK_ULONG      ulPasswordLen;
1555     CK_BYTE_PTR    pPassword;
1556     CK_ULONG      ulPublicDataLen;
1557     CK_BYTE_PTR    pPublicData;
1558     CK_ULONG      ulPAndGLen;
1559     CK_ULONG      ulQLen;
1560     CK_ULONG      ulRandomLen;
1561     CK_BYTE_PTR    pRandomA;
1562     CK_BYTE_PTR    pPrimeP;
1563     CK_BYTE_PTR    pBaseG;
1564     CK_BYTE_PTR    pSubprimeQ;
1565 } CK_SKIPJACK_PRIVATE_WRAP_PARAMS;

1567 typedef CK_SKIPJACK_PRIVATE_WRAP_PARAMS CK_PTR \
1568     CK_SKIPJACK_PRIVATE_WRAP_PTR;

1571 /* CK_SKIPJACK_RELAYX_PARAMS provides the parameters to the
1572  * CKM_SKIPJACK_RELAYX mechanism */
1573 /* CK_SKIPJACK_RELAYX_PARAMS is new for v2.0 */
1574 typedef struct CK_SKIPJACK_RELAYX_PARAMS {
1575     CK_ULONG      ulOldWrappedXLen;
1576     CK_BYTE_PTR    pOldWrappedX;
1577     CK_ULONG      ulOldPasswordLen;
1578     CK_BYTE_PTR    pOldPassword;
1579     CK_ULONG      ulOldPublicDataLen;

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1580 CK_BYTE_PTR    pOldPublicData;
1581 CK_ULONG        ulOldRandomLen;
1582 CK_BYTE_PTR    pOldRandomA;
1583 CK_ULONG        ulNewPasswordLen;
1584 CK_BYTE_PTR    pNewPassword;
1585 CK_ULONG        ulNewPublicDataLen;
1586 CK_BYTE_PTR    pNewPublicData;
1587 CK_ULONG        ulNewRandomLen;
1588 CK_BYTE_PTR    pNewRandomA;
1589 } CK_SKIPJACK_RELAYX_PARAMS;

1591 typedef CK_SKIPJACK_RELAYX_PARAMS CK_PTR \
1592     CK_SKIPJACK_RELAYX_PARAMS_PTR;

1595 typedef struct CK_PBE_PARAMS {
1596     CK_BYTE_PTR    pInitVector;
1597     CK_UTF8CHAR_PTR pPassword;
1598     CK_ULONG        ulPasswordLen;
1599     CK_BYTE_PTR    pSalt;
1600     CK_ULONG        ulSaltLen;
1601     CK_ULONG        ulIteration;
1602 } CK_PBE_PARAMS;

1604 typedef CK_PBE_PARAMS CK_PTR CK_PBE_PARAMS_PTR;

1607 /* CK_KEY_WRAP_SET_OAEP_PARAMS provides the parameters to the
1608  * CKM_KEY_WRAP_SET_OAEP mechanism */
1609 /* CK_KEY_WRAP_SET_OAEP_PARAMS is new for v2.0 */
1610 typedef struct CK_KEY_WRAP_SET_OAEP_PARAMS {
1611     CK_BYTE        bBC; /* block contents byte */
1612     CK_BYTE_PTR    pX; /* extra data */
1613     CK_ULONG        ulXLen; /* length of extra data in bytes */
1614 } CK_KEY_WRAP_SET_OAEP_PARAMS;

1616 typedef CK_KEY_WRAP_SET_OAEP_PARAMS CK_PTR \
1617     CK_KEY_WRAP_SET_OAEP_PARAMS_PTR;

1620 typedef struct CK_SSL3_RANDOM_DATA {
1621     CK_BYTE_PTR    pClientRandom;
1622     CK_ULONG        ulClientRandomLen;
1623     CK_BYTE_PTR    pServerRandom;
1624     CK_ULONG        ulServerRandomLen;
1625 } CK_SSL3_RANDOM_DATA;

1628 typedef struct CK_SSL3_MASTER_KEY_DERIVE_PARAMS {
1629     CK_SSL3_RANDOM_DATA RandomInfo;
1630     CK_VERSION_PTR    pVersion;
1631 } CK_SSL3_MASTER_KEY_DERIVE_PARAMS;

1633 typedef struct CK_SSL3_MASTER_KEY_DERIVE_PARAMS CK_PTR \
1634     CK_SSL3_MASTER_KEY_DERIVE_PARAMS_PTR;

1637 typedef struct CK_SSL3_KEY_MAT_OUT {
1638     CK_OBJECT_HANDLE hClientMacSecret;
1639     CK_OBJECT_HANDLE hServerMacSecret;
1640     CK_OBJECT_HANDLE hClientKey;
1641     CK_OBJECT_HANDLE hServerKey;
1642     CK_BYTE_PTR    pIVClient;
1643     CK_BYTE_PTR    pIVServer;
1644 } CK_SSL3_KEY_MAT_OUT;

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1646 typedef CK_SSL3_KEY_MAT_OUT CK_PTR CK_SSL3_KEY_MAT_OUT_PTR;

1649 typedef struct CK_SSL3_KEY_MAT_PARAMS {
1650     CK_ULONG        ulMacSizeInBits;
1651     CK_ULONG        ulKeySizeInBits;
1652     CK_ULONG        ulIVSizeInBits;
1653     CK_BBOOL        bIsExport;
1654     CK_SSL3_RANDOM_DATA RandomInfo;
1655     CK_SSL3_KEY_MAT_OUT_PTR pReturnedKeyMaterial;
1656 } CK_SSL3_KEY_MAT_PARAMS;

1658 typedef CK_SSL3_KEY_MAT_PARAMS CK_PTR CK_SSL3_KEY_MAT_PARAMS_PTR;

1660 /* CK_TLS_PRF_PARAMS is new for version 2.20 */
1661 typedef struct CK_TLS_PRF_PARAMS {
1662     CK_BYTE_PTR    pSeed;
1663     CK_ULONG        ulSeedLen;
1664     CK_BYTE_PTR    pLabel;
1665     CK_ULONG        ulLabelLen;
1666     CK_BYTE_PTR    pOutput;
1667     CK_ULONG_PTR    pulOutputLen;
1668 } CK_TLS_PRF_PARAMS;

1670 typedef CK_TLS_PRF_PARAMS CK_PTR CK_TLS_PRF_PARAMS_PTR;

1672 /* WTLS is new for version 2.20 */
1673 typedef struct CK_WTLS_RANDOM_DATA {
1674     CK_BYTE_PTR    pClientRandom;
1675     CK_ULONG        ulClientRandomLen;
1676     CK_BYTE_PTR    pServerRandom;
1677     CK_ULONG        ulServerRandomLen;
1678 } CK_WTLS_RANDOM_DATA;

1680 typedef CK_WTLS_RANDOM_DATA CK_PTR CK_WTLS_RANDOM_DATA_PTR;

1682 typedef struct CK_WTLS_MASTER_KEY_DERIVE_PARAMS {
1683     CK_MECHANISM_TYPE DigestMechanism;
1684     CK_WTLS_RANDOM_DATA RandomInfo;
1685     CK_BYTE_PTR    pVersion;
1686 } CK_WTLS_MASTER_KEY_DERIVE_PARAMS;

1688 typedef CK_WTLS_MASTER_KEY_DERIVE_PARAMS CK_PTR \
1689     CK_WTLS_MASTER_KEY_DERIVE_PARAMS_PTR;

1691 typedef struct CK_WTLS_PRF_PARAMS {
1692     CK_MECHANISM_TYPE DigestMechanism;
1693     CK_BYTE_PTR    pSeed;
1694     CK_ULONG        ulSeedLen;
1695     CK_BYTE_PTR    pLabel;
1696     CK_ULONG        ulLabelLen;
1697     CK_BYTE_PTR    pOutput;
1698     CK_ULONG_PTR    pulOutputLen;
1699 } CK_WTLS_PRF_PARAMS;

1701 typedef CK_WTLS_PRF_PARAMS CK_PTR CK_WTLS_PRF_PARAMS_PTR;

1703 typedef struct CK_WTLS_KEY_MAT_OUT {
1704     CK_OBJECT_HANDLE hMacSecret;
1705     CK_OBJECT_HANDLE hKey;
1706     CK_BYTE_PTR    pIV;
1707 } CK_WTLS_KEY_MAT_OUT;

1709 typedef CK_WTLS_KEY_MAT_OUT CK_PTR CK_WTLS_KEY_MAT_OUT_PTR;

1711 typedef struct CK_WTLS_KEY_MAT_PARAMS {

```

```

1712 CK_MECHANISM_TYPE      DigestMechanism;
1713 CK_ULONG                ulMacSizeInBits;
1714 CK_ULONG                ulKeySizeInBits;
1715 CK_ULONG                ulIVSizeInBits;
1716 CK_ULONG                ulSequenceNumber;
1717 CK_BBOOL                bIsExport;
1718 CK_WTLS_RANDOM_DATA     RandomInfo;
1719 CK_WTLS_KEY_MAT_OUT_PTR pReturnedKeyMaterial;
1720 } CK_WTLS_KEY_MAT_PARAMS;

1722 typedef CK_WTLS_KEY_MAT_PARAMS CK_PTR CK_WTLS_KEY_MAT_PARAMS_PTR;

1724 /* CMS is new for version 2.20 */
1725 typedef struct CK_CMS_SIG_PARAMS {
1726     CK_OBJECT_HANDLE      certificateHandle;
1727     CK_MECHANISM_PTR      pSigningMechanism;
1728     CK_MECHANISM_PTR      pDigestMechanism;
1729     CK_UTF8CHAR_PTR       pContentType;
1730     CK_BYTE_PTR           pRequestedAttributes;
1731     CK_ULONG              ulRequestedAttributesLen;
1732     CK_BYTE_PTR           pRequiredAttributes;
1733     CK_ULONG              ulRequiredAttributesLen;
1734 } CK_CMS_SIG_PARAMS;

1736 typedef CK_CMS_SIG_PARAMS CK_PTR CK_CMS_SIG_PARAMS_PTR;

1738 typedef struct CK_KEY_DERIVATION_STRING_DATA {
1739     CK_BYTE_PTR pData;
1740     CK_ULONG    ulLen;
1741 } CK_KEY_DERIVATION_STRING_DATA;

1743 typedef CK_KEY_DERIVATION_STRING_DATA CK_PTR \
1744     CK_KEY_DERIVATION_STRING_DATA_PTR;

1747 /* The CK_EXTRACT_PARAMS is used for the
1748  * CKM_EXTRACT_KEY_FROM_KEY mechanism. It specifies which bit
1749  * of the base key should be used as the first bit of the
1750  * derived key */
1751 /* CK_EXTRACT_PARAMS is new for v2.0 */
1752 typedef CK_ULONG CK_EXTRACT_PARAMS;

1754 typedef CK_EXTRACT_PARAMS CK_PTR CK_EXTRACT_PARAMS_PTR;

1756 /* CK_PKCS5_PBKD2_PSEUDO_RANDOM_FUNCTION_TYPE is new for v2.10.
1757  * CK_PKCS5_PBKD2_PSEUDO_RANDOM_FUNCTION_TYPE is used to
1758  * indicate the Pseudo-Random Function (PRF) used to generate
1759  * key bits using PKCS #5 PBKDF2. */
1760 typedef CK_ULONG CK_PKCS5_PBKD2_PSEUDO_RANDOM_FUNCTION_TYPE;

1762 typedef CK_PKCS5_PBKD2_PSEUDO_RANDOM_FUNCTION_TYPE CK_PTR CK_PKCS5_PBKD2_PSEUDO_

1764 /* The following PRFs are defined in PKCS #5 v2.0. */
1765 #define CKP_PKCS5_PBKD2_HMAC_SHA1 0x00000001

1768 /* CK_PKCS5_PBKDF2_SALT_SOURCE_TYPE is new for v2.10.
1769  * CK_PKCS5_PBKDF2_SALT_SOURCE_TYPE is used to indicate the
1770  * source of the salt value when deriving a key using PKCS #5
1771  * PBKDF2. */
1772 typedef CK_ULONG CK_PKCS5_PBKDF2_SALT_SOURCE_TYPE;

1774 typedef CK_PKCS5_PBKDF2_SALT_SOURCE_TYPE CK_PTR CK_PKCS5_PBKDF2_SALT_SOURCE_TYPE

1776 /* The following salt value sources are defined in PKCS #5 v2.0. */
1777 #define CKZ_SALT_SPECIFIED 0x00000001

```

```

1779 /* CK_PKCS5_PBKD2_PARAMS is new for v2.10.
1780  * CK_PKCS5_PBKD2_PARAMS is a structure that provides the
1781  * parameters to the CKM_PKCS5_PBKD2 mechanism. */
1782 typedef struct CK_PKCS5_PBKD2_PARAMS {
1783     CK_PKCS5_PBKDF2_SALT_SOURCE_TYPE saltSource;
1784     CK_VOID_PTR                      pSaltSourceData;
1785     CK_ULONG                          ulSaltSourceDataLen;
1786     CK_ULONG                          iterations;
1787     CK_PKCS5_PBKD2_PSEUDO_RANDOM_FUNCTION_TYPE prf;
1788     CK_VOID_PTR                      pPrfData;
1789     CK_ULONG                          ulPrfDataLen;
1790     CK_UTF8CHAR_PTR                  pPassword;
1791     CK_ULONG_PTR                     ulPasswordLen;
1792 } CK_PKCS5_PBKD2_PARAMS;

1794 typedef CK_PKCS5_PBKD2_PARAMS CK_PTR CK_PKCS5_PBKD2_PARAMS_PTR;

1796 /* All CK_OTP structs are new for PKCS #11 v2.20 amendment 3 */

1798 typedef CK_ULONG CK_OTP_PARAM_TYPE;
1799 typedef CK_OTP_PARAM_TYPE CK_PARAM_TYPE; /* B/w compatibility */

1801 typedef struct CK_OTP_PARAM {
1802     CK_OTP_PARAM_TYPE type;
1803     CK_VOID_PTR pValue;
1804     CK_ULONG ulValueLen;
1805 } CK_OTP_PARAM;

1807 typedef CK_OTP_PARAM CK_PTR CK_OTP_PARAM_PTR;

1809 typedef struct CK_OTP_PARAMS {
1810     CK_OTP_PARAM_PTR pParams;
1811     CK_ULONG ulCount;
1812 } CK_OTP_PARAMS;

1814 typedef CK_OTP_PARAMS CK_PTR CK_OTP_PARAMS_PTR;

1816 typedef struct CK_OTP_SIGNATURE_INFO {
1817     CK_OTP_PARAM_PTR pParams;
1818     CK_ULONG ulCount;
1819 } CK_OTP_SIGNATURE_INFO;

1821 typedef CK_OTP_SIGNATURE_INFO CK_PTR CK_OTP_SIGNATURE_INFO_PTR;

1823 /* The following OTP-related defines are new for PKCS #11 v2.20 amendment 1 */
1824 #define CK_OTP_VALUE 0
1825 #define CK_OTP_PIN 1
1826 #define CK_OTP_CHALLENGE 2
1827 #define CK_OTP_TIME 3
1828 #define CK_OTP_COUNTER 4
1829 #define CK_OTP_FLAGS 5
1830 #define CK_OTP_OUTPUT_LENGTH 6
1831 #define CK_OTP_OUTPUT_FORMAT 7

1833 /* The following OTP-related defines are new for PKCS #11 v2.20 amendment 1 */
1834 #define CKF_NEXT_OTP 0x00000001
1835 #define CKF_EXCLUDE_TIME 0x00000002
1836 #define CKF_EXCLUDE_COUNTER 0x00000004
1837 #define CKF_EXCLUDE_CHALLENGE 0x00000008
1838 #define CKF_EXCLUDE_PIN 0x00000010
1839 #define CKF_USER_FRIENDLY_OTP 0x00000020

1841 /* CK_KIP_PARAMS is new for PKCS #11 v2.20 amendment 2 */
1842 typedef struct CK_KIP_PARAMS {
1843     CK_MECHANISM_PTR pMechanism;

```

```
1844     CK_OBJECT_HANDLE hKey;
1845     CK_BYTE_PTR       pSeed;
1846     CK_ULONG          ulSeedLen;
1847 } CK_KIP_PARAMS;

1849 typedef CK_KIP_PARAMS CK_PTR CK_KIP_PARAMS_PTR;

1851 /* CK_AES_CTR_PARAMS is new for PKCS #11 v2.20 amendment 3 */
1852 typedef struct CK_AES_CTR_PARAMS {
1853     CK_ULONG ulCounterBits;
1854     CK_BYTE cb[16];
1855 } CK_AES_CTR_PARAMS;

1857 typedef CK_AES_CTR_PARAMS CK_PTR CK_AES_CTR_PARAMS_PTR;

1859 /* CK_CAMELLIA_CTR_PARAMS is new for PKCS #11 v2.20 amendment 3 */
1860 typedef struct CK_CAMELLIA_CTR_PARAMS {
1861     CK_ULONG ulCounterBits;
1862     CK_BYTE cb[16];
1863 } CK_CAMELLIA_CTR_PARAMS;

1865 typedef CK_CAMELLIA_CTR_PARAMS CK_PTR CK_CAMELLIA_CTR_PARAMS_PTR;

1867 /* CK_CAMELLIA_CBC_ENCRYPT_DATA_PARAMS is new for PKCS #11 v2.20 amendment 3 */
1868 typedef struct CK_CAMELLIA_CBC_ENCRYPT_DATA_PARAMS {
1869     CK_BYTE iv[16];
1870     CK_BYTE_PTR pData;
1871     CK_ULONG length;
1872 } CK_CAMELLIA_CBC_ENCRYPT_DATA_PARAMS;

1874 typedef CK_CAMELLIA_CBC_ENCRYPT_DATA_PARAMS CK_PTR CK_CAMELLIA_CBC_ENCRYPT_DATA_

1876 /* CK_ARIA_CBC_ENCRYPT_DATA_PARAMS is new for PKCS #11 v2.20 amendment 3 */
1877 typedef struct CK_ARIA_CBC_ENCRYPT_DATA_PARAMS {
1878     CK_BYTE iv[16];
1879     CK_BYTE_PTR pData;
1880     CK_ULONG length;
1881 } CK_ARIA_CBC_ENCRYPT_DATA_PARAMS;

1883 typedef CK_ARIA_CBC_ENCRYPT_DATA_PARAMS CK_PTR CK_ARIA_CBC_ENCRYPT_DATA_PARAMS_P

1885 #endif
```


new/usr/src/lib/openssl/include/rand_lcl.h

1

```
*****
7394 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/rand_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rand/rand_lcl.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without
```

new/usr/src/lib/openssl/include/rand_lcl.h

2

```
62 * modification, are permitted provided that the following conditions
63 * are met:
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67 *
68 * 2. Redistributions in binary form must reproduce the above copyright
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70 * the documentation and/or other materials provided with the
71 * distribution.
72 *
73 * 3. All advertising materials mentioning features or use of this
74 * software must display the following acknowledgment:
75 * "This product includes software developed by the OpenSSL Project
76 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
77 *
78 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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101 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
102 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #ifndef HEADER_RAND_LCL_H
113 #define HEADER_RAND_LCL_H
114
115 #define ENTROPY_NEEDED 32 /* require 256 bits = 32 bytes of randomness */
116
117 #if !defined(USE_MD5_RAND) && !defined(USE_SHA1_RAND) && !defined(USE_MDC2_RAND)
118 #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_SHA1)
119 #define USE_SHA1_RAND
120 #elif !defined(OPENSSL_NO_MD5)
121 #define USE_MD5_RAND
122 #elif !defined(OPENSSL_NO_MDC2) && !defined(OPENSSL_NO_DES)
123 #define USE_MDC2_RAND
124 #elif !defined(OPENSSL_NO_MD2)
125 #define USE_MD2_RAND
126 #else
127 #else
```

```
128 #error No message digest algorithm available
129 #endif
130 #endif

132 #include <openssl/evp.h>
133 #define MD_Update(a,b,c)      EVP_DigestUpdate(a,b,c)
134 #define MD_Final(a,b)        EVP_DigestFinal_ex(a,b,NULL)
135 #if defined(USE_MD5 RAND)
136 #include <openssl/md5.h>
137 #define MD_DIGEST_LENGTH     MD5_DIGEST_LENGTH
138 #define MD_Init(a)           EVP_DigestInit_ex(a,EVP_md5(), NULL)
139 #define MD(a,b,c)            EVP_Digest(a,b,c,NULL,EVP_md5(), NULL)
140 #elif defined(USE_SHA1 RAND)
141 #include <openssl/sha.h>
142 #define MD_DIGEST_LENGTH     SHA_DIGEST_LENGTH
143 #define MD_Init(a)           EVP_DigestInit_ex(a,EVP_sha1(), NULL)
144 #define MD(a,b,c)            EVP_Digest(a,b,c,NULL,EVP_sha1(), NULL)
145 #elif defined(USE_MDC2 RAND)
146 #include <openssl/mdc2.h>
147 #define MD_DIGEST_LENGTH     MDC2_DIGEST_LENGTH
148 #define MD_Init(a)           EVP_DigestInit_ex(a,EVP_mdc2(), NULL)
149 #define MD(a,b,c)            EVP_Digest(a,b,c,NULL,EVP_mdc2(), NULL)
150 #elif defined(USE_MD2 RAND)
151 #include <openssl/md2.h>
152 #define MD_DIGEST_LENGTH     MD2_DIGEST_LENGTH
153 #define MD_Init(a)           EVP_DigestInit_ex(a,EVP_md2(), NULL)
154 #define MD(a,b,c)            EVP_Digest(a,b,c,NULL,EVP_md2(), NULL)
155 #endif

158 #endif
```

```

*****
6676 Fri May 30 18:31:24 2014
new/usr/src/lib/openssl/include/rc2_loc1.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/rc2/rc2_loc1.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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21 * in documentation (online or textual) provided with the package.
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29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
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33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #undef c2l
60 #define c2l(c,l) (l=((unsigned long)*((c)+))) \
61 l|=((unsigned long)*((c)+))<< 8L, \

```

```

62 l|=((unsigned long)*((c)+))<<16L, \
63 l|=((unsigned long)*((c)+))<<24L)
64
65 /* NOTE - c is not incremented as per c2l */
66 #undef c2ln
67 #define c2ln(c,l1,l2,n) { \
68     c+=n; \
69     l1=l2=0; \
70     switch (n) { \
71     case 8: l2=((unsigned long)*((c)+))<<24L; \
72     case 7: l2|=((unsigned long)*((c)+))<<16L; \
73     case 6: l2|=((unsigned long)*((c)+))<< 8L; \
74     case 5: l2|=((unsigned long)*((c)+)); \
75     case 4: l1=((unsigned long)*((c)+))<<24L; \
76     case 3: l1|=((unsigned long)*((c)+))<<16L; \
77     case 2: l1|=((unsigned long)*((c)+))<< 8L; \
78     case 1: l1|=((unsigned long)*((c)+)); \
79     } \
80 }
81
82 #undef l2c
83 #define l2c(l,c) (*(c)+)=(unsigned char)(((l) >> 8L)&0xff), \
84                 (*(c)+)=(unsigned char)(((l)>>16L)&0xff), \
85                 (*(c)+)=(unsigned char)(((l)>>24L)&0xff)
86
87
88 /* NOTE - c is not incremented as per l2c */
89 #undef l2cn
90 #define l2cn(l1,l2,c,n) { \
91     c+=n; \
92     switch (n) { \
93     case 8: *--(c)=(unsigned char)(((l2)>>24L)&0xff); \
94     case 7: *--(c)=(unsigned char)(((l2)>>16L)&0xff); \
95     case 6: *--(c)=(unsigned char)(((l2)>> 8L)&0xff); \
96     case 5: *--(c)=(unsigned char)(((l2) >> 0L)&0xff); \
97     case 4: *--(c)=(unsigned char)(((l1)>>24L)&0xff); \
98     case 3: *--(c)=(unsigned char)(((l1)>>16L)&0xff); \
99     case 2: *--(c)=(unsigned char)(((l1)>> 8L)&0xff); \
100    case 1: *--(c)=(unsigned char)(((l1) >> 0L)&0xff); \
101    } \
102 }
103
104 /* NOTE - c is not incremented as per n2l */
105 #define n2ln(c,l1,l2,n) { \
106     c+=n; \
107     l1=l2=0; \
108     switch (n) { \
109     case 8: l2=((unsigned long)*((c)+))<<24L; \
110     case 7: l2|=((unsigned long)*((c)+))<<16L; \
111     case 6: l2|=((unsigned long)*((c)+))<< 8L; \
112     case 5: l2|=((unsigned long)*((c)+)); \
113     case 4: l1=((unsigned long)*((c)+))<<24L; \
114     case 3: l1|=((unsigned long)*((c)+))<<16L; \
115     case 2: l1|=((unsigned long)*((c)+))<< 8L; \
116     case 1: l1|=((unsigned long)*((c)+)); \
117     } \
118 }
119
120 /* NOTE - c is not incremented as per l2n */
121 #define l2nn(l1,l2,c,n) { \
122     c+=n; \
123     switch (n) { \
124     case 8: *--(c)=(unsigned char)(((l2) >> 8L)&0xff); \
125     case 7: *--(c)=(unsigned char)(((l2)>>16L)&0xff); \
126     case 6: *--(c)=(unsigned char)(((l2)>> 8L)&0xff); \
127     case 5: *--(c)=(unsigned char)(((l2) >> 0L)&0xff); \

```

```

128         case 4: *--(c)=(unsigned char)(((l1)>>0)&0xff); \
129         case 3: *--(c)=(unsigned char)(((l1)>>8)&0xff); \
130         case 2: *--(c)=(unsigned char)(((l1)>>16)&0xff); \
131         case 1: *--(c)=(unsigned char)(((l1)>>24)&0xff); \
132             } \
133     }

135 #undef n2l
136 #define n2l(c,l)      (l=((unsigned long)*((c)+))<<24L, \
137                      l|=((unsigned long)*((c)+))<<16L, \
138                      l|=((unsigned long)*((c)+))<< 8L, \
139                      l|=((unsigned long)*((c)+)))

141 #undef l2n
142 #define l2n(l,c)      (*(c)+)=(unsigned char)(((l)>>24L)&0xff), \
143                      (*(c)+)=(unsigned char)(((l)>>16L)&0xff), \
144                      (*(c)+)=(unsigned char)(((l)>> 8L)&0xff), \
145                      (*(c)+)=(unsigned char)(((l)>>0)&0xff))

147 #define C_RC2(n) \
148     t=(x0+(x1& ~x3)+(x2&x3)+ *(p0++))&0xffff; \
149     x0=(t<<1)|(t>>15); \
150     t=(x1+(x2& ~x0)+(x3&x0)+ *(p0++))&0xffff; \
151     x1=(t<<2)|(t>>14); \
152     t=(x2+(x3& ~x1)+(x0&x1)+ *(p0++))&0xffff; \
153     x2=(t<<3)|(t>>13); \
154     t=(x3+(x0& ~x2)+(x1&x2)+ *(p0++))&0xffff; \
155     x3=(t<<5)|(t>>11);

```

new/usr/src/lib/openssl/include/rc4_locl.h

1

114 Fri May 30 18:31:25 2014

new/usr/src/lib/openssl/include/rc4_locl.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #ifndef HEADER_RC4_LOCL_H
2 #define HEADER_RC4_LOCL_H
3 #include <openssl/opensslconf.h>
4 #include <cryptlib.h>
5 #endif
```

new/usr/src/lib/openssl/include/rc5_loc1.h

1

```
*****
7920 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/rc5_loc1.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/rc5/rc5_loc1.h */
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4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
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56 * [including the GNU Public Licence.]
57 */
59 #include <stdlib.h>
61 #undef c2l
```

new/usr/src/lib/openssl/include/rc5_loc1.h

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```
62 #define c2l(c,l)      (l=((unsigned long)((c)+))) \
63                       l|=((unsigned long)((c)+))<< 8L, \
64                       l|=((unsigned long)((c)+))<<16L, \
65                       l|=((unsigned long)((c)+))<<24L)

67 /* NOTE - c is not incremented as per c2l */
68 #undef c2ln
69 #define c2ln(c,l1,l2,n) { \
70     c+=n; \
71     l1=l2=0; \
72     switch (n) { \
73     case 8: l2=((unsigned long)((--(c))))<<24L; \
74     case 7: l2|=((unsigned long)((--(c))))<<16L; \
75     case 6: l2|=((unsigned long)((--(c))))<< 8L; \
76     case 5: l2|=((unsigned long)((--(c))))<< 0L; \
77     case 4: l1=((unsigned long)((--(c))))<<24L; \
78     case 3: l1|=((unsigned long)((--(c))))<<16L; \
79     case 2: l1|=((unsigned long)((--(c))))<< 8L; \
80     case 1: l1|=((unsigned long)((--(c))))<< 0L; \
81     } \
82 }

84 #undef l2c
85 #define l2c(l,c)      ((c)=(unsigned char)(((l)>> 8L)&0xff), \
86                       *(c)=(unsigned char)(((l)>>16L)&0xff), \
87                       *(c)=(unsigned char)(((l)>>24L)&0xff))

90 /* NOTE - c is not incremented as per l2c */
91 #undef l2cn
92 #define l2cn(l1,l2,c,n) { \
93     c+=n; \
94     switch (n) { \
95     case 8: *(--(c))=(unsigned char)(((l2)>>24L)&0xff); \
96     case 7: *(--(c))=(unsigned char)(((l2)>>16L)&0xff); \
97     case 6: *(--(c))=(unsigned char)(((l2)>> 8L)&0xff); \
98     case 5: *(--(c))=(unsigned char)(((l2)>> 0L)&0xff); \
99     case 4: *(--(c))=(unsigned char)(((l1)>>24L)&0xff); \
100    case 3: *(--(c))=(unsigned char)(((l1)>>16L)&0xff); \
101    case 2: *(--(c))=(unsigned char)(((l1)>> 8L)&0xff); \
102    case 1: *(--(c))=(unsigned char)(((l1)>> 0L)&0xff); \
103    } \
104 }

106 /* NOTE - c is not incremented as per n2l */
107 #define n2ln(l1,l2,n) { \
108     c+=n; \
109     l1=l2=0; \
110     switch (n) { \
111     case 8: l2=((unsigned long)((--(c))))<<24L; \
112     case 7: l2|=((unsigned long)((--(c))))<<16L; \
113     case 6: l2|=((unsigned long)((--(c))))<< 8L; \
114     case 5: l2|=((unsigned long)((--(c))))<< 0L; \
115     case 4: l1=((unsigned long)((--(c))))<<24L; \
116     case 3: l1|=((unsigned long)((--(c))))<<16L; \
117     case 2: l1|=((unsigned long)((--(c))))<< 8L; \
118     case 1: l1|=((unsigned long)((--(c))))<< 0L; \
119     } \
120 }

122 /* NOTE - c is not incremented as per l2n */
123 #define l2nn(l1,l2,c,n) { \
124     c+=n; \
125     switch (n) { \
126     case 8: *(--(c))=(unsigned char)(((l2)>>24L)&0xff); \
127     case 7: *(--(c))=(unsigned char)(((l2)>>16L)&0xff); \
128     case 6: *(--(c))=(unsigned char)(((l2)>> 8L)&0xff); \
129     case 5: *(--(c))=(unsigned char)(((l2)>> 0L)&0xff); \
130     case 4: *(--(c))=(unsigned char)(((l1)>>24L)&0xff); \
131     case 3: *(--(c))=(unsigned char)(((l1)>>16L)&0xff); \
132     case 2: *(--(c))=(unsigned char)(((l1)>> 8L)&0xff); \
133     case 1: *(--(c))=(unsigned char)(((l1)>> 0L)&0xff); \
134     } \
135 }
```

```

128     case 6: *--(c)=(unsigned char)(((l2)>>16)&0xff); \
129     case 5: *--(c)=(unsigned char)(((l2)>>24)&0xff); \
130     case 4: *--(c)=(unsigned char)(((l1)>>8)&0xff); \
131     case 3: *--(c)=(unsigned char)(((l1)>> 8)&0xff); \
132     case 2: *--(c)=(unsigned char)(((l1)>>16)&0xff); \
133     case 1: *--(c)=(unsigned char)(((l1)>>24)&0xff); \
134     } \
135 }

137 #undef n2l
138 #define n2l(c,l)      (l=((unsigned long)*((c++))<<24L, \
139                       l|=((unsigned long)*((c++))<<16L, \
140                       l|=((unsigned long)*((c++))<< 8L, \
141                       l|=((unsigned long)*((c++))))))

143 #undef l2n
144 #define l2n(l,c)      (*(c++)=(unsigned char)(((l)>>24L)&0xff), \
145                       *(c++)=(unsigned char)(((l)>>16L)&0xff), \
146                       *(c++)=(unsigned char)(((l)>> 8L)&0xff), \
147                       *(c++)=(unsigned char)(((l)>>0L)&0xff))

149 #if (defined(OPENSSL_SYS_WIN32) && defined(_MSC_VER)) || defined(__ICC)
150 #define ROTATE_l32(a,n)      _lrotl(a,n)
151 #define ROTATE_r32(a,n)      _lrotr(a,n)
152 #elif defined(__GNUC__) && __GNUC__>=2 && !defined(__STRICT_ANSI__) && !defined(
153 # if defined(__i386) || defined(__i386__) || defined(__x86_64) || defined(__x86_
154 #  define ROTATE_l32(a,n)      ({ register unsigned int ret; \
155                                asm ("roll %%cl,%0" \
156                                    : "=r"(ret) \
157                                    : "c"(n), "0"((unsigned int)(a)) \
158                                    : "cc"); \
159                                ret; \
160                                })
161 #  define ROTATE_r32(a,n)      ({ register unsigned int ret; \
162                                asm ("rorl %%cl,%0" \
163                                    : "=r"(ret) \
164                                    : "c"(n), "0"((unsigned int)(a)) \
165                                    : "cc"); \
166                                ret; \
167                                })
168 # endif
169 #endif
170 #ifndef ROTATE_l32
171 #define ROTATE_l32(a,n)      (((a)<<(n&0x1f))|(((a)&0xffffffff)>>(32-(n&0x1f))))
172 #endif
173 #ifndef ROTATE_r32
174 #define ROTATE_r32(a,n)      (((a)<<(32-(n&0x1f))|(((a)&0xffffffff)>>(n&0x1f)))
175 #endif

177 #define RC5_32_MASK      0xffffffffL

179 #define RC5_16_P          0xB7E1
180 #define RC5_16_Q          0x9E37
181 #define RC5_32_P          0xB7E15163L
182 #define RC5_32_Q          0x9E3779B9L
183 #define RC5_64_P          0xB7E151628AED2A6BLL
184 #define RC5_64_Q          0x9E3779B97F4A7C15LL

186 #define E_RC5_32(a,b,s,n) \
187     a^=b; \
188     a=ROTATE_l32(a,b); \
189     a+=s[n]; \
190     a&=RC5_32_MASK; \
191     b^=a; \
192     b=ROTATE_l32(b,a); \
193     b+=s[n+1]; \

```

```

194     b&=RC5_32_MASK;

196 #define D_RC5_32(a,b,s,n) \
197     b-=s[n+1]; \
198     b&=RC5_32_MASK; \
199     b=ROTATE_r32(b,a); \
200     b^=a; \
201     a-=s[n]; \
202     a&=RC5_32_MASK; \
203     a=ROTATE_r32(a,b); \
204     a^=b;

```

new/usr/src/lib/openssl/include/rmd_locl.h

1

5719 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/rmd_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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4  *
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdlib.h>
60 #include <string.h>
61 #include <openssl/opensslconf.h>
```

new/usr/src/lib/openssl/include/rmd_locl.h

2

62 #include <openssl/ripemd.h>

```
64 #ifndef RIPEMD160_LONG_LOG2
65 #define RIPEMD160_LONG_LOG2 2 /* default to 32 bits */
66 #endif
68 /*
69  * DO EXAMINE COMMENTS IN crypto/md5/md5_locl.h & crypto/md5/md5_dgst.c
70  * FOR EXPLANATIONS ON FOLLOWING "CODE."
71  *
72  * <appro@fy.chalmers.se>
73 #ifdef RMD160_ASM
74 # if defined(__i386) || defined(__i386__) || defined(_M_IX86) || defined(__INTEL
75 # define ripemd160_block_data_order ripemd160_block_asm_data_order
76 # endif
77 #endif
79 void ripemd160_block_data_order (RIPEMD160_CTX *c, const void *p, size_t num);
81 #define DATA_ORDER_IS_LITTLE_ENDIAN
83 #define HASH_LONG RIPEMD160_LONG
84 #define HASH_CTX RIPEMD160_CTX
85 #define HASH_CBLOCK RIPEMD160_CBLOCK
86 #define HASH_UPDATE RIPEMD160_Update
87 #define HASH_TRANSFORM RIPEMD160_Transform
88 #define HASH_FINAL RIPEMD160_Final
89 #define HASH_MAKE_STRING(c,s) do { \
90 unsigned long ll; \
91 ll=(c)->A; (void)HOST_l2c(ll,(s)); \
92 ll=(c)->B; (void)HOST_l2c(ll,(s)); \
93 ll=(c)->C; (void)HOST_l2c(ll,(s)); \
94 ll=(c)->D; (void)HOST_l2c(ll,(s)); \
95 ll=(c)->E; (void)HOST_l2c(ll,(s)); \
96 } while (0)
97 #define HASH_BLOCK_DATA_ORDER ripemd160_block_data_order
99 #include "md32_common.h"
101 #if 0
102 #define F1(x,y,z) ((x)^(y)^(z))
103 #define F2(x,y,z) (((x)&(y))|((~x)&z))
104 #define F3(x,y,z) (((x)|(~y))^(z))
105 #define F4(x,y,z) (((x)&(z))|((y)&(~(z))))
106 #define F5(x,y,z) ((x)^(y)|(~(z)))
107 #else
108 /*
109  * Transformed F2 and F4 are courtesy of Wei Dai <weidai@eskimo.com>
110  */
111 #define F1(x,y,z) ((x) ^ (y) ^ (z))
112 #define F2(x,y,z) (((y) ^ (z)) & (x)) ^ (z))
113 #define F3(x,y,z) (((~(y)) | (x)) ^ (z))
114 #define F4(x,y,z) (((x) ^ (y)) & (z)) ^ (y))
115 #define F5(x,y,z) (((~(z)) | (y)) ^ (x))
116 #endif
118 #define RIPEMD160_A 0x67452301L
119 #define RIPEMD160_B 0xEFCDAB89L
120 #define RIPEMD160_C 0x98BADCFEL
121 #define RIPEMD160_D 0x10325476L
122 #define RIPEMD160_E 0xC3D2E1F0L
124 #include "rmdconst.h"
126 #define RIP1(a,b,c,d,e,w,s) { \
127 a+=F1(b,c,d)+X(w); \
```



```
128     a=ROTATE(a,s)+e; \
129     c=ROTATE(c,10); }

131 #define RIP2(a,b,c,d,e,w,s,K) { \
132     a+=F2(b,c,d)+X(w)+K; \
133     a=ROTATE(a,s)+e; \
134     c=ROTATE(c,10); }

136 #define RIP3(a,b,c,d,e,w,s,K) { \
137     a+=F3(b,c,d)+X(w)+K; \
138     a=ROTATE(a,s)+e; \
139     c=ROTATE(c,10); }

141 #define RIP4(a,b,c,d,e,w,s,K) { \
142     a+=F4(b,c,d)+X(w)+K; \
143     a=ROTATE(a,s)+e; \
144     c=ROTATE(c,10); }

146 #define RIP5(a,b,c,d,e,w,s,K) { \
147     a+=F5(b,c,d)+X(w)+K; \
148     a=ROTATE(a,s)+e; \
149     c=ROTATE(c,10); }
```

8572 Fri May 30 18:31:25 2014
 new/usr/src/lib/openssl/include/rmdconst.h
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

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57 */
58 #define KL0 0x00000000L
59 #define KL1 0x5A827999L
60 #define KL2 0x6ED9EBA1L
61 #define KL3 0x8F1BBCDCL

```

62 #define KL4 0xA953FD4EL

64 #define KR0 0x50A28BE6L
 65 #define KR1 0x5C4DD124L
 66 #define KR2 0x6D703EF3L
 67 #define KR3 0x7A6D76E9L
 68 #define KR4 0x00000000L

70 #define WL00 0
 71 #define SL00 11
 72 #define WL01 1
 73 #define SL01 14
 74 #define WL02 2
 75 #define SL02 15
 76 #define WL03 3
 77 #define SL03 12
 78 #define WL04 4
 79 #define SL04 5
 80 #define WL05 5
 81 #define SL05 8
 82 #define WL06 6
 83 #define SL06 7
 84 #define WL07 7
 85 #define SL07 9
 86 #define WL08 8
 87 #define SL08 11
 88 #define WL09 9
 89 #define SL09 13
 90 #define WL10 10
 91 #define SL10 14
 92 #define WL11 11
 93 #define SL11 15
 94 #define WL12 12
 95 #define SL12 6
 96 #define WL13 13
 97 #define SL13 7
 98 #define WL14 14
 99 #define SL14 9
 100 #define WL15 15
 101 #define SL15 8

103 #define WL16 7
 104 #define SL16 7
 105 #define WL17 4
 106 #define SL17 6
 107 #define WL18 13
 108 #define SL18 8
 109 #define WL19 1
 110 #define SL19 13
 111 #define WL20 10
 112 #define SL20 11
 113 #define WL21 6
 114 #define SL21 9
 115 #define WL22 15
 116 #define SL22 7
 117 #define WL23 3
 118 #define SL23 15
 119 #define WL24 12
 120 #define SL24 7
 121 #define WL25 0
 122 #define SL25 12
 123 #define WL26 9
 124 #define SL26 15
 125 #define WL27 5
 126 #define SL27 9
 127 #define WL28 2

```
128 #define SL28 11
129 #define WL29 14
130 #define SL29 7
131 #define WL30 11
132 #define SL30 13
133 #define WL31 8
134 #define SL31 12
```

```
136 #define WL32 3
137 #define SL32 11
138 #define WL33 10
139 #define SL33 13
140 #define WL34 14
141 #define SL34 6
142 #define WL35 4
143 #define SL35 7
144 #define WL36 9
145 #define SL36 14
146 #define WL37 15
147 #define SL37 9
148 #define WL38 8
149 #define SL38 13
150 #define WL39 1
151 #define SL39 15
152 #define WL40 2
153 #define SL40 14
154 #define WL41 7
155 #define SL41 8
156 #define WL42 0
157 #define SL42 13
158 #define WL43 6
159 #define SL43 6
160 #define WL44 13
161 #define SL44 5
162 #define WL45 11
163 #define SL45 12
164 #define WL46 5
165 #define SL46 7
166 #define WL47 12
167 #define SL47 5
```

```
169 #define WL48 1
170 #define SL48 11
171 #define WL49 9
172 #define SL49 12
173 #define WL50 11
174 #define SL50 14
175 #define WL51 10
176 #define SL51 15
177 #define WL52 0
178 #define SL52 14
179 #define WL53 8
180 #define SL53 15
181 #define WL54 12
182 #define SL54 9
183 #define WL55 4
184 #define SL55 8
185 #define WL56 13
186 #define SL56 9
187 #define WL57 3
188 #define SL57 14
189 #define WL58 7
190 #define SL58 5
191 #define WL59 15
192 #define SL59 6
193 #define WL60 14
```

```
194 #define SL60 8
195 #define WL61 5
196 #define SL61 6
197 #define WL62 6
198 #define SL62 5
199 #define WL63 2
200 #define SL63 12
```

```
202 #define WL64 4
203 #define SL64 9
204 #define WL65 0
205 #define SL65 15
206 #define WL66 5
207 #define SL66 5
208 #define WL67 9
209 #define SL67 11
210 #define WL68 7
211 #define SL68 6
212 #define WL69 12
213 #define SL69 8
214 #define WL70 2
215 #define SL70 13
216 #define WL71 10
217 #define SL71 12
218 #define WL72 14
219 #define SL72 5
220 #define WL73 1
221 #define SL73 12
222 #define WL74 3
223 #define SL74 13
224 #define WL75 8
225 #define SL75 14
226 #define WL76 11
227 #define SL76 11
228 #define WL77 6
229 #define SL77 8
230 #define WL78 15
231 #define SL78 5
232 #define WL79 13
233 #define SL79 6
```

```
235 #define WR00 5
236 #define SR00 8
237 #define WR01 14
238 #define SR01 9
239 #define WR02 7
240 #define SR02 9
241 #define WR03 0
242 #define SR03 11
243 #define WR04 9
244 #define SR04 13
245 #define WR05 2
246 #define SR05 15
247 #define WR06 11
248 #define SR06 15
249 #define WR07 4
250 #define SR07 5
251 #define WR08 13
252 #define SR08 7
253 #define WR09 6
254 #define SR09 7
255 #define WR10 15
256 #define SR10 8
257 #define WR11 8
258 #define SR11 11
259 #define WR12 1
```

```
260 #define SR12 14
261 #define WR13 10
262 #define SR13 14
263 #define WR14 3
264 #define SR14 12
265 #define WR15 12
266 #define SR15 6
```

```
268 #define WR16 6
269 #define SR16 9
270 #define WR17 11
271 #define SR17 13
272 #define WR18 3
273 #define SR18 15
274 #define WR19 7
275 #define SR19 7
276 #define WR20 0
277 #define SR20 12
278 #define WR21 13
279 #define SR21 8
280 #define WR22 5
281 #define SR22 9
282 #define WR23 10
283 #define SR23 11
284 #define WR24 14
285 #define SR24 7
286 #define WR25 15
287 #define SR25 7
288 #define WR26 8
289 #define SR26 12
290 #define WR27 12
291 #define SR27 7
292 #define WR28 4
293 #define SR28 6
294 #define WR29 9
295 #define SR29 15
296 #define WR30 1
297 #define SR30 13
298 #define WR31 2
299 #define SR31 11
```

```
301 #define WR32 15
302 #define SR32 9
303 #define WR33 5
304 #define SR33 7
305 #define WR34 1
306 #define SR34 15
307 #define WR35 3
308 #define SR35 11
309 #define WR36 7
310 #define SR36 8
311 #define WR37 14
312 #define SR37 6
313 #define WR38 6
314 #define SR38 6
315 #define WR39 9
316 #define SR39 14
317 #define WR40 11
318 #define SR40 12
319 #define WR41 8
320 #define SR41 13
321 #define WR42 12
322 #define SR42 5
323 #define WR43 2
324 #define SR43 14
325 #define WR44 10
```

```
326 #define SR44 13
327 #define WR45 0
328 #define SR45 13
329 #define WR46 4
330 #define SR46 7
331 #define WR47 13
332 #define SR47 5
```

```
334 #define WR48 8
335 #define SR48 15
336 #define WR49 6
337 #define SR49 5
338 #define WR50 4
339 #define SR50 8
340 #define WR51 1
341 #define SR51 11
342 #define WR52 3
343 #define SR52 14
344 #define WR53 11
345 #define SR53 14
346 #define WR54 15
347 #define SR54 6
348 #define WR55 0
349 #define SR55 14
350 #define WR56 5
351 #define SR56 6
352 #define WR57 12
353 #define SR57 9
354 #define WR58 2
355 #define SR58 12
356 #define WR59 13
357 #define SR59 9
358 #define WR60 9
359 #define SR60 12
360 #define WR61 7
361 #define SR61 5
362 #define WR62 10
363 #define SR62 15
364 #define WR63 14
365 #define SR63 8
```

```
367 #define WR64 12
368 #define SR64 8
369 #define WR65 15
370 #define SR65 5
371 #define WR66 10
372 #define SR66 12
373 #define WR67 4
374 #define SR67 9
375 #define WR68 1
376 #define SR68 12
377 #define WR69 5
378 #define SR69 5
379 #define WR70 8
380 #define SR70 14
381 #define WR71 7
382 #define SR71 6
383 #define WR72 6
384 #define SR72 8
385 #define WR73 2
386 #define SR73 13
387 #define WR74 13
388 #define SR74 6
389 #define WR75 14
390 #define SR75 5
391 #define WR76 0
```

```
392 #define SR76 15
393 #define WR77 3
394 #define SR77 13
395 #define WR78 9
396 #define SR78 11
397 #define WR79 11
398 #define SR79 11
```

5616 Fri May 30 18:31:25 2014
 new/usr/src/lib/openssl/include/rpc_des.h
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/des/rpc_des.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* @(#)des.h 2.2 88/08/10 4.0 RPCSRC; from 2.7 88/02/08 SMI */
60
61 * Sun RPC is a product of Sun Microsystems, Inc. and is provided for

```

```

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83 *
84 * Sun Microsystems, Inc.
85 * 2550 Garcia Avenue
86 * Mountain View, California 94043
87 */
88 /*
89 * Generic DES driver interface
90 * Keep this file hardware independent!
91 * Copyright (c) 1986 by Sun Microsystems, Inc.
92 */
93
94 #define DES_MAXLEN 65536 /* maximum # of bytes to encrypt */
95 #define DES_QUICKLEN 16 /* maximum # of bytes to encrypt quickly */
96
97 #ifdef HEADER_DES_H
98 #undef ENCRYPT
99 #undef DECRYPT
100 #endif
101
102 enum desdir { ENCRYPT, DECRYPT };
103 enum desmode { CBC, ECB };
104
105 /*
106 * parameters to ioctl call
107 */
108 struct desparams {
109     unsigned char des_key[8]; /* key (with low bit parity) */
110     enum desdir des_dir; /* direction */
111     enum desmode des_mode; /* mode */
112     unsigned char des_ivec[8]; /* input vector */
113     unsigned des_len; /* number of bytes to crypt */
114     union {
115         unsigned char UDES_data[DES_QUICKLEN];
116         unsigned char *UDES_buf;
117     } UDES;
118     #define des_data UDES.UDES_data /* direct data here if quick */
119     #define des_buf UDES.UDES_buf /* otherwise, pointer to data */
120 };
121
122 /*
123 * Encrypt an arbitrary sized buffer
124 */
125 #define DESIOCBLOCK _IOWR('d', 6, struct desparams)
126
127 /*

```

new/usr/src/lib/openssl/include/rpc_des.h

3

```
128  * Encrypt of small amount of data, quickly
129  */
130 #define DESIOCQUICK    _IOWR('d', 7, struct desparams)
```

new/usr/src/lib/openssl/include/rsa_locl.h

1

178 Fri May 30 18:31:25 2014

new/usr/src/lib/openssl/include/rsa_locl.h

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 extern int int_rsa_verify(int dtype, const unsigned char *m, unsigned int m_len,
2     unsigned char *rm, size_t *prm_len,
3     const unsigned char *sigbuf, size_t siglen,
4     RSA *rsa);
```



```

*****
4438 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/seed_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Copyright (c) 2007 KISA(Korea Information Security Agency). All rights reserv
3  *
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5  * modification, are permitted provided that the following conditions
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8  * notice, this list of conditions and the following disclaimer.
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10 * be used to endorse or promote products derived from this software
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13 * THIS SOFTWARE IS PROVIDED BY AUTHOR AND CONTRIBUTORS 'AS IS' AND
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15 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
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17 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
18 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
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20 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
21 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
22 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
23 * SUCH DAMAGE.
24 *
25 */
26 #ifndef HEADER_SEED_LOCL_H
27 #define HEADER_SEED_LOCL_H

29 #include "openssl/e_os2.h"
30 #include <openssl/seed.h>

33 #ifdef SEED_LONG /* need 32-bit type */
34 typedef unsigned long seed_word;
35 #else
36 typedef unsigned int seed_word;
37 #endif

40 #ifdef __cplusplus
41 extern "C" {
42 #endif

44 #define G_FUNC(v) \
45     SS[0][(unsigned char)(v) & 0xff] ^ SS[1][(unsigned char)((v)>>8)
46     SS[2][(unsigned char)((v)>>16) & 0xff] ^ SS[3][(unsigned char)((v)>>24)

48 #define char2word(c, i) \
49     (i) = (((seed_word)(c)[0]) << 24) | (((seed_word)(c)[1]) << 16) | (((se

51 #define word2char(l, c) \
52     *((c)+0) = (unsigned char)((l)>>24) & 0xff; \
53     *((c)+1) = (unsigned char)((l)>>16) & 0xff; \
54     *((c)+2) = (unsigned char)((l)>> 8) & 0xff; \
55     *((c)+3) = (unsigned char)((l)) & 0xff

57 #define KEYSCHEDULE_UPDATE0(T0, T1, X1, X2, X3, X4, KC) \
58     (T0) = (X3); \
59     (X3) = (((X3)<<8) ^ ((X4)>>24)) & 0xffffffff; \
60     (X4) = (((X4)<<8) ^ ((T0)>>24)) & 0xffffffff; \
61     (T0) = ((X1) + (X3) - (KC)) & 0xffffffff; \

```

```

62     (T1) = ((X2) + (KC) - (X4)) & 0xffffffff

64 #define KEYSCHEDULE_UPDATE1(T0, T1, X1, X2, X3, X4, KC) \
65     (T0) = (X1); \
66     (X1) = (((X1)>>8) ^ ((X2)<<24)) & 0xffffffff; \
67     (X2) = (((X2)>>8) ^ ((T0)<<24)) & 0xffffffff; \
68     (T0) = ((X1) + (X3) - (KC)) & 0xffffffff; \
69     (T1) = ((X2) + (KC) - (X4)) & 0xffffffff

71 #define KEYUPDATE_TEMP(T0, T1, K) \
72     (K)[0] = G_FUNC((T0)); \
73     (K)[1] = G_FUNC((T1))

75 #define XOR_SEEDBLOCK(DST, SRC) \
76     ((DST))[0] ^= ((SRC))[0]; \
77     ((DST))[1] ^= ((SRC))[1]; \
78     ((DST))[2] ^= ((SRC))[2]; \
79     ((DST))[3] ^= ((SRC))[3]

81 #define MOV_SEEDBLOCK(DST, SRC) \
82     ((DST))[0] = ((SRC))[0]; \
83     ((DST))[1] = ((SRC))[1]; \
84     ((DST))[2] = ((SRC))[2]; \
85     ((DST))[3] = ((SRC))[3]

87 # define CHAR2WORD(C, I) \
88     char2word((C), (I)[0]); \
89     char2word((C+4), (I)[1]); \
90     char2word((C+8), (I)[2]); \
91     char2word((C+12), (I)[3])

93 # define WORD2CHAR(I, C) \
94     word2char((I)[0], (C)); \
95     word2char((I)[1], (C+4)); \
96     word2char((I)[2], (C+8)); \
97     word2char((I)[3], (C+12))

99 # define E_SEED(T0, T1, X1, X2, X3, X4, rbase) \
100     (T0) = (X3) ^ (ks->data)[(rbase)]; \
101     (T1) = (X4) ^ (ks->data)[(rbase)+1]; \
102     (T1) ^= (T0); \
103     (T1) = G_FUNC((T1)); \
104     (T0) = ((T0) + (T1)) & 0xffffffff; \
105     (T0) = G_FUNC((T0)); \
106     (T1) = ((T1) + (T0)) & 0xffffffff; \
107     (T1) = G_FUNC((T1)); \
108     (T0) = ((T0) + (T1)) & 0xffffffff; \
109     (X1) ^= (T0); \
110     (X2) ^= (T1)

112 #ifdef __cplusplus
113 }
114 #endif

116 #endif /* HEADER_SEED_LOCL_H */

```

new/usr/src/lib/openssl/include/sha_locl.h

1

15716 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/sha_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/sha/sha_locl.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdlib.h>
60 #include <string.h>
```

new/usr/src/lib/openssl/include/sha_locl.h

2

```
62 #include <openssl/opensslconf.h>
63 #include <openssl/sha.h>

65 #define DATA_ORDER_IS_BIG_ENDIAN

67 #define HASH_LONG          SHA_LONG
68 #define HASH_CTX          SHA_CTX
69 #define HASH_CBLOCK       SHA_CBLOCK
70 #define HASH_MAKE_STRING(c,s) do { \
71     unsigned long ll; \
72     ll=(c)->h0; (void)HOST_l2c(ll,(s)); \
73     ll=(c)->h1; (void)HOST_l2c(ll,(s)); \
74     ll=(c)->h2; (void)HOST_l2c(ll,(s)); \
75     ll=(c)->h3; (void)HOST_l2c(ll,(s)); \
76     ll=(c)->h4; (void)HOST_l2c(ll,(s)); \
77     } while (0)

79 #if defined(SHA_0)

81 # define HASH_UPDATE      SHA_Update
82 # define HASH_TRANSFORM  SHA_Transform
83 # define HASH_FINAL      SHA_Final
84 # define HASH_INIT        SHA_Init
85 # define HASH_BLOCK_DATA_ORDER sha_block_data_order
86 # define Xupdate(a,ix,ia,ib,ic,id) (ix=(a)=(ia^ib^ic^id))

88 static void sha_block_data_order (SHA_CTX *c, const void *p,size_t num);

90 #elif defined(SHA_1)

92 # define HASH_UPDATE      SHA1_Update
93 # define HASH_TRANSFORM  SHA1_Transform
94 # define HASH_FINAL      SHA1_Final
95 # define HASH_INIT        SHA1_Init
96 # define HASH_BLOCK_DATA_ORDER sha1_block_data_order
97 # if defined(__MWERKS__) && defined(__MC68K__)
98     /* Metrowerks for Motorola fails otherwise:-( <appro@fy.chalmers.se> */
99     # define Xupdate(a,ix,ia,ib,ic,id) do { (a)=(ia^ib^ic^id); \
100     ix=(a)=ROTATE((a),1); \
101     } while (0)
102 # else
103 # define Xupdate(a,ix,ia,ib,ic,id) ( (a)=(ia^ib^ic^id), \
104     ix=(a)=ROTATE((a),1) \
105     )
106 # endif

108 #ifndef SHA1_ASM
109 static
110 #endif
111 void sha1_block_data_order (SHA_CTX *c, const void *p,size_t num);

113 #else
114 # error "Either SHA_0 or SHA_1 must be defined."
115 #endif

117 #include "md32_common.h"

119 #define INIT_DATA_h0 0x67452301UL
120 #define INIT_DATA_h1 0xefcdab89UL
121 #define INIT_DATA_h2 0x98badcfeUL
122 #define INIT_DATA_h3 0x10325476UL
123 #define INIT_DATA_h4 0xc3d2e1f0UL

125 #ifdef SHA_0
126 fips_md_init(SHA)
127 #else
```

```

128 fips_md_init_ctx(SHA1, SHA)
129 #endif
130 {
131     memset(c, 0, sizeof(*c));
132     c->h0=INIT_DATA_h0;
133     c->h1=INIT_DATA_h1;
134     c->h2=INIT_DATA_h2;
135     c->h3=INIT_DATA_h3;
136     c->h4=INIT_DATA_h4;
137     return 1;
138 }

140 #define K_00_19 0x5a827999UL
141 #define K_20_39 0x6ed9eba1UL
142 #define K_40_59 0x8f1bbcdcUL
143 #define K_60_79 0xca62c1d6UL

145 /* As pointed out by Wei Dai <weidai@eskimo.com>, F() below can be
146 * simplified to the code in F_00_19. Wei attributes these optimisations
147 * to Peter Gutmann's SHS code, and he attributes it to Rich Schroeppel.
148 * #define F(x,y,z) (((x) & (y)) | ((~(x)) & (z)))
149 * I've just become aware of another tweak to be made, again from Wei Dai,
150 * in F_40_59, (x&a)|(y&a) -> (x|y)&a
151 */
152 #define F_00_19(b,c,d) (((c) ^ (d)) & (b)) ^ (d))
153 #define F_20_39(b,c,d) ((b) ^ (c) ^ (d))
154 #define F_40_59(b,c,d) (((b) & (c)) | (((b)|(c)) & (d)))
155 #define F_60_79(b,c,d) F_20_39(b,c,d)

157 #ifndef OPENSSSL_SMALL_FOOTPRINT

159 #define BODY_00_15(i,a,b,c,d,e,f,xi) \
160     (f)=xi+(e)+K_00_19+ROTATE((a),5)+F_00_19((b),(c),(d)); \
161     (b)=ROTATE((b),30);

163 #define BODY_16_19(i,a,b,c,d,e,f,xi,xa,xb,xc,xd) \
164     Xupdate(f,xi,xa,xb,xc,xd); \
165     (f)+=(e)+K_00_19+ROTATE((a),5)+F_00_19((b),(c),(d)); \
166     (b)=ROTATE((b),30);

168 #define BODY_20_31(i,a,b,c,d,e,f,xi,xa,xb,xc,xd) \
169     Xupdate(f,xi,xa,xb,xc,xd); \
170     (f)+=(e)+K_20_39+ROTATE((a),5)+F_20_39((b),(c),(d)); \
171     (b)=ROTATE((b),30);

173 #define BODY_32_39(i,a,b,c,d,e,f,xi,xa,xb,xc,xd) \
174     Xupdate(f,xi,xa,xb,xc,xd); \
175     (f)+=(e)+K_20_39+ROTATE((a),5)+F_20_39((b),(c),(d)); \
176     (b)=ROTATE((b),30);

178 #define BODY_40_59(i,a,b,c,d,e,f,xi,xa,xb,xc,xd) \
179     Xupdate(f,xi,xa,xb,xc,xd); \
180     (f)+=(e)+K_40_59+ROTATE((a),5)+F_40_59((b),(c),(d)); \
181     (b)=ROTATE((b),30);

183 #define BODY_60_79(i,a,b,c,d,e,f,xi,xa,xb,xc,xd) \
184     Xupdate(f,xi,xa,xb,xc,xd); \
185     (f)=xa+(e)+K_60_79+ROTATE((a),5)+F_60_79((b),(c),(d)); \
186     (b)=ROTATE((b),30);

188 #ifdef X
189 #undef X
190 #endif
191 #ifndef MD32_XARRAY
192 /*
193  * Originally X was an array. As it's automatic it's natural

```

```

194 * to expect RISC compiler to accomodate at least part of it in
195 * the register bank, isn't it? Unfortunately not all compilers
196 * "find" this expectation reasonable:- (On order to make such
197 * compilers generate better code I replace X[] with a bunch of
198 * X0, X1, etc. See the function body below...
199 * <appro@fy.chalmers.se>
200 */
201 #define X(i) XX##i
202 #else
203 /*
204 * However! Some compilers (most notably HP C) get overwhelmed by
205 * that many local variables so that we have to have the way to
206 * fall down to the original behavior.
207 */
208 #define X(i) XX[i]
209 #endif

211 #if !defined(SHA_1) || !defined(SHA1_ASM)
212 static void HASH_BLOCK_DATA_ORDER (SHA_CTX *c, const void *p, size_t num)
213 {
214     const unsigned char *data=p;
215     register unsigned MD32_REG_T A,B,C,D,E,T,l;
216 #ifndef MD32_XARRAY
217     unsigned MD32_REG_T XX0, XX1, XX2, XX3, XX4, XX5, XX6, XX7,
218     XX8, XX9, XX10, XX11, XX12, XX13, XX14, XX15;
219 #else
220     SHA_LONG XX[16];
221 #endif

223     A=c->h0;
224     B=c->h1;
225     C=c->h2;
226     D=c->h3;
227     E=c->h4;

229     for (;;)
230     {
231         const union { long one; char little; } is_endian = {1};

233         if (!is_endian.little && sizeof(SHA_LONG)==4 && ((size_t)p%4)==0)
234         {
235             const SHA_LONG *W=(const SHA_LONG *)data;

237             X( 0) = W[0];
238             BODY_00_15( 0,A,B,C,D,E,T,X( 0));
239             BODY_00_15( 1,T,A,B,C,D,E,X( 1));
240             BODY_00_15( 2,E,T,A,B,C,D,X( 2));
241             BODY_00_15( 3,D,E,T,A,B,C,X( 3));
242             BODY_00_15( 4,C,D,E,T,A,B,X( 4));
243             BODY_00_15( 5,B,C,D,E,T,A,X( 5));
244             BODY_00_15( 6,A,B,C,D,E,T,X( 6));
245             BODY_00_15( 7,T,A,B,C,D,E,X( 7));
246             BODY_00_15( 8,E,T,A,B,C,D,X( 8));
247             BODY_00_15( 9,D,E,T,A,B,C,X( 9));
248             BODY_00_15(10,C,D,E,T,A,B,X(10));
249             BODY_00_15(11,B,C,D,E,T,A,X(11));
250             BODY_00_15(12,A,B,C,D,E,T,X(12));
251             BODY_00_15(13,T,A,B,C,D,E,X(13));
252             BODY_00_15(14,E,T,A,B,C,D,X(14));
253             BODY_00_15(15,D,E,T,A,B,C,X(15));

255             data += SHA_CBLOCK;
256         }
257         else
258         {
259             (void)HOST_c2l(data,l); X( 0)=l;
             (void)HOST_c2l(data,l);

```

```

260 BODY_00_15( 0,A,B,C,D,E,T,X( 0)); (void)HOST_c2l(data,l);
261 BODY_00_15( 1,T,A,B,C,D,E,X( 1)); (void)HOST_c2l(data,l);
262 BODY_00_15( 2,E,T,A,B,C,D,X( 2)); (void)HOST_c2l(data,l);
263 BODY_00_15( 3,D,E,T,A,B,C,X( 3)); (void)HOST_c2l(data,l);
264 BODY_00_15( 4,C,D,E,T,A,B,X( 4)); (void)HOST_c2l(data,l);
265 BODY_00_15( 5,B,C,D,E,T,A,X( 5)); (void)HOST_c2l(data,l);
266 BODY_00_15( 6,A,B,C,D,E,T,X( 6)); (void)HOST_c2l(data,l);
267 BODY_00_15( 7,T,A,B,C,D,E,X( 7)); (void)HOST_c2l(data,l);
268 BODY_00_15( 8,E,T,A,B,C,D,X( 8)); (void)HOST_c2l(data,l);
269 BODY_00_15( 9,D,E,T,A,B,C,X( 9)); (void)HOST_c2l(data,l);
270 BODY_00_15(10,C,D,E,T,A,B,X(10)); (void)HOST_c2l(data,l);
271 BODY_00_15(11,B,C,D,E,T,A,X(11)); (void)HOST_c2l(data,l);
272 BODY_00_15(12,A,B,C,D,E,T,X(12)); (void)HOST_c2l(data,l);
273 BODY_00_15(13,T,A,B,C,D,E,X(13)); (void)HOST_c2l(data,l);
274 BODY_00_15(14,E,T,A,B,C,D,X(14));
275 BODY_00_15(15,D,E,T,A,B,C,X(15));
276 }

278 BODY_16_19(16,C,D,E,T,A,B,X( 0),X( 0),X( 2),X( 8),X(13));
279 BODY_16_19(17,B,C,D,E,T,A,X( 1),X( 1),X( 3),X( 9),X(14));
280 BODY_16_19(18,A,B,C,D,E,T,X( 2),X( 2),X( 4),X(10),X(15));
281 BODY_16_19(19,T,A,B,C,D,E,X( 3),X( 3),X( 5),X(11),X( 0));

283 BODY_20_31(20,E,T,A,B,C,D,X( 4),X( 4),X( 6),X(12),X( 1));
284 BODY_20_31(21,D,E,T,A,B,C,X( 5),X( 5),X( 7),X(13),X( 2));
285 BODY_20_31(22,C,D,E,T,A,B,X( 6),X( 6),X( 8),X(14),X( 3));
286 BODY_20_31(23,B,C,D,E,T,A,X( 7),X( 7),X( 9),X(15),X( 4));
287 BODY_20_31(24,A,B,C,D,E,T,X( 8),X( 8),X(10),X( 0),X( 5));
288 BODY_20_31(25,T,A,B,C,D,E,X( 9),X( 9),X(11),X( 1),X( 6));
289 BODY_20_31(26,E,T,A,B,C,D,X(10),X(10),X(12),X( 2),X( 7));
290 BODY_20_31(27,D,E,T,A,B,C,X(11),X(11),X(13),X( 3),X( 8));
291 BODY_20_31(28,C,D,E,T,A,B,X(12),X(12),X(14),X( 4),X( 9));
292 BODY_20_31(29,B,C,D,E,T,A,X(13),X(13),X(15),X( 5),X(10));
293 BODY_20_31(30,A,B,C,D,E,T,X(14),X(14),X( 0),X( 6),X(11));
294 BODY_20_31(31,T,A,B,C,D,E,X(15),X(15),X( 1),X( 7),X(12));

296 BODY_32_39(32,E,T,A,B,C,D,X( 0),X( 2),X( 8),X(13));
297 BODY_32_39(33,D,E,T,A,B,C,X( 1),X( 3),X( 9),X(14));
298 BODY_32_39(34,C,D,E,T,A,B,X( 2),X( 4),X(10),X(15));
299 BODY_32_39(35,B,C,D,E,T,A,X( 3),X( 5),X(11),X( 0));
300 BODY_32_39(36,A,B,C,D,E,T,X( 4),X( 6),X(12),X( 1));
301 BODY_32_39(37,T,A,B,C,D,E,X( 5),X( 7),X(13),X( 2));
302 BODY_32_39(38,E,T,A,B,C,D,X( 6),X( 8),X(14),X( 3));
303 BODY_32_39(39,D,E,T,A,B,C,X( 7),X( 9),X(15),X( 4));

305 BODY_40_59(40,C,D,E,T,A,B,X( 8),X(10),X( 0),X( 5));
306 BODY_40_59(41,B,C,D,E,T,A,X( 9),X(11),X( 1),X( 6));
307 BODY_40_59(42,A,B,C,D,E,T,X(10),X(12),X( 2),X( 7));
308 BODY_40_59(43,T,A,B,C,D,E,X(11),X(13),X( 3),X( 8));
309 BODY_40_59(44,E,T,A,B,C,D,X(12),X(14),X( 4),X( 9));
310 BODY_40_59(45,D,E,T,A,B,C,X(13),X(15),X( 5),X(10));
311 BODY_40_59(46,C,D,E,T,A,B,X(14),X( 0),X( 6),X(11));
312 BODY_40_59(47,B,C,D,E,T,A,X(15),X( 1),X( 7),X(12));
313 BODY_40_59(48,A,B,C,D,E,T,X( 0),X( 2),X( 8),X(13));
314 BODY_40_59(49,T,A,B,C,D,E,X( 1),X( 3),X( 9),X(14));
315 BODY_40_59(50,E,T,A,B,C,D,X( 2),X( 4),X(10),X(15));
316 BODY_40_59(51,D,E,T,A,B,C,X( 3),X( 5),X(11),X( 0));
317 BODY_40_59(52,C,D,E,T,A,B,X( 4),X( 6),X(12),X( 1));
318 BODY_40_59(53,B,C,D,E,T,A,X( 5),X( 7),X(13),X( 2));
319 BODY_40_59(54,A,B,C,D,E,T,X( 6),X( 8),X(14),X( 3));
320 BODY_40_59(55,T,A,B,C,D,E,X( 7),X( 9),X(15),X( 4));
321 BODY_40_59(56,E,T,A,B,C,D,X( 8),X(10),X( 0),X( 5));
322 BODY_40_59(57,D,E,T,A,B,C,X( 9),X(11),X( 1),X( 6));
323 BODY_40_59(58,C,D,E,T,A,B,X(10),X(12),X( 2),X( 7));
324 BODY_40_59(59,B,C,D,E,T,A,X(11),X(13),X( 3),X( 8));

```

```

326 BODY_60_79(60,A,B,C,D,E,T,X(12),X(14),X( 4),X( 9));
327 BODY_60_79(61,T,A,B,C,D,E,X(13),X(15),X( 5),X(10));
328 BODY_60_79(62,E,T,A,B,C,D,X(14),X( 0),X( 6),X(11));
329 BODY_60_79(63,D,E,T,A,B,C,X(15),X( 1),X( 7),X(12));
330 BODY_60_79(64,C,D,E,T,A,B,X( 0),X( 2),X( 8),X(13));
331 BODY_60_79(65,B,C,D,E,T,A,X( 1),X( 3),X( 9),X(14));
332 BODY_60_79(66,A,B,C,D,E,T,X( 2),X( 4),X(10),X(15));
333 BODY_60_79(67,T,A,B,C,D,E,X( 3),X( 5),X(11),X( 0));
334 BODY_60_79(68,E,T,A,B,C,D,X( 4),X( 6),X(12),X( 1));
335 BODY_60_79(69,D,E,T,A,B,C,X( 5),X( 7),X(13),X( 2));
336 BODY_60_79(70,C,D,E,T,A,B,X( 6),X( 8),X(14),X( 3));
337 BODY_60_79(71,B,C,D,E,T,A,X( 7),X( 9),X(15),X( 4));
338 BODY_60_79(72,A,B,C,D,E,T,X( 8),X(10),X( 0),X( 5));
339 BODY_60_79(73,T,A,B,C,D,E,X( 9),X(11),X( 1),X( 6));
340 BODY_60_79(74,E,T,A,B,C,D,X(10),X(12),X( 2),X( 7));
341 BODY_60_79(75,D,E,T,A,B,C,X(11),X(13),X( 3),X( 8));
342 BODY_60_79(76,C,D,E,T,A,B,X(12),X(14),X( 4),X( 9));
343 BODY_60_79(77,B,C,D,E,T,A,X(13),X(15),X( 5),X(10));
344 BODY_60_79(78,A,B,C,D,E,T,X(14),X( 0),X( 6),X(11));
345 BODY_60_79(79,T,A,B,C,D,E,X(15),X( 1),X( 7),X(12));

347 c->h0=(c->h0+E)&0xffffffffL;
348 c->h1=(c->h1+T)&0xffffffffL;
349 c->h2=(c->h2+A)&0xffffffffL;
350 c->h3=(c->h3+B)&0xffffffffL;
351 c->h4=(c->h4+C)&0xffffffffL;

353 if (--num == 0) break;

355 A=c->h0;
356 B=c->h1;
357 C=c->h2;
358 D=c->h3;
359 E=c->h4;

361 }
362 }
363 #endif

365 #else /* OPENSSL_SMALL_FOOTPRINT */

367 #define BODY_00_15(xi) do { \
368 T=E+K_00_19+F_00_19(B,C,D); \
369 E=D, D=C, C=ROTATE(B,30), B=A; \
370 A=ROTATE(A,5)+T+xi; } while(0)

372 #define BODY_16_19(xa,xb,xc,xd) do { \
373 Xupdate(T,xa,xa,xb,xc,xd); \
374 T+=E+K_00_19+F_00_19(B,C,D); \
375 E=D, D=C, C=ROTATE(B,30), B=A; \
376 A=ROTATE(A,5)+T; } while(0)

378 #define BODY_20_39(xa,xb,xc,xd) do { \
379 Xupdate(T,xa,xa,xb,xc,xd); \
380 T+=E+K_20_39+F_20_39(B,C,D); \
381 E=D, D=C, C=ROTATE(B,30), B=A; \
382 A=ROTATE(A,5)+T; } while(0)

384 #define BODY_40_59(xa,xb,xc,xd) do { \
385 Xupdate(T,xa,xa,xb,xc,xd); \
386 T+=E+K_40_59+F_40_59(B,C,D); \
387 E=D, D=C, C=ROTATE(B,30), B=A; \
388 A=ROTATE(A,5)+T; } while(0)

390 #define BODY_60_79(xa,xb,xc,xd) do { \
391 Xupdate(T,xa,xa,xb,xc,xd); \

```

```

392     T=E+K_60_79+F_60_79(B,C,D); \
393     E=D, D=C, C=ROTATE(B,30), B=A; \
394     A=ROTATE(A,5)+T+xa; } while(0)

396 #if !defined(SHA_1) || !defined(SHA1_ASM)
397 static void HASH_BLOCK_DATA_ORDER (SHA_CTX *c, const void *p, size_t num)
398 {
399     const unsigned char *data=p;
400     register unsigned MD32_REG_T A,B,C,D,E,T,l;
401     int i;
402     SHA_LONG      X[16];

404     A=c->h0;
405     B=c->h1;
406     C=c->h2;
407     D=c->h3;
408     E=c->h4;

410     for (;;)
411     {
412         for (i=0;i<16;i++)
413             { HOST_c2l(data,l); X[i]=l; BODY_00_15(X[i]); }
414         for (i=0;i<4;i++)
415             { BODY_16_19(X[i],      X[i+2],      X[i+8],      X[(i+13)&15]); }
416         for (;i<24;i++)
417             { BODY_20_39(X[i&15],    X[(i+2)&15], X[(i+8)&15],X[(i+13)&15]); }
418         for (i=0;i<20;i++)
419             { BODY_40_59(X[(i+8)&15],X[(i+10)&15],X[i&15],    X[(i+5)&15]); }
420         for (i=4;i<24;i++)
421             { BODY_60_79(X[(i+8)&15],X[(i+10)&15],X[i&15],    X[(i+5)&15]); }

423         c->h0=(c->h0+A)&0xffffffffL;
424         c->h1=(c->h1+B)&0xffffffffL;
425         c->h2=(c->h2+C)&0xffffffffL;
426         c->h3=(c->h3+D)&0xffffffffL;
427         c->h4=(c->h4+E)&0xffffffffL;

429         if (--num == 0) break;

431         A=c->h0;
432         B=c->h1;
433         C=c->h2;
434         D=c->h3;
435         E=c->h4;

437     }
438 }
439 #endif
441 #endif

```

```

*****
10054 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/spr.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/des/spr.h */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 OPENSSL_GLOBAL const DES_LONG DES_SPtrans[8][64]={
60 {
61 /* nibble 0 */

```

```

62 0x02080800L, 0x00080000L, 0x02000002L, 0x02080802L,
63 0x02000000L, 0x00080802L, 0x00080002L, 0x02000002L,
64 0x00080802L, 0x02080800L, 0x02080000L, 0x00000802L,
65 0x02000802L, 0x02000000L, 0x00000000L, 0x00080002L,
66 0x00080000L, 0x00000002L, 0x02000800L, 0x00080800L,
67 0x02080802L, 0x02080000L, 0x00000802L, 0x02000800L,
68 0x00000002L, 0x00000800L, 0x00080800L, 0x02080002L,
69 0x00000800L, 0x02000802L, 0x02080002L, 0x00000000L,
70 0x00000000L, 0x02080802L, 0x02000800L, 0x00080002L,
71 0x02080800L, 0x00080000L, 0x00000802L, 0x02000800L,
72 0x02080002L, 0x00000800L, 0x00080800L, 0x02000002L,
73 0x00080802L, 0x00000002L, 0x02000002L, 0x02080000L,
74 0x02080802L, 0x00080800L, 0x02080000L, 0x02000802L,
75 0x00000000L, 0x00000802L, 0x00080002L, 0x00000000L,
76 0x00080000L, 0x02000000L, 0x02000802L, 0x02080800L,
77 0x00000002L, 0x02080002L, 0x00000800L, 0x00080802L,
78 },{
79 /* nibble 1 */
80 0x40108010L, 0x00000000L, 0x00108000L, 0x40100000L,
81 0x40000010L, 0x000008010L, 0x40008000L, 0x00108000L,
82 0x00000800L, 0x40100010L, 0x00000010L, 0x40008000L,
83 0x00100010L, 0x40108000L, 0x40100000L, 0x00000010L,
84 0x00100000L, 0x40008010L, 0x40008000L, 0x0008000L,
85 0x00108010L, 0x40000000L, 0x00000000L, 0x00100010L,
86 0x40008010L, 0x00108010L, 0x40108000L, 0x40000010L,
87 0x40000000L, 0x00100000L, 0x00008010L, 0x40108010L,
88 0x00100010L, 0x40108000L, 0x40008000L, 0x00108010L,
89 0x40108010L, 0x00100010L, 0x40000010L, 0x00000000L,
90 0x40000000L, 0x00008010L, 0x00100000L, 0x40100010L,
91 0x00008000L, 0x40000000L, 0x00108010L, 0x40008010L,
92 0x40108000L, 0x00008000L, 0x00008000L, 0x40000010L,
93 0x00000010L, 0x40108010L, 0x00108000L, 0x40100000L,
94 0x40100010L, 0x00100000L, 0x00008010L, 0x40008000L,
95 0x40008010L, 0x00000010L, 0x40100000L, 0x00108000L,
96 },{
97 /* nibble 2 */
98 0x04000001L, 0x04040100L, 0x00000100L, 0x04000101L,
99 0x00004000L, 0x04000001L, 0x04000000L, 0x00040100L,
100 0x04000100L, 0x00040000L, 0x04040000L, 0x00000001L,
101 0x00040101L, 0x00000101L, 0x00000001L, 0x04040100L,
102 0x00000000L, 0x00040001L, 0x04040100L, 0x00000100L,
103 0x00000101L, 0x04040101L, 0x00040000L, 0x04000001L,
104 0x04040001L, 0x04000100L, 0x00040101L, 0x04040000L,
105 0x00040100L, 0x00000000L, 0x04000000L, 0x00040101L,
106 0x04040100L, 0x00000001L, 0x00000001L, 0x00040000L,
107 0x00000101L, 0x00040001L, 0x04040000L, 0x04000101L,
108 0x00000000L, 0x04040100L, 0x00040100L, 0x00000001L,
109 0x00040001L, 0x04000000L, 0x04040101L, 0x00000001L,
110 0x00040101L, 0x04000001L, 0x04000000L, 0x04040101L,
111 0x00004000L, 0x04000100L, 0x04000101L, 0x00040100L,
112 0x04000100L, 0x00000000L, 0x04040001L, 0x00000101L,
113 0x04000001L, 0x00040101L, 0x00000100L, 0x04040000L,
114 },{
115 /* nibble 3 */
116 0x00401008L, 0x10001000L, 0x00000008L, 0x10401008L,
117 0x00000000L, 0x10400000L, 0x10001008L, 0x00400008L,
118 0x10401000L, 0x10000008L, 0x10000000L, 0x00001008L,
119 0x10000008L, 0x00401008L, 0x00400000L, 0x10000000L,
120 0x10400008L, 0x00401000L, 0x00001000L, 0x00000008L,
121 0x00401000L, 0x10001008L, 0x10001008L, 0x00001000L,
122 0x00001008L, 0x00000000L, 0x00400008L, 0x10401000L,
123 0x10001000L, 0x10400008L, 0x10400000L, 0x00400000L,
124 0x10400008L, 0x00001008L, 0x00400000L, 0x10000008L,
125 0x00401000L, 0x10001000L, 0x00000008L, 0x10400000L,
126 0x10001008L, 0x00000000L, 0x00001000L, 0x00400008L,
127 0x00000000L, 0x10400008L, 0x10401000L, 0x00001000L,

```

```
128 0x10000000L, 0x10401008L, 0x00401008L, 0x00400000L,
129 0x10401008L, 0x00000008L, 0x10001000L, 0x00401008L,
130 0x00400008L, 0x00401000L, 0x10400000L, 0x10001008L,
131 0x00001008L, 0x10000000L, 0x10000008L, 0x10401000L,
132 },{
133 /* nibble 4 */
134 0x08000000L, 0x00010000L, 0x00000400L, 0x08010420L,
135 0x08010020L, 0x08000400L, 0x00010420L, 0x08010000L,
136 0x00010000L, 0x00000020L, 0x08000020L, 0x00010400L,
137 0x08000420L, 0x08010020L, 0x08010400L, 0x00000000L,
138 0x00010400L, 0x08000000L, 0x00010020L, 0x00000420L,
139 0x08000400L, 0x00010420L, 0x00000000L, 0x08000020L,
140 0x00000020L, 0x08000420L, 0x08010420L, 0x00010020L,
141 0x08010000L, 0x00000400L, 0x00000420L, 0x08010400L,
142 0x08010400L, 0x08000420L, 0x00010020L, 0x08010000L,
143 0x00010000L, 0x00000020L, 0x08000020L, 0x08000400L,
144 0x08000000L, 0x00010400L, 0x08010420L, 0x00000000L,
145 0x00010420L, 0x08000000L, 0x00000400L, 0x00010020L,
146 0x08000420L, 0x00000400L, 0x00000000L, 0x08010420L,
147 0x08010020L, 0x08010400L, 0x00000420L, 0x00010000L,
148 0x00010400L, 0x08010020L, 0x08000400L, 0x00000420L,
149 0x00000020L, 0x00010420L, 0x08010000L, 0x08000020L,
150 },{
151 /* nibble 5 */
152 0x80000040L, 0x00200040L, 0x00000000L, 0x80202000L,
153 0x00200040L, 0x00002000L, 0x00002040L, 0x00200000L,
154 0x00002040L, 0x80202040L, 0x00202000L, 0x80000000L,
155 0x80002000L, 0x80000040L, 0x80200000L, 0x00202040L,
156 0x00200000L, 0x80002040L, 0x80200040L, 0x00000000L,
157 0x00002000L, 0x00000040L, 0x80202000L, 0x80200040L,
158 0x80202040L, 0x80200000L, 0x80000000L, 0x00002040L,
159 0x00000040L, 0x00202000L, 0x00202040L, 0x80002000L,
160 0x00002040L, 0x80000000L, 0x80002000L, 0x00202040L,
161 0x80202000L, 0x00200040L, 0x00000000L, 0x80002000L,
162 0x80000000L, 0x00002000L, 0x80200040L, 0x00200000L,
163 0x00200040L, 0x80202040L, 0x00202000L, 0x00000040L,
164 0x80202040L, 0x00202000L, 0x00200000L, 0x80002040L,
165 0x80000040L, 0x80200000L, 0x00202040L, 0x00000000L,
166 0x00002000L, 0x80000040L, 0x80002040L, 0x80202000L,
167 0x80200000L, 0x00002040L, 0x00000040L, 0x80200040L,
168 },{
169 /* nibble 6 */
170 0x00004000L, 0x00000200L, 0x01000200L, 0x0100004L,
171 0x01004204L, 0x00004004L, 0x00004200L, 0x00000000L,
172 0x01000000L, 0x01000204L, 0x00000204L, 0x01004000L,
173 0x00000004L, 0x01004200L, 0x01004000L, 0x00000204L,
174 0x01000204L, 0x00004000L, 0x00004004L, 0x01004204L,
175 0x00000000L, 0x01000200L, 0x01000004L, 0x00004200L,
176 0x01004004L, 0x00004204L, 0x01004200L, 0x00000004L,
177 0x00004204L, 0x01004004L, 0x00000200L, 0x01000000L,
178 0x00004204L, 0x01004000L, 0x01004004L, 0x00000204L,
179 0x00004000L, 0x00000200L, 0x01000000L, 0x01004004L,
180 0x01000204L, 0x00004204L, 0x00004200L, 0x00000000L,
181 0x00000200L, 0x01000004L, 0x00000004L, 0x01000200L,
182 0x00000000L, 0x01000204L, 0x01000200L, 0x00004200L,
183 0x00000204L, 0x00004000L, 0x01004204L, 0x01000000L,
184 0x01004200L, 0x00000004L, 0x00004004L, 0x01004204L,
185 0x01000004L, 0x01004200L, 0x01004000L, 0x00004004L,
186 },{
187 /* nibble 7 */
188 0x20800080L, 0x20820000L, 0x00020080L, 0x00000000L,
189 0x20020000L, 0x00800080L, 0x20820000L, 0x20820080L,
190 0x00000080L, 0x20000000L, 0x00820000L, 0x00020080L,
191 0x00820080L, 0x20020080L, 0x20000080L, 0x20800000L,
192 0x00020000L, 0x00820080L, 0x00800080L, 0x20020000L,
193 0x20820080L, 0x20000080L, 0x00000000L, 0x00820000L,
```

```
194 0x20000000L, 0x00800000L, 0x20020080L, 0x20800080L,
195 0x00800000L, 0x00020000L, 0x20820000L, 0x00000080L,
196 0x00800000L, 0x00020000L, 0x20000080L, 0x20820080L,
197 0x00020080L, 0x20000000L, 0x00000000L, 0x00820000L,
198 0x20800080L, 0x20020080L, 0x20020000L, 0x00800080L,
199 0x20820000L, 0x00000080L, 0x00800080L, 0x20020000L,
200 0x20820080L, 0x00800000L, 0x20800000L, 0x20000080L,
201 0x00820000L, 0x00020080L, 0x20020080L, 0x20800000L,
202 0x00000080L, 0x20820000L, 0x00820080L, 0x00000000L,
203 0x20000000L, 0x20800080L, 0x00020000L, 0x00820080L,
204 };
```

```

*****
18750 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/srp_grps.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* start of generated data */

3 static BN_ULONG bn_group_1024_value[] = {
4     bn_pack4(0x9FC6, 0x1D2F, 0xC0EB, 0x06E3),
5     bn_pack4(0xFD51, 0x38FE, 0x8376, 0x435B),
6     bn_pack4(0x2FD4, 0xCBFA, 0x976E, 0xAA9A),
7     bn_pack4(0x68ED, 0xBC3C, 0x0572, 0x6CC0),
8     bn_pack4(0xC529, 0xF566, 0x660E, 0x57EC),
9     bn_pack4(0x8255, 0x9B29, 0x7BCF, 0x1885),
10    bn_pack4(0xCE8E, 0xF4AD, 0x69B1, 0x5D4D),
11    bn_pack4(0x5DC7, 0xD7B4, 0x6154, 0xD6B6),
12    bn_pack4(0x8E49, 0x5C1D, 0x6089, 0xDAD1),
13    bn_pack4(0xE0D5, 0xD8E2, 0x50B9, 0x8BE4),
14    bn_pack4(0x383B, 0x4813, 0xD692, 0xC6E0),
15    bn_pack4(0xD674, 0xDF74, 0x96EA, 0x81D3),
16    bn_pack4(0x9EA2, 0x314C, 0x9C25, 0x657E),
17    bn_pack4(0x6072, 0x6187, 0x75FF, 0x3C0B),
18    bn_pack4(0x9C33, 0xF80A, 0xFA8F, 0xC5E8),
19    bn_pack4(0xEEAF, 0x0AB9, 0xADB3, 0x8DD6)
20 };
21 static BIGNUM bn_group_1024 = {
22     bn_group_1024_value,
23     (sizeof bn_group_1024_value)/sizeof(BN_ULONG),
24     (sizeof bn_group_1024_value)/sizeof(BN_ULONG),
25     0,
26     BN_FLG_STATIC_DATA
27 };

29 static BN_ULONG bn_group_1536_value[] = {
30     bn_pack4(0xCF76, 0xE3FE, 0xD135, 0xF9BB),
31     bn_pack4(0x1518, 0x0F93, 0x499A, 0x234D),
32     bn_pack4(0x8CE7, 0xA28C, 0x2442, 0xC6F3),
33     bn_pack4(0x5A02, 0x1FFF, 0x5E91, 0x479E),
34     bn_pack4(0x7F8A, 0x2FE9, 0xB8B5, 0x292E),
35     bn_pack4(0x837C, 0x264A, 0xE3A9, 0xBEB8),
36     bn_pack4(0xE442, 0x734A, 0xF7CC, 0xB7AE),
37     bn_pack4(0x6577, 0x2E43, 0x7D6C, 0x7F8C),
38     bn_pack4(0xDB2F, 0xD53D, 0x24B7, 0xC486),
39     bn_pack4(0x6EDF, 0x0195, 0x3934, 0x9627),
40     bn_pack4(0x158B, 0xFD3E, 0x2B9C, 0x8CF5),
41     bn_pack4(0x764E, 0x3F4B, 0x53DD, 0x9DA1),
42     bn_pack4(0x4754, 0x8381, 0xDBC5, 0xB1FC),
43     bn_pack4(0x9B60, 0x9E0B, 0xE3BA, 0xB63D),
44     bn_pack4(0x8134, 0xB1C8, 0xB979, 0x8914),
45     bn_pack4(0x0DF0, 0x8A7C, 0xEC67, 0xF0D0),
46     bn_pack4(0x80B6, 0x55BB, 0x9A22, 0xE8DC),
47     bn_pack4(0x1558, 0x903B, 0xA0D0, 0xF843),
48     bn_pack4(0x51C6, 0xA94B, 0xE460, 0x7A29),
49     bn_pack4(0x5F4F, 0x5F55, 0x6E27, 0xCBDE),
50     bn_pack4(0xBEEE, 0xA961, 0x4B19, 0xCC4D),
51     bn_pack4(0xDBA5, 0x1DF4, 0x99AC, 0x4C80),
52     bn_pack4(0xB1F1, 0x2A86, 0x17A4, 0x7BBB),
53     bn_pack4(0x9DEF, 0x3CAF, 0xB939, 0x277A)
54 };
55 static BIGNUM bn_group_1536 = {
56     bn_group_1536_value,
57     (sizeof bn_group_1536_value)/sizeof(BN_ULONG),
58     (sizeof bn_group_1536_value)/sizeof(BN_ULONG),
59     0,
60     BN_FLG_STATIC_DATA
61 };

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```

63 static BN_ULONG bn_group_2048_value[] = {
64     bn_pack4(0x0FA7, 0x111F, 0x9E4A, 0xFF73),
65     bn_pack4(0x9B65, 0xE372, 0xFCDB, 0x8EF2),
66     bn_pack4(0x35DE, 0x236D, 0x525F, 0x5475),
67     bn_pack4(0x94B5, 0xC803, 0xD89F, 0x7AE4),
68     bn_pack4(0x71AE, 0x35F8, 0xE9DB, 0xFBB6),
69     bn_pack4(0x2A56, 0x98F3, 0xA8D0, 0xC382),
70     bn_pack4(0x9CCC, 0x041C, 0x7BC3, 0x08D8),
71     bn_pack4(0xAF87, 0x4E73, 0x03CE, 0x5329),
72     bn_pack4(0x6160, 0x2790, 0x04E5, 0x7AE6),
73     bn_pack4(0x032C, 0xFBDB, 0xF52F, 0xB378),
74     bn_pack4(0x5EA7, 0x7A27, 0x75D2, 0xECFA),
75     bn_pack4(0x5445, 0x23B5, 0x24B0, 0xD57D),
76     bn_pack4(0x5B9D, 0x32E6, 0x88F8, 0x7748),
77     bn_pack4(0xF1D2, 0xB907, 0x8717, 0x461A),
78     bn_pack4(0x76BD, 0x207A, 0x436C, 0x6481),
79     bn_pack4(0xCA97, 0xB43A, 0x23FB, 0x8016),
80     bn_pack4(0x1D28, 0x1E44, 0x6B14, 0x773B),
81     bn_pack4(0x7359, 0xD041, 0xD5C3, 0x3EA7),
82     bn_pack4(0xA80D, 0x740A, 0xDBF4, 0xFF74),
83     bn_pack4(0x55F9, 0x7993, 0xEC97, 0x5EEA),
84     bn_pack4(0x2918, 0xA996, 0x2F0B, 0x93B8),
85     bn_pack4(0x661A, 0x05FB, 0xD5FA, 0xAAE8),
86     bn_pack4(0xCF60, 0x9517, 0x9A16, 0x3AB3),
87     bn_pack4(0xE808, 0x3969, 0xEDB7, 0x67B0),
88     bn_pack4(0xCD7F, 0x48A9, 0xDA04, 0xFD50),
89     bn_pack4(0xD523, 0x12AB, 0x4B03, 0x310D),
90     bn_pack4(0x8193, 0xE075, 0x7767, 0xA13D),
91     bn_pack4(0xA373, 0x29CB, 0xB4A0, 0x99ED),
92     bn_pack4(0xFC31, 0x9294, 0x3DB5, 0x6050),
93     bn_pack4(0xAF72, 0xB665, 0x1987, 0xEE07),
94     bn_pack4(0xF166, 0xDE5E, 0x1389, 0x582F),
95     bn_pack4(0xAC6B, 0xDB41, 0x324A, 0x9A9B)
96 };
97 static BIGNUM bn_group_2048 = {
98     bn_group_2048_value,
99     (sizeof bn_group_2048_value)/sizeof(BN_ULONG),
100    (sizeof bn_group_2048_value)/sizeof(BN_ULONG),
101    0,
102    BN_FLG_STATIC_DATA
103 };

105 static BN_ULONG bn_group_3072_value[] = {
106     bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF),
107     bn_pack4(0x4B82, 0xD120, 0xA93A, 0xD2CA),
108     bn_pack4(0x43DB, 0x5BFC, 0xE0FD, 0x108E),
109     bn_pack4(0x08E2, 0x4FA0, 0x74E5, 0xAB31),
110     bn_pack4(0x7709, 0x88C0, 0xBAD9, 0x46E2),
111     bn_pack4(0xBBE1, 0x1757, 0x7A61, 0x5D6C),
112     bn_pack4(0x521F, 0x2B18, 0x177B, 0x200C),
113     bn_pack4(0xD876, 0x0273, 0x3EC8, 0x6A64),
114     bn_pack4(0xF12F, 0xFA06, 0xD98A, 0x0864),
115     bn_pack4(0xCCE3, 0xD226, 0x1AD2, 0xEE6B),
116     bn_pack4(0x1E8C, 0x94E0, 0x4A25, 0x619D),
117     bn_pack4(0xABF5, 0xAE8C, 0xDB09, 0x33D7),
118     bn_pack4(0xB397, 0x0F85, 0xA6E1, 0x4C7),
119     bn_pack4(0x8AEA, 0x7157, 0x5D06, 0x0C7D),
120     bn_pack4(0xECFB, 0x8504, 0x58DB, 0xEF0A),
121     bn_pack4(0xA855, 0x21AB, 0xDF1C, 0xBA64),
122     bn_pack4(0xAD33, 0x170D, 0x0450, 0x7A33),
123     bn_pack4(0x1572, 0x8E5A, 0x8AAA, 0xC42D),
124     bn_pack4(0x15D2, 0x2618, 0x98FA, 0x0510),
125     bn_pack4(0x3995, 0x497C, 0xEA95, 0x6AE5),
126     bn_pack4(0xDE2B, 0xCBFA, 0x9558, 0x1718),
127     bn_pack4(0xB5C5, 0x5DF0, 0x6F4C, 0x52C9),

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128 bn_pack4(0x9B27, 0x83A2, 0xEC07, 0xA28F),
129 bn_pack4(0xE39E, 0x772C, 0x180E, 0x8603),
130 bn_pack4(0x3290, 0x5E46, 0x2E36, 0xCE3B),
131 bn_pack4(0xF174, 0x6C08, 0xCA18, 0x217C),
132 bn_pack4(0x670C, 0x354E, 0x4ABC, 0x9804),
133 bn_pack4(0x9ED5, 0x2907, 0x7096, 0x966D),
134 bn_pack4(0x1C62, 0xF356, 0x2085, 0x52BB),
135 bn_pack4(0x8365, 0x5D23, 0xDCA3, 0xAD96),
136 bn_pack4(0x6916, 0x3FA8, 0xFD24, 0xCF5F),
137 bn_pack4(0x98DA, 0x4836, 0x1C55, 0xD39A),
138 bn_pack4(0xC200, 0x7CB8, 0xA163, 0xBF05),
139 bn_pack4(0x4928, 0x6651, 0xECE4, 0x5B3D),
140 bn_pack4(0xAE9F, 0x2411, 0x7C4B, 0x1FE6),
141 bn_pack4(0xEE38, 0x6BFB, 0x5A89, 0x9FA5),
142 bn_pack4(0x0BFF, 0x5CB6, 0xF406, 0xB7ED),
143 bn_pack4(0xF44C, 0x42E9, 0xA637, 0xED6B),
144 bn_pack4(0xE485, 0xB576, 0x625E, 0x7EC6),
145 bn_pack4(0x4FE1, 0x356D, 0x6D51, 0xC245),
146 bn_pack4(0x302B, 0x0A6D, 0xF25F, 0x1437),
147 bn_pack4(0xEF95, 0x19B3, 0xCD3A, 0x431B),
148 bn_pack4(0x514A, 0x0879, 0x8E34, 0x04DD),
149 bn_pack4(0x020B, 0xBEA6, 0x3B13, 0x9B22),
150 bn_pack4(0x2902, 0x4E08, 0x8A67, 0xCC74),
151 bn_pack4(0xC4C6, 0x628B, 0x80DC, 0x1CD1),
152 bn_pack4(0xC90F, 0xDAA2, 0x2168, 0xC234),
153 bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF)
154 };
155 static BIGNUM bn_group_3072 = {
156 bn_group_3072_value,
157 (sizeof bn_group_3072_value)/sizeof(BN_ULONG),
158 (sizeof bn_group_3072_value)/sizeof(BN_ULONG),
159 0,
160 BN_FLG_STATIC_DATA
161 };

163 static BN_ULONG bn_group_4096_value[] = {
164 bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF),
165 bn_pack4(0x4DF4, 0x35C9, 0x3406, 0x3199),
166 bn_pack4(0x86FF, 0xB7DC, 0x90A6, 0xC08F),
167 bn_pack4(0x93B4, 0xEA98, 0x8D8F, 0xDDC1),
168 bn_pack4(0xD006, 0x9127, 0xD5B0, 0x5AA9),
169 bn_pack4(0xB81B, 0xDD76, 0x2170, 0x481C),
170 bn_pack4(0x1F61, 0x2970, 0xCCE2, 0xD7AF),
171 bn_pack4(0x233B, 0xA186, 0x515B, 0xE7ED),
172 bn_pack4(0x99B2, 0x964F, 0xA090, 0xC3A2),
173 bn_pack4(0x287C, 0x5947, 0x4E6B, 0xC05D),
174 bn_pack4(0x2E8E, 0xFC14, 0x1FBE, 0xCAAE),
175 bn_pack4(0xDBBB, 0xC2DB, 0x04DE, 0x8EF9),
176 bn_pack4(0x2583, 0xE9CA, 0x2AD4, 0x4CE8),
177 bn_pack4(0x1A94, 0x6834, 0xB615, 0x0BDA),
178 bn_pack4(0x99C3, 0x2718, 0x6AF4, 0xE23C),
179 bn_pack4(0x8871, 0x9A10, 0xBDBA, 0x5B26),
180 bn_pack4(0x1A72, 0x3C12, 0xA787, 0xE6D7),
181 bn_pack4(0x4B82, 0xD120, 0xA921, 0x0801),
182 bn_pack4(0x43DB, 0x5BFC, 0xE0FD, 0x108E),
183 bn_pack4(0x08E2, 0x4FA0, 0x74E5, 0xAB31),
184 bn_pack4(0x7709, 0x88C0, 0xBAD9, 0x46E2),
185 bn_pack4(0xBBE1, 0x1757, 0x7A61, 0x5D6C),
186 bn_pack4(0x521F, 0x2B18, 0x177B, 0x200C),
187 bn_pack4(0xD876, 0x0273, 0x3EC8, 0x6A64),
188 bn_pack4(0xF12F, 0xFA06, 0xD98A, 0x0864),
189 bn_pack4(0xCCE3, 0xD226, 0x1AD2, 0xEE6B),
190 bn_pack4(0x1E8C, 0x94E0, 0x4A25, 0x619D),
191 bn_pack4(0xABF5, 0xAE8C, 0xDB09, 0x33D7),
192 bn_pack4(0xB397, 0x0F85, 0xA6E1, 0xE4C7),
193 bn_pack4(0x8AEA, 0x7157, 0x5D06, 0x0C7D),

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```

194 bn_pack4(0xECFB, 0x8504, 0x58DB, 0xEF0A),
195 bn_pack4(0xA855, 0x21AB, 0xDF1C, 0xBA64),
196 bn_pack4(0xAD33, 0x170D, 0x0450, 0x7A33),
197 bn_pack4(0x1572, 0x8E5A, 0x8AAA, 0xC42D),
198 bn_pack4(0x15D2, 0x2618, 0x98FA, 0x0510),
199 bn_pack4(0x3995, 0x497C, 0xEA95, 0x6AE5),
200 bn_pack4(0xDE2B, 0xCBFB, 0x9558, 0x1718),
201 bn_pack4(0xB5C5, 0x5DF0, 0x6F4C, 0x52C9),
202 bn_pack4(0x9B27, 0x83A2, 0xEC07, 0xA28F),
203 bn_pack4(0xE39E, 0x772C, 0x180E, 0x8603),
204 bn_pack4(0x3290, 0x5E46, 0x2E36, 0xCE3B),
205 bn_pack4(0xF174, 0x6C08, 0xCA18, 0x217C),
206 bn_pack4(0x670C, 0x354E, 0x4ABC, 0x9804),
207 bn_pack4(0x9ED5, 0x2907, 0x7096, 0x966D),
208 bn_pack4(0x1C62, 0xF356, 0x2085, 0x52BB),
209 bn_pack4(0x8365, 0x5D23, 0xDCA3, 0xAD96),
210 bn_pack4(0x6916, 0x3FA8, 0xFD24, 0xCF5F),
211 bn_pack4(0x98DA, 0x4836, 0x1C55, 0xD39A),
212 bn_pack4(0xC200, 0x7CB8, 0xA163, 0xBF05),
213 bn_pack4(0x4928, 0x6651, 0xECE4, 0x5B3D),
214 bn_pack4(0xAE9F, 0x2411, 0x7C4B, 0x1FE6),
215 bn_pack4(0xEE38, 0x6BFB, 0x5A89, 0x9FA5),
216 bn_pack4(0x0BFF, 0x5CB6, 0xF406, 0xB7ED),
217 bn_pack4(0xF44C, 0x42E9, 0xA637, 0xED6B),
218 bn_pack4(0xE485, 0xB576, 0x625E, 0x7EC6),
219 bn_pack4(0x4FE1, 0x356D, 0x6D51, 0xC245),
220 bn_pack4(0x302B, 0x0A6D, 0xF25F, 0x1437),
221 bn_pack4(0xEF95, 0x19B3, 0xCD3A, 0x431B),
222 bn_pack4(0x514A, 0x0879, 0x8E34, 0x04DD),
223 bn_pack4(0x020B, 0xBEA6, 0x3B13, 0x9B22),
224 bn_pack4(0x2902, 0x4E08, 0x8A67, 0xCC74),
225 bn_pack4(0xC4C6, 0x628B, 0x80DC, 0x1CD1),
226 bn_pack4(0xC90F, 0xDAA2, 0x2168, 0xC234),
227 bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF)
228 };
229 static BIGNUM bn_group_4096 = {
230 bn_group_4096_value,
231 (sizeof bn_group_4096_value)/sizeof(BN_ULONG),
232 (sizeof bn_group_4096_value)/sizeof(BN_ULONG),
233 0,
234 BN_FLG_STATIC_DATA
235 };

237 static BN_ULONG bn_group_6144_value[] = {
238 bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF),
239 bn_pack4(0xE694, 0xF91E, 0x6DCC, 0x4024),
240 bn_pack4(0x12BF, 0x2D5B, 0x0B74, 0x74D6),
241 bn_pack4(0x043E, 0x8F66, 0x3F48, 0x60EE),
242 bn_pack4(0x387F, 0xE8D7, 0x6E3C, 0x0468),
243 bn_pack4(0xDA56, 0xC9EC, 0x2EF2, 0x9632),
244 bn_pack4(0xEB19, 0xCCB1, 0xA313, 0xD55C),
245 bn_pack4(0xF550, 0xAA3D, 0x8A1F, 0xBFF0),
246 bn_pack4(0x06A1, 0xD58B, 0xB7C5, 0xDA76),
247 bn_pack4(0xA797, 0x15EE, 0xF29B, 0xE328),
248 bn_pack4(0x14CC, 0x5ED2, 0x0F80, 0x37E0),
249 bn_pack4(0xCC8F, 0x6D7E, 0xBF48, 0xE1D8),
250 bn_pack4(0x4BD4, 0x07B2, 0x2B41, 0x54AA),
251 bn_pack4(0x0F1D, 0x45B7, 0xFF58, 0x5AC5),
252 bn_pack4(0x23A9, 0x7A7E, 0x36CC, 0x88BE),
253 bn_pack4(0x59E7, 0xC97F, 0xBEC7, 0xE8F3),
254 bn_pack4(0xB5A8, 0x4031, 0x900B, 0x1C9E),
255 bn_pack4(0xD55E, 0x702F, 0x4698, 0x0C82),
256 bn_pack4(0xF482, 0xD7CE, 0x6E74, 0xFE6F),
257 bn_pack4(0xF032, 0xEA15, 0xD172, 0x1D03),
258 bn_pack4(0x5983, 0xCA01, 0xC64B, 0x92EC),
259 bn_pack4(0x6FB8, 0xF401, 0x378C, 0xD2BF),

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260 bn_pack4(0x3320, 0x5151, 0x2BD7, 0xAF42),
261 bn_pack4(0xDB7F, 0x1447, 0xE6CC, 0x254B),
262 bn_pack4(0x44CE, 0x6CBA, 0xCED4, 0xBB1B),
263 bn_pack4(0xDA3E, 0xDBEB, 0xCF9B, 0x14ED),
264 bn_pack4(0x1797, 0x27B0, 0x865A, 0x8918),
265 bn_pack4(0xB06A, 0x53ED, 0x9027, 0xD831),
266 bn_pack4(0xE5DB, 0x382F, 0x4130, 0x01AE),
267 bn_pack4(0xF8FF, 0x9406, 0xAD9E, 0x530E),
268 bn_pack4(0xC975, 0x1E76, 0x3DBA, 0x37BD),
269 bn_pack4(0xC1D4, 0xDCB2, 0x6026, 0x46DE),
270 bn_pack4(0x36C3, 0xFAB4, 0xD27C, 0x7026),
271 bn_pack4(0x4DF4, 0x35C9, 0x3402, 0x8492),
272 bn_pack4(0x86FF, 0xB7DC, 0x90A6, 0xC08F),
273 bn_pack4(0x93B4, 0xEA98, 0x8D8F, 0xDDC1),
274 bn_pack4(0xD006, 0x9127, 0xD5B0, 0x5AA9),
275 bn_pack4(0xB81B, 0xDD76, 0x2170, 0x481C),
276 bn_pack4(0x1F61, 0x2970, 0xCCE2, 0xD7AF),
277 bn_pack4(0x233B, 0xA186, 0x515B, 0xE7ED),
278 bn_pack4(0x99B2, 0x964F, 0xA090, 0xC3A2),
279 bn_pack4(0x287C, 0x5947, 0x4E6B, 0xC05D),
280 bn_pack4(0x2E8E, 0xFC14, 0x1FBE, 0xCAAE),
281 bn_pack4(0xDBBB, 0xC2DB, 0x04DE, 0x8EF9),
282 bn_pack4(0x2583, 0xE9CA, 0x2AD4, 0x4CE8),
283 bn_pack4(0x1A94, 0x6834, 0xB615, 0x0BDA),
284 bn_pack4(0x99C3, 0x2718, 0x6AF4, 0xE23C),
285 bn_pack4(0x8871, 0x9A10, 0xBDBA, 0x5B26),
286 bn_pack4(0x1A72, 0x3C12, 0xA787, 0xE6D7),
287 bn_pack4(0x4B82, 0xD120, 0xA921, 0x0801),
288 bn_pack4(0x43DB, 0x5BFC, 0xE0FD, 0x108E),
289 bn_pack4(0x08E2, 0x4FA0, 0x74E5, 0xAB31),
290 bn_pack4(0x7709, 0x88C0, 0xBAD9, 0x46E2),
291 bn_pack4(0xBBE1, 0x1757, 0x7A61, 0x5D6C),
292 bn_pack4(0x521F, 0x2B18, 0x177B, 0x200C),
293 bn_pack4(0xD876, 0x0273, 0x3EC8, 0x6A64),
294 bn_pack4(0xF12F, 0xFA06, 0xD98A, 0x0864),
295 bn_pack4(0xCCE3, 0xD226, 0x1AD2, 0xEE6B),
296 bn_pack4(0x1E8C, 0x94E0, 0x4A25, 0x619D),
297 bn_pack4(0xABF5, 0xAE8C, 0xDB09, 0x33D7),
298 bn_pack4(0xB397, 0x0F85, 0xA6E1, 0xE4C7),
299 bn_pack4(0x8AEA, 0x7157, 0x5D06, 0x0C7D),
300 bn_pack4(0xECFB, 0x8504, 0x58DB, 0xEF0A),
301 bn_pack4(0xA855, 0x21AB, 0xDF1C, 0xBA64),
302 bn_pack4(0xAD33, 0x170D, 0x0450, 0x7A33),
303 bn_pack4(0x1572, 0x8E5A, 0x8AAA, 0xC42D),
304 bn_pack4(0x15D2, 0x2618, 0x98FA, 0x0510),
305 bn_pack4(0x3995, 0x497C, 0xEA95, 0x6AE5),
306 bn_pack4(0xDE2B, 0xCBFA, 0x9558, 0x1718),
307 bn_pack4(0xB5C5, 0x5DF0, 0x6F4C, 0x52C9),
308 bn_pack4(0x9B27, 0x83A2, 0xEC07, 0xA28F),
309 bn_pack4(0xE39E, 0x772C, 0x180E, 0x8603),
310 bn_pack4(0x3290, 0x5E46, 0x2E36, 0xCE3B),
311 bn_pack4(0xF174, 0x6C08, 0xCA18, 0x217C),
312 bn_pack4(0x670C, 0x354E, 0x4ABC, 0x9804),
313 bn_pack4(0x9ED5, 0x2907, 0x7096, 0x966D),
314 bn_pack4(0x1C62, 0xF356, 0x2085, 0x52BB),
315 bn_pack4(0x8365, 0x5D23, 0xDCA3, 0xAD96),
316 bn_pack4(0x6916, 0x3FA8, 0xFD24, 0xCF5F),
317 bn_pack4(0x98DA, 0x4836, 0x1C55, 0xD39A),
318 bn_pack4(0xC200, 0x7CB8, 0xA163, 0xBF05),
319 bn_pack4(0x4928, 0x6651, 0xECE4, 0x5B3D),
320 bn_pack4(0xAE9F, 0x2411, 0x7C4B, 0x1FE6),
321 bn_pack4(0xEE38, 0x6BFB, 0x5A89, 0x9FA5),
322 bn_pack4(0x0BFF, 0x5CB6, 0xF406, 0xB7ED),
323 bn_pack4(0xF44C, 0x42E9, 0xA637, 0xED6B),
324 bn_pack4(0xE485, 0xB576, 0x625E, 0x7EC6),
325 bn_pack4(0x4FE1, 0x356D, 0x6D51, 0xC245),

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326 bn_pack4(0x302B, 0x0A6D, 0xF25F, 0x1437),
327 bn_pack4(0xEF95, 0x19B3, 0xCD3A, 0x431B),
328 bn_pack4(0x514A, 0x0879, 0x8E34, 0x04DD),
329 bn_pack4(0x020B, 0xBEA6, 0x3B13, 0x9B22),
330 bn_pack4(0x2902, 0x4E08, 0x8A67, 0xCC74),
331 bn_pack4(0xC4C6, 0x628B, 0x80DC, 0x1CD1),
332 bn_pack4(0xC90F, 0xDAA2, 0x2168, 0xC234),
333 bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF)
334 };
335 static BIGNUM bn_group_6144 = {
336     bn_group_6144_value,
337     (sizeof bn_group_6144_value)/sizeof(BN_ULONG),
338     (sizeof bn_group_6144_value)/sizeof(BN_ULONG),
339     0,
340     BN_FLG_STATIC_DATA
341 };
342
343 static BN_ULONG bn_group_8192_value[] = {
344     bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF),
345     bn_pack4(0x60C9, 0x80DD, 0x98ED, 0xD3DF),
346     bn_pack4(0xC81F, 0x56E8, 0x80B9, 0x6E71),
347     bn_pack4(0x9E30, 0x50E2, 0x7656, 0x94DF),
348     bn_pack4(0x9558, 0xE447, 0x5677, 0xE9AA),
349     bn_pack4(0xC919, 0x0DA6, 0xFC02, 0x6E47),
350     bn_pack4(0x889A, 0x002E, 0xD5EE, 0x382B),
351     bn_pack4(0x4009, 0x438B, 0x481C, 0x6CD7),
352     bn_pack4(0x3590, 0x46F4, 0xEB87, 0x9F92),
353     bn_pack4(0xFAF3, 0x6BC3, 0x1ECF, 0xA268),
354     bn_pack4(0xB1D5, 0x10BD, 0x7EE7, 0x4D73),
355     bn_pack4(0xF9AB, 0x4819, 0x5DED, 0x7EA1),
356     bn_pack4(0x64F3, 0x1CC5, 0x0846, 0x851D),
357     bn_pack4(0x4597, 0xE899, 0xA025, 0x5DC1),
358     bn_pack4(0xDF31, 0x0EE0, 0x74AB, 0x6A36),
359     bn_pack4(0x6D2A, 0x13F8, 0x3F44, 0xF82D),
360     bn_pack4(0x062B, 0x3CF5, 0xB3A2, 0x78A6),
361     bn_pack4(0x7968, 0x3303, 0xED5B, 0xDD3A),
362     bn_pack4(0xFA9D, 0x4B7F, 0xA2C0, 0x87E8),
363     bn_pack4(0x4BCB, 0xC886, 0x2F83, 0x85DD),
364     bn_pack4(0x3473, 0xFC64, 0x6CEA, 0x306B),
365     bn_pack4(0x13EB, 0x57A8, 0x1A23, 0xF0C7),
366     bn_pack4(0x2222, 0x2E04, 0xA403, 0x7C07),
367     bn_pack4(0xE3FD, 0xB8BE, 0xFC84, 0x8AD9),
368     bn_pack4(0x238F, 0x16CB, 0xE39D, 0x652D),
369     bn_pack4(0x3423, 0xB474, 0x2BF1, 0xC978),
370     bn_pack4(0x3AAB, 0x639C, 0x5AE4, 0xF568),
371     bn_pack4(0x2576, 0xF693, 0x6BA4, 0x2466),
372     bn_pack4(0x741F, 0xA7BF, 0x8AFC, 0x47ED),
373     bn_pack4(0x3BC8, 0x32B6, 0x8D9D, 0xD300),
374     bn_pack4(0xD8BE, 0xC4D0, 0x73B9, 0x31BA),
375     bn_pack4(0x3877, 0x7CB6, 0xA932, 0xDF8C),
376     bn_pack4(0x74A3, 0x926F, 0x12FE, 0xE5E4),
377     bn_pack4(0xE694, 0xF91E, 0x6DBE, 0x1159),
378     bn_pack4(0x12BF, 0x2D5B, 0x0B74, 0x74D6),
379     bn_pack4(0x043E, 0x8F66, 0x3F48, 0x60EE),
380     bn_pack4(0x387F, 0xE8D7, 0x6E3C, 0x0468),
381     bn_pack4(0xDA56, 0xC9EC, 0x2EF2, 0x9632),
382     bn_pack4(0xEB19, 0xCCB1, 0xA313, 0xD55C),
383     bn_pack4(0xF550, 0xAA3D, 0x8A1F, 0xBF00),
384     bn_pack4(0x06A1, 0xD58B, 0xB7C5, 0xDA76),
385     bn_pack4(0xA797, 0x15EE, 0xF29B, 0xE328),
386     bn_pack4(0x14CC, 0x5ED2, 0x0F80, 0x37E0),
387     bn_pack4(0xCC8F, 0x6D7E, 0xBF48, 0xE1D8),
388     bn_pack4(0x4BD4, 0x07B2, 0x2B41, 0x54AA),
389     bn_pack4(0x0F1D, 0x45B7, 0xFF58, 0x5AC5),
390     bn_pack4(0x23A9, 0x7A7E, 0x36CC, 0x88BE),
391     bn_pack4(0x59E7, 0xC97F, 0xBEC7, 0xE8F3),

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392 bn_pack4(0xB5A8, 0x4031, 0x900B, 0x1C9E),
393 bn_pack4(0xD55E, 0x702F, 0x4698, 0x0C82),
394 bn_pack4(0xF482, 0xD7CE, 0xE674, 0xFEFE),
395 bn_pack4(0xF032, 0xEA15, 0xD172, 0x1D03),
396 bn_pack4(0x5983, 0xCA01, 0xC64B, 0x92EC),
397 bn_pack4(0x6FB8, 0xF401, 0x378C, 0xD2BF),
398 bn_pack4(0x3320, 0x5151, 0x2BD7, 0xAF42),
399 bn_pack4(0xDB7F, 0x1447, 0xE6CC, 0x254B),
400 bn_pack4(0x44CE, 0x6CBA, 0xCED4, 0xBB1B),
401 bn_pack4(0xDA3E, 0xDBEB, 0xCF9B, 0x14ED),
402 bn_pack4(0x1797, 0x27B0, 0x865A, 0x8918),
403 bn_pack4(0xB06A, 0x53ED, 0x9027, 0xD831),
404 bn_pack4(0xE5DB, 0x382F, 0x4130, 0x01AE),
405 bn_pack4(0xF8FF, 0x9406, 0xAD9E, 0x530E),
406 bn_pack4(0xC975, 0x1E76, 0x3DBA, 0x37BD),
407 bn_pack4(0xC1D4, 0xDCB2, 0x6026, 0x46DE),
408 bn_pack4(0x36C3, 0xFAB4, 0xD27C, 0x7026),
409 bn_pack4(0x4DF4, 0x35C9, 0x3402, 0x8492),
410 bn_pack4(0x86FF, 0xB7DC, 0x90A6, 0xC08F),
411 bn_pack4(0x93B4, 0xEA98, 0x8D8F, 0xDDC1),
412 bn_pack4(0xD006, 0x9127, 0xD5B0, 0x5AA9),
413 bn_pack4(0xB81B, 0xDD76, 0x2170, 0x481C),
414 bn_pack4(0x1F61, 0x2970, 0xCCE2, 0xD7AF),
415 bn_pack4(0x233B, 0xA186, 0x515B, 0xE7ED),
416 bn_pack4(0x99B2, 0x964F, 0xA090, 0xC3A2),
417 bn_pack4(0x287C, 0x5947, 0x4E6B, 0xC05D),
418 bn_pack4(0x2E8E, 0xFC14, 0x1FBE, 0xCAA6),
419 bn_pack4(0xDBBB, 0xC2DB, 0x04DE, 0x8EF9),
420 bn_pack4(0x2583, 0xE9CA, 0x2AD4, 0x4CE8),
421 bn_pack4(0x1A94, 0x6834, 0xB615, 0x0BDA),
422 bn_pack4(0x99C3, 0x2718, 0x6AF4, 0xE23C),
423 bn_pack4(0x8871, 0x9A10, 0xBDBA, 0x5B26),
424 bn_pack4(0x1A72, 0x3C12, 0xA787, 0xE6D7),
425 bn_pack4(0x4B82, 0xD120, 0xA921, 0x0801),
426 bn_pack4(0x43DB, 0x5BFC, 0xE0FD, 0x108E),
427 bn_pack4(0x08E2, 0x4FA0, 0x74E5, 0xAB31),
428 bn_pack4(0x7709, 0x88C0, 0xBAD9, 0x46E2),
429 bn_pack4(0xBBE1, 0x1757, 0x7A61, 0x5D6C),
430 bn_pack4(0x521F, 0x2B18, 0x177B, 0x200C),
431 bn_pack4(0xD876, 0x0273, 0x3EC8, 0x6A64),
432 bn_pack4(0xF12F, 0xFA06, 0xD98A, 0x0864),
433 bn_pack4(0xCCE3, 0xD226, 0x1AD2, 0xEE6B),
434 bn_pack4(0x1E8C, 0x94E0, 0x4A25, 0x619D),
435 bn_pack4(0xABF5, 0xAE8C, 0xDB09, 0x33D7),
436 bn_pack4(0xB397, 0x0F85, 0xA6E1, 0xE4C7),
437 bn_pack4(0x8AEA, 0x7157, 0x5D06, 0x0C7D),
438 bn_pack4(0xECFB, 0x8504, 0x58DB, 0xEF0A),
439 bn_pack4(0xA855, 0x21AB, 0xDF1C, 0xBA64),
440 bn_pack4(0xAD33, 0x170D, 0x0450, 0x7A33),
441 bn_pack4(0x1572, 0x8E5A, 0x8AAA, 0xC42D),
442 bn_pack4(0x15D2, 0x2618, 0x98FA, 0x0510),
443 bn_pack4(0x3995, 0x497C, 0xEA95, 0x6AE5),
444 bn_pack4(0xDE2B, 0xCB6F, 0x9558, 0x1718),
445 bn_pack4(0xB5C5, 0x5DF0, 0x6F4C, 0x52C9),
446 bn_pack4(0x9B27, 0x83A2, 0xEC07, 0xA28F),
447 bn_pack4(0xE39E, 0x772C, 0x180E, 0x8603),
448 bn_pack4(0x3290, 0x5E46, 0x2E36, 0xCE3B),
449 bn_pack4(0xF174, 0x6C08, 0xCA18, 0x217C),
450 bn_pack4(0x670C, 0x354E, 0x4ABC, 0x9804),
451 bn_pack4(0x9ED5, 0x2907, 0x7096, 0x966D),
452 bn_pack4(0x1C62, 0xF356, 0x2085, 0x52BB),
453 bn_pack4(0x8365, 0x5D23, 0xDCA3, 0xAD96),
454 bn_pack4(0x6916, 0x3FA8, 0xFD24, 0xCF5F),
455 bn_pack4(0x98DA, 0x4836, 0x1C55, 0xD39A),
456 bn_pack4(0xC200, 0x7CB8, 0xA163, 0xBF05),
457 bn_pack4(0x4928, 0x6651, 0xECE4, 0x5B3D),

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458 bn_pack4(0xAE9F, 0x2411, 0x7C4B, 0x1FE6),
459 bn_pack4(0xEE38, 0x6BFB, 0x5A89, 0x9FA5),
460 bn_pack4(0x0BFF, 0x5CB6, 0xF406, 0xB7ED),
461 bn_pack4(0xF44C, 0x42E9, 0xA637, 0xED6B),
462 bn_pack4(0xE485, 0xB576, 0x625E, 0x7EC6),
463 bn_pack4(0x4FE1, 0x356D, 0x6D51, 0xC245),
464 bn_pack4(0x302B, 0x0A6D, 0xF25F, 0x1437),
465 bn_pack4(0xEF95, 0x19B3, 0xCD3A, 0x431B),
466 bn_pack4(0x514A, 0x0879, 0x8E34, 0x04DD),
467 bn_pack4(0x020B, 0xBEA6, 0x3B13, 0x9B22),
468 bn_pack4(0x2902, 0x4E08, 0x8A67, 0xCC74),
469 bn_pack4(0xC4C6, 0x628B, 0x80DC, 0x1CD1),
470 bn_pack4(0xC90F, 0xDAA2, 0x2168, 0xC234),
471 bn_pack4(0xFFFF, 0xFFFF, 0xFFFF, 0xFFFF)
472 };
473 static BIGNUM bn_group_8192 = {
474     bn_group_8192_value,
475     (sizeof bn_group_8192_value)/sizeof(BN_ULONG),
476     (sizeof bn_group_8192_value)/sizeof(BN_ULONG),
477     0,
478     BN_FLG_STATIC_DATA
479 };
481 static BN_ULONG bn_generator_19_value[] = {19} ;
482 static BIGNUM bn_generator_19 = {
483     bn_generator_19_value,
484     1,
485     1,
486     0,
487     BN_FLG_STATIC_DATA
488 };
489 static BN_ULONG bn_generator_5_value[] = {5} ;
490 static BIGNUM bn_generator_5 = {
491     bn_generator_5_value,
492     1,
493     1,
494     0,
495     BN_FLG_STATIC_DATA
496 };
497 static BN_ULONG bn_generator_2_value[] = {2} ;
498 static BIGNUM bn_generator_2 = {
499     bn_generator_2_value,
500     1,
501     1,
502     0,
503     BN_FLG_STATIC_DATA
504 };
506 static SRP_gN knownGN[] = {
507     {"8192", &bn_generator_19, &bn_group_8192},
508     {"6144", &bn_generator_5, &bn_group_6144},
509     {"4096", &bn_generator_5, &bn_group_4096},
510     {"3072", &bn_generator_5, &bn_group_3072},
511     {"2048", &bn_generator_2, &bn_group_2048},
512     {"1536", &bn_generator_2, &bn_group_1536},
513     {"1024", &bn_generator_2, &bn_group_1024},
514 };
515 #define KNOWN_GN_NUMBER sizeof(knownGN) / sizeof(SRP_gN)
517 /* end of generated data */

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new/usr/src/lib/openssl/include/srp_lcl.h

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*****
3121 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/srp_lcl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/srp/srp_lcl.h */
2 /* Written by Peter Sylvester (peter.sylvester@edelweb.fr)
3  * for the EdelKey project and contributed to the OpenSSL project 2004.
4  */
5 /* =====
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
58 #ifndef HEADER_SRP_LCL_H
59 #define HEADER_SRP_LCL_H
60
61 #include <openssl/srp.h>
```

new/usr/src/lib/openssl/include/srp_lcl.h

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```
62 #include <openssl/sha.h>
63
64 #if 0
65 #define srp_bn_print(a) {fprintf(stderr, #a "="); BN_print_fp(stderr,a); \
66     fprintf(stderr,"\\n");}
67 #else
68 #define srp_bn_print(a)
69 #endif
70
71
72
73 #ifdef __cplusplus
74 extern "C" {
75 #endif
76
77
78
79 #ifdef __cplusplus
80 }
81 #endif
82
83 #endif
```

new/usr/src/lib/openssl/include/ssl_locl.h

1

42321 Fri May 30 18:31:25 2014
new/usr/src/lib/openssl/include/ssl_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* ssl/ssl_locl.h */
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3  * All rights reserved.
4  *
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6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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```

new/usr/src/lib/openssl/include/ssl_locl.h

2

```
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108 * Hudson (tjh@cryptsoft.com).
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111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 * ECC cipher suite support in OpenSSL originally developed by
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140 * OTHERWISE.
141 */

```

```

143 #ifndef HEADER_SSL_LOCL_H
144 #define HEADER_SSL_LOCL_H
145 #include <stdlib.h>
146 #include <time.h>
147 #include <string.h>
148 #include <errno.h>

```

```

150 #include "e_os.h"

```

```

152 #include <openssl/buffer.h>
153 #ifndef OPENSSL_NO_COMP
154 #include <openssl/comp.h>
155 #endif
156 #include <openssl/bio.h>
157 #include <openssl/stack.h>
158 #ifndef OPENSSL_NO_RSA
159 #include <openssl/rsa.h>
160 #endif
161 #ifndef OPENSSL_NO_DSA
162 #include <openssl/dsa.h>
163 #endif
164 #include <openssl/err.h>
165 #include <openssl/ssl.h>
166 #include <openssl/symhacks.h>

```

```

168 #ifdef OPENSSL_BUILD_SHLIBSSL
169 # undef OPENSSL_EXTERN
170 # define OPENSSL_EXTERN OPENSSL_EXPORT
171 #endif

```

```

173 #undef PKCS1_CHECK

```

```

175 #define c2l(c,l)      (l = (((unsigned long)*((c)++))) << 8, \
176                      l|((((unsigned long)*((c)++))) << 16), \
177                      l|((((unsigned long)*((c)++))) << 24))
178

```

```

180 /* NOTE - c is not incremented as per c2l */

```

```

181 #define c2ln(c,l1,l2,n) { \
182     c+=n; \
183     l1=l2=0; \
184     switch (n) { \
185     case 8: l2 = (((unsigned long)*((c)++))) << 24; \
186     case 7: l2 = (((unsigned long)*((c)++))) << 16; \
187     case 6: l2 = (((unsigned long)*((c)++))) << 8; \
188     case 5: l2 = (((unsigned long)*((c)++))); \
189     case 4: l1 = (((unsigned long)*((c)++))) << 24; \
190     case 3: l1 = (((unsigned long)*((c)++))) << 16; \
191     case 2: l1 = (((unsigned long)*((c)++))) << 8; \
192     case 1: l1 = (((unsigned long)*((c)++))); \
193     } \

```

```

194     }
196 #define l2c(l,c)      (*(c)++) = ((unsigned char)((l) >> 24) & 0xff), \
197                      (*(c)++) = ((unsigned char)((l) >> 16) & 0xff), \
198                      (*(c)++) = ((unsigned char)((l) >> 8) & 0xff), \
199                      (*(c)++) = ((unsigned char)((l) >> 0) & 0xff)

```

```

201 #define n2l(c,l)      (l = (((unsigned long)*((c)++))) << 24, \
202                      l|((((unsigned long)*((c)++))) << 16), \
203                      l|((((unsigned long)*((c)++))) << 8), \
204                      l|((((unsigned long)*((c)++))) << 0))

```

```

206 #define l2n(l,c)      (*(c)++) = ((unsigned char)((l) >> 24) & 0xff), \
207                      (*(c)++) = ((unsigned char)((l) >> 16) & 0xff), \
208                      (*(c)++) = ((unsigned char)((l) >> 8) & 0xff), \
209                      (*(c)++) = ((unsigned char)((l) >> 0) & 0xff)

```

```

211 #define l2n6(l,c)     (*(c)++) = ((unsigned char)((l) >> 40) & 0xff), \
212                      (*(c)++) = ((unsigned char)((l) >> 32) & 0xff), \
213                      (*(c)++) = ((unsigned char)((l) >> 24) & 0xff), \
214                      (*(c)++) = ((unsigned char)((l) >> 16) & 0xff), \
215                      (*(c)++) = ((unsigned char)((l) >> 8) & 0xff), \
216                      (*(c)++) = ((unsigned char)((l) >> 0) & 0xff)

```

```

218 #define l2n8(l,c)     (*(c)++) = ((unsigned char)((l) >> 56) & 0xff), \
219                      (*(c)++) = ((unsigned char)((l) >> 48) & 0xff), \
220                      (*(c)++) = ((unsigned char)((l) >> 40) & 0xff), \
221                      (*(c)++) = ((unsigned char)((l) >> 32) & 0xff), \
222                      (*(c)++) = ((unsigned char)((l) >> 24) & 0xff), \
223                      (*(c)++) = ((unsigned char)((l) >> 16) & 0xff), \
224                      (*(c)++) = ((unsigned char)((l) >> 8) & 0xff), \
225                      (*(c)++) = ((unsigned char)((l) >> 0) & 0xff)

```

```

227 #define n2l6(c,l)     (l = (((BN_ULONG)*((c)++))) << 40, \
228                      l|((((BN_ULONG)*((c)++))) << 32), \
229                      l|((((BN_ULONG)*((c)++))) << 24), \
230                      l|((((BN_ULONG)*((c)++))) << 16), \
231                      l|((((BN_ULONG)*((c)++))) << 8), \
232                      l|((((BN_ULONG)*((c)++))) << 0))

```

```

234 /* NOTE - c is not incremented as per l2c */

```

```

235 #define l2cn(l1,l2,c,n) { \
236     c+=n; \
237     switch (n) { \
238     case 8: *--(c) = ((unsigned char)((l2) >> 24) & 0xff); \
239     case 7: *--(c) = ((unsigned char)((l2) >> 16) & 0xff); \
240     case 6: *--(c) = ((unsigned char)((l2) >> 8) & 0xff); \
241     case 5: *--(c) = ((unsigned char)((l2) >> 0) & 0xff); \
242     case 4: *--(c) = ((unsigned char)((l1) >> 24) & 0xff); \
243     case 3: *--(c) = ((unsigned char)((l1) >> 16) & 0xff); \
244     case 2: *--(c) = ((unsigned char)((l1) >> 8) & 0xff); \
245     case 1: *--(c) = ((unsigned char)((l1) >> 0) & 0xff); \
246     } \
247 }

```

```

249 #define n2s(c,s)      ((s = (((unsigned int)(c[0])) << 8) | \
250                      (((unsigned int)(c[1])) << 8)), c+=2)

```

```

251 #define s2n(s,c)      ((c[0] = ((unsigned char)((s) >> 8) & 0xff), \
252                      c[1] = ((unsigned char)((s) >> 0) & 0xff)), c+=2)

```

```

254 #define n2l3(c,l)     ((l = (((unsigned long)(c[0])) << 16) | \
255                      (((unsigned long)(c[1])) << 8) | \
256                      (((unsigned long)(c[2])) << 0)), c+=3)

```

```

258 #define l2n3(l,c)     ((c[0] = ((unsigned char)((l) >> 16) & 0xff), \
259                      c[1] = ((unsigned char)((l) >> 8) & 0xff), \

```

```

260             c[2]=(unsigned char)(((l)>0xff)?0xff:(l)<0?0:0),c+=3)

262 /* LOCAL STUFF */

264 #define SSL_DECRYPT      0
265 #define SSL_ENCRYPT      1

267 #define TWO_BYTE_BIT    0x80
268 #define SEC_ESC_BIT     0x40
269 #define TWO_BYTE_MASK   0x7fff
270 #define THREE_BYTE_MASK 0x3fff

272 #define INC32(a)         ((a)={ (a)+1,&0xffffffffL })
273 #define DEC32(a)         ((a)={ (a)-1,&0xffffffffL })
274 #define MAX_MAC_SIZE    20 /* up from 16 for SSLv3 */

276 /*
277  * Define the Bitmasks for SSL_CIPHER.algorithms.
278  * This bits are used packed as dense as possible. If new methods/ciphers
279  * etc will be added, the bits a likely to change, so this information
280  * is for internal library use only, even though SSL_CIPHER.algorithms
281  * can be publicly accessed.
282  * Use the according functions for cipher management instead.
283  *
284  * The bit mask handling in the selection and sorting scheme in
285  * ssl_create_cipher_list() has only limited capabilities, reflecting
286  * that the different entities within are mutually exclusive:
287  * ONLY ONE BIT PER MASK CAN BE SET AT A TIME.
288  */

290 /* Bits for algorithm_mkey (key exchange algorithm) */
291 #define SSL_kRSA          0x00000001L /* RSA key exchange */
292 #define SSL_kDHR          0x00000002L /* DH cert, RSA CA cert */ /* no suc
293 #define SSL_kDHD          0x00000004L /* DH cert, DSA CA cert */ /* no suc
294 #define SSL_kEDH          0x00000008L /* tmp DH key no DH cert */
295 #define SSL_kKRB5         0x00000010L /* Kerberos5 key exchange */
296 #define SSL_kECDHr        0x00000020L /* ECDH cert, RSA CA cert */
297 #define SSL_kECDHe        0x00000040L /* ECDH cert, ECDSA CA cert */
298 #define SSL_kEECDH        0x00000080L /* ephemeral ECDH */
299 #define SSL_kPSK          0x00000100L /* PSK */
300 #define SSL_kGOST          0x00000200L /* GOST key exchange */
301 #define SSL_kSRP          0x00000400L /* SRP */

303 /* Bits for algorithm_auth (server authentication) */
304 #define SSL_aRSA          0x00000001L /* RSA auth */
305 #define SSL_aDSS          0x00000002L /* DSS auth */
306 #define SSL_aNULL         0x00000004L /* no auth (i.e. use ADH or AECDH) */
307 #define SSL_aDH           0x00000008L /* Fixed DH auth (kDHD or kDHR) */
308 #define SSL_aECDH         0x00000010L /* Fixed ECDH auth (kECDHe or kECDHr) */
309 #define SSL_aKRB5         0x00000020L /* KRB5 auth */
310 #define SSL_aECDSA        0x00000040L /* ECDSA auth */
311 #define SSL_aPSK          0x00000080L /* PSK auth */
312 #define SSL_aGOST94       0x00000100L /* GOST R 34.10-94 s
313 #define SSL_aGOST01       0x00000200L /* GOST R 34.10-2001 signatu

316 /* Bits for algorithm_enc (symmetric encryption) */
317 #define SSL_DES           0x00000001L
318 #define SSL_3DES          0x00000002L
319 #define SSL_RC4           0x00000004L
320 #define SSL_RC2           0x00000008L
321 #define SSL_IDEA          0x00000010L
322 #define SSL_eNULL         0x00000020L
323 #define SSL_AES128        0x00000040L
324 #define SSL_AES256        0x00000080L
325 #define SSL_CAMELLIA128   0x00000100L

```

```

326 #define SSL_CAMELLIA256   0x00000200L
327 #define SSL_eGOST2814789CNT 0x00000400L
328 #define SSL_SEED          0x00000800L
329 #define SSL_AES128GCM     0x00001000L
330 #define SSL_AES256GCM     0x00002000L

332 #define SSL_AES            (SSL_AES128|SSL_AES256|SSL_AES128GCM|SSL_AES256G
333 #define SSL_CAMELLIA      (SSL_CAMELLIA128|SSL_CAMELLIA256)

336 /* Bits for algorithm_mac (symmetric authentication) */

338 #define SSL_MD5            0x00000001L
339 #define SSL_SHA1           0x00000002L
340 #define SSL_GOST94         0x00000004L
341 #define SSL_GOST89MAC     0x00000008L
342 #define SSL_SHA256         0x00000010L
343 #define SSL_SHA384         0x00000020L
344 /* Not a real MAC, just an indication it is part of cipher */
345 #define SSL_AEAD           0x00000040L

347 /* Bits for algorithm_ssl (protocol version) */
348 #define SSL_SSLV2          0x00000001L
349 #define SSL_SSLV3          0x00000002L
350 #define SSL_TLSV1         SSL_SSLV3 /* for now */
351 #define SSL_TLSV1_2       0x00000004L

354 /* Bits for algorithm2 (handshake digests and other extra flags) */

356 #define SSL_HANDSHAKE_MAC_MD5 0x10
357 #define SSL_HANDSHAKE_MAC_SHA 0x20
358 #define SSL_HANDSHAKE_MAC_GOST94 0x40
359 #define SSL_HANDSHAKE_MAC_SHA256 0x80
360 #define SSL_HANDSHAKE_MAC_SHA384 0x100
361 #define SSL_HANDSHAKE_MAC_DEFAULT (SSL_HANDSHAKE_MAC_MD5 | SSL_HANDSHAKE_MAC_SHA

363 /* When adding new digest in the ssl_ciph.c and increment SSM_MD_NUM_IDX
364  * make sure to update this constant too */
365 #define SSL_MAX_DIGEST 6

367 #define TLS1_PRF_DGST_MASK (0xff << TLS1_PRF_DGST_SHIFT)

369 #define TLS1_PRF_DGST_SHIFT 10
370 #define TLS1_PRF_MD5 (SSL_HANDSHAKE_MAC_MD5 << TLS1_PRF_DGST_SHIFT)
371 #define TLS1_PRF_SHA1 (SSL_HANDSHAKE_MAC_SHA << TLS1_PRF_DGST_SHIFT)
372 #define TLS1_PRF_SHA256 (SSL_HANDSHAKE_MAC_SHA256 << TLS1_PRF_DGST_SHIFT)
373 #define TLS1_PRF_SHA384 (SSL_HANDSHAKE_MAC_SHA384 << TLS1_PRF_DGST_SHIFT)
374 #define TLS1_PRF_GOST94 (SSL_HANDSHAKE_MAC_GOST94 << TLS1_PRF_DGST_SHIFT)
375 #define TLS1_PRF (TLS1_PRF_MD5 | TLS1_PRF_SHA1)

377 /* Stream MAC for GOST ciphersuites from cryptopro draft
378  * (currently this also goes into algorithm2) */
379 #define TLS1_STREAM_MAC 0x04

383 /*
384  * Export and cipher strength information. For each cipher we have to decide
385  * whether it is exportable or not. This information is likely to change
386  * over time, since the export control rules are no static technical issue.
387  *
388  * Independent of the export flag the cipher strength is sorted into classes.
389  * SSL_EXP40 was denoting the 40bit US export limit of past times, which now
390  * is at 56bit (SSL_EXP56). If the exportable cipher class is going to change
391  * again (eg. to 64bit) the use of "SSL_EXP*" becomes blurred even more,

```

```

392 * since SSL_EXP64 could be similar to SSL_LOW.
393 * For this reason SSL_MICRO and SSL_MINI macros are included to widen the
394 * namespace of SSL_LOW-SSL_HIGH to lower values. As development of speed
395 * and ciphers goes, another extension to SSL_SUPER and/or SSL_ULTRA would
396 * be possible.
397 */
398 #define SSL_EXP_MASK          0x00000003L
399 #define SSL_STRONG_MASK      0x0000001fL

401 #define SSL_NOT_EXP          0x00000001L
402 #define SSL_EXPORT           0x00000002L

404 #define SSL_STRONG_NONE      0x00000004L
405 #define SSL_EXP40            0x00000008L
406 #define SSL_MICRO            (SSL_EXP40)
407 #define SSL_EXP56            0x00000010L
408 #define SSL_MINI             (SSL_EXP56)
409 #define SSL_LOW              0x00000020L
410 #define SSL_MEDIUM           0x00000040L
411 #define SSL_HIGH             0x00000080L
412 #define SSL_FIPS             0x00000100L

414 /* we have used 000001ff - 23 bits left to go */

416 /*
417 * Macros to check the export status and cipher strength for export ciphers.
418 * Even though the macros for EXPORT and EXPORT40/56 have similar names,
419 * their meaning is different:
420 * *_EXPORT macros check the 'exportable' status.
421 * *_EXPORT40/56 macros are used to check whether a certain cipher strength
422 * is given.
423 * Since the SSL_IS_EXPORT* and SSL_EXPORT* macros depend on the correct
424 * algorithm structure element to be passed (algorithms, algo_strength) and no
425 * typechecking can be done as they are all of type unsigned long, their
426 * direct usage is discouraged.
427 * Use the SSL_C_* macros instead.
428 */
429 #define SSL_IS_EXPORT(a)      ((a)&SSL_EXPORT)
430 #define SSL_IS_EXPORT56(a)    ((a)&SSL_EXP56)
431 #define SSL_IS_EXPORT40(a)    ((a)&SSL_EXP40)
432 #define SSL_C_IS_EXPORT(c)    SSL_IS_EXPORT((c)->algo_strength)
433 #define SSL_C_IS_EXPORT56(c)  SSL_IS_EXPORT56((c)->algo_strength)
434 #define SSL_C_IS_EXPORT40(c)  SSL_IS_EXPORT40((c)->algo_strength)

436 #define SSL_EXPORT_KEYLENGTH(a,s) (SSL_IS_EXPORT40(s) ? 5 : \
437                                     (a) == SSL_DES ? 8 : 7)
438 #define SSL_EXPORT_PKEYLENGTH(a) (SSL_IS_EXPORT40(a) ? 512 : 1024)
439 #define SSL_C_EXPORT_KEYLENGTH(c) SSL_EXPORT_KEYLENGTH((c)->algorithm_enc,
440                                                         (c)->algo_strength)
441 #define SSL_C_EXPORT_PKEYLENGTH(c) SSL_EXPORT_PKEYLENGTH((c)->algo_strength)

446 /* Mostly for SSLv3 */
447 #define SSL_PKEY_RSA_ENC      0
448 #define SSL_PKEY_RSA_SIGN    1
449 #define SSL_PKEY_DSA_SIGN    2
450 #define SSL_PKEY_DH_RSA      3
451 #define SSL_PKEY_DH_DSA      4
452 #define SSL_PKEY_ECC          5
453 #define SSL_PKEY_GOST94      6
454 #define SSL_PKEY_GOST01      7
455 #define SSL_PKEY_NUM          8

457 /* SSL_kRSA <- RSA_ENC | (RSA_TMP & RSA_SIGN) |

```

```

458 *      <- (EXPORT & (RSA_ENC | RSA_TMP) & RSA_SIGN)
459 * SSL_kDH <- DH_ENC & (RSA_ENC | RSA_SIGN | DSA_SIGN)
460 * SSL_kEDH <- RSA_ENC | RSA_SIGN | DSA_SIGN
461 * SSL_aRSA <- RSA_ENC | RSA_SIGN
462 * SSL_aDSS <- DSA_SIGN
463 */

465 /*
466 #define CERT_INVALID          0
467 #define CERT_PUBLIC_KEY      1
468 #define CERT_PRIVATE_KEY     2
469 */

471 #ifndef OPENSSL_NO_EC
472 /* From ECC-TLS draft, used in encoding the curve type in
473 * ECParameters
474 */
475 #define EXPLICIT_PRIME_CURVE_TYPE 1
476 #define EXPLICIT_CHAR2_CURVE_TYPE 2
477 #define NAMED_CURVE_TYPE          3
478 #endif /* OPENSSL_NO_EC */

480 typedef struct cert_pkey_st
481 {
482     X509 *x509;
483     EVP_PKEY *privatekey;
484     /* Digest to use when signing */
485     const EVP_MD *digest;
486 } CERT_PKEY;

488 typedef struct cert_st
489 {
490     /* Current active set */
491     CERT_PKEY *key; /* ALWAYS points to an element of the pkeys array
492                      * Probably it would make more sense to store
493                      * an index, not a pointer. */
494
495     /* The following masks are for the key and auth
496      * algorithms that are supported by the certs below */
497     int valid;
498     unsigned long mask_k;
499     unsigned long mask_a;
500     unsigned long export_mask_k;
501     unsigned long export_mask_a;
502 #ifndef OPENSSL_NO_RSA
503     RSA *rsa_tmp;
504     RSA *(*rsa_tmp_cb)(SSL *ssl,int is_export,int keysz);
505 #endif
506 #ifndef OPENSSL_NO_DH
507     DH *dh_tmp;
508     DH *(*dh_tmp_cb)(SSL *ssl,int is_export,int keysz);
509 #endif
510 #ifndef OPENSSL_NO_ECDH
511     EC_KEY *ecdh_tmp;
512     /* Callback for generating ephemeral ECDH keys */
513     EC_KEY *(*ecdh_tmp_cb)(SSL *ssl,int is_export,int keysz);
514 #endif

516     CERT_PKEY pkeys[SSL_PKEY_NUM];

518     int references; /* >1 only if SSL_copy_session_id is used */
519 } CERT;

522 typedef struct sess_cert_st
523 {

```



```

524     STACK_OF(X509) *cert_chain; /* as received from peer (not for SSL2) */
525
526     /* The 'peer_...' members are used only by clients. */
527     int peer_cert_type;
528
529     CERT_PKEY *peer_key; /* points to an element of peer_pkeys (never NULL!)
530     CERT_PKEY peer_pkeys[SSL_PKEY_NUM];
531     /* Obviously we don't have the private keys of these,
532     * so maybe we shouldn't even use the CERT_PKEY type here. */
533
534 #ifndef OPENSSL_NO_RSA
535     RSA *peer_rsa_tmp; /* not used for SSL 2 */
536 #endif
537 #ifndef OPENSSL_NO_DH
538     DH *peer_dh_tmp; /* not used for SSL 2 */
539 #endif
540 #ifndef OPENSSL_NO_ECDH
541     EC_KEY *peer_ecdh_tmp;
542 #endif
543
544     int references; /* actually always 1 at the moment */
545     } SESS_CERT;
546
547
548 /*#define MAC_DEBUG */
549
550 /*#define ERR_DEBUG */
551 /*#define ABORT_DEBUG */
552 /*#define PKT_DEBUG 1 */
553 /*#define DES_DEBUG */
554 /*#define DES_OFB_DEBUG */
555 /*#define SSL_DEBUG */
556 /*#define RSA_DEBUG */
557 /*#define IDEA_DEBUG */
558
559 #define FP_ICC (int (*)(const void *, const void *))
560 #define ssl_put_cipher_by_char(ssl, ciph, ptr) \
561     ((ssl)->method->put_cipher_by_char((ciph), (ptr)))
562 #define ssl_get_cipher_by_char(ssl, ptr) \
563     ((ssl)->method->get_cipher_by_char(ptr))
564
565 /* This is for the SSLv3/TLSv1.0 differences in crypto/hash stuff
566 * It is a bit of a mess of functions, but hell, think of it as
567 * an opaque structure :-) */
568 typedef struct ssl3_enc_method
569 {
570     int (*enc)(SSL *, int);
571     int (*mac)(SSL *, unsigned char *, int);
572     int (*setup_key_block)(SSL *);
573     int (*generate_master_secret)(SSL *, unsigned char *, unsigned char *, int);
574     int (*change_cipher_state)(SSL *, int);
575     int (*final_finish_mac)(SSL *, const char *, int, unsigned char *);
576     int finish_mac_length;
577     int (*cert_verify_mac)(SSL *, int, unsigned char *);
578     const char *client_finished_label;
579     int client_finished_label_len;
580     const char *server_finished_label;
581     int server_finished_label_len;
582     int (*alert_value)(int);
583     int (*export_keying_material)(SSL *, unsigned char *, size_t,
584     const char *, size_t,
585     const unsigned char *, size_t,
586     int use_context);
587 } SSL3_ENC_METHOD;
588
589 #ifndef OPENSSL_NO_COMP

```

```

590 /* Used for holding the relevant compression methods loaded into SSL_CTX */
591 typedef struct ssl3_comp_st
592 {
593     int comp_id; /* The identifier byte for this compression type */
594     char *name; /* Text name used for the compression type */
595     COMP_METHOD *method; /* The method :-) */
596 } SSL3_COMP;
597 #endif
598
599 #ifndef OPENSSL_NO_BUF_FREELISTS
600 typedef struct ssl3_buf_freelist_st
601 {
602     size_t chunklen;
603     unsigned int len;
604     struct ssl3_buf_freelist_entry_st *head;
605 } SSL3_BUF_FREELIST;
606
607 typedef struct ssl3_buf_freelist_entry_st
608 {
609     struct ssl3_buf_freelist_entry_st *next;
610 } SSL3_BUF_FREELIST_ENTRY;
611 #endif
612
613 extern SSL3_ENC_METHOD ssl3_undef_enc_method;
614 OPENSSL_EXTERN const SSL_CIPHER ssl2_ciphers[];
615 OPENSSL_EXTERN const SSL_CIPHER ssl3_ciphers[];
616
617
618 SSL_METHOD *ssl_bad_method(int ver);
619
620 extern SSL3_ENC_METHOD TLSv1_enc_data;
621 extern SSL3_ENC_METHOD SSLv3_enc_data;
622 extern SSL3_ENC_METHOD DTLSv1_enc_data;
623
624 #define SSL_IS_DTLS(s) (s->method->version == DTLS1_VERSION)
625
626 #define IMPLEMENT_tls_meth_func(version, func_name, s_accept, s_connect, \
627     s_get_meth) \
628 const SSL_METHOD *func_name(void) \
629 { \
630     static const SSL_METHOD func_name##_data = { \
631         version, \
632         tls1_new, \
633         tls1_clear, \
634         tls1_free, \
635         s_accept, \
636         s_connect, \
637         ssl3_read, \
638         ssl3_peek, \
639         ssl3_write, \
640         ssl3_shutdown, \
641         ssl3_renegotiate, \
642         ssl3_renegotiate_check, \
643         ssl3_get_message, \
644         ssl3_read_bytes, \
645         ssl3_write_bytes, \
646         ssl3_dispatch_alert, \
647         ssl3_ctrl, \
648         ssl3_ctx_ctrl, \
649         ssl3_get_cipher_by_char, \
650         ssl3_put_cipher_by_char, \
651         ssl3_pending, \
652         ssl3_num_ciphers, \
653         ssl3_get_cipher, \
654         s_get_meth, \
655         tls1_default_timeout, \

```

```

656         &TLSv1_enc_data, \
657         ssl_undefined_void_function, \
658         ssl3_callback_ctrl, \
659         ssl3_ctx_callback_ctrl, \
660     }; \
661     return &func_name##_data; \
662 }

664 #define IMPLEMENT_ssl3_meth_func(func_name, s_accept, s_connect, s_get_meth) \
665 const SSL_METHOD *func_name(void) \
666 { \
667     static const SSL_METHOD func_name##_data= { \
668         SSL3_VERSION, \
669         ssl3_new, \
670         ssl3_clear, \
671         ssl3_free, \
672         s_accept, \
673         s_connect, \
674         ssl3_read, \
675         ssl3_peek, \
676         ssl3_write, \
677         ssl3_shutdown, \
678         ssl3_renegotiate, \
679         ssl3_renegotiate_check, \
680         ssl3_get_message, \
681         ssl3_read_bytes, \
682         ssl3_write_bytes, \
683         ssl3_dispatch_alert, \
684         ssl3_ctrl, \
685         ssl3_ctx_ctrl, \
686         ssl3_get_cipher_by_char, \
687         ssl3_put_cipher_by_char, \
688         ssl3_pending, \
689         ssl3_num_ciphers, \
690         ssl3_get_cipher, \
691         s_get_meth, \
692         ssl3_default_timeout, \
693         &SSLv3_enc_data, \
694         ssl_undefined_void_function, \
695         ssl3_callback_ctrl, \
696         ssl3_ctx_callback_ctrl, \
697     }; \
698     return &func_name##_data; \
699 }

701 #define IMPLEMENT_ssl23_meth_func(func_name, s_accept, s_connect, s_get_meth) \
702 const SSL_METHOD *func_name(void) \
703 { \
704     static const SSL_METHOD func_name##_data= { \
705         TLS1_2_VERSION, \
706         tls1_new, \
707         tls1_clear, \
708         tls1_free, \
709         s_accept, \
710         s_connect, \
711         ssl23_read, \
712         ssl23_peek, \
713         ssl23_write, \
714         ssl_undefined_function, \
715         ssl_undefined_function, \
716         ssl_ok, \
717         ssl3_get_message, \
718         ssl3_read_bytes, \
719         ssl3_write_bytes, \
720         ssl3_dispatch_alert, \
721         ssl3_ctrl, \

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```

722         ssl3_ctx_ctrl, \
723         ssl23_get_cipher_by_char, \
724         ssl23_put_cipher_by_char, \
725         ssl_undefined_const_function, \
726         ssl23_num_ciphers, \
727         ssl23_get_cipher, \
728         s_get_meth, \
729         ssl23_default_timeout, \
730         &ssl3_undef_enc_method, \
731         ssl_undefined_void_function, \
732         ssl3_callback_ctrl, \
733         ssl3_ctx_callback_ctrl, \
734     }; \
735     return &func_name##_data; \
736 }

738 #define IMPLEMENT_ssl2_meth_func(func_name, s_accept, s_connect, s_get_meth) \
739 const SSL_METHOD *func_name(void) \
740 { \
741     static const SSL_METHOD func_name##_data= { \
742         SSL2_VERSION, \
743         ssl2_new, /* local */ \
744         ssl2_clear, /* local */ \
745         ssl2_free, /* local */ \
746         s_accept, \
747         s_connect, \
748         ssl2_read, \
749         ssl2_peek, \
750         ssl2_write, \
751         ssl2_shutdown, \
752         ssl_ok, /* NULL - renegotiate */ \
753         ssl_ok, /* NULL - check renegotiate */ \
754         NULL, /* NULL - ssl_get_message */ \
755         NULL, /* NULL - ssl_get_record */ \
756         NULL, /* NULL - ssl_write_bytes */ \
757         NULL, /* NULL - dispatch_alert */ \
758         ssl2_ctrl, /* local */ \
759         ssl2_ctx_ctrl, /* local */ \
760         ssl2_get_cipher_by_char, \
761         ssl2_put_cipher_by_char, \
762         ssl2_pending, \
763         ssl2_num_ciphers, \
764         ssl2_get_cipher, \
765         s_get_meth, \
766         ssl2_default_timeout, \
767         &ssl3_undef_enc_method, \
768         ssl_undefined_void_function, \
769         ssl2_callback_ctrl, /* local */ \
770         ssl2_ctx_callback_ctrl, /* local */ \
771     }; \
772     return &func_name##_data; \
773 }

775 #define IMPLEMENT_dtls1_meth_func(func_name, s_accept, s_connect, s_get_meth) \
776 const SSL_METHOD *func_name(void) \
777 { \
778     static const SSL_METHOD func_name##_data= { \
779         DTLS1_VERSION, \
780         dtls1_new, \
781         dtls1_clear, \
782         dtls1_free, \
783         s_accept, \
784         s_connect, \
785         ssl3_read, \
786         ssl3_peek, \
787         ssl3_write, \

```

```

788     dtls1_shutdown, \
789     ssl3_renegotiate, \
790     ssl3_renegotiate_check, \
791     dtls1_get_message, \
792     dtls1_read_bytes, \
793     dtls1_write_app_data_bytes, \
794     dtls1_dispatch_alert, \
795     dtls1_ctrl, \
796     ssl3_ctx_ctrl, \
797     ssl3_get_cipher_by_char, \
798     ssl3_put_cipher_by_char, \
799     ssl3_pending, \
800     ssl3_num_ciphers, \
801     dtls1_get_cipher, \
802     s_get_meth, \
803     dtls1_default_timeout, \
804     &DTLSv1_enc_data, \
805     ssl_undefined_void_function, \
806     ssl3_callback_ctrl, \
807     ssl3_ctx_callback_ctrl, \
808 }; \
809 return &func_name##_data; \
810 }

812 void ssl_clear_cipher_ctx(SSL *s);
813 int ssl_clear_bad_session(SSL *s);
814 CERT *ssl_cert_new(void);
815 CERT *ssl_cert_dup(CERT *cert);
816 int ssl_cert_inst(CERT **o);
817 void ssl_cert_free(CERT *c);
818 SESS_CERT *ssl_sess_cert_new(void);
819 void ssl_sess_cert_free(SESS_CERT *sc);
820 int ssl_set_peer_cert_type(SESS_CERT *c, int type);
821 int ssl_get_new_session(SSL *s, int session);
822 int ssl_get_prev_session(SSL *s, unsigned char *session, int len, const unsigned
823 int ssl_cipher_id_cmp(const SSL_CIPHER *a, const SSL_CIPHER *b);
824 DECLARE_OBJ_BSEARCH_GLOBAL_CMP_FN(SSL_CIPHER, SSL_CIPHER,
825                                   ssl_cipher_id);
826 int ssl_cipher_ptr_id_cmp(const SSL_CIPHER * const *ap,
827                           const SSL_CIPHER * const *bp);
828 STACK_OF(SSL_CIPHER) *ssl_bytes_to_cipher_list(SSL *s, unsigned char *p, int num,
829                                                STACK_OF(SSL_CIPHER) **skp);
830 int ssl_cipher_list_to_bytes(SSL *s, STACK_OF(SSL_CIPHER) *sk, unsigned char *p,
831                              int (*put_cb)(const SSL_CIPHER *, unsigned char *))
832 STACK_OF(SSL_CIPHER) *ssl_create_cipher_list(const SSL_METHOD *meth,
833                                              STACK_OF(SSL_CIPHER) **pref,
834                                              STACK_OF(SSL_CIPHER) **sorted,
835                                              const char *rule_str);
836 void ssl_update_cache(SSL *s, int mode);
837 int ssl_cipher_get_evp(const SSL_SESSION *s, const EVP_CIPHER **enc,
838                       const EVP_MD **md, int *mac_pkey_type, int *mac_secret_size);
839 int ssl_get_handshake_digest(int i, long *mask, const EVP_MD **md);
840 int ssl_verify_cert_chain(SSL *s, STACK_OF(X509) *sk);
841 int ssl_undefined_function(SSL *s);
842 int ssl_undefined_void_function(void);
843 int ssl_undefined_const_function(const SSL *s);
844 CERT_PKEY *ssl_get_server_send_pkey(const SSL *s);
845 X509 *ssl_get_server_send_cert(const SSL *s);
846 EVP_PKEY *ssl_get_sign_pkey(SSL *s, const SSL_CIPHER *c, const EVP_MD **pmd);
847 int ssl_cert_type(X509 *x, EVP_PKEY *pkey);
848 void ssl_set_cert_masks(CERT *c, const SSL_CIPHER *cipher);
849 STACK_OF(SSL_CIPHER) *ssl_get_ciphers_by_id(SSL *s);
850 int ssl_verify_alarm_type(long type);
851 void ssl_load_ciphers(void);
852 int ssl_fill_hello_random(SSL *s, int server, unsigned char *field, int len);

```

```

854 int ssl2_enc_init(SSL *s, int client);
855 int ssl2_generate_key_material(SSL *s);
856 void ssl2_enc(SSL *s, int send_data);
857 void ssl2_mac(SSL *s, unsigned char *mac, int send_data);
858 const SSL_CIPHER *ssl2_get_cipher_by_char(const unsigned char *p);
859 int ssl2_put_cipher_by_char(const SSL_CIPHER *c, unsigned char *p);
860 int ssl2_part_read(SSL *s, unsigned long f, int i);
861 int ssl2_do_write(SSL *s);
862 int ssl2_set_certificate(SSL *s, int type, int len, const unsigned char *data);
863 void ssl2_return_error(SSL *s, int reason);
864 void ssl2_write_error(SSL *s);
865 int ssl2_num_ciphers(void);
866 const SSL_CIPHER *ssl2_get_cipher(unsigned int u);
867 int ssl2_new(SSL *s);
868 void ssl2_free(SSL *s);
869 int ssl2_accept(SSL *s);
870 int ssl2_connect(SSL *s);
871 int ssl2_read(SSL *s, void *buf, int len);
872 int ssl2_peek(SSL *s, void *buf, int len);
873 int ssl2_write(SSL *s, const void *buf, int len);
874 int ssl2_shutdown(SSL *s);
875 void ssl2_clear(SSL *s);
876 long ssl2_ctrl(SSL *s, int cmd, long larg, void *parg);
877 long ssl2_ctx_ctrl(SSL_CTX *s, int cmd, long larg, void *parg);
878 long ssl2_callback_ctrl(SSL *s, int cmd, void (*fp)(void));
879 long ssl2_ctx_callback_ctrl(SSL_CTX *s, int cmd, void (*fp)(void));
880 int ssl2_pending(const SSL *s);
881 long ssl2_default_timeout(void);

883 const SSL_CIPHER *ssl3_get_cipher_by_char(const unsigned char *p);
884 int ssl3_put_cipher_by_char(const SSL_CIPHER *c, unsigned char *p);
885 void ssl3_init_finished_mac(SSL *s);
886 int ssl3_send_server_certificate(SSL *s);
887 int ssl3_send_newsession_ticket(SSL *s);
888 int ssl3_send_cert_status(SSL *s);
889 int ssl3_get_finished(SSL *s, int state_a, int state_b);
890 int ssl3_setup_key_block(SSL *s);
891 int ssl3_send_change_cipher_spec(SSL *s, int state_a, int state_b);
892 int ssl3_change_cipher_state(SSL *s, int which);
893 void ssl3_cleanup_key_block(SSL *s);
894 int ssl3_do_write(SSL *s, int type);
895 int ssl3_send_alert(SSL *s, int level, int desc);
896 int ssl3_generate_master_secret(SSL *s, unsigned char *out,
897                                unsigned char *p, int len);
898 int ssl3_get_req_cert_type(SSL *s, unsigned char *p);
899 long ssl3_get_message(SSL *s, int st1, int stn, int mt, long max, int *ok);
900 int ssl3_send_finished(SSL *s, int a, int b, const char *sender, int slen);
901 int ssl3_num_ciphers(void);
902 const SSL_CIPHER *ssl3_get_cipher(unsigned int u);
903 int ssl3_renegotiate(SSL *ssl);
904 int ssl3_renegotiate_check(SSL *ssl);
905 int ssl3_dispatch_alert(SSL *s);
906 int ssl3_read_bytes(SSL *s, int type, unsigned char *buf, int len, int peek);
907 int ssl3_write_bytes(SSL *s, int type, const void *buf, int len);
908 int ssl3_final_finish_mac(SSL *s, const char *sender, int slen, unsigned char *p);
909 int ssl3_cert_verify_mac(SSL *s, int md_nid, unsigned char *p);
910 void ssl3_finish_mac(SSL *s, const unsigned char *buf, int len);
911 int ssl3_enc(SSL *s, int send_data);
912 int n_ssl3_mac(SSL *ssl, unsigned char *md, int send_data);
913 void ssl3_free_digest_list(SSL *s);
914 unsigned long ssl3_output_cert_chain(SSL *s, X509 *x);
915 SSL_CIPHER *ssl3_choose_cipher(SSL *ssl, STACK_OF(SSL_CIPHER) *c1nt,
916                               STACK_OF(SSL_CIPHER) *s1rvr);
917 int ssl3_setup_buffers(SSL *s);
918 int ssl3_setup_read_buffer(SSL *s);
919 int ssl3_setup_write_buffer(SSL *s);

```

```

920 int      ssl3_release_read_buffer(SSL *s);
921 int      ssl3_release_write_buffer(SSL *s);
922 int      ssl3_digest_cached_records(SSL *s);
923 int      ssl3_new(SSL *s);
924 void      ssl3_free(SSL *s);
925 int      ssl3_accept(SSL *s);
926 int      ssl3_connect(SSL *s);
927 int      ssl3_read(SSL *s, void *buf, int len);
928 int      ssl3_peek(SSL *s, void *buf, int len);
929 int      ssl3_write(SSL *s, const void *buf, int len);
930 int      ssl3_shutdown(SSL *s);
931 void      ssl3_clear(SSL *s);
932 long      ssl3_ctrl(SSL *s, int cmd, long larg, void *parg);
933 long      ssl3_ctx_ctrl(SSL_CTX *s, int cmd, long larg, void *parg);
934 long      ssl3_callback_ctrl(SSL *s, int cmd, void (*fp)(void));
935 long      ssl3_ctx_callback_ctrl(SSL_CTX *s, int cmd, void (*fp)(void));
936 int      ssl3_pending(const SSL *s);

938 void ssl3_record_sequence_update(unsigned char *seq);
939 int ssl3_do_change_cipher_spec(SSL *ssl);
940 long ssl3_default_timeout(void);

942 int ssl23_num_ciphers(void);
943 const SSL_CIPHER *ssl23_get_cipher(unsigned int u);
944 int ssl23_read(SSL *s, void *buf, int len);
945 int ssl23_peek(SSL *s, void *buf, int len);
946 int ssl23_write(SSL *s, const void *buf, int len);
947 int ssl23_put_cipher_by_char(const SSL_CIPHER *c, unsigned char *p);
948 const SSL_CIPHER *ssl23_get_cipher_by_char(const unsigned char *p);
949 long ssl23_default_timeout(void);

951 long tls1_default_timeout(void);
952 int dtls1_do_write(SSL *s, int type);
953 int ssl3_read_n(SSL *s, int n, int max, int extend);
954 int dtls1_read_bytes(SSL *s, int type, unsigned char *buf, int len, int peek);
955 int ssl3_do_compress(SSL *ssl);
956 int ssl3_do_uncompress(SSL *ssl);
957 int ssl3_write_pending(SSL *s, int type, const unsigned char *buf,
958     unsigned int len);
959 unsigned char *dtls1_set_message_header(SSL *s,
960     unsigned char *p, unsigned char mt, unsigned long len,
961     unsigned long frag_off, unsigned long frag_len);

963 int dtls1_write_app_data_bytes(SSL *s, int type, const void *buf, int len);
964 int dtls1_write_bytes(SSL *s, int type, const void *buf, int len);

966 int dtls1_send_change_cipher_spec(SSL *s, int a, int b);
967 int dtls1_send_finished(SSL *s, int a, int b, const char *sender, int slen);
968 unsigned long dtls1_output_cert_chain(SSL *s, X509 *x);
969 int dtls1_read_failed(SSL *s, int code);
970 int dtls1_buffer_message(SSL *s, int ccs);
971 int dtls1_retransmit_message(SSL *s, unsigned short seq,
972     unsigned long frag_off, int *found);
973 int dtls1_get_queue_priority(unsigned short seq, int is_ccs);
974 int dtls1_retransmit_buffered_messages(SSL *s);
975 void dtls1_clear_record_buffer(SSL *s);
976 void dtls1_get_message_header(unsigned char *data, struct hm_header_st *msg_hdr);
977 void dtls1_get_ccs_header(unsigned char *data, struct ccs_header_st *ccs_hdr);
978 void dtls1_reset_seq_numbers(SSL *s, int rw);
979 long dtls1_default_timeout(void);
980 struct timeval* dtls1_get_timeout(SSL *s, struct timeval* timeleft);
981 int dtls1_check_timeout_num(SSL *s);
982 int dtls1_handle_timeout(SSL *s);
983 const SSL_CIPHER *dtls1_get_cipher(unsigned int u);
984 void dtls1_start_timer(SSL *s);
985 void dtls1_stop_timer(SSL *s);

```

```

986 int dtls1_is_timer_expired(SSL *s);
987 void dtls1_double_timeout(SSL *s);
988 int dtls1_send_newsession_ticket(SSL *s);
989 unsigned int dtls1_min_mtu(void);

991 /* some client-only functions */
992 int ssl3_client_hello(SSL *s);
993 int ssl3_get_server_hello(SSL *s);
994 int ssl3_get_certificate_request(SSL *s);
995 int ssl3_get_new_session_ticket(SSL *s);
996 int ssl3_get_cert_status(SSL *s);
997 int ssl3_get_server_done(SSL *s);
998 int ssl3_send_client_verify(SSL *s);
999 int ssl3_send_client_certificate(SSL *s);
1000 int ssl_do_client_cert_cb(SSL *s, X509 **px509, EVP_PKEY **ppkey);
1001 int ssl3_send_client_key_exchange(SSL *s);
1002 int ssl3_get_key_exchange(SSL *s);
1003 int ssl3_get_server_certificate(SSL *s);
1004 int ssl3_check_cert_and_algorithm(SSL *s);
1005 #ifndef OPENSSL_NO_TLSEXT
1006 int ssl3_check_finished(SSL *s);
1007 #ifdef OPENSSL_NO_NEXTPROTONEG
1008 int ssl3_send_next_proto(SSL *s);
1009 #endif
1010 #endif

1012 int dtls1_client_hello(SSL *s);
1013 int dtls1_send_client_certificate(SSL *s);
1014 int dtls1_send_client_key_exchange(SSL *s);
1015 int dtls1_send_client_verify(SSL *s);

1017 /* some server-only functions */
1018 int ssl3_get_client_hello(SSL *s);
1019 int ssl3_send_server_hello(SSL *s);
1020 int ssl3_send_hello_request(SSL *s);
1021 int ssl3_send_server_key_exchange(SSL *s);
1022 int ssl3_send_certificate_request(SSL *s);
1023 int ssl3_send_server_done(SSL *s);
1024 int ssl3_check_client_hello(SSL *s);
1025 int ssl3_get_client_certificate(SSL *s);
1026 int ssl3_get_client_key_exchange(SSL *s);
1027 int ssl3_get_cert_verify(SSL *s);
1028 #ifndef OPENSSL_NO_NEXTPROTONEG
1029 int ssl3_get_next_proto(SSL *s);
1030 #endif

1032 int dtls1_send_hello_request(SSL *s);
1033 int dtls1_send_server_hello(SSL *s);
1034 int dtls1_send_server_certificate(SSL *s);
1035 int dtls1_send_server_key_exchange(SSL *s);
1036 int dtls1_send_certificate_request(SSL *s);
1037 int dtls1_send_server_done(SSL *s);

1041 int ssl23_accept(SSL *s);
1042 int ssl23_connect(SSL *s);
1043 int ssl23_read_bytes(SSL *s, int n);
1044 int ssl23_write_bytes(SSL *s);

1046 int tls1_new(SSL *s);
1047 void tls1_free(SSL *s);
1048 void tls1_clear(SSL *s);
1049 long tls1_ctrl(SSL *s, int cmd, long larg, void *parg);
1050 long tls1_callback_ctrl(SSL *s, int cmd, void (*fp)(void));

```

```

1052 int dtls1_new(SSL *s);
1053 int dtls1_accept(SSL *s);
1054 int dtls1_connect(SSL *s);
1055 void dtls1_free(SSL *s);
1056 void dtls1_clear(SSL *s);
1057 long dtls1_ctrl(SSL *s, int cmd, long larg, void *parg);
1058 int dtls1_shutdown(SSL *s);

1060 long dtls1_get_message(SSL *s, int st1, int stn, int mt, long max, int *ok);
1061 int dtls1_get_record(SSL *s);
1062 int do_dtls1_write(SSL *s, int type, const unsigned char *buf,
1063     unsigned int len, int create_empty_fragment);
1064 int dtls1_dispatch_alert(SSL *s);
1065 int dtls1_enc(SSL *s, int snd);

1067 int ssl_init_wbio_buffer(SSL *s, int push);
1068 void ssl_free_wbio_buffer(SSL *s);

1070 int tls1_change_cipher_state(SSL *s, int which);
1071 int tls1_setup_key_block(SSL *s);
1072 int tls1_enc(SSL *s, int snd);
1073 int tls1_final_finish_mac(SSL *s,
1074     const char *str, int slen, unsigned char *p);
1075 int tls1_cert_verify_mac(SSL *s, int md_nid, unsigned char *p);
1076 int tls1_mac(SSL *s, unsigned char *md, int snd);
1077 int tls1_generate_master_secret(SSL *s, unsigned char *out,
1078     unsigned char *p, int len);
1079 int tls1_export_keying_material(SSL *s, unsigned char *out, size_t olen,
1080     const char *label, size_t llen,
1081     const unsigned char *p, size_t plen, int use_context);
1082 int tls1_alert_code(int code);
1083 int ssl3_alert_code(int code);
1084 int ssl_ok(SSL *s);

1086 #ifndef OPENSSL_NO_ECDH
1087 int ssl_check_srvr_ecc_cert_and_alg(X509 *x, SSL *s);
1088 #endif

1090 SSL_COMP *ssl3_comp_find(STACK_OF(SSL_COMP) *sk, int n);

1092 #ifndef OPENSSL_NO_EC
1093 int tls1_ec_curve_id2nid(int curve_id);
1094 int tls1_ec_nid2curve_id(int nid);
1095 #endif /* OPENSSL_NO_EC */

1097 #ifndef OPENSSL_NO_TLS1
1098 unsigned char *ssl_add_clienthello_tlsext(SSL *s, unsigned char *p, unsigned char *p, unsigned char *p);
1099 unsigned char *ssl_add_serverhello_tlsext(SSL *s, unsigned char *p, unsigned char *p, unsigned char *p);
1100 int ssl_parse_clienthello_tlsext(SSL *s, unsigned char **data, unsigned char *d,
1101     int ssl_parse_serverhello_tlsext(SSL *s, unsigned char **data, unsigned char *d,
1102     int ssl_prepare_clienthello_tlsext(SSL *s);
1103 int ssl_prepare_serverhello_tlsext(SSL *s);
1104 int ssl_check_clienthello_tlsext_early(SSL *s);
1105 int ssl_check_clienthello_tlsext_late(SSL *s);
1106 int ssl_check_serverhello_tlsext(SSL *s);

1108 #ifndef OPENSSL_NO_HEARTBEATS
1109 int tls1_heartbeat(SSL *s);
1110 int dtls1_heartbeat(SSL *s);
1111 int tls1_process_heartbeat(SSL *s);
1112 int dtls1_process_heartbeat(SSL *s);
1113 #endif

1115 #ifndef OPENSSL_NO_SHA256
1116 #define tlsext_tick_md EVP_sha1
1117 #else

```

```

1118 #define tlsext_tick_md EVP_sha256
1119 #endif
1120 int tls1_process_ticket(SSL *s, unsigned char *session_id, int len,
1121     const unsigned char *limit, SSL_SESSION **ret);

1123 int tls12_get_sigandhash(unsigned char *p, const EVP_PKEY *pk,
1124     const EVP_MD *md);
1125 int tls12_get_sigid(const EVP_PKEY *pk);
1126 const EVP_MD *tls12_get_hash(unsigned char hash_alg);

1128 #endif
1129 EVP_MD_CTX *ssl_replace_hash(EVP_MD_CTX **hash, const EVP_MD *md) ;
1130 void ssl_clear_hash_ctx(EVP_MD_CTX **hash);
1131 int ssl_add_serverhello_renegotiate_ext(SSL *s, unsigned char *p, int *len,
1132     int maxlen);
1133 int ssl_parse_serverhello_renegotiate_ext(SSL *s, unsigned char *d, int len,
1134     int *al);
1135 int ssl_add_clienthello_renegotiate_ext(SSL *s, unsigned char *p, int *len,
1136     int maxlen);
1137 int ssl_parse_clienthello_renegotiate_ext(SSL *s, unsigned char *d, int len,
1138     int *al);
1139 long ssl_get_algorithm2(SSL *s);
1140 int tls1_process_sigalgs(SSL *s, const unsigned char *data, int dsize);
1141 int tls12_get_req_sigalgs(SSL *s, unsigned char *p);

1143 int ssl_add_clienthello_use_srtp_ext(SSL *s, unsigned char *p, int *len, int max
1144 int ssl_parse_clienthello_use_srtp_ext(SSL *s, unsigned char *d, int len, int *al
1145 int ssl_add_serverhello_use_srtp_ext(SSL *s, unsigned char *p, int *len, int max
1146 int ssl_parse_serverhello_use_srtp_ext(SSL *s, unsigned char *d, int len, int *al

1148 /* s3_cbc.c */
1149 void ssl3_cbc_copy_mac(unsigned char * out,
1150     const SSL3_RECORD *rec,
1151     unsigned md_size, unsigned orig_len);
1152 int ssl3_cbc_remove_padding(const SSL * s,
1153     SSL3_RECORD *rec,
1154     unsigned block_size,
1155     unsigned mac_size);
1156 int tls1_cbc_remove_padding(const SSL * s,
1157     SSL3_RECORD *rec,
1158     unsigned block_size,
1159     unsigned mac_size);
1160 char ssl3_cbc_record_digest_supported(const EVP_MD_CTX *ctx);
1161 void ssl3_cbc_digest_record(
1162     const EVP_MD_CTX *ctx,
1163     unsigned char * md_out,
1164     size_t * md_out_size,
1165     const unsigned char header[13],
1166     const unsigned char *data,
1167     size_t data_plus_mac_size,
1168     size_t data_plus_mac_plus_padding_size,
1169     const unsigned char *mac_secret,
1170     unsigned mac_secret_length,
1171     char is_sslv3);

1173 void tls_fips_digest_extra(
1174     const EVP_CIPHER_CTX *cipher_ctx, EVP_MD_CTX *mac_ctx,
1175     const unsigned char *data, size_t data_len, size_t orig_len);

1177 #endif

```

new/usr/src/lib/openssl/include/str_locl.h

1

```
*****
4794 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/include/str_locl.h
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/store/str_locl.h - mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2003.
4  */
5 /* =====
6  * Copyright (c) 2003 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
16  * notice, this list of conditions and the following disclaimer in
17  * the documentation and/or other materials provided with the
18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
23  * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
24  *
25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26  * endorse or promote products derived from this software without
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29  *
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33  *
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37  * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
38  *
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40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #ifndef HEADER_STORE_LOCL_H
60 #define HEADER_STORE_LOCL_H
```

new/usr/src/lib/openssl/include/str_locl.h

2

```
62 #include <openssl/crypto.h>
63 #include <openssl/store.h>
64
65 #ifdef __cplusplus
66 extern "C" {
67 #endif
68
69 struct store_method_st
70 {
71     char *name;
72
73     /* All the functions return a positive integer or non-NULL for success
74      * and 0, a negative integer or NULL for failure */
75
76     /* Initialise the STORE with private data */
77     STORE_INITIALISE_FUNC_PTR init;
78     /* Initialise the STORE with private data */
79     STORE_CLEANUP_FUNC_PTR clean;
80     /* Generate an object of a given type */
81     STORE_GENERATE_OBJECT_FUNC_PTR generate_object;
82     /* Get an object of a given type. This function isn't really very
83      * useful since the listing functions (below) can be used for the
84      * same purpose and are much more general. */
85     STORE_GET_OBJECT_FUNC_PTR get_object;
86     /* Store an object of a given type. */
87     STORE_STORE_OBJECT_FUNC_PTR store_object;
88     /* Modify the attributes bound to an object of a given type. */
89     STORE_MODIFY_OBJECT_FUNC_PTR modify_object;
90     /* Revoke an object of a given type. */
91     STORE_HANDLE_OBJECT_FUNC_PTR revoke_object;
92     /* Delete an object of a given type. */
93     STORE_HANDLE_OBJECT_FUNC_PTR delete_object;
94     /* List a bunch of objects of a given type and with the associated
95      * attributes. */
96     STORE_START_OBJECT_FUNC_PTR list_object_start;
97     STORE_NEXT_OBJECT_FUNC_PTR list_object_next;
98     STORE_END_OBJECT_FUNC_PTR list_object_end;
99     STORE_END_OBJECT_FUNC_PTR list_object_endp;
100     /* Store-level function to make any necessary update operations. */
101     STORE_GENERIC_FUNC_PTR update_store;
102     /* Store-level function to get exclusive access to the store. */
103     STORE_GENERIC_FUNC_PTR lock_store;
104     /* Store-level function to release exclusive access to the store. */
105     STORE_GENERIC_FUNC_PTR unlock_store;
106
107     /* Generic control function */
108     STORE_CTRL_FUNC_PTR ctrl;
109 };
110
111 struct store_st
112 {
113     const STORE_METHOD *meth;
114     /* functional reference if 'meth' is ENGINE-provided */
115     ENGINE *engine;
116
117     CRYPTO_EX_DATA ex_data;
118     int references;
119 };
120 #ifdef __cplusplus
121 }
122 #endif
123
124 #endif
```



```
128     {
129         const char *action_desc; /* Input */
130         const char *ok_chars; /* Input */
131         const char *cancel_chars; /* Input */
132     } boolean_data;
133     } _;

135 #define OUT_STRING_FREEABLE 0x01
136 int flags; /* flags for internal use */
137 };

139 struct ui_st
140 {
141     const UI_METHOD *meth;
142     STACK_OF(UI_STRING) *strings; /* We might want to prompt for more
143                                     than one thing at a time, and
144                                     with different echoing status. */
145     void *user_data;
146     CRYPTO_EX_DATA ex_data;

148 #define UI_FLAG_REDOABLE 0x0001
149 #define UI_FLAG_PRINT_ERRORS 0x0100
150 int flags;
151 };

153 #endif
```



```

*****
3681 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/LPdir_unix.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* SLP: LPlib/source/LPdir_unix.c,v 1.11 2004/09/23 22:07:22 _cvs_levitte Exp $
2 /*
3  * Copyright (c) 2004, Richard Levitte <richard@levitte.org>
4  * All rights reserved.
5  *
6  * Redistribution and use in source and binary forms, with or without
7  * modification, are permitted provided that the following conditions
8  * are met:
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14  *
15  * THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS
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19  * OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
20  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT
21  * LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE,
22  * DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY
23  * THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
24  * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE
25  * OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
26  */
27
28 #include <stddef.h>
29 #include <stdlib.h>
30 #include <limits.h>
31 #include <string.h>
32 #include <sys/types.h>
33 #include <dirent.h>
34 #include <errno.h>
35 #ifndef LPDIR_H
36 #include "LPdir.h"
37 #endif
38
39 /* The POSIXly macro for the maximum number of characters in a file path
40  * is NAME_MAX. However, some operating systems use PATH_MAX instead.
41  * Therefore, it seems natural to first check for PATH_MAX and use that,
42  * and if it doesn't exist, use NAME_MAX. */
43 #if defined(PATH_MAX)
44 # define LP_ENTRY_SIZE PATH_MAX
45 #elif defined(NAME_MAX)
46 # define LP_ENTRY_SIZE NAME_MAX
47 #endif
48
49 /* Of course, there's the possibility that neither PATH_MAX nor NAME_MAX
50  * exist. It's also possible that NAME_MAX exists but is define to a
51  * very small value (HP-UX offers 14), so we need to check if we got a
52  * result, and if it meets a minimum standard, and create or change it
53  * if not. */
54 #if !defined(LP_ENTRY_SIZE) || LP_ENTRY_SIZE<255
55 # undef LP_ENTRY_SIZE
56 # define LP_ENTRY_SIZE 255
57 #endif
58
59 struct LP_dir_context_st
60 {
61     DIR *dir;

```

```

62     char entry_name[LP_ENTRY_SIZE+1];
63 };
64
65 const char *LP_find_file(LP_DIR_CTX **ctx, const char *directory)
66 {
67     struct dirent *dirent = NULL;
68
69     if (ctx == NULL || directory == NULL)
70     {
71         errno = EINVAL;
72         return 0;
73     }
74
75     errno = 0;
76     if (*ctx == NULL)
77     {
78         *ctx = (LP_DIR_CTX *)malloc(sizeof(LP_DIR_CTX));
79         if (*ctx == NULL)
80         {
81             errno = ENOMEM;
82             return 0;
83         }
84         memset(*ctx, '\0', sizeof(LP_DIR_CTX));
85
86         (*ctx)->dir = opendir(directory);
87         if ((*ctx)->dir == NULL)
88         {
89             int save_errno = errno; /* Probably not needed, but I'm paranoid */
90             free(*ctx);
91             *ctx = NULL;
92             errno = save_errno;
93             return 0;
94         }
95     }
96
97     dirent = readdir((*ctx)->dir);
98     if (dirent == NULL)
99     {
100         return 0;
101     }
102
103     strncpy((*ctx)->entry_name, dirent->d_name, sizeof((*ctx)->entry_name) - 1);
104     (*ctx)->entry_name[sizeof((*ctx)->entry_name) - 1] = '\0';
105     return (*ctx)->entry_name;
106 }
107
108 int LP_find_file_end(LP_DIR_CTX **ctx)
109 {
110     if (ctx != NULL && *ctx != NULL)
111     {
112         int ret = closedir((*ctx)->dir);
113
114         free(*ctx);
115         switch (ret)
116         {
117             case 0:
118                 return 1;
119             case -1:
120                 return 0;
121             default:
122                 break;
123         }
124     }
125     errno = EINVAL;
126     return 0;
127 }

```


new/usr/src/lib/openssl/libsunw_crypto/Makefile

1

1414 Fri May 30 18:31:26 2014

new/usr/src/lib/openssl/libsunw_crypto/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
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13 # When distributing Covered Code, include this CDDL HEADER in each
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15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
23 # Use is subject to license terms.
24 #
25 #
27 include $(SRC)/lib/Makefile.lib
29 SUBDIRS = .WAIT $(MACH) $(BUILD64) $(MACH64)
31 # conditional assignments
32 all := TARGET= all
33 install := TARGET= install
34 clean := TARGET= clean
35 clobber := TARGET= clobber
36 lint := TARGET= lint
37 _msg := TARGET= _msg
39 .KEEP_STATE:
41 all install clean clobber lint: $(SUBDIRS)
43 _msg: $(MACH) $(MACH64)
46 $(ROOTHDRDIR)/%: %
47 $(INS.file)
49 $(ROOTHDRDIR):
50 $(INS.dir)
52 check: $(CHECKHDRS)
54 $(MACH) $(MACH64): FRC
55 @cd $@; pwd; $(MAKE) $(TARGET)
57 FRC:
```

```
*****
15722 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
23 # Use is subject to license terms.
24 #
```

```
26 LIBRARY=      libsunw_crypto.a
27 VERS=         .1
```

```
29 COMMON_OBJECTS =      cpt_err.o \
30                        cryptlib.o \
31                        cversion.o \
32                        ebcddic.o \
33                        ex_data.o \
34                        fips_ers.o \
35                        mem_dbg.o \
36                        mem.o \
37                        o_dir.o \
38                        o_fips.o \
39                        o_init.o \
40                        o_str.o \
41                        o_time.o \
42                        uid.o
43 OBJECTS +=      $(COMMON_OBJECTS)
```

```
45 # aes/*
46 AES_OBJECTS =      aes_cfb.o \
47                    aes_ctr.o \
48                    aes_ecb.o \
49                    aes_ige.o \
50                    aes_misc.o \
51                    aes_ofb.o \
52                    aes_wrap.o
53 OBJECTS +=      $(AES_OBJECTS)
```

```
55 # asn1/*
56 ASN1_OBJECTS =      a_bitstr.o \
57                    a_bool.o \
58                    a_bytes.o \
59                    a_d2i_fp.o \
60                    a_digest.o \
61                    a_dup.o \
```

```
62                    a_enum.o \
63                    a_gentm.o \
64                    a_i2d_fp.o \
65                    a_int.o \
66                    a_mbstr.o \
67                    a_object.o \
68                    a_octet.o \
69                    a_print.o \
70                    a_set.o \
71                    a_sign.o \
72                    a_strex.o \
73                    a_strnid.o \
74                    a_time.o \
75                    a_type.o \
76                    a_utctm.o \
77                    a_utf8.o \
78                    a_verify.o \
79                    ameth_lib.o \
80                    asn1_err.o \
81                    asn1_gen.o \
82                    asn1_lib.o \
83                    asn1_par.o \
84                    asn_mime.o \
85                    asn_moid.o \
86                    asn_pack.o \
87                    bio_asn1.o \
88                    bio_ndef.o \
89                    d2i_pr.o \
90                    d2i_pu.o \
91                    evp_asn1.o \
92                    f_enum.o \
93                    f_int.o \
94                    f_string.o \
95                    i2d_pr.o \
96                    i2d_pu.o \
97                    n_pkey.o \
98                    nsseq.o \
99                    p5_pbe.o \
100                   p5_pbev2.o \
101                   p8_pkey.o \
102                   t_bitst.o \
103                   t_crl.o \
104                   t_pkey.o \
105                   t_req.o \
106                   t_spki.o \
107                   t_x509.o \
108                   t_x509a.o \
109                   tasn_dec.o \
110                   tasn_enc.o \
111                   tasn_fre.o \
112                   tasn_new.o \
113                   tasn_prn.o \
114                   tasn_typ.o \
115                   tasn_utl.o \
116                   x_algor.o \
117                   x_attrib.o \
118                   x_bignum.o \
119                   x_crl.o \
120                   x_exten.o \
121                   x_info.o \
122                   x_long.o \
123                   x_name.o \
124                   x_nx509.o \
125                   x_pkey.o \
126                   x_pubkey.o \
127                   x_req.o \
```

```

128         x_sig.o      \
129         x_spki.o     \
130         x_val.o      \
131         x_x509.o     \
132         x_x509a.o    \
133 OBJECTS += $(ASN1_OBJECTS)

135 # bf/*
136 BF_OBJECTS = bf_cfb64.o \
137              bf_ecb.o   \
138              bf_ofb64.o \
139              bf_key.o   \
140 OBJECTS += $(BF_OBJECTS)

142 # bio/*
143 BIO_OBJECTS = b_dump.o      \
144              b_print.o     \
145              b_sock.o      \
146              bf_buff.o     \
147              bf_nbio.o     \
148              bf_null.o     \
149              bio_cb.o      \
150              bio_err.o     \
151              bio_lib.o     \
152              bss_acpt.o    \
153              bss_bio.o     \
154              bss_conn.o    \
155              bss_dgram.o   \
156              bss_fd.o      \
157              bss_file.o    \
158              bss_log.o     \
159              bss_mem.o     \
160              bss_null.o    \
161              bss_sock.o    \
162 OBJECTS += $(BIO_OBJECTS)

164 # bn/*
165 BN_OBJECTS = bn_add.o      \
166              bn_blind.o    \
167              bn_const.o    \
168              bn_ctx.o      \
169              bn_depr.o     \
170              bn_div.o      \
171              bn_err.o      \
172              bn_exp.o      \
173              bn_exp2.o     \
174              bn_gcd.o      \
175              bn_gf2m.o     \
176              bn_kron.o     \
177              bn_lib.o      \
178              bn_mod.o      \
179              bn_mont.o     \
180              bn_mpi.o      \
181              bn_mul.o      \
182              bn_nist.o     \
183              bn_prime.o    \
184              bn_print.o    \
185              bn_rand.o     \
186              bn_recp.o     \
187              bn_shift.o    \
188              bn_sqr.o      \
189              bn_sqrt.o     \
190              bn_word.o     \
191              bn_x931p.o    \
192 OBJECTS += $(BN_OBJECTS)

```

```

194 # buffer/*
195 BUFFER_OBJECTS = buf_err.o   \
196                 buf_str.o    \
197                 buffer.o     \
198 OBJECTS += $(BUFFER_OBJECTS)

200 # camellia/*
201 CAMELLIA_OBJECTS = cml_cfb.o  \
202                  cml_ctr.o    \
203                  cml_ecb.o    \
204                  cml_ofb.o    \
205                  cml_utl.o    \
206 OBJECTS += $(CAMELLIA_OBJECTS)

208 # cast/*
209 CAST_OBJECTS = c_cfb64.o      \
210               c_ecb.o         \
211               c_enc.o         \
212               c_ofb64.o       \
213               c_key.o         \
214 OBJECTS += $(CAST_OBJECTS)

216 # cmac/*
217 CMAC_OBJECTS = cm_ameth.o     \
218               cm_pmeth.o      \
219               cmac.o          \
220 OBJECTS += $(CMAC_OBJECTS)

222 # cms/*
223 CMS_OBJECTS = cms_asn1.o      \
224              cms_att.o        \
225              cms_cd.o         \
226              cms_dd.o         \
227              cms_enc.o        \
228              cms_env.o        \
229              cms_err.o        \
230              cms_ess.o        \
231              cms_io.o         \
232              cms_lib.o        \
233              cms_pwri.o       \
234              cms_sd.o         \
235              cms_smime.o      \
236 OBJECTS += $(CMS_OBJECTS)

238 # comp/*
239 COMP_OBJECTS = c_rle.o        \
240               c_zlib.o        \
241               comp_err.o      \
242               comp_lib.o      \
243 OBJECTS += $(COMP_OBJECTS)

245 # conf/*
246 CONF_OBJECTS = conf_api.o     \
247               conf_def.o      \
248               conf_err.o      \
249               conf_lib.o      \
250               conf_mall.o     \
251               conf_mod.o      \
252               conf_sap.o      \
253 OBJECTS += $(CONF_OBJECTS)

255 # des/*
256 DES_OBJECTS = cbc_cksm.o      \
257               cbc_enc.o        \
258               cfb_enc.o        \
259               cfb64ede.o       \

```

```

260         cfb64enc.o \
261         des_old.o \
262         des_old2.o \
263         ecb_enc.o \
264         ecb3_enc.o \
265         ede_cbc_m_enc.o \
266         enc_read.o \
267         enc_writ.o \
268         fcrypt.o \
269         ofb_enc.o \
270         ofb64ede.o \
271         ofb64enc.o \
272         pcbbc_enc.o \
273         qud_cksm.o \
274         rand_key.o \
275         read2pwd.o \
276         rpc_enc.o \
277         set_key.o \
278         str2key.o \
279         xcbc_enc.o \
280 OBJECTS += $(DES_OBJECTS)

282 # dh/*
283 DH_OBJECTS = dh_ameth.o \
284              dh_asn1.o \
285              dh_check.o \
286              dh_depr.o \
287              dh_err.o \
288              dh_gen.o \
289              dh_key.o \
290              dh_lib.o \
291              dh_pmeth.o \
292              dh_prn.o \
293 OBJECTS += $(DH_OBJECTS)

295 # dsa/*
296 DSA_OBJECTS = dsa_ameth.o \
297              dsa_asn1.o \
298              dsa_depr.o \
299              dsa_err.o \
300              dsa_gen.o \
301              dsa_key.o \
302              dsa_lib.o \
303              dsa_oss1.o \
304              dsa_pmeth.o \
305              dsa_prn.o \
306              dsa_sign.o \
307              dsa_vrf.o \
308 OBJECTS += $(DSA_OBJECTS)

310 # dso/*
311 DSO_OBJECTS = dso_beos.o \
312              dso_dl.o \
313              dso_dlfcn.o \
314              dso_err.o \
315              dso_lib.o \
316              dso_null.o \
317              dso_openssl.o \
318              dso_vms.o \
319              dso_win32.o \
320 OBJECTS += $(DSO_OBJECTS)

322 # engine/*
323 ENGINE_OBJECTS = eng_all.o \
324                 eng_cnf.o \
325                 eng_cryptodev.o \

```

```

326         eng_ctrl.o \
327         eng_dyn.o \
328         eng_err.o \
329         eng_fat.o \
330         eng_init.o \
331         eng_lib.o \
332         eng_list.o \
333         eng_openssl.o \
334         eng_pkey.o \
335         eng_rdrand.o \
336         eng_rsax.o \
337         eng_table.o \
338         hw_pk11.o \
339         hw_pk11_pub.o \
340         tb_asnmth.o \
341         tb_cipher.o \
342         tb_dh.o \
343         tb_digest.o \
344         tb_dsa.o \
345         tb_ecdh.o \
346         tb_ecdsa.o \
347         tb_pkmeth.o \
348         tb_rand.o \
349         tb_rsa.o \
350         tb_store.o \
351 OBJECTS += $(ENGINE_OBJECTS)

353 # err/*
354 ERR_OBJECTS = err_all.o \
355              err_prn.o \
356              err.o \
357 OBJECTS += $(ERR_OBJECTS)

359 # evp/*
360 EVP_OBJECTS = bio_b64.o \
361              bio_enc.o \
362              bio_md.o \
363              bio_ok.o \
364              c_all.o \
365              c_allc.o \
366              c_alld.o \
367              digest.o \
368              e_aes.o \
369              e_aes_cbc_hmac_sha1.o \
370              e_bf.o \
371              e_camellia.o \
372              e_cast.o \
373              e_des.o \
374              e_des3.o \
375              e_idea.o \
376              e_null.o \
377              e_old.o \
378              e_rc2.o \
379              e_rc4.o \
380              e_rc4_hmac_md5.o \
381              e_rc5.o \
382              e_seed.o \
383              e_xcbc_d.o \
384              encode.o \
385              evp_acnf.o \
386              evp_cnf.o \
387              evp_enc.o \
388              evp_err.o \
389              evp_fips.o \
390              evp_key.o \
391              evp_lib.o \

```

```

392         evp_pbe.o           \
393         evp_pkey.o          \
394         m_dss.o             \
395         m_dss1.o            \
396         m_ecdsa.o           \
397         m_md2.o             \
398         m_md4.o             \
399         m_md5.o             \
400         m_mdcc2.o           \
401         m_null.o            \
402         m_ripemd.o          \
403         m_sha.o             \
404         m_sha1.o            \
405         m_sigver.o          \
406         m_wp.o              \
407         names.o             \
408         p5_crpt.o           \
409         p5_crpt2.o          \
410         p_dec.o             \
411         p_enc.o             \
412         p_lib.o             \
413         p_open.o            \
414         p_seal.o            \
415         p_sign.o            \
416         p_verify.o          \
417         pmeth_fn.o          \
418         pmeth_gn.o          \
419         pmeth_lib.o         \
420 OBJECTS += $(EVP_OBJECTS)

422 # hmac/*
423 HMAC_OBJECTS = hm_ameth.o \
424                hm_pmeth.o \
425                hmac.o
426 OBJECTS += $(HMAC_OBJECTS)

428 # krb5/*
429 KRB5_OBJECTS = krb5_asn.o
430 OBJECTS += $(KRB5_OBJECTS)

432 # lhash/*
433 LHASH_OBJECTS = lh_stats.o \
434                lhash.o
435 OBJECTS += $(LHASH_OBJECTS)

437 # md2/*
438 MD2_OBJECTS = md2_dgst.o \
439               md2_one.o
440 OBJECTS += $(MD2_OBJECTS)

442 # md4/*
443 MD4_OBJECTS = md4_dgst.o \
444               md4_one.o
445 OBJECTS += $(MD4_OBJECTS)

447 # md5/*
448 MD5_OBJECTS = md5_dgst.o \
449               md5_one.o
450 OBJECTS += $(MD5_OBJECTS)

452 # modes/*
453 MODES_OBJECTS = cbc128.o \
454                 ccm128.o \
455                 cfb128.o \
456                 ctr128.o \
457                 cts128.o \

```

```

458         gcm128.o           \
459         ofb128.o           \
460         xts128.o           \
461 OBJECTS += $(MODES_OBJECTS)

463 # objects/*
464 OBJECTS_OBJECTS = o_names.o \
465                  obj_dat.o \
466                  obj_err.o \
467                  obj_lib.o \
468                  obj_xref.o
469 OBJECTS += $(OBJECTS_OBJECTS)

471 # ocsp/*
472 OCSP_OBJECTS = ocsp_asn.o \
473                ocsp_cl.o \
474                ocsp_err.o \
475                ocsp_ext.o \
476                ocsp_ht.o \
477                ocsp_lib.o \
478                ocsp_prn.o \
479                ocsp_srv.o \
480                ocsp_vfy.o
481 OBJECTS += $(OCSP_OBJECTS)

483 # pem/*
484 PEM_OBJECTS = pem_all.o \
485               pem_err.o \
486               pem_info.o \
487               pem_lib.o \
488               pem_oth.o \
489               pem_pk8.o \
490               pem_pkey.o \
491               pem_seal.o \
492               pem_sign.o \
493               pem_x509.o \
494               pem_xaux.o \
495               pvkfmt.o
496 OBJECTS += $(PEM_OBJECTS)

498 # pkcs12/*
499 PKCS12_OBJECTS = p12_add.o \
500                  p12_asn.o \
501                  p12_attr.o \
502                  p12_crpt.o \
503                  p12_crt.o \
504                  p12_decr.o \
505                  p12_init.o \
506                  p12_key.o \
507                  p12_kiss.o \
508                  p12_mutl.o \
509                  p12_npas.o \
510                  p12_p8d.o \
511                  p12_p8e.o \
512                  p12_utl.o \
513                  pk12err.o
514 OBJECTS += $(PKCS12_OBJECTS)

516 # pkcs7/*
517 PKCS7_OBJECTS = bio_pk7.o \
518                 pk7_asn1.o \
519                 pk7_attr.o \
520                 pk7_doit.o \
521                 pk7_lib.o \
522                 pk7_mime.o \
523                 pk7_smime.o \

```

```

524         pkcs7err.o
525 OBJECTS += $(PKCS7_OBJECTS)

527 # pqueue/*
528 PQUEUE_OBJECTS = pqueue.o
529 OBJECTS += $(PQUEUE_OBJECTS)

531 # rand/*
532 RAND_OBJECTS = md_rand.o      \
533                rand_egd.o      \
534                rand_err.o      \
535                rand_lib.o      \
536                rand_nw.o       \
537                rand_os2.o       \
538                rand_unix.o      \
539                rand_win.o       \
540                randfile.o
541 OBJECTS += $(RAND_OBJECTS)

543 # rc2/*
544 RC2_OBJECTS = rc2_cbc.o        \
545                rc2_ecb.o        \
546                rc2_skey.o       \
547                rc2cfb64.o       \
548                rc2ofb64.o
549 OBJECTS += $(RC2_OBJECTS)

551 # rc4/*
552 RC4_OBJECTS = rc4_utl.o
553 OBJECTS += $(RC4_OBJECTS)

555 # ripemd/*
556 RIPEMD_OBJECTS = rmd_dgst.o    \
557                rmd_one.o
558 OBJECTS += $(RIPEMD_OBJECTS)

560 # rsa/*
561 RSA_OBJECTS = rsa_ameth.o      \
562                rsa_asn1.o       \
563                rsa_chk.o        \
564                rsa_crpt.o       \
565                rsa_depr.o       \
566                rsa_eay.o        \
567                rsa_err.o        \
568                rsa_gen.o        \
569                rsa_lib.o        \
570                rsa_none.o       \
571                rsa_null.o       \
572                rsa_oaep.o       \
573                rsa_pk1.o        \
574                rsa_pmeth.o      \
575                rsa_prn.o        \
576                rsa_pss.o        \
577                rsa_saos.o       \
578                rsa_sign.o       \
579                rsa_ssl.o        \
580                rsa_x931.o
581 OBJECTS += $(RSA_OBJECTS)

583 # sha/*
584 SHA_OBJECTS = sha1_one.o       \
585                sha1dgst.o       \
586                sha256.o         \
587                sha512.o         \
588                sha_dgst.o       \
589                sha_one.o

```

```

590 OBJECTS += $(SHA_OBJECTS)

592 # srp/*
593 SRP_OBJECTS = srp_lib.o        \
594                srp_vfy.o
595 OBJECTS += $(SRP_OBJECTS)

597 # stack/*
598 STACK_OBJECTS = stack.o
599 OBJECTS += $(STACK_OBJECTS)

601 # ts/*
602 TS_OBJECTS = ts_asn1.o         \
603                ts_conf.o        \
604                ts_err.o         \
605                ts_lib.o         \
606                ts_req_print.o   \
607                ts_req_utils.o   \
608                ts_rsp_print.o   \
609                ts_rsp_sign.o    \
610                ts_rsp_utils.o   \
611                ts_rsp_verify.o  \
612                ts_verify_ctx.o
613 OBJECTS += $(TS_OBJECTS)

615 # txt_db/*
616 TXT_DB_OBJECTS = txt_db.o
617 OBJECTS += $(TXT_DB_OBJECTS)

619 # ui/*
620 UI_OBJECTS = ui_compat.o       \
621                ui_err.o         \
622                ui_lib.o         \
623                ui_openssl.o     \
624                ui_util.o
625 OBJECTS += $(UI_OBJECTS)

627 # x509/*
628 X509_OBJECTS = by_dir.o        \
629                by_file.o        \
630                x_all.o          \
631                x509_att.o       \
632                x509_cmp.o       \
633                x509_d2.o        \
634                x509_def.o       \
635                x509_err.o       \
636                x509_ext.o       \
637                x509_lu.o        \
638                x509_obj.o       \
639                x509_r2x.o       \
640                x509_req.o       \
641                x509_set.o       \
642                x509_trs.o       \
643                x509_txt.o       \
644                x509_v3.o        \
645                x509_vfy.o       \
646                x509_vpm.o       \
647                x509cset.o       \
648                x509name.o       \
649                x509rset.o       \
650                x509spki.o       \
651                x509type.o
652 OBJECTS += $(X509_OBJECTS)

654 # x509v3/*
655 X509V3_OBJECTS = pcy_cache.o   \

```



```

656         pcy_data.o      \
657         pcy_lib.o       \
658         pcy_map.o       \
659         pcy_node.o      \
660         pcy_tree.o      \
661         v3_addr.o       \
662         v3_akey.o       \
663         v3_akeya.o      \
664         v3_alt.o        \
665         v3_asid.o       \
666         v3_bcons.o      \
667         v3_bitst.o      \
668         v3_conf.o       \
669         v3_cpols.o      \
670         v3_crld.o       \
671         v3_enum.o       \
672         v3_extku.o      \
673         v3_genn.o       \
674         v3_ia5.o        \
675         v3_info.o       \
676         v3_int.o        \
677         v3_lib.o        \
678         v3_ncons.o      \
679         v3_ocsp.o       \
680         v3_pci.o        \
681         v3_pcia.o       \
682         v3_pcons.o      \
683         v3_pku.o        \
684         v3_pmaps.o      \
685         v3_prn.o        \
686         v3_purp.o       \
687         v3_skey.o       \
688         v3_sxnet.o      \
689         v3_utl.o        \
690         v3err.o         \
691 OBJECTS += $(X509V3_OBJECTS)

693 # include library definitions
694 include $(SRC)/lib/Makefile.lib

696 CLOBBERFILES += $(LIBLINKS)

698 LIBS =          $(DYNLIB)

700 LDLIBS += -lsocket -lnsl -lc

702 LINTFLAGS =      -uxn
703 LINTFLAGS64 =    $(LINTFLAGS) -m64
704 LINTOUT=         lint.out
705 LINTSRC =        $(LINTLIB:%.ln=%)
706 ROOTLINTDIR =    $(ROOTLIBDIR)
707 ROOTLINT =        $(LINTSRC:%=$(ROOTLINTDIR)/%)

709 CPPFLAGS +=      -I.. \
710                 -I$(SRC)/lib/openssl/include

712 CPPFLAGS +=      -D_REENTRANT
713 CPPFLAGS +=      -DOPENSSL_THREADS
714 CPPFLAGS +=      -DOPENSSL_PIC
715 CPPFLAGS +=      -DDSO_DLFCN
716 CPPFLAGS +=      -DHAVE_DLFCN_H
717 CPPFLAGS +=      -DSOLARIS_OPENSSL
718 CPPFLAGS +=      -DNO_WINDOWS_BRAINDEATH
719 CPPFLAGS +=      -DOPENSSL_BN_ASM_GF2m
720 CPPFLAGS +=      -DSHA1_ASM
721 CPPFLAGS +=      -DSHA256_ASM

```

```

722 CPPFLAGS +=      -DSHA512_ASM
723 CPPFLAGS +=      -DMD5_ASM
724 CPPFLAGS +=      -DAES_ASM
725 CPPFLAGS +=      -DVPAES_ASM
726 CPPFLAGS +=      -DGHASH_ASM
727 CPPFLAGS +=      -DVPAES_ASM
728 CPPFLAGS +=      -DOPENSSL_BN_ASM_MONT

730 CFLAGS +=        $(CCVERBOSE)

732 CERRWARN +=      -_gcc=-Wno-switch
733 CERRWARN +=      -erroff=E_CONST_PROMOTED_UNSIGNED_LONG
734 CERRWARN +=      -erroff=E_END_OF_LOOP_CODE_NOT_REACHED

736 $(LINTLIB) :=     LINTFLAGS = -nvx -I..
737 $(LINTLIB) :=     LINTFLAGS64 = -nvx -m64 -I..

739 BUILD.perl =      $(PERL) $< elf $(PERL_CPPFLAGS) > $@

741 .KEEP_STATE:

743 all : $(LIBS)

745 lint : lintcheck

747 # include library targets
748 include $(SRC)/lib/Makefile.targ

750 pics/%.o:         ../%.c
751                 $(COMPILE.c) -o $@ $<
752                 $(POST_PROCESS_0)

754 pics/%.o:         ../aes/%.c
755                 $(COMPILE.c) -o $@ $<
756                 $(POST_PROCESS_0)

758 pics/%.o:         ../asn1/%.c
759                 $(COMPILE.c) -o $@ $<
760                 $(POST_PROCESS_0)

762 pics/%.o:         ../bf/%.c
763                 $(COMPILE.c) -o $@ $<
764                 $(POST_PROCESS_0)

766 pics/%.o:         ../bio/%.c
767                 $(COMPILE.c) -o $@ $<
768                 $(POST_PROCESS_0)

770 pics/%.o:         ../bn/%.c
771                 $(COMPILE.c) -o $@ $<
772                 $(POST_PROCESS_0)

774 pics/%.o:         ../buffer/%.c
775                 $(COMPILE.c) -o $@ $<
776                 $(POST_PROCESS_0)

778 pics/%.o:         ../camellia/%.c
779                 $(COMPILE.c) -o $@ $<
780                 $(POST_PROCESS_0)

782 pics/%.o:         ../cast/%.c
783                 $(COMPILE.c) -o $@ $<
784                 $(POST_PROCESS_0)

786 pics/%.o:         ../cmac/%.c
787                 $(COMPILE.c) -o $@ $<

```

```
788 $(POST_PROCESS_0)
790 pics/%.o: ../cms/%.c
791 $(COMPILE.c) -o $@ $<
792 $(POST_PROCESS_0)
794 pics/%.o: ../comp/%.c
795 $(COMPILE.c) -o $@ $<
796 $(POST_PROCESS_0)
798 pics/%.o: ../conf/%.c
799 $(COMPILE.c) -o $@ $<
800 $(POST_PROCESS_0)
802 pics/%.o: ../des/%.c
803 $(COMPILE.c) -o $@ $<
804 $(POST_PROCESS_0)
806 pics/%.o: ../dh/%.c
807 $(COMPILE.c) -o $@ $<
808 $(POST_PROCESS_0)
810 pics/%.o: ../dsa/%.c
811 $(COMPILE.c) -o $@ $<
812 $(POST_PROCESS_0)
814 pics/%.o: ../dso/%.c
815 $(COMPILE.c) -o $@ $<
816 $(POST_PROCESS_0)
818 pics/%.o: ../engine/%.c
819 $(COMPILE.c) -o $@ $<
820 $(POST_PROCESS_0)
822 pics/%.o: ../err/%.c
823 $(COMPILE.c) -o $@ $<
824 $(POST_PROCESS_0)
826 pics/%.o: ../evp/%.c
827 $(COMPILE.c) -o $@ $<
828 $(POST_PROCESS_0)
830 pics/%.o: ../hmac/%.c
831 $(COMPILE.c) -o $@ $<
832 $(POST_PROCESS_0)
834 pics/%.o: ../krb5/%.c
835 $(COMPILE.c) -o $@ $<
836 $(POST_PROCESS_0)
838 pics/%.o: ../lhash/%.c
839 $(COMPILE.c) -o $@ $<
840 $(POST_PROCESS_0)
842 pics/%.o: ../md2/%.c
843 $(COMPILE.c) -o $@ $<
844 $(POST_PROCESS_0)
846 pics/%.o: ../md4/%.c
847 $(COMPILE.c) -o $@ $<
848 $(POST_PROCESS_0)
850 pics/%.o: ../md5/%.c
851 $(COMPILE.c) -o $@ $<
852 $(POST_PROCESS_0)
```

```
854 pics/%.o: ../modes/%.c
855 $(COMPILE.c) -o $@ $<
856 $(POST_PROCESS_0)
858 pics/%.o: ../objects/%.c
859 $(COMPILE.c) -o $@ $<
860 $(POST_PROCESS_0)
862 pics/%.o: ../ocsp/%.c
863 $(COMPILE.c) -o $@ $<
864 $(POST_PROCESS_0)
866 pics/%.o: ../pem/%.c
867 $(COMPILE.c) -o $@ $<
868 $(POST_PROCESS_0)
870 pics/%.o: ../pkcs12/%.c
871 $(COMPILE.c) -o $@ $<
872 $(POST_PROCESS_0)
874 pics/%.o: ../pkcs7/%.c
875 $(COMPILE.c) -o $@ $<
876 $(POST_PROCESS_0)
878 pics/%.o: ../pqueue/%.c
879 $(COMPILE.c) -o $@ $<
880 $(POST_PROCESS_0)
882 pics/%.o: ../rand/%.c
883 $(COMPILE.c) -o $@ $<
884 $(POST_PROCESS_0)
886 pics/%.o: ../rc2/%.c
887 $(COMPILE.c) -o $@ $<
888 $(POST_PROCESS_0)
890 pics/%.o: ../rc4/%.c
891 $(COMPILE.c) -o $@ $<
892 $(POST_PROCESS_0)
894 pics/%.o: ../ripemd/%.c
895 $(COMPILE.c) -o $@ $<
896 $(POST_PROCESS_0)
898 pics/%.o: ../rsa/%.c
899 $(COMPILE.c) -o $@ $<
900 $(POST_PROCESS_0)
902 pics/%.o: ../sha/%.c
903 $(COMPILE.c) -o $@ $<
904 $(POST_PROCESS_0)
906 pics/%.o: ../srp/%.c
907 $(COMPILE.c) -o $@ $<
908 $(POST_PROCESS_0)
910 pics/%.o: ../stack/%.c
911 $(COMPILE.c) -o $@ $<
912 $(POST_PROCESS_0)
914 pics/%.o: ../ts/%.c
915 $(COMPILE.c) -o $@ $<
916 $(POST_PROCESS_0)
918 pics/%.o: ../txt_db/%.c
919 $(COMPILE.c) -o $@ $<
```

```
920      $(POST_PROCESS_0)

922 pics/%.o:      ../ui/%.c
923      $(COMPILE.c) -o $@ $<
924      $(POST_PROCESS_0)

926 pics/%.o:      ../x509/%.c
927      $(COMPILE.c) -o $@ $<
928      $(POST_PROCESS_0)

930 pics/%.o:      ../x509v3/%.c
931      $(COMPILE.c) -o $@ $<
932      $(POST_PROCESS_0)

934 pics/%.o:      %.s
935      $(COMPILE.c) -o $@ $<

937 %.s:      ../pl/%.pl
938      $(BUILD.perl)

940 $(ROOTLINTDIR)/%: ../%
941      $(INS.file)
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_cfb.c

1

```
*****
3588 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/aes/aes_cfb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/aes/aes_cfb.c -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
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45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */
52 #include <openssl/aes.h>
53 #include <openssl/modes.h>
55 /* The input and output encrypted as though 128bit cfb mode is being
56 * used. The extra state information to record how much of the
57 * 128bit block we have used is contained in *num;
58 */
60 void AES_cfb128_encrypt(const unsigned char *in, unsigned char *out,
61 size_t length, const AES_KEY *key,
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_cfb.c

2

```
62 unsigned char *ivec, int *num, const int enc) {
64 CRYPTO_cfb128_encrypt(in,out,length,key,ivec,num,enc,(block128_f)AES_enc
65 }
67 /* N.B. This expects the input to be packed, MS bit first */
68 void AES_cfb1_encrypt(const unsigned char *in, unsigned char *out,
69 size_t length, const AES_KEY *key,
70 unsigned char *ivec, int *num, const int enc)
71 {
72 CRYPTO_cfb128_1_encrypt(in,out,length,key,ivec,num,enc,(block128_f)AES_encry
73 }
75 void AES_cfb8_encrypt(const unsigned char *in, unsigned char *out,
76 size_t length, const AES_KEY *key,
77 unsigned char *ivec, int *num, const int enc)
78 {
79 CRYPTO_cfb128_8_encrypt(in,out,length,key,ivec,num,enc,(block128_f)AES_encry
80 }
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ctr.c

1

2880 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ctr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */

52 #include <openssl/aes.h>
53 #include <openssl/modes.h>

55 void AES_ctr128_encrypt(const unsigned char *in, unsigned char *out,
56                         size_t length, const AES_KEY *key,
57                         unsigned char ivec[AES_BLOCK_SIZE],
58                         unsigned char ecount_buf[AES_BLOCK_SIZE],
59                         unsigned int *num) {
60     CRYPTO_ctr128_encrypt(in, out, length, key, ivec, ecount_buf, num, (block128_f)
61 }
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ctr.c

2

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ecb.c

1

```
*****
2949 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ecb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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48 * =====
49 *
50 */

52 #ifndef AES_DEBUG
53 # ifdef NDEBUG
54 #  define NDEBUG
55 # endif
56 #endif
57 #include <assert.h>

59 #include <openssl/aes.h>
60 #include "aes_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ecb.c

2

```
62 void AES_ecb_encrypt(const unsigned char *in, unsigned char *out,
63                      const AES_KEY *key, const int enc) {
64
65     assert(in && out && key);
66     assert((AES_ENCRYPT == enc) || (AES_DECRYPT == enc));
67
68     if (AES_ENCRYPT == enc)
69         AES_encrypt(in, out, key);
70     else
71         AES_decrypt(in, out, key);
72 }
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ige.c

1

```
*****
9663 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ige.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/aes/aes_ige.c *- mode:C; c-file-style: "eay" *- */
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45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 */
52 #include "cryptlib.h"
54 #include <openssl/aes.h>
55 #include "aes_locl.h"
57 #define N_WORDS (AES_BLOCK_SIZE / sizeof(unsigned long))
58 typedef struct {
59     unsigned long data[N_WORDS];
60 } aes_block_t;
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ige.c

2

```
62 /* XXX: probably some better way to do this */
63 #if defined(__i386__) || defined(__x86_64__)
64 #define UNALIGNED_MEMOPS_ARE_FAST 1
65 #else
66 #define UNALIGNED_MEMOPS_ARE_FAST 0
67 #endif
69 #if UNALIGNED_MEMOPS_ARE_FAST
70 #define load_block(d, s) (d) = *(const aes_block_t *) (s)
71 #define store_block(d, s) *(aes_block_t *) (d) = (s)
72 #else
73 #define load_block(d, s) memcpy((d).data, (s), AES_BLOCK_SIZE)
74 #define store_block(d, s) memcpy((d).data, (s).data, AES_BLOCK_SIZE)
75 #endif
77 /* N.B. The IV for this mode is _twice_ the block size */
79 void AES_ige_encrypt(const unsigned char *in, unsigned char *out,
80                     size_t length, const AES_KEY *key,
81                     unsigned char *ivec, const int enc)
82 {
83     size_t n;
84     size_t len = length;
86     OPENSSL_assert(in && out && key && ivec);
87     OPENSSL_assert((AES_ENCRYPT == enc) || (AES_DECRYPT == enc));
88     OPENSSL_assert((length % AES_BLOCK_SIZE) == 0);
90     len = length / AES_BLOCK_SIZE;
92     if (AES_ENCRYPT == enc)
93     {
94         if (in != out &&
95             (UNALIGNED_MEMOPS_ARE_FAST || ((size_t)in | (size_t)out | (size_t)len & 7)))
96         {
97             aes_block_t *ivp = (aes_block_t *) ivec;
98             aes_block_t *iv2p = (aes_block_t *) (ivec + AES_BLOCK_SIZE);
100             while (len)
101             {
102                 aes_block_t *inp = (aes_block_t *) in;
103                 aes_block_t *outp = (aes_block_t *) out;
105                 for (n = 0; n < N_WORDS; ++n)
106                     outp->data[n] = inp->data[n] ^ ivp->data[n];
107                 AES_encrypt((unsigned char *) outp->data, (unsigned char *) outp->data, key);
108                 for (n = 0; n < N_WORDS; ++n)
109                     outp->data[n] ^= iv2p->data[n];
110                 ivp = outp;
111                 iv2p = inp;
112                 --len;
113                 in += AES_BLOCK_SIZE;
114                 out += AES_BLOCK_SIZE;
115             }
116             memcpy(ivec, ivp->data, AES_BLOCK_SIZE);
117             memcpy(ivec + AES_BLOCK_SIZE, iv2p->data, AES_BLOCK_SIZE);
118         }
119         else
120         {
121             aes_block_t tmp, tmp2;
122             aes_block_t iv;
123             aes_block_t iv2;
125             load_block(iv, ivec);
126             load_block(iv2, ivec + AES_BLOCK_SIZE);
```

```

128         while (len)
129         {
130             load_block(tmp, in);
131             for(n=0 ; n < N_WORDS; ++n)
132                 tmp2.data[n] = tmp.data[n] ^ iv.data[n];
133             AES_encrypt((unsigned char *)tmp2.data, (unsigned
134             for(n=0 ; n < N_WORDS; ++n)
135                 tmp2.data[n] ^= iv2.data[n];
136             store_block(out, tmp2);
137             iv = tmp2;
138             iv2 = tmp;
139             --len;
140             in += AES_BLOCK_SIZE;
141             out += AES_BLOCK_SIZE;
142         }
143         memcpy(ivec, iv.data, AES_BLOCK_SIZE);
144         memcpy(ivec + AES_BLOCK_SIZE, iv2.data, AES_BLOCK_SIZE);
145     }
146 }
147 else
148 {
149     if (in != out &&
150         (UNALIGNED_MEMOPS_ARE_FAST || ((size_t)in|(size_t)out|(size_
151         {
152             aes_block_t *ivp = (aes_block_t *)ivec;
153             aes_block_t *iv2p = (aes_block_t *) (ivec + AES_BLOCK_SIZ
154
155             while (len)
156             {
157                 aes_block_t tmp;
158                 aes_block_t *inp = (aes_block_t *)in;
159                 aes_block_t *outp = (aes_block_t *)out;
160
161                 for(n=0 ; n < N_WORDS; ++n)
162                     tmp.data[n] = inp->data[n] ^ iv2p->data[
163                 AES_decrypt((unsigned char *)tmp.data, (unsigned
164                 for(n=0 ; n < N_WORDS; ++n)
165                     outp->data[n] ^= ivp->data[n];
166                 ivp = inp;
167                 iv2p = outp;
168                 --len;
169                 in += AES_BLOCK_SIZE;
170                 out += AES_BLOCK_SIZE;
171             }
172             memcpy(ivec, ivp->data, AES_BLOCK_SIZE);
173             memcpy(ivec + AES_BLOCK_SIZE, iv2p->data, AES_BLOCK_SIZE
174         }
175     else
176     {
177         aes_block_t tmp, tmp2;
178         aes_block_t iv;
179         aes_block_t iv2;
180
181         load_block(iv, ivec);
182         load_block(iv2, ivec + AES_BLOCK_SIZE);
183
184         while (len)
185         {
186             load_block(tmp, in);
187             tmp2 = tmp;
188             for(n=0 ; n < N_WORDS; ++n)
189                 tmp.data[n] ^= iv2.data[n];
190             AES_decrypt((unsigned char *)tmp.data, (unsigned
191             for(n=0 ; n < N_WORDS; ++n)
192                 tmp.data[n] ^= iv.data[n];
193             store_block(out, tmp);

```

```

194             iv = tmp2;
195             iv2 = tmp;
196             --len;
197             in += AES_BLOCK_SIZE;
198             out += AES_BLOCK_SIZE;
199         }
200         memcpy(ivec, iv.data, AES_BLOCK_SIZE);
201         memcpy(ivec + AES_BLOCK_SIZE, iv2.data, AES_BLOCK_SIZE);
202     }
203 }
204 }
205
206 /*
207  * Note that its effectively impossible to do biIGE in anything other
208  * than a single pass, so no provision is made for chaining.
209  */
210
211 /* N.B. The IV for this mode is _four times_ the block size */
212
213 void AES_bi_ige_encrypt(const unsigned char *in, unsigned char *out,
214                        size_t length, const AES_KEY *key,
215                        const AES_KEY *key2, const unsigned int enc)
216 {
217     size_t n;
218     size_t len = length;
219     unsigned char tmp[AES_BLOCK_SIZE];
220     unsigned char tmp2[AES_BLOCK_SIZE];
221     unsigned char tmp3[AES_BLOCK_SIZE];
222     unsigned char prev[AES_BLOCK_SIZE];
223     const unsigned char *iv;
224     const unsigned char *iv2;
225
226     OPENSSL_assert(in && out && key && ivec);
227     OPENSSL_assert((AES_ENCRYPT == enc) || (AES_DECRYPT == enc));
228     OPENSSL_assert((length % AES_BLOCK_SIZE) == 0);
229
230     if (AES_ENCRYPT == enc)
231     {
232         /* XXX: Do a separate case for when in != out (strictly should
233         check for overlap, too) */
234
235         /* First the forward pass */
236         iv = ivec;
237         iv2 = ivec + AES_BLOCK_SIZE;
238         while (len >= AES_BLOCK_SIZE)
239         {
240             for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
241                 out[n] = in[n] ^ iv[n];
242             AES_encrypt(out, out, key);
243             for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
244                 out[n] ^= iv2[n];
245             iv = out;
246             memcpy(prev, in, AES_BLOCK_SIZE);
247             iv2 = prev;
248             len -= AES_BLOCK_SIZE;
249             in += AES_BLOCK_SIZE;
250             out += AES_BLOCK_SIZE;
251         }
252
253         /* And now backwards */
254         iv = ivec + AES_BLOCK_SIZE*2;
255         iv2 = ivec + AES_BLOCK_SIZE*3;
256         len = length;
257         while(len >= AES_BLOCK_SIZE)
258         {

```



```

260         out -= AES_BLOCK_SIZE;
261         /* XXX: reduce copies by alternating between buffers */
262         memcpy(tmp, out, AES_BLOCK_SIZE);
263         for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
264             out[n] ^= iv[n];
265         /* hexdump(stdout, "out ^ iv", out,
266         AES_encrypt(out, out, key);
267         /* hexdump(stdout, "enc", out, AES_B
268         /* hexdump(stdout, "iv2", iv2, AES_B
269         for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
270             out[n] ^= iv2[n];
271         /* hexdump(stdout, "out", out, AES_B
272         iv = out;
273         memcpy(prev, tmp, AES_BLOCK_SIZE);
274         iv2 = prev;
275         len -= AES_BLOCK_SIZE;
276     }
277 }
278 else
279 {
280     /* First backwards */
281     iv = ivec + AES_BLOCK_SIZE*2;
282     iv2 = ivec + AES_BLOCK_SIZE*3;
283     in += length;
284     out += length;
285     while (len >= AES_BLOCK_SIZE)
286     {
287         in -= AES_BLOCK_SIZE;
288         out -= AES_BLOCK_SIZE;
289         memcpy(tmp, in, AES_BLOCK_SIZE);
290         memcpy(tmp2, in, AES_BLOCK_SIZE);
291         for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
292             tmp[n] ^= iv2[n];
293         AES_decrypt(tmp, out, key);
294         for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
295             out[n] ^= iv[n];
296         memcpy(tmp3, tmp2, AES_BLOCK_SIZE);
297         iv = tmp3;
298         iv2 = out;
299         len -= AES_BLOCK_SIZE;
300     }
301
302     /* And now forwards */
303     iv = ivec;
304     iv2 = ivec + AES_BLOCK_SIZE;
305     len = length;
306     while (len >= AES_BLOCK_SIZE)
307     {
308         memcpy(tmp, out, AES_BLOCK_SIZE);
309         memcpy(tmp2, out, AES_BLOCK_SIZE);
310         for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
311             tmp[n] ^= iv2[n];
312         AES_decrypt(tmp, out, key);
313         for(n=0 ; n < AES_BLOCK_SIZE ; ++n)
314             out[n] ^= iv[n];
315         memcpy(tmp3, tmp2, AES_BLOCK_SIZE);
316         iv = tmp3;
317         iv2 = out;
318         len -= AES_BLOCK_SIZE;
319         in += AES_BLOCK_SIZE;
320         out += AES_BLOCK_SIZE;
321     }
322 }
323 }

```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_misc.c

1

```
*****
3291 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/aes/aes_misc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/aes/aes_misc.c -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
3  * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
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42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */

52 #include <openssl/opensslv.h>
53 #include <openssl/crypto.h>
54 #include <openssl/aes.h>
55 #include "aes_locl.h"

57 const char AES_version[]="AES" OPENSSL_VERSION_PTEXT;

59 const char *AES_options(void) {
60 #ifdef FULL_UNROLL
61     return "aes(full)";
62 #endif
63 }
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_misc.c

2

```
62 #else
63     return "aes(partial)";
64 #endif
65 }

67 /* FIPS wrapper functions to block low level AES calls in FIPS mode */

69 int AES_set_encrypt_key(const unsigned char *userKey, const int bits,
70                         AES_KEY *key)
71 {
72     #ifdef OPENSSL_FIPS
73         fips_cipher_abort(AES);
74     #endif
75     return private_AES_set_encrypt_key(userKey, bits, key);
76 }

78 int AES_set_decrypt_key(const unsigned char *userKey, const int bits,
79                         AES_KEY *key)
80 {
81     #ifdef OPENSSL_FIPS
82         fips_cipher_abort(AES);
83     #endif
84     return private_AES_set_decrypt_key(userKey, bits, key);
85 }
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ofb.c

1

2793 Fri May 30 18:31:26 2014

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_ofb.c

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/aes/aes_ofb.c -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
3  * Copyright (c) 2002-2006 The OpenSSL Project. All rights reserved.
4  *
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6  * modification, are permitted provided that the following conditions
7  * are met:
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15 * distribution.
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17 * 3. All advertising materials mentioning features or use of this
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28 * nor may "OpenSSL" appear in their names without prior written
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38 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
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44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */

52 #include <openssl/aes.h>
53 #include <openssl/modes.h>

55 void AES_ofb128_encrypt(const unsigned char *in, unsigned char *out,
56 size_t length, const AES_KEY *key,
57 unsigned char *ivec, int *num)
58 {
59     CRYPTO_ofb128_encrypt(in, out, length, key, ivec, num, (block128_f)AES_encrypt
60 }
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_wrap.c

1

```
*****
7677 Fri May 30 18:31:26 2014
new/usr/src/lib/openssl/libsunw_crypto/aes/aes_wrap.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/aes/aes_wrap.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
54 #include "cryptlib.h"
55 #include <openssl/aes.h>
56 #include <openssl/bio.h>
58 static const unsigned char default_iv[] = {
59     0xA6, 0xA6, 0xA6, 0xA6, 0xA6, 0xA6, 0xA6, 0xA6,
60 };
```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_wrap.c

2

```
62 int AES_wrap_key(AES_KEY *key, const unsigned char *iv,
63                  unsigned char *out,
64                  const unsigned char *in, unsigned int inlen)
65 {
66     unsigned char *A, B[16], *R;
67     unsigned int i, j, t;
68     if ((inlen & 0x7) || (inlen < 8))
69         return -1;
70     A = B;
71     t = 1;
72     memcpy(out + 8, in, inlen);
73     if (!iv)
74         iv = default_iv;
76     memcpy(A, iv, 8);
78     for (j = 0; j < 6; j++)
79     {
80         R = out + 8;
81         for (i = 0; i < inlen; i += 8, t++, R += 8)
82         {
83             memcpy(B + 8, R, 8);
84             AES_encrypt(B, B, key);
85             A[7] ^= (unsigned char)(t & 0xff);
86             if (t > 0xff)
87             {
88                 A[6] ^= (unsigned char)((t >> 8) & 0xff);
89                 A[5] ^= (unsigned char)((t >> 16) & 0xff);
90                 A[4] ^= (unsigned char)((t >> 24) & 0xff);
91             }
92             memcpy(R, B + 8, 8);
93         }
94     }
95     memcpy(out, A, 8);
96     return inlen + 8;
97 }
99 int AES_unwrap_key(AES_KEY *key, const unsigned char *iv,
100                   unsigned char *out,
101                   const unsigned char *in, unsigned int inlen)
102 {
103     unsigned char *A, B[16], *R;
104     unsigned int i, j, t;
105     inlen -= 8;
106     if (inlen & 0x7)
107         return -1;
108     if (inlen < 8)
109         return -1;
110     A = B;
111     t = 6 * (inlen >> 3);
112     memcpy(A, in, 8);
113     memcpy(out, in + 8, inlen);
114     for (j = 0; j < 6; j++)
115     {
116         R = out + inlen - 8;
117         for (i = 0; i < inlen; i += 8, t--, R -= 8)
118         {
119             A[7] ^= (unsigned char)(t & 0xff);
120             if (t > 0xff)
121             {
122                 A[6] ^= (unsigned char)((t >> 8) & 0xff);
123                 A[5] ^= (unsigned char)((t >> 16) & 0xff);
124                 A[4] ^= (unsigned char)((t >> 24) & 0xff);
125             }
126             memcpy(B + 8, R, 8);
127             AES_decrypt(B, B, key);
```

```

128         memcpy(R, B + 8, 8);
129     }
130 }
131 if (!iv)
132     iv = default_iv;
133 if (memcmp(A, iv, 8))
134 {
135     OPENSSL_cleanse(out, inlen);
136     return 0;
137 }
138 return inlen;
139 }

141 #ifdef AES_WRAP_TEST

143 int AES_wrap_unwrap_test(const unsigned char *kek, int keybits,
144                          const unsigned char *iv,
145                          const unsigned char *eout,
146                          const unsigned char *key, int keylen)
147 {
148     unsigned char *otmp = NULL, *ptmp = NULL;
149     int r, ret = 0;
150     AES_KEY wctx;
151     otmp = OPENSSL_malloc(keylen + 8);
152     ptmp = OPENSSL_malloc(keylen);
153     if (!otmp || !ptmp)
154         return 0;
155     if (AES_set_encrypt_key(kek, keybits, &wctx))
156         goto err;
157     r = AES_wrap_key(&wctx, iv, otmp, key, keylen);
158     if (r <= 0)
159         goto err;

161     if (eout && memcmp(eout, otmp, keylen))
162         goto err;
163
164     if (AES_set_decrypt_key(kek, keybits, &wctx))
165         goto err;
166     r = AES_unwrap_key(&wctx, iv, ptmp, otmp, r);

168     if (memcmp(key, ptmp, keylen))
169         goto err;

171     ret = 1;

173 err:
174     if (otmp)
175         OPENSSL_free(otmp);
176     if (ptmp)
177         OPENSSL_free(ptmp);

179     return ret;

181 }

185 int main(int argc, char **argv)
186 {
188     static const unsigned char kek[] = {
189         0x00, 0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07,
190         0x08, 0x09, 0x0a, 0x0b, 0x0c, 0x0d, 0x0e, 0x0f,
191         0x10, 0x11, 0x12, 0x13, 0x14, 0x15, 0x16, 0x17,
192         0x18, 0x19, 0x1a, 0x1b, 0x1c, 0x1d, 0x1e, 0x1f
193     };

```

```

195 static const unsigned char key[] = {
196     0x00, 0x11, 0x22, 0x33, 0x44, 0x55, 0x66, 0x77,
197     0x88, 0x99, 0xaa, 0xbb, 0xcc, 0xdd, 0xee, 0xff,
198     0x00, 0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07,
199     0x08, 0x09, 0x0a, 0x0b, 0x0c, 0x0d, 0x0e, 0x0f
200 };

202 static const unsigned char e1[] = {
203     0x1f, 0xa6, 0x8b, 0x0a, 0x81, 0x12, 0xb4, 0x47,
204     0xae, 0xf3, 0x4b, 0xd8, 0xfb, 0x5a, 0x7b, 0x82,
205     0x9d, 0x3e, 0x86, 0x23, 0x71, 0xd2, 0xcf, 0xe5
206 };

208 static const unsigned char e2[] = {
209     0x96, 0x77, 0x8b, 0x25, 0xae, 0x6c, 0xa4, 0x35,
210     0xf9, 0x2b, 0x5b, 0x97, 0xc0, 0x50, 0xae, 0xd2,
211     0x46, 0x8a, 0xb8, 0xa1, 0x7a, 0xd8, 0x4e, 0x5d
212 };

214 static const unsigned char e3[] = {
215     0x64, 0xe8, 0xc3, 0xf9, 0xce, 0x0f, 0x5b, 0xa2,
216     0x63, 0xe9, 0x77, 0x79, 0x05, 0x81, 0x8a, 0x2a,
217     0x93, 0xc8, 0x19, 0x1e, 0x7d, 0x6e, 0x8a, 0xe7
218 };

220 static const unsigned char e4[] = {
221     0x03, 0x1d, 0x33, 0x26, 0x4e, 0x15, 0xd3, 0x32,
222     0x68, 0xf2, 0x4e, 0xc2, 0x60, 0x74, 0x3e, 0xdc,
223     0xe1, 0xc6, 0xc7, 0xdd, 0xee, 0x72, 0x5a, 0x93,
224     0x6b, 0xa8, 0x14, 0x91, 0x5c, 0x67, 0x62, 0xd2
225 };

227 static const unsigned char e5[] = {
228     0xa8, 0xf9, 0xbc, 0x16, 0x12, 0xc6, 0x8b, 0x3f,
229     0xf6, 0xe6, 0xf4, 0xfb, 0xe3, 0x0e, 0x71, 0xe4,
230     0x76, 0x9c, 0x8b, 0x80, 0xa3, 0x2c, 0xb8, 0x95,
231     0x8c, 0xd5, 0xd1, 0x7d, 0x6b, 0x25, 0x4d, 0xa1
232 };

234 static const unsigned char e6[] = {
235     0x28, 0xc9, 0xf4, 0x04, 0xc4, 0xb8, 0x10, 0xf4,
236     0xcb, 0xcc, 0xb3, 0x5c, 0xfb, 0x87, 0xf8, 0x26,
237     0x3f, 0x57, 0x86, 0xe2, 0xd8, 0x0e, 0xd3, 0x26,
238     0xcb, 0xc7, 0xf0, 0xe7, 0x1a, 0x99, 0xf4, 0x3b,
239     0xfb, 0x98, 0x8b, 0x9b, 0x7a, 0x02, 0xdd, 0x21
240 };

242     AES_KEY wctx, xctx;
243     int ret;
244     ret = AES_wrap_unwrap_test(kek, 128, NULL, e1, key, 16);
245     fprintf(stderr, "Key test result %d\n", ret);
246     ret = AES_wrap_unwrap_test(kek, 192, NULL, e2, key, 16);
247     fprintf(stderr, "Key test result %d\n", ret);
248     ret = AES_wrap_unwrap_test(kek, 256, NULL, e3, key, 16);
249     fprintf(stderr, "Key test result %d\n", ret);
250     ret = AES_wrap_unwrap_test(kek, 192, NULL, e4, key, 24);
251     fprintf(stderr, "Key test result %d\n", ret);
252     ret = AES_wrap_unwrap_test(kek, 256, NULL, e5, key, 24);
253     fprintf(stderr, "Key test result %d\n", ret);
254     ret = AES_wrap_unwrap_test(kek, 256, NULL, e6, key, 32);
255     fprintf(stderr, "Key test result %d\n", ret);
256 }
257
258 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/aes/aes_wrap.c

new/usr/src/lib/openssl/libsunw_crypto/amd64/Makefile

1

2182 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/amd64/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
23 # Use is subject to license terms.
```

25 .KEEP_STATE:

```
27 # aes/*.s
28 ASM_SOURCES = x86_64cpuid.s \
29 aes-x86_64.s \
30 aesni-sha1-x86_64.s \
31 aesni-x86_64.s \
32 bsaes-x86_64.s \
33 vpaes-x86_64.s \
34 modexp512-x86_64.s \
35 x86_64-gf2m.s \
36 x86_64-mont.s \
37 x86_64-mont5.s \
38 cml1-x86_64.s \
39 md5-x86_64.s \
40 ghash-x86_64.s \
41 rc4-md5-x86_64.s \
42 rc4-x86_64.s \
43 sha1-x86_64.s \
44 sha256-x86_64.s \
45 sha512-x86_64.s
```

47 OBJECTS += \$(ASM_SOURCES:%.s=%.o)

```
49 OBJECTS64 = bf_enc.o \
50 x86_64-gcc.o \
51 cml1_misc.o \
52 des_enc.o \
53 fcrypt_b.o
```

55 OBJECTS += \$(OBJECTS64)

57 CLEANFILES += \$(ASM_SOURCES)

```
59 include ../Makefile.com
60 include ../../../Makefile.lib.64
```

new/usr/src/lib/openssl/libsunw_crypto/amd64/Makefile

2

```
62 CPPFLAGS += -DL_ENDIAN
63 CPPFLAGS += -DOPENSSL_IA32_SSE2
64 CPPFLAGS += -DOPENSSL_BN_ASM_MONT5
65 CPPFLAGS += -DBSAES_ASM
66 CPPFLAGS += -DPK11_LIB_LOCATION="/usr/lib/64/libpkcs11.so.1"

68 # OpenSSL interface is a mess
69 MAPFILES =

71 all: $(ROOTLIBDIR64) $(LIBS) $(LIBLINKS)

73 $(LIBLINKS): FRC
74 $(RM) $@; $(SYMLINK) $(DYNLIB) $@

76 $(ROOTLIBDIR64):
77 $(INS.dir)

79 # sha512-x86_64.pl generates both sha512-x86_64.s and sha256-x86_64.s
80 # sha256-x86_64.s is generated by default
81 sha256-x86_64.s: ../pl/sha512-x86_64.pl
82 $(PERL) ../pl/sha512-x86_64.pl elf $@

84 sha512-x86_64.s: ../pl/sha512-x86_64.pl
85 $(PERL) ../pl/sha512-x86_64.pl elf $@

87 install: all $(ROOTLIBS64) $(ROOTLINKS64)

89 FRC:
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_bitstr.c

1

```
*****
7281 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_bitstr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_bitstr.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
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18 * If this package is used in a product, Eric Young should be given attribution
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22 *
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31 * 3. All advertising materials mentioning features or use of this software
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33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_bitstr.c

2

```
63 int ASN1_BIT_STRING_set(ASN1_BIT_STRING *x, unsigned char *d, int len)
64 { return M_ASN1_BIT_STRING_set(x, d, len); }

66 int i2c_ASN1_BIT_STRING(ASN1_BIT_STRING *a, unsigned char **pp)
67 {
68     int ret,j,bits,len;
69     unsigned char *p,*d;

71     if (a == NULL) return(0);

73     len=a->length;

75     if (len > 0)
76     {
77         if (a->flags & ASN1_STRING_FLAG_BITS_LEFT)
78         {
79             bits=(int)a->flags&0x07;
80         }
81         else
82         {
83             for ( ; len > 0; len--)
84             {
85                 if (a->data[len-1]) break;
86             }
87             j=a->data[len-1];
88             if (j & 0x01) bits=0;
89             else if (j & 0x02) bits=1;
90             else if (j & 0x04) bits=2;
91             else if (j & 0x08) bits=3;
92             else if (j & 0x10) bits=4;
93             else if (j & 0x20) bits=5;
94             else if (j & 0x40) bits=6;
95             else if (j & 0x80) bits=7;
96             else bits=0; /* should not happen */
97         }
98     }
99     else
100         bits=0;

102     ret=1+len;
103     if (pp == NULL) return(ret);

105     p= *pp;

107     *(p++)=(unsigned char)bits;
108     d=a->data;
109     memcpy(p,d,len);
110     p+=len;
111     if (len > 0) p[-1]&=(0xff<<bits);
112     *pp=p;
113     return(ret);
114 }

116 ASN1_BIT_STRING *c2i_ASN1_BIT_STRING(ASN1_BIT_STRING **a,
117 const unsigned char **pp, long len)
118 {
119     ASN1_BIT_STRING *ret=NULL;
120     const unsigned char *p;
121     unsigned char *s;
122     int i;

124     if (len < 1)
125     {
126         i=ASN1_R_STRING_TOO_SHORT;
127         goto err;
```



```

128     }
129
130     if ((a == NULL) || ((*a) == NULL))
131     {
132         if ((ret=M_ASN1_BIT_STRING_new()) == NULL) return(NULL);
133     }
134     else
135         ret=(*a);
136
137     p= *pp;
138     i= *(p++);
139     /* We do this to preserve the settings. If we modify
140      * the settings, via the _set_bit function, we will recalculate
141      * on output */
142     ret->flags&= ~(ASN1_STRING_FLAG_BITS_LEFT|0x07); /* clear */
143     ret->flags|=(ASN1_STRING_FLAG_BITS_LEFT|(i&0x07)); /* set */
144
145     if (len-- > 1) /* using one because of the bits left byte */
146     {
147         s=(unsigned char *)OPENSSL_malloc((int)len);
148         if (s == NULL)
149         {
150             i=ERR_R_MALLOC_FAILURE;
151             goto err;
152         }
153         memcpy(s,p,(int)len);
154         s[len-1]&=(0xff<<i);
155         p+=len;
156     }
157     else
158         s=NULL;
159
160     ret->length=(int)len;
161     if (ret->data != NULL) OPENSSL_free(ret->data);
162     ret->data=s;
163     ret->type=V_ASN1_BIT_STRING;
164     if (a != NULL) (*a)=ret;
165     *pp=p;
166     return(ret);
167 err:
168     ASN1err(ASN1_F_C2I_ASN1_BIT_STRING,i);
169     if ((ret != NULL) && ((a == NULL) || (*a != ret)))
170         M_ASN1_BIT_STRING_free(ret);
171     return(NULL);
172 }
173
174 /* These next 2 functions from Goetz Babin-Ebell <babinebell@trustcenter.de>
175 */
176 int ASN1_BIT_STRING_set_bit(ASN1_BIT_STRING *a, int n, int value)
177 {
178     int w,v,iv;
179     unsigned char *c;
180
181     w=n/8;
182     v=1<<(7-(n&0x07));
183     iv= ~v;
184     if (!value) v=0;
185
186     if (a == NULL)
187         return 0;
188
189     a->flags&= ~(ASN1_STRING_FLAG_BITS_LEFT|0x07); /* clear, set on write */
190
191     if ((a->length < (w+1)) || (a->data == NULL))
192     {
193         if (!value) return(1); /* Don't need to set */

```

```

194         if (a->data == NULL)
195             c=(unsigned char *)OPENSSL_malloc(w+1);
196         else
197             c=(unsigned char *)OPENSSL_realloc_clean(a->data,
198                                                     a->length,
199                                                     w+1);
200
201         if (c == NULL)
202         {
203             ASN1err(ASN1_F_ASN1_BIT_STRING_SET_BIT,ERR_R_MALLOC_FAIL);
204             return 0;
205         }
206         if (w+1-a->length > 0) memset(c+a->length, 0, w+1-a->length);
207         a->data=c;
208         a->length=w+1;
209     }
210     a->data[w]=((a->data[w])&iv)|v;
211     while ((a->length > 0) && (a->data[a->length-1] == 0))
212         a->length--;
213     return(1);
214 }
215
216 int ASN1_BIT_STRING_get_bit(ASN1_BIT_STRING *a, int n)
217 {
218     int w,v;
219
220     w=n/8;
221     v=1<<(7-(n&0x07));
222     if ((a == NULL) || (a->length < (w+1)) || (a->data == NULL))
223         return(0);
224     return((a->data[w]&v) != 0);
225 }
226
227 /*
228 * Checks if the given bit string contains only bits specified by
229 * the flags vector. Returns 0 if there is at least one bit set in 'a'
230 * which is not specified in 'flags', 1 otherwise.
231 * 'len' is the length of 'flags'.
232 */
233 int ASN1_BIT_STRING_check(ASN1_BIT_STRING *a,
234                          unsigned char *flags, int flags_len)
235 {
236     int i, ok;
237     /* Check if there is one bit set at all. */
238     if (!a || !a->data) return 1;
239
240     /* Check each byte of the internal representation of the bit string. */
241     ok = 1;
242     for (i = 0; i < a->length && ok; ++i)
243     {
244         unsigned char mask = i < flags_len ? ~flags[i] : 0xff;
245         /* We are done if there is an unneeded bit set. */
246         ok = (a->data[i] & mask) == 0;
247     }
248     return ok;
249 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_bool.c

1

```
*****
4094 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_bool.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_bool.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_bool.c

2

```
63 int i2d_ASN1_BOOLEAN(int a, unsigned char **pp)
64 {
65     int r;
66     unsigned char *p;
67
68     r=ASN1_object_size(0,1,V_ASN1_BOOLEAN);
69     if (pp == NULL) return(r);
70     p= *pp;
71
72     ASN1_put_object(&p,0,1,V_ASN1_BOOLEAN,V_ASN1_UNIVERSAL);
73     *(p++)= (unsigned char)a;
74     *pp=p;
75     return(r);
76 }
78 int d2i_ASN1_BOOLEAN(int *a, const unsigned char **pp, long length)
79 {
80     int ret= -1;
81     const unsigned char *p;
82     long len;
83     int inf,tag,xclass;
84     int i=0;
85
86     p= *pp;
87     inf=ASN1_get_object(&p,&len,&tag,&xclass,length);
88     if (inf & 0x80)
89     {
90         i=ASN1_R_BAD_OBJECT_HEADER;
91         goto err;
92     }
93
94     if (tag != V_ASN1_BOOLEAN)
95     {
96         i=ASN1_R_EXPECTING_A_BOOLEAN;
97         goto err;
98     }
99
100     if (len != 1)
101     {
102         i=ASN1_R_BOOLEAN_IS_WRONG_LENGTH;
103         goto err;
104     }
105     ret= (int)*(p++);
106     if (a != NULL) (*a)=ret;
107     *pp=p;
108     return(ret);
109 err:
110     ASN1err(ASN1_F_D2I_ASN1_BOOLEAN,i);
111     return(ret);
112 }
```

7918 Fri May 30 18:31:27 2014
 new/usr/src/lib/openssl/libsunw_crypto/asn1/a_bytes.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/asn1/a_bytes.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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5  * This package is an SSL implementation written
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>

```

```

63 static int asn1_collate_primitive(ASN1_STRING *a, ASN1_const_CTX *c);
64 /* type is a 'bitmap' of acceptable string types.
65 */
66 ASN1_STRING *d2i_ASN1_type_bytes(ASN1_STRING **a, const unsigned char **pp,
67                                   long length, int type)
68 {
69     ASN1_STRING *ret=NULL;
70     const unsigned char *p;
71     unsigned char *s;
72     long len;
73     int inf,tag,xclass;
74     int i=0;
75
76     p= *pp;
77     inf=ASN1_get_object(&p,&len,&tag,&xclass,length);
78     if (inf & 0x80) goto err;
79
80     if (tag >= 32)
81     {
82         i=ASN1_R_TAG_VALUE_TOO_HIGH;
83         goto err;
84     }
85     if (!(ASN1_tag2bit(tag) & type))
86     {
87         i=ASN1_R_WRONG_TYPE;
88         goto err;
89     }
90
91     /* If a bit-string, exit early */
92     if (tag == V_ASN1_BIT_STRING)
93         return(d2i_ASN1_BIT_STRING(a,pp,length));
94
95     if ((a == NULL) || ((*a) == NULL))
96     {
97         if ((ret=ASN1_STRING_new()) == NULL) return(NULL);
98     }
99     else
100         ret=(*a);
101
102     if (len != 0)
103     {
104         s=(unsigned char *)OPENSSL_malloc((int)len+1);
105         if (s == NULL)
106         {
107             i=ERR_R_MALLOC_FAILURE;
108             goto err;
109         }
110         memcpy(s,p,(int)len);
111         s[len]='\0';
112         p+=len;
113     }
114     else
115         s=NULL;
116
117     if (ret->data != NULL) OPENSSL_free(ret->data);
118     ret->length=(int)len;
119     ret->data=s;
120     ret->type=tag;
121     if (a != NULL) (*a)=ret;
122     *pp=p;
123     return(ret);
124 err:
125     ASN1err(ASN1_F_D2I_ASN1_TYPE_BYTES,i);
126     if ((ret != NULL) && ((a == NULL) || (*a != ret)))
127         ASN1_STRING_free(ret);

```

```

128     return(NULL);
129 }

131 int i2d_ASN1_bytes(ASN1_STRING *a, unsigned char **pp, int tag, int xclass)
132 {
133     int ret,r,constructed;
134     unsigned char *p;

136     if (a == NULL) return(0);

138     if (tag == V_ASN1_BIT_STRING)
139         return(i2d_ASN1_BIT_STRING(a,pp));
140
141     ret=a->length;
142     r=ASN1_object_size(0,ret,tag);
143     if (pp == NULL) return(r);
144     p= *pp;

146     if ((tag == V_ASN1_SEQUENCE) || (tag == V_ASN1_SET))
147         constructed=1;
148     else
149         constructed=0;
150     ASN1_put_object(&p,constructed,ret,tag,xclass);
151     memcpy(p,a->data,a->length);
152     p+=a->length;
153     *pp= p;
154     return(r);
155 }

157 ASN1_STRING *d2i_ASN1_bytes(ASN1_STRING **a, const unsigned char **pp,
158                             long length, int Ptag, int Pclass)
159 {
160     ASN1_STRING *ret=NULL;
161     const unsigned char *p;
162     unsigned char *s;
163     long len;
164     int inf,tag,xclass;
165     int i=0;

167     if ((a == NULL) || ((*a) == NULL))
168     {
169         if ((ret=ASN1_STRING_new()) == NULL) return(NULL);
170     }
171     else
172         ret=(*a);

174     p= *pp;
175     inf=ASN1_get_object(&p,&len,&tag,&xclass,length);
176     if (inf & 0x80)
177     {
178         i=ASN1_R_BAD_OBJECT_HEADER;
179         goto err;
180     }

182     if (tag != Ptag)
183     {
184         i=ASN1_R_WRONG_TAG;
185         goto err;
186     }

188     if (inf & V_ASN1_CONSTRUCTED)
189     {
190         ASN1_const_CTX c;

192         c.pp=pp;
193         c.p=p;

```

```

194         c.inf=inf;
195         c.slen=len;
196         c.tag=Ptag;
197         c.xclass=Pclass;
198         c.max=(length == 0)?0:(p+length);
199         if (!asn1_collate_primitive(ret,&c))
200             goto err;
201     else
202     {
203         p=c.p;
204     }
205 }
206
207 else
208 {
209     if (len != 0)
210     {
211         if ((ret->length < len) || (ret->data == NULL))
212         {
213             if (ret->data != NULL) OPENSSL_free(ret->data);
214             s=(unsigned char *)OPENSSL_malloc((int)len + 1);
215             if (s == NULL)
216             {
217                 i=ERR_R_MALLOC_FAILURE;
218                 goto err;
219             }
220         }
221         else
222             s=ret->data;
223         memcpy(s,p,(int)len);
224         s[len] = '\0';
225         p+=len;
226     }
227     else
228     {
229         s=NULL;
230         if (ret->data != NULL) OPENSSL_free(ret->data);
231     }

232     ret->length=(int)len;
233     ret->data=s;
234     ret->type=Ptag;
235 }

237 if (a != NULL) (*a)=ret;
238 *pp=p;
239 return(ret);
240 err:
241 if ((ret != NULL) && ((a == NULL) || (*a != ret)))
242     ASN1_STRING_free(ret);
243 ASN1err(ASN1_F_D2I_ASN1_BYTES,i);
244 return(NULL);
245 }

248 /* We are about to parse 0..n d2i_ASN1_bytes objects, we are to collapse
249  * them into the one structure that is then returned */
250 /* There have been a few bug fixes for this function from
251  * Paul Keogh <paul.keogh@sse.ie>, many thanks to him */
252 static int asn1_collate_primitive(ASN1_STRING *a, ASN1_const_CTX *c)
253 {
254     ASN1_STRING *os=NULL;
255     BUF_MEM b;
256     int num;

258     b.length=0;
259     b.max=0;

```

```
260     b.data=NULL;

262     if (a == NULL)
263     {
264         c->error=ERR_R_PASSED_NULL_PARAMETER;
265         goto err;
266     }

268     num=0;
269     for (;;)
270     {
271         if (c->inf & 1)
272         {
273             c->eos=ASN1_const_check_infinite_end(&c->p,
274             (long)(c->max-c->p));
275             if (c->eos) break;
276         }
277         else
278         {
279             if (c->slen <= 0) break;
280         }

282         c->q=c->p;
283         if (d2i_ASN1_bytes(&os,&c->p,c->max-c->p,c->tag,c->xclass)
284             == NULL)
285         {
286             c->error=ERR_R_ASN1_LIB;
287             goto err;
288         }

290         if (!BUF_MEM_grow_clean(&b,num+os->length))
291         {
292             c->error=ERR_R_BUF_LIB;
293             goto err;
294         }
295         memcpy(&(b.data[num]),os->data,os->length);
296         if (!(c->inf & 1))
297             c->slen-=(c->p-c->q);
298         num+=os->length;
299     }

301     if (!asn1_const_Finish(c)) goto err;

303     a->length=num;
304     if (a->data != NULL) OPENSSL_free(a->data);
305     a->data=(unsigned char *)b.data;
306     if (os != NULL) ASN1_STRING_free(os);
307     return(1);
308 err:
309     ASN1err(ASN1_F_ASN1_COLLATE_PRIMITIVE,c->error);
310     if (os != NULL) ASN1_STRING_free(os);
311     if (b.data != NULL) OPENSSL_free(b.data);
312     return(0);
313 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_d2i_fp.c

1

```
*****
7624 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_d2i_fp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_d2i_fp.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <limits.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_d2i_fp.c

2

```
62 #include <openssl/buffer.h>
63 #include <openssl/asn1_mac.h>
64
65 static int asn1_d2i_read_bio(BIO *in, BUF_MEM **pb);
66
67 #ifndef NO_OLD_ASN1
68 #ifndef OPENSSL_NO_FP_API
69
70 void *ASN1_d2i_fp(void *(*xnew)(void), d2i_of_void *d2i, FILE *in, void **x)
71 {
72     BIO *b;
73     void *ret;
74
75     if ((b=BIO_new(BIO_s_file())) == NULL)
76     {
77         ASN1err(ASN1_F_ASN1_D2I_FP,ERR_R_BUF_LIB);
78         return(NULL);
79     }
80     BIO_set_fp(b,in,BIO_NOCLOSE);
81     ret=ASN1_d2i_bio(xnew,d2i,b,x);
82     BIO_free(b);
83     return(ret);
84 }
85 #endif
86
87 void *ASN1_d2i_bio(void *(*xnew)(void), d2i_of_void *d2i, BIO *in, void **x)
88 {
89     BUF_MEM *b = NULL;
90     const unsigned char *p;
91     void *ret=NULL;
92     int len;
93
94     len = asn1_d2i_read_bio(in, &b);
95     if(len < 0) goto err;
96
97     p=(unsigned char *)b->data;
98     ret=d2i(x,&p,len);
99 err:
100     if (b != NULL) BUF_MEM_free(b);
101     return(ret);
102 }
103
104 #endif
105
106 void *ASN1_item_d2i_bio(const ASN1_ITEM *it, BIO *in, void *x)
107 {
108     BUF_MEM *b = NULL;
109     const unsigned char *p;
110     void *ret=NULL;
111     int len;
112
113     len = asn1_d2i_read_bio(in, &b);
114     if(len < 0) goto err;
115
116     p=(const unsigned char *)b->data;
117     ret=ASN1_item_d2i(x,&p,len, it);
118 err:
119     if (b != NULL) BUF_MEM_free(b);
120     return(ret);
121 }
122
123 #ifndef OPENSSL_NO_FP_API
124 void *ASN1_item_d2i_fp(const ASN1_ITEM *it, FILE *in, void *x)
125 {
126     BIO *b;
127     char *ret;
```

```

129     if ((b=BIO_new(BIO_s_file())) == NULL)
130     {
131         ASN1err(ASN1_F_ASN1_ITEM_D2I_FP,ERR_R_BUF_LIB);
132         return(NULL);
133     }
134     BIO_set_fp(b,in,BIO_NOCLOSE);
135     ret=ASN1_item_d2i_bio(it,b,x);
136     BIO_free(b);
137     return(ret);
138 }
139 #endif

141 #define HEADER_SIZE 8
142 static int asn1_d2i_read_bio(BIO *in, BUF_MEM **pb)
143 {
144     BUF_MEM *b;
145     unsigned char *p;
146     int i;
147     ASN1_const_CTX c;
148     size_t want=HEADER_SIZE;
149     int eos=0;
150     size_t off=0;
151     size_t len=0;

153     b=BUF_MEM_new();
154     if (b == NULL)
155     {
156         ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ERR_R_MALLOC_FAILURE);
157         return -1;
158     }

160     ERR_clear_error();
161     for (;;)
162     {
163         if (want >= (len-off))
164         {
165             want-=(len-off);

167             if (len + want < len || !BUF_MEM_grow_clean(b,len+want))
168             {
169                 ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ERR_R_MALLOC_FA
170                 goto err;
171             }
172             i=BIO_read(in,&(b->data[len]),want);
173             if ((i < 0) && ((len-off) == 0))
174             {
175                 ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ASN1_R_NOT_ENOU
176                 goto err;
177             }
178             if (i > 0)
179             {
180                 if (len+i < len)
181                 {
182                     ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ASN1_R_
183                     goto err;
184                 }
185                 len+=i;
186             }
187         }
188         /* else data already loaded */

190         p=(unsigned char *)&(b->data[off]);
191         c.p=p;
192         c.inf=ASN1_get_object(&(c.p),&(c.slen),&(c.tag),&(c.xclass),
193         len-off);

```

```

194     if (c.inf & 0x80)
195     {
196         unsigned long e;

198         e=ERR_GET_REASON(ERR_peek_error());
199         if (e != ASN1_R_TOO_LONG)
200             goto err;
201         else
202             ERR_clear_error(); /* clear error */
203     }
204     i=c.p-p; /* header length */
205     off+=i; /* end of data */

207     if (c.inf & 1)
208     {
209         /* no data body so go round again */
210         eos++;
211         if (eos < 0)
212         {
213             ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ASN1_R_HEADER_T
214             goto err;
215         }
216         want=HEADER_SIZE;
217     }
218     else if (eos && (c.slen == 0) && (c.tag == V_ASN1_EOC))
219     {
220         /* eos value, so go back and read another header */
221         eos--;
222         if (eos <= 0)
223             break;
224         else
225             want=HEADER_SIZE;
226     }
227     else
228     {
229         /* suck in c.slen bytes of data */
230         want=c.slen;
231         if (want > (len-off))
232         {
233             want-=(len-off);
234             if (want > INT_MAX /* BIO_read takes an int leng
235                 len+want < len)
236             {
237                 ASN1err(ASN1_F_ASN1_D2I_READ_BIO
238                 goto err;
239             }
240             if (!BUF_MEM_grow_clean(b,len+want))
241             {
242                 ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ERR_R_M
243                 goto err;
244             }
245             while (want > 0)
246             {
247                 i=BIO_read(in,&(b->data[len]),want);
248                 if (i <= 0)
249                 {
250                     ASN1err(ASN1_F_ASN1_D2I_READ_BIO
251                     ASN1_R_NOT_ENOUGH_DATA);
252                     goto err;
253                 }
254             }
255             /* This can't overflow because
256              * |len+want| didn't overflow. */
257             len+=i;
258             want-=i;
259         }

```

```
260         if (off + c.slen < off)
261         {
262             ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ASN1_R_TOO_LONG
263             goto err;
264         }
265         off+=c.slen;
266         if (eos <= 0)
267         {
268             break;
269         }
270         else
271             want=HEADER_SIZE;
272     }
273 }
274
275 if (off > INT_MAX)
276 {
277     ASN1err(ASN1_F_ASN1_D2I_READ_BIO,ASN1_R_TOO_LONG);
278     goto err;
279 }
280
281 *pb = b;
282 return off;
283 err:
284 if (b != NULL) BUF_MEM_free(b);
285 return -1;
286 }
```


new/usr/src/lib/openssl/libsunw_crypto/asn1/a_digest.c

1

```
*****
4161 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_digest.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_digest.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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57 */
59 #include <stdio.h>
60 #include <time.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_digest.c

2

```
62 #include "cryptlib.h"
64 #ifndef NO_SYS_TYPES_H
65 # include <sys/types.h>
66 #endif
68 #include <openssl/err.h>
69 #include <openssl/evp.h>
70 #include <openssl/buffer.h>
71 #include <openssl/x509.h>
73 #ifndef NO_ASN1_OLD
75 int ASN1_digest(i2d_of_void *i2d, const EVP_MD *type, char *data,
76                unsigned char *md, unsigned int *len)
77 {
78     int i;
79     unsigned char *str,*p;
81     i=i2d(data,NULL);
82     if ((str=(unsigned char *)OPENSSL_malloc(i)) == NULL)
83     {
84         ASN1err(ASN1_F_ASN1_DIGEST,ERR_R_MALLOC_FAILURE);
85         return(0);
86     }
87     p=str;
88     i2d(data,&p);
90     if (!EVP_Digest(str, i, md, len, type, NULL))
91         return 0;
92     OPENSSL_free(str);
93     return(1);
94 }
96 #endif
99 int ASN1_item_digest(const ASN1_ITEM *it, const EVP_MD *type, void *asn,
100                    unsigned char *md, unsigned int *len)
101 {
102     int i;
103     unsigned char *str = NULL;
105     i=ASN1_item_i2d(asn,&str, it);
106     if (!str) return(0);
108     if (!EVP_Digest(str, i, md, len, type, NULL))
109         return 0;
110     OPENSSL_free(str);
111     return(1);
112 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_dup.c

1

```
*****
4249 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_dup.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_dup.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_dup.c

2

```
63 #ifndef NO_OLD_ASN1
64
65 void *ASN1_dup(i2d_of_void *i2d, d2i_of_void *d2i, void *x)
66 {
67     unsigned char *b,*p;
68     const unsigned char *p2;
69     int i;
70     char *ret;
71
72     if (x == NULL) return(NULL);
73
74     i=i2d(x,NULL);
75     b=OPENSSL_malloc(i+10);
76     if (b == NULL)
77         { ASN1err(ASN1_F_ASN1_DUP,ERR_R_MALLOC_FAILURE); return(NULL); }
78     p= b;
79     i=i2d(x,&p);
80     p2= b;
81     ret=d2i(NULL,&p2,i);
82     OPENSSL_free(b);
83     return(ret);
84 }
85
86 #endif
87
88 /* ASN1_ITEM version of dup: this follows the model above except we don't need
89  * to allocate the buffer. At some point this could be rewritten to directly dup
90  * the underlying structure instead of doing and encode and decode.
91  */
92
93 void *ASN1_item_dup(const ASN1_ITEM *it, void *x)
94 {
95     unsigned char *b = NULL;
96     const unsigned char *p;
97     long i;
98     void *ret;
99
100     if (x == NULL) return(NULL);
101
102     i=ASN1_item_i2d(x,&b,it);
103     if (b == NULL)
104         { ASN1err(ASN1_F_ASN1_ITEM_DUP,ERR_R_MALLOC_FAILURE); return(NUL
105     p= b;
106     ret=ASN1_item_d2i(NULL,&p,i, it);
107     OPENSSL_free(b);
108     return(ret);
109 }
```

5617 Fri May 30 18:31:27 2014
 new/usr/src/lib/openssl/libsunw_crypto/asn1/a_enum.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/asn1/a_enum.c */
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4  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>

```

62 #include <openssl/bn.h>

```

63 /*
64  * Code for ENUMERATED type: identical to INTEGER apart from a different tag.
65  * for comments on encoding see a_int.c
66  */
67
68 int ASN1_ENUMERATED_set(ASN1_ENUMERATED *a, long v)
69 {
70     int j,k;
71     unsigned int i;
72     unsigned char buf[sizeof(long)+1];
73     long d;
74
75     a->type=V_ASN1_ENUMERATED;
76     if (a->length < (int)(sizeof(long)+1))
77     {
78         if (a->data != NULL)
79             OPENSSL_free(a->data);
80         if ((a->data=(unsigned char *)OPENSSL_malloc(sizeof(long)+1)) !=
81             memset((char *)a->data,0,sizeof(long)+1);
82         }
83     if (a->data == NULL)
84     {
85         ASN1err(ASN1_F_ASN1_ENUMERATED_SET, ERR_R_MALLOC_FAILURE);
86         return(0);
87     }
88     d=v;
89     if (d < 0)
90     {
91         d= -d;
92         a->type=V_ASN1_NEG_ENUMERATED;
93     }
94
95     for (i=0; i<sizeof(long); i++)
96     {
97         if (d == 0) break;
98         buf[i]=(int)d&0xff;
99         d>>=8;
100     }
101     j=0;
102     for (k=i-1; k >=0; k--)
103         a->data[j++]=buf[k];
104     a->length=j;
105     return(1);
106 }
107
108 long ASN1_ENUMERATED_get(ASN1_ENUMERATED *a)
109 {
110     int neg=0,i;
111     long r=0;
112
113     if (a == NULL) return(0L);
114     i=a->type;
115     if (i == V_ASN1_NEG_ENUMERATED)
116         neg=1;
117     else if (i != V_ASN1_ENUMERATED)
118         return -1;
119
120     if (a->length > (int)sizeof(long))
121     {
122         /* hmm... a bit ugly */
123         return(0xffffffffL);
124     }
125     if (a->data == NULL)
126         return 0;
127

```

```
129     for (i=0; i<a->length; i++)
130     {
131         r<<=8;
132         r|=(unsigned char)a->data[i];
133     }
134     if (neg) r= -r;
135     return(r);
136 }

138 ASN1_ENUMERATED *BN_to_ASN1_ENUMERATED(BIGNUM *bn, ASN1_ENUMERATED *ai)
139 {
140     ASN1_ENUMERATED *ret;
141     int len,j;

143     if (ai == NULL)
144         ret=M_ASN1_ENUMERATED_new();
145     else
146         ret=ai;
147     if (ret == NULL)
148     {
149         ASN1err(ASN1_F_BN_TO_ASN1_ENUMERATED,ERR_R_NESTED_ASN1_ERROR);
150         goto err;
151     }
152     if(BN_is_negative(bn)) ret->type = V_ASN1_NEG_ENUMERATED;
153     else ret->type=V_ASN1_ENUMERATED;
154     j=BN_num_bits(bn);
155     len=((j == 0)?0:((j/8)+1));
156     if (ret->length < len+4)
157     {
158         unsigned char *new_data=OPENSSL_realloc(ret->data, len+4);
159         if (!new_data)
160         {
161             ASN1err(ASN1_F_BN_TO_ASN1_ENUMERATED,ERR_R_MALLOC_FAILUR
162             goto err;
163         }
164         ret->data=new_data;
165     }

167     ret->length=BN_bn2bin(bn,ret->data);
168     return(ret);
169 err:
170     if (ret != ai) M_ASN1_ENUMERATED_free(ret);
171     return(NULL);
172 }

174 BIGNUM *ASN1_ENUMERATED_to_BN(ASN1_ENUMERATED *ai, BIGNUM *bn)
175 {
176     BIGNUM *ret;

178     if ((ret=BN_bin2bn(ai->data,ai->length,bn)) == NULL)
179         ASN1err(ASN1_F_ASN1_ENUMERATED_TO_BN,ASN1_R_BN_LIB);
180     else if(ai->type == V_ASN1_NEG_ENUMERATED) BN_set_negative(ret,1);
181     return(ret);
182 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_gentm.c

1

7767 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_gentm.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/a_gentm.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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18 * If this package is used in a product, Eric Young should be given attribution
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21 * in documentation (online or textual) provided with the package.
22 *
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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51 * SUCH DAMAGE.
52 *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* GENERALIZEDTIME implementation, written by Steve Henson. Based on UTCTIME */
60
61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_gentm.c

2

```
62 #include <time.h>
63 #include "cryptlib.h"
64 #include "o_time.h"
65 #include <openssl/asn1.h>
66
67 #if 0
68
69 int i2d_ASN1_GENERALIZEDTIME(ASN1_GENERALIZEDTIME *a, unsigned char **pp)
70 {
71 #ifdef CHARSET_EBCDIC
72 /* KLUDGE! We convert to ascii before writing DER */
73 int len;
74 char tmp[24];
75 ASN1_STRING tmpstr = *(ASN1_STRING *)a;
76
77 len = tmpstr.length;
78 ebcdic2ascii(tmp, tmpstr.data, (len >= sizeof tmp) ? sizeof tmp : len);
79 tmpstr.data = tmp;
80
81 a = (ASN1_GENERALIZEDTIME *) &tmpstr;
82 #endif
83 return(i2d_ASN1_bytes((ASN1_STRING *)a, pp,
84 V_ASN1_GENERALIZEDTIME, V_ASN1_UNIVERSAL));
85 }
86
87
88 ASN1_GENERALIZEDTIME *d2i_ASN1_GENERALIZEDTIME(ASN1_GENERALIZEDTIME **a,
89 unsigned char **pp, long length)
90 {
91 ASN1_GENERALIZEDTIME *ret=NULL;
92
93 ret=(ASN1_GENERALIZEDTIME *)d2i_ASN1_bytes((ASN1_STRING **)a, pp, length,
94 V_ASN1_GENERALIZEDTIME, V_ASN1_UNIVERSAL);
95 if (ret == NULL)
96 {
97 ASN1err(ASN1_F_D2I_ASN1_GENERALIZEDTIME, ERR_R_NESTED_ASN1_ERROR)
98 return(NULL);
99 }
100 #ifdef CHARSET_EBCDIC
101 ascii2ebcdic(ret->data, ret->data, ret->length);
102 #endif
103 if (!ASN1_GENERALIZEDTIME_check(ret))
104 {
105 ASN1err(ASN1_F_D2I_ASN1_GENERALIZEDTIME, ASN1_R_INVALID_TIME_FORM
106 goto err;
107 }
108
109 return(ret);
110
111 err:
112 if ((ret != NULL) && ((a == NULL) || (*a != ret)))
113 M_ASN1_GENERALIZEDTIME_free(ret);
114 return(NULL);
115 }
116 #endif
117
118 int ASN1_GENERALIZEDTIME_check(ASN1_GENERALIZEDTIME *d)
119 {
120 static const int min[9]={ 0, 0, 1, 1, 0, 0, 0, 0, 0};
121 static const int max[9]={99, 99,12,31,23,59,59,12,59};
122 char *a;
123 int n,i,l,o;
124
125 if (d->type != V_ASN1_GENERALIZEDTIME) return(0);
126 l=d->length;
127 a=(char *)d->data;
```

```

128     o=0;
129     /* GENERALIZEDTIME is similar to UTCTIME except the year is
130      * represented as YYYY. This stuff treats everything as a two digit
131      * field so make first two fields 00 to 99
132      */
133     if (l < 13) goto err;
134     for (i=0; i<7; i++)
135     {
136         if ((i == 6) && ((a[o] == 'Z') ||
137             (a[o] == '+') || (a[o] == '-')))
138             { i++; break; }
139         if ((a[o] < '0') || (a[o] > '9')) goto err;
140         n = a[o] - '0';
141         if (++o > l) goto err;

143         if ((a[o] < '0') || (a[o] > '9')) goto err;
144         n = (n*10) + a[o] - '0';
145         if (++o > l) goto err;

147         if ((n < min[i]) || (n > max[i])) goto err;
148     }
149     /* Optional fractional seconds: decimal point followed by one
150      * or more digits.
151      */
152     if (a[o] == '.')
153     {
154         if (++o > l) goto err;
155         i = 0;
156         while ((a[o] >= '0') && (a[o] <= '9') && (o <= l))
157             o++;
158         /* Must have at least one digit after decimal point */
159         if (i == 0) goto err;
160     }

162     if (a[o] == 'Z')
163         o++;
164     else if ((a[o] == '+') || (a[o] == '-'))
165     {
166         o++;
167         if (o+4 > l) goto err;
168         for (i=7; i<9; i++)
169         {
170             if ((a[o] < '0') || (a[o] > '9')) goto err;
171             n = a[o] - '0';
172             o++;
173             if ((a[o] < '0') || (a[o] > '9')) goto err;
174             n = (n*10) + a[o] - '0';
175             if ((n < min[i]) || (n > max[i])) goto err;
176             o++;
177         }
178     }
179     else
180     {
181         /* Missing time zone information. */
182         goto err;
183     }
184     return(o == l);
185 err:
186     return(0);
187 }

189 int ASN1_GENERALIZEDTIME_set_string(ASN1_GENERALIZEDTIME *s, const char *str)
190 {
191     ASN1_GENERALIZEDTIME t;
193     t.type = V_ASN1_GENERALIZEDTIME;

```

```

194     t.length = strlen(str);
195     t.data = (unsigned char *)str;
196     if (ASN1_GENERALIZEDTIME_check(&t))
197     {
198         if (s != NULL)
199         {
200             if (!ASN1_STRING_set((ASN1_STRING *)s,
201                 (unsigned char *)str, t.length))
202                 return 0;
203             s->type = V_ASN1_GENERALIZEDTIME;
204         }
205         return(1);
206     }
207     else
208         return(0);
209 }

211 ASN1_GENERALIZEDTIME *ASN1_GENERALIZEDTIME_set(ASN1_GENERALIZEDTIME *s,
212     time_t t)
213 {
214     return ASN1_GENERALIZEDTIME_adj(s, t, 0, 0);
215 }

217 ASN1_GENERALIZEDTIME *ASN1_GENERALIZEDTIME_adj(ASN1_GENERALIZEDTIME *s,
218     time_t t, int offset_day, long offset_sec)
219 {
220     char *p;
221     struct tm *ts;
222     struct tm data;
223     size_t len = 20;

225     if (s == NULL)
226         s = M_ASN1_GENERALIZEDTIME_new();
227     if (s == NULL)
228         return(NULL);

230     ts = OPENSSL_gmtime(&t, &data);
231     if (ts == NULL)
232         return(NULL);

234     if (offset_day || offset_sec)
235     {
236         if (!OPENSSL_gmtime_adj(ts, offset_day, offset_sec))
237             return NULL;
238     }

240     p = (char *)s->data;
241     if ((p == NULL) || ((size_t)s->length < len))
242     {
243         p = OPENSSL_malloc(len);
244         if (p == NULL)
245         {
246             ASN1err(ASN1_F_ASN1_GENERALIZEDTIME_ADJ,
247                 ERR_R_MALLOC_FAILURE);
248             return(NULL);
249         }
250         if (s->data != NULL)
251             OPENSSL_free(s->data);
252         s->data = (unsigned char *)p;
253     }

255     BIO_snprintf(p, len, "%04d%02d%02d%02d%02dZ", ts->tm_year + 1900,
256         ts->tm_mon+1, ts->tm_mday, ts->tm_hour, ts->tm_min, ts->tm_sec);
257     s->length = strlen(p);
258     s->type = V_ASN1_GENERALIZEDTIME;
259 #ifdef CHARSET_EBCDIC_not

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_gentm.c

5

```
260     ebcDic2ascii(s->data, s->data, s->length);
261 #endif
262     return(s);
263 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_i2d_fp.c

1

```
*****
4969 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_i2d_fp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_i2d_fp.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
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35 * The word 'cryptographic' can be left out if the rouines from the library
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_i2d_fp.c

2

```
62 #include <openssl/asn1.h>
64 #ifndef NO_OLD_ASN1
66 #ifndef OPENSSL_NO_FP_API
67 int ASN1_i2d_fp(i2d_of_void *i2d, FILE *out, void *x)
68 {
69     BIO *b;
70     int ret;
72     if ((b=BIO_new(BIO_s_file())) == NULL)
73     {
74         ASN1err(ASN1_F_ASN1_I2D_FP,ERR_R_BUF_LIB);
75         return(0);
76     }
77     BIO_set_fp(b,out,BIO_NOCLOSE);
78     ret=ASN1_i2d_bio(i2d,b,x);
79     BIO_free(b);
80     return(ret);
81 }
82 #endif
84 int ASN1_i2d_bio(i2d_of_void *i2d, BIO *out, unsigned char *x)
85 {
86     char *b;
87     unsigned char *p;
88     int i,j=0,n,ret=1;
90     n=i2d(x,NULL);
91     b=(char *)OPENSSL_malloc(n);
92     if (b == NULL)
93     {
94         ASN1err(ASN1_F_ASN1_I2D_BIO,ERR_R_MALLOC_FAILURE);
95         return(0);
96     }
98     p=(unsigned char *)b;
99     i2d(x,&p);
100     for (;;)
101     {
102         i=BIO_write(out,&(b[j]),n);
103         if (i == n) break;
104         if (i <= 0)
105         {
106             ret=0;
107             break;
108         }
109         j+=i;
110         n-=i;
111     }
112     OPENSSL_free(b);
113     return(ret);
114 }
115 #endif
117 #ifndef OPENSSL_NO_FP_API
120 int ASN1_item_i2d_fp(const ASN1_ITEM *it, FILE *out, void *x)
121 {
122     BIO *b;
123     int ret;
125     if ((b=BIO_new(BIO_s_file())) == NULL)
126     {
127         ASN1err(ASN1_F_ASN1_ITEM_I2D_FP,ERR_R_BUF_LIB);
```



```
128         return(0);
129     }
130     BIO_set_fp(b,out,BIO_NOCLOSE);
131     ret=ASN1_item_i2d_bio(it,b,x);
132     BIO_free(b);
133     return(ret);
134 }
135 #endif

137 int ASN1_item_i2d_bio(const ASN1_ITEM *it, BIO *out, void *x)
138 {
139     unsigned char *b = NULL;
140     int i,j=0,n,ret=1;

142     n = ASN1_item_i2d(x, &b, it);
143     if (b == NULL)
144     {
145         ASN1err(ASN1_F_ASN1_ITEM_I2D_BIO,ERR_R_MALLOC_FAILURE);
146         return(0);
147     }

149     for (;;)
150     {
151         i=BIO_write(out,&(b[j]),n);
152         if (i == n) break;
153         if (i <= 0)
154         {
155             ret=0;
156             break;
157         }
158         j+=i;
159         n-=i;
160     }
161     OPENSSL_free(b);
162     return(ret);
163 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_int.c

1

11901 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_int.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/a_int.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_int.c

2

```
62 #include <openssl/bn.h>
```

```
64 ASN1_INTEGER *ASN1_INTEGER_dup(const ASN1_INTEGER *x)
65 { return M_ASN1_INTEGER_dup(x);}
```

```
67 int ASN1_INTEGER_cmp(const ASN1_INTEGER *x, const ASN1_INTEGER *y)
68 {
69     int neg, ret;
70     /* Compare signs */
71     neg = x->type & V_ASN1_NEG;
72     if (neg != (y->type & V_ASN1_NEG))
73     {
74         if (neg)
75             return -1;
76         else
77             return 1;
78     }
79
80     ret = ASN1_STRING_cmp(x, y);
81
82     if (neg)
83         return -ret;
84     else
85         return ret;
86 }
87
```

```
89 /*
90 * This converts an ASN1 INTEGER into its content encoding.
91 * The internal representation is an ASN1_STRING whose data is a big endian
92 * representation of the value, ignoring the sign. The sign is determined by
93 * the type: V_ASN1_INTEGER for positive and V_ASN1_NEG_INTEGER for negative.
94 *
95 * Positive integers are no problem: they are almost the same as the DER
96 * encoding, except if the first byte is >= 0x80 we need to add a zero pad.
97 *
98 * Negative integers are a bit trickier...
99 * The DER representation of negative integers is in 2s complement form.
100 * The internal form is converted by complementing each octet and finally
101 * adding one to the result. This can be done less messily with a little trick.
102 * If the internal form has trailing zeroes then they will become FF by the
103 * complement and 0 by the add one (due to carry) so just copy as many trailing
104 * zeros to the destination as there are in the source. The carry will add one
105 * to the last none zero octet: so complement this octet and add one and finally
106 * complement any left over until you get to the start of the string.
107 *
108 * Padding is a little trickier too. If the first bytes is > 0x80 then we pad
109 * with 0xff. However if the first byte is 0x80 and one of the following bytes
110 * is non-zero we pad with 0xff. The reason for this distinction is that 0x80
111 * followed by optional zeros isn't padded.
112 */
```

```
114 int i2c_ASN1_INTEGER(ASN1_INTEGER *a, unsigned char **pp)
115 {
116     int pad=0,ret,i,neg;
117     unsigned char *p,*n,pb=0;
118
119     if (a == NULL) return(0);
120     neg=a->type & V_ASN1_NEG;
121     if (a->length == 0)
122         ret=1;
123     else
124     {
125         ret=a->length;
126         i=a->data[0];
127         if (!neg && (i > 127)) {
```

```

128         pad=1;
129         pb=0;
130     } else if(neg) {
131         if(i>128) {
132             pad=1;
133             pb=0xFF;
134         } else if(i == 128) {
135             /*
136              * Special case: if any other bytes non zero we pad:
137              * otherwise we don't.
138              */
139             for(i = 1; i < a->length; i++) if(a->data[i]) {
140                 pad=1;
141                 pb=0xFF;
142                 break;
143             }
144         }
145         ret+=pad;
146     }
147     if (pp == NULL) return(ret);
148     p= *pp;
149
151     if (pad) *(p++)=pb;
152     if (a->length == 0) *(p++)=0;
153     else if (!neg) memcpy(p,a->data,(unsigned int)a->length);
154     else {
155         /* Begin at the end of the encoding */
156         n=a->data + a->length - 1;
157         p += a->length - 1;
158         i = a->length;
159         /* Copy zeros to destination as long as source is zero */
160         while(!*n) {
161             *(p--) = 0;
162             n--;
163             i--;
164         }
165         /* Complement and increment next octet */
166         *(p--) = ((*n--) ^ 0xff) + 1;
167         i--;
168         /* Complement any octets left */
169         for(; i > 0; i--) *(p--) = *(n--) ^ 0xff;
170     }
172     *pp+=ret;
173     return(ret);
174 }
176 /* Convert just ASN1_INTEGER content octets to ASN1_INTEGER structure */
178 ASN1_INTEGER *c2i_ASN1_INTEGER(ASN1_INTEGER **a, const unsigned char **pp,
179                                long len)
180 {
181     ASN1_INTEGER *ret=NULL;
182     const unsigned char *p, *pend;
183     unsigned char *to,*s;
184     int i;
186     if ((a == NULL) || ((*a) == NULL))
187     {
188         if ((ret=M_ASN1_INTEGER_new()) == NULL) return(NULL);
189         ret->type=V_ASN1_INTEGER;
190     }
191     else
192         ret=(*a);

```

```

194     p= *pp;
195     pend = p + len;
197     /* We must OPENSSL_malloc stuff, even for 0 bytes otherwise it
198      * signifies a missing NULL parameter. */
199     s=(unsigned char *)OPENSSL_malloc((int)len+1);
200     if (s == NULL)
201     {
202         i=ERR_R_MALLOC_FAILURE;
203         goto err;
204     }
205     to=s;
206     if(!len) {
207         /* Strictly speaking this is an illegal INTEGER but we
208          * tolerate it.
209          */
210         ret->type=V_ASN1_INTEGER;
211     } else if (*p & 0x80) /* a negative number */
212     {
213         ret->type=V_ASN1_NEG_INTEGER;
214         if ((*p == 0xff) && (len != 1)) {
215             p++;
216             len--;
217         }
218         i = len;
219         p += i - 1;
220         to += i - 1;
221         while((!*p) && i) {
222             *(to--) = 0;
223             i--;
224             p--;
225         }
226         /* Special case: if all zeros then the number will be of
227          * the form FF followed by n zero bytes: this corresponds to
228          * 1 followed by n zero bytes. We've already written n zeros
229          * so we just append an extra one and set the first byte to
230          * a 1. This is treated separately because it is the only case
231          * where the number of bytes is larger than len.
232          */
233         if(!i) {
234             *s = 1;
235             s[len] = 0;
236             len++;
237         } else {
238             *(to--) = (*(p--) ^ 0xff) + 1;
239             i--;
240             for(; i > 0; i--) *(to--) = *(p--) ^ 0xff;
241         }
242     } else {
243         ret->type=V_ASN1_INTEGER;
244         if ((*p == 0) && (len != 1))
245         {
246             p++;
247             len--;
248         }
249         memcpy(s,p,(int)len);
250     }
252     if (ret->data != NULL) OPENSSL_free(ret->data);
253     ret->data=s;
254     ret->length=(int)len;
255     if (a != NULL) (*a)=ret;
256     *pp=p;
257     return(ret);
258 err:
259     ASN1err(ASN1_F_C2I_ASN1_INTEGER,i);

```

```

260     if ((ret != NULL) && ((a == NULL) || (*a != ret)))
261         M_ASN1_INTEGER_free(ret);
262     return(NULL);
263 }

266 /* This is a version of d2i_ASN1_INTEGER that ignores the sign bit of
267  * ASN1 integers: some broken software can encode a positive INTEGER
268  * with its MSB set as negative (it doesn't add a padding zero).
269  */

271 ASN1_INTEGER *d2i_ASN1_INTEGER(ASN1_INTEGER **a, const unsigned char **pp,
272     long length)
273 {
274     ASN1_INTEGER *ret=NULL;
275     const unsigned char *p;
276     unsigned char *s;
277     long len;
278     int inf,tag,xclass;
279     int i;

281     if ((a == NULL) || ((*a) == NULL))
282     {
283         if ((ret=M_ASN1_INTEGER_new()) == NULL) return(NULL);
284         ret->type=V_ASN1_INTEGER;
285     }
286     else
287         ret=(*a);

289     p= *pp;
290     inf=ASN1_get_object(&p,&len,&tag,&xclass,length);
291     if (inf & 0x80)
292     {
293         i=ASN1_R_BAD_OBJECT_HEADER;
294         goto err;
295     }

297     if (tag != V_ASN1_INTEGER)
298     {
299         i=ASN1_R_EXPECTING_AN_INTEGER;
300         goto err;
301     }

303     /* We must OPENSSL_malloc stuff, even for 0 bytes otherwise it
304      * signifies a missing NULL parameter. */
305     s=(unsigned char *)OPENSSL_malloc((int)len+1);
306     if (s == NULL)
307     {
308         i=ERR_R_MALLOC_FAILURE;
309         goto err;
310     }
311     ret->type=V_ASN1_INTEGER;
312     if(len) {
313         if ((*p == 0) && (len != 1))
314         {
315             p++;
316             len--;
317         }
318         memcpy(s,p,(int)len);
319         p+=len;
320     }

322     if (ret->data != NULL) OPENSSL_free(ret->data);
323     ret->data=s;
324     ret->length=(int)len;
325     if (a != NULL) (*a)=ret;

```

```

326     *pp=p;
327     return(ret);
328 err:
329     ASN1err(ASN1_F_D2I_ASN1_INTEGER,i);
330     if ((ret != NULL) && ((a == NULL) || (*a != ret)))
331         M_ASN1_INTEGER_free(ret);
332     return(NULL);
333 }

335 int ASN1_INTEGER_set(ASN1_INTEGER *a, long v)
336 {
337     int j,k;
338     unsigned int i;
339     unsigned char buf[sizeof(long)+1];
340     long d;

342     a->type=V_ASN1_INTEGER;
343     if (a->length < (int)(sizeof(long)+1))
344     {
345         if (a->data != NULL)
346             OPENSSL_free(a->data);
347         if ((a->data=(unsigned char *)OPENSSL_malloc(sizeof(long)+1)) !=
348             memset((char *)a->data,0,sizeof(long)+1);
349     }
350     if (a->data == NULL)
351     {
352         ASN1err(ASN1_F_ASN1_INTEGER_SET,ERR_R_MALLOC_FAILURE);
353         return(0);
354     }
355     d=v;
356     if (d < 0)
357     {
358         d= -d;
359         a->type=V_ASN1_NEG_INTEGER;
360     }

362     for (i=0; i<sizeof(long); i++)
363     {
364         if (d == 0) break;
365         buf[i]=(int)d&0xff;
366         d>>=8;
367     }
368     j=0;
369     for (k=i-1; k >=0; k--)
370         a->data[j++]=buf[k];
371     a->length=j;
372     return(1);
373 }

375 long ASN1_INTEGER_get(const ASN1_INTEGER *a)
376 {
377     int neg=0,i;
378     long r=0;

380     if (a == NULL) return(0L);
381     i=a->type;
382     if (i == V_ASN1_NEG_INTEGER)
383         neg=1;
384     else if (i != V_ASN1_INTEGER)
385         return -1;
386
387     if (a->length > (int)sizeof(long))
388     {
389         /* hmm... a bit ugly, return all ones */
390         return -1;
391     }

```

```

392     if (a->data == NULL)
393         return 0;

395     for (i=0; i<a->length; i++)
396     {
397         r<=8;
398         r|=(unsigned char)a->data[i];
399     }
400     if (neg) r= -r;
401     return(r);
402 }

404 ASN1_INTEGER *BN_to_ASN1_INTEGER(const BIGNUM *bn, ASN1_INTEGER *ai)
405 {
406     ASN1_INTEGER *ret;
407     int len,j;

409     if (ai == NULL)
410         ret=M_ASN1_INTEGER_new();
411     else
412         ret=ai;
413     if (ret == NULL)
414     {
415         ASN1err(ASN1_F_BN_TO_ASN1_INTEGER,ERR_R_NESTED_ASN1_ERROR);
416         goto err;
417     }
418     if (BN_is_negative(bn))
419         ret->type = V_ASN1_NEG_INTEGER;
420     else ret->type=V_ASN1_INTEGER;
421     j=BN_num_bits(bn);
422     len=((j == 0)?0:((j/8)+1));
423     if (ret->length < len+4)
424     {
425         unsigned char *new_data=OPENSSL_realloc(ret->data, len+4);
426         if (!new_data)
427         {
428             ASN1err(ASN1_F_BN_TO_ASN1_INTEGER,ERR_R_MALLOC_FAILURE);
429             goto err;
430         }
431         ret->data=new_data;
432     }
433     ret->length=BN_bn2bin(bn,ret->data);
434     /* Correct zero case */
435     if(!ret->length)
436     {
437         ret->data[0] = 0;
438         ret->length = 1;
439     }
440     return(ret);
441 err:
442     if (ret != ai) M_ASN1_INTEGER_free(ret);
443     return(NULL);
444 }

446 BIGNUM *ASN1_INTEGER_to_BN(const ASN1_INTEGER *ai, BIGNUM *bn)
447 {
448     BIGNUM *ret;

450     if ((ret=BN_bin2bn(ai->data,ai->length,bn)) == NULL)
451         ASN1err(ASN1_F_ASN1_INTEGER_TO_BN,ASN1_R_BN_LIB);
452     else if (ai->type == V_ASN1_NEG_INTEGER)
453         BN_set_negative(ret, 1);
454     return(ret);
455 }

457 IMPLEMENT_STACK_OF(ASN1_INTEGER)

```

```

458 IMPLEMENT_ASN1_SET_OF(ASN1_INTEGER)

```

```

*****
11427 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_mbstr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* a_mbstr.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
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46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include <ctype.h>
61 #include "cryptlib.h"

```

```

62 #include <openssl/asn1.h>

64 static int traverse_string(const unsigned char *p, int len, int inform,
65                             int (*rfunc)(unsigned long value, void *in), void *arg);
66 static int in_utf8(unsigned long value, void *arg);
67 static int out_utf8(unsigned long value, void *arg);
68 static int type_str(unsigned long value, void *arg);
69 static int cpy_asc(unsigned long value, void *arg);
70 static int cpy_bmp(unsigned long value, void *arg);
71 static int cpy_univ(unsigned long value, void *arg);
72 static int cpy_utf8(unsigned long value, void *arg);
73 static int is_printable(unsigned long value);

75 /* These functions take a string in UTF8, ASCII or multibyte form and
76  * a mask of permissible ASN1 string types. It then works out the minimal
77  * type (using the order Printable < IA5 < T61 < BMP < Universal < UTF8)
78  * and creates a string of the correct type with the supplied data.
79  * Yes this is horrible: it has to be :-{
80  * The 'ncopy' form checks minimum and maximum size limits too.
81  */

83 int ASN1_mbstring_copy(ASN1_STRING **out, const unsigned char *in, int len,
84                         int inform, unsigned long mask)
85 {
86     return ASN1_mbstring_ncopy(out, in, len, inform, mask, 0, 0);
87 }

89 int ASN1_mbstring_ncopy(ASN1_STRING **out, const unsigned char *in, int len,
90                         int inform, unsigned long mask,
91                         long minsize, long maxsize)
92 {
93     int str_type;
94     int ret;
95     char free_out;
96     int outform, outlen = 0;
97     ASN1_STRING *dest;
98     unsigned char *p;
99     int nchar;
100     char strbuf[32];
101     int (*cpyfunc)(unsigned long, void *) = NULL;
102     if(len == -1) len = strlen((const char *)in);
103     if(!mask) mask = DIRSTRING_TYPE;

105     /* First do a string check and work out the number of characters */
106     switch(inform) {

108         case MBSTRING_BMP:
109             if(len & 1) {
110                 ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY,
111                         ASN1_R_INVALID_BMPSTRING_LENGTH);
112                 return -1;
113             }
114             nchar = len >> 1;
115             break;

117         case MBSTRING_UNIV:
118             if(len & 3) {
119                 ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY,
120                         ASN1_R_INVALID_UNIVERSALSTRING_LENGTH);
121                 return -1;
122             }
123             nchar = len >> 2;
124             break;

126         case MBSTRING_UTF8:
127             nchar = 0;

```

```

128     /* This counts the characters and does utf8 syntax checking */
129     ret = traverse_string(in, len, MBSTRING_UTF8, in_utf8, &nchar);
130     if(ret < 0) {
131         ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY,
132                ASN1_R_INVALID_UTF8STRING);
133         return -1;
134     }
135     break;

137     case MBSTRING_ASC:
138         nchar = len;
139         break;

141     default:
142         ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY, ASN1_R_UNKNOWN_FORMAT);
143         return -1;
144 }

146 if((minsize > 0) && (nchar < minsize)) {
147     ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY, ASN1_R_STRING_TOO_SHORT);
148     BIO_snprintf(strbuf, sizeof strbuf, "%ld", minsize);
149     ERR_add_error_data(2, "minsize=", strbuf);
150     return -1;
151 }

153 if((maxsize > 0) && (nchar > maxsize)) {
154     ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY, ASN1_R_STRING_TOO_LONG);
155     BIO_snprintf(strbuf, sizeof strbuf, "%ld", maxsize);
156     ERR_add_error_data(2, "maxsize=", strbuf);
157     return -1;
158 }

160 /* Now work out minimal type (if any) */
161 if(traverse_string(in, len, inform, type_str, &mask) < 0) {
162     ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY, ASN1_R_ILLEGAL_CHARACTERS);
163     return -1;
164 }

167 /* Now work out output format and string type */
168 outform = MBSTRING_ASC;
169 if(mask & B_ASN1_PRINTABLESTRING) str_type = V_ASN1_PRINTABLESTRING;
170 else if(mask & B_ASN1_IA5STRING) str_type = V_ASN1_IA5STRING;
171 else if(mask & B_ASN1_T61STRING) str_type = V_ASN1_T61STRING;
172 else if(mask & B_ASN1_BMPSTRING) {
173     str_type = V_ASN1_BMPSTRING;
174     outform = MBSTRING_BMP;
175 } else if(mask & B_ASN1_UNIVERSALSTRING) {
176     str_type = V_ASN1_UNIVERSALSTRING;
177     outform = MBSTRING_UNIV;
178 } else {
179     str_type = V_ASN1_UTF8STRING;
180     outform = MBSTRING_UTF8;
181 }
182 if(!out) return str_type;
183 if(*out) {
184     free_out = 0;
185     dest = *out;
186     if(dest->data) {
187         dest->length = 0;
188         OPENSSL_free(dest->data);
189         dest->data = NULL;
190     }
191     dest->type = str_type;
192 } else {
193     free_out = 1;

```

```

194     dest = ASN1_STRING_type_new(str_type);
195     if(!dest) {
196         ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY,
197                ERR_R_MALLOC_FAILURE);
198         return -1;
199     }
200     *out = dest;
201 }
202 /* If both the same type just copy across */
203 if(inform == outform) {
204     if(!ASN1_STRING_set(dest, in, len)) {
205         ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY, ERR_R_MALLOC_FAILURE);
206         return -1;
207     }
208     return str_type;
209 }

211 /* Work out how much space the destination will need */
212 switch(outform) {
213     case MBSTRING_ASC:
214         outlen = nchar;
215         cpyfunc = cpy_asc;
216         break;

218     case MBSTRING_BMP:
219         outlen = nchar << 1;
220         cpyfunc = cpy_bmp;
221         break;

223     case MBSTRING_UNIV:
224         outlen = nchar << 2;
225         cpyfunc = cpy_univ;
226         break;

228     case MBSTRING_UTF8:
229         outlen = 0;
230         traverse_string(in, len, inform, out_utf8, &outlen);
231         cpyfunc = cpy_utf8;
232         break;
233 }
234 if(!(p = OPENSSL_malloc(outlen + 1))) {
235     if(free_out) ASN1_STRING_free(dest);
236     ASN1err(ASN1_F_ASN1_MBSTRING_NCOPY, ERR_R_MALLOC_FAILURE);
237     return -1;
238 }
239 dest->length = outlen;
240 dest->data = p;
241 p[outlen] = 0;
242 traverse_string(in, len, inform, cpyfunc, &p);
243 return str_type;
244 }

246 /* This function traverses a string and passes the value of each character
247    * to an optional function along with a void * argument.
248    */

250 static int traverse_string(const unsigned char *p, int len, int inform,
251                           int (*rfunc)(unsigned long value, void *in), void *arg)
252 {
253     unsigned long value;
254     int ret;
255     while(len) {
256         if(inform == MBSTRING_ASC) {
257             value = *p++;
258             len--;
259         } else if(inform == MBSTRING_BMP) {

```

```

260         value = *p++ << 8;
261         value |= *p++;
262         len -= 2;
263     } else if(inform == MBSTRING_UNIV) {
264         value = ((unsigned long)*p++) << 24;
265         value |= ((unsigned long)*p++) << 16;
266         value |= *p++ << 8;
267         value |= *p++;
268         len -= 4;
269     } else {
270         ret = UTF8_getc(p, len, &value);
271         if(ret < 0) return -1;
272         len -= ret;
273         p += ret;
274     }
275     if(rfunc) {
276         ret = rfunc(value, arg);
277         if(ret <= 0) return ret;
278     }
279 }
280 return 1;
281 }

283 /* Various utility functions for traverse_string */

285 /* Just count number of characters */

287 static int in_utf8(unsigned long value, void *arg)
288 {
289     int *nchar;
290     nchar = arg;
291     (*nchar)++;
292     return 1;
293 }

295 /* Determine size of output as a UTF8 String */

297 static int out_utf8(unsigned long value, void *arg)
298 {
299     int *outlen;
300     outlen = arg;
301     *outlen += UTF8_putc(NULL, -1, value);
302     return 1;
303 }

305 /* Determine the "type" of a string: check each character against a
306  * supplied "mask".
307  */

309 static int type_str(unsigned long value, void *arg)
310 {
311     unsigned long types;
312     types = *((unsigned long *)arg);
313     if((types & B_ASN1_PRINTABLESTRING) && !is_printable(value))
314         types &= ~B_ASN1_PRINTABLESTRING;
315     if((types & B_ASN1_IA5STRING) && (value > 127))
316         types &= ~B_ASN1_IA5STRING;
317     if((types & B_ASN1_T61STRING) && (value > 0xff))
318         types &= ~B_ASN1_T61STRING;
319     if((types & B_ASN1_BMPSTRING) && (value > 0xffff))
320         types &= ~B_ASN1_BMPSTRING;
321     if(!types) return -1;
322     *((unsigned long *)arg) = types;
323     return 1;
324 }

```

```

326 /* Copy one byte per character ASCII like strings */

328 static int cpy_asc(unsigned long value, void *arg)
329 {
330     unsigned char **p, *q;
331     p = arg;
332     q = *p;
333     *q = (unsigned char) value;
334     (*p)++;
335     return 1;
336 }

338 /* Copy two byte per character BMPStrings */

340 static int cpy_bmp(unsigned long value, void *arg)
341 {
342     unsigned char **p, *q;
343     p = arg;
344     q = *p;
345     *q++ = (unsigned char) ((value >> 8) & 0xff);
346     *q = (unsigned char) (value & 0xff);
347     *p += 2;
348     return 1;
349 }

351 /* Copy four byte per character UniversalStrings */

353 static int cpy_univ(unsigned long value, void *arg)
354 {
355     unsigned char **p, *q;
356     p = arg;
357     q = *p;
358     *q++ = (unsigned char) ((value >> 24) & 0xff);
359     *q++ = (unsigned char) ((value >> 16) & 0xff);
360     *q++ = (unsigned char) ((value >> 8) & 0xff);
361     *q = (unsigned char) (value & 0xff);
362     *p += 4;
363     return 1;
364 }

366 /* Copy to a UTF8String */

368 static int cpy_utf8(unsigned long value, void *arg)
369 {
370     unsigned char **p;
371     int ret;
372     p = arg;
373     /* We already know there is enough room so pass 0xff as the length */
374     ret = UTF8_putc(*p, 0xff, value);
375     *p += ret;
376     return 1;
377 }

379 /* Return 1 if the character is permitted in a PrintableString */
380 static int is_printable(unsigned long value)
381 {
382     int ch;
383     if(value > 0x7f) return 0;
384     ch = (int) value;
385     /* Note: we can't use 'isalnum' because certain accented
386      * characters may count as alphanumeric in some environments.
387      */
388     #ifndef CHARSET_EBCDIC
389     if((ch >= 'a') && (ch <= 'z')) return 1;
390     if((ch >= 'A') && (ch <= 'Z')) return 1;
391     if((ch >= '0') && (ch <= '9')) return 1;

```



```
392     if ((ch == ' ') || strchr("()+,-./:=?", ch)) return 1;
393 #else /*CHARSET_EBCDIC*/
394     if((ch >= os_toascii['a']) && (ch <= os_toascii['z'])) return 1;
395     if((ch >= os_toascii['A']) && (ch <= os_toascii['Z'])) return 1;
396     if((ch >= os_toascii['0']) && (ch <= os_toascii['9'])) return 1;
397     if ((ch == os_toascii[' ']) || strchr("()+,-./:=?", os_toebcdic[ch])) r
398 #endif /*CHARSET_EBCDIC*/
399     return 0;
400 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_object.c

1

```
*****
10073 Fri May 30 18:31:27 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_object.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/asn1/a_object.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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15 *
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18 * If this package is used in a product, Eric Young should be given attribution
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20 * This can be in the form of a textual message at program startup or
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22 *
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <limits.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_object.c

2

```
62 #include <openssl/buffer.h>
63 #include <openssl/asn1.h>
64 #include <openssl/objects.h>
65 #include <openssl/bn.h>

67 int i2d_ASN1_OBJECT(ASN1_OBJECT *a, unsigned char **pp)
68 {
69     unsigned char *p;
70     int objsize;

72     if ((a == NULL) || (a->data == NULL)) return(0);

74     objsize = ASN1_object_size(0,a->length,V_ASN1_OBJECT);
75     if (pp == NULL) return objsize;

77     p= *pp;
78     ASN1_put_object(&p,0,a->length,V_ASN1_OBJECT,V_ASN1_UNIVERSAL);
79     memcpy(p,a->data,a->length);
80     p+=a->length;

82     *pp=p;
83     return(objsize);
84 }

86 int a2d_ASN1_OBJECT(unsigned char *out, int olen, const char *buf, int num)
87 {
88     int i,first,len=0,c, use_bn;
89     char ftmp[24], *tmp = ftmp;
90     int tmpsize = sizeof ftmp;
91     const char *p;
92     unsigned long l;
93     BIGNUM *bl = NULL;

95     if (num == 0)
96         return(0);
97     else if (num == -1)
98         num=strlen(buf);

100     p=buf;
101     c= *(p++);
102     num--;
103     if ((c >= '0') && (c <= '2'))
104     {
105         first= c-'0';
106     }
107     else
108     {
109         ASN1err(ASN1_F_A2D_ASN1_OBJECT,ASN1_R_FIRST_NUM_TOO_LARGE);
110         goto err;
111     }

113     if (num <= 0)
114     {
115         ASN1err(ASN1_F_A2D_ASN1_OBJECT,ASN1_R_MISSING_SECOND_NUMBER);
116         goto err;
117     }
118     c= *(p++);
119     num--;
120     for (;;)
121     {
122         if (num <= 0) break;
123         if ((c != '.') && (c != ' '))
124         {
125             ASN1err(ASN1_F_A2D_ASN1_OBJECT,ASN1_R_INVALID_SEPARATOR);
126             goto err;
127         }
128     }
```

```

128     l=0;
129     use_bn = 0;
130     for (;;)
131     {
132         if (num <= 0) break;
133         num--;
134         c = *(p++);
135         if ((c == ' ' || (c == '.')))
136             break;
137         if ((c < '0') || (c > '9'))
138         {
139             ASN1err(ASN1_F_A2D_ASN1_OBJECT, ASN1_R_INVALID_DI
140             goto err;
141         }
142         if (!use_bn && l >= ((ULONG_MAX - 80) / 10L))
143         {
144             use_bn = 1;
145             if (!bl)
146                 bl = BN_new();
147             if (!bl || !BN_set_word(bl, l))
148                 goto err;
149         }
150         if (use_bn)
151         {
152             if (!BN_mul_word(bl, 10L)
153             || !BN_add_word(bl, c-'0'))
154                 goto err;
155         }
156         else
157             l=l*10L+(long)(c-'0');
158     }
159     if (len == 0)
160     {
161         if ((first < 2) && (l >= 40))
162         {
163             ASN1err(ASN1_F_A2D_ASN1_OBJECT, ASN1_R_SECOND_NUM
164             goto err;
165         }
166         if (use_bn)
167         {
168             if (!BN_add_word(bl, first * 40))
169                 goto err;
170         }
171         else
172             l+=(long)first*40;
173     }
174     i=0;
175     if (use_bn)
176     {
177         int blsize;
178         blsize = BN_num_bits(bl);
179         blsize = (blsize + 6)/7;
180         if (blsize > tmpsize)
181         {
182             if (tmp != ftmp)
183                 OPENSSL_free(tmp);
184             tmpsize = blsize + 32;
185             tmp = OPENSSL_malloc(tmpsize);
186             if (!tmp)
187                 goto err;
188         }
189         while(blsize--)
190             tmp[i++] = (unsigned char)BN_div_word(bl, 0x80L)
191     }
192     else
193     {

```

```

194     for (;;)
195     {
196         tmp[i++]=(unsigned char)l&0x7f;
197         l>>=7L;
198         if (l == 0L) break;
199     }
200     }
201     if (out != NULL)
202     {
203         if (len+i > olen)
204         {
205             ASN1err(ASN1_F_A2D_ASN1_OBJECT, ASN1_R_BUFFER_TOO
206             goto err;
207         }
208         while (--i > 0)
209             out[len++] = tmp[i] | 0x80;
210         out[len++] = tmp[0];
211     }
212     else
213         len+=i;
214     }
215     if (tmp != ftmp)
216         OPENSSL_free(tmp);
217     if (bl)
218         BN_free(bl);
219     return(len);
220 err:
221     if (tmp != ftmp)
222         OPENSSL_free(tmp);
223     if (bl)
224         BN_free(bl);
225     return(0);
226 }
227
228 int i2t_ASN1_OBJECT(char *buf, int buf_len, ASN1_OBJECT *a)
229 {
230     return OBJ_obj2txt(buf, buf_len, a, 0);
231 }
232
233 int i2a_ASN1_OBJECT(BIO *bp, ASN1_OBJECT *a)
234 {
235     char buf[80], *p = buf;
236     int i;
237
238     if ((a == NULL) || (a->data == NULL))
239         return(BIO_write(bp, "NULL", 4));
240     i=i2t_ASN1_OBJECT(buf, sizeof buf, a);
241     if (i > (int)(sizeof(buf) - 1))
242     {
243         p = OPENSSL_malloc(i + 1);
244         if (!p)
245             return -1;
246         i2t_ASN1_OBJECT(p, i + 1, a);
247     }
248     if (i <= 0)
249         return BIO_write(bp, "<INVALID>", 9);
250     BIO_write(bp, p, i);
251     if (p != buf)
252         OPENSSL_free(p);
253     return(i);
254 }
255
256 ASN1_OBJECT *d2i_ASN1_OBJECT(ASN1_OBJECT **a, const unsigned char **pp,
257 long length)

```

```

260 {
261     const unsigned char *p;
262     long len;
263     int tag, xclass;
264     int inf, i;
265     ASN1_OBJECT *ret = NULL;
266     p = *pp;
267     inf = ASN1_get_object(&p, &len, &tag, &xclass, length);
268     if (inf & 0x80)
269     {
270         i = ASN1_R_BAD_OBJECT_HEADER;
271         goto err;
272     }
273
274     if (tag != V_ASN1_OBJECT)
275     {
276         i = ASN1_R_EXPECTING_AN_OBJECT;
277         goto err;
278     }
279     ret = c2i_ASN1_OBJECT(a, &p, len);
280     if (ret) *pp = p;
281     return ret;
282 err:
283     ASN1err(ASN1_F_D2I_ASN1_OBJECT, i);
284     return(NULL);
285 }
286 ASN1_OBJECT *c2i_ASN1_OBJECT(ASN1_OBJECT **a, const unsigned char **pp,
287                               long len)
288 {
289     ASN1_OBJECT *ret = NULL;
290     const unsigned char *p;
291     unsigned char *data;
292     int i;
293     /* Sanity check OID encoding: can't have leading 0x80 in
294      * subidentifiers, see: X.690 8.19.2
295      */
296     for (i = 0, p = *pp; i < len; i++, p++)
297     {
298         if (*p == 0x80 && (!i || !(p[-1] & 0x80)))
299         {
300             ASN1err(ASN1_F_C2I_ASN1_OBJECT, ASN1_R_INVALID_OBJECT_ENC);
301             return NULL;
302         }
303     }
304
305     /* only the ASN1_OBJECTs from the 'table' will have values
306      * for ->sn or ->ln */
307     if ((a == NULL) || ((*a) == NULL) ||
308         !((a->flags & ASN1_OBJECT_FLAG_DYNAMIC)))
309     {
310         if ((ret = ASN1_OBJECT_new()) == NULL) return(NULL);
311     }
312     else
313         ret = (*a);
314
315     p = *pp;
316     /* detach data from object */
317     data = (unsigned char *)ret->data;
318     ret->data = NULL;
319     /* once detached we can change it */
320     if ((data == NULL) || (ret->length < len))
321     {
322         ret->length = 0;
323         if (data != NULL) OPENSSL_free(data);
324         data = (unsigned char *)OPENSSL_malloc(len ? (int)len : 1);
325         if (data == NULL)
326             { i = ERR_R_MALLOC_FAILURE; goto err; }

```

```

326         ret->flags |= ASN1_OBJECT_FLAG_DYNAMIC_DATA;
327     }
328     memcpy(data, p, (int)len);
329     /* reattach data to object, after which it remains const */
330     ret->data = data;
331     ret->length = (int)len;
332     ret->sn = NULL;
333     ret->ln = NULL;
334     /* ret->flags = ASN1_OBJECT_FLAG_DYNAMIC; we know it is dynamic */
335     p += len;
336
337     if (a != NULL) (*a) = ret;
338     *pp = p;
339     return(ret);
340 err:
341     ASN1err(ASN1_F_C2I_ASN1_OBJECT, i);
342     if ((ret != NULL) && ((a == NULL) || (*a != ret)))
343         ASN1_OBJECT_free(ret);
344     return(NULL);
345 }
346
347 ASN1_OBJECT *ASN1_OBJECT_new(void)
348 {
349     ASN1_OBJECT *ret;
350
351     ret = (ASN1_OBJECT *)OPENSSL_malloc(sizeof(ASN1_OBJECT));
352     if (ret == NULL)
353     {
354         ASN1err(ASN1_F_ASN1_OBJECT_NEW, ERR_R_MALLOC_FAILURE);
355         return(NULL);
356     }
357     ret->length = 0;
358     ret->data = NULL;
359     ret->nid = 0;
360     ret->sn = NULL;
361     ret->ln = NULL;
362     ret->flags = ASN1_OBJECT_FLAG_DYNAMIC;
363     return(ret);
364 }
365
366 void ASN1_OBJECT_free(ASN1_OBJECT *a)
367 {
368     if (a == NULL) return;
369     if (a->flags & ASN1_OBJECT_FLAG_DYNAMIC_STRINGS)
370     {
371         #ifndef CONST_STRICT /* disable purely for compile-time strict const checking. D
372             if (a->sn != NULL) OPENSSL_free((void *)a->sn);
373             if (a->ln != NULL) OPENSSL_free((void *)a->ln);
374         #endif
375         a->sn = a->ln = NULL;
376     }
377     if (a->flags & ASN1_OBJECT_FLAG_DYNAMIC_DATA)
378     {
379         if (a->data != NULL) OPENSSL_free((void *)a->data);
380         a->data = NULL;
381         a->length = 0;
382     }
383     if (a->flags & ASN1_OBJECT_FLAG_DYNAMIC)
384         OPENSSL_free(a);
385 }
386
387 ASN1_OBJECT *ASN1_OBJECT_create(int nid, unsigned char *data, int len,
388                                 const char *sn, const char *ln)
389 {
390     ASN1_OBJECT o;

```

```
392     o.sn=sn;
393     o.ln=ln;
394     o.data=data;
395     o.nid=nid;
396     o.length=len;
397     o.flags=ASN1_OBJECT_FLAG_DYNAMIC|ASN1_OBJECT_FLAG_DYNAMIC_STRINGS|
398             ASN1_OBJECT_FLAG_DYNAMIC_DATA;
399     return(OBJ_dup(&o));
400 }

402 IMPLEMENT_STACK_OF(ASN1_OBJECT)
403 IMPLEMENT_ASN1_SET_OF(ASN1_OBJECT)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_octet.c

1

3629 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_octet.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/a_octet.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
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34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_octet.c

2

```
63 ASN1_OCTET_STRING *ASN1_OCTET_STRING_dup(const ASN1_OCTET_STRING *x)
64 { return M_ASN1_OCTET_STRING_dup(x); }

66 int ASN1_OCTET_STRING_cmp(const ASN1_OCTET_STRING *a, const ASN1_OCTET_STRING *b)
67 { return M_ASN1_OCTET_STRING_cmp(a, b); }

69 int ASN1_OCTET_STRING_set(ASN1_OCTET_STRING *x, const unsigned char *d, int len)
70 { return M_ASN1_OCTET_STRING_set(x, d, len); }
```

4598 Fri May 30 18:31:28 2014
 new/usr/src/lib/openssl/libsunw_crypto/asn1/a_print.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/asn1/a_print.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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31 * 3. All advertising materials mentioning features or use of this software
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>

```

```

63 int ASN1_PRINTABLE_type(const unsigned char *s, int len)
64 {
65     int c;
66     int ia5=0;
67     int t61=0;
68
69     if (len <= 0) len= -1;
70     if (s == NULL) return(V_ASN1_PRINTABLESTRING);
71
72     while ((*s) && (len-- != 0))
73     {
74         c = *(s++);
75 #ifndef CHARSET_EBCDIC
76         if (!((c >= 'a') && (c <= 'z')) ||
77             ((c >= 'A') && (c <= 'Z')) ||
78             (c == ' ') ||
79             ((c >= '0') && (c <= '9')) ||
80             (c == '\') || (c == '\') ||
81             (c == '(') || (c == ')') ||
82             (c == '+') || (c == '-') ||
83             (c == '/') || (c == ':') ||
84             (c == '=') || (c == '?'))
85             ia5=1;
86         if (c < 0x80)
87             t61=1;
88 #else
89         if (!isalnum(c) && (c != ' ') &&
90             strchr("()+,./:=?", c) == NULL)
91             ia5=1;
92         if (os_toascii[c] & 0x80)
93             t61=1;
94 #endif
95     }
96     if (t61) return(V_ASN1_T61STRING);
97     if (ia5) return(V_ASN1_IA5STRING);
98     return(V_ASN1_PRINTABLESTRING);
99 }
100
102 int ASN1_UNIVERSALSTRING_to_string(ASN1_UNIVERSALSTRING *s)
103 {
104     int i;
105     unsigned char *p;
106
107     if (s->type != V_ASN1_UNIVERSALSTRING) return(0);
108     if ((s->length%4) != 0) return(0);
109     p=s->data;
110     for (i=0; i<s->length; i+=4)
111     {
112         if ((p[0] != '\0') || (p[1] != '\0') || (p[2] != '\0'))
113             break;
114         else
115             p+=4;
116     }
117     if (i < s->length) return(0);
118     p=s->data;
119     for (i=3; i<s->length; i+=4)
120     {
121         (p++)=s->data[i];
122     }
123     *(p)='\0';
124     s->length/=4;
125     s->type=ASN1_PRINTABLE_type(s->data,s->length);
126     return(1);
127 }

```



```

*****
7735 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_set.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1_mac.h>

```

```

63 #ifndef NO_ASN1_OLD
64
65 typedef struct
66 {
67     unsigned char *pbData;
68     int cbData;
69 } MYBLOB;
70
71 /* SetBlobCmp
72  * This function compares two elements of SET_OF block
73  */
74 static int SetBlobCmp(const void *elem1, const void *elem2 )
75 {
76     const MYBLOB *b1 = (const MYBLOB *)elem1;
77     const MYBLOB *b2 = (const MYBLOB *)elem2;
78     int r;
79
80     r = memcmp(b1->pbData, b2->pbData,
81               b1->cbData < b2->cbData ? b1->cbData : b2->cbData);
82     if(r != 0)
83         return r;
84     return b1->cbData-b2->cbData;
85 }
86
87 /* int is_set: if TRUE, then sort the contents (i.e. it isn't a SEQUENCE) */
88 int i2d_ASN1_SET(STACK_OF(OPENSSSL_BLOCK) *a, unsigned char **pp,
89                 i2d_of_void *i2d, int ex_tag, int ex_class,
90                 int is_set)
91 {
92     int ret=0,r;
93     int i;
94     unsigned char *p;
95     unsigned char *pStart, *pTempMem;
96     MYBLOB *rgSetBlob;
97     int totSize;
98
99     if (a == NULL) return(0);
100     for (i=sk_OPENSSL_BLOCK_num(a)-1; i>=0; i--)
101         ret+=i2d(sk_OPENSSL_BLOCK_value(a,i),NULL);
102     r=ASN1_object_size(1,ret,ex_tag);
103     if (pp == NULL) return(r);
104
105     p= *pp;
106     ASN1_put_object(&p,1,ret,ex_tag,ex_class);
107
108     /* Modified by gp@nsj.co.jp */
109     /* And then again by Ben */
110     /* And again by Steve */
111
112     if(!is_set || (sk_OPENSSL_BLOCK_num(a) < 2))
113     {
114         for (i=0; i<sk_OPENSSL_BLOCK_num(a); i++)
115             i2d(sk_OPENSSL_BLOCK_value(a,i),&p);
116
117         *pp=p;
118         return(r);
119     }
120
121     pStart = p; /* Catch the beg of Setblobs*/
122     /* In this array we will store the SET blobs */
123     rgSetBlob = OPENSSL_malloc(sk_OPENSSL_BLOCK_num(a) * sizeof(MYBLOB)
124                               if (rgSetBlob == NULL)
125     {
126         ASN1err(ASN1_F_I2D_ASN1_SET,ERR_R_MALLOC_FAILURE);
127         return(0);

```

```

128         }
129     }
130     for (i=0; i<sk_OPENSSL_BLOCK_num(a); i++)
131     {
132         rgSetBlob[i].pbData = p; /* catch each set encode blob */
133         i2d(sk_OPENSSL_BLOCK_value(a,i),&p);
134         rgSetBlob[i].cbData = p - rgSetBlob[i].pbData; /* Length of this
135     SetBlob
136     */
137     }
138     *pp=p;
139     totSize = p - pStart; /* This is the total size of all set blobs */

141 /* Now we have to sort the blobs. I am using a simple algo.
142 *Sort ptrs *Copy to temp-mem *Copy from temp-mem to user-mem*/
143 qsort( rgSetBlob, sk_OPENSSL_BLOCK_num(a), sizeof(MYBLOB), SetBlobCmp);
144 if (!(pTempMem = OPENSSL_malloc(totSize)))
145 {
146     ASN1err(ASN1_F_I2D_ASN1_SET,ERR_R_MALLOC_FAILURE);
147     return(0);
148 }

150 /* Copy to temp mem */
151 p = pTempMem;
152 for(i=0; i<sk_OPENSSL_BLOCK_num(a); ++i)
153 {
154     memcpy(p, rgSetBlob[i].pbData, rgSetBlob[i].cbData);
155     p += rgSetBlob[i].cbData;
156 }

158 /* Copy back to user mem*/
159 memcpy(pStart, pTempMem, totSize);
160 OPENSSL_free(pTempMem);
161 OPENSSL_free(rgSetBlob);

163     return(r);
164 }

166 STACK_OF(OPENSLL_BLOCK) *d2i_ASN1_SET(STACK_OF(OPENSLL_BLOCK) **a,
167     const unsigned char **pp,
168     long length, d2i_of_void *d2i,
169     void (*free_func)(OPENSLL_BLOCK), int ex_tag,
170     int ex_class)
171 {
172     ASN1_const_CTX c;
173     STACK_OF(OPENSLL_BLOCK) *ret=NULL;

175     if ((a == NULL) || ((*a) == NULL))
176     {
177         if ((ret=sk_OPENSSL_BLOCK_new_null()) == NULL)
178         {
179             ASN1err(ASN1_F_D2I_ASN1_SET,ERR_R_MALLOC_FAILURE);
180             goto err;
181         }
182     }
183     else
184         ret=(*a);

186     c.p= *pp;
187     c.max=(length == 0)?0:(c.p+length);

189     c.inf=ASN1_get_object(&c.p,&c.slen,&c.tag,&c.xclass,c.max-c.p);
190     if (c.inf & 0x80) goto err;
191     if (ex_class != c.xclass)
192     {
193         ASN1err(ASN1_F_D2I_ASN1_SET,ASN1_R_BAD_CLASS);

```

```

194         goto err;
195     }
196     if (ex_tag != c.tag)
197     {
198         ASN1err(ASN1_F_D2I_ASN1_SET,ASN1_R_BAD_TAG);
199         goto err;
200     }
201     if ((c.slen+c.p) > c.max)
202     {
203         ASN1err(ASN1_F_D2I_ASN1_SET,ASN1_R_LENGTH_ERROR);
204         goto err;
205     }
206     /* check for infinite constructed - it can be as long
207     * as the amount of data passed to us */
208     if (c.inf == (V_ASN1_CONSTRUCTED+1))
209         c.slen=length+ *pp-c.p;
210     c.max=c.p+c.slen;

212     while (c.p < c.max)
213     {
214         char *s;

216         if (M_ASN1_D2I_end_sequence()) break;
217         /* XXX: This was called with 4 arguments, incorrectly, it seems
218         * if ((s=func(NULL,&c.p,c.slen,c.max-c.p)) == NULL) */
219         if ((s=d2i(NULL,&c.p,c.slen)) == NULL)
220         {
221             ASN1err(ASN1_F_D2I_ASN1_SET,ASN1_R_ERROR_PARSING_SET_ELE
222             asn1_add_error(*pp,(int)(c.p- *pp));
223             goto err;
224         }
225         if (!sk_OPENSSL_BLOCK_push(ret,s)) goto err;
226     }
227     if (a != NULL) (*a)=ret;
228     *pp=c.p;
229     return(ret);
230 err:
231     if ((ret != NULL) && ((a == NULL) || (*a != ret)))
232     {
233         if (free_func != NULL)
234             sk_OPENSSL_BLOCK_pop_free(ret,free_func);
235         else
236             sk_OPENSSL_BLOCK_free(ret);
237     }
238     return(NULL);
239 }

241 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_sign.c

1

```
*****
11424 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_sign.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_sign.c

2

```
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109 *
110 */
111
112 #include <stdio.h>
113 #include <time.h>
114
115 #include "cryptlib.h"
116
117 #ifndef NO_SYS_TYPES_H
118 # include <sys/types.h>
119 #endif
120
121 #include <openssl/bn.h>
122 #include <openssl/evp.h>
123 #include <openssl/x509.h>
124 #include <openssl/objects.h>
125 #include <openssl/buffer.h>
126 #include "asn1_locl.h"
```

```

128 #ifndef NO_ASN1_OLD
130 int ASN1_sign(i2d_of_void *i2d, X509_ALGOR *algor1, X509_ALGOR *algor2,
131              ASN1_BIT_STRING *signature, char *data, EVP_PKEY *pkey,
132              const EVP_MD *type)
133 {
134     EVP_MD_CTX ctx;
135     unsigned char *p,*buf_in=NULL,*buf_out=NULL;
136     int i,inl=0,outl=0,outll=0;
137     X509_ALGOR *a;
138
139     EVP_MD_CTX_init(&ctx);
140     for (i=0; i<2; i++)
141     {
142         if (i == 0)
143             a=algor1;
144         else
145             a=algor2;
146         if (a == NULL) continue;
147         if (type->pkey_type == NID_dsaWithSHA1)
148         {
149             /* special case: RFC 2459 tells us to omit 'parameters'
150              * with id-dsa-with-sha1 */
151             ASN1_TYPE_free(a->parameter);
152             a->parameter = NULL;
153         }
154         else if ((a->parameter == NULL) ||
155                  (a->parameter->type != V_ASN1_NULL))
156         {
157             ASN1_TYPE_free(a->parameter);
158             if ((a->parameter=ASN1_TYPE_new()) == NULL) goto err;
159             a->parameter->type=V_ASN1_NULL;
160         }
161         ASN1_OBJECT_free(a->algorithm);
162         a->algorithm=OBJ_nid2obj(type->pkey_type);
163         if (a->algorithm == NULL)
164         {
165             ASN1err(ASN1_F_ASN1_SIGN,ASN1_R_UNKNOWN_OBJECT_TYPE);
166             goto err;
167         }
168         if (a->algorithm->length == 0)
169         {
170             ASN1err(ASN1_F_ASN1_SIGN,ASN1_R_THE_ASN1_OBJECT_IDENTIFI
171             goto err;
172         }
173     }
174     inl=i2d(data,NULL);
175     buf_in=(unsigned char *)OPENSSL_malloc((unsigned int)inl);
176     outll=outl=EVP_PKEY_size(pkey);
177     buf_out=(unsigned char *)OPENSSL_malloc((unsigned int)outll);
178     if ((buf_in == NULL) || (buf_out == NULL))
179     {
180         outl=0;
181         ASN1err(ASN1_F_ASN1_SIGN,ERR_R_MALLOC_FAILURE);
182         goto err;
183     }
184     p=buf_in;
185
186     i2d(data,&p);
187     if (!EVP_SignInit_ex(&ctx,type, NULL)
188         || !EVP_SignUpdate(&ctx,(unsigned char *)buf_in,inl)
189         || !EVP_SignFinal(&ctx,(unsigned char *)buf_out,
190                          (unsigned int *)&outl,pkey))
191     {
192         outl=0;
193         ASN1err(ASN1_F_ASN1_SIGN,ERR_R_EVP_LIB);

```

```

194         goto err;
195     }
196     if (signature->data != NULL) OPENSSL_free(signature->data);
197     signature->data=buf_out;
198     buf_out=NULL;
199     signature->length=outl;
200     /* In the interests of compatibility, I'll make sure that
201      * the bit string has a 'not-used bits' value of 0
202      */
203     signature->flags&= ~(ASN1_STRING_FLAG_BITS_LEFT|0x07);
204     signature->flags|=ASN1_STRING_FLAG_BITS_LEFT;
205 err:
206     EVP_MD_CTX_cleanup(&ctx);
207     if (buf_in != NULL)
208     { OPENSSL_cleanse((char *)buf_in,(unsigned int)inl); OPENSSL_fre
209     if (buf_out != NULL)
210     { OPENSSL_cleanse((char *)buf_out,outll); OPENSSL_free(buf_out);
211     return(outl);
212     }
213
214 #endif
215
216 int ASN1_item_sign(const ASN1_ITEM *it, X509_ALGOR *algor1, X509_ALGOR *algor2,
217                  ASN1_BIT_STRING *signature, void *asn, EVP_PKEY *pkey,
218                  const EVP_MD *type)
219 {
220     EVP_MD_CTX ctx;
221     EVP_MD_CTX_init(&ctx);
222     if (!EVP_DigestSignInit(&ctx, NULL, type, NULL, pkey))
223     {
224         EVP_MD_CTX_cleanup(&ctx);
225         return 0;
226     }
227     return ASN1_item_sign_ctx(it, algor1, algor2, signature, asn, &ctx);
228 }
229
230 int ASN1_item_sign_ctx(const ASN1_ITEM *it,
231                       X509_ALGOR *algor1, X509_ALGOR *algor2,
232                       ASN1_BIT_STRING *signature, void *asn, EVP_MD_CTX *ctx)
233 {
234     const EVP_MD *type;
235     EVP_PKEY *pkey;
236     unsigned char *buf_in=NULL,*buf_out=NULL;
237     size_t inl=0,outl=0,outll=0;
238     int signid, paramtype;
239     int rv;
240
241     type = EVP_MD_CTX_md(ctx);
242     pkey = EVP_PKEY_CTX_get0_pkey(ctx->pctx);
243
244     if (!type || !pkey)
245     {
246         ASN1err(ASN1_F_ASN1_ITEM_SIGN_CTX, ASN1_R_CONTEXT_NOT_INITIALISE
247         return 0;
248     }
249
250     if (pkey->ameth->item_sign)
251     {
252         rv = pkey->ameth->item_sign(ctx, it, asn, algor1, algor2,
253                                     signature);
254         if (rv == 1)
255             outl = signature->length;
256         /* Return value meanings:
257          * <=0: error.
258          * 1: method does everything.

```

```

260      * 2: carry on as normal.
261      * 3: ASN1 method sets algorithm identifiers: just sign.
262      */
263      if (rv <= 0)
264          ASN1err(ASN1_F_ASN1_ITEM_SIGN_CTX, ERR_R_EVP_LIB);
265      if (rv <= 1)
266          goto err;
267      }
268  else
269      rv = 2;

271  if (rv == 2)
272      {
273          if (type->flags & EVP_MD_FLAG_PKEY_METHOD_SIGNATURE)
274              {
275                  if (!pkey->ameth ||
276                      !OBJ_find_sigid_by_algs(&signid,
277                                             EVP_MD_nid(type),
278                                             pkey->ameth->pkey_id))
279                      {
280                          ASN1err(ASN1_F_ASN1_ITEM_SIGN_CTX,
281                                  ASN1_R_DIGEST_AND_KEY_TYPE_NOT_SUPPORTED);
282                          return 0;
283                      }
284              }
285          else
286              signid = type->pkey_type;

288          if (pkey->ameth->pkey_flags & ASN1_PKEY_SIGPARAM_NULL)
289              paramtype = V_ASN1_NULL;
290          else
291              paramtype = V_ASN1_UNDEF;

293          if (algor1)
294              X509_ALGOR_set0(algor1, OBJ_nid2obj(signid), paramtype,
295                              if (algor2)
296                                  X509_ALGOR_set0(algor2, OBJ_nid2obj(signid), paramtype,

298              }

300      inl=ASN1_item_i2d(asn,&buf_in, it);
301      outll=outl=EVP_PKEY_size(pkey);
302      buf_out=OPENSSL_malloc((unsigned int)outll);
303      if ((buf_in == NULL) || (buf_out == NULL))
304          {
305              outl=0;
306              ASN1err(ASN1_F_ASN1_ITEM_SIGN_CTX,ERR_R_MALLOC_FAILURE);
307              goto err;
308          }

310      if (!EVP_DigestSignUpdate(ctx, buf_in, inl)
311          || !EVP_DigestSignFinal(ctx, buf_out, &outl))
312          {
313              outl=0;
314              ASN1err(ASN1_F_ASN1_ITEM_SIGN_CTX,ERR_R_EVP_LIB);
315              goto err;
316          }

317      if (signature->data != NULL) OPENSSL_free(signature->data);
318      signature->data=buf_out;
319      buf_out=NULL;
320      signature->length=outl;
321      /* In the interests of compatibility, I'll make sure that
322       * the bit string has a 'not-used bits' value of 0
323       */
324      signature->flags&= ~(ASN1_STRING_FLAG_BITS_LEFT|0x07);
325      signature->flags|=ASN1_STRING_FLAG_BITS_LEFT;

```

```

326  err:
327      EVP_MD_CTX_cleanup(ctx);
328      if (buf_in != NULL)
329          { OPENSSL_cleanse((char *)buf_in,(unsigned int)inl); OPENSSL_free
330      if (buf_out != NULL)
331          { OPENSSL_cleanse((char *)buf_out,outll); OPENSSL_free(buf_out);
332      return(outl);
333      }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_strex.c

1

```
*****
15846 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_strex.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* a_strex.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
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49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include <string.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_strex.c

2

```
62 #include <openssl/crypto.h>
63 #include <openssl/x509.h>
64 #include <openssl/asn1.h>
65
66 #include "charmap.h"
67
68 /* ASN1_STRING_print_ex() and X509_NAME_print_ex().
69  * Enhanced string and name printing routines handling
70  * multibyte characters, RFC2253 and a host of other
71  * options.
72  */
73
74 #define CHARTYPE_BS_ESC (ASN1_STRFLGS_ESC_2253 | CHARTYPE_FIRST_ESC_2253)
75
76 #define ESC_FLAGS (ASN1_STRFLGS_ESC_2253 | \
77                  ASN1_STRFLGS_ESC_QUOTE | \
78                  ASN1_STRFLGS_ESC_CTRL | \
79                  ASN1_STRFLGS_ESC_MSB)
80
81 /* Three IO functions for sending data to memory, a BIO and
82  * and a FILE pointer.
83  */
84
85 #if 0 /* never used */
86 static int send_mem_chars(void *arg, const void *buf, int len)
87 {
88     unsigned char **out = arg;
89     if(!out) return 1;
90     memcpy(out, buf, len);
91     *out += len;
92     return 1;
93 }
94 #endif
95
96 static int send_bio_chars(void *arg, const void *buf, int len)
97 {
98     if(!arg) return 1;
99     if(BIO_write(arg, buf, len) != len) return 0;
100     return 1;
101 }
102
103 static int send_fp_chars(void *arg, const void *buf, int len)
104 {
105     if(!arg) return 1;
106     if(fwrite(buf, 1, len, arg) != (unsigned int)len) return 0;
107     return 1;
108 }
109
110 typedef int char_io(void *arg, const void *buf, int len);
111
112 /* This function handles display of
113  * strings, one character at a time.
114  * It is passed an unsigned long for each
115  * character because it could come from 2 or even
116  * 4 byte forms.
117  */
118
119 static int do_esc_char(unsigned long c, unsigned char flags, char *do_quotes, ch
120 {
121     unsigned char chflgs, chtmp;
122     char tmphex[HEX_SIZE(long)+3];
123
124     if(c > 0xffffffffL)
125         return -1;
126     if(c > 0xffff) {

```

```

128     BIO_snprintf(tmphex, sizeof tmphex, "\\w%08lx", c);
129     if(!io_ch(arg, tmphex, 10)) return -1;
130     return 10;
131 }
132 if(c > 0xff) {
133     BIO_snprintf(tmphex, sizeof tmphex, "\\U%04lx", c);
134     if(!io_ch(arg, tmphex, 6)) return -1;
135     return 6;
136 }
137 chtmp = (unsigned char)c;
138 if(chtmp > 0x7f) chflgs = flags & ASN1_STRFLGS_ESC_MSB;
139 else chflgs = char_type[ chtmp ] & flags;
140 if(chflgs & CHARTYPE_BS_ESC) {
141     /* If we don't escape with quotes, signal we need quotes */
142     if(chflgs & ASN1_STRFLGS_ESC_QUOTE) {
143         if(do_quotes) *do_quotes = 1;
144         if(!io_ch(arg, &chtmp, 1)) return -1;
145         return 1;
146     }
147     if(!io_ch(arg, "\\ ", 1)) return -1;
148     if(!io_ch(arg, &chtmp, 1)) return -1;
149     return 2;
150 }
151 if(chflgs & (ASN1_STRFLGS_ESC_CTRL|ASN1_STRFLGS_ESC_MSB)) {
152     BIO_snprintf(tmphex, 11, "\\%02X", chtmp);
153     if(!io_ch(arg, tmphex, 3)) return -1;
154     return 3;
155 }
156 /* If we get this far and do any escaping at all must escape
157  * the escape character itself: backslash.
158  */
159 if (chtmp == '\\' && flags & ESC_FLAGS) {
160     if(!io_ch(arg, "\\ ", 2)) return -1;
161     return 2;
162 }
163 if(!io_ch(arg, &chtmp, 1)) return -1;
164 return 1;
165 }

167 #define BUF_TYPE_WIDTH_MASK    0x7
168 #define BUF_TYPE_CONVUTF8      0x8

170 /* This function sends each character in a buffer to
171  * do_esc_char(). It interprets the content formats
172  * and converts to or from UTF8 as appropriate.
173  */

175 static int do_buf(unsigned char *buf, int buflen,
176                  int type, unsigned char flags, char *quotes, char_io *io)
177 {
178     int i, outlen, len;
179     unsigned char orflags, *p, *q;
180     unsigned long c;
181     p = buf;
182     q = buf + buflen;
183     outlen = 0;
184     while(p != q) {
185         if(p == buf && flags & ASN1_STRFLGS_ESC_2253) orflags = CHARTYPE_
186         else orflags = 0;
187         switch(type & BUF_TYPE_WIDTH_MASK) {
188             case 4:
189                 c = ((unsigned long)*p++) << 24;
190                 c |= ((unsigned long)*p++) << 16;
191                 c |= ((unsigned long)*p++) << 8;
192                 c |= *p++;
193                 break;

```

```

195         case 2:
196             c = ((unsigned long)*p++) << 8;
197             c |= *p++;
198             break;

200         case 1:
201             c = *p++;
202             break;

203         case 0:
204             i = UTF8_getc(p, buflen, &c);
205             if(i < 0) return -1; /* Invalid UTF8String */
206             p += i;
207             break;
208         default:
209             return -1; /* invalid width */
210     }
211     if (p == q && flags & ASN1_STRFLGS_ESC_2253) orflags = CHARTYPE_
212     if(type & BUF_TYPE_CONVUTF8) {
213         unsigned char utfbuf[6];
214         int utflen;
215         utflen = UTF8_putc(utfbuf, sizeof utfbuf, c);
216         for(i = 0; i < utflen; i++) {
217             /* We don't need to worry about setting orflags
218              * because if utflen==1 its value will be correct
219              * otherwise each character will be > 0x7f and s
220              * character will never be escaped on first and
221              */
222             len = do_esc_char(utfbuf[i], (unsigned char)(flags | orflags), q
223             if(len < 0) return -1;
224             outlen += len;
225         }
226     } else {
227         len = do_esc_char(c, (unsigned char)(flags | orflags), q
228         if(len < 0) return -1;
229         outlen += len;
230     }
231 }
232 return outlen;
233 }
234 }

236 /* This function hex dumps a buffer of characters */

238 static int do_hex_dump(char_io *io_ch, void *arg, unsigned char *buf, int buflen)
239 {
240     static const char hexdig[] = "0123456789ABCDEF";
241     unsigned char *p, *q;
242     char hextmp[2];
243     if(arg) {
244         p = buf;
245         q = buf + buflen;
246         while(p != q) {
247             hextmp[0] = hexdig[*p >> 4];
248             hextmp[1] = hexdig[*p & 0xf];
249             if(!io_ch(arg, hextmp, 2)) return -1;
250             p++;
251         }
252     }
253     return buflen << 1;
254 }

256 /* "dump" a string. This is done when the type is unknown,
257  * or the flags request it. We can either dump the content
258  * octets or the entire DER encoding. This uses the RFC2253
259  * #01234 format.

```

```

260 */
262 static int do_dump(unsigned long lflags, char_io *io_ch, void *arg, ASN1_STRING
263 {
264     /* Placing the ASN1_STRING in a temp ASN1_TYPE allows
265      * the DER encoding to readily obtained
266      */
267     ASN1_TYPE t;
268     unsigned char *der_buf, *p;
269     int outlen, der_len;
271     if(!io_ch(arg, "#", 1)) return -1;
272     /* If we don't dump DER encoding just dump content octets */
273     if(!(lflags & ASN1_STRFLGS_DUMP_DER)) {
274         outlen = do_hex_dump(io_ch, arg, str->data, str->length);
275         if(outlen < 0) return -1;
276         return outlen + 1;
277     }
278     t.type = str->type;
279     t.value.ptr = (char *)str;
280     der_len = i2d_ASN1_TYPE(&t, NULL);
281     der_buf = OPENSSL_malloc(der_len);
282     if(!der_buf) return -1;
283     p = der_buf;
284     i2d_ASN1_TYPE(&t, &p);
285     outlen = do_hex_dump(io_ch, arg, der_buf, der_len);
286     OPENSSL_free(der_buf);
287     if(outlen < 0) return -1;
288     return outlen + 1;
289 }
291 /* Lookup table to convert tags to character widths,
292  * 0 = UTF8 encoded, -1 is used for non string types
293  * otherwise it is the number of bytes per character
294  */
296 static const signed char tag2nbyte[] = {
297     -1, -1, -1, -1, -1, /* 0-4 */
298     -1, -1, -1, -1, -1, /* 5-9 */
299     -1, -1, 0, -1, /* 10-13 */
300     -1, -1, -1, -1, /* 15-17 */
301     -1, 1, 1, /* 18-20 */
302     -1, 1, 1, 1, /* 21-24 */
303     -1, 1, -1, /* 25-27 */
304     4, -1, 2, /* 28-30 */
305 };
307 /* This is the main function, print out an
308  * ASN1_STRING taking note of various escape
309  * and display options. Returns number of
310  * characters written or -1 if an error
311  * occurred.
312  */
314 static int do_print_ex(char_io *io_ch, void *arg, unsigned long lflags, ASN1_STR
315 {
316     int outlen, len;
317     int type;
318     char quotes;
319     unsigned char flags;
320     quotes = 0;
321     /* Keep a copy of escape flags */
322     flags = (unsigned char)(lflags & ESC_FLAGS);
324     type = str->type;

```

```

326     outlen = 0;
329     if(lflags & ASN1_STRFLGS_SHOW_TYPE) {
330         const char *tagname;
331         tagname = ASN1_tag2str(type);
332         outlen += strlen(tagname);
333         if(!io_ch(arg, tagname, outlen) || !io_ch(arg, ":", 1)) return -
334         outlen++;
335     }
337     /* Decide what to do with type, either dump content or display it */
339     /* Dump everything */
340     if(lflags & ASN1_STRFLGS_DUMP_ALL) type = -1;
341     /* Ignore the string type */
342     else if(lflags & ASN1_STRFLGS_IGNORE_TYPE) type = 1;
343     else {
344         /* Else determine width based on type */
345         if((type > 0) && (type < 31)) type = tag2nbyte[type];
346         else type = -1;
347         if((type == -1) && !(lflags & ASN1_STRFLGS_DUMP_UNKNOWN)) type =
348     }
350     if(type == -1) {
351         len = do_dump(lflags, io_ch, arg, str);
352         if(len < 0) return -1;
353         outlen += len;
354         return outlen;
355     }
357     if(lflags & ASN1_STRFLGS_UTF8_CONVERT) {
358         /* Note: if string is UTF8 and we want
359          * to convert to UTF8 then we just interpret
360          * it as 1 byte per character to avoid converting
361          * twice.
362          */
363         if(!type) type = 1;
364         else type |= BUF_TYPE_CONVUTF8;
365     }
367     len = do_buf(str->data, str->length, type, flags, &quotes, io_ch, NULL);
368     if(len < 0) return -1;
369     outlen += len;
370     if(quotes) outlen += 2;
371     if(!arg) return outlen;
372     if(quotes && !io_ch(arg, "\"", 1)) return -1;
373     if(do_buf(str->data, str->length, type, flags, NULL, io_ch, arg) < 0)
374         return -1;
375     if(quotes && !io_ch(arg, "\"", 1)) return -1;
376     return outlen;
377 }
379 /* Used for line indenting: print 'indent' spaces */
381 static int do_indent(char_io *io_ch, void *arg, int indent)
382 {
383     int i;
384     for(i = 0; i < indent; i++)
385         if(!io_ch(arg, " ", 1)) return 0;
386     return 1;
387 }
389 #define FN_WIDTH_LN 25
390 #define FN_WIDTH_SN 10

```



```

392 static int do_name_ex(char_io *io_ch, void *arg, X509_NAME *n,
393                      int indent, unsigned long flags)
394 {
395     int i, prev = -1, orflags, cnt;
396     int fn_opt, fn_nid;
397     ASN1_OBJECT *fn;
398     ASN1_STRING *val;
399     X509_NAME_ENTRY *ent;
400     char objtmp[80];
401     const char *objbuf;
402     int outlen, len;
403     char *sep_dn, *sep_mv, *sep_eq;
404     int sep_dn_len, sep_mv_len, sep_eq_len;
405     if(indent < 0) indent = 0;
406     outlen = indent;
407     if(!do_indent(io_ch, arg, indent)) return -1;
408     switch (flags & XN_FLAG_SEP_MASK)
409     {
410         case XN_FLAG_SEP_MULTILINE:
411             sep_dn = "\n";
412             sep_dn_len = 1;
413             sep_mv = " + ";
414             sep_mv_len = 3;
415             break;
416
417         case XN_FLAG_SEP_COMMA_PLUS:
418             sep_dn = ",";
419             sep_dn_len = 1;
420             sep_mv = "+";
421             sep_mv_len = 1;
422             indent = 0;
423             break;
424
425         case XN_FLAG_SEP_CPLUS_SPC:
426             sep_dn = ", ";
427             sep_dn_len = 2;
428             sep_mv = " + ";
429             sep_mv_len = 3;
430             indent = 0;
431             break;
432
433         case XN_FLAG_SEP_SPLUS_SPC:
434             sep_dn = ", ";
435             sep_dn_len = 2;
436             sep_mv = " + ";
437             sep_mv_len = 3;
438             indent = 0;
439             break;
440
441         default:
442             return -1;
443     }
444
445     if(flags & XN_FLAG_SPC_EQ) {
446         sep_eq = " = ";
447         sep_eq_len = 3;
448     } else {
449         sep_eq = "=";
450         sep_eq_len = 1;
451     }
452
453     fn_opt = flags & XN_FLAG_FN_MASK;
454
455     cnt = X509_NAME_entry_count(n);
456     for(i = 0; i < cnt; i++) {
457         if(flags & XN_FLAG_DN_REV)

```

```

458         ent = X509_NAME_get_entry(n, cnt - i - 1);
459     else ent = X509_NAME_get_entry(n, i);
460     if(prev != -1) {
461         if(prev == ent->set) {
462             if(!io_ch(arg, sep_mv, sep_mv_len)) return -1;
463             outlen += sep_mv_len;
464         } else {
465             if(!io_ch(arg, sep_dn, sep_dn_len)) return -1;
466             outlen += sep_dn_len;
467             if(!do_indent(io_ch, arg, indent)) return -1;
468             outlen += indent;
469         }
470     }
471     prev = ent->set;
472     fn = X509_NAME_ENTRY_get_object(ent);
473     val = X509_NAME_ENTRY_get_data(ent);
474     fn_nid = OBJ_obj2nid(fn);
475     if(fn_opt != XN_FLAG_FN_NONE) {
476         int objlen, fld_len;
477         if((fn_opt == XN_FLAG_FN_OID) || (fn_nid == NID_undef)) {
478             OBJ_obj2txt(objtmp, sizeof objtmp, fn, 1);
479             fld_len = 0; /* XXX: what should this be? */
480             objbuf = objtmp;
481         } else {
482             if(fn_opt == XN_FLAG_FN_SN) {
483                 fld_len = FN_WIDTH_SN;
484                 objbuf = OBJ_nid2sn(fn_nid);
485             } else if(fn_opt == XN_FLAG_FN_LN) {
486                 fld_len = FN_WIDTH_LN;
487                 objbuf = OBJ_nid2ln(fn_nid);
488             } else {
489                 fld_len = 0; /* XXX: what should this be */
490                 objbuf = "";
491             }
492         }
493         objlen = strlen(objbuf);
494         if(!io_ch(arg, objbuf, objlen)) return -1;
495         if ((objlen < fld_len) && (flags & XN_FLAG_FN_ALIGN)) {
496             if (!do_indent(io_ch, arg, fld_len - objlen)) re
497                 outlen += fld_len - objlen;
498         }
499         if(!io_ch(arg, sep_eq, sep_eq_len)) return -1;
500         outlen += objlen + sep_eq_len;
501     }
502     /* If the field name is unknown then fix up the DER dump
503     * flag. We might want to limit this further so it will
504     * DER dump on anything other than a few 'standard' fields.
505     */
506     if((fn_nid == NID_undef) && (flags & XN_FLAG_DUMP_UNKNOWN_FIELDS
507                                orflags = ASN1_STRFLGS_DUMP_ALL;
508     else orflags = 0;
509
510     len = do_print_ex(io_ch, arg, flags | orflags, val);
511     if(len < 0) return -1;
512     outlen += len;
513 }
514 return outlen;
515 }
516
517 /* Wrappers round the main functions */
518
519 int X509_NAME_print_ex(BIO *out, X509_NAME *nm, int indent, unsigned long flags)
520 {
521     if(flags == XN_FLAG_COMPAT)
522         return X509_NAME_print(out, nm, indent);
523     return do_name_ex(send_bio_chars, out, nm, indent, flags);

```

```
524 }

526 #ifndef OPENSSL_NO_FP_API
527 int X509_NAME_print_ex_fp(FILE *fp, X509_NAME *nm, int indent, unsigned long fla
528 {
529     if(flags == XN_FLAG_COMPAT)
530     {
531         BIO *btmp;
532         int ret;
533         btmp = BIO_new_fp(fp, BIO_NOCLOSE);
534         if(!btmp) return -1;
535         ret = X509_NAME_print(btmp, nm, indent);
536         BIO_free(btmp);
537         return ret;
538     }
539     return do_name_ex(send_fp_chars, fp, nm, indent, flags);
540 }
541 #endif

543 int ASN1_STRING_print_ex(BIO *out, ASN1_STRING *str, unsigned long flags)
544 {
545     return do_print_ex(send_bio_chars, out, flags, str);
546 }

548 #ifndef OPENSSL_NO_FP_API
549 int ASN1_STRING_print_ex_fp(FILE *fp, ASN1_STRING *str, unsigned long flags)
550 {
551     return do_print_ex(send_fp_chars, fp, flags, str);
552 }
553 #endif

555 /* Utility function: convert any string type to UTF8, returns number of bytes
556  * in output string or a negative error code
557  */

559 int ASN1_STRING_to_UTF8(unsigned char **out, ASN1_STRING *in)
560 {
561     ASN1_STRING stmp, *str = &stmp;
562     int mbflag, type, ret;
563     if(!in) return -1;
564     type = in->type;
565     if((type < 0) || (type > 30)) return -1;
566     mbflag = tag2nbyte[type];
567     if(mbflag == -1) return -1;
568     mbflag |= MBSTRING_FLAG;
569     stmp.data = NULL;
570     stmp.length = 0;
571     ret = ASN1_mbstring_copy(&str, in->data, in->length, mbflag, B_ASN1_UTF8
572     if(ret < 0) return ret;
573     *out = stmp.data;
574     return stmp.length;
575 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_strnid.c

1

```
*****
9393 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_strnid.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* a_strnid.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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7  *
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49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
59 #include <stdio.h>
60 #include <ctype.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_strnid.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/objects.h>

66 static STACK_OF(ASN1_STRING_TABLE) *stable = NULL;
67 static void st_free(ASN1_STRING_TABLE *tbl);
68 static int sk_table_cmp(const ASN1_STRING_TABLE * const *a,
69                        const ASN1_STRING_TABLE * const *b);

72 /* This is the global mask for the mbstring functions: this is use to
73  * mask out certain types (such as BMPString and UTF8String) because
74  * certain software (e.g. Netscape) has problems with them.
75  */

77 static unsigned long global_mask = 0xFFFFFFFFL;

79 void ASN1_STRING_set_default_mask(unsigned long mask)
80 {
81     global_mask = mask;
82 }

84 unsigned long ASN1_STRING_get_default_mask(void)
85 {
86     return global_mask;
87 }

89 /* This function sets the default to various "flavours" of configuration.
90  * based on an ASCII string. Currently this is:
91  * MASK:XXXX : a numerical mask value.
92  * nobmp : Don't use BMPStrings (just Printable, T61).
93  * pkix : PKIX recommendation in RFC2459.
94  * utf8only : only use UTF8Strings (RFC2459 recommendation for 2004).
95  * default: the default value, Printable, T61, BMP.
96  */

98 int ASN1_STRING_set_default_mask_asc(const char *p)
99 {
100     unsigned long mask;
101     char *end;
102     if(!strncmp(p, "MASK:", 5)) {
103         if(!p[5]) return 0;
104         mask = strtoul(p + 5, &end, 0);
105         if(*end) return 0;
106     } else if(!strcmp(p, "nobmp"))
107         mask = ~((unsigned long)(B_ASN1_BMPSTRING|B_ASN1_UTF8ST
108     else if(!strcmp(p, "pkix"))
109         mask = ~((unsigned long)B_ASN1_T61STRING);
110     else if(!strcmp(p, "utf8only")) mask = B_ASN1_UTF8STRING;
111     else if(!strcmp(p, "default"))
112         mask = 0xFFFFFFFFL;
113     else return 0;
114     ASN1_STRING_set_default_mask(mask);
115     return 1;
116 }

118 /* The following function generates an ASN1_STRING based on limits in a table.
119  * Frequently the types and length of an ASN1_STRING are restricted by a
120  * corresponding OID. For example certificates and certificate requests.
121  */

123 ASN1_STRING *ASN1_STRING_set_by_NID(ASN1_STRING **out, const unsigned char *in,
124                                     int inlen, int inform, int nid)
125 {
126     ASN1_STRING_TABLE *tbl;
127     ASN1_STRING *str = NULL;
```

```

128     unsigned long mask;
129     int ret;
130     if(!out) out = &str;
131     tbl = ASN1_STRING_TABLE_get(nid);
132     if(tbl) {
133         mask = tbl->mask;
134         if(!(tbl->flags & STABLE_NO_MASK)) mask &= global_mask;
135         ret = ASN1_mbstring_ncopy(out, in, inlen, inform, mask,
136                                 tbl->minsize, tbl->maxsize);
137     } else ret = ASN1_mbstring_copy(out, in, inlen, inform, DIRSTRING_TYPE &
138 if(ret <= 0) return NULL;
139     return *out;
140 }

142 /* Now the tables and helper functions for the string table:
143 */

145 /* size limits: this stuff is taken straight from RFC3280 */

147 #define ub_name 32768
148 #define ub_common_name 64
149 #define ub_locality_name 128
150 #define ub_state_name 128
151 #define ub_organization_name 64
152 #define ub_organization_unit_name 64
153 #define ub_title 64
154 #define ub_email_address 128
155 #define ub_serial_number 64

158 /* This table must be kept in NID order */

160 static const ASN1_STRING_TABLE tbl_standard[] = {
161 {NID_commonName, 1, ub_common_name, DIRSTRING_TYPE, 0},
162 {NID_countryName, 2, 2, B_ASN1_PRINTABLESTRING, STABLE_NO_MASK},
163 {NID_localityName, 1, ub_locality_name, DIRSTRING_TYPE, 0},
164 {NID_stateOrProvinceName, 1, ub_state_name, DIRSTRING_TYPE, 0},
165 {NID_organizationName, 1, ub_organization_name, DIRSTRING_TYPE, 0},
166 {NID_organizationalUnitName, 1, ub_organization_unit_name, DIRSTRING_TYPE, 0},
167 {NID_pkcs9_emailAddress, 1, ub_email_address, B_ASN1_IA5STRING, STABLE_NO
168 {NID_pkcs9_unstructuredName, 1, -1, PKCS9STRING_TYPE, 0},
169 {NID_pkcs9_challengePassword, 1, -1, PKCS9STRING_TYPE, 0},
170 {NID_pkcs9_unstructuredAddress, 1, -1, DIRSTRING_TYPE, 0},
171 {NID_givenName, 1, ub_name, DIRSTRING_TYPE, 0},
172 {NID_surname, 1, ub_name, DIRSTRING_TYPE, 0},
173 {NID_initials, 1, ub_name, DIRSTRING_TYPE, 0},
174 {NID_serialNumber, 1, ub_serial_number, B_ASN1_PRINTABLESTRING, STA
175 {NID_friendlyName, -1, -1, B_ASN1_BMPSTRING, STABLE_NO_MASK},
176 {NID_name, 1, ub_name, DIRSTRING_TYPE, 0},
177 {NID_dnQualifier, -1, -1, B_ASN1_PRINTABLESTRING, STABLE_NO_MASK},
178 {NID_domainComponent, 1, -1, B_ASN1_IA5STRING, STABLE_NO_MASK},
179 {NID_ms_csp_name, -1, -1, B_ASN1_BMPSTRING, STABLE_NO_MASK}
180 };

182 static int sk_table_cmp(const ASN1_STRING_TABLE * const *a,
183                        const ASN1_STRING_TABLE * const *b)
184 {
185     return (*a)->nid - (*b)->nid;
186 }

188 DECLARE_OBJ_BSEARCH_CMP_FN(ASN1_STRING_TABLE, ASN1_STRING_TABLE, table);

190 static int table_cmp(const ASN1_STRING_TABLE *a, const ASN1_STRING_TABLE *b)
191 {
192     return a->nid - b->nid;
193 }

```

```

195 IMPLEMENT_OBJ_BSEARCH_CMP_FN(ASN1_STRING_TABLE, ASN1_STRING_TABLE, table);

197 ASN1_STRING_TABLE *ASN1_STRING_TABLE_get(int nid)
198 {
199     int idx;
200     ASN1_STRING_TABLE *tmp;
201     ASN1_STRING_TABLE fnd;
202     fnd.nid = nid;
203     tmp = OBJ_bsearch_table(&fnd, tbl_standard,
204                           sizeof(tbl_standard)/sizeof(ASN1_STRING_TABLE));
205     if(tmp) return tmp;
206     if(!stable) return NULL;
207     idx = sk_ASN1_STRING_TABLE_find(stable, &fnd);
208     if(idx < 0) return NULL;
209     return sk_ASN1_STRING_TABLE_value(stable, idx);
210 }

211 int ASN1_STRING_TABLE_add(int nid,
212                          long minsize, long maxsize, unsigned long mask,
213                          unsigned long flags)
214 {
215     ASN1_STRING_TABLE *tmp;
216     char new_nid = 0;
217     flags &= ~STABLE_FLAGS_MALLOC;
218     if(!stable) stable = sk_ASN1_STRING_TABLE_new(sk_table_cmp);
219     if(!stable) {
220         ASN1err(ASN1_F_ASN1_STRING_TABLE_ADD, ERR_R_MALLOC_FAILURE);
221         return 0;
222     }
223     if(!(tmp = ASN1_STRING_TABLE_get(nid))) {
224         tmp = OPENSSL_malloc(sizeof(ASN1_STRING_TABLE));
225         if(!tmp) {
226             ASN1err(ASN1_F_ASN1_STRING_TABLE_ADD,
227                     ERR_R_MALLOC_FAILURE);
228             return 0;
229         }
230         tmp->flags = flags | STABLE_FLAGS_MALLOC;
231         tmp->nid = nid;
232         new_nid = 1;
233     } else tmp->flags = (tmp->flags & STABLE_FLAGS_MALLOC) | flags;
234     if(minsize != -1) tmp->minsize = minsize;
235     if(maxsize != -1) tmp->maxsize = maxsize;
236     tmp->mask = mask;
237     if(new_nid) sk_ASN1_STRING_TABLE_push(stable, tmp);
238     return 1;
239 }

240 void ASN1_STRING_TABLE_cleanup(void)
241 {
242     STACK_OF(ASN1_STRING_TABLE) *tmp;
243     tmp = stable;
244     if(!tmp) return;
245     stable = NULL;
246     sk_ASN1_STRING_TABLE_pop_free(tmp, st_free);
247 }

248 static void st_free(ASN1_STRING_TABLE *tbl)
249 {
250     if(tbl->flags & STABLE_FLAGS_MALLOC) OPENSSL_free(tbl);
251 }

252 static void st_free(ASN1_STRING_TABLE *tbl)
253 {
254     if(tbl->flags & STABLE_FLAGS_MALLOC) OPENSSL_free(tbl);
255 }

257 IMPLEMENT_STACK_OF(ASN1_STRING_TABLE)

259 #ifdef STRING_TABLE_TEST

```

```
261 main()
262 {
263     ASN1_STRING_TABLE *tmp;
264     int i, last_nid = -1;
265
266     for (tmp = tbl_standard, i = 0;
267          i < sizeof(tbl_standard)/sizeof(ASN1_STRING_TABLE); i++, tmp++)
268     {
269         if (tmp->nid < last_nid)
270         {
271             last_nid = 0;
272             break;
273         }
274         last_nid = tmp->nid;
275     }
276
277     if (last_nid != 0)
278     {
279         printf("Table order OK\n");
280         exit(0);
281     }
282
283     for (tmp = tbl_standard, i = 0;
284          i < sizeof(tbl_standard)/sizeof(ASN1_STRING_TABLE); i++, tmp++)
285         printf("Index %d, NID %d, Name=%s\n", i, tmp->nid,
286               OBJ_nid2ln(tmp->nid));
287
288 }
289
290 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_time.c

1

```
*****
5904 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_time.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/asn1/a_time.c */
2 /* =====
3  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
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22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

57 /* This is an implementation of the ASN1 Time structure which is:
58  * Time ::= CHOICE {
59  *     utcTime        UTCTime,
60  *     generalTime    GeneralizedTime }
61  * written by Steve Henson.
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_time.c

2

```
62 */

64 #include <stdio.h>
65 #include <time.h>
66 #include "cryptlib.h"
67 #include "o_time.h"
68 #include <openssl/asn1t.h>

70 IMPLEMENT_ASN1_MSTRING(ASN1_TIME, B_ASN1_TIME)

72 IMPLEMENT_ASN1_FUNCTIONS(ASN1_TIME)

74 #if 0
75 int i2d_ASN1_TIME(ASN1_TIME *a, unsigned char **pp)
76 {
77     #ifdef CHARSET_EBCDIC
78         /* KLUDGE! We convert to ascii before writing DER */
79         char tmp[24];
80         ASN1_STRING tmpstr;

82         if(a->type == V_ASN1_UTCTIME || a->type == V_ASN1_GENERALIZEDTIME) {
83             int len;

85             tmpstr = *(ASN1_STRING *)a;
86             len = tmpstr.length;
87             ebcdic2ascii(tmp, tmpstr.data, (len >= sizeof tmp) ? sizeof tmp : len);
88             tmpstr.data = tmp;
89             a = (ASN1_GENERALIZEDTIME *) &tmpstr;
90         }
91 #endif
92         if(a->type == V_ASN1_UTCTIME || a->type == V_ASN1_GENERALIZEDTIME)
93             return(i2d_ASN1_bytes((ASN1_STRING *)a, pp,
94                                   a->type, V_ASN1_UNIVERSAL));
95         ASN1err(ASN1_F_I2D_ASN1_TIME, ASN1_R_EXPECTING_A_TIME);
96         return -1;
97     }
98 #endif

101 ASN1_TIME *ASN1_TIME_set(ASN1_TIME *s, time_t t)
102 {
103     return ASN1_TIME_adj(s, t, 0, 0);
104 }

106 ASN1_TIME *ASN1_TIME_adj(ASN1_TIME *s, time_t t,
107                          int offset_day, long offset_sec)
108 {
109     struct tm *ts;
110     struct tm data;

112     ts=OPENSSL_gmtime(&t,&data);
113     if (ts == NULL)
114     {
115         ASN1err(ASN1_F_ASN1_TIME_ADJ, ASN1_R_ERROR_GETTING_TIME);
116         return NULL;
117     }
118     if (offset_day || offset_sec)
119     {
120         if (!OPENSSL_gmtime_adj(ts, offset_day, offset_sec))
121             return NULL;
122     }
123     if((ts->tm_year >= 50) && (ts->tm_year < 150))
124         return ASN1_UTCTIME_adj(s, t, offset_day, offset_sec);
125     return ASN1_GENERALIZEDTIME_adj(s, t, offset_day, offset_sec);
126 }
```

```

128 int ASN1_TIME_check(ASN1_TIME *t)
129 {
130     if (t->type == V_ASN1_GENERALIZEDTIME)
131         return ASN1_GENERALIZEDTIME_check(t);
132     else if (t->type == V_ASN1_UTCTIME)
133         return ASN1_UTCTIME_check(t);
134     return 0;
135 }

137 /* Convert an ASN1_TIME structure to GeneralizedTime */
138 ASN1_GENERALIZEDTIME *ASN1_TIME_to_generalizedtime(ASN1_TIME *t, ASN1_GENERALIZE
139 {
140     ASN1_GENERALIZEDTIME *ret;
141     char *str;
142     int newlen;

144     if (!ASN1_TIME_check(t)) return NULL;

146     if (!out || !*out)
147     {
148         if (!(ret = ASN1_GENERALIZEDTIME_new ()))
149             return NULL;
150         if (out) *out = ret;
151     }
152     else ret = *out;

154     /* If already GeneralizedTime just copy across */
155     if (t->type == V_ASN1_GENERALIZEDTIME)
156     {
157         if(!ASN1_STRING_set(ret, t->data, t->length))
158             return NULL;
159         return ret;
160     }

162     /* grow the string */
163     if (!ASN1_STRING_set(ret, NULL, t->length + 2))
164         return NULL;
165     /* ASN1_STRING_set() allocated 'len + 1' bytes. */
166     newlen = t->length + 2 + 1;
167     str = (char *)ret->data;
168     /* Work out the century and prepend */
169     if (t->data[0] >= '5') BUF_strlcpy(str, "19", newlen);
170     else BUF_strlcpy(str, "20", newlen);

172     BUF_strlcat(str, (char *)t->data, newlen);

174     return ret;
175 }

177 int ASN1_TIME_set_string(ASN1_TIME *s, const char *str)
178 {
179     ASN1_TIME t;

181     t.length = strlen(str);
182     t.data = (unsigned char *)str;
183     t.flags = 0;

184     t.type = V_ASN1_UTCTIME;

187     if (!ASN1_TIME_check(&t))
188     {
189         t.type = V_ASN1_GENERALIZEDTIME;
190         if (!ASN1_TIME_check(&t))
191             return 0;
192     }
193

```

```

194         if (s && !ASN1_STRING_copy((ASN1_STRING *)s, (ASN1_STRING *)&t))
195             return 0;

197         return 1;
198     }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_type.c

1

```
*****
5285 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_type.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_type.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ''AS IS'' AND
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_type.c

2

```
62 #include <openssl/objects.h>
64 int ASN1_TYPE_get(ASN1_TYPE *a)
65 {
66     if ((a->value.ptr != NULL) || (a->type == V_ASN1_NULL))
67         return(a->type);
68     else
69         return(0);
70 }
72 void ASN1_TYPE_set(ASN1_TYPE *a, int type, void *value)
73 {
74     if (a->value.ptr != NULL)
75     {
76         ASN1_TYPE **tmp_a = &a;
77         ASN1_primitive_free((ASN1_VALUE **)tmp_a, NULL);
78     }
79     a->type=type;
80     if (type == V_ASN1_BOOLEAN)
81         a->value.boolean = value ? 0xff : 0;
82     else
83         a->value.ptr=value;
84 }
86 int ASN1_TYPE_set1(ASN1_TYPE *a, int type, const void *value)
87 {
88     if (!value || (type == V_ASN1_BOOLEAN))
89     {
90         void *p = (void *)value;
91         ASN1_TYPE_set(a, type, p);
92     }
93     else if (type == V_ASN1_OBJECT)
94     {
95         ASN1_OBJECT *odup;
96         odup = OBJ_dup(value);
97         if (!odup)
98             return 0;
99         ASN1_TYPE_set(a, type, odup);
100     }
101     else
102     {
103         ASN1_STRING *sdup;
104         sdup = ASN1_STRING_dup(value);
105         if (!sdup)
106             return 0;
107         ASN1_TYPE_set(a, type, sdup);
108     }
109     return 1;
110 }
112 IMPLEMENT_STACK_OF(ASN1_TYPE)
113 IMPLEMENT_ASN1_SET_OF(ASN1_TYPE)
115 /* Returns 0 if they are equal, != 0 otherwise. */
116 int ASN1_TYPE_cmp(ASN1_TYPE *a, ASN1_TYPE *b)
117 {
118     int result = -1;
119
120     if (!a || !b || a->type != b->type) return -1;
121
122     switch (a->type)
123     {
124     case V_ASN1_OBJECT:
125         result = OBJ_cmp(a->value.object, b->value.object);
126         break;
127     case V_ASN1_NULL:
```



```
128         result = 0;      /* They do not have content. */
129         break;
130     case V_ASN1_INTEGER:
131     case V_ASN1_NEG_INTEGER:
132     case V_ASN1_ENUMERATED:
133     case V_ASN1_NEG_ENUMERATED:
134     case V_ASN1_BIT_STRING:
135     case V_ASN1_OCTET_STRING:
136     case V_ASN1_SEQUENCE:
137     case V_ASN1_SET:
138     case V_ASN1_NUMERICSTRING:
139     case V_ASN1_PRINTABLESTRING:
140     case V_ASN1_T61STRING:
141     case V_ASN1_VIDEOTEXSTRING:
142     case V_ASN1_IA5STRING:
143     case V_ASN1_UTCTIME:
144     case V_ASN1_GENERALIZEDTIME:
145     case V_ASN1_GRAPHICSTRING:
146     case V_ASN1_VISIBLESTRING:
147     case V_ASN1_GENERALSTRING:
148     case V_ASN1_UNIVERSALSTRING:
149     case V_ASN1_BMPSTRING:
150     case V_ASN1_UTF8STRING:
151     case V_ASN1_OTHER:
152     default:
153         result = ASN1_STRING_cmp((ASN1_STRING *) a->value.ptr,
154                                 (ASN1_STRING *) b->value.ptr);
155         break;
156     }
157
158     return result;
159 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_utctm.c

1

```
*****
8822 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_utctm.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_utctm.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <time.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_utctm.c

2

```
62 #include "o_time.h"
63 #include <openssl/asn1.h>
64
65 #if 0
66 int i2d_ASN1_UTCTIME(ASN1_UTCTIME *a, unsigned char **pp)
67 {
68 #ifndef CHARSET_EBCDIC
69     return(i2d_ASN1_bytes((ASN1_STRING *)a, pp,
70                          V_ASN1_UTCTIME,V_ASN1_UNIVERSAL));
71 #else
72     /* KLUDGE! We convert to ascii before writing DER */
73     int len;
74     char tmp[24];
75     ASN1_STRING x = *(ASN1_STRING *)a;
76
77     len = x.length;
78     ebcdic2ascii(tmp, x.data, (len >= sizeof tmp) ? sizeof tmp : len);
79     x.data = tmp;
80     return i2d_ASN1_bytes(&x, pp, V_ASN1_UTCTIME,V_ASN1_UNIVERSAL);
81 #endif
82 }
83
84 ASN1_UTCTIME *d2i_ASN1_UTCTIME(ASN1_UTCTIME **a, unsigned char **pp,
85                                long length)
86 {
87     ASN1_UTCTIME *ret=NULL;
88
89     ret=(ASN1_UTCTIME *)d2i_ASN1_bytes((ASN1_STRING **)a, pp, length,
90                                       V_ASN1_UTCTIME,V_ASN1_UNIVERSAL);
91     if (ret == NULL)
92     {
93         ASN1err(ASN1_F_D2I_ASN1_UTCTIME,ERR_R_NESTED_ASN1_ERROR);
94         return(NULL);
95     }
96 #ifdef CHARSET_EBCDIC
97     ascii2ebcdic(ret->data, ret->data, ret->length);
98 #endif
99     if (!ASN1_UTCTIME_check(ret))
100     {
101         ASN1err(ASN1_F_D2I_ASN1_UTCTIME,ASN1_R_INVALID_TIME_FORMAT);
102         goto err;
103     }
104
105     return(ret);
106 err:
107     if ((ret != NULL) && ((a == NULL) || (*a != ret)))
108         M_ASN1_UTCTIME_free(ret);
109     return(NULL);
110 }
111
112 #endif
113
114 int ASN1_UTCTIME_check(ASN1_UTCTIME *d)
115 {
116     static const int min[8]={ 0, 1, 1, 0, 0, 0, 0, 0};
117     static const int max[8]={99,12,31,23,59,59,12,59};
118     char *a;
119     int n,i,l,o;
120
121     if (d->type != V_ASN1_UTCTIME) return(0);
122     l=d->length;
123     a=(char *)d->data;
124     o=0;
125
126     if (l < 11) goto err;
```

```

128     for (i=0; i<6; i++)
129     {
130         if ((i == 5) && ((a[o] == 'Z') ||
131             (a[o] == '+' || (a[o] == '-'))))
132             { i++; break; }
133         if ((a[o] < '0') || (a[o] > '9')) goto err;
134         n= a[o]-'0';
135         if (++o > l) goto err;

137         if ((a[o] < '0') || (a[o] > '9')) goto err;
138         n=(n*10)+ a[o]-'0';
139         if (++o > l) goto err;

141         if ((n < min[i]) || (n > max[i])) goto err;
142     }
143     if (a[o] == 'Z')
144         o++;
145     else if ((a[o] == '+') || (a[o] == '-'))
146     {
147         o++;
148         if (o+4 > l) goto err;
149         for (i=6; i<8; i++)
150         {
151             if ((a[o] < '0') || (a[o] > '9')) goto err;
152             n= a[o]-'0';
153             o++;
154             if ((a[o] < '0') || (a[o] > '9')) goto err;
155             n=(n*10)+ a[o]-'0';
156             if ((n < min[i]) || (n > max[i])) goto err;
157             o++;
158         }
159     }
160     return(o == l);
161 err:
162     return(0);
163 }

165 int ASN1_UTCTIME_set_string(ASN1_UTCTIME *s, const char *str)
166 {
167     ASN1_UTCTIME t;

169     t.type=V_ASN1_UTCTIME;
170     t.length=strlen(str);
171     t.data=(unsigned char *)str;
172     if (ASN1_UTCTIME_check(&t))
173     {
174         if (s != NULL)
175         {
176             if (!ASN1_STRING_set((ASN1_STRING *)s,
177                 (unsigned char *)str,t.length))
178                 return 0;
179             s->type = V_ASN1_UTCTIME;
180         }
181         return(1);
182     }
183     else
184         return(0);
185 }

187 ASN1_UTCTIME *ASN1_UTCTIME_set(ASN1_UTCTIME *s, time_t t)
188 {
189     return ASN1_UTCTIME_adj(s, t, 0, 0);
190 }

192 ASN1_UTCTIME *ASN1_UTCTIME_adj(ASN1_UTCTIME *s, time_t t,
193     int offset_day, long offset_sec)

```

```

194     {
195         char *p;
196         struct tm *ts;
197         struct tm data;
198         size_t len = 20;

200         if (s == NULL)
201             s=M_ASN1_UTCTIME_new();
202         if (s == NULL)
203             return(NULL);

205         ts=OPENSSL_gmtime(&t, &data);
206         if (ts == NULL)
207             return(NULL);

209         if (offset_day || offset_sec)
210         {
211             if (!OPENSSL_gmtime_adj(ts, offset_day, offset_sec))
212                 return NULL;
213         }

215         if((ts->tm_year < 50) || (ts->tm_year >= 150))
216             return NULL;

218         p=(char *)s->data;
219         if ((p == NULL) || ((size_t)s->length < len))
220         {
221             p=OPENSSL_malloc(len);
222             if (p == NULL)
223             {
224                 ASN1err(ASN1_F_ASN1_UTCTIME_ADJ,ERR_R_MALLOC_FAILURE);
225                 return(NULL);
226             }
227             if (s->data != NULL)
228                 OPENSSL_free(s->data);
229             s->data=(unsigned char *)p;
230         }

232         BIO_snprintf(p, len, "%02d%02d%02d%02d%02dZ", ts->tm_year%100,
233             ts->tm_mon+1, ts->tm_mday, ts->tm_hour, ts->tm_min, ts->tm_sec)
234         s->length=strlen(p);
235         s->type=V_ASN1_UTCTIME;
236 #ifdef CHARSET_EBCDIC_not
237         ebcdic2ascii(s->data, s->data, s->length);
238 #endif
239         return(s);
240     }

243 int ASN1_UTCTIME_cmp_time_t(const ASN1_UTCTIME *s, time_t t)
244 {
245     struct tm *tm;
246     struct tm data;
247     int offset;
248     int year;

250 #define g2(p) (((p)[0]-'0')*10+(p)[1]-'0')

252     if (s->data[12] == 'Z')
253         offset=0;
254     else
255     {
256         offset = g2(s->data+13)*60+g2(s->data+15);
257         if (s->data[12] == '-')
258             offset = -offset;
259     }

```

```

261     t -= offset*60; /* FIXME: may overflow in extreme cases */
263     tm = OPENSSL_gmtime(&t, &data);
264
265 #define return_cmp(a,b) if ((a)<(b)) return -1; else if ((a)>(b)) return 1
266     year = g2(s->data);
267     if (year < 50)
268         year += 100;
269     return_cmp(year, tm->tm_year);
270     return_cmp(g2(s->data+2) - 1, tm->tm_mon);
271     return_cmp(g2(s->data+4), tm->tm_mday);
272     return_cmp(g2(s->data+6), tm->tm_hour);
273     return_cmp(g2(s->data+8), tm->tm_min);
274     return_cmp(g2(s->data+10), tm->tm_sec);
275 #undef g2
276 #undef return_cmp
278     return 0;
279 }
282 #if 0
283 time_t ASN1_UTCTIME_get(const ASN1_UTCTIME *s)
284 {
285     struct tm tm;
286     int offset;
288     memset(&tm, '\0', sizeof tm);
290 #define g2(p) (((p)[0]-'0')*10+(p)[1]-'0')
291     tm.tm_year=g2(s->data);
292     if(tm.tm_year < 50)
293         tm.tm_year+=100;
294     tm.tm_mon=g2(s->data+2)-1;
295     tm.tm_mday=g2(s->data+4);
296     tm.tm_hour=g2(s->data+6);
297     tm.tm_min=g2(s->data+8);
298     tm.tm_sec=g2(s->data+10);
299     if(s->data[12] == 'Z')
300         offset=0;
301     else
302     {
303         offset=g2(s->data+13)*60+g2(s->data+15);
304         if(s->data[12] == '-')
305             offset= -offset;
306     }
307 #undef g2
309     return mktime(&tm)-offset*60; /* FIXME: mktime assumes the current timez
310     * instead of UTC, and unless we rewrite 0
311     * in Lisp we cannot locally change the ti
312     * without possibly interfering with other
313     * of the program. timegm, which uses UTC,
314     * non-standard.
315     * Also time_t is inappropriate for genera
316     * UTC times because it may a 32 bit type.
317 }
318 #endif

```

```
*****
```

```
7870 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_utf8.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/asn1/a_utf8.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

```
64 /* UTF8 utilities */
```

```
66 /* This parses a UTF8 string one character at a time. It is passed a pointer
67  * to the string and the length of the string. It sets 'value' to the value of
68  * the current character. It returns the number of characters read or a
69  * negative error code:
70  * -1 = string too short
71  * -2 = illegal character
72  * -3 = subsequent characters not of the form 10xxxxxx
73  * -4 = character encoded incorrectly (not minimal length).
74  */
75
76 int UTF8_getc(const unsigned char *str, int len, unsigned long *val)
77 {
78     const unsigned char *p;
79     unsigned long value;
80     int ret;
81     if(len <= 0) return 0;
82     p = str;
83
84     /* Check syntax and work out the encoded value (if correct) */
85     if((*p & 0x80) == 0) {
86         value = *p++ & 0x7f;
87         ret = 1;
88     } else if((*p & 0xe0) == 0xc0) {
89         if(len < 2) return -1;
90         if((p[1] & 0xc0) != 0x80) return -3;
91         value = (*p++ & 0x1f) << 6;
92         value |= *p++ & 0x3f;
93         if(value < 0x80) return -4;
94         ret = 2;
95     } else if((*p & 0xf0) == 0xe0) {
96         if(len < 3) return -1;
97         if( ((p[1] & 0xc0) != 0x80)
98             || ((p[2] & 0xc0) != 0x80) ) return -3;
99         value = (*p++ & 0xf) << 12;
100        value |= (*p++ & 0x3f) << 6;
101        value |= *p++ & 0x3f;
102        if(value < 0x800) return -4;
103        ret = 3;
104    } else if((*p & 0xf8) == 0xf0) {
105        if(len < 4) return -1;
106        if( ((p[1] & 0xc0) != 0x80)
107            || ((p[2] & 0xc0) != 0x80)
108            || ((p[3] & 0xc0) != 0x80) ) return -3;
109        value = ((unsigned long)(*p++ & 0x7)) << 18;
110        value |= (*p++ & 0x3f) << 12;
111        value |= (*p++ & 0x3f) << 6;
112        value |= *p++ & 0x3f;
113        if(value < 0x10000) return -4;
114        ret = 4;
115    } else if((*p & 0xfc) == 0xf8) {
116        if(len < 5) return -1;
117        if( ((p[1] & 0xc0) != 0x80)
118            || ((p[2] & 0xc0) != 0x80)
119            || ((p[3] & 0xc0) != 0x80)
120            || ((p[4] & 0xc0) != 0x80) ) return -3;
121        value = ((unsigned long)(*p++ & 0x3)) << 24;
122        value |= ((unsigned long)(*p++ & 0x3f)) << 18;
123        value |= ((unsigned long)(*p++ & 0x3f)) << 12;
124        value |= (*p++ & 0x3f) << 6;
125        value |= *p++ & 0x3f;
126        if(value < 0x200000) return -4;
127        ret = 5;
128    }
```

```

128     } else if((*p & 0xfe) == 0xfc) {
129         if(len < 6) return -1;
130         if( ((p[1] & 0xc0) != 0x80)
131             || ((p[2] & 0xc0) != 0x80)
132             || ((p[3] & 0xc0) != 0x80)
133             || ((p[4] & 0xc0) != 0x80)
134             || ((p[5] & 0xc0) != 0x80) ) return -3;
135         value = ((unsigned long)(*p++ & 0x1)) << 30;
136         value |= ((unsigned long)(*p++ & 0x3f)) << 24;
137         value |= ((unsigned long)(*p++ & 0x3f)) << 18;
138         value |= ((unsigned long)(*p++ & 0x3f)) << 12;
139         value |= (*p++ & 0x3f) << 6;
140         value |= *p++ & 0x3f;
141         if(value < 0x4000000) return -4;
142         ret = 6;
143     } else return -2;
144     *val = value;
145     return ret;
146 }

148 /* This takes a character 'value' and writes the UTF8 encoded value in
149  * 'str' where 'str' is a buffer containing 'len' characters. Returns
150  * the number of characters written or -1 if 'len' is too small. 'str' can
151  * be set to NULL in which case it just returns the number of characters.
152  * It will need at most 6 characters.
153  */

155 int UTF8_putc(unsigned char *str, int len, unsigned long value)
156 {
157     if(!str) len = 6; /* Maximum we will need */
158     else if(len <= 0) return -1;
159     if(value < 0x80) {
160         if(str) *str = (unsigned char)value;
161         return 1;
162     }
163     if(value < 0x800) {
164         if(len < 2) return -1;
165         if(str) {
166             *str++ = (unsigned char)(((value >> 6) & 0x1f) | 0xc0);
167             *str = (unsigned char)((value & 0x3f) | 0x80);
168         }
169         return 2;
170     }
171     if(value < 0x10000) {
172         if(len < 3) return -1;
173         if(str) {
174             *str++ = (unsigned char)(((value >> 12) & 0xf) | 0xe0);
175             *str++ = (unsigned char)(((value >> 6) & 0x3f) | 0x80);
176             *str = (unsigned char)((value & 0x3f) | 0x80);
177         }
178         return 3;
179     }
180     if(value < 0x200000) {
181         if(len < 4) return -1;
182         if(str) {
183             *str++ = (unsigned char)(((value >> 18) & 0x7) | 0xf0);
184             *str++ = (unsigned char)(((value >> 12) & 0x3f) | 0x80);
185             *str++ = (unsigned char)(((value >> 6) & 0x3f) | 0x80);
186             *str = (unsigned char)((value & 0x3f) | 0x80);
187         }
188         return 4;
189     }
190     if(value < 0x40000000) {
191         if(len < 5) return -1;
192         if(str) {
193             *str++ = (unsigned char)(((value >> 24) & 0x3) | 0xf8);

```

```

194             *str++ = (unsigned char)(((value >> 18) & 0x3f) | 0x80);
195             *str++ = (unsigned char)(((value >> 12) & 0x3f) | 0x80);
196             *str++ = (unsigned char)(((value >> 6) & 0x3f) | 0x80);
197             *str = (unsigned char)((value & 0x3f) | 0x80);
198         }
199         return 5;
200     }
201     if(len < 6) return -1;
202     if(str) {
203         *str++ = (unsigned char)(((value >> 30) & 0x1) | 0xfc);
204         *str++ = (unsigned char)(((value >> 24) & 0x3f) | 0x80);
205         *str++ = (unsigned char)(((value >> 18) & 0x3f) | 0x80);
206         *str++ = (unsigned char)(((value >> 12) & 0x3f) | 0x80);
207         *str++ = (unsigned char)(((value >> 6) & 0x3f) | 0x80);
208         *str = (unsigned char)((value & 0x3f) | 0x80);
209     }
210     return 6;
211 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_verify.c

1

```
*****
6935 Fri May 30 18:31:28 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/a_verify.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/a_verify.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <time.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/a_verify.c

2

```
62 #include "cryptlib.h"
63 #include "asn1_locl.h"
64
65 #ifndef NO_SYS_TYPES_H
66 # include <sys/types.h>
67 #endif
68
69 #include <openssl/bn.h>
70 #include <openssl/x509.h>
71 #include <openssl/objects.h>
72 #include <openssl/buffer.h>
73 #include <openssl/evp.h>
74
75 #ifndef NO_ASN1_OLD
76
77 int ASN1_verify(i2d_of_void *i2d, X509_ALGOR *a, ASN1_BIT_STRING *signature,
78                char *data, EVP_PKEY *pkey)
79 {
80     EVP_MD_CTX ctx;
81     const EVP_MD *type;
82     unsigned char *p,*buf_in=NULL;
83     int ret= -1,i,inl;
84
85     EVP_MD_CTX_init(&ctx);
86     i=OBJ_obj2nid(a->algorithm);
87     type=EVP_get_digestbyname(OBJ_nid2sn(i));
88     if (type == NULL)
89     {
90         ASN1err(ASN1_F_ASN1_VERIFY,ASN1_R_UNKNOWN_MESSAGE_DIGEST_ALGORIT
91         goto err;
92     }
93
94     inl=i2d(data,NULL);
95     buf_in=OPENSSL_malloc((unsigned int)inl);
96     if (buf_in == NULL)
97     {
98         ASN1err(ASN1_F_ASN1_VERIFY,ERR_R_MALLOC_FAILURE);
99         goto err;
100     }
101     p=buf_in;
102
103     i2d(data,&p);
104     if (!EVP_VerifyInit_ex(&ctx,type, NULL)
105         || !EVP_VerifyUpdate(&ctx,(unsigned char *)buf_in,inl))
106     {
107         ASN1err(ASN1_F_ASN1_VERIFY,ERR_R_EVP_LIB);
108         ret=0;
109         goto err;
110     }
111
112     OPENSSL_cleanse(buf_in,(unsigned int)inl);
113     OPENSSL_free(buf_in);
114
115     if (EVP_VerifyFinal(&ctx,(unsigned char *)signature->data,
116                        (unsigned int)signature->length,pkey) <= 0)
117     {
118         ASN1err(ASN1_F_ASN1_VERIFY,ERR_R_EVP_LIB);
119         ret=0;
120         goto err;
121     }
122     /* we don't need to zero the 'ctx' because we just checked
123      * public information */
124     /* memset(&ctx,0,sizeof(ctx)); */
125     ret=1;
126 err:
127     EVP_MD_CTX_cleanup(&ctx);
```

```

128     return(ret);
129 }

131 #endif

134 int ASN1_item_verify(const ASN1_ITEM *it, X509_ALGOR *a,
135                     ASN1_BIT_STRING *signature, void *asn, EVP_PKEY *pkey)
136 {
137     EVP_MD_CTX ctx;
138     unsigned char *buf_in=NULL;
139     int ret= -1,inl;

141     int mdnid, pknid;

143     if (!pkey)
144     {
145         ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ERR_R_PASSED_NULL_PARAMETER);
146         return -1;
147     }

149     EVP_MD_CTX_init(&ctx);

151     /* Convert signature OID into digest and public key OIDs */
152     if (!OBJ_find_sigid_algs(OBJ_obj2nid(a->algorithm), &mdnid, &pknid))
153     {
154         ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ASN1_R_UNKNOWN_SIGNATURE_ALGORIT
155         goto err;
156     }
157     if (mdnid == NID_undef)
158     {
159         if (!pkey->ameth || !pkey->ameth->item_verify)
160         {
161             ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ASN1_R_UNKNOWN_SIGNATURE
162             goto err;
163         }
164         ret = pkey->ameth->item_verify(&ctx, it, asn, a,
165                                     signature, pkey);
166         /* Return value of 2 means carry on, anything else means we
167          * exit straight away: either a fatal error of the underlying
168          * verification routine handles all verification.
169          */
170         if (ret != 2)
171             goto err;
172         ret = -1;
173     }
174     else
175     {
176         const EVP_MD *type;
177         type=EVP_get_digestbynid(mdnid);
178         if (type == NULL)
179         {
180             ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ASN1_R_UNKNOWN_MESSAGE_D
181             goto err;
182         }

184         /* Check public key OID matches public key type */
185         if (EVP_PKEY_type(pknid) != pkey->ameth->pkey_id)
186         {
187             ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ASN1_R_WRONG_PUBLIC_KEY_
188             goto err;
189         }

191         if (!EVP_DigestVerifyInit(&ctx, NULL, type, NULL, pkey))
192         {
193             ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ERR_R_EVP_LIB);

```

```

194         ret=0;
195         goto err;
196     }

198     }

200     inl = ASN1_item_i2d(asn, &buf_in, it);
201     if (buf_in == NULL)
202     {
203         ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ERR_R_MALLOC_FAILURE);
204         goto err;
205     }
206     }

208     if (!EVP_DigestVerifyUpdate(&ctx, buf_in, inl))
209     {
210         ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ERR_R_EVP_LIB);
211         ret=0;
212         goto err;
213     }

215     OPENSSL_cleanse(buf_in, (unsigned int)inl);
216     OPENSSL_free(buf_in);

218     if (EVP_DigestVerifyFinal(&ctx, signature->data,
219                             (size_t)signature->length) <= 0)
220     {
221         ASN1err(ASN1_F_ASN1_ITEM_VERIFY, ERR_R_EVP_LIB);
222         ret=0;
223         goto err;
224     }

225     /* we don't need to zero the 'ctx' because we just checked
226      * public information */
227     /* memset(&ctx,0,sizeof(ctx)); */
228     ret=1;
229 err:
230     EVP_MD_CTX_cleanup(&ctx);
231     return(ret);
232 }

```



```

129 int EVP_PKEY_asn1_get_count(void)
130 {
131     int num = sizeof(standard_methods)/sizeof(EVP_PKEY_ASN1_METHOD *);
132     if (app_methods)
133         num += sk_EVP_PKEY_ASN1_METHOD_num(app_methods);
134     return num;
135 }

137 const EVP_PKEY_ASN1_METHOD *EVP_PKEY_asn1_get0(int idx)
138 {
139     int num = sizeof(standard_methods)/sizeof(EVP_PKEY_ASN1_METHOD *);
140     if (idx < 0)
141         return NULL;
142     if (idx < num)
143         return standard_methods[idx];
144     idx -= num;
145     return sk_EVP_PKEY_ASN1_METHOD_value(app_methods, idx);
146 }

148 static const EVP_PKEY_ASN1_METHOD *pkey_asn1_find(int type)
149 {
150     EVP_PKEY_ASN1_METHOD tmp;
151     const EVP_PKEY_ASN1_METHOD *t = &tmp, **ret;
152     tmp.pkey_id = type;
153     if (app_methods)
154     {
155         int idx;
156         idx = sk_EVP_PKEY_ASN1_METHOD_find(app_methods, &tmp);
157         if (idx >= 0)
158             return sk_EVP_PKEY_ASN1_METHOD_value(app_methods, idx);
159     }
160     ret = OBJ_bsearch_ameth(&t, standard_methods,
161                             sizeof(standard_methods)
162                             /sizeof(EVP_PKEY_ASN1_METHOD *));
163     if (!ret || !*ret)
164         return NULL;
165     return *ret;
166 }

168 /* Find an implementation of an ASN1 algorithm. If 'pe' is not NULL
169  * also search through engines and set *pe to a functional reference
170  * to the engine implementing 'type' or NULL if no engine implements
171  * it.
172  */

174 const EVP_PKEY_ASN1_METHOD *EVP_PKEY_asn1_find(ENGINE **pe, int type)
175 {
176     const EVP_PKEY_ASN1_METHOD *t;

178     for (;;)
179     {
180         t = pkey_asn1_find(type);
181         if (!t || !(t->pkey_flags & ASN1_PKEY_ALIAS))
182             break;
183         type = t->pkey_base_id;
184     }

185     if (pe)
186     {
187 #ifndef OPENSSL_NO_ENGINE
188         ENGINE *e;
189         /* type will contain the final unaliased type */
190         e = ENGINE_get_pkey_asn1_meth_engine(type);
191         if (e)
192             {
193                 *pe = e;

```

```

194         return ENGINE_get_pkey_asn1_meth(e, type);
195     }
196 #endif
197     *pe = NULL;
198 }
199     return t;
200 }

202 const EVP_PKEY_ASN1_METHOD *EVP_PKEY_asn1_find_str(ENGINE **pe,
203                                                     const char *str, int len)
204 {
205     int i;
206     const EVP_PKEY_ASN1_METHOD *ameth;
207     if (len == -1)
208         len = strlen(str);
209     if (pe)
210     {
211 #ifndef OPENSSL_NO_ENGINE
212         ENGINE *e;
213         ameth = ENGINE_pkey_asn1_find_str(&e, str, len);
214         if (ameth)
215             {
216                 /* Convert structural into
217                  * functional reference
218                  */
219                 if (!ENGINE_init(e))
220                     ameth = NULL;
221                 ENGINE_free(e);
222                 *pe = e;
223                 return ameth;
224             }
225 #endif
226         *pe = NULL;
227     }
228     for (i = 0; i < EVP_PKEY_asn1_get_count(); i++)
229     {
230         ameth = EVP_PKEY_asn1_get0(i);
231         if (ameth->pkey_flags & ASN1_PKEY_ALIAS)
232             continue;
233         if (((int)strlen(ameth->pem_str) == len) &&
234             !strncasecmp(ameth->pem_str, str, len))
235             return ameth;
236     }
237     return NULL;
238 }

240 int EVP_PKEY_asn1_add0(const EVP_PKEY_ASN1_METHOD *ameth)
241 {
242     if (app_methods == NULL)
243     {
244         app_methods = sk_EVP_PKEY_ASN1_METHOD_new(ameth_cmp);
245         if (!app_methods)
246             return 0;
247     }
248     if (!sk_EVP_PKEY_ASN1_METHOD_push(app_methods, ameth))
249         return 0;
250     sk_EVP_PKEY_ASN1_METHOD_sort(app_methods);
251     return 1;
252 }

254 int EVP_PKEY_asn1_add_alias(int to, int from)
255 {
256     EVP_PKEY_ASN1_METHOD *ameth;
257     ameth = EVP_PKEY_asn1_new(from, ASN1_PKEY_ALIAS, NULL, NULL);
258     if (!ameth)
259         return 0;

```

```

260     ameth->pkey_base_id = to;
261     return EVP_PKEY_asn1_add0(ameth);
262 }

264 int EVP_PKEY_asn1_get0_info(int *ppkey_id, int *ppkey_base_id, int *ppkey_flags,
265                             const char **pinfo, const char **ppem_str,
266                             const EVP_PKEY_ASN1_METHOD *ameth)
267 {
268     if (!ameth)
269         return 0;
270     if (ppkey_id)
271         *ppkey_id = ameth->pkey_id;
272     if (ppkey_base_id)
273         *ppkey_base_id = ameth->pkey_base_id;
274     if (ppkey_flags)
275         *ppkey_flags = ameth->pkey_flags;
276     if (pinfo)
277         *pinfo = ameth->info;
278     if (ppem_str)
279         *ppem_str = ameth->pem_str;
280     return 1;
281 }

283 const EVP_PKEY_ASN1_METHOD* EVP_PKEY_get0_asn1(EVP_PKEY *pkey)
284 {
285     return pkey->ameth;
286 }

288 EVP_PKEY_ASN1_METHOD* EVP_PKEY_asn1_new(int id, int flags,
289                                           const char *pem_str, const char *info)
290 {
291     EVP_PKEY_ASN1_METHOD *ameth;
292     ameth = OPENSSL_malloc(sizeof(EVP_PKEY_ASN1_METHOD));
293     if (!ameth)
294         return NULL;

296     memset(ameth, 0, sizeof(EVP_PKEY_ASN1_METHOD));

298     ameth->pkey_id = id;
299     ameth->pkey_base_id = id;
300     ameth->pkey_flags = flags | ASN1_PKEY_DYNAMIC;

302     if (info)
303     {
304         ameth->info = BUF_strdup(info);
305         if (!ameth->info)
306             goto err;
307     }
308     else
309         ameth->info = NULL;

311     if (pem_str)
312     {
313         ameth->pem_str = BUF_strdup(pem_str);
314         if (!ameth->pem_str)
315             goto err;
316     }
317     else
318         ameth->pem_str = NULL;

320     ameth->pub_decode = 0;
321     ameth->pub_encode = 0;
322     ameth->pub_cmp = 0;
323     ameth->pub_print = 0;

325     ameth->priv_decode = 0;

```

```

326     ameth->priv_encode = 0;
327     ameth->priv_print = 0;

329     ameth->old_priv_encode = 0;
330     ameth->old_priv_decode = 0;

332     ameth->item_verify = 0;
333     ameth->item_sign = 0;

335     ameth->pkey_size = 0;
336     ameth->pkey_bits = 0;

338     ameth->param_decode = 0;
339     ameth->param_encode = 0;
340     ameth->param_missing = 0;
341     ameth->param_copy = 0;
342     ameth->param_cmp = 0;
343     ameth->param_print = 0;

345     ameth->pkey_free = 0;
346     ameth->pkey_ctrl = 0;

348     return ameth;

350     err:

352     EVP_PKEY_asn1_free(ameth);
353     return NULL;

355 }

357 void EVP_PKEY_asn1_copy(EVP_PKEY_ASN1_METHOD *dst,
358                         const EVP_PKEY_ASN1_METHOD *src)
359 {
361     dst->pub_decode = src->pub_decode;
362     dst->pub_encode = src->pub_encode;
363     dst->pub_cmp = src->pub_cmp;
364     dst->pub_print = src->pub_print;

366     dst->priv_decode = src->priv_decode;
367     dst->priv_encode = src->priv_encode;
368     dst->priv_print = src->priv_print;

370     dst->old_priv_encode = src->old_priv_encode;
371     dst->old_priv_decode = src->old_priv_decode;

373     dst->pkey_size = src->pkey_size;
374     dst->pkey_bits = src->pkey_bits;

376     dst->param_decode = src->param_decode;
377     dst->param_encode = src->param_encode;
378     dst->param_missing = src->param_missing;
379     dst->param_copy = src->param_copy;
380     dst->param_cmp = src->param_cmp;
381     dst->param_print = src->param_print;

383     dst->pkey_free = src->pkey_free;
384     dst->pkey_ctrl = src->pkey_ctrl;

386     dst->item_sign = src->item_sign;
387     dst->item_verify = src->item_verify;

389 }

391 void EVP_PKEY_asn1_free(EVP_PKEY_ASN1_METHOD *ameth)

```

```

392     {
393     if (ameth && (ameth->pkey_flags & ASN1_PKEY_DYNAMIC))
394     {
395         if (ameth->pem_str)
396             OPENSSL_free(ameth->pem_str);
397         if (ameth->info)
398             OPENSSL_free(ameth->info);
399         OPENSSL_free(ameth);
400     }
401 }

403 void EVP_PKEY_asn1_set_public(EVP_PKEY_ASN1_METHOD *ameth,
404     int (*pub_decode)(EVP_PKEY *pk, X509_PUBKEY *pub),
405     int (*pub_encode)(X509_PUBKEY *pub, const EVP_PKEY *pk),
406     int (*pub_cmp)(const EVP_PKEY *a, const EVP_PKEY *b),
407     int (*pub_print)(BIO *out, const EVP_PKEY *pkey, int indent,
408                     ASN1_PCTX *pctx),
409     int (*pkey_size)(const EVP_PKEY *pk),
410     int (*pkey_bits)(const EVP_PKEY *pk))
411 {
412     ameth->pub_decode = pub_decode;
413     ameth->pub_encode = pub_encode;
414     ameth->pub_cmp = pub_cmp;
415     ameth->pub_print = pub_print;
416     ameth->pkey_size = pkey_size;
417     ameth->pkey_bits = pkey_bits;
418 }

420 void EVP_PKEY_asn1_set_private(EVP_PKEY_ASN1_METHOD *ameth,
421     int (*priv_decode)(EVP_PKEY *pk, PKCS8_PRIV_KEY_INFO *p8inf),
422     int (*priv_encode)(PKCS8_PRIV_KEY_INFO *p8, const EVP_PKEY *pk),
423     int (*priv_print)(BIO *out, const EVP_PKEY *pkey, int indent,
424                      ASN1_PCTX *pctx))
425 {
426     ameth->priv_decode = priv_decode;
427     ameth->priv_encode = priv_encode;
428     ameth->priv_print = priv_print;
429 }

431 void EVP_PKEY_asn1_set_param(EVP_PKEY_ASN1_METHOD *ameth,
432     int (*param_decode)(EVP_PKEY *pkey,
433                         const unsigned char **pder, int derlen),
434     int (*param_encode)(const EVP_PKEY *pkey, unsigned char **pder),
435     int (*param_missing)(const EVP_PKEY *pk),
436     int (*param_copy)(EVP_PKEY *to, const EVP_PKEY *from),
437     int (*param_cmp)(const EVP_PKEY *a, const EVP_PKEY *b),
438     int (*param_print)(BIO *out, const EVP_PKEY *pkey, int indent,
439                       ASN1_PCTX *pctx))
440 {
441     ameth->param_decode = param_decode;
442     ameth->param_encode = param_encode;
443     ameth->param_missing = param_missing;
444     ameth->param_copy = param_copy;
445     ameth->param_cmp = param_cmp;
446     ameth->param_print = param_print;
447 }

449 void EVP_PKEY_asn1_set_free(EVP_PKEY_ASN1_METHOD *ameth,
450     void (*pkey_free)(EVP_PKEY *pkey))
451 {
452     ameth->pkey_free = pkey_free;
453 }

455 void EVP_PKEY_asn1_set_ctrl(EVP_PKEY_ASN1_METHOD *ameth,
456     int (*pkey_ctrl)(EVP_PKEY *pkey, int op,
457                     long arg1, void *arg2))

```

```

458     {
459     ameth->pkey_ctrl = pkey_ctrl;
460     }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_err.c

1

```
*****
18220 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/asn1/asn1_err.c */
2 /* =====
3  * Copyright (c) 1999-2011 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
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14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
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30  *
31  * 6. Redistributions of any form whatsoever must retain the following
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33  * "This product includes software developed by the OpenSSL Project
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35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/asn1.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_ASN1,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_ASN1,0,reason)

71 static ERR_STRING_DATA ASN1_str_functs[]=
72 {
73 {ERR_FUNC(ASN1_F_A2D_ASN1_OBJECT), "a2d_ASN1_OBJECT"},
74 {ERR_FUNC(ASN1_F_A2I_ASN1_ENUMERATED), "a2i_ASN1_ENUMERATED"},
75 {ERR_FUNC(ASN1_F_A2I_ASN1_INTEGER), "a2i_ASN1_INTEGER"},
76 {ERR_FUNC(ASN1_F_A2I_ASN1_STRING), "a2i_ASN1_STRING"},
77 {ERR_FUNC(ASN1_F_APPEND_EXP), "APPEND_EXP"},
78 {ERR_FUNC(ASN1_F_ASN1_BIT_STRING_SET_BIT), "ASN1_BIT_STRING_set_bit"},
79 {ERR_FUNC(ASN1_F_ASN1_CB), "ASN1_CB"},
80 {ERR_FUNC(ASN1_F_ASN1_CHECK_TLEN), "ASN1_CHECK_TLEN"},
81 {ERR_FUNC(ASN1_F_ASN1_COLLATE_PRIMITIVE), "ASN1_COLLATE_PRIMITIVE"},
82 {ERR_FUNC(ASN1_F_ASN1_COLLECT), "ASN1_COLLECT"},
83 {ERR_FUNC(ASN1_F_ASN1_D2I_EX_PRIMITIVE), "ASN1_D2I_EX_PRIMITIVE"},
84 {ERR_FUNC(ASN1_F_ASN1_D2I_FP), "ASN1_d2i_fp"},
85 {ERR_FUNC(ASN1_F_ASN1_D2I_READ_BIO), "ASN1_D2I_READ_BIO"},
86 {ERR_FUNC(ASN1_F_ASN1_DIGEST), "ASN1_digest"},
87 {ERR_FUNC(ASN1_F_ASN1_DO_ADB), "ASN1_DO_ADB"},
88 {ERR_FUNC(ASN1_F_ASN1_DUP), "ASN1_dup"},
89 {ERR_FUNC(ASN1_F_ASN1_ENUMERATED_SET), "ASN1_ENUMERATED_set"},
90 {ERR_FUNC(ASN1_F_ASN1_ENUMERATED_TO_BN), "ASN1_ENUMERATED_to_BN"},
91 {ERR_FUNC(ASN1_F_ASN1_EX_C2I), "ASN1_EX_C2I"},
92 {ERR_FUNC(ASN1_F_ASN1_FIND_END), "ASN1_FIND_END"},
93 {ERR_FUNC(ASN1_F_ASN1_GENERALIZEDTIME_ADJ), "ASN1_GENERALIZEDTIME_adj"},
94 {ERR_FUNC(ASN1_F_ASN1_GENERALIZEDTIME_SET), "ASN1_GENERALIZEDTIME_set"},
95 {ERR_FUNC(ASN1_F_ASN1_GENERATE_V3), "ASN1_generate_v3"},
96 {ERR_FUNC(ASN1_F_ASN1_GET_OBJECT), "ASN1_get_object"},
97 {ERR_FUNC(ASN1_F_ASN1_HEADER_NEW), "ASN1_HEADER_NEW"},
98 {ERR_FUNC(ASN1_F_ASN1_I2D_BIO), "ASN1_i2d_bio"},
99 {ERR_FUNC(ASN1_F_ASN1_I2D_FP), "ASN1_i2d_fp"},
100 {ERR_FUNC(ASN1_F_ASN1_INTEGER_SET), "ASN1_INTEGER_set"},
101 {ERR_FUNC(ASN1_F_ASN1_INTEGER_TO_BN), "ASN1_INTEGER_to_BN"},
102 {ERR_FUNC(ASN1_F_ASN1_ITEM_D2I_FP), "ASN1_item_d2i_fp"},
103 {ERR_FUNC(ASN1_F_ASN1_ITEM_DUP), "ASN1_item_dup"},
104 {ERR_FUNC(ASN1_F_ASN1_ITEM_EX_COMBINE_NEW), "ASN1_ITEM_EX_COMBINE_NEW"},
105 {ERR_FUNC(ASN1_F_ASN1_ITEM_EX_D2I), "ASN1_ITEM_EX_D2I"},
106 {ERR_FUNC(ASN1_F_ASN1_ITEM_I2D_BIO), "ASN1_item_i2d_bio"},
107 {ERR_FUNC(ASN1_F_ASN1_ITEM_I2D_FP), "ASN1_item_i2d_fp"},
108 {ERR_FUNC(ASN1_F_ASN1_ITEM_PACK), "ASN1_item_pack"},
109 {ERR_FUNC(ASN1_F_ASN1_ITEM_SIGN), "ASN1_item_sign"},
110 {ERR_FUNC(ASN1_F_ASN1_ITEM_SIGN_CTX), "ASN1_item_sign_ctx"},
111 {ERR_FUNC(ASN1_F_ASN1_ITEM_UNPACK), "ASN1_item_unpack"},
112 {ERR_FUNC(ASN1_F_ASN1_ITEM_VERIFY), "ASN1_item_verify"},
113 {ERR_FUNC(ASN1_F_ASN1_MBSTRING_NCOPY), "ASN1_mbstring_ncopy"},
114 {ERR_FUNC(ASN1_F_ASN1_OBJECT_NEW), "ASN1_OBJECT_new"},
115 {ERR_FUNC(ASN1_F_ASN1_OUTPUT_DATA), "ASN1_OUTPUT_DATA"},
116 {ERR_FUNC(ASN1_F_ASN1_PACK_STRING), "ASN1_pack_string"},
117 {ERR_FUNC(ASN1_F_ASN1_PCTX_NEW), "ASN1_PCTX_new"},
118 {ERR_FUNC(ASN1_F_ASN1_PKCS5_PBE_SET), "ASN1_PKCS5_PBE_SET"},
119 {ERR_FUNC(ASN1_F_ASN1_SEQ_PACK), "ASN1_seq_pack"},
120 {ERR_FUNC(ASN1_F_ASN1_SEQ_UNPACK), "ASN1_seq_unpack"},
121 {ERR_FUNC(ASN1_F_ASN1_SIGN), "ASN1_sign"},
122 {ERR_FUNC(ASN1_F_ASN1_STR2TYPE), "ASN1_STR2TYPE"},
123 {ERR_FUNC(ASN1_F_ASN1_STRING_SET), "ASN1_STRING_set"},
124 {ERR_FUNC(ASN1_F_ASN1_STRING_TABLE_ADD), "ASN1_STRING_TABLE_add"},
125 {ERR_FUNC(ASN1_F_ASN1_STRING_TYPE_NEW), "ASN1_STRING_type_new"},
126 {ERR_FUNC(ASN1_F_ASN1_TEMPLATE_EX_D2I), "ASN1_TEMPLATE_EX_D2I"},
127 {ERR_FUNC(ASN1_F_ASN1_TEMPLATE_NEW), "ASN1_TEMPLATE_NEW"},
}
```

```

128 {ERR_FUNC(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I), "ASN1_TEMPLATE_NOEXP_D2I"},
129 {ERR_FUNC(ASN1_F_ASN1_TIME_ADJ), "ASN1_TIME_adj"},
130 {ERR_FUNC(ASN1_F_ASN1_TIME_SET), "ASN1_TIME_set"},
131 {ERR_FUNC(ASN1_F_ASN1_TYPE_GET_INT_OCTETSTRING), "ASN1_TYPE_get_int_octet"},
132 {ERR_FUNC(ASN1_F_ASN1_TYPE_GET_OCTETSTRING), "ASN1_TYPE_get_octetstring"},
133 {ERR_FUNC(ASN1_F_ASN1_UNPACK_STRING), "ASN1_unpack_string"},
134 {ERR_FUNC(ASN1_F_ASN1_UTCTIME_ADJ), "ASN1_UTCTIME_adj"},
135 {ERR_FUNC(ASN1_F_ASN1_UTCTIME_SET), "ASN1_UTCTIME_set"},
136 {ERR_FUNC(ASN1_F_ASN1_VERIFY), "ASN1_verify"},
137 {ERR_FUNC(ASN1_F_B64_READ_ASN1), "B64_READ_ASN1"},
138 {ERR_FUNC(ASN1_F_B64_WRITE_ASN1), "B64_WRITE_ASN1"},
139 {ERR_FUNC(ASN1_F_BIO_NEW_NDEF), "BIO_new_NDEF"},
140 {ERR_FUNC(ASN1_F_BITSTR_CB), "BITSTR_CB"},
141 {ERR_FUNC(ASN1_F_BN_TO_ASN1_ENUMERATED), "BN_to_ASN1_ENUMERATED"},
142 {ERR_FUNC(ASN1_F_BN_TO_ASN1_INTEGER), "BN_to_ASN1_INTEGER"},
143 {ERR_FUNC(ASN1_F_C2I_ASN1_BIT_STRING), "c2i_ASN1_BIT_STRING"},
144 {ERR_FUNC(ASN1_F_C2I_ASN1_INTEGER), "c2i_ASN1_INTEGER"},
145 {ERR_FUNC(ASN1_F_C2I_ASN1_OBJECT), "c2i_ASN1_OBJECT"},
146 {ERR_FUNC(ASN1_F_COLLECT_DATA), "COLLECT_DATA"},
147 {ERR_FUNC(ASN1_F_D2I_ASN1_BIT_STRING), "D2I_ASN1_BIT_STRING"},
148 {ERR_FUNC(ASN1_F_D2I_ASN1_BOOLEAN), "d2i_ASN1_BOOLEAN"},
149 {ERR_FUNC(ASN1_F_D2I_ASN1_BYTES), "d2i_ASN1_bytes"},
150 {ERR_FUNC(ASN1_F_D2I_ASN1_GENERALIZEDTIME), "D2I_ASN1_GENERALIZEDTIME"},
151 {ERR_FUNC(ASN1_F_D2I_ASN1_HEADER), "D2I_ASN1_HEADER"},
152 {ERR_FUNC(ASN1_F_D2I_ASN1_INTEGER), "D2I_ASN1_INTEGER"},
153 {ERR_FUNC(ASN1_F_D2I_ASN1_OBJECT), "d2i_ASN1_OBJECT"},
154 {ERR_FUNC(ASN1_F_D2I_ASN1_SET), "d2i_ASN1_SET"},
155 {ERR_FUNC(ASN1_F_D2I_ASN1_TYPE_BYTES), "d2i_ASN1_type_bytes"},
156 {ERR_FUNC(ASN1_F_D2I_ASN1_UNINTEGER), "d2i_ASN1_UNINTEGER"},
157 {ERR_FUNC(ASN1_F_D2I_ASN1_UTCTIME), "D2I_ASN1_UTCTIME"},
158 {ERR_FUNC(ASN1_F_D2I_AUTOPRIVATEKEY), "d2i_AutoPrivateKey"},
159 {ERR_FUNC(ASN1_F_D2I_NETSCAPE_RSA), "d2i_Netscape_RSA"},
160 {ERR_FUNC(ASN1_F_D2I_NETSCAPE_RSA_2), "D2I_NETSCAPE_RSA_2"},
161 {ERR_FUNC(ASN1_F_D2I_PRIVATEKEY), "d2i_PrivateKey"},
162 {ERR_FUNC(ASN1_F_D2I_PUBLICKEY), "d2i_PublicKey"},
163 {ERR_FUNC(ASN1_F_D2I_RSA_NET), "d2i_RSA_NET"},
164 {ERR_FUNC(ASN1_F_D2I_RSA_NET_2), "D2I_RSA_NET_2"},
165 {ERR_FUNC(ASN1_F_D2I_X509), "D2I_X509"},
166 {ERR_FUNC(ASN1_F_D2I_X509_CINF), "D2I_X509_CINF"},
167 {ERR_FUNC(ASN1_F_D2I_X509_PKEY), "d2i_X509_PKEY"},
168 {ERR_FUNC(ASN1_F_I2D_ASN1_BIO_STREAM), "i2d_ASN1_bio_stream"},
169 {ERR_FUNC(ASN1_F_I2D_ASN1_SET), "i2d_ASN1_SET"},
170 {ERR_FUNC(ASN1_F_I2D_ASN1_TIME), "I2D_ASN1_TIME"},
171 {ERR_FUNC(ASN1_F_I2D_DSA_PUBKEY), "i2d_DSA_PUBKEY"},
172 {ERR_FUNC(ASN1_F_I2D_EC_PUBKEY), "i2d_EC_PUBKEY"},
173 {ERR_FUNC(ASN1_F_I2D_PRIVATEKEY), "i2d_PrivateKey"},
174 {ERR_FUNC(ASN1_F_I2D_PUBLICKEY), "i2d_PublicKey"},
175 {ERR_FUNC(ASN1_F_I2D_RSA_NET), "i2d_RSA_NET"},
176 {ERR_FUNC(ASN1_F_I2D_RSA_PUBKEY), "i2d_RSA_PUBKEY"},
177 {ERR_FUNC(ASN1_F_LONG_C2I), "LONG_C2I"},
178 {ERR_FUNC(ASN1_F_OID_MODULE_INIT), "OID_MODULE_INIT"},
179 {ERR_FUNC(ASN1_F_PARSE_TAGGING), "PARSE_TAGGING"},
180 {ERR_FUNC(ASN1_F_PKCS5_PBE2_SET_IV), "PKCS5_pbe2_set_iv"},
181 {ERR_FUNC(ASN1_F_PKCS5_PBE_SET), "PKCS5_pbe_set"},
182 {ERR_FUNC(ASN1_F_PKCS5_PBE_SET0_ALGOR), "PKCS5_pbe_set0_algor"},
183 {ERR_FUNC(ASN1_F_PKCS5_PBKDF2_SET), "PKCS5_pbkdf2_set"},
184 {ERR_FUNC(ASN1_F_SMIME_READ_ASN1), "SMIME_read_ASN1"},
185 {ERR_FUNC(ASN1_F_SMIME_TEXT), "SMIME_text"},
186 {ERR_FUNC(ASN1_F_X509_CINF_NEW), "X509_CINF_NEW"},
187 {ERR_FUNC(ASN1_F_X509_CRL_ADD0_REVOKED), "X509_CRL_add0_revoked"},
188 {ERR_FUNC(ASN1_F_X509_INFO_NEW), "X509_INFO_new"},
189 {ERR_FUNC(ASN1_F_X509_NAME_ENCODE), "X509_NAME_ENCODE"},
190 {ERR_FUNC(ASN1_F_X509_NAME_EX_D2I), "X509_NAME_EX_D2I"},
191 {ERR_FUNC(ASN1_F_X509_NAME_EX_NEW), "X509_NAME_EX_NEW"},
192 {ERR_FUNC(ASN1_F_X509_NEW), "X509_NEW"},
193 {ERR_FUNC(ASN1_F_X509_PKEY_NEW), "X509_PKEY_new"},

```

```

194 {0, NULL}
195 };

197 static ERR_STRING_DATA ASN1_str_reasons[]=
198 {
199 {ERR_REASON(ASN1_R_ADDING_OBJECT), "adding object"},
200 {ERR_REASON(ASN1_R_ASN1_PARSE_ERROR), "asn1 parse error"},
201 {ERR_REASON(ASN1_R_ASN1_SIG_PARSE_ERROR), "asn1 sig parse error"},
202 {ERR_REASON(ASN1_R_AUX_ERROR), "aux error"},
203 {ERR_REASON(ASN1_R_BAD_CLASS), "bad class"},
204 {ERR_REASON(ASN1_R_BAD_OBJECT_HEADER), "bad object header"},
205 {ERR_REASON(ASN1_R_BAD_PASSWORD_READ), "bad password read"},
206 {ERR_REASON(ASN1_R_BAD_TAG), "bad tag"},
207 {ERR_REASON(ASN1_R_BMPSTRING_IS_WRONG_LENGTH), "bmpstring is wrong length"},
208 {ERR_REASON(ASN1_R_BN_LIB), "bn lib"},
209 {ERR_REASON(ASN1_R_BOOLEAN_IS_WRONG_LENGTH), "boolean is wrong length"},
210 {ERR_REASON(ASN1_R_BUFFER_TOO_SMALL), "buffer too small"},
211 {ERR_REASON(ASN1_R_CIPHHER_HAS_NO_OBJECT_IDENTIFIER), "cipher has no object identi"},
212 {ERR_REASON(ASN1_R_CONTEXT_NOT_INITIALISED), "context not initialised"},
213 {ERR_REASON(ASN1_R_DATA_IS_WRONG), "data is wrong"},
214 {ERR_REASON(ASN1_R_DECODE_ERROR), "decode error"},
215 {ERR_REASON(ASN1_R_DECODING_ERROR), "decoding error"},
216 {ERR_REASON(ASN1_R_DEPTH_EXCEEDED), "depth exceeded"},
217 {ERR_REASON(ASN1_R_DIGEST_AND_KEY_TYPE_NOT_SUPPORTED), "digest and key type not s"},
218 {ERR_REASON(ASN1_R_ENCODE_ERROR), "encode error"},
219 {ERR_REASON(ASN1_R_ERROR_GETTING_TIME), "error getting time"},
220 {ERR_REASON(ASN1_R_ERROR_LOADING_SECTION), "error loading section"},
221 {ERR_REASON(ASN1_R_ERROR_PARSING_SET_ELEMENT), "error parsing set element"},
222 {ERR_REASON(ASN1_R_ERROR_SETTING_CIPHER_PARAMS), "error setting cipher params"},
223 {ERR_REASON(ASN1_R_EXPECTING_AN_INTEGER), "expecting an integer"},
224 {ERR_REASON(ASN1_R_EXPECTING_AN_OBJECT), "expecting an object"},
225 {ERR_REASON(ASN1_R_EXPECTING_A_BOOLEAN), "expecting a boolean"},
226 {ERR_REASON(ASN1_R_EXPECTING_A_TIME), "expecting a time"},
227 {ERR_REASON(ASN1_R_EXPLICIT_LENGTH_MISMATCH), "explicit length mismatch"},
228 {ERR_REASON(ASN1_R_EXPLICIT_TAG_NOT_CONSTRUCTED), "explicit tag not constructed"},
229 {ERR_REASON(ASN1_R_FIELD_MISSING), "field missing"},
230 {ERR_REASON(ASN1_R_FIRST_NUM_TOO_LARGE), "first num too large"},
231 {ERR_REASON(ASN1_R_HEADER_TOO_LONG), "header too long"},
232 {ERR_REASON(ASN1_R_ILLEGAL_BITSTRING_FORMAT), "illegal bitstring format"},
233 {ERR_REASON(ASN1_R_ILLEGAL_BOOLEAN), "illegal boolean"},
234 {ERR_REASON(ASN1_R_ILLEGAL_CHARACTERS), "illegal characters"},
235 {ERR_REASON(ASN1_R_ILLEGAL_FORMAT), "illegal format"},
236 {ERR_REASON(ASN1_R_ILLEGAL_HEX), "illegal hex"},
237 {ERR_REASON(ASN1_R_ILLEGAL_IMPLICIT_TAG), "illegal implicit tag"},
238 {ERR_REASON(ASN1_R_ILLEGAL_INTEGER), "illegal integer"},
239 {ERR_REASON(ASN1_R_ILLEGAL_NESTED_TAGGING), "illegal nested tagging"},
240 {ERR_REASON(ASN1_R_ILLEGAL_NULL), "illegal null"},
241 {ERR_REASON(ASN1_R_ILLEGAL_NULL_VALUE), "illegal null value"},
242 {ERR_REASON(ASN1_R_ILLEGAL_OBJECT), "illegal object"},
243 {ERR_REASON(ASN1_R_ILLEGAL_OPTIONAL_ANY), "illegal optional any"},
244 {ERR_REASON(ASN1_R_ILLEGAL_OPTIONS_ON_ITEM_TEMPLATE), "illegal options on item te"},
245 {ERR_REASON(ASN1_R_ILLEGAL_TAGGED_ANY), "illegal tagged any"},
246 {ERR_REASON(ASN1_R_ILLEGAL_TIME_VALUE), "illegal time value"},
247 {ERR_REASON(ASN1_R_INTEGER_NOT_ASCII_FORMAT), "integer not ascii format"},
248 {ERR_REASON(ASN1_R_INTEGER_TOO_LARGE_FOR_LONG), "integer too large for long"},
249 {ERR_REASON(ASN1_R_INVALID_BMPSTRING_LENGTH), "invalid bmpstring length"},
250 {ERR_REASON(ASN1_R_INVALID_DIGIT), "invalid digit"},
251 {ERR_REASON(ASN1_R_INVALID_MIME_TYPE), "invalid mime type"},
252 {ERR_REASON(ASN1_R_INVALID_MODIFIER), "invalid modifier"},
253 {ERR_REASON(ASN1_R_INVALID_NUMBER), "invalid number"},
254 {ERR_REASON(ASN1_R_INVALID_OBJECT_ENCODING), "invalid object encoding"},
255 {ERR_REASON(ASN1_R_INVALID_SEPARATOR), "invalid separator"},
256 {ERR_REASON(ASN1_R_INVALID_TIME_FORMAT), "invalid time format"},
257 {ERR_REASON(ASN1_R_INVALID_UNIVERSALSTRING_LENGTH), "invalid universalstring leng"},
258 {ERR_REASON(ASN1_R_INVALID_UTF8STRING), "invalid utf8string"},
259 {ERR_REASON(ASN1_R_IV_TOO_LARGE), "iv too large"},

```

```

260 {ERR_REASON(ASN1_R_LENGTH_ERROR), "length error"},
261 {ERR_REASON(ASN1_R_LIST_ERROR), "list error"},
262 {ERR_REASON(ASN1_R_MIME_NO_CONTENT_TYPE), "mime no content type"},
263 {ERR_REASON(ASN1_R_MIME_PARSE_ERROR), "mime parse error"},
264 {ERR_REASON(ASN1_R_MIME_SIG_PARSE_ERROR), "mime sig parse error"},
265 {ERR_REASON(ASN1_R_MISSING_EOC), "missing eoc"},
266 {ERR_REASON(ASN1_R_MISSING_SECOND_NUMBER), "missing second number"},
267 {ERR_REASON(ASN1_R_MISSING_VALUE), "missing value"},
268 {ERR_REASON(ASN1_R_MSTRING_NOT_UNIVERSAL), "mstring not universal"},
269 {ERR_REASON(ASN1_R_MSTRING_WRONG_TAG), "mstring wrong tag"},
270 {ERR_REASON(ASN1_R_NESTED_ASN1_STRING), "nested asn1 string"},
271 {ERR_REASON(ASN1_R_NON_HEX_CHARACTERS), "non hex characters"},
272 {ERR_REASON(ASN1_R_NOT_ASCII_FORMAT), "not ascii format"},
273 {ERR_REASON(ASN1_R_NOT_ENOUGH_DATA), "not enough data"},
274 {ERR_REASON(ASN1_R_NO_CONTENT_TYPE), "no content type"},
275 {ERR_REASON(ASN1_R_NO_DEFAULT_DIGEST), "no default digest"},
276 {ERR_REASON(ASN1_R_NO_MATCHING_CHOICE_TYPE), "no matching choice type"},
277 {ERR_REASON(ASN1_R_NO_MULTIPART_BODY_FAILURE), "no multipart body failure"},
278 {ERR_REASON(ASN1_R_NO_MULTIPART_BOUNDARY), "no multipart boundary"},
279 {ERR_REASON(ASN1_R_NO_SIG_CONTENT_TYPE), "no sig content type"},
280 {ERR_REASON(ASN1_R_NULL_IS_WRONG_LENGTH), "null is wrong length"},
281 {ERR_REASON(ASN1_R_OBJECT_NOT_ASCII_FORMAT), "object not ascii format"},
282 {ERR_REASON(ASN1_R_ODD_NUMBER_OF_CHARS), "odd number of chars"},
283 {ERR_REASON(ASN1_R_PRIVATE_KEY_HEADER_MISSING), "private key header missing"},
284 {ERR_REASON(ASN1_R_SECOND_NUMBER_TOO_LARGE), "second number too large"},
285 {ERR_REASON(ASN1_R_SEQUENCE_LENGTH_MISMATCH), "sequence length mismatch"},
286 {ERR_REASON(ASN1_R_SEQUENCE_NOT_CONSTRUCTED), "sequence not constructed"},
287 {ERR_REASON(ASN1_R_SEQUENCE_OR_SET_NEEDS_CONFIG), "sequence or set needs config"},
288 {ERR_REASON(ASN1_R_SHORT_LINE), "short line"},
289 {ERR_REASON(ASN1_R_SIG_INVALID_MIME_TYPE), "sig invalid mime type"},
290 {ERR_REASON(ASN1_R_STREAMING_NOT_SUPPORTED), "streaming not supported"},
291 {ERR_REASON(ASN1_R_STRING_TOO_LONG), "string too long"},
292 {ERR_REASON(ASN1_R_STRING_TOO_SHORT), "string too short"},
293 {ERR_REASON(ASN1_R_TAG_VALUE_TOO_HIGH), "tag value too high"},
294 {ERR_REASON(ASN1_R_THE_ASN1_OBJECT_IDENTIFIER_IS_NOT_KNOWN_FOR_THIS_MD), "the asn"},
295 {ERR_REASON(ASN1_R_TIME_NOT_ASCII_FORMAT), "time not ascii format"},
296 {ERR_REASON(ASN1_R_TOO_LONG), "too long"},
297 {ERR_REASON(ASN1_R_TYPE_NOT_CONSTRUCTED), "type not constructed"},
298 {ERR_REASON(ASN1_R_UNABLE_TO_DECODE_RSA_KEY), "unable to decode rsa key"},
299 {ERR_REASON(ASN1_R_UNABLE_TO_DECODE_RSA_PRIVATE_KEY), "unable to decode rsa priva"},
300 {ERR_REASON(ASN1_R_UNEXPECTED_EOC), "unexpected eoc"},
301 {ERR_REASON(ASN1_R_UNIVERSALSTRING_IS_WRONG_LENGTH), "universalstring is wrong le"},
302 {ERR_REASON(ASN1_R_UNKNOWN_FORMAT), "unknown format"},
303 {ERR_REASON(ASN1_R_UNKNOWN_MESSAGE_DIGEST_ALGORITHM), "unknown message digest alg"},
304 {ERR_REASON(ASN1_R_UNKNOWN_OBJECT_TYPE), "unknown object type"},
305 {ERR_REASON(ASN1_R_UNKNOWN_PUBLIC_KEY_TYPE), "unknown public key type"},
306 {ERR_REASON(ASN1_R_UNKNOWN_SIGNATURE_ALGORITHM), "unknown signature algorithm"},
307 {ERR_REASON(ASN1_R_UNKNOWN_TAG), "unknown tag"},
308 {ERR_REASON(ASN1_R_UNKNOWN_FORMAT), "unknown format"},
309 {ERR_REASON(ASN1_R_UNSUPPORTED_ANY_DEFINED_BY_TYPE), "unsupported any defined by"},
310 {ERR_REASON(ASN1_R_UNSUPPORTED_CIPHER), "unsupported cipher"},
311 {ERR_REASON(ASN1_R_UNSUPPORTED_ENCRYPTION_ALGORITHM), "unsupported encryption alg"},
312 {ERR_REASON(ASN1_R_UNSUPPORTED_PUBLIC_KEY_TYPE), "unsupported public key type"},
313 {ERR_REASON(ASN1_R_UNSUPPORTED_TYPE), "unsupported type"},
314 {ERR_REASON(ASN1_R_WRONG_PUBLIC_KEY_TYPE), "wrong public key type"},
315 {ERR_REASON(ASN1_R_WRONG_TAG), "wrong tag"},
316 {ERR_REASON(ASN1_R_WRONG_TYPE), "wrong type"},
317 {0, NULL}
318 };
320 #endif

322 void ERR_load_ASN1_strings(void)
323 {
324 #ifndef OPENSSL_NO_ERR

```

```

326     if (ERR_func_error_string(ASN1_str_functs[0].error) == NULL)
327     {
328         ERR_load_strings(0, ASN1_str_functs);
329         ERR_load_strings(0, ASN1_str_reasons);
330     }
331 #endif
332 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_gen.c

1

```
*****
21101 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_gen.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* asn1_gen.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
6  * Copyright (c) 2002 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
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17  * the documentation and/or other materials provided with the
18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
23  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
24  *
25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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34  * 6. Redistributions of any form whatsoever must retain the following
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37  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include "cryptlib.h"
60 #include <openssl/asn1.h>
61 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_gen.c

2

```
63 #define ASN1_GEN_FLAG          0x10000
64 #define ASN1_GEN_FLAG_IMP      (ASN1_GEN_FLAG|1)
65 #define ASN1_GEN_FLAG_EXP      (ASN1_GEN_FLAG|2)
66 #define ASN1_GEN_FLAG_TAG      (ASN1_GEN_FLAG|3)
67 #define ASN1_GEN_FLAG_BITWRAP  (ASN1_GEN_FLAG|4)
68 #define ASN1_GEN_FLAG_OCTWRAP  (ASN1_GEN_FLAG|5)
69 #define ASN1_GEN_FLAG_SEQWRAP  (ASN1_GEN_FLAG|6)
70 #define ASN1_GEN_FLAG_SETWRAP  (ASN1_GEN_FLAG|7)
71 #define ASN1_GEN_FLAG_FORMAT   (ASN1_GEN_FLAG|8)

73 #define ASN1_GEN_STR(str,val)   {str, sizeof(str) - 1, val}

75 #define ASN1_FLAG_EXP_MAX      20

77 /* Input formats */

79 /* ASCII: default */
80 #define ASN1_GEN_FORMAT_ASCII   1
81 /* UTF8 */
82 #define ASN1_GEN_FORMAT_UTF8    2
83 /* Hex */
84 #define ASN1_GEN_FORMAT_HEX     3
85 /* List of bits */
86 #define ASN1_GEN_FORMAT_BITLIST 4

89 struct tag_name_st
90 {
91     const char *strnam;
92     int len;
93     int tag;
94 };

96 typedef struct
97 {
98     int exp_tag;
99     int exp_class;
100    int exp_constructed;
101    int exp_pad;
102    long exp_len;
103 } tag_exp_type;

105 typedef struct
106 {
107     int imp_tag;
108     int imp_class;
109     int utype;
110     int format;
111     const char *str;
112     tag_exp_type exp_list[ASN1_FLAG_EXP_MAX];
113     int exp_count;
114 } tag_exp_arg;

116 static int bitstr_cb(const char *elem, int len, void *bitstr);
117 static int asn1_cb(const char *elem, int len, void *bitstr);
118 static int append_exp(tag_exp_arg *arg, int exp_tag, int exp_class, int exp_cons);
119 static int parse_tagging(const char *vstart, int vlen, int *ptag, int *pclass);
120 static ASN1_TYPE *asn1_multi(int utype, const char *section, X509V3_CTX *cnf);
121 static ASN1_TYPE *asn1_str2type(const char *str, int format, int utype);
122 static int asn1_str2tag(const char *tagstr, int len);

124 ASN1_TYPE *ASN1_generate_nconf(char *str, CONF *nconf)
125 {
126     X509V3_CTX cnf;
```



```

128     if (!nconf)
129         return ASN1_generate_v3(str, NULL);

131     X509V3_set_nconf(&cnf, nconf);
132     return ASN1_generate_v3(str, &cnf);
133 }

135 ASN1_TYPE *ASN1_generate_v3(char *str, X509V3_CTX *cnf)
136 {
137     ASN1_TYPE *ret;
138     tag_exp_arg asn1_tags;
139     tag_exp_type *etmp;

141     int i, len;

143     unsigned char *orig_der = NULL, *new_der = NULL;
144     const unsigned char *cpy_start;
145     unsigned char *p;
146     const unsigned char *cp;
147     int cpy_len;
148     long hdr_len;
149     int hdr_constructed = 0, hdr_tag, hdr_class;
150     int r;

152     asn1_tags.imp_tag = -1;
153     asn1_tags.imp_class = -1;
154     asn1_tags.format = ASN1_GEN_FORMAT_ASCII;
155     asn1_tags.exp_count = 0;
156     if (CONF_parse_list(str, ',', 1, asn1_cb, &asn1_tags) != 0)
157         return NULL;

159     if ((asn1_tags.utype == V_ASN1_SEQUENCE) || (asn1_tags.utype == V_ASN1_S
160     {
161         if (!cnf)
162         {
163             ASN1err(ASN1_F_ASN1_GENERATE_V3, ASN1_R_SEQUENCE_OR_SET
164             return NULL;
165         }
166         ret = asn1_multi(asn1_tags.utype, asn1_tags.str, cnf);
167     }
168     else
169         ret = asn1_str2type(asn1_tags.str, asn1_tags.format, asn1_tags.u

171     if (!ret)
172         return NULL;

174     /* If no tagging return base type */
175     if ((asn1_tags.imp_tag == -1) && (asn1_tags.exp_count == 0))
176         return ret;

178     /* Generate the encoding */
179     cpy_len = i2d_ASN1_TYPE(ret, &orig_der);
180     ASN1_TYPE_free(ret);
181     ret = NULL;
182     /* Set point to start copying for modified encoding */
183     cpy_start = orig_der;

185     /* Do we need IMPLICIT tagging? */
186     if (asn1_tags.imp_tag != -1)
187     {
188         /* If IMPLICIT we will replace the underlying tag */
189         /* Skip existing tag+len */
190         r = ASN1_get_object(&cpy_start, &hdr_len, &hdr_tag, &hdr_class,
191         if (r & 0x80)
192             goto err;
193         /* Update copy length */

```

```

194     cpy_len -= cpy_start - orig_der;
195     /* For IMPLICIT tagging the length should match the
196     * original length and constructed flag should be
197     * consistent.
198     */
199     if (r & 0x1)
200     {
201         /* Indefinite length constructed */
202         hdr_constructed = 2;
203         hdr_len = 0;
204     }
205     else
206     {
207         /* Just retain constructed flag */
208         hdr_constructed = r & V_ASN1_CONSTRUCTED;
209         /* Work out new length with IMPLICIT tag: ignore constructed
210         * because it will mess up if indefinite length
211         */
212         len = ASN1_object_size(0, hdr_len, asn1_tags.imp_tag);
213     }
214     else
215         len = cpy_len;

216     /* Work out length in any EXPLICIT, starting from end */
217     for(i = 0, etmp = asn1_tags.exp_list + asn1_tags.exp_count - 1; i < asn1
218     {
219         /* Content length: number of content octets + any padding */
220         len += etmp->exp_pad;
221         etmp->exp_len = len;
222         /* Total object length: length including new header */
223         len = ASN1_object_size(0, len, etmp->exp_tag);
224     }
225     }

227     /* Allocate buffer for new encoding */

229     new_der = OPENSSL_malloc(len);
230     if (!new_der)
231         goto err;

233     /* Generate tagged encoding */

235     p = new_der;

237     /* Output explicit tags first */

239     for (i = 0, etmp = asn1_tags.exp_list; i < asn1_tags.exp_count; i++, etm
240     {
241         ASN1_put_object(&p, etmp->exp_constructed, etmp->exp_len,
242         etmp->exp_tag, etmp->exp_class);
243         if (etmp->exp_pad)
244             *p++ = 0;
245     }

247     /* If IMPLICIT, output tag */

249     if (asn1_tags.imp_tag != -1)
250     {
251         if (asn1_tags.imp_class == V_ASN1_UNIVERSAL
252         && (asn1_tags.imp_tag == V_ASN1_SEQUENCE
253         || asn1_tags.imp_tag == V_ASN1_SET) )
254             hdr_constructed = V_ASN1_CONSTRUCTED;
255         ASN1_put_object(&p, hdr_constructed, hdr_len,
256         asn1_tags.imp_tag, asn1_tags.imp_class);
257     }

259     /* Copy across original encoding */

```

```

260     memcpy(p, cpy_start, cpy_len);
262     cp = new_der;
264     /* Obtain new ASN1_TYPE structure */
265     ret = d2i_ASN1_TYPE(NULL, &cp, len);
267     err:
268     if (orig_der)
269         OPENSSL_free(orig_der);
270     if (new_der)
271         OPENSSL_free(new_der);
273     return ret;
275 }
277 static int asn1_cb(const char *elem, int len, void *bitstr)
278 {
279     tag_exp_arg *arg = bitstr;
280     int i;
281     int utype;
282     int vlen = 0;
283     const char *p, *vstart = NULL;
285     int tmp_tag, tmp_class;
287     for(i = 0, p = elem; i < len; p++, i++)
288     {
289         /* Look for the ':' in name value pairs */
290         if (*p == ':')
291         {
292             vstart = p + 1;
293             vlen = len - (vstart - elem);
294             len = p - elem;
295             break;
296         }
297     }
299     utype = asn1_str2tag(elem, len);
301     if (utype == -1)
302     {
303         ASN1err(ASN1_F_ASN1_CB, ASN1_R_UNKNOWN_TAG);
304         ERR_add_error_data(2, "tag=", elem);
305         return -1;
306     }
308     /* If this is not a modifier mark end of string and exit */
309     if (!(utype & ASN1_GEN_FLAG))
310     {
311         arg->utype = utype;
312         arg->str = vstart;
313         /* If no value and not end of string, error */
314         if (!vstart && elem[len])
315         {
316             ASN1err(ASN1_F_ASN1_CB, ASN1_R_MISSING_VALUE);
317             return -1;
318         }
319         return 0;
320     }
322     switch(utype)
323     {
325         case ASN1_GEN_FLAG_IMP:

```

```

326         /* Check for illegal multiple IMPLICIT tagging */
327         if (arg->imp_tag != -1)
328         {
329             ASN1err(ASN1_F_ASN1_CB, ASN1_R_ILLEGAL_NESTED_TAGGING);
330             return -1;
331         }
332         if (!parse_tagging(vstart, vlen, &arg->imp_tag, &arg->imp_class))
333             return -1;
334         break;
336     case ASN1_GEN_FLAG_EXP:
338         if (!parse_tagging(vstart, vlen, &tmp_tag, &tmp_class))
339             return -1;
340         if (!append_exp(arg, tmp_tag, tmp_class, 1, 0, 0))
341             return -1;
342         break;
344     case ASN1_GEN_FLAG_SEQWRAP:
345         if (!append_exp(arg, V_ASN1_SEQUENCE, V_ASN1_UNIVERSAL, 1, 0, 1))
346             return -1;
347         break;
349     case ASN1_GEN_FLAG_SETWRAP:
350         if (!append_exp(arg, V_ASN1_SET, V_ASN1_UNIVERSAL, 1, 0, 1))
351             return -1;
352         break;
354     case ASN1_GEN_FLAG_BITWRAP:
355         if (!append_exp(arg, V_ASN1_BIT_STRING, V_ASN1_UNIVERSAL, 0, 1,
356             return -1;
357         break;
359     case ASN1_GEN_FLAG_OCTWRAP:
360         if (!append_exp(arg, V_ASN1_OCTET_STRING, V_ASN1_UNIVERSAL, 0, 0,
361             return -1;
362         break;
364     case ASN1_GEN_FLAG_FORMAT:
365         if (!strcmp(vstart, "ASCII", 5))
366             arg->format = ASN1_GEN_FORMAT_ASCII;
367         else if (!strcmp(vstart, "UTF8", 4))
368             arg->format = ASN1_GEN_FORMAT_UTF8;
369         else if (!strcmp(vstart, "HEX", 3))
370             arg->format = ASN1_GEN_FORMAT_HEX;
371         else if (!strcmp(vstart, "BITLIST", 3))
372             arg->format = ASN1_GEN_FORMAT_BITLIST;
373         else
374         {
375             ASN1err(ASN1_F_ASN1_CB, ASN1_R_UNKNOWN_FORMAT);
376             return -1;
377         }
378         break;
380     }
382     return 1;
384 }
386 static int parse_tagging(const char *vstart, int vlen, int *ptag, int *pclass)
387 {
388     char erch[2];
389     long tag_num;
390     char *eptr;
391     if (!vstart)

```

```

392     return 0;
393     tag_num = strtoul(vstart, &eptr, 10);
394     /* Check we haven't gone past max length: should be impossible */
395     if (eptr && *eptr && (eptr > vstart + vlen))
396         return 0;
397     if (tag_num < 0)
398     {
399         ASN1err(ASN1_F_PARSE_TAGGING, ASN1_R_INVALID_NUMBER);
400         return 0;
401     }
402     *ptag = tag_num;
403     /* If we have non numeric characters, parse them */
404     if (eptr)
405         vlen -= eptr - vstart;
406     else
407         vlen = 0;
408     if (vlen)
409     {
410         switch (*eptr)
411         {
412             case 'U':
413                 *pclass = V_ASN1_UNIVERSAL;
414                 break;
415
416             case 'A':
417                 *pclass = V_ASN1_APPLICATION;
418                 break;
419
420             case 'P':
421                 *pclass = V_ASN1_PRIVATE;
422                 break;
423
424             case 'C':
425                 *pclass = V_ASN1_CONTEXT_SPECIFIC;
426                 break;
427
428             default:
429                 erch[0] = *eptr;
430                 erch[1] = 0;
431                 ASN1err(ASN1_F_PARSE_TAGGING, ASN1_R_INVALID_MODIFIER);
432                 ERR_add_error_data(2, "Char=", erch);
433                 return 0;
434                 break;
435         }
436     }
437     else
438     {
439         *pclass = V_ASN1_CONTEXT_SPECIFIC;
440     }
441
442     return 1;
443 }
444
445 /* Handle multiple types: SET and SEQUENCE */
446
447 static ASN1_TYPE *asn1_multi(int utype, const char *section, X509V3_CTX *cnf)
448 {
449     ASN1_TYPE *ret = NULL;
450     STACK_OF(ASN1_TYPE) *sk = NULL;
451     STACK_OF(CONF_VALUE) *sect = NULL;
452     unsigned char *der = NULL;
453     int derlen;
454     int i;
455     sk = sk_ASN1_TYPE_new_null();
456     if (!sk)

```

```

458         goto bad;
459     if (section)
460     {
461         if (!cnf)
462             goto bad;
463         sect = X509V3_get_section(cnf, (char *)section);
464         if (!sect)
465             goto bad;
466         for (i = 0; i < sk_CONF_VALUE_num(sect); i++)
467         {
468             ASN1_TYPE *typ = ASN1_generate_v3(sk_CONF_VALUE_value(se
469             if (!typ)
470                 goto bad;
471             if (!sk_ASN1_TYPE_push(sk, typ))
472                 goto bad;
473         }
474     }
475
476     /* Now we have a STACK of the components, convert to the correct form */
477
478     if (utype == V_ASN1_SET)
479         derlen = i2d_ASN1_SET_ANY(sk, &der);
480     else
481         derlen = i2d_ASN1_SEQUENCE_ANY(sk, &der);
482
483     if (derlen < 0)
484         goto bad;
485
486     if (!(ret = ASN1_TYPE_new()))
487         goto bad;
488
489     if (!(ret->value.asn1_string = ASN1_STRING_type_new(utype)))
490         goto bad;
491
492     ret->type = utype;
493
494     ret->value.asn1_string->data = der;
495     ret->value.asn1_string->length = derlen;
496
497     der = NULL;
498
499     bad:
500
501     if (der)
502         OPENSSL_free(der);
503
504     if (sk)
505         sk_ASN1_TYPE_pop_free(sk, ASN1_TYPE_free);
506     if (sect)
507         X509V3_section_free(cnf, sect);
508
509     return ret;
510 }
511
512 static int append_exp(tag_exp_arg *arg, int exp_tag, int exp_class, int exp_cons
513 {
514     tag_exp_type *exp_tmp;
515     /* Can only have IMPLICIT if permitted */
516     if ((arg->imp_tag != -1) && !imp_ok)
517     {
518         ASN1err(ASN1_F_APPEND_EXP, ASN1_R_ILLEGAL_IMPLICIT_TAG);
519         return 0;
520     }
521
522     if (arg->exp_count == ASN1_FLAG_EXP_MAX)
523     {

```

```

524     ASN1err(ASN1_F_APPEND_EXP, ASN1_R_DEPTH_EXCEEDED);
525     return 0;
526 }

528     exp_tmp = &arg->exp_list[arg->exp_count++];

530     /* If IMPLICIT set tag to implicit value then
531      * reset implicit tag since it has been used.
532      */
533     if (arg->imp_tag != -1)
534     {
535         exp_tmp->exp_tag = arg->imp_tag;
536         exp_tmp->exp_class = arg->imp_class;
537         arg->imp_tag = -1;
538         arg->imp_class = -1;
539     }
540     else
541     {
542         exp_tmp->exp_tag = exp_tag;
543         exp_tmp->exp_class = exp_class;
544     }
545     exp_tmp->exp_constructed = exp_constructed;
546     exp_tmp->exp_pad = exp_pad;

548     return 1;
549 }

552 static int asn1_str2tag(const char *tagstr, int len)
553 {
554     unsigned int i;
555     static const struct tag_name_st *tntmp, tnst [] = {
556         ASN1_GEN_STR("BOOL", V_ASN1_BOOLEAN),
557         ASN1_GEN_STR("BOOLEAN", V_ASN1_BOOLEAN),
558         ASN1_GEN_STR("NULL", V_ASN1_NULL),
559         ASN1_GEN_STR("INT", V_ASN1_INTEGER),
560         ASN1_GEN_STR("INTEGER", V_ASN1_INTEGER),
561         ASN1_GEN_STR("ENUM", V_ASN1_ENUMERATED),
562         ASN1_GEN_STR("ENUMERATED", V_ASN1_ENUMERATED),
563         ASN1_GEN_STR("OID", V_ASN1_OBJECT),
564         ASN1_GEN_STR("OBJECT", V_ASN1_OBJECT),
565         ASN1_GEN_STR("UTCTIME", V_ASN1_UTCTIME),
566         ASN1_GEN_STR("UTC", V_ASN1_UTCTIME),
567         ASN1_GEN_STR("GENERALIZEDTIME", V_ASN1_GENERALIZEDTIME),
568         ASN1_GEN_STR("GENTIME", V_ASN1_GENERALIZEDTIME),
569         ASN1_GEN_STR("OCT", V_ASN1_OCTET_STRING),
570         ASN1_GEN_STR("OCTETSTRING", V_ASN1_OCTET_STRING),
571         ASN1_GEN_STR("BITSTR", V_ASN1_BIT_STRING),
572         ASN1_GEN_STR("BITSTRING", V_ASN1_BIT_STRING),
573         ASN1_GEN_STR("UNIVERSALSTRING", V_ASN1_UNIVERSALSTRING),
574         ASN1_GEN_STR("UNIV", V_ASN1_UNIVERSALSTRING),
575         ASN1_GEN_STR("IA5", V_ASN1_IA5STRING),
576         ASN1_GEN_STR("IA5STRING", V_ASN1_IA5STRING),
577         ASN1_GEN_STR("UTF8", V_ASN1_UTF8STRING),
578         ASN1_GEN_STR("UTF8String", V_ASN1_UTF8STRING),
579         ASN1_GEN_STR("BMP", V_ASN1_BMPSTRING),
580         ASN1_GEN_STR("BMPSTRING", V_ASN1_BMPSTRING),
581         ASN1_GEN_STR("VISIBLESTRING", V_ASN1_VISIBLESTRING),
582         ASN1_GEN_STR("VISIBLE", V_ASN1_VISIBLESTRING),
583         ASN1_GEN_STR("PRINTABLESTRING", V_ASN1_PRINTABLESTRING),
584         ASN1_GEN_STR("PRINTABLE", V_ASN1_PRINTABLESTRING),
585         ASN1_GEN_STR("T61", V_ASN1_T61STRING),
586         ASN1_GEN_STR("T61STRING", V_ASN1_T61STRING),
587         ASN1_GEN_STR("TELETEXSTRING", V_ASN1_T61STRING),
588         ASN1_GEN_STR("GeneralString", V_ASN1_GENERALSTRING),
589         ASN1_GEN_STR("GENSTR", V_ASN1_GENERALSTRING),

```

```

590     ASN1_GEN_STR("NUMERIC", V_ASN1_NUMERICSTRING),
591     ASN1_GEN_STR("NUMERICSTRING", V_ASN1_NUMERICSTRING),

593     /* Special cases */
594     ASN1_GEN_STR("SEQUENCE", V_ASN1_SEQUENCE),
595     ASN1_GEN_STR("SEQ", V_ASN1_SEQUENCE),
596     ASN1_GEN_STR("SET", V_ASN1_SET),
597     /* type modifiers */
598     /* Explicit tag */
599     ASN1_GEN_STR("EXP", ASN1_GEN_FLAG_EXP),
600     ASN1_GEN_STR("EXPLICIT", ASN1_GEN_FLAG_EXP),
601     /* Implicit tag */
602     ASN1_GEN_STR("IMP", ASN1_GEN_FLAG_IMP),
603     ASN1_GEN_STR("IMPLICIT", ASN1_GEN_FLAG_IMP),
604     /* OCTET STRING wrapper */
605     ASN1_GEN_STR("OCTWRAP", ASN1_GEN_FLAG_OCTWRAP),
606     /* SEQUENCE wrapper */
607     ASN1_GEN_STR("SEQWRAP", ASN1_GEN_FLAG_SEQWRAP),
608     /* SET wrapper */
609     ASN1_GEN_STR("SETWRAP", ASN1_GEN_FLAG_SETWRAP),
610     /* BIT STRING wrapper */
611     ASN1_GEN_STR("BITWRAP", ASN1_GEN_FLAG_BITWRAP),
612     ASN1_GEN_STR("FORM", ASN1_GEN_FLAG_FORMAT),
613     ASN1_GEN_STR("FORMAT", ASN1_GEN_FLAG_FORMAT),
614 };

616     if (len == -1)
617         len = strlen(tagstr);

618     tntmp = tnst;
619     for (i = 0; i < sizeof(tnst) / sizeof(struct tag_name_st); i++, tntmp++)
620     {
621         if ((len == tntmp->len) && !strcmp(tntmp->strnam, tagstr, len))
622             return tntmp->tag;
623     }

624     return -1;
625 }

626
627
629 static ASN1_TYPE *asn1_str2type(const char *str, int format, int utype)
630 {
631     ASN1_TYPE *atmp = NULL;

633     CONF_VALUE vtmp;

635     unsigned char *rdata;
636     long rrlen;

638     int no_unused = 1;

640     if (!(atmp = ASN1_TYPE_new()))
641     {
642         ASN1err(ASN1_F_ASN1_STR2TYPE, ERR_R_MALLOC_FAILURE);
643         return NULL;
644     }

646     if (!str)
647         str = "";

649     switch(utype)
650     {
652         case V_ASN1_NULL:
653             if (str && *str)
654             {
655                 ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_NULL_VALUE)

```

```

656         goto bad_form;
657     }
658     break;
659
660     case V_ASN1_BOOLEAN:
661     if (format != ASN1_GEN_FORMAT_ASCII)
662     {
663         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_NOT_ASCII_FORMAT);
664         goto bad_form;
665     }
666     vtmp.name = NULL;
667     vtmp.section = NULL;
668     vtmp.value = (char *)str;
669     if (!X509V3_get_value_bool(&vtmp, &atmp->value.boolean))
670     {
671         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_BOOLEAN);
672         goto bad_str;
673     }
674     break;
675
676     case V_ASN1_INTEGER:
677     case V_ASN1_ENUMERATED:
678     if (format != ASN1_GEN_FORMAT_ASCII)
679     {
680         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_INTEGER_NOT_ASCII_F
681         goto bad_form;
682     }
683     if (!(atmp->value.integer = s2i_ASN1_INTEGER(NULL, (char *)str))
684     {
685         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_INTEGER);
686         goto bad_str;
687     }
688     break;
689
690     case V_ASN1_OBJECT:
691     if (format != ASN1_GEN_FORMAT_ASCII)
692     {
693         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_OBJECT_NOT_ASCII_FO
694         goto bad_form;
695     }
696     if (!(atmp->value.object = OBJ_txt2obj(str, 0)))
697     {
698         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_OBJECT);
699         goto bad_str;
700     }
701     break;
702
703     case V_ASN1_UTCTIME:
704     case V_ASN1_GENERALIZEDTIME:
705     if (format != ASN1_GEN_FORMAT_ASCII)
706     {
707         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_TIME_NOT_ASCII_FORM
708         goto bad_form;
709     }
710     if (!(atmp->value.asn1_string = ASN1_STRING_new()))
711     {
712         ASN1err(ASN1_F_ASN1_STR2TYPE, ERR_R_MALLOC_FAILURE);
713         goto bad_str;
714     }
715     if (!ASN1_STRING_set(atmp->value.asn1_string, str, -1))
716     {
717         ASN1err(ASN1_F_ASN1_STR2TYPE, ERR_R_MALLOC_FAILURE);
718         goto bad_str;
719     }
720     atmp->value.asn1_string->type = utype;
721     if (!ASN1_TIME_check(atmp->value.asn1_string))

```

```

722     {
723         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_TIME_VALUE)
724         goto bad_str;
725     }
726
727     break;
728
729     case V_ASN1_BMPSTRING:
730     case V_ASN1_PRINTABLESTRING:
731     case V_ASN1_IA5STRING:
732     case V_ASN1_T61STRING:
733     case V_ASN1_UTF8STRING:
734     case V_ASN1_VISIBLESTRING:
735     case V_ASN1_UNIVERSALSTRING:
736     case V_ASN1_GENERALSTRING:
737     case V_ASN1_NUMERICSTRING:
738
739     if (format == ASN1_GEN_FORMAT_ASCII)
740         format = MBSTRING_ASC;
741     else if (format == ASN1_GEN_FORMAT_UTF8)
742         format = MBSTRING_UTF8;
743     else
744     {
745         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_FORMAT);
746         goto bad_form;
747     }
748
749     if (ASN1_mbstring_copy(&atmp->value.asn1_string, (unsigned char
750     -1, format, ASN1_tag2bit(utype))
751     {
752         ASN1err(ASN1_F_ASN1_STR2TYPE, ERR_R_MALLOC_FAILURE);
753         goto bad_str;
754     }
755
756     break;
757
758     case V_ASN1_BIT_STRING:
759
760     case V_ASN1_OCTET_STRING:
761
762     if (!(atmp->value.asn1_string = ASN1_STRING_new()))
763     {
764         ASN1err(ASN1_F_ASN1_STR2TYPE, ERR_R_MALLOC_FAILURE);
765         goto bad_form;
766     }
767
768     if (format == ASN1_GEN_FORMAT_HEX)
769     {
770         if (!(rdata = string_to_hex((char *)str, &rdlen)))
771         {
772             ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_HEX
773             goto bad_str;
774         }
775
776         atmp->value.asn1_string->data = rdata;
777         atmp->value.asn1_string->length = rdlen;
778         atmp->value.asn1_string->type = utype;
779
780     }
781
782     else if (format == ASN1_GEN_FORMAT_ASCII)
783         ASN1_STRING_set(atmp->value.asn1_string, str, -1);
784     else if ((format == ASN1_GEN_FORMAT_BITLIST) && (utype == V_ASN1
785     {
786
787

```

```

788         if (!CONF_parse_list(str, ',', 1, bitstr_cb, atmp->value
789             {
790                 ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_LIST_ERROR)
791                 goto bad_str;
792             }
793         no_unused = 0;
794     }
795     else
796     {
797         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_ILLEGAL_BITSTRING_F
798         goto bad_form;
799     }
800

802     if ((utype == V_ASN1_BIT_STRING) && no_unused)
803     {
804         atmp->value.asn1_string->flags
805             &= ~(ASN1_STRING_FLAG_BITS_LEFT|0x07);
806         atmp->value.asn1_string->flags
807             |= ASN1_STRING_FLAG_BITS_LEFT;
808     }

811     break;

813     default:
814         ASN1err(ASN1_F_ASN1_STR2TYPE, ASN1_R_UNSUPPORTED_TYPE);
815         goto bad_str;
816         break;
817     }

820     atmp->type = utype;
821     return atmp;

824     bad_str:
825     ERR_add_error_data(2, "string=", str);
826     bad_form:

828     ASN1_TYPE_free(atmp);
829     return NULL;

831     }

833 static int bitstr_cb(const char *elem, int len, void *bitstr)
834 {
835     long bitnum;
836     char *eptr;
837     if (!elem)
838         return 0;
839     bitnum = strtoul(elem, &eptr, 10);
840     if (eptr && *eptr && (eptr != elem + len))
841         return 0;
842     if (bitnum < 0)
843     {
844         ASN1err(ASN1_F_BITSTR_CB, ASN1_R_INVALID_NUMBER);
845         return 0;
846     }
847     if (!ASN1_BIT_STRING_set_bit(bitstr, bitnum, 1))
848     {
849         ASN1err(ASN1_F_BITSTR_CB, ERR_R_MALLOC_FAILURE);
850         return 0;
851     }
852     return 1;
853 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_lib.c

1

11031 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/asn1_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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22 *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <limits.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_lib.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1_mac.h>

65 static int asn1_get_length(const unsigned char **pp,int *inf,long *rl,int max);
66 static void asn1_put_length(unsigned char **pp, int length);
67 const char ASN1_version[]="ASN.1" OPENSSL_VERSION_PTEXT;

69 static int _asn1_check_infinite_end(const unsigned char **p, long len)
70 {
71     /* If there is 0 or 1 byte left, the length check should pick
72      * things up */
73     if (len <= 0)
74         return(1);
75     else if ((len >= 2) && ((*p)[0] == 0) && ((*p)[1] == 0))
76     {
77         (*p)+=2;
78         return(1);
79     }
80     return(0);
81 }

83 int ASN1_check_infinite_end(unsigned char **p, long len)
84 {
85     return _asn1_check_infinite_end((const unsigned char **)p, len);
86 }

88 int ASN1_const_check_infinite_end(const unsigned char **p, long len)
89 {
90     return _asn1_check_infinite_end(p, len);
91 }

94 int ASN1_get_object(const unsigned char **pp, long *plength, int *ptag,
95 int *pclass, long omax)
96 {
97     int i,ret;
98     long l;
99     const unsigned char *p= *pp;
100     int tag,xclass,inf;
101     long max=omax;

103     if (!max) goto err;
104     ret=(*p&V_ASN1_CONSTRUCTED);
105     xclass=(*p&V_ASN1_PRIVATE);
106     i= *p&V_ASN1_PRIMITIVE_TAG;
107     if (i == V_ASN1_PRIMITIVE_TAG)
108     {
109         /* high-tag */
110         p++;
111         if (--max == 0) goto err;
112         l=0;
113         while (*p&0x80)
114         {
115             l<=7L;
116             l|= *(p++)&0x7f;
117             if (--max == 0) goto err;
118             if (l > (INT_MAX >> 7L)) goto err;
119         }
120         l<=7L;
121         l|= *(p++)&0x7f;
122         tag=(int)l;
123         if (--max == 0) goto err;
124     }
125     else
126     {
127         tag=i;
128         p++;
```

```

128         if (--max == 0) goto err;
129     }
130     *ptag=tag;
131     *pclass=xclass;
132     if (!asn1_get_length(&p,&inf,length,(int)max)) goto err;

134 #if 0
135     fprintf(stderr,"p=%d + *length=%ld > omax=%ld + *pp=%d (%d > %d)\n",
136             (int)p,*length,omax,(int)*pp,(int)(p+ *length),
137             (int)(omax+ *pp));

139 #endif
140     if (*length > (omax - (p - *pp)))
141     {
142         ASN1err(ASN1_F_ASN1_GET_OBJECT,ASN1_R_TOO_LONG);
143         /* Set this so that even if things are not long enough
144          * the values are set correctly */
145         ret|=0x80;
146     }
147     *pp=p;
148     return(ret|inf);
149 err:
150     ASN1err(ASN1_F_ASN1_GET_OBJECT,ASN1_R_HEADER_TOO_LONG);
151     return(0x80);
152 }

154 static int asn1_get_length(const unsigned char **pp, int *inf, long *rl, int max
155 {
156     const unsigned char *p= *pp;
157     unsigned long ret=0;
158     unsigned int i;

160     if (max-- < 1) return(0);
161     if (*p == 0x80)
162     {
163         *inf=1;
164         ret=0;
165         p++;
166     }
167     else
168     {
169         *inf=0;
170         i= *p&0x7f;
171         if (*(p++) & 0x80)
172         {
173             if (i > sizeof(long))
174                 return 0;
175             if (max-- == 0) return(0);
176             while (i-- > 0)
177             {
178                 ret<=8L;
179                 ret|= *(p++);
180                 if (max-- == 0) return(0);
181             }
182         }
183         else
184             ret=i;
185     }
186     if (ret > LONG_MAX)
187         return 0;
188     *pp=p;
189     *rl=(long)ret;
190     return(1);
191 }

193 /* class 0 is constructed

```

```

194 * constructed == 2 for indefinite length constructed */
195 void ASN1_put_object(unsigned char **pp, int constructed, int length, int tag,
196                     int xclass)
197 {
198     unsigned char *p= *pp;
199     int i, ttag;

201     i=(constructed)?V_ASN1_CONSTRUCTED:0;
202     i|=(xclass&V_ASN1_PRIVATE);
203     if (tag < 31)
204         *(p++)=i|(tag&V_ASN1_PRIMITIVE_TAG);
205     else
206     {
207         *(p++)=i|V_ASN1_PRIMITIVE_TAG;
208         for(i = 0, ttag = tag; ttag > 0; i++) ttag >>=7;
209         ttag = i;
210         while(i-- > 0)
211         {
212             p[i] = tag & 0x7f;
213             if(i != (ttag - 1)) p[i] |= 0x80;
214             tag >>= 7;
215         }
216         p += ttag;
217     }
218     if (constructed == 2)
219         *(p++)=0x80;
220     else
221         asn1_put_length(&p, length);
222     *pp=p;
223 }

225 int ASN1_put_eoc(unsigned char **pp)
226 {
227     unsigned char *p = *pp;
228     *p++ = 0;
229     *p++ = 0;
230     *pp = p;
231     return 2;
232 }

234 static void asn1_put_length(unsigned char **pp, int length)
235 {
236     unsigned char *p= *pp;
237     int i,l;
238     if (length <= 127)
239         *(p++)=(unsigned char)length;
240     else
241     {
242         l=length;
243         for (i=0; l > 0; i++)
244             l>>=8;
245         *(p++)=i|0x80;
246         l=i;
247         while (i-- > 0)
248         {
249             p[i]=length&0xff;
250             length>>=8;
251         }
252         p+=l;
253     }
254     *pp=p;
255 }

257 int ASN1_object_size(int constructed, int length, int tag)
258 {
259     int ret;

```



```

261     ret=length;
262     ret++;
263     if (tag >= 31)
264     {
265         while (tag > 0)
266         {
267             tag>=7;
268             ret++;
269         }
270     }
271     if (constructed == 2)
272         return ret + 3;
273     ret++;
274     if (length > 127)
275     {
276         while (length > 0)
277         {
278             length>=8;
279             ret++;
280         }
281     }
282     return(ret);
283 }

285 static int _asn1_Finish(ASN1_const_CTX *c)
286 {
287     if ((c->inf == (1|V_ASN1_CONSTRUCTED)) && (!c->eos))
288     {
289         if (!ASN1_const_check_infinite_end(&c->p, c->slen))
290         {
291             c->error=ERR_R_MISSING_ASN1_EOS;
292             return(0);
293         }
294     }
295     if (
296         ((c->slen != 0) && !(c->inf & 1)) ||
297         ((c->slen < 0) && (c->inf & 1)))
298     {
299         c->error=ERR_R_ASN1_LENGTH_MISMATCH;
300         return(0);
301     }
302     return(1);
303 }

304 int asn1_Finish(ASN1_CTX *c)
305 {
306     return _asn1_Finish((ASN1_const_CTX *)c);
307 }

309 int asn1_const_Finish(ASN1_const_CTX *c)
310 {
311     return _asn1_Finish(c);
312 }

314 int asn1_GetSequence(ASN1_const_CTX *c, long *length)
315 {
316     const unsigned char *q;

318     q=c->p;
319     c->inf=ASN1_get_object(&(c->p), &(c->slen), &(c->tag), &(c->xclass),
320                          *length);
321     if (c->inf & 0x80)
322     {
323         c->error=ERR_R_BAD_GET_ASN1_OBJECT_CALL;
324         return(0);
325     }

```

```

326     if (c->tag != V_ASN1_SEQUENCE)
327     {
328         c->error=ERR_R_EXPECTING_AN_ASN1_SEQUENCE;
329         return(0);
330     }
331     (*length)--=(c->p-q);
332     if (c->max && (*length < 0))
333     {
334         c->error=ERR_R_ASN1_LENGTH_MISMATCH;
335         return(0);
336     }
337     if (c->inf == (1|V_ASN1_CONSTRUCTED))
338         c->slen= *length+ *(c->pp)-c->p;
339     c->eos=0;
340     return(1);
341 }

343 int ASN1_STRING_copy(ASN1_STRING *dst, const ASN1_STRING *str)
344 {
345     if (str == NULL)
346         return 0;
347     dst->type = str->type;
348     if (!ASN1_STRING_set(dst, str->data, str->length))
349         return 0;
350     dst->flags = str->flags;
351     return 1;
352 }

354 ASN1_STRING *ASN1_STRING_dup(const ASN1_STRING *str)
355 {
356     ASN1_STRING *ret;
357     if (!str)
358         return NULL;
359     ret=ASN1_STRING_new();
360     if (!ret)
361         return NULL;
362     if (!ASN1_STRING_copy(ret, str))
363     {
364         ASN1_STRING_free(ret);
365         return NULL;
366     }
367     return ret;
368 }

370 int ASN1_STRING_set(ASN1_STRING *str, const void *_data, int len)
371 {
372     unsigned char *c;
373     const char *data=_data;

375     if (len < 0)
376     {
377         if (data == NULL)
378             return(0);
379         else
380             len=strlen(data);
381     }
382     if ((str->length < len) || (str->data == NULL))
383     {
384         c=str->data;
385         if (c == NULL)
386             str->data=OPENSSL_malloc(len+1);
387         else
388             str->data=OPENSSL_realloc(c, len+1);

390         if (str->data == NULL)
391             {

```

```

392         ASN1err(ASN1_F_ASN1_STRING_SET,ERR_R_MALLOC_FAILURE);
393         str->data=c;
394         return(0);
395     }
396 }
397 str->length=len;
398 if (data != NULL)
399 {
400     memcpy(str->data,data,len);
401     /* an allowance for strings :-) */
402     str->data[len]='\0';
403 }
404 return(1);
405 }

407 void ASN1_STRING_set0(ASN1_STRING *str, void *data, int len)
408 {
409     if (str->data)
410         OPENSSL_free(str->data);
411     str->data = data;
412     str->length = len;
413 }

415 ASN1_STRING *ASN1_STRING_new(void)
416 {
417     return(ASN1_STRING_type_new(V_ASN1_OCTET_STRING));
418 }

421 ASN1_STRING *ASN1_STRING_type_new(int type)
422 {
423     ASN1_STRING *ret;

425     ret=(ASN1_STRING *)OPENSSL_malloc(sizeof(ASN1_STRING));
426     if (ret == NULL)
427     {
428         ASN1err(ASN1_F_ASN1_STRING_TYPE_NEW,ERR_R_MALLOC_FAILURE);
429         return(NULL);
430     }
431     ret->length=0;
432     ret->type=type;
433     ret->data=NULL;
434     ret->flags=0;
435     return(ret);
436 }

438 void ASN1_STRING_free(ASN1_STRING *a)
439 {
440     if (a == NULL) return;
441     if (a->data && !(a->flags & ASN1_STRING_FLAG_NDEF))
442         OPENSSL_free(a->data);
443     OPENSSL_free(a);
444 }

446 int ASN1_STRING_cmp(const ASN1_STRING *a, const ASN1_STRING *b)
447 {
448     int i;

450     i=(a->length-b->length);
451     if (i == 0)
452     {
453         i=memcmp(a->data,b->data,a->length);
454         if (i == 0)
455             return(a->type-b->type);
456         else
457             return(i);

```

```

458     }
459     else
460         return(i);
461 }

463 void asn1_add_error(const unsigned char *address, int offset)
464 {
465     char buf1[DECIMAL_SIZE(address)+1],buf2[DECIMAL_SIZE(offset)+1];

467     BIO_snprintf(buf1,sizeof buf1,"%lu",(unsigned long)address);
468     BIO_snprintf(buf2,sizeof buf2,"%d",offset);
469     ERR_add_error_data(4,"address=",buf1," offset=",buf2);
470 }

472 int ASN1_STRING_length(const ASN1_STRING *x)
473 { return M_ASN1_STRING_length(x); }

475 void ASN1_STRING_length_set(ASN1_STRING *x, int len)
476 { M_ASN1_STRING_length_set(x, len); return; }

478 int ASN1_STRING_type(ASN1_STRING *x)
479 { return M_ASN1_STRING_type(x); }

481 unsigned char * ASN1_STRING_data(ASN1_STRING *x)
482 { return M_ASN1_STRING_data(x); }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_par.c

1

```
*****
11666 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_par.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/asn1/asn1_par.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_par.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/asn1.h>

65 static int asn1_print_info(BIO *bp, int tag, int xclass,int constructed,
66 int indent);
67 static int asn1_parse2(BIO *bp, const unsigned char **pp, long length,
68 int offset, int depth, int indent, int dump);
69 static int asn1_print_info(BIO *bp, int tag, int xclass, int constructed,
70 int indent)
71 {
72 static const char fmt[]="%-18s";
73 char str[128];
74 const char *p;

76 if (constructed & V_ASN1_CONSTRUCTED)
77 p="cons: ";
78 else
79 p="prim: ";
80 if (BIO_write(bp,p,6) < 6) goto err;
81 BIO_indent(bp,indent,128);

83 p=str;
84 if ((xclass & V_ASN1_PRIVATE) == V_ASN1_PRIVATE)
85 BIO_snprintf(str,sizeof str,"priv [ %d ] ",tag);
86 else if ((xclass & V_ASN1_CONTEXT_SPECIFIC) == V_ASN1_CONTEXT_SPECIFIC)
87 BIO_snprintf(str,sizeof str,"cont [ %d ]",tag);
88 else if ((xclass & V_ASN1_APPLICATION) == V_ASN1_APPLICATION)
89 BIO_snprintf(str,sizeof str,"appl [ %d ]",tag);
90 else if (tag > 30)
91 BIO_snprintf(str,sizeof str,"<ASN1 %d>",tag);
92 else
93 p = ASN1_tag2str(tag);

95 if (BIO_printf(bp,fmt,p) <= 0)
96 goto err;
97 return(1);
98 err:
99 return(0);
100 }

102 int ASN1_parse(BIO *bp, const unsigned char *pp, long len, int indent)
103 {
104 return(asn1_parse2(bp,&pp,len,0,0,indent,0));
105 }

107 int ASN1_parse_dump(BIO *bp, const unsigned char *pp, long len, int indent, int
108 {
109 return(asn1_parse2(bp,&pp,len,0,0,indent,dump));
110 }

112 static int asn1_parse2(BIO *bp, const unsigned char **pp, long length, int offse
113 int depth, int indent, int dump)
114 {
115 const unsigned char *p,*ep,*tot,*op,*opp;
116 long len;
117 int tag,xclass,ret=0;
118 int nl,hl,j,r;
119 ASN1_OBJECT *o=NULL;
120 ASN1_OCTET_STRING *os=NULL;
121 /* ASN1_BMPSTRING *bmp=NULL;*/
122 int dump_indent;

124 #if 0
125 dump_indent = indent;
126 #else
127 dump_indent = 6; /* Because we know BIO_dump_indent() */
```

```

128 #endif
129     p= *pp;
130     tot=p+length;
131     op=p-1;
132     while ((p < tot) && (op < p))
133     {
134         op=p;
135         j=ASN1_get_object(&p,&len,&tag,&xclass,length);
136 #ifdef LINT
137         j=j;
138 #endif
139         if (j & 0x80)
140         {
141             if (BIO_write(bp,"Error in encoding\n",18) <= 0)
142                 goto end;
143             ret=0;
144             goto end;
145         }
146         hl=(p-op);
147         length-=hl;
148         /* if j == 0x21 it is a constructed indefinite length object */
149         if (BIO_printf(bp,"%5ld:",(long)offset+(long)(op- *pp))
150             <= 0) goto end;
151
152         if (j != (V_ASN1_CONSTRUCTED | 1))
153         {
154             if (BIO_printf(bp,"d=-2d hl=%ld l=%4ld ",
155                 depth,(long)hl,len) <= 0)
156                 goto end;
157         }
158         else
159         {
160             if (BIO_printf(bp,"d=-2d hl=%ld l=inf ",
161                 depth,(long)hl) <= 0)
162                 goto end;
163         }
164         if (!asn1_print_info(bp,tag,xclass,j,(indent)?depth:0))
165             goto end;
166         if (j & V_ASN1_CONSTRUCTED)
167         {
168             ep=p+len;
169             if (BIO_write(bp,"\n",1) <= 0) goto end;
170             if (len > length)
171             {
172                 BIO_printf(bp,
173                     "length is greater than %ld\n",length);
174                 ret=0;
175                 goto end;
176             }
177             if ((j == 0x21) && (len == 0))
178             {
179                 for (;;)
180                 {
181                     r=asn1_parse2(bp,&p,(long)(tot-p),
182                         offset+(p- *pp),depth+1,
183                         indent,dump);
184                     if (r == 0) { ret=0; goto end; }
185                     if ((r == 2) || (p >= tot)) break;
186                 }
187             }
188             else
189             while (p < ep)
190             {
191                 r=asn1_parse2(bp,&p,(long)len,
192                     offset+(p- *pp),depth+1,
193                     indent,dump);

```

```

194         if (r == 0) { ret=0; goto end; }
195     }
196     else if (xclass != 0)
197     {
198         p+=len;
199         if (BIO_write(bp,"\n",1) <= 0) goto end;
200     }
201     else
202     {
203         nl=0;
204         if (
205             (tag == V_ASN1_PRINTABLESTRING) ||
206             (tag == V_ASN1_T61STRING) ||
207             (tag == V_ASN1_IA5STRING) ||
208             (tag == V_ASN1_VISIBLESTRING) ||
209             (tag == V_ASN1_NUMERICSTRING) ||
210             (tag == V_ASN1_UTF8STRING) ||
211             (tag == V_ASN1_UTCTIME) ||
212             (tag == V_ASN1_GENERALIZEDTIME))
213         {
214             if (BIO_write(bp,":",1) <= 0) goto end;
215             if ((len > 0) &&
216                 BIO_write(bp,(const char *)p,(int)len)
217                 != (int)len)
218                 goto end;
219         }
220         else if (tag == V_ASN1_OBJECT)
221         {
222             opp=op;
223             if (d2i_ASN1_OBJECT(&o,&opp,len+hl) != NULL)
224             {
225                 if (BIO_write(bp,":",1) <= 0) goto end;
226                 i2a_ASN1_OBJECT(bp,o);
227             }
228             else
229             {
230                 if (BIO_write(bp,":BAD OBJECT",11) <= 0)
231                     goto end;
232             }
233         }
234         else if (tag == V_ASN1_BOOLEAN)
235         {
236             int ii;
237
238             opp=op;
239             ii=d2i_ASN1_BOOLEAN(NULL,&opp,len+hl);
240             if (ii < 0)
241             {
242                 if (BIO_write(bp,"Bad boolean\n",12) <=
243                     0) goto end;
244             }
245             BIO_printf(bp,"%d",ii);
246         }
247         else if (tag == V_ASN1_BMPSTRING)
248         {
249             /* do the BMP thang */
250         }
251         else if (tag == V_ASN1_OCTET_STRING)
252         {
253             int i,printable=1;
254
255             opp=op;
256             os=d2i_ASN1_OCTET_STRING(NULL,&opp,len+hl);
257             if (os != NULL && os->length > 0)
258             {
259                 opp = os->data;

```

```
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn1_par.c
```

```

326         if (bs != NULL)
327         {
328             if (BIO_write(bp,":",1) <= 0) goto end;
329             if (bs->type == V_ASN1_NEG_INTEGER)
330                 if (BIO_write(bp,"-",1) <= 0)
331                     goto end;
332             for (i=0; i<bs->length; i++)
333             {
334                 if (BIO_printf(bp,"%02X",
335                     bs->data[i]) <= 0)
336                     goto end;
337             }
338             if (bs->length == 0)
339             {
340                 if (BIO_write(bp,"00",2) <= 0)
341                     goto end;
342             }
343         }
344         else
345         {
346             if (BIO_write(bp,"BAD INTEGER",11) <= 0)
347                 goto end;
348         }
349         M_ASN1_INTEGER_free(bs);
350     }
351     else if (tag == V_ASN1_ENUMERATED)
352     {
353         ASN1_ENUMERATED *bs;
354         int i;
355
356         opp=op;
357         bs=d2i_ASN1_ENUMERATED(NULL,&opp,len+hl);
358         if (bs != NULL)
359         {
360             if (BIO_write(bp,":",1) <= 0) goto end;
361             if (bs->type == V_ASN1_NEG_ENUMERATED)
362                 if (BIO_write(bp,"-",1) <= 0)
363                     goto end;
364             for (i=0; i<bs->length; i++)
365             {
366                 if (BIO_printf(bp,"%02X",
367                     bs->data[i]) <= 0)
368                     goto end;
369             }
370             if (bs->length == 0)
371             {
372                 if (BIO_write(bp,"00",2) <= 0)
373                     goto end;
374             }
375         }
376         else
377         {
378             if (BIO_write(bp,"BAD ENUMERATED",11) <= 0)
379                 goto end;
380         }
381         M_ASN1_ENUMERATED_free(bs);
382     }
383     else if (len > 0 && dump)
384     {
385         if (!nl)
386         {
387             if (BIO_write(bp,"\n",1) <= 0)
388                 goto end;
389         }
390         if (BIO_dump_indent(bp,(const char *)p,
391             ((dump == -1 || dump > len)?len:dump),

```

```
392         dump_indent) <= 0)
393         goto end;
394         nl=1;
395     }
396
397     if (!nl)
398     {
399         if (BIO_write(bp, "\n", 1) <= 0) goto end;
400     }
401     p+=len;
402     if ((tag == V_ASN1_EOC) && (xclass == 0))
403     {
404         ret=2; /* End of sequence */
405         goto end;
406     }
407     }
408     length-=len;
409 }
410 ret=1;
411 end:
412 if (o != NULL) ASN1_OBJECT_free(o);
413 if (os != NULL) M_ASN1_OCTET_STRING_free(os);
414 *pp=p;
415 return(ret);
416 }
417
418 const char *ASN1_tag2str(int tag)
419 {
420     static const char * const tag2str[] = {
421         "EOC", "BOOLEAN", "INTEGER", "BIT STRING", "OCTET STRING", /* 0-4 */
422         "NULL", "OBJECT", "OBJECT DESCRIPTOR", "EXTERNAL", "REAL", /* 5-9 */
423         "ENUMERATED", "<ASN1 11>", "UTF8STRING", "<ASN1 13>", /* 10-13 */
424         "<ASN1 14>", "<ASN1 15>", "SEQUENCE", "SET", /* 15-17 */
425         "NUMERICSTRING", "PRINTABLESTRING", "T61STRING", /* 18-20 */
426         "VIDEOTEXSTRING", "IASSTRING", "UTCTIME", "GENERALIZEDTIME", /* 21-24 */
427         "GRAPHICSTRING", "VISIBLESTRING", "GENERALSTRING", /* 25-27 */
428         "UNIVERSALSTRING", "<ASN1 29>", "BMPSTRING" /* 28-30 */
429     };
430
431     if((tag == V_ASN1_NEG_INTEGER) || (tag == V_ASN1_NEG_ENUMERATED))
432         tag &= ~0x100;
433
434     if(tag < 0 || tag > 30) return "(unknown)";
435     return tag2str[tag];
436 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_mime.c

1

```
*****
24648 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_mime.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* asn_mime.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 1999-2008 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
53
54 #include <stdio.h>
55 #include <ctype.h>
56 #include "cryptlib.h"
57 #include <openssl/rand.h>
58 #include <openssl/x509.h>
59 #include <openssl/asn1.h>
60 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_mime.c

2

```
62 #include "asn1_locl.h"
63
64 /* Generalised MIME like utilities for streaming ASN1. Although many
65  * have a PKCS7/CMS like flavour others are more general purpose.
66  */
67
68 /* MIME format structures
69  * Note that all are translated to lower case apart from
70  * parameter values. Quotes are stripped off
71  */
72
73 typedef struct {
74     char *param_name; /* Param name e.g. "micalg" */
75     char *param_value; /* Param value e.g. "sha1" */
76 } MIME_PARAM;
77
78 DECLARE_STACK_OF(MIME_PARAM)
79 IMPLEMENT_STACK_OF(MIME_PARAM)
80
81 typedef struct {
82     char *name; /* Name of line e.g. "content-type" */
83     char *value; /* Value of line e.g. "text/plain" */
84     STACK_OF(MIME_PARAM) *params; /* Zero or more parameters */
85 } MIME_HEADER;
86
87 DECLARE_STACK_OF(MIME_HEADER)
88 IMPLEMENT_STACK_OF(MIME_HEADER)
89
90 static int asn1_output_data(BIO *out, BIO *data, ASN1_VALUE *val, int flags,
91                             const ASN1_ITEM *it);
92 static char *strip_ends(char *name);
93 static char *strip_start(char *name);
94 static char *strip_end(char *name);
95 static MIME_HEADER *mime_hdr_new(char *name, char *value);
96 static int mime_hdr_addparam(MIME_HEADER *mhdr, char *name, char *value);
97 static STACK_OF(MIME_HEADER) *mime_parse_hdr(BIO *bio);
98 static int mime_hdr_cmp(const MIME_HEADER *const *a,
99                         const MIME_HEADER *const *b);
100 static int mime_param_cmp(const MIME_PARAM *const *a,
101                           const MIME_PARAM *const *b);
102 static void mime_param_free(MIME_PARAM *param);
103 static int mime_bound_check(char *line, int linelen, char *bound, int blen);
104 static int multi_split(BIO *bio, char *bound, STACK_OF(BIO) **ret);
105 static int strip_eol(char *linebuf, int *plen);
106 static MIME_HEADER *mime_hdr_find(STACK_OF(MIME_HEADER) *hdrs, char *name);
107 static MIME_PARAM *mime_param_find(MIME_HEADER *hdr, char *name);
108 static void mime_hdr_free(MIME_HEADER *hdr);
109
110 #define MAX_SMLEN 1024
111 #define mime_debug(x) /* x */
112
113 /* Output an ASN1 structure in BER format streaming if necessary */
114
115 int i2d_ASN1_bio_stream(BIO *out, ASN1_VALUE *val, BIO *in, int flags,
116                        const ASN1_ITEM *it)
117 {
118     /* If streaming create stream BIO and copy all content through it */
119     if (flags & SMIME_STREAM)
120     {
121         BIO *tbio;
122         bio = BIO_new_NDEF(out, val, it);
123         if (!bio)
124         {
125             ASN1err(ASN1_F_I2D_ASN1_BIO_STREAM, ERR_R_MALLOC_FAILURE);
126             return 0;
127         }
128     }
```

```

128     SMIME_crlf_copy(in, bio, flags);
129     (void)BIO_flush(bio);
130     /* Free up successive BIOs until we hit the old output BIO */
131     do
132     {
133         tbio = BIO_pop(bio);
134         BIO_free(bio);
135         bio = tbio;
136     } while (bio != out);
137 }
138 /* else just write out ASN1 structure which will have all content
139  * stored internally
140  */
141 else
142     ASN1_item_i2d_bio(it, out, val);
143 return 1;
144 }

146 /* Base 64 read and write of ASN1 structure */

148 static int B64_write_ASN1(BIO *out, ASN1_VALUE *val, BIO *in, int flags,
149                          const ASN1_ITEM *it)
150 {
151     BIO *b64;
152     int r;
153     b64 = BIO_new(BIO_f_base64());
154     if(!b64)
155     {
156         ASN1err(ASN1_F_B64_WRITE_ASN1,ERR_R_MALLOC_FAILURE);
157         return 0;
158     }
159     /* prepend the b64 BIO so all data is base64 encoded.
160     */
161     out = BIO_push(b64, out);
162     r = i2d_ASN1_bio_stream(out, val, in, flags, it);
163     (void)BIO_flush(out);
164     BIO_pop(out);
165     BIO_free(b64);
166     return r;
167 }

169 /* Streaming ASN1 PEM write */

171 int PEM_write_bio_ASN1_stream(BIO *out, ASN1_VALUE *val, BIO *in, int flags,
172                              const char *hdr,
173                              const ASN1_ITEM *it)
174 {
175     int r;
176     BIO_printf(out, "-----BEGIN %s-----\n", hdr);
177     r = B64_write_ASN1(out, val, in, flags, it);
178     BIO_printf(out, "-----END %s-----\n", hdr);
179     return r;
180 }

182 static ASN1_VALUE *b64_read_asn1(BIO *bio, const ASN1_ITEM *it)
183 {
184     BIO *b64;
185     ASN1_VALUE *val;
186     if(!(b64 = BIO_new(BIO_f_base64()))) {
187         ASN1err(ASN1_F_B64_READ_ASN1,ERR_R_MALLOC_FAILURE);
188         return 0;
189     }
190     bio = BIO_push(b64, bio);
191     val = ASN1_item_d2i_bio(it, bio, NULL);
192     if(!val)
193         ASN1err(ASN1_F_B64_READ_ASN1,ASN1_R_DECODE_ERROR);

```

```

194     (void)BIO_flush(bio);
195     bio = BIO_pop(bio);
196     BIO_free(b64);
197     return val;
198 }

200 /* Generate the MIME "micalg" parameter from RFC3851, RFC4490 */

202 static int asn1_write_micalg(BIO *out, STACK_OF(X509_ALGOR) *mdalgs)
203 {
204     const EVP_MD *md;
205     int i, have_unknown = 0, write_comma, ret = 0, md_nid;
206     have_unknown = 0;
207     write_comma = 0;
208     for (i = 0; i < sk_X509_ALGOR_num(mdalgs); i++)
209     {
210         if (write_comma)
211             BIO_write(out, ",", 1);
212         write_comma = 1;
213         md_nid = OBJ_obj2nid(sk_X509_ALGOR_value(mdalgs, i)->algorithm);
214         md = EVP_get_digestbynid(md_nid);
215         if (md && md->md_ctrl)
216         {
217             int rv;
218             char *micstr;
219             rv = md->md_ctrl(NULL, EVP_MD_CTRL_MICALG, 0, &micstr);
220             if (rv > 0)
221             {
222                 BIO_puts(out, micstr);
223                 OPENSSL_free(micstr);
224                 continue;
225             }
226             if (rv != -2)
227                 goto err;
228         }
229         switch(md_nid)
230         {
231             case NID_sha1:
232                 BIO_puts(out, "sha1");
233                 break;

235             case NID_md5:
236                 BIO_puts(out, "md5");
237                 break;

239             case NID_sha256:
240                 BIO_puts(out, "sha-256");
241                 break;

243             case NID_sha384:
244                 BIO_puts(out, "sha-384");
245                 break;

247             case NID_sha512:
248                 BIO_puts(out, "sha-512");
249                 break;

251             case NID_id_GostR3411_94:
252                 BIO_puts(out, "gostr3411-94");
253                 goto err;
254             break;

256             default:
257                 if (have_unknown)
258                     write_comma = 0;
259                 else

```



```

260         {
261             BIO_puts(out, "unknown");
262             have_unknown = 1;
263         }
264         break;
265     }
266 }
267
269     ret = 1;
270     err:
271
272     return ret;
273 }
274
276 /* SMIME sender */
277
278 int SMIME_write_ASN1(BIO *bio, ASN1_VALUE *val, BIO *data, int flags,
279                     int ctype_nid, int econt_nid,
280                     STACK_OF(X509_ALGOR) *mdalgs,
281                     const ASN1_ITEM *it)
282 {
283     char bound[33], c;
284     int i;
285     const char *mime_prefix, *mime_eol, *cname = "smime.p7m";
286     const char *msg_type=NULL;
287     if (flags & SMIME_OLDMIME)
288         mime_prefix = "application/x-pkcs7-";
289     else
290         mime_prefix = "application/pkcs7-";
291
292     if (flags & SMIME_CRLFEOEOL)
293         mime_eol = "\r\n";
294     else
295         mime_eol = "\n";
296     if ((flags & SMIME_DETACHED) && data) {
297         /* We want multipart/signed */
298         /* Generate a random boundary */
299         RAND_pseudo_bytes((unsigned char *)bound, 32);
300         for(i = 0; i < 32; i++) {
301             c = bound[i] & 0xf;
302             if(c < 10) c += '0';
303             else c += 'A' - 10;
304             bound[i] = c;
305         }
306         bound[32] = 0;
307         BIO_printf(bio, "MIME-Version: 1.0%s", mime_eol);
308         BIO_printf(bio, "Content-Type: multipart/signed;");
309         BIO_printf(bio, " protocol=\"%s\"signature\"", mime_prefix);
310         BIO_puts(bio, " micalg=\"");
311         asn1_write_micalg(bio, mdalgs);
312         BIO_printf(bio, "\"; boundary=\"%s\"",
313                   bound, mime_eol, mime_eol);
314         BIO_printf(bio, "This is an S/MIME signed message%s",
315                   mime_eol, mime_eol);
316         /* Now write out the first part */
317         BIO_printf(bio, "-----%s", bound, mime_eol);
318         if (!asn1_output_data(bio, data, val, flags, it))
319             return 0;
320         BIO_printf(bio, "%s-----%s", mime_eol, bound, mime_eol);
321
322         /* Headers for signature */
323
324         BIO_printf(bio, "Content-Type: %ssignature;", mime_prefix);
325         BIO_printf(bio, " name=\"%smime.p7s\"", mime_eol);

```

```

326         BIO_printf(bio, "Content-Transfer-Encoding: base64%s",
327                     mime_eol);
328         BIO_printf(bio, "Content-Disposition: attachment;");
329         BIO_printf(bio, " filename=\"%smime.p7s\"", mime_eol, mime_eol);
330         B64_write_ASN1(bio, val, NULL, 0, it);
331         BIO_printf(bio, "%s-----%s", mime_eol, bound,
332                     mime_eol, mime_eol);
333         return 1;
334     }
335 }
336
337 /* Determine smime-type header */
338
339 if (ctype_nid == NID_pkcs7_enveloped)
340     msg_type = "enveloped-data";
341 else if (ctype_nid == NID_pkcs7_signed)
342     {
343         if (econt_nid == NID_id_smime_ct_receipt)
344             msg_type = "signed-receipt";
345         else if (sk_X509_ALGOR_num(mdalgs) >= 0)
346             msg_type = "signed-data";
347         else
348             msg_type = "certs-only";
349     }
350 else if (ctype_nid == NID_id_smime_ct_compressedData)
351     {
352         msg_type = "compressed-data";
353         cname = "smime.p7z";
354     }
355 /* MIME headers */
356 BIO_printf(bio, "MIME-Version: 1.0%s", mime_eol);
357 BIO_printf(bio, "Content-Disposition: attachment;");
358 BIO_printf(bio, " filename=\"%s\"", cname, mime_eol);
359 BIO_printf(bio, "Content-Type: %smime;", mime_prefix);
360 if (msg_type)
361     BIO_printf(bio, " smime-type=%s;", msg_type);
362 BIO_printf(bio, " name=\"%s\"", cname, mime_eol);
363 BIO_printf(bio, "Content-Transfer-Encoding: base64%s",
364             mime_eol, mime_eol);
365 if (!B64_write_ASN1(bio, val, data, flags, it))
366     return 0;
367 BIO_printf(bio, "%s", mime_eol);
368 return 1;
369 }
370
371 /* Handle output of ASN1 data */
372
373 static int asn1_output_data(BIO *out, BIO *data, ASN1_VALUE *val, int flags,
374                             const ASN1_ITEM *it)
375 {
376     BIO *tmpbio;
377     const ASN1_AUX *aux = it->funcs;
378     ASN1_STREAM_ARG sarg;
379     int rv = 1;
380
381     /* If data is not detected or resigning then the output BIO is
382     * already set up to finalise when it is written through.
383     */
384     if (!(flags & SMIME_DETACHED) || (flags & PKCS7_REUSE_DIGEST))
385     {
386         SMIME_crlf_copy(data, out, flags);
387         return 1;
388     }
389
390     if (!aux || !aux->asn1_cb)

```

```

392     {
393         ASN1err(ASN1_F_ASN1_OUTPUT_DATA,
394                 ASN1_R_STREAMING_NOT_SUPPORTED);
395     }
396     return 0;
397 }
398
399     sarg.out = out;
400     sarg.ndef_bio = NULL;
401     sarg.boundary = NULL;
402
403     /* Let ASN1 code prepend any needed BIOs */
404     if (aux->asn1_cb(ASN1_OP_DETACHED_PRE, &val, it, &sarg) <= 0)
405         return 0;
406
407     /* Copy data across, passing through filter BIOs for processing */
408     SMIME_crlf_copy(data, sarg.ndef_bio, flags);
409
410     /* Finalize structure */
411     if (aux->asn1_cb(ASN1_OP_DETACHED_POST, &val, it, &sarg) <= 0)
412         rv = 0;
413
414     /* Now remove any digests prepended to the BIO */
415     while (sarg.ndef_bio != out)
416     {
417         tmpbio = BIO_pop(sarg.ndef_bio);
418         BIO_free(sarg.ndef_bio);
419         sarg.ndef_bio = tmpbio;
420     }
421
422     return rv;
423 }
424
425 }
426
427 /* SMIME reader: handle multipart/signed and opaque signing.
428  * in multipart case the content is placed in a memory BIO
429  * pointed to by "bcont". In opaque this is set to NULL
430  */
431
432 ASN1_VALUE *SMIME_read_ASN1(BIO *bio, BIO **bcont, const ASN1_ITEM *it)
433 {
434     BIO *asnin;
435     STACK_OF(MIME_HEADER) *headers = NULL;
436     STACK_OF(BIO) *parts = NULL;
437     MIME_HEADER *hdr;
438     MIME_PARAM *prm;
439     ASN1_VALUE *val;
440     int ret;
441
442     if(bcont) *bcont = NULL;
443
444     if (!(headers = mime_parse_hdr(bio))) {
445         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_MIME_PARSE_ERROR);
446         return NULL;
447     }
448
449     if (!(hdr = mime_hdr_find(headers, "content-type")) || !hdr->value) {
450         sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
451         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_NO_CONTENT_TYPE);
452         return NULL;
453     }
454
455     /* Handle multipart/signed */
456     if(!strcmp(hdr->value, "multipart/signed")) {

```

```

458     /* Split into two parts */
459     prm = mime_param_find(hdr, "boundary");
460     if(!prm || !prm->param_value) {
461         sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
462         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_NO_MULTIPART_BOUNDARY);
463         return NULL;
464     }
465     ret = multi_split(bio, prm->param_value, &parts);
466     sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
467     if(!ret || (sk_BIO_num(parts) != 2)) {
468         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_NO_MULTIPART_BODY);
469         sk_BIO_pop_free(parts, BIO_vfree);
470         return NULL;
471     }
472
473     /* Parse the signature piece */
474     asnin = sk_BIO_value(parts, 1);
475
476     if (!(headers = mime_parse_hdr(asnin))) {
477         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_MIME_SIG_PARSE_ERROR);
478         sk_BIO_pop_free(parts, BIO_vfree);
479         return NULL;
480     }
481
482     /* Get content type */
483     if (!(hdr = mime_hdr_find(headers, "content-type")) || !hdr->value) {
484         sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
485         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_NO_SIG_CONTENT_TYPE);
486         return NULL;
487     }
488
489     if(strcmp(hdr->value, "application/x-pkcs7-signature") &&
490         strcmp(hdr->value, "application/pkcs7-signature")) {
491         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_SIG_INVALID_MIME_TYPE);
492         ERR_add_error_data(2, "type: ", hdr->value);
493         sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
494         sk_BIO_pop_free(parts, BIO_vfree);
495         return NULL;
496     }
497     sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
498     /* Read in ASN1 */
499     if(!(val = b64_read_asn1(asnin, it))) {
500         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_ASN1_SIG_PARSE_ERROR);
501         sk_BIO_pop_free(parts, BIO_vfree);
502         return NULL;
503     }
504
505     if(bcont) {
506         *bcont = sk_BIO_value(parts, 0);
507         BIO_free(asnin);
508         sk_BIO_free(parts);
509     } else sk_BIO_pop_free(parts, BIO_vfree);
510     return val;
511 }
512
513 /* OK, if not multipart/signed try opaque signature */
514
515 if (strcmp(hdr->value, "application/x-pkcs7-mime") &&
516     strcmp(hdr->value, "application/pkcs7-mime")) {
517     ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_INVALID_MIME_TYPE);
518     ERR_add_error_data(2, "type: ", hdr->value);
519     sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
520     return NULL;
521 }

```

```

525     sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
526
527     if(!(val = b64_read_asn1(bio, it))) {
528         ASN1err(ASN1_F_SMIME_READ_ASN1, ASN1_R_ASN1_PARSE_ERROR);
529         return NULL;
530     }
531     return val;
532 }
533
534 /* Copy text from one BIO to another making the output CRLF at EOL */
535 int SMIME_crlf_copy(BIO *in, BIO *out, int flags)
536 {
537     BIO *bf;
538     char eol;
539     int len;
540     char linebuf[MAX_SMLEN];
541     /* Buffer output so we don't write one line at a time. This is
542      * useful when streaming as we don't end up with one OCTET STRING
543      * per line.
544      */
545     bf = BIO_new(BIO_f_buffer());
546     if (!bf)
547         return 0;
548     out = BIO_push(bf, out);
549     if(flags & SMIME_BINARY)
550     {
551         while((len = BIO_read(in, linebuf, MAX_SMLEN)) > 0)
552             BIO_write(out, linebuf, len);
553     }
554     else
555     {
556         if(flags & SMIME_TEXT)
557             BIO_printf(out, "Content-Type: text/plain\r\n\r\n");
558         while ((len = BIO_gets(in, linebuf, MAX_SMLEN)) > 0)
559         {
560             eol = strip_eol(linebuf, &len);
561             if (len)
562                 BIO_write(out, linebuf, len);
563             if(eol) BIO_write(out, "\r\n", 2);
564         }
565     }
566     (void)BIO_flush(out);
567     BIO_pop(out);
568     BIO_free(bf);
569     return 1;
570 }
571
572 /* Strip off headers if they are text/plain */
573 int SMIME_text(BIO *in, BIO *out)
574 {
575     char iobuf[4096];
576     int len;
577     STACK_OF(MIME_HEADER) *headers;
578     MIME_HEADER *hdr;
579
580     if (!(headers = mime_parse_hdr(in))) {
581         ASN1err(ASN1_F_SMIME_TEXT, ASN1_R_MIME_PARSE_ERROR);
582         return 0;
583     }
584     if(!(hdr = mime_hdr_find(headers, "content-type")) || !hdr->value) {
585         ASN1err(ASN1_F_SMIME_TEXT, ASN1_R_MIME_NO_CONTENT_TYPE);
586         sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
587         return 0;
588     }
589 }

```

```

590     if (strcmp(hdr->value, "text/plain")) {
591         ASN1err(ASN1_F_SMIME_TEXT, ASN1_R_INVALID_MIME_TYPE);
592         ERR_add_error_data(2, "type: ", hdr->value);
593         sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
594         return 0;
595     }
596     sk_MIME_HEADER_pop_free(headers, mime_hdr_free);
597     while ((len = BIO_read(in, iobuf, sizeof(iobuf))) > 0)
598         BIO_write(out, iobuf, len);
599     if (len < 0)
600         return 0;
601     return 1;
602 }
603
604 /* Split a multipart/XXX message body into component parts: result is
605  * canonical parts in a STACK of bios
606  */
607
608 static int multi_split(BIO *bio, char *bound, STACK_OF(BIO) **ret)
609 {
610     char linebuf[MAX_SMLEN];
611     int len, blen;
612     int eol = 0, next_eol = 0;
613     BIO *bpart = NULL;
614     STACK_OF(BIO) *parts;
615     char state, part, first;
616
617     blen = strlen(bound);
618     part = 0;
619     state = 0;
620     first = 1;
621     parts = sk_BIO_new_null();
622     *ret = parts;
623     while ((len = BIO_gets(bio, linebuf, MAX_SMLEN)) > 0) {
624         state = mime_bound_check(linebuf, len, bound, blen);
625         if(state == 1) {
626             first = 1;
627             part++;
628         } else if(state == 2) {
629             sk_BIO_push(parts, bpart);
630             return 1;
631         } else if(part) {
632             /* Strip CR+LF from linebuf */
633             next_eol = strip_eol(linebuf, &len);
634             if(first) {
635                 first = 0;
636                 if(bpart) sk_BIO_push(parts, bpart);
637                 bpart = BIO_new(BIO_s_mem());
638                 BIO_set_mem_eof_return(bpart, 0);
639             } else if (eol)
640                 BIO_write(bpart, "\r\n", 2);
641             eol = next_eol;
642             if (len)
643                 BIO_write(bpart, linebuf, len);
644         }
645     }
646     return 0;
647 }
648
649 /* This is the big one: parse MIME header lines up to message body */
650
651 #define MIME_INVALID      0
652 #define MIME_START        1
653 #define MIME_TYPE          2
654 #define MIME_NAME          3
655 #define MIME_VALUE         4

```

```

656 #define MIME_QUOTE      5
657 #define MIME_COMMENT    6

660 static STACK_OF(MIME_HEADER) *mime_parse_hdr(BIO *bio)
661 {
662     char *p, *q, c;
663     char *ntmp;
664     char linebuf[MAX_SMLEN];
665     MIME_HEADER *mhdr = NULL;
666     STACK_OF(MIME_HEADER) *headers;
667     int len, state, save_state = 0;

669     headers = sk_MIME_HEADER_new(mime_hdr_cmp);
670     while ((len = BIO_gets(bio, linebuf, MAX_SMLEN)) > 0) {
671         /* If whitespace at line start then continuation line */
672         if(mhdr && isspace((unsigned char)linebuf[0])) state = MIME_NAME;
673         else state = MIME_START;
674         ntmp = NULL;
675         /* Go through all characters */
676         for(p = linebuf, q = linebuf; (c = *p) && (c!='\r') && (c!='\n'); p++) {

678         /* State machine to handle MIME headers
679          * if this looks horrible that's because it *is*
680          */

682         switch(state) {
683             case MIME_START:
684                 if(c == ':') {
685                     state = MIME_TYPE;
686                     *p = 0;
687                     ntmp = strip_ends(q);
688                     q = p + 1;
689                 }
690                 break;

692             case MIME_TYPE:
693                 if(c == ';') {
694                     mime_debug("Found End Value\n");
695                     *p = 0;
696                     mhdr = mime_hdr_new(ntmp, strip_ends(q));
697                     sk_MIME_HEADER_push(headers, mhdr);
698                     ntmp = NULL;
699                     q = p + 1;
700                     state = MIME_NAME;
701                 } else if(c == '(') {
702                     save_state = state;
703                     state = MIME_COMMENT;
704                 }
705                 break;

707             case MIME_COMMENT:
708                 if(c == ')') {
709                     state = save_state;
710                 }
711                 break;

713             case MIME_NAME:
714                 if(c == '=') {
715                     state = MIME_VALUE;
716                     *p = 0;
717                     ntmp = strip_ends(q);
718                     q = p + 1;
719                 }
720                 break ;

```

```

722         case MIME_VALUE:
723             if(c == ';') {
724                 state = MIME_NAME;
725                 *p = 0;
726                 mime_hdr_addparam(mhdr, ntmp, strip_ends(q));
727                 ntmp = NULL;
728                 q = p + 1;
729             } else if (c == '"') {
730                 mime_debug("Found Quote\n");
731                 state = MIME_QUOTE;
732             } else if(c == '(') {
733                 save_state = state;
734                 state = MIME_COMMENT;
735             }
736             break;

738         case MIME_QUOTE:
739             if(c == '"') {
740                 mime_debug("Found Match Quote\n");
741                 state = MIME_VALUE;
742             }
743             break;
744         }
745     }

747     if(state == MIME_TYPE) {
748         mhdr = mime_hdr_new(ntmp, strip_ends(q));
749         sk_MIME_HEADER_push(headers, mhdr);
750     } else if(state == MIME_VALUE)
751         mime_hdr_addparam(mhdr, ntmp, strip_ends(q));
752     if(p == linebuf) break; /* Blank line means end of headers */
753 }

755 return headers;

757 }

759 static char *strip_ends(char *name)
760 {
761     return strip_end(strip_start(name));
762 }

764 /* Strip a parameter of whitespace from start of param */
765 static char *strip_start(char *name)
766 {
767     char *p, c;
768     /* Look for first non white space or quote */
769     for(p = name; (c = *p) ; p++) {
770         if(c == '"') {
771             /* Next char is start of string if non null */
772             if(p[1]) return p + 1;
773             /* Else null string */
774             return NULL;
775         }
776         if(!isspace((unsigned char)c)) return p;
777     }
778     return NULL;
779 }

781 /* As above but strip from end of string : maybe should handle brackets? */
782 static char *strip_end(char *name)
783 {
784     char *p, c;
785     if(!name) return NULL;
786     /* Look for first non white space or quote */
787     for(p = name + strlen(name) - 1; p >= name ; p--) {

```

```

788         c = *p;
789         if(c == '"') {
790             if(p - 1 == name) return NULL;
791             *p = 0;
792             return name;
793         }
794         if(isspace((unsigned char)c)) *p = 0;
795         else return name;
796     }
797     return NULL;
798 }

800 static MIME_HEADER *mime_hdr_new(char *name, char *value)
801 {
802     MIME_HEADER *mhdr;
803     char *tmpname, *tmpval, *p;
804     int c;
805     if(name) {
806         if(!(tmpname = BUF_strdup(name))) return NULL;
807         for(p = tmpname ; *p; p++) {
808             c = (unsigned char)*p;
809             if(isupper(c)) {
810                 c = tolower(c);
811                 *p = c;
812             }
813         }
814     } else tmpname = NULL;
815     if(value) {
816         if(!(tmpval = BUF_strdup(value))) return NULL;
817         for(p = tmpval ; *p; p++) {
818             c = (unsigned char)*p;
819             if(isupper(c)) {
820                 c = tolower(c);
821                 *p = c;
822             }
823         }
824     } else tmpval = NULL;
825     mhdr = (MIME_HEADER *) OPENSSL_malloc(sizeof(MIME_HEADER));
826     if(!mhdr) return NULL;
827     mhdr->name = tmpname;
828     mhdr->value = tmpval;
829     if(!(mhdr->params = sk_MIME_PARAM_new(mime_param_cmp))) return NULL;
830     return mhdr;
831 }

832
833 static int mime_hdr_addparam(MIME_HEADER *mhdr, char *name, char *value)
834 {
835     char *tmpname, *tmpval, *p;
836     int c;
837     MIME_PARAM *mparam;
838     if(name) {
839         tmpname = BUF_strdup(name);
840         if(!tmpname) return 0;
841         for(p = tmpname ; *p; p++) {
842             c = (unsigned char)*p;
843             if(isupper(c)) {
844                 c = tolower(c);
845                 *p = c;
846             }
847         }
848     } else tmpname = NULL;
849     if(value) {
850         tmpval = BUF_strdup(value);
851         if(!tmpval) return 0;
852     } else tmpval = NULL;
853     /* Parameter values are case sensitive so leave as is */

```

```

854     mparam = (MIME_PARAM *) OPENSSL_malloc(sizeof(MIME_PARAM));
855     if(!mparam) return 0;
856     mparam->param_name = tmpname;
857     mparam->param_value = tmpval;
858     sk_MIME_PARAM_push(mhdr->params, mparam);
859     return 1;
860 }

862 static int mime_hdr_cmp(const MIME_HEADER * const *a,
863                        const MIME_HEADER * const *b)
864 {
865     if (!(*a)->name || !(*b)->name)
866         return !(*a)->name - !(*b)->name;

868     return(strcmp((*a)->name, (*b)->name));
869 }

871 static int mime_param_cmp(const MIME_PARAM * const *a,
872                          const MIME_PARAM * const *b)
873 {
874     if (!(*a)->param_name || !(*b)->param_name)
875         return !(*a)->param_name - !(*b)->param_name;
876     return(strcmp((*a)->param_name, (*b)->param_name));
877 }

879 /* Find a header with a given name (if possible) */

881 static MIME_HEADER *mime_hdr_find(STACK_OF(MIME_HEADER) *hdrs, char *name)
882 {
883     MIME_HEADER http;
884     int idx;
885     http.name = name;
886     idx = sk_MIME_HEADER_find(hdrs, &http);
887     if(idx < 0) return NULL;
888     return sk_MIME_HEADER_value(hdrs, idx);
889 }

891 static MIME_PARAM *mime_param_find(MIME_HEADER *hdr, char *name)
892 {
893     MIME_PARAM param;
894     int idx;
895     param.param_name = name;
896     idx = sk_MIME_PARAM_find(hdr->params, &param);
897     if(idx < 0) return NULL;
898     return sk_MIME_PARAM_value(hdr->params, idx);
899 }

901 static void mime_hdr_free(MIME_HEADER *hdr)
902 {
903     if(hdr->name) OPENSSL_free(hdr->name);
904     if(hdr->value) OPENSSL_free(hdr->value);
905     if(hdr->params) sk_MIME_PARAM_pop_free(hdr->params, mime_param_free);
906     OPENSSL_free(hdr);
907 }

909 static void mime_param_free(MIME_PARAM *param)
910 {
911     if(param->param_name) OPENSSL_free(param->param_name);
912     if(param->param_value) OPENSSL_free(param->param_value);
913     OPENSSL_free(param);
914 }

916 /* Check for a multipart boundary. Returns:
917  * 0 : no boundary
918  * 1 : part boundary
919  * 2 : final boundary

```

```
920 */
921 static int mime_bound_check(char *line, int linelen, char *bound, int blen)
922 {
923     if(linelen == -1) linelen = strlen(line);
924     if(blen == -1) blen = strlen(bound);
925     /* Quickly eliminate if line length too short */
926     if(blen + 2 > linelen) return 0;
927     /* Check for part boundary */
928     if(!strncmp(line, "--", 2) && !strncmp(line + 2, bound, blen)) {
929         if(!strncmp(line + blen + 2, "--", 2)) return 2;
930         else return 1;
931     }
932     return 0;
933 }

935 static int strip_eol(char *linebuf, int *plen)
936 {
937     int len = *plen;
938     char *p, c;
939     int is_eol = 0;
940     p = linebuf + len - 1;
941     for (p = linebuf + len - 1; len > 0; len--, p--)
942     {
943         c = *p;
944         if (c == '\n')
945             is_eol = 1;
946         else if (c != '\r')
947             break;
948     }
949     *plen = len;
950     return is_eol;
951 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_moid.c

1

```
*****
4618 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_moid.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* asn_moid.c */
2 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001-2004 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include <ctype.h>
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_moid.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/conf.h>
64 #include <openssl/dso.h>
65 #include <openssl/x509.h>

67 /* Simple ASN1 OID module: add all objects in a given section */
69 static int do_create(char *value, char *name);

71 static int oid_module_init(CONF_IMODULE *md, const CONF *cnf)
72 {
73     int i;
74     const char *oid_section;
75     STACK_OF(CONF_VALUE) *sktmp;
76     CONF_VALUE *oval;
77     oid_section = CONF_imodule_get_value(md);
78     if (!(sktmp = NCONF_get_section(cnf, oid_section)))
79     {
80         ASN1err(ASN1_F_OID_MODULE_INIT, ASN1_R_ERROR_LOADING_SECTION);
81         return 0;
82     }
83     for(i = 0; i < sk_CONF_VALUE_num(sktmp); i++)
84     {
85         oval = sk_CONF_VALUE_value(sktmp, i);
86         if (!do_create(oval->value, oval->name))
87         {
88             ASN1err(ASN1_F_OID_MODULE_INIT, ASN1_R_ADDING_OBJECT);
89             return 0;
90         }
91     }
92     return 1;
93 }

95 static void oid_module_finish(CONF_IMODULE *md)
96 {
97     OBJ_cleanup();
98 }

100 void ASN1_add_oid_module(void)
101 {
102     CONF_module_add("oid_section", oid_module_init, oid_module_finish);
103 }

105 /* Create an OID based on a name value pair. Accept two formats.
106  * shortname = 1.2.3.4
107  * shortname = some long name, 1.2.3.4
108  */

111 static int do_create(char *value, char *name)
112 {
113     int nid;
114     ASN1_OBJECT *oid;
115     char *ln, *ostr, *p, *lntmp;
116     p = strrchr(value, ',');
117     if (!p)
118     {
119         ln = name;
120         ostr = value;
121     }
122     else
123     {
124         ln = NULL;
125         ostr = p + 1;
126         if (!*ostr)
127             return 0;
```

```
128         while(isspace((unsigned char)*ostr)) ostr++;
129     }
131     nid = OBJ_create(ostr, name, ln);
133     if (nid == NID_undef)
134         return 0;
136     if (p)
137     {
138         ln = value;
139         while(isspace((unsigned char)*ln)) ln++;
140         p--;
141         while(isspace((unsigned char)*p))
142         {
143             if (p == ln)
144                 return 0;
145             p--;
146         }
147         p++;
148         lntmp = OPENSSL_malloc((p - ln) + 1);
149         if (lntmp == NULL)
150             return 0;
151         memcpy(lntmp, ln, p - ln);
152         lntmp[p - ln] = 0;
153         oid = OBJ_nid2obj(nid);
154         oid->ln = lntmp;
155     }
157     return 1;
158 }
159
160
```


new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_pack.c

1

```
*****
5939 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_pack.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* asn_pack.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/asn_pack.c

2

```
63 #ifndef NO_ASN1_OLD
64
65 /* ASN1 packing and unpacking functions */
66
67 /* Turn an ASN1 encoded SEQUENCE OF into a STACK of structures */
68
69 STACK_OF(OPENSSSL_BLOCK) *ASN1_seq_unpack(const unsigned char *buf, int len,
70 d2i_of_void *d2i, void (*free_func)(OPENSSSL_BLOCK))
71 {
72     STACK_OF(OPENSSSL_BLOCK) *sk;
73     const unsigned char *pbuf;
74     pbuf = buf;
75     if (!(sk = d2i_ASN1_SET(NULL, &pbuf, len, d2i, free_func,
76                             V_ASN1_SEQUENCE, V_ASN1_UNIVERSAL)))
77         ASN1err(ASN1_F_ASN1_SEQ_UNPACK, ASN1_R_DECODE_ERROR);
78     return sk;
79 }
80
81 /* Turn a STACK structures into an ASN1 encoded SEQUENCE OF structure in a
82  * OPENSSSL_malloc'ed buffer
83  */
84
85 unsigned char *ASN1_seq_pack(STACK_OF(OPENSSSL_BLOCK) *safes, i2d_of_void *i2d,
86 unsigned char **buf, int *len)
87 {
88     int safelen;
89     unsigned char *safe, *p;
90     if (!(safelen = i2d_ASN1_SET(safes, NULL, i2d, V_ASN1_SEQUENCE,
91                                V_ASN1_UNIVERSAL, IS_SEQUENCE))) {
92         ASN1err(ASN1_F_ASN1_SEQ_PACK, ASN1_R_ENCODE_ERROR);
93         return NULL;
94     }
95     if (!(safe = OPENSSSL_malloc (safelen))) {
96         ASN1err(ASN1_F_ASN1_SEQ_PACK, ERR_R_MALLOC_FAILURE);
97         return NULL;
98     }
99     p = safe;
100     i2d_ASN1_SET(safes, &p, i2d, V_ASN1_SEQUENCE, V_ASN1_UNIVERSAL,
101                 IS_SEQUENCE);
102     if (len) *len = safelen;
103     if (buf) *buf = safe;
104     return safe;
105 }
106
107 /* Extract an ASN1 object from an ASN1_STRING */
108
109 void *ASN1_unpack_string(ASN1_STRING *oct, d2i_of_void *d2i)
110 {
111     const unsigned char *p;
112     char *ret;
113
114     p = oct->data;
115     if (!(ret = d2i(NULL, &p, oct->length)))
116         ASN1err(ASN1_F_ASN1_UNPACK_STRING, ASN1_R_DECODE_ERROR);
117     return ret;
118 }
119
120 /* Pack an ASN1 object into an ASN1_STRING */
121
122 ASN1_STRING *ASN1_pack_string(void *obj, i2d_of_void *i2d, ASN1_STRING **oct)
123 {
124     unsigned char *p;
125     ASN1_STRING *octmp;
126
127     if (!oct || !*oct) {
```

```
128         if (!(octmp = ASN1_STRING_new ())) {
129             ASN1err(ASN1_F_ASN1_PACK_STRING,ERR_R_MALLOC_FAILURE);
130             return NULL;
131         }
132         if (oct) *oct = octmp;
133     } else octmp = *oct;
134
135     if (!(octmp->length = i2d(obj, NULL))) {
136         ASN1err(ASN1_F_ASN1_PACK_STRING,ASN1_R_ENCODE_ERROR);
137         return NULL;
138     }
139     if (!(p = OPENSSL_malloc (octmp->length))) {
140         ASN1err(ASN1_F_ASN1_PACK_STRING,ERR_R_MALLOC_FAILURE);
141         return NULL;
142     }
143     octmp->data = p;
144     i2d (obj, &p);
145     return octmp;
146 }
147
148 #endif
149
150 /* ASN1_ITEM versions of the above */
151
152 ASN1_STRING *ASN1_item_pack(void *obj, const ASN1_ITEM *it, ASN1_STRING **oct)
153 {
154     ASN1_STRING *octmp;
155
156     if (!oct || !*oct) {
157         if (!(octmp = ASN1_STRING_new ())) {
158             ASN1err(ASN1_F_ASN1_ITEM_PACK,ERR_R_MALLOC_FAILURE);
159             return NULL;
160         }
161         if (oct) *oct = octmp;
162     } else octmp = *oct;
163
164     if(octmp->data) {
165         OPENSSL_free(octmp->data);
166         octmp->data = NULL;
167     }
168
169     if (!(octmp->length = ASN1_item_i2d(obj, &octmp->data, it))) {
170         ASN1err(ASN1_F_ASN1_ITEM_PACK,ASN1_R_ENCODE_ERROR);
171         return NULL;
172     }
173     if (!octmp->data) {
174         ASN1err(ASN1_F_ASN1_ITEM_PACK,ERR_R_MALLOC_FAILURE);
175         return NULL;
176     }
177     return octmp;
178 }
179
180 /* Extract an ASN1 object from an ASN1_STRING */
181
182 void *ASN1_item_unpack(ASN1_STRING *oct, const ASN1_ITEM *it)
183 {
184     const unsigned char *p;
185     void *ret;
186
187     p = oct->data;
188     if(!(ret = ASN1_item_d2i(NULL, &p, oct->length, it)))
189         ASN1err(ASN1_F_ASN1_ITEM_UNPACK,ASN1_R_DECODE_ERROR);
190     return ret;
191 }
```



```

128         asn1_bio_state_t other_state);

130 static BIO_METHOD methods_asn1=
131 {
132     BIO_TYPE_ASN1,
133     "asn1",
134     asn1_bio_write,
135     asn1_bio_read,
136     asn1_bio_puts,
137     asn1_bio_gets,
138     asn1_bio_ctrl,
139     asn1_bio_new,
140     asn1_bio_free,
141     asn1_bio_callback_ctrl,
142 };

144 BIO_METHOD *BIO_f_asn1(void)
145 {
146     return(&methods_asn1);
147 }

150 static int asn1_bio_new(BIO *b)
151 {
152     BIO_ASN1_BUF_CTX *ctx;
153     ctx = OPENSSL_malloc(sizeof(BIO_ASN1_BUF_CTX));
154     if (!ctx)
155         return 0;
156     if (!asn1_bio_init(ctx, DEFAULT_ASN1_BUF_SIZE))
157         return 0;
158     b->init = 1;
159     b->ptr = (char *)ctx;
160     b->flags = 0;
161     return 1;
162 }

164 static int asn1_bio_init(BIO_ASN1_BUF_CTX *ctx, int size)
165 {
166     ctx->buf = OPENSSL_malloc(size);
167     if (!ctx->buf)
168         return 0;
169     ctx->bufsize = size;
170     ctx->bufpos = 0;
171     ctx->buflen = 0;
172     ctx->copylen = 0;
173     ctx->asn1_class = V_ASN1_UNIVERSAL;
174     ctx->asn1_tag = V_ASN1_OCTET_STRING;
175     ctx->ex_buf = 0;
176     ctx->ex_pos = 0;
177     ctx->ex_len = 0;
178     ctx->state = ASN1_STATE_START;
179     return 1;
180 }

182 static int asn1_bio_free(BIO *b)
183 {
184     BIO_ASN1_BUF_CTX *ctx;
185     ctx = (BIO_ASN1_BUF_CTX *) b->ptr;
186     if (ctx == NULL)
187         return 0;
188     if (ctx->buf)
189         OPENSSL_free(ctx->buf);
190     OPENSSL_free(ctx);
191     b->init = 0;
192     b->ptr = NULL;
193     b->flags = 0;

```

```

194     return 1;
195 }

197 static int asn1_bio_write(BIO *b, const char *in, int inl)
198 {
199     BIO_ASN1_BUF_CTX *ctx;
200     int wrmax, wrlen, ret;
201     unsigned char *p;
202     if (!in || (inl < 0) || (b->next_bio == NULL))
203         return 0;
204     ctx = (BIO_ASN1_BUF_CTX *) b->ptr;
205     if (ctx == NULL)
206         return 0;

208     wrlen = 0;
209     ret = -1;

211     for(;;)
212     {
213         switch (ctx->state)
214         {
215             /* Setup prefix data, call it */
216             case ASN1_STATE_START:
217                 if (!asn1_bio_setup_ex(b, ctx, ctx->prefix,
218                     ASN1_STATE_PRE_COPY, ASN1_STATE_HEADER))
219                     return 0;
220                 break;

221             /* Copy any pre data first */
222             case ASN1_STATE_PRE_COPY:

223                 ret = asn1_bio_flush_ex(b, ctx, ctx->prefix_free,
224                     ASN1_STATE_HEADER);

226                 if (ret <= 0)
227                     goto done;

229                 break;

230             case ASN1_STATE_HEADER:
231                 ctx->buflen =
232                     ASN1_object_size(0, inl, ctx->asn1_tag) - inl;
233                 OPENSSL_assert(ctx->buflen <= ctx->bufsize);
234                 p = ctx->buf;
235                 ASN1_put_object(&p, 0, inl,
236                     ctx->asn1_tag, ctx->asn1_class);
237                 ctx->copylen = inl;
238                 ctx->state = ASN1_STATE_HEADER_COPY;

240                 break;

241             case ASN1_STATE_HEADER_COPY:
242                 ret = BIO_write(b->next_bio,
243                     ctx->buf + ctx->bufpos, ctx->buflen);
244                 if (ret <= 0)
245                     goto done;

246                 ctx->buflen -= ret;
247                 if (ctx->buflen)
248                     ctx->bufpos += ret;
249                 else
250                 {
251                     ctx->bufpos = 0;
252                     ctx->state = ASN1_STATE_DATA_COPY;
253                 }

```

```

261         break;

263         case ASN1_STATE_DATA_COPY:

265             if (inl > ctx->copylen)
266                 wrmax = ctx->copylen;
267             else
268                 wrmax = inl;
269             ret = BIO_write(b->next_bio, in, wrmax);
270             if (ret <= 0)
271                 break;
272             wrlen += ret;
273             ctx->copylen -= ret;
274             in += ret;
275             inl -= ret;

277             if (ctx->copylen == 0)
278                 ctx->state = ASN1_STATE_HEADER;

280             if (inl == 0)
281                 goto done;

283             break;

285             default:
286                 BIO_clear_retry_flags(b);
287                 return 0;

289         }

291     }

293     done:
294     BIO_clear_retry_flags(b);
295     BIO_copy_next_retry(b);

297     return (wrlen > 0) ? wrlen : ret;

299 }

301 static int asn1_bio_flush_ex(BIO *b, BIO_ASN1_BUF_CTX *ctx,
302                             asn1_ps_func *cleanup, asn1_bio_state_t next)
303 {
304     int ret;
305     if (ctx->ex_len <= 0)
306         return 1;
307     for(;;)
308     {
309         ret = BIO_write(b->next_bio, ctx->ex_buf + ctx->ex_pos,
310                        ctx->ex_len);
311         if (ret <= 0)
312             break;
313         ctx->ex_len -= ret;
314         if (ctx->ex_len > 0)
315             ctx->ex_pos += ret;
316         else
317             {
318                 if(cleanup)
319                     cleanup(b, &ctx->ex_buf, &ctx->ex_len,
320                            &ctx->ex_arg);
321                 ctx->state = next;
322                 ctx->ex_pos = 0;
323                 break;
324             }
325     }

```

```

326     return ret;
327 }

329 static int asn1_bio_setup_ex(BIO *b, BIO_ASN1_BUF_CTX *ctx,
330                             asn1_ps_func *setup,
331                             asn1_bio_state_t ex_state,
332                             asn1_bio_state_t other_state)
333 {
334     if (setup && !setup(b, &ctx->ex_buf, &ctx->ex_len, &ctx->ex_arg))
335     {
336         BIO_clear_retry_flags(b);
337         return 0;
338     }
339     if (ctx->ex_len > 0)
340         ctx->state = ex_state;
341     else
342         ctx->state = other_state;
343     return 1;
344 }

346 static int asn1_bio_read(BIO *b, char *in, int inl)
347 {
348     if (!b->next_bio)
349         return 0;
350     return BIO_read(b->next_bio, in, inl);
351 }

353 static int asn1_bio_puts(BIO *b, const char *str)
354 {
355     return asn1_bio_write(b, str, strlen(str));
356 }

358 static int asn1_bio_gets(BIO *b, char *str, int size)
359 {
360     if (!b->next_bio)
361         return 0;
362     return BIO_gets(b->next_bio, str, size);
363 }

365 static long asn1_bio_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
366 {
367     if (b->next_bio == NULL) return(0);
368     return BIO_callback_ctrl(b->next_bio,cmd,fp);
369 }

371 static long asn1_bio_ctrl(BIO *b, int cmd, long arg1, void *arg2)
372 {
373     BIO_ASN1_BUF_CTX *ctx;
374     BIO_ASN1_EX_FUNCS *ex_func;
375     long ret = 1;
376     ctx = (BIO_ASN1_BUF_CTX *) b->ptr;
377     if (ctx == NULL)
378         return 0;
379     switch(cmd)
380     {
381     case BIO_C_SET_PREFIX:
382         ex_func = arg2;
383         ctx->prefix = ex_func->ex_func;
384         ctx->prefix_free = ex_func->ex_free_func;
385         break;

388     case BIO_C_GET_PREFIX:
389         ex_func = arg2;
390         ex_func->ex_func = ctx->prefix;
391         ex_func->ex_free_func = ctx->prefix_free;

```

```

392         break;

394         case BIO_C_SET_SUFFIX:
395             ex_func = arg2;
396             ctx->suffix = ex_func->ex_func;
397             ctx->suffix_free = ex_func->ex_free_func;
398             break;

400         case BIO_C_GET_SUFFIX:
401             ex_func = arg2;
402             ex_func->ex_func = ctx->suffix;
403             ex_func->ex_free_func = ctx->suffix_free;
404             break;

406         case BIO_C_SET_EX_ARG:
407             ctx->ex_arg = arg2;
408             break;

410         case BIO_C_GET_EX_ARG:
411             *(void **)arg2 = ctx->ex_arg;
412             break;

414         case BIO_CTRL_FLUSH:
415             if (!b->next_bio)
416                 return 0;

418         /* Call post function if possible */
419         if (ctx->state == ASN1_STATE_HEADER)
420             {
421                 if (!asn1_bio_setup_ex(b, ctx, ctx->suffix,
422                     ASN1_STATE_POST_COPY, ASN1_STATE_DONE))
423                     return 0;
424             }

426         if (ctx->state == ASN1_STATE_POST_COPY)
427             {
428                 ret = asn1_bio_flush_ex(b, ctx, ctx->suffix_free,
429                     ASN1_STATE_DONE);
430                 if (ret <= 0)
431                     return ret;
432             }

434         if (ctx->state == ASN1_STATE_DONE)
435             return BIO_ctrl(b->next_bio, cmd, arg1, arg2);
436         else
437             {
438                 BIO_clear_retry_flags(b);
439                 return 0;
440             }
441         break;

444         default:
445             if (!b->next_bio)
446                 return 0;
447             return BIO_ctrl(b->next_bio, cmd, arg1, arg2);

449     }

451     return ret;
452 }

454 static int asn1_bio_set_ex(BIO *b, int cmd,
455     asn1_ps_func *ex_func, asn1_ps_func *ex_free_func)
456 {
457     BIO_ASN1_EX_FUNCS extmp;

```

```

458     extmp.ex_func = ex_func;
459     extmp.ex_free_func = ex_free_func;
460     return BIO_ctrl(b, cmd, 0, &extmp);
461 }

463 static int asn1_bio_get_ex(BIO *b, int cmd,
464     asn1_ps_func **ex_func, asn1_ps_func **ex_free_func)
465 {
466     BIO_ASN1_EX_FUNCS extmp;
467     int ret;
468     ret = BIO_ctrl(b, cmd, 0, &extmp);
469     if (ret > 0)
470         {
471             *ex_func = extmp.ex_func;
472             *ex_free_func = extmp.ex_free_func;
473         }
474     return ret;
475 }

477 int BIO_asn1_set_prefix(BIO *b, asn1_ps_func *prefix, asn1_ps_func *prefix_free)
478 {
479     return asn1_bio_set_ex(b, BIO_C_SET_PREFIX, prefix, prefix_free);
480 }

482 int BIO_asn1_get_prefix(BIO *b, asn1_ps_func **pprefix, asn1_ps_func **pprefix_f
483 {
484     return asn1_bio_get_ex(b, BIO_C_GET_PREFIX, pprefix, pprefix_free);
485 }

487 int BIO_asn1_set_suffix(BIO *b, asn1_ps_func *suffix, asn1_ps_func *suffix_free)
488 {
489     return asn1_bio_set_ex(b, BIO_C_SET_SUFFIX, suffix, suffix_free);
490 }

492 int BIO_asn1_get_suffix(BIO *b, asn1_ps_func **psuffix, asn1_ps_func **psuffix_f
493 {
494     return asn1_bio_get_ex(b, BIO_C_GET_SUFFIX, psuffix, psuffix_free);
495 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/bio_ndef.c

1

```
*****
6972 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/bio_ndef.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* bio_ndef.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
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14  *
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
53
55 #include <openssl/asn1.h>
56 #include <openssl/asn1t.h>
57 #include <openssl/bio.h>
58 #include <openssl/err.h>
59
60 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/bio_ndef.c

2

```
62 /* Experimental NDEF ASN1 BIO support routines */
63
64 /* The usage is quite simple, initialize an ASN1 structure,
65  * get a BIO from it then any data written through the BIO
66  * will end up translated to appropriate format on the fly.
67  * The data is streamed out and does *not* need to be
68  * all held in memory at once.
69  *
70  * When the BIO is flushed the output is finalized and any
71  * signatures etc written out.
72  *
73  * The BIO is a 'proper' BIO and can handle non blocking I/O
74  * correctly.
75  *
76  * The usage is simple. The implementation is *not*...
77  */
78
79 /* BIO support data stored in the ASN1 BIO ex_arg */
80
81 typedef struct ndef_aux_st
82 {
83     /* ASN1 structure this BIO refers to */
84     ASN1_VALUE *val;
85     const ASN1_ITEM *it;
86     /* Top of the BIO chain */
87     BIO *ndef_bio;
88     /* Output BIO */
89     BIO *out;
90     /* Boundary where content is inserted */
91     unsigned char **boundary;
92     /* DER buffer start */
93     unsigned char *derbuf;
94     } NDEF_SUPPORT;
95
96 static int ndef_prefix(BIO *b, unsigned char **pbuf, int *plen, void *parg);
97 static int ndef_prefix_free(BIO *b, unsigned char **pbuf, int *plen, void *parg);
98 static int ndef_suffix(BIO *b, unsigned char **pbuf, int *plen, void *parg);
99 static int ndef_suffix_free(BIO *b, unsigned char **pbuf, int *plen, void *parg);
100
101 BIO *BIO_new_NDEF(BIO *out, ASN1_VALUE *val, const ASN1_ITEM *it)
102 {
103     NDEF_SUPPORT *ndef_aux = NULL;
104     BIO *asn_bio = NULL;
105     const ASN1_AUX *aux = it->funcs;
106     ASN1_STREAM_ARG sarg;
107
108     if (!aux || !aux->asn1_cb)
109     {
110         ASN1err(ASN1_F_BIO_NEW_NDEF, ASN1_R_STREAMING_NOT_SUPPORTED);
111         return NULL;
112     }
113     ndef_aux = OPENSSL_malloc(sizeof(NDEF_SUPPORT));
114     asn_bio = BIO_new(BIO_f_asn1());
115
116     /* ASN1 bio needs to be next to output BIO */
117
118     out = BIO_push(asn_bio, out);
119
120     if (!ndef_aux || !asn_bio || !out)
121         goto err;
122
123     BIO_asn1_set_prefix(asn_bio, ndef_prefix, ndef_prefix_free);
124     BIO_asn1_set_suffix(asn_bio, ndef_suffix, ndef_suffix_free);
125
126     /* Now let callback prepend any digest, cipher etc BIOs
127      * ASN1 structure needs.
```

```

128     */
130     sarg.out = out;
131     sarg.ndef_bio = NULL;
132     sarg.boundary = NULL;
134     if (aux->asn1_cb(ASN1_OP_STREAM_PRE, &val, it, &sarg) <= 0)
135         goto err;
137     ndef_aux->val = val;
138     ndef_aux->it = it;
139     ndef_aux->ndef_bio = sarg.ndef_bio;
140     ndef_aux->boundary = sarg.boundary;
141     ndef_aux->out = out;
143     BIO_ctrl(asn_bio, BIO_C_SET_EX_ARG, 0, ndef_aux);
145     return sarg.ndef_bio;
147     err:
148     if (asn_bio)
149         BIO_free(asn_bio);
150     if (ndef_aux)
151         OPENSSL_free(ndef_aux);
152     return NULL;
153 }
155 static int ndef_prefix(BIO *b, unsigned char **pbuf, int *plen, void *parg)
156 {
157     NDEF_SUPPORT *ndef_aux;
158     unsigned char *p;
159     int derlen;
161     if (!parg)
162         return 0;
164     ndef_aux = *(NDEF_SUPPORT **)parg;
166     derlen = ASN1_item_ndef_i2d(ndef_aux->val, NULL, ndef_aux->it);
167     p = OPENSSL_malloc(derlen);
168     ndef_aux->derbuf = p;
169     *pbuf = p;
170     derlen = ASN1_item_ndef_i2d(ndef_aux->val, &p, ndef_aux->it);
172     if (!*ndef_aux->boundary)
173         return 0;
175     *plen = *ndef_aux->boundary - *pbuf;
177     return 1;
178 }
180 static int ndef_prefix_free(BIO *b, unsigned char **pbuf, int *plen, void *parg)
181 {
182     NDEF_SUPPORT *ndef_aux;
184     if (!parg)
185         return 0;
187     ndef_aux = *(NDEF_SUPPORT **)parg;
189     if (ndef_aux->derbuf)
190         OPENSSL_free(ndef_aux->derbuf);
192     ndef_aux->derbuf = NULL;
193     *pbuf = NULL;

```

```

194     *plen = 0;
195     return 1;
196 }
198 static int ndef_suffix_free(BIO *b, unsigned char **pbuf, int *plen, void *parg)
199 {
200     NDEF_SUPPORT *ndef_aux = (NDEF_SUPPORT **)parg;
201     if (!ndef_prefix_free(b, pbuf, plen, parg))
202         return 0;
203     OPENSSL_free(*ndef_aux);
204     *ndef_aux = NULL;
205     return 1;
206 }
208 static int ndef_suffix(BIO *b, unsigned char **pbuf, int *plen, void *parg)
209 {
210     NDEF_SUPPORT *ndef_aux;
211     unsigned char *p;
212     int derlen;
213     const ASN1_AUX *aux;
214     ASN1_STREAM_ARG sarg;
216     if (!parg)
217         return 0;
219     ndef_aux = *(NDEF_SUPPORT **)parg;
221     aux = ndef_aux->it->funcs;
223     /* Finalize structures */
224     sarg.ndef_bio = ndef_aux->ndef_bio;
225     sarg.out = ndef_aux->out;
226     sarg.boundary = ndef_aux->boundary;
227     if (aux->asn1_cb(ASN1_OP_STREAM_POST,
228                    &ndef_aux->val, ndef_aux->it, &sarg) <= 0)
229         return 0;
231     derlen = ASN1_item_ndef_i2d(ndef_aux->val, NULL, ndef_aux->it);
232     p = OPENSSL_malloc(derlen);
233     ndef_aux->derbuf = p;
234     *pbuf = p;
235     derlen = ASN1_item_ndef_i2d(ndef_aux->val, &p, ndef_aux->it);
237     if (!*ndef_aux->boundary)
238         return 0;
239     *pbuf = *ndef_aux->boundary;
240     *plen = derlen - (*ndef_aux->boundary - ndef_aux->derbuf);
242     return 1;
243 }

```


new/usr/src/lib/openssl/libsunw_crypto/asn1/d2i_pr.c

1

```
*****
5863 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/d2i_pr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/d2i_pr.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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18 * If this package is used in a product, Eric Young should be given attribution
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21 * in documentation (online or textual) provided with the package.
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24 * modification, are permitted provided that the following conditions
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30 * documentation and/or other materials provided with the distribution.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/d2i_pr.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/objects.h>
64 #ifndef OPENSSL_NO_ENGINE
65 #include <openssl/engine.h>
66 #endif
67 #include <openssl/x509.h>
68 #include <openssl/asn1.h>
69 #include "asn1_locl.h"
71 EVP_PKEY *d2i_PrivateKey(int type, EVP_PKEY **a, const unsigned char **pp,
72                          long length)
73 {
74     EVP_PKEY *ret;
76     if ((a == NULL) || (*a == NULL))
77     {
78         if ((ret=EVP_PKEY_new()) == NULL)
79         {
80             ASN1err(ASN1_F_D2I_PRIVATEKEY,ERR_R_EVP_LIB);
81             return(NULL);
82         }
83     }
84     else
85     {
86         ret= *a;
87 #ifndef OPENSSL_NO_ENGINE
88         if (ret->engine)
89         {
90             ENGINE_finish(ret->engine);
91             ret->engine = NULL;
92         }
93 #endif
94     }
96     if (!EVP_PKEY_set_type(ret, type))
97     {
98         ASN1err(ASN1_F_D2I_PRIVATEKEY,ASN1_R_UNKNOWN_PUBLIC_KEY_TYPE);
99         goto err;
100     }
102     if (!ret->ameth->old_priv_decode ||
103         !ret->ameth->old_priv_decode(ret, pp, length))
104     {
105         if (ret->ameth->priv_decode)
106         {
107             PKCS8_PRIV_KEY_INFO *p8=NULL;
108             p8=d2i_PKCS8_PRIV_KEY_INFO(NULL,pp,length);
109             if (!p8) goto err;
110             EVP_PKEY_free(ret);
111             ret = EVP_PKCS82PKEY(p8);
112             PKCS8_PRIV_KEY_INFO_free(p8);
114         }
115         else
116         {
117             ASN1err(ASN1_F_D2I_PRIVATEKEY,ERR_R_ASN1_LIB);
118             goto err;
119         }
120     }
121     if (a != NULL) (*a)=ret;
122     return(ret);
123 err:
124     if ((ret != NULL) && ((a == NULL) || (*a != ret))) EVP_PKEY_free(ret);
125     return(NULL);
126 }
```

```
128 /* This works like d2i_PrivateKey() except it automatically works out the type */
129
130 EVP_PKEY *d2i_AutoPrivateKey(EVP_PKEY **a, const unsigned char **pp,
131                               long length)
132 {
133     STACK_OF(ASN1_TYPE) *inkey;
134     const unsigned char *p;
135     int keytype;
136     p = *pp;
137     /* Dirty trick: read in the ASN1 data into a STACK_OF(ASN1_TYPE):
138      * by analyzing it we can determine the passed structure: this
139      * assumes the input is surrounded by an ASN1 SEQUENCE.
140      */
141     inkey = d2i_ASN1_SEQUENCE_ANY(NULL, &p, length);
142     /* Since we only need to discern "traditional format" RSA and DSA
143      * keys we can just count the elements.
144      */
145     if(sk_ASN1_TYPE_num(inkey) == 6)
146         keytype = EVP_PKEY_DSA;
147     else if (sk_ASN1_TYPE_num(inkey) == 4)
148         keytype = EVP_PKEY_EC;
149     else if (sk_ASN1_TYPE_num(inkey) == 3)
150     { /* This seems to be PKCS8, not traditional format */
151         PKCS8_PRIV_KEY_INFO *p8 = d2i_PKCS8_PRIV_KEY_INFO(NULL, p,
152                                                             length);
153         EVP_PKEY *ret;
154
155         sk_ASN1_TYPE_pop_free(inkey, ASN1_TYPE_free);
156         if (!p8)
157         {
158             ASN1err(ASN1_F_D2I_AUTOPRIVATEKEY, ASN1_R_UNSUPP
159                     return NULL;
160         }
161         ret = EVP_PKCS82PKEY(p8);
162         PKCS8_PRIV_KEY_INFO_free(p8);
163         if (a) {
164             *a = ret;
165         }
166         return ret;
167     }
168     else keytype = EVP_PKEY_RSA;
169     sk_ASN1_TYPE_pop_free(inkey, ASN1_TYPE_free);
170     return d2i_PrivateKey(keytype, a, pp, length);
171 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/d2i_pu.c

1

```
*****
4854 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/d2i_pu.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/d2i_pu.c */
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7  * The implementation was written so as to conform with Netscapes SSL.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/d2i_pu.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/objects.h>
64 #include <openssl/asn1.h>
65 #ifndef OPENSSL_NO_RSA
66 #include <openssl/rsa.h>
67 #endif
68 #ifndef OPENSSL_NO_DSA
69 #include <openssl/dsa.h>
70 #endif
71 #ifndef OPENSSL_NO_EC
72 #include <openssl/ec.h>
73 #endif
75 EVP_PKEY *d2i_PublicKey(int type, EVP_PKEY **a, const unsigned char **pp,
76                          long length)
77 {
78     EVP_PKEY *ret;
79
80     if ((a == NULL) || (*a == NULL))
81     {
82         if ((ret=EVP_PKEY_new()) == NULL)
83         {
84             ASN1err(ASN1_F_D2I_PUBLICKEY,ERR_R_EVP_LIB);
85             return(NULL);
86         }
87     }
88     else ret= *a;
89
90     if (!EVP_PKEY_set_type(ret, type))
91     {
92         ASN1err(ASN1_F_D2I_PUBLICKEY,ERR_R_EVP_LIB);
93         goto err;
94     }
95
96     switch (EVP_PKEY_id(ret))
97     {
98     #ifndef OPENSSL_NO_RSA
99     case EVP_PKEY_RSA:
100         if ((ret->pkey.rsa=d2i_RSAPublicKey(NULL,
101             (const unsigned char **)pp,length)) == NULL) /* TMP UGLY
102         {
103             ASN1err(ASN1_F_D2I_PUBLICKEY,ERR_R_ASN1_LIB);
104             goto err;
105         }
106         break;
107     #endif
108     #ifndef OPENSSL_NO_DSA
109     case EVP_PKEY_DSA:
110         if (!d2i_DSAPublicKey(&(ret->pkey.dsa),
111             (const unsigned char **)pp,length)) /* TMP UGLY CAST */
112         {
113             ASN1err(ASN1_F_D2I_PUBLICKEY,ERR_R_ASN1_LIB);
114             goto err;
115         }
116         break;
117     #endif
118     #ifndef OPENSSL_NO_EC
119     case EVP_PKEY_EC:
120         if (!o2i_ECPublicKey(&(ret->pkey.ec),
121             (const unsigned char **)pp, length))
122         {
123             ASN1err(ASN1_F_D2I_PUBLICKEY, ERR_R_ASN1_LIB);
124             goto err;
125         }
126         break;
127     #endif
```

```
128     default:
129         ASN1err(ASN1_F_D2I_PUBKEY, ASN1_R_UNKNOWN_PUBLIC_KEY_TYPE);
130         goto err;
131         /* break; */
132     }
133     if (a != NULL) (*a)=ret;
134     return(ret);
135 err:
136     if ((ret != NULL) && ((a == NULL) || (*a != ret))) EVP_PKEY_free(ret);
137     return(NULL);
138 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/evp_asn1.c

1

```
*****
6252 Fri May 30 18:31:29 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/evp_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/evp_asn1.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/evp_asn1.c

2

```
62 #include <openssl/asn1_mac.h>
64 int ASN1_TYPE_set_octetstring(ASN1_TYPE *a, unsigned char *data, int len)
65 {
66     ASN1_STRING *os;
68     if ((os=M_ASN1_OCTET_STRING_new()) == NULL) return(0);
69     if (!M_ASN1_OCTET_STRING_set(os,data,len)) return(0);
70     ASN1_TYPE_set(a,V_ASN1_OCTET_STRING,os);
71     return(1);
72 }
74 /* int max_len: for returned value */
75 int ASN1_TYPE_get_octetstring(ASN1_TYPE *a, unsigned char *data,
76     int max_len)
77 {
78     int ret,num;
79     unsigned char *p;
81     if ((a->type != V_ASN1_OCTET_STRING) || (a->value.octet_string == NULL))
82     {
83         ASN1err(ASN1_F_ASN1_TYPE_GET_OCTETSTRING,ASN1_R_DATA_IS_WRONG);
84         return(-1);
85     }
86     p=M_ASN1_STRING_data(a->value.octet_string);
87     ret=M_ASN1_STRING_length(a->value.octet_string);
88     if (ret < max_len)
89         num=ret;
90     else
91         num=max_len;
92     memcpy(data,p,num);
93     return(ret);
94 }
96 int ASN1_TYPE_set_int_octetstring(ASN1_TYPE *a, long num, unsigned char *data,
97     int len)
98 {
99     int n,size;
100     ASN1_OCTET_STRING os,*osp;
101     ASN1_INTEGER in;
102     unsigned char *p;
103     unsigned char buf[32]; /* when they have 256bit longs,
104                          * I'll be in trouble */
105     in.data=buf;
106     in.length=32;
107     os.data=data;
108     os.type=V_ASN1_OCTET_STRING;
109     os.length=len;
110     ASN1_INTEGER_set(&in,num);
111     n = i2d_ASN1_INTEGER(&in,NULL);
112     n+=M_i2d_ASN1_OCTET_STRING(&os,NULL);
114     size=ASN1_object_size(1,n,V_ASN1_SEQUENCE);
116     if ((osp=ASN1_STRING_new()) == NULL) return(0);
117     /* Grow the 'string' */
118     if (!ASN1_STRING_set(osp,NULL,size))
119     {
120         ASN1_STRING_free(osp);
121         return(0);
122     }
124     M_ASN1_STRING_length_set(osp, size);
125     p=M_ASN1_STRING_data(osp);
127     ASN1_put_object(&p,1,n,V_ASN1_SEQUENCE,V_ASN1_UNIVERSAL);
```

```
128     i2d_ASN1_INTEGER(&in,&p);
129     M_i2d_ASN1_OCTET_STRING(&os,&p);

131     ASN1_TYPE_set(a,V_ASN1_SEQUENCE,osp);
132     return(1);
133 }

135 /* we return the actual length..., num may be missing, in which
136  * case, set it to zero */
137 /* int max_len: for returned value */
138 int ASN1_TYPE_get_int_octetstring(ASN1_TYPE *a, long *num, unsigned char *data,
139     int max_len)
140 {
141     int ret= -1,n;
142     ASN1_INTEGER *ai=NULL;
143     ASN1_OCTET_STRING *os=NULL;
144     const unsigned char *p;
145     long length;
146     ASN1_const_CTX c;

148     if ((a->type != V_ASN1_SEQUENCE) || (a->value.sequence == NULL))
149     {
150         goto err;
151     }
152     p=M_ASN1_STRING_data(a->value.sequence);
153     length=M_ASN1_STRING_length(a->value.sequence);

155     c.pp= &p;
156     c.p=p;
157     c.max=p+length;
158     c.error=ASN1_R_DATA_IS_WRONG;

160     M_ASN1_D2I_start_sequence();
161     c.q=c.p;
162     if ((ai=d2i_ASN1_INTEGER(NULL,&c.p,c.slen)) == NULL) goto err;
163     c.slen-=(c.p-c.q);
164     c.q=c.p;
165     if ((os=d2i_ASN1_OCTET_STRING(NULL,&c.p,c.slen)) == NULL) goto err;
166     c.slen-=(c.p-c.q);
167     if (!M_ASN1_D2I_end_sequence()) goto err;

169     if (num != NULL)
170         *num=ASN1_INTEGER_get(ai);

172     ret=M_ASN1_STRING_length(os);
173     if (max_len > ret)
174         n=ret;
175     else
176         n=max_len;

178     if (data != NULL)
179         memcpy(data,M_ASN1_STRING_data(os),n);
180     if (0)
181     {
182 err:
183         ASN1err(ASN1_F_ASN1_TYPE_GET_INT_OCTETSTRING,ASN1_R_DATA_IS_WRONG);
184     }
185     if (os != NULL) M_ASN1_OCTET_STRING_free(os);
186     if (ai != NULL) M_ASN1_INTEGER_free(ai);
187     return(ret);
188 }
```

```

*****
5967 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/f_enum.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/f_enum.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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35 * The word 'cryptographic' can be left out if the rouines from the library
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>

```

```

62 #include <openssl/asn1.h>
64 /* Based on a_int.c: equivalent ENUMERATED functions */
66 int i2a_ASN1_ENUMERATED(BIO *bp, ASN1_ENUMERATED *a)
67 {
68     int i,n=0;
69     static const char *h="0123456789ABCDEF";
70     char buf[2];
72     if (a == NULL) return(0);
74     if (a->length == 0)
75     {
76         if (BIO_write(bp,"00",2) != 2) goto err;
77         n=2;
78     }
79     else
80     {
81         for (i=0; i<a->length; i++)
82         {
83             if ((i != 0) && (i%35 == 0))
84             {
85                 if (BIO_write(bp,"\\n",2) != 2) goto err;
86                 n+=2;
87             }
88             buf[0]=h[((unsigned char)a->data[i]>>4)&0x0f];
89             buf[1]=h[((unsigned char)a->data[i])&0x0f];
90             if (BIO_write(bp,buf,2) != 2) goto err;
91             n+=2;
92         }
93     }
94     return(n);
95 err:
96     return(-1);
97 }
99 int a2i_ASN1_ENUMERATED(BIO *bp, ASN1_ENUMERATED *bs, char *buf, int size)
100 {
101     int ret=0;
102     int i,j,k,m,n,again,bufsize;
103     unsigned char *s=NULL,*sp;
104     unsigned char *bufp;
105     int num=0,slen=0,first=1;
107     bs->type=V_ASN1_ENUMERATED;
109     bufsize=BIO_gets(bp,buf,size);
110     for (;;)
111     {
112         if (bufsize < 1) goto err_sl;
113         i=bufsize;
114         if (buf[i-1] == '\n') buf[--i]='\0';
115         if (i == 0) goto err_sl;
116         if (buf[i-1] == '\r') buf[--i]='\0';
117         if (i == 0) goto err_sl;
118         again=(buf[i-1] == '\\');
120         for (j=0; j<i; j++)
121         {
122             if (!( ((buf[j] >= '0') && (buf[j] <= '9')) ||
123                   ((buf[j] >= 'a') && (buf[j] <= 'f')) ||
124                   ((buf[j] >= 'A') && (buf[j] <= 'F'))))
125             {
126                 i=j;
127                 break;

```

```

128     }
129     }
130     buf[i]='\0';
131     /* We have now cleared all the crap off the end of the
132      * line */
133     if (i < 2) goto err_sl;

135     bufp=(unsigned char *)buf;
136     if (first)
137     {
138         first=0;
139         if ((bufp[0] == '0') && (buf[1] == '0'))
140         {
141             bufp+=2;
142             i-=2;
143         }
144     }
145     k=0;
146     i-=again;
147     if (i%2 != 0)
148     {
149         ASN1err(ASN1_F_A2I_ASN1_ENUMERATED,ASN1_R_ODD_NUMBER_OF_
150             goto err;
151     }
152     i/=2;
153     if (num+i > slen)
154     {
155         if (s == NULL)
156             sp=(unsigned char *)OPENSSL_malloc(
157                 (unsigned int)num+i*2);
158         else
159             sp=(unsigned char *)OPENSSL_realloc(s,
160                 (unsigned int)num+i*2);
161         if (sp == NULL)
162         {
163             ASN1err(ASN1_F_A2I_ASN1_ENUMERATED,ERR_R_MALLOC_
164             if (s != NULL) OPENSSL_free(s);
165             goto err;
166         }
167         s=sp;
168         slen=num+i*2;
169     }
170     for (j=0; j<i; j++,k+=2)
171     {
172         for (n=0; n<2; n++)
173         {
174             m=bufp[k+n];
175             if ((m >= '0') && (m <= '9'))
176                 m-='0';
177             else if ((m >= 'a') && (m <= 'f'))
178                 m=m-'a'+10;
179             else if ((m >= 'A') && (m <= 'F'))
180                 m=m-'A'+10;
181             else
182             {
183                 ASN1err(ASN1_F_A2I_ASN1_ENUMERATED,ASN1_
184                 goto err;
185             }
186             s[num+j]<=4;
187             s[num+j]|=m;
188         }
189     }
190     num+=i;
191     if (again)
192         bufsize=BI0_gets(bp,buf,size);
193     else

```

```

194         break;
195     }
196     bs->length=num;
197     bs->data=s;
198     ret=1;
199 err:
200     if (0)
201     {
202 err_sl:
203         ASN1err(ASN1_F_A2I_ASN1_ENUMERATED,ASN1_R_SHORT_LINE);
204     }
205     return(ret);
206 }

```



```

*****
6222 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/f_int.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/f_int.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>

```

```

62 #include <openssl/asn1.h>
64 int i2a_ASN1_INTEGER(BIO *bp, ASN1_INTEGER *a)
65 {
66     int i,n=0;
67     static const char *h="0123456789ABCDEF";
68     char buf[2];
69
70     if (a == NULL) return(0);
71
72     if (a->type & V_ASN1_NEG)
73     {
74         if (BIO_write(bp, "-", 1) != 1) goto err;
75         n = 1;
76     }
77
78     if (a->length == 0)
79     {
80         if (BIO_write(bp,"00",2) != 2) goto err;
81         n += 2;
82     }
83     else
84     {
85         for (i=0; i<a->length; i++)
86             if ((i != 0) && (i%35 == 0))
87             {
88                 if (BIO_write(bp,"\\n",2) != 2) goto err;
89                 n+=2;
90             }
91         buf[0]=h[((unsigned char)a->data[i]>>4)&0x0f];
92         buf[1]=h[((unsigned char)a->data[i])&0x0f];
93         if (BIO_write(bp,buf,2) != 2) goto err;
94         n+=2;
95     }
96     return(n);
97
98 err:
99     return(-1);
100 }
101
102 int a2i_ASN1_INTEGER(BIO *bp, ASN1_INTEGER *bs, char *buf, int size)
103 {
104     int ret=0;
105     int i,j,k,m,n,again,bufsize;
106     unsigned char *s=NULL,*sp;
107     unsigned char *bufp;
108     int num=0,slen=0,first=1;
109
110     bs->type=V_ASN1_INTEGER;
111
112     bufsize=BIO_gets(bp,buf,size);
113     for (;;)
114     {
115         if (bufsize < 1) goto err_sl;
116         i=bufsize;
117         if (buf[i-1] == '\n') buf[--i]='\0';
118         if (i == 0) goto err_sl;
119         if (buf[i-1] == '\r') buf[--i]='\0';
120         if (i == 0) goto err_sl;
121         again=(buf[i-1] == '\\');
122
123         for (j=0; j<i; j++)
124         {
125             if (!( (buf[j] >= '0') && (buf[j] <= '9')) ||

```

```

128         ((buf[j] >= 'a') && (buf[j] <= 'f')) ||
129         ((buf[j] >= 'A') && (buf[j] <= 'F'))))
130 #else
131     /* This #ifdef is not strictly necessary, since
132     * the characters A...F a...f 0...9 are contiguous
133     * (yes, even in EBCDIC - but not the whole alphabet).
134     * Nevertheless, isxdigit() is faster.
135     */
136     if (!isxdigit(buf[j]))
137 #endif
138     {
139         i=j;
140         break;
141     }
142 }
143 buf[i]='\0';
144 /* We have now cleared all the crap off the end of the
145  * line */
146 if (i < 2) goto err_sl;

148 bufp=(unsigned char *)buf;
149 if (first)
150 {
151     first=0;
152     if ((bufp[0] == '0') && (buf[1] == '0'))
153     {
154         bufp+=2;
155         i-=2;
156     }
157 }
158 k=0;
159 i-=again;
160 if (i%2 != 0)
161 {
162     ASN1err(ASN1_F_A2I_ASN1_INTEGER,ASN1_R_ODD_NUMBER_OF_CHA
163     goto err;
164 }
165 i/=2;
166 if (num+i > slen)
167 {
168     if (s == NULL)
169         sp=(unsigned char *)OPENSSL_malloc(
170         (unsigned int)num+i*2);
171     else
172         sp=OPENSSL_realloc_clean(s,slen,num+i*2);
173     if (sp == NULL)
174     {
175         ASN1err(ASN1_F_A2I_ASN1_INTEGER,ERR_R_MALLOC_FAI
176         if (s != NULL) OPENSSL_free(s);
177         goto err;
178     }
179     s=sp;
180     slen=num+i*2;
181 }
182 for (j=0; j<i; j++,k+=2)
183 {
184     for (n=0; n<2; n++)
185     {
186         m=bufp[k+n];
187         if ((m >= '0') && (m <= '9'))
188             m-='0';
189         else if ((m >= 'a') && (m <= 'f'))
190             m=m-'a'+10;
191         else if ((m >= 'A') && (m <= 'F'))
192             m=m-'A'+10;
193         else

```

```

194     {
195         ASN1err(ASN1_F_A2I_ASN1_INTEGER,ASN1_R_N
196         goto err;
197     }
198     s[num+j]<=4;
199     s[num+j]|=m;
200 }
201 }
202 num+=i;
203 if (again)
204     bufsize=BI0_gets(bp,buf,size);
205 else
206     break;
207 }
208 bs->length=num;
209 bs->data=s;
210 ret=1;
211 err:
212 if (0)
213 {
214 err_sl:
215     ASN1err(ASN1_F_A2I_ASN1_INTEGER,ASN1_R_SHORT_LINE);
216 }
217 return(ret);
218 }

```

```

*****
6081 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/f_string.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/f_string.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>

```

```

62 #include <openssl/asn1.h>
63
64 int i2a_ASN1_STRING(BIO *bp, ASN1_STRING *a, int type)
65 {
66     int i,n=0;
67     static const char *h="0123456789ABCDEF";
68     char buf[2];
69
70     if (a == NULL) return(0);
71
72     if (a->length == 0)
73     {
74         if (BIO_write(bp,"0",1) != 1) goto err;
75         n=1;
76     }
77     else
78     {
79         for (i=0; i<a->length; i++)
80         {
81             if ((i != 0) && (i%35 == 0))
82             {
83                 if (BIO_write(bp,"\\n",2) != 2) goto err;
84                 n+=2;
85             }
86             buf[0]=h[((unsigned char)a->data[i]>>4)&0x0f];
87             buf[1]=h[((unsigned char)a->data[i]&0x0f)];
88             if (BIO_write(bp,buf,2) != 2) goto err;
89             n+=2;
90         }
91     }
92     return(n);
93 err:
94     return(-1);
95 }
96
97 int a2i_ASN1_STRING(BIO *bp, ASN1_STRING *bs, char *buf, int size)
98 {
99     int ret=0;
100     int i,j,k,m,n,again,bufsize;
101     unsigned char *s=NULL,*sp;
102     unsigned char *bufp;
103     int num=0,slen=0,first=1;
104
105     bufsize=BIO_gets(bp,buf,size);
106     for (;;)
107     {
108         if (bufsize < 1)
109         {
110             if (first)
111                 break;
112             else
113                 goto err_sl;
114         }
115         first=0;
116
117         i=bufsize;
118         if (buf[i-1] == '\n') buf[--i]='\0';
119         if (i == 0) goto err_sl;
120         if (buf[i-1] == '\r') buf[--i]='\0';
121         if (i == 0) goto err_sl;
122         again=(buf[i-1] == '\\');
123
124         for (j=i-1; j>0; j--)
125         {
126             #ifndef CHARSET_EBCDIC
127                 if (!( (buf[j] >= '0') && (buf[j] <= '9')) ||

```

```

128         ((buf[j] >= 'a') && (buf[j] <= 'f')) ||
129         ((buf[j] >= 'A') && (buf[j] <= 'F'))))
130 #else
131     /* This #ifdef is not strictly necessary, since
132     * the characters A...F a...f 0...9 are contiguous
133     * (yes, even in EBCDIC - but not the whole alphabet).
134     * Nevertheless, isxdigit() is faster.
135     */
136     if (!isxdigit(buf[j]))
137 #endif
138     {
139         i=j;
140         break;
141     }
142 }
143 buf[i]='\0';
144 /* We have now cleared all the crap off the end of the
145 * line */
146 if (i < 2) goto err_sl;
147
148 bufp=(unsigned char *)buf;
149
150 k=0;
151 i-=again;
152 if (i%2 != 0)
153 {
154     ASN1err(ASN1_F_A2I_ASN1_STRING,ASN1_R_ODD_NUMBER_OF_CHAR
155 goto err;
156 }
157 i/=2;
158 if (num+i > slen)
159 {
160     if (s == NULL)
161         sp=(unsigned char *)OPENSSL_malloc(
162             (unsigned int)num+i*2);
163     else
164         sp=(unsigned char *)OPENSSL_realloc(s,
165             (unsigned int)num+i*2);
166     if (sp == NULL)
167     {
168         ASN1err(ASN1_F_A2I_ASN1_STRING,ERR_R_MALLOC_FAIL
169         if (s != NULL) OPENSSL_free(s);
170         goto err;
171     }
172     s=sp;
173     slen=num+i*2;
174 }
175 for (j=0; j<i; j++,k+=2)
176 {
177     for (n=0; n<2; n++)
178     {
179         m=bufp[k+n];
180         if ((m >= '0') && (m <= '9'))
181             m-='0';
182         else if ((m >= 'a') && (m <= 'f'))
183             m=m-'a'+10;
184         else if ((m >= 'A') && (m <= 'F'))
185             m=m-'A'+10;
186         else
187         {
188             ASN1err(ASN1_F_A2I_ASN1_STRING,ASN1_R_NO
189             goto err;
190         }
191         s[num+j]<=4;
192         s[num+j]=m;
193     }

```

```

194     }
195     num+=i;
196     if (again)
197         bufsize=BI0_gets(bp,buf,size);
198     else
199         break;
200 }
201 bs->length=num;
202 bs->data=s;
203 ret=1;
204 err:
205     if (0)
206     {
207 err_sl:
208         ASN1err(ASN1_F_A2I_ASN1_STRING,ASN1_R_SHORT_LINE);
209     }
210     return(ret);
211 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/i2d_pr.c

1

3731 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/i2d_pr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/i2d_pr.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/i2d_pr.c

2

```
62 #include <openssl/x509.h>
63 #include "asn1_locl.h"
64
65 int i2d_PrivateKey(EVP_PKEY *a, unsigned char **pp)
66 {
67     if (a->ameth && a->ameth->old_priv_encode)
68     {
69         return a->ameth->old_priv_encode(a, pp);
70     }
71     if (a->ameth && a->ameth->priv_encode) {
72         PKCS8_PRIV_KEY_INFO *p8 = EVP_PKEY2PKCS8(a);
73         int ret = i2d_PKCS8_PRIV_KEY_INFO(p8, pp);
74         PKCS8_PRIV_KEY_INFO_free(p8);
75         return ret;
76     }
77     ASN1err(ASN1_F_I2D_PRIVATEKEY, ASN1_R_UNSUPPORTED_PUBLIC_KEY_TYPE);
78     return(-1);
79 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/i2d_pu.c

1

```
*****
3935 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/i2d_pu.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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5  * This package is an SSL implementation written
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56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/i2d_pu.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/objects.h>
64 #ifndef OPENSSL_NO_RSA
65 #include <openssl/rsa.h>
66 #endif
67 #ifndef OPENSSL_NO_DSA
68 #include <openssl/dsa.h>
69 #endif
70 #ifndef OPENSSL_NO_EC
71 #include <openssl/ec.h>
72 #endif
74 int i2d_PublicKey(EVP_PKEY *a, unsigned char **pp)
75 {
76     switch (a->type)
77     {
78 #ifndef OPENSSL_NO_RSA
79         case EVP_PKEY_RSA:
80             return(i2d_RSAPublicKey(a->pkey.rsa, pp));
81 #endif
82 #ifndef OPENSSL_NO_DSA
83         case EVP_PKEY_DSA:
84             return(i2d_DSAPublicKey(a->pkey.dsa, pp));
85 #endif
86 #ifndef OPENSSL_NO_EC
87         case EVP_PKEY_EC:
88             return(i2o_ECPublicKey(a->pkey.ec, pp));
89 #endif
90         default:
91             ASN1err(ASN1_F_I2D_PUBLICKEY, ASN1_R_UNSUPPORTED_PUBLIC_KEY_TYPE)
92             return(-1);
93     }
94 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/n_pkey.c

1

10589 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/n_pkey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #ifndef OPENSSL_NO_RSA
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/n_pkey.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/objects.h>
64 #include <openssl/asn1t.h>
65 #include <openssl/asn1_mac.h>
66 #include <openssl/evp.h>
67 #include <openssl/x509.h>
68
69 #ifndef OPENSSL_NO_RC4
70
71 typedef struct netscape_pkey_st
72 {
73     long version;
74     X509_ALGOR *algor;
75     ASN1_OCTET_STRING *private_key;
76 } NETSCAPE_PKEY;
77
78 typedef struct netscape_encrypted_pkey_st
79 {
80     ASN1_OCTET_STRING *os;
81     /* This is the same structure as DigestInfo so use it:
82      * although this isn't really anything to do with
83      * digests.
84      */
85     X509_SIG *enckey;
86 } NETSCAPE_ENCRYPTED_PKEY;
87
88
89 ASN1_SEQUENCE(NETSCAPE_PKEY) = {
90     ASN1_SIMPLE(NETSCAPE_PKEY, version, LONG),
91     ASN1_SIMPLE(NETSCAPE_PKEY, algor, X509_ALGOR),
92     ASN1_SIMPLE(NETSCAPE_PKEY, private_key, ASN1_OCTET_STRING)
93 } ASN1_SEQUENCE_END(NETSCAPE_PKEY)
94
95 DECLARE_ASN1_FUNCTIONS_const(NETSCAPE_PKEY)
96 DECLARE_ASN1_ENCODE_FUNCTIONS_const(NETSCAPE_PKEY, NETSCAPE_PKEY)
97 IMPLEMENT_ASN1_FUNCTIONS_const(NETSCAPE_PKEY)
98
99 ASN1_SEQUENCE(NETSCAPE_ENCRYPTED_PKEY) = {
100     ASN1_SIMPLE(NETSCAPE_ENCRYPTED_PKEY, os, ASN1_OCTET_STRING),
101     ASN1_SIMPLE(NETSCAPE_ENCRYPTED_PKEY, enckey, X509_SIG)
102 } ASN1_SEQUENCE_END(NETSCAPE_ENCRYPTED_PKEY)
103
104 DECLARE_ASN1_FUNCTIONS_const(NETSCAPE_ENCRYPTED_PKEY)
105 DECLARE_ASN1_ENCODE_FUNCTIONS_const(NETSCAPE_ENCRYPTED_PKEY, NETSCAPE_ENCRYPTED_PKEY)
106 IMPLEMENT_ASN1_FUNCTIONS_const(NETSCAPE_ENCRYPTED_PKEY)
107
108 static RSA *d2i_RSA_NET_2(RSA **a, ASN1_OCTET_STRING *os,
109 int (*cb)(char *buf, int len, const char *prompt,
110 int verify),
111 int sgckey);
112
113 int i2d_Netscape_RSA(const RSA *a, unsigned char **pp,
114 int (*cb)(char *buf, int len, const char *prompt,
115 int verify))
116 {
117     return i2d_RSA_NET(a, pp, cb, 0);
118 }
119
120 int i2d_RSA_NET(const RSA *a, unsigned char **pp,
121 int (*cb)(char *buf, int len, const char *prompt, int verify),
122 int sgckey)
123 {
124     int i, j, ret = 0;
125     int rsalen, pkeylen, olen;
126     NETSCAPE_PKEY *pkey = NULL;
127
```

```

128     NETSCAPE_ENCRYPTED_PKEY *enckey = NULL;
129     unsigned char buf[256],*zz;
130     unsigned char key[EVP_MAX_KEY_LENGTH];
131     EVP_CIPHER_CTX ctx;
132     EVP_CIPHER_CTX_init(&ctx);

134     if (a == NULL) return(0);

136     if ((pkey=NETSCAPE_PKEY_new()) == NULL) goto err;
137     if ((enckey=NETSCAPE_ENCRYPTED_PKEY_new()) == NULL) goto err;
138     pkey->version = 0;

140     pkey->algor->algorithm=OBJ_nid2obj(NID_rsaEncryption);
141     if ((pkey->algor->parameter=ASN1_TYPE_new()) == NULL) goto err;
142     pkey->algor->parameter->type=V_ASN1_NULL;

144     rsalen = i2d_RSAPrivateKey(a, NULL);

146     /* Fake some octet strings just for the initial length
147      * calculation.
148      */

150     pkey->private_key->length=rsalen;

152     pkeylen=i2d_NETSCAPE_PKEY(pkey,NULL);

154     enckey->enckey->digest->length = pkeylen;

156     enckey->os->length = 11;          /* "private-key" */

158     enckey->enckey->algor->algorithm=OBJ_nid2obj(NID_rc4);
159     if ((enckey->enckey->algor->parameter=ASN1_TYPE_new()) == NULL) goto err
160     enckey->enckey->algor->parameter->type=V_ASN1_NULL;

162     if (pp == NULL)
163     {
164         olen = i2d_NETSCAPE_ENCRYPTED_PKEY(enckey, NULL);
165         NETSCAPE_PKEY_free(pkey);
166         NETSCAPE_ENCRYPTED_PKEY_free(enckey);
167         return olen;
168     }

171     /* Since its RC4 encrypted length is actual length */
172     if ((zz=(unsigned char *)OPENSSL_malloc(rsalen)) == NULL)
173     {
174         ASN1err(ASN1_F_I2D_RSA_NET,ERR_R_MALLOC_FAILURE);
175         goto err;
176     }

178     pkey->private_key->data = zz;
179     /* Write out private key encoding */
180     i2d_RSAPrivateKey(a,&zz);

182     if ((zz=OPENSSL_malloc(pkeylen)) == NULL)
183     {
184         ASN1err(ASN1_F_I2D_RSA_NET,ERR_R_MALLOC_FAILURE);
185         goto err;
186     }

188     if (!ASN1_STRING_set(enckey->os, "private-key", -1))
189     {
190         ASN1err(ASN1_F_I2D_RSA_NET,ERR_R_MALLOC_FAILURE);
191         goto err;
192     }
193     enckey->enckey->digest->data = zz;

```

```

194     i2d_NETSCAPE_PKEY(pkey,&zz);

196     /* Wipe the private key encoding */
197     OPENSSL_cleanse(pkey->private_key->data, rsalen);
198
199     if (cb == NULL)
200         cb=EVP_read_pw_string;
201     i=cb((char *)buf,256,"Enter Private Key password:",1);
202     if (i != 0)
203     {
204         ASN1err(ASN1_F_I2D_RSA_NET,ASN1_R_BAD_PASSWORD_READ);
205         goto err;
206     }
207     i = strlen((char *)buf);
208     /* If the key is used for SGC the algorithm is modified a little. */
209     if(sgckey) {
210         if (!EVP_Digest(buf, i, buf, NULL, EVP_md5(), NULL))
211             goto err;
212         memcpy(buf + 16, "SGCKEYSALT", 10);
213         i = 26;
214     }

216     if (!EVP_BytesToKey(EVP_rc4(), EVP_md5(), NULL, buf, i, 1, key, NULL))
217         goto err;
218     OPENSSL_cleanse(buf,256);

220     /* Encrypt private key in place */
221     zz = enckey->enckey->digest->data;
222     if (!EVP_EncryptInit_ex(&ctx,EVP_rc4(),NULL,key,NULL))
223         goto err;
224     if (!EVP_EncryptUpdate(&ctx,zz,&i,zz,pkeylen))
225         goto err;
226     if (!EVP_EncryptFinal_ex(&ctx,zz + i,&j))
227         goto err;

229     ret = i2d_NETSCAPE_ENCRYPTED_PKEY(enckey, pp);
230 err:
231     EVP_CIPHER_CTX_cleanup(&ctx);
232     NETSCAPE_ENCRYPTED_PKEY_free(enckey);
233     NETSCAPE_PKEY_free(pkey);
234     return(ret);
235 }

238 RSA *d2i_Netscape_RSA(RSA **a, const unsigned char **pp, long length,
239                       int (*cb)(char *buf, int len, const char *prompt,
240                                int verify))
241 {
242     return d2i_RSA_NET(a, pp, length, cb, 0);
243 }

245 RSA *d2i_RSA_NET(RSA **a, const unsigned char **pp, long length,
246                  int (*cb)(char *buf, int len, const char *prompt, int verify),
247                  int sgckey)
248 {
249     RSA *ret=NULL;
250     const unsigned char *p;
251     NETSCAPE_ENCRYPTED_PKEY *enckey = NULL;

253     p = *pp;

255     enckey = d2i_NETSCAPE_ENCRYPTED_PKEY(NULL, &p, length);
256     if(!enckey) {
257         ASN1err(ASN1_F_D2I_RSA_NET,ASN1_R_DECODING_ERROR);
258         return NULL;
259     }

```



```

261     if ((enckey->os->length != 11) || (strcmp("private-key",
262         {char *}enckey->os->data,11) != 0))
263     {
264         ASN1err(ASN1_F_D2I_RSA_NET,ASN1_R_PRIVATE_KEY_HEADER_MISSING);
265         NETSCAPE_ENCRYPTED_PKEY_free(enckey);
266         return NULL;
267     }
268     if (OBJ_obj2nid(enckey->enckey->algor->algorithm) != NID_rc4)
269     {
270         ASN1err(ASN1_F_D2I_RSA_NET,ASN1_R_UNSUPPORTED_ENCRYPTION_ALGORIT
271             goto err;
272     }
273     if (cb == NULL)
274         cb=EVP_read_pw_string;
275     if ((ret=d2i_RSA_NET_2(a, enckey->enckey->digest,cb, sgckey)) == NULL) g
276
277     *pp = p;
278
279     err:
280     NETSCAPE_ENCRYPTED_PKEY_free(enckey);
281     return ret;
282
283 }
284
285 static RSA *d2i_RSA_NET_2(RSA **a, ASN1_OCTET_STRING *os,
286     int (*cb)(char *buf, int len, const char *prompt,
287         int verify), int sgckey)
288 {
289     NETSCAPE_PKEY *pkey=NULL;
290     RSA *ret=NULL;
291     int i,j;
292     unsigned char buf[256];
293     const unsigned char *zz;
294     unsigned char key[EVP_MAX_KEY_LENGTH];
295     EVP_CIPHER_CTX ctx;
296     EVP_CIPHER_CTX_init(&ctx);
297
298     i=cb((char *)buf,256,"Enter Private Key password:",0);
299     if (i != 0)
300     {
301         ASN1err(ASN1_F_D2I_RSA_NET_2,ASN1_R_BAD_PASSWORD_READ);
302         goto err;
303     }
304
305     i = strlen((char *)buf);
306     if(sgckey){
307         if (!EVP_Digest(buf, i, buf, NULL, EVP_md5(), NULL))
308             goto err;
309         memcpy(buf + 16, "SGCKEYSALT", 10);
310         i = 26;
311     }
312
313     if (!EVP_BytesToKey(EVP_rc4(),EVP_md5(),NULL,buf,i,1,key,NULL))
314         goto err;
315     OPENSSL_cleanse(buf,256);
316
317     if (!EVP_DecryptInit_ex(&ctx,EVP_rc4(),NULL, key,NULL))
318         goto err;
319     if (!EVP_DecryptUpdate(&ctx,os->data,&i,os->data,os->length))
320         goto err;
321     if (!EVP_DecryptFinal_ex(&ctx,&(os->data[i]),&j))
322         goto err;
323     os->length=i+j;
324
325     zz=os->data;

```

```

327     if ((pkey=d2i_NETSCAPE_PKEY(NULL,&zz,os->length)) == NULL)
328     {
329         ASN1err(ASN1_F_D2I_RSA_NET_2,ASN1_R_UNABLE_TO_DECODE_RSA_PRIVATE
330             goto err;
331     }
332
333     zz=pkey->private_key->data;
334     if ((ret=d2i_RSAPrivateKey(a,&zz,pkey->private_key->length)) == NULL)
335     {
336         ASN1err(ASN1_F_D2I_RSA_NET_2,ASN1_R_UNABLE_TO_DECODE_RSA_KEY);
337         goto err;
338     }
339 err:
340     EVP_CIPHER_CTX_cleanup(&ctx);
341     NETSCAPE_PKEY_free(pkey);
342     return(ret);
343 }
344
345 #endif /* OPENSSL_NO_RC4 */
346
347 #else /* !OPENSSL_NO_RSA */
348
349 # if PEDANTIC
350 static void *dummy=&dummy;
351 # endif
352
353 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/nsseq.c

1

```
*****
3489 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/nsseq.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* nsseq.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/nsseq.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/objects.h>
65 static int nsseq_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
66                     void *exarg)
67 {
68     if(operation == ASN1_OP_NEW_POST) {
69         NETSCAPE_CERT_SEQUENCE *nsseq;
70         nsseq = (NETSCAPE_CERT_SEQUENCE *)*pval;
71         nsseq->type = OBJ_nid2obj(NID_netscape_cert_sequence);
72     }
73     return 1;
74 }
76 /* Netscape certificate sequence structure */
78 ASN1_SEQUENCE_cb(NETSCAPE_CERT_SEQUENCE, nsseq_cb) = {
79     ASN1_SIMPLE(NETSCAPE_CERT_SEQUENCE, type, ASN1_OBJECT),
80     ASN1_EXP_SEQUENCE_OF_OPT(NETSCAPE_CERT_SEQUENCE, certs, X509, 0)
81 } ASN1_SEQUENCE_END_cb(NETSCAPE_CERT_SEQUENCE, NETSCAPE_CERT_SEQUENCE)
83 IMPLEMENT_ASN1_FUNCTIONS(NETSCAPE_CERT_SEQUENCE)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/p5_pbe.c

1

```
*****
4709 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/p5_pbe.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p5_pbe.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/p5_pbe.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/rand.h>
65 /* PKCS#5 password based encryption structure */
67 ASN1_SEQUENCE(PBEPARAM) = {
68     ASN1_SIMPLE(PBEPARAM, salt, ASN1_OCTET_STRING),
69     ASN1_SIMPLE(PBEPARAM, iter, ASN1_INTEGER)
70 } ASN1_SEQUENCE_END(PBEPARAM)
72 IMPLEMENT_ASN1_FUNCTIONS(PBEPARAM)
74
75 /* Set an algorithm identifier for a PKCS#5 PBE algorithm */
77 int PKCS5_pbe_set0_algor(X509_ALGOR *algor, int alg, int iter,
78                          const unsigned char *salt, int saltlen)
79 {
80     PBEPARAM *pbe=NULL;
81     ASN1_STRING *pbe_str=NULL;
82     unsigned char *sstr;
84     pbe = PBEPARAM_new();
85     if (!pbe)
86     {
87         ASN1err(ASN1_F_PKCS5_PBE_SET0_ALGOR,ERR_R_MALLOC_FAILURE);
88         goto err;
89     }
90     if(iter <= 0)
91         iter = PKCS5_DEFAULT_ITER;
92     if (!ASN1_INTEGER_set(pbe->iter, iter))
93     {
94         ASN1err(ASN1_F_PKCS5_PBE_SET0_ALGOR,ERR_R_MALLOC_FAILURE);
95         goto err;
96     }
97     if (!saltlen)
98         saltlen = PKCS5_SALT_LEN;
99     if (!ASN1_STRING_set(pbe->salt, NULL, saltlen))
100     {
101         ASN1err(ASN1_F_PKCS5_PBE_SET0_ALGOR,ERR_R_MALLOC_FAILURE);
102         goto err;
103     }
104     sstr = ASN1_STRING_data(pbe->salt);
105     if (salt)
106         memcpy(sstr, salt, saltlen);
107     else if (RAND_pseudo_bytes(sstr, saltlen) < 0)
108         goto err;
109
110     if(!ASN1_item_pack(pbe, ASN1_ITEM_rptr(PBEPARAM), &pbe_str))
111     {
112         ASN1err(ASN1_F_PKCS5_PBE_SET0_ALGOR,ERR_R_MALLOC_FAILURE);
113         goto err;
114     }
116     PBEPARAM_free(pbe);
117     pbe = NULL;
119     if (X509_ALGOR_set0(algor, OBJ_nid2obj(alg), V_ASN1_SEQUENCE, pbe_str))
120         return 1;
122 err:
123     if (pbe != NULL)
124         PBEPARAM_free(pbe);
125     if (pbe_str != NULL)
126         ASN1_STRING_free(pbe_str);
127     return 0;
```

```
128     }
130 /* Return an algorithm identifier for a PKCS#5 PBE algorithm */
132 X509_ALGOR *PKCS5_pbe_set(int alg, int iter,
133                           const unsigned char *salt, int saltlen)
134 {
135     X509_ALGOR *ret;
136     ret = X509_ALGOR_new();
137     if (!ret)
138     {
139         ASN1err(ASN1_F_PKCS5_PBE_SET, ERR_R_MALLOC_FAILURE);
140         return NULL;
141     }
143     if (PKCS5_pbe_set0_algor(ret, alg, iter, salt, saltlen))
144         return ret;
146     X509_ALGOR_free(ret);
147     return NULL;
148 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/p5_pbev2.c

1

```
*****
8023 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/p5_pbev2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p5_pbev2.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
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4  */
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53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/p5_pbev2.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/rand.h>
64
65 /* PKCS#5 v2.0 password based encryption structures */
66
67 ASN1_SEQUENCE(PBE2PARAM) = {
68     ASN1_SIMPLE(PBE2PARAM, keyfunc, X509_ALGOR),
69     ASN1_SIMPLE(PBE2PARAM, encryption, X509_ALGOR)
70 } ASN1_SEQUENCE_END(PBE2PARAM)
71
72 IMPLEMENT_ASN1_FUNCTIONS(PBE2PARAM)
73
74 ASN1_SEQUENCE(PBKDF2PARAM) = {
75     ASN1_SIMPLE(PBKDF2PARAM, salt, ASN1_ANY),
76     ASN1_SIMPLE(PBKDF2PARAM, iter, ASN1_INTEGER),
77     ASN1_OPT(PBKDF2PARAM, keylength, ASN1_INTEGER),
78     ASN1_OPT(PBKDF2PARAM, prf, X509_ALGOR)
79 } ASN1_SEQUENCE_END(PBKDF2PARAM)
80
81 IMPLEMENT_ASN1_FUNCTIONS(PBKDF2PARAM)
82
83 /* Return an algorithm identifier for a PKCS#5 v2.0 PBE algorithm:
84  * yes I know this is horrible!
85  *
86  * Extended version to allow application supplied PRF NID and IV.
87  */
88
89 X509_ALGOR *PKCS5_pbe2_set_iv(const EVP_CIPHER *cipher, int iter,
90                               unsigned char *salt, int saltlen,
91                               unsigned char *aiv, int prf_nid)
92 {
93     X509_ALGOR *scheme = NULL, *kalg = NULL, *ret = NULL;
94     int alg_nid, keylen;
95     EVP_CIPHER_CTX ctx;
96     unsigned char iv[EVP_MAX_IV_LENGTH];
97     PBE2PARAM *pbe2 = NULL;
98     ASN1_OBJECT *obj;
99
100     alg_nid = EVP_CIPHER_type(cipher);
101     if (alg_nid == NID_undef) {
102         ASN1err(ASN1_F_PKCS5_PBE2_SET_IV,
103                ASN1_R_CIPHER_HAS_NO_OBJECT_IDENTIFIER);
104         goto err;
105     }
106     obj = OBJ_nid2obj(alg_nid);
107
108     if (!(pbe2 = PBE2PARAM_new())) goto merr;
109
110     /* Setup the AlgorithmIdentifier for the encryption scheme */
111     scheme = pbe2->encryption;
112
113     scheme->algorithm = obj;
114     if (!(scheme->parameter = ASN1_TYPE_new())) goto merr;
115
116     /* Create random IV */
117     if (EVP_CIPHER_iv_length(cipher))
118     {
119         if (aiv)
120             memcpy(iv, aiv, EVP_CIPHER_iv_length(cipher));
121         else if (RAND_pseudo_bytes(iv, EVP_CIPHER_iv_length(cipher)) < 0)
122             goto err;
123     }
124
125     EVP_CIPHER_CTX_init(&ctx);
126
127     /* Dummy cipherinit to just setup the IV, and PRF */
```

```

128     if (!EVP_CipherInit_ex(&ctx, cipher, NULL, NULL, iv, 0))
129         goto err;
130     if (EVP_CIPHER_param_to_asn1(&ctx, scheme->parameter) < 0) {
131         ASN1err(ASN1_F_PKCS5_PBE2_SET_IV,
132                ASN1_R_ERROR_SETTING_CIPHER_PARAMS);
133         EVP_CIPHER_CTX_cleanup(&ctx);
134         goto err;
135     }
136     /* If prf NID unspecified see if cipher has a preference.
137      * An error is OK here: just means use default PRF.
138      */
139     if ((prf_nid == -1) &&
140         EVP_CIPHER_CTX_ctrl(&ctx, EVP_CTRL_PBE_PRf_NID, 0, &prf_nid) <= 0)
141     {
142         ERR_clear_error();
143         prf_nid = NID_hmacWithSHA1;
144     }
145     EVP_CIPHER_CTX_cleanup(&ctx);
146
147     /* If its RC2 then we'd better setup the key length */
148
149     if (alg_nid == NID_rc2_cbc)
150         keylen = EVP_CIPHER_key_length(cipher);
151     else
152         keylen = -1;
153
154     /* Setup keyfunc */
155
156     X509_ALGOR_free(pbe2->keyfunc);
157
158     pbe2->keyfunc = PKCS5_pbkdf2_set(iter, salt, saltlen, prf_nid, keylen);
159
160     if (!pbe2->keyfunc)
161         goto merr;
162
163     /* Now set up top level AlgorithmIdentifier */
164
165     if (!(ret = X509_ALGOR_new())) goto merr;
166     if (!(ret->parameter = ASN1_TYPE_new())) goto merr;
167
168     ret->algorithm = OBJ_nid2obj(NID_pbes2);
169
170     /* Encode PBE2PARAM into parameter */
171
172     if (!ASN1_item_pack(pbe2, ASN1_ITEM_rptr(PBE2PARAM),
173                        &ret->parameter->value.sequence)) goto merr;
174     ret->parameter->type = V_ASN1_SEQUENCE;
175
176     PBE2PARAM_free(pbe2);
177     pbe2 = NULL;
178
179     return ret;
180
181 merr:
182     ASN1err(ASN1_F_PKCS5_PBE2_SET_IV, ERR_R_MALLOC_FAILURE);
183
184     err:
185     PBE2PARAM_free(pbe2);
186     /* Note 'scheme' is freed as part of pbe2 */
187     X509_ALGOR_free(kalg);
188     X509_ALGOR_free(ret);
189
190     return NULL;
191 }

```

```

194 X509_ALGOR *PKCS5_pbe2_set(const EVP_CIPHER *cipher, int iter,
195                            unsigned char *salt, int saltlen)
196 {
197     return PKCS5_pbe2_set_iv(cipher, iter, salt, saltlen, NULL, -1);
198 }
199
200 X509_ALGOR *PKCS5_pbkdf2_set(int iter, unsigned char *salt, int saltlen,
201                              int prf_nid, int keylen)
202 {
203     X509_ALGOR *keyfunc = NULL;
204     PBKDF2PARAM *kdf = NULL;
205     ASN1_OCTET_STRING *osalt = NULL;
206
207     if (!(kdf = PBKDF2PARAM_new()))
208         goto merr;
209     if (!(osalt = M_ASN1_OCTET_STRING_new()))
210         goto merr;
211
212     kdf->salt->value.octet_string = osalt;
213     kdf->salt->type = V_ASN1_OCTET_STRING;
214
215     if (!saltlen)
216         saltlen = PKCS5_SALT_LEN;
217     if (!(osalt->data = OPENSSL_malloc (saltlen)))
218         goto merr;
219
220     osalt->length = saltlen;
221
222     if (salt)
223         memcpy (osalt->data, salt, saltlen);
224     else if (RAND_pseudo_bytes (osalt->data, saltlen) < 0)
225         goto merr;
226
227     if (iter <= 0)
228         iter = PKCS5_DEFAULT_ITER;
229
230     if (!ASN1_INTEGER_set(kdf->iter, iter))
231         goto merr;
232
233     /* If have a key len set it up */
234
235     if (keylen > 0)
236     {
237         if (!(kdf->keylength = M_ASN1_INTEGER_new()))
238             goto merr;
239         if (!ASN1_INTEGER_set (kdf->keylength, keylen))
240             goto merr;
241     }
242
243     /* prf can stay NULL if we are using hmacWithSHA1 */
244     if (prf_nid > 0 && prf_nid != NID_hmacWithSHA1)
245     {
246         kdf->prf = X509_ALGOR_new();
247         if (!kdf->prf)
248             goto merr;
249         X509_ALGOR_set0(kdf->prf, OBJ_nid2obj(prf_nid),
250                        V_ASN1_NULL, NULL);
251     }
252
253     /* Finally setup the keyfunc structure */
254
255     keyfunc = X509_ALGOR_new();
256     if (!keyfunc)
257         goto merr;
258
259     keyfunc->algorithm = OBJ_nid2obj(NID_id_pbkdf2);

```

```
261      /* Encode PBKDF2PARAM into parameter of pbe2 */
263      if(!(keyfunc->parameter = ASN1_TYPE_new()))
264          goto merr;
266      if(!ASN1_item_pack(kdf, ASN1_ITEM_rptr(PBKDF2PARAM),
267                        &keyfunc->parameter->value.sequence))
268          goto merr;
269      keyfunc->parameter->type = V_ASN1_SEQUENCE;
271      PBKDF2PARAM_free(kdf);
272      return keyfunc;
274  merr:
275      ASN1err(ASN1_F_PKCS5_PBKDF2_SET,ERR_R_MALLOC_FAILURE);
276      PBKDF2PARAM_free(kdf);
277      X509_ALGOR_free(keyfunc);
278      return NULL;
279  }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/p8_pkey.c

1

```
*****
5103 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/p8_pkey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p8_pkey.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
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4  */
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55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/p8_pkey.c

2

```
62 #include <openssl/x509.h>
63
64 /* Minor tweak to operation: zero private key data */
65 static int pkey_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
66 void *exarg)
67 {
68     /* Since the structure must still be valid use ASN1_OP_FREE_PRE */
69     if(operation == ASN1_OP_FREE_PRE) {
70         PKCS8_PRIV_KEY_INFO *key = (PKCS8_PRIV_KEY_INFO *)*pval;
71         if (key->pkey->value.octet_string)
72             OPENSSL_cleanse(key->pkey->value.octet_string->data,
73                             key->pkey->value.octet_string->length);
74     }
75     return 1;
76 }
77
78 ASN1_SEQUENCE_cb(PKCS8_PRIV_KEY_INFO, pkey_cb) = {
79     ASN1_SIMPLE(PKCS8_PRIV_KEY_INFO, version, ASN1_INTEGER),
80     ASN1_SIMPLE(PKCS8_PRIV_KEY_INFO, pkeyalg, X509_ALGOR),
81     ASN1_SIMPLE(PKCS8_PRIV_KEY_INFO, pkey, ASN1_ANY),
82     ASN1_IMP_SET_OF_OPT(PKCS8_PRIV_KEY_INFO, attributes, X509_ATTRIBUTE, 0)
83 } ASN1_SEQUENCE_END_cb(PKCS8_PRIV_KEY_INFO, PKCS8_PRIV_KEY_INFO)
84
85 IMPLEMENT_ASN1_FUNCTIONS(PKCS8_PRIV_KEY_INFO)
86
87 int PKCS8_pkey_set0(PKCS8_PRIV_KEY_INFO *priv, ASN1_OBJECT *aobj,
88 int version,
89 int ptype, void *pval,
90 unsigned char *penc, int penclen)
91 {
92     unsigned char **ppenc = NULL;
93     if (version >= 0)
94     {
95         if (!ASN1_INTEGER_set(priv->version, version))
96             return 0;
97     }
98     if (penc)
99     {
100         int pmttype;
101         ASN1_OCTET_STRING *oct;
102         oct = ASN1_OCTET_STRING_new();
103         if (!oct)
104             return 0;
105         oct->data = penc;
106         ppenc = &oct->data;
107         oct->length = penclen;
108         if (priv->broken == PKCS8_NO_OCTET)
109             pmttype = V_ASN1_SEQUENCE;
110         else
111             pmttype = V_ASN1_OCTET_STRING;
112         ASN1_TYPE_set(priv->pkey, pmttype, oct);
113     }
114     if (!X509_ALGOR_set0(priv->pkeyalg, aobj, ptype, pval))
115     {
116         /* If call fails do not swallow 'enc' */
117         if (ppenc)
118             *ppenc = NULL;
119         return 0;
120     }
121     return 1;
122 }
123
124 int PKCS8_pkey_get0(ASN1_OBJECT **ppkalg,
125 const unsigned char **pk, int *ppklen,
126 X509_ALGOR **pa,
127 PKCS8_PRIV_KEY_INFO *p8)
```



```
128     {
129         if (ppkalg)
130             *ppkalg = p8->pkeyalg->algorithm;
131         if (p8->pkey->type == V_ASN1_OCTET_STRING)
132         {
133             p8->broken = PKCS8_OK;
134             if (pk)
135             {
136                 *pk = p8->pkey->value.octet_string->data;
137                 *ppklen = p8->pkey->value.octet_string->length;
138             }
139         }
140         else if (p8->pkey->type == V_ASN1_SEQUENCE)
141         {
142             p8->broken = PKCS8_NO_OCTET;
143             if (pk)
144             {
145                 *pk = p8->pkey->value.sequence->data;
146                 *ppklen = p8->pkey->value.sequence->length;
147             }
148         }
149         else
150             return 0;
151         if (pa)
152             *pa = p8->pkeyalg;
153         return 1;
154     }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_bitst.c

1

```
*****
3746 Fri May 30 18:31:30 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/t_bitst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* t_bitst.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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53  * This product includes cryptographic software written by Eric Young
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55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_bitst.c

2

```
62 #include <openssl/x509v3.h>
64 int ASN1_BIT_STRING_name_print(BIO *out, ASN1_BIT_STRING *bs,
65                                BIT_STRING_BITNAME *tbl, int indent)
66 {
67     BIT_STRING_BITNAME *bname;
68     char first = 1;
69     BIO_printf(out, "%s", indent, "");
70     for(bname = tbl; bname->lname; bname++) {
71         if(ASN1_BIT_STRING_get_bit(bs, bname->bitnum)) {
72             if(!first) BIO_puts(out, ", ");
73             BIO_puts(out, bname->lname);
74             first = 0;
75         }
76     }
77     BIO_puts(out, "\n");
78     return 1;
79 }
81 int ASN1_BIT_STRING_set_asc(ASN1_BIT_STRING *bs, char *name, int value,
82                             BIT_STRING_BITNAME *tbl)
83 {
84     int bitnum;
85     bitnum = ASN1_BIT_STRING_num_asc(name, tbl);
86     if(bitnum < 0) return 0;
87     if(bs) {
88         if(!ASN1_BIT_STRING_set_bit(bs, bitnum, value))
89             return 0;
90     }
91     return 1;
92 }
94 int ASN1_BIT_STRING_num_asc(char *name, BIT_STRING_BITNAME *tbl)
95 {
96     BIT_STRING_BITNAME *bname;
97     for(bname = tbl; bname->lname; bname++) {
98         if(!strcmp(bname->sname, name) ||
99             !strcmp(bname->lname, name) ) return bname->bitnum;
100     }
101     return -1;
102 }
```


new/usr/src/lib/openssl/libsunw_crypto/asn1/t_crl.c

3

```
128     X509_signature_print(out, x->sig_alg, x->signature);
130     return 1;
132 }
```

```

*****
4314 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/t_pkey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/t_pkey.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>

```

```

62 #include <openssl/buffer.h>
63 #include <openssl/bn.h>
64
65 int ASN1_bn_print(BIO *bp, const char *number, const BIGNUM *num,
66                  unsigned char *buf, int off)
67 {
68     int n,i;
69     const char *neg;
70
71     if (num == NULL) return(1);
72     neg = (BN_is_negative(num))?"-":"";
73     if(!BIO_indent(bp,off,128))
74         return 0;
75     if (BN_is_zero(num))
76     {
77         if (BIO_printf(bp, "%s 0\n", number) <= 0)
78             return 0;
79         return 1;
80     }
81
82     if (BN_num_bytes(num) <= BN_BYTES)
83     {
84         if (BIO_printf(bp,"%s %s%lu (%s0x%lx)\n",number,neg,
85                      (unsigned long)num->d[0],neg,(unsigned long)num->d[0])
86             <= 0) return(0);
87     }
88     else
89     {
90         buf[0]=0;
91         if (BIO_printf(bp,"%s%s",number,
92                      (neg[0] == '-')?" (Negative)":"" ) <= 0)
93             return(0);
94         n=BN_bn2bin(num,&buf[1]);
95
96         if (buf[1] & 0x80)
97             n++;
98         else
99             buf++;
100
101         for (i=0; i<n; i++)
102         {
103             if ((i%15) == 0)
104             {
105                 if(BIO_puts(bp,"\n") <= 0
106                    || !BIO_indent(bp,off+4,128))
107                     return 0;
108             }
109             if (BIO_printf(bp,"%02x%s",buf[i],((i+1) == n)?"":"")
110                 <= 0) return(0);
111         }
112         if (BIO_write(bp,"\n",1) <= 0) return(0);
113     }
114     return(1);
115 }

```

```

*****
8136 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/t_req.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/t_req.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>

```

```

62 #include <openssl/bn.h>
63 #include <openssl/objects.h>
64 #include <openssl/x509.h>
65 #include <openssl/x509v3.h>
66 #ifndef OPENSSL_NO_RSA
67 #include <openssl/rsa.h>
68 #endif
69 #ifndef OPENSSL_NO_DSA
70 #include <openssl/dsa.h>
71 #endif
73 #ifndef OPENSSL_NO_FP_API
74 int X509_REQ_print_fp(FILE *fp, X509_REQ *x)
75 {
76     BIO *b;
77     int ret;
79     if ((b=BIO_new(BIO_s_file())) == NULL)
80     {
81         X509err(X509_F_X509_REQ_PRINT_FP,ERR_R_BUF_LIB);
82         return(0);
83     }
84     BIO_set_fp(b,fp,BIO_NOCLOSE);
85     ret=X509_REQ_print(b, x);
86     BIO_free(b);
87     return(ret);
88 }
89 #endif
91 int X509_REQ_print_ex(BIO *bp, X509_REQ *x, unsigned long nmflags, unsigned long
92 {
93     unsigned long l;
94     int i;
95     const char *neg;
96     X509_REQ_INFO *ri;
97     EVP_PKEY *pkey;
98     STACK_OF(X509_ATTRIBUTE) *sk;
99     STACK_OF(X509_EXTENSION) *exts;
100     char mlch = ' ';
101     int nmindent = 0;
103     if((nmflags & XN_FLAG_SEP_MASK) == XN_FLAG_SEP_MULTILINE) {
104         mlch = '\n';
105         nmindent = 12;
106     }
108     if(nmflags == X509_FLAG_COMPAT)
109         nmindent = 16;
112     ri=x->req_info;
113     if(!(cflag & X509_FLAG_NO_HEADER))
114     {
115         if (BIO_write(bp,"Certificate Request:\n",21) <= 0) goto err;
116         if (BIO_write(bp,"    Data:\n",10) <= 0) goto err;
117     }
118     if(!(cflag & X509_FLAG_NO_VERSION))
119     {
120         neg=(ri->version->type == V_ASN1_NEG_INTEGER)?"-":"";
121         l=0;
122         for (i=0; i<ri->version->length; i++)
123             { l<=8; l+=ri->version->data[i]; }
124         if(BIO_printf(bp,"%8sVersion: %s%lu (%s0x%lx)\n","",neg,l,neg,
125                     l) <= 0)
126             goto err;
127     }

```

```

128     if(!(cflag & X509_FLAG_NO_SUBJECT))
129     {
130         if (BIO_printf(bp, "      Subject:%c", mlch) <= 0) goto err;
131         if (X509_NAME_print_ex(bp, ri->subject, nmindent, nmflags) < 0) go
132         if (BIO_write(bp, "\n", 1) <= 0) goto err;
133     }
134     if(!(cflag & X509_FLAG_NO_PUBKEY))
135     {
136         if (BIO_write(bp, "      Subject Public Key Info:\n", 33) <= 0)
137         goto err;
138         if (BIO_printf(bp, "%12sPublic Key Algorithm: ", "") <= 0)
139         goto err;
140         if (i2a_ASN1_OBJECT(bp, ri->pubkey->algor->algorithm) <= 0)
141         goto err;
142         if (BIO_puts(bp, "\n") <= 0)
143         goto err;
144
145         pkey=X509_REQ_get_pubkey(x);
146         if (pkey == NULL)
147         {
148             BIO_printf(bp, "%12sUnable to load Public Key\n", "");
149             ERR_print_errors(bp);
150         }
151         else
152         {
153             EVP_PKEY_print_public(bp, pkey, 16, NULL);
154             EVP_PKEY_free(pkey);
155         }
156     }
157
158     if(!(cflag & X509_FLAG_NO_ATTRIBUTES))
159     {
160         /* may not be */
161         if(BIO_printf(bp, "%8sAttributes:\n", "") <= 0)
162         goto err;
163
164         sk=x->req_info->attributes;
165         if (sk_X509_ATTRIBUTE_num(sk) == 0)
166         {
167             if(BIO_printf(bp, "%12sa0:00\n", "") <= 0)
168             goto err;
169         }
170         else
171         {
172             for (i=0; i<sk_X509_ATTRIBUTE_num(sk); i++)
173             {
174                 ASN1_TYPE *at;
175                 X509_ATTRIBUTE *a;
176                 ASN1_BIT_STRING *bs=NULL;
177                 ASN1_TYPE *t;
178                 int j, type=0, count=1, ii=0;
179
180                 a=sk_X509_ATTRIBUTE_value(sk, i);
181                 if (X509_REQ_extension_nid(OBJ_obj2nid(a->object)
182                 continue
183                 if(BIO_printf(bp, "%12s", "") <= 0)
184                 goto err;
185                 if ((j=i2a_ASN1_OBJECT(bp, a->object)) > 0)
186                 {
187                     if (a->single)
188                     {
189                         t=a->value.single;
190                         type=t->type;
191                         bs=t->value.bit_string;
192                     }
193                     else

```

```

194         {
195             ii=0;
196             count=sk_ASN1_TYPE_num(a->value.set);
197         get_next:
198             at=sk_ASN1_TYPE_value(a->value.set, ii);
199             type=at->type;
200             bs=at->value.asn1_string;
201         }
202     }
203     for (j=25-j; j>0; j--)
204     if (BIO_write(bp, " ", 1) != 1) goto err;
205     if (BIO_puts(bp, ":") <= 0) goto err;
206     if (
207         (type == V_ASN1_PRINTABLESTRING) ||
208         (type == V_ASN1_T61STRING) ||
209         (type == V_ASN1_IA5STRING))
210     {
211         if (BIO_write(bp, (char *)bs->data, bs->le
212         != bs->length)
213         goto err;
214         BIO_puts(bp, "\n");
215     }
216     else
217     {
218         BIO_puts(bp, "unable to print attribute\n
219         if (++ii < count) goto get_next;
220     }
221 }
222 }
223 if(!(cflag & X509_FLAG_NO_EXTENSIONS))
224 {
225     exts = X509_REQ_get_extensions(x);
226     if(exts)
227     {
228         BIO_printf(bp, "%8sRequested Extensions:\n", "");
229         for (i=0; i<sk_X509_EXTENSION_num(exts); i++)
230         {
231             ASN1_OBJECT *obj;
232             X509_EXTENSION *ex;
233             int j;
234             ex=sk_X509_EXTENSION_value(exts, i);
235             if (BIO_printf(bp, "%12s", "") <= 0) goto err;
236             obj=X509_EXTENSION_get_object(ex);
237             i2a_ASN1_OBJECT(bp, obj);
238             j=X509_EXTENSION_get_critical(ex);
239             if (BIO_printf(bp, "  %s\n", j?"critical":"" ) <= 0
240             goto err;
241             if(!X509V3_EXT_print(bp, ex, cflag, 16))
242             {
243                 BIO_printf(bp, "%16s", "");
244                 M_ASN1_OCTET_STRING_print(bp, ex->value);
245             }
246             if (BIO_write(bp, "\n", 1) <= 0) goto err;
247         }
248         sk_X509_EXTENSION_pop_free(exts, X509_EXTENSION_free);
249     }
250 }
251
252 if(!(cflag & X509_FLAG_NO_SIGDUMP))
253 {
254     if(!X509_signature_print(bp, x->sig_alg, x->signature)) goto err
255 }
256
257 return(1);
258 err:
259 X509err(X509_F_X509_REQ_PRINT_EX, ERR_R_BUF_LIB);

```

```
260     return(0);
261 }

263 int X509_REQ_print(BIO *bp, X509_REQ *x)
264 {
265     return X509_REQ_print_ex(bp, x, XN_FLAG_COMPAT, X509_FLAG_COMPAT);
266 }
```


new/usr/src/lib/openssl/libsunw_crypto/asn1/t_spki.c

1

```
*****
3978 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/t_spki.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* t_spki.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
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15  * 2. Redistributions in binary form must reproduce the above copyright
16  * notice, this list of conditions and the following disclaimer in
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19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
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24  *
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42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/x509.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_spki.c

2

```
62 #include <openssl/asn1.h>
63 #ifndef OPENSSL_NO_RSA
64 #include <openssl/rsa.h>
65 #endif
66 #ifndef OPENSSL_NO_DSA
67 #include <openssl/dsa.h>
68 #endif
69 #include <openssl/bn.h>
71 /* Print out an SPKI */
73 int NETSCAPE_SPKI_print(BIO *out, NETSCAPE_SPKI *spki)
74 {
75     EVP_PKEY *pkey;
76     ASN1_IA5STRING *chal;
77     int i, n;
78     char *s;
79     BIO_printf(out, "Netscape SPKI:\n");
80     i=OBJ_obj2nid(spki->spkac->pubkey->algorithm);
81     BIO_printf(out, " Public Key Algorithm: %s\n",
82                (i == NID_undef)?"UNKNOWN":OBJ_nid2ln(i));
83     pkey = X509_PUBKEY_get(spki->spkac->pubkey);
84     if(!pkey) BIO_printf(out, " Unable to load public key\n");
85     else
86     {
87         EVP_PKEY_print_public(out, pkey, 4, NULL);
88         EVP_PKEY_free(pkey);
89     }
90     chal = spki->spkac->challenge;
91     if(chal->length)
92         BIO_printf(out, " Challenge String: %s\n", chal->data);
93     i=OBJ_obj2nid(spki->sig_algor->algorithm);
94     BIO_printf(out, " Signature Algorithm: %s",
95                (i == NID_undef)?"UNKNOWN":OBJ_nid2ln(i));
97     n=spki->signature->length;
98     s=(char *)spki->signature->data;
99     for (i=0; i<n; i++)
100     {
101         if ((i%18) == 0) BIO_write(out, "\n", 7);
102         BIO_printf(out, "%02x%s", (unsigned char)s[i],
103                    ((i+1) == n)?":":""");
104     }
105     BIO_write(out, "\n", 1);
106     return 1;
107 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_x509.c

1

13725 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/t_x509.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/t_x509.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_x509.c

2

```
62 #include <openssl/bn.h>
63 #ifndef OPENSSL_NO_RSA
64 #include <openssl/rsa.h>
65 #endif
66 #ifndef OPENSSL_NO_DSA
67 #include <openssl/dsa.h>
68 #endif
69 #ifndef OPENSSL_NO_EC
70 #include <openssl/ec.h>
71 #endif
72 #include <openssl/objects.h>
73 #include <openssl/x509.h>
74 #include <openssl/x509v3.h>
75 #include "asn1_locl.h"
76
77 #ifndef OPENSSL_NO_FP_API
78 int X509_print_fp(FILE *fp, X509 *x)
79 {
80     return X509_print_ex_fp(fp, x, XN_FLAG_COMPAT, X509_FLAG_COMPAT);
81 }
82
83 int X509_print_ex_fp(FILE *fp, X509 *x, unsigned long nmflag, unsigned long cflag)
84 {
85     BIO *b;
86     int ret;
87
88     if ((b=BIO_new(BIO_s_file())) == NULL)
89     {
90         X509err(X509_F_X509_PRINT_EX_FP, ERR_R_BUF_LIB);
91         return(0);
92     }
93     BIO_set_fp(b,fp,BIO_NOCLOSE);
94     ret=X509_print_ex(b, x, nmflag, cflag);
95     BIO_free(b);
96     return(ret);
97 }
98 #endif
99
100 int X509_print(BIO *bp, X509 *x)
101 {
102     return X509_print_ex(bp, x, XN_FLAG_COMPAT, X509_FLAG_COMPAT);
103 }
104
105 int X509_print_ex(BIO *bp, X509 *x, unsigned long nmflags, unsigned long cflag)
106 {
107     long l;
108     int ret=0,i;
109     char *m=NULL,mlch = ' ';
110     int nmindent = 0;
111     X509_CINF *ci;
112     ASN1_INTEGER *bs;
113     EVP_PKEY *pkey=NULL;
114     const char *neg;
115
116     if((nmflags & XN_FLAG_SEP_MASK) == XN_FLAG_SEP_MULTILINE) {
117         mlch = '\n';
118         nmindent = 12;
119     }
120
121     if(nmflags == X509_FLAG_COMPAT)
122         nmindent = 16;
123
124     ci=x->cert_info;
125     if(!(cflag & X509_FLAG_NO_HEADER))
126     {
127         if (BIO_write(bp,"Certificate:\n",13) <= 0) goto err;
```

```

128         if (BIO_write(bp, "    Data:\n",10) <= 0) goto err;
129     }
130     if(!(cflag & X509_FLAG_NO_VERSION))
131     {
132         l=X509_get_version(x);
133         if (BIO_printf(bp,"%8sVersion: %lu (0x%lx)\n","", l+1,l) <= 0) go
134     }
135     if(!(cflag & X509_FLAG_NO_SERIAL))
136     {
137
138         if (BIO_write(bp, "        Serial Number:",22) <= 0) goto err;
139
140         bs=X509_get_serialNumber(x);
141         if (bs->length <= (int)sizeof(long))
142         {
143             l=ASN1_INTEGER_get(bs);
144             if (bs->type == V_ASN1_NEG_INTEGER)
145             {
146                 l= -l;
147                 neg="-";
148             }
149             else
150                 neg="";
151             if (BIO_printf(bp, "    %s%lu (%s0x%lx)\n",neg,l,neg,l) <= 0
152             goto err;
153         }
154         else
155         {
156             neg=(bs->type == V_ASN1_NEG_INTEGER)?" (Negative)":"";
157             if (BIO_printf(bp,"\n%12s%s","",neg) <= 0) goto err;
158
159             for (i=0; i<bs->length; i++)
160             {
161                 if (BIO_printf(bp,"%02x%c",bs->data[i],
162                     ((i+1 == bs->length)?'\n':' ')) <= 0)
163                     goto err;
164             }
165         }
166     }
167 }
168
169 if(!(cflag & X509_FLAG_NO_SIGNAME))
170 {
171     if(X509_signature_print(bp, x->sig_alg, NULL) <= 0)
172         goto err;
173 #if 0
174     if (BIO_printf(bp,"%8sSignature Algorithm: ", "") <= 0)
175         goto err;
176     if (i2a_ASN1_OBJECT(bp, ci->signature->algorithm) <= 0)
177         goto err;
178     if (BIO_puts(bp, "\n") <= 0)
179         goto err;
180 #endif
181 }
182
183 if(!(cflag & X509_FLAG_NO_ISSUER))
184 {
185     if (BIO_printf(bp, "        Issuer:%c",mlch) <= 0) goto err;
186     if (X509_NAME_print_ex(bp,X509_get_issuer_name(x),nmindent, nmfl
187     if (BIO_write(bp,"\n",1) <= 0) goto err;
188 }
189 if(!(cflag & X509_FLAG_NO_VALIDITY))
190 {
191     if (BIO_write(bp, "        Validity\n",17) <= 0) goto err;
192     if (BIO_write(bp, "            Not Before: ",24) <= 0) goto err;
193     if (!ASN1_TIME_print(bp,X509_get_notBefore(x))) goto err;

```

```

194         if (BIO_write(bp, "\n            Not After : ",25) <= 0) goto err
195         if (!ASN1_TIME_print(bp,X509_get_notAfter(x))) goto err;
196         if (BIO_write(bp, "\n",1) <= 0) goto err;
197     }
198     if(!(cflag & X509_FLAG_NO_SUBJECT))
199     {
200         if (BIO_printf(bp, "        Subject:%c",mlch) <= 0) goto err;
201         if (X509_NAME_print_ex(bp,X509_get_subject_name(x),nmindent, nmf
202         if (BIO_write(bp, "\n",1) <= 0) goto err;
203     }
204     if(!(cflag & X509_FLAG_NO_PUBKEY))
205     {
206         if (BIO_write(bp, "        Subject Public Key Info:\n",33) <= 0)
207             goto err;
208         if (BIO_printf(bp,"%12sPublic Key Algorithm: ", "") <= 0)
209             goto err;
210         if (i2a_ASN1_OBJECT(bp, ci->key->algor->algorithm) <= 0)
211             goto err;
212         if (BIO_puts(bp, "\n") <= 0)
213             goto err;
214
215         pkey=X509_get_pubkey(x);
216         if (pkey == NULL)
217         {
218             BIO_printf(bp,"%12sUnable to load Public Key\n", "");
219             ERR_print_errors(bp);
220         }
221         else
222         {
223             EVP_PKEY_print_public(bp, pkey, 16, NULL);
224             EVP_PKEY_free(pkey);
225         }
226     }
227
228     if (!(cflag & X509_FLAG_NO_EXTENSIONS))
229         X509V3_extensions_print(bp, "X509v3 extensions",
230             ci->extensions, cflag, 8);
231
232     if(!(cflag & X509_FLAG_NO_SIGDUMP))
233     {
234         if(X509_signature_print(bp, x->sig_alg, x->signature) <= 0) goto
235     }
236     if(!(cflag & X509_FLAG_NO_AUX))
237     {
238         if (!X509_CERT_AUX_print(bp, x->aux, 0)) goto err;
239     }
240     ret=1;
241 err:
242     if (m != NULL) OPENSSL_free(m);
243     return(ret);
244 }
245
246 int X509_ocspid_print (BIO *bp, X509 *x)
247 {
248     unsigned char *der=NULL ;
249     unsigned char *dertmp;
250     int derlen;
251     int i;
252     unsigned char SHA1md[SHA_DIGEST_LENGTH];
253
254     /* display the hash of the subject as it would appear
255     in OSCP requests */
256     if (BIO_printf(bp, "        Subject OSCP hash: ") <= 0)
257         goto err;
258     derlen = i2d_X509_NAME(x->cert_info->subject, NULL);
259     if ((der = dertmp = (unsigned char *)OPENSSL_malloc (derlen)) == NULL)

```

```

260         goto err;
261         i2d_X509_NAME(x->cert_info->subject, &dertmp);

263     if (!EVP_Digest(der, derlen, SHA1md, NULL, EVP_sha1(), NULL))
264         goto err;
265     for (i=0; i < SHA_DIGEST_LENGTH; i++)
266     {
267         if (BIO_printf(bp, "%02X", SHA1md[i]) <= 0) goto err;
268     }
269     OPENSSL_free(der);
270     der=NULL;

272     /* display the hash of the public key as it would appear
273        in OSCP requests */
274     if (BIO_printf(bp, "\n        Public key OSCP hash: ") <= 0)
275         goto err;

277     if (!EVP_Digest(x->cert_info->key->public_key->data,
278                    x->cert_info->key->public_key->length,
279                    SHA1md, NULL, EVP_sha1(), NULL))
280         goto err;
281     for (i=0; i < SHA_DIGEST_LENGTH; i++)
282     {
283         if (BIO_printf(bp, "%02X", SHA1md[i]) <= 0)
284             goto err;
285     }
286     BIO_printf(bp, "\n");

288     return (1);
289 err:
290     if (der != NULL) OPENSSL_free(der);
291     return(0);
292 }

294 int X509_signature_dump(BIO *bp, const ASN1_STRING *sig, int indent)
295 {
296     const unsigned char *s;
297     int i, n;

299     n=sig->length;
300     s=sig->data;
301     for (i=0; i<n; i++)
302     {
303         if ((i%18) == 0)
304         {
305             if (BIO_write(bp, "\n", 1) <= 0) return 0;
306             if (BIO_indent(bp, indent, indent) <= 0) return 0;
307             if (BIO_printf(bp, "%02x%s", s[i],
308                           ((i+1) == n) ? ":" : ":") <= 0) return 0;
309         }
310     }
311     if (BIO_write(bp, "\n", 1) != 1) return 0;

313     return 1;
314 }

316 int X509_signature_print(BIO *bp, X509_ALGOR *sigalg, ASN1_STRING *sig)
317 {
318     int sig_nid;
319     if (BIO_puts(bp, "    Signature Algorithm: ") <= 0) return 0;
320     if (i2a_ASN1_OBJECT(bp, sigalg->algorithm) <= 0) return 0;

322     sig_nid = OBJ_obj2nid(sigalg->algorithm);
323     if (sig_nid != NID_undef)
324     {
325         int pkey_nid, dig_nid;

```

```

326         const EVP_PKEY_ASN1_METHOD *ameth;
327         if (OBJ_find_sigid_algs(sig_nid, &dig_nid, &pkey_nid))
328         {
329             ameth = EVP_PKEY_asn1_find(NULL, pkey_nid);
330             if (ameth && ameth->sig_print)
331                 return ameth->sig_print(bp, sigalg, sig, 9, 0);
332         }
333     }
334     if (sig)
335         return X509_signature_dump(bp, sig, 9);
336     else if (BIO_puts(bp, "\n") <= 0)
337         return 0;
338     return 1;
339 }

341 int ASN1_STRING_print(BIO *bp, const ASN1_STRING *v)
342 {
343     int i, n;
344     char buf[80];
345     const char *p;

347     if (v == NULL) return(0);
348     n=0;
349     p=(const char *)v->data;
350     for (i=0; i<v->length; i++)
351     {
352         if ((p[i] > '~') || ((p[i] < ' ') &&
353                               (p[i] != '\n') && (p[i] != '\r'))))
354             buf[n]='.';
355         else
356             buf[n]=p[i];
357         n++;
358         if (n >= 80)
359         {
360             if (BIO_write(bp, buf, n) <= 0)
361                 return(0);
362             n=0;
363         }
364     }
365     if (n > 0)
366         if (BIO_write(bp, buf, n) <= 0)
367             return(0);
368     return(1);
369 }

371 int ASN1_TIME_print(BIO *bp, const ASN1_TIME *tm)
372 {
373     if (tm->type == V_ASN1_UTCTIME) return ASN1_UTCTIME_print(bp, tm);
374     if (tm->type == V_ASN1_GENERALIZEDTIME)
375         return ASN1_GENERALIZEDTIME_print(bp, tm);
376     BIO_write(bp, "Bad time value", 14);
377     return(0);
378 }

380 static const char *mon[12]=
381 {
382     "Jan", "Feb", "Mar", "Apr", "May", "Jun",
383     "Jul", "Aug", "Sep", "Oct", "Nov", "Dec"
384 };

386 int ASN1_GENERALIZEDTIME_print(BIO *bp, const ASN1_GENERALIZEDTIME *tm)
387 {
388     char *v;
389     int gmt=0;
390     int i;
391     int y=0, M=0, d=0, h=0, m=0, s=0;

```

```

392     char *f = NULL;
393     int f_len = 0;

395     i=tm->length;
396     v=(char *)tm->data;

398     if (i < 12) goto err;
399     if (v[i-1] == 'Z') gmt=1;
400     for (i=0; i<12; i++)
401         if ((v[i] > '9') || (v[i] < '0')) goto err;
402     y= (v[0]-'0')*1000+(v[1]-'0')*100 + (v[2]-'0')*10+(v[3]-'0');
403     M= (v[4]-'0')*10+(v[5]-'0');
404     if ((M > 12) || (M < 1)) goto err;
405     d= (v[6]-'0')*10+(v[7]-'0');
406     h= (v[8]-'0')*10+(v[9]-'0');
407     m= (v[10]-'0')*10+(v[11]-'0');
408     if (tm->length >= 14 &&
409         (v[12] >= '0') && (v[12] <= '9') &&
410         (v[13] >= '0') && (v[13] <= '9'))
411     {
412         s= (v[12]-'0')*10+(v[13]-'0');
413         /* Check for fractions of seconds. */
414         if (tm->length >= 15 && v[14] == '.')
415         {
416             int l = tm->length;
417             f = &v[14]; /* The decimal point. */
418             f_len = 1;
419             while (14 + f_len < l && f[f_len] >= '0' && f[f_len] <=
420                 ++f_len;
421         }
422     }

424     if (BIO_printf(bp,"%s %2d %02d:%02d:%02d%.*s %d%s",
425         mon[M-1],d,h,m,s,f_len,f,y,(gmt?" GMT":"") <= 0)
426         return(0);
427     else
428         return(1);
429 err:
430     BIO_write(bp,"Bad time value",14);
431     return(0);
432 }

434 int ASN1_UTCTIME_print(BIO *bp, const ASN1_UTCTIME *tm)
435 {
436     const char *v;
437     int gmt=0;
438     int i;
439     int y=0,M=0,d=0,h=0,m=0,s=0;

441     i=tm->length;
442     v=(const char *)tm->data;

444     if (i < 10) goto err;
445     if (v[i-1] == 'Z') gmt=1;
446     for (i=0; i<10; i++)
447         if ((v[i] > '9') || (v[i] < '0')) goto err;
448     y= (v[0]-'0')*10+(v[1]-'0');
449     if (y < 50) y+=100;
450     M= (v[2]-'0')*10+(v[3]-'0');
451     if ((M > 12) || (M < 1)) goto err;
452     d= (v[4]-'0')*10+(v[5]-'0');
453     h= (v[6]-'0')*10+(v[7]-'0');
454     m= (v[8]-'0')*10+(v[9]-'0');
455     if (tm->length >= 12 &&
456         (v[10] >= '0') && (v[10] <= '9') &&
457         (v[11] >= '0') && (v[11] <= '9'))

```

```

458         s= (v[10]-'0')*10+(v[11]-'0');

460     if (BIO_printf(bp,"%s %2d %02d:%02d:%02d %d%s",
461         mon[M-1],d,h,m,s,y+1900,(gmt?" GMT":"") <= 0)
462         return(0);
463     else
464         return(1);
465 err:
466     BIO_write(bp,"Bad time value",14);
467     return(0);
468 }

470 int X509_NAME_print(BIO *bp, X509_NAME *name, int obase)
471 {
472     char *s,*c,*b;
473     int ret=0,l,i;

475     l=80-2-obase;

477     b=X509_NAME_oneline(name,NULL,0);
478     if (!*b)
479     {
480         OPENSSL_free(b);
481         return 1;
482     }
483     s=b+1; /* skip the first slash */

485     c=s;
486     for (;;)
487     {
488 #ifndef CHARSET_EBCDIC
489         if (
490             ((*s == '/') &&
491              ((s[1] >= 'A') && (s[1] <= 'Z') && (
492                  (s[2] == '=') ||
493                  ((s[2] >= 'A') && (s[2] <= 'Z') &&
494                  (s[3] == '='))
495              )) ||
496             (*s == '\0'))
497         #else
498         if (
499             ((*s == '/') &&
500              (isupper(s[1]) && (
501                  (s[2] == '=') ||
502                  (isupper(s[2]) &&
503                  (s[3] == '='))
504              )) ||
505             (*s == '\0'))
506         #endif
507         {
508             i=s-c;
509             if (BIO_write(bp,c,i) != i) goto err;
510             c=s+1; /* skip following slash */
511             if (*s != '\0')
512             {
513                 if (BIO_write(bp," ",2) != 2) goto err;
514             }
515             l--;
516             if (*s == '\0') break;
517             s++;
518             l--;
519         }
520     }
521     ret=1;
522     if (0)
523 err:

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_x509.c

9

```
524         X509err(X509_F_X509_NAME_PRINT, ERR_R_BUF_LIB);
525     }
526     OPENSSL_free(b);
527     return(ret);
528 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_x509a.c

1

```
*****
4169 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/t_x509a.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* t_x509a.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/t_x509a.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/x509.h>
64
65 /* X509_CERT_AUX and string set routines
66  */
67
68 int X509_CERT_AUX_print(BIO *out, X509_CERT_AUX *aux, int indent)
69 {
70     char oidstr[80], first;
71     int i;
72     if(!aux) return 1;
73     if(aux->trust) {
74         first = 1;
75         BIO_printf(out, "%sTrusted Uses:\n%s",
76                    indent, "", indent + 2, "");
77         for(i = 0; i < sk_ASN1_OBJECT_num(aux->trust); i++) {
78             if(!first) BIO_puts(out, ", ");
79             else first = 0;
80             OBJ_obj2txt(oidstr, sizeof oidstr,
81                        sk_ASN1_OBJECT_value(aux->trust, i), 0);
82             BIO_puts(out, oidstr);
83         }
84         BIO_puts(out, "\n");
85     } else BIO_printf(out, "%sNo Trusted Uses.\n", indent, "");
86     if(aux->reject) {
87         first = 1;
88         BIO_printf(out, "%sRejected Uses:\n%s",
89                    indent, "", indent + 2, "");
90         for(i = 0; i < sk_ASN1_OBJECT_num(aux->reject); i++) {
91             if(!first) BIO_puts(out, ", ");
92             else first = 0;
93             OBJ_obj2txt(oidstr, sizeof oidstr,
94                        sk_ASN1_OBJECT_value(aux->reject, i), 0);
95             BIO_puts(out, oidstr);
96         }
97         BIO_puts(out, "\n");
98     } else BIO_printf(out, "%sNo Rejected Uses.\n", indent, "");
99     if(aux->alias) BIO_printf(out, "%sAlias: %s\n", indent, "",
100                             aux->alias->data);
101     if(aux->keyid) {
102         BIO_printf(out, "%sKey Id: ", indent, "");
103         for(i = 0; i < aux->keyid->length; i++)
104             BIO_printf(out, "%s%02X",
105                        i ? " : " : "",
106                        aux->keyid->data[i]);
107         BIO_write(out, "\n", 1);
108     }
109     return 1;
110 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_dec.c

1

```
*****
32086 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_dec.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* tasn_dec.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

60 #include <stddef.h>
61 #include <string.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_dec.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/objects.h>
65 #include <openssl/buffer.h>
66 #include <openssl/err.h>

68 static int asn1_check_eoc(const unsigned char **in, long len);
69 static int asn1_find_end(const unsigned char **in, long len, char inf);

71 static int asn1_collect(BUF_MEM *buf, const unsigned char **in, long len,
72                        char inf, int tag, int aclass, int depth);

74 static int collect_data(BUF_MEM *buf, const unsigned char **p, long plen);

76 static int asn1_check_tlen(long *olen, int *otag, unsigned char *oclass,
77                          char *inf, char *cst,
78                          const unsigned char **in, long len,
79                          int exp tag, int exp class, char opt,
80                          ASN1_TLC *ctx);

82 static int asn1_template_ex_d2i(ASN1_VALUE **pval,
83                                const unsigned char **in, long len,
84                                const ASN1_TEMPLATE *tt, char opt,
85                                ASN1_TLC *ctx);
86 static int asn1_template_noexp_d2i(ASN1_VALUE **pval,
87                                    const unsigned char **in, long len,
88                                    const ASN1_TEMPLATE *tt, char opt,
89                                    ASN1_TLC *ctx);
90 static int asn1_d2i_ex_primitive(ASN1_VALUE **pval,
91                                 const unsigned char **in, long len,
92                                 const ASN1_ITEM *it,
93                                 int tag, int aclass, char opt, ASN1_TLC *ctx);

95 /* Table to convert tags to bit values, used for MSTRING type */
96 static const unsigned long tag2bit[32] = {
97     0, 0, 0, 0, B_ASN1_BIT_STRING, /* tags 0 - 3 */
98     B_ASN1_OCTET_STRING, 0, 0, 0, B_ASN1_UNKNOWN, /* tags 4-7 */
99     B_ASN1_UNKNOWN, B_ASN1_UNKNOWN, B_ASN1_UNKNOWN, B_ASN1_UNKNOWN, /* tags 8-11 */
100    B_ASN1_UTF8STRING, B_ASN1_UNKNOWN, B_ASN1_UNKNOWN, B_ASN1_UNKNOWN, /* tags 12-15 */
101    B_ASN1_SEQUENCE, 0, B_ASN1_NUMERICSTRING, B_ASN1_PRINTABLESTRING, /* tags 16-19 */
102    B_ASN1_T61STRING, B_ASN1_VIDEOTEXSTRING, B_ASN1_IA5STRING, /* tags 20-22 */
103    B_ASN1_UTCTIME, B_ASN1_GENERALIZEDTIME, /* tags 23-24 */
104    B_ASN1_GRAPHICSTRING, B_ASN1_ISO64STRING, B_ASN1_GENERALSTRING, /* tags 25-27 */
105    B_ASN1_UNIVERSALSTRING, B_ASN1_UNKNOWN, B_ASN1_BITMAPSTRING, B_ASN1_UNKNOWN, /* tags 28-31 */
106    };

108 unsigned long ASN1_tag2bit(int tag)
109 {
110     if ((tag < 0) || (tag > 30)) return 0;
111     return tag2bit[tag];
112 }

114 /* Macro to initialize and invalidate the cache */

116 #define asn1_tlc_clear(c) if (c) (c)->valid = 0
117 /* Version to avoid compiler warning about 'c' always non-NULL */
118 #define asn1_tlc_clear_nc(c) (c)->valid = 0

120 /* Decode an ASN1 item, this currently behaves just
121  * like a standard 'd2i' function. 'in' points to
122  * a buffer to read the data from, in future we will
123  * have more advanced versions that can input data
124  * a piece at a time and this will simply be a special
125  * case.
126  */
```



```

128 ASN1_VALUE *ASN1_item_d2i(ASN1_VALUE **pval,
129     const unsigned char **in, long len, const ASN1_ITEM *it)
130 {
131     ASN1_TLC c;
132     ASN1_VALUE *ptmpval = NULL;
133     if (!pval)
134         pval = &ptmpval;
135     asn1_tlc_clear_nc(&c);
136     if (ASN1_item_ex_d2i(pval, in, len, it, -1, 0, 0, &c) > 0)
137         return *pval;
138     return NULL;
139 }

141 int ASN1_template_d2i(ASN1_VALUE **pval,
142     const unsigned char **in, long len, const ASN1_TEMPLATE *tt)
143 {
144     ASN1_TLC c;
145     asn1_tlc_clear_nc(&c);
146     return asn1_template_ex_d2i(pval, in, len, tt, 0, &c);
147 }

150 /* Decode an item, taking care of IMPLICIT tagging, if any.
151  * If 'opt' set and tag mismatch return -1 to handle OPTIONAL
152  */

154 int ASN1_item_ex_d2i(ASN1_VALUE **pval, const unsigned char **in, long len,
155     const ASN1_ITEM *it,
156     int tag, int aclass, char opt, ASN1_TLC *ctx)
157 {
158     const ASN1_TEMPLATE *tt, *errtt = NULL;
159     const ASN1_COMPAT_FUNCS *cf;
160     const ASN1_EXTERN_FUNCS *ef;
161     const ASN1_AUX *aux = it->funcs;
162     ASN1_aux_cb *asn1_cb;
163     const unsigned char *p = NULL, *q;
164     unsigned char *wp=NULL; /* BIG FAT WARNING! BREAKS CONST WHERE USED */
165     unsigned char imphack = 0, oclass;
166     char seq_eoc, seq_nolen, cst, isopt;
167     long tmlen;
168     int i;
169     int otag;
170     int ret = 0;
171     ASN1_VALUE **pchptr, *ptmpval;
172     if (!pval)
173         return 0;
174     if (aux && aux->asn1_cb)
175         asn1_cb = aux->asn1_cb;
176     else asn1_cb = 0;

178     switch(it->itype)
179     {
180         case ASN1_ITYPE_PRIMITIVE:
181             if (it->templates)
182             {
183                 /* tagging or OPTIONAL is currently illegal on an item
184                  * template because the flags can't get passed down.
185                  * In practice this isn't a problem: we include the
186                  * relevant flags from the item template in the
187                  * template itself.
188                  */
189                 if ((tag != -1) || opt)
190                 {
191                     ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
192                         ASN1_R_ILLEGAL_OPTIONS_ON_ITEM_TEMPLATE);
193                     goto err;

```

```

194     }
195     return asn1_template_ex_d2i(pval, in, len,
196         it->templates, opt, ctx);
197 }
198 return asn1_d2i_ex_primitive(pval, in, len, it,
199     tag, aclass, opt, ctx);
200 break;

202 case ASN1_ITYPE_MSTRING:
203     p = *in;
204     /* Just read in tag and class */
205     ret = asn1_check_tlen(NULL, &otag, &oclass, NULL, NULL,
206         &p, len, -1, 0, 1, ctx);
207     if (!ret)
208     {
209         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
210             ERR_R_NESTED_ASN1_ERROR);
211         goto err;
212     }

214     /* Must be UNIVERSAL class */
215     if (oclass != V_ASN1_UNIVERSAL)
216     {
217         /* If OPTIONAL, assume this is OK */
218         if (opt) return -1;
219         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
220             ASN1_R_MSTRING_NOT_UNIVERSAL);
221         goto err;
222     }
223     /* Check tag matches bit map */
224     if (!(ASN1_tag2bit(otag) & it->utype))
225     {
226         /* If OPTIONAL, assume this is OK */
227         if (opt) return -1;
228         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
229             ASN1_R_MSTRING_WRONG_TAG);
230         goto err;
231     }
232     return asn1_d2i_ex_primitive(pval, in, len,
233         it, otag, 0, 0, ctx);

236 case ASN1_ITYPE_EXTERN:
237     /* Use new style d2i */
238     ef = it->funcs;
239     return ef->asn1_ex_d2i(pval, in, len,
240         it, tag, aclass, opt, ctx);

242 case ASN1_ITYPE_COMPAT:
243     /* we must resort to old style evil hackery */
244     cf = it->funcs;

246     /* If OPTIONAL see if it is there */
247     if (opt)
248     {
249         int exptag;
250         p = *in;
251         if (tag == -1)
252             exptag = it->utype;
253         else exptag = tag;
254         /* Don't care about anything other than presence
255          * of expected tag */

257         ret = asn1_check_tlen(NULL, NULL, NULL, NULL, NULL,
258             &p, len, exptag, aclass, 1, ctx);
259         if (!ret)

```

```

260         {
261             ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
262                     ERR_R_NESTED_ASN1_ERROR);
263             goto err;
264         }
265         if (ret == -1)
266             return -1;
267     }

269     /* This is the old style evil hack IMPLICIT handling:
270      * since the underlying code is expecting a tag and
271      * class other than the one present we change the
272      * buffer temporarily then change it back afterwards.
273      * This doesn't and never did work for tags > 30.
274      *
275      * Yes this is *horrible* but it is only needed for
276      * old style d2i which will hopefully not be around
277      * for much longer.
278      * FIXME: should copy the buffer then modify it so
279      * the input buffer can be const: we should *always*
280      * copy because the old style d2i might modify the
281      * buffer.
282      */

284     if (tag != -1)
285     {
286         wp = *(unsigned char **)in;
287         imphack = *wp;
288         if (p == NULL)
289         {
290             ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
291                     ERR_R_NESTED_ASN1_ERROR);
292             goto err;
293         }
294         *wp = (unsigned char)((*p & V_ASN1_CONSTRUCTED)
295                               | it->utype);
296     }

298     ptmpval = cf->asn1_d2i(pval, in, len);

300     if (tag != -1)
301         *wp = imphack;

303     if (ptmpval)
304         return 1;

306     ASN1err(ASN1_F_ASN1_ITEM_EX_D2I, ERR_R_NESTED_ASN1_ERROR);
307     goto err;

310     case ASN1_ITYPE_CHOICE:
311     if (asn1_cb && !asn1_cb(ASN1_OP_D2I_PRE, pval, it, NULL))
312         goto auxerr;

314     /* Allocate structure */
315     if (!*pval && !ASN1_item_ex_new(pval, it))
316     {
317         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
318                 ERR_R_NESTED_ASN1_ERROR);
319         goto err;
320     }
321     /* CHOICE type, try each possibility in turn */
322     p = *in;
323     for (i = 0, tt=it->templates; i < it->tcount; i++, tt++)
324     {
325         pchpstr = asn1_get_field_ptr(pval, tt);

```

```

326         /* We mark field as OPTIONAL so its absence
327          * can be recognised.
328          */
329         ret = asn1_template_ex_d2i(pchpstr, &p, len, tt, 1, ctx);
330         /* If field not present, try the next one */
331         if (ret == -1)
332             continue;
333         /* If positive return, read OK, break loop */
334         if (ret > 0)
335             break;
336         /* Otherwise must be an ASN1 parsing error */
337         errtt = tt;
338         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
339                 ERR_R_NESTED_ASN1_ERROR);
340         goto err;
341     }

343     /* Did we fall off the end without reading anything? */
344     if (i == it->tcount)
345     {
346         /* If OPTIONAL, this is OK */
347         if (opt)
348         {
349             /* Free and zero it */
350             ASN1_item_ex_free(pval, it);
351             return -1;
352         }
353         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
354                 ASN1_R_NO_MATCHING_CHOICE_TYPE);
355         goto err;
356     }

358     asn1_set_choice_selector(pval, i, it);
359     *in = p;
360     if (asn1_cb && !asn1_cb(ASN1_OP_D2I_POST, pval, it, NULL))
361         goto auxerr;
362     return 1;

364     case ASN1_ITYPE_NDEF_SEQUENCE:
365     case ASN1_ITYPE_SEQUENCE:
366     p = *in;
367     tmplen = len;

369     /* If no IMPLICIT tagging set to SEQUENCE, UNIVERSAL */
370     if (tag == -1)
371     {
372         tag = V_ASN1_SEQUENCE;
373         aclass = V_ASN1_UNIVERSAL;
374     }
375     /* Get SEQUENCE length and update len, p */
376     ret = asn1_check_tlen(&len, NULL, NULL, &seq_eoc, &cst,
377                          &p, len, tag, aclass, opt, ctx);
378     if (!ret)
379     {
380         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
381                 ERR_R_NESTED_ASN1_ERROR);
382         goto err;
383     }
384     else if (ret == -1)
385         return -1;
386     if (aux && (aux->flags & ASN1_AFLG_BROKEN))
387     {
388         len = tmplen - (p - *in);
389         seq_nolen = 1;
390     }
391     /* If indefinite we don't do a length check */

```

```

392     else seq_nolen = seq_eoc;
393     if (!cst)
394     {
395         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
396                ASN1_R_SEQUENCE_NOT_CONSTRUCTED);
397         goto err;
398     }
399
400     if (!*pval && !ASN1_item_ex_new(pval, it))
401     {
402         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
403                ERR_R_NESTED_ASN1_ERROR);
404         goto err;
405     }
406
407     if (asn1_cb && !asn1_cb(ASN1_OP_D2I_PRE, pval, it, NULL))
408         goto auxerr;
409
410     /* Get each field entry */
411     for (i = 0, tt = it->templates; i < it->tcount; i++, tt++)
412     {
413         const ASN1_TEMPLATE *seqtt;
414         ASN1_VALUE **pseqval;
415         seqtt = asn1_do_adb(pval, tt, 1);
416         if (!seqtt)
417             goto err;
418         pseqval = asn1_get_field_ptr(pval, seqtt);
419         /* Have we ran out of data? */
420         if (!len)
421             break;
422         q = p;
423         if (asn1_check_eoc(&p, len))
424         {
425             if (!seq_eoc)
426             {
427                 ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
428                        ASN1_R_UNEXPECTED_EOC);
429                 goto err;
430             }
431             len -= p - q;
432             seq_eoc = 0;
433             q = p;
434             break;
435         }
436         /* This determines the OPTIONAL flag value. The field
437          * cannot be omitted if it is the last of a SEQUENCE
438          * and there is still data to be read. This isn't
439          * strictly necessary but it increases efficiency in
440          * some cases.
441          */
442         if (i == (it->tcount - 1))
443             isopt = 0;
444         else isopt = (char)(seqtt->flags & ASN1_TFLG_OPTIONAL);
445         /* attempt to read in field, allowing each to be
446          * OPTIONAL */
447
448         ret = asn1_template_ex_d2i(pseqval, &p, len,
449                                   seqtt, isopt, ctx);
450         if (!ret)
451         {
452             errtt = seqtt;
453             goto err;
454         }
455         else if (ret == -1)
456         {
457             /* OPTIONAL component absent.

```

```

458             * Free and zero the field.
459             */
460             ASN1_template_free(pseqval, seqtt);
461             continue;
462         }
463         /* Update length */
464         len -= p - q;
465     }
466
467     /* Check for EOC if expecting one */
468     if (seq_eoc && !asn1_check_eoc(&p, len))
469     {
470         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I, ASN1_R_MISSING_EOC);
471         goto err;
472     }
473     /* Check all data read */
474     if (!seq_nolen && len)
475     {
476         ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
477                ASN1_R_SEQUENCE_LENGTH_MISMATCH);
478         goto err;
479     }
480
481     /* If we get here we've got no more data in the SEQUENCE,
482     * however we may not have read all fields so check all
483     * remaining are OPTIONAL and clear any that are.
484     */
485     for (; i < it->tcount; tt++, i++)
486     {
487         const ASN1_TEMPLATE *seqtt;
488         seqtt = asn1_do_adb(pval, tt, 1);
489         if (!seqtt)
490             goto err;
491         if (seqtt->flags & ASN1_TFLG_OPTIONAL)
492         {
493             ASN1_VALUE **pseqval;
494             pseqval = asn1_get_field_ptr(pval, seqtt);
495             ASN1_template_free(pseqval, seqtt);
496         }
497         else
498         {
499             errtt = seqtt;
500             ASN1err(ASN1_F_ASN1_ITEM_EX_D2I,
501                    ASN1_R_FIELD_MISSING);
502             goto err;
503         }
504     }
505     /* Save encoding */
506     if (!asn1_enc_save(pval, *in, p - *in, it))
507         goto auxerr;
508     *in = p;
509     if (asn1_cb && !asn1_cb(ASN1_OP_D2I_POST, pval, it, NULL))
510         goto auxerr;
511     return 1;
512
513     default:
514         return 0;
515     }
516
517     auxerr:
518     ASN1err(ASN1_F_ASN1_ITEM_EX_D2I, ASN1_R_AUX_ERROR);
519     err:
520     ASN1_item_ex_free(pval, it);
521     if (errtt)
522         ERR_add_error_data(4, "Field=", errtt->field_name,
523                           ", Type=", it->sname);
524     else

```

```

524     ERR_add_error_data(2, "Type=", it->sname);
525     return 0;
526 }

528 /* Templates are handled with two separate functions.
529  * One handles any EXPLICIT tag and the other handles the rest.
530  */

532 static int asn1_template_ex_d2i(ASN1_VALUE **val,
533                                const unsigned char **in, long inlen,
534                                const ASN1_TEMPLATE *tt, char opt,
535                                ASN1_TLC *ctx)
536 {
537     int flags, aclass;
538     int ret;
539     long len;
540     const unsigned char *p, *q;
541     char exp_eoc;
542     if (!val)
543         return 0;
544     flags = tt->flags;
545     aclass = flags & ASN1_TFLG_TAG_CLASS;

547     p = *in;

549     /* Check if EXPLICIT tag expected */
550     if (flags & ASN1_TFLG_EXPTAG)
551     {
552         char cst;
553         /* Need to work out amount of data available to the inner
554          * content and where it starts: so read in EXPLICIT header to
555          * get the info.
556          */
557         ret = asn1_check_tlen(&len, NULL, NULL, &exp_eoc, &cst,
558                             &p, inlen, tt->tag, aclass, opt, ctx);
559         q = p;
560         if (!ret)
561         {
562             ASN1err(ASN1_F_ASN1_TEMPLATE_EX_D2I,
563                     ERR_R_NESTED_ASN1_ERROR);
564             return 0;
565         }
566         else if (ret == -1)
567             return -1;
568         if (!cst)
569         {
570             ASN1err(ASN1_F_ASN1_TEMPLATE_EX_D2I,
571                     ASN1_R_EXPLICIT_TAG_NOT_CONSTRUCTED);
572             return 0;
573         }
574         /* We've found the field so it can't be OPTIONAL now */
575         ret = asn1_template_noexp_d2i(val, &p, len, tt, 0, ctx);
576         if (!ret)
577         {
578             ASN1err(ASN1_F_ASN1_TEMPLATE_EX_D2I,
579                     ERR_R_NESTED_ASN1_ERROR);
580             return 0;
581         }
582         /* We read the field in OK so update length */
583         len -= p - q;
584         if (exp_eoc)
585         {
586             /* If NDEF we must have an EOC here */
587             if (!asn1_check_eoc(&p, len))
588             {
589                 ASN1err(ASN1_F_ASN1_TEMPLATE_EX_D2I,

```

```

590                                     ASN1_R_MISSING_EOC);
591         goto err;
592     }
593 }
594 else
595 {
596     /* Otherwise we must hit the EXPLICIT tag end or its
597     * an error */
598     if (len)
599     {
600         ASN1err(ASN1_F_ASN1_TEMPLATE_EX_D2I,
601                 ASN1_R_EXPLICIT_LENGTH_MISMATCH);
602         goto err;
603     }
604 }
605 }
606 else
607     return asn1_template_noexp_d2i(val, in, inlen,
608                                     tt, opt, ctx);

610 *in = p;
611 return 1;

613 err:
614     ASN1_template_free(val, tt);
615     return 0;
616 }

618 static int asn1_template_noexp_d2i(ASN1_VALUE **val,
619                                    const unsigned char **in, long len,
620                                    const ASN1_TEMPLATE *tt, char opt,
621                                    ASN1_TLC *ctx)
622 {
623     int flags, aclass;
624     int ret;
625     const unsigned char *p, *q;
626     if (!val)
627         return 0;
628     flags = tt->flags;
629     aclass = flags & ASN1_TFLG_TAG_CLASS;

631     p = *in;
632     q = p;

634     if (flags & ASN1_TFLG_SK_MASK)
635     {
636         /* SET OF, SEQUENCE OF */
637         int sktag, skaclass;
638         char sk_eoc;
639         /* First work out expected inner tag value */
640         if (flags & ASN1_TFLG_IMPTAG)
641         {
642             sktag = tt->tag;
643             skaclass = aclass;
644         }
645         else
646         {
647             skaclass = V_ASN1_UNIVERSAL;
648             if (flags & ASN1_TFLG_SET_OF)
649                 sktag = V_ASN1_SET;
650             else
651                 sktag = V_ASN1_SEQUENCE;
652         }
653         /* Get the tag */
654         ret = asn1_check_tlen(&len, NULL, NULL, &sk_eoc, NULL,
655                             &p, len, sktag, skaclass, opt, ctx);

```

```

656     if (!ret)
657     {
658         ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I,
659                 ERR_R_NESTED_ASN1_ERROR);
660         return 0;
661     }
662     else if (ret == -1)
663         return -1;
664     if (!*val)
665         *val = (ASN1_VALUE *)sk_new_null();
666     else
667     {
668         /* We've got a valid STACK: free up any items present */
669         STACK_OF(ASN1_VALUE) *sktmp
670             = (STACK_OF(ASN1_VALUE) *)*val;
671         ASN1_VALUE *vtmp;
672         while(sk_ASN1_VALUE_num(sktmp) > 0)
673         {
674             vtmp = sk_ASN1_VALUE_pop(sktmp);
675             ASN1_item_ex_free(&vtmp,
676                               ASN1_ITEM_ptr(tt->item));
677         }
678     }
679     if (!*val)
680     {
681         ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I,
682                 ERR_R_MALLOC_FAILURE);
683         goto err;
684     }
685
686     /* Read as many items as we can */
687     while(len > 0)
688     {
689         ASN1_VALUE *skfield;
690         q = p;
691         /* See if EOC found */
692         if (asn1_check_eoc(&p, len))
693         {
694             if (!sk_eoc)
695             {
696                 ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I,
697                         ASN1_R_UNEXPECTED_EOC);
698                 goto err;
699             }
700             len -= p - q;
701             sk_eoc = 0;
702             break;
703         }
704         skfield = NULL;
705         if (!ASN1_item_ex_d2i(&skfield, &p, len,
706                             ASN1_ITEM_ptr(tt->item),
707                             -1, 0, 0, ctx))
708         {
709             ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I,
710                     ERR_R_NESTED_ASN1_ERROR);
711             goto err;
712         }
713         len -= p - q;
714         if (!sk_ASN1_VALUE_push((STACK_OF(ASN1_VALUE) *)*val,
715                                 skfield))
716         {
717             ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I,
718                     ERR_R_MALLOC_FAILURE);
719             goto err;
720         }
721     }

```

```

722     }
723     if (sk_eoc)
724     {
725         ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I, ASN1_R_MISSING_E
726                 goto err;
727     }
728     }
729     else if (flags & ASN1_TFLG_IMPTAG)
730     {
731         /* IMPLICIT tagging */
732         ret = ASN1_item_ex_d2i(val, &p, len,
733                               ASN1_ITEM_ptr(tt->item), tt->tag, aclass, opt, ctx);
734         if (!ret)
735         {
736             ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I,
737                     ERR_R_NESTED_ASN1_ERROR);
738             goto err;
739         }
740         else if (ret == -1)
741             return -1;
742     }
743     else
744     {
745         /* Nothing special */
746         ret = ASN1_item_ex_d2i(val, &p, len, ASN1_ITEM_ptr(tt->item),
747                               -1, 0, opt, ctx);
748         if (!ret)
749         {
750             ASN1err(ASN1_F_ASN1_TEMPLATE_NOEXP_D2I,
751                     ERR_R_NESTED_ASN1_ERROR);
752             goto err;
753         }
754         else if (ret == -1)
755             return -1;
756     }
757
758     *in = p;
759     return 1;
760
761 err:
762     ASN1_template_free(val, tt);
763     return 0;
764 }
765
766 static int asn1_d2i_ex_primitive(ASN1_VALUE **pval,
767                                  const unsigned char **in, long inlen,
768                                  const ASN1_ITEM *it,
769                                  int tag, int aclass, char opt, ASN1_TLC *ctx)
770 {
771     int ret = 0, utype;
772     long plen;
773     char cst, inf, free_cont = 0;
774     const unsigned char *p;
775     BUF_MEM buf;
776     const unsigned char *cont = NULL;
777     long len;
778     if (!pval)
779     {
780         ASN1err(ASN1_F_ASN1_D2I_EX_PRIMITIVE, ASN1_R_ILLEGAL_NULL);
781         return 0; /* Should never happen */
782     }
783
784     if (it->itype == ASN1_ITYPE_MSTRING)
785     {
786         utype = tag;
787         tag = -1;

```

```

788     }
789     else
790         utype = it->utype;

792     if (utype == V_ASN1_ANY)
793     {
794         /* If type is ANY need to figure out type from tag */
795         unsigned char oclass;
796         if (tag >= 0)
797         {
798             ASN1err(ASN1_F_ASN1_D2I_EX_PRIMITIVE,
799                     ASN1_R_ILLEGAL_TAGGED_ANY);
800             return 0;
801         }
802         if (opt)
803         {
804             ASN1err(ASN1_F_ASN1_D2I_EX_PRIMITIVE,
805                     ASN1_R_ILLEGAL_OPTIONAL_ANY);
806             return 0;
807         }
808         p = *in;
809         ret = asn1_check_tlen(NULL, &utype, &oclass, NULL, NULL,
810                             &p, inlen, -1, 0, 0, ctx);
811         if (!ret)
812             ASN1err(ASN1_F_ASN1_D2I_EX_PRIMITIVE,
813                     ERR_R_NESTED_ASN1_ERROR);
814             return 0;
815         }
816         if (oclass != V_ASN1_UNIVERSAL)
817             utype = V_ASN1_OTHER;
818     }
819     if (tag == -1)
820     {
821         tag = utype;
822         aclass = V_ASN1_UNIVERSAL;
823     }
824     p = *in;
825     /* Check header */
826     ret = asn1_check_tlen(&plen, NULL, NULL, &inf, &cst,
827                         &p, inlen, tag, aclass, opt, ctx);
828     if (!ret)
829     {
830         ASN1err(ASN1_F_ASN1_D2I_EX_PRIMITIVE, ERR_R_NESTED_ASN1_ERROR);
831         return 0;
832     }
833     else if (ret == -1)
834         return -1;
835     ret = 0;
836     /* SEQUENCE, SET and "OTHER" are left in encoded form */
837     if ((utype == V_ASN1_SEQUENCE)
838         || (utype == V_ASN1_SET) || (utype == V_ASN1_OTHER))
839     {
840         /* Clear context cache for type OTHER because the auto clear
841          * when we have a exact match wont work
842          */
843         if (utype == V_ASN1_OTHER)
844         {
845             asn1_tlc_clear(ctx);
846         }
847         /* SEQUENCE and SET must be constructed */
848         else if (!cst)
849         {
850             ASN1err(ASN1_F_ASN1_D2I_EX_PRIMITIVE,
851                     ASN1_R_TYPE_NOT_CONSTRUCTED);
852             return 0;

```

```

854     }

856     cont = *in;
857     /* If indefinite length constructed find the real end */
858     if (inf)
859     {
860         if (!asn1_find_end(&p, plen, inf))
861             goto err;
862         len = p - cont;
863     }
864     else
865     {
866         len = p - cont + plen;
867         p += plen;
868         buf.data = NULL;
869     }
870 }
871 else if (cst)
872 {
873     buf.length = 0;
874     buf.max = 0;
875     buf.data = NULL;
876     /* Should really check the internal tags are correct but
877      * some things may get this wrong. The relevant specs
878      * say that constructed string types should be OCTET STRINGS
879      * internally irrespective of the type. So instead just check
880      * for UNIVERSAL class and ignore the tag.
881      */
882     if (!asn1_collect(&buf, &p, plen, inf, -1, V_ASN1_UNIVERSAL, 0))
883     {
884         free_cont = 1;
885         goto err;
886     }
887     len = buf.length;
888     /* Append a final null to string */
889     if (!BUF_MEM_grow_clean(&buf, len + 1))
890     {
891         ASN1err(ASN1_F_ASN1_D2I_EX_PRIMITIVE,
892                 ERR_R_MALLOC_FAILURE);
893         return 0;
894     }
895     buf.data[len] = 0;
896     cont = (const unsigned char *)buf.data;
897     free_cont = 1;
898 }
899 else
900 {
901     cont = p;
902     len = plen;
903     p += plen;
904 }

906 /* We now have content length and type: translate into a structure */
907 if (!asn1_ex_c2i(pval, cont, len, utype, &free_cont, it))
908     goto err;

910 *in = p;
911 ret = 1;
912 err:
913 if (free_cont && buf.data) OPENSSL_free(buf.data);
914 return ret;
915 }

917 /* Translate ASN1 content octets into a structure */
919 int asn1_ex_c2i(ASN1_VALUE **pval, const unsigned char *cont, int len,

```

```

920         int utype, char *free_cont, const ASN1_ITEM *it)
921     {
922         ASN1_VALUE **opval = NULL;
923         ASN1_STRING *stmp;
924         ASN1_TYPE *typ = NULL;
925         int ret = 0;
926         const ASN1_PRIMITIVE_FUNCS *pf;
927         ASN1_INTEGER **tint;
928         pf = it->funcs;
929
930         if (pf && pf->prim_c2i)
931             return pf->prim_c2i(pval, cont, len, utype, free_cont, it);
932         /* If ANY type clear type and set pointer to internal value */
933         if (it->utype == V_ASN1_ANY)
934         {
935             if (!*pval)
936             {
937                 typ = ASN1_TYPE_new();
938                 if (typ == NULL)
939                     goto err;
940                 *pval = (ASN1_VALUE *)typ;
941             }
942             else
943                 typ = (ASN1_TYPE *)*pval;
944
945             if (utype != typ->type)
946                 ASN1_TYPE_set(typ, utype, NULL);
947             opval = pval;
948             pval = &typ->value.asn1_value;
949         }
950         switch(utype)
951         {
952             case V_ASN1_OBJECT:
953                 if (!c2i_ASN1_OBJECT((ASN1_OBJECT **)pval, &cont, len))
954                     goto err;
955                 break;
956
957             case V_ASN1_NULL:
958                 if (len)
959                 {
960                     ASN1err(ASN1_F_ASN1_EX_C2I,
961                             ASN1_R_NULL_IS_WRONG_LENGTH);
962                     goto err;
963                 }
964                 *pval = (ASN1_VALUE *)1;
965                 break;
966
967             case V_ASN1_BOOLEAN:
968                 if (len != 1)
969                 {
970                     ASN1err(ASN1_F_ASN1_EX_C2I,
971                             ASN1_R_BOOLEAN_IS_WRONG_LENGTH);
972                     goto err;
973                 }
974             else
975             {
976                 ASN1_BOOLEAN *tbool;
977                 tbool = (ASN1_BOOLEAN *)pval;
978                 *tbool = *cont;
979             }
980             break;
981
982             case V_ASN1_BIT_STRING:
983                 if (!c2i_ASN1_BIT_STRING((ASN1_BIT_STRING **)pval, &cont, len))
984                     goto err;
985                 break;

```

```

987         case V_ASN1_INTEGER:
988         case V_ASN1_NEG_INTEGER:
989         case V_ASN1_ENUMERATED:
990         case V_ASN1_NEG_ENUMERATED:
991             tint = (ASN1_INTEGER **)pval;
992             if (!c2i_ASN1_INTEGER(tint, &cont, len))
993                 goto err;
994             /* Fixup type to match the expected form */
995             (*tint)->type = utype | ((*tint)->type & V_ASN1_NEG);
996             break;
997
998         case V_ASN1_OCTET_STRING:
999         case V_ASN1_NUMERICSTRING:
1000         case V_ASN1_PRINTABLESTRING:
1001         case V_ASN1_T61STRING:
1002         case V_ASN1_VIDEOTEXSTRING:
1003         case V_ASN1_IA5STRING:
1004         case V_ASN1_UTCTIME:
1005         case V_ASN1_GENERALIZEDTIME:
1006         case V_ASN1_GRAPHICSTRING:
1007         case V_ASN1_VISIBLESTRING:
1008         case V_ASN1_GENERALSTRING:
1009         case V_ASN1_UNIVERSALSTRING:
1010         case V_ASN1_BMPSTRING:
1011         case V_ASN1_UTF8STRING:
1012         case V_ASN1_OTHER:
1013         case V_ASN1_SET:
1014         case V_ASN1_SEQUENCE:
1015             default:
1016                 if (utype == V_ASN1_BMPSTRING && (len & 1))
1017                 {
1018                     ASN1err(ASN1_F_ASN1_EX_C2I,
1019                             ASN1_R_BMPSTRING_IS_WRONG_LENGTH);
1020                     goto err;
1021                 }
1022                 if (utype == V_ASN1_UNIVERSALSTRING && (len & 3))
1023                 {
1024                     ASN1err(ASN1_F_ASN1_EX_C2I,
1025                             ASN1_R_UNIVERSALSTRING_IS_WRONG_LENGTH);
1026                     goto err;
1027                 }
1028                 /* All based on ASN1_STRING and handled the same */
1029                 if (!*pval)
1030                 {
1031                     stmp = ASN1_STRING_type_new(utype);
1032                     if (!stmp)
1033                     {
1034                         ASN1err(ASN1_F_ASN1_EX_C2I,
1035                                 ERR_R_MALLOC_FAILURE);
1036                         goto err;
1037                     }
1038                     *pval = (ASN1_VALUE *)stmp;
1039                 }
1040             else
1041             {
1042                 stmp = (ASN1_STRING *)*pval;
1043                 stmp->type = utype;
1044             }
1045             /* If we've already allocated a buffer use it */
1046             if (*free_cont)
1047             {
1048                 if (stmp->data)
1049                     OPENSSL_free(stmp->data);
1050                 stmp->data = (unsigned char *)cont; /* UGLY CAST! RL */
1051                 stmp->length = len;

```

```

1052         *free_cont = 0;
1053     }
1054     else
1055     {
1056         if (!ASN1_STRING_set(stmp, cont, len))
1057         {
1058             ASN1err(ASN1_F_ASN1_EX_C2I,
1059                     ERR_R_MALLOC_FAILURE);
1060             ASN1_STRING_free(stmp);
1061             *pval = NULL;
1062             goto err;
1063         }
1064     }
1065     break;
1066 }
1067 /* If ASN1_ANY and NULL type fix up value */
1068 if (typ && (utype == V_ASN1_NULL))
1069     typ->value.ptr = NULL;
1071 ret = 1;
1072 err:
1073 if (!ret)
1074 {
1075     ASN1_TYPE_free(typ);
1076     if (opval)
1077         *opval = NULL;
1078 }
1079 return ret;
1080 }

```

```

1083 /* This function finds the end of an ASN1 structure when passed its maximum
1084  * length, whether it is indefinite length and a pointer to the content.
1085  * This is more efficient than calling asn1_collect because it does not
1086  * recurse on each indefinite length header.
1087 */

```

```

1089 static int asn1_find_end(const unsigned char **in, long len, char inf)
1090 {
1091     int expected_eoc;
1092     long plen;
1093     const unsigned char *p = *in, *q;
1094     /* If not indefinite length constructed just add length */
1095     if (inf == 0)
1096     {
1097         *in += len;
1098         return 1;
1099     }
1100     expected_eoc = 1;
1101     /* Indefinite length constructed form. Find the end when enough EOCs
1102      * are found. If more indefinite length constructed headers
1103      * are encountered increment the expected eoc count otherwise just
1104      * skip to the end of the data.
1105      */
1106     while (len > 0)
1107     {
1108         if (asn1_check_eoc(&p, len))
1109         {
1110             expected_eoc--;
1111             if (expected_eoc == 0)
1112                 break;
1113             len -= 2;
1114             continue;
1115         }
1116         q = p;
1117         /* Just read in a header: only care about the length */

```

```

1118         if (!asn1_check_tlen(&plen, NULL, NULL, &inf, NULL, &p, len,
1119                             -1, 0, 0, NULL))
1120         {
1121             ASN1err(ASN1_F_ASN1_FIND_END, ERR_R_NESTED_ASN1_ERROR);
1122             return 0;
1123         }
1124         if (inf)
1125             expected_eoc++;
1126         else
1127             p += plen;
1128         len -= p - q;
1129     }
1130     if (expected_eoc)
1131     {
1132         ASN1err(ASN1_F_ASN1_FIND_END, ASN1_R_MISSING_EOC);
1133         return 0;
1134     }
1135     *in = p;
1136     return 1;
1137 }
1138 /* This function collects the asn1 data from a constructed string
1139  * type into a buffer. The values of 'in' and 'len' should refer
1140  * to the contents of the constructed type and 'inf' should be set
1141  * if it is indefinite length.
1142 */

```

```

1144 #ifndef ASN1_MAX_STRING_NEST
1145 /* This determines how many levels of recursion are permitted in ASN1
1146  * string types. If it is not limited stack overflows can occur. If set
1147  * to zero no recursion is allowed at all. Although zero should be adequate
1148  * examples exist that require a value of 1. So 5 should be more than enough.
1149 */
1150 #define ASN1_MAX_STRING_NEST 5
1151 #endif

```

```

1154 static int asn1_collect(BUF_MEM *buf, const unsigned char **in, long len,
1155                        char inf, int tag, int aclass, int depth)
1156 {
1157     const unsigned char *p, *q;
1158     long plen;
1159     char cst, ininf;
1160     p = *in;
1161     inf &= 1;
1162     /* If no buffer and not indefinite length constructed just pass over
1163      * the encoded data */
1164     if (!buf && !inf)
1165     {
1166         *in += len;
1167         return 1;
1168     }
1169     while (len > 0)
1170     {
1171         q = p;
1172         /* Check for EOC */
1173         if (asn1_check_eoc(&p, len))
1174         {
1175             /* EOC is illegal outside indefinite length
1176              * constructed form */
1177             if (!inf)
1178             {
1179                 ASN1err(ASN1_F_ASN1_COLLECT,
1180                         ASN1_R_UNEXPECTED_EOC);
1181                 return 0;
1182             }
1183             inf = 0;

```



```

1184         break;
1185     }

1187     if (!asn1_check_tlen(&plen, NULL, NULL, &ininf, &cst, &p,
1188         len, tag, aclass, 0, NULL))
1189     {
1190         ASN1err(ASN1_F_ASN1_COLLECT, ERR_R_NESTED_ASN1_ERROR);
1191         return 0;
1192     }

1194     /* If indefinite length constructed update max length */
1195     if (cst)
1196     {
1197         if (depth >= ASN1_MAX_STRING_NEST)
1198         {
1199             ASN1err(ASN1_F_ASN1_COLLECT,
1200                 ASN1_R_NESTED_ASN1_STRING);
1201             return 0;
1202         }
1203         if (!asn1_collect(buf, &p, plen, ininf, tag, aclass,
1204             depth + 1))
1205             return 0;
1206     }
1207     else if (plen && !collect_data(buf, &p, plen))
1208         return 0;
1209     len -= p - q;
1210 }
1211 if (inif)
1212 {
1213     ASN1err(ASN1_F_ASN1_COLLECT, ASN1_R_MISSING_EOC);
1214     return 0;
1215 }
1216 *in = p;
1217 return 1;
1218 }

1220 static int collect_data(BUF_MEM *buf, const unsigned char **p, long plen)
1221 {
1222     int len;
1223     if (buf)
1224     {
1225         len = buf->length;
1226         if (!BUF_MEM_grow_clean(buf, len + plen))
1227         {
1228             ASN1err(ASN1_F_COLLECT_DATA, ERR_R_MALLOC_FAILURE);
1229             return 0;
1230         }
1231         memcpy(buf->data + len, *p, plen);
1232     }
1233     *p += plen;
1234     return 1;
1235 }

1237 /* Check for ASN1 EOC and swallow it if found */

1239 static int asn1_check_eoc(const unsigned char **in, long len)
1240 {
1241     const unsigned char *p;
1242     if (len < 2) return 0;
1243     p = *in;
1244     if (!p[0] && !p[1])
1245     {
1246         *in += 2;
1247         return 1;
1248     }
1249     return 0;

```

```

1250     }

1252 /* Check an ASN1 tag and length: a bit like ASN1_get_object
1253  * but it sets the length for indefinite length constructed
1254  * form, we don't know the exact length but we can set an
1255  * upper bound to the amount of data available minus the
1256  * header length just read.
1257  */

1259 static int asn1_check_tlen(long *olen, int *otag, unsigned char *oclass,
1260     char *inif, char *cst,
1261     const unsigned char **in, long len,
1262     int exptag, int expclass, char opt,
1263     ASN1_TLC *ctx)
1264 {
1265     int i;
1266     int ptag, pclass;
1267     long plen;
1268     const unsigned char *p, *q;
1269     p = *in;
1270     q = p;

1272     if (ctx && ctx->valid)
1273     {
1274         i = ctx->ret;
1275         plen = ctx->plen;
1276         pclass = ctx->pclass;
1277         ptag = ctx->ptag;
1278         p += ctx->hdrlen;
1279     }
1280     else
1281     {
1282         i = ASN1_get_object(&p, &plen, &ptag, &pclass, len);
1283         if (ctx)
1284         {
1285             ctx->ret = i;
1286             ctx->plen = plen;
1287             ctx->pclass = pclass;
1288             ctx->ptag = ptag;
1289             ctx->hdrlen = p - q;
1290             ctx->valid = 1;
1291             /* If definite length, and no error, length +
1292              * header can't exceed total amount of data available.
1293              */
1294             if (!(i & 0x81) && ((plen + ctx->hdrlen) > len))
1295             {
1296                 ASN1err(ASN1_F_ASN1_CHECK_TLEN,
1297                     ASN1_R_TOO_LONG);
1298                 asn1_tlc_clear(ctx);
1299                 return 0;
1300             }
1301         }
1302     }

1304     if (i & 0x80)
1305     {
1306         ASN1err(ASN1_F_ASN1_CHECK_TLEN, ASN1_R_BAD_OBJECT_HEADER);
1307         asn1_tlc_clear(ctx);
1308         return 0;
1309     }
1310     if (exptag >= 0)
1311     {
1312         if ((exptag != ptag) || (expclass != pclass))
1313         {
1314             /* If type is OPTIONAL, not an error:
1315              * indicate missing type.

```

```
1316         */
1317         if (opt) return -1;
1318         asn1_tlc_clear(ctx);
1319         ASN1err(ASN1_F_ASN1_CHECK_TLEN, ASN1_R_WRONG_TAG);
1320         return 0;
1321     }
1322     /* We have a tag and class match:
1323      * assume we are going to do something with it */
1324     asn1_tlc_clear(ctx);
1325 }
1327 if (i & 1)
1328     plen = len - (p - q);
1330 if (inf)
1331     *inf = i & 1;
1333 if (cst)
1334     *cst = i & V_ASN1_CONSTRUCTED;
1336 if (olen)
1337     *olen = plen;
1339 if (oclass)
1340     *oclass = pclass;
1342 if (otag)
1343     *otag = ptag;
1345 *in = p;
1346 return 1;
1347 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_enc.c

1

```
*****
18091 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* tasn_enc.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000-2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
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18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
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24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

60 #include <stddef.h>
61 #include <string.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_enc.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/asn1.h>
64 #include <openssl/asn1t.h>
65 #include <openssl/objects.h>

67 static int asn1_i2d_ex_primitive(ASN1_VALUE **pval, unsigned char **out,
68                                 const ASN1_ITEM *it,
69                                 int tag, int aclass);
70 static int asn1_set_seq_out(STACK_OF(ASN1_VALUE) *sk, unsigned char **out,
71                             int skcontlen, const ASN1_ITEM *item,
72                             int do_sort, int iclass);
73 static int asn1_template_ex_i2d(ASN1_VALUE **pval, unsigned char **out,
74                                 const ASN1_TEMPLATE *tt,
75                                 int tag, int aclass);
76 static int asn1_item_flags_i2d(ASN1_VALUE *val, unsigned char **out,
77                                const ASN1_ITEM *it, int flags);

79 /* Top level i2d equivalents: the 'ndef' variant instructs the encoder
80  * to use indefinite length constructed encoding, where appropriate
81  */

83 int ASN1_item_ndef_i2d(ASN1_VALUE *val, unsigned char **out,
84                        const ASN1_ITEM *it)
85 {
86     return asn1_item_flags_i2d(val, out, it, ASN1_TFLG_NDEF);
87 }

89 int ASN1_item_i2d(ASN1_VALUE *val, unsigned char **out, const ASN1_ITEM *it)
90 {
91     return asn1_item_flags_i2d(val, out, it, 0);
92 }

94 /* Encode an ASN1 item, this is use by the
95  * standard 'i2d' function. 'out' points to
96  * a buffer to output the data to.
97  *
98  * The new i2d has one additional feature. If the output
99  * buffer is NULL (i.e. *out == NULL) then a buffer is
100 * allocated and populated with the encoding.
101 */

103 static int asn1_item_flags_i2d(ASN1_VALUE *val, unsigned char **out,
104                                const ASN1_ITEM *it, int flags)
105 {
106     if (out && !*out)
107     {
108         unsigned char *p, *buf;
109         int len;
110         len = ASN1_item_ex_i2d(&val, NULL, it, -1, flags);
111         if (len <= 0)
112             return len;
113         buf = OPENSSL_malloc(len);
114         if (!buf)
115             return -1;
116         p = buf;
117         ASN1_item_ex_i2d(&val, &p, it, -1, flags);
118         *out = buf;
119         return len;
120     }

122     return ASN1_item_ex_i2d(&val, out, it, -1, flags);
123 }

125 /* Encode an item, taking care of IMPLICIT tagging (if any).
126  * This function performs the normal item handling: it can be
127  * used in external types.
```

```

128 */
130 int ASN1_item_ex_i2d(ASN1_VALUE **pval, unsigned char **out,
131                     const ASN1_ITEM *it, int tag, int aclass)
132 {
133     const ASN1_TEMPLATE *tt = NULL;
134     unsigned char *p = NULL;
135     int i, seqcontlen, seqlen, ndef = 1;
136     const ASN1_COMPAT_FUNCS *cf;
137     const ASN1_EXTERN_FUNCS *ef;
138     const ASN1_AUX *aux = it->funcs;
139     ASN1_aux_cb *asn1_cb = 0;
141     if ((it->itype != ASN1_ITYPE_PRIMITIVE) && !*pval)
142         return 0;
144     if (aux && aux->asn1_cb)
145         asn1_cb = aux->asn1_cb;
147     switch(it->itype)
148     {
149         case ASN1_ITYPE_PRIMITIVE:
150             if (it->templates)
151                 return asn1_template_ex_i2d(pval, out, it->templates,
152                                             tag, aclass);
153             return asn1_i2d_ex_primitive(pval, out, it, tag, aclass);
154             break;
155
156         case ASN1_ITYPE_MSTRING:
157             return asn1_i2d_ex_primitive(pval, out, it, -1, aclass);
158
159         case ASN1_ITYPE_CHOICE:
160             if (asn1_cb && !asn1_cb(ASN1_OP_I2D_PRE, pval, it, NULL))
161                 return 0;
162             i = asn1_get_choice_selector(pval, it);
163             if ((i >= 0) && (i < it->tcount))
164             {
165                 ASN1_VALUE **pchval;
166                 const ASN1_TEMPLATE *chtt;
167                 chtt = it->templates + i;
168                 pchval = asn1_get_field_ptr(pval, chtt);
169                 return asn1_template_ex_i2d(pchval, out, chtt,
170                                             -1, aclass);
171             }
172             /* Fixme: error condition if selector out of range */
173             if (asn1_cb && !asn1_cb(ASN1_OP_I2D_POST, pval, it, NULL))
174                 return 0;
175             break;
176
177         case ASN1_ITYPE_EXTERN:
178             /* If new style i2d it does all the work */
179             ef = it->funcs;
180             return ef->asn1_ex_i2d(pval, out, it, tag, aclass);
181
182         case ASN1_ITYPE_COMPAT:
183             /* old style hackery... */
184             cf = it->funcs;
185             if (out)
186                 p = *out;
187             i = cf->asn1_i2d(*pval, out);
188             /* Fixup for IMPLICIT tag: note this messes up for tags > 30,
189              * but so did the old code. Tags > 30 are very rare anyway.
190              */
191             if (out && (tag != -1))
192                 *p = aclass | tag | (*p & V_ASN1_CONSTRUCTED);
193     }

```

```

194     return i;
195
196     case ASN1_ITYPE_NDEF_SEQUENCE:
197         /* Use indefinite length constructed if requested */
198         if (aclass & ASN1_TFLG_NDEF) ndef = 2;
199         /* fall through */
201
202     case ASN1_ITYPE_SEQUENCE:
203         i = asn1_enc_restore(&seqcontlen, out, pval, it);
204         /* An error occurred */
205         if (i < 0)
206             return 0;
207         /* We have a valid cached encoding... */
208         if (i > 0)
209             return seqcontlen;
210         /* Otherwise carry on */
211         seqcontlen = 0;
212         /* If no IMPLICIT tagging set to SEQUENCE, UNIVERSAL */
213         if (tag == -1)
214         {
215             tag = V_ASN1_SEQUENCE;
216             /* Retain any other flags in aclass */
217             aclass = (aclass & ~ASN1_TFLG_TAG_CLASS)
218                     | V_ASN1_UNIVERSAL;
219         }
220         if (asn1_cb && !asn1_cb(ASN1_OP_I2D_PRE, pval, it, NULL))
221             return 0;
222         /* First work out sequence content length */
223         for (i = 0, tt = it->templates; i < it->tcount; tt++, i++)
224         {
225             const ASN1_TEMPLATE *seqtt;
226             ASN1_VALUE **pseqval;
227             seqtt = asn1_do_adb(pval, tt, 1);
228             if (!seqtt)
229                 return 0;
230             pseqval = asn1_get_field_ptr(pval, seqtt);
231             /* FIXME: check for errors in enhanced version */
232             seqcontlen += asn1_template_ex_i2d(pseqval, NULL, seqtt,
233                                             -1, aclass);
234         }
235
236         seqlen = ASN1_object_size(ndef, seqcontlen, tag);
237         if (!out)
238             return seqlen;
239         /* Output SEQUENCE header */
240         ASN1_put_object(out, ndef, seqcontlen, tag, aclass);
241         for (i = 0, tt = it->templates; i < it->tcount; tt++, i++)
242         {
243             const ASN1_TEMPLATE *seqtt;
244             ASN1_VALUE **pseqval;
245             seqtt = asn1_do_adb(pval, tt, 1);
246             if (!seqtt)
247                 return 0;
248             pseqval = asn1_get_field_ptr(pval, seqtt);
249             /* FIXME: check for errors in enhanced version */
250             asn1_template_ex_i2d(pseqval, out, seqtt, -1, aclass);
251         }
252         if (ndef == 2)
253             ASN1_put_eoc(out);
254         if (asn1_cb && !asn1_cb(ASN1_OP_I2D_POST, pval, it, NULL))
255             return 0;
256
257         return seqlen;
258
259     default:
260         return 0;

```

```

260     }
261     return 0;
262 }

264 int ASN1_template_i2d(ASN1_VALUE **pval, unsigned char **out,
265                      const ASN1_TEMPLATE *tt)
266 {
267     return asn1_template_ex_i2d(pval, out, tt, -1, 0);
268 }

270 static int asn1_template_ex_i2d(ASN1_VALUE **pval, unsigned char **out,
271                                const ASN1_TEMPLATE *tt, int tag, int iclass)
272 {
273     int i, ret, flags, ttag, tclass, ndef;
274     flags = tt->flags;
275     /* Work out tag and class to use: tagging may come
276      * either from the template or the arguments, not both
277      * because this would create ambiguity. Additionally
278      * the iclass argument may contain some additional flags
279      * which should be noted and passed down to other levels.
280      */
281     if (flags & ASN1_TFLG_TAG_MASK)
282     {
283         /* Error if argument and template tagging */
284         if (tag != -1)
285             /* FIXME: error code here */
286             return -1;
287         /* Get tagging from template */
288         ttag = tt->tag;
289         tclass = flags & ASN1_TFLG_TAG_CLASS;
290     }
291     else if (tag != -1)
292     {
293         /* No template tagging, get from arguments */
294         ttag = tag;
295         tclass = iclass & ASN1_TFLG_TAG_CLASS;
296     }
297     else
298     {
299         ttag = -1;
300         tclass = 0;
301     }
302     /*
303      * Remove any class mask from iflag.
304      */
305     iclass &= ~ASN1_TFLG_TAG_CLASS;

307     /* At this point 'ttag' contains the outer tag to use,
308      * 'tclass' is the class and iclass is any flags passed
309      * to this function.
310      */

312     /* if template and arguments require ndef, use it */
313     if ((flags & ASN1_TFLG_NDEF) && (iclass & ASN1_TFLG_NDEF))
314         ndef = 2;
315     else ndef = 1;

317     if (flags & ASN1_TFLG_SK_MASK)
318     {
319         /* SET OF, SEQUENCE OF */
320         STACK_OF(ASN1_VALUE) *sk = (STACK_OF(ASN1_VALUE) *)pval;
321         int isset, sktag, skaclass;
322         int skcontlen, sklen;
323         ASN1_VALUE *skitem;

325         if (!*pval)

```

```

326         return 0;

328         if (flags & ASN1_TFLG_SET_OF)
329         {
330             isset = 1;
331             /* 2 means we reorder */
332             if (flags & ASN1_TFLG_SEQUENCE_OF)
333                 isset = 2;
334         }
335         else isset = 0;

337         /* Work out inner tag value: if EXPLICIT
338          * or no tagging use underlying type.
339          */
340         if ((ttag != -1) && !(flags & ASN1_TFLG_EXPTAG))
341         {
342             sktag = ttag;
343             skaclass = tclass;
344         }
345         else
346         {
347             skaclass = V_ASN1_UNIVERSAL;
348             if (isset)
349                 sktag = V_ASN1_SET;
350             else sktag = V_ASN1_SEQUENCE;
351         }

353         /* Determine total length of items */
354         skcontlen = 0;
355         for (i = 0; i < sk_ASN1_VALUE_num(sk); i++)
356         {
357             skitem = sk_ASN1_VALUE_value(sk, i);
358             skcontlen += ASN1_item_ex_i2d(&skitem, NULL,
359                                           ASN1_ITEM_ptr(tt->item),
360                                           -1, iclass);
361         }
362         sklen = ASN1_object_size(ndef, skcontlen, sktag);
363         /* If EXPLICIT need length of surrounding tag */
364         if (flags & ASN1_TFLG_EXPTAG)
365             ret = ASN1_object_size(ndef, sklen, ttag);
366         else ret = sklen;

368         if (!out)
369             return ret;

371         /* Now encode this lot... */
372         /* EXPLICIT tag */
373         if (flags & ASN1_TFLG_EXPTAG)
374             ASN1_put_object(out, ndef, sklen, ttag, tclass);
375         /* SET or SEQUENCE and IMPLICIT tag */
376         ASN1_put_object(out, ndef, skcontlen, sktag, skaclass);
377         /* And the stuff itself */
378         asn1_set_seq_out(sk, out, skcontlen, ASN1_ITEM_ptr(tt->item),
379                         isset, iclass);
380         if (ndef == 2)
381         {
382             ASN1_put_eoc(out);
383             if (flags & ASN1_TFLG_EXPTAG)
384                 ASN1_put_eoc(out);
385         }

387         return ret;
388     }

390     if (flags & ASN1_TFLG_EXPTAG)
391     {

```

```

392     /* EXPLICIT tagging */
393     /* Find length of tagged item */
394     i = ASN1_item_ex_i2d(pval, NULL, ASN1_ITEM_ptr(tt->item),
395                          -1, iclass);
396     if (!i)
397         return 0;
398     /* Find length of EXPLICIT tag */
399     ret = ASN1_object_size(ndef, i, ttag);
400     if (out)
401     {
402         /* Output tag and item */
403         ASN1_put_object(out, ndef, i, ttag, tclass);
404         ASN1_item_ex_i2d(pval, out, ASN1_ITEM_ptr(tt->item),
405                          -1, iclass);
406         if (ndef == 2)
407             ASN1_put_eoc(out);
408     }
409     return ret;
410 }

412 /* Either normal or IMPLICIT tagging: combine class and flags */
413 return ASN1_item_ex_i2d(pval, out, ASN1_ITEM_ptr(tt->item),
414                          ttag, tclass | iclass);

416 }

418 /* Temporary structure used to hold DER encoding of items for SET OF */

420 typedef struct {
421     unsigned char *data;
422     int length;
423     ASN1_VALUE *field;
424 } DER_ENC;

426 static int der_cmp(const void *a, const void *b)
427 {
428     const DER_ENC *d1 = a, *d2 = b;
429     int cmplen, i;
430     cmplen = (d1->length < d2->length) ? d1->length : d2->length;
431     i = memcmp(d1->data, d2->data, cmplen);
432     if (i)
433         return i;
434     return d1->length - d2->length;
435 }

437 /* Output the content octets of SET OF or SEQUENCE OF */

439 static int asn1_set_seq_out(STACK_OF(ASN1_VALUE) *sk, unsigned char **out,
440                             int skcontlen, const ASN1_ITEM *item,
441                             int do_sort, int iclass)
442 {
443     int i;
444     ASN1_VALUE *skitem;
445     unsigned char *tmpdat = NULL, *p = NULL;
446     DER_ENC *derlst = NULL, *tder;
447     if (do_sort)
448     {
449         /* Don't need to sort less than 2 items */
450         if (sk_ASN1_VALUE_num(sk) < 2)
451             do_sort = 0;
452         else
453         {
454             derlst = OPENSSL_malloc(sk_ASN1_VALUE_num(sk)
455                                     * sizeof(*derlst));
456             tmpdat = OPENSSL_malloc(skcontlen);
457             if (!derlst || !tmpdat)

```

```

458         return 0;
459     }
460     /* If not sorting just output each item */
461     if (!do_sort)
462     {
463         for (i = 0; i < sk_ASN1_VALUE_num(sk); i++)
464         {
465             skitem = sk_ASN1_VALUE_value(sk, i);
466             ASN1_item_ex_i2d(&skitem, out, item, -1, iclass);
467         }
468         return 1;
469     }
470     p = tmpdat;
471
473     /* Doing sort: build up a list of each member's DER encoding */
474     for (i = 0, tder = derlst; i < sk_ASN1_VALUE_num(sk); i++, tder++)
475     {
476         skitem = sk_ASN1_VALUE_value(sk, i);
477         tder->data = p;
478         tder->length = ASN1_item_ex_i2d(&skitem, &p, item, -1, iclass);
479         tder->field = skitem;
480     }

482     /* Now sort them */
483     qsort(derlst, sk_ASN1_VALUE_num(sk), sizeof(*derlst), der_cmp);
484     /* Output sorted DER encoding */
485     p = *out;
486     for (i = 0, tder = derlst; i < sk_ASN1_VALUE_num(sk); i++, tder++)
487     {
488         memcpy(p, tder->data, tder->length);
489         p += tder->length;
490     }
491     *out = p;
492     /* If do_sort is 2 then reorder the STACK */
493     if (do_sort == 2)
494     {
495         for (i = 0, tder = derlst; i < sk_ASN1_VALUE_num(sk);
496              i++, tder++)
497             (void)sk_ASN1_VALUE_set(sk, i, tder->field);
498     }
499     OPENSSL_free(derlst);
500     OPENSSL_free(tmpdat);
501     return 1;
502 }

504 static int asn1_i2d_ex_primitive(ASN1_VALUE **pval, unsigned char **out,
505                                 const ASN1_ITEM *it, int tag, int aclass)
506 {
507     int len;
508     int utype;
509     int usetag;
510     int ndef = 0;

512     utype = it->utype;

514     /* Get length of content octets and maybe find
515      * out the underlying type.
516      */

518     len = asn1_ex_i2c(pval, NULL, &utype, it);

520     /* If SEQUENCE, SET or OTHER then header is
521      * included in pseudo content octets so don't
522      * include tag+length. We need to check here
523      * because the call to asn1_ex_i2c() could change

```

```

524     * utype.
525     */
526     if ((utype == V_ASN1_SEQUENCE) || (utype == V_ASN1_SET) ||
527         (utype == V_ASN1_OTHER))
528         usetag = 0;
529     else usetag = 1;
531     /* -1 means omit type */
533     if (len == -1)
534         return 0;
536     /* -2 return is special meaning use ndef */
537     if (len == -2)
538     {
539         ndef = 2;
540         len = 0;
541     }
543     /* If not implicitly tagged get tag from underlying type */
544     if (tag == -1) tag = utype;
546     /* Output tag+length followed by content octets */
547     if (out)
548     {
549         if (usetag)
550             ASN1_put_object(out, ndef, len, tag, aclass);
551         asn1_ex_i2c(pval, *out, &utype, it);
552         if (ndef)
553             ASN1_put_eoc(out);
554         else
555             *out += len;
556     }
558     if (usetag)
559         return ASN1_object_size(ndef, len, tag);
560     return len;
561 }
563 /* Produce content octets from a structure */
565 int asn1_ex_i2c(ASN1_VALUE **pval, unsigned char *cout, int *putype,
566                 const ASN1_ITEM *it)
567 {
568     ASN1_BOOLEAN *tbool = NULL;
569     ASN1_STRING *strtmp;
570     ASN1_OBJECT *otmp;
571     int utype;
572     const unsigned char *cont;
573     unsigned char c;
574     int len;
575     const ASN1_PRIMITIVE_FUNCS *pf;
576     pf = it->funcs;
577     if (pf && pf->prim_i2c)
578         return pf->prim_i2c(pval, cout, putype, it);
580     /* Should type be omitted? */
581     if ((it->itype != ASN1_ITYPE_PRIMITIVE)
582         || (it->utype != V_ASN1_BOOLEAN))
583     {
584         if (!*pval) return -1;
585     }
587     if (it->itype == ASN1_ITYPE_MSTRING)
588     {
589         /* If MSTRING type set the underlying type */

```

```

590     strtmp = (ASN1_STRING *)*pval;
591     utype = strtmp->type;
592     *putype = utype;
593 }
594 else if (it->utype == V_ASN1_ANY)
595 {
596     /* If ANY set type and pointer to value */
597     ASN1_TYPE *typ;
598     typ = (ASN1_TYPE *)*pval;
599     utype = typ->type;
600     *putype = utype;
601     pval = &typ->value.asn1_value;
602 }
603 else utype = *putype;
605 switch(utype)
606 {
607     case V_ASN1_OBJECT:
608         otmp = (ASN1_OBJECT *)*pval;
609         cont = otmp->data;
610         len = otmp->length;
611         break;
613     case V_ASN1_NULL:
614         cont = NULL;
615         len = 0;
616         break;
618     case V_ASN1_BOOLEAN:
619         tbool = (ASN1_BOOLEAN *)*pval;
620         if (*tbool == -1)
621             return -1;
622         if (it->utype != V_ASN1_ANY)
623         {
624             /* Default handling if value == size field then omit */
625             if (*tbool && (it->size > 0))
626                 return -1;
627             if (!*tbool && !it->size)
628                 return -1;
629         }
630         c = (unsigned char)*tbool;
631         cont = &c;
632         len = 1;
633         break;
635     case V_ASN1_BIT_STRING:
636         return i2c_ASN1_BIT_STRING((ASN1_BIT_STRING *)*pval,
637                                     cout ? &cout : NULL);
638         break;
640     case V_ASN1_INTEGER:
641     case V_ASN1_NEG_INTEGER:
642     case V_ASN1_ENUMERATED:
643     case V_ASN1_NEG_ENUMERATED:
644         /* These are all have the same content format
645          * as ASN1_INTEGER
646          */
647         return i2c_ASN1_INTEGER((ASN1_INTEGER *)*pval,
648                                 cout ? &cout : NULL);
649         break;
651     case V_ASN1_OCTET_STRING:
652     case V_ASN1_NUMERICSTRING:
653     case V_ASN1_PRINTABLESTRING:
654     case V_ASN1_T61STRING:
655     case V_ASN1_VIDEOTEXSTRING:

```

```
656         case V_ASN1_IA5STRING:
657         case V_ASN1_UTCTIME:
658         case V_ASN1_GENERALIZEDTIME:
659         case V_ASN1_GRAPHICSTRING:
660         case V_ASN1_VISIBLESTRING:
661         case V_ASN1_GENERALSTRING:
662         case V_ASN1_UNIVERSALSTRING:
663         case V_ASN1_BMPSTRING:
664         case V_ASN1_UTF8STRING:
665         case V_ASN1_SEQUENCE:
666         case V_ASN1_SET:
667         default:
668             /* All based on ASN1_STRING and handled the same */
669             strtmp = (ASN1_STRING *)pval;
670             /* Special handling for NDEF */
671             if ((it->size == ASN1_TFLG_NDEF)
672                 && (strtmp->flags & ASN1_STRING_FLAG_NDEF))
673             {
674                 if (cout)
675                 {
676                     strtmp->data = cout;
677                     strtmp->length = 0;
678                 }
679                 /* Special return code */
680                 return -2;
681             }
682             cont = strtmp->data;
683             len = strtmp->length;
684
685             break;
686     }
687 }
688 if (cout && len)
689     memcpy(cout, cont, len);
690 return len;
691 }
```


new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_fre.c

1

```
*****
6924 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_fre.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* tasn_fre.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
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46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
60 #include <stddef.h>
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_fre.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/objects.h>
65 static void asn1_item_combine_free(ASN1_VALUE **pval, const ASN1_ITEM *it, int c
67 /* Free up an ASN1 structure */
69 void asn1_item_free(ASN1_VALUE *val, const ASN1_ITEM *it)
70 {
71     asn1_item_combine_free(&val, it, 0);
72 }
74 void asn1_item_ex_free(ASN1_VALUE **pval, const ASN1_ITEM *it)
75 {
76     asn1_item_combine_free(pval, it, 0);
77 }
79 static void asn1_item_combine_free(ASN1_VALUE **pval, const ASN1_ITEM *it, int c
80 {
81     const ASN1_TEMPLATE *tt = NULL, *seqtt;
82     const ASN1_EXTERN_FUNCS *ef;
83     const ASN1_COMPAT_FUNCS *cf;
84     const ASN1_AUX *aux = it->funcs;
85     ASN1_aux_cb *asn1_cb;
86     int i;
87     if (!pval)
88         return;
89     if ((it->itype != ASN1_ITYPE_PRIMITIVE) && !*pval)
90         return;
91     if (aux && aux->asn1_cb)
92         asn1_cb = aux->asn1_cb;
93     else
94         asn1_cb = 0;
96     switch(it->itype)
97     {
99         case ASN1_ITYPE_PRIMITIVE:
100             if (it->templates)
101                 ASN1_template_free(pval, it->templates);
102             else
103                 ASN1_primitive_free(pval, it);
104             break;
106         case ASN1_ITYPE_MSTRING:
107             ASN1_primitive_free(pval, it);
108             break;
110         case ASN1_ITYPE_CHOICE:
111             if (asn1_cb)
112             {
113                 i = asn1_cb(ASN1_OP_FREE_PRE, pval, it, NULL);
114                 if (i == 2)
115                     return;
116             }
117             i = asn1_get_choice_selector(pval, it);
118             if ((i >= 0) && (i < it->tcount))
119             {
120                 ASN1_VALUE **pchval;
121                 tt = it->templates + i;
122                 pchval = asn1_get_field_ptr(pval, tt);
123                 ASN1_template_free(pchval, tt);
124             }
125             if (asn1_cb)
126                 asn1_cb(ASN1_OP_FREE_POST, pval, it, NULL);
127             if (!combine)
```

```

128         {
129             OPENSSL_free(*pval);
130             *pval = NULL;
131         }
132     break;

134     case ASN1_ITYPE_COMPAT:
135         cf = it->funcs;
136         if (cf && cf->asn1_free)
137             cf->asn1_free(*pval);
138     break;

140     case ASN1_ITYPE_EXTERN:
141         ef = it->funcs;
142         if (ef && ef->asn1_ex_free)
143             ef->asn1_ex_free(pval, it);
144     break;

146     case ASN1_ITYPE_NDEF_SEQUENCE:
147     case ASN1_ITYPE_SEQUENCE:
148         if (asn1_do_lock(pval, -1, it) > 0)
149             return;
150         if (asn1_cb)
151             {
152                 i = asn1_cb(ASN1_OP_FREE_PRE, pval, it, NULL);
153                 if (i == 2)
154                     return;
155             }
156         asn1_enc_free(pval, it);
157         /* If we free up as normal we will invalidate any
158          * ANY DEFINED BY field and we wont be able to
159          * determine the type of the field it defines. So
160          * free up in reverse order.
161          */
162         tt = it->templates + it->tcount - 1;
163         for (i = 0; i < it->tcount; tt--, i++)
164             {
165                 ASN1_VALUE **pseqval;
166                 seqtt = asn1_do_adb(pval, tt, 0);
167                 if (!seqtt)
168                     continue;
169                 pseqval = asn1_get_field_ptr(pval, seqtt);
170                 ASN1_template_free(pseqval, seqtt);
171             }
172         if (asn1_cb)
173             asn1_cb(ASN1_OP_FREE_POST, pval, it, NULL);
174         if (!combine)
175             {
176                 OPENSSL_free(*pval);
177                 *pval = NULL;
178             }
179     break;
180 }
181 }

183 void ASN1_template_free(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt)
184 {
185     int i;
186     if (tt->flags & ASN1_TFLG_SK_MASK)
187     {
188         STACK_OF(ASN1_VALUE) *sk = (STACK_OF(ASN1_VALUE) *)*pval;
189         for (i = 0; i < sk_ASN1_VALUE_num(sk); i++)
190             {
191                 ASN1_VALUE *vtmp;
192                 vtmp = sk_ASN1_VALUE_value(sk, i);
193                 asn1_item_combine_free(&vtmp, ASN1_ITEM_ptr(tt->item),

```

```

194                                     0);
195             }
196             sk_ASN1_VALUE_free(sk);
197             *pval = NULL;
198         }
199     else
200         asn1_item_combine_free(pval, ASN1_ITEM_ptr(tt->item),
201                                tt->flags & ASN1_TFLG_COMBINE);
202     }

204 void ASN1_primitive_free(ASN1_VALUE **pval, const ASN1_ITEM *it)
205 {
206     int utype;
207     if (it)
208     {
209         const ASN1_PRIMITIVE_FUNCS *pf;
210         pf = it->funcs;
211         if (pf && pf->prim_free)
212             {
213                 pf->prim_free(pval, it);
214                 return;
215             }
216     }
217     /* Special case: if 'it' is NULL free contents of ASN1_TYPE */
218     if (!it)
219     {
220         ASN1_TYPE *typ = (ASN1_TYPE *)*pval;
221         utype = typ->type;
222         pval = &typ->value.asn1_value;
223         if (!*pval)
224             return;
225     }
226     else if (it->itype == ASN1_ITYPE_MSTRING)
227     {
228         utype = -1;
229         if (!*pval)
230             return;
231     }
232     else
233     {
234         utype = it->utype;
235         if ((utype != V_ASN1_BOOLEAN) && !*pval)
236             return;
237     }

239     switch(utype)
240     {
241         case V_ASN1_OBJECT:
242             ASN1_OBJECT_free((ASN1_OBJECT *)*pval);
243             break;

245         case V_ASN1_BOOLEAN:
246             if (it)
247                 *(ASN1_BOOLEAN *)pval = it->size;
248             else
249                 *(ASN1_BOOLEAN *)pval = -1;
250             return;

252         case V_ASN1_NULL:
253             break;

255         case V_ASN1_ANY:
256             ASN1_primitive_free(pval, NULL);
257             OPENSSL_free(*pval);
258             break;

```

```
260         default:
261             ASN1_STRING_free((ASN1_STRING *)*pval);
262             *pval = NULL;
263             break;
264         }
265     *pval = NULL;
266 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_new.c

1

```
*****
9503 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_new.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* tasn_new.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000-2004 The OpenSSL Project. All rights reserved.
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9  * modification, are permitted provided that the following conditions
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47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

60 #include <stddef.h>
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_new.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/err.h>
64 #include <openssl/asn1t.h>
65 #include <string.h>

67 static int asn1_item_ex_combine_new(ASN1_VALUE **pval, const ASN1_ITEM *it,
68                                     int combine);
69 static void asn1_item_clear(ASN1_VALUE **pval, const ASN1_ITEM *it);
70 static void asn1_template_clear(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt);
71 static void asn1_primitive_clear(ASN1_VALUE **pval, const ASN1_ITEM *it);

73 ASN1_VALUE *ASN1_item_new(const ASN1_ITEM *it)
74 {
75     ASN1_VALUE *ret = NULL;
76     if (ASN1_item_ex_new(&ret, it) > 0)
77         return ret;
78     return NULL;
79 }

81 /* Allocate an ASN1 structure */

83 int ASN1_item_ex_new(ASN1_VALUE **pval, const ASN1_ITEM *it)
84 {
85     return asn1_item_ex_combine_new(pval, it, 0);
86 }

88 static int asn1_item_ex_combine_new(ASN1_VALUE **pval, const ASN1_ITEM *it,
89                                     int combine)
90 {
91     const ASN1_TEMPLATE *tt = NULL;
92     const ASN1_COMPAT_FUNCS *cf;
93     const ASN1_EXTERN_FUNCS *ef;
94     const ASN1_AUX *aux = it->funcs;
95     ASN1_aux_cb *asn1_cb;
96     ASN1_VALUE **pseqval;
97     int i;
98     if (aux && aux->asn1_cb)
99         asn1_cb = aux->asn1_cb;
100     else
101         asn1_cb = 0;

103     if (!combine) *pval = NULL;

105 #ifdef CRYPTO_MDEBUG
106     if (it->sname)
107         CRYPTO_push_info(it->sname);
108 #endif

110     switch(it->itype)
111     {
112     case ASN1_ITYPE_EXTERN:
113         ef = it->funcs;
114         if (ef && ef->asn1_ex_new)
115             if (!ef->asn1_ex_new(pval, it))
116                 goto memerr;
117         break;

119     case ASN1_ITYPE_COMPAT:
120         cf = it->funcs;
121         if (cf && cf->asn1_new) {
122             *pval = cf->asn1_new();
123             if (!*pval)
124                 goto memerr;
125         }
126     }
```

```

128     }
129     break;

131     case ASN1_ITYPE_PRIMITIVE:
132     if (it->templates)
133     {
134         if (!ASN1_template_new(pval, it->templates))
135             goto memerr;
136     }
137     else if (!ASN1_primitive_new(pval, it))
138         goto memerr;
139     break;

141     case ASN1_ITYPE_MSTRING:
142     if (!ASN1_primitive_new(pval, it))
143         goto memerr;
144     break;

146     case ASN1_ITYPE_CHOICE:
147     if (asn1_cb)
148     {
149         i = asn1_cb(ASN1_OP_NEW_PRE, pval, it, NULL);
150         if (!i)
151             goto auxerr;
152         if (i==2)
153         {
154             #ifdef CRYPTO_MDEBUG
155                 if (it->sname)
156                     CRYPTO_pop_info();
157             #endif
158             return 1;
159         }
160     }
161     if (!combine)
162     {
163         *pval = OPENSSL_malloc(it->size);
164         if (!*pval)
165             goto memerr;
166         memset(*pval, 0, it->size);
167     }
168     asn1_set_choice_selector(pval, -1, it);
169     if (asn1_cb && !asn1_cb(ASN1_OP_NEW_POST, pval, it, NULL))
170         goto auxerr;
171     break;

173     case ASN1_ITYPE_NDEF_SEQUENCE:
174     case ASN1_ITYPE_SEQUENCE:
175     if (asn1_cb)
176     {
177         i = asn1_cb(ASN1_OP_NEW_PRE, pval, it, NULL);
178         if (!i)
179             goto auxerr;
180         if (i==2)
181         {
182             #ifdef CRYPTO_MDEBUG
183                 if (it->sname)
184                     CRYPTO_pop_info();
185             #endif
186             return 1;
187         }
188     }
189     if (!combine)
190     {
191         *pval = OPENSSL_malloc(it->size);
192         if (!*pval)
193             goto memerr;

```

```

194         memset(*pval, 0, it->size);
195         asn1_do_lock(pval, 0, it);
196         asn1_enc_init(pval, it);
197     }
198     for (i = 0, tt = it->templates; i < it->tcount; tt++, i++)
199     {
200         pseqval = asn1_get_field_ptr(pval, tt);
201         if (!ASN1_template_new(pseqval, tt))
202             goto memerr;
203     }
204     if (asn1_cb && !asn1_cb(ASN1_OP_NEW_POST, pval, it, NULL))
205         goto auxerr;
206     break;
207 }
208 #ifdef CRYPTO_MDEBUG
209 if (it->sname) CRYPTO_pop_info();
210 #endif
211 return 1;

213 memerr:
214 ASN1err(ASN1_F_ASN1_ITEM_EX_COMBINE_NEW, ERR_R_MALLOC_FAILURE);
215 #ifdef CRYPTO_MDEBUG
216 if (it->sname) CRYPTO_pop_info();
217 #endif
218 return 0;

220 auxerr:
221 ASN1err(ASN1_F_ASN1_ITEM_EX_COMBINE_NEW, ASN1_R_AUX_ERROR);
222 ASN1_item_ex_free(pval, it);
223 #ifdef CRYPTO_MDEBUG
224 if (it->sname) CRYPTO_pop_info();
225 #endif
226 return 0;

228 }

230 static void asn1_item_clear(ASN1_VALUE **pval, const ASN1_ITEM *it)
231 {
232     const ASN1_EXTERN_FUNCS *ef;

234     switch(it->itype)
235     {

237         case ASN1_ITYPE_EXTERN:
238             ef = it->funcs;
239             if (ef && ef->asn1_ex_clear)
240                 ef->asn1_ex_clear(pval, it);
241             else *pval = NULL;
242             break;

244         case ASN1_ITYPE_PRIMITIVE:
245             if (it->templates)
246                 asn1_template_clear(pval, it->templates);
247             else
248                 asn1_primitive_clear(pval, it);
249             break;

251         case ASN1_ITYPE_MSTRING:
252             asn1_primitive_clear(pval, it);
253             break;

255         case ASN1_ITYPE_COMPAT:
256         case ASN1_ITYPE_CHOICE:
257         case ASN1_ITYPE_SEQUENCE:
258         case ASN1_ITYPE_NDEF_SEQUENCE:

```

```

260         *pval = NULL;
261         break;
262     }
263 }

266 int ASN1_template_new(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt)
267 {
268     const ASN1_ITEM *it = ASN1_ITEM_ptr(tt->item);
269     int ret;
270     if (tt->flags & ASN1_TFLG_OPTIONAL)
271     {
272         asn1_template_clear(pval, tt);
273         return 1;
274     }
275     /* If ANY DEFINED BY nothing to do */
276
277     if (tt->flags & ASN1_TFLG_ADB_MASK)
278     {
279         *pval = NULL;
280         return 1;
281     }
282 #ifdef CRYPTO_MDEBBUG
283     if (tt->field_name)
284         CRYPTO_push_info(tt->field_name);
285 #endif
286     /* If SET OF or SEQUENCE OF, its a STACK */
287     if (tt->flags & ASN1_TFLG_SK_MASK)
288     {
289         STACK_OF(ASN1_VALUE) *skval;
290         skval = sk_ASN1_VALUE_new_null();
291         if (!skval)
292         {
293             ASN1err(ASN1_F_ASN1_TEMPLATE_NEW, ERR_R_MALLOC_FAILURE);
294             ret = 0;
295             goto done;
296         }
297         *pval = (ASN1_VALUE *)skval;
298         ret = 1;
299         goto done;
300     }
301     /* Otherwise pass it back to the item routine */
302     ret = asn1_item_ex_combine_new(pval, it, tt->flags & ASN1_TFLG_COMBINE);
303     done:
304 #ifdef CRYPTO_MDEBBUG
305     if (it->sname)
306         CRYPTO_pop_info();
307 #endif
308     return ret;
309 }

311 static void asn1_template_clear(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt)
312 {
313     /* If ADB or STACK just NULL the field */
314     if (tt->flags & (ASN1_TFLG_ADB_MASK|ASN1_TFLG_SK_MASK))
315         *pval = NULL;
316     else
317         asn1_item_clear(pval, ASN1_ITEM_ptr(tt->item));
318 }

321 /* NB: could probably combine most of the real XXX_new() behaviour and junk
322  * all the old functions.
323  */

325 int ASN1_primitive_new(ASN1_VALUE **pval, const ASN1_ITEM *it)

```

```

326     {
327         ASN1_TYPE *typ;
328         ASN1_STRING *str;
329         int utype;

331         if (it && it->funcs)
332         {
333             const ASN1_PRIMITIVE_FUNCS *pf = it->funcs;
334             if (pf->prim_new)
335                 return pf->prim_new(pval, it);
336         }

338         if (!it || (it->itype == ASN1_ITYPE_MSTRING))
339             utype = -1;
340         else
341             utype = it->utype;
342         switch(utype)
343         {
344             case V_ASN1_OBJECT:
345                 *pval = (ASN1_VALUE *)OBJ_nid2obj(NID_undef);
346                 return 1;

348             case V_ASN1_BOOLEAN:
349                 *(ASN1_BOOLEAN *)pval = it->size;
350                 return 1;

352             case V_ASN1_NULL:
353                 *pval = (ASN1_VALUE *)1;
354                 return 1;

356             case V_ASN1_ANY:
357                 typ = OPENSSL_malloc(sizeof(ASN1_TYPE));
358                 if (!typ)
359                     return 0;
360                 typ->value.ptr = NULL;
361                 typ->type = -1;
362                 *pval = (ASN1_VALUE *)typ;
363                 break;

365             default:
366                 str = ASN1_STRING_type_new(utype);
367                 if (it->itype == ASN1_ITYPE_MSTRING && str)
368                     str->flags |= ASN1_STRING_FLAG_MSTRING;
369                 *pval = (ASN1_VALUE *)str;
370                 break;
371         }
372         if (*pval)
373             return 1;
374         return 0;
375     }

377 static void asn1_primitive_clear(ASN1_VALUE **pval, const ASN1_ITEM *it)
378 {
379     int utype;
380     if (it && it->funcs)
381     {
382         const ASN1_PRIMITIVE_FUNCS *pf = it->funcs;
383         if (pf->prim_clear)
384             pf->prim_clear(pval, it);
385         else
386             *pval = NULL;
387         return;
388     }
389     if (!it || (it->itype == ASN1_ITYPE_MSTRING))
390         utype = -1;
391     else

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_new.c

7

```
392         utype = it->utype;
393         if (utype == V_ASN1_BOOLEAN)
394             *(ASN1_BOOLEAN *)pval = it->size;
395         else *pval = NULL;
396     }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_prn.c

1

```
*****
14498 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_prn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* tasn_prn.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000,2005 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
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15  * 2. Redistributions in binary form must reproduce the above copyright
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18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
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25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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38  *
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40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

60 #include <stddef.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_prn.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/objects.h>
65 #include <openssl/buffer.h>
66 #include <openssl/err.h>
67 #include <openssl/x509v3.h>
68 #include "asn1_locl.h"

70 /* Print routines.
71  */

73 /* ASN1_PCTX routines */

75 ASN1_PCTX default_pctx =
76 {
77     ASN1_PCTX_FLAGS_SHOW_ABSENT, /* flags */
78     0, /* nm_flags */
79     0, /* cert_flags */
80     0, /* oid_flags */
81     0 /* str_flags */
82 };
83

85 ASN1_PCTX *ASN1_PCTX_new(void)
86 {
87     ASN1_PCTX *ret;
88     ret = OPENSSL_malloc(sizeof(ASN1_PCTX));
89     if (ret == NULL)
90     {
91         ASN1err(ASN1_F_ASN1_PCTX_NEW, ERR_R_MALLOC_FAILURE);
92         return NULL;
93     }
94     ret->flags = 0;
95     ret->nm_flags = 0;
96     ret->cert_flags = 0;
97     ret->oid_flags = 0;
98     ret->str_flags = 0;
99     return ret;
100 }

102 void ASN1_PCTX_free(ASN1_PCTX *p)
103 {
104     OPENSSL_free(p);
105 }

107 unsigned long ASN1_PCTX_get_flags(ASN1_PCTX *p)
108 {
109     return p->flags;
110 }

112 void ASN1_PCTX_set_flags(ASN1_PCTX *p, unsigned long flags)
113 {
114     p->flags = flags;
115 }

117 unsigned long ASN1_PCTX_get_nm_flags(ASN1_PCTX *p)
118 {
119     return p->nm_flags;
120 }

122 void ASN1_PCTX_set_nm_flags(ASN1_PCTX *p, unsigned long flags)
123 {
124     p->nm_flags = flags;
125 }

127 unsigned long ASN1_PCTX_get_cert_flags(ASN1_PCTX *p)
```



```

128     {
129         return p->cert_flags;
130     }

132 void ASN1_PCTX_set_cert_flags(ASN1_PCTX *p, unsigned long flags)
133 {
134     p->cert_flags = flags;
135 }

137 unsigned long ASN1_PCTX_get_oid_flags(ASN1_PCTX *p)
138 {
139     return p->oid_flags;
140 }

142 void ASN1_PCTX_set_oid_flags(ASN1_PCTX *p, unsigned long flags)
143 {
144     p->oid_flags = flags;
145 }

147 unsigned long ASN1_PCTX_get_str_flags(ASN1_PCTX *p)
148 {
149     return p->str_flags;
150 }

152 void ASN1_PCTX_set_str_flags(ASN1_PCTX *p, unsigned long flags)
153 {
154     p->str_flags = flags;
155 }

157 /* Main print routines */

159 static int asn1_item_print_ctx(BIO *out, ASN1_VALUE **fld, int indent,
160                               const ASN1_ITEM *it,
161                               const char *fname, const char *sname,
162                               int nohdr, const ASN1_PCTX *pctx);

164 int asn1_template_print_ctx(BIO *out, ASN1_VALUE **fld, int indent,
165                             const ASN1_TEMPLATE *tt, const ASN1_PCTX *pctx);

167 static int asn1_primitive_print(BIO *out, ASN1_VALUE **fld,
168                                 const ASN1_ITEM *it, int indent,
169                                 const char *fname, const char *sname,
170                                 const ASN1_PCTX *pctx);

172 static int asn1_print_fsnname(BIO *out, int indent,
173                               const char *fname, const char *sname,
174                               const ASN1_PCTX *pctx);

176 int ASN1_item_print(BIO *out, ASN1_VALUE *ifld, int indent,
177                    const ASN1_ITEM *it, const ASN1_PCTX *pctx)
178 {
179     const char *sname;
180     if (pctx == NULL)
181         pctx = &default_pctx;
182     if (pctx->flags & ASN1_PCTX_FLAGS_NO_STRUCT_NAME)
183         sname = NULL;
184     else
185         sname = it->sname;
186     return asn1_item_print_ctx(out, &ifld, indent, it,
187                               NULL, sname, 0, pctx);
188 }

190 static int asn1_item_print_ctx(BIO *out, ASN1_VALUE **fld, int indent,
191                               const ASN1_ITEM *it,
192                               const char *fname, const char *sname,
193                               int nohdr, const ASN1_PCTX *pctx)

```

```

194     {
195         const ASN1_TEMPLATE *tt;
196         const ASN1_EXTERN_FUNCS *ef;
197         ASN1_VALUE **tmpfld;
198         const ASN1_AUX *aux = it->funcs;
199         ASN1_aux_cb *asn1_cb;
200         ASN1_PRINT_ARG parg;
201         int i;
202         if (aux && aux->asn1_cb)
203         {
204             parg.out = out;
205             parg.indent = indent;
206             parg.pctx = pctx;
207             asn1_cb = aux->asn1_cb;
208         }
209         else asn1_cb = 0;

211         if(*fld == NULL)
212         {
213             if (pctx->flags & ASN1_PCTX_FLAGS_SHOW_ABSENT)
214             {
215                 if (!nohdr && !asn1_print_fsnname(out, indent,
216                                                    fname, sname, pctx))
217                     return 0;
218                 if (BIO_puts(out, "<ABSENT>\n") <= 0)
219                     return 0;
220             }
221             return 1;
222         }

224         switch(it->itype)
225         {
226             case ASN1_ITYPE_PRIMITIVE:
227                 if(it->templates)
228                 {
229                     if (!asn1_template_print_ctx(out, fld, indent,
230                                                    it->templates, pctx))
231                         return 0;
232                 }
233                 /* fall thru */
234             case ASN1_ITYPE_MSTRING:
235                 if (!asn1_primitive_print(out, fld, it,
236                                           indent, fname, sname, pctx))
237                     return 0;
238                 break;

240             case ASN1_ITYPE_EXTERN:
241                 if (!nohdr && !asn1_print_fsnname(out, indent, fname, sname, pctx))
242                     return 0;
243                 /* Use new style print routine if possible */
244                 ef = it->funcs;
245                 if (ef && ef->asn1_ex_print)
246                 {
247                     i = ef->asn1_ex_print(out, fld, indent, "", pctx);
248                     if (!i)
249                         return 0;
250                     if ((i == 2) && (BIO_puts(out, "\n") <= 0))
251                         return 0;
252                     return 1;
253                 }
254                 else if (sname &&
255                          BIO_printf(out, ":EXTERNAL TYPE %s\n", sname) <= 0)
256                     return 0;
257                 break;

259             case ASN1_ITYPE_CHOICE:

```

```

260 #if 0
261     if (!nohdr && !asn1_print_fname(out, indent, fname, sname, pctx)
262         return 0;
263 #endif
264     /* CHOICE type, get selector */
265     i = asn1_get_choice_selector(fld, it);
266     /* This should never happen... */
267     if((i < 0) || (i >= it->tcount))
268     {
269         if (BIO_printf(out,
270             "ERROR: selector [%d] invalid\n", i) <= 0)
271             return 0;
272         return 1;
273     }
274     tt = it->templates + i;
275     tmpfld = asn1_get_field_ptr(fld, tt);
276     if (!asn1_template_print_ctx(out, tmpfld, indent, tt, pctx))
277         return 0;
278     break;
279
280 case ASN1_ITYPE_SEQUENCE:
281 case ASN1_ITYPE_NDEF_SEQUENCE:
282     if (!nohdr && !asn1_print_fname(out, indent, fname, sname, pctx)
283         return 0;
284     if (fname || sname)
285     {
286         if (pctx->flags & ASN1_PCTX_FLAGS_SHOW_SEQUENCE)
287         {
288             if (BIO_puts(out, " {\n") <= 0)
289                 return 0;
290         }
291         else
292         {
293             if (BIO_puts(out, "\n") <= 0)
294                 return 0;
295         }
296     }
297
298     if (asn1_cb)
299     {
300         i = asn1_cb(ASN1_OP_PRINT_PRE, fld, it, &parg);
301         if (i == 0)
302             return 0;
303         if (i == 2)
304             return 1;
305     }
306
307     /* Print each field entry */
308     for(i = 0, tt = it->templates; i < it->tcount; i++, tt++)
309     {
310         const ASN1_TEMPLATE *seqtt;
311         seqtt = asn1_do_adb(fld, tt, 1);
312         tmpfld = asn1_get_field_ptr(fld, seqtt);
313         if (!asn1_template_print_ctx(out, tmpfld,
314             indent + 2, seqtt, pctx))
315             return 0;
316     }
317     if (pctx->flags & ASN1_PCTX_FLAGS_SHOW_SEQUENCE)
318     {
319         if (BIO_printf(out, "%s}\n", indent, "") < 0)
320             return 0;
321     }
322
323     if (asn1_cb)
324     {
325         i = asn1_cb(ASN1_OP_PRINT_POST, fld, it, &parg);

```

```

326         if (i == 0)
327             return 0;
328         }
329         break;
330
331     default:
332     BIO_printf(out, "Unprocessed type %d\n", it->itype);
333     return 0;
334     }
335
336     return 1;
337 }
338
339 int asn1_template_print_ctx(BIO *out, ASN1_VALUE **fld, int indent,
340     const ASN1_TEMPLATE *tt, const ASN1_PCTX *pctx)
341 {
342     int i, flags;
343     const char *sname, *fname;
344     flags = tt->flags;
345     if (pctx->flags & ASN1_PCTX_FLAGS_SHOW_FIELD_STRUCT_NAME)
346         sname = ASN1_ITEM_ptr(tt->item)->sname;
347     else
348         sname = NULL;
349     if (pctx->flags & ASN1_PCTX_FLAGS_NO_FIELD_NAME)
350         fname = NULL;
351     else
352         fname = tt->field_name;
353     if (flags & ASN1_TFLG_SK_MASK)
354     {
355         char *tname;
356         ASN1_VALUE *skitem;
357         STACK_OF(ASN1_VALUE) *stack;
358
359         /* SET OF, SEQUENCE OF */
360         if (fname)
361         {
362             if (pctx->flags & ASN1_PCTX_FLAGS_SHOW_SSOF)
363             {
364                 if (flags & ASN1_TFLG_SET_OF)
365                     tname = "SET";
366                 else
367                     tname = "SEQUENCE";
368                 if (BIO_printf(out, "%s%s OF %s {\n",
369                     indent, "", tname, tt->field_name) <= 0)
370                     return 0;
371             }
372             else if (BIO_printf(out, "%s%s:\n", indent, "",
373                 fname) <= 0)
374                 return 0;
375         }
376         stack = (STACK_OF(ASN1_VALUE) *)*fld;
377         for(i = 0; i < sk_ASN1_VALUE_num(stack); i++)
378         {
379             if ((i > 0) && (BIO_puts(out, "\n") <= 0))
380                 return 0;
381
382             skitem = sk_ASN1_VALUE_value(stack, i);
383             if (!asn1_item_print_ctx(out, &skitem, indent + 2,
384                 ASN1_ITEM_ptr(tt->item), NULL, NULL, 1, pctx))
385                 return 0;
386         }
387         if (!i && BIO_printf(out, "%s<EMPTY>\n", indent + 2, "") <= 0)
388             return 0;
389         if (pctx->flags & ASN1_PCTX_FLAGS_SHOW_SEQUENCE)
390         {
391             if (BIO_printf(out, "%s}\n", indent, "") <= 0)

```



```

524     long utype;
525     ASN1_STRING *str;
526     int ret = 1, needlf = 1;
527     const char *pname;
528     const ASN1_PRIMITIVE_FUNCS *pf;
529     pf = it->funcs;
530     if (!asn1_print_fname(out, indent, fname, sname, pctx))
531         return 0;
532     if (pf && pf->prim_print)
533         return pf->prim_print(out, fld, it, indent, pctx);
534     str = (ASN1_STRING *)*fld;
535     if (it->itype == ASN1_ITYPE_MSTRING)
536         utype = str->type & ~V_ASN1_NEG;
537     else
538         utype = it->utype;
539     if (utype == V_ASN1_ANY)
540     {
541         ASN1_TYPE *atype = (ASN1_TYPE *)*fld;
542         utype = atype->type;
543         fld = &atype->value.asn1_value;
544         str = (ASN1_STRING *)*fld;
545         if (pctx->flags & ASN1_PCTX_FLAGS_NO_ANY_TYPE)
546             pname = NULL;
547         else
548             pname = ASN1_tag2str(utype);
549     }
550     else
551     {
552         if (pctx->flags & ASN1_PCTX_FLAGS_SHOW_TYPE)
553             pname = ASN1_tag2str(utype);
554         else
555             pname = NULL;
556     }
557
558     if (utype == V_ASN1_NULL)
559     {
560         if (BIO_puts(out, "NULL\n") <= 0)
561             return 0;
562         return 1;
563     }
564
565     if (pname)
566     {
567         if (BIO_puts(out, pname) <= 0)
568             return 0;
569         if (BIO_puts(out, ":") <= 0)
570             return 0;
571     }
572
573     switch (utype)
574     {
575     case V_ASN1_BOOLEAN:
576     {
577         int boolval = *(int *)fld;
578         if (boolval == -1)
579             boolval = it->size;
580         ret = asn1_print_boolean_ctx(out, boolval, pctx);
581     }
582     break;
583
584     case V_ASN1_INTEGER:
585     case V_ASN1_ENUMERATED:
586     {
587         ret = asn1_print_integer_ctx(out, str, pctx);
588     }
589     break;
590
591     case V_ASN1_UTCTIME:

```

```

590         ret = ASN1_UTCTIME_print(out, str);
591         break;
592
593     case V_ASN1_GENERALIZEDTIME:
594     {
595         ret = ASN1_GENERALIZEDTIME_print(out, str);
596     }
597     break;
598
599     case V_ASN1_OBJECT:
600     {
601         ret = asn1_print_oid_ctx(out, (const ASN1_OBJECT *)*fld, pctx);
602     }
603     break;
604
605     case V_ASN1_OCTET_STRING:
606     case V_ASN1_BIT_STRING:
607     {
608         ret = asn1_print_obstring_ctx(out, str, indent, pctx);
609         needlf = 0;
610     }
611     break;
612
613     case V_ASN1_SEQUENCE:
614     case V_ASN1_SET:
615     case V_ASN1_OTHER:
616     {
617         if (BIO_puts(out, "\n") <= 0)
618             return 0;
619         if (ASN1_parse_dump(out, str->data, str->length,
620                             indent, 0) <= 0)
621             ret = 0;
622         needlf = 0;
623     }
624     break;
625
626     default:
627     {
628         ret = ASN1_STRING_print_ex(out, str, pctx->str_flags);
629     }
630 }
631
632 if (!ret)
633     return 0;
634 if (needlf && BIO_puts(out, "\n") <= 0)
635     return 0;
636 return 1;
637 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_typ.c

1

```
*****
5551 Fri May 30 18:31:31 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_typ.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* tasn_typ.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <stdio.h>
59 #include <openssl/asn1.h>
60 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_typ.c

2

```
62 /* Declarations for string types */

65 IMPLEMENT_ASN1_TYPE(ASN1_INTEGER)
66 IMPLEMENT_ASN1_FUNCTIONS(ASN1_INTEGER)

68 IMPLEMENT_ASN1_TYPE(ASN1_ENUMERATED)
69 IMPLEMENT_ASN1_FUNCTIONS(ASN1_ENUMERATED)

71 IMPLEMENT_ASN1_TYPE(ASN1_BIT_STRING)
72 IMPLEMENT_ASN1_FUNCTIONS(ASN1_BIT_STRING)

74 IMPLEMENT_ASN1_TYPE(ASN1_OCTET_STRING)
75 IMPLEMENT_ASN1_FUNCTIONS(ASN1_OCTET_STRING)

77 IMPLEMENT_ASN1_TYPE(ASN1_NULL)
78 IMPLEMENT_ASN1_FUNCTIONS(ASN1_NULL)

80 IMPLEMENT_ASN1_TYPE(ASN1_OBJECT)

82 IMPLEMENT_ASN1_TYPE(ASN1_UTF8STRING)
83 IMPLEMENT_ASN1_FUNCTIONS(ASN1_UTF8STRING)

85 IMPLEMENT_ASN1_TYPE(ASN1_PRINTABLESTRING)
86 IMPLEMENT_ASN1_FUNCTIONS(ASN1_PRINTABLESTRING)

88 IMPLEMENT_ASN1_TYPE(ASN1_T61STRING)
89 IMPLEMENT_ASN1_FUNCTIONS(ASN1_T61STRING)

91 IMPLEMENT_ASN1_TYPE(ASN1_IA5STRING)
92 IMPLEMENT_ASN1_FUNCTIONS(ASN1_IA5STRING)

94 IMPLEMENT_ASN1_TYPE(ASN1_GENERALSTRING)
95 IMPLEMENT_ASN1_FUNCTIONS(ASN1_GENERALSTRING)

97 IMPLEMENT_ASN1_TYPE(ASN1_UTCTIME)
98 IMPLEMENT_ASN1_FUNCTIONS(ASN1_UTCTIME)

100 IMPLEMENT_ASN1_TYPE(ASN1_GENERALIZEDTIME)
101 IMPLEMENT_ASN1_FUNCTIONS(ASN1_GENERALIZEDTIME)

103 IMPLEMENT_ASN1_TYPE(ASN1_VISIBLESTRING)
104 IMPLEMENT_ASN1_FUNCTIONS(ASN1_VISIBLESTRING)

106 IMPLEMENT_ASN1_TYPE(ASN1_UNIVERSALSTRING)
107 IMPLEMENT_ASN1_FUNCTIONS(ASN1_UNIVERSALSTRING)

109 IMPLEMENT_ASN1_TYPE(ASN1_BMPSTRING)
110 IMPLEMENT_ASN1_FUNCTIONS(ASN1_BMPSTRING)

112 IMPLEMENT_ASN1_TYPE(ASN1_ANY)

114 /* Just swallow an ASN1_SEQUENCE in an ASN1_STRING */
115 IMPLEMENT_ASN1_TYPE(ASN1_SEQUENCE)

117 IMPLEMENT_ASN1_FUNCTIONS_fname(ASN1_TYPE, ASN1_ANY, ASN1_TYPE)

119 /* Multistring types */

121 IMPLEMENT_ASN1_MSTRING(ASN1_PRINTABLE, B_ASN1_PRINTABLE)
122 IMPLEMENT_ASN1_FUNCTIONS_name(ASN1_STRING, ASN1_PRINTABLE)

124 IMPLEMENT_ASN1_MSTRING(DISPLAYTEXT, B_ASN1_DISPLAYTEXT)
125 IMPLEMENT_ASN1_FUNCTIONS_name(ASN1_STRING, DISPLAYTEXT)

127 IMPLEMENT_ASN1_MSTRING(DIRECTORYSTRING, B_ASN1_DIRECTORYSTRING)
```

```
128 IMPLEMENT_ASN1_FUNCTIONS_name(ASN1_STRING, DIRECTORYSTRING)

130 /* Three separate BOOLEAN type: normal, DEFAULT TRUE and DEFAULT FALSE */
131 IMPLEMENT_ASN1_TYPE_ex(ASN1_BOOLEAN, ASN1_BOOLEAN, -1)
132 IMPLEMENT_ASN1_TYPE_ex(ASN1_TBBOOLEAN, ASN1_BOOLEAN, 1)
133 IMPLEMENT_ASN1_TYPE_ex(ASN1_FBOOLEAN, ASN1_BOOLEAN, 0)

135 /* Special, OCTET STRING with indefinite length constructed support */

137 IMPLEMENT_ASN1_TYPE_ex(ASN1_OCTET_STRING_NDEF, ASN1_OCTET_STRING, ASN1_TFLG_NDEF

139 ASN1_ITEM_TEMPLATE(ASN1_SEQUENCE_ANY) =
140     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, ASN1_SEQUENCE_ANY, ASN1_
141     ASN1_ITEM_TEMPLATE_END(ASN1_SEQUENCE_ANY)

143 ASN1_ITEM_TEMPLATE(ASN1_SET_ANY) =
144     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SET_OF, 0, ASN1_SET_ANY, ASN1_ANY)
145 ASN1_ITEM_TEMPLATE_END(ASN1_SET_ANY)

147 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(ASN1_SEQUENCE_ANY, ASN1_SEQUENCE_ANY
148 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(ASN1_SEQUENCE_ANY, ASN1_SET_ANY, ASN
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_utl.c

1

```
*****
7803 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_utl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* tasn_utl.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

60 #include <stddef.h>
61 #include <string.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/tasn_utl.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/objects.h>
65 #include <openssl/err.h>

67 /* Utility functions for manipulating fields and offsets */

69 /* Add 'offset' to 'addr' */
70 #define offset2ptr(addr, offset) (void *)(((char *) addr) + offset)

72 /* Given an ASN1_ITEM CHOICE type return
73  * the selector value
74  */

76 int asn1_get_choice_selector(ASN1_VALUE **pval, const ASN1_ITEM *it)
77 {
78     int *sel = offset2ptr(*pval, it->utype);
79     return *sel;
80 }

82 /* Given an ASN1_ITEM CHOICE type set
83  * the selector value, return old value.
84  */

86 int asn1_set_choice_selector(ASN1_VALUE **pval, int value, const ASN1_ITEM *it)
87 {
88     int *sel, ret;
89     sel = offset2ptr(*pval, it->utype);
90     ret = *sel;
91     *sel = value;
92     return ret;
93 }

95 /* Do reference counting. The value 'op' decides what to do.
96  * if it is +1 then the count is incremented. If op is 0 count is
97  * set to 1. If op is -1 count is decremented and the return value
98  * is the current reference count or 0 if no reference count exists.
99  */

101 int asn1_do_lock(ASN1_VALUE **pval, int op, const ASN1_ITEM *it)
102 {
103     const ASN1_AUX *aux;
104     int *lck, ret;
105     if ((it->itype != ASN1_ITYPE_SEQUENCE)
106         && (it->itype != ASN1_ITYPE_NDEF_SEQUENCE))
107         return 0;
108     aux = it->funcs;
109     if (!aux || !(aux->flags & ASN1_AFLG_REFCOUNT))
110         return 0;
111     lck = offset2ptr(*pval, aux->ref_offset);
112     if (op == 0)
113     {
114         *lck = 1;
115         return 1;
116     }
117     ret = CRYPTO_add(lck, op, aux->ref_lock);
118 #ifdef REF_PRINT
119     fprintf(stderr, "%s: Reference Count: %d\n", it->sname, *lck);
120 #endif
121 #ifdef REF_CHECK
122     if (ret < 0)
123         fprintf(stderr, "%s, bad reference count\n", it->sname);
124 #endif
125     return ret;
126 }
```

```

128 static ASN1_ENCODING *asn1_get_enc_ptr(ASN1_VALUE **pval, const ASN1_ITEM *it)
129 {
130     const ASN1_AUX *aux;
131     if (!pval || !*pval)
132         return NULL;
133     aux = it->funcs;
134     if (!aux || !(aux->flags & ASN1_AFLG_ENCODING))
135         return NULL;
136     return offset2ptr(*pval, aux->enc_offset);
137 }

139 void asn1_enc_init(ASN1_VALUE **pval, const ASN1_ITEM *it)
140 {
141     ASN1_ENCODING *enc;
142     enc = asn1_get_enc_ptr(pval, it);
143     if (enc)
144     {
145         enc->enc = NULL;
146         enc->len = 0;
147         enc->modified = 1;
148     }
149 }

151 void asn1_enc_free(ASN1_VALUE **pval, const ASN1_ITEM *it)
152 {
153     ASN1_ENCODING *enc;
154     enc = asn1_get_enc_ptr(pval, it);
155     if (enc)
156     {
157         if (enc->enc)
158             OPENSSL_free(enc->enc);
159         enc->enc = NULL;
160         enc->len = 0;
161         enc->modified = 1;
162     }
163 }

165 int asn1_enc_save(ASN1_VALUE **pval, const unsigned char *in, int inlen,
166                  const ASN1_ITEM *it)
167 {
168     ASN1_ENCODING *enc;
169     enc = asn1_get_enc_ptr(pval, it);
170     if (!enc)
171         return 1;
172
173     if (enc->enc)
174         OPENSSL_free(enc->enc);
175     enc->enc = OPENSSL_malloc(inlen);
176     if (!enc->enc)
177         return 0;
178     memcpy(enc->enc, in, inlen);
179     enc->len = inlen;
180     enc->modified = 0;
181
182     return 1;
183 }
184
185 int asn1_enc_restore(int *len, unsigned char **out, ASN1_VALUE **pval,
186                    const ASN1_ITEM *it)
187 {
188     ASN1_ENCODING *enc;
189     enc = asn1_get_enc_ptr(pval, it);
190     if (!enc || enc->modified)
191         return 0;
192     if (out)
193     {

```

```

194         memcpy(*out, enc->enc, enc->len);
195         *out += enc->len;
196     }
197     if (len)
198         *len = enc->len;
199     return 1;
200 }

202 /* Given an ASN1_TEMPLATE get a pointer to a field */
203 ASN1_VALUE **asn1_get_field_ptr(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt)
204 {
205     ASN1_VALUE **pvaltmp;
206     if (tt->flags & ASN1_TFLG_COMBINE)
207         return pval;
208     pvaltmp = offset2ptr(*pval, tt->offset);
209     /* NOTE for BOOLEAN types the field is just a plain
210      * int so we can't return int **, so settle for
211      * (int *).
212      */
213     return pvaltmp;
214 }

216 /* Handle ANY DEFINED BY template, find the selector, look up
217  * the relevant ASN1_TEMPLATE in the table and return it.
218  */

220 const ASN1_TEMPLATE *asn1_do_adb(ASN1_VALUE **pval, const ASN1_TEMPLATE *tt,
221                                  int nullerr)
222 {
223     const ASN1_ADB *adb;
224     const ASN1_ADB_TABLE *atbl;
225     long selector;
226     ASN1_VALUE **sfld;
227     int i;
228     if (!(tt->flags & ASN1_TFLG_ADB_MASK))
229         return tt;
230
231     /* Else ANY DEFINED BY ... get the table */
232     adb = ASN1_ADB_ptr(tt->item);
233
234     /* Get the selector field */
235     sfld = offset2ptr(*pval, adb->offset);
236
237     /* Check if NULL */
238     if (!sfld)
239     {
240         if (!adb->null_tt)
241             goto err;
242         return adb->null_tt;
243     }
244
245     /* Convert type to a long:
246      * NB: don't check for NID_undef here because it
247      * might be a legitimate value in the table
248      */
249     if (tt->flags & ASN1_TFLG_ADB_OID)
250         selector = OBJ_obj2nid((ASN1_OBJECT *)*sfld);
251     else
252         selector = ASN1_INTEGER_get((ASN1_INTEGER *)*sfld);
253
254     /* Try to find matching entry in table
255      * Maybe should check application types first to
256      * allow application override? Might also be useful
257      * to have a flag which indicates table is sorted and
258      * we can do a binary search. For now stick to a
259      * linear search.

```



```
260      */
262      for (atbl = adb->tbl, i = 0; i < adb->tblcount; i++, atbl++)
263          if (atbl->value == selector)
264              return &atbl->tt;
266      /* FIXME: need to search application table too */
268      /* No match, return default type */
269      if (!adb->default_tt)
270          goto err;
271      return adb->default_tt;
272
273      err:
274      /* FIXME: should log the value or OID of unsupported type */
275      if (nullerr)
276          ASN1err(ASN1_F_ASN1_DO_ADB,
277                 ASN1_R_UNSUPPORTED_ANY_DEFINED_BY_TYPE);
278      return NULL;
279  }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_algor.c

1

```
*****
4609 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_algor.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* x_algor.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stddef.h>
60 #include <openssl/x509.h>
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_algor.c

2

```
62 #include <openssl/asn1t.h>

64 ASN1_SEQUENCE(X509_ALGOR) = {
65     ASN1_SIMPLE(X509_ALGOR, algorithm, ASN1_OBJECT),
66     ASN1_OPT(X509_ALGOR, parameter, ASN1_ANY)
67 } ASN1_SEQUENCE_END(X509_ALGOR)

69 ASN1_ITEM_TEMPLATE(X509_ALGORS) =
70     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, algorithms, X509_ALGOR)
71 ASN1_ITEM_TEMPLATE_END(X509_ALGORS)

73 IMPLEMENT_ASN1_FUNCTIONS(X509_ALGOR)
74 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_fname(X509_ALGORS, X509_ALGORS, X509_ALGORS)
75 IMPLEMENT_ASN1_DUP_FUNCTION(X509_ALGOR)

77 IMPLEMENT_STACK_OF(X509_ALGOR)
78 IMPLEMENT_ASN1_SET_OF(X509_ALGOR)

80 int X509_ALGOR_set0(X509_ALGOR *alg, ASN1_OBJECT *aobj, int ptype, void *pval)
81 {
82     if (!alg)
83         return 0;
84     if (ptype != V_ASN1_UNDEF)
85     {
86         if (alg->parameter == NULL)
87             alg->parameter = ASN1_TYPE_new();
88         if (alg->parameter == NULL)
89             return 0;
90     }
91     if (alg)
92     {
93         if (alg->algorithm)
94             ASN1_OBJECT_free(alg->algorithm);
95         alg->algorithm = aobj;
96     }
97     if (ptype == 0)
98         return 1;
99     if (ptype == V_ASN1_UNDEF)
100     {
101         if (alg->parameter)
102         {
103             ASN1_TYPE_free(alg->parameter);
104             alg->parameter = NULL;
105         }
106     }
107     else
108         ASN1_TYPE_set(alg->parameter, ptype, pval);
109     return 1;
110 }

112 void X509_ALGOR_get0(ASN1_OBJECT **paobj, int *pptype, void **ppval,
113                     X509_ALGOR *algor)
114 {
115     if (paobj)
116         *paobj = algor->algorithm;
117     if (pptype)
118     {
119         if (algor->parameter == NULL)
120         {
121             *pptype = V_ASN1_UNDEF;
122             return;
123         }
124         else
125             *pptype = algor->parameter->type;
126     }
127     if (ppval)
128         *ppval = algor->parameter->value.ptr;
```

```
128         }
129     }

131 /* Set up an X509_ALGOR DigestAlgorithmIdentifier from an EVP_MD */

133 void X509_ALGOR_set_md(X509_ALGOR *alg, const EVP_MD *md)
134 {
135     int param_type;

137     if (md->flags & EVP_MD_FLAG_DIGALGID_ABSENT)
138         param_type = V_ASN1_UNDEF;
139     else
140         param_type = V_ASN1_NULL;

142     X509_ALGOR_set0(alg, OBJ_nid2obj(EVP_MD_type(md)), param_type, NULL);

144 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_attrib.c

1

```
*****
4897 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_attrib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/x_attrib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_attrib.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/x509.h>
64
65 /* X509_ATTRIBUTE: this has the following form:
66  *
67  * typedef struct x509_attributes_st
68  * {
69  *     ASN1_OBJECT *object;
70  *     int single;
71  *     union {
72  *         char *ptr;
73  *         STACK_OF(ASN1_TYPE) *set;
74  *         ASN1_TYPE *single;
75  *     } value;
76  * } X509_ATTRIBUTE;
77  *
78  * this needs some extra thought because the CHOICE type is
79  * merged with the main structure and because the value can
80  * be anything at all we *must* try the SET OF first because
81  * the ASN1_ANY type will swallow anything including the whole
82  * SET OF structure.
83  */
84
85 ASN1_CHOICE(X509_ATTRIBUTE_SET) = {
86     ASN1_SET_OF(X509_ATTRIBUTE, value.set, ASN1_ANY),
87     ASN1_SIMPLE(X509_ATTRIBUTE, value.single, ASN1_ANY)
88 } ASN1_CHOICE_END_selector(X509_ATTRIBUTE, X509_ATTRIBUTE_SET, single)
89
90 ASN1_SEQUENCE(X509_ATTRIBUTE) = {
91     ASN1_SIMPLE(X509_ATTRIBUTE, object, ASN1_OBJECT),
92     /* CHOICE type merged with parent */
93     ASN1_EX_COMBINE(0, 0, X509_ATTRIBUTE_SET)
94 } ASN1_SEQUENCE_END(X509_ATTRIBUTE)
95
96 IMPLEMENT_ASN1_FUNCTIONS(X509_ATTRIBUTE)
97 IMPLEMENT_ASN1_DUP_FUNCTION(X509_ATTRIBUTE)
98
99 X509_ATTRIBUTE *X509_ATTRIBUTE_create(int nid, int atrtype, void *value)
100 {
101     X509_ATTRIBUTE *ret=NULL;
102     ASN1_TYPE *val=NULL;
103
104     if ((ret=X509_ATTRIBUTE_new()) == NULL)
105         return(NULL);
106     ret->object=OBJ_nid2obj(nid);
107     ret->single=0;
108     if ((ret->value.set=sk_ASN1_TYPE_new_null()) == NULL) goto err;
109     if ((val=ASN1_TYPE_new()) == NULL) goto err;
110     if (!sk_ASN1_TYPE_push(ret->value.set,val)) goto err;
111
112     ASN1_TYPE_set(val,atrtype,value);
113     return(ret);
114 err:
115     if (ret != NULL) X509_ATTRIBUTE_free(ret);
116     if (val != NULL) ASN1_TYPE_free(val);
117     return(NULL);
118 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_bignum.c

1

```
*****
4780 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_bignum.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* x_bignum.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_bignum.c

2

```
62 #include <openssl/bn.h>
63
64 /* Custom primitive type for BIGNUM handling. This reads in an ASN1_INTEGER as a
65  * BIGNUM directly. Currently it ignores the sign which isn't a problem since al
66  * BIGNUMs used are non negative and anything that looks negative is normally du
67  * to an encoding error.
68  */
69
70 #define BN_SENSITIVE 1
71
72 static int bn_new(ASN1_VALUE **pval, const ASN1_ITEM *it);
73 static void bn_free(ASN1_VALUE **pval, const ASN1_ITEM *it);
74
75 static int bn_i2c(ASN1_VALUE **pval, unsigned char *cont, int *putype, const ASN
76 static int bn_c2i(ASN1_VALUE **pval, const unsigned char *cont, int len, int uty
77
78 static ASN1_PRIMITIVE_FUNCS bignum_pf = {
79     NULL, 0,
80     bn_new,
81     bn_free,
82     0,
83     bn_c2i,
84     bn_i2c
85 };
86
87 ASN1_ITEM_start(BIGNUM)
88     ASN1_ITYPE_PRIMITIVE, V_ASN1_INTEGER, NULL, 0, &bignum_pf, 0, "BIGNUM"
89 ASN1_ITEM_end(BIGNUM)
90
91 ASN1_ITEM_start(CBIGNUM)
92     ASN1_ITYPE_PRIMITIVE, V_ASN1_INTEGER, NULL, 0, &bignum_pf, BN_SENSITIVE,
93 ASN1_ITEM_end(CBIGNUM)
94
95 static int bn_new(ASN1_VALUE **pval, const ASN1_ITEM *it)
96 {
97     *pval = (ASN1_VALUE *)BN_new();
98     if(*pval) return 1;
99     else return 0;
100 }
101
102 static void bn_free(ASN1_VALUE **pval, const ASN1_ITEM *it)
103 {
104     if(!*pval) return;
105     if(it->size & BN_SENSITIVE) BN_clear_free((BIGNUM *)*pval);
106     else BN_free((BIGNUM *)*pval);
107     *pval = NULL;
108 }
109
110 static int bn_i2c(ASN1_VALUE **pval, unsigned char *cont, int *putype, const ASN
111 {
112     BIGNUM *bn;
113     int pad;
114     if(!*pval) return -1;
115     bn = (BIGNUM *)*pval;
116     /* If MSB set in an octet we need a padding byte */
117     if(BN_num_bits(bn) & 0x7) pad = 0;
118     else pad = 1;
119     if(cont) {
120         if(pad) *cont++ = 0;
121         BN_bn2bin(bn, cont);
122     }
123     return pad + BN_num_bytes(bn);
124 }
125
126 static int bn_c2i(ASN1_VALUE **pval, const unsigned char *cont, int len,
127                 int utype, char *free_cont, const ASN1_ITEM *it)
```

```
128 {  
129     BIGNUM *bn;  
130     if(!*pval) bn_new(pval, it);  
131     bn = (BIGNUM *)*pval;  
132     if(!BN_bin2bn(cont, len, bn)) {  
133         bn_free(pval, it);  
134         return 0;  
135     }  
136     return 1;  
137 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_crl.c

1

14438 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_crl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/x_crl.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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10 * the following conditions are aheared to. The following conditions
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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31 * 3. All advertising materials mentioning features or use of this software
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34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include "asn1_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_crl.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/x509.h>
64 #include <openssl/x509v3.h>
65
66 static int X509_REVOKED_cmp(const X509_REVOKED * const *a,
67                             const X509_REVOKED * const *b);
68 static void setup_idp(X509_CRL *crl, ISSUING_DIST_POINT *idp);
69
70 ASN1_SEQUENCE(X509_REVOKED) = {
71     ASN1_SIMPLE(X509_REVOKED, serialNumber, ASN1_INTEGER),
72     ASN1_SIMPLE(X509_REVOKED, revocationDate, ASN1_TIME),
73     ASN1_SEQUENCE_OF_OPT(X509_REVOKED, extensions, X509_EXTENSION)
74 } ASN1_SEQUENCE_END(X509_REVOKED)
75
76 static int def_crl_verify(X509_CRL *crl, EVP_PKEY *r);
77 static int def_crl_lookup(X509_CRL *crl,
78                           X509_REVOKED **ret, ASN1_INTEGER *serial, X509_NAME *issuer);
79
80 static X509_CRL_METHOD int_crl_meth =
81 {
82     0,
83     0, 0,
84     def_crl_lookup,
85     def_crl_verify
86 };
87
88 static const X509_CRL_METHOD *default_crl_method = &int_crl_meth;
89
90 /* The X509_CRL_INFO structure needs a bit of customisation.
91  * Since we cache the original encoding the signature wont be affected by
92  * reordering of the revoked field.
93  */
94 static int crl_inf_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
95                       void *exarg)
96 {
97     X509_CRL_INFO *a = (X509_CRL_INFO *)*pval;
98
99     if(!a || !a->revoked) return 1;
100     switch(operation) {
101         /* Just set cmp function here. We don't sort because that
102          * would affect the output of X509_CRL_print().
103          */
104         case ASN1_OP_D2I_POST:
105             (void)sk_X509_REVOKED_set_cmp_func(a->revoked, X509_REVOKED_cmp);
106             break;
107     }
108     return 1;
109 }
110
111 ASN1_SEQUENCE_enc(X509_CRL_INFO, enc, crl_inf_cb) = {
112     ASN1_OPT(X509_CRL_INFO, version, ASN1_INTEGER),
113     ASN1_SIMPLE(X509_CRL_INFO, sig_alg, X509_ALGOR),
114     ASN1_SIMPLE(X509_CRL_INFO, issuer, X509_NAME),
115     ASN1_SIMPLE(X509_CRL_INFO, lastUpdate, ASN1_TIME),
116     ASN1_OPT(X509_CRL_INFO, nextUpdate, ASN1_TIME),
117     ASN1_SEQUENCE_OF_OPT(X509_CRL_INFO, revoked, X509_REVOKED),
118     ASN1_EXP_SEQUENCE_OF_OPT(X509_CRL_INFO, extensions, X509_EXTENSION, 0)
119 } ASN1_SEQUENCE_END_enc(X509_CRL_INFO, X509_CRL_INFO)
120
121 /* Set CRL entry issuer according to CRL certificate issuer extension.
122  * Check for unhandled critical CRL entry extensions.
123  */
124
125 static int crl_set_issuers(X509_CRL *crl)
126 {
127 }
```

```

129     int i, j;
130     GENERAL_NAMES *gens, *gtmp;
131     STACK_OF(X509_REVOKED) *revoked;

133     revoked = X509_CRL_get_REVOKED(crl);

135     gens = NULL;
136     for (i = 0; i < sk_X509_REVOKED_num(revoked); i++)
137     {
138         X509_REVOKED *rev = sk_X509_REVOKED_value(revoked, i);
139         STACK_OF(X509_EXTENSION) *exts;
140         ASN1_ENUMERATED *reason;
141         X509_EXTENSION *ext;
142         gtmp = X509_REVOKED_get_ext_d2i(rev,
143                                         NID_certificate_issuer,
144                                         &j, NULL);
145         if (!gtmp && (j != -1))
146         {
147             crl->flags |= EXFLAG_INVALID;
148             return 1;
149         }

151         if (gtmp)
152         {
153             gens = gtmp;
154             if (!crl->issuers)
155             {
156                 crl->issuers = sk_GENERAL_NAMES_new_null();
157                 if (!crl->issuers)
158                     return 0;
159             }
160             if (!sk_GENERAL_NAMES_push(crl->issuers, gtmp))
161                 return 0;
162         }
163         rev->issuer = gens;

165         reason = X509_REVOKED_get_ext_d2i(rev, NID_crl_reason,
166                                             &j, NULL);
167         if (!reason && (j != -1))
168         {
169             crl->flags |= EXFLAG_INVALID;
170             return 1;
171         }

173         if (reason)
174         {
175             rev->reason = ASN1_ENUMERATED_get(reason);
176             ASN1_ENUMERATED_free(reason);
177         }
178         else
179             rev->reason = CRL_REASON_NONE;

181         /* Check for critical CRL entry extensions */

183         exts = rev->extensions;

185         for (j = 0; j < sk_X509_EXTENSION_num(exts); j++)
186         {
187             ext = sk_X509_EXTENSION_value(exts, j);
188             if (ext->critical > 0)
189             {
190                 if (OBJ_obj2nid(ext->object) ==
191                     NID_certificate_issuer)
192                     continue;
193                 crl->flags |= EXFLAG_CRITICAL;

```

```

194         break;
195     }
196     }

199     }

201     return 1;

203     }

205     /* The X509_CRL structure needs a bit of customisation. Cache some extensions
206        * and hash of the whole CRL.
207        */
208     static int crl_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
209                      void *exarg)
210     {
211         X509_CRL *crl = (X509_CRL *)*pval;
212         STACK_OF(X509_EXTENSION) *exts;
213         X509_EXTENSION *ext;
214         int idx;

216         switch(operation)
217         {
218             case ASN1_OP_NEW_POST:
219                 crl->idp = NULL;
220                 crl->akid = NULL;
221                 crl->flags = 0;
222                 crl->idp_flags = 0;
223                 crl->idp_reasons = CRLDP_ALL_REASONS;
224                 crl->meth = default_crl_method;
225                 crl->meth_data = NULL;
226                 crl->issuers = NULL;
227                 crl->crl_number = NULL;
228                 crl->base_crl_number = NULL;
229                 break;

231             case ASN1_OP_D2I_POST:
232                 #ifndef OPENSSL_NO_SHA
233                 X509_CRL_digest(crl, EVP_sha1(), crl->sha1_hash, NULL);
234                 #endif
235                 crl->idp = X509_CRL_get_ext_d2i(crl,
236                                                 NID_issuing_distribution_point, NULL, NULL);
237                 if (crl->idp)
238                     setup_idp(crl, crl->idp);

240                 crl->akid = X509_CRL_get_ext_d2i(crl,
241                                                 NID_authority_key_identifier, NULL, NULL);

243                 crl->crl_number = X509_CRL_get_ext_d2i(crl,
244                                                         NID_crl_number, NULL, NULL);

246                 crl->base_crl_number = X509_CRL_get_ext_d2i(crl,
247                                                             NID_delta_crl, NULL, NULL);
248                 /* Delta CRLs must have CRL number */
249                 if (crl->base_crl_number && !crl->crl_number)
250                     crl->flags |= EXFLAG_INVALID;

252             /* See if we have any unhandled critical CRL extensions and
253                * indicate this in a flag. We only currently handle IDP so
254                * anything else critical sets the flag.
255                */
256             /* This code accesses the X509_CRL structure directly:
257                * applications shouldn't do this.
258                */

```



```

260     exts = crl->crl->extensions;
261
262     for (idx = 0; idx < sk_X509_EXTENSION_num(exts); idx++)
263     {
264         int nid;
265         ext = sk_X509_EXTENSION_value(exts, idx);
266         nid = OBJ_obj2nid(ext->object);
267         if (nid == NID_freshest_crl)
268             crl->flags |= EXFLAG_FRESHEST;
269         if (ext->critical > 0)
270         {
271             /* We handle IDP and deltas */
272             if ((nid == NID_issuing_distribution_point)
273                 || (nid == NID_delta_crl))
274                 break;
275             crl->flags |= EXFLAG_CRITICAL;
276             break;
277         }
278     }
279
281     if (!crl_set_issuers(crl))
282         return 0;
283
284     if (crl->meth->crl_init)
285     {
286         if (crl->meth->crl_init(crl) == 0)
287             return 0;
288     }
289     break;
290
291     case ASN1_OP_FREE_POST:
292     if (crl->meth->crl_free)
293     {
294         if (!crl->meth->crl_free(crl))
295             return 0;
296     }
297     if (crl->akid)
298         AUTHORITY_KEYID_free(crl->akid);
299     if (crl->idp)
300         ISSUING_DIST_POINT_free(crl->idp);
301     ASN1_INTEGER_free(crl->crl_number);
302     ASN1_INTEGER_free(crl->base_crl_number);
303     sk_GENERAL_NAMES_pop_free(crl->issuers, GENERAL_NAMES_free);
304     break;
305 }
306 return 1;
307 }
308
309 /* Convert IDP into a more convenient form */
310
311 static void setup_idp(X509_CRL *crl, ISSUING_DIST_POINT *idp)
312 {
313     int idp_only = 0;
314     /* Set various flags according to IDP */
315     crl->idp_flags |= IDP_PRESENT;
316     if (idp->onlyuser > 0)
317     {
318         idp_only++;
319         crl->idp_flags |= IDP_ONLYUSER;
320     }
321     if (idp->onlyCA > 0)
322     {
323         idp_only++;
324         crl->idp_flags |= IDP_ONLYCA;
325     }

```

```

326     if (idp->onlyattr > 0)
327     {
328         idp_only++;
329         crl->idp_flags |= IDP_ONLYATTR;
330     }
331
332     if (idp_only > 1)
333         crl->idp_flags |= IDP_INVALID;
334
335     if (idp->indirectCRL > 0)
336         crl->idp_flags |= IDP_INDIRECT;
337
338     if (idp->onlysomereasons)
339     {
340         crl->idp_flags |= IDP_REASONS;
341         if (idp->onlysomereasons->length > 0)
342             crl->idp_reasons = idp->onlysomereasons->data[0];
343         if (idp->onlysomereasons->length > 1)
344             crl->idp_reasons |=
345                 (idp->onlysomereasons->data[1] << 8);
346         crl->idp_reasons &= CRLDP_ALL_REASONS;
347     }
348
349     DIST_POINT_set_dpname(idp->distpoint, X509_CRL_get_issuer(crl));
350 }
351
352 ASN1_SEQUENCE_ref(X509_CRL, crl_cb, CRYPTO_LOCK_X509_CRL) = {
353     ASN1_SIMPLE(X509_CRL, crl, X509_CRL_INFO),
354     ASN1_SIMPLE(X509_CRL, sig_alg, X509_ALGOR),
355     ASN1_SIMPLE(X509_CRL, signature, ASN1_BIT_STRING)
356 } ASN1_SEQUENCE_END_ref(X509_CRL, X509_CRL)
357
358 IMPLEMENT_ASN1_FUNCTIONS(X509_REVOKED)
359 IMPLEMENT_ASN1_FUNCTIONS(X509_CRL_INFO)
360 IMPLEMENT_ASN1_FUNCTIONS(X509_CRL)
361 IMPLEMENT_ASN1_FUNCTIONS(X509_CRL)
362
363 static int X509_REVOKED_cmp(const X509_REVOKED * const *a,
364                             const X509_REVOKED * const *b)
365 {
366     return(ASN1_STRING_cmp(
367         (ASN1_STRING *)(*a)->serialNumber,
368         (ASN1_STRING *)(*b)->serialNumber));
369 }
370
371 int X509_CRL_add0_revoked(X509_CRL *crl, X509_REVOKED *rev)
372 {
373     X509_CRL_INFO *inf;
374     inf = crl->crl;
375     if (!inf->revoked)
376         inf->revoked = sk_X509_REVOKED_new(X509_REVOKED_cmp);
377     if (!inf->revoked || !sk_X509_REVOKED_push(inf->revoked, rev)) {
378         ASN1err(ASN1_F_X509_CRL_ADD0_REVOKED, ERR_R_MALLOC_FAILURE);
379         return 0;
380     }
381     inf->enc.modified = 1;
382     return 1;
383 }
384
385 int X509_CRL_verify(X509_CRL *crl, EVP_PKEY *r)
386 {
387     if (crl->meth->crl_verify)
388         return crl->meth->crl_verify(crl, r);
389     return 0;
390 }

```

```

392 int X509_CRL_get0_by_serial(X509_CRL *crl,
393                             X509_REVOKED **ret, ASN1_INTEGER *serial)
394 {
395     if (crl->meth->crl_lookup)
396         return crl->meth->crl_lookup(crl, ret, serial, NULL);
397     return 0;
398 }
399
400 int X509_CRL_get0_by_cert(X509_CRL *crl, X509_REVOKED **ret, X509 *x)
401 {
402     if (crl->meth->crl_lookup)
403         return crl->meth->crl_lookup(crl, ret,
404                                     X509_get_serialNumber(x),
405                                     X509_get_issuer_name(x));
406     return 0;
407 }
408
409 static int def_crl_verify(X509_CRL *crl, EVP_PKEY *r)
410 {
411     return(ASN1_item_verify(ASN1_ITEM_rptr(X509_CRL_INFO),
412                             crl->sig_alg, crl->signature, crl->crl, r));
413 }
414
415 static int crl_revoked_issuer_match(X509_CRL *crl, X509_NAME *nm,
416                                     X509_REVOKED *rev)
417 {
418     int i;
419
420     if (!rev->issuer)
421     {
422         if (!nm)
423             return 1;
424         if (!X509_NAME_cmp(nm, X509_CRL_get_issuer(crl)))
425             return 1;
426         return 0;
427     }
428
429     if (!nm)
430         nm = X509_CRL_get_issuer(crl);
431
432     for (i = 0; i < sk_GENERAL_NAME_num(rev->issuer); i++)
433     {
434         GENERAL_NAME *gen = sk_GENERAL_NAME_value(rev->issuer, i);
435         if (gen->type != GEN_DIRNAME)
436             continue;
437         if (!X509_NAME_cmp(nm, gen->d.directoryName))
438             return 1;
439     }
440     return 0;
441 }
442
443 static int def_crl_lookup(X509_CRL *crl,
444                           X509_REVOKED **ret, ASN1_INTEGER *serial, X509_NAME *issuer)
445 {
446     X509_REVOKED rtmp, *rev;
447     int idx;
448     rtmp.serialNumber = serial;
449     /* Sort revoked into serial number order if not already sorted.
450      * Do this under a lock to avoid race condition.
451      */
452     if (!sk_X509_REVOKED_is_sorted(crl->crl->revoked))
453     {
454         CRYPTO_w_lock(CRYPTO_LOCK_X509_CRL);
455         sk_X509_REVOKED_sort(crl->crl->revoked);
456         CRYPTO_w_unlock(CRYPTO_LOCK_X509_CRL);

```

```

458     }
459     idx = sk_X509_REVOKED_find(crl->crl->revoked, &rtmp);
460     if (idx < 0)
461         return 0;
462     /* Need to look for matching name */
463     for (; idx < sk_X509_REVOKED_num(crl->crl->revoked); idx++)
464     {
465         rev = sk_X509_REVOKED_value(crl->crl->revoked, idx);
466         if (ASN1_INTEGER_cmp(rev->serialNumber, serial))
467             return 0;
468         if (crl_revoked_issuer_match(crl, issuer, rev))
469         {
470             if (ret)
471                 *ret = rev;
472             if (rev->reason == CRL_REASON_REMOVE_FROM_CRL)
473                 return 2;
474             return 1;
475         }
476     }
477     return 0;
478 }
479
480 void X509_CRL_set_default_method(const X509_CRL_METHOD *meth)
481 {
482     if (meth == NULL)
483         default_crl_method = &int_crl_method;
484     else
485         default_crl_method = meth;
486 }
487
488 X509_CRL_METHOD *X509_CRL_METHOD_new(
489     int (*crl_init)(X509_CRL *crl),
490     int (*crl_free)(X509_CRL *crl),
491     int (*crl_lookup)(X509_CRL *crl, X509_REVOKED **ret,
492                       ASN1_INTEGER *ser, X509_NAME *issuer),
493     int (*crl_verify)(X509_CRL *crl, EVP_PKEY *pk))
494 {
495     X509_CRL_METHOD *m;
496     m = OPENSSL_malloc(sizeof(X509_CRL_METHOD));
497     if (!m)
498         return NULL;
499     m->crl_init = crl_init;
500     m->crl_free = crl_free;
501     m->crl_lookup = crl_lookup;
502     m->crl_verify = crl_verify;
503     m->flags = X509_CRL_METHOD_DYNAMIC;
504     return m;
505 }
506
507 void X509_CRL_METHOD_free(X509_CRL_METHOD *m)
508 {
509     if (!(m->flags & X509_CRL_METHOD_DYNAMIC))
510         return;
511     OPENSSL_free(m);
512 }
513
514 void X509_CRL_set_meth_data(X509_CRL *crl, void *dat)
515 {
516     crl->meth_data = dat;
517 }
518
519 void *X509_CRL_get_meth_data(X509_CRL *crl)
520 {
521     return crl->meth_data;
522 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_crl.c

9

```
524 IMPLEMENT_STACK_OF(X509_REVOKED)
525 IMPLEMENT_ASN1_SET_OF(X509_REVOKED)
526 IMPLEMENT_STACK_OF(X509_CRL)
527 IMPLEMENT_ASN1_SET_OF(X509_CRL)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_exten.c

1

```
*****
3392 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_exten.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* x_exten.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stddef.h>
60 #include <openssl/x509.h>
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_exten.c

2

```
62 #include <openssl/asn1t.h>
64 ASN1_SEQUENCE(X509_EXTENSION) = {
65     ASN1_SIMPLE(X509_EXTENSION, object, ASN1_OBJECT),
66     ASN1_OPT(X509_EXTENSION, critical, ASN1_BOOLEAN),
67     ASN1_SIMPLE(X509_EXTENSION, value, ASN1_OCTET_STRING)
68 } ASN1_SEQUENCE_END(X509_EXTENSION)
70 ASN1_ITEM_TEMPLATE(X509_EXTENSIONS) =
71     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, Extension, X509_EXTENSIO
72 ASN1_ITEM_TEMPLATE_END(X509_EXTENSIONS)
74 IMPLEMENT_ASN1_FUNCTIONS(X509_EXTENSION)
75 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_fname(X509_EXTENSIONS, X509_EXTENSIONS, X509_EXT
76 IMPLEMENT_ASN1_DUP_FUNCTION(X509_EXTENSION)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_info.c

1

```
*****
4261 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_info.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/x_info.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_info.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/x509.h>
64
65 X509_INFO *X509_INFO_new(void)
66 {
67     X509_INFO *ret=NULL;
68
69     ret=(X509_INFO *)OPENSSL_malloc(sizeof(X509_INFO));
70     if (ret == NULL)
71     {
72         ASN1err(ASN1_F_X509_INFO_NEW,ERR_R_MALLOC_FAILURE);
73         return(NULL);
74     }
75
76     ret->enc_cipher.cipher=NULL;
77     ret->enc_len=0;
78     ret->enc_data=NULL;
79
80     ret->references=1;
81     ret->x509=NULL;
82     ret->crl=NULL;
83     ret->x_pkey=NULL;
84     return(ret);
85 }
86
87 void X509_INFO_free(X509_INFO *x)
88 {
89     int i;
90
91     if (x == NULL) return;
92
93     i=CRYPTO_add(&x->references,-1,CRYPTO_LOCK_X509_INFO);
94     #ifdef REF_PRINT
95     REF_PRINT("X509_INFO",x);
96     #endif
97     if (i > 0) return;
98     #ifdef REF_CHECK
99     if (i < 0)
100     {
101         fprintf(stderr,"X509_INFO_free, bad reference count\n");
102         abort();
103     }
104     #endif
105
106     if (x->x509 != NULL) X509_free(x->x509);
107     if (x->crl != NULL) X509_CRL_free(x->crl);
108     if (x->x_pkey != NULL) X509_PKEY_free(x->x_pkey);
109     if (x->enc_data != NULL) OPENSSL_free(x->enc_data);
110     OPENSSL_free(x);
111 }
112
113 IMPLEMENT_STACK_OF(X509_INFO)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_long.c

1

```
*****
5845 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_long.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* x_long.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_long.c

2

```
62 #include <openssl/bn.h>
63
64 /* Custom primitive type for long handling. This converts between an ASN1_INTEGER
65  * and a long directly.
66  */
67
69 static int long_new(ASN1_VALUE **pval, const ASN1_ITEM *it);
70 static void long_free(ASN1_VALUE **pval, const ASN1_ITEM *it);
71
72 static int long_i2c(ASN1_VALUE **pval, unsigned char *cont, int *putype, const A
73 static int long_c2i(ASN1_VALUE **pval, const unsigned char *cont, int len, int u
74 static int long_print(BIO *out, ASN1_VALUE **pval, const ASN1_ITEM *it, int inde
75
76 static ASN1_PRIMITIVE_FUNCS long_pf = {
77     NULL, 0,
78     long_new,
79     long_free,
80     long_free, /* Clear should set to initial value */
81     long_c2i,
82     long_i2c,
83     long_print
84 };
85
86 ASN1_ITEM_start(LONG)
87     ASN1_ITYPE_PRIMITIVE, V_ASN1_INTEGER, NULL, 0, &long_pf, ASN1_LONG_UNDEF
88 ASN1_ITEM_end(LONG)
89
90 ASN1_ITEM_start(ZLONG)
91     ASN1_ITYPE_PRIMITIVE, V_ASN1_INTEGER, NULL, 0, &long_pf, 0, "ZLONG"
92 ASN1_ITEM_end(ZLONG)
93
94 static int long_new(ASN1_VALUE **pval, const ASN1_ITEM *it)
95 {
96     *(long *)pval = it->size;
97     return 1;
98 }
99
100 static void long_free(ASN1_VALUE **pval, const ASN1_ITEM *it)
101 {
102     *(long *)pval = it->size;
103 }
104
105 static int long_i2c(ASN1_VALUE **pval, unsigned char *cont, int *putype, const A
106 {
107     long ltmp;
108     unsigned long utmp;
109     int clen, pad, i;
110     /* this exists to bypass broken gcc optimization */
111     char *cp = (char *)pval;
112
113     /* use memcpy, because we may not be long aligned */
114     memcpy(&ltmp, cp, sizeof(long));
115
116     if(ltmp == it->size) return -1;
117     /* Convert the long to positive: we subtract one if negative so
118      * we can cleanly handle the padding if only the MSB of the leading
119      * octet is set.
120      */
121     if(ltmp < 0) utmp = -ltmp - 1;
122     else utmp = ltmp;
123     clen = BN_num_bits_word(utmp);
124     /* If MSB of leading octet set we need to pad */
125     if(!(clen & 0x7)) pad = 1;
126     else pad = 0;
```

```
128 /* Convert number of bits to number of octets */
129 clen = (clen + 7) >> 3;
131 if(cont) {
132     if(pad) *cont++ = (ltmp < 0) ? 0xff : 0;
133     for(i = clen - 1; i >= 0; i--) {
134         cont[i] = (unsigned char)(utmp & 0xff);
135         if(ltmp < 0) cont[i] ^= 0xff;
136         utmp >>= 8;
137     }
138 }
139 return clen + pad;
140 }

142 static int long_c2i(ASN1_VALUE **pval, const unsigned char *cont, int len,
143                    int utype, char *free_cont, const ASN1_ITEM *it)
144 {
145     int neg, i;
146     long ltmp;
147     unsigned long utmp = 0;
148     char *cp = (char *)pval;
149     if(len > (int)sizeof(long)) {
150         ASN1err(ASN1_F_LONG_C2I, ASN1_R_INTEGER_TOO_LARGE_FOR_LONG);
151         return 0;
152     }
153     /* Is it negative? */
154     if(len && (cont[0] & 0x80)) neg = 1;
155     else neg = 0;
156     utmp = 0;
157     for(i = 0; i < len; i++) {
158         utmp <= 8;
159         if(neg) utmp |= cont[i] ^ 0xff;
160         else utmp |= cont[i];
161     }
162     ltmp = (long)utmp;
163     if(neg) {
164         ltmp++;
165         ltmp = -ltmp;
166     }
167     if(ltmp == it->size) {
168         ASN1err(ASN1_F_LONG_C2I, ASN1_R_INTEGER_TOO_LARGE_FOR_LONG);
169         return 0;
170     }
171     memcpy(cp, &lttmp, sizeof(long));
172     return 1;
173 }

175 static int long_print(BIO *out, ASN1_VALUE **pval, const ASN1_ITEM *it,
176                      int indent, const ASN1_PCTX *pctx)
177 {
178     return BIO_printf(out, "%ld\n", *(long *)pval);
179 }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_name.c

1

14703 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_name.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/x_name.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
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33 * "This product includes cryptographic software written by
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40 *
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <ctype.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_name.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/x509.h>
64 #include "asn1_locl.h"
65
66 typedef STACK_OF(X509_NAME_ENTRY) STACK_OF_X509_NAME_ENTRY;
67 DECLARE_STACK_OF(STACK_OF_X509_NAME_ENTRY)
68
69 static int x509_name_ex_d2i(ASN1_VALUE **val,
70                             const unsigned char **in, long len,
71                             const ASN1_ITEM *it,
72                             int tag, int aclass, char opt, ASN1_TLC *ctx);
73
74 static int x509_name_ex_i2d(ASN1_VALUE **val, unsigned char **out,
75                             const ASN1_ITEM *it, int tag, int aclass);
76 static int x509_name_ex_new(ASN1_VALUE **val, const ASN1_ITEM *it);
77 static void x509_name_ex_free(ASN1_VALUE **val, const ASN1_ITEM *it);
78
79 static int x509_name_encode(X509_NAME *a);
80 static int x509_name_canon(X509_NAME *a);
81 static int asn1_string_canon(ASN1_STRING *out, ASN1_STRING *in);
82 static int i2d_name_canon(STACK_OF(STACK_OF_X509_NAME_ENTRY) *intname,
83                           unsigned char **in);
84
85
86 static int x509_name_ex_print(BIO *out, ASN1_VALUE **pval,
87                               int indent,
88                               const char *fname,
89                               const ASN1_PCTX *pctx);
89
90
91 ASN1_SEQUENCE(X509_NAME_ENTRY) = {
92     ASN1_SIMPLE(X509_NAME_ENTRY, object, ASN1_OBJECT),
93     ASN1_SIMPLE(X509_NAME_ENTRY, value, ASN1_PRINTABLE)
94 } ASN1_SEQUENCE_END(X509_NAME_ENTRY)
95
96 IMPLEMENT_ASN1_FUNCTIONS(X509_NAME_ENTRY)
97 IMPLEMENT_ASN1_DUP_FUNCTION(X509_NAME_ENTRY)
98
99 /* For the "Name" type we need a SEQUENCE OF { SET OF X509_NAME_ENTRY }
100  * so declare two template wrappers for this
101  */
102
103 ASN1_ITEM_TEMPLATE(X509_NAME_ENTRIES) =
104     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SET_OF, 0, RDNS, X509_NAME_ENTRY)
105 ASN1_ITEM_TEMPLATE_END(X509_NAME_ENTRIES)
106
107 ASN1_ITEM_TEMPLATE(X509_NAME_INTERNAL) =
108     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, Name, X509_NAME_ENTRIES)
109 ASN1_ITEM_TEMPLATE_END(X509_NAME_INTERNAL)
110
111 /* Normally that's where it would end: we'd have two nested STACK structures
112  * representing the ASN1. Unfortunately X509_NAME uses a completely different
113  * form and caches encodings so we have to process the internal form and convert
114  * to the external form.
115  */
116
117 const ASN1_EXTERN_FUNCS x509_name_ff = {
118     NULL,
119     x509_name_ex_new,
120     x509_name_ex_free,
121     0, /* Default clear behaviour is OK */
122     x509_name_ex_d2i,
123     x509_name_ex_i2d,
124     x509_name_ex_print
125 };
126
127 IMPLEMENT_EXTERN_ASN1(X509_NAME, V_ASN1_SEQUENCE, x509_name_ff)
```



```

129 IMPLEMENT_ASN1_FUNCTIONS(X509_NAME)
130 IMPLEMENT_ASN1_DUP_FUNCTION(X509_NAME)

132 static int x509_name_ex_new(ASN1_VALUE **val, const ASN1_ITEM *it)
133 {
134     X509_NAME *ret = NULL;
135     ret = OPENSSL_malloc(sizeof(X509_NAME));
136     if(!ret) goto memerr;
137     if((ret->entries=sk_X509_NAME_ENTRY_new_null()) == NULL)
138         goto memerr;
139     if((ret->bytes = BUF_MEM_new()) == NULL) goto memerr;
140     ret->canon_enc = NULL;
141     ret->canon_enclen = 0;
142     ret->modified=1;
143     *val = (ASN1_VALUE *)ret;
144     return 1;

146 memerr:
147     ASN1err(ASN1_F_X509_NAME_EX_NEW, ERR_R_MALLOC_FAILURE);
148     if (ret)
149     {
150         if (ret->entries)
151             sk_X509_NAME_ENTRY_free(ret->entries);
152         OPENSSL_free(ret);
153     }
154     return 0;
155 }

157 static void x509_name_ex_free(ASN1_VALUE **pval, const ASN1_ITEM *it)
158 {
159     X509_NAME *a;
160     if(!pval || !*pval)
161         return;
162     a = (X509_NAME *)*pval;

164     BUF_MEM_free(a->bytes);
165     sk_X509_NAME_ENTRY_pop_free(a->entries, X509_NAME_ENTRY_free);
166     if (a->canon_enc)
167         OPENSSL_free(a->canon_enc);
168     OPENSSL_free(a);
169     *pval = NULL;
170 }

172 static int x509_name_ex_d2i(ASN1_VALUE **val,
173                             const unsigned char **in, long len, const ASN1_ITEM *it,
174                             int tag, int aclass, char opt, ASN1_TLC *ctx)
175 {
176     const unsigned char *p = *in, *q;
177     union { STACK_OF(STACK_OF_X509_NAME_ENTRY) *s;
178             ASN1_VALUE *a; } inname = {NULL};
179     union { X509_NAME *x; ASN1_VALUE *a; } nm = {NULL};
180     int i, j, ret;
181     STACK_OF(X509_NAME_ENTRY) *entries;
182     X509_NAME_ENTRY *entry;
183     q = p;

185     /* Get internal representation of Name */
186     ret = ASN1_item_ex_d2i(&inname.a,
187                           &p, len, ASN1_ITEM_rptr(X509_NAME_INTERNAL),
188                           tag, aclass, opt, ctx);
189
190     if(ret <= 0) return ret;

192     if(*val) x509_name_ex_free(val, NULL);
193     if(!x509_name_ex_new(&nm.a, NULL)) goto err;

```

```

194     /* We've decoded it: now cache encoding */
195     if(!BUF_MEM_grow(nm.x->bytes, p - q)) goto err;
196     memcpy(nm.x->bytes->data, q, p - q);

198     /* Convert internal representation to X509_NAME structure */
199     for(i = 0; i < sk_STACK_OF_X509_NAME_ENTRY_num(inname.s); i++) {
200         entries = sk_STACK_OF_X509_NAME_ENTRY_value(inname.s, i);
201         for(j = 0; j < sk_X509_NAME_ENTRY_num(entries); j++) {
202             entry = sk_X509_NAME_ENTRY_value(entries, j);
203             entry->set = i;
204             if(!sk_X509_NAME_ENTRY_push(nm.x->entries, entry))
205                 goto err;
206         }
207         sk_X509_NAME_ENTRY_free(entries);
208     }
209     sk_STACK_OF_X509_NAME_ENTRY_free(inname.s);
210     ret = x509_name_canon(nm.x);
211     if (!ret)
212         goto err;
213     nm.x->modified = 0;
214     *val = nm.a;
215     *in = p;
216     return ret;
217 err:
218     if (nm.x != NULL)
219         X509_NAME_free(nm.x);
220     ASN1err(ASN1_F_X509_NAME_EX_D2I, ERR_R_NESTED_ASN1_ERROR);
221     return 0;
222 }

224 static int x509_name_ex_i2d(ASN1_VALUE **val, unsigned char **out, const ASN1_IT
225 {
226     int ret;
227     X509_NAME *a = (X509_NAME *)*val;
228     if(a->modified) {
229         ret = x509_name_encode(a);
230         if(ret < 0)
231             return ret;
232         ret = x509_name_canon(a);
233         if(ret < 0)
234             return ret;
235     }
236     ret = a->bytes->length;
237     if(out != NULL) {
238         memcpy(*out, a->bytes->data, ret);
239         *out+=ret;
240     }
241     return ret;
242 }

244 static void local_sk_X509_NAME_ENTRY_free(STACK_OF(X509_NAME_ENTRY) *ne)
245 {
246     sk_X509_NAME_ENTRY_free(ne);
247 }

249 static void local_sk_X509_NAME_ENTRY_pop_free(STACK_OF(X509_NAME_ENTRY) *ne)
250 {
251     sk_X509_NAME_ENTRY_pop_free(ne, X509_NAME_ENTRY_free);
252 }

254 static int x509_name_encode(X509_NAME *a)
255 {
256     union { STACK_OF(STACK_OF_X509_NAME_ENTRY) *s;
257             ASN1_VALUE *a; } inname = {NULL};
258     int len;
259     unsigned char *p;

```

```

260     STACK_OF(X509_NAME_ENTRY) *entries = NULL;
261     X509_NAME_ENTRY *entry;
262     int i, set = -1;
263     intname.s = sk_STACK_OF_X509_NAME_ENTRY_new_null();
264     if(!intname.s) goto memerr;
265     for(i = 0; i < sk_X509_NAME_ENTRY_num(a->entries); i++) {
266         entry = sk_X509_NAME_ENTRY_value(a->entries, i);
267         if(entry->set != set) {
268             entries = sk_X509_NAME_ENTRY_new_null();
269             if(!entries) goto memerr;
270             if(!sk_STACK_OF_X509_NAME_ENTRY_push(intname.s,
271                                                     entry))
272                 goto memerr;
273             set = entry->set;
274         }
275         if(!sk_X509_NAME_ENTRY_push(entries, entry)) goto memerr;
276     }
277     len = ASN1_item_ex_i2d(&intname.a, NULL,
278                            ASN1_ITEM_rptr(X509_NAME_INTERNAL), -1, -1);
279     if (!BUF_MEM_grow(a->bytes, len)) goto memerr;
280     p=(unsigned char *)a->bytes->data;
281     ASN1_item_ex_i2d(&intname.a,
282                     &p, ASN1_ITEM_rptr(X509_NAME_INTERNAL), -1, -1);
283     sk_STACK_OF_X509_NAME_ENTRY_pop_free(intname.s,
284                                           local_sk_X509_NAME_ENTRY_free);
285     a->modified = 0;
286     return len;
287 memerr:
288     sk_STACK_OF_X509_NAME_ENTRY_pop_free(intname.s,
289                                           local_sk_X509_NAME_ENTRY_free);
290     ASN1err(ASN1_F_X509_NAME_ENCODE, ERR_R_MALLOC_FAILURE);
291     return -1;
292 }

294 static int x509_name_ex_print(BIO *out, ASN1_VALUE **pval,
295                               int indent,
296                               const char *fname,
297                               const ASN1_PCTX *pctx)
298 {
299     if (X509_NAME_print_ex(out, (X509_NAME *)*pval,
300                            indent, pctx->nm_flags) <= 0)
301         return 0;
302     return 2;
303 }

305 /* This function generates the canonical encoding of the Name structure.
306  * In it all strings are converted to UTF8, leading, trailing and
307  * multiple spaces collapsed, converted to lower case and the leading
308  * SEQUENCE header removed.
309  *
310  * In future we could also normalize the UTF8 too.
311  *
312  * By doing this comparison of Name structures can be rapidly
313  * performed by just using memcmp() of the canonical encoding.
314  * By omitting the leading SEQUENCE name constraints of type
315  * dirName can also be checked with a simple memcmp().
316  */

318 static int x509_name_canon(X509_NAME *a)
319 {
320     unsigned char *p;
321     STACK_OF(STACK_OF_X509_NAME_ENTRY) *intname = NULL;
322     STACK_OF(X509_NAME_ENTRY) *entries = NULL;
323     X509_NAME_ENTRY *entry, *tmpentry = NULL;
324     int i, set = -1, ret = 0;

```

```

326     if (a->canon_enc)
327     {
328         OPENSSL_free(a->canon_enc);
329         a->canon_enc = NULL;
330     }
331     /* Special case: empty X509_NAME => null encoding */
332     if (sk_X509_NAME_ENTRY_num(a->entries) == 0)
333     {
334         a->canon_enclen = 0;
335         return 1;
336     }
337     intname = sk_STACK_OF_X509_NAME_ENTRY_new_null();
338     if(!intname)
339         goto err;
340     for(i = 0; i < sk_X509_NAME_ENTRY_num(a->entries); i++)
341     {
342         entry = sk_X509_NAME_ENTRY_value(a->entries, i);
343         if(entry->set != set)
344         {
345             entries = sk_X509_NAME_ENTRY_new_null();
346             if(!entries)
347                 goto err;
348             if(!sk_STACK_OF_X509_NAME_ENTRY_push(intname, entries))
349                 goto err;
350             set = entry->set;
351         }
352         tmpentry = X509_NAME_ENTRY_new();
353         tmpentry->object = OBJ_dup(entry->object);
354         if (!asn1_string_canon(tmpentry->value, entry->value))
355             goto err;
356         if(!sk_X509_NAME_ENTRY_push(entries, tmpentry))
357             goto err;
358         tmpentry = NULL;
359     }

361     /* Finally generate encoding */

363     a->canon_enclen = i2d_name_canon(intname, NULL);

365     p = OPENSSL_malloc(a->canon_enclen);

367     if (!p)
368         goto err;

370     a->canon_enc = p;

372     i2d_name_canon(intname, &p);

374     ret = 1;

376     err:

378     if (tmpentry)
379         X509_NAME_ENTRY_free(tmpentry);
380     if (intname)
381         sk_STACK_OF_X509_NAME_ENTRY_pop_free(intname,
382                                               local_sk_X509_NAME_ENTRY_pop_free);
383     return ret;
384 }

386 /* Bitmap of all the types of string that will be canonicalized. */

388 #define ASN1_MASK_CANON \
389     (B_ASN1_UTF8STRING | B_ASN1_BMPSTRING | B_ASN1_UNIVERSALSTRING \
390      | B_ASN1_PRINTABLESTRING | B_ASN1_T61STRING | B_ASN1_IA5STRING \
391      | B_ASN1_VISIBLESTRING)

```

```

392
394 static int asn1_string_canon(ASN1_STRING *out, ASN1_STRING *in)
395 {
396     unsigned char *to, *from;
397     int len, i;
398
399     /* If type not in bitmask just copy string across */
400     if (!(ASN1_tag2bit(in->type) & ASN1_MASK_CANON))
401     {
402         if (!ASN1_STRING_copy(out, in))
403             return 0;
404         return 1;
405     }
406
407     out->type = V_ASN1_UTF8STRING;
408     out->length = ASN1_STRING_to_UTF8(&out->data, in);
409     if (out->length == -1)
410         return 0;
411
412     to = out->data;
413     from = to;
414
415     len = out->length;
416
417     /* Convert string in place to canonical form.
418     * Ultimately we may need to handle a wider range of characters
419     * but for now ignore anything with MSB set and rely on the
420     * isspace() and tolower() functions.
421     */
422
423     /* Ignore leading spaces */
424     while((len > 0) && !(*from & 0x80) && isspace(*from))
425     {
426         from++;
427         len--;
428     }
429
430     to = from + len - 1;
431
432     /* Ignore trailing spaces */
433     while ((len > 0) && !(*to & 0x80) && isspace(*to))
434     {
435         to--;
436         len--;
437     }
438
439     to = out->data;
440
441     i = 0;
442     while(i < len)
443     {
444         /* If MSB set just copy across */
445         if (*from & 0x80)
446         {
447             *to++ = *from++;
448             i++;
449         }
450         /* Collapse multiple spaces */
451         else if (isspace(*from))
452         {
453             /* Copy one space across */
454             *to++ = ' ';
455             /* Ignore subsequent spaces. Note: don't need to
456             * check len here because we know the last
457             * character is a non-space so we can't overflow.

```

```

458         */
459         do
460         {
461             from++;
462             i++;
463         }
464         while(!(*from & 0x80) && isspace(*from));
465     }
466     else
467     {
468         *to++ = tolower(*from);
469         from++;
470         i++;
471     }
472 }
473
474 out->length = to - out->data;
475
476 return 1;
477
478 }
479
480 static int i2d_name_canon(STACK_OF(STACK_OF_X509_NAME_ENTRY) *_intname,
481                          unsigned char **in)
482 {
483     int i, len, ltmp;
484     ASN1_VALUE *v;
485     STACK_OF(ASN1_VALUE) *intname = (STACK_OF(ASN1_VALUE) *)_intname;
486
487     len = 0;
488     for (i = 0; i < sk_ASN1_VALUE_num(intname); i++)
489     {
490         v = sk_ASN1_VALUE_value(intname, i);
491         ltmp = ASN1_item_ex_i2d(&v, in,
492                                ASN1_ITEM_rptr(X509_NAME_ENTRIES), -1, -1);
493         if (ltmp < 0)
494             return ltmp;
495         len += ltmp;
496     }
497     return len;
498 }
499
500 int X509_NAME_set(X509_NAME **xn, X509_NAME *name)
501 {
502     X509_NAME *in;
503
504     if (!xn || !name) return(0);
505
506     if (*xn != name)
507     {
508         in=X509_NAME_dup(name);
509         if (in != NULL)
510         {
511             X509_NAME_free(*xn);
512             *xn=in;
513         }
514     }
515     return(*xn != NULL);
516 }
517
518 IMPLEMENT_STACK_OF(X509_NAME_ENTRY)
519 IMPLEMENT_ASN1_SET_OF(X509_NAME_ENTRY)

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_nx509.c

1

```
*****
3084 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_nx509.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* x_nx509.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2005.
4  */
5 /* =====
6  * Copyright (c) 2005 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stddef.h>
60 #include <openssl/x509.h>
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_nx509.c

2

```
62 #include <openssl/asn1t.h>
64 /* Old netscape certificate wrapper format */
66 ASN1_SEQUENCE(NETSCAPE_X509) = {
67     ASN1_SIMPLE(NETSCAPE_X509, header, ASN1_OCTET_STRING),
68     ASN1_OPT(NETSCAPE_X509, cert, X509)
69 } ASN1_SEQUENCE_END(NETSCAPE_X509)
71 IMPLEMENT_ASN1_FUNCTIONS(NETSCAPE_X509)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_pkey.c

1

```
*****
5436 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_pkey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/x_pkey.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_pkey.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/asn1_mac.h>
64 #include <openssl/x509.h>
65
66 /* need to implement */
67 int i2d_X509_PKEY(X509_PKEY *a, unsigned char **pp)
68 {
69     return(0);
70 }
71
72 X509_PKEY *d2i_X509_PKEY(X509_PKEY **a, const unsigned char **pp, long length)
73 {
74     int i;
75     M_ASN1_D2I_vars(a,X509_PKEY *,X509_PKEY_new);
76
77     M_ASN1_D2I_Init();
78     M_ASN1_D2I_start_sequence();
79     M_ASN1_D2I_get_x(X509_ALGOR,ret->enc_algor,d2i_X509_ALGOR);
80     M_ASN1_D2I_get_x(ASN1_OCTET_STRING,ret->enc_pkey,d2i_ASN1_OCTET_STRING);
81
82     ret->cipher.cipher=EVP_get_cipherbyname(
83         OBJ_nid2ln(OBJ_obj2nid(ret->enc_algor->algorithm)));
84     if (ret->cipher.cipher == NULL)
85     {
86         c.error=ASN1_R_UNSUPPORTED_CIPHER;
87         c.line=__LINE__;
88         goto err;
89     }
90     if (ret->enc_algor->parameter->type == V_ASN1_OCTET_STRING)
91     {
92         i=ret->enc_algor->parameter->value.octet_string->length;
93         if (i > EVP_MAX_IV_LENGTH)
94         {
95             c.error=ASN1_R_IV_TOO_LARGE;
96             c.line=__LINE__;
97             goto err;
98         }
99         memcpy(ret->cipher.iv,
100             ret->enc_algor->parameter->value.octet_string->data,i);
101     }
102     else
103         memset(ret->cipher.iv,0,EVP_MAX_IV_LENGTH);
104     M_ASN1_D2I_Finish(a,X509_PKEY_free,ASN1_F_D2I_X509_PKEY);
105 }
106
107 X509_PKEY *X509_PKEY_new(void)
108 {
109     X509_PKEY *ret=NULL;
110     ASN1_CTX c;
111
112     M_ASN1_New_Malloc(ret,X509_PKEY);
113     ret->version=0;
114     M_ASN1_New(ret->enc_algor,X509_ALGOR_new);
115     M_ASN1_New(ret->enc_pkey,M_ASN1_OCTET_STRING_new);
116     ret->dec_pkey=NULL;
117     ret->key_length=0;
118     ret->key_data=NULL;
119     ret->key_free=0;
120     ret->cipher.cipher=NULL;
121     memset(ret->cipher.iv,0,EVP_MAX_IV_LENGTH);
122     ret->references=1;
123     return(ret);
124     M_ASN1_New_Error(ASN1_F_X509_PKEY_NEW);
125 }
126
127 void X509_PKEY_free(X509_PKEY *x)
```

```
128     {
129         int i;

131         if (x == NULL) return;

133         i=CRYPTO_add(&x->references, -1, CRYPTO_LOCK_X509_PKEY);
134 #ifdef REF_PRINT
135     REF_PRINT("X509_PKEY",x);
136 #endif
137         if (i > 0) return;
138 #ifdef REF_CHECK
139         if (i < 0)
140         {
141             fprintf(stderr,"X509_PKEY_free, bad reference count\n");
142             abort();
143         }
144 #endif

146         if (x->enc_algor != NULL) X509_ALGOR_free(x->enc_algor);
147         if (x->enc_pkey != NULL) M_ASN1_OCTET_STRING_free(x->enc_pkey);
148         if (x->dec_pkey != NULL) EVP_PKEY_free(x->dec_pkey);
149         if ((x->key_data != NULL) && (x->key_free)) OPENSSL_free(x->key_data);
150         OPENSSL_free(x);
151     }
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_pubkey.c

1

```
*****
9514 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_pubkey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/asn1/x_pubkey.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_pubkey.c

2

```
62 #include <openssl/x509.h>
63 #include "asn1_locl.h"
64 #ifndef OPENSSL_NO_RSA
65 #include <openssl/rsa.h>
66 #endif
67 #ifndef OPENSSL_NO_DSA
68 #include <openssl/dsa.h>
69 #endif

71 /* Minor tweak to operation: free up EVP_PKEY */
72 static int pubkey_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
73 void *exarg)
74 {
75     if (operation == ASN1_OP_FREE_POST)
76     {
77         X509_PUBKEY *pubkey = (X509_PUBKEY *)*pval;
78         EVP_PKEY_free(pubkey->pkey);
79     }
80     return 1;
81 }

83 ASN1_SEQUENCE_cb(X509_PUBKEY, pubkey_cb) = {
84     ASN1_SIMPLE(X509_PUBKEY, algor, X509_ALGOR),
85     ASN1_SIMPLE(X509_PUBKEY, public_key, ASN1_BIT_STRING)
86 } ASN1_SEQUENCE_END_cb(X509_PUBKEY, X509_PUBKEY)

88 IMPLEMENT_ASN1_FUNCTIONS(X509_PUBKEY)

90 int X509_PUBKEY_set(X509_PUBKEY **x, EVP_PKEY *pkey)
91 {
92     X509_PUBKEY *pk=NULL;

94     if (x == NULL) return(0);

96     if ((pk=X509_PUBKEY_new()) == NULL) goto error;

98     if (pkey->ameth)
99     {
100         if (pkey->ameth->pub_encode)
101         {
102             if (!pkey->ameth->pub_encode(pk, pkey))
103             {
104                 X509err(X509_F_X509_PUBKEY_SET,
105                     X509_R_PUBLIC_KEY_ENCODE_ERROR);
106                 goto error;
107             }
108         }
109         else
110         {
111             X509err(X509_F_X509_PUBKEY_SET,
112                 X509_R_METHOD_NOT_SUPPORTED);
113             goto error;
114         }
115     }
116     else
117     {
118         X509err(X509_F_X509_PUBKEY_SET,X509_R_UNSUPPORTED_ALGORITHM);
119         goto error;
120     }

122     if (*x != NULL)
123         X509_PUBKEY_free(*x);

125     *x=pk;

127     return 1;
```

```

128 error:
129     if (pk != NULL) X509_PUBKEY_free(pk);
130     return 0;
131 }

133 EVP_PKEY *X509_PUBKEY_get(X509_PUBKEY *key)
134 {
135     EVP_PKEY *ret=NULL;

137     if (key == NULL) goto error;

139     if (key->pkey != NULL)
140     {
141         CRYPTO_add(&key->pkey->references, 1, CRYPTO_LOCK_EVP_PKEY);
142         return key->pkey;
143     }

145     if (key->public_key == NULL) goto error;

147     if ((ret = EVP_PKEY_new()) == NULL)
148     {
149         X509err(X509_F_X509_PUBKEY_GET, ERR_R_MALLOC_FAILURE);
150         goto error;
151     }

153     if (!EVP_PKEY_set_type(ret, OBJ_obj2nid(key->algor->algorithm)))
154     {
155         X509err(X509_F_X509_PUBKEY_GET, X509_R_UNSUPPORTED_ALGORITHM);
156         goto error;
157     }

159     if (ret->ameth->pub_decode)
160     {
161         if (!ret->ameth->pub_decode(ret, key))
162         {
163             X509err(X509_F_X509_PUBKEY_GET,
164                     X509_R_PUBLIC_KEY_DECODE_ERROR);
165             goto error;
166         }
167     }
168     else
169     {
170         X509err(X509_F_X509_PUBKEY_GET, X509_R_METHOD_NOT_SUPPORTED);
171         goto error;
172     }

174     /* Check to see if another thread set key->pkey first */
175     CRYPTO_w_lock(CRYPTO_LOCK_EVP_PKEY);
176     if (key->pkey)
177     {
178         CRYPTO_w_unlock(CRYPTO_LOCK_EVP_PKEY);
179         EVP_PKEY_free(ret);
180         ret = key->pkey;
181     }
182     else
183     {
184         key->pkey = ret;
185         CRYPTO_w_unlock(CRYPTO_LOCK_EVP_PKEY);
186     }
187     CRYPTO_add(&ret->references, 1, CRYPTO_LOCK_EVP_PKEY);

189     return ret;

191 error:
192 if (ret != NULL)
193     EVP_PKEY_free(ret);

```

```

194     return(NULL);
195 }

197 /* Now two pseudo ASN1 routines that take an EVP_PKEY structure
198 * and encode or decode as X509_PUBKEY
199 */

201 EVP_PKEY *d2i_PUBKEY(EVP_PKEY **a, const unsigned char **pp,
202                      long length)
203 {
204     X509_PUBKEY *xpk;
205     EVP_PKEY *pktmp;
206     xpk = d2i_X509_PUBKEY(NULL, pp, length);
207     if(!xpk) return NULL;
208     pktmp = X509_PUBKEY_get(xpk);
209     X509_PUBKEY_free(xpk);
210     if(!pktmp) return NULL;
211     if(a)
212     {
213         EVP_PKEY_free(*a);
214         *a = pktmp;
215     }
216     return pktmp;
217 }

219 int i2d_PUBKEY(EVP_PKEY *a, unsigned char **pp)
220 {
221     X509_PUBKEY *xpk=NULL;
222     int ret;
223     if(!a) return 0;
224     if(!X509_PUBKEY_set(&xpk, a)) return 0;
225     ret = i2d_X509_PUBKEY(xpk, pp);
226     X509_PUBKEY_free(xpk);
227     return ret;
228 }

230 /* The following are equivalents but which return RSA and DSA
231 * keys
232 */
233 #ifndef OPENSSL_NO_RSA
234 RSA *d2i_RSA_PUBKEY(RSA **a, const unsigned char **pp,
235                     long length)
236 {
237     EVP_PKEY *pkey;
238     RSA *key;
239     const unsigned char *q;
240     q = *pp;
241     pkey = d2i_PUBKEY(NULL, &q, length);
242     if (!pkey) return NULL;
243     key = EVP_PKEY_get1_RSA(pkey);
244     EVP_PKEY_free(pkey);
245     if (!key) return NULL;
246     *pp = q;
247     if (a)
248     {
249         RSA_free(*a);
250         *a = key;
251     }
252     return key;
253 }

255 int i2d_RSA_PUBKEY(RSA *a, unsigned char **pp)
256 {
257     EVP_PKEY *pktmp;
258     int ret;
259     if (!a) return 0;

```



```

260     pktmp = EVP_PKEY_new();
261     if (!pktmp)
262     {
263         ASN1err(ASN1_F_I2D_RSA_PUBKEY, ERR_R_MALLOC_FAILURE);
264         return 0;
265     }
266     EVP_PKEY_set1_RSA(pktmp, a);
267     ret = i2d_PUBKEY(pktmp, pp);
268     EVP_PKEY_free(pktmp);
269     return ret;
270 }
271 #endif

273 #ifndef OPENSSL_NO_DSA
274 DSA *d2i_DSA_PUBKEY(DSA **a, const unsigned char **pp,
275                     long length)
276 {
277     EVP_PKEY *pkey;
278     DSA *key;
279     const unsigned char *q;
280     q = *pp;
281     pkey = d2i_PUBKEY(NULL, &q, length);
282     if (!pkey) return NULL;
283     key = EVP_PKEY_get1_DSA(pkey);
284     EVP_PKEY_free(pkey);
285     if (!key) return NULL;
286     *pp = q;
287     if (a)
288     {
289         DSA_free(*a);
290         *a = key;
291     }
292     return key;
293 }

295 int i2d_DSA_PUBKEY(DSA *a, unsigned char **pp)
296 {
297     EVP_PKEY *pktmp;
298     int ret;
299     if (!a) return 0;
300     pktmp = EVP_PKEY_new();
301     if (!pktmp)
302     {
303         ASN1err(ASN1_F_I2D_DSA_PUBKEY, ERR_R_MALLOC_FAILURE);
304         return 0;
305     }
306     EVP_PKEY_set1_DSA(pktmp, a);
307     ret = i2d_PUBKEY(pktmp, pp);
308     EVP_PKEY_free(pktmp);
309     return ret;
310 }
311 #endif

313 #ifndef OPENSSL_NO_EC
314 EC_KEY *d2i_EC_PUBKEY(EC_KEY **a, const unsigned char **pp, long length)
315 {
316     EVP_PKEY *pkey;
317     EC_KEY *key;
318     const unsigned char *q;
319     q = *pp;
320     pkey = d2i_PUBKEY(NULL, &q, length);
321     if (!pkey) return(NULL);
322     key = EVP_PKEY_get1_EC_KEY(pkey);
323     EVP_PKEY_free(pkey);
324     if (!key) return(NULL);
325     *pp = q;

```

```

326     if (a)
327     {
328         EC_KEY_free(*a);
329         *a = key;
330     }
331     return(key);
332 }

334 int i2d_EC_PUBKEY(EC_KEY *a, unsigned char **pp)
335 {
336     EVP_PKEY *pktmp;
337     int ret;
338     if (!a) return(0);
339     if ((pktmp = EVP_PKEY_new()) == NULL)
340     {
341         ASN1err(ASN1_F_I2D_EC_PUBKEY, ERR_R_MALLOC_FAILURE);
342         return(0);
343     }
344     EVP_PKEY_set1_EC_KEY(pktmp, a);
345     ret = i2d_PUBKEY(pktmp, pp);
346     EVP_PKEY_free(pktmp);
347     return(ret);
348 }
349 #endif

351 int X509_PUBKEY_set0_param(X509_PUBKEY *pub, ASN1_OBJECT *aobj,
352                             int ptype, void *pval,
353                             unsigned char *penc, int penclen)
354 {
355     if (!X509_ALGOR_set0(pub->algor, aobj, ptype, pval))
356         return 0;
357     if (penc)
358     {
359         if (pub->public_key->data)
360             OPENSSL_free(pub->public_key->data);
361         pub->public_key->data = penc;
362         pub->public_key->length = penclen;
363         /* Set number of unused bits to zero */
364         pub->public_key->flags&= ~(ASN1_STRING_FLAG_BITS_LEFT|0x07);
365         pub->public_key->flags|=ASN1_STRING_FLAG_BITS_LEFT;
366     }
367     return 1;
368 }

370 int X509_PUBKEY_get0_param(ASN1_OBJECT **ppkalg,
371                             const unsigned char **pk, int *ppklen,
372                             X509_ALGOR **pa,
373                             X509_PUBKEY *pub)
374 {
375     if (ppkalg)
376         *ppkalg = pub->algor->algorithm;
377     if (pk)
378     {
379         *pk = pub->public_key->data;
380         *ppklen = pub->public_key->length;
381     }
382     if (pa)
383         *pa = pub->algor;
384     return 1;
385 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_req.c

1

5068 Fri May 30 18:31:32 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_req.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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4  *
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_req.c

2

```
62 #include <openssl/x509.h>
63
64 /* X509_REQ_INFO is handled in an unusual way to get round
65  * invalid encodings. Some broken certificate requests don't
66  * encode the attributes field if it is empty. This is in
67  * violation of PKCS#10 but we need to tolerate it. We do
68  * this by making the attributes field OPTIONAL then using
69  * the callback to initialise it to an empty STACK.
70  *
71  * This means that the field will be correctly encoded unless
72  * we NULL out the field.
73  *
74  * As a result we no longer need the req_kludge field because
75  * the information is now contained in the attributes field:
76  * 1. If it is NULL then it's the invalid omission.
77  * 2. If it is empty it is the correct encoding.
78  * 3. If it is not empty then some attributes are present.
79  */
80
81 static int rinf_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
82                    void *exarg)
83 {
84     X509_REQ_INFO *rinf = (X509_REQ_INFO *)*pval;
85
86     if(operation == ASN1_OP_NEW_POST) {
87         rinf->attributes = sk_X509_ATTRIBUTE_new_null();
88         if(!rinf->attributes) return 0;
89     }
90     return 1;
91 }
92
93 ASN1_SEQUENCE_enc(X509_REQ_INFO, enc, rinf_cb) = {
94     ASN1_SIMPLE(X509_REQ_INFO, version, ASN1_INTEGER),
95     ASN1_SIMPLE(X509_REQ_INFO, subject, X509_NAME),
96     ASN1_SIMPLE(X509_REQ_INFO, pubkey, X509_PUBKEY),
97     /* This isn't really OPTIONAL but it gets round invalid
98      * encodings
99      */
100     ASN1_IMP_SET_OF_OPT(X509_REQ_INFO, attributes, X509_ATTRIBUTE, 0)
101 } ASN1_SEQUENCE_END_enc(X509_REQ_INFO, X509_REQ_INFO)
102
103 IMPLEMENT_ASN1_FUNCTIONS(X509_REQ_INFO)
104
105 ASN1_SEQUENCE_ref(X509_REQ, 0, CRYPTO_LOCK_X509_REQ) = {
106     ASN1_SIMPLE(X509_REQ, req_info, X509_REQ_INFO),
107     ASN1_SIMPLE(X509_REQ, sig_alg, X509_ALGOR),
108     ASN1_SIMPLE(X509_REQ, signature, ASN1_BIT_STRING)
109 } ASN1_SEQUENCE_END_ref(X509_REQ, X509_REQ)
110
111 IMPLEMENT_ASN1_FUNCTIONS(X509_REQ)
112 IMPLEMENT_ASN1_DUP_FUNCTION(X509_REQ)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_sig.c

1

3478 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_sig.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/x_sig.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_sig.c

2

62 #include <openssl/x509.h>

```
64 ASN1_SEQUENCE(X509_SIG) = {
65     ASN1_SIMPLE(X509_SIG, algor, X509_ALGOR),
66     ASN1_SIMPLE(X509_SIG, digest, ASN1_OCTET_STRING)
67 } ASN1_SEQUENCE_END(X509_SIG)
```

69 IMPLEMENT_ASN1_FUNCTIONS(X509_SIG)

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_spki.c

1

3914 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_spki.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* This module was send to me my Pat Richards <patr@x509.com> who
60  * wrote it. It is under my Copyright with his permission
61  */
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_spki.c

2

```
63 #include <stdio.h>
64 #include "cryptlib.h"
65 #include <openssl/x509.h>
66 #include <openssl/asn1t.h>
67
68 ASN1_SEQUENCE(NETSCAPE_SPKAC) = {
69     ASN1_SIMPLE(NETSCAPE_SPKAC, pubkey, X509_PUBKEY),
70     ASN1_SIMPLE(NETSCAPE_SPKAC, challenge, ASN1_IA5STRING)
71 } ASN1_SEQUENCE_END(NETSCAPE_SPKAC)
72
73 IMPLEMENT_ASN1_FUNCTIONS(NETSCAPE_SPKAC)
74
75 ASN1_SEQUENCE(NETSCAPE_SPKI) = {
76     ASN1_SIMPLE(NETSCAPE_SPKI, spkac, NETSCAPE_SPKAC),
77     ASN1_SIMPLE(NETSCAPE_SPKI, sig_algor, X509_ALGOR),
78     ASN1_SIMPLE(NETSCAPE_SPKI, signature, ASN1_BIT_STRING)
79 } ASN1_SEQUENCE_END(NETSCAPE_SPKI)
80
81 IMPLEMENT_ASN1_FUNCTIONS(NETSCAPE_SPKI)
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_val.c

1

3475 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_val.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/asn1/x_val.c */
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57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_val.c

2

62 #include <openssl/x509.h>

```
64 ASN1_SEQUENCE(X509_VAL) = {
65     ASN1_SIMPLE(X509_VAL, notBefore, ASN1_TIME),
66     ASN1_SIMPLE(X509_VAL, notAfter, ASN1_TIME)
67 } ASN1_SEQUENCE_END(X509_VAL)
```

69 IMPLEMENT_ASN1_FUNCTIONS(X509_VAL)

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_x509.c

1

6915 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_x509.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_x509.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/x509.h>
64 #include <openssl/x509v3.h>
65
66 ASN1_SEQUENCE_enc(X509_CINF, enc, 0) = {
67     ASN1_EXP_OPT(X509_CINF, version, ASN1_INTEGER, 0),
68     ASN1_SIMPLE(X509_CINF, serialNumber, ASN1_INTEGER),
69     ASN1_SIMPLE(X509_CINF, signature, X509_ALGOR),
70     ASN1_SIMPLE(X509_CINF, issuer, X509_NAME),
71     ASN1_SIMPLE(X509_CINF, validity, X509_VAL),
72     ASN1_SIMPLE(X509_CINF, subject, X509_NAME),
73     ASN1_SIMPLE(X509_CINF, key, X509_PUBKEY),
74     ASN1_IMP_OPT(X509_CINF, issuerUID, ASN1_BIT_STRING, 1),
75     ASN1_IMP_OPT(X509_CINF, subjectUID, ASN1_BIT_STRING, 2),
76     ASN1_EXP_SEQUENCE_OF_OPT(X509_CINF, extensions, X509_EXTENSION, 3)
77 } ASN1_SEQUENCE_END_enc(X509_CINF, X509_CINF)
78
79 IMPLEMENT_ASN1_FUNCTIONS(X509_CINF)
80 /* X509 top level structure needs a bit of customisation */
81
82 extern void policy_cache_free(X509_POLICY_CACHE *cache);
83
84 static int x509_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
85                    void *exarg)
86 {
87     X509 *ret = (X509 *)*pval;
88
89     switch(operation) {
90
91         case ASN1_OP_NEW_POST:
92             ret->valid=0;
93             ret->name = NULL;
94             ret->ex_flags = 0;
95             ret->ex_pathlen = -1;
96             ret->skid = NULL;
97             ret->akid = NULL;
98             #ifndef OPENSSL_NO_RFC3779
99             ret->rfc3779_addr = NULL;
100            ret->rfc3779_asid = NULL;
101            #endif
102            ret->aux = NULL;
103            ret->crldp = NULL;
104            CRYPTO_new_ex_data(CRYPTO_EX_INDEX_X509, ret, &ret->ex_data);
105            break;
106
107         case ASN1_OP_D2I_POST:
108             if (ret->name != NULL) OPENSSL_free(ret->name);
109             ret->name=X509_NAME_oneline(ret->cert_info->subject,NULL,0);
110             break;
111
112         case ASN1_OP_FREE_POST:
113             CRYPTO_free_ex_data(CRYPTO_EX_INDEX_X509, ret, &ret->ex_data);
114             X509_CERT_AUX_free(ret->aux);
115             ASN1_OCTET_STRING_free(ret->skid);
116             AUTHORITY_KEYID_free(ret->akid);
117             CRL_DIST_POINTS_free(ret->crldp);
118             policy_cache_free(ret->policy_cache);
119             GENERAL_NAMES_free(ret->altname);
120             NAME_CONSTRAINTS_free(ret->nc);
121             #ifndef OPENSSL_NO_RFC3779
122             sk_IPAddressFamily_pop_free(ret->rfc3779_addr, IPAddressFamily_f
123             ASIdentifiers_free(ret->rfc3779_asid);
124             #endif
125
126             if (ret->name != NULL) OPENSSL_free(ret->name);
127             break;
```

```

129     }
131     return 1;
133 }

135 ASN1_SEQUENCE_ref(X509, x509_cb, CRYPTO_LOCK_X509) = {
136     ASN1_SIMPLE(X509, cert_info, X509_CINF),
137     ASN1_SIMPLE(X509, sig_alg, X509_ALGOR),
138     ASN1_SIMPLE(X509, signature, ASN1_BIT_STRING)
139 } ASN1_SEQUENCE_END_ref(X509, X509)

141 IMPLEMENT_ASN1_FUNCTIONS(X509)
142 IMPLEMENT_ASN1_DUP_FUNCTION(X509)

144 int X509_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
145     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
146 {
147     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_X509, argl, argp,
148     new_func, dup_func, free_func);
149 }

151 int X509_set_ex_data(X509 *r, int idx, void *arg)
152 {
153     return(CRYPTO_set_ex_data(&r->ex_data,idx,arg));
154 }

156 void *X509_get_ex_data(X509 *r, int idx)
157 {
158     return(CRYPTO_get_ex_data(&r->ex_data,idx));
159 }

161 /* X509_AUX ASN1 routines. X509_AUX is the name given to
162  * a certificate with extra info tagged on the end. Since these
163  * functions set how a certificate is trusted they should only
164  * be used when the certificate comes from a reliable source
165  * such as local storage.
166  */
167 */

169 X509 *d2i_X509_AUX(X509 **a, const unsigned char **pp, long length)
170 {
171     const unsigned char *q;
172     X509 *ret;
173     /* Save start position */
174     q = *pp;
175     ret = d2i_X509(a, pp, length);
176     /* If certificate unreadable then forget it */
177     if(!ret) return NULL;
178     /* update length */
179     length -= *pp - q;
180     if(!length) return ret;
181     if(!d2i_X509_CERT_AUX(&ret->aux, pp, length)) goto err;
182     return ret;
183 err:
184     X509_free(ret);
185     return NULL;
186 }

188 int i2d_X509_AUX(X509 *a, unsigned char **pp)
189 {
190     int length;
191     length = i2d_X509(a, pp);
192     if(a) length += i2d_X509_CERT_AUX(a->aux, pp);
193     return length;

```

```

194 }

```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_x509a.c

1

```
*****
5947 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/asn1/x_x509a.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* a_x509a.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/asn1/x_x509a.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/x509.h>

65 /* X509_CERT_AUX routines. These are used to encode additional
66  * user modifiable data about a certificate. This data is
67  * appended to the X509 encoding when the *_X509_AUX routines
68  * are used. This means that the "traditional" X509 routines
69  * will simply ignore the extra data.
70  */

72 static X509_CERT_AUX *aux_get(X509 *x);

74 ASN1_SEQUENCE(X509_CERT_AUX) = {
75     ASN1_SEQUENCE_OF_OPT(X509_CERT_AUX, trust, ASN1_OBJECT),
76     ASN1_IMP_SEQUENCE_OF_OPT(X509_CERT_AUX, reject, ASN1_OBJECT, 0),
77     ASN1_OPT(X509_CERT_AUX, alias, ASN1_UTF8STRING),
78     ASN1_OPT(X509_CERT_AUX, keyid, ASN1_OCTET_STRING),
79     ASN1_IMP_SEQUENCE_OF_OPT(X509_CERT_AUX, other, X509_ALGOR, 1)
80 } ASN1_SEQUENCE_END(X509_CERT_AUX)

82 IMPLEMENT_ASN1_FUNCTIONS(X509_CERT_AUX)

84 static X509_CERT_AUX *aux_get(X509 *x)
85 {
86     if(!x) return NULL;
87     if(!x->aux && !(x->aux = X509_CERT_AUX_new())) return NULL;
88     return x->aux;
89 }

91 int X509_alias_set1(X509 *x, unsigned char *name, int len)
92 {
93     X509_CERT_AUX *aux;
94     if (!name)
95     {
96         if (!x || !x->aux || !x->aux->alias)
97             return 1;
98         ASN1_UTF8STRING_free(x->aux->alias);
99         x->aux->alias = NULL;
100         return 1;
101     }
102     if(!(aux = aux_get(x))) return 0;
103     if(!aux->alias && !(aux->alias = ASN1_UTF8STRING_new())) return 0;
104     return ASN1_STRING_set(aux->alias, name, len);
105 }

107 int X509_keyid_set1(X509 *x, unsigned char *id, int len)
108 {
109     X509_CERT_AUX *aux;
110     if (!id)
111     {
112         if (!x || !x->aux || !x->aux->keyid)
113             return 1;
114         ASN1_OCTET_STRING_free(x->aux->keyid);
115         x->aux->keyid = NULL;
116         return 1;
117     }
118     if(!(aux = aux_get(x))) return 0;
119     if(!aux->keyid && !(aux->keyid = ASN1_OCTET_STRING_new())) return 0;
120     return ASN1_STRING_set(aux->keyid, id, len);
121 }

123 unsigned char *X509_alias_get0(X509 *x, int *len)
124 {
125     if(!x->aux || !x->aux->alias) return NULL;
126     if(len) *len = x->aux->alias->length;
127     return x->aux->alias->data;
```



```
128 }

130 unsigned char *X509_keyid_get0(X509 *x, int *len)
131 {
132     if(!x->aux || !x->aux->keyid) return NULL;
133     if(len) *len = x->aux->keyid->length;
134     return x->aux->keyid->data;
135 }

137 int X509_add1_trust_object(X509 *x, ASN1_OBJECT *obj)
138 {
139     X509_CERT_AUX *aux;
140     ASN1_OBJECT *objtmp;
141     if(!(objtmp = OBJ_dup(obj))) return 0;
142     if(!(aux = aux_get(x))) return 0;
143     if(!aux->trust
144         && !(aux->trust = sk_ASN1_OBJECT_new_null())) return 0;
145     return sk_ASN1_OBJECT_push(aux->trust, objtmp);
146 }

148 int X509_add1_reject_object(X509 *x, ASN1_OBJECT *obj)
149 {
150     X509_CERT_AUX *aux;
151     ASN1_OBJECT *objtmp;
152     if(!(objtmp = OBJ_dup(obj))) return 0;
153     if(!(aux = aux_get(x))) return 0;
154     if(!aux->reject
155         && !(aux->reject = sk_ASN1_OBJECT_new_null())) return 0;
156     return sk_ASN1_OBJECT_push(aux->reject, objtmp);
157 }

159 void X509_trust_clear(X509 *x)
160 {
161     if(x->aux && x->aux->trust) {
162         sk_ASN1_OBJECT_pop_free(x->aux->trust, ASN1_OBJECT_free);
163         x->aux->trust = NULL;
164     }
165 }

167 void X509_reject_clear(X509 *x)
168 {
169     if(x->aux && x->aux->reject) {
170         sk_ASN1_OBJECT_pop_free(x->aux->reject, ASN1_OBJECT_free);
171         x->aux->reject = NULL;
172     }
173 }

175 ASN1_SEQUENCE(X509_CERT_PAIR) = {
176     ASN1_EXP_OPT(X509_CERT_PAIR, forward, X509, 0),
177     ASN1_EXP_OPT(X509_CERT_PAIR, reverse, X509, 1)
178 } ASN1_SEQUENCE_END(X509_CERT_PAIR)

180 IMPLEMENT_ASN1_FUNCTIONS(X509_CERT_PAIR)
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_cfb64.c

1

4458 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/bf/bf_cfb64.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bf/bf_cfb64.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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34 * Eric Young (eay@cryptsoft.com)"
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38 * the apps directory (application code) you must include an acknowledgement:
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
```

```
59 #include <openssl/blowfish.h>
60 #include "bf_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_cfb64.c

2

```
62 /* The input and output encrypted as though 64bit cfb mode is being
63  * used. The extra state information to record how much of the
64  * 64bit block we have used is contained in *num;
65  */
```

```
67 void BF_cfb64_encrypt(const unsigned char *in, unsigned char *out, long length,
68                       const BF_KEY *schedule, unsigned char *ivec, int *num, int encrypt)
69 {
70     register BF_LONG v0,v1,t;
71     register int n= *num;
72     register long l=length;
73     BF_LONG ti[2];
74     unsigned char *iv,c,cc;
75
76     iv=(unsigned char *)ivec;
77     if (encrypt)
78     {
79         while (l-->0)
80         {
81             if (n == 0)
82             {
83                 n2l(iv,v0); ti[0]=v0;
84                 n2l(iv,v1); ti[1]=v1;
85                 BF_encrypt((BF_LONG *)ti,schedule);
86                 iv=(unsigned char *)ivec;
87                 t=ti[0]; l2n(t,iv);
88                 t=ti[1]; l2n(t,iv);
89                 iv=(unsigned char *)ivec;
90             }
91             c= *(in++)^iv[n];
92             *(out++)=c;
93             iv[n]=c;
94             n=(n+1)&0x07;
95         }
96     }
97     else
98     {
99         while (l-->0)
100         {
101             if (n == 0)
102             {
103                 n2l(iv,v0); ti[0]=v0;
104                 n2l(iv,v1); ti[1]=v1;
105                 BF_encrypt((BF_LONG *)ti,schedule);
106                 iv=(unsigned char *)ivec;
107                 t=ti[0]; l2n(t,iv);
108                 t=ti[1]; l2n(t,iv);
109                 iv=(unsigned char *)ivec;
110             }
111             cc= *(in++);
112             c=iv[n];
113             iv[n]=cc;
114             *(out++)=c^cc;
115             n=(n+1)&0x07;
116         }
117     }
118     v0=v1=ti[0]=ti[1]=t=c=cc=0;
119     *num=n;
120 }
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_ecb.c

1

```
*****
4004 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/bf/bf_ecb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bf/bf_ecb.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <openssl/blowfish.h>
60 #include "bf_locl.h"
61 #include <openssl/opensslv.h>
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_ecb.c

2

```
63 /* Blowfish as implemented from 'Blowfish: Springer-Verlag paper'
64  * (From LECTURE NOTES IN COMPUTER SCIENCE 809, FAST SOFTWARE ENCRYPTION,
65  * CAMBRIDGE SECURITY WORKSHOP, CAMBRIDGE, U.K., DECEMBER 9-11, 1993)
66  */
67
68 const char BF_version[]="Blowfish" OPENSSL_VERSION_PTEXT;
69
70 const char *BF_options(void)
71 {
72 #ifdef BF_PTR
73     return("blowfish(ptr)");
74 #elif defined(BF_PTR2)
75     return("blowfish(ptr2)");
76 #else
77     return("blowfish(idx)");
78 #endif
79 }
80
81 void BF_ecb_encrypt(const unsigned char *in, unsigned char *out,
82                     const BF_KEY *key, int encrypt)
83 {
84     BF_LONG l,d[2];
85
86     n2l(in,l); d[0]=l;
87     n2l(in,l); d[1]=l;
88     if (encrypt)
89         BF_encrypt(d,key);
90     else
91         BF_decrypt(d,key);
92     l=d[0]; l2n(l,out);
93     l=d[1]; l2n(l,out);
94     l=d[0]=d[1]=0;
95 }
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_enc.c

1

7681 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/bf/bf_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
```

```
59 #include <openssl/blowfish.h>
60 #include "bf_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_enc.c

2

```
62 /* Blowfish as implemented from 'Blowfish: Springer-Verlag paper'
63  * (From LECTURE NOTES IN COMPUTER SCIENCE 809, FAST SOFTWARE ENCRYPTION,
64  * CAMBRIDGE SECURITY WORKSHOP, CAMBRIDGE, U.K., DECEMBER 9-11, 1993)
65  */
66
67 #if (BF_ROUNDS != 16) && (BF_ROUNDS != 20)
68 #error If you set BF_ROUNDS to some value other than 16 or 20, you will have \
69 to modify the code.
70 #endif
71
72 void BF_encrypt(BF_LONG *data, const BF_KEY *key)
73 {
74     #ifndef BF_PTR2
75         register BF_LONG l,r;
76         register const BF_LONG *p,*s;
77
78         p=key->P;
79         s = &(key->S[0]);
80         l=data[0];
81         r=data[1];
82
83         l^=p[0];
84         BF_ENC(r,l,s,p[ 1]);
85         BF_ENC(l,r,s,p[ 2]);
86         BF_ENC(r,l,s,p[ 3]);
87         BF_ENC(l,r,s,p[ 4]);
88         BF_ENC(r,l,s,p[ 5]);
89         BF_ENC(l,r,s,p[ 6]);
90         BF_ENC(r,l,s,p[ 7]);
91         BF_ENC(l,r,s,p[ 8]);
92         BF_ENC(r,l,s,p[ 9]);
93         BF_ENC(l,r,s,p[10]);
94         BF_ENC(r,l,s,p[11]);
95         BF_ENC(l,r,s,p[12]);
96         BF_ENC(r,l,s,p[13]);
97         BF_ENC(l,r,s,p[14]);
98         BF_ENC(r,l,s,p[15]);
99         BF_ENC(l,r,s,p[16]);
100     #if BF_ROUNDS == 20
101         BF_ENC(r,l,s,p[17]);
102         BF_ENC(l,r,s,p[18]);
103         BF_ENC(r,l,s,p[19]);
104         BF_ENC(l,r,s,p[20]);
105     #endif
106         r^=p[BF_ROUNDS+1];
107
108         data[1]=l&0xffffffffL;
109         data[0]=r&0xffffffffL;
110     #else
111         register BF_LONG l,r,t,*k;
112
113         l=data[0];
114         r=data[1];
115         k=(BF_LONG*)key;
116
117         l^=k[0];
118         BF_ENC(r,l,k, 1);
119         BF_ENC(l,r,k, 2);
120         BF_ENC(r,l,k, 3);
121         BF_ENC(l,r,k, 4);
122         BF_ENC(r,l,k, 5);
123         BF_ENC(l,r,k, 6);
124         BF_ENC(r,l,k, 7);
125         BF_ENC(l,r,k, 8);
126         BF_ENC(r,l,k, 9);
127         BF_ENC(l,r,k,10);
```

```

128     BF_ENC(r, l, k, 11);
129     BF_ENC(l, r, k, 12);
130     BF_ENC(r, l, k, 13);
131     BF_ENC(l, r, k, 14);
132     BF_ENC(r, l, k, 15);
133     BF_ENC(l, r, k, 16);
134 #if BF_ROUNDS == 20
135     BF_ENC(r, l, k, 17);
136     BF_ENC(l, r, k, 18);
137     BF_ENC(r, l, k, 19);
138     BF_ENC(l, r, k, 20);
139 #endif
140     r^=k[BF_ROUNDS+1];

142     data[1]=l&0xffffffffL;
143     data[0]=r&0xffffffffL;
144 #endif
145 }

147 #ifndef BF_DEFAULT_OPTIONS

149 void BF_decrypt(BF_LONG *data, const BF_KEY *key)
150 {
151 #ifndef BF_PTR2
152     register BF_LONG l,r;
153     register const BF_LONG *p,*s;

155     p=key->P;
156     s= &(key->S[0]);
157     l=data[0];
158     r=data[1];

160     l^=p[BF_ROUNDS+1];
161 #if BF_ROUNDS == 20
162     BF_ENC(r, l, s, p[20]);
163     BF_ENC(l, r, s, p[19]);
164     BF_ENC(r, l, s, p[18]);
165     BF_ENC(l, r, s, p[17]);
166 #endif
167     BF_ENC(r, l, s, p[16]);
168     BF_ENC(l, r, s, p[15]);
169     BF_ENC(r, l, s, p[14]);
170     BF_ENC(l, r, s, p[13]);
171     BF_ENC(r, l, s, p[12]);
172     BF_ENC(l, r, s, p[11]);
173     BF_ENC(r, l, s, p[10]);
174     BF_ENC(l, r, s, p[9]);
175     BF_ENC(r, l, s, p[8]);
176     BF_ENC(l, r, s, p[7]);
177     BF_ENC(r, l, s, p[6]);
178     BF_ENC(l, r, s, p[5]);
179     BF_ENC(r, l, s, p[4]);
180     BF_ENC(l, r, s, p[3]);
181     BF_ENC(r, l, s, p[2]);
182     BF_ENC(l, r, s, p[1]);
183     r^=p[0];

185     data[1]=l&0xffffffffL;
186     data[0]=r&0xffffffffL;
187 #else
188     register BF_LONG l,r,t,*k;

190     l=data[0];
191     r=data[1];
192     k=(BF_LONG *)key;

```

```

194     l^=k[BF_ROUNDS+1];
195 #if BF_ROUNDS == 20
196     BF_ENC(r, l, k, 20);
197     BF_ENC(l, r, k, 19);
198     BF_ENC(r, l, k, 18);
199     BF_ENC(l, r, k, 17);
200 #endif
201     BF_ENC(r, l, k, 16);
202     BF_ENC(l, r, k, 15);
203     BF_ENC(r, l, k, 14);
204     BF_ENC(l, r, k, 13);
205     BF_ENC(r, l, k, 12);
206     BF_ENC(l, r, k, 11);
207     BF_ENC(r, l, k, 10);
208     BF_ENC(l, r, k, 9);
209     BF_ENC(r, l, k, 8);
210     BF_ENC(l, r, k, 7);
211     BF_ENC(r, l, k, 6);
212     BF_ENC(l, r, k, 5);
213     BF_ENC(r, l, k, 4);
214     BF_ENC(l, r, k, 3);
215     BF_ENC(r, l, k, 2);
216     BF_ENC(l, r, k, 1);
217     r^=k[0];

219     data[1]=l&0xffffffffL;
220     data[0]=r&0xffffffffL;
221 #endif
222 }

224 void BF_cbc_encrypt(const unsigned char *in, unsigned char *out, long length,
225                     const BF_KEY *schedule, unsigned char *ivec, int encrypt)
226 {
227     register BF_LONG tin0,tin1;
228     register BF_LONG tout0,tout1,xor0,xor1;
229     register long l=length;
230     BF_LONG tin[2];

232     if (encrypt)
233     {
234         n2l(ivec,tout0);
235         n2l(ivec,tout1);
236         ivec-=8;
237         for (l-=8; l>=0; l-=8)
238         {
239             n2l(in,tin0);
240             n2l(in,tin1);
241             tin0^=tout0;
242             tin1^=tout1;
243             tin[0]=tin0;
244             tin[1]=tin1;
245             BF_encrypt(tin,schedule);
246             tout0=tin[0];
247             tout1=tin[1];
248             l2n(tout0,out);
249             l2n(tout1,out);
250         }
251         if (l != -8)
252         {
253             n2ln(in,tin0,tin1,l+8);
254             tin0^=tout0;
255             tin1^=tout1;
256             tin[0]=tin0;
257             tin[1]=tin1;
258             BF_encrypt(tin,schedule);
259             tout0=tin[0];

```

```
260         tout1=tin[1];
261         l2n(tout0,out);
262         l2n(tout1,out);
263     }
264     l2n(tout0,ivec);
265     l2n(tout1,ivec);
266 }
267 else
268 {
269     n2l(ivec,xor0);
270     n2l(ivec,xor1);
271     ivec-=8;
272     for (l-=8; l>=0; l-=8)
273     {
274         n2l(in,tin0);
275         n2l(in,tin1);
276         tin[0]=tin0;
277         tin[1]=tin1;
278         BF_decrypt(tin,schedule);
279         tout0=tin[0]^xor0;
280         tout1=tin[1]^xor1;
281         l2n(tout0,out);
282         l2n(tout1,out);
283         xor0=tin0;
284         xor1=tin1;
285     }
286     if (l != -8)
287     {
288         n2l(in,tin0);
289         n2l(in,tin1);
290         tin[0]=tin0;
291         tin[1]=tin1;
292         BF_decrypt(tin,schedule);
293         tout0=tin[0]^xor0;
294         tout1=tin[1]^xor1;
295         l2nn(tout0,tout1,out,l+8);
296         xor0=tin0;
297         xor1=tin1;
298     }
299     l2n(xor0,ivec);
300     l2n(xor1,ivec);
301 }
302 tin0=tin1=tout0=tout1=xor0=xor1=0;
303 tin[0]=tin[1]=0;
304 }
306 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_ofb64.c

1

```
*****
4197 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/bf/bf_ofb64.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bf/bf_ofb64.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <openssl/blowfish.h>
60 #include "bf_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_ofb64.c

2

```
62 /* The input and output encrypted as though 64bit ofb mode is being
63  * used. The extra state information to record how much of the
64  * 64bit block we have used is contained in *num;
65  */
66 void BF_ofb64_encrypt(const unsigned char *in, unsigned char *out, long length,
67                       const BF_KEY *schedule, unsigned char *ivec, int *num)
68 {
69     register BF_LONG v0,v1,t;
70     register int n= *num;
71     register long l=length;
72     unsigned char d[8];
73     register char *dp;
74     BF_LONG ti[2];
75     unsigned char *iv;
76     int save=0;
77
78     iv=(unsigned char *)ivec;
79     n2l(iv,v0);
80     n2l(iv,v1);
81     ti[0]=v0;
82     ti[1]=v1;
83     dp=(char *)d;
84     l2n(v0,dp);
85     l2n(v1,dp);
86     while (l--)
87     {
88         if (n == 0)
89         {
90             BF_encrypt((BF_LONG *)ti,schedule);
91             dp=(char *)d;
92             t=ti[0]; l2n(t,dp);
93             t=ti[1]; l2n(t,dp);
94             save++;
95         }
96         *(out++)= *(in++)^d[n];
97         n=(n+1)&0x07;
98     }
99     if (save)
100     {
101         v0=ti[0];
102         v1=ti[1];
103         iv=(unsigned char *)ivec;
104         l2n(v0,iv);
105         l2n(v1,iv);
106     }
107     t=v0=v1=ti[0]=ti[1]=0;
108     *num=n;
109 }
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_skey.c

1

4233 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/bf/bf_skey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bf/bf_skey.c */
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57 */

59 #include <stdio.h>
60 #include <string.h>
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/bf/bf_skey.c

2

```
62 #include <openssl/blowfish.h>
63 #include "bf_locl.h"
64 #include "bf_pi.h"

66 void BF_set_key(BF_KEY *key, int len, const unsigned char *data)
67 #ifdef OPENSSL_FIPS
68 {
69     fips_cipher_abort(BLOWFISH);
70     private_BF_set_key(key, len, data);
71 }
72 void private_BF_set_key(BF_KEY *key, int len, const unsigned char *data)
73 #endif
74 {
75     int i;
76     BF_LONG *p,ri,in[2];
77     const unsigned char *d,*end;

80     memcpy(key,&bf_init,sizeof(BF_KEY));
81     p=key->P;

83     if (len > ((BF_ROUNDS+2)*4)) len=(BF_ROUNDS+2)*4;

85     d=data;
86     end= &(data[len]);
87     for (i=0; i<(BF_ROUNDS+2); i++)
88     {
89         ri= *(d++);
90         if (d >= end) d=data;

92         ri<=8;
93         ri|= *(d++);
94         if (d >= end) d=data;

96         ri<=8;
97         ri|= *(d++);
98         if (d >= end) d=data;

100         ri<=8;
101         ri|= *(d++);
102         if (d >= end) d=data;

104         p[i]^=ri;
105     }

107     in[0]=0L;
108     in[1]=0L;
109     for (i=0; i<(BF_ROUNDS+2); i+=2)
110     {
111         BF_encrypt(in,key);
112         p[i ]=in[0];
113         p[i+1]=in[1];
114     }

116     p=key->S;
117     for (i=0; i<4*256; i+=2)
118     {
119         BF_encrypt(in,key);
120         p[i ]=in[0];
121         p[i+1]=in[1];
122     }
123 }
```



```

*****
6175 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/b_dump.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

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7   * The implementation was written so as to conform with Netscapes SSL.
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55  * copied and put under another distribution licence
56  * [including the GNU Public Licence.]
57  */
58
59 /*
60  * Stolen from tjh's ssl/ssl_trc.c stuff.
61  */

```

```

63 #include <stdio.h>
64 #include "cryptlib.h"
65 #include "bio_lcl.h"
66
67 #define TRUNCATE
68 #define DUMP_WIDTH 16
69 #define DUMP_WIDTH_LESS_INDENT(i) (DUMP_WIDTH-((i-(i>6?6:i)+3)/4))
70
71 int BIO_dump_cb(int (*cb)(const void *data, size_t len, void *u),
72 void *u, const char *s, int len)
73 {
74     return BIO_dump_indent_cb(cb, u, s, len, 0);
75 }
76
77 int BIO_dump_indent_cb(int (*cb)(const void *data, size_t len, void *u),
78 void *u, const char *s, int len, int indent)
79 {
80     int ret=0;
81     char buf[288+1],tmp[20],str[128+1];
82     int i,j,rows,trc;
83     unsigned char ch;
84     int dump_width;
85
86     trc=0;
87
88 #ifdef TRUNCATE
89     for(; (len > 0) && ((s[len-1] == ' ') || (s[len-1] == '\0')); len--)
90         trc++;
91 #endif
92
93     if (indent < 0)
94         indent = 0;
95     if (indent)
96     {
97         if (indent > 128) indent=128;
98         memset(str,' ',indent);
99     }
100    str[indent]='\0';
101
102    dump_width=DUMP_WIDTH_LESS_INDENT(indent);
103    rows=(len/dump_width);
104    if ((rows*dump_width)<len)
105        rows++;
106    for(i=0;i<rows;i++)
107    {
108        buf[0]='\0'; /* start with empty string */
109        BUF_strncpy(buf,str,sizeof buf);
110        BIO_snprintf(tmp,sizeof tmp,"%04x - ",i*dump_width);
111        BUF_strcat(buf,tmp,sizeof buf);
112        for(j=0;j<dump_width;j++)
113        {
114            if (((i*dump_width)+j)>=len)
115            {
116                BUF_strcat(buf," ",sizeof buf);
117            }
118            else
119            {
120                ch=((unsigned char)*(s+i*dump_width+j)) & 0xff;
121                BIO_snprintf(tmp,sizeof tmp,"%02x%c",ch,
122                    j==7?'-':' ');
123                BUF_strcat(buf,tmp,sizeof buf);
124            }
125        }
126        BUF_strcat(buf," ",sizeof buf);
127        for(j=0;j<dump_width;j++)

```

```

128     {
129         if (((i*dump_width)+j)>=len)
130             break;
131         ch=((unsigned char)*(s+i*dump_width+j)) & 0xff;
132 #ifndef CHARSET_EBCDIC
133         BIO_snprintf(tmp,sizeof tmp,"%c",
134             ((ch>=' ')&&(ch<='~'))?ch:'.');
135 #else
136         BIO_snprintf(tmp,sizeof tmp,"%c",
137             ((ch==os_toascii[' '])&&(ch<=os_toascii['~'])))
138             ? os_toebcdic[ch]
139             : '.');
140 #endif
141         BUF_strlcat(buf,tmp,sizeof buf);
142     }
143     BUF_strlcat(buf,"\n",sizeof buf);
144     /* if this is the last call then update the ddt_dump thing so
145      * that we will move the selection point in the debug window
146      */
147     ret+=cb((void *)buf,strlen(buf),u);
148 }
149 #ifdef TRUNCATE
150 if (trc > 0)
151 {
152     BIO_snprintf(buf,sizeof buf,"%s%04x - <SPACES/NULS>\n",str,
153         len+trc);
154     ret+=cb((void *)buf,strlen(buf),u);
155 }
156 #endif
157 return(ret);
158 }

160 #ifndef OPENSSL_NO_FP_API
161 static int write_fp(const void *data, size_t len, void *fp)
162 {
163     return UP_fwrite(data, len, 1, fp);
164 }
165 int BIO_dump_fp(FILE *fp, const char *s, int len)
166 {
167     return BIO_dump_cb(write_fp, fp, s, len);
168 }
169 int BIO_dump_indent_fp(FILE *fp, const char *s, int len, int indent)
170 {
171     return BIO_dump_indent_cb(write_fp, fp, s, len, indent);
172 }
173 #endif

175 static int write_bio(const void *data, size_t len, void *bp)
176 {
177     return BIO_write((BIO *)bp, (const char *)data, len);
178 }
179 int BIO_dump(BIO *bp, const char *s, int len)
180 {
181     return BIO_dump_cb(write_bio, bp, s, len);
182 }
183 int BIO_dump_indent(BIO *bp, const char *s, int len, int indent)
184 {
185     return BIO_dump_indent_cb(write_bio, bp, s, len, indent);
186 }

```

new/usr/src/lib/openssl/libsunw_crypto/bio/b_print.c

1

23669 Fri May 30 18:31:33 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/b_print.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* disable assert() unless BIO_DEBUG has been defined */
60 #ifndef BIO_DEBUG
61 #ifndef NDEBUG
```

new/usr/src/lib/openssl/libsunw_crypto/bio/b_print.c

2

```
62 # define NDEBUG
63 # endif
64 #endif
65
66 /*
67  * Stolen from tjh's ssl/ssl_trc.c stuff.
68  */
69
70 #include <stdio.h>
71 #include <string.h>
72 #include <ctype.h>
73 #include <assert.h>
74 #include <limits.h>
75 #include "cryptlib.h"
76 #ifndef NO_SYS_TYPES_H
77 #include <sys/types.h>
78 #endif
79 #include <openssl/bn.h> /* To get BN_LONG properly defined */
80 #include <openssl/bio.h>
81
82 #if defined(BN_LONG) || defined(SIXTY_FOUR_BIT)
83 # ifndef HAVE_LONG_LONG
84 # define HAVE_LONG_LONG 1
85 # endif
86 #endif
87
88 /*****
89  *
90  * Copyright Patrick Powell 1995
91  * This code is based on code written by Patrick Powell <papowell@astart.com>
92  * It may be used for any purpose as long as this notice remains intact
93  * on all source code distributions.
94  */
95
96 /*
97  * This code contains numerous changes and enhancements which were
98  * made by lots of contributors over the last years to Patrick Powell's
99  * original code:
100  *
101  * o Patrick Powell <papowell@astart.com> (1995)
102  * o Brandon Long <blong@fiction.net> (1996, for Mutt)
103  * o Thomas Roessler <roessler@guug.de> (1998, for Mutt)
104  * o Michael Elkins <me@cs.hmc.edu> (1998, for Mutt)
105  * o Andrew Tridgell <tridge@samba.org> (1998, for Samba)
106  * o Luke Mewburn <lukem@netbsd.org> (1999, for LukemFTP)
107  * o Ralf S. Engelschall <rse@engelschall.com> (1999, for Pth)
108  * o ... (for OpenSSL)
109  */
110
111 #ifdef HAVE_LONG_DOUBLE
112 #define LDOUBLE long double
113 #else
114 #define LDOUBLE double
115 #endif
116
117 #ifdef HAVE_LONG_LONG
118 # if defined(_WIN32) && !defined(__GNUC__)
119 # define LLONG __int64
120 # else
121 # define LLONG long long
122 # endif
123 #endif
124 #else
125 #define LLONG long
126 #endif
```

```

128 static void fmtstr      (char **, char **, size_t *, size_t *,
129                          const char *, int, int, int);
130 static void fmtint      (char **, char **, size_t *, size_t *,
131                          LONG, int, int, int, int);
132 static void fmtfp       (char **, char **, size_t *, size_t *,
133                          LDOUBLE, int, int, int);
134 static void doapr_outch (char **, char **, size_t *, size_t *, int);
135 static void _dopr(char **sbuffer, char **buffer,
136                  size_t *maxlen, size_t *retlen, int *truncated,
137                  const char *format, va_list args);

```

```

139 /* format read states */
140 #define DP_S_DEFAULT    0
141 #define DP_S_FLAGS      1
142 #define DP_S_MIN        2
143 #define DP_S_DOT        3
144 #define DP_S_MAX        4
145 #define DP_S_MOD        5
146 #define DP_S_CONV       6
147 #define DP_S_DONE       7

149 /* format flags - Bits */
150 #define DP_F_MINUS      (1 << 0)
151 #define DP_F_PLUS       (1 << 1)
152 #define DP_F_SPACE      (1 << 2)
153 #define DP_F_NUM        (1 << 3)
154 #define DP_F_ZERO       (1 << 4)
155 #define DP_F_UP         (1 << 5)
156 #define DP_F_UNSIGNED   (1 << 6)

158 /* conversion flags */
159 #define DP_C_SHORT      1
160 #define DP_C_LONG       2
161 #define DP_C_LDOUBLE    3
162 #define DP_C_LLONG      4

164 /* some handy macros */
165 #define char_to_int(p) ((p - '0'))
166 #define OSSL_MAX(p,q) ((p >= q) ? p : q)

```

```

168 static void
169 _dopr(
170     char **sbuffer,
171     char **buffer,
172     size_t *maxlen,
173     size_t *retlen,
174     int *truncated,
175     const char *format,
176     va_list args)
177 {
178     char ch;
179     LONG value;
180     LDOUBLE fvalue;
181     char *strvalue;
182     int min;
183     int max;
184     int state;
185     int flags;
186     int cflags;
187     size_t currlen;

189     state = DP_S_DEFAULT;
190     flags = currlen = cflags = min = 0;
191     max = -1;
192     ch = *format++;

```

```

194     while (state != DP_S_DONE) {
195         if (ch == '\0' || (buffer == NULL && currlen >= *maxlen))
196             state = DP_S_DONE;

198         switch (state) {
199             case DP_S_DEFAULT:
200                 if (ch == '%')
201                     state = DP_S_FLAGS;
202                 else
203                     doapr_outch(sbuffer, buffer, &currlen, maxlen, ch);
204                 ch = *format++;
205                 break;
206             case DP_S_FLAGS:
207                 switch (ch) {
208                     case '-':
209                         flags |= DP_F_MINUS;
210                         ch = *format++;
211                         break;
212                     case '+':
213                         flags |= DP_F_PLUS;
214                         ch = *format++;
215                         break;
216                     case ' ':
217                         flags |= DP_F_SPACE;
218                         ch = *format++;
219                         break;
220                     case '#':
221                         flags |= DP_F_NUM;
222                         ch = *format++;
223                         break;
224                     case '0':
225                         flags |= DP_F_ZERO;
226                         ch = *format++;
227                         break;
228                     default:
229                         state = DP_S_MIN;
230                         break;
231                 }
232                 break;
233             case DP_S_MIN:
234                 if (isdigit((unsigned char)ch)) {
235                     min = 10 * min + char_to_int(ch);
236                     ch = *format++;
237                 } else if (ch == '*') {
238                     min = va_arg(args, int);
239                     ch = *format++;
240                     state = DP_S_DOT;
241                 } else
242                     state = DP_S_DOT;
243                 break;
244             case DP_S_DOT:
245                 if (ch == '.') {
246                     state = DP_S_MAX;
247                     ch = *format++;
248                 } else
249                     state = DP_S_MOD;
250                 break;
251             case DP_S_MAX:
252                 if (isdigit((unsigned char)ch)) {
253                     if (max < 0)
254                         max = 0;
255                     max = 10 * max + char_to_int(ch);
256                     ch = *format++;
257                 } else if (ch == '*') {
258                     max = va_arg(args, int);
259                     ch = *format++;

```

```

260     state = DP_S_MOD;
261 } else
262     state = DP_S_MOD;
263 break;
264 case DP_S_MOD:
265     switch (ch) {
266     case 'h':
267         cflags = DP_C_SHORT;
268         ch = *format++;
269         break;
270     case 'l':
271         if (*format == 'l') {
272             cflags = DP_C_LLONG;
273             format++;
274         } else
275             cflags = DP_C_LONG;
276         ch = *format++;
277         break;
278     case 'q':
279         cflags = DP_C_LLONG;
280         ch = *format++;
281         break;
282     case 'L':
283         cflags = DP_C_LDOUBLE;
284         ch = *format++;
285         break;
286     default:
287         break;
288     }
289     state = DP_S_CONV;
290     break;
291 case DP_S_CONV:
292     switch (ch) {
293     case 'd':
294     case 'i':
295         switch (cflags) {
296         case DP_C_SHORT:
297             value = (short int)va_arg(args, int);
298             break;
299         case DP_C_LONG:
300             value = va_arg(args, long int);
301             break;
302         case DP_C_LLONG:
303             value = va_arg(args, LONGLONG);
304             break;
305         default:
306             value = va_arg(args, int);
307             break;
308         }
309         fmtint(sbuffer, buffer, &currlen, maxlen,
310             value, 10, min, max, flags);
311         break;
312     case 'X':
313         flags |= DP_F_UP;
314         /* FALLTHROUGH */
315     case 'x':
316     case 'o':
317     case 'u':
318         flags |= DP_F_UNSIGNED;
319         switch (cflags) {
320         case DP_C_SHORT:
321             value = (unsigned short int)va_arg(args, unsigned int);
322             break;
323         case DP_C_LONG:
324             value = (LONGLONG) va_arg(args,
325                 unsigned long int);

```

```

326         break;
327     case DP_C_LLONG:
328         value = va_arg(args, unsigned LONGLONG);
329         break;
330     default:
331         value = (LONGLONG) va_arg(args,
332             unsigned int);
333         break;
334     }
335     fmtint(sbuffer, buffer, &currlen, maxlen, value,
336         ch == 'o' ? 8 : (ch == 'u' ? 10 : 16),
337         min, max, flags);
338     break;
339 case 'f':
340     if (cflags == DP_C_LDOUBLE)
341         fvalue = va_arg(args, LDOUBLE);
342     else
343         fvalue = va_arg(args, double);
344     fmtfp(sbuffer, buffer, &currlen, maxlen,
345         fvalue, min, max, flags);
346     break;
347 case 'E':
348     flags |= DP_F_UP;
349 case 'e':
350     if (cflags == DP_C_LDOUBLE)
351         fvalue = va_arg(args, LDOUBLE);
352     else
353         fvalue = va_arg(args, double);
354     break;
355 case 'G':
356     flags |= DP_F_UP;
357 case 'g':
358     if (cflags == DP_C_LDOUBLE)
359         fvalue = va_arg(args, LDOUBLE);
360     else
361         fvalue = va_arg(args, double);
362     break;
363 case 'c':
364     doapr_outch(sbuffer, buffer, &currlen, maxlen,
365         va_arg(args, int));
366     break;
367 case 's':
368     strvalue = va_arg(args, char *);
369     if (max < 0) {
370         if (buffer)
371             max = INT_MAX;
372         else
373             max = *maxlen;
374     }
375     fmtstr(sbuffer, buffer, &currlen, maxlen, strvalue,
376         flags, min, max);
377     break;
378 case 'p':
379     value = (long)va_arg(args, void *);
380     fmtint(sbuffer, buffer, &currlen, maxlen,
381         value, 16, min, max, flags|DP_F_NUM);
382     break;
383 case 'n': /* XXX */
384     if (cflags == DP_C_SHORT) {
385         short int *num;
386         num = va_arg(args, short int *);
387         *num = currlen;
388     } else if (cflags == DP_C_LONG) { /* XXX */
389         long int *num;
390         num = va_arg(args, long int *);
391         *num = (long int) currlen;

```

```

392     } else if (cflags == DP_C_LLONG) { /* XXX */
393         LLONG *num;
394         num = va_arg(args, LLONG *);
395         *num = (LLONG) currlen;
396     } else {
397         int *num;
398         num = va_arg(args, int *);
399         *num = currlen;
400     }
401     break;
402 case '%':
403     doapr_outch(sbuffer, buffer, &currlen, maxlen, ch);
404     break;
405 case 'w':
406     /* not supported yet, treat as next char */
407     ch = *format++;
408     break;
409 default:
410     /* unknown, skip */
411     break;
412 }
413 ch = *format++;
414 state = DP_S_DEFAULT;
415 flags = cflags = min = 0;
416 max = -1;
417 break;
418 case DP_S_DONE:
419     break;
420 default:
421     break;
422 }
423 }
424 *truncated = (currlen > *maxlen - 1);
425 if (*truncated)
426     currlen = *maxlen - 1;
427 doapr_outch(sbuffer, buffer, &currlen, maxlen, '\0');
428 *retlen = currlen - 1;
429 return;
430 }

432 static void
433 fmtstr(
434     char **sbuffer,
435     char **buffer,
436     size_t *currlen,
437     size_t *maxlen,
438     const char *value,
439     int flags,
440     int min,
441     int max)
442 {
443     int padlen, strln;
444     int cnt = 0;

446     if (value == 0)
447         value = "<NULL>";
448     for (strln = 0; value[strln]; ++strln)
449         ;
450     padlen = min - strln;
451     if (padlen < 0)
452         padlen = 0;
453     if (flags & DP_F_MINUS)
454         padlen = -padlen;

456     while ((padlen > 0) && (cnt < max)) {
457         doapr_outch(sbuffer, buffer, currlen, maxlen, ' ');

```

```

458         --padlen;
459         ++cnt;
460     }
461     while (*value && (cnt < max)) {
462         doapr_outch(sbuffer, buffer, currlen, maxlen, *value++);
463         ++cnt;
464     }
465     while ((padlen < 0) && (cnt < max)) {
466         doapr_outch(sbuffer, buffer, currlen, maxlen, ' ');
467         ++padlen;
468         ++cnt;
469     }
470 }

472 static void
473 fmtint(
474     char **sbuffer,
475     char **buffer,
476     size_t *currlen,
477     size_t *maxlen,
478     LLONG value,
479     int base,
480     int min,
481     int max,
482     int flags)
483 {
484     int signvalue = 0;
485     const char *prefix = "";
486     unsigned LLONG uvalue;
487     char convert[DECIMAL_SIZE(value)+3];
488     int place = 0;
489     int spadlen = 0;
490     int zpadlen = 0;
491     int caps = 0;

493     if (max < 0)
494         max = 0;
495     uvalue = value;
496     if (!(flags & DP_F_UNSIGNED)) {
497         if (value < 0) {
498             signvalue = '-';
499             uvalue = -value;
500         } else if (flags & DP_F_PLUS)
501             signvalue = '+';
502         else if (flags & DP_F_SPACE)
503             signvalue = ' ';
504     }
505     if (flags & DP_F_NUM) {
506         if (base == 8) prefix = "0";
507         if (base == 16) prefix = "0x";
508     }
509     if (flags & DP_F_UP)
510         caps = 1;
511     do {
512         convert[place++] =
513             (caps ? "0123456789ABCDEF" : "0123456789abcdef")
514             [uvalue % (unsigned) base];
515         uvalue = (uvalue / (unsigned) base);
516     } while (uvalue && (place < (int)sizeof(convert)));
517     if (place == sizeof(convert))
518         place--;
519     convert[place] = 0;

521     zpadlen = max - place;
522     spadlen = min - OSSL_MAX(max, place) - (signvalue ? 1 : 0) - strlen(prefix);
523     if (zpadlen < 0)

```

```

524     zpadlen = 0;
525     if (spadlen < 0)
526         spadlen = 0;
527     if (flags & DP_F_ZERO) {
528         zpadlen = OSSL_MAX(zpadlen, spadlen);
529         spadlen = 0;
530     }
531     if (flags & DP_F_MINUS)
532         spadlen = -spadlen;

534     /* spaces */
535     while (spadlen > 0) {
536         doapr_outch(sbuffer, buffer, currlen, maxlen, ' ');
537         --spadlen;
538     }

540     /* sign */
541     if (signvalue)
542         doapr_outch(sbuffer, buffer, currlen, maxlen, signvalue);

544     /* prefix */
545     while (*prefix) {
546         doapr_outch(sbuffer, buffer, currlen, maxlen, *prefix);
547         prefix++;
548     }

550     /* zeros */
551     if (zpadlen > 0) {
552         while (zpadlen > 0) {
553             doapr_outch(sbuffer, buffer, currlen, maxlen, '0');
554             --zpadlen;
555         }
556     }
557     /* digits */
558     while (place > 0)
559         doapr_outch(sbuffer, buffer, currlen, maxlen, convert[--place]);

561     /* left justified spaces */
562     while (spadlen < 0) {
563         doapr_outch(sbuffer, buffer, currlen, maxlen, ' ');
564         ++spadlen;
565     }
566     return;
567 }

569 static LDOUBLE
570 abs_val(LDOUBLE value)
571 {
572     LDOUBLE result = value;
573     if (value < 0)
574         result = -value;
575     return result;
576 }

578 static LDOUBLE
579 pow_10(int in_exp)
580 {
581     LDOUBLE result = 1;
582     while (in_exp) {
583         result *= 10;
584         in_exp--;
585     }
586     return result;
587 }

589 static long

```

```

590 roundv(LDOUBLE value)
591 {
592     long intpart;
593     intpart = (long) value;
594     value = value - intpart;
595     if (value >= 0.5)
596         intpart++;
597     return intpart;
598 }

600 static void
601 fmtfp(
602     char **sbuffer,
603     char **buffer,
604     size_t *currlen,
605     size_t *maxlen,
606     LDOUBLE fvalue,
607     int min,
608     int max,
609     int flags)
610 {
611     int signvalue = 0;
612     LDOUBLE ufvalue;
613     char iconvert[20];
614     char fconvert[20];
615     int iplace = 0;
616     int fplace = 0;
617     int padlen = 0;
618     int zpadlen = 0;
619     int caps = 0;
620     long intpart;
621     long fracpart;
622     long max10;

624     if (max < 0)
625         max = 6;
626     ufvalue = abs_val(fvalue);
627     if (fvalue < 0)
628         signvalue = '-';
629     else if (flags & DP_F_PLUS)
630         signvalue = '+';
631     else if (flags & DP_F_SPACE)
632         signvalue = ' ';

634     intpart = (long)ufvalue;

636     /* sorry, we only support 9 digits past the decimal because of our
637     conversion method */
638     if (max > 9)
639         max = 9;

641     /* we "cheat" by converting the fractional part to integer by
642     multiplying by a factor of 10 */
643     max10 = roundv(pow_10(max));
644     fracpart = roundv(pow_10(max) * (ufvalue - intpart));

646     if (fracpart >= max10) {
647         intpart++;
648         fracpart -= max10;
649     }

651     /* convert integer part */
652     do {
653         iconvert[iplace++] =
654             (caps ? "0123456789ABCDEF"
655              : "0123456789abcdef")[intpart % 10];

```

```

656     intpart = (intpart / 10);
657 } while (intpart && (iplace < (int)sizeof(iconvert)));
658 if (iplace == sizeof iconvert)
659     iplace--;
660 iconvert[iplace] = 0;

662 /* convert fractional part */
663 do {
664     fconvert[fplace++] =
665         (caps ? "0123456789ABCDEF"
666          : "0123456789abcdef")[fracpart % 10];
667     fracpart = (fracpart / 10);
668 } while (fplace < max);
669 if (fplace == sizeof fconvert)
670     fplace--;
671 fconvert[fplace] = 0;

673 /* -1 for decimal point, another -1 if we are printing a sign */
674 padlen = min - iplace - max - 1 - ((signvalue) ? 1 : 0);
675 zpadlen = max - fplace;
676 if (zpadlen < 0)
677     zpadlen = 0;
678 if (padlen < 0)
679     padlen = 0;
680 if (flags & DP_F_MINUS)
681     padlen = -padlen;

683 if ((flags & DP_F_ZERO) && (padlen > 0)) {
684     if (signvalue) {
685         doapr_outch(sbuffer, buffer, currlen, maxlen, signvalue);
686         --padlen;
687         signvalue = 0;
688     }
689     while (padlen > 0) {
690         doapr_outch(sbuffer, buffer, currlen, maxlen, '0');
691         --padlen;
692     }
693 }
694 while (padlen > 0) {
695     doapr_outch(sbuffer, buffer, currlen, maxlen, ' ');
696     --padlen;
697 }
698 if (signvalue)
699     doapr_outch(sbuffer, buffer, currlen, maxlen, signvalue);

701 while (iplace > 0)
702     doapr_outch(sbuffer, buffer, currlen, maxlen, iconvert[--iplace]);

704 /*
705  * Decimal point. This should probably use locale to find the correct
706  * char to print out.
707  */
708 if (max > 0 || (flags & DP_F_NUM)) {
709     doapr_outch(sbuffer, buffer, currlen, maxlen, '.');

711     while (fplace > 0)
712         doapr_outch(sbuffer, buffer, currlen, maxlen, fconvert[--fplace]);
713 }
714 while (zpadlen > 0) {
715     doapr_outch(sbuffer, buffer, currlen, maxlen, '0');
716     --zpadlen;
717 }

719 while (padlen < 0) {
720     doapr_outch(sbuffer, buffer, currlen, maxlen, ' ');
721     ++padlen;

```

```

722     }
723 }

725 static void
726 doapr_outch(
727     char **sbuffer,
728     char **buffer,
729     size_t *currlen,
730     size_t *maxlen,
731     int c)
732 {
733     /* If we haven't at least one buffer, someone has doe a big booboo */
734     assert(*sbuffer != NULL || *buffer != NULL);

736     if (*sbuffer) {
737         while (*currlen >= *maxlen) {
738             if (*buffer == NULL) {
739                 if (*maxlen == 0)
740                     *maxlen = 1024;
741                 *buffer = OPENSSL_malloc(*maxlen);
742                 if (*currlen > 0) {
743                     assert(*sbuffer != NULL);
744                     memcpy(*buffer, *sbuffer, *currlen);
745                 }
746                 *sbuffer = NULL;
747             } else {
748                 *maxlen += 1024;
749                 *buffer = OPENSSL_realloc(*buffer, *maxlen);
750             }
751         }
752         /* What to do if *buffer is NULL? */
753         assert(*sbuffer != NULL || *buffer != NULL);
754     }

756     if (*currlen < *maxlen) {
757         if (*sbuffer)
758             (*sbuffer)[(*currlen)++] = (char)c;
759         else
760             (*buffer)[(*currlen)++] = (char)c;
761     }

763     return;
764 }

766 /*****

768 int BIO_printf (BIO *bio, const char *format, ...)
769 {
770     va_list args;
771     int ret;

773     va_start(args, format);
775     ret = BIO_vprintf(bio, format, args);

777     va_end(args);
778     return(ret);
779 }

781 int BIO_vprintf (BIO *bio, const char *format, va_list args)
782 {
783     int ret;
784     size_t retlen;
785     char hugebuf[1024*2]; /* Was previously 10k, which is unreasonable
786                          in small-stack environments, like threads
787                          or DOS programs. */

```



```
788     char *hugebufp = hugebuf;
789     size_t hugebufsize = sizeof(hugebuf);
790     char *dynbuf = NULL;
791     int ignored;

793     dynbuf = NULL;
794     CRYPTO_push_info("doapr()");
795     _dopr(&hugebufp, &dynbuf, &hugebufsize,
796          &retlen, &ignored, format, args);
797     if (dynbuf)
798     {
799         ret=BIO_write(bio, dynbuf, (int)retlen);
800         OPENSSL_free(dynbuf);
801     }
802     else
803     {
804         ret=BIO_write(bio, hugebuf, (int)retlen);
805     }
806     CRYPTO_pop_info();
807     return(ret);
808 }

810 /* As snprintf is not available everywhere, we provide our own implementation.
811  * This function has nothing to do with BIOs, but it's closely related
812  * to BIO_printf, and we need *some* name prefix ...
813  * (XXX the function should be renamed, but to what?) */
814 int BIO_snprintf(char *buf, size_t n, const char *format, ...)
815 {
816     va_list args;
817     int ret;

819     va_start(args, format);

821     ret = BIO_vsnprintf(buf, n, format, args);

823     va_end(args);
824     return(ret);
825 }

827 int BIO_vsnprintf(char *buf, size_t n, const char *format, va_list args)
828 {
829     size_t retlen;
830     int truncated;

832     _dopr(&buf, NULL, &n, &retlen, &truncated, format, args);

834     if (truncated)
835     /* In case of truncation, return -1 like traditional snprintf.
836      * (Current drafts for ISO/IEC 9899 say snprintf should return
837      * the number of characters that would have been written,
838      * had the buffer been large enough.) */
839         return -1;
840     else
841         return (retlen <= INT_MAX) ? (int)retlen : -1;
842 }
```

new/usr/src/lib/openssl/libsunw_crypto/bio/b_sock.c

1

```
*****
24078 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/b_sock.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/b_sock.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <errno.h>
```

new/usr/src/lib/openssl/libsunw_crypto/bio/b_sock.c

2

```
62 #define USE_SOCKETS
63 #include "cryptlib.h"
64 #include <openssl/bio.h>
65 #if defined(OPENSSSL_SYS_NETWARE) && defined(NETWARE_BSDSOCK)
66 #include <netdb.h>
67 #if defined(NETWARE_CLIB)
68 #include <sys/ioctl.h>
69 NETDB_DEFINE_CONTEXT
70 #endif
71 #endif
73 #ifndef OPENSSSL_NO_SOCKET
75 #include <openssl/dso.h>
77 #define SOCKET_PROTOCOL IPPROTO_TCP
79 #ifdef SO_MAXCONN
80 #define MAX_LISTEN SO_MAXCONN
81 #elif defined(SOMAXCONN)
82 #define MAX_LISTEN SOMAXCONN
83 #else
84 #define MAX_LISTEN 32
85 #endif
87 #if defined(OPENSSSL_SYS_WINDOWS) || (defined(OPENSSSL_SYS_NETWARE) && !defined(NE
88 static int wsa_init_done=0;
89 #endif
91 /*
92  * WSAAPI specifier is required to make indirect calls to run-time
93  * linked WinSock 2 functions used in this module, to be specific
94  * [get|free]addrinfo and getnameinfo. This is because WinSock uses
95  * uses non-C calling convention, __stdcall vs. __cdecl, on x86
96  * Windows. On non-WinSock platforms WSAAPI needs to be void.
97  */
98 #ifndef WSAAPI
99 #define WSAAPI
100 #endif
102 #if 0
103 static unsigned long BIO_ghbn_hits=0L;
104 static unsigned long BIO_ghbn_miss=0L;
106 #define GHBN_NUM 4
107 static struct ghbn_cache_st
108 {
109     char name[129];
110     struct hostent *ent;
111     unsigned long order;
112 } ghbn_cache[GHBN_NUM];
113 #endif
115 static int get_ip(const char *str,unsigned char *ip);
116 #if 0
117 static void ghbn_free(struct hostent *a);
118 static struct hostent *ghbn_dup(struct hostent *a);
119 #endif
120 int BIO_get_host_ip(const char *str, unsigned char *ip)
121 {
122     int i;
123     int err = 1;
124     int locked = 0;
125     struct hostent *he;
127     i=get_ip(str,ip);
```

```

128     if (i < 0)
129     {
130         BIOerr(BIO_F_BIO_GET_HOST_IP, BIO_R_INVALID_IP_ADDRESS);
131         goto err;
132     }

134     /* At this point, we have something that is most probably correct
135     in some way, so let's init the socket. */
136     if (BIO_sock_init() != 1)
137         return 0; /* don't generate another error code here */

139     /* If the string actually contained an IP address, we need not do
140     anything more */
141     if (i > 0) return(1);

143     /* do a gethostbyname */
144     CRYPTO_w_lock(CRYPTO_LOCK_GETHOSTBYNAME);
145     locked = 1;
146     he=BIO_gethostbyname(str);
147     if (he == NULL)
148     {
149         BIOerr(BIO_F_BIO_GET_HOST_IP, BIO_R_BAD_HOSTNAME_LOOKUP);
150         goto err;
151     }

153     /* cast to short because of win16 winsock definition */
154     if ((short)he->h_addrtype != AF_INET)
155     {
156         BIOerr(BIO_F_BIO_GET_HOST_IP, BIO_R_GETHOSTBYNAME_ADDR_IS_NOT_AF_
157         goto err;
158     }
159     for (i=0; i<4; i++)
160         ip[i]=he->h_addr_list[0][i];
161     err = 0;

163 err:
164     if (locked)
165         CRYPTO_w_unlock(CRYPTO_LOCK_GETHOSTBYNAME);
166     if (err)
167     {
168         ERR_add_error_data(2, "host=", str);
169         return 0;
170     }
171     else
172         return 1;
173 }

175 int BIO_get_port(const char *str, unsigned short *port_ptr)
176 {
177     int i;
178     struct servent *s;

180     if (str == NULL)
181     {
182         BIOerr(BIO_F_BIO_GET_PORT, BIO_R_NO_PORT_DEFINED);
183         return(0);
184     }
185     i=atoi(str);
186     if (i != 0)
187         *port_ptr=(unsigned short)i;
188     else
189     {
190         CRYPTO_w_lock(CRYPTO_LOCK_GETSERVBYNAME);
191         /* Note: under VMS with SOCKETSHR, it seems like the first
192         * parameter is 'char *', instead of 'const char *'
193         */

```

```

194 #ifndef CONST_STRICT
195     s=getservbyname((char *)str, "tcp");
196 #else
197     s=getservbyname(str, "tcp");
198 #endif
199     if (s != NULL)
200         *port_ptr=ntohs((unsigned short)s->s_port);
201     CRYPTO_w_unlock(CRYPTO_LOCK_GETSERVBYNAME);
202     if (s == NULL)
203     {
204         if (strcmp(str, "http") == 0)
205             *port_ptr=80;
206         else if (strcmp(str, "telnet") == 0)
207             *port_ptr=23;
208         else if (strcmp(str, "socks") == 0)
209             *port_ptr=1080;
210         else if (strcmp(str, "https") == 0)
211             *port_ptr=443;
212         else if (strcmp(str, "ssl") == 0)
213             *port_ptr=443;
214         else if (strcmp(str, "ftp") == 0)
215             *port_ptr=21;
216         else if (strcmp(str, "gopher") == 0)
217             *port_ptr=70;
218     #if 0
219         else if (strcmp(str, "wais") == 0)
220             *port_ptr=21;
221     #endif
222     }
223     else
224     {
225         SYSerr(SYS_F_GETSERVBYNAME, get_last_socket_error
226         ERR_add_error_data(3, "service=", str, "");
227         return(0);
228     }
229     }
230     return(1);
231 }

233 int BIO_sock_error(int sock)
234 {
235     int j, i;
236     int size;
237
238     #if defined(OPENSSL_SYS_BEOS_R5)
239         return 0;
240     #endif
241
242     size=sizeof(int);
243     /* Note: under Windows the third parameter is of type (char *)
244     * whereas under other systems it is (void *) if you don't have
245     * a cast it will choke the compiler: if you do have a cast then
246     * you can either go for (char *) or (void *).
247     */
248     i=getsockopt(sock, SOL_SOCKET, SO_ERROR, (void *)&j, (void *)&size);
249     if (i < 0)
250         return(1);
251     else
252         return(j);
253 }

255 #if 0
256 long BIO_gbn_ctrl(int cmd, int iarg, char *parg)
257 {
258     int i;
259     char **p;

```

```

261     switch (cmd)
262     {
263     case BIO_GHBN_CTRL_HITS:
264         return(BIO_ghbn_hits);
265         /* break; */
266     case BIO_GHBN_CTRL_MISSES:
267         return(BIO_ghbn_miss);
268         /* break; */
269     case BIO_GHBN_CTRL_CACHE_SIZE:
270         return(GHBN_NUM);
271         /* break; */
272     case BIO_GHBN_CTRL_GET_ENTRY:
273         if ((iarg >= 0) && (iarg < GHBN_NUM) &&
274             (ghbn_cache[iarg].order > 0))
275         {
276             p=(char **)parg;
277             if (p == NULL) return(0);
278             *p=ghbn_cache[iarg].name;
279             ghbn_cache[iarg].name[128]='\0';
280             return(1);
281         }
282         return(0);
283         /* break; */
284     case BIO_GHBN_CTRL_FLUSH:
285         for (i=0; i<GHBN_NUM; i++)
286             ghbn_cache[i].order=0;
287         break;
288     default:
289         return(0);
290     }
291     return(1);
292 }
293 #endif

295 #if 0
296 static struct hostent *ghbn_dup(struct hostent *a)
297 {
298     struct hostent *ret;
299     int i,j;

301     MemCheck_off();
302     ret=(struct hostent *)OPENSSL_malloc(sizeof(struct hostent));
303     if (ret == NULL) return(NULL);
304     memset(ret,0,sizeof(struct hostent));

306     for (i=0; a->h_aliases[i] != NULL; i++)
307         ;
308     i++;
309     ret->h_aliases = (char **)OPENSSL_malloc(i*sizeof(char *));
310     if (ret->h_aliases == NULL)
311         goto err;
312     memset(ret->h_aliases, 0, i*sizeof(char *));

314     for (i=0; a->h_addr_list[i] != NULL; i++)
315         ;
316     i++;
317     ret->h_addr_list=(char **)OPENSSL_malloc(i*sizeof(char *));
318     if (ret->h_addr_list == NULL)
319         goto err;
320     memset(ret->h_addr_list, 0, i*sizeof(char *));

322     j=strlen(a->h_name)+1;
323     if ((ret->h_name=OPENSSL_malloc(j)) == NULL) goto err;
324     memcpy((char *)ret->h_name,a->h_name,j);
325     for (i=0; a->h_aliases[i] != NULL; i++)

```

```

326     {
327         j=strlen(a->h_aliases[i])+1;
328         if ((ret->h_aliases[i]=OPENSSL_malloc(j)) == NULL) goto err;
329         memcpy(ret->h_aliases[i],a->h_aliases[i],j);
330     }
331     ret->h_length=a->h_length;
332     ret->h_addrtype=a->h_addrtype;
333     for (i=0; a->h_addr_list[i] != NULL; i++)
334     {
335         if ((ret->h_addr_list[i]=OPENSSL_malloc(a->h_length)) == NULL)
336             goto err;
337         memcpy(ret->h_addr_list[i],a->h_addr_list[i],a->h_length);
338     }
339     if (0)
340     {
341     err:
342         if (ret != NULL)
343             ghbn_free(ret);
344         ret=NULL;
345     }
346     MemCheck_on();
347     return(ret);
348 }

350 static void ghbn_free(struct hostent *a)
351 {
352     int i;

354     if(a == NULL)
355         return;

357     if (a->h_aliases != NULL)
358     {
359         for (i=0; a->h_aliases[i] != NULL; i++)
360             OPENSSL_free(a->h_aliases[i]);
361         OPENSSL_free(a->h_aliases);
362     }
363     if (a->h_addr_list != NULL)
364     {
365         for (i=0; a->h_addr_list[i] != NULL; i++)
366             OPENSSL_free(a->h_addr_list[i]);
367         OPENSSL_free(a->h_addr_list);
368     }
369     if (a->h_name != NULL) OPENSSL_free(a->h_name);
370     OPENSSL_free(a);
371 }

373 #endif

375 struct hostent *BIO_gethostbyname(const char *name)
376 {
377     #if 1
378         /* Caching gethostbyname() results forever is wrong,
379          * so we have to let the true gethostbyname() worry about this */
380         #if (defined(NETWARE_BSDSOCK) && !defined(__NOVELL_LIBC__))
381             return gethostbyname((char*)name);
382         #else
383             return gethostbyname(name);
384         #endif
385     #else
386         struct hostent *ret;
387         int i,lowi=0,j;
388         unsigned long low= (unsigned long)-1;

391     # if 0

```

```

392 /* It doesn't make sense to use locking here: The function interface
393  * is not thread-safe, because threads can never be sure when
394  * some other thread destroys the data they were given a pointer to.
395  */
396 CRYPTO_w_lock(CRYPTO_LOCK_GETHOSTBYNAME);
397 # endif
398 j=strlen(name);
399 if (j < 128)
400 {
401     for (i=0; i<GHBN_NUM; i++)
402     {
403         if (low > ghbn_cache[i].order)
404         {
405             low=ghbn_cache[i].order;
406             lowi=i;
407         }
408         if (ghbn_cache[i].order > 0)
409         {
410             if (strcmp(name,ghbn_cache[i].name,128) == 0)
411                 break;
412         }
413     }
414 }
415 else
416     i=GHBN_NUM;
417
418 if (i == GHBN_NUM) /* no hit*/
419 {
420     BIO_ghbn_miss++;
421     /* Note: under VMS with SOCKETSHR, it seems like the first
422      * parameter is 'char *', instead of 'const char *'
423      */
424 # ifndef CONST_STRICT
425     ret=gethostbyname((char *)name);
426 # else
427     ret=gethostbyname(name);
428 # endif
429
430 if (ret == NULL)
431     goto end;
432 if (j > 128) /* too big to cache */
433 {
434 # if 0
435     /* If we were trying to make this function thread-safe (
436      * is bound to fail), we'd have to give up in this case
437      * (or allocate more memory). */
438     ret = NULL;
439 # endif
440     goto end;
441 }
442
443 /* else add to cache */
444 if (ghbn_cache[lowi].ent != NULL)
445     ghbn_free(ghbn_cache[lowi].ent); /* XXX not thread-safe
446     ghbn_cache[lowi].name[0] = '\0';
447
448 if((ret=ghbn_cache[lowi].ent=ghbn_dup(ret)) == NULL)
449 {
450     BIOerr(BIO_F_BIO_GETHOSTBYNAME,ERR_R_MALLOC_FAILURE);
451     goto end;
452 }
453 strncpy(ghbn_cache[lowi].name,name,128);
454 ghbn_cache[lowi].order=BIO_ghbn_miss+BIO_ghbn_hits;
455 }
456 else
457 {

```

```

458     BIO_ghbn_hits++;
459     ret= ghbn_cache[i].ent;
460     ghbn_cache[i].order=BIO_ghbn_miss+BIO_ghbn_hits;
461 }
462 end:
463 # if 0
464     CRYPTO_w_unlock(CRYPTO_LOCK_GETHOSTBYNAME);
465 # endif
466 return(ret);
467 #endif
468 }
469
471 int BIO_sock_init(void)
472 {
473 #ifdef OPENSSL_SYS_WINDOWS
474     static struct WSADATA wsa_state;
475
476     if (!wsa_init_done)
477     {
478         int err;
479
480         wsa_init_done=1;
481         memset(&wsa_state,0,sizeof(wsa_state));
482         /* Not making wsa_state available to the rest of the
483          * code is formally wrong. But the structures we use
484          * are [beleived to be] invariable among winsock DLLs,
485          * while API availability is [expected to be] probed
486          * at run-time with DSO global lookup. */
487         if (WSAStartup(0x0202,&wsa_state)!=0)
488         {
489             err=WSAGetLastError();
490             SYSerr(SYS_F_WSASTARTUP,err);
491             BIOerr(BIO_F_BIO SOCK_INIT,BIO_R_WSASTARTUP);
492             return(-1);
493         }
494     }
495 #endif /* OPENSSL_SYS_WINDOWS */
496 #ifdef WATT32
497     extern int _watt_do_exit;
498     _watt_do_exit = 0; /* don't make sock_init() call exit() */
499     if (sock_init())
500         return (-1);
501 #endif
502
503 #if defined(OPENSSL_SYS_NETWARE) && !defined(NETWARE_BSDSOCK)
504     WORD wVerReq;
505     WSADATA wsaData;
506     int err;
507
508     if (!wsa_init_done)
509     {
510         wsa_init_done=1;
511         wVerReq = MAKEWORD( 2, 0 );
512         err = WSAStartup(wVerReq,&wsaData);
513         if (err != 0)
514         {
515             SYSerr(SYS_F_WSASTARTUP,err);
516             BIOerr(BIO_F_BIO SOCK_INIT,BIO_R_WSASTARTUP);
517             return(-1);
518         }
519     }
520 #endif
521
522     return(1);
523 }

```

```

525 void BIO_sock_cleanup(void)
526 {
527 #ifdef OPENSSSL_SYS_WINDOWS
528     if (wsa_init_done)
529     {
530         wsa_init_done=0;
531         /* this call is claimed to be non-present in Winsock2 */
532         WSACancelBlockingCall();
533     }
534     WSACleanup();
535 #elif defined(OPENSSSL_SYS_NETWARE) && !defined(NETWARE_BSDSOCK)
536     if (wsa_init_done)
537     {
538         wsa_init_done=0;
539         WSACleanup();
540     }
541 #endif
542 }
543
544 #if !defined(OPENSSSL_SYS_VMS) || __VMS_VER >= 70000000
545
546 int BIO_socket_ioctl(int fd, long type, void *arg)
547 {
548     int i;
549
550 #ifdef _DJBPP
551     i=ioctlsocket(fd,type,(char *)arg);
552 #else
553     #if defined(OPENSSSL_SYS_VMS)
554         /* 2011-02-18 SMS.
555          * VMS ioctl() can't tolerate a 64-bit "void *arg", but we
556          * observe that all the consumers pass in an "unsigned long *",
557          * so we arrange a local copy with a short pointer, and use
558          * that, instead.
559          */
560         # if __INITIAL_POINTER_SIZE == 64
561         #   define ARG arg_32p
562         #   pragma pointer_size save
563         #   pragma pointer_size 32
564         unsigned long arg_32;
565         unsigned long *arg_32p;
566         #   pragma pointer_size restore
567         arg_32p = &arg_32;
568         arg_32 = *((unsigned long *) arg);
569         # else /* __INITIAL_POINTER_SIZE == 64 */
570         #   define ARG arg
571         #   define ARG arg
572         #   endif /* __INITIAL_POINTER_SIZE == 64 [else] */
573         # else /* defined(OPENSSSL_SYS_VMS) */
574         #   define ARG arg
575         #   endif /* defined(OPENSSSL_SYS_VMS) [else] */
576
577         i=ioctlsocket(fd,type,ARG);
578     #endif /* _DJBPP */
579     if (i < 0)
580         SYSerr(SYS_F_IOCTL_SOCKET,get_last_socket_error());
581     return(i);
582 }
583 #endif /* __VMS_VER */
584
585 /* The reason I have implemented this instead of using sscanf is because
586  * Visual C 1.52c gives an unresolved external when linking a DLL :( */
587 static int get_ip(const char *str, unsigned char ip[4])
588 {
589     unsigned int tmp[4];

```

```

590     int num=0,c,ok=0;
591
592     tmp[0]=tmp[1]=tmp[2]=tmp[3]=0;
593
594     for (;;)
595     {
596         c=*(str++);
597         if ((c >= '0') && (c <= '9'))
598         {
599             ok=1;
600             tmp[num]=tmp[num]*10+c-'0';
601             if (tmp[num] > 255) return(0);
602         }
603         else if (c == '.')
604         {
605             if (!ok) return(-1);
606             if (num == 3) return(0);
607             num++;
608             ok=0;
609         }
610         else if (c == '\0' && (num == 3) && ok)
611             break;
612         else
613             return(0);
614     }
615     ip[0]=tmp[0];
616     ip[1]=tmp[1];
617     ip[2]=tmp[2];
618     ip[3]=tmp[3];
619     return(1);
620 }
621
622 int BIO_get_accept_socket(char *host, int bind_mode)
623 {
624     int ret=0;
625     union {
626         struct sockaddr sa;
627         struct sockaddr_in sa_in;
628     } #if OPENSSSL_USE_IPV6
629     struct sockaddr_in6 sa_in6;
630 #endif
631     server,client;
632     int s=INVALID_SOCKET,cs,addrlen;
633     unsigned char ip[4];
634     unsigned short port;
635     char *str=NULL,*e;
636     char *h,*p;
637     unsigned long l;
638     int err_num;
639
640     if (BIO_sock_init() != 1) return(INVALID_SOCKET);
641
642     if ((str=BUF_strdup(host)) == NULL) return(INVALID_SOCKET);
643
644     h=p=NULL;
645     h=str;
646     for (e=str; *e; e++)
647     {
648         if (*e == ':')
649         {
650             p=e;
651         }
652         else if (*e == '/')
653         {
654             *e='\0';
655             break;

```

```

656     }
657     }
658     if (p) *p++='\0'; /* points at last ':', ':::port' is special [see
659     else p=h,h=NULL;

661 #ifdef EAI_FAMILY
662 do {
663     static union { void *p;
664                     int (WSAAPI *f)(const char *,const char *,
665                                     const struct addrinfo *,
666                                     struct addrinfo **);
667                     } p_getaddrinfo = {NULL};
668     static union { void *p;
669                     void (WSAAPI *f)(struct addrinfo *);
670                     } p_freeaddrinfo = {NULL};
671     struct addrinfo *res,hint;

673     if (p_getaddrinfo.p==NULL)
674     {
675         if ((p_getaddrinfo.p=DSO_global_lookup("getaddrinfo"))==NULL ||
676             (p_freeaddrinfo.p=DSO_global_lookup("freeaddrinfo"))==NULL)
677             p_getaddrinfo.p=(void*)-1;
678     }
679     if (p_getaddrinfo.p==(void *)-1) break;

681     /* ':::port' enforces IPv6 wildcard listener. Some OSes,
682     * e.g. Solaris, default to IPv6 without any hint. Also
683     * note that commonly IPv6 wildcard socket can service
684     * IPv4 connections just as well... */
685     memset(&hint,0,sizeof(hint));
686     hint.ai_flags = AI_PASSIVE;
687     if (h)
688     {
689         if (strchr(h,':'))
690         {
691             if (h[1]=='\0') h=NULL;
692 #if OPENSLL_USE_IPV6
693             hint.ai_family = AF_INET6;
694 #else
695             h=NULL;
696 #endif
697         }
698         else if (h[0]=='*' && h[1]=='\0')
699         {
700             hint.ai_family = AF_INET;
701             h=NULL;
702         }
703     }

705     if ((*p_getaddrinfo.f)(h,p,&hint,&res)) break;

707     addrlen = res->ai_addrlen<=sizeof(server) ?
708         res->ai_addrlen :
709         sizeof(server);
710     memcpy(&server, res->ai_addr, addrlen);

712     (*p_freeaddrinfo.f)(res);
713     goto again;
714 } while (0);
715 #endif

717 if (!BIO_get_port(p,&port)) goto err;

719 memset((char *)&server,0,sizeof(server));
720 server.sa_in.sin_family=AF_INET;
721 server.sa_in.sin_port=htons(port);

```

```

722     addrlen = sizeof(server.sa_in);

724     if (h == NULL || strcmp(h,"") == 0)
725         server.sa_in.sin_addr.s_addr=INADDR_ANY;
726     else
727     {
728         if (!BIO_get_host_ip(h,&(ip[0]))) goto err;
729         l=(unsigned long)
730             ((unsigned long)ip[0]<<24L)|
731             ((unsigned long)ip[1]<<16L)|
732             ((unsigned long)ip[2]<< 8L)|
733             ((unsigned long)ip[3]);
734         server.sa_in.sin_addr.s_addr=htonl(l);
735     }

737 again:
738     s=socket(server.sa.sa_family,SOCK_STREAM,SOCKET_PROTOCOL);
739     if (s == INVALID_SOCKET)
740     {
741         SYSerr(SYS_F_SOCKET,get_last_socket_error());
742         ERR_add_error_data(3,"port=",host,"");
743         BIOerr(BIO_F_BIO_GET_ACCEPT_SOCKET,BIO_R_UNABLE_TO_CREATE_SOCKET
744             goto err;
745     }

747 #ifdef SO_REUSEADDR
748     if (bind_mode == BIO_BIND_REUSEADDR)
749     {
750         int i=1;

752         ret=setsockopt(s,SOL_SOCKET,SO_REUSEADDR,(char *)&i,sizeof(i));
753         bind_mode=BIO_BIND_NORMAL;
754     }
755 #endif
756     if (bind(s,&server.sa,addrlen) == -1)
757     {
758 #ifdef SO_REUSEADDR
759         err_num=get_last_socket_error();
760         if ((bind_mode == BIO_BIND_REUSEADDR_IF_UNUSED) &&
761             #ifdef OPENSLL_SYS_WINDOWS
762             /* Some versions of Windows define EADDRINUSE to
763             * a dummy value.
764             */
765             (err_num == WSAEADDRINUSE))
766 #else
767             (err_num == EADDRINUSE))
768 #endif
769         {
770             client = server;
771             if (h == NULL || strcmp(h,"") == 0)
772             {
773 #if OPENSLL_USE_IPV6
774                 if (client.sa.sa_family == AF_INET6)
775                 {
776                     memset(&client.sa_in6.sin6_addr,0,sizeof
777                         client.sa_in6.sin6_addr.s6_addr[15]=1;
778                 }
779             else
780 #endif
781                 if (client.sa.sa_family == AF_INET)
782                 {
783                     client.sa_in.sin_addr.s_addr=htonl(0x7F0
784                 }
785             else
786                 goto err;
787         }
788         cs=socket(client.sa.sa_family,SOCK_STREAM,SOCKET_PROTOCO

```

```

788         if (cs != INVALID_SOCKET)
789         {
790             int ii;
791             ii=connect(cs,&client.sa,addrlen);
792             closesocket(cs);
793             if (ii == INVALID_SOCKET)
794             {
795                 bind_mode=BIO_BIND_REUSEADDR;
796                 closesocket(s);
797                 goto again;
798             }
799             /* else error */
800         }
801         /* else error */
802     }
803 #endif
804     SYSerr(SYS_F_BIND,err_num);
805     ERR_add_error_data(3,"port=''",host,"'");
806     BIOerr(BIO_F_BIO_GET_ACCEPT_SOCKET,BIO_R_UNABLE_TO_BIND_SOCKET);
807     goto err;
808 }
809 if (listen(s,MAX_LISTEN) == -1)
810 {
811     SYSerr(SYS_F_BIND,get_last_socket_error());
812     ERR_add_error_data(3,"port=''",host,"'");
813     BIOerr(BIO_F_BIO_GET_ACCEPT_SOCKET,BIO_R_UNABLE_TO_LISTEN_SOCKET);
814     goto err;
815 }
816 ret=1;
817 err:
818 if (str != NULL) OPENSSL_free(str);
819 if ((ret == 0) && (s != INVALID_SOCKET))
820 {
821     closesocket(s);
822     s= INVALID_SOCKET;
823 }
824 return(s);
825 }

827 int BIO_accept(int sock, char **addr)
828 {
829     int ret=INVALID_SOCKET;
830     unsigned long l;
831     unsigned short port;
832     char *p;

834     struct {
835         /*
836          * As for following union. Trouble is that there are platforms
837          * that have socklen_t and there are platforms that don't, on
838          * some platforms socklen_t is int and on some size_t. So what
839          * one can do? One can cook #ifdef spaghetti, which is nothing
840          * but masochistic. Or one can do union between int and size_t.
841          * One naturally does it primarily for 64-bit platforms where
842          * sizeof(int) != sizeof(size_t). But would it work? Note that
843          * if size_t member is initialized to 0, then later int member
844          * assignment naturally does the job on little-endian platforms
845          * regardless accept's expectations! What about big-endians?
846          * If accept expects int*, then it works, and if size_t*, then
847          * length value would appear as unreasonably large. But this
848          * won't prevent it from filling in the address structure. The
849          * trouble of course would be if accept returns more data than
850          * actual buffer can accommodate and overwrite stack... That's
851          * where early OPENSSL_assert comes into picture. Besides, the
852          * only 64-bit big-endian platform found so far that expects
853          * size_t* is HP-UX, where stack grows towards higher address.

```

```

854         * <appro>
855         */
856         union { size_t s; int i; } len;
857         union {
858             struct sockaddr sa;
859             struct sockaddr_in sa_in;
860             #if OPENSSL_USE_IPV6
861                 struct sockaddr_in6 sa_in6;
862             #endif
863             } from;
864         } sa;

866         sa.len.s=0;
867         sa.len.i=sizeof(sa.from);
868         memset(&sa.from,0,sizeof(sa.from));
869         ret=accept(sock,&sa.from.sa,(void *)&sa.len);
870         if (sizeof(sa.len.i)!=sizeof(sa.len.s) && sa.len.i==0)
871         {
872             OPENSSL_assert(sa.len.s<=sizeof(sa.from));
873             sa.len.i = (int)sa.len.s;
874             /* use sa.len.i from this point */
875         }
876         if (ret == INVALID_SOCKET)
877         {
878             if(BIO_sock_should_retry(ret)) return -2;
879             SYSerr(SYS_F_ACCEPT,get_last_socket_error());
880             BIOerr(BIO_F_BIO_ACCEPT,BIO_R_ACCEPT_ERROR);
881             goto end;
882         }

884         if (addr == NULL) goto end;

886 #ifdef EAI_FAMILY
887         do {
888             char h[NI_MAXHOST],s[NI_MAXSERV];
889             size_t nl;
890             static union { void *p;
891                 int (WSAAPI *f)(const struct sockaddr *,size_t/*socklen_t*/,
892                     char *,size_t,char *,size_t,int);
893             } p_getnameinfo = {NULL};
894             /* 2nd argument to getnameinfo is specified to
895              * be socklen_t. Unfortunately there is a number
896              * of environments where socklen_t is not defined.
897              * As it's passed by value, it's safe to pass it
898              * as size_t... <appro> */

899         if (p_getnameinfo.p==NULL)
900         {
901             if ((p_getnameinfo.p=DSO_global_lookup("getnameinfo"))==NULL)
902                 p_getnameinfo.p=(void*)-1;
903         }
904         if (p_getnameinfo.p==(void *)-1) break;

907         if ((*p_getnameinfo.f)(&sa.from.sa,sa.len.i,h,sizeof(h),s,sizeof(s),
908             NI_NUMERICHOST|NI_NUMERICSERV)) break;
909         nl = strlen(h)+strlen(s)+2;
910         p = *addr;
911         if (p) { *p = '\0'; p = OPENSSL_realloc(p,nl); }
912         else { p = OPENSSL_malloc(nl); }
913         if (p==NULL)
914         {
915             BIOerr(BIO_F_BIO_ACCEPT,ERR_R_MALLOC_FAILURE);
916             goto end;
917         }
918         *addr = p;
919         BIO_snprintf(*addr,nl,"%s:%s",h,s);

```



```
920     goto end;
921 } while(0);
922 #endif
923 if (sa.from.sa.sa_family != AF_INET) goto end;
924 l=ntohl(sa.from.sa_in.sin_addr.s_addr);
925 port=ntohs(sa.from.sa_in.sin_port);
926 if (*addr == NULL)
927 {
928     if ((p=OPENSSL_malloc(24)) == NULL)
929     {
930         BIOerr(BIO_F_BIO_ACCEPT,ERR_R_MALLOC_FAILURE);
931         goto end;
932     }
933     *addr=p;
934 }
935 BIO_snprintf(*addr,24,"%d.%d.%d.%d:%d",
936             (unsigned char)(l>>24L)&0xff,
937             (unsigned char)(l>>16L)&0xff,
938             (unsigned char)(l>> 8L)&0xff,
939             (unsigned char)(l      )&0xff,
940             port);
941 end:
942     return(ret);
943 }

945 int BIO_set_tcp_ndelay(int s, int on)
946 {
947     int ret=0;
948     #if defined(TCP_NODELAY) && (defined(IPPROTO_TCP) || defined(SOL_TCP))
949         int opt;
951     #ifdef SOL_TCP
952         opt=SOL_TCP;
953     #else
954     #ifdef IPPROTO_TCP
955         opt=IPPROTO_TCP;
956     #endif
957     #endif
958
959     ret=setsockopt(s,opt,TCP_NODELAY,(char *)&on,sizeof(on));
960 #endif
961     return(ret == 0);
962 }

964 int BIO_socket_nbio(int s, int mode)
965 {
966     int ret= -1;
967     int l;
969     l=mode;
970     #ifdef FIONBIO
971     ret=BIO_socket_ioctl(s,FIONBIO,&l);
972     #endif
973     return(ret == 0);
974 }
975 #endif
```

12420 Fri May 30 18:31:34 2014
 new/usr/src/lib/openssl/libsunw_crypto/bio/bf_buff.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/bio/bf_buff.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"

```

62 #include <openssl/bio.h>

```

64 static int buffer_write(BIO *h, const char *buf, int num);
65 static int buffer_read(BIO *h, char *buf, int size);
66 static int buffer_puts(BIO *h, const char *str);
67 static int buffer_gets(BIO *h, char *str, int size);
68 static long buffer_ctrl(BIO *h, int cmd, long arg1, void *arg2);
69 static int buffer_new(BIO *h);
70 static int buffer_free(BIO *data);
71 static long buffer_callback_ctrl(BIO *h, int cmd, bio_info_cb *fp);
72 #define DEFAULT_BUFFER_SIZE 4096

74 static BIO_METHOD methods_buffer=
75 {
76     BIO_TYPE_BUFFER,
77     "buffer",
78     buffer_write,
79     buffer_read,
80     buffer_puts,
81     buffer_gets,
82     buffer_ctrl,
83     buffer_new,
84     buffer_free,
85     buffer_callback_ctrl,
86 };

88 BIO_METHOD *BIO_f_buffer(void)
89 {
90     return(&methods_buffer);
91 }

93 static int buffer_new(BIO *bi)
94 {
95     BIO_F_BUFFER_CTX *ctx;

97     ctx=(BIO_F_BUFFER_CTX *)OPENSSL_malloc(sizeof(BIO_F_BUFFER_CTX));
98     if (ctx == NULL) return(0);
99     ctx->ibuf=(char *)OPENSSL_malloc(DEFAULT_BUFFER_SIZE);
100     if (ctx->ibuf == NULL) { OPENSSL_free(ctx); return(0); }
101     ctx->obuf=(char *)OPENSSL_malloc(DEFAULT_BUFFER_SIZE);
102     if (ctx->obuf == NULL) { OPENSSL_free(ctx->ibuf); OPENSSL_free(ctx); ret
103     ctx->ibuf_size=DEFAULT_BUFFER_SIZE;
104     ctx->obuf_size=DEFAULT_BUFFER_SIZE;
105     ctx->ibuf_len=0;
106     ctx->ibuf_off=0;
107     ctx->obuf_len=0;
108     ctx->obuf_off=0;

110     bi->init=1;
111     bi->ptr=(char *)ctx;
112     bi->flags=0;
113     return(1);
114 }

116 static int buffer_free(BIO *a)
117 {
118     BIO_F_BUFFER_CTX *b;

120     if (a == NULL) return(0);
121     b=(BIO_F_BUFFER_CTX *)a->ptr;
122     if (b->ibuf != NULL) OPENSSL_free(b->ibuf);
123     if (b->obuf != NULL) OPENSSL_free(b->obuf);
124     OPENSSL_free(a->ptr);
125     a->ptr=NULL;
126     a->init=0;
127     a->flags=0;

```

```

128     return(1);
129 }
130
131 static int buffer_read(BIO *b, char *out, int outl)
132 {
133     int i,num=0;
134     BIO_F_BUFFER_CTX *ctx;
135
136     if (out == NULL) return(0);
137     ctx=(BIO_F_BUFFER_CTX *)b->ptr;
138
139     if ((ctx == NULL) || (b->next_bio == NULL)) return(0);
140     num=0;
141     BIO_clear_retry_flags(b);
142
143 start:
144     i=ctx->ibuf_len;
145     /* If there is stuff left over, grab it */
146     if (i != 0)
147     {
148         if (i > outl) i=outl;
149         memcpy(out,&(ctx->ibuf[ctx->ibuf_off]),i);
150         ctx->ibuf_off+=i;
151         ctx->ibuf_len-=i;
152         num+=i;
153         if (outl == i) return(num);
154         outl-=i;
155         out+=i;
156     }
157
158     /* We may have done a partial read. try to do more.
159     * We have nothing in the buffer.
160     * If we get an error and have read some data, just return it
161     * and let them retry to get the error again.
162     * copy direct to parent address space */
163     if (outl > ctx->ibuf_size)
164     {
165         for (;;)
166         {
167             i=BIO_read(b->next_bio,out,outl);
168             if (i <= 0)
169             {
170                 BIO_copy_next_retry(b);
171                 if (i < 0) return((num > 0)?num:i);
172                 if (i == 0) return(num);
173             }
174             num+=i;
175             if (outl == i) return(num);
176             out+=i;
177             outl-=i;
178         }
179     }
180     /* else */
181
182     /* we are going to be doing some buffering */
183     i=BIO_read(b->next_bio,ctx->ibuf,ctx->ibuf_size);
184     if (i <= 0)
185     {
186         BIO_copy_next_retry(b);
187         if (i < 0) return((num > 0)?num:i);
188         if (i == 0) return(num);
189     }
190     ctx->ibuf_off=0;
191     ctx->ibuf_len=i;
192
193     /* Lets re-read using ourselves :- ) */

```

```

194     goto start;
195 }
196
197 static int buffer_write(BIO *b, const char *in, int inl)
198 {
199     int i,num=0;
200     BIO_F_BUFFER_CTX *ctx;
201
202     if ((in == NULL) || (inl <= 0)) return(0);
203     ctx=(BIO_F_BUFFER_CTX *)b->ptr;
204     if ((ctx == NULL) || (b->next_bio == NULL)) return(0);
205
206     BIO_clear_retry_flags(b);
207 start:
208     i=ctx->obuf_size-(ctx->obuf_len+ctx->obuf_off);
209     /* add to buffer and return */
210     if (i >= inl)
211     {
212         memcpy(&(ctx->obuf[ctx->obuf_off+ctx->obuf_len]),in,inl);
213         ctx->obuf_len+=inl;
214         return(num+inl);
215     }
216     /* else */
217     /* stuff already in buffer, so add to it first, then flush */
218     if (ctx->obuf_len != 0)
219     {
220         if (i > 0) /* lets fill it up if we can */
221         {
222             memcpy(&(ctx->obuf[ctx->obuf_off+ctx->obuf_len]),in,i);
223             in+=i;
224             inl-=i;
225             num+=i;
226             ctx->obuf_len+=i;
227         }
228         /* we now have a full buffer needing flushing */
229         for (;;)
230         {
231             i=BIO_write(b->next_bio,&(ctx->obuf[ctx->obuf_off]),
232                        ctx->obuf_len);
233             if (i <= 0)
234             {
235                 BIO_copy_next_retry(b);
236
237                 if (i < 0) return((num > 0)?num:i);
238                 if (i == 0) return(num);
239             }
240             ctx->obuf_off+=i;
241             ctx->obuf_len-=i;
242             if (ctx->obuf_len == 0) break;
243         }
244     }
245     /* we only get here if the buffer has been flushed and we
246     * still have stuff to write */
247     ctx->obuf_off=0;
248
249     /* we now have inl bytes to write */
250     while (inl >= ctx->obuf_size)
251     {
252         i=BIO_write(b->next_bio,in,inl);
253         if (i <= 0)
254         {
255             BIO_copy_next_retry(b);
256             if (i < 0) return((num > 0)?num:i);
257             if (i == 0) return(num);
258         }
259         num+=i;

```

```

260         in+=i;
261         inl-=i;
262         if (inl == 0) return(num);
263     }

265     /* copy the rest into the buffer since we have only a small
266      * amount left */
267     goto start;
268 }

270 static long buffer_ctrl(BIO *b, int cmd, long num, void *ptr)
271 {
272     BIO *dbio;
273     BIO_F_BUFFER_CTX *ctx;
274     long ret=1;
275     char *p1,*p2;
276     int r,i,*ip;
277     int ibs,obs;

279     ctx=(BIO_F_BUFFER_CTX *)b->ptr;

281     switch (cmd)
282     {
283     case BIO_CTRL_RESET:
284         ctx->ibuf_off=0;
285         ctx->ibuf_len=0;
286         ctx->obuf_off=0;
287         ctx->obuf_len=0;
288         if (b->next_bio == NULL) return(0);
289         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
290         break;
291     case BIO_CTRL_INFO:
292         ret=(long)ctx->obuf_len;
293         break;
294     case BIO_C_GET_BUFF_NUM_LINES:
295         ret=0;
296         p1=ctx->ibuf;
297         for (i=0; i<ctx->ibuf_len; i++)
298             if (p1[ctx->ibuf_off + i] == '\n') ret++;
299         break;
300     case BIO_CTRL_WPENDING:
301         ret=(long)ctx->obuf_len;
302         if (ret == 0)
303             if (b->next_bio == NULL) return(0);
304             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
305         break;
306     case BIO_CTRL_PENDING:
307         ret=(long)ctx->ibuf_len;
308         if (ret == 0)
309             if (b->next_bio == NULL) return(0);
310             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
311         break;
312     case BIO_C_SET_BUFF_READ_DATA:
313         if (num > ctx->ibuf_size)
314             p1=OPENSSL_malloc((int)num);
315             if (p1 == NULL) goto malloc_error;
316             if (ctx->ibuf != NULL) OPENSSL_free(ctx->ibuf);
317             ctx->ibuf=p1;
318     }

```

```

326         ctx->ibuf_off=0;
327         ctx->ibuf_len=(int)num;
328         memcpy(ctx->ibuf,ptr,(int)num);
329         ret=1;
330         break;
331     case BIO_C_SET_BUFF_SIZE:
332         if (ptr != NULL)
333             ip=(int *)ptr;
334             if (*ip == 0)
335                 {
336                     ibs=(int)num;
337                     obs=ctx->obuf_size;
338                 }
339             else /* if (*ip == 1) */
340                 {
341                     ibs=ctx->ibuf_size;
342                     obs=(int)num;
343                 }
344         }
345     else
346         {
347             ibs=(int)num;
348             obs=(int)num;
349         }
350     p1=ctx->ibuf;
351     p2=ctx->obuf;
352     if ((ibs > DEFAULT_BUFFER_SIZE) && (ibs != ctx->ibuf_size))
353         {
354             p1=(char *)OPENSSL_malloc((int)num);
355             if (p1 == NULL) goto malloc_error;
356         }
357     if ((obs > DEFAULT_BUFFER_SIZE) && (obs != ctx->obuf_size))
358         {
359             p2=(char *)OPENSSL_malloc((int)num);
360             if (p2 == NULL)
361                 if (p1 != ctx->ibuf) OPENSSL_free(p1);
362                 goto malloc_error;
363         }
364     if (ctx->ibuf != p1)
365         {
366             OPENSSL_free(ctx->ibuf);
367             ctx->ibuf=p1;
368             ctx->ibuf_off=0;
369             ctx->ibuf_len=0;
370             ctx->ibuf_size=ibs;
371         }
372     if (ctx->obuf != p2)
373         {
374             OPENSSL_free(ctx->obuf);
375             ctx->obuf=p2;
376             ctx->obuf_off=0;
377             ctx->obuf_len=0;
378             ctx->obuf_size=obs;
379         }
380     break;
381     case BIO_C_DO_STATE_MACHINE:
382         if (b->next_bio == NULL) return(0);
383         BIO_clear_retry_flags(b);
384         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
385         BIO_copy_next_retry(b);
386         break;
387     case BIO_CTRL_FLUSH:

```

```

392     if (b->next_bio == NULL) return(0);
393     if (ctx->obuf_len <= 0)
394     {
395         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
396         break;
397     }

399     for (;;)
400     {
401         BIO_clear_retry_flags(b);
402         if (ctx->obuf_len > 0)
403         {
404             r=BIO_write(b->next_bio,
405                 &(ctx->obuf[ctx->obuf_off]),
406                 ctx->obuf_len);
407             #if 0
408             fprintf(stderr,"FLUSH [%3d] %3d -> %3d\n",ctx->obuf_off,ctx->obuf_len,r);
409             #endif
410             BIO_copy_next_retry(b);
411             if (r <= 0) return((long)r);
412             ctx->obuf_off+=r;
413             ctx->obuf_len-=r;
414         }
415         else
416         {
417             ctx->obuf_len=0;
418             ctx->obuf_off=0;
419             ret=1;
420             break;
421         }
422     }
423     ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
424     break;
425 case BIO_CTRL_DUP:
426     dbio=(BIO *)ptr;
427     if ( !BIO_set_read_buffer_size(dbio,ctx->ibuf_size) ||
428         !BIO_set_write_buffer_size(dbio,ctx->obuf_size))
429         ret=0;
430     break;
431 default:
432     if (b->next_bio == NULL) return(0);
433     ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
434     break;
435 }
436 return(ret);
437 malloc_error:
438     BIOerr(BIO_F_BUFFER_CTRL,ERR_R_MALLOC_FAILURE);
439     return(0);
440 }

442 static long buffer_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
443 {
444     long ret=1;

446     if (b->next_bio == NULL) return(0);
447     switch (cmd)
448     {
449     default:
450         ret=BIO_callback_ctrl(b->next_bio,cmd,fp);
451         break;
452     }
453     return(ret);
454 }

456 static int buffer_gets(BIO *b, char *buf, int size)
457 {

```

```

458     BIO_F_BUFFER_CTRL *ctx;
459     int num=0,i,flag;
460     char *p;

462     ctx=(BIO_F_BUFFER_CTRL *)b->ptr;
463     size--; /* reserve space for a '\0' */
464     BIO_clear_retry_flags(b);

466     for (;;)
467     {
468         if (ctx->ibuf_len > 0)
469         {
470             p = &(ctx->ibuf[ctx->ibuf_off]);
471             flag=0;
472             for (i=0; (i<ctx->ibuf_len) && (i<size); i++)
473             {
474                 *(buf++)=p[i];
475                 if (p[i] == '\n')
476                 {
477                     flag=1;
478                     i++;
479                     break;
480                 }
481             }
482             num+=i;
483             size-=i;
484             ctx->ibuf_len-=i;
485             ctx->ibuf_off+=i;
486             if (flag || size == 0)
487             {
488                 *buf='\0';
489                 return(num);
490             }
491         }
492         else /* read another chunk */
493         {
494             i=BIO_read(b->next_bio,ctx->ibuf,ctx->ibuf_size);
495             if (i <= 0)
496             {
497                 BIO_copy_next_retry(b);
498                 *buf='\0';
499                 if (i < 0) return((num > 0)?num:i);
500                 if (i == 0) return(num);
501             }
502             ctx->ibuf_len=i;
503             ctx->ibuf_off=0;
504         }
505     }
506 }

508 static int buffer_puts(BIO *b, const char *str)
509 {
510     return(buffer_write(b,str,strlen(str)));
511 }

```

```

*****
6486 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bf_nbio.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/bf_nbio.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"

```

```

62 #include <openssl/rand.h>
63 #include <openssl/bio.h>
64
65 /* BIO_put and BIO_get both add to the digest,
66  * BIO_gets returns the digest */
67
68 static int nbiof_write(BIO *h, const char *buf, int num);
69 static int nbiof_read(BIO *h, char *buf, int size);
70 static int nbiof_puts(BIO *h, const char *str);
71 static int nbiof_gets(BIO *h, char *str, int size);
72 static long nbiof_ctrl(BIO *h, int cmd, long arg1, void *arg2);
73 static int nbiof_new(BIO *h);
74 static int nbiof_free(BIO *data);
75 static long nbiof_callback_ctrl(BIO *h, int cmd, bio_info_cb *fp);
76 typedef struct nbio_test_st
77 {
78     /* only set if we sent a 'should retry' error */
79     int lrn;
80     int lwn;
81 } NBIO_TEST;
82
83 static BIO_METHOD methods_nbiof=
84 {
85     BIO_TYPE_NBIO_TEST,
86     "non-blocking IO test filter",
87     nbiof_write,
88     nbiof_read,
89     nbiof_puts,
90     nbiof_gets,
91     nbiof_ctrl,
92     nbiof_new,
93     nbiof_free,
94     nbiof_callback_ctrl,
95 };
96
97 BIO_METHOD *BIO_f_nbio_test(void)
98 {
99     return(&methods_nbiof);
100 }
101
102 static int nbiof_new(BIO *bi)
103 {
104     NBIO_TEST *nt;
105
106     if (!(nt=(NBIO_TEST *)OPENSSL_malloc(sizeof(NBIO_TEST)))) return(0);
107     nt->lrn= -1;
108     nt->lwn= -1;
109     bi->ptr=(char *)nt;
110     bi->init=1;
111     bi->flags=0;
112     return(1);
113 }
114
115 static int nbiof_free(BIO *a)
116 {
117     if (a == NULL) return(0);
118     if (a->ptr != NULL)
119         OPENSSL_free(a->ptr);
120     a->ptr=NULL;
121     a->init=0;
122     a->flags=0;
123     return(1);
124 }
125
126 static int nbiof_read(BIO *b, char *out, int outl)
127 {

```

```

128     int ret=0;
129 #if 1
130     int num;
131     unsigned char n;
132 #endif
133
134     if (out == NULL) return(0);
135     if (b->next_bio == NULL) return(0);
136
137     BIO_clear_retry_flags(b);
138 #if 1
139     RAND_pseudo_bytes(&n,1);
140     num=(n&0x07);
141
142     if (outl > num) outl=num;
143
144     if (num == 0)
145     {
146         ret= -1;
147         BIO_set_retry_read(b);
148     }
149     else
150 #endif
151     {
152         ret=BIO_read(b->next_bio,out,outl);
153         if (ret < 0)
154             BIO_copy_next_retry(b);
155     }
156     return(ret);
157 }
158
159 static int nbiof_write(BIO *b, const char *in, int inl)
160 {
161     NBIO_TEST *nt;
162     int ret=0;
163     int num;
164     unsigned char n;
165
166     if ((in == NULL) || (inl <= 0)) return(0);
167     if (b->next_bio == NULL) return(0);
168     nt=(NBIO_TEST *)b->ptr;
169
170     BIO_clear_retry_flags(b);
171
172 #if 1
173     if (nt->lwn > 0)
174     {
175         num=nt->lwn;
176         nt->lwn=0;
177     }
178     else
179     {
180         RAND_pseudo_bytes(&n,1);
181         num=(n&7);
182     }
183
184     if (inl > num) inl=num;
185
186     if (num == 0)
187     {
188         ret= -1;
189         BIO_set_retry_write(b);
190     }
191     else
192 #endif
193     {

```

```

194         ret=BIO_write(b->next_bio,in,inl);
195         if (ret < 0)
196         {
197             BIO_copy_next_retry(b);
198             nt->lwn=inl;
199         }
200     }
201     return(ret);
202 }
203
204 static long nbiof_ctrl(BIO *b, int cmd, long num, void *ptr)
205 {
206     long ret;
207
208     if (b->next_bio == NULL) return(0);
209     switch (cmd)
210     {
211     case BIO_C_DO_STATE_MACHINE:
212         BIO_clear_retry_flags(b);
213         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
214         BIO_copy_next_retry(b);
215         break;
216     case BIO_CTRL_DUP:
217         ret=0L;
218         break;
219     default:
220         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
221         break;
222     }
223     return(ret);
224 }
225
226 static long nbiof_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
227 {
228     long ret=1;
229
230     if (b->next_bio == NULL) return(0);
231     switch (cmd)
232     {
233     default:
234         ret=BIO_callback_ctrl(b->next_bio,cmd,fp);
235         break;
236     }
237     return(ret);
238 }
239
240 static int nbiof_gets(BIO *bp, char *buf, int size)
241 {
242     if (bp->next_bio == NULL) return(0);
243     return(BIO_gets(bp->next_bio,buf,size));
244 }
245
246 static int nbiof_puts(BIO *bp, const char *str)
247 {
248     if (bp->next_bio == NULL) return(0);
249     return(BIO_puts(bp->next_bio,str));
250 }
251 }

```

new/usr/src/lib/openssl/libsunw_crypto/bio/bf_null.c

1

5613 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bf_null.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bio/bf_null.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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10 * the following conditions are aheared to. The following conditions
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/bio/bf_null.c

2

62 #include <openssl/bio.h>

```
64 /* BIO_put and BIO_get both add to the digest,
65  * BIO_gets returns the digest */
66
67 static int nullf_write(BIO *h, const char *buf, int num);
68 static int nullf_read(BIO *h, char *buf, int size);
69 static int nullf_puts(BIO *h, const char *str);
70 static int nullf_gets(BIO *h, char *str, int size);
71 static long nullf_ctrl(BIO *h, int cmd, long arg1, void *arg2);
72 static int nullf_new(BIO *h);
73 static int nullf_free(BIO *data);
74 static long nullf_callback_ctrl(BIO *h, int cmd, bio_info_cb *fp);
75 static BIO_METHOD methods_nullf=
76 {
77     BIO_TYPE_NULL_FILTER,
78     "NULL filter",
79     nullf_write,
80     nullf_read,
81     nullf_puts,
82     nullf_gets,
83     nullf_ctrl,
84     nullf_new,
85     nullf_free,
86     nullf_callback_ctrl,
87 };
88
89 BIO_METHOD *BIO_f_null(void)
90 {
91     return(&methods_nullf);
92 }
93
94 static int nullf_new(BIO *bi)
95 {
96     bi->init=1;
97     bi->ptr=NULL;
98     bi->flags=0;
99     return(1);
100 }
101
102 static int nullf_free(BIO *a)
103 {
104     if (a == NULL) return(0);
105     /* a->ptr=NULL;
106     a->init=0;
107     a->flags=0;*/
108     return(1);
109 }
110
111 static int nullf_read(BIO *b, char *out, int outl)
112 {
113     int ret=0;
114
115     if (out == NULL) return(0);
116     if (b->next_bio == NULL) return(0);
117     ret=BIO_read(b->next_bio,out,outl);
118     BIO_clear_retry_flags(b);
119     BIO_copy_next_retry(b);
120     return(ret);
121 }
122
123 static int nullf_write(BIO *b, const char *in, int inl)
124 {
125     int ret=0;
126
127     if ((in == NULL) || (inl <= 0)) return(0);
```



```
128     if (b->next_bio == NULL) return(0);
129     ret=BIO_write(b->next_bio,in,inl);
130     BIO_clear_retry_flags(b);
131     BIO_copy_next_retry(b);
132     return(ret);
133 }

135 static long nullf_ctrl(BIO *b, int cmd, long num, void *ptr)
136 {
137     long ret;

139     if (b->next_bio == NULL) return(0);
140     switch(cmd)
141     {
142     case BIO_C_DO_STATE_MACHINE:
143         BIO_clear_retry_flags(b);
144         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
145         BIO_copy_next_retry(b);
146         break;
147     case BIO_CTRL_DUP:
148         ret=0L;
149         break;
150     default:
151         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
152     }
153     return(ret);
154 }

156 static long nullf_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
157 {
158     long ret=1;

160     if (b->next_bio == NULL) return(0);
161     switch (cmd)
162     {
163     default:
164         ret=BIO_callback_ctrl(b->next_bio,cmd,fp);
165         break;
166     }
167     return(ret);
168 }

170 static int nullf_gets(BIO *bp, char *buf, int size)
171 {
172     if (bp->next_bio == NULL) return(0);
173     return(BIO_gets(bp->next_bio,buf,size));
174 }

177 static int nullf_puts(BIO *bp, const char *str)
178 {
179     if (bp->next_bio == NULL) return(0);
180     return(BIO_puts(bp->next_bio,str));
181 }
```

```

*****
5467 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bio_cb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bio/bio_cb.c */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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31 * 3. All advertising materials mentioning features or use of this software
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <string.h>
61 #include <stdlib.h>

```

```

62 #include "cryptlib.h"
63 #include <openssl/bio.h>
64 #include <openssl/err.h>
65
66 long MS_CALLBACK BIO_debug_callback(BIO *bio, int cmd, const char *argp,
67                                     int argi, long argl, long ret)
68 {
69     BIO *b;
70     MS_STATIC char buf[256];
71     char *p;
72     long r=1;
73     size_t p_maxlen;
74
75     if (BIO_CB_RETURN & cmd)
76         r=ret;
77
78     BIO_snprintf(buf, sizeof buf, "BIO[%08lx]:", (unsigned long)bio);
79     p= &(buf[14]);
80     p_maxlen = sizeof buf - 14;
81     switch (cmd)
82     {
83     case BIO_CB_FREE:
84         BIO_snprintf(p, p_maxlen, "Free - %s\n", bio->method->name);
85         break;
86     case BIO_CB_READ:
87         if (bio->method->type & BIO_TYPE_DESCRIPTOR)
88             BIO_snprintf(p, p_maxlen, "read(%d,%lu) - %s fd=%d\n",
89                           bio->num, (unsigned long)argi,
90                           bio->method->name, bio->num);
91         else
92             BIO_snprintf(p, p_maxlen, "read(%d,%lu) - %s\n",
93                           bio->num, (unsigned long)argi,
94                           bio->method->name);
95         break;
96     case BIO_CB_WRITE:
97         if (bio->method->type & BIO_TYPE_DESCRIPTOR)
98             BIO_snprintf(p, p_maxlen, "write(%d,%lu) - %s fd=%d\n",
99                           bio->num, (unsigned long)argi,
100                           bio->method->name, bio->num);
101         else
102             BIO_snprintf(p, p_maxlen, "write(%d,%lu) - %s\n",
103                           bio->num, (unsigned long)argi,
104                           bio->method->name);
105         break;
106     case BIO_CB_PUTS:
107         BIO_snprintf(p, p_maxlen, "puts() - %s\n", bio->method->name);
108         break;
109     case BIO_CB_GETS:
110         BIO_snprintf(p, p_maxlen, "gets(%lu) - %s\n", (unsigned long)argi,
111                       bio->method->name);
112         break;
113     case BIO_CB_CTRL:
114         BIO_snprintf(p, p_maxlen, "ctrl(%lu) - %s\n", (unsigned long)argi,
115                       bio->method->name);
116         break;
117     case BIO_CB_RETURN|BIO_CB_READ:
118         BIO_snprintf(p, p_maxlen, "read return %ld\n", ret);
119         break;
120     case BIO_CB_RETURN|BIO_CB_WRITE:
121         BIO_snprintf(p, p_maxlen, "write return %ld\n", ret);
122         break;
123     case BIO_CB_RETURN|BIO_CB_GETS:
124         BIO_snprintf(p, p_maxlen, "gets return %ld\n", ret);
125         break;
126     case BIO_CB_RETURN|BIO_CB_PUTS:
127         BIO_snprintf(p, p_maxlen, "puts return %ld\n", ret);
128         break;
129     case BIO_CB_RETURN|BIO_CB_CTRL:
130         BIO_snprintf(p, p_maxlen, "ctrl return %ld\n", ret);
131         break;
132     }
133     return r;
134 }

```

```
128         BIO_snprintf(p,p_maxlen,"ctrl return %ld\n",ret);
129         break;
130     default:
131         BIO_snprintf(p,p_maxlen,"bio callback - unknown type (%d)\n",cmd
132         break;
133     }
134
135     b=(BIO *)bio->cb_arg;
136     if (b != NULL)
137         BIO_write(b,buf,strlen(buf));
138     #if !defined(OPENSSL_NO_STDIO) && !defined(OPENSSL_SYS_WIN16)
139     else
140         fputs(buf,stderr);
141     #endif
142     return(r);
143 }
```

```

*****
6891 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bio_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/bio_err.c */
2 /* =====
3 * Copyright (c) 1999-2011 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
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10 * notice, this list of conditions and the following disclaimer.
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43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */
60
61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/bio.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_BIO,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_BIO,0,reason)
70
71 static ERR_STRING_DATA BIO_str_functs[]=
72 {
73 {ERR_FUNC(BIO_F_ACPT_STATE), "ACPT_STATE"},
74 {ERR_FUNC(BIO_F_BIO_ACCEPT), "BIO_accept"},
75 {ERR_FUNC(BIO_F_BIO_BER_GET_HEADER), "BIO_BER_GET_HEADER"},
76 {ERR_FUNC(BIO_F_BIO_CALLBACK_CTRL), "BIO_callback_ctrl"},
77 {ERR_FUNC(BIO_F_BIO_CTRL), "BIO_ctrl"},
78 {ERR_FUNC(BIO_F_BIO_GETHOSTBYNAME), "BIO_gethostbyname"},
79 {ERR_FUNC(BIO_F_BIO_GETS), "BIO_gets"},
80 {ERR_FUNC(BIO_F_BIO_GET_ACCEPT_SOCKET), "BIO_get_accept_socket"},
81 {ERR_FUNC(BIO_F_BIO_GET_HOST_IP), "BIO_get_host_ip"},
82 {ERR_FUNC(BIO_F_BIO_GET_PORT), "BIO_get_port"},
83 {ERR_FUNC(BIO_F_BIO_MAKE_PAIR), "BIO_MAKE_PAIR"},
84 {ERR_FUNC(BIO_F_BIO_NEW), "BIO_new"},
85 {ERR_FUNC(BIO_F_BIO_NEW_FILE), "BIO_new_file"},
86 {ERR_FUNC(BIO_F_BIO_NEW_MEM_BUF), "BIO_new_mem_buf"},
87 {ERR_FUNC(BIO_F_BIO_NREAD), "BIO_nread"},
88 {ERR_FUNC(BIO_F_BIO_NREAD0), "BIO_nread0"},
89 {ERR_FUNC(BIO_F_BIO_NWRITE), "BIO_nwrite"},
90 {ERR_FUNC(BIO_F_BIO_NWRITE0), "BIO_nwrite0"},
91 {ERR_FUNC(BIO_F_BIO_PUTS), "BIO_puts"},
92 {ERR_FUNC(BIO_F_BIO_READ), "BIO_read"},
93 {ERR_FUNC(BIO_F_BIO_SOCK_INIT), "BIO_sock_init"},
94 {ERR_FUNC(BIO_F_BIO_WRITE), "BIO_write"},
95 {ERR_FUNC(BIO_F_BUFFER_CTRL), "BUFFER_CTRL"},
96 {ERR_FUNC(BIO_F_CONN_CTRL), "CONN_CTRL"},
97 {ERR_FUNC(BIO_F_CONN_STATE), "CONN_STATE"},
98 {ERR_FUNC(BIO_F_DGRAM_SCTP_READ), "DGRAM_SCTP_READ"},
99 {ERR_FUNC(BIO_F_FILE_CTRL), "FILE_CTRL"},
100 {ERR_FUNC(BIO_F_FILE_READ), "FILE_READ"},
101 {ERR_FUNC(BIO_F_LINEBUFFER_CTRL), "LINEBUFFER_CTRL"},
102 {ERR_FUNC(BIO_F_MEM_READ), "MEM_READ"},
103 {ERR_FUNC(BIO_F_MEM_WRITE), "MEM_WRITE"},
104 {ERR_FUNC(BIO_F_SSL_NEW), "SSL_new"},
105 {ERR_FUNC(BIO_F_WSASTARTUP), "WSASTARTUP"},
106 {0,NULL}};
107
108
109 static ERR_STRING_DATA BIO_str_reasons[]=
110 {
111 {ERR_REASON(BIO_R_ACCEPT_ERROR), "accept error"},
112 {ERR_REASON(BIO_R_BAD_FOPEN_MODE), "bad fopen mode"},
113 {ERR_REASON(BIO_R_BAD_HOSTNAME_LOOKUP), "bad hostname lookup"},
114 {ERR_REASON(BIO_R_BROKEN_PIPE), "broken pipe"},
115 {ERR_REASON(BIO_R_CONNECT_ERROR), "connect error"},
116 {ERR_REASON(BIO_R_EOF_ON_MEMORY_BIO), "EOF on memory BIO"},
117 {ERR_REASON(BIO_R_ERROR_SETTING_NBIO), "error setting nbio"},
118 {ERR_REASON(BIO_R_ERROR_SETTING_NBIO_ON_ACCEPTED_SOCKET), "error setting nbio on"},
119 {ERR_REASON(BIO_R_ERROR_SETTING_NBIO_ON_ACCEPT_SOCKET), "error setting nbio on ac"},
120 {ERR_REASON(BIO_R_GETHOSTBYNAME_ADDR_IS_NOT_AF_INET), "gethostbyname addr is not"},
121 {ERR_REASON(BIO_R_INVALID_ARGUMENT), "invalid argument"},
122 {ERR_REASON(BIO_R_INVALID_IP_ADDRESS), "invalid ip address"},
123 {ERR_REASON(BIO_R_IN_USE), "in use"},
124 {ERR_REASON(BIO_R_KEEPAIVE), "keepalive"},
125 {ERR_REASON(BIO_R_NBIO_CONNECT_ERROR), "nbio connect error"},
126 {ERR_REASON(BIO_R_NO_ACCEPT_PORT_SPECIFIED), "no accept port specified"},
127 {ERR_REASON(BIO_R_NO_HOSTNAME_SPECIFIED), "no hostname specified"},

```

```
128 {ERR_REASON(BIO_R_NO_PORT_DEFINED)      , "no port defined"},
129 {ERR_REASON(BIO_R_NO_PORT_SPECIFIED)     , "no port specified"},
130 {ERR_REASON(BIO_R_NO_SUCH_FILE)          , "no such file"},
131 {ERR_REASON(BIO_R_NULL_PARAMETER)        , "null parameter"},
132 {ERR_REASON(BIO_R_TAG_MISMATCH)          , "tag mismatch"},
133 {ERR_REASON(BIO_R_UNABLE_TO_BIND_SOCKET) , "unable to bind socket"},
134 {ERR_REASON(BIO_R_UNABLE_TO_CREATE_SOCKET), "unable to create socket"},
135 {ERR_REASON(BIO_R_UNABLE_TO_LISTEN_SOCKET), "unable to listen socket"},
136 {ERR_REASON(BIO_R_UNINITIALIZED)         , "uninitialized"},
137 {ERR_REASON(BIO_R_UNSUPPORTED_METHOD)    , "unsupported method"},
138 {ERR_REASON(BIO_R_WRITE_TO_READ_ONLY_BIO), "write to read only BIO"},
139 {ERR_REASON(BIO_R_WSASTARTUP)            , "WSAStartup"},
140 {0, NULL}
141 };

143 #endif

145 void ERR_load_BIO_strings(void)
146 {
147 #ifndef OPENSSL_NO_ERR
148
149     if (ERR_func_error_string(BIO_str_functs[0].error) == NULL)
150     {
151         ERR_load_strings(0, BIO_str_functs);
152         ERR_load_strings(0, BIO_str_reasons);
153     }
154 #endif
155 }
```

13124 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bio_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/bio/bio_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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31 * 3. All advertising materials mentioning features or use of this software
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #include <openssl/crypto.h>

```

```

62 #include "cryptlib.h"
63 #include <openssl/bio.h>
64 #include <openssl/stack.h>
65
66 BIO *BIO_new(BIO_METHOD *method)
67 {
68     BIO *ret=NULL;
69
70     ret=(BIO *)OPENSSL_malloc(sizeof(BIO));
71     if (ret == NULL)
72     {
73         BIOerr(BIO_F_BIO_NEW,ERR_R_MALLOC_FAILURE);
74         return(NULL);
75     }
76     if (!BIO_set(ret,method))
77     {
78         OPENSSL_free(ret);
79         ret=NULL;
80     }
81     return(ret);
82 }
83
84 int BIO_set(BIO *bio, BIO_METHOD *method)
85 {
86     bio->method=method;
87     bio->callback=NULL;
88     bio->cb_arg=NULL;
89     bio->init=0;
90     bio->shutdown=1;
91     bio->flags=0;
92     bio->retry_reason=0;
93     bio->num=0;
94     bio->ptr=NULL;
95     bio->prev_bio=NULL;
96     bio->next_bio=NULL;
97     bio->references=1;
98     bio->num_read=0L;
99     bio->num_write=0L;
100     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_BIO, bio, &bio->ex_data);
101     if (method->create != NULL)
102         if (!method->create(bio))
103         {
104             CRYPTO_free_ex_data(CRYPTO_EX_INDEX_BIO, bio,
105                                 &bio->ex_data);
106             return(0);
107         }
108     return(1);
109 }
110
111 int BIO_free(BIO *a)
112 {
113     int i;
114
115     if (a == NULL) return(0);
116
117     i=CRYPTO_add(&a->references,-1,CRYPTO_LOCK_BIO);
118     #ifdef REF_PRINT
119     REF_PRINT("BIO",a);
120     #endif
121     if (i > 0) return(1);
122     #ifdef REF_CHECK
123     if (i < 0)
124     {
125         fprintf(stderr,"BIO_free, bad reference count\n");
126         abort();
127     }
128 }

```

```

128 #endif
129     if ((a->callback != NULL) &&
130         ((i=(int)a->callback(a,BIO_CB_FREE,NULL,0,0L,1L)) <= 0))
131         return(i);
133     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_BIO, a, &a->ex_data);
135     if ((a->method == NULL) || (a->method->destroy == NULL)) return(1);
136     a->method->destroy(a);
137     OPENSSL_free(a);
138     return(1);
139 }
141 void BIO_vfree(BIO *a)
142 { BIO_free(a); }
144 void BIO_clear_flags(BIO *b, int flags)
145 {
146     b->flags &= ~flags;
147 }
149 int BIO_test_flags(const BIO *b, int flags)
150 {
151     return (b->flags & flags);
152 }
154 void BIO_set_flags(BIO *b, int flags)
155 {
156     b->flags |= flags;
157 }
159 long (*BIO_get_callback(const BIO *b))(struct bio_st *,int,const char *,int, long)
160 {
161     return b->callback;
162 }
164 void BIO_set_callback(BIO *b, long (*cb)(struct bio_st *,int,const char *,int, l
165 {
166     b->callback = cb;
167 }
169 void BIO_set_callback_arg(BIO *b, char *arg)
170 {
171     b->cb_arg = arg;
172 }
174 char * BIO_get_callback_arg(const BIO *b)
175 {
176     return b->cb_arg;
177 }
179 const char * BIO_method_name(const BIO *b)
180 {
181     return b->method->name;
182 }
184 int BIO_method_type(const BIO *b)
185 {
186     return b->method->type;
187 }
190 int BIO_read(BIO *b, void *out, int outl)
191 {
192     int i;
193     long (*cb)(BIO *,int,const char *,int,long, long);

```

```

195     if ((b == NULL) || (b->method == NULL) || (b->method->bread == NULL))
196     {
197         BIOerr(BIO_F_BIO_READ,BIO_R_UNSUPPORTED_METHOD);
198         return(-2);
199     }
201     cb=b->callback;
202     if ((cb != NULL) &&
203         ((i=(int)cb(b,BIO_CB_READ,out,outl,0L,1L)) <= 0))
204         return(i);
206     if (!b->init)
207     {
208         BIOerr(BIO_F_BIO_READ,BIO_R_UNINITIALIZED);
209         return(-2);
210     }
212     i=b->method->bread(b,out,outl);
214     if (i > 0) b->num_read+=(unsigned long)i;
216     if (cb != NULL)
217         i=(int)cb(b,BIO_CB_READ|BIO_CB_RETURN,out,outl,
218                 0L,(long)i);
219     return(i);
220 }
222 int BIO_write(BIO *b, const void *in, int inl)
223 {
224     int i;
225     long (*cb)(BIO *,int,const char *,int,long, long);
227     if (b == NULL)
228         return(0);
230     cb=b->callback;
231     if ((b->method == NULL) || (b->method->bwrite == NULL))
232     {
233         BIOerr(BIO_F_BIO_WRITE,BIO_R_UNSUPPORTED_METHOD);
234         return(-2);
235     }
237     if ((cb != NULL) &&
238         ((i=(int)cb(b,BIO_CB_WRITE,in,inl,0L,1L)) <= 0))
239         return(i);
241     if (!b->init)
242     {
243         BIOerr(BIO_F_BIO_WRITE,BIO_R_UNINITIALIZED);
244         return(-2);
245     }
247     i=b->method->bwrite(b,in,inl);
249     if (i > 0) b->num_write+=(unsigned long)i;
251     if (cb != NULL)
252         i=(int)cb(b,BIO_CB_WRITE|BIO_CB_RETURN,in,inl,
253                 0L,(long)i);
254     return(i);
255 }
257 int BIO_puts(BIO *b, const char *in)
258 {
259     int i;

```

```

260     long (*cb)(BIO *,int,const char *,int,long,long);
262     if ((b == NULL) || (b->method == NULL) || (b->method->bputs == NULL))
263     {
264         BIOerr(BIO_F_BIO_PUTS,BIO_R_UNSUPPORTED_METHOD);
265         return(-2);
266     }
268     cb=b->callback;
270     if ((cb != NULL) &&
271         ((i=(int)cb(b,BIO_CB_PUTS,in,0,0L,1L)) <= 0))
272         return(i);
274     if (!b->init)
275     {
276         BIOerr(BIO_F_BIO_PUTS,BIO_R_UNINITIALIZED);
277         return(-2);
278     }
280     i=b->method->bputs(b,in);
282     if (i > 0) b->num_write+=(unsigned long)i;
284     if (cb != NULL)
285         i=(int)cb(b,BIO_CB_PUTS|BIO_CB_RETURN,in,0,
286                 0L,(long)i);
287     return(i);
288 }
290 int BIO_gets(BIO *b, char *in, int inl)
291 {
292     int i;
293     long (*cb)(BIO *,int,const char *,int,long,long);
295     if ((b == NULL) || (b->method == NULL) || (b->method->bgets == NULL))
296     {
297         BIOerr(BIO_F_BIO_GETS,BIO_R_UNSUPPORTED_METHOD);
298         return(-2);
299     }
301     cb=b->callback;
303     if ((cb != NULL) &&
304         ((i=(int)cb(b,BIO_CB_GETS,in,inl,0L,1L)) <= 0))
305         return(i);
307     if (!b->init)
308     {
309         BIOerr(BIO_F_BIO_GETS,BIO_R_UNINITIALIZED);
310         return(-2);
311     }
313     i=b->method->bgets(b,in,inl);
315     if (cb != NULL)
316         i=(int)cb(b,BIO_CB_GETS|BIO_CB_RETURN,in,inl,
317                 0L,(long)i);
318     return(i);
319 }
321 int BIO_indent(BIO *b,int indent,int max)
322 {
323     if(indent < 0)
324         indent=0;
325     if(indent > max)

```

```

326         indent=max;
327         while(indent-->0)
328             if(BIO_puts(b," ") != 1)
329                 return 0;
330         return 1;
331     }
333 long BIO_int_ctrl(BIO *b, int cmd, long larg, int iarg)
334 {
335     int i;
337     i=iarg;
338     return(BIO_ctrl(b,cmd,larg,(char *)&i));
339 }
341 char *BIO_ptr_ctrl(BIO *b, int cmd, long larg)
342 {
343     char *p=NULL;
345     if (BIO_ctrl(b,cmd,larg,(char *)&p) <= 0)
346         return(NULL);
347     else
348         return(p);
349 }
351 long BIO_ctrl(BIO *b, int cmd, long larg, void *parg)
352 {
353     long ret;
354     long (*cb)(BIO *,int,const char *,int,long,long);
356     if (b == NULL) return(0);
358     if ((b->method == NULL) || (b->method->ctrl == NULL))
359     {
360         BIOerr(BIO_F_BIO_CTRL,BIO_R_UNSUPPORTED_METHOD);
361         return(-2);
362     }
364     cb=b->callback;
366     if ((cb != NULL) &&
367         ((ret=cb(b,BIO_CB_CTRL,parg,cmd,larg,1L)) <= 0))
368         return(ret);
370     ret=b->method->ctrl(b,cmd,larg,parg);
372     if (cb != NULL)
373         ret=cb(b,BIO_CB_CTRL|BIO_CB_RETURN,parg,cmd,
374               larg,ret);
375     return(ret);
376 }
378 long BIO_callback_ctrl(BIO *b, int cmd, void (*fp)(struct bio_st *, int, const c
379 {
380     long ret;
381     long (*cb)(BIO *,int,const char *,int,long,long);
383     if (b == NULL) return(0);
385     if ((b->method == NULL) || (b->method->callback_ctrl == NULL))
386     {
387         BIOerr(BIO_F_BIO_CALLBACK_CTRL,BIO_R_UNSUPPORTED_METHOD);
388         return(-2);
389     }
391     cb=b->callback;

```



```

393     if ((cb != NULL) &&
394         ((ret=cb(b,BIO_CB_CTRL,(void *)&fp,cmd,0,1L)) <= 0))
395         return(ret);

397     ret=b->method->callback_ctrl(b,cmd,fp);

399     if (cb != NULL)
400         ret=cb(b,BIO_CB_CTRL|BIO_CB_RETURN,(void *)&fp,cmd,
401               0,ret);
402     return(ret);
403 }

405 /* It is unfortunate to duplicate in functions what the BIO_(w)pending macros
406  * do; but those macros have inappropriate return type, and for interfacing
407  * from other programming languages, C macros aren't much of a help anyway. */
408 size_t BIO_ctrl_pending(BIO *bio)
409 {
410     return BIO_ctrl(bio, BIO_CTRL_PENDING, 0, NULL);
411 }

413 size_t BIO_ctrl_wpending(BIO *bio)
414 {
415     return BIO_ctrl(bio, BIO_CTRL_WPENDING, 0, NULL);
416 }

419 /* put the 'bio' on the end of b's list of operators */
420 BIO *BIO_push(BIO *b, BIO *bio)
421 {
422     BIO *lb;

424     if (b == NULL) return(bio);
425     lb=b;
426     while (lb->next_bio != NULL)
427         lb=lb->next_bio;
428     lb->next_bio=bio;
429     if (bio != NULL)
430         bio->prev_bio=lb;
431     /* called to do internal processing */
432     BIO_ctrl(b,BIO_CTRL_PUSH,0,lb);
433     return(b);
434 }

436 /* Remove the first and return the rest */
437 BIO *BIO_pop(BIO *b)
438 {
439     BIO *ret;

441     if (b == NULL) return(NULL);
442     ret=b->next_bio;

444     BIO_ctrl(b,BIO_CTRL_POP,0,b);

446     if (b->prev_bio != NULL)
447         b->prev_bio->next_bio=b->next_bio;
448     if (b->next_bio != NULL)
449         b->next_bio->prev_bio=b->prev_bio;

451     b->next_bio=NULL;
452     b->prev_bio=NULL;
453     return(ret);
454 }

456 BIO *BIO_get_retry_BIO(BIO *bio, int *reason)
457 {

```

```

458     BIO *b,*last;

460     b=last=bio;
461     for (;;)
462     {
463         if (!BIO_should_retry(b)) break;
464         last=b;
465         b=b->next_bio;
466         if (b == NULL) break;
467     }
468     if (reason != NULL) *reason=last->retry_reason;
469     return(last);
470 }

472 int BIO_get_retry_reason(BIO *bio)
473 {
474     return(bio->retry_reason);
475 }

477 BIO *BIO_find_type(BIO *bio, int type)
478 {
479     int mt,mask;

481     if(!bio) return NULL;
482     mask=type&0xff;
483     do
484     {
485         if (bio->method != NULL)
486             mt=bio->method->type;

488         if (!mask)
489             if (mt & type) return(bio);
490         else if (mt == type)
491             return(bio);
492     } while (bio = bio->next_bio);
493     return(NULL);
494 }

500 BIO *BIO_next(BIO *b)
501 {
502     if(!b) return NULL;
503     return b->next_bio;
504 }

506 void BIO_free_all(BIO *bio)
507 {
508     BIO *b;
509     int ref;

511     while (bio != NULL)
512     {
513         b=bio;
514         ref=b->references;
515         bio=bio->next_bio;
516         BIO_free(b);
517         /* Since ref count > 1, don't free anyone else. */
518         if (ref > 1) break;
519     }
520 }

522 BIO *BIO_dup_chain(BIO *in)
523 {

```

```

524     BIO *ret=NULL, *eoc=NULL, *bio, *new_bio;

526     for (bio=in; bio != NULL; bio=bio->next_bio)
527     {
528         if ((new_bio=BIO_new(bio->method)) == NULL) goto err;
529         new_bio->callback=bio->callback;
530         new_bio->cb_arg=bio->cb_arg;
531         new_bio->init=bio->init;
532         new_bio->shutdown=bio->shutdown;
533         new_bio->flags=bio->flags;

535         /* This will let SSL_s_sock() work with stdin/stdout */
536         new_bio->num=bio->num;

538         if (!BIO_dup_state(bio, (char *)new_bio))
539         {
540             BIO_free(new_bio);
541             goto err;
542         }

544         /* copy app data */
545         if (!CRYPTO_dup_ex_data(CRYPTO_EX_INDEX_BIO, &new_bio->ex_data,
546                               &bio->ex_data))
547             goto err;

549         if (ret == NULL)
550         {
551             eoc=new_bio;
552             ret=eoc;
553         }
554         else
555         {
556             BIO_push(eoc, new_bio);
557             eoc=new_bio;
558         }
559     }
560     return(ret);
561 err:
562     if (ret != NULL)
563         BIO_free(ret);
564     return(NULL);
565 }

567 void BIO_copy_next_retry(BIO *b)
568 {
569     BIO_set_flags(b, BIO_get_retry_flags(b->next_bio));
570     b->retry_reason=b->next_bio->retry_reason;
571 }

573 int BIO_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
574                          CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
575 {
576     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_BIO, argl, argp,
577                                    new_func, dup_func, free_func);
578 }

580 int BIO_set_ex_data(BIO *bio, int idx, void *data)
581 {
582     return(CRYPTO_set_ex_data(&(bio->ex_data), idx, data));
583 }

585 void *BIO_get_ex_data(BIO *bio, int idx)
586 {
587     return(CRYPTO_get_ex_data(&(bio->ex_data), idx));
588 }

```

```

590 unsigned long BIO_number_read(BIO *bio)
591 {
592     if(bio) return bio->num_read;
593     return 0;
594 }

596 unsigned long BIO_number_written(BIO *bio)
597 {
598     if(bio) return bio->num_write;
599     return 0;
600 }

602 IMPLEMENT_STACK_OF(BIO)

```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_acpt.c

1

10895 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_acpt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bio/bss_acpt.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
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29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
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33 * "This product includes cryptographic software written by
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35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #define USE_SOCKETS
```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_acpt.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/bio.h>
64
65 #ifndef OPENSSL_NO_SOCKET
66
67 #ifdef OPENSSL_SYS_WIN16
68 #define SOCKET_PROTOCOL 0 /* more microsoft stupidity */
69 #else
70 #define SOCKET_PROTOCOL IPPROTO_TCP
71 #endif
72
73 #if (defined(OPENSSL_SYS_VMS) && __VMS_VER < 70000000)
74 /* FIONBIO used as a switch to enable ioctl, and that isn't in VMS < 7.0 */
75 #undef FIONBIO
76 #endif
77
78 typedef struct bio_accept_st
79 {
80     int state;
81     char *param_addr;
82
83     int accept_sock;
84     int accept_nbio;
85
86     char *addr;
87     int nbio;
88     /* If 0, it means normal, if 1, do a connect on bind failure,
89      * and if there is no-one listening, bind with SO_REUSEADDR.
90      * If 2, always use SO_REUSEADDR. */
91     int bind_mode;
92     BIO *bio_chain;
93 } BIO_ACCEPT;
94
95 static int acpt_write(BIO *h, const char *buf, int num);
96 static int acpt_read(BIO *h, char *buf, int size);
97 static int acpt_puts(BIO *h, const char *str);
98 static long acpt_ctrl(BIO *h, int cmd, long arg1, void *arg2);
99 static int acpt_new(BIO *h);
100 static int acpt_free(BIO *data);
101 static int acpt_state(BIO *b, BIO_ACCEPT *c);
102 static void acpt_close_socket(BIO *data);
103 static BIO_ACCEPT *BIO_ACCEPT_new(void);
104 static void BIO_ACCEPT_free(BIO_ACCEPT *a);
105
106 #define ACPT_S_BEFORE 1
107 #define ACPT_S_GET_ACCEPT_SOCKET 2
108 #define ACPT_S_OK 3
109
110 static BIO_METHOD methods_acptp=
111 {
112     BIO_TYPE_ACCEPT,
113     "socket accept",
114     acpt_write,
115     acpt_read,
116     acpt_puts,
117     NULL, /* connect_gets, */
118     acpt_ctrl,
119     acpt_new,
120     acpt_free,
121     NULL,
122 };
123
124 BIO_METHOD *BIO_s_accept(void)
125 {
126     return(&methods_acptp);
127 }
```

```

129 static int acpt_new(BIO *bi)
130 {
131     BIO_ACCEPT *ba;

133     bi->init=0;
134     bi->num=INVALID_SOCKET;
135     bi->flags=0;
136     if ((ba=BIO_ACCEPT_new()) == NULL)
137         return(0);
138     bi->ptr=(char *)ba;
139     ba->state=ACPT_S_BEFORE;
140     bi->shutdown=1;
141     return(1);
142 }

144 static BIO_ACCEPT *BIO_ACCEPT_new(void)
145 {
146     BIO_ACCEPT *ret;

148     if ((ret=(BIO_ACCEPT *)OPENSSL_malloc(sizeof(BIO_ACCEPT))) == NULL)
149         return(NULL);

151     memset(ret,0,sizeof(BIO_ACCEPT));
152     ret->accept_sock=INVALID_SOCKET;
153     ret->bind_mode=BIO_BIND_NORMAL;
154     return(ret);
155 }

157 static void BIO_ACCEPT_free(BIO_ACCEPT *a)
158 {
159     if(a == NULL)
160         return;

162     if (a->param_addr != NULL) OPENSSL_free(a->param_addr);
163     if (a->addr != NULL) OPENSSL_free(a->addr);
164     if (a->bio_chain != NULL) BIO_free(a->bio_chain);
165     OPENSSL_free(a);
166 }

168 static void acpt_close_socket(BIO *bio)
169 {
170     BIO_ACCEPT *c;

172     c=(BIO_ACCEPT *)bio->ptr;
173     if (c->accept_sock != INVALID_SOCKET)
174     {
175         shutdown(c->accept_sock,2);
176         closesocket(c->accept_sock);
177         c->accept_sock=INVALID_SOCKET;
178         bio->num=INVALID_SOCKET;
179     }
180 }

182 static int acpt_free(BIO *a)
183 {
184     BIO_ACCEPT *data;

186     if (a == NULL) return(0);
187     data=(BIO_ACCEPT *)a->ptr;
188
189     if (a->shutdown)
190     {
191         acpt_close_socket(a);
192         BIO_ACCEPT_free(data);
193         a->ptr=NULL;

```

```

194         a->flags=0;
195         a->init=0;
196     }
197     return(1);
198 }

199
200 static int acpt_state(BIO *b, BIO_ACCEPT *c)
201 {
202     BIO *bio=NULL,*dbio;
203     int s= -1;
204     int i;

206 again:
207     switch (c->state)
208     {
209     case ACPT_S_BEFORE:
210         if (c->param_addr == NULL)
211         {
212             BIOerr(BIO_F_ACPT_STATE,BIO_R_NO_ACCEPT_PORT_SPECIFIED);
213             return(-1);
214         }
215         s=BIO_get_accept_socket(c->param_addr,c->bind_mode);
216         if (s == INVALID_SOCKET)
217             return(-1);

219         if (c->accept_nbio)
220         {
221             if (!BIO_socket_nbio(s,1))
222             {
223                 closesocket(s);
224                 BIOerr(BIO_F_ACPT_STATE,BIO_R_ERROR_SETTING_NBIO);
225                 return(-1);
226             }
227         }
228         c->accept_sock=s;
229         b->num=s;
230         c->state=ACPT_S_GET_ACCEPT_SOCKET;
231         return(1);
232         /* break; */
233     case ACPT_S_GET_ACCEPT_SOCKET:
234         if (b->next_bio != NULL)
235         {
236             c->state=ACPT_S_OK;
237             goto again;
238         }
239         BIO_clear_retry_flags(b);
240         b->retry_reason=0;
241         i=BIO_accept(c->accept_sock,&(c->addr));

243         /* -2 return means we should retry */
244         if(i == -2)
245         {
246             BIO_set_retry_special(b);
247             b->retry_reason=BIO_RR_ACCEPT;
248             return -1;
249         }

251         if (i < 0) return(i);

253         bio=BIO_new_socket(i,BIO_CLOSE);
254         if (bio == NULL) goto err;

256         BIO_set_callback(bio,BIO_get_callback(b));
257         BIO_set_callback_arg(bio,BIO_get_callback_arg(b));

259         if (c->nbio)

```

```

260         {
261             if (!BIO_socket_nbio(i,1))
262             {
263                 BIOerr(BIO_F_ACPT_STATE,BIO_R_ERROR_SETTING_NBIO
264                 goto err;
265             }
266         }
267
268     /* If the accept BIO has an bio_chain, we dup it and
269     * put the new socket at the end. */
270     if (c->bio_chain != NULL)
271     {
272         if ((dbio=BIO_dup_chain(c->bio_chain)) == NULL)
273             goto err;
274         if (!BIO_push(dbio,bio)) goto err;
275         bio=dbio;
276     }
277     if (BIO_push(b,bio) == NULL) goto err;
278
279     c->state=ACPT_S_OK;
280     return(1);
281 err:
282     if (bio != NULL)
283         BIO_free(bio);
284     else if (s >= 0)
285         closesocket(s);
286     return(0);
287     /* break; */
288 case ACPT_S_OK:
289     if (b->next_bio == NULL)
290     {
291         c->state=ACPT_S_GET_ACCEPT_SOCKET;
292         goto again;
293     }
294     return(1);
295     /* break; */
296 default:
297     return(0);
298     /* break; */
299 }
300
301 }
302
303 static int acpt_read(BIO *b, char *out, int outl)
304 {
305     int ret=0;
306     BIO_ACCEPT *data;
307
308     BIO_clear_retry_flags(b);
309     data=(BIO_ACCEPT *)b->ptr;
310
311     while (b->next_bio == NULL)
312     {
313         ret=acpt_state(b,data);
314         if (ret <= 0) return(ret);
315     }
316
317     ret=BIO_read(b->next_bio,out,outl);
318     BIO_copy_next_retry(b);
319     return(ret);
320 }
321
322 static int acpt_write(BIO *b, const char *in, int inl)
323 {
324     int ret;
325     BIO_ACCEPT *data;

```

```

327     BIO_clear_retry_flags(b);
328     data=(BIO_ACCEPT *)b->ptr;
329
330     while (b->next_bio == NULL)
331     {
332         ret=acpt_state(b,data);
333         if (ret <= 0) return(ret);
334     }
335
336     ret=BIO_write(b->next_bio,in,inl);
337     BIO_copy_next_retry(b);
338     return(ret);
339 }
340
341 static long acpt_ctrl(BIO *b, int cmd, long num, void *ptr)
342 {
343     int *ip;
344     long ret=1;
345     BIO_ACCEPT *data;
346     char **pp;
347
348     data=(BIO_ACCEPT *)b->ptr;
349
350     switch (cmd)
351     {
352     case BIO_CTRL_RESET:
353         ret=0;
354         data->state=ACPT_S_BEFORE;
355         acpt_close_socket(b);
356         b->flags=0;
357         break;
358     case BIO_C_DO_STATE_MACHINE:
359         /* use this one to start the connection */
360         ret=(long)acpt_state(b,data);
361         break;
362     case BIO_C_SET_ACCEPT:
363         if (ptr != NULL)
364         {
365             if (num == 0)
366             {
367                 b->init=1;
368                 if (data->param_addr != NULL)
369                     OPENSSL_free(data->param_addr);
370                 data->param_addr=BUF_strdup(ptr);
371             }
372             else if (num == 1)
373             {
374                 data->accept_nbio=(ptr != NULL);
375             }
376             else if (num == 2)
377             {
378                 if (data->bio_chain != NULL)
379                     BIO_free(data->bio_chain);
380                 data->bio_chain=(BIO *)ptr;
381             }
382         }
383         break;
384     case BIO_C_SET_NBIO:
385         data->nbio=(int)num;
386         break;
387     case BIO_C_SET_FD:
388         b->init=1;
389         b->num= *((int *)ptr);
390         data->accept_sock=b->num;
391         data->state=ACPT_S_GET_ACCEPT_SOCKET;

```

```

392         b->shutdown=(int)num;
393         b->init=1;
394         break;
395     case BIO_C_GET_FD:
396         if (b->init)
397             {
398                 ip=(int *)ptr;
399                 if (ip != NULL)
400                     *ip=data->accept_sock;
401                 ret=data->accept_sock;
402             }
403         else
404             ret= -1;
405         break;
406     case BIO_C_GET_ACCEPT:
407         if (b->init)
408             {
409                 if (ptr != NULL)
410                     {
411                         pp=(char **)ptr;
412                         *pp=data->param_addr;
413                     }
414                 else
415                     ret= -1;
416             }
417         else
418             ret= -1;
419         break;
420     case BIO_CTRL_GET_CLOSE:
421         ret=b->shutdown;
422         break;
423     case BIO_CTRL_SET_CLOSE:
424         b->shutdown=(int)num;
425         break;
426     case BIO_CTRL_PENDING:
427     case BIO_CTRL_WPENDING:
428         ret=0;
429         break;
430     case BIO_CTRL_FLUSH:
431         break;
432     case BIO_C_SET_BIND_MODE:
433         data->bind_mode=(int)num;
434         break;
435     case BIO_C_GET_BIND_MODE:
436         ret=(long)data->bind_mode;
437         break;
438     case BIO_CTRL_DUP:
439     /*
440         dbio=(BIO *)ptr;
441         if (data->param_port) EAY EAY
442             BIO_set_port(dbio,data->param_port);
443         if (data->param_hostname)
444             BIO_set_hostname(dbio,data->param_hostname);
445         BIO_set_nbio(dbio,data->nbio); */
446         break;
447     default:
448         ret=0;
449         break;
450     }
451     return(ret);
452 }
453
454 static int acpt_puts(BIO *bp, const char *str)
455 {
456     int n,ret;

```

```

458         n=strlen(str);
459         ret=acpt_write(bp,str,n);
460         return(ret);
461     }
462
463     BIO *BIO_new_accept(char *str)
464     {
465         BIO *ret;
466
467         ret=BIO_new(BIO_s_accept());
468         if (ret == NULL) return(NULL);
469         if (BIO_set_accept_port(ret,str))
470             return(ret);
471         else
472             {
473                 BIO_free(ret);
474                 return(NULL);
475             }
476     }
477
478 #endif

```

```

*****
19049 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_bio.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/bss_bio.c  *- Mode: C; c-file-style: "eay"  *- */
2 /* =====
3 * Copyright (c) 1998-2003 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
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11 *
12 * 2. Redistributions in binary form must reproduce the above copyright
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14 * the documentation and/or other materials provided with the
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16 *
17 * 3. All advertising materials mentioning features or use of this
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21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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35 *
36 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
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39 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
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42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* Special method for a BIO where the other endpoint is also a BIO
57 * of this kind, handled by the same thread (i.e. the "peer" is actually
58 * ourselves, wearing a different hat).
59 * Such "BIO pairs" are mainly for using the SSL library with I/O interfaces
60 * for which no specific BIO method is available.
61 * See ssl/ssltst.c for some hints on how this can be used. */

```

```

63 /* BIO_DEBUG implies BIO_PAIR_DEBUG */
64 #ifdef BIO_DEBUG
65 # ifnndef BIO_PAIR_DEBUG
66 # define BIO_PAIR_DEBUG
67 # endif
68 #endif
69
70 /* disable assert() unless BIO_PAIR_DEBUG has been defined */
71 #ifnndef BIO_PAIR_DEBUG
72 # ifnndef NDEBUG
73 # define NDEBUG
74 # endif
75 #endif
76
77 #include <assert.h>
78 #include <limits.h>
79 #include <stdlib.h>
80 #include <string.h>
81
82 #include <openssl/bio.h>
83 #include <openssl/err.h>
84 #include <openssl/crypto.h>
85
86 #include "e_os.h"
87
88 /* VxWorks defines SSIZE_MAX with an empty value causing compile errors */
89 #if defined(OPENSSSL_SYS_VXWORKS)
90 # undef SSIZE_MAX
91 #endif
92 #ifnndef SSIZE_MAX
93 # define SSIZE_MAX INT_MAX
94 #endif
95
96 static int bio_new(BIO *bio);
97 static int bio_free(BIO *bio);
98 static int bio_read(BIO *bio, char *buf, int size);
99 static int bio_write(BIO *bio, const char *buf, int num);
100 static long bio_ctrl(BIO *bio, int cmd, long num, void *ptr);
101 static int bio_puts(BIO *bio, const char *str);
102
103 static int bio_make_pair(BIO *bio1, BIO *bio2);
104 static void bio_destroy_pair(BIO *bio);
105
106 static BIO_METHOD methods_biop =
107 {
108     BIO_TYPE_BIO,
109     "BIO pair",
110     bio_write,
111     bio_read,
112     bio_puts,
113     NULL /* no bio_gets */,
114     bio_ctrl,
115     bio_new,
116     bio_free,
117     NULL /* no bio_callback_ctrl */
118 };
119
120 BIO_METHOD *BIO_s_bio(void)
121 {
122     return &methods_biop;
123 }
124
125 struct bio_bio_st
126 {
127     BIO *peer; /* NULL if buf == NULL.

```

```

128         * If peer != NULL, then peer->ptr is also a bio_bio_st,
129         * and its "peer" member points back to us.
130         * peer != NULL iff init != 0 in the BIO. */
131
132     /* This is for what we write (i.e. reading uses peer's struct): */
133     int closed; /* valid iff peer != NULL */
134     size_t len; /* valid iff buf != NULL; 0 if peer == NULL */
135     size_t offset; /* valid iff buf != NULL; 0 if len == 0 */
136     size_t size;
137     char *buf; /* "size" elements (if != NULL) */
138
139     size_t request; /* valid iff peer != NULL; 0 if len != 0,
140                    * otherwise set by peer to number of bytes
141                    * it (unsuccessfully) tried to read,
142                    * never more than buffer space (size-len) warrants. */
143 };
144
145 static int bio_new(BIO *bio)
146 {
147     struct bio_bio_st *b;
148
149     b = OPENSSL_malloc(sizeof *b);
150     if (b == NULL)
151         return 0;
152
153     b->peer = NULL;
154     b->size = 17*1024; /* enough for one TLS record (just a default) */
155     b->buf = NULL;
156
157     bio->ptr = b;
158     return 1;
159 }
160
161 static int bio_free(BIO *bio)
162 {
163     struct bio_bio_st *b;
164
165     if (bio == NULL)
166         return 0;
167     b = bio->ptr;
168
169     assert(b != NULL);
170
171     if (b->peer)
172         bio_destroy_pair(bio);
173
174     if (b->buf != NULL)
175     {
176         OPENSSL_free(b->buf);
177     }
178
179     OPENSSL_free(b);
180
181     return 1;
182 }
183
184 static int bio_read(BIO *bio, char *buf, int size_)
185 {
186     size_t size = size_;
187     size_t rest;
188     struct bio_bio_st *b, *peer_b;
189
190     BIO_clear_retry_flags(bio);

```

```

195     if (!bio->init)
196         return 0;
197
198     b = bio->ptr;
199     assert(b != NULL);
200     assert(b->peer != NULL);
201     peer_b = b->peer->ptr;
202     assert(peer_b != NULL);
203     assert(peer_b->buf != NULL);
204
205     peer_b->request = 0; /* will be set in "retry_read" situation */
206
207     if (buf == NULL || size == 0)
208         return 0;
209
210     if (peer_b->len == 0)
211     {
212         if (peer_b->closed)
213             return 0; /* writer has closed, and no data is left */
214         else
215         {
216             BIO_set_retry_read(bio); /* buffer is empty */
217             if (size <= peer_b->size)
218                 peer_b->request = size;
219             else
220                 /* don't ask for more than the peer can
221                  * deliver in one write */
222                 peer_b->request = peer_b->size;
223             return -1;
224         }
225     }
226
227     /* we can read */
228     if (peer_b->len < size)
229         size = peer_b->len;
230
231     /* now read "size" bytes */
232
233     rest = size;
234
235     assert(rest > 0);
236     do /* one or two iterations */
237     {
238         size_t chunk;
239
240         assert(rest <= peer_b->len);
241         if (peer_b->offset + rest <= peer_b->size)
242             chunk = rest;
243         else
244             /* wrap around ring buffer */
245             chunk = peer_b->size - peer_b->offset;
246         assert(peer_b->offset + chunk <= peer_b->size);
247
248         memcpy(buf, peer_b->buf + peer_b->offset, chunk);
249
250         peer_b->len -= chunk;
251         if (peer_b->len)
252         {
253             peer_b->offset += chunk;
254             assert(peer_b->offset <= peer_b->size);
255             if (peer_b->offset == peer_b->size)
256                 peer_b->offset = 0;
257             buf += chunk;
258         }
259         else

```



```

260         {
261             /* buffer now empty, no need to advance "buf" */
262             assert(chunk == rest);
263             peer_b->offset = 0;
264         }
265         rest -= chunk;
266     }
267     while (rest);
268     return size;
269 }
270
272 /* non-copying interface: provide pointer to available data in buffer
273  * bio_nread0: return number of available bytes
274  * bio_nread:  also advance index
275  * (example usage: bio_nread0(), read from buffer, bio_nread()
276  * or just bio_nread(), read from buffer)
277  */
278 /* WARNING: The non-copying interface is largely untested as of yet
279  * and may contain bugs. */
280 static ossl_ssize_t bio_nread0(BIO *bio, char **buf)
281 {
282     struct bio_bio_st *b, *peer_b;
283     ossl_ssize_t num;
284
285     BIO_clear_retry_flags(bio);
286
287     if (!bio->init)
288         return 0;
289
290     b = bio->ptr;
291     assert(b != NULL);
292     assert(b->peer != NULL);
293     peer_b = b->peer->ptr;
294     assert(peer_b != NULL);
295     assert(peer_b->buf != NULL);
296
297     peer_b->request = 0;
298
299     if (peer_b->len == 0)
300     {
301         char dummy;
302
303         /* avoid code duplication -- nothing available for reading */
304         return bio_read(bio, &dummy, 1); /* returns 0 or -1 */
305     }
306
307     num = peer_b->len;
308     if (peer_b->size < peer_b->offset + num)
309         /* no ring buffer wrap-around for non-copying interface */
310         num = peer_b->size - peer_b->offset;
311     assert(num > 0);
312
313     if (buf != NULL)
314         *buf = peer_b->buf + peer_b->offset;
315     return num;
316 }
317
318 static ossl_ssize_t bio_nread(BIO *bio, char **buf, size_t num_)
319 {
320     struct bio_bio_st *b, *peer_b;
321     ossl_ssize_t num, available;
322
323     if (num_ > SSIZE_MAX)
324         num = SSIZE_MAX;
325     else

```

```

326         num = (ossl_ssize_t)num_;
327
328     available = bio_nread0(bio, buf);
329     if (num > available)
330         num = available;
331     if (num <= 0)
332         return num;
333
334     b = bio->ptr;
335     peer_b = b->peer->ptr;
336
337     peer_b->len -= num;
338     if (peer_b->len)
339     {
340         peer_b->offset += num;
341         assert(peer_b->offset <= peer_b->size);
342         if (peer_b->offset == peer_b->size)
343             peer_b->offset = 0;
344     }
345     else
346         peer_b->offset = 0;
347
348     return num;
349 }
350
352 static int bio_write(BIO *bio, const char *buf, int num_)
353 {
354     size_t num = num_;
355     size_t rest;
356     struct bio_bio_st *b;
357
358     BIO_clear_retry_flags(bio);
359
360     if (!bio->init || buf == NULL || num == 0)
361         return 0;
362
363     b = bio->ptr;
364     assert(b != NULL);
365     assert(b->peer != NULL);
366     assert(b->buf != NULL);
367
368     b->request = 0;
369     if (b->closed)
370     {
371         /* we already closed */
372         BIOerr(BIO_F_BIO_WRITE, BIO_R_BROKEN_PIPE);
373         return -1;
374     }
375
376     assert(b->len <= b->size);
377
378     if (b->len == b->size)
379     {
380         BIO_set_retry_write(bio); /* buffer is full */
381         return -1;
382     }
383
384     /* we can write */
385     if (num > b->size - b->len)
386         num = b->size - b->len;
387
388     /* now write "num" bytes */
389
390     rest = num;
391

```

```

392     assert(rest > 0);
393     do /* one or two iterations */
394     {
395         size_t write_offset;
396         size_t chunk;
397
398         assert(b->len + rest <= b->size);
399
400         write_offset = b->offset + b->len;
401         if (write_offset >= b->size)
402             write_offset -= b->size;
403         /* b->buf[write_offset] is the first byte we can write to. */
404
405         if (write_offset + rest <= b->size)
406             chunk = rest;
407         else
408             /* wrap around ring buffer */
409             chunk = b->size - write_offset;
410
411         memcpy(b->buf + write_offset, buf, chunk);
412
413         b->len += chunk;
414
415         assert(b->len <= b->size);
416
417         rest -= chunk;
418         buf += chunk;
419     }
420     while (rest);
421
422     return num;
423 }
424
425 /* non-copying interface: provide pointer to region to write to
426 * bio_nwrite0: check how much space is available
427 * bio_nwrite: also increase length
428 * (example usage: bio_nwrite0(), write to buffer, bio_nwrite())
429 * or just bio_nwrite(), write to buffer)
430 */
431 static ossl_size_t bio_nwrite0(BIO *bio, char **buf)
432 {
433     struct bio_bio_st *b;
434     size_t num;
435     size_t write_offset;
436
437     BIO_clear_retry_flags(bio);
438
439     if (!bio->init)
440         return 0;
441
442     b = bio->ptr;
443     assert(b != NULL);
444     assert(b->peer != NULL);
445     assert(b->buf != NULL);
446
447     b->request = 0;
448     if (b->closed)
449     {
450         BIOerr(BIO_F_BIO_NWRITE0, BIO_R_BROKEN_PIPE);
451         return -1;
452     }
453
454     assert(b->len <= b->size);
455
456     if (b->len == b->size)
457     {

```

```

458         BIO_set_retry_write(bio);
459         return -1;
460     }
461
462     num = b->size - b->len;
463     write_offset = b->offset + b->len;
464     if (write_offset >= b->size)
465         write_offset -= b->size;
466     if (write_offset + num > b->size)
467         /* no ring buffer wrap-around for non-copying interface
468          * (to fulfil the promise by BIO_ctrl_get_write_guarantee,
469          * BIO_nwrite may have to be called twice) */
470         num = b->size - write_offset;
471
472     if (buf != NULL)
473         *buf = b->buf + write_offset;
474     assert(write_offset + num <= b->size);
475
476     return num;
477 }
478
479 static ossl_size_t bio_nwrite(BIO *bio, char **buf, size_t num_)
480 {
481     struct bio_bio_st *b;
482     ossl_size_t num, space;
483
484     if (num_ > SSIZE_MAX)
485         num = SSIZE_MAX;
486     else
487         num = (ossl_size_t)num_;
488
489     space = bio_nwrite0(bio, buf);
490     if (num > space)
491         num = space;
492     if (num <= 0)
493         return num;
494     b = bio->ptr;
495     assert(b != NULL);
496     b->len += num;
497     assert(b->len <= b->size);
498
499     return num;
500 }
501
502
503 static long bio_ctrl(BIO *bio, int cmd, long num, void *ptr)
504 {
505     long ret;
506     struct bio_bio_st *b = bio->ptr;
507
508     assert(b != NULL);
509
510     switch (cmd)
511     {
512         /* specific CTRL codes */
513
514         case BIO_C_SET_WRITE_BUF_SIZE:
515             if (b->peer)
516             {
517                 BIOerr(BIO_F_BIO_CTRL, BIO_R_IN_USE);
518                 ret = 0;
519             }
520             else if (num == 0)
521             {
522                 BIOerr(BIO_F_BIO_CTRL, BIO_R_INVALID_ARGUMENT);
523                 ret = 0;

```

```

524     }
525     else
526     {
527         size_t new_size = num;

529         if (b->size != new_size)
530         {
531             if (b->buf)
532             {
533                 OPENSSL_free(b->buf);
534                 b->buf = NULL;
535             }
536             b->size = new_size;
537         }
538         ret = 1;
539     }
540     break;

542 case BIO_C_GET_WRITE_BUF_SIZE:
543     ret = (long) b->size;
544     break;

546 case BIO_C_MAKE_BIO_PAIR:
547     {
548         BIO *other_bio = ptr;
549
550         if (bio_make_pair(bio, other_bio))
551             ret = 1;
552         else
553             ret = 0;
554     }
555     break;

557 case BIO_C_DESTROY_BIO_PAIR:
558     /* Affects both BIOs in the pair -- call just once!
559     * Or let BIO_free(bio1); BIO_free(bio2); do the job. */
560     bio_destroy_pair(bio);
561     ret = 1;
562     break;

564 case BIO_C_GET_WRITE_GUARANTEE:
565     /* How many bytes can the caller feed to the next write
566     * without having to keep any? */
567     if (b->peer == NULL || b->closed)
568         ret = 0;
569     else
570         ret = (long) b->size - b->len;
571     break;

573 case BIO_C_GET_READ_REQUEST:
574     /* If the peer unsuccessfully tried to read, how many bytes
575     * were requested? (As with BIO_CTRL_PENDING, that number
576     * can usually be treated as boolean.) */
577     ret = (long) b->request;
578     break;

580 case BIO_C_RESET_READ_REQUEST:
581     /* Reset request. (Can be useful after read attempts
582     * at the other side that are meant to be non-blocking,
583     * e.g. when probing SSL_read to see if any data is
584     * available.) */
585     b->request = 0;
586     ret = 1;
587     break;

589 case BIO_C_SHUTDOWN_WR:

```

```

590     /* similar to shutdown(..., SHUT_WR) */
591     b->closed = 1;
592     ret = 1;
593     break;

595 case BIO_C_NREAD0:
596     /* prepare for non-copying read */
597     ret = (long) bio_nread0(bio, ptr);
598     break;

600 case BIO_C_NREAD:
601     /* non-copying read */
602     ret = (long) bio_nread(bio, ptr, (size_t) num);
603     break;

604 case BIO_C_NWRITE0:
605     /* prepare for non-copying write */
606     ret = (long) bio_nwrite0(bio, ptr);
607     break;

608 case BIO_C_NWRITE:
609     /* non-copying write */
610     ret = (long) bio_nwrite(bio, ptr, (size_t) num);
611     break;

612 /* standard CTRL codes follow */

618 case BIO_CTRL_RESET:
619     if (b->buf != NULL)
620     {
621         b->len = 0;
622         b->offset = 0;
623     }
624     ret = 0;
625     break;

627 case BIO_CTRL_GET_CLOSE:
628     ret = bio->shutdown;
629     break;

631 case BIO_CTRL_SET_CLOSE:
632     bio->shutdown = (int) num;
633     ret = 1;
634     break;

636 case BIO_CTRL_PENDING:
637     if (b->peer != NULL)
638     {
639         struct bio_bio_st *peer_b = b->peer->ptr;
640
641         ret = (long) peer_b->len;
642     }
643     else
644         ret = 0;
645     break;

647 case BIO_CTRL_WPENDING:
648     if (b->buf != NULL)
649         ret = (long) b->len;
650     else
651         ret = 0;
652     break;

654 case BIO_CTRL_DUP:
655     /* See BIO_dup_chain for circumstances we have to expect. */

```

```

656     {
657         BIO *other_bio = ptr;
658         struct bio_bio_st *other_b;
659
660         assert(other_bio != NULL);
661         other_b = other_bio->ptr;
662         assert(other_b != NULL);
663
664         assert(other_b->buf == NULL); /* other_bio is always fresh */
665
666         other_b->size = b->size;
667     }
668
669     ret = 1;
670     break;
671
672 case BIO_CTRL_FLUSH:
673     ret = 1;
674     break;
675
676 case BIO_CTRL_EOF:
677     {
678         BIO *other_bio = ptr;
679
680         if (other_bio)
681         {
682             struct bio_bio_st *other_b = other_bio->ptr;
683
684             assert(other_b != NULL);
685             ret = other_b->len == 0 && other_b->closed;
686         }
687         else
688             ret = 1;
689     }
690     break;
691
692 default:
693     ret = 0;
694 }
695 return ret;
696 }
697
698 static int bio_puts(BIO *bio, const char *str)
699 {
700     return bio_write(bio, str, strlen(str));
701 }
702
703
704 static int bio_make_pair(BIO *bio1, BIO *bio2)
705 {
706     struct bio_bio_st *b1, *b2;
707
708     assert(bio1 != NULL);
709     assert(bio2 != NULL);
710
711     b1 = bio1->ptr;
712     b2 = bio2->ptr;
713
714     if (b1->peer != NULL || b2->peer != NULL)
715     {
716         BIOerr(BIO_F_BIO_MAKE_PAIR, BIO_R_IN_USE);
717         return 0;
718     }
719
720     if (b1->buf == NULL)
721     {

```

```

722         b1->buf = OPENSSL_malloc(b1->size);
723         if (b1->buf == NULL)
724         {
725             BIOerr(BIO_F_BIO_MAKE_PAIR, ERR_R_MALLOC_FAILURE);
726             return 0;
727         }
728         b1->len = 0;
729         b1->offset = 0;
730     }
731
732     if (b2->buf == NULL)
733     {
734         b2->buf = OPENSSL_malloc(b2->size);
735         if (b2->buf == NULL)
736         {
737             BIOerr(BIO_F_BIO_MAKE_PAIR, ERR_R_MALLOC_FAILURE);
738             return 0;
739         }
740         b2->len = 0;
741         b2->offset = 0;
742     }
743
744     b1->peer = bio2;
745     b1->closed = 0;
746     b1->request = 0;
747     b2->peer = bio1;
748     b2->closed = 0;
749     b2->request = 0;
750
751     bio1->init = 1;
752     bio2->init = 1;
753
754     return 1;
755 }
756
757 static void bio_destroy_pair(BIO *bio)
758 {
759     struct bio_bio_st *b = bio->ptr;
760
761     if (b != NULL)
762     {
763         BIO *peer_bio = b->peer;
764
765         if (peer_bio != NULL)
766         {
767             struct bio_bio_st *peer_b = peer_bio->ptr;
768
769             assert(peer_b != NULL);
770             assert(peer_b->peer == bio);
771
772             peer_b->peer = NULL;
773             peer_b->init = 0;
774             assert(peer_b->buf != NULL);
775             peer_b->len = 0;
776             peer_b->offset = 0;
777
778             b->peer = NULL;
779             bio->init = 0;
780             assert(b->buf != NULL);
781             b->len = 0;
782             b->offset = 0;
783         }
784     }
785 }
786

```

```

788 /* Exported convenience functions */
789 int BIO_new_bio_pair(BIO **bio1_p, size_t writebuf1,
790     BIO **bio2_p, size_t writebuf2)
791 {
792     BIO *bio1 = NULL, *bio2 = NULL;
793     long r;
794     int ret = 0;
795
796     bio1 = BIO_new(BIO_s_bio());
797     if (bio1 == NULL)
798         goto err;
799     bio2 = BIO_new(BIO_s_bio());
800     if (bio2 == NULL)
801         goto err;
802
803     if (writebuf1)
804     {
805         r = BIO_set_write_buf_size(bio1, writebuf1);
806         if (!r)
807             goto err;
808     }
809     if (writebuf2)
810     {
811         r = BIO_set_write_buf_size(bio2, writebuf2);
812         if (!r)
813             goto err;
814     }
815
816     r = BIO_make_bio_pair(bio1, bio2);
817     if (!r)
818         goto err;
819     ret = 1;
820
821 err:
822     if (ret == 0)
823     {
824         if (bio1)
825         {
826             BIO_free(bio1);
827             bio1 = NULL;
828         }
829         if (bio2)
830         {
831             BIO_free(bio2);
832             bio2 = NULL;
833         }
834     }
835
836     *bio1_p = bio1;
837     *bio2_p = bio2;
838     return ret;
839 }
840
841 size_t BIO_ctrl_get_write_guarantee(BIO *bio)
842 {
843     return BIO_ctrl(bio, BIO_C_GET_WRITE_GUARANTEE, 0, NULL);
844 }
845
846 size_t BIO_ctrl_get_read_request(BIO *bio)
847 {
848     return BIO_ctrl(bio, BIO_C_GET_READ_REQUEST, 0, NULL);
849 }
850
851 int BIO_ctrl_reset_read_request(BIO *bio)
852 {
853     return (BIO_ctrl(bio, BIO_C_RESET_READ_REQUEST, 0, NULL) != 0);

```

```

854     }
855
856     /* BIO_nread0/nread/nwrite0/nwrite are available only for BIO pairs for now
857     * (conceivably some other BIOs could allow non-copying reads and writes too.)
858     */
859     int BIO_nread0(BIO *bio, char **buf)
860     {
861         long ret;
862
863         if (!bio->init)
864         {
865             BIOerr(BIO_F_BIO_NREAD0, BIO_R_UNINITIALIZED);
866             return -2;
867         }
868
869         ret = BIO_ctrl(bio, BIO_C_NREAD0, 0, buf);
870         if (ret > INT_MAX)
871             return INT_MAX;
872         else
873             return (int) ret;
874     }
875
876 int BIO_nread(BIO *bio, char **buf, int num)
877 {
878     int ret;
879
880     if (!bio->init)
881     {
882         BIOerr(BIO_F_BIO_NREAD, BIO_R_UNINITIALIZED);
883         return -2;
884     }
885
886     ret = (int) BIO_ctrl(bio, BIO_C_NREAD, num, buf);
887     if (ret > 0)
888         bio->num_read += ret;
889     return ret;
890 }
891
892 int BIO_nwrite0(BIO *bio, char **buf)
893 {
894     long ret;
895
896     if (!bio->init)
897     {
898         BIOerr(BIO_F_BIO_NWRITE0, BIO_R_UNINITIALIZED);
899         return -2;
900     }
901
902     ret = BIO_ctrl(bio, BIO_C_NWRITE0, 0, buf);
903     if (ret > INT_MAX)
904         return INT_MAX;
905     else
906         return (int) ret;
907 }
908
909 int BIO_nwrite(BIO *bio, char **buf, int num)
910 {
911     int ret;
912
913     if (!bio->init)
914     {
915         BIOerr(BIO_F_BIO_NWRITE, BIO_R_UNINITIALIZED);
916         return -2;
917     }
918

```

```
920     ret = BIO_ctrl(bio, BIO_C_NWRITE, num, buf);
921     if (ret > 0)
922         bio->num_write += ret;
923     return ret;
924 }
```

```

*****
14935 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_conn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/bss_conn.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
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57 */
59 #include <stdio.h>
60 #include <errno.h>
61 #define USE_SOCKETS

```

```

62 #include "cryptlib.h"
63 #include <openssl/bio.h>
64
65 #ifndef OPENSSL_NO_SOCKET
66
67 #ifdef OPENSSL_SYS_WIN16
68 #define SOCKET_PROTOCOL 0 /* more microsoft stupidity */
69 #else
70 #define SOCKET_PROTOCOL IPPROTO_TCP
71 #endif
72
73 #if (defined(OPENSSL_SYS_VMS) && __VMS_VER < 70000000)
74 /* FIONBIO used as a switch to enable ioctl, and that isn't in VMS < 7.0 */
75 #undef FIONBIO
76 #endif
77
78
79 typedef struct bio_connect_st
80 {
81     int state;
82
83     char *param_hostname;
84     char *param_port;
85     int nbio;
86
87     unsigned char ip[4];
88     unsigned short port;
89
90     struct sockaddr_in them;
91
92     /* int socket; this will be kept in bio->num so that it is
93      * compatible with the bss_sock bio */
94
95     /* called when the connection is initially made
96      * callback(BIO,state,ret); The callback should return
97      * 'ret'. state is for compatibility with the ssl info_callback */
98     int (*info_callback)(const BIO *bio,int state,int ret);
99     } BIO_CONNECT;
100
101 static int conn_write(BIO *h, const char *buf, int num);
102 static int conn_read(BIO *h, char *buf, int size);
103 static int conn_puts(BIO *h, const char *str);
104 static long conn_ctrl(BIO *h, int cmd, long arg1, void *arg2);
105 static int conn_new(BIO *h);
106 static int conn_free(BIO *data);
107 static long conn_callback_ctrl(BIO *h, int cmd, bio_info_cb *);
108
109 static int conn_state(BIO *b, BIO_CONNECT *c);
110 static void conn_close_socket(BIO *data);
111 static BIO_CONNECT *BIO_CONNECT_new(void);
112 static void BIO_CONNECT_free(BIO_CONNECT *a);
113
114 static BIO_METHOD methods_connectp=
115 {
116     BIO_TYPE_CONNECT,
117     "socket connect",
118     conn_write,
119     conn_read,
120     conn_puts,
121     NULL, /* connect_gets, */
122     conn_ctrl,
123     conn_new,
124     conn_free,
125     conn_callback_ctrl,
126 };

```

```

128 static int conn_state(BIO *b, BIO_CONNECT *c)
129 {
130     int ret= -1,i;
131     unsigned long l;
132     char *p,*q;
133     int (*cb)(const BIO *,int,int)=NULL;
134
135     if (c->info_callback != NULL)
136         cb=c->info_callback;
137
138     for (;;)
139     {
140         switch (c->state)
141         {
142             case BIO_CONN_S_BEFORE:
143                 p=c->param_hostname;
144                 if (p == NULL)
145                 {
146                     BIOerr(BIO_F_CONN_STATE,BIO_R_NO_HOSTNAME_SPECIF
147                         goto exit_loop;
148                 }
149                 for ( ; *p != '\0'; p++)
150                 {
151                     if ((*p == ':') || (*p == '/')) break;
152                 }
153
154                 i= *p;
155                 if ((i == ':') || (i == '/'))
156                 {
157                     *(p++)='\0';
158                     if (i == ':')
159                     {
160                         for (q=p; *q; q++)
161                             if (*q == '/')
162                             {
163                                 *q='\0';
164                                 break;
165                             }
166                         if (c->param_port != NULL)
167                             OPENSSL_free(c->param_port);
168                         c->param_port=BUF_strdup(p);
169                     }
170                 }
171
172                 if (c->param_port == NULL)
173                 {
174                     BIOerr(BIO_F_CONN_STATE,BIO_R_NO_PORT_SPECIFIED)
175                     ERR_add_error_data(2,"host=",c->param_hostname);
176                     goto exit_loop;
177                 }
178                 c->state=BIO_CONN_S_GET_IP;
179                 break;
180
181             case BIO_CONN_S_GET_IP:
182                 if (BIO_get_host_ip(c->param_hostname,&(c->ip[0])) <= 0)
183                     goto exit_loop;
184                 c->state=BIO_CONN_S_GET_PORT;
185                 break;
186
187             case BIO_CONN_S_GET_PORT:
188                 if (c->param_port == NULL)
189                 {
190                     /* abort(); */
191                     goto exit_loop;
192                 }
193

```

```

194         else if (BIO_get_port(c->param_port,&c->port) <= 0)
195             goto exit_loop;
196         c->state=BIO_CONN_S_CREATE_SOCKET;
197         break;
198
199     case BIO_CONN_S_CREATE_SOCKET:
200         /* now setup address */
201         memset((char *)&c->them,0,sizeof(c->them));
202         c->them.sin_family=AF_INET;
203         c->them.sin_port=htons((unsigned short)c->port);
204         l=(unsigned long)
205             ((unsigned long)c->ip[0]<<24L)|
206             ((unsigned long)c->ip[1]<<16L)|
207             ((unsigned long)c->ip[2]<< 8L)|
208             ((unsigned long)c->ip[3]);
209         c->them.sin_addr.s_addr=htonl(l);
210         c->state=BIO_CONN_S_CREATE_SOCKET;
211
212         ret=socket(AF_INET,SOCK_STREAM,SOCKET_PROTOCOL);
213         if (ret == INVALID_SOCKET)
214         {
215             SYSerr(SYS_F_SOCKET,get_last_socket_error());
216             ERR_add_error_data(4,"host=",c->param_hostname,
217                 ":",c->param_port);
218             BIOerr(BIO_F_CONN_STATE,BIO_R_UNABLE_TO_CREATE_S
219                 goto exit_loop;
220         }
221         b->num=ret;
222         c->state=BIO_CONN_S_NBIO;
223         break;
224
225     case BIO_CONN_S_NBIO:
226         if (c->nbio)
227         {
228             if (!BIO_socket_nbio(b->num,1))
229             {
230                 BIOerr(BIO_F_CONN_STATE,BIO_R_ERROR_SETT
231                 ERR_add_error_data(4,"host=",
232                     c->param_hostname,
233                     ":",c->param_port);
234                 goto exit_loop;
235             }
236         }
237         c->state=BIO_CONN_S_CONNECT;
238
239     #if defined(SO_KEEPALIVE) && !defined(OPENSSL_SYS_MPE)
240         i=1;
241         i=sockopt(b->num,SOL_SOCKET,SO_KEEPALIVE,(char *)&i,S
242         if (i < 0)
243         {
244             SYSerr(SYS_F_SOCKET,get_last_socket_error());
245             ERR_add_error_data(4,"host=",c->param_hostname,
246                 ":",c->param_port);
247             BIOerr(BIO_F_CONN_STATE,BIO_R_KEEPALIVE);
248             goto exit_loop;
249         }
250     #endif
251         break;
252
253     case BIO_CONN_S_CONNECT:
254         BIO_clear_retry_flags(b);
255         ret=connect(b->num,
256             (struct sockaddr *)&c->them,
257             sizeof(c->them));
258         b->retry_reason=0;
259         if (ret < 0)

```



```

260         {
261             if (BIO_sock_should_retry(ret))
262             {
263                 BIO_set_retry_special(b);
264                 c->state=BIO_CONN_S_BLOCKED_CONNECT;
265                 b->retry_reason=BIO_RR_CONNECT;
266             }
267         }
268     else
269     {
270         SYSerr(SYS_F_CONNECT,get_last_socket_err
271         ERR_add_error_data(4,"host=",
272         c->param_hostname,
273         ":",c->param_port);
274         BIOerr(BIO_F_CONN_STATE,BIO_R_CONNECT_ER
275         }
276     goto exit_loop;
277 }
278 else
279     c->state=BIO_CONN_S_OK;
280 break;
281
282 case BIO_CONN_S_BLOCKED_CONNECT:
283     i=BIO_sock_error(b->num);
284     if (i)
285     {
286         BIO_clear_retry_flags(b);
287         SYSerr(SYS_F_CONNECT,i);
288         ERR_add_error_data(4,"host=",
289         c->param_hostname,
290         ":",c->param_port);
291         BIOerr(BIO_F_CONN_STATE,BIO_R_NBIO_CONNECT_ERROR
292         ret=0;
293         goto exit_loop;
294     }
295     else
296         c->state=BIO_CONN_S_OK;
297 break;
298
299 case BIO_CONN_S_OK:
300     ret=1;
301     goto exit_loop;
302 default:
303     /* abort(); */
304     goto exit_loop;
305 }
306
307 if (cb != NULL)
308 {
309     if (!(ret=cb((BIO *)b,c->state,ret)))
310         goto end;
311 }
312
313 /* Loop does not exit */
314 exit_loop:
315 if (cb != NULL)
316     ret=cb((BIO *)b,c->state,ret);
317 end:
318     return(ret);
319 }
320
321 BIO_CONNECT *BIO_CONNECT_new(void)
322 {
323     BIO_CONNECT *ret;
324
325     if ((ret=(BIO_CONNECT *)OPENSSL_malloc(sizeof(BIO_CONNECT))) == NULL)

```

```

326         return(NULL);
327     ret->state=BIO_CONN_S_BEFORE;
328     ret->param_hostname=NULL;
329     ret->param_port=NULL;
330     ret->info_callback=NULL;
331     ret->nbio=0;
332     ret->ip[0]=0;
333     ret->ip[1]=0;
334     ret->ip[2]=0;
335     ret->ip[3]=0;
336     ret->port=0;
337     memset((char *)&ret->them,0,sizeof(ret->them));
338     return(ret);
339 }
340
341 void BIO_CONNECT_free(BIO_CONNECT *a)
342 {
343     if(a == NULL)
344         return;
345
346     if (a->param_hostname != NULL)
347         OPENSSL_free(a->param_hostname);
348     if (a->param_port != NULL)
349         OPENSSL_free(a->param_port);
350     OPENSSL_free(a);
351 }
352
353 BIO_METHOD *BIO_s_connect(void)
354 {
355     return(&methods_connectp);
356 }
357
358 static int conn_new(BIO *bi)
359 {
360     bi->init=0;
361     bi->num=INVALID_SOCKET;
362     bi->flags=0;
363     if ((bi->ptr=(char *)BIO_CONNECT_new()) == NULL)
364         return(0);
365     else
366         return(1);
367 }
368
369 static void conn_close_socket(BIO *bio)
370 {
371     BIO_CONNECT *c;
372
373     c=(BIO_CONNECT *)bio->ptr;
374     if (bio->num != INVALID_SOCKET)
375     {
376         /* Only do a shutdown if things were established */
377         if (c->state == BIO_CONN_S_OK)
378             shutdown(bio->num,2);
379         closesocket(bio->num);
380         bio->num=INVALID_SOCKET;
381     }
382 }
383
384 static int conn_free(BIO *a)
385 {
386     BIO_CONNECT *data;
387
388     if (a == NULL) return(0);
389     data=(BIO_CONNECT *)a->ptr;
390
391     if (a->shutdown)

```

```

392         {
393             conn_close_socket(a);
394             BIO_CONNECT_free(data);
395             a->ptr=NULL;
396             a->flags=0;
397             a->init=0;
398         }
399         return(1);
400     }
401
402 static int conn_read(BIO *b, char *out, int outl)
403 {
404     int ret=0;
405     BIO_CONNECT *data;
406
407     data=(BIO_CONNECT *)b->ptr;
408     if (data->state != BIO_CONN_S_OK)
409     {
410         ret=conn_state(b,data);
411         if (ret <= 0)
412             return(ret);
413     }
414
415     if (out != NULL)
416     {
417         clear_socket_error();
418         ret=readsocket(b->num,out,outl);
419         BIO_clear_retry_flags(b);
420         if (ret <= 0)
421         {
422             if (BIO_sock_should_retry(ret))
423                 BIO_set_retry_read(b);
424         }
425     }
426     return(ret);
427 }
428
429 static int conn_write(BIO *b, const char *in, int inl)
430 {
431     int ret;
432     BIO_CONNECT *data;
433
434     data=(BIO_CONNECT *)b->ptr;
435     if (data->state != BIO_CONN_S_OK)
436     {
437         ret=conn_state(b,data);
438         if (ret <= 0) return(ret);
439     }
440
441     clear_socket_error();
442     ret=writesocket(b->num,in,inl);
443     BIO_clear_retry_flags(b);
444     if (ret <= 0)
445     {
446         if (BIO_sock_should_retry(ret))
447             BIO_set_retry_write(b);
448     }
449     return(ret);
450 }
451
452 static long conn_ctrl(BIO *b, int cmd, long num, void *ptr)
453 {
454     BIO *dbio;
455     int *ip;
456     const char **pptr;
457     long ret=1;

```

```

458     BIO_CONNECT *data;
459
460     data=(BIO_CONNECT *)b->ptr;
461
462     switch (cmd)
463     {
464     case BIO_CTRL_RESET:
465         ret=0;
466         data->state=BIO_CONN_S_BEFORE;
467         conn_close_socket(b);
468         b->flags=0;
469         break;
470     case BIO_C_DO_STATE_MACHINE:
471         /* use this one to start the connection */
472         if (data->state != BIO_CONN_S_OK)
473             ret=(long)conn_state(b,data);
474         else
475             ret=1;
476         break;
477     case BIO_C_GET_CONNECT:
478         if (ptr != NULL)
479         {
480             pptr=(const char **)ptr;
481             if (num == 0)
482             {
483                 *pptr=data->param_hostname;
484             }
485             else if (num == 1)
486             {
487                 *pptr=data->param_port;
488             }
489             else if (num == 2)
490             {
491                 *pptr= (char *)&(data->ip[0]);
492             }
493             else if (num == 3)
494             {
495                 *((int *)ptr)=data->port;
496             }
497             if ((!b->init) || (ptr == NULL))
498                 *pptr="not initialized";
499             ret=1;
500         }
501         break;
502     case BIO_C_SET_CONNECT:
503         if (ptr != NULL)
504         {
505             b->init=1;
506             if (num == 0)
507             {
508                 if (data->param_hostname != NULL)
509                     OPENSSL_free(data->param_hostname);
510                 data->param_hostname=BUF_strdup(ptr);
511             }
512             else if (num == 1)
513             {
514                 if (data->param_port != NULL)
515                     OPENSSL_free(data->param_port);
516                 data->param_port=BUF_strdup(ptr);
517             }
518             else if (num == 2)
519             {
520                 char buf[16];
521                 unsigned char *p = ptr;
522

```

```

524         BIO_snprintf(buf, sizeof buf, "%d.%d.%d",
525                       p[0], p[1], p[2], p[3]);
526         if (data->param_hostname != NULL)
527             OPENSSL_free(data->param_hostname);
528         data->param_hostname=BUF_strdup(buf);
529         memcpy(&(data->ip[0]), ptr, 4);
530     }
531     else if (num == 3)
532     {
533         char buf[DECIMAL_SIZE(int)+1];
534
535         BIO_snprintf(buf, sizeof buf, "%d", *(int *)ptr);
536         if (data->param_port != NULL)
537             OPENSSL_free(data->param_port);
538         data->param_port=BUF_strdup(buf);
539         data->port= *(int *)ptr;
540     }
541 }
542 break;
543 case BIO_C_SET_NBIO:
544     data->nbio=(int)num;
545     break;
546 case BIO_C_GET_FD:
547     if (b->init)
548     {
549         ip=(int *)ptr;
550         if (ip != NULL)
551             *ip=b->num;
552         ret=b->num;
553     }
554     else
555         ret= -1;
556     break;
557 case BIO_CTRL_GET_CLOSE:
558     ret=b->shutdown;
559     break;
560 case BIO_CTRL_SET_CLOSE:
561     b->shutdown=(int)num;
562     break;
563 case BIO_CTRL_PENDING:
564     ret=0;
565     break;
566 case BIO_CTRL_FLUSH:
567     break;
568 case BIO_CTRL_DUP:
569     {
570         dbio=(BIO *)ptr;
571         if (data->param_port)
572             BIO_set_conn_port(dbio, data->param_port);
573         if (data->param_hostname)
574             BIO_set_conn_hostname(dbio, data->param_hostname);
575         BIO_set_nbio(dbio, data->nbio);
576         /* FIXME: the cast of the function seems unlikely to be a good id
577         (void)BIO_set_info_callback(dbio, (bio_info_cb *)data->info_callback);
578         break;
579     }
580 case BIO_CTRL_SET_CALLBACK:
581     {
582         #if 0 /* FIXME: Should this be used? -- Richard Levitte */
583         BIOerr(BIO_F_CONN_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
584         ret = -1;
585         #else
586         ret=0;
587         #endif
588     }
589 }

```

```

590         break;
591 case BIO_CTRL_GET_CALLBACK:
592     {
593         int (**fptr)(const BIO *bio, int state, int xret);
594
595         fptr=(int (**)(const BIO *bio, int state, int xret))ptr;
596         *fptr=data->info_callback;
597     }
598     break;
599 default:
600     ret=0;
601     break;
602 }
603 return(ret);
604 }
605
606 static long conn_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
607 {
608     long ret=1;
609     BIO_CONNECT *data;
610
611     data=(BIO_CONNECT *)b->ptr;
612
613     switch (cmd)
614     {
615     case BIO_CTRL_SET_CALLBACK:
616         {
617             data->info_callback=(int (*)(const struct bio_st *, int, int))fp;
618         }
619         break;
620     default:
621         ret=0;
622         break;
623     }
624     return(ret);
625 }
626
627 static int conn_puts(BIO *bp, const char *str)
628 {
629     int n, ret;
630
631     n=strlen(str);
632     ret=conn_write(bp, str, n);
633     return(ret);
634 }
635
636 BIO *BIO_new_connect(char *str)
637 {
638     BIO *ret;
639
640     ret=BIO_new(BIO_s_connect());
641     if (ret == NULL) return(NULL);
642     if (BIO_set_conn_hostname(ret, str))
643         return(ret);
644     else
645     {
646         BIO_free(ret);
647         return(NULL);
648     }
649 }
650
651 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_dgram.c

1

```
*****
47447 Fri May 30 18:31:34 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_dgram.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/bio_dgram.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * Copyright (c) 1999-2005 The OpenSSL Project. All rights reserved.
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52 *
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_dgram.c

2

```
62 #include <errno.h>
63 #define USE_SOCKETS
64 #include "cryptlib.h"

66 #include <openssl/bio.h>
67 #ifndef OPENSSSL_NO_DGRAM

69 #if defined(OPENSSSL_SYS_WIN32) || defined(OPENSSSL_SYS_VMS)
70 #include <sys/timeb.h>
71 #endif

73 #ifndef OPENSSSL_NO_SCTP
74 #include <netinet/sctp.h>
75 #include <fcntl.h>
76 #define OPENSSSL_SCTP_DATA_CHUNK_TYPE 0x00
77 #define OPENSSSL_SCTP_FORWARD_CUM_TSN_CHUNK_TYPE 0xc0
78 #endif

80 #if defined(OPENSSSL_SYS_LINUX) && !defined(IP_MTU)
81 #define IP_MTU 14 /* linux is lame */
82 #endif

84 #if defined(__FreeBSD__) && defined(IN6_IS_ADDR_V4MAPPED)
85 /* Standard definition causes type-punning problems. */
86 #undef IN6_IS_ADDR_V4MAPPED
87 #define s6_addr32 __u6_addr.__u6_addr32
88 #define IN6_IS_ADDR_V4MAPPED(a) \
89     (((a)->s6_addr32[0] == 0) && \
90      ((a)->s6_addr32[1] == 0) && \
91      ((a)->s6_addr32[2] == htonl(0x0000ffff)))
92 #endif

94 #ifdef WATT32
95 #define sock_write SockWrite /* Watt-32 uses same names */
96 #define sock_read SockRead
97 #define sock_puts SockPuts
98 #endif

100 static int dgram_write(BIO *h, const char *buf, int num);
101 static int dgram_read(BIO *h, char *buf, int size);
102 static int dgram_puts(BIO *h, const char *str);
103 static long dgram_ctrl(BIO *h, int cmd, long arg1, void *arg2);
104 static int dgram_new(BIO *h);
105 static int dgram_free(BIO *data);
106 static int dgram_clear(BIO *bio);

108 #ifndef OPENSSSL_NO_SCTP
109 static int dgram_sctp_write(BIO *h, const char *buf, int num);
110 static int dgram_sctp_read(BIO *h, char *buf, int size);
111 static int dgram_sctp_puts(BIO *h, const char *str);
112 static long dgram_sctp_ctrl(BIO *h, int cmd, long arg1, void *arg2);
113 static int dgram_sctp_new(BIO *h);
114 static int dgram_sctp_free(BIO *data);
115 #ifdef SCTP_AUTHENTICATION_EVENT
116 static void dgram_sctp_handle_auth_free_key_event(BIO *b, union sctp_notificatio
117 #endif
118 #endif

120 static int BIO_dgram_should_retry(int s);

122 static void get_current_time(struct timeval *t);

124 static BIO_METHOD methods_dgram=
125 {
126     BIO_TYPE_DGRAM,
127     "datagram socket",
```

```

128     dgram_write,
129     dgram_read,
130     dgram_puts,
131     NULL, /* dgram_gets, */
132     dgram_ctrl,
133     dgram_new,
134     dgram_free,
135     NULL,
136     };

138 #ifndef OPENSSL_NO_SCTP
139 static BIO_METHOD methods_dgramp_sctp=
140 {
141     BIO_TYPE_DGRAM_SCTP,
142     "datagram sctp socket",
143     dgram_sctp_write,
144     dgram_sctp_read,
145     dgram_sctp_puts,
146     NULL, /* dgram_gets, */
147     dgram_sctp_ctrl,
148     dgram_sctp_new,
149     dgram_sctp_free,
150     NULL,
151 };
152 #endif

154 typedef struct bio_dgram_data_st
155 {
156     union {
157         struct sockaddr sa;
158         struct sockaddr_in sa_in;
159 #if OPENSSL_USE_IPV6
160         struct sockaddr_in6 sa_in6;
161 #endif
162     } peer;
163     unsigned int connected;
164     unsigned int _errno;
165     unsigned int mtu;
166     struct timeval next_timeout;
167     struct timeval socket_timeout;
168 } bio_dgram_data;

170 #ifndef OPENSSL_NO_SCTP
171 typedef struct bio_dgram_sctp_save_message_st
172 {
173     BIO *bio;
174     char *data;
175     int length;
176 } bio_dgram_sctp_save_message;

178 typedef struct bio_dgram_sctp_data_st
179 {
180     union {
181         struct sockaddr sa;
182         struct sockaddr_in sa_in;
183 #if OPENSSL_USE_IPV6
184         struct sockaddr_in6 sa_in6;
185 #endif
186     } peer;
187     unsigned int connected;
188     unsigned int _errno;
189     unsigned int mtu;
190     struct bio_dgram_sctp_sndinfo sndinfo;
191     struct bio_dgram_sctp_rcvinfo rcvinfo;
192     struct bio_dgram_sctp_prinfo prinfo;
193     void (*handle_notifications)(BIO *bio, void *context, void *buf);

```

```

194     void* notification_context;
195     int in_handshake;
196     int ccs_rcvd;
197     int ccs_sent;
198     int save_shutdown;
199     int peer_auth_tested;
200     bio_dgram_sctp_save_message saved_message;
201     } bio_dgram_sctp_data;
202 #endif

204 BIO_METHOD *BIO_s_datagram(void)
205 {
206     return(&methods_dgramp);
207 }

209 BIO *BIO_new_dgram(int fd, int close_flag)
210 {
211     BIO *ret;

213     ret=BIO_new(BIO_s_datagram());
214     if (ret == NULL) return(NULL);
215     BIO_set_fd(ret,fd,close_flag);
216     return(ret);
217 }

219 static int dgram_new(BIO *bi)
220 {
221     bio_dgram_data *data = NULL;

223     bi->init=0;
224     bi->num=0;
225     data = OPENSSL_malloc(sizeof(bio_dgram_data));
226     if (data == NULL)
227         return 0;
228     memset(data, 0x00, sizeof(bio_dgram_data));
229     bi->ptr = data;

231     bi->flags=0;
232     return(1);
233 }

235 static int dgram_free(BIO *a)
236 {
237     bio_dgram_data *data;

239     if (a == NULL) return(0);
240     if (! dgram_clear(a))
241         return 0;

243     data = (bio_dgram_data *)a->ptr;
244     if(data != NULL) OPENSSL_free(data);

246     return(1);
247 }

249 static int dgram_clear(BIO *a)
250 {
251     if (a == NULL) return(0);
252     if (a->shutdown)
253     {
254         if (a->init)
255         {
256             SHUTDOWN2(a->num);
257         }
258         a->init=0;
259         a->flags=0;

```

```

260     }
261     return(1);
262 }

264 static void dgram_adjust_rcv_timeout(BIO *b)
265 {
266     #if defined(SO_RCVTIMEO)
267         bio_dgram_data *data = (bio_dgram_data *)b->ptr;
268         union { size_t s; int i; } sz = {0};

270         /* Is a timer active? */
271         if (data->next_timeout.tv_sec > 0 || data->next_timeout.tv_usec > 0)
272         {
273             struct timeval timenow, timeleft;

275             /* Read current socket timeout */
276             #ifdef OPENSSL_SYS_WINDOWS
277                 int timeout;

279                 sz.i = sizeof(timeout);
280                 if (getsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO,
281                             (void*)&timeout, &sz.i) < 0)
282                     { perror("getsockopt"); }
283                 else
284                 {
285                     data->socket_timeout.tv_sec = timeout / 1000;
286                     data->socket_timeout.tv_usec = (timeout % 1000) * 1000;
287                 }
288             #else
289                 sz.i = sizeof(data->socket_timeout);
290                 if (getsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO,
291                             &(data->socket_timeout), (void *)
292                             { perror("getsockopt"); } }
293                 else if (sizeof(sz.s)!=sizeof(sz.i) && sz.i==0)
294                     OPENSSL_assert(sz.s<=sizeof(data->socket_timeout));
295             #endif

297             /* Get current time */
298             get_current_time(&timenow);

300             /* Calculate time left until timer expires */
301             memcpy(&timeleft, &(data->next_timeout), sizeof(struct timeval))
302             timeleft.tv_sec -= timenow.tv_sec;
303             timeleft.tv_usec -= timenow.tv_usec;
304             if (timeleft.tv_usec < 0)
305             {
306                 timeleft.tv_sec--;
307                 timeleft.tv_usec += 1000000;
308             }

310             if (timeleft.tv_sec < 0)
311             {
312                 timeleft.tv_sec = 0;
313                 timeleft.tv_usec = 1;
314             }

316             /* Adjust socket timeout if next handshake message timer
317              * will expire earlier.
318              */
319             if ((data->socket_timeout.tv_sec == 0 && data->socket_timeout.tv
320                 (data->socket_timeout.tv_sec > timeleft.tv_sec) ||
321                 (data->socket_timeout.tv_sec == timeleft.tv_sec &&
322                 data->socket_timeout.tv_usec >= timeleft.tv_usec))
323                 {
324                 #ifdef OPENSSL_SYS_WINDOWS
325                     timeout = timeleft.tv_sec * 1000 + timeleft.tv_usec / 10

```

```

326             if (setsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO,
327                             (void*)&timeout, sizeof(timeout))
328                 { perror("setsockopt"); }
329             #else
330                 if (setsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO, &timele
331                             sizeof(struct timeval))
332                     { perror("setsockopt"); }
333             #endif
334         }
335     }
336 #endif
337 }

339 static void dgram_reset_rcv_timeout(BIO *b)
340 {
341     #if defined(SO_RCVTIMEO)
342         bio_dgram_data *data = (bio_dgram_data *)b->ptr;

344         /* Is a timer active? */
345         if (data->next_timeout.tv_sec > 0 || data->next_timeout.tv_usec > 0)
346         {
347             #ifdef OPENSSL_SYS_WINDOWS
348                 int timeout = data->socket_timeout.tv_sec * 1000 +
349                             data->socket_timeout.tv_usec / 1000;
350                 if (setsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO,
351                             (void*)&timeout, sizeof(timeout)) < 0
352                     { perror("setsockopt"); }
353             #else
354                 if (setsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO, &(data->socket
355                             sizeof(struct timeval)) < 0)
356                     { perror("setsockopt"); }
357             #endif
358         }
359     #endif
360 }

362 static int dgram_read(BIO *b, char *out, int outl)
363 {
364     int ret=0;
365     bio_dgram_data *data = (bio_dgram_data *)b->ptr;

367     struct {
368         /*
369          * See commentary in b_sock.c. <appro>
370          */
371         union { size_t s; int i; } len;
372         union {
373             struct sockaddr sa;
374             struct sockaddr_in sa_in;
375             #if OPENSSL_USE_IPV6
376                 struct sockaddr_in6 sa_in6;
377             #endif
378         } peer;
379     } sa;

381     sa.len.s=0;
382     sa.len.i=sizeof(sa.peer);

384     if (out != NULL)
385     {
386         clear_socket_error();
387         memset(&sa.peer, 0x00, sizeof(sa.peer));
388         dgram_adjust_rcv_timeout(b);
389         ret=recvfrom(b->num,out,outl,0,&sa.peer.sa,(void *)&sa.len);
390         if (sizeof(sa.len.i)!=sizeof(sa.len.s) && sa.len.i==0)
391             {

```

```

392         OPENSSL_assert(sa.len.s<=sizeof(sa.peer));
393         sa.len.i = (int)sa.len.s;
394     }
395
396     if ( ! data->connected && ret >= 0)
397         BIO_ctrl(b, BIO_CTRL_DGRAM_SET_PEER, 0, &sa.peer);
398
399     BIO_clear_retry_flags(b);
400     if (ret < 0)
401     {
402         if (BIO_dgram_should_retry(ret))
403         {
404             BIO_set_retry_read(b);
405             data->errno = get_last_socket_error();
406         }
407     }
408
409     dgram_reset_rcv_timeout(b);
410 }
411 return(ret);
412 }
413
414 static int dgram_write(BIO *b, const char *in, int inl)
415 {
416     int ret;
417     bio_dgram_data *data = (bio_dgram_data *)b->ptr;
418     clear_socket_error();
419
420     if ( data->connected )
421         ret=writesocket(b->num,in,inl);
422     else
423     {
424         int peerlen = sizeof(data->peer);
425
426         if (data->peer.sa.sa_family == AF_INET)
427             peerlen = sizeof(data->peer.sa_in);
428         #if OPENSSL_USE_IPV6
429         else if (data->peer.sa.sa_family == AF_INET6)
430             peerlen = sizeof(data->peer.sa_in6);
431         #endif
432         #if defined(NETWARE_CLIB) && defined(NETWARE_BSDSOCK)
433         ret=sendto(b->num, (char *)in, inl, 0, &data->peer.sa, peerlen);
434         #else
435         ret=sendto(b->num, in, inl, 0, &data->peer.sa, peerlen);
436         #endif
437     }
438
439     BIO_clear_retry_flags(b);
440     if (ret <= 0)
441     {
442         if (BIO_dgram_should_retry(ret))
443         {
444             BIO_set_retry_write(b);
445             data->errno = get_last_socket_error();
446         }
447     }
448     #if 0 /* higher layers are responsible for querying MTU, if necessary */
449     if ( data->errno == EMSGSIZE)
450         /* retrieve the new MTU */
451         BIO_ctrl(b, BIO_CTRL_DGRAM_QUERY_MTU, 0, NULL);
452     #endif
453 }
454 return(ret);
455 }
456
457 static long dgram_ctrl(BIO *b, int cmd, long num, void *ptr)

```

```

458     {
459         long ret=1;
460         int *ip;
461         struct sockaddr *to = NULL;
462         bio_dgram_data *data = NULL;
463         #if defined(OPENSSL_SYS_LINUX) && (defined(IP_MTU_DISCOVER) || defined(IP_MTU))
464         int sockopt_val = 0;
465         socklen_t sockopt_len; /* assume that system supporting IP_MTU is
466                                * modern enough to define socklen_t */
467         socklen_t addr_len;
468         union
469         {
470             struct sockaddr sa;
471             struct sockaddr_in s4;
472             struct sockaddr_in6 s6;
473         } addr;
474     }
475     #endif
476
477     data = (bio_dgram_data *)b->ptr;
478
479     switch (cmd)
480     {
481     case BIO_CTRL_RESET:
482         num=0;
483     case BIO_C_FILE_SEEK:
484         ret=0;
485         break;
486     case BIO_C_FILE_TELL:
487     case BIO_CTRL_INFO:
488         ret=0;
489         break;
490     case BIO_C_SET_FD:
491         dgram_clear(b);
492         b->num= *(int *)ptr;
493         b->shutdown=(int)num;
494         b->init=1;
495         break;
496     case BIO_C_GET_FD:
497         if (b->init)
498         {
499             ip=(int *)ptr;
500             if (ip != NULL) *ip=b->num;
501             ret=b->num;
502         }
503         else
504             ret= -1;
505         break;
506     case BIO_CTRL_GET_CLOSE:
507         ret=b->shutdown;
508         break;
509     case BIO_CTRL_SET_CLOSE:
510         b->shutdown=(int)num;
511         break;
512     case BIO_CTRL_PENDING:
513     case BIO_CTRL_WPENDING:
514         ret=0;
515         break;
516     case BIO_CTRL_DUP:
517     case BIO_CTRL_FLUSH:
518         ret=1;
519         break;
520     case BIO_CTRL_DGRAM_CONNECT:
521         to = (struct sockaddr *)ptr;
522         #if 0
523         if (connect(b->num, to, sizeof(struct sockaddr)) < 0)

```

```

524         { perror("connect"); ret = 0; }
525     else
526     {
527 #endif
528         switch (to->sa_family)
529         {
530             case AF_INET:
531                 memcpy(&data->peer, to, sizeof(data->peer));
532                 break;
533 #if OPENSSL_USE_IPV6
534             case AF_INET6:
535                 memcpy(&data->peer, to, sizeof(data->peer));
536                 break;
537 #endif
538             default:
539                 memcpy(&data->peer, to, sizeof(data->peer));
540                 break;
541         }
542 #if 0
543     }
544 #endif
545     break;
546     /* (Linux)kernel sets DF bit on outgoing IP packets */
547     case BIO_CTRL_DGRAM_MTU_DISCOVER:
548 #if defined(OPENSSL_SYS_LINUX) && defined(IP_MTU_DISCOVER) && defined(IP_PMTUDIS
549     addr_len = (socklen_t)sizeof(addr);
550     memset((void *)&addr, 0, sizeof(addr));
551     if (getsockname(b->num, &addr.sa, &addr_len) < 0)
552     {
553         ret = 0;
554         break;
555     }
556     switch (addr.sa.sa_family)
557     {
558     case AF_INET:
559         sockopt_val = IP_PMTUDISC_D0;
560         if ((ret = setsockopt(b->num, IPPROTO_IP, IP_MTU_DISCOVER,
561             &sockopt_val, sizeof(sockopt_val))) < 0)
562             perror("setsockopt");
563         break;
564 #if OPENSSL_USE_IPV6 && defined(IPV6_MTU_DISCOVER) && defined(IPV6_PMTUDISC_D0)
565     case AF_INET6:
566         sockopt_val = IPV6_PMTUDISC_D0;
567         if ((ret = setsockopt(b->num, IPPROTO_IPV6, IPV6_MTU_DISCOVER,
568             &sockopt_val, sizeof(sockopt_val))) < 0)
569             perror("setsockopt");
570         break;
571 #endif
572     default:
573         ret = -1;
574         break;
575     }
576     ret = -1;
577 #else
578     break;
579 #endif
580     case BIO_CTRL_DGRAM_QUERY_MTU:
581 #if defined(OPENSSL_SYS_LINUX) && defined(IP_MTU)
582     addr_len = (socklen_t)sizeof(addr);
583     memset((void *)&addr, 0, sizeof(addr));
584     if (getsockname(b->num, &addr.sa, &addr_len) < 0)
585     {
586         ret = 0;
587         break;
588     }
589     sockopt_len = sizeof(sockopt_val);

```

```

590     switch (addr.sa.sa_family)
591     {
592     case AF_INET:
593         if ((ret = getsockopt(b->num, IPPROTO_IP, IP_MTU, (void
594             &sockopt_len)) < 0 || sockopt_val < 0)
595         {
596             ret = 0;
597         }
598     else
599     {
600         /* we assume that the transport protocol is UDP
601         * IP options are used.
602         */
603         data->mtu = sockopt_val - 8 - 20;
604         ret = data->mtu;
605     }
606     break;
607 #if OPENSSL_USE_IPV6 && defined(IPV6_MTU)
608     case AF_INET6:
609         if ((ret = getsockopt(b->num, IPPROTO_IPV6, IPV6_MTU, (v
610             &sockopt_len)) < 0 || sockopt_val < 0)
611         {
612             ret = 0;
613         }
614     else
615     {
616         /* we assume that the transport protocol is UDP
617         * IPV6 options are used.
618         */
619         data->mtu = sockopt_val - 8 - 40;
620         ret = data->mtu;
621     }
622     break;
623 #endif
624     default:
625         ret = 0;
626         break;
627     }
628 #else
629     ret = 0;
630 #endif
631     break;
632     case BIO_CTRL_DGRAM_GET_FALLBACK_MTU:
633     switch (data->peer.sa.sa_family)
634     {
635     case AF_INET:
636         ret = 576 - 20 - 8;
637         break;
638 #if OPENSSL_USE_IPV6
639     case AF_INET6:
640 #ifdef IN6_IS_ADDR_V4MAPPED
641         if (IN6_IS_ADDR_V4MAPPED(&data->peer.sa_in6.sin6
642             ret = 576 - 20 - 8;
643         else
644             ret = 1280 - 40 - 8;
645         break;
646 #endif
647 #endif
648     default:
649         ret = 576 - 20 - 8;
650         break;
651     }
652     break;
653     case BIO_CTRL_DGRAM_GET_MTU:
654     return data->mtu;
655     break;

```



```

656     case BIO_CTRL_DGRAM_SET_MTU:
657         data->mtu = num;
658         ret = num;
659         break;
660     case BIO_CTRL_DGRAM_SET_CONNECTED:
661         to = (struct sockaddr *)ptr;
662
663         if (to != NULL)
664         {
665             data->connected = 1;
666             switch (to->sa_family)
667             {
668                 case AF_INET:
669                     memcpy(&data->peer, to, sizeof(data->peer));
670                     break;
671 #if OPENSSL_USE_IPV6
672                 case AF_INET6:
673                     memcpy(&data->peer, to, sizeof(data->peer));
674                     break;
675 #endif
676                 default:
677                     memcpy(&data->peer, to, sizeof(data->peer));
678                     break;
679             }
680         }
681         else
682         {
683             data->connected = 0;
684             memset(&(data->peer), 0x00, sizeof(data->peer));
685         }
686         break;
687     case BIO_CTRL_DGRAM_GET_PEER:
688         switch (data->peer.sa.sa_family)
689         {
690             case AF_INET:
691                 ret = sizeof(data->peer.sa_in);
692                 break;
693 #if OPENSSL_USE_IPV6
694             case AF_INET6:
695                 ret = sizeof(data->peer.sa_in6);
696                 break;
697 #endif
698             default:
699                 ret = sizeof(data->peer.sa);
700                 break;
701         }
702         if (num == 0 || num > ret)
703             num = ret;
704         memcpy(ptr, &data->peer, (ret = num));
705         break;
706     case BIO_CTRL_DGRAM_SET_PEER:
707         to = (struct sockaddr *)ptr;
708         switch (to->sa_family)
709         {
710             case AF_INET:
711                 memcpy(&data->peer, to, sizeof(data->peer.sa_in));
712                 break;
713 #if OPENSSL_USE_IPV6
714             case AF_INET6:
715                 memcpy(&data->peer, to, sizeof(data->peer.sa_in6));
716                 break;
717 #endif
718             default:
719                 memcpy(&data->peer, to, sizeof(data->peer.sa));
720                 break;
721         }

```

```

722         break;
723     case BIO_CTRL_DGRAM_SET_NEXT_TIMEOUT:
724         memcpy(&(data->next_timeout), ptr, sizeof(struct timeval));
725         break;
726 #if defined(SO_RCVTIMEO)
727     case BIO_CTRL_DGRAM_SET_RECV_TIMEOUT:
728 #ifdef OPENSSL_SYS_WINDOWS
729     {
730         struct timeval *tv = (struct timeval *)ptr;
731         int timeout = tv->tv_sec * 1000 + tv->tv_usec/1000;
732         if (setsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO,
733             (void*)&timeout, sizeof(timeout)) < 0)
734             { perror("setsockopt"); ret = -1; }
735     }
736 #else
737     if (setsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO, ptr,
738         sizeof(struct timeval)) < 0)
739         { perror("setsockopt"); ret = -1; }
740 #endif
741     break;
742     case BIO_CTRL_DGRAM_GET_RECV_TIMEOUT:
743     {
744         union { size_t s; int i; } sz = {0};
745 #ifdef OPENSSL_SYS_WINDOWS
746         int timeout;
747         struct timeval *tv = (struct timeval *)ptr;
748
749         sz.i = sizeof(timeout);
750         if (getsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO,
751             (void*)&timeout, &sz.i) < 0)
752             { perror("getsockopt"); ret = -1; }
753         else
754         {
755             tv->tv_sec = timeout / 1000;
756             tv->tv_usec = (timeout % 1000) * 1000;
757             ret = sizeof(*tv);
758         }
759 #else
760         sz.i = sizeof(struct timeval);
761         if (getsockopt(b->num, SOL_SOCKET, SO_RCVTIMEO,
762             ptr, (void *)&sz) < 0)
763             { perror("getsockopt"); ret = -1; }
764         else if (sizeof(sz.s) != sizeof(sz.i) && sz.i == 0)
765         {
766             OPENSSL_assert(sz.s <= sizeof(struct timeval));
767             ret = (int)sz.s;
768         }
769         else
770             ret = sz.i;
771 #endif
772     }
773     break;
774 #endif
775 #if defined(SO_SNDBTIMEO)
776     case BIO_CTRL_DGRAM_SET_SEND_TIMEOUT:
777 #ifdef OPENSSL_SYS_WINDOWS
778     {
779         struct timeval *tv = (struct timeval *)ptr;
780         int timeout = tv->tv_sec * 1000 + tv->tv_usec/1000;
781         if (setsockopt(b->num, SOL_SOCKET, SO_SNDBTIMEO,
782             (void*)&timeout, sizeof(timeout)) < 0)
783             { perror("setsockopt"); ret = -1; }
784     }
785 #else
786     if (setsockopt(b->num, SOL_SOCKET, SO_SNDBTIMEO, ptr,
787         sizeof(struct timeval)) < 0)

```

```

788         { perror("setsockopt"); ret = -1; }
789     #endif
790     break;
791     case BIO_CTRL_DGRAM_GET_SEND_TIMEOUT:
792     {
793         union { size_t s; int i; } sz = {0};
794         #ifdef OPENSSL_SYS_WINDOWS
795             int timeout;
796             struct timeval *tv = (struct timeval *)ptr;
798             sz.i = sizeof(timeout);
799             if (getsockopt(b->num, SOL_SOCKET, SO_SNDTIMEO,
800                 (void*)&timeout, &sz.i) < 0)
801                 { perror("getsockopt"); ret = -1; }
802             else
803             {
804                 tv->tv_sec = timeout / 1000;
805                 tv->tv_usec = (timeout % 1000) * 1000;
806                 ret = sizeof(*tv);
807             }
808         #else
809             sz.i = sizeof(struct timeval);
810             if (getsockopt(b->num, SOL_SOCKET, SO_SNDTIMEO,
811                 ptr, (void *)&sz) < 0)
812                 { perror("getsockopt"); ret = -1; }
813             else if (sizeof(sz.s) != sizeof(sz.i) && sz.i == 0)
814             {
815                 OPENSSL_assert(sz.s <= sizeof(struct timeval));
816                 ret = (int)sz.s;
817             }
818             else
819                 ret = sz.i;
820         #endif
821     }
822     break;
823 #endif
824     case BIO_CTRL_DGRAM_GET_SEND_TIMER_EXP:
825         /* fall-through */
826     case BIO_CTRL_DGRAM_GET_RECV_TIMER_EXP:
827         #ifdef OPENSSL_SYS_WINDOWS
828             if (data->errno == WSAETIMEDOUT)
829         #else
830             if (data->errno == EAGAIN)
831         #endif
832         {
833             ret = 1;
834             data->errno = 0;
835         }
836         else
837             ret = 0;
838         break;
839 #ifdef EMMSGSIZE
840     case BIO_CTRL_DGRAM_MTU_EXCEEDED:
841         if (data->errno == EMMSGSIZE)
842         {
843             ret = 1;
844             data->errno = 0;
845         }
846         else
847             ret = 0;
848         break;
849 #endif
850     default:
851         ret=0;
852         break;
853 }

```

```

854     return(ret);
855 }
857 static int dgram_puts(BIO *bp, const char *str)
858 {
859     int n,ret;
861     n=strlen(str);
862     ret=dgram_write(bp,str,n);
863     return(ret);
864 }
866 #ifndef OPENSSL_NO_SCTP
867 BIO_METHOD *BIO_s_datagram_sctp(void)
868 {
869     return(&methods_dgram_sctp);
870 }
872 BIO *BIO_new_dgram_sctp(int fd, int close_flag)
873 {
874     BIO *bio;
875     int ret, optval = 20000;
876     int auth_data = 0, auth_forward = 0;
877     unsigned char *p;
878     struct sctp_authchunk auth;
879     struct sctp_authchunks *authchunks;
880     socklen_t sockopt_len;
881     #ifdef SCTP_AUTHENTICATION_EVENT
882     #ifdef SCTP_EVENT
883         struct sctp_event event;
884     #else
885         struct sctp_event_subscribe event;
886     #endif
887     #endif
889     bio=BIO_new(BIO_s_datagram_sctp());
890     if (bio == NULL) return(NULL);
891     BIO_set_fd(bio,fd,close_flag);
893     /* Activate SCTP-AUTH for DATA and FORWARD-TSN chunks */
894     auth.sauth_chunk = OPENSSL_SCTP_DATA_CHUNK_TYPE;
895     ret = setsockopt(fd, IPPROTO_SCTP, SCTP_AUTH_CHUNK, &auth, sizeof(struct
896     OPENSSL_assert(ret >= 0);
897     auth.sauth_chunk = OPENSSL_SCTP_FORWARD_CUM_TSN_CHUNK_TYPE;
898     ret = setsockopt(fd, IPPROTO_SCTP, SCTP_AUTH_CHUNK, &auth, sizeof(struct
899     OPENSSL_assert(ret >= 0);
901     /* Test if activation was successful. When using accept(),
902     * SCTP-AUTH has to be activated for the listening socket
903     * already, otherwise the connected socket won't use it. */
904     sockopt_len = (socklen_t)(sizeof(sctp_assoc_t) + 256 * sizeof(uint8_t));
905     authchunks = OPENSSL_malloc(sockopt_len);
906     memset(authchunks, 0, sizeof(sockopt_len));
907     ret = getsockopt(fd, IPPROTO_SCTP, SCTP_LOCAL_AUTH_CHUNKS, authchunks, &
908     OPENSSL_assert(ret >= 0);
910     for (p = (unsigned char*) authchunks->gauth_chunks;
911         p < (unsigned char*) authchunks + sockopt_len;
912         p += sizeof(uint8_t))
913     {
914         if (*p == OPENSSL_SCTP_DATA_CHUNK_TYPE) auth_data = 1;
915         if (*p == OPENSSL_SCTP_FORWARD_CUM_TSN_CHUNK_TYPE) auth_forward
916     }
917
918     OPENSSL_free(authchunks);

```

```

920     OPENSSL_assert(auth_data);
921     OPENSSL_assert(auth_forward);

923 #ifdef Sctp_AUTHENTICATION_EVENT
924 #ifdef Sctp_EVENT
925     memset(&event, 0, sizeof(struct sctp_event));
926     event.se_assoc_id = 0;
927     event.se_type = Sctp_AUTHENTICATION_EVENT;
928     event.se_on = 1;
929     ret = setsockopt(fd, IPPROTO_SCTP, Sctp_EVENT, &event, sizeof(struct sct
930     OPENSSL_assert(ret >= 0);
931 #else
932     sockopt_len = (socklen_t) sizeof(struct sctp_event_subscribe);
933     ret = getsockopt(fd, IPPROTO_SCTP, Sctp_EVENTS, &event, &sockopt_len);
934     OPENSSL_assert(ret >= 0);

936     event.sctp_authentication_event = 1;

938     ret = setsockopt(fd, IPPROTO_SCTP, Sctp_EVENTS, &event, sizeof(struct sc
939     OPENSSL_assert(ret >= 0);
940 #endif
941 #endif

943     /* Disable partial delivery by setting the min size
944     * larger than the max record size of 2^14 + 2048 + 13
945     */
946     ret = setsockopt(fd, IPPROTO_SCTP, Sctp_PARTIAL_DELIVERY_POINT, &optval,
947     OPENSSL_assert(ret >= 0);

949     return(bio);
950 }

952 int BIO_dgram_is_sctp(BIO *bio)
953 {
954     return (BIO_method_type(bio) == BIO_TYPE_DGRAM_SCTP);
955 }

957 static int dgram_sctp_new(BIO *bi)
958 {
959     bio_dgram_sctp_data *data = NULL;

961     bi->init=0;
962     bi->num=0;
963     data = OPENSSL_malloc(sizeof(bio_dgram_sctp_data));
964     if (data == NULL)
965         return 0;
966     memset(data, 0x00, sizeof(bio_dgram_sctp_data));
967 #ifdef Sctp_PR_SCTP_NONE
968     data->prinfo.pr_policy = Sctp_PR_SCTP_NONE;
969 #endif
970     bi->ptr = data;

972     bi->flags=0;
973     return(1);
974 }

976 static int dgram_sctp_free(BIO *a)
977 {
978     bio_dgram_sctp_data *data;

980     if (a == NULL) return(0);
981     if (! dgram_clear(a))
982         return 0;

984     data = (bio_dgram_sctp_data *)a->ptr;
985     if(data != NULL) OPENSSL_free(data);

```

```

987     return(1);
988 }

990 #ifdef Sctp_AUTHENTICATION_EVENT
991 void dgram_sctp_handle_auth_free_key_event(BIO *b, union sctp_notification *snp)
992 {
993     int ret;
994     struct sctp_authkey_event* authkeyevent = &snp->sn_auth_event;

996     if (authkeyevent->auth_indication == Sctp_AUTH_FREE_KEY)
997     {
998         struct sctp_authkeyid authkeyid;

1000         /* delete key */
1001         authkeyid.scact_keynumber = authkeyevent->auth_keynumber;
1002         ret = setsockopt(b->num, IPPROTO_SCTP, Sctp_AUTH_DELETE_KEY,
1003         &authkeyid, sizeof(struct sctp_authkeyid));
1004     }
1005 }
1006 #endif

1008 static int dgram_sctp_read(BIO *b, char *out, int outl)
1009 {
1010     int ret = 0, n = 0, i, optval;
1011     socklen_t optlen;
1012     bio_dgram_sctp_data *data = (bio_dgram_sctp_data *)b->ptr;
1013     union sctp_notification *snp;
1014     struct msghdr msg;
1015     struct iovec iov;
1016     struct cmsghdr *cmsg;
1017     char cmsgbuf[512];

1019     if (out != NULL)
1020     {
1021         clear_socket_error();

1023         do
1024         {
1025             memset(&data->rcvinfo, 0x00, sizeof(struct bio_dgram_sct
1026             iov.iov_base = out;
1027             iov.iov_len = outl;
1028             msg.msg_name = NULL;
1029             msg.msg_namelen = 0;
1030             msg.msg_iov = &iov;
1031             msg.msg_iovlen = 1;
1032             msg.msg_control = cmsgbuf;
1033             msg.msg_controllen = 512;
1034             msg.msg_flags = 0;
1035             n = recvmmsg(b->num, &msg, 0);

1037             if (msg.msg_controllen > 0)
1038             {
1039                 for (cmsg = CMSG_FIRSTHDR(&msg); cmsg; cmsg = CM
1040                 {
1041                     if (cmsg->cmsg_level != IPPROTO_SCTP)
1042                         continue;
1043 #ifdef Sctp_RCVINFO
1044                     if (cmsg->cmsg_type == Sctp_RCVINFO)
1045                     {
1046                         struct sctp_rcvinfo *rcvinfo;

1048                         rcvinfo = (struct sctp_rcvinfo *
1049                         data->rcvinfo.rcv_sid = rcvinfo-
1050                         data->rcvinfo.rcv_ssn = rcvinfo-
1051                         data->rcvinfo.rcv_flags = rcvinfo-

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```

1052         data->rcvinfo.rcv_ppid = rcvinfo
1053         data->rcvinfo.rcv_tsn = rcvinfo-
1054         data->rcvinfo.rcv_cumtsn = rcvin
1055         data->rcvinfo.rcv_context = rcvi
1056     }
1057 #endif
1058 #ifdef Sctp_Sndrcv
1059     if (cmsg->cmsg_type == Sctp_Sndrcv)
1060     {
1061         struct sctp_sndrcvinfo *sndrcvin
1062
1063         sndrcvin = (struct sctp_sndrcv
1064         data->rcvinfo.rcv_sid = sndrcvin
1065         data->rcvinfo.rcv_ssn = sndrcvin
1066         data->rcvinfo.rcv_flags = sndrcv
1067         data->rcvinfo.rcv_ppid = sndrcvi
1068         data->rcvinfo.rcv_tsn = sndrcvin
1069         data->rcvinfo.rcv_cumtsn = sndrc
1070         data->rcvinfo.rcv_context = sndr
1071     }
1072 #endif
1073     }
1074
1075     if (n <= 0)
1076     {
1077         if (n < 0)
1078             ret = n;
1079         break;
1080     }
1081
1082     if (msg.msg_flags & MSG_NOTIFICATION)
1083     {
1084         snp = (union sctp_notification*) out;
1085         if (snp->sn_header.sn_type == Sctp_Sender_Dry_Ev
1086         {
1087             struct sctp_event event;
1088
1089             struct sctp_event_subscribe event;
1090             socklen_t eventsz;
1091
1092             /* If a message has been delayed until t
1093              * is dry, it can be sent now.
1094              */
1095             if (data->saved_message.length > 0)
1096             {
1097                 dgram_sctp_write(data->saved_mes
1098                 data->saved_mes
1099                 OPENSSL_free(data->saved_message
1100                 data->saved_message.length = 0;
1101             }
1102
1103             /* disable sender dry event */
1104
1105             memset(&event, 0, sizeof(struct sctp_eve
1106             event.se_assoc_id = 0;
1107             event.se_type = Sctp_Sender_Dry_Event;
1108             event.se_on = 0;
1109             i = setsockopt(b->num, IPPROTO_SCTP, SCT
1110             OPENSSL_assert(i >= 0);
1111
1112             eventsz = sizeof(struct sctp_event_sub
1113             i = setsockopt(b->num, IPPROTO_SCTP, SCT
1114             OPENSSL_assert(i >= 0);

```

```

1118         event.sctp_sender_dry_event = 0;
1119
1120         i = setsockopt(b->num, IPPROTO_SCTP, SCT
1121         OPENSSL_assert(i >= 0);
1122 #endif
1123     }
1124
1125 #ifdef Sctp_Authentication_Event
1126     if (snp->sn_header.sn_type == Sctp_Authenticatio
1127         dgram_sctp_handle_auth_free_key_event(b,
1128 #endif
1129
1130     if (data->handle_notifications != NULL)
1131         data->handle_notifications(b, data->noti
1132
1133         memset(out, 0, outl);
1134     }
1135     else
1136         ret += n;
1137 }
1138
1139 while ((msg.msg_flags & MSG_NOTIFICATION) && (msg.msg_flags & MS
1140
1141 if (ret > 0 && !(msg.msg_flags & MSG_EOR))
1142 {
1143     /* Partial message read, this should never happen! */
1144
1145     /* The buffer was too small, this means the peer sent
1146     * a message that was larger than allowed. */
1147     if (ret == outl)
1148         return -1;
1149
1150     /* Test if socket buffer can handle max record
1151     * size (2^14 + 2048 + 13)
1152     */
1153     optlen = (socklen_t) sizeof(int);
1154     ret = getsockopt(b->num, SOL_SOCKET, SO_RCVBUF, &optval,
1155     OPENSSL_assert(ret >= 0);
1156     OPENSSL_assert(optval >= 18445);
1157
1158     /* Test if SCTP doesn't partially deliver below
1159     * max record size (2^14 + 2048 + 13)
1160     */
1161     optlen = (socklen_t) sizeof(int);
1162     ret = getsockopt(b->num, IPPROTO_SCTP, Sctp_Partial_Deli
1163     &optval, &optlen);
1164     OPENSSL_assert(ret >= 0);
1165     OPENSSL_assert(optval >= 18445);
1166
1167     /* Partially delivered notification??? Probably a bug...
1168     OPENSSL_assert(!(msg.msg_flags & MSG_NOTIFICATION));
1169
1170     /* Everything seems ok till now, so it's most likely
1171     * a message dropped by PR-SCTP.
1172     */
1173     memset(out, 0, outl);
1174     BIO_set_retry_read(b);
1175     return -1;
1176 }
1177
1178 BIO_clear_retry_flags(b);
1179 if (ret < 0)
1180 {
1181     if (BIO_dgram_should_retry(ret))
1182     {
1183         BIO_set_retry_read(b);
1184         data->errno = get_last_socket_error();

```

```

1184     }
1185 }
1186
1187 /* Test if peer uses SCTP-AUTH before continuing */
1188 if (!data->peer_auth_tested)
1189 {
1190     int ii, auth_data = 0, auth_forward = 0;
1191     unsigned char *p;
1192     struct sctp_authchunks *authchunks;
1193
1194     optlen = (socklen_t)(sizeof(sctp_assoc_t) + 256 * sizeof
1195 authchunks = OPENSSL_malloc(optlen);
1196 memset(authchunks, 0, sizeof(optlen));
1197 ii = getsockopt(b->num, IPPROTO_SCTP, SCTP_PEER_AUTH_CHUNK
1198 OPENSSL_assert(ii >= 0);
1199
1200     for (p = (unsigned char*) authchunks->gauth_chunks;
1201          p < (unsigned char*) authchunks + optlen;
1202          p += sizeof(uint8_t))
1203     {
1204         if (*p == OPENSSL_SCTP_DATA_CHUNK_TYPE) auth_dat
1205         if (*p == OPENSSL_SCTP_FORWARD_CUM_TSN_CHUNK_TYP
1206     }
1207
1208     OPENSSL_free(authchunks);
1209
1210     if (!auth_data || !auth_forward)
1211     {
1212         BIOerr(BIO_F_DGRAM_SCTP_READ, BIO_R_CONNECT_ERROR
1213         return -1;
1214     }
1215
1216     data->peer_auth_tested = 1;
1217 }
1218
1219 return(ret);
1220 }
1221
1222 static int dgram_sctp_write(BIO *b, const char *in, int inl)
1223 {
1224     int ret;
1225     bio_dgram_sctp_data *data = (bio_dgram_sctp_data *)b->ptr;
1226     struct bio_dgram_sctp_sndinfo *sinfo = &(data->sndinfo);
1227     struct bio_dgram_sctp_prinfo *pinfo = &(data->prinfo);
1228     struct bio_dgram_sctp_sndinfo handshake_sinfo;
1229     struct iovec iov[1];
1230     struct msghdr msg;
1231     struct cmsghdr *cmsg;
1232     #if defined(SCTP_SNDFINFO) && defined(SCTP_PRINFO)
1233     char cmsgbuf[CMMSG_SPACE(sizeof(struct sctp_sndinfo)) + CMMSG_SPACE(sizeof
1234     struct sctp_sndinfo *sndinfo;
1235     struct sctp_prinfo *prinfo;
1236     #else
1237     char cmsgbuf[CMMSG_SPACE(sizeof(struct sctp_sndrcvinfo))];
1238     struct sctp_sndrcvinfo *sndrcvinfo;
1239     #endif
1240
1241     clear_socket_error();
1242
1243     /* If we're send anything else than application data,
1244      * disable all user parameters and flags.
1245      */
1246     if (in[0] != 23) {
1247         memset(&handshake_sinfo, 0x00, sizeof(struct bio_dgram_sctp_sndi
1248     #ifdef SCTP_SACK_IMMEDIATELY
1249         handshake_sinfo.snd_flags = SCTP_SACK_IMMEDIATELY;

```

```

1250 #endif
1251     sinfo = &handshake_sinfo;
1252 }
1253
1254 /* If we have to send a shutdown alert message and the
1255  * socket is not dry yet, we have to save it and send it
1256  * as soon as the socket gets dry.
1257  */
1258 if (data->save_shutdown && !BIO_dgram_sctp_wait_for_dry(b))
1259 {
1260     data->saved_message.bio = b;
1261     data->saved_message.length = inl;
1262     data->saved_message.data = OPENSSL_malloc(inl);
1263     memcpy(data->saved_message.data, in, inl);
1264     return inl;
1265 }
1266
1267 iov[0].iov_base = (char *)in;
1268 iov[0].iov_len = inl;
1269 msg.msg_name = NULL;
1270 msg.msg_namelen = 0;
1271 msg.msg_iov = iov;
1272 msg.msg_iovlen = 1;
1273 msg.msg_control = (caddr_t)cmsgbuf;
1274 msg.msg_controllen = 0;
1275 msg.msg_flags = 0;
1276 #if defined(SCTP_SNDFINFO) && defined(SCTP_PRINFO)
1277 cmsg = (struct cmsghdr *)cmsgbuf;
1278 cmsg->cmsg_level = IPPROTO_SCTP;
1279 cmsg->cmsg_type = SCTP_SNDFINFO;
1280 cmsg->cmsg_len = CMMSG_LEN(sizeof(struct sctp_sndinfo));
1281 sndinfo = (struct sctp_sndinfo *)CMMSG_DATA(cmsg);
1282 memset(sndinfo, 0, sizeof(struct sctp_sndinfo));
1283 sndinfo->snd_sid = sinfo->snd_sid;
1284 sndinfo->snd_flags = sinfo->snd_flags;
1285 sndinfo->snd_ppid = sinfo->snd_ppid;
1286 sndinfo->snd_context = sinfo->snd_context;
1287 msg.msg_controllen += CMMSG_SPACE(sizeof(struct sctp_sndinfo));
1288
1289 cmsg = (struct cmsghdr *)&cmsgbuf[CMMSG_SPACE(sizeof(struct sctp_sndinfo)
1290 cmsg->cmsg_level = IPPROTO_SCTP;
1291 cmsg->cmsg_type = SCTP_PRINFO;
1292 cmsg->cmsg_len = CMMSG_LEN(sizeof(struct sctp_prinfo));
1293 prinfo = (struct sctp_prinfo *)CMMSG_DATA(cmsg);
1294 memset(prinfo, 0, sizeof(struct sctp_prinfo));
1295 prinfo->pr_policy = pinfo->pr_policy;
1296 prinfo->pr_value = pinfo->pr_value;
1297 msg.msg_controllen += CMMSG_SPACE(sizeof(struct sctp_prinfo));
1298 #else
1299 cmsg = (struct cmsghdr *)cmsgbuf;
1300 cmsg->cmsg_level = IPPROTO_SCTP;
1301 cmsg->cmsg_type = SCTP_SNDRCV;
1302 cmsg->cmsg_len = CMMSG_LEN(sizeof(struct sctp_sndrcvinfo));
1303 sndrcvinfo = (struct sctp_sndrcvinfo *)CMMSG_DATA(cmsg);
1304 memset(sndrcvinfo, 0, sizeof(struct sctp_sndrcvinfo));
1305 sndrcvinfo->sinfo_stream = sinfo->snd_sid;
1306 sndrcvinfo->sinfo_flags = sinfo->snd_flags;
1307 #ifdef _FreeBSD_
1308 sndrcvinfo->sinfo_flags |= pinfo->pr_policy;
1309 #endif
1310 sndrcvinfo->sinfo_ppid = sinfo->snd_ppid;
1311 sndrcvinfo->sinfo_context = sinfo->snd_context;
1312 sndrcvinfo->sinfo_timetolive = pinfo->pr_value;
1313 msg.msg_controllen += CMMSG_SPACE(sizeof(struct sctp_sndrcvinfo));
1314 #endif

```

```

1316     ret = sendmsg(b->num, &msg, 0);
1318     BIO_clear_retry_flags(b);
1319     if (ret <= 0)
1320     {
1321         if (BIO_dgram_should_retry(ret))
1322         {
1323             BIO_set_retry_write(b);
1324             data->errno = get_last_socket_error();
1325         }
1326     }
1327     return(ret);
1328 }

1330 static long dgram_sctp_ctrl(BIO *b, int cmd, long num, void *ptr)
1331 {
1332     long ret=1;
1333     bio_dgram_sctp_data *data = NULL;
1334     socklen_t sockopt_len = 0;
1335     struct sctp_authkeyid authkeyid;
1336     struct sctp_authkey *authkey;

1338     data = (bio_dgram_sctp_data *)b->ptr;

1340     switch (cmd)
1341     {
1342     case BIO_CTRL_DGRAM_QUERY_MTU:
1343         /* Set to maximum (2^14)
1344          * and ignore user input to enable transport
1345          * protocol fragmentation.
1346          * Returns always 2^14.
1347          */
1348         data->mtu = 16384;
1349         ret = data->mtu;
1350         break;
1351     case BIO_CTRL_DGRAM_SET_MTU:
1352         /* Set to maximum (2^14)
1353          * and ignore input to enable transport
1354          * protocol fragmentation.
1355          * Returns always 2^14.
1356          */
1357         data->mtu = 16384;
1358         ret = data->mtu;
1359         break;
1360     case BIO_CTRL_DGRAM_SET_CONNECTED:
1361     case BIO_CTRL_DGRAM_CONNECT:
1362         /* Returns always -1. */
1363         ret = -1;
1364         break;
1365     case BIO_CTRL_DGRAM_SET_NEXT_TIMEOUT:
1366         /* SCTP doesn't need the DTLS timer
1367          * Returns always 1.
1368          */
1369         break;
1370     case BIO_CTRL_DGRAM_SCTP_SET_IN_HANDSHAKE:
1371         if (num > 0)
1372             data->in_handshake = 1;
1373         else
1374             data->in_handshake = 0;

1376         ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_NODELAY, &data->in_h
1377         break;
1378     case BIO_CTRL_DGRAM_SCTP_ADD_AUTH_KEY:
1379         /* New shared key for SCTP AUTH.
1380          * Returns 0 on success, -1 otherwise.
1381          */

```

```

1383         /* Get active key */
1384         sockopt_len = sizeof(struct sctp_authkeyid);
1385         ret = getsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH_ACTIVE_KEY, &au
1386         if (ret < 0) break;

1388         /* Add new key */
1389         sockopt_len = sizeof(struct sctp_authkey) + 64 * sizeof(uint8_t)
1390         authkey = OPENSSL_malloc(sockopt_len);
1391         memset(authkey, 0x00, sockopt_len);
1392         authkey->sca_keynumber = authkeyid.sact_keynumber + 1;
1393 #ifndef __FreeBSD__
1394         /* This field is missing in FreeBSD 8.2 and earlier,
1395          * and FreeBSD 8.3 and higher work without it.
1396          */
1397         authkey->sca_keylength = 64;
1398 #endif
1399         memcpy(&authkey->sca_key[0], ptr, 64 * sizeof(uint8_t));

1401         ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH_KEY, authkey, s
1402         if (ret < 0) break;

1404         /* Reset active key */
1405         ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH_ACTIVE_KEY,
1406         &authkeyid, sizeof(struct sctp_authkeyid));
1407         if (ret < 0) break;

1409         break;
1410     case BIO_CTRL_DGRAM_SCTP_NEXT_AUTH_KEY:
1411         /* Returns 0 on success, -1 otherwise. */

1413         /* Get active key */
1414         sockopt_len = sizeof(struct sctp_authkeyid);
1415         ret = getsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH_ACTIVE_KEY, &au
1416         if (ret < 0) break;

1418         /* Set active key */
1419         authkeyid.sact_keynumber = authkeyid.sact_keynumber + 1;
1420         ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH_ACTIVE_KEY,
1421         &authkeyid, sizeof(struct sctp_authkeyid));
1422         if (ret < 0) break;

1424         /* CCS has been sent, so remember that and fall through
1425          * to check if we need to deactivate an old key
1426          */
1427         data->ccs_sent = 1;

1429     case BIO_CTRL_DGRAM_SCTP_AUTH_CCS_RCVD:
1430         /* Returns 0 on success, -1 otherwise. */

1432         /* Has this command really been called or is this just a fall-th
1433         if (cmd == BIO_CTRL_DGRAM_SCTP_AUTH_CCS_RCVD)
1434             data->ccs_rcvd = 1;

1436         /* CSS has been both, received and sent, so deactivate an old ke
1437         if (data->ccs_rcvd == 1 && data->ccs_sent == 1)
1438         {
1439             /* Get active key */
1440             sockopt_len = sizeof(struct sctp_authkeyid);
1441             ret = getsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH_ACTIVE_
1442             if (ret < 0) break;

1444             /* Deactivate key or delete second last key if
1445              * SCTP_AUTHENTICATION_EVENT is not available.
1446              */
1447             authkeyid.sact_keynumber = authkeyid.sact_keynumber -

```

```

1448 #ifdef SCTP_AUTH_DEACTIVATE_KEY
1449     sockopt_len = sizeof(struct sctp_authkeyid);
1450     ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH_DEACTIV
1451         &authkeyid, sockopt_len);
1452     if (ret < 0) break;
1453 #endif
1454 #ifndef Sctp_AUTHENTICATION_EVENT
1455     if (authkeyid.scact_keynumber > 0)
1456     {
1457         authkeyid.scact_keynumber = authkeyid.scact_keyn
1458         ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_AUTH
1459             &authkeyid, sizeof(struct sctp_authkey
1460             if (ret < 0) break;
1461         }
1462 #endif

1464         data->ccs_rcvd = 0;
1465         data->ccs_sent = 0;
1466     }
1467     break;
1468 case BIO_CTRL_DGRAM_SCTP_GET_SNDFINFO:
1469     /* Returns the size of the copied struct. */
1470     if (num > (long) sizeof(struct bio_dgram_sctp_sndinfo))
1471         num = sizeof(struct bio_dgram_sctp_sndinfo);

1473     memcpy(ptr, &(data->sndinfo), num);
1474     ret = num;
1475     break;
1476 case BIO_CTRL_DGRAM_SCTP_SET_SNDFINFO:
1477     /* Returns the size of the copied struct. */
1478     if (num > (long) sizeof(struct bio_dgram_sctp_sndinfo))
1479         num = sizeof(struct bio_dgram_sctp_sndinfo);

1481     memcpy(&(data->sndinfo), ptr, num);
1482     break;
1483 case BIO_CTRL_DGRAM_SCTP_GET_RCVINFO:
1484     /* Returns the size of the copied struct. */
1485     if (num > (long) sizeof(struct bio_dgram_sctp_rcvinfo))
1486         num = sizeof(struct bio_dgram_sctp_rcvinfo);

1488     memcpy(ptr, &data->rcvinfo, num);

1490     ret = num;
1491     break;
1492 case BIO_CTRL_DGRAM_SCTP_SET_RCVINFO:
1493     /* Returns the size of the copied struct. */
1494     if (num > (long) sizeof(struct bio_dgram_sctp_rcvinfo))
1495         num = sizeof(struct bio_dgram_sctp_rcvinfo);

1497     memcpy(&(data->rcvinfo), ptr, num);
1498     break;
1499 case BIO_CTRL_DGRAM_SCTP_GET_PRINFO:
1500     /* Returns the size of the copied struct. */
1501     if (num > (long) sizeof(struct bio_dgram_sctp_prinfo))
1502         num = sizeof(struct bio_dgram_sctp_prinfo);

1504     memcpy(ptr, &(data->prinfo), num);
1505     ret = num;
1506     break;
1507 case BIO_CTRL_DGRAM_SCTP_SET_PRINFO:
1508     /* Returns the size of the copied struct. */
1509     if (num > (long) sizeof(struct bio_dgram_sctp_prinfo))
1510         num = sizeof(struct bio_dgram_sctp_prinfo);

1512     memcpy(&(data->prinfo), ptr, num);
1513     break;

```

```

1514 case BIO_CTRL_DGRAM_SCTP_SAVE_SHUTDOWN:
1515     /* Returns always 1. */
1516     if (num > 0)
1517         data->save_shutdown = 1;
1518     else
1519         data->save_shutdown = 0;
1520     break;

1522 default:
1523     /* Pass to default ctrl function to
1524     * process SCTP unspecific commands
1525     */
1526     ret=dgram_ctrl(b, cmd, num, ptr);
1527     break;
1528 }
1529 return(ret);
1530 }

1532 int BIO_dgram_sctp_notification_cb(BIO *b,
1533     void (*handle_notifications)(BIO *bio, void *
1534     void *context)
1535 )
1536 {
1537     bio_dgram_sctp_data *data = (bio_dgram_sctp_data *) b->ptr;
1538     if (handle_notifications != NULL)
1539     {
1540         data->handle_notifications = handle_notifications;
1541         data->notification_context = context;
1542     }
1543     else
1544         return -1;

1546     return 0;
1547 }

1549 int BIO_dgram_sctp_wait_for_dry(BIO *b)
1550 {
1551     int is_dry = 0;
1552     int n, sockflags, ret;
1553     union sctp_notification snp;
1554     struct msghdr msg;
1555     struct iovec iov;
1556 #ifdef SCTP_EVENT
1557     struct sctp_event event;
1558 #else
1559     struct sctp_event_subscribe event;
1560     socklen_t eventsz;
1561 #endif
1562     bio_dgram_sctp_data *data = (bio_dgram_sctp_data *)b->ptr;

1564     /* set sender dry event */
1565 #ifdef SCTP_EVENT
1566     memset(&event, 0, sizeof(struct sctp_event));
1567     event.se_assoc_id = 0;
1568     event.se_type = SCTP_SENDER_DRY_EVENT;
1569     event.se_on = 1;
1570     ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_EVENT, &event, sizeof(struct
1571 #else
1572     eventsz = sizeof(struct sctp_event_subscribe);
1573     ret = getsockopt(b->num, IPPROTO_SCTP, SCTP_EVENTS, &event, &eventsz);
1574     if (ret < 0)
1575         return -1;
1576     event.sctp_sender_dry_event = 1;
1577     ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_EVENTS, &event, sizeof(struc

```

```

1580 #endif
1581     if (ret < 0)
1582         return -1;

1584     /* peek for notification */
1585     memset(&snp, 0x00, sizeof(union sctp_notification));
1586     iov.iov_base = (char *)&snp;
1587     iov.iov_len = sizeof(union sctp_notification);
1588     msg.msg_name = NULL;
1589     msg.msg_namelen = 0;
1590     msg.msg_iov = &iov;
1591     msg.msg_iovlen = 1;
1592     msg.msg_control = NULL;
1593     msg.msg_controllen = 0;
1594     msg.msg_flags = 0;

1596     n = recvmmsg(b->num, &msg, MSG_PEEK);
1597     if (n <= 0)
1598     {
1599         if ((n < 0) && (get_last_socket_error() != EAGAIN) && (get_last_
1600             return -1;
1601     }
1602     else
1603         return 0;

1605     /* if we find a notification, process it and try again if necessary */
1606     while (msg.msg_flags & MSG_NOTIFICATION)
1607     {
1608         memset(&snp, 0x00, sizeof(union sctp_notification));
1609         iov.iov_base = (char *)&snp;
1610         iov.iov_len = sizeof(union sctp_notification);
1611         msg.msg_name = NULL;
1612         msg.msg_namelen = 0;
1613         msg.msg_iov = &iov;
1614         msg.msg_iovlen = 1;
1615         msg.msg_control = NULL;
1616         msg.msg_controllen = 0;
1617         msg.msg_flags = 0;

1619         n = recvmmsg(b->num, &msg, 0);
1620         if (n <= 0)
1621         {
1622             if ((n < 0) && (get_last_socket_error() != EAGAIN) && (g
1623                 return -1;
1624             else
1625                 return is_dry;
1626         }

1627         if (snp.sn_header.sn_type == SCTP_SENDER_DRY_EVENT)
1628         {
1629             is_dry = 1;
1630         }

1632         /* disable sender dry event */
1633 #ifdef SCTP_EVENT
1634         memset(&event, 0, sizeof(struct sctp_event));
1635         event.se_assoc_id = 0;
1636         event.se_type = SCTP_SENDER_DRY_EVENT;
1637         event.se_on = 0;
1638         ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_EVENT, &event
1639 #else
1640         eventsz = (socklen_t) sizeof(struct sctp_event_subscri
1641         ret = getsockopt(b->num, IPPROTO_SCTP, SCTP_EVENTS, &eve
1642         if (ret < 0)
1643             return -1;
1644     }

1645     event.sctp_sender_dry_event = 0;

```

```

1647         ret = setsockopt(b->num, IPPROTO_SCTP, SCTP_EVENTS, &eve
1648 #endif
1649         if (ret < 0)
1650             return -1;
1651     }

1653 #ifdef SCTP_AUTHENTICATION_EVENT
1654     if (snp.sn_header.sn_type == SCTP_AUTHENTICATION_EVENT)
1655         dgram_sctp_handle_auth_free_key_event(b, &snp);
1656 #endif

1658     if (data->handle_notifications != NULL)
1659         data->handle_notifications(b, data->notification_context

1661     /* found notification, peek again */
1662     memset(&snp, 0x00, sizeof(union sctp_notification));
1663     iov.iov_base = (char *)&snp;
1664     iov.iov_len = sizeof(union sctp_notification);
1665     msg.msg_name = NULL;
1666     msg.msg_namelen = 0;
1667     msg.msg_iov = &iov;
1668     msg.msg_iovlen = 1;
1669     msg.msg_control = NULL;
1670     msg.msg_controllen = 0;
1671     msg.msg_flags = 0;

1673     /* if we have seen the dry already, don't wait */
1674     if (is_dry)
1675     {
1676         sockflags = fcntl(b->num, F_GETFL, 0);
1677         fcntl(b->num, F_SETFL, O_NONBLOCK);
1678     }

1680     n = recvmmsg(b->num, &msg, MSG_PEEK);

1682     if (is_dry)
1683     {
1684         fcntl(b->num, F_SETFL, sockflags);
1685     }

1687     if (n <= 0)
1688     {
1689         if ((n < 0) && (get_last_socket_error() != EAGAIN) && (g
1690             return -1;
1691         else
1692             return is_dry;
1693     }

1694 }

1696     /* read anything else */
1697     return is_dry;
1698 }

1700 int BIO_dgram_sctp_msg_waiting(BIO *b)
1701 {
1702     int n, sockflags;
1703     union sctp_notification snp;
1704     struct msghdr msg;
1705     struct iovec iov;
1706     bio_dgram_sctp_data *data = (bio_dgram_sctp_data *)b->ptr;

1708     /* Check if there are any messages waiting to be read */
1709     do
1710     {
1711         memset(&snp, 0x00, sizeof(union sctp_notification));

```



```

1712         iov.iov_base = (char *)&snp;
1713         iov.iov_len = sizeof(union sctp_notification);
1714         msg.msg_name = NULL;
1715         msg.msg_namelen = 0;
1716         msg.msg_iov = &iov;
1717         msg.msg_iovlen = 1;
1718         msg.msg_control = NULL;
1719         msg.msg_controllen = 0;
1720         msg.msg_flags = 0;

1722         sockflags = fcntl(b->num, F_GETFL, 0);
1723         fcntl(b->num, F_SETFL, O_NONBLOCK);
1724         n = recvmmsg(b->num, &msg, MSG_PEEK);
1725         fcntl(b->num, F_SETFL, sockflags);

1727         /* if notification, process and try again */
1728         if (n > 0 && (msg.msg_flags & MSG_NOTIFICATION))
1729         {
1730 #ifdef SCTP_AUTHENTICATION_EVENT
1731             if (snp.sn_header.sn_type == SCTP_AUTHENTICATION_EVENT)
1732                 dgram_sctp_handle_auth_free_key_event(b, &snp);
1733 #endif

1735             memset(&snp, 0x00, sizeof(union sctp_notification));
1736             iov.iov_base = (char *)&snp;
1737             iov.iov_len = sizeof(union sctp_notification);
1738             msg.msg_name = NULL;
1739             msg.msg_namelen = 0;
1740             msg.msg_iov = &iov;
1741             msg.msg_iovlen = 1;
1742             msg.msg_control = NULL;
1743             msg.msg_controllen = 0;
1744             msg.msg_flags = 0;
1745             n = recvmmsg(b->num, &msg, 0);

1747             if (data->handle_notifications != NULL)
1748                 data->handle_notifications(b, data->notification);
1749             }

1751         } while (n > 0 && (msg.msg_flags & MSG_NOTIFICATION));

1753         /* Return 1 if there is a message to be read, return 0 otherwise. */
1754         if (n > 0)
1755             return 1;
1756         else
1757             return 0;
1758     }

1760 static int dgram_sctp_puts(BIO *bp, const char *str)
1761 {
1762     int n, ret;

1764     n = strlen(str);
1765     ret = dgram_sctp_write(bp, str, n);
1766     return (ret);
1767 }
1768 #endif

1770 static int BIO_dgram_should_retry(int i)
1771 {
1772     int err;

1774     if ((i == 0) || (i == -1))
1775     {
1776         err = get_last_socket_error();

```

```

1778 #if defined(OPENSSSL_SYS_WINDOWS)
1779     /* If the socket return value (i) is -1
1780     * and err is unexpectedly 0 at this point,
1781     * the error code was overwritten by
1782     * another system call before this error
1783     * handling is called.
1784     */
1785 #endif

1787     return(BIO_dgram_non_fatal_error(err));
1788 }
1789 return(0);
1790 }

1792 int BIO_dgram_non_fatal_error(int err)
1793 {
1794     switch (err)
1795     {
1796 #if defined(OPENSSSL_SYS_WINDOWS)
1797 # if defined(WSAEWOULDBLOCK)
1798         case WSAEWOULDBLOCK:
1799 # endif

1801 # if 0 /* This appears to always be an error */
1802 # if defined(WSAENOTCONN)
1803         case WSAENOTCONN:
1804 # endif
1805 # endif
1806 #endif

1808 #ifdef EWOULDBLOCK
1809 # if defined(WSAEWOULDBLOCK)
1810 # if WSAEWOULDBLOCK != EWOULDBLOCK
1811         case EWOULDBLOCK:
1812 # endif
1813 # else
1814         case EWOULDBLOCK:
1815 # endif
1816 #endif

1818 #ifdef EINTR
1819     case EINTR:
1820 #endif

1822 #ifdef EAGAIN
1823 #if EWOULDBLOCK != EAGAIN
1824     case EAGAIN:
1825 #endif
1826 #endif

1828 #ifdef EPROTO
1829     case EPROTO:
1830 #endif

1832 #ifdef EINPROGRESS
1833     case EINPROGRESS:
1834 #endif

1836 #ifdef EALREADY
1837     case EALREADY:
1838 #endif

1840         return(1);
1841         /* break; */
1842     default:
1843         break;

```

```
1844     }
1845     return(0);
1846 }

1848 static void get_current_time(struct timeval *t)
1849 {
1850 #ifdef OPENSSL_SYS_WIN32
1851     struct _timeb tb;
1852     _ftime(&tb);
1853     t->tv_sec = (long)tb.time;
1854     t->tv_usec = (long)tb.millitm * 1000;
1855 #elif defined(OPENSSL_SYS_VMS)
1856     struct timeb tb;
1857     ftime(&tb);
1858     t->tv_sec = (long)tb.time;
1859     t->tv_usec = (long)tb.millitm * 1000;
1860 #else
1861     gettimeofday(t, NULL);
1862 #endif
1863 }

1865 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_fd.c

1

```
*****
7710 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_fd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/bio/bss_fd.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #define USE_SOCKETS
```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_fd.c

2

```
62 #include "cryptlib.h"
63
64 #if defined(OPENSSSL_NO_POSIX_IO)
65 /*
66  * One can argue that one should implement dummy placeholder for
67  * BIO_s_fd here...
68  */
69 #else
70 /*
71  * As for unconditional usage of "UPLINK" interface in this module.
72  * Trouble is that unlike Unix file descriptors [which are indexes
73  * in kernel-side per-process table], corresponding descriptors on
74  * platforms which require "UPLINK" interface seem to be indexes
75  * in a user-land, non-global table. Well, in fact they are indexes
76  * in stdio_iob[], and recall that _iob[] was the very reason why
77  * "UPLINK" interface was introduced in first place. But one way on
78  * another. Neither libcrypto or libssl use this BIO meaning that
79  * file descriptors can only be provided by application. Therefore
80  * "UPLINK" calls are due...
81  */
82 #include "bio_lcl.h"
83
84 static int fd_write(BIO *h, const char *buf, int num);
85 static int fd_read(BIO *h, char *buf, int size);
86 static int fd_puts(BIO *h, const char *str);
87 static int fd_gets(BIO *h, char *buf, int size);
88 static long fd_ctrl(BIO *h, int cmd, long arg1, void *arg2);
89 static int fd_new(BIO *h);
90 static int fd_free(BIO *data);
91 int BIO_fd_should_retry(int s);
92
93 static BIO_METHOD methods_fdp=
94 {
95     BIO_TYPE_FD,"file descriptor",
96     fd_write,
97     fd_read,
98     fd_puts,
99     fd_gets,
100     fd_ctrl,
101     fd_new,
102     fd_free,
103     NULL,
104 };
105
106 BIO_METHOD *BIO_s_fd(void)
107 {
108     return(&methods_fdp);
109 }
110
111 BIO *BIO_new_fd(int fd,int close_flag)
112 {
113     BIO *ret;
114     ret=BIO_new(BIO_s_fd());
115     if (ret == NULL) return(NULL);
116     BIO_set_fd(ret,fd,close_flag);
117     return(ret);
118 }
119
120 static int fd_new(BIO *bi)
121 {
122     bi->init=0;
123     bi->num=-1;
124     bi->ptr=NULL;
125     bi->flags=BIO_FLAGS_UPLINK; /* essentially redundant */
126     return(1);
127 }
```

```

129 static int fd_free(BIO *a)
130 {
131     if (a == NULL) return(0);
132     if (a->shutdown)
133     {
134         if (a->init)
135         {
136             UP_close(a->num);
137         }
138         a->init=0;
139         a->flags=BIO_FLAGS_UPLINK;
140     }
141     return(1);
142 }
143
144 static int fd_read(BIO *b, char *out,int outl)
145 {
146     int ret=0;
147
148     if (out != NULL)
149     {
150         clear_sys_error();
151         ret=UP_read(b->num,out,outl);
152         BIO_clear_retry_flags(b);
153         if (ret <= 0)
154         {
155             if (BIO_fd_should_retry(ret))
156                 BIO_set_retry_read(b);
157         }
158     }
159     return(ret);
160 }
161
162 static int fd_write(BIO *b, const char *in, int inl)
163 {
164     int ret;
165     clear_sys_error();
166     ret=UP_write(b->num,in,inl);
167     BIO_clear_retry_flags(b);
168     if (ret <= 0)
169     {
170         if (BIO_fd_should_retry(ret))
171             BIO_set_retry_write(b);
172     }
173     return(ret);
174 }
175
176 static long fd_ctrl(BIO *b, int cmd, long num, void *ptr)
177 {
178     long ret=1;
179     int *ip;
180
181     switch (cmd)
182     {
183     case BIO_CTRL_RESET:
184         num=0;
185     case BIO_C_FILE_SEEK:
186         ret=(long)UP_lseek(b->num,num,0);
187         break;
188     case BIO_C_FILE_TELL:
189     case BIO_CTRL_INFO:
190         ret=(long)UP_lseek(b->num,0,1);
191         break;
192     case BIO_C_SET_FD:
193         fd_free(b);

```

```

194         b->num= *((int *)ptr);
195         b->shutdown=(int)num;
196         b->init=1;
197         break;
198     case BIO_C_GET_FD:
199         if (b->init)
200         {
201             ip=(int *)ptr;
202             if (ip != NULL) *ip=b->num;
203             ret=b->num;
204         }
205         else
206             ret= -1;
207         break;
208     case BIO_CTRL_GET_CLOSE:
209         ret=b->shutdown;
210         break;
211     case BIO_CTRL_SET_CLOSE:
212         b->shutdown=(int)num;
213         break;
214     case BIO_CTRL_PENDING:
215     case BIO_CTRL_WPENDING:
216         ret=0;
217         break;
218     case BIO_CTRL_DUP:
219     case BIO_CTRL_FLUSH:
220         ret=1;
221         break;
222     default:
223         ret=0;
224         break;
225     }
226     return(ret);
227 }
228
229 static int fd_puts(BIO *bp, const char *str)
230 {
231     int n,ret;
232
233     n=strlen(str);
234     ret=fd_write(bp,str,n);
235     return(ret);
236 }
237
238 static int fd_gets(BIO *bp, char *buf, int size)
239 {
240     int ret=0;
241     char *ptr=buf;
242     char *end=buf+size-1;
243
244     while ( (ptr < end) && (fd_read(bp, ptr, 1) > 0) && (ptr[0] != '\n') )
245         ptr++;
246
247     ptr[0]='\0';
248
249     if (buf[0] != '\0')
250         ret=strlen(buf);
251     return(ret);
252 }
253
254 int BIO_fd_should_retry(int i)
255 {
256     int err;
257
258     if ((i == 0) || (i == -1))
259         {

```

```
260         err=get_last_sys_error();

262 #if defined(OPENSSL_SYS_WINDOWS) && 0 /* more microsoft stupidity? perhaps not?
263     if ((i == -1) && (err == 0))
264         return(1);
265 #endif

267         return(BIO_fd_non_fatal_error(err));
268     }
269     return(0);
270 }

272 int BIO_fd_non_fatal_error(int err)
273 {
274     switch (err)
275     {

277 #ifdef EWOULDBLOCK
278 # ifdef WSAEWOULDBLOCK
279 #   if WSAEWOULDBLOCK != EWOULDBLOCK
280     case EWOULDBLOCK:
281 #   endif
282 # else
283     case EWOULDBLOCK:
284 #   endif
285 #endif

287 #if defined(ENOTCONN)
288     case ENOTCONN:
289 #endif

291 #ifdef EINTR
292     case EINTR:
293 #endif

295 #ifdef EAGAIN
296 #if EWOULDBLOCK != EAGAIN
297     case EAGAIN:
298 #   endif
299 #endif

301 #ifdef EPROTO
302     case EPROTO:
303 #endif

305 #ifdef EINPROGRESS
306     case EINPROGRESS:
307 #endif

309 #ifdef EALREADY
310     case EALREADY:
311 #endif

312         return(1);
313         /* break; */
314     default:
315         break;
316     }
317     return(0);
318 }
319 #endif
```

```

*****
13244 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_file.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/bss_file.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /*
60 * 03-Dec-1997 rdenny@dc3.com Fix bug preventing use of stdin/stdout
61 * with binary data (e.g. asn1parse -inform DER < xxx) under

```

```

62 *
63 */
64
65 #ifndef HEADER_BSS_FILE_C
66 #define HEADER_BSS_FILE_C
67
68 #if defined(__linux) || defined(__sun) || defined(__hpux)
69 /* Following definition aliases fopen to fopen64 on above mentioned
70 * platforms. This makes it possible to open and sequentially access
71 * files larger than 2GB from 32-bit application. It does not allow to
72 * traverse them beyond 2GB with fseek/ftell, but on the other hand *no*
73 * 32-bit platform permits that, not with fseek/ftell. Not to mention
74 * that breaking 2GB limit for seeking would require surgery to *our*
75 * API. But sequential access suffices for practical cases when you
76 * can run into large files, such as fingerprinting, so we can let API
77 * alone. For reference, the list of 32-bit platforms which allow for
78 * sequential access of large files without extra "magic" comprise *BSD,
79 * Darwin, IRIX...
80 */
81 #ifndef _FILE_OFFSET_BITS
82 #define _FILE_OFFSET_BITS 64
83 #endif
84 #endif
85
86 #include <stdio.h>
87 #include <errno.h>
88 #include "cryptlib.h"
89 #include "bio_lcl.h"
90 #include <openssl/err.h>
91
92 #if defined(OPENSSL_SYS_NETWORK) && defined(NETWARE_CLIB)
93 #include <nwfileio.h>
94 #endif
95
96 #if !defined(OPENSSL_NO_STDIO)
97
98 static int MS_CALLBACK file_write(BIO *h, const char *buf, int num);
99 static int MS_CALLBACK file_read(BIO *h, char *buf, int size);
100 static int MS_CALLBACK file_puts(BIO *h, const char *str);
101 static int MS_CALLBACK file_gets(BIO *h, char *str, int size);
102 static long MS_CALLBACK file_ctrl(BIO *h, int cmd, long arg1, void *arg2);
103 static int MS_CALLBACK file_new(BIO *h);
104 static int MS_CALLBACK file_free(BIO *data);
105 static BIO_METHOD methods_file=
106 {
107     BIO_TYPE_FILE,
108     "FILE pointer",
109     file_write,
110     file_read,
111     file_puts,
112     file_gets,
113     file_ctrl,
114     file_new,
115     file_free,
116     NULL,
117 };
118
119 BIO *BIO_new_file(const char *filename, const char *mode)
120 {
121     BIO *ret;
122     FILE *file=NULL;
123
124     #if defined(_WIN32) && defined(CP_UTF8)
125         int sz, len_0 = (int)strlen(filename)+1;
126         DWORD flags;

```

```

128 /*
129  * Basically there are three cases to cover: a) filename is
130  * pure ASCII string; b) actual UTF-8 encoded string and
131  * c) locale-sized string, i.e. one containing 8-bit
132  * characters that are meaningful in current system locale.
133  * If filename is pure ASCII or real UTF-8 encoded string,
134  * MultiByteToWideChar succeeds and _wopen works. If
135  * filename is locale-sized string, chances are that
136  * MultiByteToWideChar fails reporting
137  * ERROR_NO_UNICODE_TRANSLATION, in which case we fall
138  * back to fopen...
139  */
140 if ((sz=MultiByteToWideChar(CP_UTF8, (flags=MB_ERR_INVALID_CHARS),
141                             filename, len_0, NULL, 0))>0 ||
142     (GetLastError()==ERROR_INVALID_FLAGS &&
143      (sz=MultiByteToWideChar(CP_UTF8, (flags=0),
144                              filename, len_0, NULL, 0))>0)
145 )
146 {
147     WCHAR wmode[8];
148     WCHAR *wfilename = _alloca(sz*sizeof(WCHAR));
149
150     if (MultiByteToWideChar(CP_UTF8, flags,
151                             filename, len_0, wfilename, sz) &&
152         MultiByteToWideChar(CP_UTF8, 0, mode, strlen(mode)+1,
153                             wmode, sizeof(wmode)/sizeof(wmode[0])) &&
154         (file = wopen(wfilename, wmode))!=NULL &&
155         (errno==ENOENT || errno==EBADF)
156     ) /* UTF-8 decode succeeded, but no file, filename
157        * could still have been locale-sized... */
158         file = fopen(filename, mode);
159     }
160 else if (GetLastError()==ERROR_NO_UNICODE_TRANSLATION)
161     file = fopen(filename, mode);
162 }
163 #else
164 file=fopen(filename, mode);
165 #endif
166 if (file == NULL)
167 {
168     SYSerr(SYS_F_FOPEN, get_last_sys_error());
169     ERR_add_error_data(5, "fopen('", filename, "', ", mode, "'");
170     if (errno == ENOENT)
171         BIOerr(BIO_F_BIO_NEW_FILE, BIO_R_NO_SUCH_FILE);
172     else
173         BIOerr(BIO_F_BIO_NEW_FILE, ERR_R_SYS_LIB);
174     return(NULL);
175 }
176 if ((ret=BIO_new(BIO_s_file())) == NULL)
177 {
178     fclose(file);
179     return(NULL);
180 }
181
182 BIO_clear_flags(ret, BIO_FLAGS_UPLINK); /* we did fopen -> we disengage U
183 BIO_set_fp(ret, file, BIO_CLOSE);
184 return(ret);
185 }
186
187 BIO *BIO_new_fp(FILE *stream, int close_flag)
188 {
189     BIO *ret;
190
191     if ((ret=BIO_new(BIO_s_file())) == NULL)
192         return(NULL);
193 }

```

```

195     BIO_set_flags(ret, BIO_FLAGS_UPLINK); /* redundant, left for documentatio
196     BIO_set_fp(ret, stream, close_flag);
197     return(ret);
198 }
199
200 BIO_METHOD *BIO_s_file(void)
201 {
202     return(&methods_file);
203 }
204
205 static int MS_CALLBACK file_new(BIO *bi)
206 {
207     bi->init=0;
208     bi->num=0;
209     bi->ptr=NULL;
210     bi->flags=BIO_FLAGS_UPLINK; /* default to UPLINK */
211     return(1);
212 }
213
214 static int MS_CALLBACK file_free(BIO *a)
215 {
216     if (a == NULL) return(0);
217     if (a->shutdown)
218     {
219         if ((a->init) && (a->ptr != NULL))
220         {
221             if (a->flags&BIO_FLAGS_UPLINK)
222                 UP_fclose(a->ptr);
223             else
224                 fclose(a->ptr);
225             a->ptr=NULL;
226             a->flags=BIO_FLAGS_UPLINK;
227         }
228         a->init=0;
229     }
230     return(1);
231 }
232
233 static int MS_CALLBACK file_read(BIO *b, char *out, int outl)
234 {
235     int ret=0;
236
237     if (b->init && (out != NULL))
238     {
239         if (b->flags&BIO_FLAGS_UPLINK)
240             ret=UP_fread(out, 1, (int)outl, b->ptr);
241         else
242             ret=fread(out, 1, (int)outl, (FILE *)b->ptr);
243         if (ret == 0 && (b->flags&BIO_FLAGS_UPLINK)?UP_ferror((FILE *)b->
244             {
245                 SYSerr(SYS_F_FREAD, get_last_sys_error());
246                 BIOerr(BIO_F_FILE_READ, ERR_R_SYS_LIB);
247                 ret=-1;
248             }
249     }
250     return(ret);
251 }
252
253 static int MS_CALLBACK file_write(BIO *b, const char *in, int inl)
254 {
255     int ret=0;
256
257     if (b->init && (in != NULL))
258     {
259         if (b->flags&BIO_FLAGS_UPLINK)

```

```

260         ret=UP_fwrite(in,(int)inl,1,b->ptr);
261     else
262         ret=fwrite(in,(int)inl,1,(FILE *)b->ptr);
263     if (ret)
264         ret=inl;
265     /* ret=fwrite(in,1,(int)inl,(FILE *)b->ptr); */
266     /* according to Tim Hudson <tjh@cryptsoft.com>, the commented
267      * out version above can cause 'inl' write calls under
268      * some stupid stdio implementations (VMS) */
269     }
270     return(ret);
271 }

273 static long MS_CALLBACK file_ctrl(BIO *b, int cmd, long num, void *ptr)
274 {
275     long ret=1;
276     FILE *fp=(FILE *)b->ptr;
277     FILE **fpp;
278     char p[4];

280     switch (cmd)
281     {
282     case BIO_C_FILE_SEEK:
283     case BIO_CTRL_RESET:
284         if (b->flags&BIO_FLAGS_UPLINK)
285             ret=(long)UP_fseek(b->ptr,num,0);
286         else
287             ret=(long)fseek(fp,num,0);
288         break;
289     case BIO_CTRL_EOF:
290         if (b->flags&BIO_FLAGS_UPLINK)
291             ret=(long)UP_feof(fp);
292         else
293             ret=(long)feof(fp);
294         break;
295     case BIO_C_FILE_TELL:
296     case BIO_CTRL_INFO:
297         if (b->flags&BIO_FLAGS_UPLINK)
298             ret=UP_ftell(b->ptr);
299         else
300             ret=ftell(fp);
301         break;
302     case BIO_C_SET_FILE_PTR:
303         file_free(b);
304         b->shutdown=(int)num&BIO_CLOSE;
305         b->ptr=ptr;
306         b->init=1;
307     #if BIO_FLAGS_UPLINK!=0
308     #if defined(__MINGW32__) && defined(__MSVCRT__) && !defined(_IOB_ENTRIES)
309     #define _IOB_ENTRIES 20
310     #endif
311     #if defined(_IOB_ENTRIES)
312         /* Safety net to catch purely internal BIO_set_fp calls */
313         if ((size_t)ptr >= (size_t)stdin &&
314             (size_t)ptr < (size_t)(stdin+_IOB_ENTRIES))
315             BIO_clear_flags(b,BIO_FLAGS_UPLINK);
316     #endif
317     #endif
318     #ifdef UP_fsetmod
319         if (b->flags&BIO_FLAGS_UPLINK)
320             UP_fsetmod(b->ptr,(char)((num&BIO_FP_TEXT)?'t':'b'));
321         else
322     #endif
323     {
324     #if defined(OPENSSL_SYS_WINDOWS)
325         int fd = _fileno((FILE*)ptr);

```

```

326         if (num & BIO_FP_TEXT)
327             _setmode(fd,_O_TEXT);
328         else
329             _setmode(fd,_O_BINARY);
330     #elif defined(OPENSSL_SYS_NETWARE) && defined(NETWARE_CLIB)
331         int fd = fileno((FILE*)ptr);
332         /* Under CLib there are differences in file modes */
333         if (num & BIO_FP_TEXT)
334             setmode(fd,O_TEXT);
335         else
336             setmode(fd,O_BINARY);
337     #elif defined(OPENSSL_SYS_MSDOS)
338         int fd = fileno((FILE*)ptr);
339         /* Set correct text/binary mode */
340         if (num & BIO_FP_TEXT)
341             _setmode(fd,_O_TEXT);
342         /* Dangerous to set stdin/stdout to raw (unless redirected) */
343         else
344             {
345                 if (fd == STDIN_FILENO || fd == STDOUT_FILENO)
346                     {
347                         if (isatty(fd) <= 0)
348                             _setmode(fd,_O_BINARY);
349                     }
350                 else
351                     _setmode(fd,_O_BINARY);
352             }
353     #elif defined(OPENSSL_SYS_OS2) || defined(OPENSSL_SYS_WIN32_CYGWIN)
354         int fd = fileno((FILE*)ptr);
355         if (num & BIO_FP_TEXT)
356             setmode(fd, O_TEXT);
357         else
358             setmode(fd, O_BINARY);
359     #endif
360     }
361     break;
362     case BIO_C_SET_FILENAME:
363         file_free(b);
364         b->shutdown=(int)num&BIO_CLOSE;
365         if (num & BIO_FP_APPEND)
366             {
367                 if (num & BIO_FP_READ)
368                     BUF_strncpy(p,"a+",sizeof p);
369                 else
370                     BUF_strncpy(p,"a",sizeof p);
371             }
372         else if ((num & BIO_FP_READ) && (num & BIO_FP_WRITE))
373             BUF_strncpy(p,"r+",sizeof p);
374         else if (num & BIO_FP_WRITE)
375             BUF_strncpy(p,"w",sizeof p);
376         else if (num & BIO_FP_READ)
377             BUF_strncpy(p,"r",sizeof p);
378         else
379             {
380                 BIOerr(BIO_F_FILE_CTRL,BIO_R_BAD_FOPEN_MODE);
381                 ret=0;
382                 break;
383             }
384     #if defined(OPENSSL_SYS_MSDOS) || defined(OPENSSL_SYS_WINDOWS) || defined(OPENSS
385         if (!(num & BIO_FP_TEXT))
386             strcat(p,"b");
387         else
388             strcat(p,"t");
389     #endif
390     #if defined(OPENSSL_SYS_NETWARE)
391         if (!(num & BIO_FP_TEXT))
392             strcat(p,"b");

```



```

392         else
393             strcat(p,"t");
394 #endif
395         fp=fopen(ptr,p);
396         if (fp == NULL)
397         {
398             SYSerr(SYS_F_FOPEN,get_last_sys_error());
399             ERR_add_error_data(5,"fopen('",ptr,"','",p,"')");
400             BIOerr(BIO_F_FILE_CTRL,ERR_R_SYS_LIB);
401             ret=0;
402             break;
403         }
404         b->ptr=fp;
405         b->init=1;
406         BIO_clear_flags(b,BIO_FLAGS_UPLINK); /* we did fopen -> we disen
407         break;
408     case BIO_C_GET_FILE_PTR:
409         /* the ptr parameter is actually a FILE ** in this case. */
410         if (ptr != NULL)
411         {
412             fpp=(FILE **)ptr;
413             *fpp=(FILE *)b->ptr;
414         }
415         break;
416     case BIO_CTRL_GET_CLOSE:
417         ret=(long)b->shutdown;
418         break;
419     case BIO_CTRL_SET_CLOSE:
420         b->shutdown=(int)num;
421         break;
422     case BIO_CTRL_FLUSH:
423         if (b->flags&BIO_FLAGS_UPLINK)
424             UP_fflush(b->ptr);
425         else
426             fflush((FILE *)b->ptr);
427         break;
428     case BIO_CTRL_DUP:
429         ret=1;
430         break;
431
432     case BIO_CTRL_WPENDING:
433     case BIO_CTRL_PENDING:
434     case BIO_CTRL_PUSH:
435     case BIO_CTRL_POP:
436     default:
437         ret=0;
438         break;
439     }
440     return(ret);
441 }
442
443 static int MS_CALLBACK file_gets(BIO *bp, char *buf, int size)
444 {
445     int ret=0;
446
447     buf[0]='\0';
448     if (bp->flags&BIO_FLAGS_UPLINK)
449     {
450         if (!UP_fgets(buf,size,bp->ptr))
451             goto err;
452     }
453     else
454     {
455         if (!fgets(buf,size,(FILE *)bp->ptr))
456             goto err;
457     }

```

```

458         if (buf[0] != '\0')
459             ret=strlen(buf);
460         err:
461         return(ret);
462     }
463
464 static int MS_CALLBACK file_puts(BIO *bp, const char *str)
465 {
466     int n,ret;
467
468     n=strlen(str);
469     ret=file_write(bp,str,n);
470     return(ret);
471 }
472
473 #endif /* OPENSSSL_NO_STDIO */
474
475 #endif /* HEADER_BSS_FILE_C */

```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_log.c

1

```
*****
19274 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_log.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/bio/bss_log.c */
2 /* =====
3  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
24  * prior written permission. For written permission, please contact
25  * licensing@OpenSSL.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
32  * acknowledgment:
33  * "This product includes software developed by the OpenSSL Project
34  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

55 /*
56  * Why BIO_s_log?
57  *
58  * BIO_s_log is useful for system daemons (or services under NT).
59  * It is one-way BIO, it sends all stuff to syslogd (on system that
60  * commonly use that), or event log (on NT), or OPCOM (on OpenVMS).
```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_log.c

2

```
63 */

66 #include <stdio.h>
67 #include <errno.h>

69 #include "cryptlib.h"

71 #if defined(OPENSSL_SYS_WINCE)
72 #elif defined(OPENSSL_SYS_WIN32)
73 #elif defined(OPENSSL_SYS_VMS)
74 # include <opcddef.h>
75 # include <descrip.h>
76 # include <lib$routines.h>
77 # include <starlet.h>
78 /* Some compiler options may mask the declaration of "malloc32". */
79 # if __INITIAL_POINTER_SIZE && defined __ANSI_C_SOURCE
80 #   if __INITIAL_POINTER_SIZE == 64
81 #     pragma pointer_size save
82 #     pragma pointer_size 32
83 #     void *_malloc32 (__size_t);
84 #     pragma pointer_size restore
85 #   endif /* __INITIAL_POINTER_SIZE == 64 */
86 # endif /* __INITIAL_POINTER_SIZE && defined __ANSI_C_SOURCE */
87 #elif defined(__ultrix)
88 # include <sys/syslog.h>
89 #elif defined(OPENSSL_SYS_NETWARE)
90 # define NO_SYSLOG
91 #elif (!defined(WSDOS) || defined(WATT32)) && !defined(OPENSSL_SYS_VXWORKS) && !
92 # include <syslog.h>
93 #endif

95 #include <openssl/buffer.h>
96 #include <openssl/err.h>

98 #ifndef NO_SYSLOG

100 #if defined(OPENSSL_SYS_WIN32)
101 #define LOG_EMERG      0
102 #define LOG_ALERT      1
103 #define LOG_CRIT       2
104 #define LOG_ERR        3
105 #define LOG_WARNING    4
106 #define LOG_NOTICE     5
107 #define LOG_INFO       6
108 #define LOG_DEBUG      7

110 #define LOG_DAEMON      (3<<3)
111 #elif defined(OPENSSL_SYS_VMS)
112 /* On VMS, we don't really care about these, but we need them to compile */
113 #define LOG_EMERG      0
114 #define LOG_ALERT      1
115 #define LOG_CRIT       2
116 #define LOG_ERR        3
117 #define LOG_WARNING    4
118 #define LOG_NOTICE     5
119 #define LOG_INFO       6
120 #define LOG_DEBUG      7

122 #define LOG_DAEMON      OPC$M_NM_NETWORK
123 #endif

125 static int MS_CALLBACK slg_write(BIO *h, const char *buf, int num);
126 static int MS_CALLBACK slg_puts(BIO *h, const char *str);
127 static long MS_CALLBACK slg_ctrl(BIO *h, int cmd, long arg1, void *arg2);
```

```

128 static int MS_CALLBACK slg_new(BIO *h);
129 static int MS_CALLBACK slg_free(BIO *data);
130 static void xopenlog(BIO* bp, char* name, int level);
131 static void xsyslog(BIO* bp, int priority, const char* string);
132 static void xcloselog(BIO* bp);

134 static BIO_METHOD methods_slg=
135 {
136     BIO_TYPE_MEM,"syslog",
137     slg_write,
138     NULL,
139     slg_puts,
140     NULL,
141     slg_ctrl,
142     slg_new,
143     slg_free,
144     NULL,
145 };

147 BIO_METHOD *BIO_s_log(void)
148 {
149     return(&methods_slg);
150 }

152 static int MS_CALLBACK slg_new(BIO *bi)
153 {
154     bi->init=1;
155     bi->num=0;
156     bi->ptr=NULL;
157     xopenlog(bi, "application", LOG_DAEMON);
158     return(1);
159 }

161 static int MS_CALLBACK slg_free(BIO *a)
162 {
163     if (a == NULL) return(0);
164     xcloselog(a);
165     return(1);
166 }

168 static int MS_CALLBACK slg_write(BIO *b, const char *in, int inl)
169 {
170     int ret= inl;
171     char* buf;
172     char* pp;
173     int priority, i;
174     static const struct
175     {
176         int strl;
177         char str[10];
178         int log_level;
179     }
180     mapping[] =
181     {
182         { 6, "PANIC ", LOG_EMERG },
183         { 6, "EMERG ", LOG_EMERG },
184         { 4, "EMR ", LOG_EMERG },
185         { 6, "ALERT ", LOG_ALERT },
186         { 4, "ALR ", LOG_ALERT },
187         { 5, "CRIT ", LOG_CRIT },
188         { 4, "CRI ", LOG_CRIT },
189         { 6, "ERROR ", LOG_ERR },
190         { 4, "ERR ", LOG_ERR },
191         { 8, "WARNING ", LOG_WARNING },
192         { 5, "WARN ", LOG_WARNING },
193         { 4, "WAR ", LOG_WARNING },

```

```

194     { 7, "NOTICE ", LOG_NOTICE },
195     { 5, "NOTE ", LOG_NOTICE },
196     { 4, "NOT ", LOG_NOTICE },
197     { 5, "INFO ", LOG_INFO },
198     { 4, "INF ", LOG_INFO },
199     { 6, "DEBUG ", LOG_DEBUG },
200     { 4, "DBG ", LOG_DEBUG },
201     { 0, "", LOG_ERR } /* The default */
202 };

204     if((buf= (char *)OPENSSL_malloc(inl+ 1)) == NULL){
205         return(0);
206     }
207     strncpy(buf, in, inl);
208     buf[inl]= '\0';

210     i = 0;
211     while(strncmp(buf, mapping[i].str, mapping[i].strl) != 0) i++;
212     priority = mapping[i].log_level;
213     pp = buf + mapping[i].strl;

215     xsyslog(b, priority, pp);

217     OPENSSL_free(buf);
218     return(ret);
219 }

221 static long MS_CALLBACK slg_ctrl(BIO *b, int cmd, long num, void *ptr)
222 {
223     switch (cmd)
224     {
225     case BIO_CTRL_SET:
226         xcloselog(b);
227         xopenlog(b, ptr, num);
228         break;
229     default:
230         break;
231     }
232     return(0);
233 }

235 static int MS_CALLBACK slg_puts(BIO *bp, const char *str)
236 {
237     int n,ret;

239     n=strlen(str);
240     ret=slg_write(bp,str,n);
241     return(ret);
242 }

244 #if defined(OPENSSL_SYS_WIN32)

246 static void xopenlog(BIO* bp, char* name, int level)
247 {
248     if (check_winnt())
249         bp->ptr = RegisterEventSourceA(NULL,name);
250     else
251         bp->ptr = NULL;
252 }

254 static void xsyslog(BIO *bp, int priority, const char *string)
255 {
256     LPCSTR lpszStrings[2];
257     WORD evtype= EVENTLOG_ERROR_TYPE;
258     char pidbuf[DECIMAL_SIZE(DWORD)+4];

```

```

260     if (bp->ptr == NULL)
261         return;

263     switch (priority)
264     {
265     case LOG_EMERG:
266     case LOG_ALERT:
267     case LOG_CRIT:
268     case LOG_ERR:
269         evtype = EVENTLOG_ERROR_TYPE;
270         break;
271     case LOG_WARNING:
272         evtype = EVENTLOG_WARNING_TYPE;
273         break;
274     case LOG_NOTICE:
275     case LOG_INFO:
276     case LOG_DEBUG:
277         evtype = EVENTLOG_INFORMATION_TYPE;
278         break;
279     default:
280         /* Should never happen, but set it
281            as error anyway. */
282         evtype = EVENTLOG_ERROR_TYPE;
283         break;
284     }

285     sprintf(pidbuf, "[%u] ", GetCurrentProcessId());
286     lpszStrings[0] = pidbuf;
287     lpszStrings[1] = string;

289     ReportEventA(bp->ptr, evtype, 0, 1024, NULL, 2, 0,
290                 lpszStrings, NULL);
291 }
292
293 static void xcloselog(BIO* bp)
294 {
295     if (bp->ptr)
296         DeregisterEventSource((HANDLE)(bp->ptr));
297     bp->ptr = NULL;
298 }

300 #elif defined(OPENSSL_SYS_VMS)

302 static int VMS_OPC_target = LOG_DAEMON;

304 static void xopenlog(BIO* bp, char* name, int level)
305 {
306     VMS_OPC_target = level;
307 }

309 static void xsyslog(BIO *bp, int priority, const char *string)
310 {
311     struct dsc$descriptor_s opc_dsc;

313     /* Arrange 32-bit pointer to opcddef buffer and malloc(), if needed. */
314     #if __INITIAL_POINTER_SIZE == 64
315     #pragma pointer_size save
316     #pragma pointer_size 32
317     #define OPCDEF_TYPE __char_ptr32
318     #define OPCDEF_MALLOC malloc32
319     #else /* __INITIAL_POINTER_SIZE == 64 */
320     #define OPCDEF_TYPE char *
321     #define OPCDEF_MALLOC OPENSSL_malloc
322     #endif /* __INITIAL_POINTER_SIZE == 64 [else] */

324     struct opcddef *opcddef_p;

```

```

326 #if __INITIAL_POINTER_SIZE == 64
327 #pragma pointer_size restore
328 #endif /* __INITIAL_POINTER_SIZE == 64 */

330     char buf[10240];
331     unsigned int len;
332     struct dsc$descriptor_s buf_dsc;
333     $DESCRIPTOR(fao_cmd, "!AZ: !AZ");
334     char *priority_tag;

336     switch (priority)
337     {
338     case LOG_EMERG: priority_tag = "Emergency"; break;
339     case LOG_ALERT: priority_tag = "Alert"; break;
340     case LOG_CRIT: priority_tag = "Critical"; break;
341     case LOG_ERR: priority_tag = "Error"; break;
342     case LOG_WARNING: priority_tag = "Warning"; break;
343     case LOG_NOTICE: priority_tag = "Notice"; break;
344     case LOG_INFO: priority_tag = "Info"; break;
345     case LOG_DEBUG: priority_tag = "DEBUG"; break;
346     }

348     buf_dsc.dsc$b_dtype = DSC$b_DTYPE_T;
349     buf_dsc.dsc$b_class = DSC$b_CLASS_S;
350     buf_dsc.dsc$a_pointer = buf;
351     buf_dsc.dsc$w_length = sizeof(buf) - 1;

353     lib$sys_fao(&fao_cmd, &len, &buf_dsc, priority_tag, string);

355     /* We know there's an 8-byte header. That's documented. */
356     opcddef_p = OPCDEF_MALLOC( 8+ len);
357     opcddef_p->opc$b_ms_type = OPC$b_RQ_RQST;
358     memcpy(opcddef_p->opc$z_ms_target_classes, &VMS_OPC_target, 3);
359     opcddef_p->opc$l_ms_rqstid = 0;
360     memcpy(&opcddef_p->opc$l_ms_text, buf, len);

362     opc_dsc.dsc$b_dtype = DSC$b_DTYPE_T;
363     opc_dsc.dsc$b_class = DSC$b_CLASS_S;
364     opc_dsc.dsc$a_pointer = (OPCDEF_TYPE) opcddef_p;
365     opc_dsc.dsc$w_length = len + 8;

367     sys$ndopr(opc_dsc, 0);

369     OPENSSL_free(opcddef_p);
370 }

372 static void xcloselog(BIO* bp)
373 {
374 }

376 #else /* Unix/Watt32 */

378 static void xopenlog(BIO* bp, char* name, int level)
379 {
380     #ifdef WATT32 /* djgpp/DOS */
381         openlog(name, LOG_PID|LOG_CONS|LOG_NDELAY, level);
382     #else
383         openlog(name, LOG_PID|LOG_CONS, level);
384     #endif
385 }

387 static void xsyslog(BIO *bp, int priority, const char *string)
388 {
389     syslog(priority, "%s", string);
390 }

```

new/usr/src/lib/openssl/libsunw_crypto/bio/bss_log.c

7

```
392 static void xcloselog(BIO* bp)
393 {
394     closelog();
395 }
```

```
397 #endif /* Unix */
```

```
399 #endif /* NO_SYSLOG */
```

```
*****
```

```
7795 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_mem.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/bio/bss_mem.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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29 * notice, this list of conditions and the following disclaimer in the
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34 * Eric Young (eay@cryptsoft.com)"
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51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"
```

```
62 #include <openssl/bio.h>
```

```
64 static int mem_write(BIO *h, const char *buf, int num);
65 static int mem_read(BIO *h, char *buf, int size);
66 static int mem_puts(BIO *h, const char *str);
67 static int mem_gets(BIO *h, char *str, int size);
68 static long mem_ctrl(BIO *h, int cmd, long arg1, void *arg2);
69 static int mem_new(BIO *h);
70 static int mem_free(BIO *data);
71 static BIO_METHOD mem_method=
72 {
73     BIO_TYPE_MEM,
74     "memory buffer",
75     mem_write,
76     mem_read,
77     mem_puts,
78     mem_gets,
79     mem_ctrl,
80     mem_new,
81     mem_free,
82     NULL,
83 };
84
85 /* bio->num is used to hold the value to return on 'empty', if it is
86  * 0, should_retry is not set */
87
88 BIO_METHOD *BIO_s_mem(void)
89 {
90     return(&mem_method);
91 }
92
93 BIO *BIO_new_mem_buf(void *buf, int len)
94 {
95     BIO *ret;
96     BUF_MEM *b;
97     size_t sz;
98
99     if (!buf) {
100         BIOerr(BIO_F_BIO_NEW_MEM_BUF, BIO_R_NULL_PARAMETER);
101         return NULL;
102     }
103     sz = (len<0) ? strlen(buf) : (size_t)len;
104     if(!(ret = BIO_new(BIO_s_mem()))) return NULL;
105     b = (BUF_MEM *)ret->ptr;
106     b->data = buf;
107     b->length = sz;
108     b->max = sz;
109     ret->flags |= BIO_FLAGS_MEM_RDONLY;
110     /* Since this is static data retrying wont help */
111     ret->num = 0;
112     return ret;
113 }
114
115 static int mem_new(BIO *bi)
116 {
117     BUF_MEM *b;
118
119     if ((b=BUF_MEM_new()) == NULL)
120         return(0);
121     bi->shutdown=1;
122     bi->init=1;
123     bi->num= -1;
124     bi->ptr=(char *)b;
125     return(1);
126 }
```

```

128 static int mem_free(BIO *a)
129 {
130     if (a == NULL) return(0);
131     if (a->shutdown)
132     {
133         if ((a->init) && (a->ptr != NULL))
134         {
135             BUF_MEM *b;
136             b = (BUF_MEM *)a->ptr;
137             if(a->flags & BIO_FLAGS_MEM_RDONLY) b->data = NULL;
138             BUF_MEM_free(b);
139             a->ptr=NULL;
140         }
141     }
142     return(1);
143 }
144
145 static int mem_read(BIO *b, char *out, int outl)
146 {
147     int ret= -1;
148     BUF_MEM *bm;
149
150     bm=(BUF_MEM *)b->ptr;
151     BIO_clear_retry_flags(b);
152     ret=(outl >=0 && (size_t)outl > bm->length)?(int)bm->length:outl;
153     if ((out != NULL) && (ret > 0)) {
154         memcpy(out,bm->data,ret);
155         bm->length-=ret;
156         if(b->flags & BIO_FLAGS_MEM_RDONLY) bm->data += ret;
157         else {
158             memmove(&(bm->data[0]),&(bm->data[ret]),bm->length);
159         }
160     } else if (bm->length == 0)
161     {
162         ret = b->num;
163         if (ret != 0)
164             BIO_set_retry_read(b);
165     }
166     return(ret);
167 }
168
169 static int mem_write(BIO *b, const char *in, int inl)
170 {
171     int ret= -1;
172     int blen;
173     BUF_MEM *bm;
174
175     bm=(BUF_MEM *)b->ptr;
176     if (in == NULL)
177     {
178         BIOerr(BIO_F_MEM_WRITE,BIO_R_NULL_PARAMETER);
179         goto end;
180     }
181
182     if(b->flags & BIO_FLAGS_MEM_RDONLY) {
183         BIOerr(BIO_F_MEM_WRITE,BIO_R_WRITE_TO_READ_ONLY_BIO);
184         goto end;
185     }
186
187     BIO_clear_retry_flags(b);
188     blen=bm->length;
189     if (BUF_MEM_grow_clean(bm,blen+inl) != (blen+inl))
190         goto end;
191     memcpy(&(bm->data[blen]),in,inl);
192     ret=inl;
193 end:

```

```

194     return(ret);
195 }
196
197 static long mem_ctrl(BIO *b, int cmd, long num, void *ptr)
198 {
199     long ret=1;
200     char **pptr;
201
202     BUF_MEM *bm=(BUF_MEM *)b->ptr;
203
204     switch (cmd)
205     {
206     case BIO_CTRL_RESET:
207         if (bm->data != NULL)
208         {
209             /* For read only case reset to the start again */
210             if(b->flags & BIO_FLAGS_MEM_RDONLY)
211             {
212                 bm->data -= bm->max - bm->length;
213                 bm->length = bm->max;
214             }
215             else
216             {
217                 memset(bm->data,0,bm->max);
218                 bm->length=0;
219             }
220         }
221         break;
222     case BIO_CTRL_EOF:
223         ret=(long)(bm->length == 0);
224         break;
225     case BIO_C_SET_BUF_MEM_EOF_RETURN:
226         b->num=(int)num;
227         break;
228     case BIO_CTRL_INFO:
229         ret=(long)bm->length;
230         if (ptr != NULL)
231         {
232             pptr=(char **)ptr;
233             *pptr=(char *)&(bm->data[0]);
234         }
235         break;
236     case BIO_C_SET_BUF_MEM:
237         mem_free(b);
238         b->shutdown=(int)num;
239         b->ptr=ptr;
240         break;
241     case BIO_C_GET_BUF_MEM_PTR:
242         if (ptr != NULL)
243         {
244             pptr=(char **)ptr;
245             *pptr=(char *)bm;
246         }
247         break;
248     case BIO_CTRL_GET_CLOSE:
249         ret=(long)b->shutdown;
250         break;
251     case BIO_CTRL_SET_CLOSE:
252         b->shutdown=(int)num;
253         break;
254
255     case BIO_CTRL_WPENDING:
256         ret=0L;
257         break;
258     case BIO_CTRL_PENDING:
259         ret=(long)bm->length;

```

```
260         break;
261     case BIO_CTRL_DUP:
262     case BIO_CTRL_FLUSH:
263         ret=1;
264         break;
265     case BIO_CTRL_PUSH:
266     case BIO_CTRL_POP:
267     default:
268         ret=0;
269         break;
270     }
271     return(ret);
272 }

274 static int mem_gets(BIO *bp, char *buf, int size)
275 {
276     int i,j;
277     int ret= -1;
278     char *p;
279     BUF_MEM *bm=(BUF_MEM *)bp->ptr;

281     BIO_clear_retry_flags(bp);
282     j=bm->length;
283     if ((size-1) < j) j=size-1;
284     if (j <= 0)
285     {
286         *buf='\0';
287         return 0;
288     }
289     p=bm->data;
290     for (i=0; i<j; i++)
291     {
292         if (p[i] == '\n')
293         {
294             i++;
295             break;
296         }
297     }

299     /*
300      * i is now the max num of bytes to copy, either j or up to
301      * and including the first newline
302      */

304     i=mem_read(bp,buf,i);
305     if (i > 0) buf[i]='\0';
306     ret=i;
307     return(ret);
308 }

310 static int mem_puts(BIO *bp, const char *str)
311 {
312     int n,ret;

314     n=strlen(str);
315     ret=mem_write(bp,str,n);
316     /* memory semantics is that it will always work */
317     return(ret);
318 }
```

4724 Fri May 30 18:31:35 2014
 new/usr/src/lib/openssl/libsunw_crypto/bio/bss_null.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/bio/bss_null.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"

```

62 #include <openssl/bio.h>

```

64 static int null_write(BIO *h, const char *buf, int num);
65 static int null_read(BIO *h, char *buf, int size);
66 static int null_puts(BIO *h, const char *str);
67 static int null_gets(BIO *h, char *str, int size);
68 static long null_ctrl(BIO *h, int cmd, long arg1, void *arg2);
69 static int null_new(BIO *h);
70 static int null_free(BIO *data);
71 static BIO_METHOD null_method=
72 {
73     BIO_TYPE_NULL,
74     "NULL",
75     null_write,
76     null_read,
77     null_puts,
78     null_gets,
79     null_ctrl,
80     null_new,
81     null_free,
82     NULL,
83 };

85 BIO_METHOD *BIO_s_null(void)
86 {
87     return(&null_method);
88 }

90 static int null_new(BIO *bi)
91 {
92     bi->init=1;
93     bi->num=0;
94     bi->ptr=NULL;
95     return(1);
96 }

98 static int null_free(BIO *a)
99 {
100     if (a == NULL) return(0);
101     return(1);
102 }

104 static int null_read(BIO *b, char *out, int outl)
105 {
106     return(0);
107 }

109 static int null_write(BIO *b, const char *in, int inl)
110 {
111     return(inl);
112 }

114 static long null_ctrl(BIO *b, int cmd, long num, void *ptr)
115 {
116     long ret=1;

118     switch (cmd)
119     {
120     case BIO_CTRL_RESET:
121     case BIO_CTRL_EOF:
122     case BIO_CTRL_SET:
123     case BIO_CTRL_SET_CLOSE:
124     case BIO_CTRL_FLUSH:
125     case BIO_CTRL_DUP:
126         ret=1;
127         break;

```

```
128     case BIO_CTRL_GET_CLOSE:
129     case BIO_CTRL_INFO:
130     case BIO_CTRL_GET:
131     case BIO_CTRL_PENDING:
132     case BIO_CTRL_WPENDING:
133     default:
134         ret=0;
135         break;
136     }
137     return(ret);
138 }

140 static int null_gets(BIO *bp, char *buf, int size)
141 {
142     return(0);
143 }

145 static int null_puts(BIO *bp, const char *str)
146 {
147     if (str == NULL) return(0);
148     return(strlen(str));
149 }
```

```

*****
6851 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bio/bss_sock.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bio/bss_sock.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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16 * Copyright remains Eric Young's, and as such any Copyright notices in
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18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <errno.h>
61 #define USE_SOCKETS

```

```

62 #include "cryptlib.h"
64 #ifndef OPENSSL_NO_SOCKET
66 #include <openssl/bio.h>
68 #ifdef WATT32
69 #define sock_write SockWrite /* Watt-32 uses same names */
70 #define sock_read SockRead
71 #define sock_puts SockPuts
72 #endif
74 static int sock_write(BIO *h, const char *buf, int num);
75 static int sock_read(BIO *h, char *buf, int size);
76 static int sock_puts(BIO *h, const char *str);
77 static long sock_ctrl(BIO *h, int cmd, long arg1, void *arg2);
78 static int sock_new(BIO *h);
79 static int sock_free(BIO *data);
80 int BIO_sock_should_retry(int s);
82 static BIO_METHOD methods_sockp=
83 {
84     BIO_TYPE_SOCKET,
85     "socket",
86     sock_write,
87     sock_read,
88     sock_puts,
89     NULL, /* sock_gets, */
90     sock_ctrl,
91     sock_new,
92     sock_free,
93     NULL,
94 };
96 BIO_METHOD *BIO_s_socket(void)
97 {
98     return(&methods_sockp);
99 }
101 BIO *BIO_new_socket(int fd, int close_flag)
102 {
103     BIO *ret;
105     ret=BIO_new(BIO_s_socket());
106     if (ret == NULL) return(NULL);
107     BIO_set_fd(ret,fd,close_flag);
108     return(ret);
109 }
111 static int sock_new(BIO *bi)
112 {
113     bi->init=0;
114     bi->num=0;
115     bi->ptr=NULL;
116     bi->flags=0;
117     return(1);
118 }
120 static int sock_free(BIO *a)
121 {
122     if (a == NULL) return(0);
123     if (a->shutdown)
124     {
125         if (a->init)
126         {
127             SHUTDOWN2(a->num);

```

```

128     }
129     a->init=0;
130     a->flags=0;
131     }
132     return(1);
133 }
134
135 static int sock_read(BIO *b, char *out, int outl)
136 {
137     int ret=0;
138
139     if (out != NULL)
140     {
141         clear_socket_error();
142         ret=readsocket(b->num,out,outl);
143         BIO_clear_retry_flags(b);
144         if (ret <= 0)
145         {
146             if (BIO_sock_should_retry(ret))
147                 BIO_set_retry_read(b);
148         }
149     }
150     return(ret);
151 }
152
153 static int sock_write(BIO *b, const char *in, int inl)
154 {
155     int ret;
156
157     clear_socket_error();
158     ret=writesocket(b->num,in,inl);
159     BIO_clear_retry_flags(b);
160     if (ret <= 0)
161     {
162         if (BIO_sock_should_retry(ret))
163             BIO_set_retry_write(b);
164     }
165     return(ret);
166 }
167
168 static long sock_ctrl(BIO *b, int cmd, long num, void *ptr)
169 {
170     long ret=1;
171     int *ip;
172
173     switch (cmd)
174     {
175     case BIO_C_SET_FD:
176         sock_free(b);
177         b->num= *((int *)ptr);
178         b->shutdown=(int)num;
179         b->init=1;
180         break;
181     case BIO_C_GET_FD:
182         if (b->init)
183         {
184             ip=(int *)ptr;
185             if (ip != NULL) *ip=b->num;
186             ret=b->num;
187         }
188         else
189             ret= -1;
190         break;
191     case BIO_CTRL_GET_CLOSE:
192         ret=b->shutdown;
193         break;

```

```

194     case BIO_CTRL_SET_CLOSE:
195         b->shutdown=(int)num;
196         break;
197     case BIO_CTRL_DUP:
198     case BIO_CTRL_FLUSH:
199         ret=1;
200         break;
201     default:
202         ret=0;
203         break;
204     }
205     return(ret);
206 }
207
208 static int sock_puts(BIO *bp, const char *str)
209 {
210     int n,ret;
211
212     n=strlen(str);
213     ret=sock_write(bp,str,n);
214     return(ret);
215 }
216
217 int BIO_sock_should_retry(int i)
218 {
219     int err;
220
221     if ((i == 0) || (i == -1))
222     {
223         err=get_last_socket_error();
224
225         #if defined(OPENSSSL_SYS_WINDOWS) && 0 /* more microsoft stupidity? perhaps not?
226             if ((i == -1) && (err == 0))
227                 return(1);
228         #endif
229
230         return(BIO_sock_non_fatal_error(err));
231     }
232     return(0);
233 }
234
235 int BIO_sock_non_fatal_error(int err)
236 {
237     switch (err)
238     {
239     #if defined(OPENSSSL_SYS_WINDOWS) || defined(OPENSSSL_SYS_NETWARE)
240     # if defined(WSAEWOULDBLOCK)
241     case WSAEWOULDBLOCK:
242     # endif
243
244     # if 0 /* This appears to always be an error */
245     # if defined(WSAENOTCONN)
246     case WSAENOTCONN:
247     # endif
248     # endif
249     #endif
250
251     #ifdef EWOULDBLOCK
252     # if defined(WSAEWOULDBLOCK)
253     # if WSAEWOULDBLOCK != EWOULDBLOCK
254     case EWOULDBLOCK:
255     # endif
256     # else
257     case EWOULDBLOCK:
258     # endif
259     #endif

```

```
261 #if defined(ENOTCONN)
262     case ENOTCONN:
263 #endif
264
265 #ifdef EINTR
266     case EINTR:
267 #endif
268
269 #ifdef EAGAIN
270 # if EWOULDBLOCK != EAGAIN
271     case EAGAIN:
272 # endif
273 #endif
274
275 #ifdef EPROTO
276     case EPROTO:
277 #endif
278
279 #ifdef EINPROGRESS
280     case EINPROGRESS:
281 #endif
282
283 #ifdef EALREADY
284     case EALREADY:
285 #endif
286
287     return(1);
288     /* break; */
289
290     default:
291         break;
292     }
293     return(0);
294 }
295
296 #endif /* #ifndef OPENSSSL_NO_SOCKET */
```

```

*****
6864 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_add.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_add.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include "bn_lcl.h"

```

```

63 /* r can == a or b */
64 int BN_add(BIGNUM *r, const BIGNUM *a, const BIGNUM *b)
65 {
66     const BIGNUM *tmp;
67     int a_neg = a->neg, ret;
68
69     bn_check_top(a);
70     bn_check_top(b);
71
72     /* a + b      a+b
73      * a + -b      a-b
74      * -a + b      b-a
75      * -a + -b     -(a+b)
76      */
77     if (a_neg ^ b->neg)
78     {
79         /* only one is negative */
80         if (a_neg)
81             { tmp=a; a=b; b=tmp; }
82
83         /* we are now a - b */
84
85         if (BN_ucmp(a,b) < 0)
86             {
87                 if (!BN_usub(r,b,a)) return(0);
88                 r->neg=1;
89             }
90         else
91             {
92                 if (!BN_usub(r,a,b)) return(0);
93                 r->neg=0;
94             }
95         return(1);
96     }
97
98     ret = BN_uadd(r,a,b);
99     r->neg = a_neg;
100     bn_check_top(r);
101     return ret;
102 }
103
104 /* unsigned add of b to a */
105 int BN_uadd(BIGNUM *r, const BIGNUM *a, const BIGNUM *b)
106 {
107     int max,min,dif;
108     BN_ULONG *ap,*bp,*rp,carry,t1,t2;
109     const BIGNUM *tmp;
110
111     bn_check_top(a);
112     bn_check_top(b);
113
114     if (a->top < b->top)
115         { tmp=a; a=b; b=tmp; }
116     max = a->top;
117     min = b->top;
118     dif = max - min;
119
120     if (bn_wexpand(r,max+1) == NULL)
121         return 0;
122
123     r->top=max;
124
125     ap=a->d;
126     bp=b->d;

```

```

128     rp=r->d;
130     carry=bn_add_words(rp,ap,bp,min);
131     rp+=min;
132     ap+=min;
133     bp+=min;
135     if (carry)
136     {
137         while (dif)
138         {
139             dif--;
140             t1 = *(ap++);
141             t2 = (t1+1) & BN_MASK2;
142             *(rp++) = t2;
143             if (t2)
144             {
145                 carry=0;
146                 break;
147             }
148         }
149         if (carry)
150         {
151             /* carry != 0 => dif == 0 */
152             *rp = 1;
153             r->top++;
154         }
155     }
156     if (dif && rp != ap)
157     while (dif--)
158     /* copy remaining words if ap != rp */
159     *(rp++) = *(ap++);
160     r->neg = 0;
161     bn_check_top(r);
162     return 1;
163 }

165 /* unsigned subtraction of b from a, a must be larger than b. */
166 int BN_usub(BIGNUM *r, const BIGNUM *a, const BIGNUM *b)
167 {
168     int max,min,dif;
169     register BN_ULONG t1,t2,*ap,*bp,*rp;
170     int i,carry;
171 #if defined(IRIX_CC_BUG) && !defined(LINT)
172     int dummy;
173 #endif
175     bn_check_top(a);
176     bn_check_top(b);
178     max = a->top;
179     min = b->top;
180     dif = max - min;
182     if (dif < 0) /* hmm... should not be happening */
183     {
184         BNerr(BN_F_BN_USUB,BN_R_ARG2_LT_ARG3);
185         return(0);
186     }
188     if (bn_wexpand(r,max) == NULL) return(0);
190     ap=a->d;
191     bp=b->d;
192     rp=r->d;

```

```

194 #if 1
195     carry=0;
196     for (i = min; i != 0; i--)
197     {
198         t1= *(ap++);
199         t2= *(bp++);
200         if (carry)
201         {
202             carry=(t1 <= t2);
203             t1=(t1-t2-1)&BN_MASK2;
204         }
205         else
206         {
207             carry=(t1 < t2);
208             t1=(t1-t2)&BN_MASK2;
209         }
210 #if defined(IRIX_CC_BUG) && !defined(LINT)
211         dummy=t1;
212 #endif
213         *(rp++)=t1&BN_MASK2;
214     }
215 #else
216     carry=bn_sub_words(rp,ap,bp,min);
217     ap+=min;
218     bp+=min;
219     rp+=min;
220 #endif
221 if (carry) /* subtracted */
222 {
223     if (!dif)
224         /* error: a < b */
225         return 0;
226     while (dif)
227     {
228         dif--;
229         t1 = *(ap++);
230         t2 = (t1-1)&BN_MASK2;
231         *(rp++) = t2;
232         if (t1)
233             break;
234     }
235 }
236 #if 0
237     memcpy(rp,ap,sizeof(*rp)*(max-i));
238 #else
239     if (rp != ap)
240     {
241         for (;;)
242         {
243             if (!dif--) break;
244             rp[0]=ap[0];
245             if (!dif--) break;
246             rp[1]=ap[1];
247             if (!dif--) break;
248             rp[2]=ap[2];
249             if (!dif--) break;
250             rp[3]=ap[3];
251             rp+=4;
252             ap+=4;
253         }
254     }
255 #endif
257     r->top=max;
258     r->neg=0;
259     bn_correct_top(r);

```

```
260     return(1);
261 }

263 int BN_sub(BIGNUM *r, const BIGNUM *a, const BIGNUM *b)
264 {
265     int max;
266     int add=0, neg=0;
267     const BIGNUM *tmp;

269     bn_check_top(a);
270     bn_check_top(b);

272     /* a - b      a-b
273      * a - -b     a+b
274      * -a - b     -(a+b)
275      * -a - -b    b-a
276      */
277     if (a->neg)
278     {
279         if (b->neg)
280             { tmp=a; a=b; b=tmp; }
281         else
282             { add=1; neg=1; }
283     }
284     else
285     {
286         if (b->neg) { add=1; neg=0; }
287     }

289     if (add)
290     {
291         if (!BN_uadd(r,a,b)) return(0);
292         r->neg=neg;
293         return(1);
294     }

296     /* We are actually doing a - b :- ) */
298     max=(a->top > b->top)?a->top:b->top;
299     if (bn_wexpand(r,max) == NULL) return(0);
300     if (BN_ucmp(a,b) < 0)
301     {
302         if (!BN_usub(r,b,a)) return(0);
303         r->neg=1;
304     }
305     else
306     {
307         if (!BN_usub(r,a,b)) return(0);
308         r->neg=0;
309     }
310     bn_check_top(r);
311     return(1);
312 }
```



```
*****
```

```
23202 Fri May 30 18:31:35 2014
```

```
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_asm.c
```

```
4853 illumos-gate is not lint-clean when built with openssl 1.0
```

```
*****
```

```
1 /* crypto/bn/bn_asm.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef BN_DEBUG
60 # undef NDEBUG /* avoid conflicting definitions */
61 # define NDEBUG
```

```
62 #endif
```

```
64 #include <stdio.h>
65 #include <assert.h>
66 #include "cryptlib.h"
67 #include "bn_lcl.h"
```

```
69 #if defined(BN_LLONG) || defined(BN_UMULT_HIGH)
```

```
71 BN_ULONG bn_mul_add_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w)
72 {
73     BN_ULONG c1=0;
74
75     assert(num >= 0);
76     if (num <= 0) return(c1);
```

```
78 #ifndef OPENSSSL_SMALL_FOOTPRINT
79     while (num&~3)
80     {
81         mul_add(rp[0],ap[0],w,c1);
82         mul_add(rp[1],ap[1],w,c1);
83         mul_add(rp[2],ap[2],w,c1);
84         mul_add(rp[3],ap[3],w,c1);
85         ap+=4; rp+=4; num-=4;
86     }
```

```
87 #endif
88     while (num)
89     {
90         mul_add(rp[0],ap[0],w,c1);
91         ap++; rp++; num--;
92     }
93
94     return(c1);
95 }
```

```
97 BN_ULONG bn_mul_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w)
98 {
99     BN_ULONG c1=0;
```

```
101     assert(num >= 0);
102     if (num <= 0) return(c1);
```

```
104 #ifndef OPENSSSL_SMALL_FOOTPRINT
105     while (num&~3)
106     {
107         mul(rp[0],ap[0],w,c1);
108         mul(rp[1],ap[1],w,c1);
109         mul(rp[2],ap[2],w,c1);
110         mul(rp[3],ap[3],w,c1);
111         ap+=4; rp+=4; num-=4;
112     }
```

```
113 #endif
114     while (num)
115     {
116         mul(rp[0],ap[0],w,c1);
117         ap++; rp++; num--;
118     }
119     return(c1);
120 }
```

```
122 void bn_sqr_words(BN_ULONG *r, const BN_ULONG *a, int n)
123 {
124     assert(n >= 0);
125     if (n <= 0) return;
```

```
127 #ifndef OPENSSSL_SMALL_FOOTPRINT
```

```

128     while (n&~3)
129     {
130         sqr(r[0],r[1],a[0]);
131         sqr(r[2],r[3],a[1]);
132         sqr(r[4],r[5],a[2]);
133         sqr(r[6],r[7],a[3]);
134         a+=4; r+=8; n-=4;
135     }
136 #endif
137     while (n)
138     {
139         sqr(r[0],r[1],a[0]);
140         a++; r+=2; n--;
141     }
142 }

144 #else /* !(defined(BN_LLONG) || defined(BN_UMULT_HIGH)) */

146 BN_ULONG bn_mul_add_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w)
147 {
148     BN_ULONG c=0;
149     BN_ULONG bl,bh;

151     assert(num >= 0);
152     if (num <= 0) return((BN_ULONG)0);

154     bl=LBITS(w);
155     bh=HBITS(w);

157 #ifndef OPENSSL_SMALL_FOOTPRINT
158     while (num&~3)
159     {
160         mul_add(rp[0],ap[0],bl,bh,c);
161         mul_add(rp[1],ap[1],bl,bh,c);
162         mul_add(rp[2],ap[2],bl,bh,c);
163         mul_add(rp[3],ap[3],bl,bh,c);
164         ap+=4; rp+=4; num-=4;
165     }
166 #endif
167     while (num)
168     {
169         mul_add(rp[0],ap[0],bl,bh,c);
170         ap++; rp++; num--;
171     }
172     return(c);
173 }

175 BN_ULONG bn_mul_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w)
176 {
177     BN_ULONG carry=0;
178     BN_ULONG bl,bh;

180     assert(num >= 0);
181     if (num <= 0) return((BN_ULONG)0);

183     bl=LBITS(w);
184     bh=HBITS(w);

186 #ifndef OPENSSL_SMALL_FOOTPRINT
187     while (num&~3)
188     {
189         mul(rp[0],ap[0],bl,bh,carry);
190         mul(rp[1],ap[1],bl,bh,carry);
191         mul(rp[2],ap[2],bl,bh,carry);
192         mul(rp[3],ap[3],bl,bh,carry);
193         ap+=4; rp+=4; num-=4;

```

```

194     }
195 #endif
196     while (num)
197     {
198         mul(rp[0],ap[0],bl,bh,carry);
199         ap++; rp++; num--;
200     }
201     return(carry);
202 }

204 void bn_sqr_words(BN_ULONG *r, const BN_ULONG *a, int n)
205 {
206     assert(n >= 0);
207     if (n <= 0) return;

209 #ifndef OPENSSL_SMALL_FOOTPRINT
210     while (n&~3)
211     {
212         sqr64(r[0],r[1],a[0]);
213         sqr64(r[2],r[3],a[1]);
214         sqr64(r[4],r[5],a[2]);
215         sqr64(r[6],r[7],a[3]);
216         a+=4; r+=8; n-=4;
217     }
218 #endif
219     while (n)
220     {
221         sqr64(r[0],r[1],a[0]);
222         a++; r+=2; n--;
223     }
224 }

226 #endif /* !(defined(BN_LLONG) || defined(BN_UMULT_HIGH)) */

228 #if defined(BN_LLONG) && defined(BN_DIV2W)

230 BN_ULONG bn_div_words(BN_ULONG h, BN_ULONG l, BN_ULONG d)
231 {
232     return((BN_ULONG)((((BN_ULLONG)h)<<BN_BITS2)|l)/(BN_ULLONG)d));
233 }

235 #else

237 /* Divide h,l by d and return the result. */
238 /* I need to test this some more :- ( */
239 BN_ULONG bn_div_words(BN_ULONG h, BN_ULONG l, BN_ULONG d)
240 {
241     BN_ULONG dh,dl,q,ret=0,th,tl,t;
242     int i,count=2;

244     if (d == 0) return(BN_MASK2);

246     i=BN_num_bits_word(d);
247     assert((i == BN_BITS2) || (h <= (BN_ULONG)1<<i));

249     i=BN_BITS2-i;
250     if (h >= d) h-=d;

252     if (i)
253     {
254         d<<=i;
255         h=(h<<i)|((l>>(BN_BITS2-i)));
256         l<<=i;
257     }
258     dh=(d&BN_MASK2h)>>BN_BITS4;
259     dl=(d&BN_MASK2l);

```

```

260     for (;;)
261     {
262         if ((h>>BN_BITS4) == dh)
263             q=BN_MASK2l;
264         else
265             q=h/dh;
266
267         th=q*dh;
268         tl=d1*q;
269         for (;;)
270         {
271             t=h-th;
272             if ((t&BN_MASK2h) ||
273                 ((tl) <= (
274                     (t<<BN_BITS4)|
275                     ((l&BN_MASK2h)>>BN_BITS4))))
276                 break;
277             q--;
278             th-=dh;
279             tl-=dl;
280         }
281         t=(tl>>BN_BITS4);
282         tl=(tl<<BN_BITS4)&BN_MASK2h;
283         th+=t;
284
285         if (l < tl) th++;
286         l-=tl;
287         if (h < th)
288         {
289             h+=d;
290             q--;
291         }
292         h-=th;
293
294         if (--count == 0) break;
295
296         ret=q<<BN_BITS4;
297         h=((h<<BN_BITS4)|(l>>BN_BITS4))&BN_MASK2;
298         l=((l&BN_MASK2l)<<BN_BITS4);
299     }
300     ret|=q;
301     return(ret);
302 }
303 #endif /* !defined(BN_LLONG) && defined(BN_DIV2W) */
304
305 #ifdef BN_LLONG
306 BN_ULONG bn_add_words(BN_ULONG *r, const BN_ULONG *a, const BN_ULONG *b, int n)
307 {
308     BN_ULONG ll=0;
309
310     assert(n >= 0);
311     if (n <= 0) return((BN_ULONG)0);
312
313 #ifndef OPENSSSL_SMALL_FOOTPRINT
314     while (n&~3)
315     {
316         ll+=(BN_ULONG)a[0]+b[0];
317         r[0]=(BN_ULONG)ll&BN_MASK2;
318         ll>>=BN_BITS2;
319         ll+=(BN_ULONG)a[1]+b[1];
320         r[1]=(BN_ULONG)ll&BN_MASK2;
321         ll>>=BN_BITS2;
322         ll+=(BN_ULONG)a[2]+b[2];
323         r[2]=(BN_ULONG)ll&BN_MASK2;
324         ll>>=BN_BITS2;
325         ll+=(BN_ULONG)a[3]+b[3];

```

```

326         r[3]=(BN_ULONG)ll&BN_MASK2;
327         ll>>=BN_BITS2;
328         a+=4; b+=4; r+=4; n-=4;
329     }
330 #endif
331     while (n)
332     {
333         ll+=(BN_ULONG)a[0]+b[0];
334         r[0]=(BN_ULONG)ll&BN_MASK2;
335         ll>>=BN_BITS2;
336         a++; b++; r++; n--;
337     }
338     return((BN_ULONG)ll);
339 }
340 #else /* !BN_LLONG */
341 BN_ULONG bn_add_words(BN_ULONG *r, const BN_ULONG *a, const BN_ULONG *b, int n)
342 {
343     BN_ULONG c, l, t;
344
345     assert(n >= 0);
346     if (n <= 0) return((BN_ULONG)0);
347
348     c=0;
349 #ifndef OPENSSSL_SMALL_FOOTPRINT
350     while (n&~3)
351     {
352         t=a[0];
353         t=(t+c)&BN_MASK2;
354         c=(t < c);
355         l=(t+b[0])&BN_MASK2;
356         c+=(l < t);
357         r[0]=l;
358         t=a[1];
359         t=(t+c)&BN_MASK2;
360         c=(t < c);
361         l=(t+b[1])&BN_MASK2;
362         c+=(l < t);
363         r[1]=l;
364         t=a[2];
365         t=(t+c)&BN_MASK2;
366         c=(t < c);
367         l=(t+b[2])&BN_MASK2;
368         c+=(l < t);
369         r[2]=l;
370         t=a[3];
371         t=(t+c)&BN_MASK2;
372         c=(t < c);
373         l=(t+b[3])&BN_MASK2;
374         c+=(l < t);
375         r[3]=l;
376         a+=4; b+=4; r+=4; n-=4;
377     }
378 #endif
379     while(n)
380     {
381         t=a[0];
382         t=(t+c)&BN_MASK2;
383         c=(t < c);
384         l=(t+b[0])&BN_MASK2;
385         c+=(l < t);
386         r[0]=l;
387         a++; b++; r++; n--;
388     }
389     return((BN_ULONG)c);
390 }
391 #endif /* !BN_LLONG */

```

```

393 BN_ULONG bn_sub_words(BN_ULONG *r, const BN_ULONG *a, const BN_ULONG *b, int n)
394 {
395     BN_ULONG t1,t2;
396     int c=0;

398     assert(n >= 0);
399     if (n <= 0) return((BN_ULONG)0);

401 #ifndef OPENSSL_SMALL_FOOTPRINT
402     while (n>=3)
403     {
404         t1=a[0]; t2=b[0];
405         r[0]=(t1-t2-c)&BN_MASK2;
406         if (t1 != t2) c=(t1 < t2);
407         t1=a[1]; t2=b[1];
408         r[1]=(t1-t2-c)&BN_MASK2;
409         if (t1 != t2) c=(t1 < t2);
410         t1=a[2]; t2=b[2];
411         r[2]=(t1-t2-c)&BN_MASK2;
412         if (t1 != t2) c=(t1 < t2);
413         t1=a[3]; t2=b[3];
414         r[3]=(t1-t2-c)&BN_MASK2;
415         if (t1 != t2) c=(t1 < t2);
416         a+=4; b+=4; r+=4; n-=4;
417     }
418 #endif
419     while (n)
420     {
421         t1=a[0]; t2=b[0];
422         r[0]=(t1-t2-c)&BN_MASK2;
423         if (t1 != t2) c=(t1 < t2);
424         a++; b++; r++; n--;
425     }
426     return(c);
427 }

429 #if defined(BN_MUL_COMBA) && !defined(OPENSSL_SMALL_FOOTPRINT)

431 #undef bn_mul_comba8
432 #undef bn_mul_comba4
433 #undef bn_sqr_comba8
434 #undef bn_sqr_comba4

436 /* mul_add_c(a,b,c0,c1,c2) -- c+=a*b for three word number c=(c2,c1,c0) */
437 /* mul_add_c2(a,b,c0,c1,c2) -- c+=2*a*b for three word number c=(c2,c1,c0) */
438 /* sqr_add_c(a,i,c0,c1,c2) -- c+=a[i]^2 for three word number c=(c2,c1,c0) */
439 /* sqr_add_c2(a,i,c0,c1,c2) -- c+=2*a[i]*a[j] for three word number c=(c2,c1,c0)

441 #ifdef BN_LLONG
442 #define mul_add_c(a,b,c0,c1,c2) \
443     t=(BN_ULONG)a*b; \
444     t1=(BN_ULONG)Lw(t); \
445     t2=(BN_ULONG)Hw(t); \
446     c0=(c0+t1)&BN_MASK2; if ((c0 < t1) t2++; \
447     c1=(c1+t2)&BN_MASK2; if ((c1 < t2) c2++;

449 #define mul_add_c2(a,b,c0,c1,c2) \
450     t=(BN_ULONG)a*b; \
451     tt=(t+t)&BN_MASK; \
452     if (tt < t) c2++; \
453     t1=(BN_ULONG)Lw(tt); \
454     t2=(BN_ULONG)Hw(tt); \
455     c0=(c0+t1)&BN_MASK2; \
456     if ((c0 < t1) && (((++t2)&BN_MASK2) == 0)) c2++; \
457     c1=(c1+t2)&BN_MASK2; if ((c1 < t2) c2++;

```

```

459 #define sqr_add_c(a,i,c0,c1,c2) \
460     t=(BN_ULONG)a[i]*a[i]; \
461     t1=(BN_ULONG)Lw(t); \
462     t2=(BN_ULONG)Hw(t); \
463     c0=(c0+t1)&BN_MASK2; if ((c0 < t1) t2++; \
464     c1=(c1+t2)&BN_MASK2; if ((c1 < t2) c2++;

466 #define sqr_add_c2(a,i,j,c0,c1,c2) \
467     mul_add_c2((a)[i],(a)[j],c0,c1,c2)

469 #elif defined(BN_UMULT_LOHI)

471 #define mul_add_c(a,b,c0,c1,c2) { \
472     BN_ULONG ta=(a),tb=(b); \
473     BN_UMULT_LOHI(t1,t2,ta,tb); \
474     c0 += t1; t2 += (c0<t1)?1:0; \
475     c1 += t2; c2 += (c1<t2)?1:0; \
476 }

478 #define mul_add_c2(a,b,c0,c1,c2) { \
479     BN_ULONG ta=(a),tb=(b),t0; \
480     BN_UMULT_LOHI(t0,t1,ta,tb); \
481     t2 = t1+t1; c2 += (t2<t1)?1:0; \
482     t1 = t0+t0; t2 += (t1<t0)?1:0; \
483     c0 += t1; t2 += (c0<t1)?1:0; \
484     c1 += t2; c2 += (c1<t2)?1:0; \
485 }

487 #define sqr_add_c(a,i,c0,c1,c2) { \
488     BN_ULONG ta=(a)[i]; \
489     BN_UMULT_LOHI(t1,t2,ta,ta); \
490     c0 += t1; t2 += (c0<t1)?1:0; \
491     c1 += t2; c2 += (c1<t2)?1:0; \
492 }

494 #define sqr_add_c2(a,i,j,c0,c1,c2) \
495     mul_add_c2((a)[i],(a)[j],c0,c1,c2)

497 #elif defined(BN_UMULT_HIGH)

499 #define mul_add_c(a,b,c0,c1,c2) { \
500     BN_ULONG ta=(a),tb=(b); \
501     t1 = ta * tb; \
502     t2 = BN_UMULT_HIGH(ta,tb); \
503     c0 += t1; t2 += (c0<t1)?1:0; \
504     c1 += t2; c2 += (c1<t2)?1:0; \
505 }

507 #define mul_add_c2(a,b,c0,c1,c2) { \
508     BN_ULONG ta=(a),tb=(b),t0; \
509     t1 = BN_UMULT_HIGH(ta,tb); \
510     t0 = ta * tb; \
511     t2 = t1+t1; c2 += (t2<t1)?1:0; \
512     t1 = t0+t0; t2 += (t1<t0)?1:0; \
513     c0 += t1; t2 += (c0<t1)?1:0; \
514     c1 += t2; c2 += (c1<t2)?1:0; \
515 }

517 #define sqr_add_c(a,i,c0,c1,c2) { \
518     BN_ULONG ta=(a)[i]; \
519     t1 = ta * ta; \
520     t2 = BN_UMULT_HIGH(ta,ta); \
521     c0 += t1; t2 += (c0<t1)?1:0; \
522     c1 += t2; c2 += (c1<t2)?1:0; \
523 }

```

```

525 #define sqr_add_c2(a,i,j,c0,c1,c2) \
526     mul_add_c2((a)[i],(a)[j],c0,c1,c2)

528 #else /* !BN_LLONG */
529 #define mul_add_c(a,b,c0,c1,c2) \
530     t1=LBITS(a); t2=HBITS(a); \
531     bl=LBITS(b); bh=HBITS(b); \
532     mul64(t1,t2,bl,bh); \
533     c0=(c0+t1)&BN_MASK2; if ((c0) < t1) t2++; \
534     c1=(c1+t2)&BN_MASK2; if ((c1) < t2) c2++;

536 #define mul_add_c2(a,b,c0,c1,c2) \
537     t1=LBITS(a); t2=HBITS(a); \
538     bl=LBITS(b); bh=HBITS(b); \
539     mul64(t1,t2,bl,bh); \
540     if (t2 & BN_TBIT) c2++; \
541     t2=(t2+t2)&BN_MASK2; \
542     if (t1 & BN_TBIT) t2++; \
543     t1=(t1+t1)&BN_MASK2; \
544     c0=(c0+t1)&BN_MASK2; \
545     if ((c0 < t1) && (((++t2)&BN_MASK2) == 0)) c2++; \
546     c1=(c1+t2)&BN_MASK2; if ((c1) < t2) c2++;

548 #define sqr_add_c(a,i,c0,c1,c2) \
549     sqr64(t1,t2,(a)[i]); \
550     c0=(c0+t1)&BN_MASK2; if ((c0) < t1) t2++; \
551     c1=(c1+t2)&BN_MASK2; if ((c1) < t2) c2++;

553 #define sqr_add_c2(a,i,j,c0,c1,c2) \
554     mul_add_c2((a)[i],(a)[j],c0,c1,c2)
555 #endif /* !BN_LLONG */

557 void bn_mul_comba8(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b)
558 {
559     #ifdef BN_LLONG
560         BN_ULONG t;
561     #else
562         BN_ULONG bl,bh;
563     #endif
564     BN_ULONG t1,t2;
565     BN_ULONG c1,c2,c3;

567     c1=0;
568     c2=0;
569     c3=0;
570     mul_add_c(a[0],b[0],c1,c2,c3);
571     r[0]=c1;
572     c1=0;
573     mul_add_c(a[0],b[1],c2,c3,c1);
574     mul_add_c(a[1],b[0],c2,c3,c1);
575     r[1]=c2;
576     c2=0;
577     mul_add_c(a[2],b[0],c3,c1,c2);
578     mul_add_c(a[1],b[1],c3,c1,c2);
579     mul_add_c(a[0],b[2],c3,c1,c2);
580     r[2]=c3;
581     c3=0;
582     mul_add_c(a[0],b[3],c1,c2,c3);
583     mul_add_c(a[1],b[2],c1,c2,c3);
584     mul_add_c(a[2],b[1],c1,c2,c3);
585     mul_add_c(a[3],b[0],c1,c2,c3);
586     r[3]=c1;
587     c1=0;
588     mul_add_c(a[4],b[0],c2,c3,c1);
589     mul_add_c(a[3],b[1],c2,c3,c1);

```

```

590     mul_add_c(a[2],b[2],c2,c3,c1);
591     mul_add_c(a[1],b[3],c2,c3,c1);
592     mul_add_c(a[0],b[4],c2,c3,c1);
593     r[4]=c2;
594     c2=0;
595     mul_add_c(a[0],b[5],c3,c1,c2);
596     mul_add_c(a[1],b[4],c3,c1,c2);
597     mul_add_c(a[2],b[3],c3,c1,c2);
598     mul_add_c(a[3],b[2],c3,c1,c2);
599     mul_add_c(a[4],b[1],c3,c1,c2);
600     mul_add_c(a[5],b[0],c3,c1,c2);
601     r[5]=c3;
602     c3=0;
603     mul_add_c(a[6],b[0],c1,c2,c3);
604     mul_add_c(a[5],b[1],c1,c2,c3);
605     mul_add_c(a[4],b[2],c1,c2,c3);
606     mul_add_c(a[3],b[3],c1,c2,c3);
607     mul_add_c(a[2],b[4],c1,c2,c3);
608     mul_add_c(a[1],b[5],c1,c2,c3);
609     mul_add_c(a[0],b[6],c1,c2,c3);
610     r[6]=c1;
611     c1=0;
612     mul_add_c(a[0],b[7],c2,c3,c1);
613     mul_add_c(a[1],b[6],c2,c3,c1);
614     mul_add_c(a[2],b[5],c2,c3,c1);
615     mul_add_c(a[3],b[4],c2,c3,c1);
616     mul_add_c(a[4],b[3],c2,c3,c1);
617     mul_add_c(a[5],b[2],c2,c3,c1);
618     mul_add_c(a[6],b[1],c2,c3,c1);
619     mul_add_c(a[7],b[0],c2,c3,c1);
620     r[7]=c2;
621     c2=0;
622     mul_add_c(a[7],b[1],c3,c1,c2);
623     mul_add_c(a[6],b[2],c3,c1,c2);
624     mul_add_c(a[5],b[3],c3,c1,c2);
625     mul_add_c(a[4],b[4],c3,c1,c2);
626     mul_add_c(a[3],b[5],c3,c1,c2);
627     mul_add_c(a[2],b[6],c3,c1,c2);
628     mul_add_c(a[1],b[7],c3,c1,c2);
629     r[8]=c3;
630     c3=0;
631     mul_add_c(a[2],b[7],c1,c2,c3);
632     mul_add_c(a[3],b[6],c1,c2,c3);
633     mul_add_c(a[4],b[5],c1,c2,c3);
634     mul_add_c(a[5],b[4],c1,c2,c3);
635     mul_add_c(a[6],b[3],c1,c2,c3);
636     mul_add_c(a[7],b[2],c1,c2,c3);
637     r[9]=c1;
638     c1=0;
639     mul_add_c(a[7],b[3],c2,c3,c1);
640     mul_add_c(a[6],b[4],c2,c3,c1);
641     mul_add_c(a[5],b[5],c2,c3,c1);
642     mul_add_c(a[4],b[6],c2,c3,c1);
643     mul_add_c(a[3],b[7],c2,c3,c1);
644     r[10]=c2;
645     c2=0;
646     mul_add_c(a[4],b[7],c3,c1,c2);
647     mul_add_c(a[5],b[6],c3,c1,c2);
648     mul_add_c(a[6],b[5],c3,c1,c2);
649     mul_add_c(a[7],b[4],c3,c1,c2);
650     r[11]=c3;
651     c3=0;
652     mul_add_c(a[7],b[5],c1,c2,c3);
653     mul_add_c(a[6],b[6],c1,c2,c3);
654     mul_add_c(a[5],b[7],c1,c2,c3);
655     r[12]=c1;

```

```

656     c1=0;
657     mul_add_c(a[6],b[7],c2,c3,c1);
658     mul_add_c(a[7],b[6],c2,c3,c1);
659     r[13]=c2;
660     c2=0;
661     mul_add_c(a[7],b[7],c3,c1,c2);
662     r[14]=c3;
663     r[15]=c1;
664     }

666 void bn_mul_comba4(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b)
667 {
668     #ifdef BN_LLONG
669         BN_ULLONG t;
670     #else
671         BN_ULONG bl,bh;
672     #endif
673     BN_ULONG t1,t2;
674     BN_ULONG c1,c2,c3;

676     c1=0;
677     c2=0;
678     c3=0;
679     mul_add_c(a[0],b[0],c1,c2,c3);
680     r[0]=c1;
681     c1=0;
682     mul_add_c(a[0],b[1],c2,c3,c1);
683     mul_add_c(a[1],b[0],c2,c3,c1);
684     r[1]=c2;
685     c2=0;
686     mul_add_c(a[2],b[0],c3,c1,c2);
687     mul_add_c(a[1],b[1],c3,c1,c2);
688     mul_add_c(a[0],b[2],c3,c1,c2);
689     r[2]=c3;
690     c3=0;
691     mul_add_c(a[0],b[3],c1,c2,c3);
692     mul_add_c(a[1],b[2],c1,c2,c3);
693     mul_add_c(a[2],b[1],c1,c2,c3);
694     mul_add_c(a[3],b[0],c1,c2,c3);
695     r[3]=c1;
696     c1=0;
697     mul_add_c(a[3],b[1],c2,c3,c1);
698     mul_add_c(a[2],b[2],c2,c3,c1);
699     mul_add_c(a[1],b[3],c2,c3,c1);
700     r[4]=c2;
701     c2=0;
702     mul_add_c(a[2],b[3],c3,c1,c2);
703     mul_add_c(a[3],b[2],c3,c1,c2);
704     r[5]=c3;
705     c3=0;
706     mul_add_c(a[3],b[3],c1,c2,c3);
707     r[6]=c1;
708     r[7]=c2;
709     }

711 void bn_sqr_comba8(BN_ULONG *r, const BN_ULONG *a)
712 {
713     #ifdef BN_LLONG
714         BN_ULLONG t,tt;
715     #else
716         BN_ULONG bl,bh;
717     #endif
718     BN_ULONG t1,t2;
719     BN_ULONG c1,c2,c3;

721     c1=0;

```

```

722     c2=0;
723     c3=0;
724     sqr_add_c(a,0,c1,c2,c3);
725     r[0]=c1;
726     c1=0;
727     sqr_add_c2(a,1,0,c2,c3,c1);
728     r[1]=c2;
729     c2=0;
730     sqr_add_c(a,1,c3,c1,c2);
731     sqr_add_c2(a,2,0,c3,c1,c2);
732     r[2]=c3;
733     c3=0;
734     sqr_add_c2(a,3,0,c1,c2,c3);
735     sqr_add_c2(a,2,1,c1,c2,c3);
736     r[3]=c1;
737     c1=0;
738     sqr_add_c(a,2,c2,c3,c1);
739     sqr_add_c2(a,3,1,c2,c3,c1);
740     sqr_add_c2(a,4,0,c2,c3,c1);
741     r[4]=c2;
742     c2=0;
743     sqr_add_c2(a,5,0,c3,c1,c2);
744     sqr_add_c2(a,4,1,c3,c1,c2);
745     sqr_add_c2(a,3,2,c3,c1,c2);
746     r[5]=c3;
747     c3=0;
748     sqr_add_c(a,3,c1,c2,c3);
749     sqr_add_c2(a,4,2,c1,c2,c3);
750     sqr_add_c2(a,5,1,c1,c2,c3);
751     sqr_add_c2(a,6,0,c1,c2,c3);
752     r[6]=c1;
753     c1=0;
754     sqr_add_c2(a,7,0,c2,c3,c1);
755     sqr_add_c2(a,6,1,c2,c3,c1);
756     sqr_add_c2(a,5,2,c2,c3,c1);
757     sqr_add_c2(a,4,3,c2,c3,c1);
758     r[7]=c2;
759     c2=0;
760     sqr_add_c(a,4,c3,c1,c2);
761     sqr_add_c2(a,5,3,c3,c1,c2);
762     sqr_add_c2(a,6,2,c3,c1,c2);
763     sqr_add_c2(a,7,1,c3,c1,c2);
764     r[8]=c3;
765     c3=0;
766     sqr_add_c2(a,7,2,c1,c2,c3);
767     sqr_add_c2(a,6,3,c1,c2,c3);
768     sqr_add_c2(a,5,4,c1,c2,c3);
769     r[9]=c1;
770     c1=0;
771     sqr_add_c(a,5,c2,c3,c1);
772     sqr_add_c2(a,6,4,c2,c3,c1);
773     sqr_add_c2(a,7,3,c2,c3,c1);
774     r[10]=c2;
775     c2=0;
776     sqr_add_c2(a,7,4,c3,c1,c2);
777     sqr_add_c2(a,6,5,c3,c1,c2);
778     r[11]=c3;
779     c3=0;
780     sqr_add_c(a,6,c1,c2,c3);
781     sqr_add_c2(a,7,5,c1,c2,c3);
782     r[12]=c1;
783     c1=0;
784     sqr_add_c2(a,7,6,c2,c3,c1);
785     r[13]=c2;
786     c2=0;
787     sqr_add_c(a,7,c3,c1,c2);

```

```

788     r[14]=c3;
789     r[15]=c1;
790 }

792 void bn_sqr_comba4(BN_ULONG *r, const BN_ULONG *a)
793 {
794     #ifdef BN_LLONG
795         BN_ULONG t,tt;
796     #else
797         BN_ULONG bl,bh;
798     #endif
799     BN_ULONG t1,t2;
800     BN_ULONG c1,c2,c3;

802     c1=0;
803     c2=0;
804     c3=0;
805     sqr_add_c(a,0,c1,c2,c3);
806     r[0]=c1;
807     c1=0;
808     sqr_add_c2(a,1,0,c2,c3,c1);
809     r[1]=c2;
810     c2=0;
811     sqr_add_c(a,1,c3,c1,c2);
812     sqr_add_c2(a,2,0,c3,c1,c2);
813     r[2]=c3;
814     c3=0;
815     sqr_add_c2(a,3,0,c1,c2,c3);
816     sqr_add_c2(a,2,1,c1,c2,c3);
817     r[3]=c1;
818     c1=0;
819     sqr_add_c(a,2,c2,c3,c1);
820     sqr_add_c2(a,3,1,c2,c3,c1);
821     r[4]=c2;
822     c2=0;
823     sqr_add_c2(a,3,2,c3,c1,c2);
824     r[5]=c3;
825     c3=0;
826     sqr_add_c(a,3,c1,c2,c3);
827     r[6]=c1;
828     r[7]=c2;
829 }

831 #ifdef OPENSSL_NO_ASM
832 #ifdef OPENSSL_BN_ASM_MONT
833 #include <alloca.h>
834 /*
835  * This is essentially reference implementation, which may or may not
836  * result in performance improvement. E.g. on IA-32 this routine was
837  * observed to give 40% faster rsa1024 private key operations and 10%
838  * faster rsa4096 ones, while on AMD64 it improves rsa1024 sign only
839  * by 10% and *worsens* rsa4096 sign by 15%. Once again, it's a
840  * reference implementation, one to be used as starting point for
841  * platform-specific assembler. Mentioned numbers apply to compiler
842  * generated code compiled with and without -DOPENSSL_BN_ASM_MONT and
843  * can vary not only from platform to platform, but even for compiler
844  * versions. Assembler vs. assembler improvement coefficients can
845  * [and are known to] differ and are to be documented elsewhere.
846  */
847 int bn_mul_mont(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, const BN_
848 {
849     BN_ULONG c0,c1,m1,*tp,n0;
850 #ifdef mul64
851     BN_ULONG mh;
852 #endif
853     volatile BN_ULONG *vp;

```

```

854     int i=0,j;

856     #if 0 /* template for platform-specific implementation */
857         if (ap==bp) return bn_sqr_mont(rp,ap,np,n0p,num);
858     #endif
859     vp = tp = alloca((num+2)*sizeof(BN_ULONG));

861     n0 = *n0p;

863     c0 = 0;
864     m1 = bp[0];
865     #ifdef mul64
866         mh = HBITS(m1);
867         m1 = LBITS(m1);
868         for (j=0;j<num;++j)
869             mul(tp[j],ap[j],m1,mh,c0);
870     #else
871         for (j=0;j<num;++j)
872             mul(tp[j],ap[j],m1,c0);
873     #endif

875     tp[num] = c0;
876     tp[num+1] = 0;
877     goto enter;

879     for(i=0;i<num;i++)
880     {
881         c0 = 0;
882         m1 = bp[i];
883         #ifdef mul64
884             mh = HBITS(m1);
885             m1 = LBITS(m1);
886             for (j=0;j<num;++j)
887                 mul_add(tp[j],ap[j],m1,mh,c0);
888         #else
889             for (j=0;j<num;++j)
890                 mul_add(tp[j],ap[j],m1,c0);
891         #endif
892         c1 = (tp[num] + c0)&BN_MASK2;
893         tp[num] = c1;
894         tp[num+1] = (c1<c0?1:0);
895     enter:
896         c1 = tp[0];
897         m1 = (c1*n0)&BN_MASK2;
898         c0 = 0;
899         #ifdef mul64
900             mh = HBITS(m1);
901             m1 = LBITS(m1);
902             mul_add(c1,np[0],m1,mh,c0);
903         #else
904             mul_add(c1,m1,np[0],c0);
905         #endif
906         for(j=1;j<num;j++)
907         {
908             c1 = tp[j];
909             #ifdef mul64
910                 mul_add(c1,np[j],m1,mh,c0);
911             #else
912                 mul_add(c1,m1,np[j],c0);
913             #endif
914             tp[j-1] = c1&BN_MASK2;
915         }
916         c1 = (tp[num] + c0)&BN_MASK2;
917         tp[num-1] = c1;
918         tp[num] = tp[num+1] + (c1<c0?1:0);
919     }

```

```

921     if (tp[num]!=0 || tp[num-1]>=np[num-1])
922     {
923         c0 = bn_sub_words(rp, tp, np, num);
924         if (tp[num]!=0 || c0==0)
925         {
926             for(i=0; i<num+2; i++)    vp[i] = 0;
927             return 1;
928         }
929     }
930     for(i=0; i<num; i++)    rp[i] = tp[i], vp[i] = 0;
931     vp[num] = 0;
932     vp[num+1] = 0;
933     return 1;
934 }
935 #else
936 /*
937  * Return value of 0 indicates that multiplication/convolution was not
938  * performed to signal the caller to fall down to alternative/original
939  * code-path.
940  */
941 int bn_mul_mont(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, const BN_U
942 {
943     return 0;
944 }
945 #endif /* OPENSSEAL_BN_ASM_MONT */
946 #endif
947
948 #else /* !BN_MUL_COMBA */
949 /* hmm... is it faster just to do a multiply? */
950 #undef bn_sqr_comba4
951 void bn_sqr_comba4(BN_ULONG *r, const BN_ULONG *a)
952 {
953     BN_ULONG t[8];
954     bn_sqr_normal(r, a, 4, t);
955 }
956
957 #undef bn_sqr_comba8
958 void bn_sqr_comba8(BN_ULONG *r, const BN_ULONG *a)
959 {
960     BN_ULONG t[16];
961     bn_sqr_normal(r, a, 8, t);
962 }
963
964 void bn_mul_comba4(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b)
965 {
966     r[4]=bn_mul_words(&(r[0]), a, 4, b[0]);
967     r[5]=bn_mul_add_words(&(r[1]), a, 4, b[1]);
968     r[6]=bn_mul_add_words(&(r[2]), a, 4, b[2]);
969     r[7]=bn_mul_add_words(&(r[3]), a, 4, b[3]);
970 }
971
972 void bn_mul_comba8(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b)
973 {
974     r[ 8]=bn_mul_words(&(r[0]), a, 8, b[0]);
975     r[ 9]=bn_mul_add_words(&(r[1]), a, 8, b[1]);
976     r[10]=bn_mul_add_words(&(r[2]), a, 8, b[2]);
977     r[11]=bn_mul_add_words(&(r[3]), a, 8, b[3]);
978     r[12]=bn_mul_add_words(&(r[4]), a, 8, b[4]);
979     r[13]=bn_mul_add_words(&(r[5]), a, 8, b[5]);
980     r[14]=bn_mul_add_words(&(r[6]), a, 8, b[6]);
981     r[15]=bn_mul_add_words(&(r[7]), a, 8, b[7]);
982 }
983
984 #ifdef OPENSSEAL_NO_ASM
985 #endif
986 #ifdef OPENSSEAL_BN_ASM_MONT
987 #include <alloca.h>

```

```

986 int bn_mul_mont(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, const BN_U
987 {
988     BN_ULONG c0, c1, *tp, n0=*n0p;
989     volatile BN_ULONG *vp;
990     int i=0, j;
991
992     vp = tp = alloca((num+2)*sizeof(BN_ULONG));
993
994     for(i=0; i<=num; i++)    tp[i]=0;
995
996     for(i=0; i<num; i++)
997     {
998         c0 = bn_mul_add_words(tp, ap, num, bp[i]);
999         c1 = (tp[num] + c0)&BN_MASK2;
1000         tp[num] = c1;
1001         tp[num+1] = (c1<c0?1:0);
1002
1003         c0 = bn_mul_add_words(tp, np, num, tp[0]*n0);
1004         c1 = (tp[num] + c0)&BN_MASK2;
1005         tp[num] = c1;
1006         tp[num+1] += (c1<c0?1:0);
1007         for(j=0; j<=num; j++)    tp[j]=tp[j+1];
1008     }
1009
1010     if (tp[num]!=0 || tp[num-1]>=np[num-1])
1011     {
1012         c0 = bn_sub_words(rp, tp, np, num);
1013         if (tp[num]!=0 || c0==0)
1014         {
1015             for(i=0; i<num+2; i++)    vp[i] = 0;
1016             return 1;
1017         }
1018     }
1019     for(i=0; i<num; i++)    rp[i] = tp[i], vp[i] = 0;
1020     vp[num] = 0;
1021     vp[num+1] = 0;
1022     return 1;
1023 }
1024 #else
1025 int bn_mul_mont(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, const BN_U
1026 {
1027     return 0;
1028 }
1029 #endif /* OPENSSEAL_BN_ASM_MONT */
1030 #endif
1031
1032 #else /* !BN_MUL_COMBA */

```


new/usr/src/lib/openssl/libsunw_crypto/bn/bn_blind.c

1

11467 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_blind.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bn/bn_blind.c */
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4  *
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 */
54 /*
55  * Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
56  * All rights reserved.
57  *
58  * This package is an SSL implementation written
59  * by Eric Young (eay@cryptsoft.com).
60  * The implementation was written so as to conform with Netscapes SSL.
61  */
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_blind.c

2

```
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105 *
106 * The licence and distribution terms for any publically available version or
107 * derivative of this code cannot be changed. i.e. this code cannot simply be
108 * copied and put under another distribution licence
109 * [including the GNU Public Licence.]
110 */
111
112 #include <stdio.h>
113 #include "cryptlib.h"
114 #include "bn_lcl.h"
115
116 #define BN_BLINDING_COUNTER 32
117
118 struct bn_blinding_st
119 {
120     BIGNUM *A;
121     BIGNUM *Ai;
122     BIGNUM *e;
123     BIGNUM *mod; /* just a reference */
124 } #ifndef OPENSSL_NO_DEPRECATED
125     unsigned long thread_id; /* added in OpenSSL 0.9.6j and 0.9.7b;
126                                * used only by crypto/rsa/rsa_eay.c, rsa_lib.c
127 #endif
```

```

128     CRYPTO_THREADID tid;
129     int counter;
130     unsigned long flags;
131     BN_MONT_CTX *m_ctx;
132     int (*bn_mod_exp)(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
133                      const BIGNUM *m, BN_CTX *ctx,
134                      BN_MONT_CTX *m_ctx);
135 };

137 BN_BLINDING *BN_BLINDING_new(const BIGNUM *A, const BIGNUM *Ai, BIGNUM *mod)
138 {
139     BN_BLINDING *ret=NULL;

141     bn_check_top(mod);

143     if ((ret=(BN_BLINDING *)OPENSSL_malloc(sizeof(BN_BLINDING))) == NULL)
144     {
145         BNerr(BN_F_BN_BLINDING_NEW,ERR_R_MALLOC_FAILURE);
146         return(NULL);
147     }
148     memset(ret,0,sizeof(BN_BLINDING));
149     if (A != NULL)
150     {
151         if ((ret->A = BN_dup(A)) == NULL) goto err;
152     }
153     if (Ai != NULL)
154     {
155         if ((ret->Ai = BN_dup(Ai)) == NULL) goto err;
156     }

158     /* save a copy of mod in the BN_BLINDING structure */
159     if ((ret->mod = BN_dup(mod)) == NULL) goto err;
160     if (BN_get_flags(mod, BN_FLG_CONSTTIME) != 0)
161         BN_set_flags(ret->mod, BN_FLG_CONSTTIME);

163     /* Set the counter to the special value -1
164      * to indicate that this is never-used fresh blinding
165      * that does not need updating before first use. */
166     ret->counter = -1;
167     CRYPTO_THREADID_current(&ret->tid);
168     return(ret);
169 err:
170     if (ret != NULL) BN_BLINDING_free(ret);
171     return(NULL);
172 }

174 void BN_BLINDING_free(BN_BLINDING *r)
175 {
176     if(r == NULL)
177         return;

179     if (r->A != NULL) BN_free(r->A);
180     if (r->Ai != NULL) BN_free(r->Ai);
181     if (r->e != NULL) BN_free(r->e);
182     if (r->mod != NULL) BN_free(r->mod);
183     OPENSSL_free(r);
184 }

186 int BN_BLINDING_update(BN_BLINDING *b, BN_CTX *ctx)
187 {
188     int ret=0;

190     if ((b->A == NULL) || (b->Ai == NULL))
191     {
192         BNerr(BN_F_BN_BLINDING_UPDATE,BN_R_NOT_INITIALIZED);
193         goto err;

```

```

194     }

196     if (b->counter == -1)
197         b->counter = 0;

199     if (++b->counter == BN_BLINDING_COUNTER && b->e != NULL &&
200         !(b->flags & BN_BLINDING_NO_RECREATE))
201     {
202         /* re-create blinding parameters */
203         if (!BN_BLINDING_create_param(b, NULL, NULL, ctx, NULL, NULL))
204             goto err;
205     }
206     else if (!(b->flags & BN_BLINDING_NO_UPDATE))
207     {
208         if (!BN_mod_mul(b->A,b->A,b->A,b->mod,ctx)) goto err;
209         if (!BN_mod_mul(b->Ai,b->Ai,b->Ai,b->mod,ctx)) goto err;
210     }

212     ret=1;
213 err:
214     if (b->counter == BN_BLINDING_COUNTER)
215         b->counter = 0;
216     return(ret);
217 }

219 int BN_BLINDING_convert(BIGNUM *n, BN_BLINDING *b, BN_CTX *ctx)
220 {
221     return BN_BLINDING_convert_ex(n, NULL, b, ctx);
222 }

224 int BN_BLINDING_convert_ex(BIGNUM *n, BIGNUM *r, BN_BLINDING *b, BN_CTX *ctx)
225 {
226     int ret = 1;

228     bn_check_top(n);

230     if ((b->A == NULL) || (b->Ai == NULL))
231     {
232         BNerr(BN_F_BN_BLINDING_CONVERT_EX,BN_R_NOT_INITIALIZED);
233         return(0);
234     }

236     if (b->counter == -1)
237         /* Fresh blinding, doesn't need updating. */
238         b->counter = 0;
239     else if (!BN_BLINDING_update(b,ctx))
240         return(0);

242     if (r != NULL)
243     {
244         if (!BN_copy(r, b->Ai)) ret=0;
245     }

247     if (!BN_mod_mul(n,n,b->A,b->mod,ctx)) ret=0;
248     return ret;
249 }

252 int BN_BLINDING_invert(BIGNUM *n, BN_BLINDING *b, BN_CTX *ctx)
253 {
254     return BN_BLINDING_invert_ex(n, NULL, b, ctx);
255 }

257 int BN_BLINDING_invert_ex(BIGNUM *n, const BIGNUM *r, BN_BLINDING *b, BN_CTX *ctx)
258 {
259     int ret;

```

```

261     bn_check_top(n);
263     if (r != NULL)
264         ret = BN_mod_mul(n, n, r, b->mod, ctx);
265     else
266     {
267         if (b->Ai == NULL)
268         {
269             BNerr(BN_F_BN_BLINDING_INVERT_EX, BN_R_NOT_INITIALIZED);
270             return(0);
271         }
272         ret = BN_mod_mul(n, n, b->Ai, b->mod, ctx);
273     }
275     bn_check_top(n);
276     return(ret);
277 }
279 #ifndef OPENSSL_NO_DEPRECATED
280 unsigned long BN_BLINDING_get_thread_id(const BN_BLINDING *b)
281 {
282     return b->thread_id;
283 }
285 void BN_BLINDING_set_thread_id(BN_BLINDING *b, unsigned long n)
286 {
287     b->thread_id = n;
288 }
289 #endif
291 CRYPTO_THREADID *BN_BLINDING_thread_id(BN_BLINDING *b)
292 {
293     return &b->tid;
294 }
296 unsigned long BN_BLINDING_get_flags(const BN_BLINDING *b)
297 {
298     return b->flags;
299 }
301 void BN_BLINDING_set_flags(BN_BLINDING *b, unsigned long flags)
302 {
303     b->flags = flags;
304 }
306 BN_BLINDING *BN_BLINDING_create_param(BN_BLINDING *b,
307     const BIGNUM *e, BIGNUM *m, BN_CTX *ctx,
308     int (*bn_mod_exp)(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
309     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *m_ctx),
310     BN_MONT_CTX *m_ctx)
311 {
312     int retry_counter = 32;
313     BN_BLINDING *ret = NULL;
315     if (b == NULL)
316         ret = BN_BLINDING_new(NULL, NULL, m);
317     else
318         ret = b;
320     if (ret == NULL)
321         goto err;
323     if (ret->A == NULL && (ret->A = BN_new()) == NULL)
324         goto err;
325     if (ret->Ai == NULL && (ret->Ai = BN_new()) == NULL)

```

```

326         goto err;
328     if (e != NULL)
329     {
330         if (ret->e != NULL)
331             BN_free(ret->e);
332         ret->e = BN_dup(e);
333     }
334     if (ret->e == NULL)
335         goto err;
337     if (bn_mod_exp != NULL)
338         ret->bn_mod_exp = bn_mod_exp;
339     if (m_ctx != NULL)
340         ret->m_ctx = m_ctx;
342     do {
343         if (!BN_rand_range(ret->A, ret->mod)) goto err;
344         if (BN_mod_inverse(ret->Ai, ret->A, ret->mod, ctx) == NULL)
345         {
346             /* this should almost never happen for good RSA keys */
347             unsigned long error = ERR_peek_last_error();
348             if (ERR_GET_REASON(error) == BN_R_NO_INVERSE)
349             {
350                 if (retry_counter-- == 0)
351                 {
352                     BNerr(BN_F_BN_BLINDING_CREATE_PARAM,
353                         BN_R_TOO_MANY_ITERATIONS);
354                     goto err;
355                 }
356                 ERR_clear_error();
357             }
358             else
359                 goto err;
360         }
361         else
362             break;
363     } while (1);
365     if (ret->bn_mod_exp != NULL && ret->m_ctx != NULL)
366     {
367         if (!ret->bn_mod_exp(ret->A, ret->A, ret->e, ret->mod, ctx, ret-
368             goto err;
369         }
370     }
371     else
372     {
373         if (!BN_mod_exp(ret->A, ret->A, ret->e, ret->mod, ctx))
374             goto err;
376     }
377     return ret;
378 err:
379     if (b == NULL && ret != NULL)
380     {
381         BN_BLINDING_free(ret);
382         ret = NULL;
383     }
384     return ret;
385 }

```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_const.c

1

```
*****
20632 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_const.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/bn/knownprimes.c */
2 /* Insert boilerplate */

4 #include <openssl/bn.h>

6 /* "First Oakley Default Group" from RFC2409, section 6.1.
7 *
8 * The prime is:  $2^{768} - 2^{704} - 1 + 2^{64} * \{ [2^{638} \text{ pi}] + 149686 \}$ 
9 *
10 * RFC2409 specifies a generator of 2.
11 * RFC2412 specifies a generator of 22.
12 */

14 BIGNUM *get_rfc2409_prime_768(BIGNUM *bn)
15 {
16     static const unsigned char RFC2409_PRIME_768[]={
17         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xC9,0x0F,0xDA,0xA2,
18         0x21,0x68,0xC2,0x34,0xC4,0xC6,0x62,0x8B,0x80,0xDC,0x1C,0xD1,
19         0x29,0x02,0x4E,0x08,0x8A,0x67,0xCC,0x74,0x02,0x0B,0xBE,0xA6,
20         0x3B,0x13,0x9B,0x22,0x51,0x4A,0x08,0x79,0x8E,0x34,0x04,0xDD,
21         0xEF,0x95,0x19,0xB3,0xCD,0x3A,0x43,0x1B,0x30,0x2B,0x0A,0x6D,
22         0xF2,0x5F,0x14,0x37,0x4F,0xE1,0x35,0x6D,0x6D,0x51,0xC2,0x45,
23         0xE4,0x85,0xB5,0x76,0x62,0x5E,0x7E,0xC6,0xF4,0x4C,0x42,0xE9,
24         0xA6,0x3A,0x36,0x20,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
25     };
26     return BN_bin2bn(RFC2409_PRIME_768,sizeof(RFC2409_PRIME_768),bn);
27 }

29 /* "Second Oakley Default Group" from RFC2409, section 6.2.
30 *
31 * The prime is:  $2^{1024} - 2^{960} - 1 + 2^{64} * \{ [2^{894} \text{ pi}] + 129093 \}$ .
32 *
33 * RFC2409 specifies a generator of 2.
34 * RFC2412 specifies a generator of 22.
35 */

37 BIGNUM *get_rfc2409_prime_1024(BIGNUM *bn)
38 {
39     static const unsigned char RFC2409_PRIME_1024[]={
40         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xC9,0x0F,0xDA,0xA2,
41         0x21,0x68,0xC2,0x34,0xC4,0xC6,0x62,0x8B,0x80,0xDC,0x1C,0xD1,
42         0x29,0x02,0x4E,0x08,0x8A,0x67,0xCC,0x74,0x02,0x0B,0xBE,0xA6,
43         0x3B,0x13,0x9B,0x22,0x51,0x4A,0x08,0x79,0x8E,0x34,0x04,0xDD,
44         0xEF,0x95,0x19,0xB3,0xCD,0x3A,0x43,0x1B,0x30,0x2B,0x0A,0x6D,
45         0xF2,0x5F,0x14,0x37,0x4F,0xE1,0x35,0x6D,0x6D,0x51,0xC2,0x45,
46         0xE4,0x85,0xB5,0x76,0x62,0x5E,0x7E,0xC6,0xF4,0x4C,0x42,0xE9,
47         0xA6,0x37,0xED,0x6B,0x0B,0xFF,0x5C,0xB6,0xF4,0x06,0xB7,0xED,
48         0xEE,0x38,0x6B,0xFB,0x5A,0x89,0x9F,0xA5,0xAE,0x9F,0x24,0x11,
49         0x7C,0x4B,0x1F,0xE6,0x49,0x28,0x66,0x51,0xEC,0xE4,0x5B,0x3D,
50         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
51     };
52     return BN_bin2bn(RFC2409_PRIME_1024,sizeof(RFC2409_PRIME_1024),bn);
53 }

55 /* "1536-bit MODP Group" from RFC3526, Section 2.
56 *
57 * The prime is:  $2^{1536} - 2^{1472} - 1 + 2^{64} * \{ [2^{1406} \text{ pi}] + 741804 \}$ 
58 *
59 * RFC3526 specifies a generator of 2.
60 * RFC2312 specifies a generator of 22.
61 */
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_const.c

2

```
63 BIGNUM *get_rfc3526_prime_1536(BIGNUM *bn)
64 {
65     static const unsigned char RFC3526_PRIME_1536[]={
66         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xC9,0x0F,0xDA,0xA2,
67         0x21,0x68,0xC2,0x34,0xC4,0xC6,0x62,0x8B,0x80,0xDC,0x1C,0xD1,
68         0x29,0x02,0x4E,0x08,0x8A,0x67,0xCC,0x74,0x02,0x0B,0xBE,0xA6,
69         0x3B,0x13,0x9B,0x22,0x51,0x4A,0x08,0x79,0x8E,0x34,0x04,0xDD,
70         0xEF,0x95,0x19,0xB3,0xCD,0x3A,0x43,0x1B,0x30,0x2B,0x0A,0x6D,
71         0xF2,0x5F,0x14,0x37,0x4F,0xE1,0x35,0x6D,0x6D,0x51,0xC2,0x45,
72         0xE4,0x85,0xB5,0x76,0x62,0x5E,0x7E,0xC6,0xF4,0x4C,0x42,0xE9,
73         0xA6,0x37,0xED,0x6B,0x0B,0xFF,0x5C,0xB6,0xF4,0x06,0xB7,0xED,
74         0xEE,0x38,0x6B,0xFB,0x5A,0x89,0x9F,0xA5,0xAE,0x9F,0x24,0x11,
75         0x7C,0x4B,0x1F,0xE6,0x49,0x28,0x66,0x51,0xEC,0xE4,0x5B,0x3D,
76         0xC2,0x00,0x7C,0xB8,0xA1,0x63,0xBF,0x05,0x98,0xDA,0x48,0x36,
77         0x1C,0x55,0xD3,0x9A,0x69,0x16,0x3F,0xA8,0xFD,0x24,0xCF,0x5F,
78         0x83,0x65,0x5D,0x23,0xDC,0xA3,0xAD,0x96,0x1C,0x62,0xF3,0x56,
79         0x20,0x85,0x52,0xBB,0x9E,0xD5,0x29,0x07,0x70,0x96,0x96,0x6D,
80         0x67,0x0C,0x35,0x4E,0x4A,0xBC,0x98,0x04,0xF1,0x74,0x6C,0x08,
81         0xCA,0x23,0x73,0x27,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
82     };
83     return BN_bin2bn(RFC3526_PRIME_1536,sizeof(RFC3526_PRIME_1536),bn);
84 }

86 /* "2048-bit MODP Group" from RFC3526, Section 3.
87 *
88 * The prime is:  $2^{2048} - 2^{1984} - 1 + 2^{64} * \{ [2^{1918} \text{ pi}] + 124476 \}$ 
89 *
90 * RFC3526 specifies a generator of 2.
91 */

93 BIGNUM *get_rfc3526_prime_2048(BIGNUM *bn)
94 {
95     static const unsigned char RFC3526_PRIME_2048[]={
96         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xC9,0x0F,0xDA,0xA2,
97         0x21,0x68,0xC2,0x34,0xC4,0xC6,0x62,0x8B,0x80,0xDC,0x1C,0xD1,
98         0x29,0x02,0x4E,0x08,0x8A,0x67,0xCC,0x74,0x02,0x0B,0xBE,0xA6,
99         0x3B,0x13,0x9B,0x22,0x51,0x4A,0x08,0x79,0x8E,0x34,0x04,0xDD,
100        0xEF,0x95,0x19,0xB3,0xCD,0x3A,0x43,0x1B,0x30,0x2B,0x0A,0x6D,
101        0xF2,0x5F,0x14,0x37,0x4F,0xE1,0x35,0x6D,0x6D,0x51,0xC2,0x45,
102        0xE4,0x85,0xB5,0x76,0x62,0x5E,0x7E,0xC6,0xF4,0x4C,0x42,0xE9,
103        0xA6,0x37,0xED,0x6B,0x0B,0xFF,0x5C,0xB6,0xF4,0x06,0xB7,0xED,
104        0xEE,0x38,0x6B,0xFB,0x5A,0x89,0x9F,0xA5,0xAE,0x9F,0x24,0x11,
105        0x7C,0x4B,0x1F,0xE6,0x49,0x28,0x66,0x51,0xEC,0xE4,0x5B,0x3D,
106        0xC2,0x00,0x7C,0xB8,0xA1,0x63,0xBF,0x05,0x98,0xDA,0x48,0x36,
107        0x1C,0x55,0xD3,0x9A,0x69,0x16,0x3F,0xA8,0xFD,0x24,0xCF,0x5F,
108        0x83,0x65,0x5D,0x23,0xDC,0xA3,0xAD,0x96,0x1C,0x62,0xF3,0x56,
109        0x20,0x85,0x52,0xBB,0x9E,0xD5,0x29,0x07,0x70,0x96,0x96,0x6D,
110        0x67,0x0C,0x35,0x4E,0x4A,0xBC,0x98,0x04,0xF1,0x74,0x6C,0x08,
111        0xCA,0x18,0x21,0x7C,0x32,0x90,0x5E,0x46,0x2E,0x36,0xCE,0x3B,
112        0xE3,0x9E,0x77,0x2C,0x18,0x0E,0x86,0x03,0x9B,0x27,0x83,0xA2,
113        0xEC,0x07,0xA2,0x8F,0xB5,0xC5,0x5D,0xF0,0x6F,0x4C,0x52,0xC9,
114        0xDE,0x2B,0xCB,0xF6,0x95,0x58,0x17,0x18,0x39,0x95,0x49,0x7C,
115        0xEA,0x95,0x6A,0xE5,0x15,0xD2,0x26,0x18,0x98,0xFA,0x05,0x10,
116        0x15,0x72,0x8E,0x5A,0x8A,0xAC,0xAA,0x68,0xFF,0xFF,0xFF,0xFF,
117        0xFF,0xFF,0xFF,0xFF,
118    };
119    return BN_bin2bn(RFC3526_PRIME_2048,sizeof(RFC3526_PRIME_2048),bn);
120 }

122 /* "3072-bit MODP Group" from RFC3526, Section 4.
123 *
124 * The prime is:  $2^{3072} - 2^{3008} - 1 + 2^{64} * \{ [2^{2942} \text{ pi}] + 1690314 \}$ 
125 *
126 * RFC3526 specifies a generator of 2.
127 */
```

```

129 BIGNUM *get_rfc3526_prime_3072(BIGNUM *bn)
130 {
131     static const unsigned char RFC3526_PRIME_3072[]={
132         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xC9,0x0F,0xDA,0xA2,
133         0x21,0x68,0xC2,0x34,0xC4,0xC6,0x62,0x8B,0x80,0xDC,0x1C,0xD1,
134         0x29,0x02,0x4E,0x08,0x8A,0x67,0xCC,0x74,0x02,0x0B,0xBE,0xA6,
135         0x3B,0x13,0x9B,0x22,0x51,0x4A,0x08,0x79,0x8E,0x34,0x04,0xDD,
136         0xEF,0x95,0x19,0xB3,0xCD,0x3A,0x43,0x1B,0x30,0x2B,0x0A,0x6D,
137         0xF2,0x5F,0x14,0x37,0x4F,0xE1,0x35,0x6D,0x6D,0x51,0xC2,0x45,
138         0xE4,0x85,0xB5,0x76,0x62,0x5E,0x7E,0xC6,0xF4,0x4C,0x42,0xE9,
139         0xA6,0x37,0xED,0x6B,0x0B,0xFF,0x5C,0xB6,0xF4,0x06,0xB7,0xED,
140         0xEE,0x38,0x6B,0xFB,0x5A,0x89,0x9F,0xA5,0xAE,0x9F,0x24,0x11,
141         0x7C,0x4B,0x1F,0xE6,0x49,0x28,0x66,0x51,0xEC,0xE4,0x5B,0x3D,
142         0xC2,0x00,0x7C,0xB8,0xA1,0x63,0xBF,0x05,0x98,0xDA,0x48,0x36,
143         0x1C,0x55,0xD3,0x9A,0x69,0x16,0x3F,0xA8,0xFD,0x24,0xCF,0x5F,
144         0x83,0x65,0x5D,0x23,0xDC,0xA3,0xAD,0x96,0x1C,0x62,0xF3,0x56,
145         0x20,0x85,0x52,0xBB,0x9E,0xD5,0x29,0x07,0x70,0x96,0x96,0x6D,
146         0x67,0x0C,0x35,0x4E,0x4A,0xBC,0x98,0x04,0xF1,0x74,0x6C,0x08,
147         0xCA,0x18,0x21,0x7C,0x32,0x90,0x5E,0x46,0x2E,0x36,0xCE,0x3B,
148         0xE3,0x9E,0x77,0x2C,0x18,0x0E,0x86,0x03,0x9B,0x27,0x83,0xA2,
149         0xEC,0x07,0xA2,0x8F,0xB5,0xC5,0x5D,0xF0,0x6F,0x4C,0x52,0xC9,
150         0xDE,0x2B,0xCB,0xF6,0x95,0x58,0x17,0x18,0x39,0x95,0x49,0x7C,
151         0xEA,0x95,0x6A,0xE5,0x15,0xD2,0x26,0x18,0x98,0xFA,0x05,0x10,
152         0x15,0x72,0x8E,0x5A,0x8A,0xAA,0xC4,0x2D,0xAD,0x33,0x17,0x0D,
153         0x04,0x5D,0x33,0xA8,0x55,0x21,0xAB,0xDF,0x1C,0xBA,0x64,
154         0xEC,0xFB,0x85,0x04,0x58,0xDB,0xEF,0x0A,0x8A,0xEA,0x71,0x57,
155         0x5D,0x06,0x0C,0x7D,0xB3,0x97,0x0F,0x85,0xA6,0xE1,0xEA,0xC7,
156         0xAB,0xF5,0xAE,0x8C,0xDB,0x09,0x33,0xD7,0x1E,0x8C,0x94,0xE0,
157         0x4A,0x25,0x61,0x9D,0xCE,0xE3,0xD2,0x26,0x1A,0xD2,0xEE,0x6B,
158         0xF1,0x2F,0xFA,0x06,0xD9,0x8A,0x08,0x64,0xD8,0x76,0x02,0x73,
159         0x3E,0xC8,0x6A,0x64,0x52,0x1F,0x2B,0x18,0x17,0x7B,0x20,0x0C,
160         0xBB,0xE1,0x17,0x57,0x7A,0x61,0x5D,0x6C,0x77,0x09,0x88,0xC0,
161         0xBA,0xD9,0x46,0xE2,0x08,0xE2,0x4F,0xA0,0x74,0xE5,0xAB,0x31,
162         0x43,0xDB,0x5B,0xFC,0xE0,0xFD,0x10,0x8E,0x4B,0x82,0xD1,0x20,
163         0xA9,0x3A,0xD2,0xCA,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
164     };
165     return BN_bin2bn(RFC3526_PRIME_3072,sizeof(RFC3526_PRIME_3072),bn);
166 }

168 /* "4096-bit MODP Group" from RFC3526, Section 5.
169  * The prime is: 2^4096 - 2^4032 - 1 + 2^64 * { [2^3966 pi] + 240904 }
170  * RFC3526 specifies a generator of 2.
171  */
172
175 BIGNUM *get_rfc3526_prime_4096(BIGNUM *bn)
176 {
177     static const unsigned char RFC3526_PRIME_4096[]={
178         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xC9,0x0F,0xDA,0xA2,
179         0x21,0x68,0xC2,0x34,0xC4,0xC6,0x62,0x8B,0x80,0xDC,0x1C,0xD1,
180         0x29,0x02,0x4E,0x08,0x8A,0x67,0xCC,0x74,0x02,0x0B,0xBE,0xA6,
181         0x3B,0x13,0x9B,0x22,0x51,0x4A,0x08,0x79,0x8E,0x34,0x04,0xDD,
182         0xEF,0x95,0x19,0xB3,0xCD,0x3A,0x43,0x1B,0x30,0x2B,0x0A,0x6D,
183         0xF2,0x5F,0x14,0x37,0x4F,0xE1,0x35,0x6D,0x6D,0x51,0xC2,0x45,
184         0xE4,0x85,0xB5,0x76,0x62,0x5E,0x7E,0xC6,0xF4,0x4C,0x42,0xE9,
185         0xA6,0x37,0xED,0x6B,0x0B,0xFF,0x5C,0xB6,0xF4,0x06,0xB7,0xED,
186         0xEE,0x38,0x6B,0xFB,0x5A,0x89,0x9F,0xA5,0xAE,0x9F,0x24,0x11,
187         0x7C,0x4B,0x1F,0xE6,0x49,0x28,0x66,0x51,0xEC,0xE4,0x5B,0x3D,
188         0xC2,0x00,0x7C,0xB8,0xA1,0x63,0xBF,0x05,0x98,0xDA,0x48,0x36,
189         0x1C,0x55,0xD3,0x9A,0x69,0x16,0x3F,0xA8,0xFD,0x24,0xCF,0x5F,
190         0x83,0x65,0x5D,0x23,0xDC,0xA3,0xAD,0x96,0x1C,0x62,0xF3,0x56,
191         0x20,0x85,0x52,0xBB,0x9E,0xD5,0x29,0x07,0x70,0x96,0x96,0x6D,
192         0x67,0x0C,0x35,0x4E,0x4A,0xBC,0x98,0x04,0xF1,0x74,0x6C,0x08,
193         0xCA,0x18,0x21,0x7C,0x32,0x90,0x5E,0x46,0x2E,0x36,0xCE,0x3B,

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194         0xE3,0x9E,0x77,0x2C,0x18,0x0E,0x86,0x03,0x9B,0x27,0x83,0xA2,
195         0xEC,0x07,0xA2,0x8F,0xB5,0xC5,0x5D,0xF0,0x6F,0x4C,0x52,0xC9,
196         0xDE,0x2B,0xCB,0xF6,0x95,0x58,0x17,0x18,0x39,0x95,0x49,0x7C,
197         0xEA,0x95,0x6A,0xE5,0x15,0xD2,0x26,0x18,0x98,0xFA,0x05,0x10,
198         0x15,0x72,0x8E,0x5A,0x8A,0xAA,0xC4,0x2D,0xAD,0x33,0x17,0x0D,
199         0x04,0x5D,0x33,0xA8,0x55,0x21,0xAB,0xDF,0x1C,0xBA,0x64,
200         0xEC,0xFB,0x85,0x04,0x58,0xDB,0xEF,0x0A,0x8A,0xEA,0x71,0x57,
201         0x5D,0x06,0x0C,0x7D,0xB3,0x97,0x0F,0x85,0xA6,0xE1,0xE4,0xC7,
202         0xAB,0xF5,0xAE,0x8C,0xDB,0x09,0x33,0xD7,0x1E,0x8C,0x94,0xE0,
203         0x4A,0x25,0x61,0x9D,0xCE,0xE3,0xD2,0x26,0x1A,0xD2,0xEE,0x6B,
204         0xF1,0x2F,0xFA,0x06,0xD9,0x8A,0x08,0x64,0xD8,0x76,0x02,0x73,
205         0x3E,0xC8,0x6A,0x64,0x52,0x1F,0x2B,0x18,0x17,0x7B,0x20,0x0C,
206         0xBB,0xE1,0x17,0x57,0x7A,0x61,0x5D,0x6C,0x77,0x09,0x88,0xC0,
207         0xBA,0xD9,0x46,0xE2,0x08,0xE2,0x4F,0xA0,0x74,0xE5,0xAB,0x31,
208         0x43,0xDB,0x5B,0xFC,0xE0,0xFD,0x10,0x8E,0x4B,0x82,0xD1,0x20,
209         0xA9,0x3A,0xD2,0xCA,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
210         0x88,0x71,0x9A,0x10,0xBD,0xBA,0x5B,0x26,0x99,0xC3,0x27,0x18,
211         0x6A,0xF4,0xE2,0x3C,0x1A,0x94,0x68,0x34,0xB6,0x15,0x0B,0xDA,
212         0x25,0x83,0xE9,0xCA,0x2A,0xD4,0x4C,0xE8,0xDB,0xBB,0xC2,0xDB,
213         0x04,0xDE,0x8E,0xF9,0x2E,0x8E,0xFC,0x14,0x1F,0xBE,0xCA,0xA6,
214         0x28,0x7C,0x59,0x47,0x4E,0x6B,0xC0,0x5D,0x99,0xB2,0x96,0x4F,
215         0xA0,0x90,0xC3,0xA2,0x23,0x3B,0xA1,0x86,0x51,0x5B,0xED,0xED,
216         0x1F,0x61,0x29,0x70,0xCE,0xE2,0xD7,0xAF,0xB8,0x1B,0xD0,0x76,
217         0x21,0x70,0x48,0x1C,0xD0,0x06,0x91,0x27,0xD5,0xB0,0x5A,0xA9,
218         0x93,0xB4,0xEA,0x98,0x8D,0x8F,0xDD,0xC1,0x86,0xFF,0xB7,0xDC,
219         0x90,0xA6,0xC0,0x8F,0x4D,0xF4,0x35,0xC9,0x34,0x06,0x31,0x99,
220         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
221     };
222     return BN_bin2bn(RFC3526_PRIME_4096,sizeof(RFC3526_PRIME_4096),bn);
223 }

225 /* "6144-bit MODP Group" from RFC3526, Section 6.
226  * The prime is: 2^6144 - 2^6080 - 1 + 2^64 * { [2^6014 pi] + 929484 }
227  * RFC3526 specifies a generator of 2.
228  */
229
232 BIGNUM *get_rfc3526_prime_6144(BIGNUM *bn)
233 {
234     static const unsigned char RFC3526_PRIME_6144[]={
235         0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xC9,0x0F,0xDA,0xA2,
236         0x21,0x68,0xC2,0x34,0xC4,0xC6,0x62,0x8B,0x80,0xDC,0x1C,0xD1,
237         0x29,0x02,0x4E,0x08,0x8A,0x67,0xCC,0x74,0x02,0x0B,0xBE,0xA6,
238         0x3B,0x13,0x9B,0x22,0x51,0x4A,0x08,0x79,0x8E,0x34,0x04,0xDD,
239         0xEF,0x95,0x19,0xB3,0xCD,0x3A,0x43,0x1B,0x30,0x2B,0x0A,0x6D,
240         0xF2,0x5F,0x14,0x37,0x4F,0xE1,0x35,0x6D,0x6D,0x51,0xC2,0x45,
241         0xE4,0x85,0xB5,0x76,0x62,0x5E,0x7E,0xC6,0xF4,0x4C,0x42,0xE9,
242         0xA6,0x37,0xED,0x6B,0x0B,0xFF,0x5C,0xB6,0xF4,0x06,0xB7,0xED,
243         0xEE,0x38,0x6B,0xFB,0x5A,0x89,0x9F,0xA5,0xAE,0x9F,0x24,0x11,
244         0x7C,0x4B,0x1F,0xE6,0x49,0x28,0x66,0x51,0xEC,0xE4,0x5B,0x3D,
245         0xC2,0x00,0x7C,0xB8,0xA1,0x63,0xBF,0x05,0x98,0xDA,0x48,0x36,
246         0x1C,0x55,0xD3,0x9A,0x69,0x16,0x3F,0xA8,0xFD,0x24,0xCF,0x5F,
247         0x83,0x65,0x5D,0x23,0xDC,0xA3,0xAD,0x96,0x1C,0x62,0xF3,0x56,
248         0x20,0x85,0x52,0xBB,0x9E,0xD5,0x29,0x07,0x70,0x96,0x96,0x6D,
249         0x67,0x0C,0x35,0x4E,0x4A,0xBC,0x98,0x04,0xF1,0x74,0x6C,0x08,
250         0xCA,0x18,0x21,0x7C,0x32,0x90,0x5E,0x46,0x2E,0x36,0xCE,0x3B,
251         0xE3,0x9E,0x77,0x2C,0x18,0x0E,0x86,0x03,0x9B,0x27,0x83,0xA2,
252         0xEC,0x07,0xA2,0x8F,0xB5,0xC5,0x5D,0xF0,0x6F,0x4C,0x52,0xC9,
253         0xDE,0x2B,0xCB,0xF6,0x95,0x58,0x17,0x18,0x39,0x95,0x49,0x7C,
254         0xEA,0x95,0x6A,0xE5,0x15,0xD2,0x26,0x18,0x98,0xFA,0x05,0x10,
255         0x15,0x72,0x8E,0x5A,0x8A,0xAA,0xC4,0x2D,0xAD,0x33,0x17,0x0D,
256         0x04,0x5D,0x33,0xA8,0x55,0x21,0xAB,0xDF,0x1C,0xBA,0x64,
257         0xEC,0xFB,0x85,0x04,0x58,0xDB,0xEF,0x0A,0x8A,0xEA,0x71,0x57,
258         0x5D,0x06,0x0C,0x7D,0xB3,0x97,0x0F,0x85,0xA6,0xE1,0xE4,0xC7,
259         0xAB,0xF5,0xAE,0x8C,0xDB,0x09,0x33,0xD7,0x1E,0x8C,0x94,0xE0,

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260     0x4A, 0x25, 0x61, 0x9D, 0xCE, 0xE3, 0xD2, 0x26, 0x1A, 0xD2, 0xEE, 0x6B,
261     0xF1, 0x2F, 0xFA, 0x06, 0xD9, 0x8A, 0x08, 0x64, 0xD8, 0x76, 0x02, 0x73,
262     0x3E, 0xC8, 0x6A, 0x64, 0x52, 0x1F, 0x2B, 0x18, 0x17, 0x7B, 0x20, 0x0C,
263     0xBB, 0xE1, 0x17, 0x57, 0x7A, 0x61, 0x5D, 0x6C, 0x77, 0x09, 0x88, 0xC0,
264     0xBA, 0xD9, 0x46, 0xE2, 0x08, 0xE2, 0x4F, 0xA0, 0x74, 0xE5, 0xAB, 0x31,
265     0x43, 0xDB, 0x5B, 0xFC, 0xE0, 0xFD, 0x10, 0x8E, 0x4B, 0x82, 0xD1, 0x20,
266     0xA9, 0x21, 0x08, 0x01, 0x1A, 0x72, 0x3C, 0x12, 0xA7, 0x87, 0xE6, 0xD7,
267     0x88, 0x71, 0x9A, 0x10, 0xBD, 0xBA, 0x5B, 0x26, 0x99, 0xC3, 0x27, 0x18,
268     0x6A, 0xF4, 0xE2, 0x3C, 0x1A, 0x94, 0x68, 0x34, 0xB6, 0x15, 0x0B, 0xDA,
269     0x25, 0x83, 0xE9, 0xCA, 0x2A, 0xD4, 0x4C, 0xE8, 0xDB, 0xBB, 0xC2, 0xDB,
270     0x04, 0xDE, 0x8E, 0xF9, 0x2E, 0x8E, 0xFC, 0x14, 0x1F, 0xBE, 0xCA, 0xA6,
271     0x28, 0x7C, 0x59, 0x47, 0x4E, 0x6B, 0xC0, 0x5D, 0x99, 0xB2, 0x96, 0x4F,
272     0xA0, 0x90, 0xC3, 0xA2, 0x23, 0x3B, 0xA1, 0x86, 0x51, 0x5B, 0xE7, 0xED,
273     0x1F, 0x61, 0x29, 0x70, 0xCE, 0xE2, 0xD7, 0xAF, 0xB8, 0x1B, 0xDD, 0x76,
274     0x21, 0x70, 0x48, 0x1C, 0xD0, 0x06, 0x91, 0x27, 0xD5, 0xB0, 0x5A, 0xA9,
275     0x93, 0xB4, 0xEA, 0x98, 0x8D, 0x8F, 0xDD, 0xC1, 0x86, 0xFF, 0xB7, 0xDC,
276     0x90, 0xA6, 0xC0, 0x8F, 0x4D, 0xF4, 0x35, 0xC9, 0x34, 0x02, 0x84, 0x92,
277     0x36, 0xC3, 0xFA, 0xB4, 0xD2, 0x7C, 0x70, 0x26, 0xC1, 0xD4, 0xDC, 0xB2,
278     0x60, 0x26, 0x46, 0xDE, 0xC9, 0x75, 0x1E, 0x76, 0x3D, 0xBA, 0x37, 0xBD,
279     0xF8, 0xFF, 0x94, 0x06, 0xAD, 0x9E, 0x53, 0x0E, 0xE5, 0xDB, 0x38, 0x2F,
280     0x41, 0x30, 0x01, 0xAE, 0xB0, 0x6A, 0x53, 0xED, 0x90, 0x27, 0xD8, 0x31,
281     0x17, 0x97, 0x27, 0xB0, 0x86, 0x5A, 0x89, 0x18, 0xDA, 0x3E, 0xDB, 0xEB,
282     0xCF, 0x9B, 0x14, 0xED, 0x44, 0xCE, 0x6C, 0xBA, 0xCE, 0xD4, 0xBB, 0x1B,
283     0xDB, 0x7F, 0x14, 0x47, 0xE6, 0xCC, 0x25, 0x4B, 0x33, 0x20, 0x51, 0x51,
284     0x2B, 0xD7, 0xAF, 0x42, 0x6F, 0xB8, 0xF4, 0x01, 0x37, 0x8C, 0xD2, 0xBF,
285     0x59, 0x83, 0xCA, 0x01, 0xC6, 0x4B, 0x92, 0xEC, 0xF0, 0x32, 0xEA, 0x15,
286     0xD1, 0x72, 0x1D, 0x03, 0xF4, 0x82, 0xD7, 0xCE, 0x6E, 0x74, 0xFE, 0xF6,
287     0xD5, 0x5E, 0x70, 0x2F, 0x46, 0x98, 0x0C, 0x82, 0xB5, 0xA8, 0x40, 0x31,
288     0x90, 0x0B, 0x1C, 0x9E, 0x59, 0xE7, 0xC9, 0x7F, 0xBE, 0xC7, 0xE8, 0xF3,
289     0x23, 0xA9, 0x7A, 0x7E, 0x36, 0xCC, 0x88, 0xBE, 0x0F, 0x1D, 0x45, 0xB7,
290     0xFF, 0x58, 0x5A, 0xC5, 0x4B, 0xD4, 0x07, 0xB2, 0x2B, 0x41, 0x54, 0xAA,
291     0xCC, 0x8F, 0x6D, 0x7E, 0xBF, 0x48, 0xE1, 0xD8, 0x14, 0xCC, 0x5E, 0xD2,
292     0x0F, 0x80, 0x37, 0xE0, 0xA7, 0x97, 0x15, 0xEE, 0xF2, 0x9B, 0xE3, 0x28,
293     0x06, 0xA1, 0xD5, 0x8B, 0xB7, 0xC5, 0xDA, 0x76, 0xF5, 0x50, 0xAA, 0x3D,
294     0x8A, 0x1F, 0xBF, 0xF0, 0xEB, 0x19, 0xCC, 0xB1, 0xA3, 0x13, 0xD5, 0x5C,
295     0xDA, 0x56, 0xC9, 0xEC, 0x2E, 0xF2, 0x96, 0x32, 0x38, 0x7F, 0xE8, 0xD7,
296     0x6E, 0x3C, 0x04, 0x68, 0x04, 0x3E, 0x8F, 0x66, 0x3F, 0x48, 0x60, 0xEE,
297     0x12, 0xBF, 0x2D, 0x5B, 0x0B, 0x74, 0xD6, 0xE6, 0x94, 0xF9, 0x1E,
298     0x6D, 0xCC, 0x40, 0x24, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF,
299     };
300     return BN_bin2bn(RFC3526_PRIME_6144, sizeof(RFC3526_PRIME_6144), bn);
301 }

303 /* "8192-bit MODP Group" from RFC3526, Section 7.
304 *
305 * The prime is: 2^8192 - 2^8128 - 1 + 2^64 * { [2^8062 pi] + 4743158 }
306 *
307 * RFC3526 specifies a generator of 2.
308 */

310 BIGNUM *get_rfc3526_prime_8192(BIGNUM *bn)
311 {
312     static const unsigned char RFC3526_PRIME_8192[]={
313         0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xC9, 0x0F, 0xDA, 0xA2,
314         0x21, 0x68, 0xC2, 0x34, 0xC4, 0xC6, 0x62, 0x8B, 0x80, 0xDC, 0x1C, 0xD1,
315         0x29, 0x02, 0x4E, 0x08, 0x8A, 0x67, 0xCC, 0x74, 0x02, 0x0B, 0xBE, 0xA6,
316         0x3B, 0x13, 0x9B, 0x22, 0x51, 0x4A, 0x08, 0x79, 0x8E, 0x34, 0x04, 0xDA,
317         0xEF, 0x95, 0x19, 0xB3, 0xCD, 0x3A, 0x43, 0x1B, 0x30, 0x2B, 0x0A, 0x6D,
318         0xF2, 0x5F, 0x14, 0x37, 0x4F, 0xE1, 0x35, 0x6D, 0x6D, 0x51, 0xC2, 0x45,
319         0xE4, 0x85, 0xB5, 0x76, 0x62, 0x5E, 0x7E, 0xC6, 0xF4, 0x4C, 0x42, 0xE9,
320         0xA6, 0x37, 0xED, 0x6B, 0x0B, 0xFF, 0x5C, 0xB6, 0xF4, 0x06, 0xB7, 0xED,
321         0xEE, 0x38, 0x6B, 0xFB, 0x5A, 0x89, 0x9F, 0xA5, 0xAE, 0x9F, 0x24, 0x11,
322         0x7C, 0x4B, 0x1F, 0xE6, 0x49, 0x28, 0x66, 0x51, 0xEC, 0xE4, 0x5B, 0x3D,
323         0xC2, 0x00, 0x97, 0xB8, 0xA1, 0x63, 0xBF, 0x05, 0x98, 0xDA, 0x48, 0x0B,
324         0x1C, 0x55, 0xD3, 0x9A, 0x69, 0x16, 0x3F, 0xA8, 0xFD, 0x24, 0xCF, 0x5F,
325         0x83, 0x65, 0x5D, 0x23, 0xDC, 0xA3, 0xAD, 0x96, 0x1C, 0x62, 0xF3, 0x56,

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326     0x20, 0x85, 0x52, 0xBB, 0x9E, 0xD5, 0x29, 0x07, 0x70, 0x96, 0x96, 0x6D,
327     0x67, 0x0C, 0x35, 0x4E, 0x4A, 0xBC, 0x98, 0x04, 0xF1, 0x74, 0x6C, 0x08,
328     0xCA, 0x18, 0x21, 0x7C, 0x32, 0x90, 0x5E, 0x46, 0x2E, 0x36, 0xCE, 0x3B,
329     0xE3, 0x9E, 0x77, 0x2C, 0x18, 0x0E, 0x86, 0x03, 0x9B, 0x27, 0x83, 0xA2,
330     0xEC, 0x07, 0xA2, 0x8F, 0xB5, 0xC5, 0x5D, 0xF0, 0x6F, 0x4C, 0x52, 0xC9,
331     0xDE, 0x2B, 0xCB, 0xF6, 0x95, 0x58, 0x17, 0x18, 0x39, 0x95, 0x49, 0x7C,
332     0xEA, 0x95, 0x6A, 0xE5, 0x15, 0xD2, 0x26, 0x18, 0x98, 0xFA, 0x05, 0x10,
333     0x15, 0x72, 0x8E, 0x5A, 0x8A, 0xAA, 0xC4, 0x2D, 0xAD, 0x33, 0x17, 0x0D,
334     0x04, 0x50, 0x7A, 0x33, 0xA8, 0x55, 0x21, 0xAB, 0xDF, 0x1C, 0xBA, 0x64,
335     0xEC, 0xFB, 0x85, 0x04, 0x58, 0xDB, 0xEF, 0x0A, 0x8A, 0xEA, 0x71, 0x57,
336     0x5D, 0x06, 0x0C, 0x7D, 0xB3, 0x97, 0x0F, 0x85, 0xA6, 0xE1, 0xEA, 0xC7,
337     0xAB, 0xF5, 0xAE, 0x8C, 0xDB, 0x09, 0x33, 0xD7, 0x1E, 0x8C, 0x94, 0xE0,
338     0x4A, 0x25, 0x61, 0x9D, 0xCE, 0xE3, 0xD2, 0x26, 0x1A, 0xD2, 0xEE, 0x6B,
339     0xF1, 0x2F, 0xFA, 0x06, 0xD9, 0x8A, 0x08, 0x64, 0xD8, 0x76, 0x02, 0x73,
340     0x3E, 0xC8, 0x6A, 0x64, 0x52, 0x1F, 0x2B, 0x18, 0x17, 0x7B, 0x20, 0x0C,
341     0xBB, 0xE1, 0x17, 0x57, 0x7A, 0x61, 0x5D, 0x6C, 0x77, 0x09, 0x88, 0xC0,
342     0xBA, 0xD9, 0x46, 0xE2, 0x08, 0xE2, 0x4F, 0xA0, 0x74, 0xE5, 0xAB, 0x31,
343     0x43, 0xDB, 0x5B, 0xFC, 0xE0, 0xFD, 0x10, 0x8E, 0x4B, 0x82, 0xD1, 0x20,
344     0xA9, 0x21, 0x08, 0x01, 0x1A, 0x72, 0x3C, 0x12, 0xA7, 0x87, 0xE6, 0xD7,
345     0x88, 0x71, 0x9A, 0x10, 0xBD, 0xBA, 0x5B, 0x26, 0x99, 0xC3, 0x27, 0x18,
346     0x6A, 0xF4, 0xE2, 0x3C, 0x1A, 0x94, 0x68, 0x34, 0xB6, 0x15, 0x0B, 0xDA,
347     0x25, 0x83, 0xE9, 0xCA, 0x2A, 0xD4, 0x4C, 0xE8, 0xDB, 0xBB, 0xC2, 0xDB,
348     0x04, 0xDE, 0x8E, 0xF9, 0x2E, 0x8E, 0xFC, 0x14, 0x1F, 0xBE, 0xCA, 0xA6,
349     0x28, 0x7C, 0x59, 0x47, 0x4E, 0x6B, 0xC0, 0x5D, 0x99, 0xB2, 0x96, 0x4F,
350     0xA0, 0x90, 0xC3, 0xA2, 0x23, 0x3B, 0xA1, 0x86, 0x51, 0x5B, 0xE7, 0xED,
351     0x1F, 0x61, 0x29, 0x70, 0xCE, 0xE2, 0xD7, 0xAF, 0xB8, 0x1B, 0xDD, 0x76,
352     0x21, 0x70, 0x48, 0x1C, 0xD0, 0x06, 0x91, 0x27, 0xD5, 0xB0, 0x5A, 0xA9,
353     0x93, 0xB4, 0xEA, 0x98, 0x8D, 0x8F, 0xDD, 0xC1, 0x86, 0xFF, 0xB7, 0xDC,
354     0x90, 0xA6, 0xC0, 0x8F, 0x4D, 0xF4, 0x35, 0xC9, 0x34, 0x02, 0x84, 0x92,
355     0x36, 0xC3, 0xFA, 0xB4, 0xD2, 0x7C, 0x70, 0x26, 0xC1, 0xD4, 0xDC, 0xB2,
356     0x60, 0x26, 0x46, 0xDE, 0xC9, 0x75, 0x1E, 0x76, 0x3D, 0xBA, 0x37, 0xBD,
357     0xF8, 0xFF, 0x94, 0x06, 0xAD, 0x9E, 0x53, 0x0E, 0xE5, 0xDB, 0x38, 0x2F,
358     0x41, 0x30, 0x01, 0xAE, 0xB0, 0x6A, 0x53, 0xED, 0x90, 0x27, 0xD8, 0x31,
359     0x17, 0x97, 0x27, 0xB0, 0x86, 0x5A, 0x89, 0x18, 0xDA, 0x3E, 0xDB, 0xEB,
360     0xCF, 0x9B, 0x14, 0xED, 0x44, 0xCE, 0x6C, 0xBA, 0xCE, 0xD4, 0xBB, 0x1B,
361     0xDB, 0x7F, 0x14, 0x47, 0xE6, 0xCC, 0x25, 0x4B, 0x33, 0x20, 0x51, 0x51,
362     0x2B, 0xD7, 0xAF, 0x42, 0x6F, 0xB8, 0xF4, 0x01, 0x37, 0x8C, 0xD2, 0xBF,
363     0x59, 0x83, 0xCA, 0x01, 0xC6, 0x4B, 0x92, 0xEC, 0xF0, 0x32, 0xEA, 0x15,
364     0xD1, 0x72, 0x1D, 0x03, 0xF4, 0x82, 0xD7, 0xCE, 0x6E, 0x74, 0xFE, 0xF6,
365     0xD5, 0x5E, 0x70, 0x2F, 0x46, 0x98, 0x0C, 0x82, 0xB5, 0xA8, 0x40, 0x31,
366     0x90, 0x0B, 0x1C, 0x9E, 0x59, 0xE7, 0xC9, 0x7F, 0xBE, 0xC7, 0xE8, 0xF3,
367     0x23, 0xA9, 0x7A, 0x7E, 0x36, 0xCC, 0x88, 0xBE, 0x0F, 0x1D, 0x45, 0xB7,
368     0xFF, 0x58, 0x5A, 0xC5, 0x4B, 0xD4, 0x07, 0xB2, 0x2B, 0x41, 0x54, 0xAA,
369     0xCC, 0x8F, 0x6D, 0x7E, 0xBF, 0x48, 0xE1, 0xD8, 0x14, 0xCC, 0x5E, 0xD2,
370     0x0F, 0x80, 0x37, 0xE0, 0xA7, 0x97, 0x15, 0xEE, 0xF2, 0x9B, 0xE3, 0x28,
371     0x06, 0xA1, 0xD5, 0x8B, 0xB7, 0xC5, 0xDA, 0x76, 0xF5, 0x50, 0xAA, 0x3D,
372     0x8A, 0x1F, 0xBF, 0xF0, 0xEB, 0x19, 0xCC, 0xB1, 0xA3, 0x13, 0xD5, 0x5C,
373     0xDA, 0x56, 0xC9, 0xEC, 0x2E, 0xF2, 0x96, 0x32, 0x38, 0x7F, 0xE8, 0xD7,
374     0x6E, 0x3C, 0x04, 0x68, 0x04, 0x3E, 0x8F, 0x66, 0x3F, 0x48, 0x60, 0xEE,
375     0x12, 0xBF, 0x2D, 0x5B, 0x0B, 0x74, 0xD6, 0xE6, 0x94, 0xF9, 0x1E,
376     0x6D, 0xBE, 0x11, 0x59, 0x74, 0xA3, 0x92, 0x6F, 0x12, 0xFE, 0xE5, 0xEA,
377     0x38, 0x77, 0x7C, 0xB6, 0xA9, 0x32, 0xDF, 0x8C, 0xD8, 0xBE, 0xC4, 0xD0,
378     0x73, 0xB9, 0x31, 0xBA, 0x3B, 0xC8, 0x32, 0xB6, 0x8D, 0x9D, 0xD3, 0x00,
379     0x74, 0x1F, 0xA7, 0xBF, 0x8A, 0xFC, 0x47, 0xED, 0x25, 0x76, 0xF6, 0x93,
380     0x6B, 0xA4, 0x24, 0x66, 0x3A, 0xAB, 0x63, 0x9C, 0x5A, 0xEA, 0xF5, 0x68,
381     0x34, 0x23, 0xB4, 0x74, 0x2B, 0xF1, 0xC9, 0x78, 0x23, 0x8F, 0x16, 0xCB,
382     0xE3, 0x9D, 0x65, 0x2D, 0xE3, 0xFD, 0xB8, 0xBE, 0xFC, 0x8A, 0x8A, 0xD9,
383     0x22, 0x22, 0x2E, 0x04, 0xA4, 0x03, 0x7C, 0x07, 0x13, 0xEB, 0x57, 0xA8,
384     0x1A, 0x23, 0xF0, 0xC7, 0x34, 0x73, 0xFC, 0x64, 0x6C, 0xEA, 0x30, 0x6B,
385     0x4B, 0xCB, 0xC8, 0x86, 0x2F, 0x83, 0x85, 0xDD, 0xFA, 0x9D, 0x4B, 0x7F,
386     0xA2, 0x2C, 0x87, 0xE8, 0x79, 0x68, 0x33, 0x03, 0xED, 0x5B, 0xDD, 0x3A,
387     0x06, 0x20, 0x87, 0xC3, 0xF5, 0xB3, 0xA2, 0x78, 0xA6, 0x6D, 0x2A, 0x13, 0x13,
388     0x3F, 0x44, 0xF8, 0x2D, 0xDF, 0x31, 0x0E, 0xE0, 0x74, 0xAB, 0x6A, 0x36,
389     0x45, 0x97, 0xE8, 0x99, 0xA0, 0x25, 0xC1, 0x64, 0xF3, 0x1C, 0xC5,
390     0x08, 0x46, 0x85, 0x1D, 0xF9, 0xAB, 0x48, 0x19, 0x5D, 0xED, 0x7E, 0xA1,
391     0xB1, 0xD5, 0x10, 0xBD, 0x7E, 0xE7, 0x4D, 0x73, 0xFA, 0xF3, 0x6B, 0xC3,

```

```
392         0x1E, 0xCF, 0xA2, 0x68, 0x35, 0x90, 0x46, 0xF4, 0xEB, 0x87, 0x9F, 0x92,  
393         0x40, 0x09, 0x43, 0x8B, 0x48, 0x1C, 0x6C, 0xD7, 0x88, 0x9A, 0x00, 0x2E,  
394         0xD5, 0xEE, 0x38, 0x2B, 0xC9, 0x19, 0x0D, 0xA6, 0xFC, 0x02, 0x6E, 0x47,  
395         0x95, 0x58, 0xE4, 0x47, 0x56, 0x77, 0xE9, 0xAA, 0x9E, 0x30, 0x50, 0xE2,  
396         0x76, 0x56, 0x94, 0xDF, 0xC8, 0x1F, 0x56, 0xE8, 0x80, 0xB9, 0x6E, 0x71,  
397         0x60, 0xC9, 0x80, 0xDD, 0x98, 0xED, 0xD3, 0xDF, 0xFF, 0xFF, 0xFF, 0xFF,  
398         0xFF, 0xFF, 0xFF, 0xFF,  
399     };  
400     return BN_bin2bn(RFC3526_PRIME_8192, sizeof(RFC3526_PRIME_8192), bn);  
401 }
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_ctx.c

1

```
*****
11809 Fri May 30 18:31:35 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_ctx.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/bn/bn_ctx.c */
2 /* Written by Ulf Moeller for the OpenSSL project. */
3 /* =====
4 * Copyright (c) 1998-2004 The OpenSSL Project. All rights reserved.
5 *
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7 * modification, are permitted provided that the following conditions
8 * are met:
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41 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
42 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
43 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
44 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
45 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
46 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
47 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
48 * OF THE POSSIBILITY OF SUCH DAMAGE.
49 * =====
50 *
51 * This product includes cryptographic software written by Eric Young
52 * (eay@cryptsoft.com). This product includes software written by Tim
53 * Hudson (tjh@cryptsoft.com).
54 *
55 */

57 #if !defined(BN_CTX_DEBUG) && !defined(BN_DEBUG)
58 #ifndef NDEBUG
59 #define NDEBUG
60 #endif
61 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_ctx.c

2

```
63 #include <stdio.h>
64 #include <assert.h>

66 #include "cryptlib.h"
67 #include "bn_lcl.h"

69 /* TODO list
70 *
71 * 1. Check a bunch of "(words+1)" type hacks in various bignum functions and
72 * check they can be safely removed.
73 * - Check +1 and other ugliness in BN_from_montgomery()
74 *
75 * 2. Consider allowing a BN_new_ex() that, at least, lets you specify an
76 * appropriate 'block' size that will be honoured by bn_expand_internal() to
77 * prevent piddly little reallocations. OTOH, profiling bignum expansions in
78 * BN_CTX doesn't show this to be a big issue.
79 */

81 /* How many bignums are in each "pool item"; */
82 #define BN_CTX_POOL_SIZE 16
83 /* The stack frame info is resizing, set a first-time expansion size; */
84 #define BN_CTX_START_FRAMES 32

86 /*****/
87 /* BN_POOL */
88 /*****/

90 /* A bundle of bignums that can be linked with other bundles */
91 typedef struct bignum_pool_item
92 {
93     /* The bignum values */
94     BIGNUM vals[BN_CTX_POOL_SIZE];
95     /* Linked-list admin */
96     struct bignum_pool_item *prev, *next;
97 } BN_POOL_ITEM;
98 /* A linked-list of bignums grouped in bundles */
99 typedef struct bignum_pool
100 {
101     /* Linked-list admin */
102     BN_POOL_ITEM *head, *current, *tail;
103     /* Stack depth and allocation size */
104     unsigned used, size;
105 } BN_POOL;
106 static void BN_POOL_init(BN_POOL *);
107 static void BN_POOL_finish(BN_POOL *);
108 #ifndef OPENSSL_NO_DEPRECATED
109 static void BN_POOL_reset(BN_POOL *);
110 #endif
111 static BIGNUM * BN_POOL_get(BN_POOL *);
112 static void BN_POOL_release(BN_POOL *, unsigned int);

114 /*****/
115 /* BN_STACK */
116 /*****/

118 /* A wrapper to manage the "stack frames" */
119 typedef struct bignum_ctx_stack
120 {
121     /* Array of indexes into the bignum stack */
122     unsigned int *indexes;
123     /* Number of stack frames, and the size of the allocated array */
124     unsigned int depth, size;
125 } BN_STACK;
126 static void BN_STACK_init(BN_STACK *);
127 static void BN_STACK_finish(BN_STACK *);
```



```

128 #ifndef OPENSSSL_NO_DEPRECATED
129 static void BN_STACK_reset(BN_STACK *);
130 #endif
131 static int BN_STACK_push(BN_STACK *, unsigned int);
132 static unsigned int BN_STACK_pop(BN_STACK *);

134 /******
135  * BN_CTX */
136 /******

138 /* The opaque BN_CTX type */
139 struct bignum_ctx
140 {
141     /* The bignum bundles */
142     BN_POOL pool;
143     /* The "stack frames", if you will */
144     BN_STACK stack;
145     /* The number of bignums currently assigned */
146     unsigned int used;
147     /* Depth of stack overflow */
148     int err_stack;
149     /* Block "gets" until an "end" (compatibility behaviour) */
150     int too_many;
151 };

153 /* Enable this to find BN_CTX bugs */
154 #ifdef BN_CTX_DEBUG
155 static const char *ctxdbg_cur = NULL;
156 static void ctxdbg(BN_CTX *ctx)
157 {
158     unsigned int bnidx = 0, fpidx = 0;
159     BN_POOL_ITEM *item = ctx->pool.head;
160     BN_STACK *stack = &ctx->stack;
161     fprintf(stderr, "(%08x): ", (unsigned int)ctx);
162     while(bnidx < ctx->used)
163     {
164         fprintf(stderr, "%03x ", item->vals[bnidx++ % BN_CTX_POOL_SIZE]);
165         if(!(bnidx % BN_CTX_POOL_SIZE))
166             item = item->next;
167     }
168     fprintf(stderr, "\n");
169     bnidx = 0;
170     fprintf(stderr, "          : ");
171     while(fpidx < stack->depth)
172     {
173         while(bnidx++ < stack->indexes[fpidx])
174             fprintf(stderr, " ");
175         fprintf(stderr, "^^^ ");
176         bnidx++;
177         fpidx++;
178     }
179     fprintf(stderr, "\n");
180 }
181 #define CTXDBG_ENTRY(str, ctx) do { \
182     ctxdbg_cur = (str); \
183     fprintf(stderr, "Starting %s\n", ctxdbg_cur); \
184     ctxdbg(ctx); \
185 } while(0)
186 #define CTXDBG_EXIT(ctx) do { \
187     fprintf(stderr, "Ending %s\n", ctxdbg_cur); \
188     ctxdbg(ctx); \
189 } while(0)
190 #define CTXDBG_RET(ctx, ret)
191 #else
192 #define CTXDBG_ENTRY(str, ctx)
193 #define CTXDBG_EXIT(ctx)

```

```

194 #define CTXDBG_RET(ctx, ret)
195 #endif

197 /* This function is an evil legacy and should not be used. This implementation
198  * is WYSIWYG, though I've done my best. */
199 #ifndef OPENSSSL_NO_DEPRECATED
200 void BN_CTX_init(BN_CTX *ctx)
201 {
202     /* Assume the caller obtained the context via BN_CTX_new() and so is
203     * trying to reset it for use. Nothing else makes sense, least of all
204     * binary compatibility from a time when they could declare a static
205     * variable. */
206     BN_POOL_reset(&ctx->pool);
207     BN_STACK_reset(&ctx->stack);
208     ctx->used = 0;
209     ctx->err_stack = 0;
210     ctx->too_many = 0;
211 }
212 #endif

214 BN_CTX *BN_CTX_new(void)
215 {
216     BN_CTX *ret = OPENSSSL_malloc(sizeof(BN_CTX));
217     if(!ret)
218     {
219         BNerr(BN_F_BN_CTX_NEW, ERR_R_MALLOC_FAILURE);
220         return NULL;
221     }
222     /* Initialise the structure */
223     BN_POOL_init(&ret->pool);
224     BN_STACK_init(&ret->stack);
225     ret->used = 0;
226     ret->err_stack = 0;
227     ret->too_many = 0;
228     return ret;
229 }

231 void BN_CTX_free(BN_CTX *ctx)
232 {
233     if (ctx == NULL)
234         return;
235 #ifdef BN_CTX_DEBUG
236     {
237         BN_POOL_ITEM *pool = ctx->pool.head;
238         fprintf(stderr, "BN_CTX_free, stack-size=%d, pool-bignums=%d\n",
239             ctx->stack.size, ctx->pool.size);
240         fprintf(stderr, "dmaxs: ");
241         while(pool) {
242             unsigned loop = 0;
243             while(loop < BN_CTX_POOL_SIZE)
244                 fprintf(stderr, "%02x ", pool->vals[loop++].dmax);
245             pool = pool->next;
246         }
247         fprintf(stderr, "\n");
248     }
249 #endif
250     BN_STACK_finish(&ctx->stack);
251     BN_POOL_finish(&ctx->pool);
252     OPENSSSL_free(ctx);
253 }

255 void BN_CTX_start(BN_CTX *ctx)
256 {
257     CTXDBG_ENTRY("BN_CTX_start", ctx);
258     /* If we're already overflowing ... */
259     if(ctx->err_stack || ctx->too_many)

```

```

260     ctx->err_stack++;
261     /* (Try to) get a new frame pointer */
262     else if(!BN_STACK_push(&ctx->stack, ctx->used))
263     {
264         BNerr(BN_F_BN_CTX_START, BN_R_TOO_MANY_TEMPORARY_VARIABLES);
265         ctx->err_stack++;
266     }
267     CTXDBG_EXIT(ctx);
268 }

270 void BN_CTX_end(BN_CTX *ctx)
271 {
272     CTXDBG_ENTRY("BN_CTX_end", ctx);
273     if(ctx->err_stack)
274         ctx->err_stack--;
275     else
276     {
277         unsigned int fp = BN_STACK_pop(&ctx->stack);
278         /* Does this stack frame have anything to release? */
279         if(fp < ctx->used)
280             BN_POOL_release(&ctx->pool, ctx->used - fp);
281         ctx->used = fp;
282         /* Unjam "too_many" in case "get" had failed */
283         ctx->too_many = 0;
284     }
285     CTXDBG_EXIT(ctx);
286 }

288 BIGNUM *BN_CTX_get(BN_CTX *ctx)
289 {
290     BIGNUM *ret;
291     CTXDBG_ENTRY("BN_CTX_get", ctx);
292     if(ctx->err_stack || ctx->too_many) return NULL;
293     if((ret = BN_POOL_get(&ctx->pool)) == NULL)
294     {
295         /* Setting too_many prevents repeated "get" attempts from
296          * cluttering the error stack. */
297         ctx->too_many = 1;
298         BNerr(BN_F_BN_CTX_GET, BN_R_TOO_MANY_TEMPORARY_VARIABLES);
299         return NULL;
300     }
301     /* OK, make sure the returned bignum is "zero" */
302     BN_zero(ret);
303     ctx->used++;
304     CTXDBG_RET(ctx, ret);
305     return ret;
306 }

308 /******
309  * BN_STACK */
310 /******

312 static void BN_STACK_init(BN_STACK *st)
313 {
314     st->indexes = NULL;
315     st->depth = st->size = 0;
316 }

318 static void BN_STACK_finish(BN_STACK *st)
319 {
320     if(st->size) OPENSSL_free(st->indexes);
321 }

323 #ifndef OPENSSL_NO_DEPRECATED
324 static void BN_STACK_reset(BN_STACK *st)
325 {

```

```

326     st->depth = 0;
327 }
328 #endif

330 static int BN_STACK_push(BN_STACK *st, unsigned int idx)
331 {
332     if(st->depth == st->size)
333     {
334         /* Need to expand */
335         unsigned int newsize = (st->size ?
336                                 (st->size * 3 / 2) : BN_CTX_START_FRAMES);
337         unsigned int *newitems = OPENSSL_malloc(newsize *
338                                                  sizeof(unsigned int));
339         if(!newitems) return 0;
340         if(st->depth)
341             memcpy(newitems, st->indexes, st->depth *
342                  sizeof(unsigned int));
343         if(st->size) OPENSSL_free(st->indexes);
344         st->indexes = newitems;
345         st->size = newsize;
346     }
347     st->indexes[(st->depth)++] = idx;
348     return 1;
349 }

351 static unsigned int BN_STACK_pop(BN_STACK *st)
352 {
353     return st->indexes[--(st->depth)];
354 }

356 /******
357  * BN_POOL */
358 /******

360 static void BN_POOL_init(BN_POOL *p)
361 {
362     p->head = p->current = p->tail = NULL;
363     p->used = p->size = 0;
364 }

366 static void BN_POOL_finish(BN_POOL *p)
367 {
368     while(p->head)
369     {
370         unsigned int loop = 0;
371         BIGNUM *bn = p->head->vals;
372         while(loop++ < BN_CTX_POOL_SIZE)
373         {
374             if(bn->d) BN_clear_free(bn);
375             bn++;
376         }
377         p->current = p->head->next;
378         OPENSSL_free(p->head);
379         p->head = p->current;
380     }
381 }

383 #ifndef OPENSSL_NO_DEPRECATED
384 static void BN_POOL_reset(BN_POOL *p)
385 {
386     BN_POOL_ITEM *item = p->head;
387     while(item)
388     {
389         unsigned int loop = 0;
390         BIGNUM *bn = item->vals;
391         while(loop++ < BN_CTX_POOL_SIZE)

```

```

392         {
393             if(bn->d) BN_clear(bn);
394             bn++;
395         }
396         item = item->next;
397     }
398     p->current = p->head;
399     p->used = 0;
400 }
401 #endif

403 static BIGNUM *BN_POOL_get(BN_POOL *p)
404 {
405     if(p->used == p->size)
406     {
407         BIGNUM *bn;
408         unsigned int loop = 0;
409         BN_POOL_ITEM *item = OPENSSL_malloc(sizeof(BN_POOL_ITEM));
410         if(!item) return NULL;
411         /* Initialise the structure */
412         bn = item->vals;
413         while(loop++ < BN_CTX_POOL_SIZE)
414             BN_init(bn++);
415         item->prev = p->tail;
416         item->next = NULL;
417         /* Link it in */
418         if(!p->head)
419             p->head = p->current = p->tail = item;
420         else
421         {
422             p->tail->next = item;
423             p->tail = item;
424             p->current = item;
425         }
426         p->size += BN_CTX_POOL_SIZE;
427         p->used++;
428         /* Return the first bignum from the new pool */
429         return item->vals;
430     }
431     if(!p->used)
432         p->current = p->head;
433     else if((p->used % BN_CTX_POOL_SIZE) == 0)
434         p->current = p->current->next;
435     return p->current->vals + ((p->used++) % BN_CTX_POOL_SIZE);
436 }

438 static void BN_POOL_release(BN_POOL *p, unsigned int num)
439 {
440     unsigned int offset = (p->used - 1) % BN_CTX_POOL_SIZE;
441     p->used -= num;
442     while(num--)
443     {
444         bn_check_top(p->current->vals + offset);
445         if(!offset)
446         {
447             offset = BN_CTX_POOL_SIZE - 1;
448             p->current = p->current->prev;
449         }
450         else
451             offset--;
452     }
453 }

```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_depr.c

1

4031 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_depr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/bn/bn_depr.c */
2 /* =====
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4  *
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6  * modification, are permitted provided that the following conditions
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43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */
55
56 /* Support for deprecated functions goes here - static linkage will only slurp
57  * this code if applications are using them directly. */
58
59 #include <stdio.h>
60 #include <time.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_depr.c

2

```
62 #include "bn_lcl.h"
63 #include <openssl/rand.h>
64
65 static void *dummy=&dummy;
66
67 #ifndef OPENSSL_NO_DEPRECATED
68 BIGNUM *BN_generate_prime(BIGNUM *ret, int bits, int safe,
69 const BIGNUM *add, const BIGNUM *rem,
70 void (*callback)(int,int,void *), void *cb_arg)
71 {
72 BN_GENCB cb;
73 BIGNUM *rnd=NULL;
74 int found = 0;
75
76 BN_GENCB_set_old(&cb, callback, cb_arg);
77
78 if (ret == NULL)
79 {
80 if ((rnd=BN_new()) == NULL) goto err;
81 }
82 else
83 rnd=ret;
84 if(!BN_generate_prime_ex(rnd, bits, safe, add, rem, &cb))
85 goto err;
86
87 /* we have a prime :-) */
88 found = 1;
89 err:
90 if (!found && (ret == NULL) && (rnd != NULL)) BN_free(rnd);
91 return(found ? rnd : NULL);
92 }
93
94 int BN_is_prime(const BIGNUM *a, int checks, void (*callback)(int,int,void *),
95 BN_CTX *ctx_passed, void *cb_arg)
96 {
97 BN_GENCB cb;
98 BN_GENCB_set_old(&cb, callback, cb_arg);
99 return BN_is_prime_ex(a, checks, ctx_passed, &cb);
100 }
101
102 int BN_is_prime_fasttest(const BIGNUM *a, int checks,
103 void (*callback)(int,int,void *),
104 BN_CTX *ctx_passed, void *cb_arg,
105 int do_trial_division)
106 {
107 BN_GENCB cb;
108 BN_GENCB_set_old(&cb, callback, cb_arg);
109 return BN_is_prime_fasttest_ex(a, checks, ctx_passed,
110 do_trial_division, &cb);
111 }
112 #endif
```

```

*****
12610 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_div.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bn/bn_div.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/bn.h>
61 #include <cryptlib.h>

```

```

62 #include <bn_lcl.h>

63
64
65 /* The old slow way */
66 #if 0
67 int BN_div(BIGNUM *dv, BIGNUM *rem, const BIGNUM *m, const BIGNUM *d,
68            BN_CTX *ctx)
69 {
70     int i, nm, nd;
71     int ret = 0;
72     BIGNUM *D;
73
74     bn_check_top(m);
75     bn_check_top(d);
76     if (BN_is_zero(d))
77     {
78         BNerr(BN_F_BN_DIV, BN_R_DIV_BY_ZERO);
79         return(0);
80     }
81
82     if (BN_ucmp(m, d) < 0)
83     {
84         if (rem != NULL)
85             { if (BN_copy(rem, m) == NULL) return(0); }
86         if (dv != NULL) BN_zero(dv);
87         return(1);
88     }
89
90     BN_CTX_start(ctx);
91     D = BN_CTX_get(ctx);
92     if (dv == NULL) dv = BN_CTX_get(ctx);
93     if (rem == NULL) rem = BN_CTX_get(ctx);
94     if (D == NULL || dv == NULL || rem == NULL)
95         goto end;
96
97     nd=BN_num_bits(d);
98     nm=BN_num_bits(m);
99     if (BN_copy(D, d) == NULL) goto end;
100    if (BN_copy(rem, m) == NULL) goto end;
101
102    /* The next 2 are needed so we can do a dv->d[0]|=1 later
103     * since BN_lshift1 will only work once there is a value :- ) */
104    BN_zero(dv);
105    if (bn_wexpand(dv, 1) == NULL) goto end;
106    dv->top=1;
107
108    if (!BN_lshift(D, D, nm-nd)) goto end;
109    for (i=nm-nd; i>=0; i--)
110    {
111        if (!BN_lshift1(dv, dv)) goto end;
112        if (BN_ucmp(rem, D) >= 0)
113        {
114            dv->d[0]|=1;
115            if (!BN_usub(rem, rem, D)) goto end;
116        }
117    }
118    /* CAN IMPROVE (and have now :=) */
119    if (!BN_rshift1(D, D)) goto end;
120
121    rem->neg=BN_is_zero(rem)?0:m->neg;
122    dv->neg=m->neg^d->neg;
123    ret = 1;
124
125 end:
126    BN_CTX_end(ctx);
127    return(ret);
128 }

```

```

128 #else
130 #if !defined(OPENSSL_NO_ASM) && !defined(OPENSSL_NO_INLINE_ASM) \
131     && !defined(PEDANTIC) && !defined(BN_DIV3W)
132 # if defined(__GNUC__) && __GNUC__ >= 2
133 #  if defined(__i386) || defined(__i386__)
134 /*
135  * There were two reasons for implementing this template:
136  * - GNU C generates a call to a function (__udivdi3 to be exact)
137  * in reply to (((BN_ULONG)n0)<<BN_BITS2)|n1)/d0 (I fail to
138  * understand why...);
139  * - divl doesn't only calculate quotient, but also leaves
140  * remainder in %edx which we can definitely use here:-)
141  *
142  *                                     <appro@fy.chalmers.se>
143  */
144 #undef bn_div_words
145 # define bn_div_words(n0,n1,d0) \
146     ({ __asm volatile ( \
147         "divl %4" \
148         : "=a"(q), "=d"(rem) \
149         : "a"(n1), "d"(n0), "g"(d0) \
150         : "cc"); \
151     } \
152     q; \
153     })
154 # define REMAINDER_IS_ALREADY_CALCULATED
155 # elif defined(__x86_64) && defined(SIXTY_FOUR_BIT_LONG)
156 /*
157  * Same story here, but it's 128-bit by 64-bit division. Wow!
158  *                                     <appro@fy.chalmers.se>
159  */
160 # undef bn_div_words
161 # define bn_div_words(n0,n1,d0) \
162     ({ __asm volatile ( \
163         "divq %4" \
164         : "=a"(q), "=d"(rem) \
165         : "a"(n1), "d"(n0), "g"(d0) \
166         : "cc"); \
167     } \
168     q; \
169     })
170 # define REMAINDER_IS_ALREADY_CALCULATED
171 # endif /* __GNUC__ */
172 #endif /* OPENSSL_NO_ASM */

174 /* BN_div computes dv := num / divisor, rounding towards
175  * zero, and sets up rm such that dv*divisor + rm = num holds.
176  * Thus:
177  *   dv->neg == num->neg ^ divisor->neg (unless the result is zero)
178  *   rm->neg == num->neg (unless the remainder is zero)
179  * If 'dv' or 'rm' is NULL, the respective value is not returned.
180 */
181 int BN_div(BIGNUM *dv, BIGNUM *rm, const BIGNUM *num, const BIGNUM *divisor,
182            BN_CTX *ctx)
183 {
184     int norm_shift, i, loop;
185     BIGNUM *tmp, *wnum, *snum, *sdiv, *res;
186     BN_ULONG *resp, *wnump;
187     BN_ULONG d0, d1;
188     int num_n, div_n;
189     int no_branch=0;

191     /* Invalid zero-padding would have particularly bad consequences
192     * in the case of 'num', so don't just rely on bn_check_top() for this o
193     * (bn_check_top() works only for BN_DEBUG builds) */

```

```

194     if (num->top > 0 && num->d[num->top - 1] == 0)
195     {
196         BNerr(BN_F_BN_DIV, BN_R_NOT_INITIALIZED);
197         return 0;
198     }

200     bn_check_top(num);

202     if ((BN_get_flags(num, BN_FLG_CONSTTIME) != 0) || (BN_get_flags(divisor,
203     {
204         no_branch=1;
205     }

207     bn_check_top(dv);
208     bn_check_top(rm);
209     /* bn_check_top(num); */ /* 'num' has been checked already */
210     bn_check_top(divisor);

212     if (BN_is_zero(divisor))
213     {
214         BNerr(BN_F_BN_DIV, BN_R_DIV_BY_ZERO);
215         return(0);
216     }

218     if (!no_branch && BN_ucmp(num, divisor) < 0)
219     {
220         if (rm != NULL)
221             { if (BN_copy(rm, num) == NULL) return(0); }
222         if (dv != NULL) BN_zero(dv);
223         return(1);
224     }

226     BN_CTX_start(ctx);
227     tmp=BN_CTX_get(ctx);
228     snum=BN_CTX_get(ctx);
229     sdiv=BN_CTX_get(ctx);
230     if (dv == NULL)
231         res=BN_CTX_get(ctx);
232     else
233         res=dv;
234     if (sdiv == NULL || res == NULL || tmp == NULL || snum == NULL)
235         goto err;

236     /* First we normalise the numbers */
237     norm_shift=BN_BITS2-((BN_num_bits(divisor))%BN_BITS2);
238     if (!(BN_lshift(sdiv, divisor, norm_shift))) goto err;
239     sdiv->neg=0;
240     norm_shift+=BN_BITS2;
241     if (!(BN_lshift(snum, num, norm_shift))) goto err;
242     snum->neg=0;

244     if (no_branch)
245     {
246         /* Since we don't know whether snum is larger than sdiv,
247         * we pad snum with enough zeroes without changing its
248         * value.
249         */
250         if (snum->top <= sdiv->top+1)
251         {
252             if (bn_wexpand(snum, sdiv->top + 2) == NULL) goto err;
253             for (i = snum->top; i < sdiv->top + 2; i++) snum->d[i] =
254                 snum->top = sdiv->top + 2;
255         }
256     }
257     else
258     {
259         if (bn_wexpand(snum, snum->top + 1) == NULL) goto err;
260         snum->d[snum->top] = 0;

```

```

260         snum->top ++;
261     }
262 }

264 div_n=sdiv->top;
265 num_n=snum->top;
266 loop=num_n-div_n;
267 /* Lets setup a 'window' into snum
268  * This is the part that corresponds to the current
269  * 'area' being divided */
270 wnum.neg = 0;
271 wnum.d = &(snum->d[loop]);
272 wnum.top = div_n;
273 /* only needed when BN_ucmp messes up the values between top and max */
274 wnum.dmax = snum->dmax - loop; /* so we don't step out of bounds */

276 /* Get the top 2 words of sdiv */
277 /* div_n=sdiv->top; */
278 d0=sdiv->d[div_n-1];
279 d1=(div_n == 1)?0:sdiv->d[div_n-2];

281 /* pointer to the 'top' of snum */
282 wnump= &(snum->d[num_n-1]);

284 /* Setup to 'res' */
285 res->neg= (num->neg^divisor->neg);
286 if (!bn_wexpand(res, (loop+1))) goto err;
287 res->top=loop-no_branch;
288 resp= &(res->d[loop-1]);

290 /* space for temp */
291 if (!bn_wexpand(tmp, (div_n+1))) goto err;

293 if (!no_branch)
294 {
295     if (BN_ucmp(&wnum, sdiv) >= 0)
296     {
297         /* If BN_DEBUG_RAND is defined BN_ucmp changes (via
298          * bn_pollute) the const bignum arguments =>
299          * clean the values between top and max again */
300         bn_clear_top2max(&wnum);
301         bn_sub_words(wnum.d, wnum.d, sdiv->d, div_n);
302         *resp=1;
303     }
304     else
305         res->top--;
306 }

308 /* if res->top == 0 then clear the neg value otherwise decrease
309  * the resp pointer */
310 if (res->top == 0)
311     res->neg = 0;
312 else
313     resp--;

315 for (i=0; i<loop-1; i++, wnump--, resp--)
316 {
317     BN_ULONG q,l0;
318     /* the first part of the loop uses the top two words of
319     * snum and sdiv to calculate a BN_ULONG q such that
320     * | wnum - sdiv * q | < sdiv */
321 #if defined(BN_DIV3W) && !defined(OPENSSL_NO_ASM)
322     BN_ULONG bn_div_3_words(BN_ULONG*, BN_ULONG, BN_ULONG);
323     q=bn_div_3_words(wnump, d1, d0);
324 #else
325     BN_ULONG n0,n1,rem=0;

```

```

327     n0=wnump[0];
328     n1=wnump[-1];
329     if (n0 == d0)
330         q=BN_MASK2;
331     else
332     {
333 #ifdef BN_LLONG
334         BN_ULLONG t2;

336 #if defined(BN_LLONG) && defined(BN_DIV2W) && !defined(bn_div_words)
337         q=(BN_ULONG)((((BN_ULLONG)n0)<<BN_BITS2)|n1)/d0);
338 #else
339         q=bn_div_words(n0,n1,d0);
340 #endif
341 #ifdef BN_DEBUG_LEVITTE
342         fprintf(stderr, "DEBUG: bn_div_words(0x%08X, 0x%08X, 0x%08\
343 X) -> 0x%08X\n",
344                 n0, n1, d0, q);
345 #endif

347 #ifndef REMAINDER_IS_ALREADY_CALCULATED
348     /*
349     * rem doesn't have to be BN_ULLONG. The least we
350     * know it's less than d0, isn't it?
351     */
352     rem=(n1-q*d0)&BN_MASK2;
353 #endif
354     t2=(BN_ULLONG)d1*q;

356     for (;;)
357     {
358         if (t2 <= (((BN_ULLONG)rem)<<BN_BITS2)|wnump[-2]
359             break;
360         q--;
361         rem += d0;
362         if (rem < d0) break; /* don't let rem overflow */
363         t2 -= d1;
364     }
365 #else /* !BN_LLONG */
366     BN_ULONG t2l,t2h;

368     q=bn_div_words(n0,n1,d0);
369 #ifdef BN_DEBUG_LEVITTE
370     fprintf(stderr, "DEBUG: bn_div_words(0x%08X, 0x%08X, 0x%08\
371 X) -> 0x%08X\n",
372             n0, n1, d0, q);
373 #endif
374 #ifndef REMAINDER_IS_ALREADY_CALCULATED
375     rem=(n1-q*d0)&BN_MASK2;
376 #endif

378 #if defined(BN_UMULT_LOHI)
379     BN_UMULT_LOHI(t2l,t2h,d1,q);
380 #elif defined(BN_UMULT_HIGH)
381     t2l = d1 * q;
382     t2h = BN_UMULT_HIGH(d1,q);
383 #else
384     {
385         BN_ULONG ql, qh;
386         t2l=LBITS(d1); t2h=HBITS(d1);
387         ql =LBITS(q); qh =HBITS(q);
388         mul64(t2l,t2h,ql,qh); /* t2=(BN_ULLONG)d1*q; */
389     }
390 #endif

```

```

392         for (;;)
393         {
394             if ((t2h < rem) ||
395                 ((t2h == rem) && (t2l <= wnump[-2])))
396                 break;
397             q--;
398             rem += d0;
399             if (rem < d0) break; /* don't let rem overflow */
400             if (t2l < d1) t2h--; t2l -= d1;
401         }
402     #endif /* !BN_LLONG */
403 }
404 #endif /* !BN_DIV3W */

406     l0=bn_mul_words(tmp->d,sdiv->d,div_n,q);
407     tmp->d[div_n]=l0;
408     wnum.d--;
409     /* ignore top values of the bignums just sub the two
410      * BN_ULONG arrays with bn_sub_words */
411     if (bn_sub_words(wnum.d, wnum.d, tmp->d, div_n+1))
412     {
413         /* Note: As we have considered only the leading
414          * two BN_ULONGs in the calculation of q, sdiv * q
415          * might be greater than wnum (but then (q-1) * sdiv
416          * is less or equal than wnum)
417          */
418         q--;
419         if (bn_add_words(wnum.d, wnum.d, sdiv->d, div_n))
420             /* we can't have an overflow here (assuming
421              * that q != 0, but if q == 0 then tmp is
422              * zero anyway) */
423             (*wnump)++;
424     }
425     /* store part of the result */
426     *resp = q;
427 }
428 bn_correct_top(snum);
429 if (rm != NULL)
430 {
431     /* Keep a copy of the neg flag in num because if rm==num
432      * BN_rshift() will overwrite it.
433      */
434     int neg = num->neg;
435     BN_rshift(rm,snum,norm_shift);
436     if (!BN_is_zero(rm))
437         rm->neg = neg;
438     bn_check_top(rm);
439 }
440 if (no_branch) bn_correct_top(res);
441 BN_CTX_end(ctx);
442 return(1);
443 err:
444     bn_check_top(rm);
445     BN_CTX_end(ctx);
446     return(0);
447 }
448 #endif

```



```

*****
6580 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/bn/bn_err.c */
2 /* =====
3  * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
4  *
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6  * modification, are permitted provided that the following conditions
7  * are met:
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27  * 5. Products derived from this software may not be called "OpenSSL"
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29  * permission of the OpenSSL Project.
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41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
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44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/bn.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_BN,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_BN,0,reason)

71 static ERR_STRING_DATA BN_str_functs[]=
72 {
73 {ERR_FUNC(BN_F_BN_rand), "BNRAND"},
74 {ERR_FUNC(BN_F_BN_BLINDING_CONVERT_EX), "BN_BLINDING_convert_ex"},
75 {ERR_FUNC(BN_F_BN_BLINDING_CREATE_PARAM), "BN_BLINDING_create_param"},
76 {ERR_FUNC(BN_F_BN_BLINDING_INVERT_EX), "BN_BLINDING_invert_ex"},
77 {ERR_FUNC(BN_F_BN_BLINDING_NEW), "BN_BLINDING_new"},
78 {ERR_FUNC(BN_F_BN_BLINDING_UPDATE), "BN_BLINDING_update"},
79 {ERR_FUNC(BN_F_BN_bn2DEC), "BN_bn2dec"},
80 {ERR_FUNC(BN_F_BN_bn2HEX), "BN_bn2hex"},
81 {ERR_FUNC(BN_F_BN_CTX_GET), "BN_CTX_get"},
82 {ERR_FUNC(BN_F_BN_CTX_NEW), "BN_CTX_new"},
83 {ERR_FUNC(BN_F_BN_CTX_START), "BN_CTX_start"},
84 {ERR_FUNC(BN_F_BN_DIV), "BN_div"},
85 {ERR_FUNC(BN_F_BN_DIV_NO_BRANCH), "BN_div_no_branch"},
86 {ERR_FUNC(BN_F_BN_DIV_RECP), "BN_div_recip"},
87 {ERR_FUNC(BN_F_BN_EXP), "BN_exp"},
88 {ERR_FUNC(BN_F_BN_EXPAND2), "bn_expand2"},
89 {ERR_FUNC(BN_F_BN_EXPAND_INTERNAL), "BN_EXPAND_INTERNAL"},
90 {ERR_FUNC(BN_F_BN_GF2M_MOD), "BN_GF2m_mod"},
91 {ERR_FUNC(BN_F_BN_GF2M_MOD_EXP), "BN_GF2m_mod_exp"},
92 {ERR_FUNC(BN_F_BN_GF2M_MOD_MUL), "BN_GF2m_mod_mul"},
93 {ERR_FUNC(BN_F_BN_GF2M_MOD_SOLVE_QUAD), "BN_GF2m_mod_solve_quad"},
94 {ERR_FUNC(BN_F_BN_GF2M_MOD_SOLVE_QUAD_ARR), "BN_GF2m_mod_solve_quad_arr"},
95 {ERR_FUNC(BN_F_BN_GF2M_MOD_SQR), "BN_GF2m_mod_sqr"},
96 {ERR_FUNC(BN_F_BN_GF2M_MOD_SQRT), "BN_GF2m_mod_sqrt"},
97 {ERR_FUNC(BN_F_BN_MOD_EXP2_MONT), "BN_mod_exp2_mont"},
98 {ERR_FUNC(BN_F_BN_MOD_EXP_MONT), "BN_mod_exp_mont"},
99 {ERR_FUNC(BN_F_BN_MOD_EXP_MONT_CONSTTIME), "BN_mod_exp_mont_consttime"},
100 {ERR_FUNC(BN_F_BN_MOD_EXP_MONT_WORD), "BN_mod_exp_mont_word"},
101 {ERR_FUNC(BN_F_BN_MOD_EXP_RECP), "BN_mod_exp_recip"},
102 {ERR_FUNC(BN_F_BN_MOD_EXP_SIMPLE), "BN_mod_exp_simple"},
103 {ERR_FUNC(BN_F_BN_MOD_INVERSE), "BN_mod_inverse"},
104 {ERR_FUNC(BN_F_BN_MOD_INVERSE_NO_BRANCH), "BN_mod_inverse_no_branch"},
105 {ERR_FUNC(BN_F_BN_MOD_LSHIFT_QUICK), "BN_mod_lshift_quick"},
106 {ERR_FUNC(BN_F_BN_MOD_MUL_RECIPROCAL), "BN_mod_mul_reciprocal"},
107 {ERR_FUNC(BN_F_BN_MOD_SQRT), "BN_mod_sqrt"},
108 {ERR_FUNC(BN_F_BN_MPI2BN), "BN_mpi2bn"},
109 {ERR_FUNC(BN_F_BN_NEW), "BN_new"},
110 {ERR_FUNC(BN_F_BN_RAND), "BN_rand"},
111 {ERR_FUNC(BN_F_BN_RAND_RANGE), "BN_rand_range"},
112 {ERR_FUNC(BN_F_BN_USUB), "BN_usub"},
113 {0,NULL}
114 };

116 static ERR_STRING_DATA BN_str_reasons[]=
117 {
118 {ERR_REASON(BN_R_ARG2_LT_ARG3), "arg2 lt arg3"},
119 {ERR_REASON(BN_R_BAD_RECIPROCAL), "bad reciprocal"},
120 {ERR_REASON(BN_R_BIGNUM_TOO_LONG), "bignum too long"},
121 {ERR_REASON(BN_R_CALLED_WITH_EVEN_MODULUS), "called with even modulus"},
122 {ERR_REASON(BN_R_DIV_BY_ZERO), "div by zero"},
123 {ERR_REASON(BN_R_ENCODING_ERROR), "encoding error"},
124 {ERR_REASON(BN_R_EXPAND_ON_STATIC_BIGNUM_DATA), "expand on static bignum data"},
125 {ERR_REASON(BN_R_INPUT_NOT_REDUCED), "input not reduced"},
126 {ERR_REASON(BN_R_INVALID_LENGTH), "invalid length"},
127 {ERR_REASON(BN_R_INVALID_RANGE), "invalid range"},

```

```
128 {ERR_REASON(BN_R_NOT_A_SQUARE)      , "not a square"},
129 {ERR_REASON(BN_R_NOT_INITIALIZED)    , "not initialized"},
130 {ERR_REASON(BN_R_NO_INVERSE)         , "no inverse"},
131 {ERR_REASON(BN_R_NO_SOLUTION)        , "no solution"},
132 {ERR_REASON(BN_R_P_IS_NOT_PRIME)     , "p is not prime"},
133 {ERR_REASON(BN_R_TOO_MANY_ITERATIONS), "too many iterations"},
134 {ERR_REASON(BN_R_TOO_MANY_TEMPORARY_VARIABLES), "too many temporary variables"},
135 {0, NULL}
136 };

138 #endif

140 void ERR_load_BN_strings(void)
141 {
142 #ifndef OPENSSL_NO_ERR
144     if (ERR_func_error_string(BN_str_functs[0].error) == NULL)
145     {
146         ERR_load_strings(0, BN_str_functs);
147         ERR_load_strings(0, BN_str_reasons);
148     }
149 #endif
150 }
```

```

*****
29573 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_exp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_exp.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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11 * apply to all code found in this distribution, be it the RC4, RSA,
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51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
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56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright (c) 1998-2005 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without

```

```

62 * modification, are permitted provided that the following conditions
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70 * the documentation and/or other materials provided with the
71 * distribution.
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100 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
101 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */

113 #include "cryptlib.h"
114 #include "bn_lcl.h"

116 #include <stdlib.h>
117 #ifdef _WIN32
118 #include <malloc.h>
119 #ifndef alloca
120 #define alloca _alloca
121 #endif
122 #elif defined(__GNUC__)
123 #ifndef alloca
124 #define alloca(s) __builtin_alloca((s))
125 #endif
126 #endif

```

```

128 /* maximum precomputation table size for *variable* sliding windows */
129 #define TABLE_SIZE      32

131 /* this one works - simple but works */
132 int BN_exp(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx)
133 {
134     int i, bits, ret=0;
135     BIGNUM *v, *rr;

137     if (BN_get_flags(p, BN_FLG_CONSTTIME) != 0)
138     {
139         /* BN_FLG_CONSTTIME only supported by BN_mod_exp_mont() */
140         BNerr(BN_F_BN_EXP, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
141         return -1;
142     }

144     BN_CTX_start(ctx);
145     if ((r == a) || (r == p))
146         rr = BN_CTX_get(ctx);
147     else
148         rr = r;
149     v = BN_CTX_get(ctx);
150     if (rr == NULL || v == NULL) goto err;

152     if (BN_copy(v, a) == NULL) goto err;
153     bits = BN_num_bits(p);

155     if (BN_is_odd(p))
156     { if (BN_copy(rr, a) == NULL) goto err; }
157     else
158     { if (!BN_one(rr)) goto err; }

159     for (i=1; i<bits; i++)
160     {
161         if (!BN_sqr(v, v, ctx)) goto err;
162         if (BN_is_bit_set(p, i))
163         {
164             if (!BN_mul(rr, rr, v, ctx)) goto err;
165         }
166     }
167     ret=1;
168 err:
169     if (r != rr) BN_copy(r, rr);
170     BN_CTX_end(ctx);
171     bn_check_top(r);
172     return(ret);
173 }

176 int BN_mod_exp(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, const BIGNUM *m,
177 BN_CTX *ctx)
178 {
179     int ret;

181     bn_check_top(a);
182     bn_check_top(p);
183     bn_check_top(m);

185     /* For even modulus m = 2^k*m_odd, it might make sense to compute
186     * a^p mod m_odd and a^p mod 2^k separately (with Montgomery
187     * exponentiation for the odd part), using appropriate exponent
188     * reductions, and combine the results using the CRT.
189     *
190     * For now, we use Montgomery only if the modulus is odd; otherwise,
191     * exponentiation using the reciprocal-based quick remaindering
192     * algorithm is used.
193     */

```

```

194     /* (Timing obtained with expspeed.c [computations a^p mod m
195     * where a, p, m are of the same length: 256, 512, 1024, 2048,
196     * 4096, 8192 bits], compared to the running time of the
197     * standard algorithm:
198     *
199     * BN_mod_exp_mont    33 .. 40 % [AMD K6-2, Linux, debug configuration
200     *                               55 .. 77 % [UltraSparc processor, but
201     *                               debug-solaris-sparcv8-gcc conf.]
202     *
203     * BN_mod_exp_recv    50 .. 70 % [AMD K6-2, Linux, debug configuration
204     *                               62 .. 118 % [UltraSparc, debug-solaris-sparcv8-gc
205     *
206     * On the Sparc, BN_mod_exp_recv was faster than BN_mod_exp_mont
207     * at 2048 and more bits, but at 512 and 1024 bits, it was
208     * slower even than the standard algorithm!
209     *
210     * "Real" timings [linux-elf, solaris-sparcv9-gcc configurations]
211     * should be obtained when the new Montgomery reduction code
212     * has been integrated into OpenSSL.)
213     */

215 #define MONT_MUL_MOD
216 #define MONT_EXP_WORD
217 #define RECP_MUL_MOD

219 #ifdef MONT_MUL_MOD
220     /* I have finally been able to take out this pre-condition of
221     * the top bit being set. It was caused by an error in BN_div
222     * with negatives. There was also another problem when for a^b%m
223     * a >= m. eay 07-May-97 */
224     /* if ((m->d[m->top-1]&BN_TBIT) && BN_is_odd(m)) */

226     if (BN_is_odd(m))
227     {
228 #ifdef MONT_EXP_WORD
229         if (a->top == 1 && !a->neg && (BN_get_flags(p, BN_FLG_CONSTTIME)
230         {
231             BN_ULONG A = a->d[0];
232             ret=BN_mod_exp_mont_word(r, A, p, m, ctx, NULL);
233         }
234         else
235 #endif
236             ret=BN_mod_exp_mont(r, a, p, m, ctx, NULL);
237     }
238     else
239 #endif
240 #ifdef RECP_MUL_MOD
241     { ret=BN_mod_exp_recv(r, a, p, m, ctx); }
242 #else
243     { ret=BN_mod_exp_simple(r, a, p, m, ctx); }
244 #endif

246     bn_check_top(r);
247     return(ret);
248 }

251 int BN_mod_exp_recv(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
252 const BIGNUM *m, BN_CTX *ctx)
253 {
254     int i, j, bits, ret=0, wstart, wend, window, wvalue;
255     int start=1;
256     BIGNUM *aa;
257     /* Table of variables obtained from 'ctx' */
258     BIGNUM *val[TABLE_SIZE];
259     BN_RECP_CTX recp;

```

```

261     if (BN_get_flags(p, BN_FLG_CONSTTIME) != 0)
262     {
263         /* BN_FLG_CONSTTIME only supported by BN_mod_exp_mont() */
264         BNerr(BN_F_BN_MOD_EXP_RECP, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
265         return -1;
266     }
268     bits=BN_num_bits(p);
270     if (bits == 0)
271     {
272         ret = BN_one(r);
273         return ret;
274     }
276     BN_CTX_start(ctx);
277     aa = BN_CTX_get(ctx);
278     val[0] = BN_CTX_get(ctx);
279     if(!aa || !val[0]) goto err;
281     BN_RECP_CTX_init(&recp);
282     if (m->neg)
283     {
284         /* ignore sign of 'm' */
285         if (!BN_copy(aa, m)) goto err;
286         aa->neg = 0;
287         if (BN_RECP_CTX_set(&recp, aa, ctx) <= 0) goto err;
288     }
289     else
290     {
291         if (BN_RECP_CTX_set(&recp, m, ctx) <= 0) goto err;
292     }
294     if (!BN_nnmod(val[0], a, m, ctx)) goto err;          /* 1 */
295     if (BN_is_zero(val[0]))
296     {
297         BN_zero(r);
298         ret = 1;
299         goto err;
300     }
302     window = BN_window_bits_for_exponent_size(bits);
303     if (window > 1)
304     {
305         if (!BN_mod_mul_reciprocal(aa, val[0], val[0], &recp, ctx))
306             goto err;          /* 2 */
307         j=1<<(window-1);
308         for (i=1; i<j; i++)
309         {
310             if(((val[i] = BN_CTX_get(ctx)) == NULL) ||
311                !BN_mod_mul_reciprocal(val[i], val[i-1],
312                                       aa, &recp, ctx))
313                 goto err;
314         }
315     }
316
317     start=1;          /* This is used to avoid multiplication etc
318                       * when there is only the value '1' in the
319                       * buffer. */
320     wvalue=0;          /* The 'value' of the window */
321     wstart=bits-1;     /* The top bit of the window */
322     wend=0;            /* The bottom bit of the window */
324     if (!BN_one(r)) goto err;

```

```

326     for (;;)
327     {
328         if (BN_is_bit_set(p, wstart) == 0)
329         {
330             if (!start)
331                 if (!BN_mod_mul_reciprocal(r, r, r, &recp, ctx))
332                     goto err;
333             if (wstart == 0) break;
334             wstart--;
335             continue;
336         }
337         /* We now have wstart on a 'set' bit, we now need to work out
338          * how bit a window to do. To do this we need to scan
339          * forward until the last set bit before the end of the
340          * window */
341         j=wstart;
342         wvalue=1;
343         wend=0;
344         for (i=1; i<window; i++)
345         {
346             if (wstart-i < 0) break;
347             if (BN_is_bit_set(p, wstart-i))
348             {
349                 wvalue<=(i-wend);
350                 wvalue|=1;
351                 wend=i;
352             }
353         }
355         /* wend is the size of the current window */
356         j=wend+1;
357         /* add the 'bytes above' */
358         if (!start)
359             for (i=0; i<j; i++)
360             {
361                 if (!BN_mod_mul_reciprocal(r, r, r, &recp, ctx))
362                     goto err;
363             }
364
365         /* wvalue will be an odd number < 2^window */
366         if (!BN_mod_mul_reciprocal(r, r, val[wvalue>>1], &recp, ctx))
367             goto err;
369         /* move the 'window' down further */
370         wstart-=wend+1;
371         wvalue=0;
372         start=0;
373         if (wstart < 0) break;
374     }
375     ret=1;
376 err:
377     BN_CTX_end(ctx);
378     BN_RECP_CTX_free(&recp);
379     bn_check_top(r);
380     return(ret);
381 }
384 int BN_mod_exp_mont(BIGNUM *rr, const BIGNUM *a, const BIGNUM *p,
385                     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *in_mont)
386 {
387     int i, j, bits, ret=0, wstart, wend, window, wvalue;
388     int start=1;
389     BIGNUM *d, *r;
390     const BIGNUM *aa;
391     /* Table of variables obtained from 'ctx' */

```

```

392     BIGNUM *val[TABLE_SIZE];
393     BN_MONT_CTX *mont=NULL;

395     if (BN_get_flags(p, BN_FLG_CONSTTIME) != 0)
396     {
397         return BN_mod_exp_mont_consttime(rr, a, p, m, ctx, in_mont);
398     }

400     bn_check_top(a);
401     bn_check_top(p);
402     bn_check_top(m);

404     if (!BN_is_odd(m))
405     {
406         BNerr(BN_F_BN_MOD_EXP_MONT, BN_R_CALLED_WITH_EVEN_MODULUS);
407         return(0);
408     }
409     bits=BN_num_bits(p);
410     if (bits == 0)
411     {
412         ret = BN_one(rr);
413         return ret;
414     }

416     BN_CTX_start(ctx);
417     d = BN_CTX_get(ctx);
418     r = BN_CTX_get(ctx);
419     val[0] = BN_CTX_get(ctx);
420     if (!d || !r || !val[0]) goto err;

422     /* If this is not done, things will break in the montgomery
423     * part */

425     if (in_mont != NULL)
426         mont=in_mont;
427     else
428     {
429         if ((mont=BN_MONT_CTX_new()) == NULL) goto err;
430         if (!BN_MONT_CTX_set(mont,m,ctx)) goto err;
431     }

433     if (a->neg || BN_ucmp(a,m) >= 0)
434     {
435         if (!BN_nnmod(val[0],a,m,ctx))
436             goto err;
437         aa= val[0];
438     }
439     else
440         aa=a;
441     if (BN_is_zero(aa))
442     {
443         BN_zero(rr);
444         ret = 1;
445         goto err;
446     }
447     if (!BN_to_montgomery(val[0],aa,mont,ctx)) goto err; /* 1 */

449     window = BN_window_bits_for_exponent_size(bits);
450     if (window > 1)
451     {
452         if (!BN_mod_mul_montgomery(d,val[0],val[0],mont,ctx)) goto err;
453         j=1<<(window-1);
454         for (i=1; i<j; i++)
455             if(((val[i] = BN_CTX_get(ctx)) == NULL) ||
456                !BN_mod_mul_montgomery(val[i],val[i-1],

```

```

458         d,mont,ctx))
459             goto err;
460     }
461 }

463     start=1; /* This is used to avoid multiplication etc
464              * when there is only the value '1' in the
465              * buffer. */
466     wvalue=0; /* The 'value' of the window */
467     wstart=bits-1; /* The top bit of the window */
468     wend=0; /* The bottom bit of the window */

470     if (!BN_to_montgomery(r,BN_value_one(),mont,ctx)) goto err;
471     for (;;)
472     {
473         if (BN_is_bit_set(p,wstart) == 0)
474         {
475             if (!start)
476             {
477                 if (!BN_mod_mul_montgomery(r,r,r,mont,ctx))
478                     goto err;
479             }
480             if (wstart == 0) break;
481             wstart--;
482             continue;
483         }
484         /* We now have wstart on a 'set' bit, we now need to work out
485         * how bit a window to do. To do this we need to scan
486         * forward until the last set bit before the end of the
487         * window */
488         j=wstart;
489         wvalue=1;
490         wend=0;
491         for (i=1; i<window; i++)
492         {
493             if (wstart-i < 0) break;
494             if (BN_is_bit_set(p,wstart-i))
495             {
496                 wvalue<=(i-wend);
497                 wvalue|=1;
498                 wend=i;
499             }
500         }

502         /* wend is the size of the current window */
503         j=wend+1;
504         /* add the 'bytes above' */
505         if (!start)
506             for (i=0; i<j; i++)
507             {
508                 if (!BN_mod_mul_montgomery(r,r,r,mont,ctx))
509                     goto err;
510             }
511         /* wvalue will be an odd number < 2^window */
512         if (!BN_mod_mul_montgomery(r,r,val[wvalue>>1],mont,ctx))
513             goto err;
514

516         /* move the 'window' down further */
517         wstart-=wend+1;
518         wvalue=0;
519         start=0;
520         if (wstart < 0) break;
521     }
522     if (!BN_from_montgomery(rr,r,mont,ctx)) goto err;
523     ret=1;

```

```

524 err:
525     if ((in_mont == NULL) && (mont != NULL)) BN_MONT_CTX_free(mont);
526     BN_CTX_end(ctx);
527     bn_check_top(rr);
528     return(ret);
529 }

532 /* BN_mod_exp_mont_consttime() stores the precomputed powers in a specific layout
533  * so that accessing any of these table values shows the same access pattern as
534  * as cache lines are concerned. The following functions are used to transfer a
535  * from/to that table. */

537 static int MOD_EXP_CTIME_COPY_TO_PREBUF(const BIGNUM *b, int top, unsigned char
538 {
539     size_t i, j;

541     if (top > b->top)
542         top = b->top; /* this works because 'buf' is explicitly zeroed */
543     for (i = 0, j=idx; i < top * sizeof b->d[0]; i++, j+=width)
544     {
545         buf[j] = ((unsigned char*)b->d)[i];
546     }

548     return 1;
549 }

551 static int MOD_EXP_CTIME_COPY_FROM_PREBUF(BIGNUM *b, int top, unsigned char *buf
552 {
553     size_t i, j;

555     if (bn_wexpand(b, top) == NULL)
556         return 0;

558     for (i=0, j=idx; i < top * sizeof b->d[0]; i++, j+=width)
559     {
560         ((unsigned char*)b->d)[i] = buf[j];
561     }

563     b->top = top;
564     bn_correct_top(b);
565     return 1;
566 }

568 /* Given a pointer value, compute the next address that is a cache line multiple
569 #define MOD_EXP_CTIME_ALIGN(x_) \
570     ((unsigned char*)(x_) + (MOD_EXP_CTIME_MIN_CACHE_LINE_WIDTH - (((size_t)

572 /* This variant of BN_mod_exp_mont() uses fixed windows and the special
573  * precomputation memory layout to limit data-dependency to a minimum
574  * to protect secret exponents (cf. the hyper-threading timing attacks
575  * pointed out by Colin Percival,
576  * http://www.daemonology.net/hyperthreading-considered-harmful/)
577 */
578 int BN_mod_exp_mont_consttime(BIGNUM *rr, const BIGNUM *a, const BIGNUM *p,
579     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *in_mont)
580 {
581     int i, bits, ret=0, window, wvalue;
582     int top;
583     BN_MONT_CTX *mont=NULL;

585     int numPowers;
586     unsigned char *powerbufFree=NULL;
587     int powerbufLen = 0;
588     unsigned char *powerbuf=NULL;
589     BIGNUM tmp, am;

```

```

591     bn_check_top(a);
592     bn_check_top(p);
593     bn_check_top(m);

595     top = m->top;

597     if (!(m->d[0] & 1))
598     {
599         BNerr(BN_F_BN_MOD_EXP_MONT_CONSTTIME, BN_R_CALLED_WITH_EVEN_MODUL
600         return(0);
601     }
602     bits=BN_num_bits(p);
603     if (bits == 0)
604     {
605         ret = BN_one(rr);
606         return ret;
607     }

609     BN_CTX_start(ctx);

611     /* Allocate a montgomery context if it was not supplied by the caller.
612     * If this is not done, things will break in the montgomery part.
613     */
614     if (in_mont != NULL)
615         mont=in_mont;
616     else
617     {
618         if ((mont=BN_MONT_CTX_new()) == NULL) goto err;
619         if (!BN_MONT_CTX_set(mont,m,ctx)) goto err;
620     }

622     /* Get the window size to use with size of p. */
623     window = BN_window_bits_for_ctime_exponent_size(bits);
624 #if defined(OPENSSL_BN_ASM_MONT5)
625     if (window==6 && bits<=1024) window=5; /* ~5% improvement of 2048-bit R
626 #endif

628     /* Allocate a buffer large enough to hold all of the pre-computed
629     * powers of am, am itself and tmp.
630     */
631     numPowers = 1 << window;
632     powerbufLen = sizeof(m->d[0])*(top*numPowers +
633     ((2*top)>numPowers?(2*top):numPowers));
634 #ifdef alloca
635     if (powerbufLen < 3072)
636         powerbufFree = alloca(powerbufLen+MOD_EXP_CTIME_MIN_CACHE_LINE_W
637     else
638 #endif
639     if ((powerbufFree=(unsigned char*)OPENSSL_malloc(powerbufLen+MOD_EXP_CTI
640         goto err;
641     powerbuf = MOD_EXP_CTIME_ALIGN(powerbufFree);
642     memset(powerbuf, 0, powerbufLen);

644 #ifdef alloca
645     if (powerbufLen < 3072)
646         powerbufFree = NULL;
647 #endif

650     /* lay down tmp and am right after powers table */
651     tmp.d = (BN_ULONG *) (powerbuf + sizeof(m->d[0])*top*numPowers);
652     am.d = tmp.d + top;
653     tmp.top = am.top = 0;
654     tmp.dmax = am.dmax = top;
655     tmp.neg = am.neg = 0;

```

```

656     tmp.flags = am.flags = BN_FLG_STATIC_DATA;

658     /* prepare a^0 in Montgomery domain */
659 #if 1
660     if (!BN_to_montgomery(&tmp, BN_value_one(), mont, ctx)) goto err;
661 #else
662     tmp.d[0] = (0-m->d[0])&BN_MASK2; /* 2^(top*BN_BITS2) - m */
663     for (i=1; i<top; i++)
664         tmp.d[i] = (~m->d[i])&BN_MASK2;
665     tmp.top = top;
666 #endif

668     /* prepare a^1 in Montgomery domain */
669     if (a->neg || BN_ucmp(a, m) >= 0)
670     {
671         if (!BN_mod(&am, a, m, ctx)) goto err;
672         if (!BN_to_montgomery(&am, &am, mont, ctx)) goto err;
673     }
674     else if (!BN_to_montgomery(&am, a, mont, ctx)) goto err;

676 #if defined(OPENSSL_BN_ASM_MONT5)
677 /* This optimization uses ideas from http://eprint.iacr.org/2011/239,
678  * specifically optimization of cache-timing attack countermeasures
679  * and pre-computation optimization. */

681 /* Dedicated window==4 case improves 512-bit RSA sign by ~15%, but as
682  * 512-bit RSA is hardly relevant, we omit it to spare size... */
683 if (window==5)
684 {
685     void bn_mul_mont_gather5(BN_ULONG *rp, const BN_ULONG *ap,
686                             const void *table, const BN_ULONG *np,
687                             const BN_ULONG *n0, int num, int power);
688     void bn_scatter5(const BN_ULONG *inp, size_t num,
689                     void *table, size_t power);
690     void bn_gather5(BN_ULONG *out, size_t num,
691                    void *table, size_t power);

693     BN_ULONG *np=mont->N.d, *n0=mont->n0;

695     /* BN_to_montgomery can contaminate words above .top
696      * [in BN_DEBUG[DEBUG] build]... */
697     for (i=am.top; i<top; i++) am.d[i]=0;
698     for (i=tmp.top; i<top; i++) tmp.d[i]=0;

700     bn_scatter5(tmp.d, top, powerbuf, 0);
701     bn_scatter5(am.d, am.top, powerbuf, 1);
702     bn_mul_mont(tmp.d, am.d, am.d, np, n0, top);
703     bn_scatter5(tmp.d, top, powerbuf, 2);

705 #if 0
706     for (i=3; i<32; i++)
707     {
708         /* Calculate a^i = a^(i-1) * a */
709         bn_mul_mont_gather5(tmp.d, am.d, powerbuf, np, n0, top, i-1);
710         bn_scatter5(tmp.d, top, powerbuf, i);
711     }
712 #else
713 /* same as above, but uses squaring for 1/2 of operations */
714 for (i=4; i<32; i*=2)
715 {
716     bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
717     bn_scatter5(tmp.d, top, powerbuf, i);
718 }
719 for (i=3; i<8; i+=2)
720 {
721     int j;

```

```

722     bn_mul_mont_gather5(tmp.d, am.d, powerbuf, np, n0, top, i-1);
723     bn_scatter5(tmp.d, top, powerbuf, i);
724     for (j=2*i; j<32; j*=2)
725     {
726         bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
727         bn_scatter5(tmp.d, top, powerbuf, j);
728     }
729 }
730 for (; i<16; i+=2)
731 {
732     bn_mul_mont_gather5(tmp.d, am.d, powerbuf, np, n0, top, i-1);
733     bn_scatter5(tmp.d, top, powerbuf, i);
734     bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
735     bn_scatter5(tmp.d, top, powerbuf, 2*i);
736 }
737 for (; i<32; i+=2)
738 {
739     bn_mul_mont_gather5(tmp.d, am.d, powerbuf, np, n0, top, i-1);
740     bn_scatter5(tmp.d, top, powerbuf, i);
741 }
742 #endif
743 bits--;
744 for (wvalue=0, i=bits%5; i>=0; i--, bits--)
745     wvalue = (wvalue<<1)+BN_is_bit_set(p, bits);
746 bn_gather5(tmp.d, top, powerbuf, wvalue);

748 /* Scan the exponent one window at a time starting from the most
749  * significant bits.
750  */
751 while (bits >= 0)
752 {
753     for (wvalue=0, i=0; i<5; i++, bits--)
754         wvalue = (wvalue<<1)+BN_is_bit_set(p, bits);

756     bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
757     bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
758     bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
759     bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
760     bn_mul_mont(tmp.d, tmp.d, tmp.d, np, n0, top);
761     bn_mul_mont_gather5(tmp.d, tmp.d, powerbuf, np, n0, top, wvalue);
762 }

764     tmp.top=top;
765     bn_correct_top(&tmp);
766 }
767 else
768 #endif
769 {
770     if (!MOD_EXP_CTIME_COPY_TO_PREBUF(&tmp, top, powerbuf, 0, numPowers)) go
771     if (!MOD_EXP_CTIME_COPY_TO_PREBUF(&am, top, powerbuf, 1, numPowers)) go

773 /* If the window size is greater than 1, then calculate
774  * val[i=2..2^winsize-1]. Powers are computed as a*a^(i-1)
775  * (even powers could instead be computed as (a^(i/2))^2
776  * to use the slight performance advantage of sqr over mul).
777  */
778 if (window > 1)
779 {
780     if (!BN_mod_mul_montgomery(&tmp, &am, &am, mont, ctx)) goto err
781     if (!MOD_EXP_CTIME_COPY_TO_PREBUF(&tmp, top, powerbuf, 2, numPow
782     for (i=3; i<numPowers; i++)
783     {
784         /* Calculate a^i = a^(i-1) * a */
785         if (!BN_mod_mul_montgomery(&tmp, &am, &tmp, mont, ctx))
786             goto err;
787         if (!MOD_EXP_CTIME_COPY_TO_PREBUF(&tmp, top, powerbuf, i

```



```

788     }
789     }
791     bits--;
792     for (wvalue=0, i=bits%window; i>=0; i--,bits--)
793         wvalue = (wvalue<<1)+BN_is_bit_set(p,bits);
794     if (!MOD_EXP_CTIME_COPY_FROM_PREBUF(&tmp,top,powerbuf,wvalue,numPowers))
795         /* Scan the exponent one window at a time starting from the most
796          * significant bits.
797          */
798     while (bits >= 0)
799     {
800         wvalue=0; /* The 'value' of the window */
801
802         /* Scan the window, squaring the result as we go */
803         for (i=0; i<window; i++,bits--)
804         {
805             if (!BN_mod_mul_montgomery(&tmp,&tmp,&tmp,mont,ctx))
806                 wvalue = (wvalue<<1)+BN_is_bit_set(p,bits);
807             wvalue = (wvalue<<1)+BN_is_bit_set(p,bits);
808         }
809
810         /* Fetch the appropriate pre-computed value from the pre-buf */
811         if (!MOD_EXP_CTIME_COPY_FROM_PREBUF(&am, top, powerbuf, wvalue,
812
813         /* Multiply the result into the intermediate result */
814         if (!BN_mod_mul_montgomery(&tmp,&tmp,&am,mont,ctx)) goto err;
815     }
816 }
818 /* Convert the final result from montgomery to standard format */
819 if (!BN_from_montgomery(rr,&tmp,mont,ctx)) goto err;
820 ret=1;
821 err:
822 if ((in_mont == NULL) && (mont != NULL)) BN_MONT_CTX_free(mont);
823 if (powerbuf!=NULL)
824 {
825     OPENSSL_cleanse(powerbuf,powerbufLen);
826     if (powerbufFree) OPENSSL_free(powerbufFree);
827 }
828 BN_CTX_end(ctx);
829 return(ret);
830 }
832 int BN_mod_exp_mont_word(BIGNUM *rr, BN_ULONG a, const BIGNUM *p,
833                          const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *in_mont)
834 {
835     BN_MONT_CTX *mont = NULL;
836     int b, bits, ret=0;
837     int r_is_one;
838     BN_ULONG w, next_w;
839     BIGNUM *d, *r, *t;
840     BIGNUM *swap_tmp;
841 #define BN_MOD_MUL_WORD(r, w, m) \
842     (BN_mul_word(r, (w)) && \
843      /* BN_ucmp(r, (m)) < 0 ? 1 : */ \
844      (BN_mod(t, r, m, ctx) && (swap_tmp = r, r = t, t = swap_
845     /* BN_MOD_MUL_WORD is only used with 'w' large,
846      * so the BN_ucmp test is probably more overhead
847      * than always using BN_mod (which uses BN_copy if
848      * a similar test returns true). */
849     /* We can use BN_mod and do not need BN_nnmod because our
850      * accumulator is never negative (the result of BN_mod does
851      * not depend on the sign of the modulus).
852     */
853 #define BN_TO_MONTGOMERY_WORD(r, w, mont) \

```

```

854     (BN_set_word(r, (w)) && BN_to_montgomery(r, r, (mont), ctx))
856     if (BN_get_flags(p, BN_FLG_CONSTTIME) != 0)
857     {
858         /* BN_FLG_CONSTTIME only supported by BN_mod_exp_mont() */
859         BNerr(BN_F_BN_MOD_EXP_MONT_WORD,ERR_R_SHOULD_NOT_HAVE_BEEN_CALLE
860         return -1;
861     }
863     bn_check_top(p);
864     bn_check_top(m);
866     if (!BN_is_odd(m))
867     {
868         BNerr(BN_F_BN_MOD_EXP_MONT_WORD,BN_R_CALLED_WITH_EVEN_MODULUS);
869         return(0);
870     }
871     if (m->top == 1)
872         a %= m->d[0]; /* make sure that 'a' is reduced */
874     bits = BN_num_bits(p);
875     if (bits == 0)
876     {
877         ret = BN_one(rr);
878         return ret;
879     }
880     if (a == 0)
881     {
882         BN_zero(rr);
883         ret = 1;
884         return ret;
885     }
887     BN_CTX_start(ctx);
888     d = BN_CTX_get(ctx);
889     r = BN_CTX_get(ctx);
890     t = BN_CTX_get(ctx);
891     if (d == NULL || r == NULL || t == NULL) goto err;
893     if (in_mont != NULL)
894         mont=in_mont;
895     else
896     {
897         if ((mont = BN_MONT_CTX_new()) == NULL) goto err;
898         if (!BN_MONT_CTX_set(mont, m, ctx)) goto err;
899     }
901     r_is_one = 1; /* except for Montgomery factor */
903     /* bits-1 >= 0 */
905     /* The result is accumulated in the product r*w. */
906     w = a; /* bit 'bits-1' of 'p' is always set */
907     for (b = bits-2; b >= 0; b--)
908     {
909         /* First, square r*w. */
910         next_w = w*w;
911         if ((next_w/w) != w) /* overflow */
912         {
913             if (r_is_one)
914             {
915                 if (!BN_TO_MONTGOMERY_WORD(r, w, mont)) goto err
916                 r_is_one = 0;
917             }
918             else
919             {

```

```

920         if (!BN_MOD_MUL_WORD(r, w, m)) goto err;
921     }
922     next_w = 1;
923 }
924 w = next_w;
925 if (!r_is_one)
926 {
927     if (!BN_mod_mul_montgomery(r, r, r, mont, ctx)) goto err
928 }

930 /* Second, multiply r*w by 'a' if exponent bit is set. */
931 if (BN_is_bit_set(p, b))
932 {
933     next_w = w*a;
934     if ((next_w/a) != w) /* overflow */
935     {
936         if (r_is_one)
937         {
938             if (!BN_TO_MONTGOMERY_WORD(r, w, mont))
939                 r_is_one = 0;
940         }
941     }
942     else
943     {
944         if (!BN_MOD_MUL_WORD(r, w, m)) goto err;
945     }
946     next_w = a;
947 }
948 w = next_w;
949 }

951 /* Finally, set r:=r*w. */
952 if (w != 1)
953 {
954     if (r_is_one)
955     {
956         if (!BN_TO_MONTGOMERY_WORD(r, w, mont)) goto err;
957         r_is_one = 0;
958     }
959     else
960     {
961         if (!BN_MOD_MUL_WORD(r, w, m)) goto err;
962     }
963 }

965 if (r_is_one) /* can happen only if a == 1 */
966 {
967     if (!BN_one(rr)) goto err;
968 }
969 else
970 {
971     if (!BN_from_montgomery(rr, r, mont, ctx)) goto err;
972 }
973 ret = 1;
974 err:
975 if ((in_mont == NULL) && (mont != NULL)) BN_MONT_CTX_free(mont);
976 BN_CTX_end(ctx);
977 bn_check_top(rr);
978 return(ret);
979 }

982 /* The old fallback, simple version :- ) */
983 int BN_mod_exp_simple(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
984                     const BIGNUM *m, BN_CTX *ctx)
985 {

```

```

986     int i,j, bits, ret=0, wstart, wend, window, wvalue;
987     int start=1;
988     BIGNUM *d;
989     /* Table of variables obtained from 'ctx' */
990     BIGNUM *val[TABLE_SIZE];

992     if (BN_get_flags(p, BN_FLG_CONSTTIME) != 0)
993     {
994         /* BN_FLG_CONSTTIME only supported by BN_mod_exp_mont() */
995         BNerr(BN_F_BN_MOD_EXP_SIMPLE, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
996         return -1;
997     }

999     bits=BN_num_bits(p);

1001     if (bits == 0)
1002     {
1003         ret = BN_one(r);
1004         return ret;
1005     }

1007     BN_CTX_start(ctx);
1008     d = BN_CTX_get(ctx);
1009     val[0] = BN_CTX_get(ctx);
1010     if(!d || !val[0]) goto err;

1012     if (!BN_nnmod(val[0], a, m, ctx)) goto err; /* 1 */
1013     if (BN_is_zero(val[0]))
1014     {
1015         BN_zero(r);
1016         ret = 1;
1017         goto err;
1018     }

1020     window = BN_window_bits_for_exponent_size(bits);
1021     if (window > 1)
1022     {
1023         if (!BN_mod_mul(d, val[0], val[0], m, ctx))
1024             goto err; /* 2 */
1025         j=1<<(window-1);
1026         for (i=1; i<j; i++)
1027         {
1028             if(((val[i] = BN_CTX_get(ctx)) == NULL) ||
1029                 !BN_mod_mul(val[i], val[i-1], d, m, ctx))
1030                 goto err;
1031         }
1032     }

1034     start=1; /* This is used to avoid multiplication etc
1035              * when there is only the value '1' in the
1036              * buffer. */
1037     wvalue=0; /* The 'value' of the window */
1038     wstart=bits-1; /* The top bit of the window */
1039     wend=0; /* The bottom bit of the window */

1041     if (!BN_one(r)) goto err;

1043     for (;;)
1044     {
1045         if (BN_is_bit_set(p, wstart) == 0)
1046         {
1047             if (!start)
1048                 if (!BN_mod_mul(r, r, r, m, ctx))
1049                     goto err;
1050             if (wstart == 0) break;
1051             wstart--;

```

```
1052         continue;
1053     }
1054     /* We now have wstart on a 'set' bit, we now need to work out
1055     * how big a window to do. To do this we need to scan
1056     * forward until the last set bit before the end of the
1057     * window */
1058     j=wstart;
1059     wvalue=1;
1060     wend=0;
1061     for (i=1; i<window; i++)
1062     {
1063         if (wstart-i < 0) break;
1064         if (BN_is_bit_set(p,wstart-i))
1065         {
1066             wvalue<=(i-wend);
1067             wvalue|=1;
1068             wend=i;
1069         }
1070     }
1071
1072     /* wend is the size of the current window */
1073     j=wend+1;
1074     /* add the 'bytes above' */
1075     if (!start)
1076         for (i=0; i<j; i++)
1077         {
1078             if (!BN_mod_mul(r,r,r,m,ctx))
1079                 goto err;
1080         }
1081
1082     /* wvalue will be an odd number < 2^window */
1083     if (!BN_mod_mul(r,r,val[wvalue>>1],m,ctx))
1084         goto err;
1085
1086     /* move the 'window' down further */
1087     wstart-=wend+1;
1088     wvalue=0;
1089     start=0;
1090     if (wstart < 0) break;
1091 }
1092 ret=1;
1093 err:
1094 BN_CTX_end(ctx);
1095 bn_check_top(r);
1096 return(ret);
1097 }
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_exp2.c

1

```
*****
10140 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_exp2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_exp2.c

2

```
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109 *
110 */
111
112 #include <stdio.h>
113 #include "cryptlib.h"
114 #include "bn_lcl.h"
115
116 #define TABLE_SIZE 32
117
118 int BN_mod_exp2_mont(BIGNUM *rr, const BIGNUM *a1, const BIGNUM *p1,
119 const BIGNUM *a2, const BIGNUM *p2, const BIGNUM *m,
120 BN_CTX *ctx, BN_MONT_CTX *in_mont)
121 {
122 int i, j, bits, b, bits1, bits2, ret=0, wpos1, wpos2, window1, window2, wvalue1, wva
123 int r_is_one=1;
124 BIGNUM *d, *r;
125 const BIGNUM *a_mod_m;
126 /* Tables of variables obtained from 'ctx' */
127 BIGNUM *val1[TABLE_SIZE], *val2[TABLE_SIZE];
```

```
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_exp2.c
```

```

194         }
195         if(((val1[i] = BN_CTX_get(ctx)) == NULL) ||
196            !BN_mod_mul_montgomery(val1[i], val1[i-1]
197                                   d, mont, ctx))
198             goto err;
199     }
200 }

203 /*
204  * Build table for a2: val2[i] := a2^(2*i + 1) mod m for i = 0 .. 2^k
205  */
206 if (a2->neg || BN_ucmp(a2,m) >= 0)
207 {
208     if (!BN_mod(val2[0], a2, m, ctx))
209         goto err;
210     a_mod_m = val2[0];
211 }
212 else
213     a_mod_m = a2;
214 if (BN_is_zero(a_mod_m))
215 {
216     BN_zero(rr);
217     ret = 1;
218     goto err;
219 }
220 if (!BN_to_montgomery(val2[0], a_mod_m, mont, ctx)) goto err;
221 if (window2 > 1)
222 {
223     if (!BN_mod_mul_montgomery(d, val2[0], val2[0], mont, ctx)) goto err
224
225     j=1<=(window2-1);
226     for (i=1; i<j; i++)
227     {
228         if(((val2[i] = BN_CTX_get(ctx)) == NULL) ||
229            !BN_mod_mul_montgomery(val2[i], val2[i-1]
230                                   d, mont, ctx))
231             goto err;
232     }
233 }

236 /* Now compute the power product, using independent windows. */
237 r_is_one=1;
238 wvalue1=0; /* The 'value' of the first window */
239 wvalue2=0; /* The 'value' of the second window */
240 wpos1=0; /* If wvalue1 > 0, the bottom bit of the first window */
241 wpos2=0; /* If wvalue2 > 0, the bottom bit of the second window */

243 if (!BN_to_montgomery(r, BN_value_one(), mont, ctx)) goto err;
244 for (b=bits-1; b>=0; b--)
245 {
246     if (!r_is_one)
247     {
248         if (!BN_mod_mul_montgomery(r, r, r, mont, ctx))
249             goto err;
250     }
251
252     if (!wvalue1)
253         if (BN_is_bit_set(p1, b))
254         {
255             /* consider bits b-window1+1 .. b for this window
256              i = b-window1+1;
257              while (!BN_is_bit_set(p1, i)) /* works for i<0 */
258                  i++;
259              wpos1 = i;

```

```

260         wvalue1 = 1;
261         for (i = b-1; i >= wpos1; i--)
262             {
263                 wvalue1 <<= 1;
264                 if (BN_is_bit_set(p1, i))
265                     wvalue1++;
266             }
267     }
268
269     if (!wvalue2)
270         if (BN_is_bit_set(p2, b))
271             {
272                 /* consider bits b-window2+1 .. b for this window
273                 i = b-window2+1;
274                 while (!BN_is_bit_set(p2, i))
275                     i++;
276                 wpos2 = i;
277                 wvalue2 = 1;
278                 for (i = b-1; i >= wpos2; i--)
279                     {
280                         wvalue2 <<= 1;
281                         if (BN_is_bit_set(p2, i))
282                             wvalue2++;
283                     }
284             }
285
286     if (wvalue1 && b == wpos1)
287     {
288         /* wvalue1 is odd and < 2^window1 */
289         if (!BN_mod_mul_montgomery(r, r, val1[wvalue1>>1], mont, ctx)
290             goto err;
291         wvalue1 = 0;
292         r_is_one = 0;
293     }
294
295     if (wvalue2 && b == wpos2)
296     {
297         /* wvalue2 is odd and < 2^window2 */
298         if (!BN_mod_mul_montgomery(r, r, val2[wvalue2>>1], mont, ctx)
299             goto err;
300         wvalue2 = 0;
301         r_is_one = 0;
302     }
303 }
304 if (!BN_from_montgomery(rr, r, mont, ctx))
305     goto err;
306 ret=1;
307 err:
308 if ((in_mont == NULL) && (mont != NULL)) BN_MONT_CTX_free(mont);
309 BN_CTX_end(ctx);
310 bn_check_top(rr);
311 return(ret);
312 }

```

```

*****
17485 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_gcd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
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110 */
111
112 #include "cryptlib.h"
113 #include "bn_lcl.h"
114
115 static BIGNUM *euclid(BIGNUM *a, BIGNUM *b);
116
117 int BN_gcd(BIGNUM *r, const BIGNUM *in_a, const BIGNUM *in_b, BN_CTX *ctx)
118 {
119     BIGNUM *a,*b,*t;
120     int ret=0;
121
122     bn_check_top(in_a);
123     bn_check_top(in_b);
124
125     BN_CTX_start(ctx);
126     a = BN_CTX_get(ctx);
127     b = BN_CTX_get(ctx);

```

```

128     if (a == NULL || b == NULL) goto err;

130     if (BN_copy(a,in_a) == NULL) goto err;
131     if (BN_copy(b,in_b) == NULL) goto err;
132     a->neg = 0;
133     b->neg = 0;

135     if (BN_cmp(a,b) < 0) { t=a; a=b; b=t; }
136     t=euclid(a,b);
137     if (t == NULL) goto err;

139     if (BN_copy(r,t) == NULL) goto err;
140     ret=1;
141 err:
142     BN_CTX_end(ctx);
143     bn_check_top(r);
144     return(ret);
145 }

147 static BIGNUM *euclid(BIGNUM *a, BIGNUM *b)
148 {
149     BIGNUM *t;
150     int shifts=0;

152     bn_check_top(a);
153     bn_check_top(b);

155     /* 0 <= b <= a */
156     while (!BN_is_zero(b))
157     {
158         /* 0 < b <= a */

160         if (BN_is_odd(a))
161         {
162             if (BN_is_odd(b))
163             {
164                 if (!BN_sub(a,a,b)) goto err;
165                 if (!BN_rshift1(a,a)) goto err;
166                 if (BN_cmp(a,b) < 0)
167                     { t=a; a=b; b=t; }
168             }
169             else /* a odd - b even */
170             {
171                 if (!BN_rshift1(b,b)) goto err;
172                 if (BN_cmp(a,b) < 0)
173                     { t=a; a=b; b=t; }
174             }
175         }
176         else /* a is even */
177         {
178             if (BN_is_odd(b))
179             {
180                 if (!BN_rshift1(a,a)) goto err;
181                 if (BN_cmp(a,b) < 0)
182                     { t=a; a=b; b=t; }
183             }
184             else /* a even - b even */
185             {
186                 if (!BN_rshift1(a,a)) goto err;
187                 if (!BN_rshift1(b,b)) goto err;
188                 shifts++;
189             }
190         }
191         /* 0 <= b <= a */
192     }

```

```

194     if (shifts)
195     {
196         if (!BN_lshift(a,a,shifts)) goto err;
197     }
198     bn_check_top(a);
199     return(a);
200 err:
201     return(NULL);
202 }

205 /* solves ax == 1 (mod n) */
206 static BIGNUM *BN_mod_inverse_no_branch(BIGNUM *in,
207     const BIGNUM *a, const BIGNUM *n, BN_CTX *ctx);

209 BIGNUM *BN_mod_inverse(BIGNUM *in,
210     const BIGNUM *a, const BIGNUM *n, BN_CTX *ctx)
211 {
212     BIGNUM *A,*B,*X,*Y,*M,*D,*T,*R=NULL;
213     BIGNUM *ret=NULL;
214     int sign;

216     if ((BN_get_flags(a, BN_FLG_CONSTTIME) != 0) || (BN_get_flags(n, BN_FLG_
217         {
218             return BN_mod_inverse_no_branch(in, a, n, ctx);
219         }

221     bn_check_top(a);
222     bn_check_top(n);

224     BN_CTX_start(ctx);
225     A = BN_CTX_get(ctx);
226     B = BN_CTX_get(ctx);
227     X = BN_CTX_get(ctx);
228     D = BN_CTX_get(ctx);
229     M = BN_CTX_get(ctx);
230     Y = BN_CTX_get(ctx);
231     T = BN_CTX_get(ctx);
232     if (T == NULL) goto err;

234     if (in == NULL)
235         R=BN_new();
236     else
237         R=in;
238     if (R == NULL) goto err;

240     BN_one(X);
241     BN_zero(Y);
242     if (BN_copy(B,a) == NULL) goto err;
243     if (BN_copy(A,n) == NULL) goto err;
244     A->neg = 0;
245     if (B->neg || (BN_ucmp(B, A) >= 0))
246     {
247         if (!BN_nnmod(B, B, A, ctx)) goto err;
248     }
249     sign = -1;
250     /* From B = a mod |n|, A = |n| it follows that
251     *
252     *      0 <= B < A,
253     *      -sign*X*a == B (mod |n|),
254     *      sign*Y*a == A (mod |n|).
255     */

257     if (BN_is_odd(n) && (BN_num_bits(n) <= (BN_BITS <= 32 ? 450 : 2048)))
258     {
259         /* Binary inversion algorithm; requires odd modulus.

```



```

260      * This is faster than the general algorithm if the modulus
261      * is sufficiently small (about 400 .. 500 bits on 32-bit
262      * systems, but much more on 64-bit systems) */
263      int shift;
264
265      while (!BN_is_zero(B))
266      {
267          /*
268           *       $0 < B < |n|$ ,
269           *       $0 < A \leq |n|$ ,
270           * (1)  $-\text{sign} \cdot X \cdot a \equiv B \pmod{|n|}$ ,
271           * (2)  $\text{sign} \cdot Y \cdot a \equiv A \pmod{|n|}$ 
272           */
273
274          /* Now divide B by the maximum possible power of two i
275           * and divide X by the same value mod |n|.
276           * When we're done, (1) still holds. */
277          shift = 0;
278          while (!BN_is_bit_set(B, shift)) /* note that  $0 < B$  */
279          {
280              shift++;
281
282              if (BN_is_odd(X))
283              {
284                  if (!BN_uadd(X, X, n)) goto err;
285              }
286              /* now X is even, so we can easily divide it by
287               if (!BN_rshift1(X, X)) goto err;
288              */
289              if (shift > 0)
290              {
291                  if (!BN_rshift(B, B, shift)) goto err;
292              }
293
294          /* Same for A and Y. Afterwards, (2) still holds. */
295          shift = 0;
296          while (!BN_is_bit_set(A, shift)) /* note that  $0 < A$  */
297          {
298              shift++;
299
300              if (BN_is_odd(Y))
301              {
302                  if (!BN_uadd(Y, Y, n)) goto err;
303              }
304              /* now Y is even */
305              if (!BN_rshift1(Y, Y)) goto err;
306              if (shift > 0)
307              {
308                  if (!BN_rshift(A, A, shift)) goto err;
309              }
310
311          /* We still have (1) and (2).
312           * Both A and B are odd.
313           * The following computations ensure that
314           *
315           *       $0 \leq B < |n|$ ,
316           *       $0 < A < |n|$ ,
317           * (1)  $-\text{sign} \cdot X \cdot a \equiv B \pmod{|n|}$ ,
318           * (2)  $\text{sign} \cdot Y \cdot a \equiv A \pmod{|n|}$ ,
319           * and that either A or B is even in the next iterat
320           */
321          if (BN_ucmp(B, A) >= 0)

```

```

326      {
327          /*  $-\text{sign} \cdot (X + Y) \cdot a \equiv B - A \pmod{|n|}$  */
328          if (!BN_uadd(X, X, Y)) goto err;
329          /* NB: we could use BN_mod_add_quick(X, X, Y, n)
330           * actually makes the algorithm slower */
331          if (!BN_usub(B, B, A)) goto err;
332      }
333      else
334      {
335          /*  $\text{sign} \cdot (X + Y) \cdot a \equiv A - B \pmod{|n|}$  */
336          if (!BN_uadd(Y, Y, X)) goto err;
337          /* as above, BN_mod_add_quick(Y, Y, X, n) would
338           if (!BN_usub(A, A, B)) goto err;
339          */
340      }
341      }
342      else
343      {
344          /* general inversion algorithm */
345
346          while (!BN_is_zero(B))
347          {
348              BIGNUM *tmp;
349
350              /*
351               *       $0 < B < A$ ,
352               * (*)  $-\text{sign} \cdot X \cdot a \equiv B \pmod{|n|}$ ,
353               *       $\text{sign} \cdot Y \cdot a \equiv A \pmod{|n|}$ 
354               */
355
356              /* (D, M) := (A/B, A%B) ... */
357              if (BN_num_bits(A) == BN_num_bits(B))
358              {
359                  if (!BN_one(D)) goto err;
360                  if (!BN_sub(M, A, B)) goto err;
361              }
362              else if (BN_num_bits(A) == BN_num_bits(B) + 1)
363              {
364                  /* A/B is 1, 2, or 3 */
365                  if (!BN_lshift1(T, B)) goto err;
366                  if (BN_ucmp(A, T) < 0)
367                  {
368                      /* A < 2*B, so D=1 */
369                      if (!BN_one(D)) goto err;
370                      if (!BN_sub(M, A, B)) goto err;
371                  }
372                  else
373                  {
374                      /* A >= 2*B, so D=2 or D=3 */
375                      if (!BN_sub(M, A, T)) goto err;
376                      if (!BN_add(D, T, B)) goto err; /* use D (
377                      if (BN_ucmp(A, D) < 0)
378                      {
379                          /* A < 3*B, so D=2 */
380                          if (!BN_set_word(D, 2)) goto err;
381                          /* M (= A - 2*B) already has the
382                          */
383                      }
384                      else
385                      {
386                          /* only D=3 remains */
387                          if (!BN_set_word(D, 3)) goto err;
388                          /* currently M = A - 2*B, but
389                          if (!BN_sub(M, M, B)) goto err;
390                          */
391                      }
392                  }
393              }
394          }
395      }

```

```

392     else
393     {
394         if (!BN_div(D,M,A,B,ctx)) goto err;
395     }
396
397     /* Now
398     *   A = D*B + M;
399     * thus we have
400     *   (**) sign*Y*a == D*B + M (mod |n|).
401     */
402
403     tmp=A; /* keep the BIGNUM object, the value does not mat
404
405     /* (A, B) := (B, A mod B) ... */
406     A=B;
407     B=M;
408     /* ... so we have 0 <= B < A again */
409
410     /* Since the former M is now B and the former B is
411     *   (**) translates into
412     *   sign*Y*a == D*A + B (mod |n|),
413     * i.e.
414     *   sign*Y*a - D*A == B (mod |n|).
415     * Similarly, (**) translates into
416     *   -sign*X*a == A (mod |n|).
417     *
418     * Thus,
419     *   sign*Y*a + D*sign*X*a == B (mod |n|),
420     * i.e.
421     *   sign*(Y + D*X)*a == B (mod |n|).
422     *
423     * So if we set (X, Y, sign) := (Y + D*X, X, -sign), w
424     *   -sign*X*a == B (mod |n|),
425     *   sign*Y*a == A (mod |n|).
426     * Note that X and Y stay non-negative all the time.
427     */
428
429     /* most of the time D is very small, so we can optimize
430     if (BN_is_one(D))
431     {
432         if (!BN_add(tmp,X,Y)) goto err;
433     }
434     else
435     {
436         if (BN_is_word(D,2))
437         {
438             if (!BN_lshift1(tmp,X)) goto err;
439         }
440         else if (BN_is_word(D,4))
441         {
442             if (!BN_lshift(tmp,X,2)) goto err;
443         }
444         else if (D->top == 1)
445         {
446             if (!BN_copy(tmp,X)) goto err;
447             if (!BN_mul_word(tmp,D->d[0])) goto err;
448         }
449         else
450         {
451             if (!BN_mul(tmp,D,X,ctx)) goto err;
452         }
453         if (!BN_add(tmp,tmp,Y)) goto err;
454     }
455
456     M=Y; /* keep the BIGNUM object, the value does not matte
457     Y=X;

```

```

458         X=tmp;
459         sign = -sign;
460     }
461 }
462
463 /*
464 * The while loop (Euclid's algorithm) ends when
465 *   A == gcd(a,n);
466 * we have
467 *   sign*Y*a == A (mod |n|),
468 * where Y is non-negative.
469 */
470
471 if (sign < 0)
472 {
473     if (!BN_sub(Y,n,Y)) goto err;
474 }
475 /* Now Y*a == A (mod |n|). */
476
477 if (BN_is_one(A))
478 {
479     /* Y*a == 1 (mod |n|) */
480     if (!Y->neg && BN_ucmp(Y,n) < 0)
481     {
482         if (!BN_copy(R,Y)) goto err;
483     }
484     else
485     {
486         if (!BN_nnmod(R,Y,n,ctx)) goto err;
487     }
488 }
489
490 else
491 {
492     BNerr(BN_F_BN_MOD_INVERSE, BN_R_NO_INVERSE);
493     goto err;
494 }
495
496 ret=R;
497
498 err:
499 if ((ret == NULL) && (in == NULL)) BN_free(R);
500 BN_CTX_end(ctx);
501 bn_check_top(ret);
502 return(ret);
503 }
504
505 /* BN_mod_inverse_no_branch is a special version of BN_mod_inverse.
506 * It does not contain branches that may leak sensitive information.
507 */
508 static BIGNUM *BN_mod_inverse_no_branch(BIGNUM *in,
509 const BIGNUM *a, const BIGNUM *n, BN_CTX *ctx)
510 {
511     BIGNUM *A,*B,*X,*Y,*M,*D,*T,*R=NULL;
512     BIGNUM local_A, local_B;
513     BIGNUM *pA, *pB;
514     BIGNUM *ret=NULL;
515     int sign;
516
517     bn_check_top(a);
518     bn_check_top(n);
519
520     BN_CTX_start(ctx);
521     A = BN_CTX_get(ctx);
522     B = BN_CTX_get(ctx);
523     X = BN_CTX_get(ctx);
524     D = BN_CTX_get(ctx);

```

```

524 M = BN_CTX_get(ctx);
525 Y = BN_CTX_get(ctx);
526 T = BN_CTX_get(ctx);
527 if (T == NULL) goto err;

529 if (in == NULL)
530     R=BN_new();
531 else
532     R=in;
533 if (R == NULL) goto err;

535 BN_one(X);
536 BN_zero(Y);
537 if (BN_copy(B,a) == NULL) goto err;
538 if (BN_copy(A,n) == NULL) goto err;
539 A->neg = 0;

541 if (B->neg || (BN_ucmp(B, A) >= 0))
542 {
543     /* Turn BN_FLG_CONSTTIME flag on, so that when BN_div is invoked
544     * BN_div_no_branch will be called eventually.
545     */
546     pB = &local_B;
547     BN_with_flags(pB, B, BN_FLG_CONSTTIME);
548     if (!BN_nnmod(B, pB, A, ctx)) goto err;
549 }
550 sign = -1;
551 /* From B = a mod |n|, A = |n| it follows that
552 *
553 * 0 <= B < A,
554 * -sign*X*a == B (mod |n|),
555 * sign*Y*a == A (mod |n|).
556 */

558 while (!BN_is_zero(B))
559 {
560     BIGNUM *tmp;
561
562     /*
563     * 0 < B < A,
564     * (*) -sign*X*a == B (mod |n|),
565     * sign*Y*a == A (mod |n|)
566     */

568     /* Turn BN_FLG_CONSTTIME flag on, so that when BN_div is invoked
569     * BN_div_no_branch will be called eventually.
570     */
571     pA = &local_A;
572     BN_with_flags(pA, A, BN_FLG_CONSTTIME);
573
574     /* (D, M) := (A/B, A%B) ... */
575     if (!BN_div(D,M,pA,B,ctx)) goto err;
576
577     /* Now
578     * A = D*B + M;
579     * thus we have
580     * (**) sign*Y*a == D*B + M (mod |n|).
581     */

582     tmp=A; /* keep the BIGNUM object, the value does not matter */
583
584     /* (A, B) := (B, A mod B) ... */
585     A=B;
586     B=M;
587     /* ... so we have 0 <= B < A again */
588
589

```

```

590     /* Since the former M is now B and the former B is now A,
591     * (**) translates into
592     * sign*Y*a == D*A + B (mod |n|),
593     * i.e.
594     * sign*Y*a - D*A == B (mod |n|).
595     * Similarly, (*) translates into
596     * -sign*X*a == A (mod |n|).
597     *
598     * Thus,
599     * sign*Y*a + D*sign*X*a == B (mod |n|),
600     * i.e.
601     * sign*(Y + D*X)*a == B (mod |n|).
602     *
603     * So if we set (X, Y, sign) := (Y + D*X, X, -sign), we arrive
604     * -sign*X*a == B (mod |n|),
605     * sign*Y*a == A (mod |n|).
606     * Note that X and Y stay non-negative all the time.
607     */
608
609     if (!BN_mul(tmp,D,X,ctx)) goto err;
610     if (!BN_add(tmp,tmp,Y)) goto err;

612     M=Y; /* keep the BIGNUM object, the value does not matter */
613     Y=X;
614     X=tmp;
615     sign = -sign;
616 }

617
618 /*
619 * The while loop (Euclid's algorithm) ends when
620 * A == gcd(a,n);
621 * we have
622 * sign*Y*a == A (mod |n|),
623 * where Y is non-negative.
624 */

626 if (sign < 0)
627 {
628     if (!BN_sub(Y,n,Y)) goto err;
629 }
630 /* Now Y*a == A (mod |n|). */

632 if (BN_is_one(A))
633 {
634     /* Y*a == 1 (mod |n|) */
635     if (!Y->neg && BN_ucmp(Y,n) < 0)
636     {
637         if (!BN_copy(R,Y)) goto err;
638     }
639     else
640     {
641         if (!BN_nnmod(R,Y,n,ctx)) goto err;
642     }
643 }
644 else
645 {
646     BNerr(BN_F_BN_MOD_INVERSE_NO_BRANCH,BN_R_NO_INVERSE);
647     goto err;
648 }

649 ret=R;
650 err:
651 if ((ret == NULL) && (in == NULL)) BN_free(R);
652 BN_CTX_end(ctx);
653 bn_check_top(ret);
654 return(ret);
655 }

```



```

*****
29676 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_gf2m.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_gf2m.c */
2 /* =====
3 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
4 *
5 * The Elliptic Curve Public-Key Crypto Library (ECC Code) included
6 * herein is developed by SUN MICROSYSTEMS, INC., and is contributed
7 * to the OpenSSL project.
8 *
9 * The ECC Code is licensed pursuant to the OpenSSL open source
10 * license provided below.
11 *
12 * In addition, Sun covenants to all licensees who provide a reciprocal
13 * covenant with respect to their own patents if any, not to sue under
14 * current and future patent claims necessarily infringed by the making,
15 * using, practicing, selling, offering for sale and/or otherwise
16 * disposing of the ECC Code as delivered hereunder (or portions thereof),
17 * provided that such covenant shall not apply:
18 * 1) for code that a licensee deletes from the ECC Code;
19 * 2) separates from the ECC Code; or
20 * 3) for infringements caused by:
21 * i) the modification of the ECC Code or
22 * ii) the combination of the ECC Code with other software or
23 * devices where such combination causes the infringement.
24 *
25 * The software is originally written by Sheueling Chang Shantz and
26 * Douglas Stebila of Sun Microsystems Laboratories.
27 *
28 */
29
30 /* NOTE: This file is licensed pursuant to the OpenSSL license below
31 * and may be modified; but after modifications, the above covenant
32 * may no longer apply! In such cases, the corresponding paragraph
33 * ["In addition, Sun covenants ... causes the infringement."] and
34 * this note can be edited out; but please keep the Sun copyright
35 * notice and attribution. */
36
37 /* =====
38 * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
39 *
40 * Redistribution and use in source and binary forms, with or without
41 * modification, are permitted provided that the following conditions
42 * are met:
43 *
44 * 1. Redistributions of source code must retain the above copyright
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46 *
47 * 2. Redistributions in binary form must reproduce the above copyright
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50 * distribution.
51 *
52 * 3. All advertising materials mentioning features or use of this
53 * software must display the following acknowledgment:
54 * "This product includes software developed by the OpenSSL Project
55 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
56 *
57 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
58 * endorse or promote products derived from this software without
59 * prior written permission. For written permission, please contact
60 * openssl-core@openssl.org.
61 */

```

```

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63 * nor may "OpenSSL" appear in their names without prior written
64 * permission of the OpenSSL Project.
65 *
66 * 6. Redistributions of any form whatsoever must retain the following
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79 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
80 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
81 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
82 * OF THE POSSIBILITY OF SUCH DAMAGE.
83 * =====
84 *
85 * This product includes cryptographic software written by Eric Young
86 * (eay@cryptsoft.com). This product includes software written by Tim
87 * Hudson (tjh@cryptsoft.com).
88 *
89 */
90
91 #include <assert.h>
92 #include <limits.h>
93 #include <stdio.h>
94 #include "cryptlib.h"
95 #include "bn_lcl.h"
96
97 #ifndef OPENSSL_NO_EC2M
98
99 /* Maximum number of iterations before BN_GF2m_mod_solve_quad_arr should fail. */
100 #define MAX_ITERATIONS 50
101
102 static const BN_ULONG SQR_tb[16] =
103 {
104     0, 1, 4, 5, 16, 17, 20, 21,
105     64, 65, 68, 69, 80, 81, 84, 85 };
106 /* Platform-specific macros to accelerate squaring. */
107 #if defined(SIXTY_FOUR_BIT) || defined(SIXTY_FOUR_BIT_LONG)
108 #define SQR1(w) \
109     SQR_tb[(w) >> 60 & 0xF] << 56 | SQR_tb[(w) >> 56 & 0xF] << 48 | \
110     SQR_tb[(w) >> 52 & 0xF] << 40 | SQR_tb[(w) >> 48 & 0xF] << 32 | \
111     SQR_tb[(w) >> 44 & 0xF] << 24 | SQR_tb[(w) >> 40 & 0xF] << 16 | \
112     SQR_tb[(w) >> 36 & 0xF] << 8 | SQR_tb[(w) >> 32 & 0xF]
113 #define SQR0(w) \
114     SQR_tb[(w) >> 28 & 0xF] << 56 | SQR_tb[(w) >> 24 & 0xF] << 48 | \
115     SQR_tb[(w) >> 20 & 0xF] << 40 | SQR_tb[(w) >> 16 & 0xF] << 32 | \
116     SQR_tb[(w) >> 12 & 0xF] << 24 | SQR_tb[(w) >> 8 & 0xF] << 16 | \
117     SQR_tb[(w) >> 4 & 0xF] << 8 | SQR_tb[(w) >> 0 & 0xF]
118 #endif
119 #if defined(THIRTY_TWO_BIT)
120 #define SQR1(w) \
121     SQR_tb[(w) >> 28 & 0xF] << 24 | SQR_tb[(w) >> 24 & 0xF] << 16 | \
122     SQR_tb[(w) >> 20 & 0xF] << 8 | SQR_tb[(w) >> 16 & 0xF]
123 #define SQR0(w) \
124     SQR_tb[(w) >> 12 & 0xF] << 24 | SQR_tb[(w) >> 8 & 0xF] << 16 | \
125     SQR_tb[(w) >> 4 & 0xF] << 8 | SQR_tb[(w) >> 0 & 0xF]
126 #endif
127 #if !defined(OPENSSL_BN_ASM_GF2m)

```

```

128 /* Product of two polynomials a, b each with degree < BN_BITS2 - 1,
129 * result is a polynomial r with degree < 2 * BN_BITS - 1
130 * The caller MUST ensure that the variables have the right amount
131 * of space allocated.
132 */
133 #ifdef THIRTY_TWO_BIT
134 static void bn_GF2m_mul_1x1(BN_ULONG *r1, BN_ULONG *r0, const BN_ULONG a, const
135 {
136     register BN_ULONG h, l, s;
137     BN_ULONG tab[8], top2b = a >> 30;
138     register BN_ULONG a1, a2, a4;

140     a1 = a & (0x3FFFFFFF); a2 = a1 << 1; a4 = a2 << 1;

142     tab[0] = 0; tab[1] = a1; tab[2] = a2; tab[3] = a1^a2;
143     tab[4] = a4; tab[5] = a1^a4; tab[6] = a2^a4; tab[7] = a1^a2^a4;

145     s = tab[b >> 0 & 0x7]; l = s;
146     s = tab[b >> 3 & 0x7]; l ^= s << 3; h = s >> 29;
147     s = tab[b >> 6 & 0x7]; l ^= s << 6; h ^= s >> 26;
148     s = tab[b >> 9 & 0x7]; l ^= s << 9; h ^= s >> 23;
149     s = tab[b >> 12 & 0x7]; l ^= s << 12; h ^= s >> 20;
150     s = tab[b >> 15 & 0x7]; l ^= s << 15; h ^= s >> 17;
151     s = tab[b >> 18 & 0x7]; l ^= s << 18; h ^= s >> 14;
152     s = tab[b >> 21 & 0x7]; l ^= s << 21; h ^= s >> 11;
153     s = tab[b >> 24 & 0x7]; l ^= s << 24; h ^= s >> 8;
154     s = tab[b >> 27 & 0x7]; l ^= s << 27; h ^= s >> 5;
155     s = tab[b >> 30]; l ^= s << 30; h ^= s >> 2;

157     /* compensate for the top two bits of a */

159     if (top2b & 01) { l ^= b << 30; h ^= b >> 2; }
160     if (top2b & 02) { l ^= b << 31; h ^= b >> 1; }

162     *r1 = h; *r0 = l;
163 }
164 #endif
165 #if defined(SIXTY_FOUR_BIT) || defined(SIXTY_FOUR_BIT_LONG)
166 static void bn_GF2m_mul_1x1(BN_ULONG *r1, BN_ULONG *r0, const BN_ULONG a, const
167 {
168     register BN_ULONG h, l, s;
169     BN_ULONG tab[16], top3b = a >> 61;
170     register BN_ULONG a1, a2, a4, a8;

172     a1 = a & (0x1FFFFFFFFFFFFFFFFULL); a2 = a1 << 1; a4 = a2 << 1; a8 = a4 <<

174     tab[0] = 0; tab[1] = a1; tab[2] = a2; tab[3] = a1^a2
175     tab[4] = a4; tab[5] = a1^a4; tab[6] = a2^a4; tab[7] = a1^a2
176     tab[8] = a8; tab[9] = a1^a8; tab[10] = a2^a8; tab[11] = a1^a2
177     tab[12] = a4^a8; tab[13] = a1^a4^a8; tab[14] = a2^a4^a8; tab[15] = a1^a2

179     s = tab[b >> 0 & 0xF]; l = s;
180     s = tab[b >> 4 & 0xF]; l ^= s << 4; h = s >> 60;
181     s = tab[b >> 8 & 0xF]; l ^= s << 8; h ^= s >> 56;
182     s = tab[b >> 12 & 0xF]; l ^= s << 12; h ^= s >> 52;
183     s = tab[b >> 16 & 0xF]; l ^= s << 16; h ^= s >> 48;
184     s = tab[b >> 20 & 0xF]; l ^= s << 20; h ^= s >> 44;
185     s = tab[b >> 24 & 0xF]; l ^= s << 24; h ^= s >> 40;
186     s = tab[b >> 28 & 0xF]; l ^= s << 28; h ^= s >> 36;
187     s = tab[b >> 32 & 0xF]; l ^= s << 32; h ^= s >> 32;
188     s = tab[b >> 36 & 0xF]; l ^= s << 36; h ^= s >> 28;
189     s = tab[b >> 40 & 0xF]; l ^= s << 40; h ^= s >> 24;
190     s = tab[b >> 44 & 0xF]; l ^= s << 44; h ^= s >> 20;
191     s = tab[b >> 48 & 0xF]; l ^= s << 48; h ^= s >> 16;
192     s = tab[b >> 52 & 0xF]; l ^= s << 52; h ^= s >> 12;
193     s = tab[b >> 56 & 0xF]; l ^= s << 56; h ^= s >> 8;

```

```

194     s = tab[b >> 60]; l ^= s << 60; h ^= s >> 4;

196     /* compensate for the top three bits of a */

198     if (top3b & 01) { l ^= b << 61; h ^= b >> 3; }
199     if (top3b & 02) { l ^= b << 62; h ^= b >> 2; }
200     if (top3b & 04) { l ^= b << 63; h ^= b >> 1; }

202     *r1 = h; *r0 = l;
203 }
204 #endif

206 /* Product of two polynomials a, b each with degree < 2 * BN_BITS2 - 1,
207 * result is a polynomial r with degree < 4 * BN_BITS2 - 1
208 * The caller MUST ensure that the variables have the right amount
209 * of space allocated.
210 */
211 static void bn_GF2m_mul_2x2(BN_ULONG *r, const BN_ULONG a1, const BN_ULONG a0, c
212 {
213     BN_ULONG m1, m0;
214     /* r[3] = h1, r[2] = h0; r[1] = l1; r[0] = l0 */
215     bn_GF2m_mul_1x1(r+3, r+2, a1, b1);
216     bn_GF2m_mul_1x1(r+1, r, a0, b0);
217     bn_GF2m_mul_1x1(&m1, &m0, a0 ^ a1, b0 ^ b1);
218     /* Correction on m1 ^= l1 ^ h1; m0 ^= l0 ^ h0; */
219     r[2] ^= m1 ^ r[1] ^ r[3]; /* h0 ^= m1 ^ l1 ^ h1; */
220     r[1] = r[3] ^ r[2] ^ r[0] ^ m1 ^ m0; /* l1 ^= l0 ^ h0 ^ m0; */
221 }
222 #else
223 void bn_GF2m_mul_2x2(BN_ULONG *r, BN_ULONG a1, BN_ULONG a0, BN_ULONG b1, BN_ULONG
224 #endif

226 /* Add polynomials a and b and store result in r; r could be a or b, a and b
227 * could be equal; r is the bitwise XOR of a and b.
228 */
229 int bn_GF2m_add(BIGNUM *r, const BIGNUM *a, const BIGNUM *b)
230 {
231     int i;
232     const BIGNUM *at, *bt;

234     bn_check_top(a);
235     bn_check_top(b);

237     if (a->top < b->top) { at = b; bt = a; }
238     else { at = a; bt = b; }

240     if (bn_wexpand(r, at->top) == NULL)
241         return 0;

243     for (i = 0; i < bt->top; i++)
244     {
245         r->d[i] = at->d[i] ^ bt->d[i];
246     }
247     for (; i < at->top; i++)
248     {
249         r->d[i] = at->d[i];
250     }

251     r->top = at->top;
252     bn_correct_top(r);

254     return 1;
255 }
256

259 /* Some functions allow for representation of the irreducible polynomials

```

```

260 * as an int[], say p. The irreducible f(t) is then of the form:
261 *  $t^p[0] + t^p[1] + \dots + t^p[k]$ 
262 * where  $m = p[0] > p[1] > \dots > p[k] = 0$ .
263 */

266 /* Performs modular reduction of a and store result in r. r could be a. */
267 int BN_GF2m_mod_arr(BIGNUM *r, const BIGNUM *a, const int p[])
268 {
269     int j, k;
270     int n, dN, d0, d1;
271     BN_ULONG zz, *z;

273     bn_check_top(a);

275     if (!p[0])
276     {
277         /* reduction mod 1 => return 0 */
278         BN_zero(r);
279         return 1;
280     }

282     /* Since the algorithm does reduction in the r value, if a != r, copy
283      * the contents of a into r so we can do reduction in r.
284      */
285     if (a != r)
286     {
287         if (!bn_wexpand(r, a->top)) return 0;
288         for (j = 0; j < a->top; j++)
289             r->d[j] = a->d[j];
290     }
291     r->top = a->top;
292     z = r->d;
293
294     /* start reduction */
295     dN = p[0] / BN_BITS2;
296     for (j = r->top - 1; j > dN;)
297     {
298         zz = z[j];
299         if (z[j] == 0) { j--; continue; }
300         z[j] = 0;
301
302         for (k = 1; p[k] != 0; k++)
303         {
304             /* reducing component  $t^p[k]$  */
305             n = p[0] - p[k];
306             d0 = n % BN_BITS2; d1 = BN_BITS2 - d0;
307             n /= BN_BITS2;
308             z[j-n] ^= (zz >> d0);
309             if (d0) z[j-n-1] ^= (zz << d1);
310         }
311
312         /* reducing component  $t^0$  */
313         n = dN;
314         d0 = p[0] % BN_BITS2;
315         d1 = BN_BITS2 - d0;
316         z[j-n] ^= (zz >> d0);
317         if (d0) z[j-n-1] ^= (zz << d1);
318     }

322     /* final round of reduction */
323     while (j == dN)
324     {

```

```

326     d0 = p[0] % BN_BITS2;
327     zz = z[dN] >> d0;
328     if (zz == 0) break;
329     d1 = BN_BITS2 - d0;
330
331     /* clear up the top d1 bits */
332     if (d0)
333         z[dN] = (z[dN] << d1) >> d1;
334     else
335         z[dN] = 0;
336     z[0] ^= zz; /* reduction  $t^0$  component */

338     for (k = 1; p[k] != 0; k++)
339     {
340         BN_ULONG tmp_ulong;

342         /* reducing component  $t^p[k]$  */
343         n = p[0] / BN_BITS2;
344         d0 = p[k] % BN_BITS2;
345         d1 = BN_BITS2 - d0;
346         z[n] ^= (zz << d0);
347         tmp_ulong = zz >> d1;
348         if (d0 && tmp_ulong)
349             z[n+1] ^= tmp_ulong;
350     }

352     }
353
355     bn_correct_top(r);
356     return 1;
357 }

359 /* Performs modular reduction of a by p and store result in r. r could be a.
360 * This function calls down to the BN_GF2m_mod_arr implementation; this wrapper
361 * function is only provided for convenience; for best performance, use the
362 * BN_GF2m_mod_arr function.
363 */
364 int BN_GF2m_mod(BIGNUM *r, const BIGNUM *a, const BIGNUM *p)
365 {
366     int ret = 0;
367     int arr[6];
368     bn_check_top(a);
369     bn_check_top(p);
370     ret = BN_GF2m_poly2arr(p, arr, sizeof(arr)/sizeof(arr[0]));
371     if (!ret || ret > (int)(sizeof(arr)/sizeof(arr[0])))
372     {
373         BNerr(BN_F_BN_GF2M_MOD, BN_R_INVALID_LENGTH);
374         return 0;
375     }
376     ret = BN_GF2m_mod_arr(r, a, arr);
377     bn_check_top(r);
378     return ret;
379 }

383 /* Compute the product of two polynomials a and b, reduce modulo p, and store
384 * the result in r. r could be a or b; a could be b.
385 */
386 int BN_GF2m_mod_mul_arr(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const int i
387 {
388     int zlen, i, j, k, ret = 0;
389     BIGNUM *s;
390     BN_ULONG x0, y0, y1, y2, zz[4];

```

```

392     bn_check_top(a);
393     bn_check_top(b);

395     if (a == b)
396     {
397         return BN_GF2m_mod_sqr_arr(r, a, p, ctx);
398     }

400     BN_CTX_start(ctx);
401     if ((s = BN_CTX_get(ctx)) == NULL) goto err;
402
403     zlen = a->top + b->top + 4;
404     if (!bn_wexpand(s, zlen)) goto err;
405     s->top = zlen;

407     for (i = 0; i < zlen; i++) s->d[i] = 0;

409     for (j = 0; j < b->top; j += 2)
410     {
411         y0 = b->d[j];
412         y1 = ((j+1) == b->top) ? 0 : b->d[j+1];
413         for (i = 0; i < a->top; i += 2)
414         {
415             x0 = a->d[i];
416             x1 = ((i+1) == a->top) ? 0 : a->d[i+1];
417             bn_GF2m_mul_2x2(zz, x1, x0, y1, y0);
418             for (k = 0; k < 4; k++) s->d[i+j+k] ^= zz[k];
419         }
420     }

422     bn_correct_top(s);
423     if (BN_GF2m_mod_arr(r, s, p))
424         ret = 1;
425     bn_check_top(r);

427 err:
428     BN_CTX_end(ctx);
429     return ret;
430 }

432 /* Compute the product of two polynomials a and b, reduce modulo p, and store
433  * the result in r. r could be a or b; a could equal b.
434  *
435  * This function calls down to the BN_GF2m_mod_mul_arr implementation; this wrap
436  * function is only provided for convenience; for best performance, use the
437  * BN_GF2m_mod_mul_arr function.
438  */
439 int BN_GF2m_mod_mul(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *p, BN_CTX *ctx)
440 {
441     int ret = 0;
442     const int max = BN_num_bits(p) + 1;
443     int *arr=NULL;
444     bn_check_top(a);
445     bn_check_top(b);
446     bn_check_top(p);
447     if ((arr = (int *)OPENSSL_malloc(sizeof(int) * max)) == NULL) goto err;
448     ret = BN_GF2m_poly2arr(p, arr, max);
449     if (!ret || ret > max)
450     {
451         BNerr(BN_F_BN_GF2M_MOD_MUL, BN_R_INVALID_LENGTH);
452         goto err;
453     }
454     ret = BN_GF2m_mod_mul_arr(r, a, b, arr, ctx);
455     bn_check_top(r);
456 err:
457     if (arr) OPENSSL_free(arr);

```

```

458     return ret;
459 }

462 /* Square a, reduce the result mod p, and store it in a. r could be a. */
463 int BN_GF2m_mod_sqr_arr(BIGNUM *r, const BIGNUM *a, const int p[], BN_CTX *ctx)
464 {
465     int i, ret = 0;
466     BIGNUM *s;

468     bn_check_top(a);
469     BN_CTX_start(ctx);
470     if ((s = BN_CTX_get(ctx)) == NULL) return 0;
471     if (!bn_wexpand(s, 2 * a->top)) goto err;

473     for (i = a->top - 1; i >= 0; i--)
474     {
475         s->d[2*i+1] = SQR1(a->d[i]);
476         s->d[2*i] = SQR0(a->d[i]);
477     }

479     s->top = 2 * a->top;
480     bn_correct_top(s);
481     if (!BN_GF2m_mod_arr(r, s, p)) goto err;
482     bn_check_top(r);
483     ret = 1;
484 err:
485     BN_CTX_end(ctx);
486     return ret;
487 }

489 /* Square a, reduce the result mod p, and store it in a. r could be a.
490  *
491  * This function calls down to the BN_GF2m_mod_sqr_arr implementation; this wrap
492  * function is only provided for convenience; for best performance, use the
493  * BN_GF2m_mod_sqr_arr function.
494  */
495 int BN_GF2m_mod_sqr(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx)
496 {
497     int ret = 0;
498     const int max = BN_num_bits(p) + 1;
499     int *arr=NULL;

501     bn_check_top(a);
502     bn_check_top(p);
503     if ((arr = (int *)OPENSSL_malloc(sizeof(int) * max)) == NULL) goto err;
504     ret = BN_GF2m_poly2arr(p, arr, max);
505     if (!ret || ret > max)
506     {
507         BNerr(BN_F_BN_GF2M_MOD_SQR, BN_R_INVALID_LENGTH);
508         goto err;
509     }
510     ret = BN_GF2m_mod_sqr_arr(r, a, arr, ctx);
511     bn_check_top(r);
512 err:
513     if (arr) OPENSSL_free(arr);
514     return ret;
515 }

518 /* Invert a, reduce modulo p, and store the result in r. r could be a.
519  * Uses Modified Almost Inverse Algorithm (Algorithm 10) from
520  * Hankerson, D., Hernandez, J.L., and Menezes, A. "Software Implementation
521  * of Elliptic Curve Cryptography Over Binary Fields".
522  */
523 int BN_GF2m_mod_inv(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx)

```



```

524     {
525         BIGNUM *b, *c = NULL, *u = NULL, *v = NULL, *tmp;
526         int ret = 0;

528         bn_check_top(a);
529         bn_check_top(p);

531         BN_CTX_start(ctx);
532
533         if ((b = BN_CTX_get(ctx)) == NULL) goto err;
534         if ((c = BN_CTX_get(ctx)) == NULL) goto err;
535         if ((u = BN_CTX_get(ctx)) == NULL) goto err;
536         if ((v = BN_CTX_get(ctx)) == NULL) goto err;

538         if (!BN_GF2m_mod(u, a, p)) goto err;
539         if (BN_is_zero(u)) goto err;

541         if (!BN_copy(v, p)) goto err;
542 #if 0
543         if (!BN_one(b)) goto err;

545         while (1)
546         {
547             while (!BN_is_odd(u))
548             {
549                 if (BN_is_zero(u)) goto err;
550                 if (!BN_rshift1(u, u)) goto err;
551                 if (BN_is_odd(b))
552                 {
553                     if (!BN_GF2m_add(b, b, p)) goto err;
554                 }
555                 if (!BN_rshift1(b, b)) goto err;
556             }

558             if (BN_abs_is_word(u, 1)) break;

560             if (BN_num_bits(u) < BN_num_bits(v))
561             {
562                 tmp = u; u = v; v = tmp;
563                 tmp = b; b = c; c = tmp;
564             }

565             if (!BN_GF2m_add(u, u, v)) goto err;
566             if (!BN_GF2m_add(b, b, c)) goto err;
567         }
568 #else
569         {
570             int i, ubits = BN_num_bits(u),
571                 vbits = BN_num_bits(v), /* v is copy of p */
572                 top = p->top;
573             BN_ULONG *udp, *bdp, *vdp, *cdp;

576             bn_wexpand(u, top);      udp = u->d;
577             for (i=u->top; i<top; i++) udp[i] = 0;
578             u->top = top;
579             bn_wexpand(b, top);      bdp = b->d;
580             bdp[0] = 1;
581             for (i=1; i<top; i++) bdp[i] = 0;
582             b->top = top;
583             bn_wexpand(c, top);      cdp = c->d;
584             for (i=0; i<top; i++) cdp[i] = 0;
585             c->top = top;

586             vdp = v->d; /* It pays off to "cache" *->d pointers, because
587                        * it allows optimizer to be more aggressive.
588                        * But we don't have to "cache" p->d, because *p
589                        * is declared 'const'... */

```

```

590         while (1)
591         {
592             while (ubits && !(udp[0]&1))
593             {
594                 BN_ULONG u0, u1, b0, b1, mask;

596                 u0 = udp[0];
597                 b0 = bdp[0];
598                 mask = (BN_ULONG)0-(b0&1);
599                 b0 ^= p->d[0]&mask;
600                 for (i=0; i<top-1; i++)
601                 {
602                     u1 = udp[i+1];
603                     udp[i] = ((u0>>1)|(u1<<(BN_BITS2-1)))&BN_MASK2;
604                     u0 = u1;
605                     b1 = bdp[i+1]^(p->d[i+1]&mask);
606                     bdp[i] = ((b0>>1)|(b1<<(BN_BITS2-1)))&BN_MASK2;
607                     b0 = b1;
608                 }
609                 udp[i] = u0>>1;
610                 bdp[i] = b0>>1;
611                 ubits--;
612             }

614             if (ubits<=BN_BITS2 && udp[0]==1) break;

616             if (ubits<vbits)
617             {
618                 i = ubits; ubits = vbits; vbits = i;
619                 tmp = u; u = v; v = tmp;
620                 tmp = b; b = c; c = tmp;
621                 udp = vdp; vdp = v->d;
622                 bdp = cdp; cdp = c->d;
623             }
624             for(i=0; i<top; i++)
625             {
626                 udp[i] ^= vdp[i];
627                 bdp[i] ^= cdp[i];
628             }
629             if (ubits==vbits)
630             {
631                 BN_ULONG ul;
632                 int utop = (ubits-1)/BN_BITS2;

634                 while ((ul=udp[utop])==0 && utop) utop--;
635                 ubits = utop*BN_BITS2 + BN_num_bits_word(ul);
636             }
637         }
638         bn_correct_top(b);
639     }
640 #endif

642     if (!BN_copy(r, b)) goto err;
643     bn_check_top(r);
644     ret = 1;

646 err:
647 #ifdef BN_DEBUG /* BN_CTX_end would complain about the expanded form */
648     bn_correct_top(c);
649     bn_correct_top(u);
650     bn_correct_top(v);
651 #endif
652     BN_CTX_end(ctx);
653     return ret;
654 }

```

```

656 /* Invert xx, reduce modulo p, and store the result in r. r could be xx.
657 */
658 * This function calls down to the BN_GF2m_mod_inv implementation; this wrapper
659 * function is only provided for convenience; for best performance, use the
660 * BN_GF2m_mod_inv function.
661 */
662 int BN_GF2m_mod_inv_arr(BIGNUM *r, const BIGNUM *xx, const int p[], BN_CTX *ctx)
663 {
664     BIGNUM *field;
665     int ret = 0;

667     bn_check_top(xx);
668     BN_CTX_start(ctx);
669     if ((field = BN_CTX_get(ctx)) == NULL) goto err;
670     if (!BN_GF2m_arr2poly(p, field)) goto err;
671
672     ret = BN_GF2m_mod_inv(r, xx, field, ctx);
673     bn_check_top(r);

675 err:
676     BN_CTX_end(ctx);
677     return ret;
678 }

681 #ifndef OPENSSL_SUN_GF2M_DIV
682 /* Divide y by x, reduce modulo p, and store the result in r. r could be x
683 * or y, x could equal y.
684 */
685 int BN_GF2m_mod_div(BIGNUM *r, const BIGNUM *y, const BIGNUM *x, const BIGNUM *p
686 {
687     BIGNUM *xinv = NULL;
688     int ret = 0;

690     bn_check_top(y);
691     bn_check_top(x);
692     bn_check_top(p);

694     BN_CTX_start(ctx);
695     xinv = BN_CTX_get(ctx);
696     if (xinv == NULL) goto err;
697
698     if (!BN_GF2m_mod_inv(xinv, x, p, ctx)) goto err;
699     if (!BN_GF2m_mod_mul(r, y, xinv, p, ctx)) goto err;
700     bn_check_top(r);
701     ret = 1;

703 err:
704     BN_CTX_end(ctx);
705     return ret;
706 }
707 #else
708 /* Divide y by x, reduce modulo p, and store the result in r. r could be x
709 * or y, x could equal y.
710 * Uses algorithm Modular_Division_GF(2^m) from
711 * Chang-Shantz, S. "From Euclid's GCD to Montgomery Multiplication to
712 * the Great Divide".
713 */
714 int BN_GF2m_mod_div(BIGNUM *r, const BIGNUM *y, const BIGNUM *x, const BIGNUM *p
715 {
716     BIGNUM *a, *b, *u, *v;
717     int ret = 0;

719     bn_check_top(y);
720     bn_check_top(x);
721     bn_check_top(p);

```

```

723     BN_CTX_start(ctx);
724
725     a = BN_CTX_get(ctx);
726     b = BN_CTX_get(ctx);
727     u = BN_CTX_get(ctx);
728     v = BN_CTX_get(ctx);
729     if (v == NULL) goto err;

731     /* reduce x and y mod p */
732     if (!BN_GF2m_mod(u, y, p)) goto err;
733     if (!BN_GF2m_mod(a, x, p)) goto err;
734     if (!BN_copy(b, p)) goto err;
735
736     while (!BN_is_odd(a))
737     {
738         if (!BN_rshift1(a, a)) goto err;
739         if (BN_is_odd(u)) if (!BN_GF2m_add(u, u, p)) goto err;
740         if (!BN_rshift1(u, u)) goto err;
741     }

743     do
744     {
745         if (BN_GF2m_cmp(b, a) > 0)
746         {
747             if (!BN_GF2m_add(b, b, a)) goto err;
748             if (!BN_GF2m_add(v, v, u)) goto err;
749             do
750             {
751                 if (!BN_rshift1(b, b)) goto err;
752                 if (BN_is_odd(v)) if (!BN_GF2m_add(v, v, p)) got
753                 if (!BN_rshift1(v, v)) goto err;
754                 } while (!BN_is_odd(b));
755             }
756             else if (BN_abs_is_word(a, 1))
757                 break;
758             else
759             {
760                 if (!BN_GF2m_add(a, a, b)) goto err;
761                 if (!BN_GF2m_add(u, u, v)) goto err;
762                 do
763                 {
764                     if (!BN_rshift1(a, a)) goto err;
765                     if (BN_is_odd(u)) if (!BN_GF2m_add(u, u, p)) got
766                     if (!BN_rshift1(u, u)) goto err;
767                     } while (!BN_is_odd(a));
768                 }
769                 } while (1);

771     if (!BN_copy(r, u)) goto err;
772     bn_check_top(r);
773     ret = 1;

775 err:
776     BN_CTX_end(ctx);
777     return ret;
778 }
779 #endif

781 /* Divide yy by xx, reduce modulo p, and store the result in r. r could be xx
782 * or yy, xx could equal yy.
783 */
784 * This function calls down to the BN_GF2m_mod_div implementation; this wrapper
785 * function is only provided for convenience; for best performance, use the
786 * BN_GF2m_mod_div function.
787 */

```

```

788 int BN_GF2m_mod_div_arr(BIGNUM *r, const BIGNUM *yy, const BIGNUM *xx, const int
789 {
790     BIGNUM *field;
791     int ret = 0;

793     bn_check_top(yy);
794     bn_check_top(xx);

796     BN_CTX_start(ctx);
797     if ((field = BN_CTX_get(ctx)) == NULL) goto err;
798     if (!BN_GF2m_arr2poly(p, field)) goto err;
799     ret = BN_GF2m_mod_div(r, yy, xx, field, ctx);
800     bn_check_top(r);
801

803 err:
804     BN_CTX_end(ctx);
805     return ret;
806 }

809 /* Compute the bth power of a, reduce modulo p, and store
810  * the result in r. r could be a.
811  * Uses simple square-and-multiply algorithm A.5.1 from IEEE P1363.
812  */
813 int BN_GF2m_mod_exp_arr(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const int i
814 {
815     int ret = 0, i, n;
816     BIGNUM *u;

818     bn_check_top(a);
819     bn_check_top(b);

821     if (BN_is_zero(b))
822         return(BN_one(r));

824     if (BN_abs_is_word(b, 1))
825         return (BN_copy(r, a) != NULL);

827     BN_CTX_start(ctx);
828     if ((u = BN_CTX_get(ctx)) == NULL) goto err;
829     if (!BN_GF2m_mod_arr(u, a, p)) goto err;
830     if (!BN_GF2m_mod_arr(u, a, p)) goto err;
831     n = BN_num_bits(b) - 1;
832     for (i = n - 1; i >= 0; i--)
833     {
834         if (!BN_GF2m_mod_sqr_arr(u, u, p, ctx)) goto err;
835         if (BN_is_bit_set(b, i))
836         {
837             if (!BN_GF2m_mod_mul_arr(u, u, a, p, ctx)) goto err;
838         }
839     }
840     if (!BN_copy(r, u)) goto err;
841     bn_check_top(r);
842     ret = 1;
843 err:
844     BN_CTX_end(ctx);
845     return ret;
846 }

849 /* Compute the bth power of a, reduce modulo p, and store
850  * the result in r. r could be a.
851  *
852  * This function calls down to the BN_GF2m_mod_exp_arr implementation; this wrap
853  * function is only provided for convenience; for best performance, use the

```

```

854  * BN_GF2m_mod_exp_arr function.
855  */
856 int BN_GF2m_mod_exp(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *p
857 {
858     int ret = 0;
859     const int max = BN_num_bits(p) + 1;
860     int *arr=NULL;
861     bn_check_top(a);
862     bn_check_top(b);
863     bn_check_top(p);
864     if ((arr = (int *)OPENSSL_malloc(sizeof(int) * max)) == NULL) goto err;
865     ret = BN_GF2m_poly2arr(p, arr, max);
866     if (!ret || ret > max)
867     {
868         BNerr(BN_F_BN_GF2M_MOD_EXP, BN_R_INVALID_LENGTH);
869         goto err;
870     }
871     ret = BN_GF2m_mod_exp_arr(r, a, b, arr, ctx);
872     bn_check_top(r);
873 err:
874     if (arr) OPENSSL_free(arr);
875     return ret;
876 }

878 /* Compute the square root of a, reduce modulo p, and store
879  * the result in r. r could be a.
880  * Uses exponentiation as in algorithm A.4.1 from IEEE P1363.
881  */
882 int BN_GF2m_mod_sqrt_arr(BIGNUM *r, const BIGNUM *a, const int p[], BN_CTX *
883 {
884     int ret = 0;
885     BIGNUM *u;

887     bn_check_top(a);

889     if (!p[0])
890     {
891         /* reduction mod 1 => return 0 */
892         BN_zero(r);
893         return 1;
894     }

896     BN_CTX_start(ctx);
897     if ((u = BN_CTX_get(ctx)) == NULL) goto err;
898     if (!BN_set_bit(u, p[0] - 1)) goto err;
899     ret = BN_GF2m_mod_exp_arr(r, a, u, p, ctx);
900     bn_check_top(r);
901

903 err:
904     BN_CTX_end(ctx);
905     return ret;
906 }

908 /* Compute the square root of a, reduce modulo p, and store
909  * the result in r. r could be a.
910  *
911  * This function calls down to the BN_GF2m_mod_sqrt_arr implementation; this wra
912  * function is only provided for convenience; for best performance, use the
913  * BN_GF2m_mod_sqrt_arr function.
914  */
915 int BN_GF2m_mod_sqrt(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx)
916 {
917     int ret = 0;
918     const int max = BN_num_bits(p) + 1;
919     int *arr=NULL;

```

```

920     bn_check_top(a);
921     bn_check_top(p);
922     if ((arr = (int *)OPENSSL_malloc(sizeof(int) * max)) == NULL) goto err;
923     ret = BN_GF2m_poly2arr(p, arr, max);
924     if (!ret || ret > max)
925     {
926         BNerr(BN_F_BN_GF2M_MOD_SQRT, BN_R_INVALID_LENGTH);
927         goto err;
928     }
929     ret = BN_GF2m_mod_sqrt_arr(r, a, arr, ctx);
930     bn_check_top(r);
931 err:
932     if (arr) OPENSSL_free(arr);
933     return ret;
934 }

936 /* Find r such that r^2 + r = a mod p. r could be a. If no r exists returns 0.
937  * Uses algorithms A.4.7 and A.4.6 from IEEE P1363.
938  */
939 int BN_GF2m_mod_solve_quad_arr(BIGNUM *r, const BIGNUM *a_, const int p[], BN_CTX *
940 {
941     int ret = 0, count = 0, j;
942     BIGNUM *a, *z, *rho, *w, *w2, *tmp;

944     bn_check_top(a_);

946     if (!p[0])
947     {
948         /* reduction mod 1 => return 0 */
949         BN_zero(r);
950         return 1;
951     }

953     BN_CTX_start(ctx);
954     a = BN_CTX_get(ctx);
955     z = BN_CTX_get(ctx);
956     w = BN_CTX_get(ctx);
957     if (w == NULL) goto err;

959     if (!BN_GF2m_mod_arr(a, a_, p)) goto err;
960
961     if (BN_is_zero(a))
962     {
963         BN_zero(r);
964         ret = 1;
965         goto err;
966     }

968     if (p[0] & 0x1) /* m is odd */
969     {
970         /* compute half-trace of a */
971         if (!BN_copy(z, a)) goto err;
972         for (j = 1; j <= (p[0] - 1) / 2; j++)
973         {
974             if (!BN_GF2m_mod_sqr_arr(z, z, p, ctx)) goto err;
975             if (!BN_GF2m_mod_sqr_arr(z, z, p, ctx)) goto err;
976             if (!BN_GF2m_add(z, z, a)) goto err;
977         }
978     }
979     else /* m is even */
980     {
981         rho = BN_CTX_get(ctx);
982         w2 = BN_CTX_get(ctx);
983         tmp = BN_CTX_get(ctx);
984         if (tmp == NULL) goto err;

```

```

986     do
987     {
988         if (!BN_rand(rho, p[0], 0, 0)) goto err;
989         if (!BN_GF2m_mod_arr(rho, rho, p)) goto err;
990         BN_zero(z);
991         if (!BN_copy(w, rho)) goto err;
992         for (j = 1; j <= p[0] - 1; j++)
993         {
994             if (!BN_GF2m_mod_sqr_arr(z, z, p, ctx)) goto err
995             if (!BN_GF2m_mod_sqr_arr(w2, w, p, ctx)) goto er
996             if (!BN_GF2m_mod_mul_arr(tmp, w2, a, p, ctx)) go
997             if (!BN_GF2m_add(z, z, tmp)) goto err;
998             if (!BN_GF2m_add(w, w2, rho)) goto err;
999         }
1000         count++;
1001         } while (BN_is_zero(w) && (count < MAX_ITERATIONS));
1002     if (BN_is_zero(w))
1003     {
1004         BNerr(BN_F_BN_GF2M_MOD_SOLVE_QUAD_ARR, BN_R_TOO_MANY_ITER
1005         goto err;
1006     }
1007 }

1009     if (!BN_GF2m_mod_sqr_arr(w, z, p, ctx)) goto err;
1010     if (!BN_GF2m_add(w, z, w)) goto err;
1011     if (BN_GF2m_cmp(w, a))
1012     {
1013         BNerr(BN_F_BN_GF2M_MOD_SOLVE_QUAD_ARR, BN_R_NO_SOLUTION);
1014         goto err;
1015     }

1017     if (!BN_copy(r, z)) goto err;
1018     bn_check_top(r);

1020     ret = 1;

1022 err:
1023     BN_CTX_end(ctx);
1024     return ret;
1025 }

1027 /* Find r such that r^2 + r = a mod p. r could be a. If no r exists returns 0.
1028  * This function calls down to the BN_GF2m_mod_solve_quad_arr implementation; th
1029  * function is only provided for convenience; for best performance, use the
1030  * BN_GF2m_mod_solve_quad_arr function.
1031  */
1032 int BN_GF2m_mod_solve_quad(BIGNUM *r, const BIGNUM *a, const BIGNUM *p, BN_CTX *
1033 {
1034     int ret = 0;
1035     const int max = BN_num_bits(p) + 1;
1036     int *arr=NULL;
1037     bn_check_top(a);
1038     bn_check_top(p);
1039     if ((arr = (int *)OPENSSL_malloc(sizeof(int) *
1040                                     max)) == NULL) goto err;

1042     ret = BN_GF2m_poly2arr(p, arr, max);
1043     if (!ret || ret > max)
1044     {
1045         BNerr(BN_F_BN_GF2M_MOD_SOLVE_QUAD, BN_R_INVALID_LENGTH);
1046         goto err;
1047     }

1048     ret = BN_GF2m_mod_solve_quad_arr(r, a, arr, ctx);
1049     bn_check_top(r);
1050 err:
1051     if (arr) OPENSSL_free(arr);

```

```

1052     return ret;
1053 }

1055 /* Convert the bit-string representation of a polynomial
1056 * ( \sum_{i=0}^n a_i * x^i) into an array of integers corresponding
1057 * to the bits with non-zero coefficient. Array is terminated with -1.
1058 * Up to max elements of the array will be filled. Return value is total
1059 * number of array elements that would be filled if array was large enough.
1060 */
1061 int BN_GF2m_poly2arr(const BIGNUM *a, int p[], int max)
1062 {
1063     int i, j, k = 0;
1064     BN_ULONG mask;

1066     if (BN_is_zero(a))
1067         return 0;

1069     for (i = a->top - 1; i >= 0; i--)
1070     {
1071         if (!a->d[i])
1072             /* skip word if a->d[i] == 0 */
1073             continue;
1074         mask = BN_TBIT;
1075         for (j = BN_BITS2 - 1; j >= 0; j--)
1076         {
1077             if (a->d[i] & mask)
1078             {
1079                 if (k < max) p[k] = BN_BITS2 * i + j;
1080                 k++;
1081             }
1082             mask >>= 1;
1083         }
1084     }

1086     if (k < max) {
1087         p[k] = -1;
1088         k++;
1089     }

1091     return k;
1092 }

1094 /* Convert the coefficient array representation of a polynomial to a
1095 * bit-string. The array must be terminated by -1.
1096 */
1097 int BN_GF2m_arr2poly(const int p[], BIGNUM *a)
1098 {
1099     int i;

1101     bn_check_top(a);
1102     BN_zero(a);
1103     for (i = 0; p[i] != -1; i++)
1104     {
1105         if (BN_set_bit(a, p[i]) == 0)
1106             return 0;
1107     }
1108     bn_check_top(a);

1110     return 1;
1111 }

1113 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_kron.c

1

```
*****
5119 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_kron.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/bn/bn_kron.c */
2 /* =====
3  * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
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13  * notice, this list of conditions and the following disclaimer in
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15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
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35  *
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37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 #include "cryptlib.h"
57 #include "bn_lcl.h"

59 /* least significant word */
60 #define BN_lsw(n) (((n)->top == 0) ? (BN_ULONG) 0 : (n)->d[0])
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_kron.c

2

```
62 /* Returns -2 for errors because both -1 and 0 are valid results. */
63 int BN_kronecker(const BIGNUM *a, const BIGNUM *b, BN_CTX *ctx)
64 {
65     int i;
66     int ret = -2; /* avoid 'uninitialized' warning */
67     int err = 0;
68     BIGNUM *A, *B, *tmp;
69     /* In 'tab', only odd-indexed entries are relevant:
70     * For any odd BIGNUM n,
71     * tab[BN_lsw(n) & 7]
72     * is  $(-1)^{\{(n^2-1)/8\}}$  (using TeX notation).
73     * Note that the sign of n does not matter.
74     */
75     static const int tab[8] = {0, 1, 0, -1, 0, -1, 0, 1};

77     bn_check_top(a);
78     bn_check_top(b);

80     BN_CTX_start(ctx);
81     A = BN_CTX_get(ctx);
82     B = BN_CTX_get(ctx);
83     if (B == NULL) goto end;
84
85     err = !BN_copy(A, a);
86     if (err) goto end;
87     err = !BN_copy(B, b);
88     if (err) goto end;

90     /*
91     * Kronecker symbol, implemented according to Henri Cohen,
92     * "A Course in Computational Algebraic Number Theory"
93     * (algorithm 1.4.10).
94     */

96     /* Cohen's step 1: */

98     if (BN_is_zero(B))
99     {
100         ret = BN_abs_is_word(A, 1);
101         goto end;
102     }

104     /* Cohen's step 2: */

106     if (!BN_is_odd(A) && !BN_is_odd(B))
107     {
108         ret = 0;
109         goto end;
110     }

112     /* now B is non-zero */
113     i = 0;
114     while (!BN_is_bit_set(B, i))
115         i++;
116     err = !BN_rshift(B, B, i);
117     if (err) goto end;
118     if (i & 1)
119     {
120         /* i is odd */
121         /* (thus B was even, thus A must be odd!) */

123         /* set 'ret' to  $(-1)^{\{(A^2-1)/8\}}$  */
124         ret = tab[BN_lsw(A) & 7];
125     }
126     else
127     {
```

```

128         /* i is even */
129         ret = 1;
130     }
131
132     if (B->neg)
133     {
134         B->neg = 0;
135         if (A->neg)
136             ret = -ret;
137     }
138
139     /* now B is positive and odd, so what remains to be done is
140      * to compute the Jacobi symbol (A/B) and multiply it by 'ret' */
141
142     while (1)
143     {
144         /* Cohen's step 3: */
145
146         /* B is positive and odd */
147
148         if (BN_is_zero(A))
149         {
150             ret = BN_is_one(B) ? ret : 0;
151             goto end;
152         }
153
154         /* now A is non-zero */
155         i = 0;
156         while (!BN_is_bit_set(A, i))
157             i++;
158         err = !BN_rshift(A, A, i);
159         if (err) goto end;
160         if (i & 1)
161         {
162             /* i is odd */
163             /* multiply 'ret' by  $(-1)^{(B^2-1)/8}$  */
164             ret = ret * tab[BN_lsw(B) & 7];
165         }
166
167         /* Cohen's step 4: */
168         /* multiply 'ret' by  $(-1)^{(A-1)(B-1)/4}$  */
169         if ((A->neg ? ~BN_lsw(A) : BN_lsw(A)) & BN_lsw(B) & 2)
170             ret = -ret;
171
172         /* (A, B) := (B mod |A|, |A|) */
173         err = !BN_nnmod(B, B, A, ctx);
174         if (err) goto end;
175         tmp = A; A = B; B = tmp;
176         tmp->neg = 0;
177     }
178 end:
179     BN_CTX_end(ctx);
180     if (err)
181         return -2;
182     else
183         return ret;
184 }

```

```

*****
19540 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bn/bn_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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21 * in documentation (online or textual) provided with the package.
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef BN_DEBUG
60 # undef NDEBUG /* avoid conflicting definitions */
61 # define NDEBUG

```

```

62 #endif
63
64 #include <assert.h>
65 #include <limits.h>
66 #include <stdio.h>
67 #include "cryptlib.h"
68 #include "bn_lcl.h"
69
70 const char BN_version[]="Big Number" OPENSSL_VERSION_PTEXT;
71
72 /* This stuff appears to be completely unused, so is deprecated */
73 #ifndef OPENSSL_NO_DEPRECATED
74 /* For a 32 bit machine
75  * 2 - 4 == 128
76  * 3 - 8 == 256
77  * 4 - 16 == 512
78  * 5 - 32 == 1024
79  * 6 - 64 == 2048
80  * 7 - 128 == 4096
81  * 8 - 256 == 8192
82  */
83 static int bn_limit_bits=0;
84 static int bn_limit_num=8; /* (1<<bn_limit_bits) */
85 static int bn_limit_bits_low=0;
86 static int bn_limit_num_low=8; /* (1<<bn_limit_bits_low) */
87 static int bn_limit_bits_high=0;
88 static int bn_limit_num_high=8; /* (1<<bn_limit_bits_high) */
89 static int bn_limit_bits_mont=0;
90 static int bn_limit_num_mont=8; /* (1<<bn_limit_bits_mont) */
91
92 void BN_set_params(int mult, int high, int low, int mont)
93 {
94     if (mult >= 0)
95     {
96         if (mult > (int)(sizeof(int)*8)-1)
97             mult=sizeof(int)*8-1;
98         bn_limit_bits=mult;
99         bn_limit_num=1<<mult;
100     }
101     if (high >= 0)
102     {
103         if (high > (int)(sizeof(int)*8)-1)
104             high=sizeof(int)*8-1;
105         bn_limit_bits_high=high;
106         bn_limit_num_high=1<<high;
107     }
108     if (low >= 0)
109     {
110         if (low > (int)(sizeof(int)*8)-1)
111             low=sizeof(int)*8-1;
112         bn_limit_bits_low=low;
113         bn_limit_num_low=1<<low;
114     }
115     if (mont >= 0)
116     {
117         if (mont > (int)(sizeof(int)*8)-1)
118             mont=sizeof(int)*8-1;
119         bn_limit_bits_mont=mont;
120         bn_limit_num_mont=1<<mont;
121     }
122 }
123
124 int BN_get_params(int which)
125 {
126     if (which == 0) return(bn_limit_bits);
127     else if (which == 1) return(bn_limit_bits_high);

```



```

128     else if (which == 2) return(bn_limit_bits_low);
129     else if (which == 3) return(bn_limit_bits_mont);
130     else return(0);
131 }
132 #endif

134 const BIGNUM *BN_value_one(void)
135 {
136     static const BN_ULONG data_one=1L;
137     static const BIGNUM const_one={(BN_ULONG *)&data_one,1,1,0,BN_FLG_STATIC

139     return(&const_one);
140 }

142 int BN_num_bits_word(BN_ULONG l)
143 {
144     static const unsigned char bits[256]={
145         0,1,2,2,3,3,3,3,4,4,4,4,4,4,4,4,
146         5,5,5,5,5,5,5,5,5,5,5,5,5,5,5,5,
147         6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,
148         6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,
149         7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,
150         7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,
151         7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,
152         7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,7,
153         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
154         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
155         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
156         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
157         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
158         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
159         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
160         8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,8,
161     };

163 #if defined(SIXTY_FOUR_BIT_LONG)
164     if (l & 0xffffffff00000000L)
165     {
166         if (l & 0xffff000000000000L)
167         {
168             if (l & 0xff00000000000000L)
169             {
170                 return(bits[(int)(l>>56)]+56);
171             }
172             else
173                 return(bits[(int)(l>>48)]+48);
174         }
175         else
176         {
177             if (l & 0x0000ff0000000000L)
178             {
179                 return(bits[(int)(l>>40)]+40);
180             }
181             else
182                 return(bits[(int)(l>>32)]+32);
183         }
184     }
185 #else
186 #ifdef SIXTY_FOUR_BIT
187     if (l & 0xffffffff00000000LL)
188     {
189         if (l & 0xffff000000000000LL)
190         {
191             if (l & 0xff00000000000000LL)
192             {
193                 return(bits[(int)(l>>56)]+56);
194             }
195         }
196     }
197 #endif
198 #endif

```

```

194     else return(bits[(int)(l>>48)]+48);
195 }
196     else
197     {
198         if (l & 0x0000ff0000000000LL)
199         {
200             return(bits[(int)(l>>40)]+40);
201         }
202         else
203             return(bits[(int)(l>>32)]+32);
204     }
205     else
206 #endif
207 #endif
208 {
209 #if defined(THIRTY_TWO_BIT) || defined(SIXTY_FOUR_BIT) || defined(SIXTY_FOUR_BIT
210     if (l & 0xffff0000L)
211     {
212         if (l & 0xff000000L)
213             return(bits[(int)(l>>24)]+24);
214         else
215             return(bits[(int)(l>>16)]+16);
216     }
217     else
218     {
219 #if defined(THIRTY_TWO_BIT) || defined(SIXTY_FOUR_BIT) || defined(SIXTY_FOUR_BIT
220         if (l & 0xff00L)
221             return(bits[(int)(l>>8)]+8);
222         else
223             return(bits[(int)(l)]);
224     }
225 }
226 }
227 }

229 int BN_num_bits(const BIGNUM *a)
230 {
231     int i = a->top - 1;
232     bn_check_top(a);

234     if (BN_is_zero(a)) return 0;
235     return ((i*BN_BITS2) + BN_num_bits_word(a->d[i]));
236 }

238 void BN_clear_free(BIGNUM *a)
239 {
240     int i;

242     if (a == NULL) return;
243     bn_check_top(a);
244     if (a->d != NULL)
245     {
246         OPENSSL_cleanse(a->d, a->dmax*sizeof(a->d[0]));
247         if (!(BN_get_flags(a, BN_FLG_STATIC_DATA)))
248             OPENSSL_free(a->d);
249     }
250     i=BN_get_flags(a, BN_FLG_MALLOCED);
251     OPENSSL_cleanse(a, sizeof(BIGNUM));
252     if (i)
253         OPENSSL_free(a);
254 }

256 void BN_free(BIGNUM *a)
257 {
258     if (a == NULL) return;
259     bn_check_top(a);

```

```

260     if ((a->d != NULL) && !(BN_get_flags(a, BN_FLG_STATIC_DATA)))
261         OPENSSL_free(a->d);
262     if (a->flags & BN_FLG_MALLOCED)
263         OPENSSL_free(a);
264     else
265     {
266 #ifndef OPENSSL_NO_DEPRECATED
267         a->flags |= BN_FLG_FREE;
268 #endif
269         a->d = NULL;
270     }
271 }

273 void BN_init(BIGNUM *a)
274 {
275     memset(a, 0, sizeof(BIGNUM));
276     bn_check_top(a);
277 }

279 BIGNUM *BN_new(void)
280 {
281     BIGNUM *ret;

283     if ((ret=(BIGNUM *)OPENSSL_malloc(sizeof(BIGNUM))) == NULL)
284     {
285         BNerr(BN_F_BN_NEW, ERR_R_MALLOC_FAILURE);
286         return(NULL);
287     }
288     ret->flags=BN_FLG_MALLOCED;
289     ret->top=0;
290     ret->neg=0;
291     ret->dmax=0;
292     ret->d=NULL;
293     bn_check_top(ret);
294     return(ret);
295 }

297 /* This is used both by bn_expand2() and bn_dup_expand() */
298 /* The caller MUST check that words > b->dmax before calling this */
299 static BN_ULONG *bn_expand_internal(const BIGNUM *b, int words)
300 {
301     BN_ULONG *A, *a = NULL;
302     const BN_ULONG *B;
303     int i;

305     bn_check_top(b);

307     if (words > (INT_MAX/(4*BN_BITS2)))
308     {
309         BNerr(BN_F_BN_EXPAND_INTERNAL, BN_R_BIGNUM_TOO_LONG);
310         return NULL;
311     }
312     if (BN_get_flags(b, BN_FLG_STATIC_DATA))
313     {
314         BNerr(BN_F_BN_EXPAND_INTERNAL, BN_R_EXPAND_ON_STATIC_BIGNUM_DATA);
315         return(NULL);
316     }
317     a=A=(BN_ULONG *)OPENSSL_malloc(sizeof(BN_ULONG)*words);
318     if (A == NULL)
319     {
320         BNerr(BN_F_BN_EXPAND_INTERNAL, ERR_R_MALLOC_FAILURE);
321         return(NULL);
322     }
323 #if 1
324     B=b->d;
325     /* Check if the previous number needs to be copied */

```

```

326     if (B != NULL)
327     {
328         for (i=b->top>>2; i>0; i--,A+=4,B+=4)
329         {
330             /*
331              * The fact that the loop is unrolled
332              * 4-wise is a tribute to Intel. It's
333              * the one that doesn't have enough
334              * registers to accomodate more data.
335              * I'd unroll it 8-wise otherwise:-)
336              *
337              * <appro@fy.chalmers.se>
338              */
339             BN_ULONG a0,a1,a2,a3;
340             a0=B[0]; a1=B[1]; a2=B[2]; a3=B[3];
341             A[0]=a0; A[1]=a1; A[2]=a2; A[3]=a3;
342         }
343         switch (b->top&3)
344         {
345             case 3: A[2]=B[2];
346             case 2: A[1]=B[1];
347             case 1: A[0]=B[0];
348             case 0: /* workaround for ultrix cc: without 'case 0', the optim
349                    * the switch table by doing a=top&3; a--; goto jump_tab
350                    * which fails for top== 0 */
351                 ;
352             }
353     }

355 #else
356     memset(A, 0, sizeof(BN_ULONG)*words);
357     memcpy(A, b->d, sizeof(b->d[0])*b->top);
358 #endif

359     return(a);
361 }

363 /* This is an internal function that can be used instead of bn_expand2()
364  * when there is a need to copy BIGNUMs instead of only expanding the
365  * data part, while still expanding them.
366  * Especially useful when needing to expand BIGNUMs that are declared
367  * 'const' and should therefore not be changed.
368  * The reason to use this instead of a BN_dup() followed by a bn_expand2()
369  * is memory allocation overhead. A BN_dup() followed by a bn_expand2()
370  * will allocate new memory for the BIGNUM data twice, and free it once,
371  * while bn_dup_expand() makes sure allocation is made only once.
372  */

374 #ifndef OPENSSL_NO_DEPRECATED
375 BIGNUM *bn_dup_expand(const BIGNUM *b, int words)
376 {
377     BIGNUM *r = NULL;

379     bn_check_top(b);

381     /* This function does not work if
382      * words <= b->dmax && top < words
383      * because BN_dup() does not preserve 'dmax'!
384      * (But bn_dup_expand() is not used anywhere yet.)
385      */

387     if (words > b->dmax)
388     {
389         BN_ULONG *a = bn_expand_internal(b, words);

391         if (a)

```

```

392         {
393             r = BN_new();
394             if (r)
395             {
396                 r->top = b->top;
397                 r->dmax = words;
398                 r->neg = b->neg;
399                 r->d = a;
400             }
401         }
402         else
403         {
404             /* r == NULL, BN_new failure */
405             OPENSSL_free(a);
406         }
407     /* If a == NULL, there was an error in allocation in
408     bn_expand_internal(), and NULL should be returned */
409 }
410 else
411 {
412     r = BN_dup(b);
413 }
414
415 bn_check_top(r);
416 return r;
417 }
418 #endif
419
420 /* This is an internal function that should not be used in applications.
421 * It ensures that 'b' has enough room for a 'words' word number
422 * and initialises any unused part of b->d with leading zeros.
423 * It is mostly used by the various BIGNUM routines. If there is an error,
424 * NULL is returned. If not, 'b' is returned. */
425
426 BIGNUM *bn_expand2(BIGNUM *b, int words)
427 {
428     bn_check_top(b);
429
430     if (words > b->dmax)
431     {
432         BN_ULONG *a = bn_expand_internal(b, words);
433         if (!a) return NULL;
434         if (b->d) OPENSSL_free(b->d);
435         b->d = a;
436         b->dmax = words;
437     }
438
439     /* None of this should be necessary because of what b->top means! */
440     #if 0
441     /* NB: bn_wexpand() calls this only if the BIGNUM really has to grow */
442     if (b->top < b->dmax)
443     {
444         int i;
445         BN_ULONG *A = &(b->d[b->top]);
446         for (i = (b->dmax - b->top) >> 3; i > 0; i--, A += 8)
447         {
448             A[0] = 0; A[1] = 0; A[2] = 0; A[3] = 0;
449             A[4] = 0; A[5] = 0; A[6] = 0; A[7] = 0;
450         }
451         for (i = (b->dmax - b->top) & 7; i > 0; i--, A++)
452             A[0] = 0;
453         assert(A == &(b->d[b->dmax]));
454     }
455 #endif
456 bn_check_top(b);
457 return b;

```

```

458     }
459
460 BIGNUM *BN_dup(const BIGNUM *a)
461 {
462     BIGNUM *t;
463
464     if (a == NULL) return NULL;
465     bn_check_top(a);
466
467     t = BN_new();
468     if (t == NULL) return NULL;
469     if (!BN_copy(t, a))
470     {
471         BN_free(t);
472         return NULL;
473     }
474     bn_check_top(t);
475     return t;
476 }
477
478 BIGNUM *BN_copy(BIGNUM *a, const BIGNUM *b)
479 {
480     int i;
481     BN_ULONG *A;
482     const BN_ULONG *B;
483
484     bn_check_top(b);
485
486     if (a == b) return(a);
487     if (bn_wexpand(a, b->top) == NULL) return(NULL);
488
489     #if 1
490     A = a->d;
491     B = b->d;
492     for (i = b->top >> 2; i > 0; i--, A += 4, B += 4)
493     {
494         BN_ULONG a0, a1, a2, a3;
495         a0 = B[0]; a1 = B[1]; a2 = B[2]; a3 = B[3];
496         A[0] = a0; A[1] = a1; A[2] = a2; A[3] = a3;
497     }
498     switch (b->top & 3)
499     {
500         case 3: A[2] = B[2];
501         case 2: A[1] = B[1];
502         case 1: A[0] = B[0];
503         case 0: ; /* ultrix cc workaround, see comments in bn_expand_int */
504     }
505 #else
506     memcpy(a->d, b->d, sizeof(b->d[0]) * b->top);
507 #endif
508
509     a->top = b->top;
510     a->neg = b->neg;
511     bn_check_top(a);
512     return(a);
513 }
514
515 void BN_swap(BIGNUM *a, BIGNUM *b)
516 {
517     int flags_old_a, flags_old_b;
518     BN_ULONG *tmp_d;
519     int tmp_top, tmp_dmax, tmp_neg;
520
521     bn_check_top(a);
522     bn_check_top(b);

```

```

524     flags_old_a = a->flags;
525     flags_old_b = b->flags;

527     tmp_d = a->d;
528     tmp_top = a->top;
529     tmp_dmax = a->dmax;
530     tmp_neg = a->neg;
531
532     a->d = b->d;
533     a->top = b->top;
534     a->dmax = b->dmax;
535     a->neg = b->neg;
536
537     b->d = tmp_d;
538     b->top = tmp_top;
539     b->dmax = tmp_dmax;
540     b->neg = tmp_neg;
541
542     a->flags = (flags_old_a & BN_FLG_MALLOCED) | (flags_old_b & BN_FLG_STATIC_DATA);
543     b->flags = (flags_old_b & BN_FLG_MALLOCED) | (flags_old_a & BN_FLG_STATIC_DATA);
544     bn_check_top(a);
545     bn_check_top(b);
546 }

548 void BN_clear(BIGNUM *a)
549 {
550     bn_check_top(a);
551     if (a->d != NULL)
552         memset(a->d, 0, a->dmax*sizeof(a->d[0]));
553     a->top=0;
554     a->neg=0;
555 }

557 BN_ULONG BN_get_word(const BIGNUM *a)
558 {
559     if (a->top > 1)
560         return BN_MASK2;
561     else if (a->top == 1)
562         return a->d[0];
563     /* a->top == 0 */
564     return 0;
565 }

567 int BN_set_word(BIGNUM *a, BN_ULONG w)
568 {
569     bn_check_top(a);
570     if (bn_expand(a, (int)sizeof(BN_ULONG)*8) == NULL) return(0);
571     a->neg = 0;
572     a->d[0] = w;
573     a->top = (w ? 1 : 0);
574     bn_check_top(a);
575     return(1);
576 }

578 BIGNUM *BN_bin2bn(const unsigned char *s, int len, BIGNUM *ret)
579 {
580     unsigned int i,m;
581     unsigned int n;
582     BN_ULONG l;
583     BIGNUM *bn = NULL;

585     if (ret == NULL)
586         ret = bn = BN_new();
587     if (ret == NULL) return(NULL);
588     bn_check_top(ret);
589     l=0;

```

```

590     n=len;
591     if (n == 0)
592     {
593         ret->top=0;
594         return(ret);
595     }
596     i=((n-1)/BN_BYTES)+1;
597     m=((n-1)%(BN_BYTES));
598     if (bn_wexpand(ret, (int)i) == NULL)
599     {
600         if (bn) BN_free(bn);
601         return NULL;
602     }
603     ret->top=i;
604     ret->neg=0;
605     while (n-- > 0)
606     {
607         l=(l<<8L) | *(s++);
608         if (m-- == 0)
609         {
610             ret->d[--i]=l;
611             l=0;
612             m=BN_BYTES-1;
613         }
614     }
615     /* need to call this due to clear byte at top if avoiding
616      * having the top bit set (-ve number) */
617     bn_correct_top(ret);
618     return(ret);
619 }

621 /* ignore negative */
622 int BN_bn2bin(const BIGNUM *a, unsigned char *to)
623 {
624     int n,i;
625     BN_ULONG l;

627     bn_check_top(a);
628     n=i=BN_num_bytes(a);
629     while (i-- > 0)
630     {
631         l=a->d[i/BN_BYTES];
632         *(to++)=(unsigned char)(l>>(8*(i%BN_BYTES)))&0xff;
633     }
634     return(n);
635 }

637 int BN_ucmp(const BIGNUM *a, const BIGNUM *b)
638 {
639     int i;
640     BN_ULONG t1,t2,*ap,*bp;

642     bn_check_top(a);
643     bn_check_top(b);

645     i=a->top-b->top;
646     if (i != 0) return(i);
647     ap=a->d;
648     bp=b->d;
649     for (i=a->top-1; i>=0; i--)
650     {
651         t1= ap[i];
652         t2= bp[i];
653         if (t1 != t2)
654             return((t1 > t2) ? 1 : -1);
655     }

```

```

656     return(0);
657 }

659 int BN_cmp(const BIGNUM *a, const BIGNUM *b)
660 {
661     int i;
662     int gt, lt;
663     BN_ULONG t1, t2;

665     if ((a == NULL) || (b == NULL))
666     {
667         if (a != NULL)
668             return(-1);
669         else if (b != NULL)
670             return(1);
671         else
672             return(0);
673     }

675     bn_check_top(a);
676     bn_check_top(b);

678     if (a->neg != b->neg)
679     {
680         if (a->neg)
681             return(-1);
682         else
683             return(1);
684     }

685     if (a->neg == 0)
686     {
687         { gt=1; lt= -1; }
688     }
689     else
690     {
691         { gt= -1; lt=1; }
692     }

693     if (a->top > b->top) return(gt);
694     if (a->top < b->top) return(lt);
695     for (i=a->top-1; i>=0; i--)
696     {
697         t1=a->d[i];
698         t2=b->d[i];
699         if (t1 > t2) return(gt);
700         if (t1 < t2) return(lt);
701     }
702     return(0);

704 int BN_set_bit(BIGNUM *a, int n)
705 {
706     int i, j, k;

708     if (n < 0)
709         return 0;

711     i=n/BN_BITS2;
712     j=n%BN_BITS2;
713     if (a->top <= i)
714     {
715         if (bn_wexpand(a, i+1) == NULL) return(0);
716         for (k=a->top; k<i+1; k++)
717             a->d[k]=0;
718         a->top=i+1;
719     }

721     a->d[i]|=((BN_ULONG)1)<<j;
722     bn_check_top(a);
723     return(1);
724 }

```

```

722 int BN_clear_bit(BIGNUM *a, int n)
723 {
724     int i, j;

726     bn_check_top(a);
727     if (n < 0) return 0;

729     i=n/BN_BITS2;
730     j=n%BN_BITS2;
731     if (a->top <= i) return(0);

733     a->d[i]&=~(((BN_ULONG)1)<<j));
734     bn_check_top(a);
735     return(1);
736 }

738 int BN_is_bit_set(const BIGNUM *a, int n)
739 {
740     int i, j;

742     bn_check_top(a);
743     if (n < 0) return 0;
744     i=n/BN_BITS2;
745     j=n%BN_BITS2;
746     if (a->top <= i) return 0;
747     return ((a->d[i]>>j)&((BN_ULONG)1));
748 }

750 int BN_mask_bits(BIGNUM *a, int n)
751 {
752     int b, w;

754     bn_check_top(a);
755     if (n < 0) return 0;

757     w=n/BN_BITS2;
758     b=n%BN_BITS2;
759     if (w >= a->top) return 0;
760     if (b == 0)
761         a->top=w;
762     else
763     {
764         a->top=w+1;
765         a->d[w]&=~(BN_MASK2<<b);
766     }
767     bn_check_top(a);
768     return(1);
769 }

771 void BN_set_negative(BIGNUM *a, int b)
772 {
773     if (b && !BN_is_zero(a))
774         a->neg = 1;
775     else
776         a->neg = 0;
777 }

779 int bn_cmp_words(const BN_ULONG *a, const BN_ULONG *b, int n)
780 {
781     int i;
782     BN_ULONG aa, bb;

784     aa=a[n-1];
785     bb=b[n-1];
786     if (aa != bb) return((aa > bb)?1:-1);
787     for (i=n-2; i>=0; i--)

```

```

788     {
789         aa=a[i];
790         bb=b[i];
791         if (aa != bb) return((aa > bb)?1:-1);
792     }
793     return(0);
794 }

796 /* Here follows a specialised variants of bn_cmp_words(). It has the
797    property of performing the operation on arrays of different sizes.
798    The sizes of those arrays is expressed through cl, which is the
799    common length ( basically, min(len(a),len(b)) ), and dl, which is the
800    delta between the two lengths, calculated as len(a)-len(b).
801    All lengths are the number of BN_ULONGs... */

803 int bn_cmp_part_words(const BN_ULONG *a, const BN_ULONG *b,
804     int cl, int dl)
805 {
806     int n,i;
807     n = cl-1;

809     if (dl < 0)
810     {
811         for (i=dl; i<0; i++)
812             if (b[n-i] != 0)
813                 return -1; /* a < b */
814     }

816     if (dl > 0)
817     {
818         for (i=dl; i>0; i--)
819             if (a[n+i] != 0)
820                 return 1; /* a > b */
821     }

823     return bn_cmp_words(a,b,cl);
824 }

825
826

828 /*
829  * Constant-time conditional swap of a and b.
830  * a and b are swapped if condition is not 0. The code assumes that at most one
831  * nwords is the number of words to swap. The code assumes that at least nwords
832  * and that no more than nwords are used by either a or b.
833  * a and b cannot be the same number
834  */
835 void BN_consttime_swap(BN_ULONG condition, BIGNUM *a, BIGNUM *b, int nwords)
836 {
837     BN_ULONG t;
838     int i;

840     bn_wcheck_size(a, nwords);
841     bn_wcheck_size(b, nwords);

843     assert(a != b);
844     assert((condition & (condition - 1)) == 0);
845     assert(sizeof(BN_ULONG) >= sizeof(int));

847     condition = ((condition - 1) >> (BN_BITS2 - 1)) - 1;

849     t = (a->top^b->top) & condition;
850     a->top ^= t;
851     b->top ^= t;

853 #define BN_CONSTTIME_SWAP(ind) \

```

```

854     do { \
855         t = (a->d[ind] ^ b->d[ind]) & condition; \
856         a->d[ind] ^= t; \
857         b->d[ind] ^= t; \
858     } while (0)

861     switch (nwords) {
862     default:
863         for (i = 10; i < nwords; i++)
864             BN_CONSTTIME_SWAP(i);
865         /* Fallthrough */
866     case 10: BN_CONSTTIME_SWAP(9); /* Fallthrough */
867     case 9: BN_CONSTTIME_SWAP(8); /* Fallthrough */
868     case 8: BN_CONSTTIME_SWAP(7); /* Fallthrough */
869     case 7: BN_CONSTTIME_SWAP(6); /* Fallthrough */
870     case 6: BN_CONSTTIME_SWAP(5); /* Fallthrough */
871     case 5: BN_CONSTTIME_SWAP(4); /* Fallthrough */
872     case 4: BN_CONSTTIME_SWAP(3); /* Fallthrough */
873     case 3: BN_CONSTTIME_SWAP(2); /* Fallthrough */
874     case 2: BN_CONSTTIME_SWAP(1); /* Fallthrough */
875     case 1: BN_CONSTTIME_SWAP(0);
876     }
877 #undef BN_CONSTTIME_SWAP
878 }

```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mod.c

1

```
*****
9723 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mod.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/bn/bn_mod.c */
2 /* Includes code written by Lenka Fibikova <fibikova@exp-math.uni-essen.de>
3  * for the OpenSSL project. */
4 /* =====
5  * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
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8  * modification, are permitted provided that the following conditions
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45  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
46  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
47  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
48  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
49  * OF THE POSSIBILITY OF SUCH DAMAGE.
50  * =====
51  *
52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  *
56  */
57 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
58  * All rights reserved.
59  *
60  * This package is an SSL implementation written
61  * by Eric Young (eay@cryptsoft.com).
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mod.c

2

```
62 * The implementation was written so as to conform with Netscapes SSL.
63 *
64 * This library is free for commercial and non-commercial use as long as
65 * the following conditions are aheared to. The following conditions
66 * apply to all code found in this distribution, be it the RC4, RSA,
67 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
68 * included with this distribution is covered by the same copyright terms
69 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
70 *
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112 */
113
114 #include "cryptlib.h"
115 #include "bn_lcl.h"
116
117
118 #if 0 /* now just a #define */
119 int BN_mod(BIGNUM *rem, const BIGNUM *m, const BIGNUM *d, BN_CTX *ctx)
120 {
121     return(BN_div(NULL, rem, m, d, ctx));
122     /* note that rem->neg == m->neg (unless the remainder is zero) */
123 }
124 #endif
125
126
127 int BN_nnmod(BIGNUM *r, const BIGNUM *m, const BIGNUM *d, BN_CTX *ctx)
```

```

128     {
129     /* like BN_mod, but returns non-negative remainder
130     * (i.e., 0 <= r < |d| always holds) */
131
132     if (!(BN_mod(r,m,d,ctx)))
133         return 0;
134     if (!r->neg)
135         return 1;
136     /* now -|d| < r < 0, so we have to set r := r + |d| */
137     return (d->neg ? BN_sub : BN_add)(r, r, d);
138 }

141 int BN_mod_add(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *m, BN_
142 {
143     if (!BN_add(r, a, b)) return 0;
144     return BN_nnmod(r, r, m, ctx);
145 }

148 /* BN_mod_add variant that may be used if both a and b are non-negative
149 * and less than m */
150 int BN_mod_add_quick(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *
151 {
152     if (!BN_uadd(r, a, b)) return 0;
153     if (BN_ucmp(r, m) >= 0)
154         return BN_usub(r, r, m);
155     return 1;
156 }

159 int BN_mod_sub(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *m, BN_
160 {
161     if (!BN_sub(r, a, b)) return 0;
162     return BN_nnmod(r, r, m, ctx);
163 }

166 /* BN_mod_sub variant that may be used if both a and b are non-negative
167 * and less than m */
168 int BN_mod_sub_quick(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *
169 {
170     if (!BN_sub(r, a, b)) return 0;
171     if (r->neg)
172         return BN_add(r, r, m);
173     return 1;
174 }

177 /* slow but works */
178 int BN_mod_mul(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, const BIGNUM *m,
179 BN_CTX *ctx)
180 {
181     BIGNUM *t;
182     int ret=0;

184     bn_check_top(a);
185     bn_check_top(b);
186     bn_check_top(m);

188     BN_CTX_start(ctx);
189     if ((t = BN_CTX_get(ctx)) == NULL) goto err;
190     if (a == b)
191         { if (!BN_sqr(t,a,ctx)) goto err; }
192     else
193         { if (!BN_mul(t,a,b,ctx)) goto err; }

```

```

194     if (!BN_nnmod(r,t,m,ctx)) goto err;
195     bn_check_top(r);
196     ret=1;
197 err:
198     BN_CTX_end(ctx);
199     return(ret);
200 }

203 int BN_mod_sqr(BIGNUM *r, const BIGNUM *a, const BIGNUM *m, BN_CTX *ctx)
204 {
205     if (!BN_sqr(r, a, ctx)) return 0;
206     /* r->neg == 0, thus we don't need BN_nnmod */
207     return BN_mod(r, r, m, ctx);
208 }

211 int BN_mod_lshift1(BIGNUM *r, const BIGNUM *a, const BIGNUM *m, BN_CTX *ctx)
212 {
213     if (!BN_lshift1(r, a)) return 0;
214     bn_check_top(r);
215     return BN_nnmod(r, r, m, ctx);
216 }

219 /* BN_mod_lshift1 variant that may be used if a is non-negative
220 * and less than m */
221 int BN_mod_lshift1_quick(BIGNUM *r, const BIGNUM *a, const BIGNUM *m)
222 {
223     if (!BN_lshift1(r, a)) return 0;
224     bn_check_top(r);
225     if (BN_cmp(r, m) >= 0)
226         return BN_sub(r, r, m);
227     return 1;
228 }

231 int BN_mod_lshift(BIGNUM *r, const BIGNUM *a, int n, const BIGNUM *m, BN_CTX *ct
232 {
233     BIGNUM *abs_m = NULL;
234     int ret;

236     if (!BN_nnmod(r, a, m, ctx)) return 0;

238     if (m->neg)
239     {
240         abs_m = BN_dup(m);
241         if (abs_m == NULL) return 0;
242         abs_m->neg = 0;
243     }

244     ret = BN_mod_lshift_quick(r, r, n, (abs_m ? abs_m : m));
245     bn_check_top(r);

248     if (abs_m)
249         BN_free(abs_m);
250     return ret;
251 }

254 /* BN_mod_lshift variant that may be used if a is non-negative
255 * and less than m */
256 int BN_mod_lshift_quick(BIGNUM *r, const BIGNUM *a, int n, const BIGNUM *m)
257 {
258     if (r != a)
259     {

```



```
260     if (BN_copy(r, a) == NULL) return 0;
261 }
262
263 while (n > 0)
264 {
265     int max_shift;
266
267     /* 0 < r < m */
268     max_shift = BN_num_bits(m) - BN_num_bits(r);
269     /* max_shift >= 0 */
270
271     if (max_shift < 0)
272     {
273         BNerr(BN_F_BN_MOD_LSHIFT_QUICK, BN_R_INPUT_NOT_REDUCED);
274         return 0;
275     }
276
277     if (max_shift > n)
278         max_shift = n;
279
280     if (max_shift)
281     {
282         if (!BN_lshift(r, r, max_shift)) return 0;
283         n -= max_shift;
284     }
285     else
286     {
287         if (!BN_lshift1(r, r)) return 0;
288         --n;
289     }
290
291     /* BN_num_bits(r) <= BN_num_bits(m) */
292
293     if (BN_cmp(r, m) >= 0)
294     {
295         if (!BN_sub(r, r, m)) return 0;
296     }
297 }
298 bn_check_top(r);
299
300 return 1;
301 }
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mont.c

1

14690 Fri May 30 18:31:36 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mont.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mont.c

2

```
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110 */
111
112 /*
113 * Details about Montgomery multiplication algorithms can be found at
114 * http://security.ece.orst.edu/publications.html, e.g.
115 * http://security.ece.orst.edu/koc/papers/j37acmon.pdf and
116 * sections 3.8 and 4.2 in http://security.ece.orst.edu/koc/papers/r01rsasw.pdf
117 */
118
119 #include <stdio.h>
120 #include "cryptlib.h"
121 #include "bn_lcl.h"
122
123 #define MONT_WORD /* use the faster word-based algorithm */
124
125 #ifdef MONT_WORD
126 static int BN_from_montgomery_word(BIGNUM *ret, BIGNUM *r, BN_MONT_CTX *mont);
127 #endif
```

```

129 int BN_mod_mul_montgomery(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,
130                            BN_MONT_CTX *mont, BN_CTX *ctx)
131 {
132     BIGNUM *tmp;
133     int ret=0;
134 #if defined(OPENSSL_BN_ASM_MONT) && defined(MONT_WORD)
135     int num = mont->N.top;
136
137     if (num>1 && a->top==num && b->top==num)
138     {
139         if (bn_wexpand(r,num) == NULL) return(0);
140         if (bn_mul_mont(r->d,a->d,b->d,mont->N.d,mont->n0,num))
141         {
142             r->neg = a->neg^b->neg;
143             r->top = num;
144             bn_correct_top(r);
145             return(1);
146         }
147     }
148 #endif
149
150     BN_CTX_start(ctx);
151     tmp = BN_CTX_get(ctx);
152     if (tmp == NULL) goto err;
153
154     bn_check_top(tmp);
155     if (a == b)
156     {
157         if (!BN_sqr(tmp,a,ctx)) goto err;
158     }
159     else
160     {
161         if (!BN_mul(tmp,a,b,ctx)) goto err;
162     }
163     /* reduce from aRR to aR */
164 #ifdef MONT_WORD
165     if (!BN_from_montgomery_word(r,tmp,mont)) goto err;
166 #else
167     if (!BN_from_montgomery(r,tmp,mont,ctx)) goto err;
168 #endif
169     bn_check_top(r);
170     ret=1;
171 err:
172     BN_CTX_end(ctx);
173     return(ret);
174 }
175
176 #ifdef MONT_WORD
177 static int BN_from_montgomery_word(BIGNUM *ret, BIGNUM *r, BN_MONT_CTX *mont)
178 {
179     BIGNUM *n;
180     BN_ULONG *ap,*np,*rp,n0,v,carry;
181     int nl,max,i;
182
183     n = &(mont->N);
184     nl=n->top;
185     if (nl == 0) { ret->top=0; return(1); }
186
187     max=(2*nl); /* carry is stored separately */
188     if (bn_wexpand(r,max) == NULL) return(0);
189
190     r->neg^=n->neg;
191     np=n->d;
192     rp=r->d;

```

```

194     /* clear the top words of T */
195 #if 1
196     for (i=r->top; i<max; i++) /* memset? XXX */
197         rp[i]=0;
198 #else
199     memset(&(rp[r->top]),0,(max-r->top)*sizeof(BN_ULONG));
200 #endif
201
202     r->top=max;
203     n0=mont->n0[0];
204
205 #ifdef BN_COUNT
206     fprintf(stderr,"word BN_from_montgomery_word %d * %d\n",nl,nl);
207 #endif
208     for (carry=0, i=0; i<nl; i++, rp++)
209     {
210 #ifdef __TANDEM
211     {
212         long long t1;
213         long long t2;
214         long long t3;
215         t1 = rp[0] * (n0 & 0177777);
216         t2 = 037777600000l;
217         t2 = n0 & t2;
218         t3 = rp[0] & 0177777;
219         t2 = (t3 * t2) & BN_MASK2;
220         t1 = t1 + t2;
221         v=bn_mul_add_words(rp,np,nl,(BN_ULONG) t1);
222     }
223 #else
224         v=bn_mul_add_words(rp,np,nl,(rp[0]*n0)&BN_MASK2);
225 #endif
226         v = (v+carry+rp[nl])&BN_MASK2;
227         carry |= (v != rp[nl]);
228         carry &= (v <= rp[nl]);
229         rp[nl]=v;
230     }
231
232     if (bn_wexpand(ret,nl) == NULL) return(0);
233     ret->top=nl;
234     ret->neg=r->neg;
235
236     rp=ret->d;
237     ap=&(r->d[nl]);
238
239 #define BRANCH_FREE 1
240 #if BRANCH_FREE
241 {
242     BN_ULONG *nnp;
243     size_t m;
244
245     v=bn_sub_words(rp,ap,np,nl)-carry;
246     /* if subtraction result is real, then
247      * trick unconditional memcpy below to perform in-place
248      * "refresh" instead of actual copy. */
249     m=(0-(size_t)v);
250     nnp=(BN_ULONG *)(((PTR_SIZE_INT)rp&-m)|((PTR_SIZE_INT)ap&m));
251
252     for (i=0,nl-=4; i<nl; i+=4)
253     {
254         BN_ULONG t1,t2,t3,t4;
255
256         t1=nnp[i+0];
257         t2=nnp[i+1];
258         t3=nnp[i+2];    ap[i+0]=0;
259         t4=nnp[i+3];    ap[i+1]=0;

```

```

260         rp[i+0]=t1;    ap[i+2]=0;
261         rp[i+1]=t2;    ap[i+3]=0;
262         rp[i+2]=t3;
263         rp[i+3]=t4;
264     }
265     for (nl+=4; i<nl; i++)
266         rp[i]=nrp[i], ap[i]=0;
267     }
268 #else
269     if (bn_sub_words(rp,ap,np,nl)-carry)
270         memcpy(rp,ap,nl*sizeof(BN_ULONG));
271 #endif
272     bn_correct_top(r);
273     bn_correct_top(ret);
274     bn_check_top(ret);

276     return(1);
277 }
278 #endif /* MONT_WORD */

280 int BN_from_montgomery(BIGNUM *ret, const BIGNUM *a, BN_MONT_CTX *mont,
281     BN_CTX *ctx)
282 {
283     int retn=0;
284 #ifdef MONT_WORD
285     BIGNUM *t;

287     BN_CTX_start(ctx);
288     if ((t = BN_CTX_get(ctx)) && BN_copy(t,a))
289         retn = BN_from_montgomery_word(ret,t,mont);
290     BN_CTX_end(ctx);
291 #else /* !MONT_WORD */
292     BIGNUM *t1,*t2;

294     BN_CTX_start(ctx);
295     t1 = BN_CTX_get(ctx);
296     t2 = BN_CTX_get(ctx);
297     if (t1 == NULL || t2 == NULL) goto err;
298
299     if (!BN_copy(t1,a)) goto err;
300     BN_mask_bits(t1,mont->ri);

302     if (!BN_mul(t2,t1,&mont->Ni,ctx)) goto err;
303     BN_mask_bits(t2,mont->ri);

305     if (!BN_mul(t1,t2,&mont->N,ctx)) goto err;
306     if (!BN_add(t2,a,t1)) goto err;
307     if (!BN_rshift(ret,t2,mont->ri)) goto err;

309     if (BN_ucmp(ret, &(mont->N)) >= 0)
310     {
311         if (!BN_usub(ret,ret,&(mont->N))) goto err;
312     }
313     retn=1;
314     bn_check_top(ret);
315 err:
316     BN_CTX_end(ctx);
317 #endif /* MONT_WORD */
318     return(retn);
319 }

321 BN_MONT_CTX *BN_MONT_CTX_new(void)
322 {
323     BN_MONT_CTX *ret;

325     if ((ret=(BN_MONT_CTX *)OPENSSL_malloc(sizeof(BN_MONT_CTX))) == NULL)

```

```

326     return(NULL);

328     BN_MONT_CTX_init(ret);
329     ret->flags=BN_FLG_MALLOCED;
330     return(ret);
331 }

333 void BN_MONT_CTX_init(BN_MONT_CTX *ctx)
334 {
335     ctx->ri=0;
336     BN_init(&(ctx->RR));
337     BN_init(&(ctx->N));
338     BN_init(&(ctx->Ni));
339     ctx->n0[0] = ctx->n0[1] = 0;
340     ctx->flags=0;
341 }

343 void BN_MONT_CTX_free(BN_MONT_CTX *mont)
344 {
345     if(mont == NULL)
346         return;

348     BN_free(&(mont->RR));
349     BN_free(&(mont->N));
350     BN_free(&(mont->Ni));
351     if (mont->flags & BN_FLG_MALLOCED)
352         OPENSSL_free(mont);
353 }

355 int BN_MONT_CTX_set(BN_MONT_CTX *mont, const BIGNUM *mod, BN_CTX *ctx)
356 {
357     int ret = 0;
358     BIGNUM *Ri,*R;

360     BN_CTX_start(ctx);
361     if((Ri = BN_CTX_get(ctx)) == NULL) goto err;
362     R = &(mont->RR);
363     if (!BN_copy(&(mont->N),mod)) goto err; /* grab RR as a temp */
364     mont->N.neg = 0; /* Set N */

366 #ifdef MONT_WORD
367     {
368         BIGNUM tmod;
369         BN_ULONG buf[2];

371         BN_init(&tmod);
372         tmod.d=buf;
373         tmod.dmax=2;
374         tmod.neg=0;

376         mont->ri=(BN_num_bits(mod)+(BN_BITS2-1))/BN_BITS2*BN_BITS2;

378 #if defined(OPENSSL_BN_ASM_MONT) && (BN_BITS2<=32)
379         /* Only certain BN_BITS2<=32 platforms actually make use of
380          * n0[1], and we could use the #else case (with a shorter R
381          * value) for the others. However, currently only the assembler
382          * files do know which is which. */

384         BN_zero(R);
385         if (!(BN_set_bit(R,2*BN_BITS2))) goto err;

387         if ((buf[0] = mod->d[0])) tmod.top=0;
388         if ((buf[1] = mod->top>1 ? mod->d[1] : 0)) tmod.top=1;
389         tmod.top=2;

391         if ((BN_mod_inverse(Ri,R,&tmod,ctx)) == NULL)

```

```

392         goto err;
393         if (!BN_lshift(Ri,Ri,2*BN_BITS2)) goto err; /* R*Ri */
394         if (!BN_is_zero(Ri))
395         {
396             if (!BN_sub_word(Ri,1)) goto err;
397         }
398         else /* if N mod word size == 1 */
399         {
400             if (bn_expand(Ri,(int)sizeof(BN_ULONG)*2) == NULL)
401                 goto err;
402             /* Ri-- (mod double word size) */
403             Ri->neg=0;
404             Ri->d[0]=BN_MASK2;
405             Ri->d[1]=BN_MASK2;
406             Ri->top=2;
407         }
408         if (!BN_div(Ri,NULL,Ri,&tmod,ctx)) goto err;
409         /* Ni = (R*Ri-1)/N,
410          * keep only couple of least significant words: */
411         mont->n0[0] = (Ri->top > 0) ? Ri->d[0] : 0;
412         mont->n0[1] = (Ri->top > 1) ? Ri->d[1] : 0;
413     #else
414         BN_zero(R);
415         if (!(BN_set_bit(R,BN_BITS2))) goto err; /* R */
416
417         buf[0]=mod->d[0]; /* tmod = N mod word size */
418         buf[1]=0;
419         tmod.top = buf[0] != 0 ? 1 : 0;
420         /* Ri = R^-1 mod N */
421         if ((BN_mod_inverse(Ri,R,&tmod,ctx)) == NULL)
422             goto err;
423         if (!BN_lshift(Ri,Ri,BN_BITS2)) goto err; /* R*Ri */
424         if (!BN_is_zero(Ri))
425         {
426             if (!BN_sub_word(Ri,1)) goto err;
427         }
428         else /* if N mod word size == 1 */
429         {
430             if (!BN_set_word(Ri,BN_MASK2)) goto err; /* Ri-- (mod w)
431         }
432         if (!BN_div(Ri,NULL,Ri,&tmod,ctx)) goto err;
433         /* Ni = (R*Ri-1)/N,
434          * keep only least significant word: */
435         mont->n0[0] = (Ri->top > 0) ? Ri->d[0] : 0;
436         mont->n0[1] = 0;
437     #endif
438 }
439 #else /* !MONT_WORD */
440 { /* bignum version */
441     mont->ri=BN_num_bits(&mont->N);
442     BN_zero(R);
443     if (!BN_set_bit(R, mont->ri)) goto err; /* R = 2^ri */
444     /* Ri = R^-1 mod N */
445     if ((BN_mod_inverse(Ri,R,&mont->N,ctx)) == NULL)
446         goto err;
447     if (!BN_lshift(Ri,Ri, mont->ri)) goto err; /* R*Ri */
448     if (!BN_sub_word(Ri,1)) goto err;
449     /* Ni = (R*Ri-1) / N */
450     if (!BN_div(&(mont->Ni), NULL, Ri, &mont->N, ctx)) goto err;
451 }
452 #endif
453
454 /* setup RR for conversions */
455 BN_zero(&(mont->RR));
456 if (!BN_set_bit(&(mont->RR), mont->ri*2)) goto err;
457 if (!BN_mod(&(mont->RR), &(mont->RR), &(mont->N), ctx)) goto err;

```

```

459     ret = 1;
460 err:
461     BN_CTX_end(ctx);
462     return ret;
463 }
464
465 BN_MONT_CTX *BN_MONT_CTX_copy(BN_MONT_CTX *to, BN_MONT_CTX *from)
466 {
467     if (to == from) return(to);
468
469     if (!BN_copy(&(to->RR), &(from->RR))) return NULL;
470     if (!BN_copy(&(to->N), &(from->N))) return NULL;
471     if (!BN_copy(&(to->Ni), &(from->Ni))) return NULL;
472     to->ri=from->ri;
473     to->n0[0]=from->n0[0];
474     to->n0[1]=from->n0[1];
475     return(to);
476 }
477
478 BN_MONT_CTX *BN_MONT_CTX_set_locked(BN_MONT_CTX **pmont, int lock,
479                                     const BIGNUM *mod, BN_CTX *ctx)
480 {
481     int got_write_lock = 0;
482     BN_MONT_CTX *ret;
483
484     CRYPTO_r_lock(lock);
485     if (!*pmont)
486     {
487         CRYPTO_r_unlock(lock);
488         CRYPTO_w_lock(lock);
489         got_write_lock = 1;
490
491         if (!*pmont)
492         {
493             ret = BN_MONT_CTX_new();
494             if (ret && !BN_MONT_CTX_set(ret, mod, ctx))
495                 BN_MONT_CTX_free(ret);
496             else
497                 *pmont = ret;
498         }
499     }
500
501     ret = *pmont;
502
503     if (got_write_lock)
504         CRYPTO_w_unlock(lock);
505     else
506         CRYPTO_r_unlock(lock);
507
508     return ret;
509 }

```

```

*****
4364 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mpi.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bn/bn_mpi.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include "bn_lcl.h"

```

```

63 int BN_bn2mpi(const BIGNUM *a, unsigned char *d)
64 {
65     int bits;
66     int num=0;
67     int ext=0;
68     long l;
69
70     bits=BN_num_bits(a);
71     num=(bits+7)/8;
72     if (bits > 0)
73     {
74         ext=((bits & 0x07) == 0);
75     }
76     if (d == NULL)
77         return(num+4+ext);
78
79     l=num+ext;
80     d[0]=(unsigned char)(l>>24)&0xff;
81     d[1]=(unsigned char)(l>>16)&0xff;
82     d[2]=(unsigned char)(l>> 8)&0xff;
83     d[3]=(unsigned char)(l    )&0xff;
84     if (ext) d[4]=0;
85     num=BN_bn2bin(a,&d[4+ext]);
86     if (a->neg)
87         d[4]=0x80;
88     return(num+4+ext);
89 }
90
91 BIGNUM *BN_mpi2bn(const unsigned char *d, int n, BIGNUM *a)
92 {
93     long len;
94     int neg=0;
95
96     if (n < 4)
97     {
98         BNerr(BN_F_BN_MPI2BN,BN_R_INVALID_LENGTH);
99         return(NULL);
100     }
101     len=((long)d[0]<<24)|((long)d[1]<<16)|((int)d[2]<<8)|(int)d[3];
102     if ((len+4) != n)
103     {
104         BNerr(BN_F_BN_MPI2BN,BN_R_ENCODING_ERROR);
105         return(NULL);
106     }
107
108     if (a == NULL) a=BN_new();
109     if (a == NULL) return(NULL);
110
111     if (len == 0)
112     {
113         a->neg=0;
114         a->top=0;
115         return(a);
116     }
117     d+=4;
118     if ((*d) & 0x80)
119         neg=1;
120     if (BN_bin2bn(d,(int)len,a) == NULL)
121         return(NULL);
122     a->neg=neg;
123     if (neg)
124     {
125         BN_clear_bit(a,BN_num_bits(a)-1);
126     }
127     bn_check_top(a);

```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mpi.c

3

```
128     return(a);  
129 }
```

```

*****
25370 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_mul.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bn/bn_mul.c */
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #ifndef BN_DEBUG
60 # undef NDEBUG /* avoid conflicting definitions */
61 # define NDEBUG

```

```

62 #endif
63
64 #include <stdio.h>
65 #include <assert.h>
66 #include "cryptlib.h"
67 #include "bn_lcl.h"
68
69 #if defined(OPENSSL_NO_ASM) || !defined(OPENSSL_BN_ASM_PART_WORDS)
70 /* Here follows specialised variants of bn_add_words() and
71  * bn_sub_words(). They have the property performing operations on
72  * arrays of different sizes. The sizes of those arrays is expressed through
73  * cl, which is the common length ( basically, min(len(a),len(b)) ), and dl,
74  * which is the delta between the two lengths, calculated as len(a)-len(b).
75  * All lengths are the number of BN_ULONGs... For the operations that require
76  * a result array as parameter, it must have the length cl+abs(dl).
77  * These functions should probably end up in bn_asm.c as soon as there are
78  * assembler counterparts for the systems that use assembler files. */
79
80 BN_ULONG bn_sub_part_words(BN_ULONG *r,
81  const BN_ULONG *a, const BN_ULONG *b,
82  int cl, int dl)
83 {
84  BN_ULONG c, t;
85
86  assert(cl >= 0);
87  c = bn_sub_words(r, a, b, cl);
88
89  if (dl == 0)
90  return c;
91
92  r += cl;
93  a += cl;
94  b += cl;
95
96  if (dl < 0)
97  {
98  #ifdef BN_COUNT
99  fprintf(stderr, " bn_sub_part_words %d + %d (dl < 0, c = %d)\n"
100 #endif
101  for (;;)
102  {
103  t = b[0];
104  r[0] = (0-t-c)&BN_MASK2;
105  if (t != 0) c=1;
106  if (++dl >= 0) break;
107
108  t = b[1];
109  r[1] = (0-t-c)&BN_MASK2;
110  if (t != 0) c=1;
111  if (++dl >= 0) break;
112
113  t = b[2];
114  r[2] = (0-t-c)&BN_MASK2;
115  if (t != 0) c=1;
116  if (++dl >= 0) break;
117
118  t = b[3];
119  r[3] = (0-t-c)&BN_MASK2;
120  if (t != 0) c=1;
121  if (++dl >= 0) break;
122
123  b += 4;
124  r += 4;
125  }
126  }
127  else

```



```

128     {
129         int save_dl = dl;
130 #ifdef BN_COUNT
131         fprintf(stderr, "  bn_sub_part_words %d + %d (dl > 0, c = %d)\n"
132 #endif
133         while(c)
134         {
135             t = a[0];
136             r[0] = (t-c)&BN_MASK2;
137             if (t != 0) c=0;
138             if (--dl <= 0) break;
139
140             t = a[1];
141             r[1] = (t-c)&BN_MASK2;
142             if (t != 0) c=0;
143             if (--dl <= 0) break;
144
145             t = a[2];
146             r[2] = (t-c)&BN_MASK2;
147             if (t != 0) c=0;
148             if (--dl <= 0) break;
149
150             t = a[3];
151             r[3] = (t-c)&BN_MASK2;
152             if (t != 0) c=0;
153             if (--dl <= 0) break;
154
155             save_dl = dl;
156             a += 4;
157             r += 4;
158         }
159         if (dl > 0)
160         {
161 #ifdef BN_COUNT
162             fprintf(stderr, "  bn_sub_part_words %d + %d (dl > 0, c
163 #endif
164             if (save_dl > dl)
165             {
166                 switch (save_dl - dl)
167                 {
168                     case 1:
169                         r[1] = a[1];
170                         if (--dl <= 0) break;
171                     case 2:
172                         r[2] = a[2];
173                         if (--dl <= 0) break;
174                     case 3:
175                         r[3] = a[3];
176                         if (--dl <= 0) break;
177                 }
178                 a += 4;
179                 r += 4;
180             }
181         }
182         if (dl > 0)
183         {
184 #ifdef BN_COUNT
185             fprintf(stderr, "  bn_sub_part_words %d + %d (dl > 0, co
186 #endif
187             for(;;)
188             {
189                 r[0] = a[0];
190                 if (--dl <= 0) break;
191                 r[1] = a[1];
192                 if (--dl <= 0) break;
193                 r[2] = a[2];

```

```

194             if (--dl <= 0) break;
195             r[3] = a[3];
196             if (--dl <= 0) break;
197
198             a += 4;
199             r += 4;
200         }
201     }
202     }
203     return c;
204 }
205 #endif
206
207 BN_ULONG bn_add_part_words(BN_ULONG *r,
208                             const BN_ULONG *a, const BN_ULONG *b,
209                             int cl, int dl)
210 {
211     BN_ULONG c, l, t;
212
213     assert(cl >= 0);
214     c = bn_add_words(r, a, b, cl);
215
216     if (dl == 0)
217         return c;
218
219     r += cl;
220     a += cl;
221     b += cl;
222
223     if (dl < 0)
224     {
225         int save_dl = dl;
226 #ifdef BN_COUNT
227         fprintf(stderr, "  bn_add_part_words %d + %d (dl < 0, c = %d)\n"
228 #endif
229         while (c)
230         {
231             l=(c+b[0])&BN_MASK2;
232             c=(l < c);
233             r[0]=l;
234             if (++dl >= 0) break;
235
236             l=(c+b[1])&BN_MASK2;
237             c=(l < c);
238             r[1]=l;
239             if (++dl >= 0) break;
240
241             l=(c+b[2])&BN_MASK2;
242             c=(l < c);
243             r[2]=l;
244             if (++dl >= 0) break;
245
246             l=(c+b[3])&BN_MASK2;
247             c=(l < c);
248             r[3]=l;
249             if (++dl >= 0) break;
250
251             save_dl = dl;
252             b+=4;
253             r+=4;
254         }
255         if (dl < 0)
256         {
257 #ifdef BN_COUNT
258             fprintf(stderr, "  bn_add_part_words %d + %d (dl < 0, c
259 #endif

```

```

260         if (save_dl < dl)
261         {
262             switch (dl - save_dl)
263             {
264                 case 1:
265                     r[1] = b[1];
266                     if (++dl >= 0) break;
267                 case 2:
268                     r[2] = b[2];
269                     if (++dl >= 0) break;
270                 case 3:
271                     r[3] = b[3];
272                     if (++dl >= 0) break;
273             }
274             b += 4;
275             r += 4;
276         }
277     }
278     if (dl < 0)
279     {
280 #ifdef BN_COUNT
281         fprintf(stderr, " bn_add_part_words %d + %d (dl < 0, co
282 #endif
283         for(;;)
284         {
285             r[0] = b[0];
286             if (++dl >= 0) break;
287             r[1] = b[1];
288             if (++dl >= 0) break;
289             r[2] = b[2];
290             if (++dl >= 0) break;
291             r[3] = b[3];
292             if (++dl >= 0) break;
293
294             b += 4;
295             r += 4;
296         }
297     }
298     else
299     {
300         int save_dl = dl;
301 #ifdef BN_COUNT
302         fprintf(stderr, " bn_add_part_words %d + %d (dl > 0)\n", cl, dl
303 #endif
304         while (c)
305         {
306             t=(a[0]+c)&BN_MASK2;
307             c=(t < c);
308             r[0]=t;
309             if (--dl <= 0) break;
310
311             t=(a[1]+c)&BN_MASK2;
312             c=(t < c);
313             r[1]=t;
314             if (--dl <= 0) break;
315
316             t=(a[2]+c)&BN_MASK2;
317             c=(t < c);
318             r[2]=t;
319             if (--dl <= 0) break;
320
321             t=(a[3]+c)&BN_MASK2;
322             c=(t < c);
323             r[3]=t;
324             if (--dl <= 0) break;
325

```

```

327         save_dl = dl;
328         a+=4;
329         r+=4;
330     }
331 #ifdef BN_COUNT
332     fprintf(stderr, " bn_add_part_words %d + %d (dl > 0, c == 0)\n"
333 #endif
334     if (dl > 0)
335     {
336         if (save_dl > dl)
337         {
338             switch (save_dl - dl)
339             {
340                 case 1:
341                     r[1] = a[1];
342                     if (--dl <= 0) break;
343                 case 2:
344                     r[2] = a[2];
345                     if (--dl <= 0) break;
346                 case 3:
347                     r[3] = a[3];
348                     if (--dl <= 0) break;
349             }
350             a += 4;
351             r += 4;
352         }
353     }
354     if (dl > 0)
355     {
356 #ifdef BN_COUNT
357         fprintf(stderr, " bn_add_part_words %d + %d (dl > 0, co
358 #endif
359         for(;;)
360         {
361             r[0] = a[0];
362             if (--dl <= 0) break;
363             r[1] = a[1];
364             if (--dl <= 0) break;
365             r[2] = a[2];
366             if (--dl <= 0) break;
367             r[3] = a[3];
368             if (--dl <= 0) break;
369
370             a += 4;
371             r += 4;
372         }
373     }
374     return c;
375 }
376
377 #ifdef BN_RECURSION
378 /* Karatsuba recursive multiplication algorithm
379 * (cf. Knuth, The Art of Computer Programming, Vol. 2) */
380
381 /* r is 2*n2 words in size,
382 * a and b are both n2 words in size.
383 * n2 must be a power of 2.
384 * We multiply and return the result.
385 * t must be 2*n2 words in size
386 * We calculate
387 * a[0]*b[0]
388 * a[0]*b[0]+a[1]*b[1]+(a[0]-a[1])*(b[1]-b[0])
389 * a[1]*b[0]
390 * a[1]*b[1]
391 */

```

```

392 /* dnx may not be positive, but n2/2+dnx has to be */
393 void bn_mul_recursive(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b, int n2,
394     int dna, int dnb, BN_ULONG *t)
395 {
396     int n=n2/2,c1,c2;
397     int tna=n+dna, tnb=n+dnb;
398     unsigned int neg,zero;
399     BN_ULONG ln,lo,*p;

401 # ifdef BN_COUNT
402     fprintf(stderr," bn_mul_recursive %d+d * %d+d\n",n2,dna,n2,dnb);
403 # endif
404 # ifdef BN_MUL_COMBA
405 # if 0
406     if (n2 == 4)
407     {
408         bn_mul_comba4(r,a,b);
409         return;
410     }
411 # endif
412 /* Only call bn_mul_comba 8 if n2 == 8 and the
413  * two arrays are complete [steve]
414  */
415     if (n2 == 8 && dna == 0 && dnb == 0)
416     {
417         bn_mul_comba8(r,a,b);
418         return;
419     }
420 # endif /* BN_MUL_COMBA */
421 /* Else do normal multiply */
422     if (n2 < BN_MUL_RECURSIVE_SIZE_NORMAL)
423     {
424         bn_mul_normal(r,a,n2+dna,b,n2+dnb);
425         if ((dna + dnb) < 0)
426             memset(&r[2*n2 + dna + dnb], 0,
427                 sizeof(BN_ULONG) * -(dna + dnb));
428         return;
429     }
430 /* r=[a[0]-a[1]]*(b[1]-b[0]) */
431     c1=bn_cmp_part_words(a,&(a[n]),tna,n-tna);
432     c2=bn_cmp_part_words(&(b[n]),b,tnb,tnb-n);
433     zero=neg=0;
434     switch (c1*3+c2)
435     {
436     case -4:
437         bn_sub_part_words(t,&(a[n]),a,tna,tna-n); /* - */
438         bn_sub_part_words(&(t[n]),b,&(b[n]),tnb,n-tnb); /* - */
439         break;
440     case -3:
441         zero=1;
442         break;
443     case -2:
444         bn_sub_part_words(t,&(a[n]),a,tna,tna-n); /* - */
445         bn_sub_part_words(&(t[n]),&(b[n]),b,tnb,tnb-n); /* + */
446         neg=1;
447         break;
448     case -1:
449     case 0:
450     case 1:
451         zero=1;
452         break;
453     case 2:
454         bn_sub_part_words(t,a,&(a[n]),tna,n-tna); /* + */
455         bn_sub_part_words(&(t[n]),b,&(b[n]),tnb,n-tnb); /* - */
456         neg=1;
457         break;

```

```

458     case 3:
459         zero=1;
460         break;
461     case 4:
462         bn_sub_part_words(t,a,&(a[n]),tna,n-tna);
463         bn_sub_part_words(&(t[n]),&(b[n]),b,tnb,tnb-n);
464         break;
465     }

467 # ifdef BN_MUL_COMBA
468     if (n == 4 && dna == 0 && dnb == 0) /* XXX: bn_mul_comba4 could take
469                                         extra args to do this well */
470     {
471         if (!zero)
472             bn_mul_comba4(&(t[n2]),t,&(t[n]));
473         else
474             memset(&(t[n2]),0,8*sizeof(BN_ULONG));
475
476         bn_mul_comba4(r,a,b);
477         bn_mul_comba4(&(r[n2]),&(a[n]),&(b[n]));
478     }
479     else if (n == 8 && dna == 0 && dnb == 0) /* XXX: bn_mul_comba8 could
480                                             take extra args to do this
481                                             well */
482     {
483         if (!zero)
484             bn_mul_comba8(&(t[n2]),t,&(t[n]));
485         else
486             memset(&(t[n2]),0,16*sizeof(BN_ULONG));
487
488         bn_mul_comba8(r,a,b);
489         bn_mul_comba8(&(r[n2]),&(a[n]),&(b[n]));
490     }
491     else
492 # endif /* BN_MUL_COMBA */
493     {
494         p=&(t[n2*2]);
495         if (!zero)
496             bn_mul_recursive(&(t[n2]),t,&(t[n]),n,0,0,p);
497         else
498             memset(&(t[n2]),0,n2*sizeof(BN_ULONG));
499         bn_mul_recursive(r,a,b,n,0,0,p);
500         bn_mul_recursive(&(r[n2]),&(a[n]),&(b[n]),n,dna,dnb,p);
501     }

503 /* t[32] holds (a[0]-a[1])*(b[1]-b[0]), c1 is the sign
504  * r[10] holds (a[0]*b[0])
505  * r[32] holds (b[1]*b[1])
506  */

508     c1=(int)(bn_add_words(t,r,&(r[n2]),n2));

510     if (neg) /* if t[32] is negative */
511     {
512         c1-=(int)(bn_sub_words(&(t[n2]),t,&(t[n2]),n2));
513     }
514     else
515     {
516         /* Might have a carry */
517         c1+=(int)(bn_add_words(&(t[n2]),&(t[n2]),t,n2));
518     }

520 /* t[32] holds (a[0]-a[1])*(b[1]-b[0])+(a[0]*b[0])+(a[1]*b[1])
521  * r[10] holds (a[0]*b[0])
522  * r[32] holds (b[1]*b[1])
523  * c1 holds the carry bits

```

```

524      /*
525      c1+=(int)(bn_add_words(&(r[n]),&(r[n]),&(t[n2]),n2));
526      if (c1)
527      {
528          p= &(r[n+n2]);
529          lo= *p;
530          ln=(lo+c1)&BN_MASK2;
531          *p=ln;

533          /* The overflow will stop before we over write
534          * words we should not overwrite */
535          if (ln < (BN_ULONG)c1)
536          {
537              do
538              {
539                  p++;
540                  lo= *p;
541                  ln=(lo+1)&BN_MASK2;
542                  *p=ln;
543              } while (ln == 0);
544          }
545      }

547  /* n+tn is the word length
548  * t needs to be n*4 is size, as does r */
549  /* tnX may not be negative but less than n */
550  void bn_mul_part_recursive(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b, int n,
551      int tna, int tnb, BN_ULONG *t)
552  {
553      int i,j,n2=n*2;
554      int c1,c2,neg;
555      BN_ULONG ln,lo,*p;

557  # ifdef BN_COUNT
558      fprintf(stderr," bn_mul_part_recursive (%d%d) * (%d%d)\n",
559          n, tna, n, tnb);
560  # endif
561      if (n < 8)
562      {
563          bn_mul_normal(r,a,n+tna,b,n+tnb);
564          return;
565      }

567      /* r=(a[0]-a[1])*(b[1]-b[0]) */
568      c1=bn_cmp_part_words(a,&(a[n]),tna,n-tna);
569      c2=bn_cmp_part_words(&(b[n]),b,tnb,tnb-n);
570      neg=0;
571      switch (c1*3+c2)
572      {
573      case -4:
574          bn_sub_part_words(t, &(a[n]),a, tna,tna-n); /* - */
575          bn_sub_part_words(&(t[n]),b, &(b[n]),tnb,n-tnb); /* - */
576          break;
577      case -3:
578          /* break; */
579      case -2:
580          bn_sub_part_words(t, &(a[n]),a, tna,tna-n); /* - */
581          bn_sub_part_words(&(t[n]),&(b[n]),b, tnb,tnb-n); /* + */
582          neg=1;
583          break;
584      case -1:
585      case 0:
586      case 1:
587          /* break; */
588      case 2:
589          bn_sub_part_words(t, a, &(a[n]),tna,n-tna); /* + */

```

```

590          bn_sub_part_words(&(t[n]),b, &(b[n]),tnb,n-tnb); /* - */
591          neg=1;
592          break;
593      case 3:
594          /* break; */
595      case 4:
596          bn_sub_part_words(t, a, &(a[n]),tna,n-tna);
597          bn_sub_part_words(&(t[n]),&(b[n]),b, tnb,tnb-n);
598          break;
599      }
600      /* The zero case isn't yet implemented here. The speedup
601      would probably be negligible. */
602  # if 0
603      if (n == 4)
604      {
605          bn_mul_comba4(&(t[n2]),t,&(t[n]));
606          bn_mul_comba4(r,a,b);
607          bn_mul_normal(&(r[n2]),&(a[n]),tn,&(b[n]),tn);
608          memset(&(r[n2+tn*2]),0,sizeof(BN_ULONG)*(n2-tn*2));
609      }
610      else
611  # endif
612      if (n == 8)
613      {
614          bn_mul_comba8(&(t[n2]),t,&(t[n]));
615          bn_mul_comba8(r,a,b);
616          bn_mul_normal(&(r[n2]),&(a[n]),tna,&(b[n]),tnb);
617          memset(&(r[n2+tna+tnb]),0,sizeof(BN_ULONG)*(n2-tna-tnb));
618      }
619      else
620      {
621          p= &(t[n2*2]);
622          bn_mul_recursive(&(t[n2]),t,&(t[n]),n,0,0,p);
623          bn_mul_recursive(r,a,b,n,0,0,p);
624          i=n/2;
625          /* If there is only a bottom half to the number,
626          * just do it */
627          if (tna > tnb)
628              j = tna - i;
629          else
630              j = tnb - i;
631          if (j == 0)
632          {
633              bn_mul_recursive(&(r[n2]),&(a[n]),&(b[n]),
634                  i,tna-i,tnb-i,p);
635              memset(&(r[n2+i*2]),0,sizeof(BN_ULONG)*(n2-i*2));
636          }
637          else if (j > 0) /* eg, n == 16, i == 8 and tn == 11 */
638          {
639              bn_mul_part_recursive(&(r[n2]),&(a[n]),&(b[n]),
640                  i,tna-i,tnb-i,p);
641              memset(&(r[n2+tna+tnb]),0,
642                  sizeof(BN_ULONG)*(n2-tna-tnb));
643          }
644          else /* (j < 0) eg, n == 16, i == 8 and tn == 5 */
645          {
646              memset(&(r[n2]),0,sizeof(BN_ULONG)*n2);
647              if (tna < BN_MUL_RECURSIVE_SIZE_NORMAL
648                  && tnb < BN_MUL_RECURSIVE_SIZE_NORMAL)
649              {
650                  bn_mul_normal(&(r[n2]),&(a[n]),tna,&(b[n]),tnb);
651              }
652              else
653              {
654                  for (;;)
655              {

```

```

656         i/=2;
657         /* these simplified conditions work
658          * exclusively because difference
659          * between tna and tnb is 1 or 0 */
660         if (i < tna || i < tnb)
661         {
662             bn_mul_part_recursive(&(r[n2]),
663                                   &(a[n]), &(b[n]),
664                                   i, tna-i, tnb-i, p);
665             break;
666         }
667         else if (i == tna || i == tnb)
668         {
669             bn_mul_recursive(&(r[n2]),
670                              &(a[n]), &(b[n]),
671                              i, tna-i, tnb-i, p);
672             break;
673         }
674     }
675 }
676 }
677
679 /* t[32] holds (a[0]-a[1])*(b[1]-b[0]), c1 is the sign
680  * r[10] holds (a[0]*b[0])
681  * r[32] holds (b[1]*b[1])
682  */
684 c1=(int)(bn_add_words(t,r,&(r[n2]),n2));
686 if (neg) /* if t[32] is negative */
687 {
688     c1=(int)(bn_sub_words(&(t[n2]),t,&(t[n2]),n2));
689 }
690 else
691 {
692     /* Might have a carry */
693     c1+=(int)(bn_add_words(&(t[n2]),&(t[n2]),t,n2));
694 }
696 /* t[32] holds (a[0]-a[1])*(b[1]-b[0])+(a[0]*b[0])+(a[1]*b[1])
697  * r[10] holds (a[0]*b[0])
698  * r[32] holds (b[1]*b[1])
699  * c1 holds the carry bits
700  */
701 c1+=(int)(bn_add_words(&(r[n]),&(r[n]),&(t[n2]),n2));
702 if (c1)
703 {
704     p= &(r[n+n2]);
705     lo= *p;
706     ln=(lo+c1)&BN_MASK2;
707     *p=ln;
709     /* The overflow will stop before we over write
710      * words we should not overwrite */
711     if (ln < (BN_ULONG)c1)
712     {
713         do
714         {
715             p++;
716             lo= *p;
717             ln=(lo+1)&BN_MASK2;
718             *p=ln;
719         } while (ln == 0);
720     }
721 }

```

```

723 /* a and b must be the same size, which is n2.
724  * r needs to be n2 words and t needs to be n2*2
725  */
726 void bn_mul_low_recursive(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b, int n2,
727                            BN_ULONG *t)
728 {
729     int n=n2/2;
731 # ifdef BN_COUNT
732     fprintf(stderr," bn_mul_low_recursive %d * %d\n",n2,n2);
733 # endif
735     bn_mul_recursive(r,a,b,n,0,0,&(t[0]));
736     if (n >= BN_MUL_LOW_RECURSIVE_SIZE_NORMAL)
737     {
738         bn_mul_low_recursive(&(t[0]),&(a[0]),&(b[n]),n,&(t[n2]));
739         bn_add_words(&(r[n]),&(r[n]),&(t[0]),n);
740         bn_mul_low_recursive(&(t[0]),&(a[n]),&(b[0]),n,&(t[n2]));
741         bn_add_words(&(r[n]),&(r[n]),&(t[0]),n);
742     }
743     else
744     {
745         bn_mul_low_normal(&(t[0]),&(a[0]),&(b[n]),n);
746         bn_mul_low_normal(&(t[n]),&(a[n]),&(b[0]),n);
747         bn_add_words(&(r[n]),&(r[n]),&(t[0]),n);
748         bn_add_words(&(r[n]),&(r[n]),&(t[n]),n);
749     }
750 }
752 /* a and b must be the same size, which is n2.
753  * r needs to be n2 words and t needs to be n2*2
754  * l is the low words of the output.
755  * t needs to be n2*3
756  */
757 void bn_mul_high(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b, BN_ULONG *l, int n2,
758                  BN_ULONG *t)
759 {
760     int i,n;
761     int c1,c2;
762     int neg,oneg,zero;
763     BN_ULONG ll,lc,*lp,*mp;
765 # ifdef BN_COUNT
766     fprintf(stderr," bn_mul_high %d * %d\n",n2,n2);
767 # endif
768     n=n2/2;
770     /* Calculate (al-ah)*(bh-bl) */
771     neg=zero=0;
772     c1=bn_cmp_words(&(a[0]),&(a[n]),n);
773     c2=bn_cmp_words(&(b[n]),&(b[0]),n);
774     switch (c1*3+c2)
775     {
776     case -4:
777         bn_sub_words(&(r[0]),&(a[n]),&(a[0]),n);
778         bn_sub_words(&(r[n]),&(b[0]),&(b[n]),n);
779         break;
780     case -3:
781         zero=1;
782         break;
783     case -2:
784         bn_sub_words(&(r[0]),&(a[n]),&(a[0]),n);
785         bn_sub_words(&(r[n]),&(b[n]),&(b[0]),n);
786         neg=1;
787         break;

```

```

788     case -1:
789     case 0:
790     case 1:
791         zero=1;
792         break;
793     case 2:
794         bn_sub_words(&(r[0]),&(a[0]),&(a[n]),n);
795         bn_sub_words(&(r[n]),&(b[0]),&(b[n]),n);
796         neg=1;
797         break;
798     case 3:
799         zero=1;
800         break;
801     case 4:
802         bn_sub_words(&(r[0]),&(a[0]),&(a[n]),n);
803         bn_sub_words(&(r[n]),&(b[n]),&(b[0]),n);
804         break;
805     }
806
807     oneg=neg;
808     /* t[10] = (a[0]-a[1])*(b[1]-b[0]) */
809     /* r[10] = (a[1]*b[1]) */
810 # ifdef BN_MUL_COMBA
811     if (n == 8)
812     {
813         bn_mul_comba8(&(t[0]),&(r[0]),&(r[n]));
814         bn_mul_comba8(r,&(a[n]),&(b[n]));
815     }
816     else
817 # endif
818     {
819         bn_mul_recursive(&(t[0]),&(r[0]),&(r[n]),n,0,0,&(t[n2]));
820         bn_mul_recursive(r,&(a[n]),&(b[n]),n,0,0,&(t[n2]));
821     }
822
823     /* s0 == low(a*b)
824     * s1 == low(ah*bh)+low((al-ah)*(bh-bl))+low(al*bl)+high(al*b)
825     * We know s0 and s1 so the only unknown is high(al*b)
826     * high(al*b) == s1 - low(ah*bh+s0+(al-ah)*(bh-bl))
827     * high(al*b) == s1 - (r[0]+l[0]+t[0])
828     */
829     if (l != NULL)
830     {
831         lp= &(t[n2+n]);
832         c1=(int)(bn_add_words(lp,&(r[0]),&(l[0]),n));
833     }
834     else
835     {
836         c1=0;
837         lp= &(r[0]);
838     }
839
840     if (neg)
841         neg=(int)(bn_sub_words(&(t[n2]),lp,&(t[0]),n));
842     else
843     {
844         bn_add_words(&(t[n2]),lp,&(t[0]),n);
845         neg=0;
846     }
847
848     if (l != NULL)
849     {
850         bn_sub_words(&(t[n2+n]),&(l[n]),&(t[n2]),n);
851     }
852     else
853     {

```

```

854         lp= &(t[n2+n]);
855         mp= &(t[n2]);
856         for (i=0; i<n; i++)
857             lp[i]=((~mp[i])+1)&BN_MASK2;
858     }
859
860     /* s[0] = low(a*b)
861     * t[3] = high(a*b)
862     * t[10] = (a[0]-a[1])*(b[1]-b[0]) neg is the sign
863     * r[10] = (a[1]*b[1])
864     */
865     /* R[10] = a*b
866     * R[21] = a*b + ah*bh + (a[0]-a[1])*(b[1]-b[0])
867     * R[32] = ah*bh
868     */
869     /* R[1]=t[3]+l[0]+r[0](+-)t[0] (have carry/borrow)
870     * R[2]=r[0]+t[3]+r[1](+-)t[1] (have carry/borrow)
871     * R[3]=r[1]+(carry/borrow)
872     */
873     if (l != NULL)
874     {
875         lp= &(t[n2]);
876         c1= (int)(bn_add_words(lp,&(t[n2+n]),&(l[0]),n));
877     }
878     else
879     {
880         lp= &(t[n2+n]);
881         c1=0;
882     }
883     c1+=(int)(bn_add_words(&(t[n2]),lp,&(r[0]),n));
884     if (oneg)
885         c1-=(int)(bn_sub_words(&(t[n2]),&(t[n2]),&(t[0]),n));
886     else
887         c1+=(int)(bn_add_words(&(t[n2]),&(t[n2]),&(t[0]),n));
888
889     c2=(int)(bn_add_words(&(r[0]),&(r[0]),&(t[n2+n]),n));
890     c2+=(int)(bn_add_words(&(r[0]),&(r[0]),&(r[n]),n));
891     if (oneg)
892         c2-=(int)(bn_sub_words(&(r[0]),&(r[0]),&(t[n]),n));
893     else
894         c2+=(int)(bn_add_words(&(r[0]),&(r[0]),&(t[n]),n));
895
896     if (c1 != 0) /* Add starting at r[0], could be +ve or -ve */
897     {
898         i=0;
899         if (c1 > 0)
900         {
901             lc=c1;
902             do
903             {
904                 ll=(r[i]+lc)&BN_MASK2;
905                 r[i++]=ll;
906                 lc=(lc > ll);
907             } while (lc);
908         }
909         else
910         {
911             lc= -c1;
912             do
913             {
914                 ll=r[i];
915                 r[i++]=(ll-lc)&BN_MASK2;
916                 lc=(lc > ll);
917             } while (lc);
918         }
919     }
920     if (c2 != 0) /* Add starting at r[1] */
921     {

```

```

920         i=n;
921         if (c2 > 0)
922             {
923                 lc=c2;
924                 do
925                     {
926                         ll=(r[i]+lc)&BN_MASK2;
927                         r[i++]=ll;
928                         lc=(lc > ll);
929                     } while (lc);
930             }
931         else
932             {
933                 lc=-c2;
934                 do
935                     {
936                         ll=r[i];
937                         r[i++]=(ll-lc)&BN_MASK2;
938                         lc=(lc > ll);
939                     } while (lc);
940             }
941 #endif /* BN_RECURSION */

943 int BN_mul(BIGNUM *r, const BIGNUM *a, const BIGNUM *b, BN_CTX *ctx)
944 {
945     int ret=0;
946     int top,al,bl;
947     BIGNUM *rr;
948 #if defined(BN_MUL_COMBA) || defined(BN_RECURSION)
949     int i;
950 #endif
951 #ifdef BN_RECURSION
952     BIGNUM *t=NULL;
953     int j=0,k;
954 #endif

956 #ifdef BN_COUNT
957     fprintf(stderr,"BN_mul %d * %d\n",a->top,b->top);
958 #endif

960     bn_check_top(a);
961     bn_check_top(b);
962     bn_check_top(r);

964     al=a->top;
965     bl=b->top;

967     if ((al == 0) || (bl == 0))
968     {
969         BN_zero(r);
970         return(1);
971     }
972     top=al+bl;

974     BN_CTX_start(ctx);
975     if ((r == a) || (r == b))
976     {
977         if ((rr = BN_CTX_get(ctx)) == NULL) goto err;
978     }
979     else
980         rr = r;
981     rr->neg=a->neg^b->neg;

983 #if defined(BN_MUL_COMBA) || defined(BN_RECURSION)
984     i = al-bl;
985 #endif

```

```

986 #ifdef BN_MUL_COMBA
987     if (i == 0)
988     {
989         # if 0
990             if (al == 4)
991             {
992                 if (bn_wexpand(rr,8) == NULL) goto err;
993                 rr->top=8;
994                 bn_mul_comba4(rr->d,a->d,b->d);
995                 goto end;
996             }
997         # endif
998         if (al == 8)
999         {
1000             if (bn_wexpand(rr,16) == NULL) goto err;
1001             rr->top=16;
1002             bn_mul_comba8(rr->d,a->d,b->d);
1003             goto end;
1004         }
1005     }
1006 #endif /* BN_MUL_COMBA */
1007 #ifdef BN_RECURSION
1008     if ((al >= BN_MULL_SIZE_NORMAL) && (bl >= BN_MULL_SIZE_NORMAL))
1009     {
1010         if (i >= -1 && i <= 1)
1011         {
1012             /* Find out the power of two lower or equal
1013              to the longest of the two numbers */
1014             if (i >= 0)
1015             {
1016                 j = BN_num_bits_word((BN_ULONG)al);
1017             }
1018             if (i == -1)
1019             {
1020                 j = BN_num_bits_word((BN_ULONG)bl);
1021             }
1022             j = 1<<(j-1);
1023             assert(j <= al || j <= bl);
1024             k = j+j;
1025             t = BN_CTX_get(ctx);
1026             if (t == NULL)
1027                 goto err;
1028             if (al > j || bl > j)
1029             {
1030                 if (bn_wexpand(t,k*4) == NULL) goto err;
1031                 if (bn_wexpand(rr,k*4) == NULL) goto err;
1032                 bn_mul_part_recursive(rr->d,a->d,b->d,
1033                                     j,al-j,bl-j,t->d);
1034             }
1035             else
1036             /* al <= j || bl <= j */
1037             {
1038                 if (bn_wexpand(t,k*2) == NULL) goto err;
1039                 if (bn_wexpand(rr,k*2) == NULL) goto err;
1040                 bn_mul_recursive(rr->d,a->d,b->d,
1041                                 j,al-j,bl-j,t->d);
1042             }
1043             rr->top=top;
1044             goto end;
1045         }
1046         #if 0
1047         if (i == 1 && !BN_get_flags(b,BN_FLG_STATIC_DATA))
1048         {
1049             BIGNUM *tmp_bn = (BIGNUM *)b;
1050             if (bn_wexpand(tmp_bn,al) == NULL) goto err;
1051             tmp_bn->d[bl]=0;
1052             bl++;

```

```

1052         i--;
1053     }
1054     else if (i == -1 && !BN_get_flags(a, BN_FLG_STATIC_DATA))
1055     {
1056         BIGNUM *tmp_bn = (BIGNUM *)a;
1057         if (bn_wexpand(tmp_bn, bl) == NULL) goto err;
1058         tmp_bn->d[al]=0;
1059         al++;
1060         i++;
1061     }
1062     if (i == 0)
1063     {
1064         /* symmetric and > 4 */
1065         /* 16 or larger */
1066         j=BN_num_bits_word((BN_ULONG)al);
1067         j=1<<(j-1);
1068         k=j+j;
1069         t = BN_CTX_get(ctx);
1070         if (al == j) /* exact multiple */
1071         {
1072             if (bn_wexpand(t, k*2) == NULL) goto err;
1073             if (bn_wexpand(rr, k*2) == NULL) goto err;
1074             bn_mul_recursive(rr->d, a->d, b->d, al, t->d);
1075         }
1076         else
1077         {
1078             if (bn_wexpand(t, k*4) == NULL) goto err;
1079             if (bn_wexpand(rr, k*4) == NULL) goto err;
1080             bn_mul_part_recursive(rr->d, a->d, b->d, al-j, j, t->d);
1081         }
1082         rr->top=top;
1083         goto end;
1084     }
1085 #endif
1086 }
1087 #endif /* BN_RECURSION */
1088 if (bn_wexpand(rr, top) == NULL) goto err;
1089 rr->top=top;
1090 bn_mul_normal(rr->d, a->d, al, b->d, bl);
1091
1092 #if defined(BN_MUL_COMBA) || defined(BN_RECURSION)
1093 #endif
1094 #endif
1095     bn_correct_top(rr);
1096     if (r != rr) BN_copy(r, rr);
1097     ret=1;
1098 err:
1099     bn_check_top(r);
1100     BN_CTX_end(ctx);
1101     return(ret);
1102 }
1103
1104 void bn_mul_normal(BN_ULONG *r, BN_ULONG *a, int na, BN_ULONG *b, int nb)
1105 {
1106     BN_ULONG *rr;
1107
1108 #ifdef BN_COUNT
1109     fprintf(stderr, "bn_mul_normal %d * %d\n", na, nb);
1110 #endif
1111
1112     if (na < nb)
1113     {
1114         int itmp;
1115         BN_ULONG *ltmp;
1116
1117         itmp=na; na=nb; nb=itmp;

```

```

1118         ltmp=a; a=b; b=ltmp;
1119     }
1120     rr= &(r[na]);
1121     if (nb <= 0)
1122     {
1123         (void)bn_mul_words(r, a, na, 0);
1124         return;
1125     }
1126     else
1127         rr[0]=bn_mul_words(r, a, na, b[0]);
1128
1129     for (;;)
1130     {
1131         if (--nb <= 0) return;
1132         rr[1]=bn_mul_add_words(&(r[1]), a, na, b[1]);
1133         if (--nb <= 0) return;
1134         rr[2]=bn_mul_add_words(&(r[2]), a, na, b[2]);
1135         if (--nb <= 0) return;
1136         rr[3]=bn_mul_add_words(&(r[3]), a, na, b[3]);
1137         if (--nb <= 0) return;
1138         rr[4]=bn_mul_add_words(&(r[4]), a, na, b[4]);
1139         rr+=4;
1140         r+=4;
1141         b+=4;
1142     }
1143 }
1144
1145 void bn_mul_low_normal(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b, int n)
1146 {
1147     #ifdef BN_COUNT
1148         fprintf(stderr, "bn_mul_low_normal %d * %d\n", n, n);
1149     #endif
1150     bn_mul_words(r, a, n, b[0]);
1151
1152     for (;;)
1153     {
1154         if (--n <= 0) return;
1155         bn_mul_add_words(&(r[1]), a, n, b[1]);
1156         if (--n <= 0) return;
1157         bn_mul_add_words(&(r[2]), a, n, b[2]);
1158         if (--n <= 0) return;
1159         bn_mul_add_words(&(r[3]), a, n, b[3]);
1160         if (--n <= 0) return;
1161         bn_mul_add_words(&(r[4]), a, n, b[4]);
1162         r+=4;
1163         b+=4;
1164     }
1165 }
1166

```



```

*****
33077 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_nist.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_nist.c */
2 /*
3  * Written by Nils Larsch for the OpenSSL project
4  */
5 /* =====
6  * Copyright (c) 1998-2005 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
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13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
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18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
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24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
58 #include "bn_lcl.h"
59 #include "cryptlib.h"

```

```

63 #define BN_NIST_192_TOP (192+BN_BITS2-1)/BN_BITS2
64 #define BN_NIST_224_TOP (224+BN_BITS2-1)/BN_BITS2
65 #define BN_NIST_256_TOP (256+BN_BITS2-1)/BN_BITS2
66 #define BN_NIST_384_TOP (384+BN_BITS2-1)/BN_BITS2
67 #define BN_NIST_521_TOP (521+BN_BITS2-1)/BN_BITS2
68
69 /* pre-computed tables are "carry-less" values of modulus*(i+1) */
70 #if BN_BITS2 == 64
71 static const BN_ULONG _nist_p_192[][BN_NIST_192_TOP] = {
72     {0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFEULL, 0xFFFFFFFFFFFFFFFFULL},
73     {0xFFFFFFFFFFFFFFFFEULL, 0xFFFFFFFFFFFFFFFFDULL, 0xFFFFFFFFFFFFFFFFULL},
74     {0xFFFFFFFFFFFFFFFFDULL, 0xFFFFFFFFFFFFFFFFCULL, 0xFFFFFFFFFFFFFFFFULL}
75 };
76 static const BN_ULONG _nist_p_192_sqr[] = {
77     0x0000000000000001ULL, 0x0000000000000002ULL, 0x0000000000000001ULL,
78     0xFFFFFFFFFFFFFFFFEULL, 0xFFFFFFFFFFFFFFFFDULL, 0xFFFFFFFFFFFFFFFFULL
79 };
80 static const BN_ULONG _nist_p_224[][BN_NIST_224_TOP] = {
81     {0x0000000000000001ULL, 0xFFFFFFFF00000000ULL,
82      0xFFFFFFFFFFFFFFFFFULL, 0x0000000000000001ULL},
83     {0x0000000000000002ULL, 0xFFFFFFFFE0000000ULL,
84      0xFFFFFFFFFFFFFFFFFULL, 0x00000001FFFFFFFFFULL} /* this one is "carry-full"
85     };
86 static const BN_ULONG _nist_p_224_sqr[] = {
87     0x0000000000000001ULL, 0xFFFFFFFFE0000000ULL,
88     0xFFFFFFFFFFFFFFFFFULL, 0x0000000020000000ULL,
89     0x0000000000000000ULL, 0xFFFFFFFFFFFFFFFFEULL,
90     0xFFFFFFFFFFFFFFFFFULL
91 };
92 static const BN_ULONG _nist_p_256[][BN_NIST_256_TOP] = {
93     {0xFFFFFFFFFFFFFFFFFULL, 0x0000000000000001ULL,
94      0x0000000000000000ULL, 0xFFFFFFFF00000001ULL},
95     {0xFFFFFFFFFFFFFFFFEULL, 0x00000001FFFFFFFFFULL,
96      0x0000000000000000ULL, 0xFFFFFFFFE0000002ULL},
97     {0xFFFFFFFFFFFFFFFFDULL, 0x00000002FFFFFFFFFULL,
98      0x0000000000000000ULL, 0xFFFFFFFFD0000003ULL},
99     {0xFFFFFFFFFFFFFFFFCULL, 0x00000003FFFFFFFFFULL,
100     0x0000000000000000ULL, 0xFFFFFFFFC0000004ULL},
101     {0xFFFFFFFFFFFFFFFFBULL, 0x00000004FFFFFFFFFULL,
102     0x0000000000000000ULL, 0xFFFFFFFFB0000005ULL},
103     };
104 static const BN_ULONG _nist_p_256_sqr[] = {
105     0x0000000000000001ULL, 0xFFFFFFFFE0000000ULL,
106     0xFFFFFFFFFFFFFFFFFULL, 0x00000001FFFFFFFFEULL,
107     0x00000001FFFFFFFFEULL, 0x00000001FFFFFFFFEULL,
108     0xFFFFFFFFE0000001ULL, 0xFFFFFFFFE0000002ULL
109 };
110 static const BN_ULONG _nist_p_384[][BN_NIST_384_TOP] = {
111     {0x00000000FFFFFFFFFULL, 0xFFFFFFFFF0000000ULL, 0xFFFFFFFFFFFFFFFFEULL,
112      0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL},
113     {0x00000001FFFFFFFFEULL, 0xFFFFFFFFE0000000ULL, 0xFFFFFFFFFFFFFFFFDULL,
114      0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL},
115     {0x00000002FFFFFFFFDULL, 0xFFFFFFFFD0000000ULL, 0xFFFFFFFFFFFFFFFFCULL,
116      0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL},
117     {0x00000003FFFFFFFFCULL, 0xFFFFFFFFC0000000ULL, 0xFFFFFFFFFFFFFFFFBULL,
118      0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL},
119     {0x00000004FFFFFFFFBULL, 0xFFFFFFFFB0000000ULL, 0xFFFFFFFFFFFFFFFFAULL,
120      0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL},
121     };
122 static const BN_ULONG _nist_p_384_sqr[] = {
123     0xFFFFFFFFE0000000ULL, 0x0000000020000000ULL, 0xFFFFFFFFE0000000ULL,
124     0x0000000020000000ULL, 0x0000000000000001ULL, 0x0000000000000000ULL,
125     0x00000001FFFFFFFFEULL, 0xFFFFFFFFE0000000ULL, 0xFFFFFFFFFFFFFFFFDULL,
126     0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFFULL
127 };

```

```

128 static const BN_ULONG _nist_p_521[] =
129     {0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL,
130     0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL,
131     0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL,
132     0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL,
133     0x00000000000001FULL};
134 static const BN_ULONG _nist_p_521_sqr[] = {
135     0x0000000000000001ULL, 0x0000000000000000ULL, 0x0000000000000000ULL,
136     0x0000000000000000ULL, 0x0000000000000000ULL, 0x0000000000000000ULL,
137     0x0000000000000000ULL, 0x0000000000000000ULL, 0xFFFFFFFFFFFFFFFFULL,
138     0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL,
139     0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL, 0xFFFFFFFFFFFFFFFFULL,
140     0xFFFFFFFFFFFFFFFFULL, 0x000000000003FFFFULL
141 };
142 #elif BN_BITS2 == 32
143 static const BN_ULONG _nist_p_192[][BN_NIST_192_TOP] = {
144     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
145     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
146     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF}
147 };
148 static const BN_ULONG _nist_p_192_sqr[] = {
149     0x00000001, 0x00000000, 0x00000002, 0x00000000, 0x00000001, 0x00000000,
150     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF
151 };
152 static const BN_ULONG _nist_p_224[][BN_NIST_224_TOP] = {
153     {0x00000001, 0x00000000, 0x00000000, 0xFFFFFFFF,
154     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
155     {0x00000002, 0x00000000, 0x00000000, 0xFFFFFFFF,
156     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF}
157 };
158 static const BN_ULONG _nist_p_224_sqr[] = {
159     0x00000001, 0x00000000, 0x00000000, 0xFFFFFFFF,
160     0xFFFFFFFF, 0xFFFFFFFF, 0x00000000, 0x00000002,
161     0x00000000, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF,
162     0xFFFFFFFF, 0xFFFFFFFF
163 };
164 static const BN_ULONG _nist_p_256[][BN_NIST_256_TOP] = {
165     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0x00000000,
166     0x00000000, 0x00000000, 0x00000001, 0xFFFFFFFF},
167     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0x00000001,
168     0x00000000, 0x00000000, 0x00000002, 0xFFFFFFFF},
169     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0x00000002,
170     0x00000000, 0x00000000, 0x00000003, 0xFFFFFFFF},
171     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0x00000003,
172     0x00000000, 0x00000000, 0x00000004, 0xFFFFFFFF},
173     {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0x00000004,
174     0x00000000, 0x00000000, 0x00000005, 0xFFFFFFFF},
175 };
176 static const BN_ULONG _nist_p_256_sqr[] = {
177     0x00000001, 0x00000000, 0x00000000, 0xFFFFFFFF,
178     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0x00000001,
179     0xFFFFFFFF, 0x00000001, 0xFFFFFFFF, 0x00000001,
180     0x00000001, 0xFFFFFFFF, 0x00000002, 0xFFFFFFFF
181 };
182 static const BN_ULONG _nist_p_384[][BN_NIST_384_TOP] = {
183     {0xFFFFFFFF, 0x00000000, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
184     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
185     {0xFFFFFFFF, 0x00000001, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
186     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
187     {0xFFFFFFFF, 0x00000002, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
188     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
189     {0xFFFFFFFF, 0x00000003, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
190     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
191     {0xFFFFFFFF, 0x00000004, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
192     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF},
193 };

```

```

194 static const BN_ULONG _nist_p_384_sqr[] = {
195     0x00000001, 0xFFFFFFFF, 0x00000000, 0x00000002, 0x00000000, 0xFFFFFFFF,
196     0x00000000, 0x00000002, 0x00000001, 0x00000000, 0x00000000, 0x00000000,
197     0xFFFFFFFF, 0x00000001, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
198     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF
199 };
200 static const BN_ULONG _nist_p_521[] = {0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
201     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
202     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
203     0xFFFFFFFF, 0x000001FF};
204 static const BN_ULONG _nist_p_521_sqr[] = {
205     0x00000001, 0x00000000, 0x00000000, 0x00000000, 0x00000000, 0x00000000,
206     0x00000000, 0x00000000, 0x00000000, 0x00000000, 0x00000000, 0x00000000,
207     0x00000000, 0x00000000, 0x00000000, 0x00000000, 0xFFFFFFFF, 0xFFFFFFFF,
208     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
209     0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF, 0xFFFFFFFF,
210     0xFFFFFFFF, 0xFFFFFFFF, 0x0003FFFF
211 };
212 #else
213 #error "unsupported BN_BITS2"
214 #endif

217 static const BIGNUM _bignum_nist_p_192 =
218     {
219         (BN_ULONG *)_nist_p_192[0],
220         BN_NIST_192_TOP,
221         BN_NIST_192_TOP,
222         0,
223         BN_FLG_STATIC_DATA
224     };

226 static const BIGNUM _bignum_nist_p_224 =
227     {
228         (BN_ULONG *)_nist_p_224[0],
229         BN_NIST_224_TOP,
230         BN_NIST_224_TOP,
231         0,
232         BN_FLG_STATIC_DATA
233     };

235 static const BIGNUM _bignum_nist_p_256 =
236     {
237         (BN_ULONG *)_nist_p_256[0],
238         BN_NIST_256_TOP,
239         BN_NIST_256_TOP,
240         0,
241         BN_FLG_STATIC_DATA
242     };

244 static const BIGNUM _bignum_nist_p_384 =
245     {
246         (BN_ULONG *)_nist_p_384[0],
247         BN_NIST_384_TOP,
248         BN_NIST_384_TOP,
249         0,
250         BN_FLG_STATIC_DATA
251     };

253 static const BIGNUM _bignum_nist_p_521 =
254     {
255         (BN_ULONG *)_nist_p_521,
256         BN_NIST_521_TOP,
257         BN_NIST_521_TOP,
258         0,
259         BN_FLG_STATIC_DATA

```

```

260     };

263 const BIGNUM *BN_get0_nist_prime_192(void)
264 {
265     return &bignum_nist_p_192;
266 }

268 const BIGNUM *BN_get0_nist_prime_224(void)
269 {
270     return &bignum_nist_p_224;
271 }

273 const BIGNUM *BN_get0_nist_prime_256(void)
274 {
275     return &bignum_nist_p_256;
276 }

278 const BIGNUM *BN_get0_nist_prime_384(void)
279 {
280     return &bignum_nist_p_384;
281 }

283 const BIGNUM *BN_get0_nist_prime_521(void)
284 {
285     return &bignum_nist_p_521;
286 }

289 static void nist_cp_bn_0(BN_ULONG *dst, const BN_ULONG *src, int top, int max)
290 {
291     int i;

293 #ifdef BN_DEBUG
294     OPENSSL_assert(top <= max);
295 #endif
296     for (i = 0; i < top; i++)
297         dst[i] = src[i];
298     for (; i < max; i++)
299         dst[i] = 0;
300 }

302 static void nist_cp_bn(BN_ULONG *dst, const BN_ULONG *src, int top)
303 {
304     int i;

306     for (i = 0; i < top; i++)
307         dst[i] = src[i];
308 }

310 #if BN_BITS2 == 64
311 #define bn_cp_64(to, n, from, m)      (to)[n] = (m>=0)?((from)[m]):0;
312 #define bn_64_set_0(to, n)          (to)[n] = (BN_ULONG)0;
313 /*
314  * two following macros are implemented under assumption that they
315  * are called in a sequence with *ascending* n, i.e. as they are...
316  */
317 #define bn_cp_32_naked(to, n, from, m) (((n)&1)?(to[(n)/2])=((m)&1)?(from[(m)/2]
318                                         : (to[(n)/2])=((m)&1)?(from[(m)/2]
319 #define bn_32_set_0(to, n)          (((n)&1)?(to[(n)/2])&=BN_MASK2):(to[(n)/
320 #define bn_cp_32(to,n,from,m)      ((m)>=0)?bn_cp_32_naked(to,n,from,m):bn_
321 # if defined(L_ENDIAN)
322 #   if defined(__arch64__)
323 #       define NIST_INT64 long
324 #   else
325 #       define NIST_INT64 long long

```

```

326 # endif
327 # endif
328 #else
329 #define bn_cp_64(to, n, from, m) \
330 { \
331     bn_cp_32(to, (n)*2, from, (m)*2); \
332     bn_cp_32(to, (n)*2+1, from, (m)*2+1); \
333 }
334 #define bn_64_set_0(to, n) \
335 { \
336     bn_32_set_0(to, (n)*2); \
337     bn_32_set_0(to, (n)*2+1); \
338 }
339 #define bn_cp_32(to, n, from, m)      (to)[n] = (m>=0)?((from)[m]):0;
340 #define bn_32_set_0(to, n)          (to)[n] = (BN_ULONG)0;
341 # if defined(_WIN32) && !defined(__GNUC__)
342 #   define NIST_INT64 __int64
343 # elif defined(BN_LLONG)
344 #   define NIST_INT64 long long
345 # endif
346 #endif /* BN_BITS2 != 64 */

348 #define nist_set_192(to, from, a1, a2, a3) \
349 { \
350     bn_cp_64(to, 0, from, (a3) - 3) \
351     bn_cp_64(to, 1, from, (a2) - 3) \
352     bn_cp_64(to, 2, from, (a1) - 3) \
353 }

355 int BN_nist_mod_192(BIGNUM *r, const BIGNUM *a, const BIGNUM *field,
356 BN_CTX *ctx)
357 {
358     int top = a->top, i;
359     int carry;
360     register BN_ULONG *r_d, *a_d = a->d;
361     union {
362         BN_ULONG bn[BN_NIST_192_TOP];
363         unsigned int ui[BN_NIST_192_TOP*sizeof(BN_ULONG)/sizeof(unsigned
364     } buf;
365     BN_ULONG c_d[BN_NIST_192_TOP],
366     *res;
367     PTR_SIZE_INT mask;
368     static const BIGNUM _bignum_nist_p_192_sqr = {
369         (BN_ULONG *)_nist_p_192_sqr,
370         sizeof(_nist_p_192_sqr)/sizeof(_nist_p_192_sqr[0]),
371         sizeof(_nist_p_192_sqr)/sizeof(_nist_p_192_sqr[0]),
372         0, BN_FLG_STATIC_DATA };

374     field = &_bignum_nist_p_192; /* just to make sure */

376     if (BN_is_negative(a) || BN_ucmp(a, &_bignum_nist_p_192_sqr) >= 0)
377         return BN_nnmod(r, a, field, ctx);

379     i = BN_ucmp(field, a);
380     if (i == 0)
381     {
382         BN_zero(r);
383         return 1;
384     }
385     else if (i > 0)
386         return (r == a) ? 1 : (BN_copy(r, a) != NULL);

388     if (r != a)
389     {
390         if (!bn_wexpand(r, BN_NIST_192_TOP))
391             return 0;

```

```

392         r_d = r->d;
393         nist_cp_bn(r_d, a_d, BN_NIST_192_TOP);
394     }
395     else
396         r_d = a_d;
397
398     nist_cp_bn_0(buf.bn, a_d + BN_NIST_192_TOP, top - BN_NIST_192_TOP, BN_NI
400 #if defined(NIST_INT64)
401 {
402     NIST_INT64      acc; /* accumulator */
403     unsigned int    *rp=(unsigned int *)r_d;
404     const unsigned int *bp=(const unsigned int *)buf.ui;
405
406     acc = rp[0];  acc += bp[3*2-6];
407                 acc += bp[5*2-6]; rp[0] = (unsigned int)acc; acc >>= 32;
408
409     acc += rp[1];  acc += bp[3*2-5];
410                 acc += bp[5*2-5]; rp[1] = (unsigned int)acc; acc >>= 32;
411
412     acc += rp[2];  acc += bp[3*2-6];
413                 acc += bp[4*2-6];
414                 acc += bp[5*2-6]; rp[2] = (unsigned int)acc; acc >>= 32;
415
416     acc += rp[3];  acc += bp[3*2-5];
417                 acc += bp[4*2-5];
418                 acc += bp[5*2-5]; rp[3] = (unsigned int)acc; acc >>= 32;
419
420     acc += rp[4];  acc += bp[4*2-6];
421                 acc += bp[5*2-6]; rp[4] = (unsigned int)acc; acc >>= 32;
422
423     acc += rp[5];  acc += bp[4*2-5];
424                 acc += bp[5*2-5]; rp[5] = (unsigned int)acc;
425
426     carry = (int)(acc>>32);
427 }
428 #else
429 {
430     BN_ULONG t_d[BN_NIST_192_TOP];
431
432     nist_set_192(t_d, buf.bn, 0, 3, 3);
433     carry = (int)bn_add_words(r_d, r_d, t_d, BN_NIST_192_TOP);
434     nist_set_192(t_d, buf.bn, 4, 4, 0);
435     carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_192_TOP);
436     nist_set_192(t_d, buf.bn, 5, 5, 5);
437     carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_192_TOP);
438 }
439 #endif
440 if (carry > 0)
441     carry = (int)bn_sub_words(r_d, r_d, _nist_p_192[carry-1], BN_NIST_1
442 else
443     carry = 1;
444
445 /*
446  * we need 'if (carry==0 || result>=modulus) result-=modulus;'
447  * as comparison implies subtraction, we can write
448  * 'tmp=result-modulus; if (!carry || !borrow) result=tmp;'
449  * this is what happens below, but without explicit if:-) a.
450  */
451 mask = 0-(PTR_SIZE_INT)bn_sub_words(c_d, r_d, _nist_p_192[0], BN_NIST_192_
452 mask &= 0-(PTR_SIZE_INT)carry;
453 res = c_d;
454 res = (BN_ULONG *)
455     (((PTR_SIZE_INT)res&~mask) | ((PTR_SIZE_INT)r_d&mask));
456 nist_cp_bn(r_d, res, BN_NIST_192_TOP);
457 r->top = BN_NIST_192_TOP;

```

```

458     bn_correct_top(r);
459
460     return 1;
461 }
462
463 typedef BN_ULONG (*bn_addsub_f)(BN_ULONG *,const BN_ULONG *,const BN_ULONG *,int
464
465 #define nist_set_224(to, from, a1, a2, a3, a4, a5, a6, a7) \
466 { \
467     bn_cp_32(to, 0, from, (a7) - 7) \
468     bn_cp_32(to, 1, from, (a6) - 7) \
469     bn_cp_32(to, 2, from, (a5) - 7) \
470     bn_cp_32(to, 3, from, (a4) - 7) \
471     bn_cp_32(to, 4, from, (a3) - 7) \
472     bn_cp_32(to, 5, from, (a2) - 7) \
473     bn_cp_32(to, 6, from, (a1) - 7) \
474 }
475
476 int BN_nist_mod_224(BIGNUM *r, const BIGNUM *a, const BIGNUM *field,
477 BN_CTX *ctx)
478 {
479     int top = a->top, i;
480     int carry;
481     BN_ULONG *r_d, *a_d = a->d;
482     union {
483         BN_ULONG bn[BN_NIST_224_TOP];
484         unsigned int ui[BN_NIST_224_TOP*sizeof(BN_ULONG)/sizeof(unsigned
485     } buf;
486     BN_ULONG c_d[BN_NIST_224_TOP],
487     *res;
488     PTR_SIZE_INT mask;
489     union { bn_addsub_f f; PTR_SIZE_INT p; } u;
490     static const BIGNUM _bignum_nist_p_224_sqr = {
491         (BN_ULONG *)_nist_p_224_sqr,
492         sizeof(_nist_p_224_sqr)/sizeof(_nist_p_224_sqr[0]),
493         sizeof(_nist_p_224_sqr)/sizeof(_nist_p_224_sqr[0]),
494         0, BN_FLG_STATIC_DATA };
495
496     field = &_bignum_nist_p_224; /* just to make sure */
497
498     if (BN_is_negative(a) || BN_ucmp(a, &_bignum_nist_p_224_sqr) >= 0)
499         return BN_nnmod(r, a, field, ctx);
500
501     i = BN_ucmp(field, a);
502     if (i == 0)
503     {
504         BN_zero(r);
505         return 1;
506     }
507     else if (i > 0)
508         return (r == a)? 1 : (BN_copy(r, a) != NULL);
509
510     if (r != a)
511     {
512         if (!bn_wexpand(r, BN_NIST_224_TOP))
513             return 0;
514         r_d = r->d;
515         nist_cp_bn(r_d, a_d, BN_NIST_224_TOP);
516     }
517     else
518         r_d = a_d;
519
520 #if BN_BITS2==64
521     /* copy upper 256 bits of 448 bit number ... */
522     nist_cp_bn_0(c_d, a_d + (BN_NIST_224_TOP-1), top - (BN_NIST_224_TOP-1),

```

```

524 /* ... and right shift by 32 to obtain upper 224 bits */
525 nist_set_224(buf.bn, c_d, 14, 13, 12, 11, 10, 9, 8);
526 /* truncate lower part to 224 bits too */
527 r_d[BN_NIST_224_TOP-1] &= BN_MASK2L;
528 #else
529 nist_cp_bn_0(buf.bn, a_d + BN_NIST_224_TOP, top - BN_NIST_224_TOP, BN_NI
530 #endif

532 #if defined(NIST_INT64) && BN_BITS2!=64
533 {
534     NIST_INT64 acc; /* accumulator */
535     unsigned int *rp=(unsigned int *)r_d;
536     const unsigned int *bp=(const unsigned int *)buf.ui;

538     acc = rp[0]; acc -= bp[7-7]; rp[0] = (unsigned int)acc; acc >=> 32;
539     acc -= bp[11-7];

541     acc += rp[1]; acc -= bp[8-7];
542     acc -= bp[12-7]; rp[1] = (unsigned int)acc; acc >=> 32;

544     acc += rp[2]; acc -= bp[9-7];
545     acc -= bp[13-7]; rp[2] = (unsigned int)acc; acc >=> 32;

547     acc += rp[3]; acc += bp[7-7];
548     acc += bp[11-7];
549     acc -= bp[10-7]; rp[3] = (unsigned int)acc; acc >=> 32;

551     acc += rp[4]; acc += bp[8-7];
552     acc += bp[12-7];
553     acc -= bp[11-7]; rp[4] = (unsigned int)acc; acc >=> 32;

555     acc += rp[5]; acc += bp[9-7];
556     acc += bp[13-7];
557     acc -= bp[12-7]; rp[5] = (unsigned int)acc; acc >=> 32;

559     acc += rp[6]; acc += bp[10-7];
560     acc -= bp[13-7]; rp[6] = (unsigned int)acc;

562     carry = (int)(acc>>32);
563 # if BN_BITS2==64
564     rp[7] = carry;
565 # endif
566 }
567 #else
568 {
569     BN_ULONG t_d[BN_NIST_224_TOP];

571     nist_set_224(t_d, buf.bn, 10, 9, 8, 7, 0, 0, 0);
572     carry = (int)bn_add_words(r_d, r_d, t_d, BN_NIST_224_TOP);
573     nist_set_224(t_d, buf.bn, 0, 13, 12, 11, 0, 0, 0);
574     carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_224_TOP);
575     nist_set_224(t_d, buf.bn, 13, 12, 11, 10, 9, 8, 7);
576     carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_224_TOP);
577     nist_set_224(t_d, buf.bn, 0, 0, 0, 0, 13, 12, 11);
578     carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_224_TOP);

580 #if BN_BITS2==64
581     carry = (int)(r_d[BN_NIST_224_TOP-1]>>32);
582 #endif
583 }
584 #endif
585 u.f = bn_sub_words;
586 if (carry > 0)
587 {
588     carry = (int)bn_sub_words(r_d, r_d, nist_p_224[carry-1], BN_NIST_2
589 #if BN_BITS2==64

```

```

590     carry=(int)(~(r_d[BN_NIST_224_TOP-1]>>32))&1;
591 #endif
592 }
593 else if (carry < 0)
594 {
595     /* it's a bit more complicated logic in this case.
596     * if bn_add_words yields no carry, then result
597     * has to be adjusted by unconditionally *adding*
598     * the modulus. but if it does, then result has
599     * to be compared to the modulus and conditionally
600     * adjusted by *subtracting* the latter. */
601     carry = (int)bn_add_words(r_d, r_d, nist_p_224[-carry-1], BN_NIST_
602     mask = 0-(PTR_SIZE_INT)carry;
603     u.p = ((PTR_SIZE_INT)bn_sub_words&mask) |
604     ((PTR_SIZE_INT)bn_add_words&-mask);
605 }
606 else
607     carry = 1;

609 /* otherwise it's effectively same as in BN_nist_mod_192... */
610 mask = 0-(PTR_SIZE_INT)(*u.f)(c_d, r_d, nist_p_224[0], BN_NIST_224_TOP);
611 mask &= 0-(PTR_SIZE_INT)carry;
612 res = c_d;
613 res = (BN_ULONG *)(((PTR_SIZE_INT)res&-mask) |
614     ((PTR_SIZE_INT)r_d&mask));
615 nist_cp_bn(r_d, res, BN_NIST_224_TOP);
616 r->top = BN_NIST_224_TOP;
617 bn_correct_top(r);

619     return 1;
620 }

622 #define nist_set_256(to, from, a1, a2, a3, a4, a5, a6, a7, a8) \
623 { \
624     bn_cp_32(to, 0, from, (a8) - 8) \
625     bn_cp_32(to, 1, from, (a7) - 8) \
626     bn_cp_32(to, 2, from, (a6) - 8) \
627     bn_cp_32(to, 3, from, (a5) - 8) \
628     bn_cp_32(to, 4, from, (a4) - 8) \
629     bn_cp_32(to, 5, from, (a3) - 8) \
630     bn_cp_32(to, 6, from, (a2) - 8) \
631     bn_cp_32(to, 7, from, (a1) - 8) \
632 }

634 int BN_nist_mod_256(BIGNUM *r, const BIGNUM *a, const BIGNUM *field,
635     BN_CTX *ctx)
636 {
637     int i, top = a->top;
638     int carry = 0;
639     register BN_ULONG *a_d = a->d, *r_d;
640     union {
641         BN_ULONG bn[BN_NIST_256_TOP];
642         unsigned int ui[BN_NIST_256_TOP*sizeof(BN_ULONG)/sizeof(unsigned
643         } buf;
644     BN_ULONG c_d[BN_NIST_256_TOP],
645     *res;
646     PTR_SIZE_INT mask;
647     union { bn_addsub_f f; PTR_SIZE_INT p; } u;
648     static const BIGNUM_bignum_nist_p_256_sqr = {
649         (BN_ULONG *)nist_p_256_sqr,
650         sizeof(_nist_p_256_sqr)/sizeof(_nist_p_256_sqr[0]),
651         sizeof(_nist_p_256_sqr)/sizeof(_nist_p_256_sqr[0]),
652         0, BN_FLG_STATIC_DATA };

654     field = &bignum_nist_p_256; /* just to make sure */

```

```

656     if (BN_is_negative(a) || BN_ucmp(a,&bignum_nist_p_256_sqr)>=0)
657         return BN_nnmod(r, a, field, ctx);

659     i = BN_ucmp(field, a);
660     if (i == 0)
661     {
662         BN_zero(r);
663         return 1;
664     }
665     else if (i > 0)
666         return (r == a)? 1 : (BN_copy(r, a) != NULL);

668     if (r != a)
669     {
670         if (!bn_wexpand(r, BN_NIST_256_TOP))
671             return 0;
672         r_d = r->d;
673         nist_cp_bn(r_d, a_d, BN_NIST_256_TOP);
674     }
675     else
676         r_d = a_d;

678     nist_cp_bn_0(buf.bn, a_d + BN_NIST_256_TOP, top - BN_NIST_256_TOP, BN_NI

680 #if defined(NIST_INT64)
681 {
682     NIST_INT64      acc;      /* accumulator */
683     unsigned int    *rp=(unsigned int *)r_d;
684     const unsigned int *bp=(const unsigned int *)buf.ui;

686     acc = rp[0];    acc += bp[8-8];
687                   acc += bp[9-8];
688                   acc -= bp[11-8];
689                   acc -= bp[12-8];
690                   acc -= bp[13-8];
691                   acc -= bp[14-8]; rp[0] = (unsigned int)acc; acc >>= 32;

693     acc += rp[1];    acc += bp[9-8];
694                   acc += bp[10-8];
695                   acc -= bp[12-8];
696                   acc -= bp[13-8];
697                   acc -= bp[14-8];
698                   acc -= bp[15-8]; rp[1] = (unsigned int)acc; acc >>= 32;

700     acc += rp[2];    acc += bp[10-8];
701                   acc += bp[11-8];
702                   acc -= bp[13-8];
703                   acc -= bp[14-8];
704                   acc -= bp[15-8]; rp[2] = (unsigned int)acc; acc >>= 32;

706     acc += rp[3];    acc += bp[11-8];
707                   acc += bp[11-8];
708                   acc += bp[12-8];
709                   acc += bp[12-8];
710                   acc += bp[13-8];
711                   acc -= bp[15-8];
712                   acc -= bp[8-8];
713                   acc -= bp[9-8]; rp[3] = (unsigned int)acc; acc >>= 32;

715     acc += rp[4];    acc += bp[12-8];
716                   acc += bp[12-8];
717                   acc += bp[13-8];
718                   acc += bp[13-8];
719                   acc += bp[14-8];
720                   acc -= bp[9-8];
721                   acc -= bp[10-8]; rp[4] = (unsigned int)acc; acc >>= 32;

```

```

723     acc += rp[5];    acc += bp[13-8];
724                   acc += bp[13-8];
725                   acc += bp[14-8];
726                   acc += bp[14-8];
727                   acc += bp[15-8];
728                   acc -= bp[10-8];
729                   acc -= bp[11-8]; rp[5] = (unsigned int)acc; acc >>= 32;

731     acc += rp[6];    acc += bp[14-8];
732                   acc += bp[14-8];
733                   acc += bp[15-8];
734                   acc += bp[15-8];
735                   acc += bp[14-8];
736                   acc += bp[13-8];
737                   acc -= bp[8-8];
738                   acc -= bp[9-8]; rp[6] = (unsigned int)acc; acc >>= 32;

740     acc += rp[7];    acc += bp[15-8];
741                   acc += bp[15-8];
742                   acc += bp[15-8];
743                   acc += bp[8-8];
744                   acc -= bp[10-8];
745                   acc -= bp[11-8];
746                   acc -= bp[12-8];
747                   acc -= bp[13-8]; rp[7] = (unsigned int)acc;

749     carry = (int)(acc>>32);
750 }
751 #else
752 {
753     BN_ULONG t_d[BN_NIST_256_TOP];

755     /*S1*/
756     nist_set_256(t_d, buf.bn, 15, 14, 13, 12, 11, 0, 0, 0);
757     /*S2*/
758     nist_set_256(c_d, buf.bn, 0, 15, 14, 13, 12, 0, 0, 0);
759     carry = (int)bn_add_words(t_d, t_d, c_d, BN_NIST_256_TOP);
760     /* left shift */
761     {
762         register BN_ULONG *ap,t,c;
763         ap = t_d;
764         c=0;
765         for (i = BN_NIST_256_TOP; i != 0; --i)
766         {
767             t= *ap;
768             *(ap++)=((t<<1)|c)&BN_MASK2;
769             c=(t & BN_TBIT)?1:0;
770         }
771         carry <= 1;
772         carry |= c;
773     }
774     carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_256_TOP);
775     /*S3*/
776     nist_set_256(t_d, buf.bn, 15, 14, 0, 0, 0, 10, 9, 8);
777     carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_256_TOP);
778     /*S4*/
779     nist_set_256(t_d, buf.bn, 8, 13, 15, 14, 13, 11, 10, 9);
780     carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_256_TOP);
781     /*D1*/
782     nist_set_256(t_d, buf.bn, 10, 8, 0, 0, 0, 13, 12, 11);
783     carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_256_TOP);
784     /*D2*/
785     nist_set_256(t_d, buf.bn, 11, 9, 0, 0, 15, 14, 13, 12);
786     carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_256_TOP);
787     /*D3*/

```

```

788 nist_set_256(t_d, buf.bn, 12, 0, 10, 9, 8, 15, 14, 13);
789 carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_256_TOP);
790 /*D4*/
791 nist_set_256(t_d, buf.bn, 13, 0, 11, 10, 9, 0, 15, 14);
792 carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_256_TOP);
793
794 }
795 #endif
796 /* see BN_nist_mod_224 for explanation */
797 u.f = bn_sub_words;
798 if (carry > 0)
799     carry = (int)bn_sub_words(r_d, r_d, nist_p_256[carry-1], BN_NIST_2
800 else if (carry < 0)
801     {
802         carry = (int)bn_add_words(r_d, r_d, nist_p_256[-carry-1], BN_NIST_
803         mask = 0-(PTR_SIZE_INT)carry;
804         u.p = ((PTR_SIZE_INT)bn_sub_words&mask) |
805             ((PTR_SIZE_INT)bn_add_words&-mask);
806     }
807 else
808     carry = 1;
809
810 mask = 0-(PTR_SIZE_INT)(*u.f)(c_d, r_d, nist_p_256[0], BN_NIST_256_TOP);
811 mask &= 0-(PTR_SIZE_INT)carry;
812 res = c_d;
813 res = (BN_ULONG *)(((PTR_SIZE_INT)res&-mask) |
814             ((PTR_SIZE_INT)r_d&mask));
815 nist_cp_bn(r_d, res, BN_NIST_256_TOP);
816 r->top = BN_NIST_256_TOP;
817 bn_correct_top(r);
818
819 return 1;
820 }
821
822 #define nist_set_384(to, from, a1, a2, a3, a4, a5, a6, a7, a8, a9, a10, a11, a12) \
823 { \
824     bn_cp_32(to, 0, from, (a12) - 12) \
825     bn_cp_32(to, 1, from, (a11) - 12) \
826     bn_cp_32(to, 2, from, (a10) - 12) \
827     bn_cp_32(to, 3, from, (a9) - 12) \
828     bn_cp_32(to, 4, from, (a8) - 12) \
829     bn_cp_32(to, 5, from, (a7) - 12) \
830     bn_cp_32(to, 6, from, (a6) - 12) \
831     bn_cp_32(to, 7, from, (a5) - 12) \
832     bn_cp_32(to, 8, from, (a4) - 12) \
833     bn_cp_32(to, 9, from, (a3) - 12) \
834     bn_cp_32(to, 10, from, (a2) - 12) \
835     bn_cp_32(to, 11, from, (a1) - 12) \
836 }
837
838 int BN_nist_mod_384(BIGNUM *r, const BIGNUM *a, const BIGNUM *field,
839 BN_CTX *ctx)
840 {
841     int i, top = a->top;
842     int carry = 0;
843     register BN_ULONG *r_d, *a_d = a->d;
844     union
845     {
846         BN_ULONG bn[BN_NIST_384_TOP];
847         unsigned int ui[BN_NIST_384_TOP*sizeof(BN_ULONG)/sizeof(unsigned
848     } buf;
849     BN_ULONG c_d[BN_NIST_384_TOP],
850         *res;
851     PTR_SIZE_INT mask;
852     union { bn_addsub_f f; PTR_SIZE_INT p; } u;
853     static const BIGNUM_bignum_nist_p_384_sqr = {
854         (BN_ULONG *)_nist_p_384_sqr,

```

```

854     sizeof(_nist_p_384_sqr)/sizeof(_nist_p_384_sqr[0]),
855     sizeof(_nist_p_384_sqr)/sizeof(_nist_p_384_sqr[0]),
856     0, BN_FLG_STATIC_DATA };
857
858
859     field = &bignum_nist_p_384; /* just to make sure */
860
861     if (BN_is_negative(a) || BN_ucmp(a, &bignum_nist_p_384_sqr) >= 0)
862         return BN_nnmod(r, a, field, ctx);
863
864     i = BN_ucmp(field, a);
865     if (i == 0)
866     {
867         BN_zero(r);
868         return 1;
869     }
870     else if (i > 0)
871         return (r == a)? 1 : (BN_copy(r, a) != NULL);
872
873     if (r != a)
874     {
875         if (!bn_wexpand(r, BN_NIST_384_TOP))
876             return 0;
877         r_d = r->d;
878         nist_cp_bn(r_d, a_d, BN_NIST_384_TOP);
879     }
880     else
881         r_d = a_d;
882
883     nist_cp_bn_0(buf.bn, a_d + BN_NIST_384_TOP, top - BN_NIST_384_TOP, BN_NI
884
885 #if defined(NIST_INT64)
886 {
887     NIST_INT64 acc; /* accumulator */
888     unsigned int *rp=(unsigned int *)r_d;
889     const unsigned int *bp=(const unsigned int *)buf.ui;
890
891     acc = rp[0]; acc += bp[12-12];
892     acc += bp[21-12];
893     acc += bp[20-12];
894     acc -= bp[23-12]; rp[0] = (unsigned int)acc; acc >>= 32;
895
896     acc += rp[1]; acc += bp[13-12];
897     acc += bp[22-12];
898     acc += bp[23-12];
899     acc -= bp[12-12];
900     acc -= bp[20-12]; rp[1] = (unsigned int)acc; acc >>= 32;
901
902     acc += rp[2]; acc += bp[14-12];
903     acc += bp[23-12];
904     acc -= bp[13-12];
905     acc -= bp[21-12]; rp[2] = (unsigned int)acc; acc >>= 32;
906
907     acc += rp[3]; acc += bp[15-12];
908     acc += bp[12-12];
909     acc += bp[20-12];
910     acc += bp[21-12];
911     acc -= bp[14-12];
912     acc -= bp[22-12];
913     acc -= bp[23-12]; rp[3] = (unsigned int)acc; acc >>= 32;
914
915     acc += rp[4]; acc += bp[21-12];
916     acc += bp[21-12];
917     acc += bp[16-12];
918     acc += bp[13-12];
919     acc += bp[12-12];

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```

920         acc += bp[20-12];
921         acc += bp[22-12];
922         acc -= bp[15-12];
923         acc -= bp[23-12];
924         acc -= bp[23-12]; rp[4] = (unsigned int)acc; acc >>= 32;

926     acc += rp[5]; acc += bp[22-12];
927         acc += bp[22-12];
928         acc += bp[17-12];
929         acc += bp[14-12];
930         acc += bp[13-12];
931         acc += bp[21-12];
932         acc += bp[23-12];
933         acc -= bp[16-12]; rp[5] = (unsigned int)acc; acc >>= 32;

935     acc += rp[6]; acc += bp[23-12];
936         acc += bp[23-12];
937         acc += bp[18-12];
938         acc += bp[15-12];
939         acc += bp[14-12];
940         acc += bp[22-12];
941         acc -= bp[17-12]; rp[6] = (unsigned int)acc; acc >>= 32;

943     acc += rp[7]; acc += bp[19-12];
944         acc += bp[16-12];
945         acc += bp[15-12];
946         acc += bp[23-12];
947         acc -= bp[18-12]; rp[7] = (unsigned int)acc; acc >>= 32;

949     acc += rp[8]; acc += bp[20-12];
950         acc += bp[17-12];
951         acc += bp[16-12];
952         acc -= bp[19-12]; rp[8] = (unsigned int)acc; acc >>= 32;

954     acc += rp[9]; acc += bp[21-12];
955         acc += bp[18-12];
956         acc += bp[17-12];
957         acc -= bp[20-12]; rp[9] = (unsigned int)acc; acc >>= 32;

959     acc += rp[10]; acc += bp[22-12];
960         acc += bp[19-12];
961         acc += bp[18-12];
962         acc -= bp[21-12]; rp[10] = (unsigned int)acc; acc >>= 32;

964     acc += rp[11]; acc += bp[23-12];
965         acc += bp[20-12];
966         acc += bp[19-12];
967         acc -= bp[22-12]; rp[11] = (unsigned int)acc;

969     carry = (int)(acc>>32);
970 }
971 #else
972 {
973     BN_ULONG t_d[BN_NIST_384_TOP];

975     /*S1*/
976     nist_set_256(t_d, buf.bn, 0, 0, 0, 0, 0, 23-4, 22-4, 21-4);
977     /* left shift */
978     {
979         register BN_ULONG *ap,t,c;
980         ap = t_d;
981         c=0;
982         for (i = 3; i != 0; --i)
983             {
984                 t= *ap;
985                 *(ap++)=((t<<1)|c)&BN_MASK2;

```

```

986         c=(t & BN_TBIT)?1:0;
987     }
988     *ap=c;
989
990     carry = (int)bn_add_words(r_d+(128/BN_BITS2), r_d+(128/BN_BITS2),
991                               t_d, BN_NIST_256_TOP);
992
993     /*S2 */
994     carry += (int)bn_add_words(r_d, r_d, buf.bn, BN_NIST_384_TOP);
995     /*S3*/
996     nist_set_384(t_d,buf.bn,20,19,18,17,16,15,14,13,12,23,22,21);
997     carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_384_TOP);
998     /*S4*/
999     nist_set_384(t_d,buf.bn,19,18,17,16,15,14,13,12,20,0,23,0);
1000    carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_384_TOP);
1001    /*S5*/
1002    nist_set_384(t_d, buf.bn,0,0,0,0,0,23,22,21,20,0,0,0,0);
1003    carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_384_TOP);
1004    /*S6*/
1005    nist_set_384(t_d,buf.bn,0,0,0,0,0,0,0,23,22,21,0,0,0,20);
1006    carry += (int)bn_add_words(r_d, r_d, t_d, BN_NIST_384_TOP);
1007    /*D1*/
1008    nist_set_384(t_d,buf.bn,22,21,20,19,18,17,16,15,14,13,12,23);
1009    carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_384_TOP);
1010    /*D2*/
1011    nist_set_384(t_d,buf.bn,0,0,0,0,0,0,0,23,22,21,20,0);
1012    carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_384_TOP);
1013    /*D3*/
1014    nist_set_384(t_d,buf.bn,0,0,0,0,0,0,0,23,23,0,0,0);
1015    carry -= (int)bn_sub_words(r_d, r_d, t_d, BN_NIST_384_TOP);

1016 }
1017 #endif
1018 /* see BN_nist_mod_224 for explanation */
1019 u.f = bn_sub_words;
1020 if (carry > 0)
1021     carry = (int)bn_sub_words(r_d,r_d,_nist_p_384[carry-1],BN_NIST_3
1022 else if (carry < 0)
1023     {
1024         carry = (int)bn_add_words(r_d,r_d,_nist_p_384[-carry-1],BN_NIST_
1025         mask = 0-(PTR_SIZE_INT)carry;
1026         u.p = ((PTR_SIZE_INT)bn_sub_words&mask) |
1027             ((PTR_SIZE_INT)bn_add_words&-mask);
1028     }
1029 else
1030     carry = 1;

1032     mask = 0-(PTR_SIZE_INT)(*u.f)(c_d,r_d,_nist_p_384[0],BN_NIST_384_TOP);
1033     mask &= 0-(PTR_SIZE_INT)carry;
1034     res = c_d;
1035     res = (BN_ULONG *)(((PTR_SIZE_INT)res&-mask) |
1036                      (((PTR_SIZE_INT)r_d&mask)));
1037     nist_cp_bn(r_d, res, BN_NIST_384_TOP);
1038     r->top = BN_NIST_384_TOP;
1039     bn_correct_top(r);

1041     return 1;
1042 }

1044 #define BN_NIST_521_RSHIFT      (521%BN_BITS2)
1045 #define BN_NIST_521_LSHIFT      (BN_BITS2-BN_NIST_521_RSHIFT)
1046 #define BN_NIST_521_TOP_MASK    ((BN_ULONG)BN_MASK2>>BN_NIST_521_LSHIFT)

1048 int BN_nist_mod_521(BIGNUM *r, const BIGNUM *a, const BIGNUM *field,
1049 BN_CTX *ctx)
1050 {
1051     int top = a->top, i;

```



```

1052     BN_ULONG *r_d, *a_d = a->d,
1053             t_d[BN_NIST_521_TOP],
1054             val,tmp,*res;
1055     PTR_SIZE_INT mask;
1056     static const BIGNUM _bignum_nist_p_521_sqr = {
1057         (BN_ULONG *)_nist_p_521_sqr,
1058         sizeof(_nist_p_521_sqr)/sizeof(_nist_p_521_sqr[0]),
1059         sizeof(_nist_p_521_sqr)/sizeof(_nist_p_521_sqr[0]),
1060         0,BN_FLG_STATIC_DATA };
1061
1062     field = &_bignum_nist_p_521; /* just to make sure */
1063
1064     if (BN_is_negative(a) || BN_ucmp(a,&_bignum_nist_p_521_sqr)>=0)
1065         return BN_nnmod(r, a, field, ctx);
1066
1067     i = BN_ucmp(field, a);
1068     if (i == 0)
1069     {
1070         BN_zero(r);
1071         return 1;
1072     }
1073     else if (i > 0)
1074         return (r == a)? 1 : (BN_copy(r ,a) != NULL);
1075
1076     if (r != a)
1077     {
1078         if (!bn_wexpand(r,BN_NIST_521_TOP))
1079             return 0;
1080         r_d = r->d;
1081         nist_cp_bn(r_d,a_d, BN_NIST_521_TOP);
1082     }
1083     else
1084         r_d = a_d;
1085
1086     /* upper 521 bits, copy ... */
1087     nist_cp_bn_0(t_d,a_d + (BN_NIST_521_TOP-1), top - (BN_NIST_521_TOP-1),BN
1088     /* ... and right shift */
1089     for (val=t_d[0],i=0; i<BN_NIST_521_TOP-1; i++)
1090     {
1091         tmp = val>>BN_NIST_521_RSHIFT;
1092         val = t_d[i+1];
1093         t_d[i] = (tmp | val<<BN_NIST_521_LSHIFT) & BN_MASK2;
1094     }
1095     t_d[i] = val>>BN_NIST_521_RSHIFT;
1096     /* lower 521 bits */
1097     r_d[i] &= BN_NIST_521_TOP_MASK;
1098
1099     bn_add_words(r_d,r_d,t_d,BN_NIST_521_TOP);
1100     mask = 0-(PTR_SIZE_INT)bn_sub_words(t_d,r_d,_nist_p_521,BN_NIST_521_TOP)
1101     res = t_d;
1102     res = (BN_ULONG *)(((PTR_SIZE_INT)res&~mask) |
1103         ((PTR_SIZE_INT)r_d&mask));
1104     nist_cp_bn(r_d,res,BN_NIST_521_TOP);
1105     r->top = BN_NIST_521_TOP;
1106     bn_correct_top(r);
1107
1108     return 1;
1109 }

```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_prime.c

1

```
*****
14208 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_prime.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_prime.c */
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6  * by Eric Young (eay@cryptsoft.com).
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
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58 /* =====
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60 *
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```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_prime.c

2

```
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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include <time.h>
114 #include "cryptlib.h"
115 #include "bn_lcl.h"
116 #include <openssl/rand.h>
117
118 /* NB: these functions have been "upgraded", the deprecated versions (which are
119 * compatibility wrappers using these functions) are in bn_depr.c.
120 * - Geoff
121 */
122
123 /* The quick sieve algorithm approach to weeding out primes is
124 * Philip Zimmermann's, as implemented in PGP. I have had a read of
125 * his comments and implemented my own version.
126 */
127 #include "bn_prime.h"
```

```

129 static int witness(BIGNUM *w, const BIGNUM *a, const BIGNUM *a1,
130     const BIGNUM *a1_odd, int k, BN_CTX *ctx, BN_MONT_CTX *mont);
131 static int probable_prime(BIGNUM *rnd, int bits);
132 static int probable_prime_dh(BIGNUM *rnd, int bits,
133     const BIGNUM *add, const BIGNUM *rem, BN_CTX *ctx);
134 static int probable_prime_dh_safe(BIGNUM *rnd, int bits,
135     const BIGNUM *add, const BIGNUM *rem, BN_CTX *ctx);

137 int BN_GENCB_call(BN_GENCB *cb, int a, int b)
138 {
139     /* No callback means continue */
140     if(!cb) return 1;
141     switch(cb->ver)
142     {
143     case 1:
144         /* Deprecated-style callbacks */
145         if(!cb->cb_1)
146             return 1;
147         cb->cb_1(a, b, cb->arg);
148         return 1;
149     case 2:
150         /* New-style callbacks */
151         return cb->cb_2(a, b, cb);
152     default:
153         break;
154     }
155     /* Unrecognised callback type */
156     return 0;
157 }

159 int BN_generate_prime_ex(BIGNUM *ret, int bits, int safe,
160     const BIGNUM *add, const BIGNUM *rem, BN_GENCB *cb)
161 {
162     BIGNUM *t;
163     int found=0;
164     int i,j,c1=0;
165     BN_CTX *ctx;
166     int checks = BN_prime_checks_for_size(bits);

168     ctx=BN_CTX_new();
169     if (ctx == NULL) goto err;
170     BN_CTX_start(ctx);
171     t = BN_CTX_get(ctx);
172     if(!t) goto err;
173 loop:
174     /* make a random number and set the top and bottom bits */
175     if (add == NULL)
176     {
177         if (!probable_prime(ret,bits)) goto err;
178     }
179     else
180     {
181         if (safe)
182         {
183             if (!probable_prime_dh_safe(ret,bits,add,rem,ctx))
184                 goto err;
185         }
186         else
187         {
188             if (!probable_prime_dh(ret,bits,add,rem,ctx))
189                 goto err;
190         }
191     }
192     /* if (BN_mod_word(ret,(BN_ULONG)3) == 1) goto loop; */
193     if(!BN_GENCB_call(cb, 0, c1++))

```

```

194         /* aborted */
195         goto err;

197     if (!safe)
198     {
199         i=BN_is_prime_fasttest_ex(ret,checks,ctx,0,cb);
200         if (i == -1) goto err;
201         if (i == 0) goto loop;
202     }
203     else
204     {
205         /* for "safe prime" generation,
206          * check that (p-1)/2 is prime.
207          * Since a prime is odd, we just
208          * need to divide by 2 */
209         if (!BN_rshift1(t,ret)) goto err;

211         for (i=0; i<checks; i++)
212         {
213             j=BN_is_prime_fasttest_ex(ret,1,ctx,0,cb);
214             if (j == -1) goto err;
215             if (j == 0) goto loop;

217             j=BN_is_prime_fasttest_ex(t,1,ctx,0,cb);
218             if (j == -1) goto err;
219             if (j == 0) goto loop;

221             if(!BN_GENCB_call(cb, 2, c1-1))
222                 goto err;
223             /* We have a safe prime test pass */
224         }
225     }
226     /* we have a prime :- ) */
227     found = 1;
228 err:
229     if (ctx != NULL)
230     {
231         BN_CTX_end(ctx);
232         BN_CTX_free(ctx);
233     }
234     bn_check_top(ret);
235     return found;
236 }

238 int BN_is_prime_ex(const BIGNUM *a, int checks, BN_CTX *ctx_passed, BN_GENCB *cb)
239 {
240     return BN_is_prime_fasttest_ex(a, checks, ctx_passed, 0, cb);
241 }

243 int BN_is_prime_fasttest_ex(const BIGNUM *a, int checks, BN_CTX *ctx_passed,
244     int do_trial_division, BN_GENCB *cb)
245 {
246     int i, j, ret = -1;
247     int k;
248     BN_CTX *ctx = NULL;
249     BIGNUM *A1, *A1_odd, *check; /* taken from ctx */
250     BN_MONT_CTX *mont = NULL;
251     const BIGNUM *A = NULL;

253     if (BN_cmp(a, BN_value_one()) <= 0)
254         return 0;
255
256     if (checks == BN_prime_checks)
257         checks = BN_prime_checks_for_size(BN_num_bits(a));
259     /* first look for small factors */

```

```

260     if (!BN_is_odd(a))
261         /* a is even => a is prime if and only if a == 2 */
262         return BN_is_word(a, 2);
263     if (do_trial_division)
264     {
265         for (i = 1; i < NUMPRIMES; i++)
266             if (BN_mod_word(a, primes[i]) == 0)
267                 return 0;
268         if (!BN_GENCB_call(cb, 1, -1))
269             goto err;
270     }

272     if (ctx_passed != NULL)
273         ctx = ctx_passed;
274     else
275         if ((ctx=BN_CTX_new()) == NULL)
276             goto err;
277     BN_CTX_start(ctx);

279     /* A := abs(a) */
280     if (a->neg)
281     {
282         BIGNUM *t;
283         if ((t = BN_CTX_get(ctx)) == NULL) goto err;
284         BN_copy(t, a);
285         t->neg = 0;
286         A = t;
287     }
288     else
289         A = a;
290     A1 = BN_CTX_get(ctx);
291     A1_odd = BN_CTX_get(ctx);
292     check = BN_CTX_get(ctx);
293     if (check == NULL) goto err;

295     /* compute A1 := A - 1 */
296     if (!BN_copy(A1, A))
297         goto err;
298     if (!BN_sub_word(A1, 1))
299         goto err;
300     if (BN_is_zero(A1))
301     {
302         ret = 0;
303         goto err;
304     }

306     /* write A1 as A1_odd * 2^k */
307     k = 1;
308     while (!BN_is_bit_set(A1, k))
309         k++;
310     if (!BN_rshift(A1_odd, A1, k))
311         goto err;

313     /* Montgomery setup for computations mod A */
314     mont = BN_MONT_CTX_new();
315     if (mont == NULL)
316         goto err;
317     if (!BN_MONT_CTX_set(mont, A, ctx))
318         goto err;

320     for (i = 0; i < checks; i++)
321     {
322         if (!BN_pseudo_rand_range(check, A1))
323             goto err;
324         if (!BN_add_word(check, 1))
325             goto err;

```

```

326         /* now 1 <= check < A */

328         j = witness(check, A, A1, A1_odd, k, ctx, mont);
329         if (j == -1) goto err;
330         if (j)
331         {
332             ret=0;
333             goto err;
334         }
335         if (!BN_GENCB_call(cb, 1, i))
336             goto err;
337     }
338     ret=1;
339 err:
340     if (ctx != NULL)
341     {
342         BN_CTX_end(ctx);
343         if (ctx_passed == NULL)
344             BN_CTX_free(ctx);
345     }
346     if (mont != NULL)
347         BN_MONT_CTX_free(mont);

349     return(ret);
350 }

352 static int witness(BIGNUM *w, const BIGNUM *a, const BIGNUM *a1,
353                   const BIGNUM *a1_odd, int k, BN_CTX *ctx, BN_MONT_CTX *mont)
354 {
355     if (!BN_mod_exp_mont(w, w, a1_odd, a, ctx, mont)) /* w := w^a1_odd mod a */
356         return -1;
357     if (BN_is_one(w))
358         return 0; /* probably prime */
359     if (BN_cmp(w, a1) == 0)
360         return 0; /* w == -1 (mod a), 'a' is probably prime */
361     while (--k)
362     {
363         if (!BN_mod_mul(w, w, w, a, ctx)) /* w := w^2 mod a */
364             return -1;
365         if (BN_is_one(w))
366             return 1; /* 'a' is composite, otherwise a previous 'w'
367                        * have been == -1 (mod 'a') */
368         if (BN_cmp(w, a1) == 0)
369             return 0; /* w == -1 (mod a), 'a' is probably prime */
370     }
371     /* If we get here, 'w' is the (a-1)/2-th power of the original 'w',
372      * and it is neither -1 nor +1 -- so 'a' cannot be prime */
373     bn_check_top(w);
374     return 1;
375 }

377 static int probable_prime(BIGNUM *rnd, int bits)
378 {
379     int i;
380     prime_t mods[NUMPRIMES];
381     BN_ULONG delta, maxdelta;

383     again:
384         if (!BN_rand(rnd, bits, 1, 1)) return(0);
385         /* we now have a random number 'rand' to test. */
386         for (i=1; i<NUMPRIMES; i++)
387             mods[i]=(prime_t)BN_mod_word(rnd, (BN_ULONG)primes[i]);
388         maxdelta=BN_MASK2 - primes[NUMPRIMES-1];
389         delta=0;
390         loop: for (i=1; i<NUMPRIMES; i++)
391             {

```

```

392         /* check that rnd is not a prime and also
393          * that gcd(rnd-1,primes) == 1 (except for 2) */
394         if (((mods[i]+delta)%primes[i]) <= 1)
395         {
396             delta+=2;
397             if (delta > maxdelta) goto again;
398             goto loop;
399         }
400     }
401     if (!BN_add_word(rnd,delta)) return(0);
402     bn_check_top(rnd);
403     return(1);
404 }

406 static int probable_prime_dh(BIGNUM *rnd, int bits,
407                             const BIGNUM *add, const BIGNUM *rem, BN_CTX *ctx)
408 {
409     int i,ret=0;
410     BIGNUM *t1;

412     BN_CTX_start(ctx);
413     if ((t1 = BN_CTX_get(ctx)) == NULL) goto err;

415     if (!BN_rand(rnd,bits,0,1)) goto err;

417     /* we need ((rnd-rem) % add) == 0 */

419     if (!BN_mod(t1,rnd,add,ctx)) goto err;
420     if (!BN_sub(rnd,rnd,t1)) goto err;
421     if (rem == NULL)
422         { if (!BN_add_word(rnd,1)) goto err; }
423     else
424         { if (!BN_add(rnd,rnd,rem)) goto err; }

426     /* we now have a random number 'rand' to test. */

428     loop: for (i=1; i<NUMPRIMES; i++)
429     {
430         /* check that rnd is a prime */
431         if (BN_mod_word(rnd,(BN_ULONG)primes[i]) <= 1)
432         {
433             if (!BN_add(rnd,rnd,add)) goto err;
434             goto loop;
435         }
436     }
437     ret=1;
438 err:
439     BN_CTX_end(ctx);
440     bn_check_top(rnd);
441     return(ret);
442 }

444 static int probable_prime_dh_safe(BIGNUM *p, int bits, const BIGNUM *padd,
445                                   const BIGNUM *rem, BN_CTX *ctx)
446 {
447     int i,ret=0;
448     BIGNUM *t1,*qadd,*q;

450     bits--;
451     BN_CTX_start(ctx);
452     t1 = BN_CTX_get(ctx);
453     q = BN_CTX_get(ctx);
454     qadd = BN_CTX_get(ctx);
455     if (qadd == NULL) goto err;

457     if (!BN_rshift1(qadd,padd)) goto err;

```

```

458
459     if (!BN_rand(q,bits,0,1)) goto err;

461     /* we need ((rnd-rem) % add) == 0 */
462     if (!BN_mod(t1,q,qadd,ctx)) goto err;
463     if (!BN_sub(q,q,t1)) goto err;
464     if (rem == NULL)
465         { if (!BN_add_word(q,1)) goto err; }
466     else
467     {
468         if (!BN_rshift1(t1,rem)) goto err;
469         if (!BN_add(q,q,t1)) goto err;
470     }

472     /* we now have a random number 'rand' to test. */
473     if (!BN_lshift1(p,q)) goto err;
474     if (!BN_add_word(p,1)) goto err;

476     loop: for (i=1; i<NUMPRIMES; i++)
477     {
478         /* check that p and q are prime */
479         /* check that for p and q
480          * gcd(p-1,primes) == 1 (except for 2) */
481         if ( (BN_mod_word(p,(BN_ULONG)primes[i]) == 0) ||
482             (BN_mod_word(q,(BN_ULONG)primes[i]) == 0) )
483         {
484             if (!BN_add(p,p,padd)) goto err;
485             if (!BN_add(q,q,qadd)) goto err;
486             goto loop;
487         }
488     }
489     ret=1;
490 err:
491     BN_CTX_end(ctx);
492     bn_check_top(p);
493     return(ret);
494 }

```

```

*****
8857 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_print.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_print.c */
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57 */
58
59 #include <stdio.h>
60 #include <ctype.h>
61 #include "cryptlib.h"

```

```

62 #include <openssl/buffer.h>
63 #include "bn_lcl.h"
64
65 static const char Hex[]="0123456789ABCDEF";
66
67 /* Must 'OPENSSL_free' the returned data */
68 char *BN_bn2hex(const BIGNUM *a)
69 {
70     int i,j,v,z=0;
71     char *buf;
72     char *p;
73
74     buf=(char *)OPENSSL_malloc(a->top*BN_BYTES*2+2);
75     if (buf == NULL)
76     {
77         Bnerr(BN_F_BN2HEX,ERR_R_MALLOC_FAILURE);
78         goto err;
79     }
80     p=buf;
81     if (a->neg) *(p++)='-';
82     if (BN_is_zero(a)) *(p++)='0';
83     for (i=a->top-1; i >=0; i--)
84     {
85         for (j=BN_BITS2-8; j >= 0; j-=8)
86         {
87             /* strip leading zeros */
88             v=((int)(a->d[i]>>(long)j))&0xff;
89             if (z || (v != 0))
90             {
91                 *(p++)=Hex[v>>4];
92                 *(p++)=Hex[v&0x0f];
93                 z=1;
94             }
95         }
96         *p='\0';
97     }
98 err:
99     return(buf);
100 }
101
102 /* Must 'OPENSSL_free' the returned data */
103 char *BN_bn2dec(const BIGNUM *a)
104 {
105     int i=0,num, ok = 0;
106     char *buf=NULL;
107     char *p;
108     BIGNUM *t=NULL;
109     BN_ULONG *bn_data=NULL,*lp;
110
111     /* get an upper bound for the length of the decimal integer
112     * num <= (BN_num_bits(a) + 1) * log(2)
113     * <= 3 * BN_num_bits(a) * 0.1001 + log(2) + 1 (rounding error)
114     * <= BN_num_bits(a)/10 + BN_num_bits/1000 + 1 + 1
115     */
116     i=BN_num_bits(a)*3;
117     num=(i/10+i/1000+1)+1;
118     bn_data=(BN_ULONG *)OPENSSL_malloc((num/BN_DEC_NUM+1)*sizeof(BN_ULONG));
119     buf=(char *)OPENSSL_malloc(num+3);
120     if ((buf == NULL) || (bn_data == NULL))
121     {
122         Bnerr(BN_F_BN2DEC,ERR_R_MALLOC_FAILURE);
123         goto err;
124     }
125     if ((t=BN_dup(a)) == NULL) goto err;
126
127 #define BUF_REMAIN (num+3 - (size_t)(p - buf))

```

```

128     p=buf;
129     lp=bn_data;
130     if (BN_is_zero(t))
131     {
132         *(p++)='0';
133         *(p++)='\0';
134     }
135     else
136     {
137         if (BN_is_negative(t))
138             *p++ = '-';

140         i=0;
141         while (!BN_is_zero(t))
142         {
143             *lp=BN_div_word(t,BN_DEC_CONV);
144             lp++;
145         }
146         lp--;
147         /* We now have a series of blocks, BN_DEC_NUM chars
148          * in length, where the last one needs truncation.
149          * The blocks need to be reversed in order. */
150         BIO_snprintf(p,BUF_REMAIN,BN_DEC_FMT1,*lp);
151         while (*p) p++;
152         while (lp != bn_data)
153         {
154             lp--;
155             BIO_snprintf(p,BUF_REMAIN,BN_DEC_FMT2,*lp);
156             while (*p) p++;
157         }
158     }
159     ok = 1;
160 err:
161     if (bn_data != NULL) OPENSSL_free(bn_data);
162     if (t != NULL) BN_free(t);
163     if (!ok && buf)
164     {
165         OPENSSL_free(buf);
166         buf = NULL;
167     }

169     return(buf);
170 }

172 int BN_hex2bn(BIGNUM **bn, const char *a)
173 {
174     BIGNUM *ret=NULL;
175     BN_ULONG l=0;
176     int neg=0,h,m,i,j,k,c;
177     int num;

179     if ((a == NULL) || (*a == '\0')) return(0);

181     if (*a == '-') { neg=1; a++; }

183     for (i=0; isxdigit((unsigned char) a[i]); i++)
184         ;

186     num=i+neg;
187     if (bn == NULL) return(num);

189     /* a is the start of the hex digits, and it is 'i' long */
190     if (*bn == NULL)
191     {
192         if ((ret=BN_new()) == NULL) return(0);
193     }

```

```

194     else
195     {
196         ret= *bn;
197         BN_zero(ret);
198     }

200     /* i is the number of hex digests; */
201     if (bn_expand(ret,i*4) == NULL) goto err;

203     j=i; /* least significant 'hex' */
204     m=0;
205     h=0;
206     while (j > 0)
207     {
208         m=((BN_BYTES*2) <= j)?(BN_BYTES*2):j;
209         l=0;
210         for (;;)
211         {
212             c=a[j-m];
213             if ((c >= '0') && (c <= '9')) k=c-'0';
214             else if ((c >= 'a') && (c <= 'f')) k=c-'a'+10;
215             else if ((c >= 'A') && (c <= 'F')) k=c-'A'+10;
216             else k=0; /* paranoia */
217             l=(l<4)|k;

219             if (--m <= 0)
220             {
221                 ret->d[h++]=l;
222                 break;
223             }
224         }
225         j--=(BN_BYTES*2);
226     }

227     ret->top=h;
228     bn_correct_top(ret);
229     ret->neg=neg;

231     *bn=ret;
232     bn_check_top(ret);
233     return(num);
234 err:
235     if (*bn == NULL) BN_free(ret);
236     return(0);
237 }

239 int BN_dec2bn(BIGNUM **bn, const char *a)
240 {
241     BIGNUM *ret=NULL;
242     BN_ULONG l=0;
243     int neg=0,i,j;
244     int num;

246     if ((a == NULL) || (*a == '\0')) return(0);
247     if (*a == '-') { neg=1; a++; }

249     for (i=0; isdigit((unsigned char) a[i]); i++)
250         ;

252     num=i+neg;
253     if (bn == NULL) return(num);

255     /* a is the start of the digits, and it is 'i' long.
256      * We chop it into BN_DEC_NUM digits at a time */
257     if (*bn == NULL)
258     {
259         if ((ret=BN_new()) == NULL) return(0);

```

```

260     }
261     else
262     {
263         ret= *bn;
264         BN_zero(ret);
265     }

266     /* i is the number of digests, a bit of an over expand; */
267     if (bn_expand(ret,i*4) == NULL) goto err;

270     j=BN_DEC_NUM-(i%BN_DEC_NUM);
271     if (j == BN_DEC_NUM) j=0;
272     l=0;
273     while (*a)
274     {
275         l*=10;
276         l+= *a-'0';
277         a++;
278         if (++j == BN_DEC_NUM)
279         {
280             BN_mul_word(ret,BN_DEC_CONV);
281             BN_add_word(ret,l);
282             l=0;
283             j=0;
284         }
285     }
286     ret->neg=neg;

288     bn_correct_top(ret);
289     *bn=ret;
290     bn_check_top(ret);
291     return(num);
292 err:
293     if (*bn == NULL) BN_free(ret);
294     return(0);
295 }

297 int BN_asc2bn(BIGNUM **bn, const char *a)
298 {
299     const char *p = a;
300     if (*p == '-')
301         p++;

303     if (p[0] == '0' && (p[1] == 'X' || p[1] == 'x'))
304     {
305         if (!BN_hex2bn(bn, p + 2))
306             return 0;
307     }
308     else
309     {
310         if (!BN_dec2bn(bn, p))
311             return 0;
312     }
313     if (*a == '-')
314         (*bn)->neg = 1;
315     return 1;
316 }

318 #ifndef OPENSSL_NO_BIO
319 #ifndef OPENSSL_NO_FP_API
320 int BN_print_fp(FILE *fp, const BIGNUM *a)
321 {
322     BIO *b;
323     int ret;

325     if ((b=BIO_new(BIO_s_file())) == NULL)

```

```

326         return(0);
327         BIO_set_fp(b,fp,BIO_NOCLOSE);
328         ret=BN_print(b,a);
329         BIO_free(b);
330         return(ret);
331     }
332 #endif

334 int BN_print(BIO *bp, const BIGNUM *a)
335 {
336     int i,j,v,z=0;
337     int ret=0;

339     if ((a->neg) && (BIO_write(bp,"-",1) != 1)) goto end;
340     if (BN_is_zero(a) && (BIO_write(bp,"0",1) != 1)) goto end;
341     for (i=a->top-1; i >=0; i--)
342     {
343         for (j=BN_BITS2-4; j >= 0; j-=4)
344         {
345             /* strip leading zeros */
346             v=((int)(a->d[i]>>(long)j))&0x0f;
347             if (z || (v != 0))
348             {
349                 if (BIO_write(bp,&(Hex[v]),1) != 1)
350                     goto end;
351                 z=1;
352             }
353         }
354     }
355     ret=1;
356 end:
357     return(ret);
358 }
359 #endif

361 char *BN_options(void)
362 {
363     static int init=0;
364     static char data[16];

366     if (!init)
367     {
368         init++;
369 #ifdef BN_LLONG
370         BIO_snprintf(data,sizeof data,"bn(%d,%d)",
371             (int)sizeof(BN_ULONG)*8,(int)sizeof(BN_ULONG)*8);
372 #else
373         BIO_snprintf(data,sizeof data,"bn(%d,%d)",
374             (int)sizeof(BN_ULONG)*8,(int)sizeof(BN_ULONG)*8);
375 #endif
376     }
377     return(data);
378 }

```


new/usr/src/lib/openssl/libsunw_crypto/bn/bn_rand.c

1

```
*****
9388 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_rand.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_rand.c */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_rand.c

2

```
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109 *
110 */
111
112 #include <stdio.h>
113 #include <time.h>
114 #include "cryptlib.h"
115 #include "bn_lcl.h"
116 #include <openssl/rand.h>
117
118 static int bnrnd(int pseudorand, BIGNUM *rnd, int bits, int top, int bottom)
119 {
120     unsigned char *buf=NULL;
121     int ret=0,bit,bytes,mask;
122     time_t ttm;
123
124     if (bits == 0)
125     {
126         BN_zero(rnd);
127         return 1;
128     }
```

```

128     }
129
130     bytes=(bits+7)/8;
131     bit=(bits-1)%8;
132     mask=0xff<<(bit+1);
133
134     buf=(unsigned char *)OPENSSL_malloc(bytes);
135     if (buf == NULL)
136     {
137         BNerr(BN_F_BN_rand,ERR_R_MALLOC_FAILURE);
138         goto err;
139     }
140
141     /* make a random number and set the top and bottom bits */
142     time(&tim);
143     RAND_add(&tim,sizeof(tim),0.0);
144
145     if (pseudorand)
146     {
147         if (RAND_pseudo_bytes(buf, bytes) == -1)
148             goto err;
149     }
150     else
151     {
152         if (RAND_bytes(buf, bytes) <= 0)
153             goto err;
154     }
155
156 #if 1
157     if (pseudorand == 2)
158     {
159         /* generate patterns that are more likely to trigger BN
160          library bugs */
161         int i;
162         unsigned char c;
163
164         for (i = 0; i < bytes; i++)
165         {
166             RAND_pseudo_bytes(&c, 1);
167             if (c >= 128 && i > 0)
168                 buf[i] = buf[i-1];
169             else if (c < 42)
170                 buf[i] = 0;
171             else if (c < 84)
172                 buf[i] = 255;
173             }
174         }
175     #endif
176
177     if (top != -1)
178     {
179         if (top)
180         {
181             if (bit == 0)
182             {
183                 buf[0]=1;
184                 buf[1]|=0x80;
185             }
186             else
187             {
188                 buf[0]|=(3<<(bit-1));
189             }
190         }
191         else
192         {
193             buf[0]|=(1<<bit);
194         }
195     }

```

```

194     }
195     }
196     buf[0] &= ~mask;
197     if (bottom) /* set bottom bit if requested */
198         buf[bytes-1]|=1;
199     if (!BN_bin2bn(buf,bytes,rnd)) goto err;
200     ret=1;
201 err:
202     if (buf != NULL)
203     {
204         OPENSSL_cleanse(buf,bytes);
205         OPENSSL_free(buf);
206     }
207     bn_check_top(rnd);
208     return(ret);
209 }
210
211 int BN_rand(BIGNUM *rnd, int bits, int top, int bottom)
212 {
213     return bnrand(0, rnd, bits, top, bottom);
214 }
215
216 int BN_pseudo_rand(BIGNUM *rnd, int bits, int top, int bottom)
217 {
218     return bnrand(1, rnd, bits, top, bottom);
219 }
220
221 #if 1
222 int BN_bntest_rand(BIGNUM *rnd, int bits, int top, int bottom)
223 {
224     return bnrand(2, rnd, bits, top, bottom);
225 }
226 #endif
227
228 /* random number r: 0 <= r < range */
229 static int bn_rand_range(int pseudo, BIGNUM *r, const BIGNUM *range)
230 {
231     int (*bn_rand)(BIGNUM *, int, int, int) = pseudo ? BN_pseudo_rand : BN_r
232     int n;
233     int count = 100;
234
235     if (range->neg || BN_is_zero(range))
236     {
237         BNerr(BN_F_BN_rand_range, BN_R_INVALID_RANGE);
238         return 0;
239     }
240
241     n = BN_num_bits(range); /* n > 0 */
242
243     /* BN_is_bit_set(range, n - 1) always holds */
244
245     if (n == 1)
246         BN_zero(r);
247     else if (!BN_is_bit_set(range, n - 2) && !BN_is_bit_set(range, n - 3))
248     {
249         /* range = 100...2,
250          * so 3*range (= 11...2) is exactly one bit longer than rang
251         do
252         {
253             if (!bn_rand(r, n + 1, -1, 0)) return 0;
254             /* If r < 3*range, use r := r MOD range
255              * (which is either r, r - range, or r - 2*range).
256              * Otherwise, iterate once more.
257              * Since 3*range = 11...2, each iteration succeeds wit
258              * probability >= .75. */
259         }

```

```
260         if (BN_cmp(r, range) >= 0)
261             {
262                 if (!BN_sub(r, r, range)) return 0;
263                 if (BN_cmp(r, range) >= 0)
264                     if (!BN_sub(r, r, range)) return 0;
265             }
266
267         if (!--count)
268             {
269                 BNerr(BN_F_BN_RAND_RANGE, BN_R_TOO_MANY_ITERATIO
270                     return 0;
271             }
272     }
273     while (BN_cmp(r, range) >= 0);
274 }
275 else
276 {
277     do
278     {
279         /* range = 11...2 or range = 101...2 */
280         if (!bn_rand(r, n, -1, 0)) return 0;
281
282         if (!--count)
283             {
284                 BNerr(BN_F_BN_RAND_RANGE, BN_R_TOO_MANY_ITERATIO
285                     return 0;
286             }
287     }
288     while (BN_cmp(r, range) >= 0);
289 }
290
291 bn_check_top(r);
292 return 1;
293 }
294
295
296
297 int BN_rand_range(BIGNUM *r, const BIGNUM *range)
298 {
299     return bn_rand_range(0, r, range);
300 }
301
302 int BN_pseudo_rand_range(BIGNUM *r, const BIGNUM *range)
303 {
304     return bn_rand_range(1, r, range);
305 }
```

```

*****
6772 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_recp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/bn/bn_recp.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
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18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include "bn_lcl.h"

```

```

63 void BN_RECP_CTX_init(BN_RECP_CTX *recp)
64 {
65     BN_init(&(recp->N));
66     BN_init(&(recp->Nr));
67     recp->num_bits=0;
68     recp->flags=0;
69 }
70
71 BN_RECP_CTX *BN_RECP_CTX_new(void)
72 {
73     BN_RECP_CTX *ret;
74
75     if ((ret=(BN_RECP_CTX *)OPENSSL_malloc(sizeof(BN_RECP_CTX))) == NULL)
76         return(NULL);
77
78     BN_RECP_CTX_init(ret);
79     ret->flags=BN_FLG_MALLOCED;
80     return(ret);
81 }
82
83 void BN_RECP_CTX_free(BN_RECP_CTX *recp)
84 {
85     if(recp == NULL)
86         return;
87
88     BN_free(&(recp->N));
89     BN_free(&(recp->Nr));
90     if (recp->flags & BN_FLG_MALLOCED)
91         OPENSSL_free(recp);
92 }
93
94 int BN_RECP_CTX_set(BN_RECP_CTX *recp, const BIGNUM *d, BN_CTX *ctx)
95 {
96     if (!BN_copy(&(recp->N),d)) return 0;
97     BN_zero(&(recp->Nr));
98     recp->num_bits=BN_num_bits(d);
99     recp->shift=0;
100     return(1);
101 }
102
103 int BN_mod_mul_reciprocal(BIGNUM *r, const BIGNUM *x, const BIGNUM *y,
104     BN_RECP_CTX *recp, BN_CTX *ctx)
105 {
106     int ret=0;
107     BIGNUM *a;
108     const BIGNUM *ca;
109
110     BN_CTX_start(ctx);
111     if ((a = BN_CTX_get(ctx)) == NULL) goto err;
112     if (y != NULL)
113     {
114         if (x == y)
115             { if (!BN_sqr(a,x,ctx)) goto err; }
116         else
117             { if (!BN_mul(a,x,y,ctx)) goto err; }
118         ca = a;
119     }
120     else
121         ca=x; /* Just do the mod */
122
123     ret = BN_div_recip(NULL,r,ca,recp,ctx);
124 err:
125     BN_CTX_end(ctx);
126     bn_check_top(r);
127     return(ret);

```

```

128     }
130 int BN_div_recip(BIGNUM *dv, BIGNUM *rem, const BIGNUM *m,
131 BN_RECP_CTX *recp, BN_CTX *ctx)
132 {
133     int i, j, ret=0;
134     BIGNUM *a, *b, *d, *r;
136     BN_CTX_start(ctx);
137     a=BN_CTX_get(ctx);
138     b=BN_CTX_get(ctx);
139     if (dv != NULL)
140         d=dv;
141     else
142         d=BN_CTX_get(ctx);
143     if (rem != NULL)
144         r=rem;
145     else
146         r=BN_CTX_get(ctx);
147     if (a == NULL || b == NULL || d == NULL || r == NULL) goto err;
149     if (BN_ucmp(m, &(recp->N)) < 0)
150     {
151         BN_zero(d);
152         if (!BN_copy(r, m)) return 0;
153         BN_CTX_end(ctx);
154         return(1);
155     }
157     /* We want the remainder
158     * Given input of ABCDEF / ab
159     * we need multiply ABCDEF by 3 digests of the reciprocal of ab
160     *
161     */
163     /* i := max(BN_num_bits(m), 2*BN_num_bits(N)) */
164     i=BN_num_bits(m);
165     j=recp->num_bits<<1;
166     if (j>i) i=j;
168     /* Nr := round(2^i / N) */
169     if (i != recp->shift)
170         recp->shift=BN_reciprocal(&(recp->Nr), &(recp->N),
171 i, ctx); /* BN_reciprocal returns i, or -1 for an error */
172     if (recp->shift == -1) goto err;
174     /* d := |round(round(m / 2^BN_num_bits(N)) * recp->Nr / 2^(i - BN_num_bi
175     *      = |round(round(m / 2^BN_num_bits(N)) * round(2^i / N) / 2^(i - BN
176     *      <= |(m / 2^BN_num_bits(N)) * (2^i / N) * (2^BN_num_bits(N) / 2^i)|
177     *      = |m/N|
178     */
179     if (!BN_rshift(a, m, recp->num_bits)) goto err;
180     if (!BN_mul(b, a, &(recp->Nr), ctx)) goto err;
181     if (!BN_rshift(d, b, i-recp->num_bits)) goto err;
182     d->neg=0;
184     if (!BN_mul(b, &(recp->N), d, ctx)) goto err;
185     if (!BN_usub(r, m, b)) goto err;
186     r->neg=0;
188 #if 1
189     j=0;
190     while (BN_ucmp(r, &(recp->N)) >= 0)
191     {
192         if (j++ > 2)
193         {

```

```

194         BNerr(BN_F_BN_DIV_RECP, BN_R_BAD_RECIPROCAL);
195         goto err;
196     }
197     if (!BN_usub(r, r, &(recp->N))) goto err;
198     if (!BN_add_word(d, 1)) goto err;
199 }
200 #endif
202     r->neg=BN_is_zero(r)?0:m->neg;
203     d->neg=m->neg^recp->N.neg;
204     ret=1;
205 err:
206     BN_CTX_end(ctx);
207     bn_check_top(dv);
208     bn_check_top(rem);
209     return(ret);
210 }
212 /* len is the expected size of the result
213 * We actually calculate with an extra word of precision, so
214 * we can do faster division if the remainder is not required.
215 */
216 /* r := 2^len / m */
217 int BN_reciprocal(BIGNUM *r, const BIGNUM *m, int len, BN_CTX *ctx)
218 {
219     int ret= -1;
220     BIGNUM *t;
222     BN_CTX_start(ctx);
223     if((t = BN_CTX_get(ctx)) == NULL) goto err;
225     if (!BN_set_bit(t, len)) goto err;
227     if (!BN_div(r, NULL, t, m, ctx)) goto err;
229     ret=len;
230 err:
231     bn_check_top(r);
232     BN_CTX_end(ctx);
233     return(ret);
234 }

```

```

*****
5648 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_shift.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_shift.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include "bn_lcl.h"

```

```

63 int BN_lshift1(BIGNUM *r, const BIGNUM *a)
64 {
65     register BN_ULONG *ap,*rp,t,c;
66     int i;
67
68     bn_check_top(r);
69     bn_check_top(a);
70
71     if (r != a)
72     {
73         r->neg=a->neg;
74         if (bn_wexpand(r,a->top+1) == NULL) return(0);
75         r->top=a->top;
76     }
77     else
78     {
79         if (bn_wexpand(r,a->top+1) == NULL) return(0);
80     }
81     ap=a->d;
82     rp=r->d;
83     c=0;
84     for (i=0; i<a->top; i++)
85     {
86         t= *(ap++);
87         *(rp++)=((t<<1)|c)&BN_MASK2;
88         c=(t & BN_TBIT)?1:0;
89     }
90     if (c)
91     {
92         *rp=1;
93         r->top++;
94     }
95     bn_check_top(r);
96     return(1);
97 }
98
99 int BN_rshift1(BIGNUM *r, const BIGNUM *a)
100 {
101     BN_ULONG *ap,*rp,t,c;
102     int i,j;
103
104     bn_check_top(r);
105     bn_check_top(a);
106
107     if (BN_is_zero(a))
108     {
109         BN_zero(r);
110         return(1);
111     }
112     i = a->top;
113     ap= a->d;
114     j = i-(ap[i-1]==1);
115     if (a != r)
116     {
117         if (bn_wexpand(r,j) == NULL) return(0);
118         r->neg=a->neg;
119     }
120     rp=r->d;
121     t=ap[--i];
122     c=(t&1)?BN_TBIT:0;
123     if (t>>=1) rp[i]=t;
124     while (i>0)
125     {
126         t=ap[--i];
127         rp[i]=((t>>1)&BN_MASK2)|c;

```

```

128         c=(t&1)?BN_TBIT:0;
129     }
130     r->top=j;
131     bn_check_top(r);
132     return(1);
133 }

135 int BN_lshift(BIGNUM *r, const BIGNUM *a, int n)
136 {
137     int i,nw,lb,rb;
138     BN_ULONG *t,*f;
139     BN_ULONG l;

141     bn_check_top(r);
142     bn_check_top(a);

144     r->neg=a->neg;
145     nw=n/BN_BITS2;
146     if (bn_wexpand(r,a->top+nw+1) == NULL) return(0);
147     lb=n%BN_BITS2;
148     rb=BN_BITS2-lb;
149     f=a->d;
150     t=r->d;
151     t[a->top+nw]=0;
152     if (lb == 0)
153         for (i=a->top-1; i>=0; i--)
154             t[nw+i]=f[i];
155     else
156         for (i=a->top-1; i>=0; i--)
157             {
158                 l=f[i];
159                 t[nw+i+1]=(l>>rb)&BN_MASK2;
160                 t[nw+i]=(l<<lb)&BN_MASK2;
161             }
162     memset(t,0,nw*sizeof(t[0]));
163 /*
164     for (i=0; i<nw; i++)
165         t[i]=0;*/
166     r->top=a->top+nw+1;
167     bn_correct_top(r);
168     bn_check_top(r);
169     return(1);
170 }

171 int BN_rshift(BIGNUM *r, const BIGNUM *a, int n)
172 {
173     int i,j,nw,lb,rb;
174     BN_ULONG *t,*f;
175     BN_ULONG l,tmp;

177     bn_check_top(r);
178     bn_check_top(a);

180     nw=n/BN_BITS2;
181     rb=n%BN_BITS2;
182     lb=BN_BITS2-rb;
183     if (nw >= a->top || a->top == 0)
184     {
185         BN_zero(r);
186         return(1);
187     }
188     i = (BN_num_bits(a)-n+(BN_BITS2-1))/BN_BITS2;
189     if (r != a)
190     {
191         r->neg=a->neg;
192         if (bn_wexpand(r,i) == NULL) return(0);
193     }

```

```

194     else
195     {
196         if (n == 0)
197             return 1; /* or the copying loop will go berserk */
198     }

200     f= &(a->d[nw]);
201     t=r->d;
202     j=a->top-nw;
203     r->top=i;

205     if (rb == 0)
206     {
207         for (i=j; i != 0; i--)
208             *(t++)= *(f++);
209     }
210     else
211     {
212         l= *(f++);
213         for (i=j-1; i != 0; i--)
214             {
215                 tmp =(l>>rb)&BN_MASK2;
216                 l= *(f++);
217                 *(t++) =(tmp|(l<<lb))&BN_MASK2;
218             }
219         if ((l = (l>>rb)&BN_MASK2)) *(t) = l;
220     }
221     bn_check_top(r);
222     return(1);
223 }

```

```

*****
7530 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_sqr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_sqr.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include "bn_lcl.h"

```

```

63 /* r must not be a */
64 /* I've just gone over this and it is now %20 faster on x86 - eay - 27 Jun 96 */
65 int BN_sqr(BIGNUM *r, const BIGNUM *a, BN_CTX *ctx)
66 {
67     int max,al;
68     int ret = 0;
69     BIGNUM *tmp,*rr;
70
71 #ifdef BN_COUNT
72     fprintf(stderr,"BN_sqr %d * %d\n",a->top,a->top);
73 #endif
74     bn_check_top(a);
75
76     al=a->top;
77     if (al <= 0)
78     {
79         r->top=0;
80         return 1;
81     }
82
83     BN_CTX_start(ctx);
84     rr=(a != r) ? r : BN_CTX_get(ctx);
85     tmp=BN_CTX_get(ctx);
86     if (!rr || !tmp) goto err;
87
88     max = 2 * al; /* Non-zero (from above) */
89     if (bn_wexpand(rr,max) == NULL) goto err;
90
91     if (al == 4)
92     {
93 #ifndef BN_SQR_COMBA
94         BN_ULONG t[8];
95         bn_sqr_normal(rr->d,a->d,4,t);
96 #else
97         bn_sqr_comba4(rr->d,a->d);
98 #endif
99     }
100     else if (al == 8)
101     {
102 #ifndef BN_SQR_COMBA
103         BN_ULONG t[16];
104         bn_sqr_normal(rr->d,a->d,8,t);
105 #else
106         bn_sqr_comba8(rr->d,a->d);
107 #endif
108     }
109     else
110     {
111 #if defined(BN_RECURSION)
112         if (al < BN_SQR_RECURSIVE_SIZE_NORMAL)
113         {
114             BN_ULONG t[BN_SQR_RECURSIVE_SIZE_NORMAL*2];
115             bn_sqr_normal(rr->d,a->d,al,t);
116         }
117         else
118         {
119             int j,k;
120
121             j=BN_num_bits_word((BN_ULONG)al);
122             j=1<<(j-1);
123             k=j+j;
124             if (al == j)
125             {
126                 if (bn_wexpand(tmp,k*2) == NULL) goto err;
127                 bn_sqr_recursive(rr->d,a->d,al,tmp->d);

```



```

128     }
129     else
130     {
131         if (bn_wexpand(tmp,max) == NULL) goto err;
132         bn_sqr_normal(rr->d,a->d,al,tmp->d);
133     }
134 }
135 #else
136     if (bn_wexpand(tmp,max) == NULL) goto err;
137     bn_sqr_normal(rr->d,a->d,al,tmp->d);
138 #endif
139 }

141 rr->neg=0;
142 /* If the most-significant half of the top word of 'a' is zero, then
143  * the square of 'a' will max-1 words. */
144 if(a->d[al - 1] == (a->d[al - 1] & BN_MASK2l))
145     rr->top = max - 1;
146 else
147     rr->top = max;
148 if (rr != r) BN_copy(r,rr);
149 ret = 1;
150 err:
151 bn_check_top(rr);
152 bn_check_top(tmp);
153 BN_CTX_end(ctx);
154 return(ret);
155 }

157 /* tmp must have 2*n words */
158 void bn_sqr_normal(BN_ULONG *r, const BN_ULONG *a, int n, BN_ULONG *tmp)
159 {
160     int i,j,max;
161     const BN_ULONG *ap;
162     BN_ULONG *rp;

164     max=n*2;
165     ap=a;
166     rp=r;
167     rp[0]=rp[max-1]=0;
168     rp++;
169     j=n;

171     if (--j > 0)
172     {
173         ap++;
174         rp[j]=bn_mul_words(rp,ap,j,ap[-1]);
175         rp+=2;
176     }

178     for (i=n-2; i>0; i--)
179     {
180         j--;
181         ap++;
182         rp[j]=bn_mul_add_words(rp,ap,j,ap[-1]);
183         rp+=2;
184     }

186     bn_add_words(r,r,r,max);

188     /* There will not be a carry */

190     bn_sqr_words(tmp,a,n);

192     bn_add_words(r,r,tmp,max);
193 }

```

```

195 #ifdef BN_RECURSION
196 /* r is 2*n words in size,
197  * a and b are both n words in size. (There's not actually a 'b' here ...)
198  * n must be a power of 2.
199  * We multiply and return the result.
200  * t must be 2*n words in size
201  * We calculate
202  * a[0]*b[0]
203  * a[0]*b[0]+a[1]*b[1]+(a[0]-a[1])*(b[1]-b[0])
204  * a[1]*b[1]
205  */
206 void bn_sqr_recursive(BN_ULONG *r, const BN_ULONG *a, int n2, BN_ULONG *t)
207 {
208     int n=n2/2;
209     int zero,c1;
210     BN_ULONG ln,lo,*p;

212 #ifdef BN_COUNT
213     fprintf(stderr," bn_sqr_recursive %d * %d\n",n2,n2);
214 #endif
215     if (n2 == 4)
216     {
217         #ifndef BN_SQR_COMBA
218             bn_sqr_normal(r,a,4,t);
219         #else
220             bn_sqr_comba4(r,a);
221         #endif
222         return;
223     }
224     else if (n2 == 8)
225     {
226         #ifndef BN_SQR_COMBA
227             bn_sqr_normal(r,a,8,t);
228         #else
229             bn_sqr_comba8(r,a);
230         #endif
231         return;
232     }
233     if (n2 < BN_SQR_RECURSIVE_SIZE_NORMAL)
234     {
235         bn_sqr_normal(r,a,n2,t);
236         return;
237     }
238     /* r=(a[0]-a[1])*(a[1]-a[0]) */
239     c1=bn_cmp_words(a,&a[n],n);
240     zero=0;
241     if (c1 > 0)
242         bn_sub_words(t,a,&a[n],n);
243     else if (c1 < 0)
244         bn_sub_words(t,&a[n],a,n);
245     else
246         zero=1;

248     /* The result will always be negative unless it is zero */
249     p= &t[n2*2];

251     if (!zero)
252         bn_sqr_recursive(&t[n2],t,n,p);
253     else
254         memset(&t[n2],0,n2*sizeof(BN_ULONG));
255     bn_sqr_recursive(r,a,n,p);
256     bn_sqr_recursive(&r[n2],&a[n],n,p);

258     /* t[32] holds (a[0]-a[1])*(a[1]-a[0]), it is negative or zero
259      * r[10] holds (a[0]*b[0])

```

```
260     * r[32] holds (b[1]*b[1])
261     */
263     c1=(int)(bn_add_words(t,r,&(r[n2]),n2));
265     /* t[32] is negative */
266     c1-=(int)(bn_sub_words(&(t[n2]),t,&(t[n2]),n2));
268     /* t[32] holds (a[0]-a[1])*(a[1]-a[0])+(a[0]*a[0])+(a[1]*a[1])
269     * r[10] holds (a[0]*a[0])
270     * r[32] holds (a[1]*a[1])
271     * c1 holds the carry bits
272     */
273     c1+=(int)(bn_add_words(&(r[n]),&(r[n]),&(t[n2]),n2));
274     if (c1)
275     {
276         p= &(r[n+n2]);
277         lo= *p;
278         ln=(lo+c1)&BN_MASK2;
279         *p=ln;
281         /* The overflow will stop before we over write
282         * words we should not overwrite */
283         if (ln < (BN_ULONG)c1)
284             {
285                 do
286                 {
287                     p++;
288                     lo= *p;
289                     ln=(lo+1)&BN_MASK2;
290                     *p=ln;
291                     } while (ln == 0);
292             }
293     }
294 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_sqrt.c

1

```
*****
10005 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_sqrt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/bn/bn_sqrt.c */
2 /* Written by Lenka Fibikova <fibikova@exp-math.uni-essen.de>
3  * and Bodo Moeller for the OpenSSL project. */
4 /* =====
5  * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
6  *
7  * Redistribution and use in source and binary forms, with or without
8  * modification, are permitted provided that the following conditions
9  * are met:
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11 * 1. Redistributions of source code must retain the above copyright
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13 *
14 * 2. Redistributions in binary form must reproduce the above copyright
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17 * distribution.
18 *
19 * 3. All advertising materials mentioning features or use of this
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21 * "This product includes software developed by the OpenSSL Project
22 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
23 *
24 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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31 * permission of the OpenSSL Project.
32 *
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36 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
37 *
38 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT 'AS IS' AND ANY
39 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
40 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
41 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
42 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
43 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
44 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
45 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
46 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
47 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
48 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
49 * OF THE POSSIBILITY OF SUCH DAMAGE.
50 * =====
51 *
52 * This product includes cryptographic software written by Eric Young
53 * (eay@cryptsoft.com). This product includes software written by Tim
54 * Hudson (tjh@cryptsoft.com).
55 *
56 */

58 #include "cryptlib.h"
59 #include "bn_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_sqrt.c

2

```
62 BIGNUM *BN_mod_sqrt(BIGNUM *in, const BIGNUM *a, const BIGNUM *p, BN_CTX *ctx)
63 /* Returns 'ret' such that
64  * ret^2 == a (mod p),
65  * using the Tonelli/Shanks algorithm (cf. Henri Cohen, "A Course
66  * in Algebraic Computational Number Theory", algorithm 1.5.1).
67  * 'p' must be prime!
68  */
69 {
70     BIGNUM *ret = in;
71     int err = 1;
72     int r;
73     BIGNUM *A, *b, *q, *t, *x, *y;
74     int e, i, j;
75
76     if (!BN_is_odd(p) || BN_abs_is_word(p, 1))
77     {
78         if (BN_abs_is_word(p, 2))
79         {
80             if (ret == NULL)
81                 ret = BN_new();
82             if (ret == NULL)
83                 goto end;
84             if (!BN_set_word(ret, BN_is_bit_set(a, 0)))
85             {
86                 if (ret != in)
87                     BN_free(ret);
88                 return NULL;
89             }
90             bn_check_top(ret);
91             return ret;
92         }
93
94         BNerr(BN_F_BN_MOD_SQRT, BN_R_P_IS_NOT_PRIME);
95         return(NULL);
96     }
97
98     if (BN_is_zero(a) || BN_is_one(a))
99     {
100         if (ret == NULL)
101             ret = BN_new();
102         if (ret == NULL)
103             goto end;
104         if (!BN_set_word(ret, BN_is_one(a)))
105         {
106             if (ret != in)
107                 BN_free(ret);
108             return NULL;
109         }
110         bn_check_top(ret);
111         return ret;
112     }
113
114     BN_CTX_start(ctx);
115     A = BN_CTX_get(ctx);
116     b = BN_CTX_get(ctx);
117     q = BN_CTX_get(ctx);
118     t = BN_CTX_get(ctx);
119     x = BN_CTX_get(ctx);
120     y = BN_CTX_get(ctx);
121     if (y == NULL) goto end;
122
123     if (ret == NULL)
124         ret = BN_new();
125     if (ret == NULL) goto end;
126
127     /* A = a mod p */
```

```

128     if (!BN_nnmod(A, a, p, ctx)) goto end;

130     /* now write |p| - 1 as 2^e*q where q is odd */
131     e = 1;
132     while (!BN_is_bit_set(p, e))
133         e++;
134     /* we'll set q later (if needed) */

136     if (e == 1)
137     {
138         /* The easy case: (|p|-1)/2 is odd, so 2 has an inverse
139          * modulo (|p|-1)/2, and square roots can be computed
140          * directly by modular exponentiation.
141          * We have
142          * 2 * (|p|+1)/4 == 1 (mod (|p|-1)/2),
143          * so we can use exponent (|p|+1)/4, i.e. (|p|-3)/4 + 1.
144          */
145         if (!BN_rshift(q, p, 2)) goto end;
146         q->neg = 0;
147         if (!BN_add_word(q, 1)) goto end;
148         if (!BN_mod_exp(ret, A, q, p, ctx)) goto end;
149         err = 0;
150         goto vrfy;
151     }

152     if (e == 2)
153     {
154         /* |p| == 5 (mod 8)
155          *
156          * In this case 2 is always a non-square since
157          * Legendre(2,p) = (-1)^((p^2-1)/8) for any odd prime.
158          * So if a really is a square, then 2*a is a non-square.
159          * Thus for
160          *   b := (2*a)^((|p|-5)/8),
161          *   i := (2*a)*b^2
162          * we have
163          *   i^2 = (2*a)^((1 + (|p|-5)/4)*2)
164          *       = (2*a)^((p-1)/2)
165          *       = -1;
166          * so if we set
167          *   x := a*b*(i-1),
168          * then
169          *   x^2 = a^2 * b^2 * (i^2 - 2*i + 1)
170          *       = a^2 * b^2 * (-2*i)
171          *       = a*(-i)*(2*a*b^2)
172          *       = a*(-i)*i
173          *       = a.
174          *
175          * (This is due to A.O.L. Atkin,
176          * <URL: http://listserv.nodak.edu/scripts/wa.exe?A2=ind9211&L=new
177          * November 1992.)
178          */
179
181         /* t := 2*a */
182         if (!BN_mod_lshift1_quick(t, A, p)) goto end;

184         /* b := (2*a)^((|p|-5)/8) */
185         if (!BN_rshift(q, p, 3)) goto end;
186         q->neg = 0;
187         if (!BN_mod_exp(b, t, q, p, ctx)) goto end;

189         /* y := b^2 */
190         if (!BN_mod_sqr(y, b, p, ctx)) goto end;

192         /* t := (2*a)*b^2 - 1 */
193         if (!BN_mod_mul(t, t, y, p, ctx)) goto end;

```

```

194         if (!BN_sub_word(t, 1)) goto end;

196         /* x = a*b*t */
197         if (!BN_mod_mul(x, A, b, p, ctx)) goto end;
198         if (!BN_mod_mul(x, x, t, p, ctx)) goto end;

200         if (!BN_copy(ret, x)) goto end;
201         err = 0;
202         goto vrfy;
203     }

204     /* e > 2, so we really have to use the Tonelli/Shanks algorithm.
205     * First, find some y that is not a square. */
206     if (!BN_copy(q, p)) goto end; /* use 'q' as temp */
207     q->neg = 0;
208     i = 2;
209     do
210     {
211         /* For efficiency, try small numbers first;
212          * if this fails, try random numbers.
213          */
214         if (i < 22)
215         {
216             if (!BN_set_word(y, i)) goto end;
217         }
218         else
219         {
220             if (!BN_pseudo_rand(y, BN_num_bits(p), 0, 0)) goto end;
221             if (BN_ucmp(y, p) >= 0)
222             {
223                 if (!(p->neg ? BN_add : BN_sub)(y, y, p)) goto end;
224             }
225             /* now 0 <= y < |p| */
226             if (BN_is_zero(y))
227                 if (!BN_set_word(y, i)) goto end;
228         }
229
230         r = BN_kronecker(y, q, ctx); /* here 'q' is |p| */
231         if (r < -1) goto end;
232         if (r == 0)
233         {
234             /* m divides p */
235             BNerr(BN_F_BN_MOD_SQRT, BN_R_P_IS_NOT_PRIME);
236             goto end;
237         }
238     }
239     while (r == 1 && ++i < 82);

241     if (r != -1)
242     {
243         /* Many rounds and still no non-square -- this is more likely
244          * a bug than just bad luck.
245          * Even if p is not prime, we should have found some y
246          * such that r == -1.
247          */
248         BNerr(BN_F_BN_MOD_SQRT, BN_R_TOO_MANY_ITERATIONS);
249         goto end;
250     }

251     /* Here's our actual 'q': */
252     if (!BN_rshift(q, q, e)) goto end;

254     /* Now that we have some non-square, we can find an element
255     * of order 2^e by computing its q'th power. */
256     if (!BN_mod_exp(y, y, q, p, ctx)) goto end;
257     if (BN_is_one(y))

```

```

260     {
261         BNerr(BN_F_BN_MOD_SQRT, BN_R_P_IS_NOT_PRIME);
262         goto end;
263     }

265 /* Now we know that (if p is indeed prime) there is an integer
266 * k,  $0 \leq k < 2^E$ , such that
267 *
268 *  $a^q * y^k \equiv 1 \pmod{p}$ .
269 *
270 * As  $a^q$  is a square and y is not, k must be even.
271 * q+1 is even, too, so there is an element
272 *
273 *  $x := a^{((q+1)/2)} * y^{(k/2)}$ ,
274 *
275 * and it satisfies
276 *
277 *  $x^2 = a^q * a * y^k$ 
278 *  $= a$ ,
279 *
280 * so it is the square root that we are looking for.
281 */
282
283 /* t := (q-1)/2 (note that q is odd) */
284 if (!BN_rshift1(t, q)) goto end;
285
286 /* x := a^{((q-1)/2)} */
287 if (BN_is_zero(t)) /* special case: p = 2^e + 1 */
288 {
289     if (!BN_nnmod(t, A, p, ctx)) goto end;
290     if (BN_is_zero(t))
291     {
292         /* special case: a == 0 (mod p) */
293         BN_zero(ret);
294         err = 0;
295         goto end;
296     }
297     else
298         if (!BN_one(x)) goto end;
299 }
300 else
301 {
302     if (!BN_mod_exp(x, A, t, p, ctx)) goto end;
303     if (BN_is_zero(x))
304     {
305         /* special case: a == 0 (mod p) */
306         BN_zero(ret);
307         err = 0;
308         goto end;
309     }
310 }
311
312 /* b := a*x^2 (= a^q) */
313 if (!BN_mod_sqr(b, x, p, ctx)) goto end;
314 if (!BN_mod_mul(b, b, A, p, ctx)) goto end;
315
316 /* x := a*x (= a^{((q+1)/2)}) */
317 if (!BN_mod_mul(x, x, A, p, ctx)) goto end;
318
319 while (1)
320 {
321     /* Now b is a^q * y^k for some even k ( $0 \leq k < 2^E$ 
322     * where E refers to the original value of e, which we
323     * don't keep in a variable), and x is  $a^{((q+1)/2)} * y^{(k/2)}$ 
324     *
325     * We have  $a*b = x^2$ ,

```

```

326     *  $y^{2^E} = -1$ ,
327     *  $b^{2^E} = 1$ .
328     */
329
330     if (BN_is_one(b))
331     {
332         if (!BN_copy(ret, x)) goto end;
333         err = 0;
334         goto vrfy;
335     }
336
337     /* find smallest i such that  $b^{(2^i)} = 1$  */
338     i = 1;
339     if (!BN_mod_sqr(t, b, p, ctx)) goto end;
340     while (!BN_is_one(t))
341     {
342         i++;
343         if (i == e)
344         {
345             BNerr(BN_F_BN_MOD_SQRT, BN_R_NOT_A_SQUARE);
346             goto end;
347         }
348         if (!BN_mod_mul(t, t, t, p, ctx)) goto end;
349     }
350
351     /* t :=  $y^{2^E} = -1$  */
352     if (!BN_copy(t, y)) goto end;
353     for (j = e - i - 1; j > 0; j--)
354     {
355         if (!BN_mod_sqr(t, t, p, ctx)) goto end;
356     }
357     if (!BN_mod_mul(y, t, t, p, ctx)) goto end;
358     if (!BN_mod_mul(x, x, t, p, ctx)) goto end;
359     if (!BN_mod_mul(b, b, y, p, ctx)) goto end;
360     e = i;
361 }
362
363 vrfy:
364 if (!err)
365 {
366     /* verify the result -- the input might have been not a square
367     * (test added in 0.9.8) */
368     if (!BN_mod_sqr(x, ret, p, ctx))
369         err = 1;
370     if (!err && 0 != BN_cmp(x, A))
371     {
372         BNerr(BN_F_BN_MOD_SQRT, BN_R_NOT_A_SQUARE);
373         err = 1;
374     }
375 }
376
377 end:
378 if (err)
379 {
380     if (ret != NULL && ret != in)
381     {
382         BN_clear_free(ret);
383     }
384     ret = NULL;
385 }
386 BN_CTX_end(ctx);
387 bn_check_top(ret);

```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_sqrt.c

7

```
392     return ret;  
393 }
```

```

*****
6005 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_word.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/bn/bn_word.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
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17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
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28 * 2. Redistributions in binary form must reproduce the above copyright
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include "bn_lcl.h"

```

```

63 BN_ULONG BN_mod_word(const BIGNUM *a, BN_ULONG w)
64 {
65     #ifndef BN_LLONG
66         BN_ULONG ret=0;
67     #else
68         BN_ULONG ret=0;
69     #endif
70     int i;
71
72     if (w == 0)
73         return (BN_ULONG)-1;
74
75     bn_check_top(a);
76     w&=BN_MASK2;
77     for (i=a->top-1; i>=0; i--)
78     {
79         #ifndef BN_LLONG
80             ret=((ret<<BN_BITS4)|((a->d[i]>>BN_BITS4)&BN_MASK2l))%w;
81             ret=((ret<<BN_BITS4)|(a->d[i]&BN_MASK2l))%w;
82         #else
83             ret=(BN_ULONG)(((ret<<(BN_ULONG)BN_BITS2)|a->d[i])%
84                             (BN_ULONG)w);
85         #endif
86     }
87     return((BN_ULONG)ret);
88 }
89
90 BN_ULONG BN_div_word(BIGNUM *a, BN_ULONG w)
91 {
92     BN_ULONG ret = 0;
93     int i, j;
94
95     bn_check_top(a);
96     w &= BN_MASK2;
97
98     if (!w)
99         /* actually this an error (division by zero) */
100         return (BN_ULONG)-1;
101     if (a->top == 0)
102         return 0;
103
104     /* normalize input (so bn_div_words doesn't complain) */
105     j = BN_BITS2 - BN_num_bits_word(w);
106     w <= j;
107     if (!BN_lshift(a, a, j))
108         return (BN_ULONG)-1;
109
110     for (i=a->top-1; i>=0; i--)
111     {
112         BN_ULONG l,d;
113
114         l=a->d[i];
115         d=bn_div_words(ret,l,w);
116         ret=(l-((d*w)&BN_MASK2))&BN_MASK2;
117         a->d[i]=d;
118     }
119     if ((a->top > 0) && (a->d[a->top-1] == 0))
120         a->top--;
121     ret >= j;
122     bn_check_top(a);
123     return(ret);
124 }
125
126 int BN_add_word(BIGNUM *a, BN_ULONG w)
127 {

```

```

128     BN_ULONG l;
129     int i;

131     bn_check_top(a);
132     w &= BN_MASK2;

134     /* degenerate case: w is zero */
135     if (!w) return 1;
136     /* degenerate case: a is zero */
137     if (BN_is_zero(a)) return BN_set_word(a, w);
138     /* handle 'a' when negative */
139     if (a->neg)
140     {
141         a->neg=0;
142         i=BN_sub_word(a,w);
143         if (!BN_is_zero(a))
144             a->neg=(i>0);
145         return(i);
146     }
147     for (i=0;w!=0 && i<a->top;i++)
148     {
149         a->d[i] = l = (a->d[i]+w)&BN_MASK2;
150         w = (w>l)?1:0;
151     }
152     if (w && i==a->top)
153     {
154         if (bn_wexpand(a,a->top+1) == NULL) return 0;
155         a->top++;
156         a->d[i]=w;
157     }
158     bn_check_top(a);
159     return(1);
160 }

162 int BN_sub_word(BIGNUM *a, BN_ULONG w)
163 {
164     int i;

166     bn_check_top(a);
167     w &= BN_MASK2;

169     /* degenerate case: w is zero */
170     if (!w) return 1;
171     /* degenerate case: a is zero */
172     if (BN_is_zero(a))
173     {
174         i = BN_set_word(a,w);
175         if (i != 0)
176             BN_set_negative(a, 1);
177         return i;
178     }
179     /* handle 'a' when negative */
180     if (a->neg)
181     {
182         a->neg=0;
183         i=BN_add_word(a,w);
184         a->neg=1;
185         return(i);
186     }

188     if ((a->top == 1) && (a->d[0] < w))
189     {
190         a->d[0]=w-a->d[0];
191         a->neg=1;
192         return(1);
193     }

```

```

194     i=0;
195     for (;;)
196     {
197         if (a->d[i] >= w)
198         {
199             a->d[i]-=w;
200             break;
201         }
202         else
203         {
204             a->d[i]=(a->d[i]-w)&BN_MASK2;
205             i++;
206             w=1;
207         }
208     }
209     if ((a->d[i] == 0) && (i == (a->top-1)))
210         a->top--;
211     bn_check_top(a);
212     return(1);
213 }

215 int BN_mul_word(BIGNUM *a, BN_ULONG w)
216 {
217     BN_ULONG ll;

219     bn_check_top(a);
220     w&=BN_MASK2;
221     if (a->top)
222     {
223         if (w == 0)
224             BN_zero(a);
225         else
226         {
227             ll=bn_mul_words(a->d,a->d,a->top,w);
228             if (ll)
229             {
230                 if (bn_wexpand(a,a->top+1) == NULL) return(0);
231                 a->d[a->top++]=ll;
232             }
233         }
234     }
235     bn_check_top(a);
236     return(1);
237 }

```


new/usr/src/lib/openssl/libsunw_crypto/bn/bn_x931p.c

1

```
*****
6929 Fri May 30 18:31:37 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/bn_x931p.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* bn_x931p.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2005.
4  */
5 /* =====
6  * Copyright (c) 2005 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
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17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
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24 *
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38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/bn/bn_x931p.c

2

```
62 /* X9.31 routines for prime derivation */
64 /* X9.31 prime derivation. This is used to generate the primes pi
65  * (p1, p2, q1, q2) from a parameter Xpi by checking successive odd
66  * integers.
67  */
69 static int bn_x931_derive_pi(BIGNUM *pi, const BIGNUM *Xpi, BN_CTX *ctx,
70                             BN_GENCB *cb)
71 {
72     int i = 0;
73     if (!BN_copy(pi, Xpi))
74         return 0;
75     if (!BN_is_odd(pi) && !BN_add_word(pi, 1))
76         return 0;
77     for(;;)
78     {
79         i++;
80         BN_GENCB_call(cb, 0, i);
81         /* NB 27 MR is specified in X9.31 */
82         if (BN_is_prime_fasttest_ex(pi, 27, ctx, 1, cb))
83             break;
84         if (!BN_add_word(pi, 2))
85             return 0;
86     }
87     BN_GENCB_call(cb, 2, i);
88     return 1;
89 }
91 /* This is the main X9.31 prime derivation function. From parameters
92  * Xp1, Xp2 and Xp derive the prime p. If the parameters p1 or p2 are
93  * not NULL they will be returned too: this is needed for testing.
94  */
96 int BN_X931_derive_prime_ex(BIGNUM *p, BIGNUM *p1, BIGNUM *p2,
97                             const BIGNUM *Xp, const BIGNUM *Xp1, const BIGNUM *Xp2,
98                             const BIGNUM *e, BN_CTX *ctx, BN_GENCB *cb)
99 {
100     int ret = 0;
102     BIGNUM *t, *p1p2, *pm1;
104     /* Only even e supported */
105     if (!BN_is_odd(e))
106         return 0;
108     BN_CTX_start(ctx);
109     if (!p1)
110         p1 = BN_CTX_get(ctx);
112     if (!p2)
113         p2 = BN_CTX_get(ctx);
115     t = BN_CTX_get(ctx);
117     p1p2 = BN_CTX_get(ctx);
119     pm1 = BN_CTX_get(ctx);
121     if (!bn_x931_derive_pi(p1, Xp1, ctx, cb))
122         goto err;
124     if (!bn_x931_derive_pi(p2, Xp2, ctx, cb))
125         goto err;
127     if (!BN_mul(p1p2, p1, p2, ctx))
```

```

128         goto err;

130     /* First set p to value of Rp */

132     if (!BN_mod_inverse(p, p2, p1, ctx))
133         goto err;

135     if (!BN_mul(p, p, p2, ctx))
136         goto err;

138     if (!BN_mod_inverse(t, p1, p2, ctx))
139         goto err;

141     if (!BN_mul(t, t, p1, ctx))
142         goto err;

144     if (!BN_sub(p, p, t))
145         goto err;

147     if (p->neg && !BN_add(p, p, p1p2))
148         goto err;

150     /* p now equals Rp */

152     if (!BN_mod_sub(p, p, Xp, p1p2, ctx))
153         goto err;

155     if (!BN_add(p, p, Xp))
156         goto err;

158     /* p now equals Yp0 */

160     for (;;)
161     {
162         int i = 1;
163         BN_GENCB_call(cb, 0, i++);
164         if (!BN_copy(pm1, p))
165             goto err;
166         if (!BN_sub_word(pm1, 1))
167             goto err;
168         if (!BN_gcd(t, pm1, e, ctx))
169             goto err;
170         if (BN_is_one(t))
171             /* X9.31 specifies 8 MR and 1 Lucas test or any prime test
172              * offering similar or better guarantees 50 MR is considerably
173              * better.
174              */
175             && BN_is_prime_fasttest_ex(p, 50, ctx, 1, cb))
176                 break;
177         if (!BN_add(p, p, p1p2))
178             goto err;
179     }

181     BN_GENCB_call(cb, 3, 0);

183     ret = 1;

185     err:

187     BN_CTX_end(ctx);

189     return ret;
190 }

192 /* Generate pair of paramters Xp, Xq for X9.31 prime generation.
193  * Note: nbits paramter is sum of number of bits in both.

```

```

194  */

196 int BN_X931_generate_Xpq(BIGNUM *Xp, BIGNUM *Xq, int nbits, BN_CTX *ctx)
197 {
198     BIGNUM *t;
199     int i;
200     /* Number of bits for each prime is of the form
201      * 512+128s for s = 0, 1, ...
202      */
203     if ((nbits < 1024) || (nbits & 0xff))
204         return 0;
205     nbits >>= 1;
206     /* The random value Xp must be between sqrt(2) * 2^(nbits-1) and
207      * 2^nbits - 1. By setting the top two bits we ensure that the lower
208      * bound is exceeded.
209      */
210     if (!BN_rand(Xp, nbits, 1, 0))
211         return 0;

213     BN_CTX_start(ctx);
214     t = BN_CTX_get(ctx);

216     for (i = 0; i < 1000; i++)
217     {
218         if (!BN_rand(Xq, nbits, 1, 0))
219             return 0;
220         /* Check that |Xp - Xq| > 2^(nbits - 100) */
221         BN_sub(t, Xp, Xq);
222         if (BN_num_bits(t) > (nbits - 100))
223             break;
224     }

226     BN_CTX_end(ctx);

228     if (i < 1000)
229         return 1;

231     return 0;
233 }

235 /* Generate primes using X9.31 algorithm. Of the values p, p1, p2, Xp1
236  * and Xp2 only 'p' needs to be non-NULL. If any of the others are not NULL
237  * the relevant parameter will be stored in it.
238  *
239  * Due to the fact that |Xp - Xq| > 2^(nbits - 100) must be satisfied Xp and Xq
240  * are generated using the previous function and supplied as input.
241  */

243 int BN_X931_generate_prime_ex(BIGNUM *p, BIGNUM *p1, BIGNUM *p2,
244                               BIGNUM *Xp1, BIGNUM *Xp2,
245                               const BIGNUM *Xp,
246                               const BIGNUM *e, BN_CTX *ctx,
247                               BN_GENCB *cb)
248 {
249     int ret = 0;

251     BN_CTX_start(ctx);
252     if (!Xp1)
253         Xp1 = BN_CTX_get(ctx);
254     if (!Xp2)
255         Xp2 = BN_CTX_get(ctx);

257     if (!BN_rand(Xp1, 101, 0, 0))
258         goto error;
259     if (!BN_rand(Xp2, 101, 0, 0))

```

```
260         goto error;
261     if (!BN_X931_derive_prime_ex(p, p1, p2, Xp, Xp1, Xp2, e, ctx, cb))
262         goto error;
263
264     ret = 1;
265
266     error:
267     BN_CTX_end(ctx);
268
269     return ret;
270
271 }
```

new/usr/src/lib/openssl/libsunw_crypto/bn/x86_64-gcc.c

1

13609 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/bn/x86_64-gcc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #include <bn_lcl.h>
2 #if !(defined(__GNUC__) && __GNUC__>=2)
3 # include "bn_asm.c" /* kind of dirty hack for Sun Studio */
4 #else
5 /*
6  * x86_64 BIGNUM accelerator version 0.1, December 2002.
7  *
8  * Implemented by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
9  * project.
10 *
11 * Rights for redistribution and usage in source and binary forms are
12 * granted according to the OpenSSL license. Warranty of any kind is
13 * disclaimed.
14 *
15 * Q. Version 0.1? It doesn't sound like Andy, he used to assign real
16 * versions, like 1.0...
17 * A. Well, that's because this code is basically a quick-n-dirty
18 * proof-of-concept hack. As you can see it's implemented with
19 * inline assembler, which means that you're bound to GCC and that
20 * there might be enough room for further improvement.
21 *
22 * Q. Why inline assembler?
23 * A. x86_64 features own ABI which I'm not familiar with. This is
24 * why I decided to let the compiler take care of subroutine
25 * prologue/epilogue as well as register allocation. For reference.
26 * Win64 implements different ABI for AMD64, different from Linux.
27 *
28 * Q. How much faster does it get?
29 * A. 'apps/openssl speed rsa dsa' output with no-asm:
30 *
31 *          sign    verify    sign/s verify/s
32 *  rsa 512 bits 0.0006s 0.0001s 1683.8 18456.2
33 *  rsa 1024 bits 0.0028s 0.0002s 356.0 6407.0
34 *  rsa 2048 bits 0.0172s 0.0005s 58.0 1957.8
35 *  rsa 4096 bits 0.1155s 0.0018s 8.7 555.6
36 *          sign    verify    sign/s verify/s
37 *  dsa 512 bits 0.0005s 0.0006s 2100.8 1768.3
38 *  dsa 1024 bits 0.0014s 0.0018s 692.3 559.2
39 *  dsa 2048 bits 0.0049s 0.0061s 204.7 165.0
40 *
41 * 'apps/openssl speed rsa dsa' output with this module:
42 *
43 *          sign    verify    sign/s verify/s
44 *  rsa 512 bits 0.0004s 0.0000s 2767.1 33297.9
45 *  rsa 1024 bits 0.0012s 0.0001s 867.4 14674.7
46 *  rsa 2048 bits 0.0061s 0.0002s 164.0 5270.0
47 *  rsa 4096 bits 0.0384s 0.0006s 26.1 1650.8
48 *          sign    verify    sign/s verify/s
49 *  dsa 512 bits 0.0002s 0.0003s 4442.2 3786.3
50 *  dsa 1024 bits 0.0005s 0.0007s 1835.1 1497.4
51 *  dsa 2048 bits 0.0016s 0.0020s 620.4 504.6
52 *
53 * For the reference. IA-32 assembler implementation performs
54 * very much like 64-bit code compiled with no-asm on the same
55 * machine.
56 */
57
58 #ifdef _WIN64
59 #define BN_ULONG unsigned long long
60 #else
61 #define BN_ULONG unsigned long
```

new/usr/src/lib/openssl/libsunw_crypto/bn/x86_64-gcc.c

2

62 #endif

```
64 #undef mul
65 #undef mul_add
66 #undef sqr
```

```
68 /*
69  * "m"(a), "+m"(r)      is the way to favor DirectPath  $\mu$ -code;
70  * "g"(0)              let the compiler to decide where does it
71  *                    want to keep the value of zero;
72  */
```

```
73 #define mul_add(r,a,word,carry) do { \
74     register BN_ULONG high,low; \
75     __asm__ ("mulq %3" \
76             : "=a"(low), "=d"(high) \
77             : "a"(word), "m"(a) \
78             : "cc"); \
79     __asm__ ("addq %2,%0; adcq %3,%1" \
80             : "+r"(carry), "+d"(high) \
81             : "a"(low), "g"(0) \
82             : "cc"); \
83     __asm__ ("addq %2,%0; adcq %3,%1" \
84             : "+m"(r), "+d"(high) \
85             : "r"(carry), "g"(0) \
86             : "cc"); \
87     carry=high; \
88 } while (0)
```

```
90 #define mul(r,a,word,carry) do { \
91     register BN_ULONG high,low; \
92     __asm__ ("mulq %3" \
93             : "=a"(low), "=d"(high) \
94             : "a"(word), "g"(a) \
95             : "cc"); \
96     __asm__ ("addq %2,%0; adcq %3,%1" \
97             : "+r"(carry), "+d"(high) \
98             : "a"(low), "g"(0) \
99             : "cc"); \
100    (r)=carry, carry=high; \
101 } while (0)
```

```
103 #define sqr(r0,r1,a) \
104     __asm__ ("mulq %2" \
105             : "=a"(r0), "=d"(r1) \
106             : "a"(a) \
107             : "cc");
```

```
109 BN_ULONG bn_mul_add_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w)
110 {
111     BN_ULONG c1=0;
112
113     if (num <= 0) return(c1);
114
115     while (num&~3)
116     {
117         mul_add(rp[0],ap[0],w,c1);
118         mul_add(rp[1],ap[1],w,c1);
119         mul_add(rp[2],ap[2],w,c1);
120         mul_add(rp[3],ap[3],w,c1);
121         ap+=4; rp+=4; num-=4;
122     }
123     if (num)
124     {
125         mul_add(rp[0],ap[0],w,c1); if (--num==0) return c1;
126         mul_add(rp[1],ap[1],w,c1); if (--num==0) return c1;
127         mul_add(rp[2],ap[2],w,c1); return c1;
128     }
```

```

128     }
129
130     return(c1);
131 }
132
133 BN_ULONG bn_mul_words(BN_ULONG *rp, const BN_ULONG *ap, int num, BN_ULONG w)
134 {
135     BN_ULONG c1=0;
136
137     if (num <= 0) return(c1);
138
139     while (num&~3)
140     {
141         mul(rp[0], ap[0], w, c1);
142         mul(rp[1], ap[1], w, c1);
143         mul(rp[2], ap[2], w, c1);
144         mul(rp[3], ap[3], w, c1);
145         ap+=4; rp+=4; num-=4;
146     }
147     if (num)
148     {
149         mul(rp[0], ap[0], w, c1); if (--num == 0) return c1;
150         mul(rp[1], ap[1], w, c1); if (--num == 0) return c1;
151         mul(rp[2], ap[2], w, c1);
152     }
153     return(c1);
154 }
155
156 void bn_sqr_words(BN_ULONG *r, const BN_ULONG *a, int n)
157 {
158     if (n <= 0) return;
159
160     while (n&~3)
161     {
162         sqr(r[0], r[1], a[0]);
163         sqr(r[2], r[3], a[1]);
164         sqr(r[4], r[5], a[2]);
165         sqr(r[6], r[7], a[3]);
166         a+=4; r+=8; n-=4;
167     }
168     if (n)
169     {
170         sqr(r[0], r[1], a[0]); if (--n == 0) return;
171         sqr(r[2], r[3], a[1]); if (--n == 0) return;
172         sqr(r[4], r[5], a[2]);
173     }
174 }
175
176 BN_ULONG bn_div_words(BN_ULONG h, BN_ULONG l, BN_ULONG d)
177 {
178     BN_ULONG ret, waste;
179
180     __asm__ ("divq  %4"
181             : "=a"(ret), "=d"(waste)
182             : "a"(l), "d"(h), "g"(d)
183             : "cc");
184
185     return ret;
186 }
187
188 BN_ULONG bn_add_words(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, int
189 { BN_ULONG ret=0, i=0;
190
191     if (n <= 0) return 0;
192
193     __asm__ (
194         "    subq    %2,%2          \n"

```

```

194         ".p2align 4                \n"
195         "1:    movq    (%4,%2,8),%0  \n"
196         "        adcq    (%5,%2,8),%0  \n"
197         "        movq    %0,(%3,%2,8)  \n"
198         "        leaq    1(%2),%2      \n"
199         "        loop    1b            \n"
200         "        sbbq    %0,%0        \n"
201         : "=&a"(ret), "+c"(n), "=&r"(i)
202         : "r"(rp), "r"(ap), "r"(bp)
203         : "cc"
204     );
205
206     return ret&1;
207 }
208
209 #ifndef SIMICS
210 BN_ULONG bn_sub_words(BN_ULONG *rp, const BN_ULONG *ap, const BN_ULONG *bp, int
211 { BN_ULONG ret=0, i=0;
212
213     if (n <= 0) return 0;
214
215     __asm__ (
216         "    subq    %2,%2          \n"
217         ".p2align 4                \n"
218         "1:    movq    (%4,%2,8),%0  \n"
219         "        sbbq    (%5,%2,8),%0  \n"
220         "        movq    %0,(%3,%2,8)  \n"
221         "        leaq    1(%2),%2      \n"
222         "        loop    1b            \n"
223         "        sbbq    %0,%0        \n"
224         : "=&a"(ret), "+c"(n), "=&r"(i)
225         : "r"(rp), "r"(ap), "r"(bp)
226         : "cc"
227     );
228
229     return ret&1;
230 }
231 #else
232 /* Simics 1.4<7 has buggy sbbq:-( */
233 #define BN_MASK2 0xffffffffffffffffL
234 BN_ULONG bn_sub_words(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b, int n)
235 {
236     BN_ULONG t1, t2;
237     int c=0;
238
239     if (n <= 0) return((BN_ULONG)0);
240
241     for (;;)
242     {
243         t1=a[0]; t2=b[0];
244         r[0]=(t1-t2-c)&BN_MASK2;
245         if (t1 != t2) c=(t1 < t2);
246         if (--n <= 0) break;
247
248         t1=a[1]; t2=b[1];
249         r[1]=(t1-t2-c)&BN_MASK2;
250         if (t1 != t2) c=(t1 < t2);
251         if (--n <= 0) break;
252
253         t1=a[2]; t2=b[2];
254         r[2]=(t1-t2-c)&BN_MASK2;
255         if (t1 != t2) c=(t1 < t2);
256         if (--n <= 0) break;
257
258         t1=a[3]; t2=b[3];
259         r[3]=(t1-t2-c)&BN_MASK2;

```

```

260         if (t1 != t2) c=(t1 < t2);
261         if (--n <= 0) break;

263         a+=4;
264         b+=4;
265         r+=4;
266     }
267     return(c);
268 }
269 #endif

271 /* mul_add_c(a,b,c0,c1,c2) -- c+=a*b for three word number c=(c2,c1,c0) */
272 /* mul_add_c2(a,b,c0,c1,c2) -- c+=2*a*b for three word number c=(c2,c1,c0) */
273 /* sqr_add_c(a,i,c0,c1,c2) -- c+=a[i]^2 for three word number c=(c2,c1,c0) */
274 /* sqr_add_c2(a,i,c0,c1,c2) -- c+=2*a[i]*a[j] for three word number c=(c2,c1,c0) */

276 #if 0
277 /* original macros are kept for reference purposes */
278 #define mul_add_c(a,b,c0,c1,c2) { \
279     BN_ULONG ta=(a),tb=(b); \
280     t1 = ta * tb; \
281     t2 = BN_UMULT_HIGH(ta,tb); \
282     c0 += t1; t2 += (c0<t1)?1:0; \
283     c1 += t2; c2 += (c1<t2)?1:0; \
284 }

286 #define mul_add_c2(a,b,c0,c1,c2) { \
287     BN_ULONG ta=(a),tb=(b),t0; \
288     t1 = BN_UMULT_HIGH(ta,tb); \
289     t0 = ta * tb; \
290     t2 = t1+t1; c2 += (t2<t1)?1:0; \
291     t1 = t0+t0; t2 += (t1<t0)?1:0; \
292     c0 += t1; t2 += (c0<t1)?1:0; \
293     c1 += t2; c2 += (c1<t2)?1:0; \
294 }

295 #else
296 #define mul_add_c(a,b,c0,c1,c2) do { \
297     __asm__ ( "mulq %3" \
298             : "=a"(t1), "=d"(t2) \
299             : "a"(a), "m"(b) \
300             : "cc"); \
301     __asm__ ( "addq %2,%0; adcq %3,%1" \
302             : "+r"(c0), "+d"(t2) \
303             : "a"(t1), "g"(0) \
304             : "cc"); \
305     __asm__ ( "addq %2,%0; adcq %3,%1" \
306             : "+r"(c1), "+r"(c2) \
307             : "d"(t2), "g"(0) \
308             : "cc"); \
309 } while (0)

311 #define sqr_add_c(a,i,c0,c1,c2) do { \
312     __asm__ ( "mulq %2" \
313             : "=a"(t1), "=d"(t2) \
314             : "a"(a[i]) \
315             : "cc"); \
316     __asm__ ( "addq %2,%0; adcq %3,%1" \
317             : "+r"(c0), "+d"(t2) \
318             : "a"(t1), "g"(0) \
319             : "cc"); \
320     __asm__ ( "addq %2,%0; adcq %3,%1" \
321             : "+r"(c1), "+r"(c2) \
322             : "d"(t2), "g"(0) \
323             : "cc"); \
324 } while (0)

```

```

326 #define mul_add_c2(a,b,c0,c1,c2) do { \
327     __asm__ ( "mulq %3" \
328             : "=a"(t1), "=d"(t2) \
329             : "a"(a), "m"(b) \
330             : "cc"); \
331     __asm__ ( "addq %0,%0; adcq %2,%1" \
332             : "+d"(t2), "+r"(c2) \
333             : "g"(0) \
334             : "cc"); \
335     __asm__ ( "addq %0,%0; adcq %2,%1" \
336             : "+a"(t1), "+d"(t2) \
337             : "g"(0) \
338             : "cc"); \
339     __asm__ ( "addq %2,%0; adcq %3,%1" \
340             : "+r"(c0), "+d"(t2) \
341             : "a"(t1), "g"(0) \
342             : "cc"); \
343     __asm__ ( "addq %2,%0; adcq %3,%1" \
344             : "+r"(c1), "+r"(c2) \
345             : "d"(t2), "g"(0) \
346             : "cc"); \
347 } while (0)
348 #endif

350 #define sqr_add_c2(a,i,j,c0,c1,c2) \
351     mul_add_c2((a)[i],(a)[j],c0,c1,c2)

353 void bn_mul_comba8(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b)
354 {
355     BN_ULONG t1,t2;
356     BN_ULONG c1,c2,c3;

358     c1=0;
359     c2=0;
360     c3=0;
361     mul_add_c(a[0],b[0],c1,c2,c3);
362     r[0]=c1;
363     c1=0;
364     mul_add_c(a[0],b[1],c2,c3,c1);
365     mul_add_c(a[1],b[0],c2,c3,c1);
366     r[1]=c2;
367     c2=0;
368     mul_add_c(a[2],b[0],c3,c1,c2);
369     mul_add_c(a[1],b[1],c3,c1,c2);
370     mul_add_c(a[0],b[2],c3,c1,c2);
371     r[2]=c3;
372     c3=0;
373     mul_add_c(a[0],b[3],c1,c2,c3);
374     mul_add_c(a[1],b[2],c1,c2,c3);
375     mul_add_c(a[2],b[1],c1,c2,c3);
376     mul_add_c(a[3],b[0],c1,c2,c3);
377     r[3]=c1;
378     c1=0;
379     mul_add_c(a[4],b[0],c2,c3,c1);
380     mul_add_c(a[3],b[1],c2,c3,c1);
381     mul_add_c(a[2],b[2],c2,c3,c1);
382     mul_add_c(a[1],b[3],c2,c3,c1);
383     mul_add_c(a[0],b[4],c2,c3,c1);
384     r[4]=c2;
385     c2=0;
386     mul_add_c(a[0],b[5],c3,c1,c2);
387     mul_add_c(a[1],b[4],c3,c1,c2);
388     mul_add_c(a[2],b[3],c3,c1,c2);
389     mul_add_c(a[3],b[2],c3,c1,c2);
390     mul_add_c(a[4],b[1],c3,c1,c2);
391     mul_add_c(a[5],b[0],c3,c1,c2);

```

```

392     r[5]=c3;
393     c3=0;
394     mul_add_c(a[6],b[0],c1,c2,c3);
395     mul_add_c(a[5],b[1],c1,c2,c3);
396     mul_add_c(a[4],b[2],c1,c2,c3);
397     mul_add_c(a[3],b[3],c1,c2,c3);
398     mul_add_c(a[2],b[4],c1,c2,c3);
399     mul_add_c(a[1],b[5],c1,c2,c3);
400     mul_add_c(a[0],b[6],c1,c2,c3);
401     r[6]=c1;
402     c1=0;
403     mul_add_c(a[0],b[7],c2,c3,c1);
404     mul_add_c(a[1],b[6],c2,c3,c1);
405     mul_add_c(a[2],b[5],c2,c3,c1);
406     mul_add_c(a[3],b[4],c2,c3,c1);
407     mul_add_c(a[4],b[3],c2,c3,c1);
408     mul_add_c(a[5],b[2],c2,c3,c1);
409     mul_add_c(a[6],b[1],c2,c3,c1);
410     mul_add_c(a[7],b[0],c2,c3,c1);
411     r[7]=c2;
412     c2=0;
413     mul_add_c(a[7],b[1],c3,c1,c2);
414     mul_add_c(a[6],b[2],c3,c1,c2);
415     mul_add_c(a[5],b[3],c3,c1,c2);
416     mul_add_c(a[4],b[4],c3,c1,c2);
417     mul_add_c(a[3],b[5],c3,c1,c2);
418     mul_add_c(a[2],b[6],c3,c1,c2);
419     mul_add_c(a[1],b[7],c3,c1,c2);
420     r[8]=c3;
421     c3=0;
422     mul_add_c(a[2],b[7],c1,c2,c3);
423     mul_add_c(a[3],b[6],c1,c2,c3);
424     mul_add_c(a[4],b[5],c1,c2,c3);
425     mul_add_c(a[5],b[4],c1,c2,c3);
426     mul_add_c(a[6],b[3],c1,c2,c3);
427     mul_add_c(a[7],b[2],c1,c2,c3);
428     r[9]=c1;
429     c1=0;
430     mul_add_c(a[7],b[3],c2,c3,c1);
431     mul_add_c(a[6],b[4],c2,c3,c1);
432     mul_add_c(a[5],b[5],c2,c3,c1);
433     mul_add_c(a[4],b[6],c2,c3,c1);
434     mul_add_c(a[3],b[7],c2,c3,c1);
435     r[10]=c2;
436     c2=0;
437     mul_add_c(a[4],b[7],c3,c1,c2);
438     mul_add_c(a[5],b[6],c3,c1,c2);
439     mul_add_c(a[6],b[5],c3,c1,c2);
440     mul_add_c(a[7],b[4],c3,c1,c2);
441     r[11]=c3;
442     c3=0;
443     mul_add_c(a[7],b[5],c1,c2,c3);
444     mul_add_c(a[6],b[6],c1,c2,c3);
445     mul_add_c(a[5],b[7],c1,c2,c3);
446     r[12]=c1;
447     c1=0;
448     mul_add_c(a[6],b[7],c2,c3,c1);
449     mul_add_c(a[7],b[6],c2,c3,c1);
450     r[13]=c2;
451     c2=0;
452     mul_add_c(a[7],b[7],c3,c1,c2);
453     r[14]=c3;
454     r[15]=c1;
455 }

```

```

457 void bn_mul_comba4(BN_ULONG *r, BN_ULONG *a, BN_ULONG *b)

```

```

458 {
459     BN_ULONG t1,t2;
460     BN_ULONG c1,c2,c3;

462     c1=0;
463     c2=0;
464     c3=0;
465     mul_add_c(a[0],b[0],c1,c2,c3);
466     r[0]=c1;
467     c1=0;
468     mul_add_c(a[0],b[1],c2,c3,c1);
469     mul_add_c(a[1],b[0],c2,c3,c1);
470     r[1]=c2;
471     c2=0;
472     mul_add_c(a[2],b[0],c3,c1,c2);
473     mul_add_c(a[1],b[1],c3,c1,c2);
474     mul_add_c(a[0],b[2],c3,c1,c2);
475     r[2]=c3;
476     c3=0;
477     mul_add_c(a[0],b[3],c1,c2,c3);
478     mul_add_c(a[1],b[2],c1,c2,c3);
479     mul_add_c(a[2],b[1],c1,c2,c3);
480     mul_add_c(a[3],b[0],c1,c2,c3);
481     r[3]=c1;
482     c1=0;
483     mul_add_c(a[3],b[1],c2,c3,c1);
484     mul_add_c(a[2],b[2],c2,c3,c1);
485     mul_add_c(a[1],b[3],c2,c3,c1);
486     r[4]=c2;
487     c2=0;
488     mul_add_c(a[2],b[3],c3,c1,c2);
489     mul_add_c(a[3],b[2],c3,c1,c2);
490     r[5]=c3;
491     c3=0;
492     mul_add_c(a[3],b[3],c1,c2,c3);
493     r[6]=c1;
494     r[7]=c2;
495 }

497 void bn_sqr_comba8(BN_ULONG *r, const BN_ULONG *a)
498 {
499     BN_ULONG t1,t2;
500     BN_ULONG c1,c2,c3;

502     c1=0;
503     c2=0;
504     c3=0;
505     sqr_add_c(a,0,c1,c2,c3);
506     r[0]=c1;
507     c1=0;
508     sqr_add_c2(a,1,0,c2,c3,c1);
509     r[1]=c2;
510     c2=0;
511     sqr_add_c(a,1,c3,c1,c2);
512     sqr_add_c2(a,2,0,c3,c1,c2);
513     r[2]=c3;
514     c3=0;
515     sqr_add_c2(a,3,0,c1,c2,c3);
516     sqr_add_c2(a,2,1,c1,c2,c3);
517     r[3]=c1;
518     c1=0;
519     sqr_add_c(a,2,c2,c3,c1);
520     sqr_add_c2(a,3,1,c2,c3,c1);
521     sqr_add_c2(a,4,0,c2,c3,c1);
522     r[4]=c2;
523     c2=0;

```

```

524     sqr_add_c2(a, 5, 0, c3, c1, c2);
525     sqr_add_c2(a, 4, 1, c3, c1, c2);
526     sqr_add_c2(a, 3, 2, c3, c1, c2);
527     r[5]=c3;
528     c3=0;
529     sqr_add_c(a, 3, c1, c2, c3);
530     sqr_add_c2(a, 4, 2, c1, c2, c3);
531     sqr_add_c2(a, 5, 1, c1, c2, c3);
532     sqr_add_c2(a, 6, 0, c1, c2, c3);
533     r[6]=c1;
534     c1=0;
535     sqr_add_c2(a, 7, 0, c2, c3, c1);
536     sqr_add_c2(a, 6, 1, c2, c3, c1);
537     sqr_add_c2(a, 5, 2, c2, c3, c1);
538     sqr_add_c2(a, 4, 3, c2, c3, c1);
539     r[7]=c2;
540     c2=0;
541     sqr_add_c(a, 4, c3, c1, c2);
542     sqr_add_c2(a, 5, 3, c3, c1, c2);
543     sqr_add_c2(a, 6, 2, c3, c1, c2);
544     sqr_add_c2(a, 7, 1, c3, c1, c2);
545     r[8]=c3;
546     c3=0;
547     sqr_add_c2(a, 7, 2, c1, c2, c3);
548     sqr_add_c2(a, 6, 3, c1, c2, c3);
549     sqr_add_c2(a, 5, 4, c1, c2, c3);
550     r[9]=c1;
551     c1=0;
552     sqr_add_c(a, 5, c2, c3, c1);
553     sqr_add_c2(a, 6, 4, c2, c3, c1);
554     sqr_add_c2(a, 7, 3, c2, c3, c1);
555     r[10]=c2;
556     c2=0;
557     sqr_add_c2(a, 7, 4, c3, c1, c2);
558     sqr_add_c2(a, 6, 5, c3, c1, c2);
559     r[11]=c3;
560     c3=0;
561     sqr_add_c(a, 6, c1, c2, c3);
562     sqr_add_c2(a, 7, 5, c1, c2, c3);
563     r[12]=c1;
564     c1=0;
565     sqr_add_c2(a, 7, 6, c2, c3, c1);
566     r[13]=c2;
567     c2=0;
568     sqr_add_c(a, 7, c3, c1, c2);
569     r[14]=c3;
570     r[15]=c1;
571 }

573 void bn_sqr_comba4(BN_ULONG *r, const BN_ULONG *a)
574 {
575     BN_ULONG t1, t2;
576     BN_ULONG c1, c2, c3;

578     c1=0;
579     c2=0;
580     c3=0;
581     sqr_add_c(a, 0, c1, c2, c3);
582     r[0]=c1;
583     c1=0;
584     sqr_add_c2(a, 1, 0, c2, c3, c1);
585     r[1]=c2;
586     c2=0;
587     sqr_add_c(a, 1, c3, c1, c2);
588     sqr_add_c2(a, 2, 0, c3, c1, c2);
589     r[2]=c3;

```

```

590     c3=0;
591     sqr_add_c2(a, 3, 0, c1, c2, c3);
592     sqr_add_c2(a, 2, 1, c1, c2, c3);
593     r[3]=c1;
594     c1=0;
595     sqr_add_c(a, 2, c2, c3, c1);
596     sqr_add_c2(a, 3, 1, c2, c3, c1);
597     r[4]=c2;
598     c2=0;
599     sqr_add_c2(a, 3, 2, c3, c1, c2);
600     r[5]=c3;
601     c3=0;
602     sqr_add_c(a, 3, c1, c2, c3);
603     r[6]=c1;
604     r[7]=c2;
605 }
606 #endif

```


new/usr/src/lib/openssl/libsunw_crypto/buffer/buf_err.c

1

```
*****
3720 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/buffer/buf_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/buffer/buf_err.c */
2 /* =====
3  * Copyright (c) 1999-2006 The OpenSSL Project.  All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  *    notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  *    notice, this list of conditions and the following disclaimer in
14  *    the documentation and/or other materials provided with the
15  *    distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  *    software must display the following acknowledgment:
19  *    "This product includes software developed by the OpenSSL Project
20  *    for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  *    endorse or promote products derived from this software without
24  *    prior written permission. For written permission, please contact
25  *    openssl-core@OpenSSL.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  *    nor may "OpenSSL" appear in their names without prior written
29  *    permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
32  *    acknowledgment:
33  *    "This product includes software developed by the OpenSSL Project
34  *    for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED.  IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com).  This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/buffer/buf_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/buffer.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_BUF,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_BUF,0,reason)

71 static ERR_STRING_DATA BUF_str_funcs[]=
72 {
73 {ERR_FUNC(BUF_F_BUF_MEMDUP), "BUF_memdup"},
74 {ERR_FUNC(BUF_F_BUF_MEM_GROW), "BUF_MEM_grow"},
75 {ERR_FUNC(BUF_F_BUF_MEM_GROW_CLEAN), "BUF_MEM_grow_clean"},
76 {ERR_FUNC(BUF_F_BUF_MEM_NEW), "BUF_MEM_new"},
77 {ERR_FUNC(BUF_F_BUF_STRDUP), "BUF_strdup"},
78 {ERR_FUNC(BUF_F_BUF_STRNDUP), "BUF_strndup"},
79 {0,NULL}
80 };

82 static ERR_STRING_DATA BUF_str_reasons[]=
83 {
84 {0,NULL}
85 };

87 #endif

89 void ERR_load_BUF_strings(void)
90 {
91 #ifndef OPENSSL_NO_ERR

93     if (ERR_func_error_string(BUF_str_funcs[0].error) == NULL)
94     {
95         ERR_load_strings(0,BUF_str_funcs);
96         ERR_load_strings(0,BUF_str_reasons);
97     }
98 #endif
99 }
```

new/usr/src/lib/openssl/libsunw_crypto/buffer/buf_str.c

1

4266 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/buffer/buf_str.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/buffer/buffer.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>
```

new/usr/src/lib/openssl/libsunw_crypto/buffer/buf_str.c

2

```
63 char *BUF_strdup(const char *str)
64 {
65     if (str == NULL) return(NULL);
66     return BUF_strndup(str, strlen(str));
67 }
68
69 char *BUF_strndup(const char *str, size_t siz)
70 {
71     char *ret;
72
73     if (str == NULL) return(NULL);
74
75     ret=OPENSSL_malloc(siz+1);
76     if (ret == NULL)
77     {
78         BUFerr(BUF_F_BUF_STRNDUP,ERR_R_MALLOC_FAILURE);
79         return(NULL);
80     }
81     BUF_strlcpy(ret,str,siz+1);
82     return(ret);
83 }
84
85 void *BUF_memdup(const void *data, size_t siz)
86 {
87     void *ret;
88
89     if (data == NULL) return(NULL);
90
91     ret=OPENSSL_malloc(siz);
92     if (ret == NULL)
93     {
94         BUFerr(BUF_F_BUF_MEMDUP,ERR_R_MALLOC_FAILURE);
95         return(NULL);
96     }
97     return memcpy(ret, data, siz);
98 }
99
100 size_t BUF_strlcpy(char *dst, const char *src, size_t size)
101 {
102     size_t l = 0;
103     for(; size > 1 && *src; size--)
104     {
105         *dst++ = *src++;
106         l++;
107     }
108     if (size)
109         *dst = '\0';
110     return l + strlen(src);
111 }
112
113 size_t BUF_strlcat(char *dst, const char *src, size_t size)
114 {
115     size_t l = 0;
116     for(; size > 0 && *dst; size--, dst++)
117         l++;
118     return l + BUF_strlcpy(dst, src, size);
119 }
```

5831 Fri May 30 18:31:38 2014
 new/usr/src/lib/openssl/libsunw_crypto/buffer/buffer.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/buffer/buffer.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>

```

```

63 /* LIMIT_BEFORE_EXPANSION is the maximum n such that (n+3)/3*4 < 2**31. That
64  * function is applied in several functions in this file and this limit ensures
65  * that the result fits in an int. */
66 #define LIMIT_BEFORE_EXPANSION 0x5fffffc

68 BUF_MEM *BUF_MEM_new(void)
69 {
70     BUF_MEM *ret;

72     ret=OPENSSL_malloc(sizeof(BUF_MEM));
73     if (ret == NULL)
74     {
75         BUFerr(BUF_F_BUF_MEM_NEW, ERR_R_MALLOC_FAILURE);
76         return(NULL);
77     }
78     ret->length=0;
79     ret->max=0;
80     ret->data=NULL;
81     return(ret);
82 }

84 void BUF_MEM_free(BUF_MEM *a)
85 {
86     if(a == NULL)
87         return;

89     if (a->data != NULL)
90     {
91         memset(a->data,0,(unsigned int)a->max);
92         OPENSSL_free(a->data);
93     }
94     OPENSSL_free(a);
95 }

97 int BUF_MEM_grow(BUF_MEM *str, size_t len)
98 {
99     char *ret;
100     size_t n;

102     if (str->length >= len)
103     {
104         str->length=len;
105         return(len);
106     }
107     if (str->max >= len)
108     {
109         memset(&str->data[str->length],0, len-str->length);
110         str->length=len;
111         return(len);
112     }
113     /* This limit is sufficient to ensure (len+3)/3*4 < 2**31 */
114     if (len > LIMIT_BEFORE_EXPANSION)
115     {
116         BUFerr(BUF_F_BUF_MEM_GROW, ERR_R_MALLOC_FAILURE);
117         return 0;
118     }
119     n=(len+3)/3*4;
120     if (str->data == NULL)
121         ret=OPENSSL_malloc(n);
122     else
123         ret=OPENSSL_realloc(str->data,n);
124     if (ret == NULL)
125     {
126         BUFerr(BUF_F_BUF_MEM_GROW, ERR_R_MALLOC_FAILURE);
127         len=0;

```

```

128     }
129     else
130     {
131         str->data=ret;
132         str->max=n;
133         memset(&str->data[str->length],0, len-str->length);
134         str->length=len;
135     }
136     return(len);
137 }

139 int BUF_MEM_grow_clean(BUF_MEM *str, size_t len)
140 {
141     char *ret;
142     size_t n;

144     if (str->length >= len)
145     {
146         memset(&str->data[len],0, str->length-len);
147         str->length=len;
148         return(len);
149     }
150     if (str->max >= len)
151     {
152         memset(&str->data[str->length],0, len-str->length);
153         str->length=len;
154         return(len);
155     }
156     /* This limit is sufficient to ensure (len+3)/3*4 < 2**31 */
157     if (len > LIMIT_BEFORE_EXPANSION)
158     {
159         BUFerr(BUF_F_BUF_MEM_GROW_CLEAN, ERR_R_MALLOC_FAILURE);
160         return 0;
161     }
162     n=(len+3)/3*4;
163     if (str->data == NULL)
164         ret=OPENSSL_malloc(n);
165     else
166         ret=OPENSSL_realloc_clean(str->data, str->max, n);
167     if (ret == NULL)
168     {
169         BUFerr(BUF_F_BUF_MEM_GROW_CLEAN, ERR_R_MALLOC_FAILURE);
170         len=0;
171     }
172     else
173     {
174         str->data=ret;
175         str->max=n;
176         memset(&str->data[str->length],0, len-str->length);
177         str->length=len;
178     }
179     return(len);
180 }

182 void BUF_reverse(unsigned char *out, const unsigned char *in, size_t size)
183 {
184     size_t i;
185     if (!in)
186     {
187         out += size - 1;
188         for (i = 0; i < size; i++)
189             *out-- = *in++;
190     }
191     else
192     {
193         unsigned char *q;

```

```

194         char c;
195         q = out + size - 1;
196         for (i = 0; i < size/2; i++)
197         {
198             c = *q;
199             *q-- = *out;
200             *out++ = c;
201         }
202     }
203 }

```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_cfb.c

1

```
*****
6802 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_cfb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/camellia/camellia_cfb.c -*- mode:C; c-file-style: "eay" -*- */
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56 * The implementation was written so as to conform with Netscapes SSL.
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60 * apply to all code found in this distribution, be it the RC4, RSA,
61 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_cfb.c

2

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106 */
107
108 #include <openssl/opensslconf.h>
109 #include <openssl/camellia.h>
110 #include <openssl/modes.h>
111
112
113 /* The input and output encrypted as though 128bit cfb mode is being
114 * used. The extra state information to record how much of the
115 * 128bit block we have used is contained in *num;
116 */
117
118 void Camellia_cfb128_encrypt(const unsigned char *in, unsigned char *out,
119                             size_t length, const CAMELLIA_KEY *key,
120                             unsigned char *ivec, int *num, const int enc)
121 {
122
123     CRYPTO_cfb128_encrypt(in, out, length, key, ivec, num, enc, (block128_f)Camelli
124 }
125
126 /* N.B. This expects the input to be packed, MS bit first */
127 void Camellia_cfb1_encrypt(const unsigned char *in, unsigned char *out,
```

```
128     size_t length, const CAMELLIA_KEY *key,  
129     unsigned char *ivec, int *num, const int enc)  
130     {  
131         CRYPTO_cfb128_1_encrypt(in,out,length,key,ivec,num,enc,(block128_f)Camel  
132     }  
  
134 void Camellia_cfb8_encrypt(const unsigned char *in, unsigned char *out,  
135     size_t length, const CAMELLIA_KEY *key,  
136     unsigned char *ivec, int *num, const int enc)  
137     {  
138         CRYPTO_cfb128_8_encrypt(in,out,length,key,ivec,num,enc,(block128_f)Camel  
139     }
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ctr.c

1

2912 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ctr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/camellia/camellia_ctr.c -*- mode:C; c-file-style: "eay" -*- */
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48 * =====
49 *
50 */

52 #include <openssl/camellia.h>
53 #include <openssl/modes.h>

55 void Camellia_ctr128_encrypt(const unsigned char *in, unsigned char *out,
56                             size_t length, const CAMELLIA_KEY *key,
57                             unsigned char ivec[CAMELLIA_BLOCK_SIZE],
58                             unsigned char ecount_buf[CAMELLIA_BLOCK_SIZE],
59                             unsigned int *num)
60 {
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ctr.c

2

```
62     CRYPTO_ctr128_encrypt(in, out, length, key, ivec, ecount_buf, num, (block128_f)
63     }
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ecb.c

1

```
*****
2990 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ecb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */

52 #ifndef CAMELLIA_DEBUG
53 # ifdef NDEBUG
54 #  define NDEBUG
55 # endif
56 #endif
57 #include <assert.h>

59 #include <openssl/camellia.h>
60 #include "cml_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ecb.c

2

```
62 void Camellia_ecb_encrypt(const unsigned char *in, unsigned char *out,
63                            const CAMELLIA_KEY *key, const int enc)
64 {
65
66     assert(in && out && key);
67     assert((CAMELLIA_ENCRYPT == enc) || (CAMELLIA_DECRYPT == enc));
68
69     if (CAMELLIA_ENCRYPT == enc)
70         Camellia_encrypt(in, out, key);
71     else
72         Camellia_decrypt(in, out, key);
73 }
```


new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_misc.c

1

```
*****
3336 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_misc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */
51
52 #include <openssl/opensslv.h>
53 #include <openssl/crypto.h>
54 #include <openssl/camellia.h>
55 #include "cml_locl.h"
56
57 const char CAMELLIA_version[]="CAMELLIA" OPENSSL_VERSION_PTEXT;
58
59 int private_Camellia_set_key(const unsigned char *userKey, const int bits,
60                             CAMELLIA_KEY *key)
61 {
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_misc.c

2

```
62     if(!userKey || !key)
63         return -1;
64     if(bits != 128 && bits != 192 && bits != 256)
65         return -2;
66     key->grand_rounds = Camellia_Ekeygen(bits , userKey, key->u.rd_key);
67     return 0;
68 }
69
70 void Camellia_encrypt(const unsigned char *in, unsigned char *out,
71                      const CAMELLIA_KEY *key)
72 {
73     Camellia_EncryptBlock_Rounds(key->grand_rounds, in , key->u.rd_key , out
74 )
75 }
76
77 void Camellia_decrypt(const unsigned char *in, unsigned char *out,
78                      const CAMELLIA_KEY *key)
79 {
80     Camellia_DecryptBlock_Rounds(key->grand_rounds, in , key->u.rd_key , out
81 )
82 }
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ofb.c

1

```
*****
6175 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ofb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/camellia/camellia_ofb.c -*- mode:C; c-file-style:"eay" -*- */
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56 * The implementation was written so as to conform with Netscapes SSL.
57 *
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61 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_ofb.c

2

```
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104 * copied and put under another distribution licence
105 * [including the GNU Public Licence.]
106 */
107
108 #include <openssl/camellia.h>
109 #include <openssl/modes.h>
110
111 /* The input and output encrypted as though 128bit ofb mode is being
112 * used. The extra state information to record how much of the
113 * 128bit block we have used is contained in *num;
114 */
115 void Camellia_ofb128_encrypt(const unsigned char *in, unsigned char *out,
116                             size_t length, const CAMELLIA_KEY *key,
117                             unsigned char *ivec, int *num) {
118     CRYPTO_ofb128_encrypt(in,out,length,key,ivec,num,(block128_f)Camellia_en
119 }
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_lutl.c

1

2841 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_lutl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */
51
52 #include <openssl/openssl.h>
53 #include <openssl/crypto.h>
54 #include <openssl/camellia.h>
55 #include "cml_lutl.h"
56
57 int Camellia_set_key(const unsigned char *userKey, const int bits,
58                     CAMELLIA_KEY *key)
59 {
60 #ifdef OPENSSL_FIPS
61     fips_cipher_abort(Camellia);
```

new/usr/src/lib/openssl/libsunw_crypto/camellia/cml_lutl.c

2

```
62 #endif
63     return private_Camellia_set_key(userKey, bits, key);
64 }
```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_cfb64.c

1

4378 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/cast/c_cfb64.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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57 */
```

```
59 #include <openssl/cast.h>
60 #include "cast_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_cfb64.c

2

```
62 /* The input and output encrypted as though 64bit cfb mode is being
63  * used. The extra state information to record how much of the
64  * 64bit block we have used is contained in *num;
65  */
66
67 void CAST_cfb64_encrypt(const unsigned char *in, unsigned char *out,
68                        long length, const CAST_KEY *schedule, unsigned char *iv,
69                        int *num, int enc)
70 {
71     register CAST_LONG v0,v1,t;
72     register int n= *num;
73     register long l=length;
74     CAST_LONG ti[2];
75     unsigned char *iv,c,cc;
76
77     iv=ivec;
78     if (enc)
79     {
80         while (l-->0)
81         {
82             if (n == 0)
83             {
84                 n2l(iv,v0); ti[0]=v0;
85                 n2l(iv,v1); ti[1]=v1;
86                 CAST_encrypt((CAST_LONG *)ti,schedule);
87                 iv=ivec;
88                 t=ti[0]; l2n(t,iv);
89                 t=ti[1]; l2n(t,iv);
90                 iv=ivec;
91             }
92             c= *(in++)^iv[n];
93             *(out++)=c;
94             iv[n]=c;
95             n=(n+1)&0x07;
96         }
97     }
98     else
99     {
100         while (l-->0)
101         {
102             if (n == 0)
103             {
104                 n2l(iv,v0); ti[0]=v0;
105                 n2l(iv,v1); ti[1]=v1;
106                 CAST_encrypt((CAST_LONG *)ti,schedule);
107                 iv=ivec;
108                 t=ti[0]; l2n(t,iv);
109                 t=ti[1]; l2n(t,iv);
110                 iv=ivec;
111             }
112             cc= *(in++);
113             c=iv[n];
114             iv[n]=cc;
115             *(out++)=c^cc;
116             n=(n+1)&0x07;
117         }
118     }
119     v0=v1=ti[0]=ti[1]=t=c=cc=0;
120     *num=n;
121 }
```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_ecb.c

1

3620 Fri May 30 18:31:38 2014
new/usr/src/lib/openssl/libsunw_crypto/cast/c_ecb.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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57 */

59 #include <openssl/cast.h>
60 #include "cast_lcl.h"
61 #include <openssl/opensslv.h>
```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_ecb.c

2

```
63 const char CAST_version[]="CAST" OPENSSL_VERSION_PTEXT;

65 void CAST_ecb_encrypt(const unsigned char *in, unsigned char *out,
66                       const CAST_KEY *ks, int enc)
67 {
68     CAST_LONG l,d[2];

70     n2l(in,l); d[0]=l;
71     n2l(in,l); d[1]=l;
72     if (enc)
73         CAST_encrypt(d,ks);
74     else
75         CAST_decrypt(d,ks);
76     l=d[0]; l2n(l,out);
77     l=d[1]; l2n(l,out);
78     l=d[0]=d[1]=0;
79 }
```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_enc.c

1

```
*****
5971 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cast/c_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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57 */

59 #include <openssl/cast.h>
60 #include <cast_lcl.h>
```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_enc.c

2

```
62 void CAST_encrypt(CAST_LONG *data, const CAST_KEY *key)
63 {
64     register CAST_LONG l,r,t;
65     register const CAST_LONG *k;

67     k= &(key->data[0]);
68     l=data[0];
69     r=data[1];

71     E_CAST( 0,k,l,r,+,^,-);
72     E_CAST( 1,k,r,l,^,-,+);
73     E_CAST( 2,k,l,r,-,+,^);
74     E_CAST( 3,k,r,l,+,^,-);
75     E_CAST( 4,k,l,r,^,-,+);
76     E_CAST( 5,k,r,l,-,+,^);
77     E_CAST( 6,k,l,r,+,^,-);
78     E_CAST( 7,k,r,l,^,-,+);
79     E_CAST( 8,k,l,r,-,+,^);
80     E_CAST( 9,k,r,l,+,^,-);
81     E_CAST(10,k,l,r,^,-,+);
82     E_CAST(11,k,r,l,-,+,^);
83     if(!key->short_key)
84     {
85         E_CAST(12,k,l,r,+,^,-);
86         E_CAST(13,k,r,l,^,-,+);
87         E_CAST(14,k,l,r,-,+,^);
88         E_CAST(15,k,r,l,+,^,-);
89     }

91     data[1]=l&0xffffffffL;
92     data[0]=r&0xffffffffL;
93 }

95 void CAST_decrypt(CAST_LONG *data, const CAST_KEY *key)
96 {
97     register CAST_LONG l,r,t;
98     register const CAST_LONG *k;

100     k= &(key->data[0]);
101     l=data[0];
102     r=data[1];

104     if(!key->short_key)
105     {
106         E_CAST(15,k,l,r,+,^,-);
107         E_CAST(14,k,r,l,^,-,+);
108         E_CAST(13,k,l,r,-,+,^);
109         E_CAST(12,k,r,l,+,^,-);
110     }
111     E_CAST(11,k,l,r,-,+,^);
112     E_CAST(10,k,r,l,^,-,+);
113     E_CAST( 9,k,l,r,+,^,-);
114     E_CAST( 8,k,r,l,-,+,^);
115     E_CAST( 7,k,l,r,^,-,+);
116     E_CAST( 6,k,r,l,+,^,-);
117     E_CAST( 5,k,l,r,-,+,^);
118     E_CAST( 4,k,r,l,^,-,+);
119     E_CAST( 3,k,l,r,+,^,-);
120     E_CAST( 2,k,r,l,-,+,^);
121     E_CAST( 1,k,l,r,^,-,+);
122     E_CAST( 0,k,r,l,+,^,-);

124     data[1]=l&0xffffffffL;
125     data[0]=r&0xffffffffL;
126 }
```

```

128 void CAST_cbc_encrypt(const unsigned char *in, unsigned char *out, long length,
129     const CAST_KEY *ks, unsigned char *iv, int enc)
130 {
131     register CAST_LONG tin0,tin1;
132     register CAST_LONG tout0,tout1,xor0,xor1;
133     register long l=length;
134     CAST_LONG tin[2];
135
136     if (enc)
137     {
138         n2l(iv,tout0);
139         n2l(iv,tout1);
140         iv-=8;
141         for (l-=8; l>=0; l-=8)
142         {
143             n2l(in,tin0);
144             n2l(in,tin1);
145             tin0^=tout0;
146             tin1^=tout1;
147             tin[0]=tin0;
148             tin[1]=tin1;
149             CAST_encrypt(tin,ks);
150             tout0=tin[0];
151             tout1=tin[1];
152             l2n(tout0,out);
153             l2n(tout1,out);
154         }
155         if (l != -8)
156         {
157             n2ln(in,tin0,tin1,l+8);
158             tin0^=tout0;
159             tin1^=tout1;
160             tin[0]=tin0;
161             tin[1]=tin1;
162             CAST_encrypt(tin,ks);
163             tout0=tin[0];
164             tout1=tin[1];
165             l2n(tout0,out);
166             l2n(tout1,out);
167         }
168         l2n(tout0,iv);
169         l2n(tout1,iv);
170     }
171     else
172     {
173         n2l(iv,xor0);
174         n2l(iv,xor1);
175         iv-=8;
176         for (l-=8; l>=0; l-=8)
177         {
178             n2l(in,tin0);
179             n2l(in,tin1);
180             tin[0]=tin0;
181             tin[1]=tin1;
182             CAST_decrypt(tin,ks);
183             tout0=tin[0]^xor0;
184             tout1=tin[1]^xor1;
185             l2n(tout0,out);
186             l2n(tout1,out);
187             xor0=tin0;
188             xor1=tin1;
189         }
190         if (l != -8)
191         {
192             n2l(in,tin0);
193             n2l(in,tin1);

```

```

194             tin[0]=tin0;
195             tin[1]=tin1;
196             CAST_decrypt(tin,ks);
197             tout0=tin[0]^xor0;
198             tout1=tin[1]^xor1;
199             l2nn(tout0,tout1,out,l+8);
200             xor0=tin0;
201             xor1=tin1;
202         }
203         l2n(xor0,iv);
204         l2n(xor1,iv);
205     }
206     tin0=tin1=tout0=tout1=xor0=xor1=0;
207     tin[0]=tin[1]=0;
208 }

```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_ofb64.c

1

4172 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cast/c_ofb64.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/cast/c_ofb64.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publicly available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
```

```
59 #include <openssl/cast.h>
60 #include "cast_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/cast/c_ofb64.c

2

```
62 /* The input and output encrypted as though 64bit ofb mode is being
63 * used. The extra state information to record how much of the
64 * 64bit block we have used is contained in *num;
65 */
66 void CAST_ofb64_encrypt(const unsigned char *in, unsigned char *out,
67                          long length, const CAST_KEY *schedule, unsigned char *iv,
68                          int *num)
69 {
70     register CAST_LONG v0,v1,t;
71     register int n= *num;
72     register long l=length;
73     unsigned char d[8];
74     register char *dp;
75     CAST_LONG ti[2];
76     unsigned char *iv;
77     int save=0;
78
79     iv=ivec;
80     n2l(iv,v0);
81     n2l(iv,v1);
82     ti[0]=v0;
83     ti[1]=v1;
84     dp=(char *)d;
85     l2n(v0,dp);
86     l2n(v1,dp);
87     while (l-->0)
88     {
89         if (n == 0)
90         {
91             CAST_encrypt((CAST_LONG *)ti,schedule);
92             dp=(char *)d;
93             t=ti[0]; l2n(t,dp);
94             t=ti[1]; l2n(t,dp);
95             save++;
96         }
97         *(out++)= *(in++)^d[n];
98         n=(n+1)&0x07;
99     }
100     if (save)
101     {
102         v0=ti[0];
103         v1=ti[1];
104         iv=ivec;
105         l2n(v0,iv);
106         l2n(v1,iv);
107     }
108     t=v0=v1=ti[0]=ti[1]=0;
109     *num=n;
110 }
```



```

*****
6675 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cast/c_skey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cast/c_skey.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
25 * are met:
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <openssl/crypto.h>
60 #include <openssl/cast.h>
61 #include <cast_lcl.h>

```

```

62 #include <cast_s.h>

64 #define CAST_exp(l,A,a,n) \
65     A[n/4]=l; \
66     a[n+3]=(l >> 8)&0xff; \
67     a[n+2]=(l >> 16)&0xff; \
68     a[n+1]=(l >> 24)&0xff; \
69     a[n+0]=(l >> 32)&0xff;

71 #define S4 CAST_S_table4
72 #define S5 CAST_S_table5
73 #define S6 CAST_S_table6
74 #define S7 CAST_S_table7
75 void CAST_set_key(CAST_KEY *key, int len, const unsigned char *data)
76 #ifdef OPENSSL_FIPS
77 {
78     fips_cipher_abort(CAST);
79     private_CAST_set_key(key, len, data);
80 }
81 void private_CAST_set_key(CAST_KEY *key, int len, const unsigned char *data)
82 #endif
83 {
84     CAST_LONG x[16];
85     CAST_LONG z[16];
86     CAST_LONG k[32];
87     CAST_LONG X[4],Z[4];
88     CAST_LONG l,*K;
89     int i;

91     for (i=0; i<16; i++) x[i]=0;
92     if (len > 16) len=16;
93     for (i=0; i<len; i++)
94         x[i]=data[i];
95     if (len <= 10)
96         key->short_key=1;
97     else
98         key->short_key=0;

100     K=&k[0];
101     X[0]=((x[0]<<24)|(x[1]<<16)|(x[2]<<8)|x[3])&0xffffffffL;
102     X[1]=((x[4]<<24)|(x[5]<<16)|(x[6]<<8)|x[7])&0xffffffffL;
103     X[2]=((x[8]<<24)|(x[9]<<16)|(x[10]<<8)|x[11])&0xffffffffL;
104     X[3]=((x[12]<<24)|(x[13]<<16)|(x[14]<<8)|x[15])&0xffffffffL;

106     for (;;)
107     {
108         l=x[0]^S4[x[13]]^S5[x[15]]^S6[x[12]]^S7[x[14]]^S6[x[8]];
109         CAST_exp(l,Z,z,0);
110         l=x[2]^S4[z[0]]^S5[z[2]]^S6[z[1]]^S7[z[3]]^S7[x[10]];
111         CAST_exp(l,Z,z,4);
112         l=x[3]^S4[z[7]]^S5[z[6]]^S6[z[5]]^S7[z[4]]^S4[x[9]];
113         CAST_exp(l,Z,z,8);
114         l=x[1]^S4[z[10]]^S5[z[9]]^S6[z[11]]^S7[z[8]]^S5[x[11]];
115         CAST_exp(l,Z,z,12);

117         K[0]= S4[z[8]]^S5[z[9]]^S6[z[7]]^S7[z[6]]^S4[z[2]];
118         K[1]= S4[z[10]]^S5[z[11]]^S6[z[5]]^S7[z[4]]^S5[z[6]];
119         K[2]= S4[z[12]]^S5[z[13]]^S6[z[3]]^S7[z[2]]^S6[z[9]];
120         K[3]= S4[z[14]]^S5[z[15]]^S6[z[1]]^S7[z[0]]^S7[z[12]];

122         l=Z[2]^S4[z[5]]^S5[z[7]]^S6[z[4]]^S7[z[6]]^S6[z[0]];
123         CAST_exp(l,X,x,0);
124         l=Z[0]^S4[x[0]]^S5[x[2]]^S6[x[1]]^S7[x[3]]^S7[z[2]];
125         CAST_exp(l,X,x,4);
126         l=Z[1]^S4[x[7]]^S5[x[6]]^S6[x[5]]^S7[x[4]]^S4[z[1]];
127         CAST_exp(l,X,x,8);

```

```

128     l=z[3]^S4[x[10]]^S5[x[ 9]]^S6[x[11]]^S7[x[ 8]]^S5[z[ 3]];
129     CAST_exp(l,X,x,12);

131     K[ 4]= S4[x[ 3]]^S5[x[ 2]]^S6[x[12]]^S7[x[13]]^S4[x[ 8]];
132     K[ 5]= S4[x[ 1]]^S5[x[ 0]]^S6[x[14]]^S7[x[15]]^S5[x[13]];
133     K[ 6]= S4[x[ 7]]^S5[x[ 6]]^S6[x[ 8]]^S7[x[ 9]]^S6[x[ 3]];
134     K[ 7]= S4[x[ 5]]^S5[x[ 4]]^S6[x[10]]^S7[x[11]]^S7[x[ 7]];

136     l=X[0]^S4[x[13]]^S5[x[15]]^S6[x[12]]^S7[x[14]]^S6[x[ 8]];
137     CAST_exp(l,Z,z, 0);
138     l=X[2]^S4[z[ 0]]^S5[z[ 2]]^S6[z[ 1]]^S7[z[ 3]]^S7[x[10]];
139     CAST_exp(l,Z,z, 4);
140     l=X[3]^S4[z[ 7]]^S5[z[ 6]]^S6[z[ 5]]^S7[z[ 4]]^S4[x[ 9]];
141     CAST_exp(l,Z,z, 8);
142     l=X[1]^S4[z[10]]^S5[z[ 9]]^S6[z[11]]^S7[z[ 8]]^S5[x[11]];
143     CAST_exp(l,Z,z,12);

145     K[ 8]= S4[z[ 3]]^S5[z[ 2]]^S6[z[12]]^S7[z[13]]^S4[z[ 9]];
146     K[ 9]= S4[z[ 1]]^S5[z[ 0]]^S6[z[14]]^S7[z[15]]^S5[z[12]];
147     K[10]= S4[z[ 7]]^S5[z[ 6]]^S6[z[ 8]]^S7[z[ 9]]^S6[z[ 3]];
148     K[11]= S4[z[ 5]]^S5[z[ 4]]^S6[z[10]]^S7[z[11]]^S7[z[ 6]];

150     l=Z[2]^S4[z[ 5]]^S5[z[ 7]]^S6[z[ 4]]^S7[z[ 6]]^S6[z[ 0]];
151     CAST_exp(l,X,x, 0);
152     l=Z[0]^S4[x[ 0]]^S5[x[ 2]]^S6[x[ 1]]^S7[x[ 3]]^S7[z[ 2]];
153     CAST_exp(l,X,x, 4);
154     l=Z[1]^S4[x[ 7]]^S5[x[ 6]]^S6[x[ 5]]^S7[x[ 4]]^S4[z[ 1]];
155     CAST_exp(l,X,x, 8);
156     l=Z[3]^S4[x[10]]^S5[x[ 9]]^S6[x[11]]^S7[x[ 8]]^S5[z[ 3]];
157     CAST_exp(l,X,x,12);

159     K[12]= S4[x[ 8]]^S5[x[ 9]]^S6[x[ 7]]^S7[x[ 6]]^S4[x[ 3]];
160     K[13]= S4[x[10]]^S5[x[11]]^S6[x[ 5]]^S7[x[ 4]]^S5[x[ 7]];
161     K[14]= S4[x[12]]^S5[x[13]]^S6[x[ 3]]^S7[x[ 2]]^S6[x[ 8]];
162     K[15]= S4[x[14]]^S5[x[15]]^S6[x[ 1]]^S7[x[ 0]]^S7[x[13]];
163     if (K != k) break;
164     K+=16;
165 }

167 for (i=0; i<16; i++)
168 {
169     key->data[i*2]=k[i];
170     key->data[i*2+1]=((k[i+16])+16)&0x1f;
171 }
172

```

new/usr/src/lib/openssl/libsunw_crypto/cmac/cm_ameth.c

1

```
*****
3192 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cmac/cm_ameth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
2  * project 2010.
3  */
4 /* =====
5  * Copyright (c) 2010 The OpenSSL Project. All rights reserved.
6  *
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8  * modification, are permitted provided that the following conditions
9  * are met:
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19  * 3. All advertising materials mentioning features or use of this
20  * software must display the following acknowledgment:
21  * "This product includes software developed by the OpenSSL Project
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44  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
45  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
46  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
47  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
48  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
49  * OF THE POSSIBILITY OF SUCH DAMAGE.
50  * =====
51  */

53 #include <stdio.h>
54 #include "cryptlib.h"
55 #include <openssl/evp.h>
56 #include <openssl/cmac.h>
57 #include "asn1_locl.h"

59 /* CMAC "ASN1" method. This is just here to indicate the
60  * maximum CMAC output length and to free up a CMAC
61  * key.
```

new/usr/src/lib/openssl/libsunw_crypto/cmac/cm_ameth.c

2

```
62 */

64 static int cmac_size(const EVP_PKEY *pkey)
65 {
66     return EVP_MAX_BLOCK_LENGTH;
67 }

69 static void cmac_key_free(EVP_PKEY *pkey)
70 {
71     CMAC_CTX *cmctx = (CMAC_CTX *)pkey->pkey.ptr;
72     if (cmctx)
73         CMAC_CTX_free(cmctx);
74 }

76 const EVP_PKEY_ASN1_METHOD cmac_asn1_meth =
77 {
78     EVP_PKEY_CMAC,
79     EVP_PKEY_CMAC,
80     0,

82     "CMAC",
83     "OpenSSL CMAC method",

85     0,0,0,0,

87     0,0,0,

89     cmac_size,
90     0,
91     0,0,0,0,0,0,0,

93     cmac_key_free,
94     0,
95     0,0
96     };
```

```

*****
5564 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cmac/cm_pmeth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
2  * project 2010.
3  */
4 /* =====
5  * Copyright (c) 2010 The OpenSSL Project. All rights reserved.
6  *
7  * Redistribution and use in source and binary forms, with or without
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14  * 2. Redistributions in binary form must reproduce the above copyright
15  * notice, this list of conditions and the following disclaimer in
16  * the documentation and/or other materials provided with the
17  * distribution.
18  *
19  * 3. All advertising materials mentioning features or use of this
20  * software must display the following acknowledgment:
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22  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
23  *
24  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
25  * endorse or promote products derived from this software without
26  * prior written permission. For written permission, please contact
27  * licensing@OpenSSL.org.
28  *
29  * 5. Products derived from this software may not be called "OpenSSL"
30  * nor may "OpenSSL" appear in their names without prior written
31  * permission of the OpenSSL Project.
32  *
33  * 6. Redistributions of any form whatsoever must retain the following
34  * acknowledgment:
35  * "This product includes software developed by the OpenSSL Project
36  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
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49  * OF THE POSSIBILITY OF SUCH DAMAGE.
50  * =====
51  */
53 #include <stdio.h>
54 #include "cryptlib.h"
55 #include <openssl/x509.h>
56 #include <openssl/x509v3.h>
57 #include <openssl/evp.h>
58 #include <openssl/cmac.h>
59 #include "evp_loc1.h"
61 /* The context structure and "key" is simply a CMAC_CTX */

```

```

63 static int pkey_cmac_init(EVP_PKEY_CTX *ctx)
64 {
65     ctx->data = CMAC_CTX_new();
66     if (!ctx->data)
67         return 0;
68     ctx->keygen_info_count = 0;
69     return 1;
70 }
72 static int pkey_cmac_copy(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src)
73 {
74     if (!pkey_cmac_init(dst))
75         return 0;
76     if (!CMAC_CTX_copy(dst->data, src->data))
77         return 0;
78     return 1;
79 }
81 static void pkey_cmac_cleanup(EVP_PKEY_CTX *ctx)
82 {
83     CMAC_CTX_free(ctx->data);
84 }
86 static int pkey_cmac_keygen(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey)
87 {
88     CMAC_CTX *cmkey = CMAC_CTX_new();
89     CMAC_CTX *cmctx = ctx->data;
90     if (!cmkey)
91         return 0;
92     if (!CMAC_CTX_copy(cmkey, cmctx))
93     {
94         CMAC_CTX_free(cmkey);
95         return 0;
96     }
97     EVP_PKEY_assign(pkey, EVP_PKEY_CMAC, cmkey);
98
99     return 1;
100 }
102 static int int_update(EVP_MD_CTX *ctx, const void *data, size_t count)
103 {
104     if (!CMAC_Update(ctx->pctx->data, data, count))
105         return 0;
106     return 1;
107 }
109 static int cmac_signctx_init(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx)
110 {
111     EVP_MD_CTX_set_flags(mctx, EVP_MD_CTX_FLAG_NO_INIT);
112     mctx->update = int_update;
113     return 1;
114 }
116 static int cmac_signctx(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
117                        EVP_MD_CTX *mctx)
118 {
119     return CMAC_Final(ctx->data, sig, siglen);
120 }
122 static int pkey_cmac_ctrl(EVP_PKEY_CTX *ctx, int type, int p1, void *p2)
123 {
124     CMAC_CTX *cmctx = ctx->data;
125     switch (type)
126     {

```

```

128     case EVP_PKEY_CTRL_SET_MAC_KEY:
129         if (!p2 || p1 < 0)
130             return 0;
131         if (!CMAC_Init(cmctx, p2, p1, NULL, NULL))
132             return 0;
133         break;
134
135     case EVP_PKEY_CTRL_CIPHER:
136         if (!CMAC_Init(cmctx, NULL, 0, p2, ctx->engine))
137             return 0;
138         break;
139
140     case EVP_PKEY_CTRL_MD:
141         if (ctx->pkey && !CMAC_CTX_copy(ctx->data,
142                                         (CMAC_CTX *)ctx->pkey->pkey.ptr))
143             return 0;
144         if (!CMAC_Init(cmctx, NULL, 0, NULL, NULL))
145             return 0;
146         break;
147
148     default:
149         return -2;
150 }
151 return 1;
152 }
153
154 static int pkey_cmac_ctrl_str(EVP_PKEY_CTX *ctx,
155                               const char *type, const char *value)
156 {
157     if (!value)
158     {
159         return 0;
160     }
161     if (!strcmp(type, "key"))
162     {
163         void *p = (void *)value;
164         return pkey_cmac_ctrl(ctx, EVP_PKEY_CTRL_SET_MAC_KEY,
165                               strlen(p), p);
166     }
167     if (!strcmp(type, "cipher"))
168     {
169         const EVP_CIPHER *c;
170         c = EVP_get_cipherbyname(value);
171         if (!c)
172             return 0;
173         return pkey_cmac_ctrl(ctx, EVP_PKEY_CTRL_CIPHER, -1, (void *)c);
174     }
175     if (!strcmp(type, "hexkey"))
176     {
177         unsigned char *key;
178         int r;
179         long keylen;
180         key = string_to_hex(value, &keylen);
181         if (!key)
182             return 0;
183         r = pkey_cmac_ctrl(ctx, EVP_PKEY_CTRL_SET_MAC_KEY, keylen, key);
184         OPENSSL_free(key);
185         return r;
186     }
187     return -2;
188 }
189
190 const EVP_PKEY_METHOD cmac_pkey_meth =
191 {
192     EVP_PKEY_CMAC,

```

```

194     EVP_PKEY_FLAG_SIGCTX_CUSTOM,
195     pkey_cmac_init,
196     pkey_cmac_copy,
197     pkey_cmac_cleanup,
198
199     0, 0,
200
201     0,
202     pkey_cmac_keygen,
203
204     0, 0,
205
206     0, 0,
207
208     0, 0,
209
210     cmac_signctx_init,
211     cmac_signctx,
212
213     0, 0,
214
215     0, 0,
216
217     0, 0,
218
219     0, 0,
220
221     pkey_cmac_ctrl,
222     pkey_cmac_ctrl_str
223
224     };

```

```

*****
8810 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cmac/cmac.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cmac/cmac.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
54 #include <stdio.h>
55 #include <stdlib.h>
56 #include <string.h>
57 #include "cryptlib.h"
58 #include <openssl/cmac.h>
59
60 #ifdef OPENSSL_FIPS
61 #include <openssl/fips.h>

```

```

62 #endif
64 struct CMAC_CTX_st
65 {
66     /* Cipher context to use */
67     EVP_CIPHER_CTX cctx;
68     /* Keys k1 and k2 */
69     unsigned char k1[EVP_MAX_BLOCK_LENGTH];
70     unsigned char k2[EVP_MAX_BLOCK_LENGTH];
71     /* Temporary block */
72     unsigned char tbl[EVP_MAX_BLOCK_LENGTH];
73     /* Last (possibly partial) block */
74     unsigned char last_block[EVP_MAX_BLOCK_LENGTH];
75     /* Number of bytes in last block: -1 means context not initialised */
76     int nlast_block;
77 };
78
79 /* Make temporary keys K1 and K2 */
80
82 static void make_kn(unsigned char *k1, unsigned char *l, int bl)
83 {
84     int i;
85     /* Shift block to left, including carry */
86     for (i = 0; i < bl; i++)
87     {
88         k1[i] = l[i] << 1;
89         if (i < bl - 1 && l[i + 1] & 0x80)
90             k1[i] |= 1;
91     }
92     /* If MSB set fixup with R */
93     if (l[0] & 0x80)
94         k1[bl - 1] ^= bl == 16 ? 0x87 : 0x1b;
95 }
96
97 CMAC_CTX *CMAC_CTX_new(void)
98 {
99     CMAC_CTX *ctx;
100     ctx = OPENSSL_malloc(sizeof(CMAC_CTX));
101     if (!ctx)
102         return NULL;
103     EVP_CIPHER_CTX_init(&ctx->cctx);
104     ctx->nlast_block = -1;
105     return ctx;
106 }
107
108 void CMAC_CTX_cleanup(CMAC_CTX *ctx)
109 {
110     #ifdef OPENSSL_FIPS
111     if (FIPS_mode() && !ctx->cctx.engine)
112     {
113         FIPS_cmac_ctx_cleanup(ctx);
114         return;
115     }
116     #endif
117     EVP_CIPHER_CTX_cleanup(&ctx->cctx);
118     OPENSSL_cleanse(ctx->tbl, EVP_MAX_BLOCK_LENGTH);
119     OPENSSL_cleanse(ctx->k1, EVP_MAX_BLOCK_LENGTH);
120     OPENSSL_cleanse(ctx->k2, EVP_MAX_BLOCK_LENGTH);
121     OPENSSL_cleanse(ctx->last_block, EVP_MAX_BLOCK_LENGTH);
122     ctx->nlast_block = -1;
123 }
124
125 EVP_CIPHER_CTX *CMAC_CTX_get0_cipher_ctx(CMAC_CTX *ctx)
126 {
127     return &ctx->cctx;

```

```

128     }
129 }
130 void CMAC_CTX_free(CMAC_CTX *ctx)
131 {
132     CMAC_CTX_cleanup(ctx);
133     OPENSSL_free(ctx);
134 }
135
136 int CMAC_CTX_copy(CMAC_CTX *out, const CMAC_CTX *in)
137 {
138     int bl;
139     if (in->nlast_block == -1)
140         return 0;
141     if (!EVP_CIPHER_CTX_copy(&out->cctx, &in->cctx))
142         return 0;
143     bl = EVP_CIPHER_CTX_block_size(&in->cctx);
144     memcpy(out->k1, in->k1, bl);
145     memcpy(out->k2, in->k2, bl);
146     memcpy(out->tbl, in->tbl, bl);
147     memcpy(out->last_block, in->last_block, bl);
148     out->nlast_block = in->nlast_block;
149     return 1;
150 }
151
152 int CMAC_Init(CMAC_CTX *ctx, const void *key, size_t keylen,
153               const EVP_CIPHER *cipher, ENGINE *impl)
154 {
155     static unsigned char zero_iv[EVP_MAX_BLOCK_LENGTH];
156 #ifdef OPENSSL_FIPS
157     if (FIPS_mode())
158     {
159         /* If we have an ENGINE need to allow non FIPS */
160         if ((impl || ctx->cctx.engine)
161             && !(ctx->cctx.flags & EVP_CIPH_FLAG_NON_FIPS_ALLOW))
162         {
163             EVPerr(EVP_F_CMAC_INIT, EVP_R_DISABLED_FOR_FIPS);
164             return 0;
165         }
166         /* Other algorithm blocking will be done in FIPS_cmac_init,
167          * via FIPS_cipherinit().
168          */
169         if (!impl && !ctx->cctx.engine)
170             return FIPS_cmac_init(ctx, key, keylen, cipher, NULL);
171     }
172 #endif
173     /* All zeros means restart */
174     if (!key && !cipher && !impl && keylen == 0)
175     {
176         /* Not initialised */
177         if (ctx->nlast_block == -1)
178             return 0;
179         if (!EVP_EncryptInit_ex(&ctx->cctx, NULL, NULL, NULL, zero_iv))
180             return 0;
181         memset(ctx->tbl, 0, EVP_CIPHER_CTX_block_size(&ctx->cctx));
182         ctx->nlast_block = 0;
183         return 1;
184     }
185     /* Initialiase context */
186     if (cipher && !EVP_EncryptInit_ex(&ctx->cctx, cipher, impl, NULL, NULL))
187         return 0;
188     /* Non-NULL key means initialisation complete */
189     if (key)
190     {
191         int bl;
192         if (!EVP_CIPHER_CTX_cipher(&ctx->cctx))

```

```

194         return 0;
195         if (!EVP_CIPHER_CTX_set_key_length(&ctx->cctx, keylen))
196             return 0;
197         if (!EVP_EncryptInit_ex(&ctx->cctx, NULL, NULL, key, zero_iv))
198             return 0;
199         bl = EVP_CIPHER_CTX_block_size(&ctx->cctx);
200         if (!EVP_Cipher(&ctx->cctx, ctx->tbl, zero_iv, bl))
201             return 0;
202         make_kn(ctx->k1, ctx->tbl, bl);
203         make_kn(ctx->k2, ctx->k1, bl);
204         OPENSSL_cleanse(ctx->tbl, bl);
205         /* Reset context again ready for first data block */
206         if (!EVP_EncryptInit_ex(&ctx->cctx, NULL, NULL, NULL, zero_iv))
207             return 0;
208         /* Zero tbl so resume works */
209         memset(ctx->tbl, 0, bl);
210         ctx->nlast_block = 0;
211     }
212     return 1;
213 }
214
215 int CMAC_Update(CMAC_CTX *ctx, const void *in, size_t dlen)
216 {
217     const unsigned char *data = in;
218     size_t bl;
219 #ifdef OPENSSL_FIPS
220     if (FIPS_mode() && !ctx->cctx.engine)
221         return FIPS_cmac_update(ctx, in, dlen);
222 #endif
223     if (ctx->nlast_block == -1)
224         return 0;
225     if (dlen == 0)
226         return 1;
227     bl = EVP_CIPHER_CTX_block_size(&ctx->cctx);
228     /* Copy into partial block if we need to */
229     if (ctx->nlast_block > 0)
230     {
231         size_t nleft;
232         nleft = bl - ctx->nlast_block;
233         if (dlen < nleft)
234             nleft = dlen;
235         memcpy(ctx->last_block + ctx->nlast_block, data, nleft);
236         dlen -= nleft;
237         ctx->nlast_block += nleft;
238         /* If no more to process return */
239         if (dlen == 0)
240             return 1;
241         data += nleft;
242         /* Else not final block so encrypt it */
243         if (!EVP_Cipher(&ctx->cctx, ctx->tbl, ctx->last_block, bl))
244             return 0;
245     }
246     /* Encrypt all but one of the complete blocks left */
247     while(dlen > bl)
248     {
249         if (!EVP_Cipher(&ctx->cctx, ctx->tbl, data, bl))
250             return 0;
251         dlen -= bl;
252         data += bl;
253     }
254     /* Copy any data left to last block buffer */
255     memcpy(ctx->last_block, data, dlen);
256     ctx->nlast_block = dlen;
257     return 1;
258 }
259

```

```
261 int CMAC_Final(CMAC_CTX *ctx, unsigned char *out, size_t *poutlen)
262 {
263     int i, bl, lb;
264 #ifdef OPENSSL_FIPS
265     if (FIPS_mode() && !ctx->cctx.engine)
266         return FIPS_cmac_final(ctx, out, poutlen);
267 #endif
268     if (ctx->nlast_block == -1)
269         return 0;
270     bl = EVP_CIPHER_CTX_block_size(&ctx->cctx);
271     *poutlen = (size_t)bl;
272     if (!out)
273         return 1;
274     lb = ctx->nlast_block;
275     /* Is last block complete? */
276     if (lb == bl)
277     {
278         for (i = 0; i < bl; i++)
279             out[i] = ctx->last_block[i] ^ ctx->k1[i];
280     }
281     else
282     {
283         ctx->last_block[lb] = 0x80;
284         if (bl - lb > 1)
285             memset(ctx->last_block + lb + 1, 0, bl - lb - 1);
286         for (i = 0; i < bl; i++)
287             out[i] = ctx->last_block[i] ^ ctx->k2[i];
288     }
289     if (!EVP_Cipher(&ctx->cctx, out, out, bl))
290     {
291         OPENSSL_cleanse(out, bl);
292         return 0;
293     }
294     return 1;
295 }

297 int CMAC_resume(CMAC_CTX *ctx)
298 {
299     if (ctx->nlast_block == -1)
300         return 0;
301     /* The buffer "tbl" contains the last fully encrypted block
302      * which is the last IV (or all zeroes if no last encrypted block).
303      * The last block has not been modified since CMAC_final().
304      * So reinitiasing using the last decrypted block will allow
305      * CMAC to continue after calling CMAC_Final().
306      */
307     return EVP_EncryptInit_ex(&ctx->cctx, NULL, NULL, NULL, ctx->tbl);
308 }
```


new/usr/src/lib/openssl/libsunw_crypto/cms/cms_asn1.c

1

```
*****
16758 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_asn1.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

54 #include <openssl/asn1t.h>
55 #include <openssl/pem.h>
56 #include <openssl/x509v3.h>
57 #include <openssl/cms.h>
58 #include <cms_lcl.h>

61 ASN1_SEQUENCE(CMS_IssuerAndSerialNumber) = {
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_asn1.c

2

```
62     ASN1_SIMPLE(CMS_IssuerAndSerialNumber, issuer, X509_NAME),
63     ASN1_SIMPLE(CMS_IssuerAndSerialNumber, serialNumber, ASN1_INTEGER)
64 } ASN1_SEQUENCE_END(CMS_IssuerAndSerialNumber)

66 ASN1_SEQUENCE(CMS_OtherCertificateFormat) = {
67     ASN1_SIMPLE(CMS_OtherCertificateFormat, otherCertFormat, ASN1_OBJECT),
68     ASN1_OPT(CMS_OtherCertificateFormat, otherCert, ASN1_ANY)
69 } ASN1_SEQUENCE_END(CMS_OtherCertificateFormat)

71 ASN1_CHOICE(CMS_CertificateChoices) = {
72     ASN1_SIMPLE(CMS_CertificateChoices, d.certificate, X509),
73     ASN1_IMP(CMS_CertificateChoices, d.extendedCertificate, ASN1_SEQUENCE, 0),
74     ASN1_IMP(CMS_CertificateChoices, d.v1AttrCert, ASN1_SEQUENCE, 1),
75     ASN1_IMP(CMS_CertificateChoices, d.v2AttrCert, ASN1_SEQUENCE, 2),
76     ASN1_IMP(CMS_CertificateChoices, d.other, CMS_OtherCertificateFormat, 3)
77 } ASN1_CHOICE_END(CMS_CertificateChoices)

79 ASN1_CHOICE(CMS_SignerIdentifier) = {
80     ASN1_SIMPLE(CMS_SignerIdentifier, d.issuerAndSerialNumber, CMS_IssuerAnd
81     ASN1_IMP(CMS_SignerIdentifier, d.subjectKeyIdentifier, ASN1_OCTET_STRING
82 } ASN1_CHOICE_END(CMS_SignerIdentifier)

84 ASN1_NDEF_SEQUENCE(CMS_EncapsulatedContentInfo) = {
85     ASN1_SIMPLE(CMS_EncapsulatedContentInfo, eContentType, ASN1_OBJECT),
86     ASN1_NDEF_EXP_OPT(CMS_EncapsulatedContentInfo, eContent, ASN1_OCTET_STR
87 } ASN1_NDEF_SEQUENCE_END(CMS_EncapsulatedContentInfo)

89 /* Minor tweak to operation: free up signer key, cert */
90 static int cms_si_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
91                      void *exarg)
92 {
93     if(operation == ASN1_OP_FREE_POST)
94     {
95         CMS_SignerInfo *si = (CMS_SignerInfo *)*pval;
96         if (si->pkey)
97             EVP_PKEY_free(si->pkey);
98         if (si->signer)
99             X509_free(si->signer);
100     }
101     return 1;
102 }

104 ASN1_SEQUENCE_cb(CMS_SignerInfo, cms_si_cb) = {
105     ASN1_SIMPLE(CMS_SignerInfo, version, LONG),
106     ASN1_SIMPLE(CMS_SignerInfo, sid, CMS_SignerIdentifier),
107     ASN1_SIMPLE(CMS_SignerInfo, digestAlgorithm, X509_ALGOR),
108     ASN1_IMP_SET_OF_OPT(CMS_SignerInfo, signedAttrs, X509_ATTRIBUTE, 0),
109     ASN1_SIMPLE(CMS_SignerInfo, signatureAlgorithm, X509_ALGOR),
110     ASN1_SIMPLE(CMS_SignerInfo, signature, ASN1_OCTET_STRING),
111     ASN1_IMP_SET_OF_OPT(CMS_SignerInfo, unsignedAttrs, X509_ATTRIBUTE, 1)
112 } ASN1_SEQUENCE_END_cb(CMS_SignerInfo, CMS_SignerInfo)

114 ASN1_SEQUENCE(CMS_OtherRevocationInfoFormat) = {
115     ASN1_SIMPLE(CMS_OtherRevocationInfoFormat, otherRevInfoFormat, ASN1_OBJE
116     ASN1_OPT(CMS_OtherRevocationInfoFormat, otherRevInfo, ASN1_ANY)
117 } ASN1_SEQUENCE_END(CMS_OtherRevocationInfoFormat)

119 ASN1_CHOICE(CMS_RevocationInfoChoice) = {
120     ASN1_SIMPLE(CMS_RevocationInfoChoice, d.crl, X509_CRL),
121     ASN1_IMP(CMS_RevocationInfoChoice, d.other, CMS_OtherRevocationInfoForma
122 } ASN1_CHOICE_END(CMS_RevocationInfoChoice)

124 ASN1_NDEF_SEQUENCE(CMS_SignedData) = {
125     ASN1_SIMPLE(CMS_SignedData, version, LONG),
126     ASN1_SET_OF(CMS_SignedData, digestAlgorithms, X509_ALGOR),
127     ASN1_SIMPLE(CMS_SignedData, encapContentInfo, CMS_EncapsulatedContentInf
```

```

128     ASN1_IMP_SET_OF_OPT(CMS_SignedData, certificates, CMS_CertificateChoices
129     ASN1_IMP_SET_OF_OPT(CMS_SignedData, crls, CMS_RevocationInfoChoice, 1),
130     ASN1_SET_OF(CMS_SignedData, signerInfos, CMS_SignerInfo)
131 } ASN1_NDEF_SEQUENCE_END(CMS_SignedData)

133 ASN1_SEQUENCE(CMS_OriginatorInfo) = {
134     ASN1_IMP_SET_OF_OPT(CMS_OriginatorInfo, certificates, CMS_CertificateCho
135     ASN1_IMP_SET_OF_OPT(CMS_OriginatorInfo, crls, CMS_RevocationInfoChoice,
136 } ASN1_SEQUENCE_END(CMS_OriginatorInfo)

138 ASN1_NDEF_SEQUENCE(CMS_EncryptedContentInfo) = {
139     ASN1_SIMPLE(CMS_EncryptedContentInfo, contentType, ASN1_OBJECT),
140     ASN1_SIMPLE(CMS_EncryptedContentInfo, contentEncryptionAlgorithm, X509_A
141     ASN1_IMP_OPT(CMS_EncryptedContentInfo, encryptedContent, ASN1_OCTET_STR
142 } ASN1_NDEF_SEQUENCE_END(CMS_EncryptedContentInfo)

144 ASN1_SEQUENCE(CMS_KeyTransRecipientInfo) = {
145     ASN1_SIMPLE(CMS_KeyTransRecipientInfo, version, LONG),
146     ASN1_SIMPLE(CMS_KeyTransRecipientInfo, rid, CMS_SignerIdentifier),
147     ASN1_SIMPLE(CMS_KeyTransRecipientInfo, keyEncryptionAlgorithm, X509_ALGO
148     ASN1_SIMPLE(CMS_KeyTransRecipientInfo, encryptedKey, ASN1_OCTET_STRING)
149 } ASN1_SEQUENCE_END(CMS_KeyTransRecipientInfo)

151 ASN1_SEQUENCE(CMS_OtherKeyAttribute) = {
152     ASN1_SIMPLE(CMS_OtherKeyAttribute, keyAttrId, ASN1_OBJECT),
153     ASN1_OPT(CMS_OtherKeyAttribute, keyAttr, ASN1_ANY)
154 } ASN1_SEQUENCE_END(CMS_OtherKeyAttribute)

156 ASN1_SEQUENCE(CMS_RecipientKeyIdentifier) = {
157     ASN1_SIMPLE(CMS_RecipientKeyIdentifier, subjectKeyIdentifier, ASN1_OCTET
158     ASN1_OPT(CMS_RecipientKeyIdentifier, date, ASN1_GENERALIZEDTIME),
159     ASN1_OPT(CMS_RecipientKeyIdentifier, other, CMS_OtherKeyAttribute)
160 } ASN1_SEQUENCE_END(CMS_RecipientKeyIdentifier)

162 ASN1_CHOICE(CMS_KeyAgreeRecipientIdentifier) = {
163     ASN1_SIMPLE(CMS_KeyAgreeRecipientIdentifier, d.issuerAndSerialNumber, CMS_Issu
164     ASN1_IMP(CMS_KeyAgreeRecipientIdentifier, d.rKeyId, CMS_RecipientKeyIdentifier
165 } ASN1_CHOICE_END(CMS_KeyAgreeRecipientIdentifier)

167 ASN1_SEQUENCE(CMS_RecipientEncryptedKey) = {
168     ASN1_SIMPLE(CMS_RecipientEncryptedKey, rid, CMS_KeyAgreeRecipientIdentif
169     ASN1_SIMPLE(CMS_RecipientEncryptedKey, encryptedKey, ASN1_OCTET_STRING)
170 } ASN1_SEQUENCE_END(CMS_RecipientEncryptedKey)

172 ASN1_SEQUENCE(CMS_OriginatorPublicKey) = {
173     ASN1_SIMPLE(CMS_OriginatorPublicKey, algorithm, X509_ALGOR),
174     ASN1_SIMPLE(CMS_OriginatorPublicKey, publicKey, ASN1_BIT_STRING)
175 } ASN1_SEQUENCE_END(CMS_OriginatorPublicKey)

177 ASN1_CHOICE(CMS_OriginatorIdentifierOrKey) = {
178     ASN1_SIMPLE(CMS_OriginatorIdentifierOrKey, d.issuerAndSerialNumber, CMS_Issuer
179     ASN1_IMP(CMS_OriginatorIdentifierOrKey, d.subjectKeyIdentifier, ASN1_OCTET_STR
180     ASN1_IMP(CMS_OriginatorIdentifierOrKey, d.originatorKey, CMS_OriginatorPublick
181 } ASN1_CHOICE_END(CMS_OriginatorIdentifierOrKey)

183 ASN1_SEQUENCE(CMS_KeyAgreeRecipientInfo) = {
184     ASN1_SIMPLE(CMS_KeyAgreeRecipientInfo, version, LONG),
185     ASN1_EXP(CMS_KeyAgreeRecipientInfo, originator, CMS_OriginatorIdentifier
186     ASN1_EXP_OPT(CMS_KeyAgreeRecipientInfo, ukm, ASN1_OCTET_STRING, 1),
187     ASN1_SIMPLE(CMS_KeyAgreeRecipientInfo, keyEncryptionAlgorithm, X509_ALGO
188     ASN1_SEQUENCE_OF(CMS_KeyAgreeRecipientInfo, recipientEncryptedKeys, CMS_
189 } ASN1_SEQUENCE_END(CMS_KeyAgreeRecipientInfo)

191 ASN1_SEQUENCE(CMS_KEYIdentifier) = {
192     ASN1_SIMPLE(CMS_KEYIdentifier, keyIdentifier, ASN1_OCTET_STRING),
193     ASN1_OPT(CMS_KEYIdentifier, date, ASN1_GENERALIZEDTIME),

```

```

194     ASN1_OPT(CMS_KEYIdentifier, other, CMS_OtherKeyAttribute)
195 } ASN1_SEQUENCE_END(CMS_KEYIdentifier)

197 ASN1_SEQUENCE(CMS_KEYRecipientInfo) = {
198     ASN1_SIMPLE(CMS_KEYRecipientInfo, version, LONG),
199     ASN1_SIMPLE(CMS_KEYRecipientInfo, kekid, CMS_KEYIdentifier),
200     ASN1_SIMPLE(CMS_KEYRecipientInfo, keyEncryptionAlgorithm, X509_ALGOR),
201     ASN1_SIMPLE(CMS_KEYRecipientInfo, encryptedKey, ASN1_OCTET_STRING)
202 } ASN1_SEQUENCE_END(CMS_KEYRecipientInfo)

204 ASN1_SEQUENCE(CMS_PasswordRecipientInfo) = {
205     ASN1_SIMPLE(CMS_PasswordRecipientInfo, version, LONG),
206     ASN1_IMP_OPT(CMS_PasswordRecipientInfo, keyDerivationAlgorithm, X509_ALG
207     ASN1_SIMPLE(CMS_PasswordRecipientInfo, keyEncryptionAlgorithm, X509_ALGO
208     ASN1_SIMPLE(CMS_PasswordRecipientInfo, encryptedKey, ASN1_OCTET_STRING)
209 } ASN1_SEQUENCE_END(CMS_PasswordRecipientInfo)

211 ASN1_SEQUENCE(CMS_OtherRecipientInfo) = {
212     ASN1_SIMPLE(CMS_OtherRecipientInfo, oriType, ASN1_OBJECT),
213     ASN1_OPT(CMS_OtherRecipientInfo, oriValue, ASN1_ANY)
214 } ASN1_SEQUENCE_END(CMS_OtherRecipientInfo)

216 /* Free up RecipientInfo additional data */
217 static int cms_ri_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
218                     void *exarg)
219 {
220     if(operation == ASN1_OP_FREE_PRE)
221     {
222         CMS_RecipientInfo *ri = (CMS_RecipientInfo *)*pval;
223         if(ri->type == CMS_RECIPINFO_TRANS)
224         {
225             CMS_KeyTransRecipientInfo *ktri = ri->d.ktri;
226             if(ktri->pkey)
227                 EVP_PKEY_free(ktri->pkey);
228             if(ktri->recip)
229                 X509_free(ktri->recip);
230         }
231         else if(ri->type == CMS_RECIPINFO_KEY)
232         {
233             CMS_KEYRecipientInfo *kekri = ri->d.kekri;
234             if(kekri->key)
235             {
236                 OPENSSL_cleanse(kekri->key, kekri->keylen);
237                 OPENSSL_free(kekri->key);
238             }
239         }
240         else if(ri->type == CMS_RECIPINFO_PASS)
241         {
242             CMS_PasswordRecipientInfo *pwri = ri->d.pwri;
243             if(pwri->pass)
244             {
245                 OPENSSL_cleanse(pwri->pass, pwri->passlen);
246                 OPENSSL_free(pwri->pass);
247             }
248         }
249     }
250     return 1;
251 }

253 ASN1_CHOICE_cb(CMS_RecipientInfo, cms_ri_cb) = {
254     ASN1_SIMPLE(CMS_RecipientInfo, d.ktri, CMS_KeyTransRecipientInfo),
255     ASN1_IMP(CMS_RecipientInfo, d.kari, CMS_KeyAgreeRecipientInfo, 1),
256     ASN1_IMP(CMS_RecipientInfo, d.kekri, CMS_KEYRecipientInfo, 2),
257     ASN1_IMP(CMS_RecipientInfo, d.pwri, CMS_PasswordRecipientInfo, 3),
258     ASN1_IMP(CMS_RecipientInfo, d.ori, CMS_OtherRecipientInfo, 4)
259 } ASN1_CHOICE_END_cb(CMS_RecipientInfo, CMS_RecipientInfo, type)

```

```

261 ASN1_NDEF_SEQUENCE(CMS_EnvelopedData) = {
262     ASN1_SIMPLE(CMS_EnvelopedData, version, LONG),
263     ASN1_IMP_OPT(CMS_EnvelopedData, originatorInfo, CMS_OriginatorInfo, 0),
264     ASN1_SET_OF(CMS_EnvelopedData, recipientInfos, CMS_RecipientInfo),
265     ASN1_SIMPLE(CMS_EnvelopedData, encryptedContentInfo, CMS_EncryptedContentInfo),
266     ASN1_IMP_SET_OF_OPT(CMS_EnvelopedData, unprotectedAttrs, X509_ATTRIBUTE, 0)
267 } ASN1_NDEF_SEQUENCE_END(CMS_EnvelopedData)

269 ASN1_NDEF_SEQUENCE(CMS_DigestedData) = {
270     ASN1_SIMPLE(CMS_DigestedData, version, LONG),
271     ASN1_SIMPLE(CMS_DigestedData, digestAlgorithm, X509_ALGOR),
272     ASN1_SIMPLE(CMS_DigestedData, encapContentInfo, CMS_EncapsulatedContentInfo),
273     ASN1_SIMPLE(CMS_DigestedData, digest, ASN1_OCTET_STRING)
274 } ASN1_NDEF_SEQUENCE_END(CMS_DigestedData)

276 ASN1_NDEF_SEQUENCE(CMS_EncryptedData) = {
277     ASN1_SIMPLE(CMS_EncryptedData, version, LONG),
278     ASN1_SIMPLE(CMS_EncryptedData, encryptedContentInfo, CMS_EncryptedContentInfo),
279     ASN1_IMP_SET_OF_OPT(CMS_EncryptedData, unprotectedAttrs, X509_ATTRIBUTE, 0)
280 } ASN1_NDEF_SEQUENCE_END(CMS_EncryptedData)

282 ASN1_NDEF_SEQUENCE(CMS_AuthenticatedData) = {
283     ASN1_SIMPLE(CMS_AuthenticatedData, version, LONG),
284     ASN1_IMP_OPT(CMS_AuthenticatedData, originatorInfo, CMS_OriginatorInfo, 0),
285     ASN1_SET_OF(CMS_AuthenticatedData, recipientInfos, CMS_RecipientInfo),
286     ASN1_SIMPLE(CMS_AuthenticatedData, macAlgorithm, X509_ALGOR),
287     ASN1_IMP(CMS_AuthenticatedData, digestAlgorithm, X509_ALGOR, 1),
288     ASN1_SIMPLE(CMS_AuthenticatedData, encapContentInfo, CMS_EncapsulatedContentInfo),
289     ASN1_IMP_SET_OF_OPT(CMS_AuthenticatedData, authAttrs, X509_ALGOR, 2),
290     ASN1_SIMPLE(CMS_AuthenticatedData, mac, ASN1_OCTET_STRING),
291     ASN1_IMP_SET_OF_OPT(CMS_AuthenticatedData, unauthAttrs, X509_ALGOR, 3)
292 } ASN1_NDEF_SEQUENCE_END(CMS_AuthenticatedData)

294 ASN1_NDEF_SEQUENCE(CMS_CompressedData) = {
295     ASN1_SIMPLE(CMS_CompressedData, version, LONG),
296     ASN1_SIMPLE(CMS_CompressedData, compressionAlgorithm, X509_ALGOR),
297     ASN1_SIMPLE(CMS_CompressedData, encapContentInfo, CMS_EncapsulatedContentInfo),
298 } ASN1_NDEF_SEQUENCE_END(CMS_CompressedData)

300 /* This is the ANY DEFINED BY table for the top level ContentInfo structure */

302 ASN1_ADB_TEMPLATE(cms_default) = ASN1_EXP(CMS_ContentInfo, d.other, ASN1_ANY, 0)

304 ASN1_ADB(CMS_ContentInfo) = {
305     ADB_ENTRY(NID_pkcs7_data, ASN1_NDEF_EXP(CMS_ContentInfo, d.data, ASN1_OC
306     ADB_ENTRY(NID_pkcs7_signed, ASN1_NDEF_EXP(CMS_ContentInfo, d.signedData,
307     ADB_ENTRY(NID_pkcs7_enveloped, ASN1_NDEF_EXP(CMS_ContentInfo, d.envelope
308     ADB_ENTRY(NID_pkcs7_digest, ASN1_NDEF_EXP(CMS_ContentInfo, d.digestedDat
309     ADB_ENTRY(NID_pkcs7_encrypted, ASN1_NDEF_EXP(CMS_ContentInfo, d.encrypte
310     ADB_ENTRY(NID_id_smime_ct_authData, ASN1_NDEF_EXP(CMS_ContentInfo, d.aut
311     ADB_ENTRY(NID_id_smime_ct_compressedData, ASN1_NDEF_EXP(CMS_ContentInfo,
312 } ASN1_ADB_END(CMS_ContentInfo, 0, contentType, 0, &cms_default_tt, NULL);

314 /* CMS streaming support */
315 static int cms_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
316                  void *exarg)
317 {
318     ASN1_STREAM_ARG *sarg = exarg;
319     CMS_ContentInfo *cms = NULL;
320     if (pval)
321         cms = (CMS_ContentInfo *)*pval;
322     else
323         return 1;
324     switch(operation)
325     {

```

```

327         case ASN1_OP_STREAM_PRE:
328             if (CMS_stream(&sarg->boundary, cms) <= 0)
329                 return 0;
330         case ASN1_OP_DETACHED_PRE:
331             sarg->ndef_bio = CMS_dataInit(cms, sarg->out);
332             if (!sarg->ndef_bio)
333                 return 0;
334             break;

336         case ASN1_OP_STREAM_POST:
337         case ASN1_OP_DETACHED_POST:
338             if (CMS_dataFinal(cms, sarg->ndef_bio) <= 0)
339                 return 0;
340             break;

342     }
343     return 1;
344 }

346 ASN1_NDEF_SEQUENCE_cb(CMS_ContentInfo, cms_cb) = {
347     ASN1_SIMPLE(CMS_ContentInfo, contentType, ASN1_OBJECT),
348     ASN1_ADB_OBJECT(CMS_ContentInfo)
349 } ASN1_NDEF_SEQUENCE_END_cb(CMS_ContentInfo, CMS_ContentInfo)

351 /* Specials for signed attributes */

353 /* When signing attributes we want to reorder them to match the sorted
354 * encoding.
355 */

357 ASN1_ITEM_TEMPLATE(CMS_Attributes_Sign) =
358     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SET_ORDER, 0, CMS_ATTRIBUTES, X509_ATTRI
359 ASN1_ITEM_TEMPLATE_END(CMS_Attributes_Sign)

361 /* When verifying attributes we need to use the received order. So
362 * we use SEQUENCE OF and tag it to SET OF
363 */

365 ASN1_ITEM_TEMPLATE(CMS_Attributes_Verify) =
366     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF | ASN1_TFLG_IMPTAG | ASN1_TF
367     V_ASN1_SET, CMS_ATTRIBUTES, X509_ATTRIBUTE)
368 ASN1_ITEM_TEMPLATE_END(CMS_Attributes_Verify)

372 ASN1_CHOICE(CMS_ReceiptsFrom) = {
373     ASN1_IMP(CMS_ReceiptsFrom, d.allorFirstTier, LONG, 0),
374     ASN1_IMP_SEQUENCE_OF(CMS_ReceiptsFrom, d.receiptList, GENERAL_NAMES, 1)
375 } ASN1_CHOICE_END(CMS_ReceiptsFrom)

377 ASN1_SEQUENCE(CMS_ReceiptRequest) = {
378     ASN1_SIMPLE(CMS_ReceiptRequest, signedContentIdentifier, ASN1_OCTET_STRING),
379     ASN1_SIMPLE(CMS_ReceiptRequest, receiptsFrom, CMS_ReceiptsFrom),
380     ASN1_SEQUENCE_OF(CMS_ReceiptRequest, receiptsTo, GENERAL_NAMES)
381 } ASN1_SEQUENCE_END(CMS_ReceiptRequest)

383 ASN1_SEQUENCE(CMS_Receipt) = {
384     ASN1_SIMPLE(CMS_Receipt, version, LONG),
385     ASN1_SIMPLE(CMS_Receipt, contentType, ASN1_OBJECT),
386     ASN1_SIMPLE(CMS_Receipt, signedContentIdentifier, ASN1_OCTET_STRING),
387     ASN1_SIMPLE(CMS_Receipt, originatorSignatureValue, ASN1_OCTET_STRING)
388 } ASN1_SEQUENCE_END(CMS_Receipt)

```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_att.c

1

```
*****
6087 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_att.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cms/cms_att.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
54 #include <openssl/asn1t.h>
55 #include <openssl/pem.h>
56 #include <openssl/x509v3.h>
57 #include <openssl/err.h>
58 #include <openssl/cms.h>
59 #include <cms_lcl.h>
61 /* CMS SignedData Attribute utilities */
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_att.c

2

```
63 int CMS_signed_get_attr_count(const CMS_SignerInfo *si)
64 {
65     return X509at_get_attr_count(si->signedAttrs);
66 }
68 int CMS_signed_get_attr_by_NID(const CMS_SignerInfo *si, int nid,
69                               int lastpos)
70 {
71     return X509at_get_attr_by_NID(si->signedAttrs, nid, lastpos);
72 }
74 int CMS_signed_get_attr_by_OBJ(const CMS_SignerInfo *si, ASN1_OBJECT *obj,
75                                int lastpos)
76 {
77     return X509at_get_attr_by_OBJ(si->signedAttrs, obj, lastpos);
78 }
80 X509_ATTRIBUTE *CMS_signed_get_attr(const CMS_SignerInfo *si, int loc)
81 {
82     return X509at_get_attr(si->signedAttrs, loc);
83 }
85 X509_ATTRIBUTE *CMS_signed_delete_attr(CMS_SignerInfo *si, int loc)
86 {
87     return X509at_delete_attr(si->signedAttrs, loc);
88 }
90 int CMS_signed_add1_attr(CMS_SignerInfo *si, X509_ATTRIBUTE *attr)
91 {
92     if(X509at_add1_attr(&si->signedAttrs, attr)) return 1;
93     return 0;
94 }
96 int CMS_signed_add1_attr_by_OBJ(CMS_SignerInfo *si,
97                                const ASN1_OBJECT *obj, int type,
98                                const void *bytes, int len)
99 {
100     if(X509at_add1_attr_by_OBJ(&si->signedAttrs, obj,
101                                type, bytes, len)) return 1;
102     return 0;
103 }
105 int CMS_signed_add1_attr_by_NID(CMS_SignerInfo *si,
106                                int nid, int type,
107                                const void *bytes, int len)
108 {
109     if(X509at_add1_attr_by_NID(&si->signedAttrs, nid,
110                                type, bytes, len)) return 1;
111     return 0;
112 }
114 int CMS_signed_add1_attr_by_txt(CMS_SignerInfo *si,
115                                const char *attrname, int type,
116                                const void *bytes, int len)
117 {
118     if(X509at_add1_attr_by_txt(&si->signedAttrs, attrname,
119                                type, bytes, len)) return 1;
120     return 0;
121 }
123 void *CMS_signed_get0_data_by_OBJ(CMS_SignerInfo *si, ASN1_OBJECT *oid,
124                                   int lastpos, int type)
125 {
126     return X509at_get0_data_by_OBJ(si->signedAttrs, oid, lastpos, type);
127 }
```

```

129 int CMS_unsigned_get_attr_count(const CMS_SignerInfo *si)
130 {
131     return X509at_get_attr_count(si->unsignedAttrs);
132 }

134 int CMS_unsigned_get_attr_by_NID(const CMS_SignerInfo *si, int nid,
135                                 int lastpos)
136 {
137     return X509at_get_attr_by_NID(si->unsignedAttrs, nid, lastpos);
138 }

140 int CMS_unsigned_get_attr_by_OBJ(const CMS_SignerInfo *si, ASN1_OBJECT *obj,
141                                 int lastpos)
142 {
143     return X509at_get_attr_by_OBJ(si->unsignedAttrs, obj, lastpos);
144 }

146 X509_ATTRIBUTE *CMS_unsigned_get_attr(const CMS_SignerInfo *si, int loc)
147 {
148     return X509at_get_attr(si->unsignedAttrs, loc);
149 }

151 X509_ATTRIBUTE *CMS_unsigned_delete_attr(CMS_SignerInfo *si, int loc)
152 {
153     return X509at_delete_attr(si->unsignedAttrs, loc);
154 }

156 int CMS_unsigned_add1_attr(CMS_SignerInfo *si, X509_ATTRIBUTE *attr)
157 {
158     if(X509at_add1_attr(&si->unsignedAttrs, attr)) return 1;
159     return 0;
160 }

162 int CMS_unsigned_add1_attr_by_OBJ(CMS_SignerInfo *si,
163                                 const ASN1_OBJECT *obj, int type,
164                                 const void *bytes, int len)
165 {
166     if(X509at_add1_attr_by_OBJ(&si->unsignedAttrs, obj,
167                               type, bytes, len)) return 1;
168     return 0;
169 }

171 int CMS_unsigned_add1_attr_by_NID(CMS_SignerInfo *si,
172                                 int nid, int type,
173                                 const void *bytes, int len)
174 {
175     if(X509at_add1_attr_by_NID(&si->unsignedAttrs, nid,
176                               type, bytes, len)) return 1;
177     return 0;
178 }

180 int CMS_unsigned_add1_attr_by_txt(CMS_SignerInfo *si,
181                                 const char *attrname, int type,
182                                 const void *bytes, int len)
183 {
184     if(X509at_add1_attr_by_txt(&si->unsignedAttrs, attrname,
185                               type, bytes, len)) return 1;
186     return 0;
187 }

189 void *CMS_unsigned_get0_data_by_OBJ(CMS_SignerInfo *si, ASN1_OBJECT *oid,
190                                    int lastpos, int type)
191 {
192     return X509at_get0_data_by_OBJ(si->unsignedAttrs, oid, lastpos, type);
193 }

```

```

195 /* Specific attribute cases */

```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_cd.c

1

```
*****
4371 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_cd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cms/cms_cd.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/pem.h>
57 #include <openssl/x509v3.h>
58 #include <openssl/err.h>
59 #include <openssl/cms.h>
60 #include <openssl/bio.h>
61 #ifndef OPENSSL_NO_COMP
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_cd.c

2

```
62 #include <openssl/comp.h>
63 #endif
64 #include "cms_lcl.h"
66 DECLARE_ASN1_ITEM(CMS_CompressedData)
68 #ifdef ZLIB
70 /* CMS CompressedData Utilities */
72 CMS_ContentInfo *cms_CompressedData_create(int comp_nid)
73 {
74     CMS_ContentInfo *cms;
75     CMS_CompressedData *cd;
76     /* Will need something cleverer if there is ever more than one
77      * compression algorithm or parameters have some meaning...
78      */
79     if (comp_nid != NID_zlib_compression)
80     {
81         CMSerr(CMS_F_CMS_COMPRESSEDData_CREATE,
82               CMS_R_UNSUPPORTED_COMPRESSION_ALGORITHM);
83         return NULL;
84     }
85     cms = CMS_ContentInfo_new();
86     if (!cms)
87         return NULL;
89     cd = M_ASN1_new_of(CMS_CompressedData);
91     if (!cd)
92         goto err;
94     cms->contentType = OBJ_nid2obj(NID_id_smime_ct_compressedData);
95     cms->d.compressedData = cd;
97     cd->version = 0;
99     X509_ALGOR_set0(cd->compressionAlgorithm,
100                   OBJ_nid2obj(NID_zlib_compression),
101                   V_ASN1_UNDEF, NULL);
103     cd->encapContentInfo->eContentType = OBJ_nid2obj(NID_pkcs7_data);
105     return cms;
107 err:
109     if (cms)
110         CMS_ContentInfo_free(cms);
112     return NULL;
113 }
115 BIO *cms_CompressedData_init_bio(CMS_ContentInfo *cms)
116 {
117     CMS_CompressedData *cd;
118     ASN1_OBJECT *compoid;
119     if (OBJ_obj2nid(cms->contentType) != NID_id_smime_ct_compressedData)
120     {
121         CMSerr(CMS_F_CMS_COMPRESSEDData_INIT_BIO,
122               CMS_R_CONTENT_TYPE_NOT_COMPRESSED_DATA);
123         return NULL;
124     }
125     cd = cms->d.compressedData;
126     X509_ALGOR_get0(&compoid, NULL, NULL, cd->compressionAlgorithm);
127     if (OBJ_obj2nid(compoid) != NID_zlib_compression)
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_cd.c

3

```
128     {
129         CMSerr(CMS_F_CMS_COMPRESSEDDATA_INIT_BIO,
130              CMS_R_UNUNSUPPORTED_COMPRESSION_ALGORITHM);
131         return NULL;
132     }
133     return BIO_new(BIO_f_zlib());
134 }

136 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_dd.c

1

```
*****
4334 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_dd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_dd.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/pem.h>
57 #include <openssl/x509v3.h>
58 #include <openssl/err.h>
59 #include <openssl/cms.h>
60 #include "cms_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_dd.c

2

```
62 DECLARE_ASN1_ITEM(CMS_DigestedData)

64 /* CMS DigestedData Utilities */

66 CMS_ContentInfo *cms_DigestedData_create(const EVP_MD *md)
67 {
68     CMS_ContentInfo *cms;
69     CMS_DigestedData *dd;
70     cms = CMS_ContentInfo_new();
71     if (!cms)
72         return NULL;

74     dd = M_ASN1_new_of(CMS_DigestedData);

76     if (!dd)
77         goto err;

79     cms->contentType = OBJ_nid2obj(NID_pkcs7_digest);
80     cms->d.digestedData = dd;

82     dd->version = 0;
83     dd->encapContentInfo->eContentType = OBJ_nid2obj(NID_pkcs7_data);

85     cms_DigestAlgorithm_set(dd->digestAlgorithm, md);

87     return cms;

89 err:

91     if (cms)
92         CMS_ContentInfo_free(cms);

94     return NULL;
95 }

97 BIO *cms_DigestedData_init_bio(CMS_ContentInfo *cms)
98 {
99     CMS_DigestedData *dd;
100     dd = cms->d.digestedData;
101     return cms_DigestAlgorithm_init_bio(dd->digestAlgorithm);
102 }

104 int cms_DigestedData_do_final(CMS_ContentInfo *cms, BIO *chain, int verify)
105 {
106     EVP_MD_CTX mctx;
107     unsigned char md[EVP_MAX_MD_SIZE];
108     unsigned int mdlen;
109     int r = 0;
110     CMS_DigestedData *dd;
111     EVP_MD_CTX_init(&mctx);

113     dd = cms->d.digestedData;

115     if (!cms_DigestAlgorithm_find_ctx(&mctx, chain, dd->digestAlgorithm))
116         goto err;

118     if (EVP_DigestFinal_ex(&mctx, md, &mdlen) <= 0)
119         goto err;

121     if (verify)
122     {
123         if (mdlen != (unsigned int)dd->digest->length)
124         {
125             CMSerr(CMS_F_CMS_DIGESTEDDATA_DO_FINAL,
126                   CMS_R_MESSAGEDIGEST_WRONG_LENGTH);
127             goto err;
128         }
129     }
130 }
```



```
128         }
130         if (memcmp(md, dd->digest->data, mdlen))
131             CMSerr(CMS_F_CMS_DIGESTEDDATA_DO_FINAL,
132                  CMS_R_VERIFICATION_FAILURE);
133         else
134             r = 1;
135     }
136 else
137     {
138         if (!ASN1_STRING_set(dd->digest, md, mdlen))
139             goto err;
140         r = 1;
141     }
143 err:
144     EVP_MD_CTX_cleanup(&mctx);
146     return r;
148 }
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_enc.c

1

```
*****
7649 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_enc.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 */

54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/pem.h>
57 #include <openssl/x509v3.h>
58 #include <openssl/err.h>
59 #include <openssl/cms.h>
60 #include <openssl/rand.h>
61 #include "cms_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_enc.c

2

```
63 /* CMS EncryptedData Utilities */
65 DECLARE_ASN1_ITEM(CMS_EncryptedData)

67 /* Return BIO based on EncryptedContentInfo and key */

69 BIO *cms_EncryptedContent_init_bio(CMS_EncryptedContentInfo *ec)
70 {
71     BIO *b;
72     EVP_CIPHER_CTX *ctx;
73     const EVP_CIPHER *ciph;
74     X509_ALGOR *calg = ec->contentEncryptionAlgorithm;
75     unsigned char iv[EVP_MAX_IV_LENGTH], *piv = NULL;
76     unsigned char *tkey = NULL;
77     size_t tkeylen = 0;

79     int ok = 0;

81     int enc, keep_key = 0;

83     enc = ec->cipher ? 1 : 0;

85     b = BIO_new(BIO_f_cipher());
86     if (!b)
87     {
88         CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
89               ERR_R_MALLOC_FAILURE);
90         return NULL;
91     }

93     BIO_get_cipher_ctx(b, &ctx);

95     if (enc)
96     {
97         ciph = ec->cipher;
98         /* If not keeping key set cipher to NULL so subsequent calls
99          * decrypt.
100          */
101         if (ec->key)
102             ec->cipher = NULL;
103     }
104     else
105     {
106         ciph = EVP_get_cipherbyobj(calg->algorithm);

108         if (!ciph)
109         {
110             CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
111                   CMS_R_UNKNOWN_CIPHER);
112             goto err;
113         }
114     }

116     if (EVP_CipherInit_ex(ctx, ciph, NULL, NULL, NULL, enc) <= 0)
117     {
118         CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
119               CMS_R_CIPHER_INITIALISATION_ERROR);
120         goto err;
121     }

123     if (enc)
124     {
125         int ivlen;
126         calg->algorithm = OBJ_nid2obj(EVP_CIPHER_CTX_type(ctx));
127         /* Generate a random IV if we need one */

```

```

128         ivlen = EVP_CIPHER_CTX_iv_length(ctx);
129         if (ivlen > 0)
130             {
131                 if (RAND_pseudo_bytes(iv, ivlen) <= 0)
132                     goto err;
133                 piv = iv;
134             }
135     else if (EVP_CIPHER_asn1_to_param(ctx, calg->parameter) <= 0)
136     {
137         CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
138               CMS_R_CIPHER_PARAMETER_INITIALISATION_ERROR);
139         goto err;
140     }
141     tkeylen = EVP_CIPHER_CTX_key_length(ctx);
142     /* Generate random session key */
143     if (!enc || !ec->key)
144     {
145         tkey = OPENSSL_malloc(tkeylen);
146         if (!tkey)
147             CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
148                   ERR_R_MALLOC_FAILURE);
149         goto err;
150     }
151     if (EVP_CIPHER_CTX_rand_key(ctx, tkey) <= 0)
152         goto err;
153     }
154     if (!ec->key)
155     {
156         ec->key = tkey;
157         ec->keylen = tkeylen;
158         tkey = NULL;
159         if (enc)
160             keep_key = 1;
161         else
162             ERR_clear_error();
163     }
164     if (ec->keylen != tkeylen)
165     {
166         /* If necessary set key length */
167         if (EVP_CIPHER_CTX_set_key_length(ctx, ec->keylen) <= 0)
168         {
169             /* Only reveal failure if debugging so we don't
170              * leak information which may be useful in MMA.
171              */
172             if (enc || ec->debug)
173             {
174                 CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
175                       CMS_R_INVALID_KEY_LENGTH);
176                 goto err;
177             }
178             else
179             {
180                 /* Use random key */
181                 OPENSSL_cleanse(ec->key, ec->keylen);
182                 OPENSSL_free(ec->key);
183                 ec->key = tkey;
184                 ec->keylen = tkeylen;
185                 tkey = NULL;
186                 ERR_clear_error();
187             }
188         }
189     }
190 }

```

```

194     }
195     if (EVP_CipherInit_ex(ctx, NULL, NULL, ec->key, piv, enc) <= 0)
196     {
197         CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
198               CMS_R_CIPHER_INITIALISATION_ERROR);
199         goto err;
200     }
201     if (piv)
202     {
203         calg->parameter = ASN1_TYPE_new();
204         if (!calg->parameter)
205             CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
206                   ERR_R_MALLOC_FAILURE);
207         goto err;
208     }
209     if (EVP_CIPHER_param_to_asn1(ctx, calg->parameter) <= 0)
210     {
211         CMSerr(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO,
212               CMS_R_CIPHER_PARAMETER_INITIALISATION_ERROR);
213         goto err;
214     }
215     ok = 1;
216     err:
217     if (ec->key && !keep_key)
218     {
219         OPENSSL_cleanse(ec->key, ec->keylen);
220         OPENSSL_free(ec->key);
221         ec->key = NULL;
222     }
223     if (tkey)
224     {
225         OPENSSL_cleanse(tkey, tkeylen);
226         OPENSSL_free(tkey);
227     }
228     if (ok)
229         return b;
230     BIO_free(b);
231     return NULL;
232 }
233
234 int cms_EncryptedContent_init(CMS_EncryptedContentInfo *ec,
235                               const EVP_CIPHER *cipher,
236                               const unsigned char *key, size_t keylen)
237 {
238     {
239         ec->cipher = cipher;
240         if (key)
241         {
242             ec->key = OPENSSL_malloc(keylen);
243             if (!ec->key)
244                 return 0;
245             memcpy(ec->key, key, keylen);
246         }
247         ec->keylen = keylen;
248         if (cipher)
249             ec->contentType = OBJ_nid2obj(NID_pkcs7_data);
250         return 1;
251     }
252 }
253
254 int CMS_EncryptedData_set1_key(CMS_ContentInfo *cms, const EVP_CIPHER *ciph,
255                                const unsigned char *key, size_t keylen)
256 {

```

```
260 CMS_EncryptedContentInfo *ec;
261 if (!key || !keylen)
262 {
263     CMSerr(CMS_F_CMS_ENCRYPTEDDATA_SET1_KEY, CMS_R_NO_KEY);
264     return 0;
265 }
266 if (ciph)
267 {
268     cms->d.encryptedData = M_ASN1_new_of(CMS_EncryptedData);
269     if (!cms->d.encryptedData)
270     {
271         CMSerr(CMS_F_CMS_ENCRYPTEDDATA_SET1_KEY,
272               ERR_R_MALLOC_FAILURE);
273         return 0;
274     }
275     cms->contentType = OBJ_nid2obj(NID_pkcs7_encrypted);
276     cms->d.encryptedData->version = 0;
277 }
278 else if (OBJ_obj2nid(cms->contentType) != NID_pkcs7_encrypted)
279 {
280     CMSerr(CMS_F_CMS_ENCRYPTEDDATA_SET1_KEY,
281           CMS_R_NOT_ENCRYPTED_DATA);
282     return 0;
283 }
284 ec = cms->d.encryptedData->encryptedContentInfo;
285 return cms_EncryptedContent_init(ec, ciph, key, keylen);
286 }

288 BIO *cms_EncryptedData_init_bio(CMS_ContentInfo *cms)
289 {
290     CMS_EncryptedData *enc = cms->d.encryptedData;
291     if (enc->encryptedContentInfo->cipher && enc->unprotectedAttrs)
292         enc->version = 2;
293     return cms_EncryptedContent_init_bio(enc->encryptedContentInfo);
294 }
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_env.c

1

```
*****
19170 Fri May 30 18:31:39 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_env.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_env.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/pem.h>
57 #include <openssl/x509v3.h>
58 #include <openssl/err.h>
59 #include <openssl/cms.h>
60 #include <openssl/rand.h>
61 #include <openssl/aes.h>
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_env.c

2

```
62 #include "cms_lcl.h"
63 #include "asn1_lcl.h"

65 /* CMS EnvelopedData Utilities */

67 DECLARE_ASN1_ITEM(CMS_EnvelopedData)
68 DECLARE_ASN1_ITEM(CMS_KeyTransRecipientInfo)
69 DECLARE_ASN1_ITEM(CMS_KEKRecipientInfo)
70 DECLARE_ASN1_ITEM(CMS_OtherKeyAttribute)

72 DECLARE_STACK_OF(CMS_RecipientInfo)

74 CMS_EnvelopedData *cms_get0_enveloped(CMS_ContentInfo *cms)
75 {
76     if (OBJ_obj2nid(cms->contentType) != NID_pkcs7_enveloped)
77     {
78         CMSerr(CMS_F_CMS_GET0_ENVELOPED,
79               CMS_R_CONTENT_TYPE_NOT_ENVELOPED_DATA);
80         return NULL;
81     }
82     return cms->d.envelopedData;
83 }

85 static CMS_EnvelopedData *cms_enveloped_data_init(CMS_ContentInfo *cms)
86 {
87     if (cms->d.other == NULL)
88     {
89         cms->d.envelopedData = M_ASN1_new_of(CMS_EnvelopedData);
90         if (!cms->d.envelopedData)
91         {
92             CMSerr(CMS_F_CMS_ENVELOPED_DATA_INIT,
93                   ERR_R_MALLOC_FAILURE);
94             return NULL;
95         }
96         cms->d.envelopedData->version = 0;
97         cms->d.envelopedData->encryptedContentInfo->contentType =
98             OBJ_nid2obj(NID_pkcs7_data);
99         ASN1_OBJECT_free(cms->contentType);
100         cms->contentType = OBJ_nid2obj(NID_pkcs7_enveloped);
101         return cms->d.envelopedData;
102     }
103     return cms_get0_enveloped(cms);
104 }

106 STACK_OF(CMS_RecipientInfo) *CMS_get0_RecipientInfos(CMS_ContentInfo *cms)
107 {
108     CMS_EnvelopedData *env;
109     env = cms_get0_enveloped(cms);
110     if (!env)
111         return NULL;
112     return env->recipientInfos;
113 }

115 int CMS_RecipientInfo_type(CMS_RecipientInfo *ri)
116 {
117     return ri->type;
118 }

120 CMS_ContentInfo *CMS_EnvelopedData_create(const EVP_CIPHER *cipher)
121 {
122     CMS_ContentInfo *cms;
123     CMS_EnvelopedData *env;
124     cms = CMS_ContentInfo_new();
125     if (!cms)
126         goto merr;
127     env = cms_enveloped_data_init(cms);
```

```

185         if (flags & CMS_USE_KEYID)
186             {
187                 ktri->version = 2;
188                 type = CMS_RECIPINFO_KEYIDENTIFIER;
189             }
190         else
191             {
192                 ktri->version = 0;
193                 type = CMS_RECIPINFO_ISSUER_SERIAL;

```

[illegible]

```

260             X509_NAME **issuer, ASN1_INTEGER **sno)
261     {
262         CMS_KeyTransRecipientInfo *ktri;
263         if (ri->type != CMS_RECIPINFO_TRANS)
264         {
265             CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_GET0_SIGNER_ID,
266                  CMS_R_NOT_KEY_TRANSPORT);
267             return 0;
268         }
269         ktri = ri->d.ktri;

271         return cms_SignerIdentifier_get0_signer_id(ktri->rid,
272                                                    keyid, issuer, sno);
273     }

275 int CMS_RecipientInfo_ktri_cert_cmp(CMS_RecipientInfo *ri, X509 *cert)
276 {
277     if (ri->type != CMS_RECIPINFO_TRANS)
278     {
279         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_CERT_CMP,
280              CMS_R_NOT_KEY_TRANSPORT);
281         return -2;
282     }
283     return cms_SignerIdentifier_cert_cmp(ri->d.ktri->rid, cert);
284 }

286 int CMS_RecipientInfo_set0_pkey(CMS_RecipientInfo *ri, EVP_PKEY *pkey)
287 {
288     if (ri->type != CMS_RECIPINFO_TRANS)
289     {
290         CMSerr(CMS_F_CMS_RECIPIENTINFO_SET0_PKEY,
291              CMS_R_NOT_KEY_TRANSPORT);
292         return 0;
293     }
294     ri->d.ktri->pkey = pkey;
295     return 1;
296 }

298 /* Encrypt content key in key transport recipient info */

300 static int cms_RecipientInfo_ktri_encrypt(CMS_ContentInfo *cms,
301                                           CMS_RecipientInfo *ri)
302 {
303     CMS_KeyTransRecipientInfo *ktri;
304     CMS_EncryptedContentInfo *ec;
305     EVP_PKEY_CTX *pctx = NULL;
306     unsigned char *ek = NULL;
307     size_t eklen;

309     int ret = 0;

311     if (ri->type != CMS_RECIPINFO_TRANS)
312     {
313         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_ENCRYPT,
314              CMS_R_NOT_KEY_TRANSPORT);
315         return 0;
316     }
317     ktri = ri->d.ktri;
318     ec = cms->d.envelopedData->encryptedContentInfo;

320     pctx = EVP_PKEY_CTX_new(ktri->pkey, NULL);
321     if (!pctx)
322         return 0;

324     if (EVP_PKEY_encrypt_init(pctx) <= 0)
325         goto err;

```

```

327     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_ENCRYPT,
328                          EVP_PKEY_CTRL_CMS_ENCRYPT, 0, ri) <= 0)
329     {
330         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_ENCRYPT, CMS_R_CTRL_ERROR);
331         goto err;
332     }

334     if (EVP_PKEY_encrypt(pctx, NULL, &eklen, ec->key, ec->keylen) <= 0)
335         goto err;

337     ek = OPENSSL_malloc(eklen);

339     if (ek == NULL)
340     {
341         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_ENCRYPT,
342              ERR_R_MALLOC_FAILURE);
343         goto err;
344     }

346     if (EVP_PKEY_encrypt(pctx, ek, &eklen, ec->key, ec->keylen) <= 0)
347         goto err;

349     ASN1_STRING_set0(ktri->encryptedKey, ek, eklen);
350     ek = NULL;

352     ret = 1;

354     err:
355     if (pctx)
356         EVP_PKEY_CTX_free(pctx);
357     if (ek)
358         OPENSSL_free(ek);
359     return ret;

361 }

363 /* Decrypt content key from KTRI */

365 static int cms_RecipientInfo_ktri_decrypt(CMS_ContentInfo *cms,
366                                           CMS_RecipientInfo *ri)
367 {
368     CMS_KeyTransRecipientInfo *ktri = ri->d.ktri;
369     EVP_PKEY_CTX *pctx = NULL;
370     unsigned char *ek = NULL;
371     size_t eklen;
372     int ret = 0;
373     CMS_EncryptedContentInfo *ec;
374     ec = cms->d.envelopedData->encryptedContentInfo;

376     if (ktri->pkey == NULL)
377     {
378         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_DECRYPT,
379              CMS_R_NO_PRIVATE_KEY);
380         return 0;
381     }

383     pctx = EVP_PKEY_CTX_new(ktri->pkey, NULL);
384     if (!pctx)
385         return 0;

387     if (EVP_PKEY_decrypt_init(pctx) <= 0)
388         goto err;

390     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_DECRYPT,
391                          EVP_PKEY_CTRL_CMS_DECRYPT, 0, ri) <= 0)

```

```

392     {
393         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_DECRYPT, CMS_R_CTRL_ERROR);
394         goto err;
395     }

397     if (EVP_PKEY_decrypt(pctx, NULL, &eklen,
398                         ktri->encryptedKey->data,
399                         ktri->encryptedKey->length) <= 0)
400         goto err;

402     ek = OPENSSL_malloc(eklen);

404     if (ek == NULL)
405     {
406         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_DECRYPT,
407               ERR_R_MALLOC_FAILURE);
408         goto err;
409     }

411     if (EVP_PKEY_decrypt(pctx, ek, &eklen,
412                         ktri->encryptedKey->data,
413                         ktri->encryptedKey->length) <= 0)
414     {
415         CMSerr(CMS_F_CMS_RECIPIENTINFO_KTRI_DECRYPT, CMS_R_CMS_LIB);
416         goto err;
417     }

419     ret = 1;

421     if (ec->key)
422     {
423         OPENSSL_cleane(ec->key, ec->keylen);
424         OPENSSL_free(ec->key);
425     }

427     ec->key = ek;
428     ec->keylen = eklen;

430     err:
431     if (pctx)
432         EVP_PKEY_CTX_free(pctx);
433     if (!ret && ek)
434         OPENSSL_free(ek);

436     return ret;
437 }

439 /* Key Encrypted Key (KEK) RecipientInfo routines */

441 int CMS_RecipientInfo_kekri_id_cmp(CMS_RecipientInfo *ri,
442                                   const unsigned char *id, size_t idlen)
443 {
444     ASN1_OCTET_STRING tmp_os;
445     CMS_KEKRecipientInfo *kekri;
446     if (ri->type != CMS_RECIPINFO_KEK)
447     {
448         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_ID_CMP, CMS_R_NOT_KEK);
449         return -2;
450     }
451     kekri = ri->d.kekri;
452     tmp_os.type = V_ASN1_OCTET_STRING;
453     tmp_os.flags = 0;
454     tmp_os.data = (unsigned char *)id;
455     tmp_os.length = (int)idlen;
456     return ASN1_OCTET_STRING_cmp(&tmp_os, kekri->kekid->keyIdentifier);
457 }

```

```

459 /* For now hard code AES key wrap info */

461 static size_t aes_wrap_keylen(int nid)
462 {
463     switch (nid)
464     {
465         case NID_id_aes128_wrap:
466             return 16;

468         case NID_id_aes192_wrap:
469             return 24;

471         case NID_id_aes256_wrap:
472             return 32;

474         default:
475             return 0;
476     }
477 }

479 CMS_RecipientInfo *CMS_add0_recipient_key(CMS_ContentInfo *cms, int nid,
480                                           unsigned char *key, size_t keylen,
481                                           unsigned char *id, size_t idlen,
482                                           ASN1_GENERALIZEDTIME *date,
483                                           ASN1_OBJECT *otherTypeId,
484                                           ASN1_TYPE *otherType)
485 {
486     CMS_RecipientInfo *ri = NULL;
487     CMS_EnvelopedData *env;
488     CMS_KEKRecipientInfo *kekri;
489     env = cms_get0_enveloped(cms);
490     if (!env)
491         goto err;

493     if (nid == NID_undef)
494     {
495         switch (keylen)
496         {
497             case 16:
498                 nid = NID_id_aes128_wrap;
499                 break;

501             case 24:
502                 nid = NID_id_aes192_wrap;
503                 break;

505             case 32:
506                 nid = NID_id_aes256_wrap;
507                 break;

509             default:
510                 CMSerr(CMS_F_CMS_ADD0_RECIPIENT_KEY,
511                       CMS_R_INVALID_KEY_LENGTH);
512                 goto err;
513         }

515     }
516     else
517     {
519         size_t exp_keylen = aes_wrap_keylen(nid);

521         if (!exp_keylen)
522         {
523             CMSerr(CMS_F_CMS_ADD0_RECIPIENT_KEY,

```



```

524         CMS_R_UNSUPPORTED_KEY_ALGORITHM);
525     goto err;
526 }
527
528     if (keylen != exp_keylen)
529     {
530         CMSerr(CMS_F_CMS_ADD0_RECIPIENT_KEY,
531             CMS_R_INVALID_KEY_LENGTH);
532         goto err;
533     }
534
535 }
536
537 /* Initialize recipient info */
538 ri = M_ASN1_new_of(CMS_RecipientInfo);
539 if (!ri)
540     goto merr;
541
542 ri->d.kekri = M_ASN1_new_of(CMS_KEKRecipientInfo);
543 if (!ri->d.kekri)
544     goto merr;
545 ri->type = CMS_RECIPINFO_KEK;
546
547 kekri = ri->d.kekri;
548
549 if (otherTypeId)
550 {
551     kekri->kekid->other = M_ASN1_new_of(CMS_OtherKeyAttribute);
552     if (kekri->kekid->other == NULL)
553         goto merr;
554 }
555
556 if (!sk_CMS_RecipientInfo_push(env->recipientInfos, ri))
557     goto merr;
558
559 /* After this point no calls can fail */
560
561 kekri->version = 4;
562
563 kekri->key = key;
564 kekri->keylen = keylen;
565
566 ASN1_STRING_set0(kekri->kekid->keyIdentifier, id, idlen);
567
568 kekri->kekid->date = date;
569
570 if (kekri->kekid->other)
571 {
572     kekri->kekid->other->keyAttrId = otherTypeId;
573     kekri->kekid->other->keyAttr = otherType;
574 }
575
576 X509_ALGOR_set0(kekri->keyEncryptionAlgorithm,
577     OBJ_nid2obj(nid), V_ASN1_UNDEF, NULL);
578
579 return ri;
580
581 merr:
582 CMSerr(CMS_F_CMS_ADD0_RECIPIENT_KEY, ERR_R_MALLOC_FAILURE);
583 err:
584 if (ri)
585     M_ASN1_free_of(ri, CMS_RecipientInfo);
586 return NULL;
587
588 }

```

```

591 int CMS_RecipientInfo_kekri_get0_id(CMS_RecipientInfo *ri,
592     X509_ALGOR **palg,
593     ASN1_OCTET_STRING **pid,
594     ASN1_GENERALIZEDTIME **pdate,
595     ASN1_OBJECT **pothrid,
596     ASN1_TYPE **pothertype)
597 {
598     CMS_KEKIdentifier *rkid;
599     if (ri->type != CMS_RECIPINFO_KEK)
600     {
601         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_GET0_ID, CMS_R_NOT_KEK);
602         return 0;
603     }
604     rkid = ri->d.kekri->kekid;
605     if (palg)
606         *palg = ri->d.kekri->keyEncryptionAlgorithm;
607     if (pid)
608         *pid = rkid->keyIdentifier;
609     if (pdate)
610         *pdate = rkid->date;
611     if (pothrid)
612     {
613         if (rkid->other)
614             *pothrid = rkid->other->keyAttrId;
615         else
616             *pothrid = NULL;
617     }
618     if (pothertype)
619     {
620         if (rkid->other)
621             *pothertype = rkid->other->keyAttr;
622         else
623             *pothertype = NULL;
624     }
625     return 1;
626 }
627
628 int CMS_RecipientInfo_set0_key(CMS_RecipientInfo *ri,
629     unsigned char *key, size_t keylen)
630 {
631     CMS_KEKRecipientInfo *kekri;
632     if (ri->type != CMS_RECIPINFO_KEK)
633     {
634         CMSerr(CMS_F_CMS_RECIPIENTINFO_SET0_KEY, CMS_R_NOT_KEK);
635         return 0;
636     }
637
638     kekri = ri->d.kekri;
639     kekri->key = key;
640     kekri->keylen = keylen;
641     return 1;
642 }
643
644 /* Encrypt content key in KEK recipient info */
645
646 static int cms_RecipientInfo_kekri_encrypt(CMS_ContentInfo *cms,
647     CMS_RecipientInfo *ri)
648 {
649     CMS_EncryptedContentInfo *ec;
650     CMS_KEKRecipientInfo *kekri;
651     AES_KEY actx;
652     unsigned char *wkey = NULL;
653     int wkeylen;
654     int r = 0;
655 }

```

```

657     ec = cms->d.envelopedData->encryptedContentInfo;
659     kekri = ri->d.kekri;

661     if (!kekri->key)
662     {
663         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_ENCRYPT, CMS_R_NO_KEY);
664         return 0;
665     }

667     if (AES_set_encrypt_key(kekri->key, kekri->keylen << 3, &actx))
668     {
669         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_ENCRYPT,
670               CMS_R_ERROR_SETTING_KEY);
671         goto err;
672     }

674     wkey = OPENSSL_malloc(ec->keylen + 8);

676     if (!wkey)
677     {
678         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_ENCRYPT,
679               ERR_R_MALLOC_FAILURE);
680         goto err;
681     }

683     wkeylen = AES_wrap_key(&actx, NULL, wkey, ec->key, ec->keylen);

685     if (wkeylen <= 0)
686     {
687         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_ENCRYPT, CMS_R_WRAP_ERROR);
688         goto err;
689     }

691     ASN1_STRING_set0(kekri->encryptedKey, wkey, wkeylen);

693     r = 1;

695     err:

697     if (!r && wkey)
698         OPENSSL_free(wkey);
699     OPENSSL_cleanse(&actx, sizeof(actx));

701     return r;
703 }

705 /* Decrypt content key in KEK recipient info */
707 static int cms_RecipientInfo_kekri_decrypt(CMS_ContentInfo *cms,
708                                           CMS_RecipientInfo *ri)
709 {
710     CMS_EncryptedContentInfo *ec;
711     CMS_KEKRecipientInfo *kekri;
712     AES_KEY actx;
713     unsigned char *ukey = NULL;
714     int ukeylen;
715     int r = 0, wrap_nid;

717     ec = cms->d.envelopedData->encryptedContentInfo;

719     kekri = ri->d.kekri;

721     if (!kekri->key)

```

```

722     {
723         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_DECRYPT, CMS_R_NO_KEY);
724         return 0;
725     }

727     wrap_nid = OBJ_obj2nid(kekri->keyEncryptionAlgorithm->algorithm);
728     if (aes_wrap_keylen(wrap_nid) != kekri->keylen)
729     {
730         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_DECRYPT,
731               CMS_R_INVALID_KEY_LENGTH);
732         return 0;
733     }

735     /* If encrypted key length is invalid don't bother */

737     if (kekri->encryptedKey->length < 16)
738     {
739         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_DECRYPT,
740               CMS_R_INVALID_ENCRYPTED_KEY_LENGTH);
741         goto err;
742     }

744     if (AES_set_decrypt_key(kekri->key, kekri->keylen << 3, &actx))
745     {
746         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_DECRYPT,
747               CMS_R_ERROR_SETTING_KEY);
748         goto err;
749     }

751     ukey = OPENSSL_malloc(kekri->encryptedKey->length - 8);

753     if (!ukey)
754     {
755         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_DECRYPT,
756               ERR_R_MALLOC_FAILURE);
757         goto err;
758     }

760     ukeylen = AES_unwrap_key(&actx, NULL, ukey,
761                             kekri->encryptedKey->data,
762                             kekri->encryptedKey->length);

764     if (ukeylen <= 0)
765     {
766         CMSerr(CMS_F_CMS_RECIPIENTINFO_KEKRI_DECRYPT,
767               CMS_R_UNWRAP_ERROR);
768         goto err;
769     }

771     ec->key = ukey;
772     ec->keylen = ukeylen;

774     r = 1;

776     err:

778     if (!r && ukey)
779         OPENSSL_free(ukey);
780     OPENSSL_cleanse(&actx, sizeof(actx));

782     return r;
784 }

786 int CMS_RecipientInfo_decrypt(CMS_ContentInfo *cms, CMS_RecipientInfo *ri)
787 {

```

```

788     switch(ri->type)
789     {
790         case CMS_RECIPINFO_TRANS:
791             return cms_RecipientInfo_ktri_decrypt(cms, ri);

793         case CMS_RECIPINFO_KEY:
794             return cms_RecipientInfo_kekri_decrypt(cms, ri);

796         case CMS_RECIPINFO_PASS:
797             return cms_RecipientInfo_pwri_crypt(cms, ri, 0);

799         default:
800             CMSerr(CMS_F_CMS_RECIPIENTINFO_DECRYPT,
801                  CMS_R_UNSUPPORTED_RECIPIENTINFO_TYPE);
802             return 0;
803     }
804 }

806 BIO *cms_EnvelopedData_init_bio(CMS_ContentInfo *cms)
807 {
808     CMS_EncryptedContentInfo *ec;
809     STACK_OF(CMS_RecipientInfo) *rinfos;
810     CMS_RecipientInfo *ri;
811     int i, r, ok = 0;
812     BIO *ret;

814     /* Get BIO first to set up key */

816     ec = cms->d.envelopedData->encryptedContentInfo;
817     ret = cms_EncryptedContent_init_bio(ec);

819     /* If error or no cipher end of processing */

821     if (!ret || !ec->cipher)
822         return ret;

824     /* Now encrypt content key according to each RecipientInfo type */

826     rinfos = cms->d.envelopedData->recipientInfos;

828     for (i = 0; i < sk_CMS_RecipientInfo_num(rinfos); i++)
829     {
830         ri = sk_CMS_RecipientInfo_value(rinfos, i);

832         switch (ri->type)
833         {
834             case CMS_RECIPINFO_TRANS:
835                 r = cms_RecipientInfo_ktri_encrypt(cms, ri);
836                 break;

838             case CMS_RECIPINFO_KEY:
839                 r = cms_RecipientInfo_kekri_encrypt(cms, ri);
840                 break;

842             case CMS_RECIPINFO_PASS:
843                 r = cms_RecipientInfo_pwri_crypt(cms, ri, 1);
844                 break;

846             default:
847                 CMSerr(CMS_F_CMS_ENVELOPEDDATA_INIT_BIO,
848                      CMS_R_UNSUPPORTED_RECIPIENT_TYPE);
849                 goto err;
850         }

852         if (r <= 0)
853         {

```

```

854             CMSerr(CMS_F_CMS_ENVELOPEDDATA_INIT_BIO,
855                  CMS_R_ERROR_SETTING_RECIPIENTINFO);
856             goto err;
857         }
858     }

860     ok = 1;

862     err:
863     ec->cipher = NULL;
864     if (ec->key)
865     {
866         OPENSSL_cleanse(ec->key, ec->keylen);
867         OPENSSL_free(ec->key);
868         ec->key = NULL;
869         ec->keylen = 0;
870     }

871     if (ok)
872         return ret;
873     BIO_free(ret);
874     return NULL;

876 }

```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_err.c

1

```
*****
13890 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_err.c */
2 /* =====
3  * Copyright (c) 1999-2009 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
24  * prior written permission. For written permission, please contact
25  * openssl-core@OpenSSL.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
32  * acknowledgment:
33  * "This product includes software developed by the OpenSSL Project
34  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/cms.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_CMS,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_CMS,0,reason)

71 static ERR_STRING_DATA CMS_str_functs[]=
72 {
73 {ERR_FUNC(CMS_F_CHECK_CONTENT), "CHECK_CONTENT"},
74 {ERR_FUNC(CMS_F_CMS_ADD0_CERT), "CMS_add0_cert"},
75 {ERR_FUNC(CMS_F_CMS_ADD0_RECIPIENT_KEY), "CMS_add0_recipient_key"},
76 {ERR_FUNC(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD), "CMS_add0_recipient_password"},
77 {ERR_FUNC(CMS_F_CMS_ADD1_RECEIPTREQUEST), "CMS_add1_receiptrequest"},
78 {ERR_FUNC(CMS_F_CMS_ADD1_RECIPIENT_CERT), "CMS_add1_recipient_cert"},
79 {ERR_FUNC(CMS_F_CMS_ADD1_SIGNER), "CMS_add1_signer"},
80 {ERR_FUNC(CMS_F_CMS_ADD1_SIGNINGTIME), "CMS_ADD1_SIGNINGTIME"},
81 {ERR_FUNC(CMS_F_CMS_COMPRESS), "CMS_compress"},
82 {ERR_FUNC(CMS_F_CMS_COMPRESSEDData_CREATE), "cms_CompressedData_create"},
83 {ERR_FUNC(CMS_F_CMS_COMPRESSEDData_INIT_BIO), "cms_CompressedData_init_bio"},
84 {ERR_FUNC(CMS_F_CMS_COPY_CONTENT), "CMS_COPY_CONTENT"},
85 {ERR_FUNC(CMS_F_CMS_COPY_MESSAGEDIGEST), "CMS_COPY_MESSAGEDIGEST"},
86 {ERR_FUNC(CMS_F_CMS_DATA), "CMS_data"},
87 {ERR_FUNC(CMS_F_CMS_DATAFINAL), "CMS_dataFinal"},
88 {ERR_FUNC(CMS_F_CMS_DATAINIT), "CMS_dataInit"},
89 {ERR_FUNC(CMS_F_CMS_DECRYPT), "CMS_decrypt"},
90 {ERR_FUNC(CMS_F_CMS_DECRYPT_SET1_KEY), "CMS_decrypt_set1_key"},
91 {ERR_FUNC(CMS_F_CMS_DECRYPT_SET1_PASSWORD), "CMS_decrypt_set1_password"},
92 {ERR_FUNC(CMS_F_CMS_DECRYPT_SET1_PKEY), "CMS_decrypt_set1_pkey"},
93 {ERR_FUNC(CMS_F_CMS_DIGESTALGORITHM_FIND_CTX), "cms_DigestAlgorithm_find_ctx"},
94 {ERR_FUNC(CMS_F_CMS_DIGESTALGORITHM_INIT_BIO), "cms_DigestAlgorithm_init_bio"},
95 {ERR_FUNC(CMS_F_CMS_DIGESTEDData_DO_FINAL), "cms_DigestedData_do_final"},
96 {ERR_FUNC(CMS_F_CMS_DIGEST_VERIFY), "CMS_digest_verify"},
97 {ERR_FUNC(CMS_F_CMS_ENCODE_RECEIPT), "cms_encode_receipt"},
98 {ERR_FUNC(CMS_F_CMS_ENCRYPT), "CMS_encrypt"},
99 {ERR_FUNC(CMS_F_CMS_ENCRYPTEDCONTENT_INIT_BIO), "cms_EncryptedContent_init_bio"},
100 {ERR_FUNC(CMS_F_CMS_ENCRYPTEDData_DECRYPT), "CMS_EncryptedData_decrypt"},
101 {ERR_FUNC(CMS_F_CMS_ENCRYPTEDData_ENCRYPT), "CMS_EncryptedData_encrypt"},
102 {ERR_FUNC(CMS_F_CMS_ENCRYPTEDData_SET1_KEY), "CMS_EncryptedData_set1_key"},
103 {ERR_FUNC(CMS_F_CMS_ENVELOPEDData_CREATE), "CMS_EnvelopedData_create"},
104 {ERR_FUNC(CMS_F_CMS_ENVELOPEDData_INIT_BIO), "cms_EnvelopedData_init_bio"},
105 {ERR_FUNC(CMS_F_CMS_ENVELOPEDData_INIT), "CMS_ENVELOPED_DATA_INIT"},
106 {ERR_FUNC(CMS_F_CMS_FINAL), "CMS_final"},
107 {ERR_FUNC(CMS_F_CMS_GET0_CERTIFICATE_CHOICES), "CMS_GET0_CERTIFICATE_CHOICES"},
108 {ERR_FUNC(CMS_F_CMS_GET0_CONTENT), "CMS_get0_content"},
109 {ERR_FUNC(CMS_F_CMS_GET0_ECONTENT_TYPE), "CMS_GET0_ECONTENT_TYPE"},
110 {ERR_FUNC(CMS_F_CMS_GET0_ENVELOPED), "cms_get0_enveloped"},
111 {ERR_FUNC(CMS_F_CMS_GET0_REVOCATION_CHOICES), "CMS_GET0_REVOCATION_CHOICES"},
112 {ERR_FUNC(CMS_F_CMS_GET0_SIGNED), "CMS_GET0_SIGNED"},
113 {ERR_FUNC(CMS_F_CMS_MSGSIGDIGEST_ADD1), "cms_msgSigDigest_add1"},
114 {ERR_FUNC(CMS_F_CMS_RECEIPTREQUEST_CREATE0), "CMS_ReceiptRequest_create0"},
115 {ERR_FUNC(CMS_F_CMS_RECEIPT_VERIFY), "cms_receipt_verify"},
116 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_DECRYPT), "CMS_RecipientInfo_decrypt"},
117 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KEKRI_DECRYPT), "CMS_RECIPIENTINFO_KEKRI"},
118 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KEKRI_ENCRYPT), "CMS_RECIPIENTINFO_KEKRI"},
119 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KEKRI_GET0_ID), "CMS_RecipientInfo_kekri"},
120 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KEKRI_ID_CMP), "CMS_RecipientInfo_kekri"},
121 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KTRI_CERT_CMP), "CMS_RecipientInfo_ktri"},
122 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KTRI_DECRYPT), "CMS_RECIPIENTINFO_KTRI"},
123 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KTRI_ENCRYPT), "CMS_RECIPIENTINFO_KTRI"},
124 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KTRI_GET0_ALGS), "CMS_RecipientInfo_ktri"},
125 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_KTRI_GET0_SIGNER_ID), "CMS_RecipientInfo_ktri"},
126 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT), "cms_RecipientInfo_pwri_crypt"},
127 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_SET0_KEY), "CMS_RecipientInfo_set0_key"},
}
```

```

128 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_SET0_PASSWORD), "CMS_RecipientInfo_set0"},
129 {ERR_FUNC(CMS_F_CMS_RECIPIENTINFO_SET0_PKEY), "CMS_RecipientInfo_set0_pkey"},
130 {ERR_FUNC(CMS_F_CMS_SET1_SIGNERIDENTIFIER), "cms_set1_SignerIdentifier"},
131 {ERR_FUNC(CMS_F_CMS_SET_DETACHED), "CMS_set_detached"},
132 {ERR_FUNC(CMS_F_CMS_SIGN), "CMS_sign"},
133 {ERR_FUNC(CMS_F_CMS_SIGNED_DATA_INIT), "CMS_SIGNED_DATA_INIT"},
134 {ERR_FUNC(CMS_F_CMS_SIGNERINFO_CONTENT_SIGN), "CMS_SIGNERINFO_CONTENT_SIGN"},
135 {ERR_FUNC(CMS_F_CMS_SIGNERINFO_SIGN), "CMS_SignerInfo_sign"},
136 {ERR_FUNC(CMS_F_CMS_SIGNERINFO_VERIFY), "CMS_SignerInfo_verify"},
137 {ERR_FUNC(CMS_F_CMS_SIGNERINFO_VERIFY_CERT), "CMS_SIGNERINFO_VERIFY_CERT"},
138 {ERR_FUNC(CMS_F_CMS_SIGNERINFO_VERIFY_CONTENT), "CMS_SignerInfo_verify_content"},
139 {ERR_FUNC(CMS_F_CMS_SIGN_RECEIPT), "CMS_sign_receipt"},
140 {ERR_FUNC(CMS_F_CMS_STREAM), "CMS_stream"},
141 {ERR_FUNC(CMS_F_CMS_UNCOMPRESS), "CMS_uncompress"},
142 {ERR_FUNC(CMS_F_CMS_VERIFY), "CMS_verify"},
143 {0, NULL}
144 };

```

```

146 static ERR_STRING_DATA CMS_str_reasons[] =
147 {
148 {ERR_REASON(CMS_R_ADD_SIGNER_ERROR), "add signer error"},
149 {ERR_REASON(CMS_R_CERTIFICATE_ALREADY_PRESENT), "certificate already present"},
150 {ERR_REASON(CMS_R_CERTIFICATE_HAS_NO_KEYID), "certificate has no keyid"},
151 {ERR_REASON(CMS_R_CERTIFICATE_VERIFY_ERROR), "certificate verify error"},
152 {ERR_REASON(CMS_R_CIPHER_INITIALISATION_ERROR), "cipher initialisation error"},
153 {ERR_REASON(CMS_R_CIPHER_PARAMETER_INITIALISATION_ERROR), "cipher parameter initi"},
154 {ERR_REASON(CMS_R_CMS_DATAFINAL_ERROR), "cms datafinal error"},
155 {ERR_REASON(CMS_R_CMS_LIB), "cms lib"},
156 {ERR_REASON(CMS_R_CONTENTIDENTIFIER_MISMATCH), "contentidentifier mismatch"},
157 {ERR_REASON(CMS_R_CONTENT_NOT_FOUND), "content not found"},
158 {ERR_REASON(CMS_R_CONTENT_TYPE_MISMATCH), "content type mismatch"},
159 {ERR_REASON(CMS_R_CONTENT_TYPE_NOT_COMPRESSED_DATA), "content type not compressed"},
160 {ERR_REASON(CMS_R_CONTENT_TYPE_NOT_ENVELOPED_DATA), "content type not enveloped d"},
161 {ERR_REASON(CMS_R_CONTENT_TYPE_NOT_SIGNED_DATA), "content type not signed data"},
162 {ERR_REASON(CMS_R_CONTENT_VERIFY_ERROR), "content verify error"},
163 {ERR_REASON(CMS_R_CTRL_ERROR), "ctrl error"},
164 {ERR_REASON(CMS_R_CTRL_FAILURE), "ctrl failure"},
165 {ERR_REASON(CMS_R_DECRYPT_ERROR), "decrypt error"},
166 {ERR_REASON(CMS_R_DIGEST_ERROR), "digest error"},
167 {ERR_REASON(CMS_R_ERROR_GETTING_PUBLIC_KEY), "error getting public key"},
168 {ERR_REASON(CMS_R_ERROR_READING_MESSAGEDIGEST_ATTRIBUTE), "error reading messaged"},
169 {ERR_REASON(CMS_R_ERROR_SETTING_KEY), "error setting key"},
170 {ERR_REASON(CMS_R_ERROR_SETTING_RECIPIENTINFO), "error setting recipientinfo"},
171 {ERR_REASON(CMS_R_INVALID_ENCRYPTED_KEY_LENGTH), "invalid encrypted key length"},
172 {ERR_REASON(CMS_R_INVALID_KEY_ENCRYPTION_PARAMETER), "invalid key encryption para"},
173 {ERR_REASON(CMS_R_INVALID_KEY_LENGTH), "invalid key length"},
174 {ERR_REASON(CMS_R_MD_BIO_INIT_ERROR), "md bio init error"},
175 {ERR_REASON(CMS_R_MESSAGEDIGEST_ATTRIBUTE_WRONG_LENGTH), "messagedigest attribute"},
176 {ERR_REASON(CMS_R_MESSAGEDIGEST_WRONG_LENGTH), "messagedigest wrong length"},
177 {ERR_REASON(CMS_R_MSGSIGDIGEST_ERROR), "msgsigdigest error"},
178 {ERR_REASON(CMS_R_MSGSIGDIGEST_VERIFICATION_FAILURE), "msgsigdigest verification"},
179 {ERR_REASON(CMS_R_MSGSIGDIGEST_WRONG_LENGTH), "msgsigdigest wrong length"},
180 {ERR_REASON(CMS_R_NEED_ONE_SIGNER), "need one signer"},
181 {ERR_REASON(CMS_R_NOT_A_SIGNED_RECEIPT), "not a signed receipt"},
182 {ERR_REASON(CMS_R_NOT_ENCRYPTED_DATA), "not encrypted data"},
183 {ERR_REASON(CMS_R_NOT_KEY), "not kek"},
184 {ERR_REASON(CMS_R_NOT_KEY_TRANSPORT), "not key transport"},
185 {ERR_REASON(CMS_R_NOT_PWRI), "not pwri"},
186 {ERR_REASON(CMS_R_NOT_SUPPORTED_FOR_THIS_KEY_TYPE), "not supported for this key t"},
187 {ERR_REASON(CMS_R_NO_CIPHER), "no cipher"},
188 {ERR_REASON(CMS_R_NO_CONTENT), "no content"},
189 {ERR_REASON(CMS_R_NO_CONTENT_TYPE), "no content type"},
190 {ERR_REASON(CMS_R_NO_DEFAULT_DIGEST), "no default digest"},
191 {ERR_REASON(CMS_R_NO_DIGEST_SET), "no digest set"},
192 {ERR_REASON(CMS_R_NO_KEY), "no key"},
193 {ERR_REASON(CMS_R_NO_KEY_OR_CERT), "no key or cert"},

```

```

194 {ERR_REASON(CMS_R_NO_MATCHING_DIGEST), "no matching digest"},
195 {ERR_REASON(CMS_R_NO_MATCHING_RECIPIENT), "no matching recipient"},
196 {ERR_REASON(CMS_R_NO_MATCHING_SIGNATURE), "no matching signature"},
197 {ERR_REASON(CMS_R_NO_MSGSIGDIGEST), "no msgsigdigest"},
198 {ERR_REASON(CMS_R_NO_PASSWORD), "no password"},
199 {ERR_REASON(CMS_R_NO_PRIVATE_KEY), "no private key"},
200 {ERR_REASON(CMS_R_NO_PUBLIC_KEY), "no public key"},
201 {ERR_REASON(CMS_R_NO_RECEIPT_REQUEST), "no receipt request"},
202 {ERR_REASON(CMS_R_NO_SIGNERS), "no signers"},
203 {ERR_REASON(CMS_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE), "private key does not"},
204 {ERR_REASON(CMS_R_RECEIPT_DECODE_ERROR), "receipt decode error"},
205 {ERR_REASON(CMS_R_RECIPIENT_ERROR), "recipient error"},
206 {ERR_REASON(CMS_R_SIGNER_CERTIFICATE_NOT_FOUND), "signer certificate not found"},
207 {ERR_REASON(CMS_R_SIGNFINAL_ERROR), "signfinal error"},
208 {ERR_REASON(CMS_R_SMIME_TEXT_ERROR), "smime text error"},
209 {ERR_REASON(CMS_R_STORE_INIT_ERROR), "store init error"},
210 {ERR_REASON(CMS_R_TYPE_NOT_COMPRESSED_DATA), "type not compressed data"},
211 {ERR_REASON(CMS_R_TYPE_NOT_DATA), "type not data"},
212 {ERR_REASON(CMS_R_TYPE_NOT_DIGESTED_DATA), "type not digested data"},
213 {ERR_REASON(CMS_R_TYPE_NOT_ENCRYPTED_DATA), "type not encrypted data"},
214 {ERR_REASON(CMS_R_TYPE_NOT_ENVELOPED_DATA), "type not enveloped data"},
215 {ERR_REASON(CMS_R_UNABLE_TO_FINALIZE_CONTEXT), "unable to finalize context"},
216 {ERR_REASON(CMS_R_UNKNOWN_CIPHER), "unknown cipher"},
217 {ERR_REASON(CMS_R_UNKNOWN_DIGEST_ALGORITHM), "unknown digest algorithm"},
218 {ERR_REASON(CMS_R_UNKNOWN_ID), "unknown id"},
219 {ERR_REASON(CMS_R_UNSUPPORTED_COMPRESSION_ALGORITHM), "unsupported compression al"},
220 {ERR_REASON(CMS_R_UNSUPPORTED_CONTENT_TYPE), "unsupported content type"},
221 {ERR_REASON(CMS_R_UNSUPPORTED_KEY_ALGORITHM), "unsupported kek algorithm"},
222 {ERR_REASON(CMS_R_UNSUPPORTED_KEY_ENCRYPTION_ALGORITHM), "unsupported key encrypt"},
223 {ERR_REASON(CMS_R_UNSUPPORTED_RECIPIENT_TYPE), "unsupported recipient type"},
224 {ERR_REASON(CMS_R_UNSUPPORTED_RECIPIENTINFO_TYPE), "unsupported recipientinfo type"},
225 {ERR_REASON(CMS_R_UNSUPPORTED_TYPE), "unsupported type"},
226 {ERR_REASON(CMS_R_UNWRAP_ERROR), "unwrap error"},
227 {ERR_REASON(CMS_R_UNWRAP_FAILURE), "unwrap failure"},
228 {ERR_REASON(CMS_R_VERIFICATION_FAILURE), "verification failure"},
229 {ERR_REASON(CMS_R_WRAP_ERROR), "wrap error"},
230 {0, NULL}
231 };

```

```
233 #endif
```

```
235 void ERR_load_CMS_strings(void)
```

```
236 {
237 #ifndef OPENSSL_NO_ERR
```

```

239     if (ERR_func_error_string(CMS_str_funcs[0].error) == NULL)
240     {
241         ERR_load_strings(0, CMS_str_funcs);
242         ERR_load_strings(0, CMS_str_reasons);
243     }
244 #endif
245 }

```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_ess.c

1

```
*****
10443 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_ess.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_ess.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 */

54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/pem.h>
57 #include <openssl/rand.h>
58 #include <openssl/x509v3.h>
59 #include <openssl/err.h>
60 #include <openssl/cms.h>
61 #include "cms_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_ess.c

2

```
63 DECLARE_ASN1_ITEM(CMS_ReceiptRequest)
64 DECLARE_ASN1_ITEM(CMS_Receipt)

66 IMPLEMENT_ASN1_FUNCTIONS(CMS_ReceiptRequest)

68 /* ESS services: for now just Signed Receipt related */

70 int CMS_get1_ReceiptRequest(CMS_SignerInfo *si, CMS_ReceiptRequest **prr)
71 {
72     ASN1_STRING *str;
73     CMS_ReceiptRequest *rr = NULL;
74     if (prr)
75         *prr = NULL;
76     str = CMS_signed_get0_data_by_OBJ(si,
77                                         OBJ_nid2obj(NID_id_smime_aa_receiptRequest),
78                                         -3, V_ASN1_SEQUENCE);
79     if (!str)
80         return 0;
81
82     rr = ASN1_item_unpack(str, ASN1_ITEM_rptr(CMS_ReceiptRequest));
83     if (!rr)
84         return -1;
85     if (prr)
86         *prr = rr;
87     else
88         CMS_ReceiptRequest_free(rr);
89     return 1;
90 }

92 CMS_ReceiptRequest *CMS_ReceiptRequest_create0(unsigned char *id, int idlen,
93                                                  int allorfirst,
94                                                  STACK_OF(GENERAL_NAMES) *receiptList,
95                                                  STACK_OF(GENERAL_NAMES) *receiptsTo)
96 {
97     CMS_ReceiptRequest *rr = NULL;
98
99     rr = CMS_ReceiptRequest_new();
100     if (!rr)
101         goto merr;
102     if (id)
103         ASN1_STRING_set0(rr->signedContentIdentifier, id, idlen);
104     else
105     {
106         if (!ASN1_STRING_set(rr->signedContentIdentifier, NULL, 32))
107             goto merr;
108         if (RAND_pseudo_bytes(rr->signedContentIdentifier->data, 32)
109             <= 0)
110             goto err;
111     }
112
113     sk_GENERAL_NAMES_pop_free(rr->receiptsTo, GENERAL_NAMES_free);
114     rr->receiptsTo = receiptList;
115
116     if (receiptList)
117     {
118         rr->receiptsFrom->type = 1;
119         rr->receiptsFrom->d.receiptList = receiptList;
120     }
121     else
122     {
123         rr->receiptsFrom->type = 0;
124         rr->receiptsFrom->d.allOrFirstTier = allorfirst;
125     }
126
127     return rr;
```

```

129     merr:
130     CMSerr(CMS_F_CMS_RECEIPTREQUEST_CREATE0, ERR_R_MALLOC_FAILURE);

132     err:
133     if (rr)
134         CMS_ReceiptRequest_free(rr);

136     return NULL;
137 }
138

140 int CMS_add1_ReceiptRequest(CMS_SignerInfo *si, CMS_ReceiptRequest *rr)
141 {
142     unsigned char *rrder = NULL;
143     int rrderlen, r = 0;

145     rrderlen = i2d_CMS_ReceiptRequest(rr, &rrder);
146     if (rrderlen < 0)
147         goto merr;

149     if (!CMS_signed_add1_attr_by_NID(si, NID_id_smime_aa_receiptRequest,
150                                     V_ASN1_SEQUENCE, rrder, rrderlen))
151         goto merr;

153     r = 1;

155     merr:
156     if (!r)
157         CMSerr(CMS_F_CMS_ADD1_RECEIPTREQUEST, ERR_R_MALLOC_FAILURE);

159     if (rrder)
160         OPENSSL_free(rrder);

162     return r;
163 }
164

166 void CMS_ReceiptRequest_get0_values(CMS_ReceiptRequest *rr,
167                                     ASN1_STRING **pcid,
168                                     int *pallorfirst,
169                                     STACK_OF(GENERAL_NAMES) **plist,
170                                     STACK_OF(GENERAL_NAMES) **prto)
171 {
172     if (pcid)
173         *pcid = rr->signedContentIdentifier;
174     if (rr->receiptsFrom->type == 0)
175     {
176         if (pallorfirst)
177             *pallorfirst = (int)rr->receiptsFrom->d.allOrFirstTier;
178         if (plist)
179             *plist = NULL;
180     }
181     else
182     {
183         if (pallorfirst)
184             *pallorfirst = -1;
185         if (plist)
186             *plist = rr->receiptsFrom->d.receiptList;
187     }
188     if (prto)
189         *prto = rr->receiptsTo;
190 }

192 /* Digest a SignerInfo structure for msgSigDigest attribute processing */

```

```

194 static int cms_msgSigDigest(CMS_SignerInfo *si,
195                             unsigned char *dig, unsigned int *diglen)
196 {
197     const EVP_MD *md;
198     md = EVP_get_digestbyobj(si->digestAlgorithm->algorithm);
199     if (md == NULL)
200         return 0;
201     if (!ASN1_item_digest(ASN1_ITEM_rptr(CMS_Attributes_Verify), md,
202                           si->signedAttrs, dig, diglen))
203         return 0;
204     return 1;
205 }

207 /* Add a msgSigDigest attribute to a SignerInfo */

209 int cms_msgSigDigest_add1(CMS_SignerInfo *dest, CMS_SignerInfo *src)
210 {
211     unsigned char dig[EVP_MAX_MD_SIZE];
212     unsigned int diglen;
213     if (!cms_msgSigDigest(src, dig, &diglen))
214     {
215         CMSerr(CMS_F_CMS_MSGSIGDIGEST_ADD1, CMS_R_MSGSIGDIGEST_ERROR);
216         return 0;
217     }
218     if (!CMS_signed_add1_attr_by_NID(dest, NID_id_smime_aa_msgSigDigest,
219                                     V_ASN1_OCTET_STRING, dig, diglen))
220     {
221         CMSerr(CMS_F_CMS_MSGSIGDIGEST_ADD1, ERR_R_MALLOC_FAILURE);
222         return 0;
223     }
224     return 1;
225 }

227 /* Verify signed receipt after it has already passed normal CMS verify */

229 int cms_Receipt_verify(CMS_ContentInfo *cms, CMS_ContentInfo *req_cms)
230 {
231     int r = 0, i;
232     CMS_ReceiptRequest *rr = NULL;
233     CMS_Receipt *rct = NULL;
234     STACK_OF(CMS_SignerInfo) *sis, *osis;
235     CMS_SignerInfo *si, *osi = NULL;
236     ASN1_OCTET_STRING *msig, *pcont;
237     ASN1_OBJECT *octype;
238     unsigned char dig[EVP_MAX_MD_SIZE];
239     unsigned int diglen;

241     /* Get SignerInfos, also checks SignedData content type */
242     osis = CMS_get0_SignerInfos(req_cms);
243     sis = CMS_get0_SignerInfos(cms);
244     if (!osis || !sis)
245         goto err;

247     if (sk_CMS_SignerInfo_num(sis) != 1)
248     {
249         CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_NEED_ONE_SIGNER);
250         goto err;
251     }

253     /* Check receipt content type */
254     if (OBJ_obj2nid(CMS_get0_eContentType(cms)) != NID_id_smime_ct_receipt)
255     {
256         CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_NOT_A_SIGNED_RECEIPT);
257         goto err;
258     }

```

```

260 /* Extract and decode receipt content */
261 pcont = CMS_get0_content(cms);
262 if (!pcont || !*pcont)
263 {
264     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_NO_CONTENT);
265     goto err;
266 }
268 rct = ASN1_item_unpack(*pcont, ASN1_ITEM_rptr(CMS_Receipt));
270 if (!rct)
271 {
272     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_RECEIPT_DECODE_ERROR);
273     goto err;
274 }
276 /* Locate original request */
278 for (i = 0; i < sk_CMS_SignerInfo_num(osis); i++)
279 {
280     osi = sk_CMS_SignerInfo_value(osis, i);
281     if (!ASN1_STRING_cmp(osi->signature,
282                          rct->originatorSignatureValue))
283         break;
284 }
286 if (i == sk_CMS_SignerInfo_num(osis))
287 {
288     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_NO_MATCHING_SIGNATURE);
289     goto err;
290 }
292 si = sk_CMS_SignerInfo_value(sis, 0);
294 /* Get msgSigDigest value and compare */
296 msgsig = CMS_signed_get0_data_by_OBJ(si,
297                                       OBJ_nid2obj(NID_id_smime_aa_msgSigDigest),
298                                       -3, V_ASN1_OCTET_STRING);
300 if (!msgsig)
301 {
302     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_NO_MSGSIGDIGEST);
303     goto err;
304 }
306 if (!cms_msgSigDigest(osi, dig, &diglen))
307 {
308     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_MSGSIGDIGEST_ERROR);
309     goto err;
310 }
312 if (diglen != (unsigned int)msgsig->length)
313 {
314     CMSerr(CMS_F_CMS_RECEIPT_VERIFY,
315           CMS_R_MSGSIGDIGEST_WRONG_LENGTH);
316     goto err;
317 }
319 if (memcmp(dig, msgsig->data, diglen))
320 {
321     CMSerr(CMS_F_CMS_RECEIPT_VERIFY,
322           CMS_R_MSGSIGDIGEST_VERIFICATION_FAILURE);
323     goto err;
324 }

```

```

326 /* Compare content types */
328 octype = CMS_signed_get0_data_by_OBJ(osi,
329                                       OBJ_nid2obj(NID_pkcs9_contentType),
330                                       -3, V_ASN1_OBJECT);
331 if (!octype)
332 {
333     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_NO_CONTENT_TYPE);
334     goto err;
335 }
337 /* Compare details in receipt request */
339 if (OBJ_cmp(octype, rct->contentType))
340 {
341     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_CONTENT_TYPE_MISMATCH);
342     goto err;
343 }
345 /* Get original receipt request details */
347 if (CMS_get1_ReceiptRequest(osi, &rr) <= 0)
348 {
349     CMSerr(CMS_F_CMS_RECEIPT_VERIFY, CMS_R_NO_RECEIPT_REQUEST);
350     goto err;
351 }
353 if (ASN1_STRING_cmp(rr->signedContentIdentifier,
354                     rct->signedContentIdentifier))
355 {
356     CMSerr(CMS_F_CMS_RECEIPT_VERIFY,
357           CMS_R_CONTENTIDENTIFIER_MISMATCH);
358     goto err;
359 }
361 r = 1;
363 err:
364 if (rr)
365     CMS_ReceiptRequest_free(rr);
366 if (rct)
367     M_ASN1_free_of(rct, CMS_Receipt);
369 return r;
371 }
373 /* Encode a Receipt into an OCTET STRING read for including into content of
374  * a SignedData ContentInfo.
375  */
377 ASN1_OCTET_STRING *cms_encode_Receipt(CMS_SignerInfo *si)
378 {
379     CMS_Receipt rct;
380     CMS_ReceiptRequest *rr = NULL;
381     ASN1_OBJECT *ctype;
382     ASN1_OCTET_STRING *os = NULL;
384     /* Get original receipt request */
386     /* Get original receipt request details */
388     if (CMS_get1_ReceiptRequest(si, &rr) <= 0)
389     {
390         CMSerr(CMS_F_CMS_ENCODE_RECEIPT, CMS_R_NO_RECEIPT_REQUEST);
391         goto err;

```



```
392     }
393
394     /* Get original content type */
395
396     ctype = CMS_signed_get0_data_by_OBJ(si,
397                                         OBJ_nid2obj(NID_pkcs9_contentType),
398                                         -3, V_ASN1_OBJECT);
399
400     if (!ctype)
401     {
402         CMSerr(CMS_F_CMS_ENCODE_RECEIPT, CMS_R_NO_CONTENT_TYPE);
403         goto err;
404     }
405
406     rct.version = 1;
407     rct.contentType = ctype;
408     rct.signedContentIdentifier = rr->signedContentIdentifier;
409     rct.originatorSignatureValue = si->signature;
410
411     os = ASN1_item_pack(&rct, ASN1_ITEM_rptr(CMS_Receipt), NULL);
412
413     err:
414     if (rr)
415         CMS_ReceiptRequest_free(rr);
416
417     return os;
418 }
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_io.c

1

```
*****
4666 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_io.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_io.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 */

54 #include <openssl/asn1t.h>
55 #include <openssl/x509.h>
56 #include <openssl/err.h>
57 #include <openssl/pem.h>
58 #include <openssl/cms.h>
59 #include <cms_lcl.h>

61 int CMS_stream(unsigned char ***boundary, CMS_ContentInfo *cms)
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_io.c

2

```
62 {
63     ASN1_OCTET_STRING **pos;
64     pos = CMS_get0_content(cms);
65     if (!pos)
66         return 0;
67     if (!*pos)
68         *pos = ASN1_OCTET_STRING_new();
69     if (*pos)
70     {
71         (*pos)->flags |= ASN1_STRING_FLAG_NDEF;
72         (*pos)->flags &= ~ASN1_STRING_FLAG_CONT;
73         *boundary = &(*pos)->data;
74         return 1;
75     }
76     CMSerr(CMS_F_CMS_STREAM, ERR_R_MALLOC_FAILURE);
77     return 0;
78 }

80 CMS_ContentInfo *d2i_CMS_bio(BIO *bp, CMS_ContentInfo **cms)
81 {
82     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(CMS_ContentInfo), bp, cms);
83 }

85 int i2d_CMS_bio(BIO *bp, CMS_ContentInfo *cms)
86 {
87     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(CMS_ContentInfo), bp, cms);
88 }

90 IMPLEMENT_PEM_rw_const(CMS, CMS_ContentInfo, PEM_STRING_CMS, CMS_ContentInfo)

92 BIO *BIO_new_CMS(BIO *out, CMS_ContentInfo *cms)
93 {
94     return BIO_new_NDEF(out, (ASN1_VALUE *)cms,
95                          ASN1_ITEM_rptr(CMS_ContentInfo));
96 }

98 /* CMS wrappers round generalised stream and MIME routines */

100 int i2d_CMS_bio_stream(BIO *out, CMS_ContentInfo *cms, BIO *in, int flags)
101 {
102     return i2d_ASN1_bio_stream(out, (ASN1_VALUE *)cms, in, flags,
103                               ASN1_ITEM_rptr(CMS_ContentInfo));
104 }

106 int PEM_write_bio_CMS_stream(BIO *out, CMS_ContentInfo *cms, BIO *in, int flags)
107 {
108     return PEM_write_bio_ASN1_stream(out, (ASN1_VALUE *)cms, in, flags,
109                                     "CMS",
110                                     ASN1_ITEM_rptr(CMS_ContentInfo));
111 }

113 int SMIME_write_CMS(BIO *bio, CMS_ContentInfo *cms, BIO *data, int flags)
114 {
115     STACK_OF(X509_ALGOR) *mdalgs;
116     int ctype_nid = OBJ_obj2nid(cms->contentType);
117     int econt_nid = OBJ_obj2nid(CMS_get0_eContentType(cms));
118     if (ctype_nid == NID_pkcs7_signed)
119         mdalgs = cms->d.signedData->digestAlgorithms;
120     else
121         mdalgs = NULL;

123     return SMIME_write_ASN1(bio, (ASN1_VALUE *)cms, data, flags,
124                             ctype_nid, econt_nid, mdalgs,
125                             ASN1_ITEM_rptr(CMS_ContentInfo));
126 }
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_io.c

3

```
128 CMS_ContentInfo *SMIME_read_CMS(BIO *bio, BIO **bcont)
129 {
130     return (CMS_ContentInfo *)SMIME_read_ASN1(bio, bcont,
131                                               ASN1_ITEM_rptr(CMS_ContentInfo));
132 }
```

```

*****
15329 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cms/cms_lib.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 */
54 #include <openssl/asn1t.h>
55 #include <openssl/x509.h>
56 #include <openssl/err.h>
57 #include <openssl/pem.h>
58 #include <openssl/bio.h>
59 #include <openssl/asn1.h>
60 #include <openssl/cms.h>
61 #include <cms_lcl.h>

```

```

63 IMPLEMENT_ASN1_FUNCTIONS(CMS_ContentInfo)
64 IMPLEMENT_ASN1_PRINT_FUNCTION(CMS_ContentInfo)

66 DECLARE_ASN1_ITEM(CMS_CertificateChoices)
67 DECLARE_ASN1_ITEM(CMS_RevocationInfoChoice)
68 DECLARE_STACK_OF(CMS_CertificateChoices)
69 DECLARE_STACK_OF(CMS_RevocationInfoChoice)

71 const ASN1_OBJECT *CMS_get0_type(CMS_ContentInfo *cms)
72 {
73     return cms->contentType;
74 }

76 CMS_ContentInfo *cms_Data_create(void)
77 {
78     CMS_ContentInfo *cms;
79     cms = CMS_ContentInfo_new();
80     if (cms)
81     {
82         cms->contentType = OBJ_nid2obj(NID_pkcs7_data);
83         /* Never detached */
84         CMS_set_detached(cms, 0);
85     }
86     return cms;
87 }

89 BIO *cms_content_bio(CMS_ContentInfo *cms)
90 {
91     ASN1_OCTET_STRING **pos = CMS_get0_content(cms);
92     if (!pos)
93         return NULL;
94     /* If content detached data goes nowhere: create NULL BIO */
95     if (!*pos)
96         return BIO_new(BIO_s_null());
97     /* If content not detached and created return memory BIO
98     */
99     if (!*pos || ((*pos)->flags == ASN1_STRING_FLAG_CONT))
100         return BIO_new(BIO_s_mem());
101     /* Else content was read in: return read only BIO for it */
102     return BIO_new_mem_buf((*pos)->data, (*pos)->length);
103 }

105 BIO *CMS_dataInit(CMS_ContentInfo *cms, BIO *icont)
106 {
107     BIO *cmsbio, *cont;
108     if (icont)
109         cont = icont;
110     else
111         cont = cms_content_bio(cms);
112     if (!cont)
113     {
114         CMSerr(CMS_F_CMS_DATAINIT, CMS_R_NO_CONTENT);
115         return NULL;
116     }
117     switch (OBJ_obj2nid(cms->contentType))
118     {
119
120         case NID_pkcs7_data:
121             return cont;

123         case NID_pkcs7_signed:
124             cmsbio = cms_SignedData_init_bio(cms);
125             break;

127         case NID_pkcs7_digest:

```

```

128         cmsbio = cms_DigestedData_init_bio(cms);
129         break;
130 #ifdef ZLIB
131         case NID_id_smime_ct_compressedData:
132             cmsbio = cms_CompressedData_init_bio(cms);
133             break;
134 #endif
136         case NID_pkcs7_encrypted:
137             cmsbio = cms_EncryptedData_init_bio(cms);
138             break;
140         case NID_pkcs7_enveloped:
141             cmsbio = cms_EnvelopedData_init_bio(cms);
142             break;
144         default:
145             CMSerr(CMS_F_CMS_DATAINIT, CMS_R_UNSUPPORTED_TYPE);
146             return NULL;
147     }
149     if (cmsbio)
150         return BIO_push(cmsbio, cont);
152     if (!icont)
153         BIO_free(cont);
154     return NULL;
156 }
158 int CMS_dataFinal(CMS_ContentInfo *cms, BIO *cmsbio)
159 {
160     ASN1_OCTET_STRING **pos = CMS_get0_content(cms);
161     if (!pos)
162         return 0;
163     /* If embedded content find memory BIO and set content */
164     if (*pos && ((*pos)->flags & ASN1_STRING_FLAG_CONT))
165     {
166         BIO *mbio;
167         unsigned char *cont;
168         long contlen;
169         mbio = BIO_find_type(cmsbio, BIO_TYPE_MEM);
170         if (!mbio)
171         {
172             CMSerr(CMS_F_CMS_DATAFINAL, CMS_R_CONTENT_NOT_FOUND);
173             return 0;
174         }
175         contlen = BIO_get_mem_data(mbio, &cont);
176         /* Set bio as read only so its content can't be clobbered */
177         BIO_set_flags(mbio, BIO_FLAGS_MEM_RDONLY);
178         BIO_set_mem_eof_return(mbio, 0);
179         ASN1_STRING_set0(*pos, cont, contlen);
180         (*pos)->flags &= ~ASN1_STRING_FLAG_CONT;
181     }
183     switch (OBJ_obj2nid(cms->contentType))
184     {
186         case NID_pkcs7_data:
187         case NID_pkcs7_enveloped:
188         case NID_pkcs7_encrypted:
189         case NID_id_smime_ct_compressedData:
190             /* Nothing to do */
191             return 1;
193         case NID_pkcs7_signed:

```

```

194         return cms_SignedData_final(cms, cmsbio);
196         case NID_pkcs7_digest:
197             return cms_DigestedData_do_final(cms, cmsbio, 0);
199         default:
200             CMSerr(CMS_F_CMS_DATAFINAL, CMS_R_UNSUPPORTED_TYPE);
201             return 0;
202     }
203 }
205 /* Return an OCTET STRING pointer to content. This allows it to
206  * be accessed or set later.
207  */
209 ASN1_OCTET_STRING **CMS_get0_content(CMS_ContentInfo *cms)
210 {
211     switch (OBJ_obj2nid(cms->contentType))
212     {
214         case NID_pkcs7_data:
215             return &cms->d.data;
217         case NID_pkcs7_signed:
218             return &cms->d.signedData->encapContentInfo->eContent;
220         case NID_pkcs7_enveloped:
221             return &cms->d.envelopedData->encryptedContentInfo->encryptedCon
223         case NID_pkcs7_digest:
224             return &cms->d.digestedData->encapContentInfo->eContent;
226         case NID_pkcs7_encrypted:
227             return &cms->d.encryptedData->encryptedContentInfo->encryptedCon
229         case NID_id_smime_ct_authData:
230             return &cms->d.authenticatedData->encapContentInfo->eContent;
232         case NID_id_smime_ct_compressedData:
233             return &cms->d.compressedData->encapContentInfo->eContent;
235         default:
236             if (cms->d.other->type == V_ASN1_OCTET_STRING)
237                 return &cms->d.other->value.octet_string;
238             CMSerr(CMS_F_CMS_GET0_CONTENT, CMS_R_UNSUPPORTED_CONTENT_TYPE);
239             return NULL;
241     }
242 }
244 /* Return an ASN1_OBJECT pointer to content type. This allows it to
245  * be accessed or set later.
246  */
248 static ASN1_OBJECT **cms_get0_econtent_type(CMS_ContentInfo *cms)
249 {
250     switch (OBJ_obj2nid(cms->contentType))
251     {
253         case NID_pkcs7_signed:
254             return &cms->d.signedData->encapContentInfo->eContentType;
256         case NID_pkcs7_enveloped:
257             return &cms->d.envelopedData->encryptedContentInfo->contentType;
259         case NID_pkcs7_digest:

```

```

260         return &cms->d.digestedData->encapContentInfo->eContentType;

262     case NID_pkcs7_encrypted:
263         return &cms->d.encryptedData->encryptedContentInfo->contentType;

265     case NID_id_smime_ct_authData:
266         return &cms->d.authenticatedData->encapContentInfo->eContentType;

268     case NID_id_smime_ct_compressedData:
269         return &cms->d.compressedData->encapContentInfo->eContentType;

271     default:
272         CMSerr(CMS_F_CMS_GET0_ECONTENT_TYPE,
273               CMS_R_UNSUPPORTED_CONTENT_TYPE);
274         return NULL;

276     }
277 }

279 const ASN1_OBJECT *CMS_get0_eContentType(CMS_ContentInfo *cms)
280 {
281     ASN1_OBJECT **petype;
282     petype = cms_get0_econtent_type(cms);
283     if (petype)
284         return *petype;
285     return NULL;
286 }

288 int CMS_set1_eContentType(CMS_ContentInfo *cms, const ASN1_OBJECT *oid)
289 {
290     ASN1_OBJECT **petype, *etype;
291     petype = cms_get0_econtent_type(cms);
292     if (!petype)
293         return 0;
294     if (!oid)
295         return 1;
296     etype = OBJ_dup(oid);
297     if (!etype)
298         return 0;
299     ASN1_OBJECT_free(*petype);
300     *petype = etype;
301     return 1;
302 }

304 int CMS_is_detached(CMS_ContentInfo *cms)
305 {
306     ASN1_OCTET_STRING **pos;
307     pos = CMS_get0_content(cms);
308     if (!pos)
309         return -1;
310     if (*pos)
311         return 0;
312     return 1;
313 }

315 int CMS_set_detached(CMS_ContentInfo *cms, int detached)
316 {
317     ASN1_OCTET_STRING **pos;
318     pos = CMS_get0_content(cms);
319     if (!pos)
320         return 0;
321     if (detached)
322     {
323         if (*pos)
324             ASN1_OCTET_STRING_free(*pos);
325         *pos = NULL;
326     }
327 }

```

```

326         *pos = NULL;
327     }
328     return 1;
329 }
330 if (!*pos)
331     *pos = ASN1_OCTET_STRING_new();
332 if (*pos)
333     /* NB: special flag to show content is created and not
334      * read in.
335      */
336     (*pos)->flags |= ASN1_STRING_FLAG_CONT;
337     return 1;
338 }
339 CMSerr(CMS_F_CMS_SET_DETACHED, ERR_R_MALLOC_FAILURE);
340 return 0;
341 }
342 }

344 /* Set up an X509_ALGOR DigestAlgorithmIdentifier from an EVP_MD */
346 void cms_DigestAlgorithm_set(X509_ALGOR *alg, const EVP_MD *md)
347 {
348     int param_type;
349
350     if (md->flags & EVP_MD_FLAG_DIGALGID_ABSENT)
351         param_type = V_ASN1_UNDEF;
352     else
353         param_type = V_ASN1_NULL;
354
355     X509_ALGOR_set0(alg, OBJ_nid2obj(EVP_MD_type(md)), param_type, NULL);
356 }

357 }

359 /* Create a digest BIO from an X509_ALGOR structure */
361 BIO *cms_DigestAlgorithm_init_bio(X509_ALGOR *digestAlgorithm)
362 {
363     BIO *mdbio = NULL;
364     ASN1_OBJECT *digestoid;
365     const EVP_MD *digest;
366     X509_ALGOR_get0(&digestoid, NULL, NULL, digestAlgorithm);
367     digest = EVP_get_digestbyobj(digestoid);
368     if (!digest)
369     {
370         CMSerr(CMS_F_CMS_DIGESTALGORITHM_INIT_BIO,
371               CMS_R_UNKNOWN_DIGEST_ALGORITHM);
372         goto err;
373     }
374     mdbio = BIO_new(BIO_f_md());
375     if (!mdbio || !BIO_set_md(mdbio, digest))
376     {
377         CMSerr(CMS_F_CMS_DIGESTALGORITHM_INIT_BIO,
378               CMS_R_MD_BIO_INIT_ERROR);
379         goto err;
380     }
381     return mdbio;
382 err:
383     if (mdbio)
384         BIO_free(mdbio);
385     return NULL;
386 }

388 /* Locate a message digest content from a BIO chain based on SignerInfo */
390 int cms_DigestAlgorithm_find_ctx(EVP_MD_CTX *mctx, BIO *chain,
391                                 X509_ALGOR *mdalg)

```

```

392     {
393         int nid;
394         ASN1_OBJECT *mdoid;
395         X509_ALGOR_get0(&mdoid, NULL, NULL, mdalg);
396         nid = OBJ_obj2nid(mdoid);
397         /* Look for digest type to match signature */
398         for (;;)
399         {
400             EVP_MD_CTX *mtmp;
401             chain = BIO_find_type(chain, BIO_TYPE_MD);
402             if (chain == NULL)
403             {
404                 CMSerr(CMS_F_CMS_DIGESTALGORITHM_FIND_CTX,
405                       CMS_R_NO_MATCHING_DIGEST);
406                 return 0;
407             }
408             BIO_get_md_ctx(chain, &mtmp);
409             if (EVP_MD_CTX_type(mtmp) == nid
410                 /* Workaround for broken implementations that use signature
411                  * algorithm OID instead of digest.
412                  */
413                 || EVP_MD_pkey_type(EVP_MD_CTX_md(mtmp)) == nid)
414                 return EVP_MD_CTX_copy_ex(mctx, mtmp);
415             chain = BIO_next(chain);
416         }
417     }
418
419 static STACK_OF(CMS_CertificateChoices) **cms_get0_certificate_choices(CMS_Conte
420 {
421     switch (OBJ_obj2nid(cms->contentType))
422     {
423
424         case NID_pkcs7_signed:
425             return &cms->d.signedData->certificates;
426
427         case NID_pkcs7_enveloped:
428             return &cms->d.envelopedData->originatorInfo->certificates;
429
430         default:
431             CMSerr(CMS_F_CMS_GET0_CERTIFICATE_CHOICES,
432                   CMS_R_UNSUPPORTED_CONTENT_TYPE);
433             return NULL;
434     }
435 }
436
437 CMS_CertificateChoices *CMS_add0_CertificateChoices(CMS_ContentInfo *cms)
438 {
439     STACK_OF(CMS_CertificateChoices) **pcerts;
440     CMS_CertificateChoices *cch;
441     pcerts = cms_get0_certificate_choices(cms);
442     if (!pcerts)
443         return NULL;
444     if (!*pcerts)
445     {
446         *pcerts = sk_CMS_CertificateChoices_new_null();
447         if (!*pcerts)
448             return NULL;
449         cch = M_ASN1_new_of(CMS_CertificateChoices);
450         if (!cch)
451             return NULL;
452         if (!sk_CMS_CertificateChoices_push(*pcerts, cch))
453             return NULL;
454         M_ASN1_free_of(cch, CMS_CertificateChoices);
455     }
456     return cch;
457 }

```

```

458     }
459
460 int CMS_add0_cert(CMS_ContentInfo *cms, X509 *cert)
461 {
462     CMS_CertificateChoices *cch;
463     STACK_OF(CMS_CertificateChoices) **pcerts;
464     int i;
465     pcerts = cms_get0_certificate_choices(cms);
466     if (!pcerts)
467         return 0;
468     for (i = 0; i < sk_CMS_CertificateChoices_num(*pcerts); i++)
469     {
470         cch = sk_CMS_CertificateChoices_value(*pcerts, i);
471         if (cch->type == CMS_CERTCHOICE_CERT)
472             if (!X509_cmp(cch->d.certificate, cert))
473             {
474                 CMSerr(CMS_F_CMS_ADD0_CERT,
475                       CMS_R_CERTIFICATE_ALREADY_PRESENT);
476                 return 0;
477             }
478     }
479     cch = CMS_add0_CertificateChoices(cms);
480     if (!cch)
481         return 0;
482     cch->type = CMS_CERTCHOICE_CERT;
483     cch->d.certificate = cert;
484     return 1;
485 }
486
487 int CMS_add1_cert(CMS_ContentInfo *cms, X509 *cert)
488 {
489     int r;
490     r = CMS_add0_cert(cms, cert);
491     if (r > 0)
492         CRYPTO_add(&cert->references, 1, CRYPTO_LOCK_X509);
493     return r;
494 }
495
496 static STACK_OF(CMS_RevocationInfoChoice) **cms_get0_revocation_choices(CMS_Cont
497 {
498     switch (OBJ_obj2nid(cms->contentType))
499     {
500
501         case NID_pkcs7_signed:
502             return &cms->d.signedData->crls;
503
504         case NID_pkcs7_enveloped:
505             return &cms->d.envelopedData->originatorInfo->crls;
506
507         default:
508             CMSerr(CMS_F_CMS_GET0_REVOCATION_CHOICES,
509                   CMS_R_UNSUPPORTED_CONTENT_TYPE);
510             return NULL;
511     }
512 }
513
514 CMS_RevocationInfoChoice *CMS_add0_RevocationInfoChoice(CMS_ContentInfo *cms)
515 {
516     STACK_OF(CMS_RevocationInfoChoice) **pcrls;
517     CMS_RevocationInfoChoice *rch;
518     pcrls = cms_get0_revocation_choices(cms);
519     if (!pcrls)
520         return NULL;
521 }

```

```

524     if (!*pcrls)
525         *pcrls = sk_CMS_RevocationInfoChoice_new_null();
526     if (!*pcrls)
527         return NULL;
528     rch = M_ASN1_new_of(CMS_RevocationInfoChoice);
529     if (!rch)
530         return NULL;
531     if (!sk_CMS_RevocationInfoChoice_push(*pcrls, rch))
532     {
533         M_ASN1_free_of(rch, CMS_RevocationInfoChoice);
534         return NULL;
535     }
536     return rch;
537 }

539 int CMS_add0_crl(CMS_ContentInfo *cms, X509_CRL *crl)
540 {
541     CMS_RevocationInfoChoice *rch;
542     rch = CMS_add0_RevocationInfoChoice(cms);
543     if (!rch)
544         return 0;
545     rch->type = CMS_REVCHOICE_CRL;
546     rch->d.crl = crl;
547     return 1;
548 }

550 int CMS_add1_crl(CMS_ContentInfo *cms, X509_CRL *crl)
551 {
552     int r;
553     r = CMS_add0_crl(cms, crl);
554     if (r > 0)
555         CRYPTO_add(&crl->references, 1, CRYPTO_LOCK_X509_CRL);
556     return r;
557 }

559 STACK_OF(X509) *CMS_get1_certs(CMS_ContentInfo *cms)
560 {
561     STACK_OF(X509) *certs = NULL;
562     CMS_CertificateChoices *cch;
563     STACK_OF(CMS_CertificateChoices) **pcerts;
564     int i;
565     pcerts = cms_get0_certificate_choices(cms);
566     if (!pcerts)
567         return NULL;
568     for (i = 0; i < sk_CMS_CertificateChoices_num(*pcerts); i++)
569     {
570         cch = sk_CMS_CertificateChoices_value(*pcerts, i);
571         if (cch->type == 0)
572         {
573             if (!certs)
574             {
575                 certs = sk_X509_new_null();
576                 if (!certs)
577                     return NULL;
578             }
579             if (!sk_X509_push(certs, cch->d.certificate))
580             {
581                 sk_X509_pop_free(certs, X509_free);
582                 return NULL;
583             }
584             CRYPTO_add(&cch->d.certificate->references,
585                        1, CRYPTO_LOCK_X509);
586         }
587     }
588     return certs;

```

```

590     }

592 STACK_OF(X509_CRL) *CMS_get1_crls(CMS_ContentInfo *cms)
593 {
594     STACK_OF(X509_CRL) *crls = NULL;
595     STACK_OF(CMS_RevocationInfoChoice) **pcrls;
596     CMS_RevocationInfoChoice *rch;
597     int i;
598     pcrls = cms_get0_revocation_choices(cms);
599     if (!pcrls)
600         return NULL;
601     for (i = 0; i < sk_CMS_RevocationInfoChoice_num(*pcrls); i++)
602     {
603         rch = sk_CMS_RevocationInfoChoice_value(*pcrls, i);
604         if (rch->type == 0)
605         {
606             if (!crls)
607             {
608                 crls = sk_X509_CRL_new_null();
609                 if (!crls)
610                     return NULL;
611             }
612             if (!sk_X509_CRL_push(crls, rch->d.crl))
613             {
614                 sk_X509_CRL_pop_free(crls, X509_CRL_free);
615                 return NULL;
616             }
617             CRYPTO_add(&rch->d.crl->references,
618                        1, CRYPTO_LOCK_X509_CRL);
619         }
620     }
621     return crls;
622 }

```


new/usr/src/lib/openssl/libsunw_crypto/cms/cms_pwri.c

1

```
*****
11946 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_pwri.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_pwri.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2009 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
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43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/pem.h>
57 #include <openssl/x509v3.h>
58 #include <openssl/err.h>
59 #include <openssl/cms.h>
60 #include <openssl/rand.h>
61 #include <openssl/aes.h>
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_pwri.c

2

```
62 #include "cms_lcl.h"
63 #include "asn1_lcl.h"

65 int CMS_RecipientInfo_set0_password(CMS_RecipientInfo *ri,
66                                     unsigned char *pass, ossl_ssize_t passlen)
67 {
68     CMS_PasswordRecipientInfo *pwri;
69     if (ri->type != CMS_RECIPINFO_PASS)
70     {
71         CMSerr(CMS_F_CMS_RECIPIENTINFO_SET0_PASSWORD, CMS_R_NOT_PWRI);
72         return 0;
73     }

75     pwri = ri->d.pwri;
76     pwri->pass = pass;
77     if (pass && passlen < 0)
78         passlen = strlen((char *)pass);
79     pwri->passlen = passlen;
80     return 1;
81 }

83 CMS_RecipientInfo *CMS_add0_recipient_password(CMS_ContentInfo *cms,
84                                                 int iter, int wrap_nid, int pbe_nid,
85                                                 unsigned char *pass,
86                                                 ossl_ssize_t passlen,
87                                                 const EVP_CIPHER *kekciph)
88 {
89     CMS_RecipientInfo *ri = NULL;
90     CMS_EnvelopedData *env;
91     CMS_PasswordRecipientInfo *pwri;
92     EVP_CIPHER_CTX ctx;
93     X509_ALGOR *encalg = NULL;
94     unsigned char iv[EVP_MAX_IV_LENGTH];
95     int ivlen;
96     env = cms_get0_enveloped(cms);
97     if (!env)
98         goto err;

100     if (wrap_nid <= 0)
101         wrap_nid = NID_id_alg_PWRI_KEK;

103     if (pbe_nid <= 0)
104         pbe_nid = NID_id_pbkdf2;

106     /* Get from enveloped data */
107     if (kekciph == NULL)
108         kekciph = env->encryptedContentInfo->cipher;

110     if (kekciph == NULL)
111     {
112         CMSerr(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD, CMS_R_NO_CIPHER);
113         return NULL;
114     }

115     if (wrap_nid != NID_id_alg_PWRI_KEK)
116     {
117         CMSerr(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD,
118               CMS_R_UNSUPPORTED_KEY_ENCRYPTION_ALGORITHM);
119         return NULL;
120     }

122     /* Setup algorithm identifier for cipher */
123     encalg = X509_ALGOR_new();
124     EVP_CIPHER_CTX_init(&ctx);

126     if (EVP_EncryptInit_ex(&ctx, kekciph, NULL, NULL, NULL) <= 0)
127     {
```

```

128     CMSerr(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD, ERR_R_EVP_LIB);
129     goto err;
130 }

132     ivlen = EVP_CIPHER_CTX_iv_length(&ctx);

134     if (ivlen > 0)
135     {
136         if (RAND_pseudo_bytes(iv, ivlen) <= 0)
137             goto err;
138         if (EVP_EncryptInit_ex(&ctx, NULL, NULL, NULL, iv) <= 0)
139         {
140             CMSerr(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD,
141                   ERR_R_EVP_LIB);
142             goto err;
143         }
144         encalg->parameter = ASN1_TYPE_new();
145         if (!encalg->parameter)
146         {
147             CMSerr(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD,
148                   ERR_R_MALLOC_FAILURE);
149             goto err;
150         }
151         if (EVP_CIPHER_param_to_asn1(&ctx, encalg->parameter) <= 0)
152         {
153             CMSerr(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD,
154                   CMS_R_CIPHER_PARAMETER_INITIALISATION_ERROR);
155             goto err;
156         }
157     }

160     encalg->algorithm = OBJ_nid2obj(EVP_CIPHER_CTX_type(&ctx));

162     EVP_CIPHER_CTX_cleanup(&ctx);

164     /* Initialize recipient info */
165     ri = M_ASN1_new_of(CMS_RecipientInfo);
166     if (!ri)
167         goto merr;

169     ri->d.pwri = M_ASN1_new_of(CMS_PasswordRecipientInfo);
170     if (!ri->d.pwri)
171         goto merr;
172     ri->type = CMS_RECIPINFO_PASS;

174     pwri = ri->d.pwri;
175     /* Since this is overwritten, free up empty structure already there */
176     X509_ALGOR_free(pwri->keyEncryptionAlgorithm);
177     pwri->keyEncryptionAlgorithm = X509_ALGOR_new();
178     if (!pwri->keyEncryptionAlgorithm)
179         goto merr;
180     pwri->keyEncryptionAlgorithm->algorithm = OBJ_nid2obj(wrap_nid);
181     pwri->keyEncryptionAlgorithm->parameter = ASN1_TYPE_new();
182     if (!pwri->keyEncryptionAlgorithm->parameter)
183         goto merr;

185     if(!ASN1_item_pack(encalg, ASN1_ITEM_rptr(X509_ALGOR),
186                       &pwri->keyEncryptionAlgorithm->parameter->value.sequence))
187         goto merr;
188     pwri->keyEncryptionAlgorithm->parameter->type = V_ASN1_SEQUENCE;

190     X509_ALGOR_free(encalg);
191     encalg = NULL;

193     /* Setup PBE algorithm */

```

```

195     pwri->keyDerivationAlgorithm = PKCS5_pbkdf2_set(iter, NULL, 0, -1, -1);

197     if (!pwri->keyDerivationAlgorithm)
198         goto err;

200     CMS_RecipientInfo_set0_password(ri, pass, passlen);
201     pwri->version = 0;

203     if (!sk_CMS_RecipientInfo_push(env->recipientInfos, ri))
204         goto merr;

206     return ri;

208     merr:
209     CMSerr(CMS_F_CMS_ADD0_RECIPIENT_PASSWORD, ERR_R_MALLOC_FAILURE);
210     err:
211     EVP_CIPHER_CTX_cleanup(&ctx);
212     if (ri)
213         M_ASN1_free_of(ri, CMS_RecipientInfo);
214     if (encalg)
215         X509_ALGOR_free(encalg);
216     return NULL;

218 }

220 /* This is an implementation of the key wrapping mechanism in RFC3211,
221    * at some point this should go into EVP.
222    */

224 static int kek_unwrap_key(unsigned char *out, size_t *outlen,
225                          const unsigned char *in, size_t inlen, EVP_CIPHER_CTX *ctx)
226 {
227     size_t blocklen = EVP_CIPHER_CTX_block_size(ctx);
228     unsigned char *tmp;
229     int outl, rv = 0;
230     if (inlen < 2 * blocklen)
231     {
232         /* too small */
233         return 0;
234     }
235     if (inlen % blocklen)
236     {
237         /* Invalid size */
238         return 0;
239     }
240     tmp = OPENSSL_malloc(inlen);
241     /* setup IV by decrypting last two blocks */
242     EVP_DecryptUpdate(ctx, tmp + inlen - 2 * blocklen, &outl,
243                     in + inlen - 2 * blocklen, blocklen * 2);
244     /* Do a decrypt of last decrypted block to set IV to correct value
245     * output it to start of buffer so we don't corrupt decrypted block
246     * this works because buffer is at least two block lengths long.
247     */
248     EVP_DecryptUpdate(ctx, tmp, &outl,
249                     tmp + inlen - blocklen, blocklen);
250     /* Can now decrypt first n - 1 blocks */
251     EVP_DecryptUpdate(ctx, tmp, &outl, in, inlen - blocklen);

253     /* Reset IV to original value */
254     EVP_DecryptInit_ex(ctx, NULL, NULL, NULL, NULL);
255     /* Decrypt again */
256     EVP_DecryptUpdate(ctx, tmp, &outl, tmp, inlen);
257     /* Check check bytes */
258     if (((tmp[1] ^ tmp[4]) & (tmp[2] ^ tmp[5]) & (tmp[3] ^ tmp[6])) != 0xff)
259     {

```

```

260      /* Check byte failure */
261      goto err;
262    }
263    if (inlen < (size_t)(tmp[0] - 4))
264    {
265      /* Invalid length value */
266      goto err;
267    }
268    *outlen = (size_t)tmp[0];
269    memcpy(out, tmp + 4, *outlen);
270    rv = 1;
271  err:
272    OPENSSL_cleanse(tmp, inlen);
273    OPENSSL_free(tmp);
274    return rv;
275  }
276
277 static int kek_wrap_key(unsigned char *out, size_t *outlen,
278                        const unsigned char *in, size_t inlen, EVP_CIPHER_CTX *ctx)
279 {
280   size_t blocklen = EVP_CIPHER_CTX_block_size(ctx);
281   size_t olen;
282   int dummy;
283   /* First decide length of output buffer: need header and round up to
284    * multiple of block length.
285    */
286   olen = (inlen + 4 + blocklen - 1)/blocklen;
287   olen *= blocklen;
288   if (olen < 2 * blocklen)
289   {
290     /* Key too small */
291     return 0;
292   }
293   if (inlen > 0xFF)
294   {
295     /* Key too large */
296     return 0;
297   }
298   if (out)
299   {
300     /* Set header */
301     out[0] = (unsigned char)inlen;
302     out[1] = in[0] ^ 0xFF;
303     out[2] = in[1] ^ 0xFF;
304     out[3] = in[2] ^ 0xFF;
305     memcpy(out + 4, in, inlen);
306     /* Add random padding to end */
307     if (olen > inlen + 4)
308       RAND_pseudo_bytes(out + 4 + inlen, olen - 4 - inlen);
309     /* Encrypt twice */
310     EVP_EncryptUpdate(ctx, out, &dummy, out, olen);
311     EVP_EncryptUpdate(ctx, out, &dummy, out, olen);
312   }
313
314   *outlen = olen;
315
316   return 1;
317 }
318
319 /* Encrypt/Decrypt content key in PWRI recipient info */
320
321 int cms_RecipientInfo_pwri_encrypt(CMS_ContentInfo *cms, CMS_RecipientInfo *ri,
322 int en_de)
323 {
324   CMS_EncryptedContentInfo *ec;

```

```

326   CMS_PasswordRecipientInfo *pwri;
327   const unsigned char *p = NULL;
328   int plen;
329   int r = 0;
330   X509_ALGOR *algtmp, *kekalg = NULL;
331   EVP_CIPHER_CTX kekctx;
332   const EVP_CIPHER *kekcipher;
333   unsigned char *key = NULL;
334   size_t keylen;
335
336   ec = cms->d.envelopedData->encryptedContentInfo;
337
338   pwri = ri->d.pwri;
339   EVP_CIPHER_CTX_init(&kekctx);
340
341   if (!pwri->pass)
342   {
343     CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT, CMS_R_NO_PASSWORD);
344     return 0;
345   }
346   algtmp = pwri->keyEncryptionAlgorithm;
347
348   if (!algtmp || OBJ_obj2nid(algtmp->algorithm) != NID_id_alg_PWRI_KEK)
349   {
350     CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT,
351           CMS_R_UNSUPPORTED_KEY_ENCRYPTION_ALGORITHM);
352     return 0;
353   }
354
355   if (algtmp->parameter->type == V_ASN1_SEQUENCE)
356   {
357     p = algtmp->parameter->value.sequence->data;
358     plen = algtmp->parameter->value.sequence->length;
359     kekalg = d2i_X509_ALGOR(NULL, &p, plen);
360   }
361   if (kekalg == NULL)
362   {
363     CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT,
364           CMS_R_INVALID_KEY_ENCRYPTION_PARAMETER);
365     return 0;
366   }
367
368   kekcipher = EVP_get_cipherbyobj(kekalg->algorithm);
369
370   if(!kekcipher)
371   {
372     CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT,
373           CMS_R_UNKNOWN_CIPHER);
374     goto err;
375   }
376
377   /* Fixup cipher based on AlgorithmIdentifier to set IV etc */
378   if (!EVP_CipherInit_ex(&kekctx, kekcipher, NULL, NULL, NULL, en_de))
379     goto err;
380   EVP_CIPHER_CTX_set_padding(&kekctx, 0);
381   if(EVP_CIPHER_asn1_to_param(&kekctx, kekalg->parameter) < 0)
382   {
383     CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT,
384           CMS_R_CIPHER_PARAMETER_INITIALISATION_ERROR);
385     goto err;
386   }
387
388   algtmp = pwri->keyDerivationAlgorithm;
389
390   /* Finish password based key derivation to setup key in "ctx" */

```

```
392     if (EVP_PBE_CipherInit(algtmp->algorithm,  
393                             (char *)pwri->pass, pwri->passlen,  
394                             algtmp->parameter, &kekctx, en_de) < 0)  
395     {  
396         CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT, ERR_R_EVP_LIB);  
397         goto err;  
398     }  
  
400     /* Finally wrap/unwrap the key */  
  
402     if (en_de)  
403     {  
405         if (!kek_wrap_key(NULL, &keylen, ec->key, ec->keylen, &kekctx))  
406             goto err;  
  
408         key = OPENSSL_malloc(keylen);  
  
410         if (!key)  
411             goto err;  
  
413         if (!kek_wrap_key(key, &keylen, ec->key, ec->keylen, &kekctx))  
414             goto err;  
415         pwri->encryptedKey->data = key;  
416         pwri->encryptedKey->length = keylen;  
417     }  
418     else  
419     {  
420         key = OPENSSL_malloc(pwri->encryptedKey->length);  
  
422         if (!key)  
423         {  
424             CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT,  
425                   ERR_R_MALLOC_FAILURE);  
426             goto err;  
427         }  
428         if (!kek_unwrap_key(key, &keylen,  
429                             pwri->encryptedKey->data,  
430                             pwri->encryptedKey->length, &kekctx))  
431         {  
432             CMSerr(CMS_F_CMS_RECIPIENTINFO_PWRI_CRYPT,  
433                   CMS_R_UNWRAP_FAILURE);  
434             goto err;  
435         }  
  
437         ec->key = key;  
438         ec->keylen = keylen;  
  
440     }  
  
442     r = 1;  
  
444     err:  
  
446     EVP_CIPHER_CTX_cleanup(&kekctx);  
  
448     if (!r && key)  
449         OPENSSL_free(key);  
450     X509_ALGOR_free(kekalg);  
  
452     return r;  
  
454 }
```

```

*****
23140 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_sd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cms/cms_sd.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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15  * 2. Redistributions in binary form must reproduce the above copyright
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18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/pem.h>
57 #include <openssl/x509v3.h>
58 #include <openssl/err.h>
59 #include <openssl/cms.h>
60 #include "cms_lcl.h"
61 #include "asn1_locl.h"

```

```

63 /* CMS SignedData Utilities */
65 DECLARE_ASN1_ITEM(CMS_SignedData)

67 static CMS_SignedData *cms_get0_signed(CMS_ContentInfo *cms)
68 {
69     if (OBJ_obj2nid(cms->contentType) != NID_pkcs7_signed)
70     {
71         CMSerr(CMS_F_CMS_GET0_SIGNED, CMS_R_CONTENT_TYPE_NOT_SIGNED_DATA);
72         return NULL;
73     }
74     return cms->d.signedData;
75 }

77 static CMS_SignedData *cms_signed_data_init(CMS_ContentInfo *cms)
78 {
79     if (cms->d.other == NULL)
80     {
81         cms->d.signedData = M_ASN1_new_of(CMS_SignedData);
82         if (!cms->d.signedData)
83         {
84             CMSerr(CMS_F_CMS_SIGNED_DATA_INIT, ERR_R_MALLOC_FAILURE);
85             return NULL;
86         }
87         cms->d.signedData->version = 1;
88         cms->d.signedData->encapContentInfo->eContentType =
89             OBJ_nid2obj(NID_pkcs7_data);
90         cms->d.signedData->encapContentInfo->partial = 1;
91         ASN1_OBJECT_free(cms->contentType);
92         cms->contentType = OBJ_nid2obj(NID_pkcs7_signed);
93         return cms->d.signedData;
94     }
95     return cms_get0_signed(cms);
96 }

98 /* Just initialize SignedData e.g. for certs only structure */

100 int CMS_SignedData_init(CMS_ContentInfo *cms)
101 {
102     if (cms_signed_data_init(cms))
103         return 1;
104     else
105         return 0;
106 }

108 /* Check structures and fixup version numbers (if necessary) */

110 static void cms_sd_set_version(CMS_SignedData *sd)
111 {
112     int i;
113     CMS_CertificateChoices *cch;
114     CMS_RevocationInfoChoice *rch;
115     CMS_SignerInfo *si;

117     for (i = 0; i < sk_CMS_CertificateChoices_num(sd->certificates); i++)
118     {
119         cch = sk_CMS_CertificateChoices_value(sd->certificates, i);
120         if (cch->type == CMS_CERTCHOICE_OTHER)
121         {
122             if (sd->version < 5)
123                 sd->version = 5;
124         }
125         else if (cch->type == CMS_CERTCHOICE_V2ACERT)
126         {
127             if (sd->version < 4)

```

```

128         sd->version = 4;
129     }
130     else if (cch->type == CMS_CERTCHOICE_V1ACERT)
131     {
132         if (sd->version < 3)
133             sd->version = 3;
134     }
135 }

137 for (i = 0; i < sk_CMS_RevocationInfoChoice_num(sd->crls); i++)
138 {
139     rch = sk_CMS_RevocationInfoChoice_value(sd->crls, i);
140     if (rch->type == CMS_REVCHOICE_OTHER)
141     {
142         if (sd->version < 5)
143             sd->version = 5;
144     }
145 }

147 if ((OBJ_obj2nid(sd->encapContentInfo->eContentType) != NID_pkcs7_data)
148     && (sd->version < 3))
149     sd->version = 3;

151 for (i = 0; i < sk_CMS_SignerInfo_num(sd->signerInfos); i++)
152 {
153     si = sk_CMS_SignerInfo_value(sd->signerInfos, i);
154     if (si->sid->type == CMS_SIGNERINFO_KEYIDENTIFIER)
155     {
156         if (si->version < 3)
157             si->version = 3;
158         if (sd->version < 3)
159             sd->version = 3;
160     }
161     else
162         sd->version = 1;
163 }

165 if (sd->version < 1)
166     sd->version = 1;

168 }
169
170 /* Copy an existing messageDigest value */

172 static int cms_copy_messageDigest(CMS_ContentInfo *cms, CMS_SignerInfo *si)
173 {
174     STACK_OF(CMS_SignerInfo) *sinfos;
175     CMS_SignerInfo *sitmp;
176     int i;
177     sinfos = CMS_get0_SignerInfos(cms);
178     for (i = 0; i < sk_CMS_SignerInfo_num(sinfos); i++)
179     {
180         ASN1_OCTET_STRING *messageDigest;
181         sitmp = sk_CMS_SignerInfo_value(sinfos, i);
182         if (sitmp == si)
183             continue;
184         if (CMS_signed_get_attr_count(sitmp) < 0)
185             continue;
186         if (OBJ_cmp(si->digestAlgorithm->algorithm,
187                     sitmp->digestAlgorithm->algorithm))
188             continue;
189         messageDigest = CMS_signed_get0_data_by_OBJ(sitmp,
190             OBJ_nid2obj(NID_pkcs9_messageDigest),
191             -3, V_ASN1_OCTET_STRING);
192         if (!messageDigest)
193             {

```

```

194         CMSerr(CMS_F_CMS_COPY_MESSAGEDIGEST,
195             CMS_R_ERROR_READING_MESSAGEDIGEST_ATTRIBUTE);
196         return 0;
197     }

199     if (CMS_signed_add1_attr_by_NID(si, NID_pkcs9_messageDigest,
200         V_ASN1_OCTET_STRING,
201         messageDigest, -1))
202         return 1;
203     else
204         return 0;
205 }
206 CMSerr(CMS_F_CMS_COPY_MESSAGEDIGEST, CMS_R_NO_MATCHING_DIGEST);
207 return 0;
208 }

210 int cms_set1_SignerIdentifier(CMS_SignerIdentifier *sid, X509 *cert, int type)
211 {
212     switch(type)
213     {
214     case CMS_SIGNERINFO_ISSUER_SERIAL:
215         sid->d.issuerAndSerialNumber =
216             M_ASN1_new_of(CMS_IssuerAndSerialNumber);
217         if (!sid->d.issuerAndSerialNumber)
218             goto merr;
219         if (!X509_NAME_set(&sid->d.issuerAndSerialNumber->issuer,
220             X509_get_issuer_name(cert)))
221             goto merr;
222         if (!ASN1_STRING_copy(
223             sid->d.issuerAndSerialNumber->serialNumber,
224             X509_get_serialNumber(cert)))
225             goto merr;
226         break;

228     case CMS_SIGNERINFO_KEYIDENTIFIER:
229         if (!cert->skid)
230         {
231             CMSerr(CMS_F_CMS_SET1_SIGNERIDENTIFIER,
232                 CMS_R_CERTIFICATE_HAS_NO_KEYID);
233             return 0;
234         }
235         sid->d.subjectKeyIdentifier = ASN1_STRING_dup(cert->skid);
236         if (!sid->d.subjectKeyIdentifier)
237             goto merr;
238         break;

240     default:
241         CMSerr(CMS_F_CMS_SET1_SIGNERIDENTIFIER, CMS_R_UNKNOWN_ID);
242         return 0;
243     }

245     sid->type = type;
247     return 1;

249     merr:
250     CMSerr(CMS_F_CMS_SET1_SIGNERIDENTIFIER, ERR_R_MALLOC_FAILURE);
251     return 0;

253 }

255 int cms_SignerIdentifier_get0_signer_id(CMS_SignerIdentifier *sid,
256     ASN1_OCTET_STRING **keyid,
257     X509_NAME **issuer, ASN1_INTEGER **sno)
258 {
259     if (sid->type == CMS_SIGNERINFO_ISSUER_SERIAL)

```

```

260     {
261         if (issuer)
262             *issuer = sid->d.issuerAndSerialNumber->issuer;
263         if (sno)
264             *sno = sid->d.issuerAndSerialNumber->serialNumber;
265     }
266     else if (sid->type == CMS_SIGNERINFO_KEYIDENTIFIER)
267     {
268         if (keyid)
269             *keyid = sid->d.subjectKeyIdentifier;
270     }
271     else
272         return 0;
273     return 1;
274 }

276 int cms_SignerIdentifier_cert_cmp(CMS_SignerIdentifier *sid, X509 *cert)
277 {
278     int ret;
279     if (sid->type == CMS_SIGNERINFO_ISSUER_SERIAL)
280     {
281         ret = X509_NAME_cmp(sid->d.issuerAndSerialNumber->issuer,
282                             X509_get_issuer_name(cert));
283         if (ret)
284             return ret;
285         return ASN1_INTEGER_cmp(sid->d.issuerAndSerialNumber->serialNumb
286                                 X509_get_serialNumber(cert));
287     }
288     else if (sid->type == CMS_SIGNERINFO_KEYIDENTIFIER)
289     {
290         X509_check_purpose(cert, -1, -1);
291         if (!cert->skid)
292             return -1;
293         return ASN1_OCTET_STRING_cmp(sid->d.subjectKeyIdentifier,
294                                       cert->skid);
295     }
296     else
297         return -1;
298 }

300 CMS_SignerInfo *CMS_add1_signer(CMS_ContentInfo *cms,
301                                 X509 *signer, EVP_PKEY *pk, const EVP_MD *md,
302                                 unsigned int flags)
303 {
304     CMS_SignedData *sd;
305     CMS_SignerInfo *si = NULL;
306     X509_ALGOR *alg;
307     int i, type;
308     if (!X509_check_private_key(signer, pk))
309     {
310         CMSerr(CMS_F_CMS_ADD1_SIGNER,
311                CMS_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE);
312         return NULL;
313     }
314     sd = cms_signed_data_init(cms);
315     if (!sd)
316         goto err;
317     si = M_ASN1_new_of(CMS_SignerInfo);
318     if (!si)
319         goto merr;
320     X509_check_purpose(signer, -1, -1);

322     CRYPTO_add(&pk->references, 1, CRYPTO_LOCK_EVP_PKEY);
323     CRYPTO_add(&signer->references, 1, CRYPTO_LOCK_X509);

325     si->pkey = pk;

```

```

326     si->signer = signer;

328     if (flags & CMS_USE_KEYID)
329     {
330         si->version = 3;
331         if (sd->version < 3)
332             sd->version = 3;
333         type = CMS_SIGNERINFO_KEYIDENTIFIER;
334     }
335     else
336     {
337         type = CMS_SIGNERINFO_ISSUER_SERIAL;
338         si->version = 1;
339     }

341     if (!cms_set1_SignerIdentifier(si->sid, signer, type))
342         goto err;

344     if (md == NULL)
345     {
346         int def_nid;
347         if (EVP_PKEY_get_default_digest_nid(pk, &def_nid) <= 0)
348             goto err;
349         md = EVP_get_digestbynid(def_nid);
350         if (md == NULL)
351         {
352             CMSerr(CMS_F_CMS_ADD1_SIGNER, CMS_R_NO_DEFAULT_DIGEST);
353             goto err;
354         }
355     }

357     if (!md)
358     {
359         CMSerr(CMS_F_CMS_ADD1_SIGNER, CMS_R_NO_DIGEST_SET);
360         goto err;
361     }

363     cms_DigestAlgorithm_set(si->digestAlgorithm, md);

365     /* See if digest is present in digestAlgorithms */
366     for (i = 0; i < sk_X509_ALGOR_num(sd->digestAlgorithms); i++)
367     {
368         ASN1_OBJECT *aoid;
369         alg = sk_X509_ALGOR_value(sd->digestAlgorithms, i);
370         X509_ALGOR_get0(&aoid, NULL, NULL, alg);
371         if (OBJ_obj2nid(aoid) == EVP_MD_type(md))
372             break;
373     }

375     if (i == sk_X509_ALGOR_num(sd->digestAlgorithms))
376     {
377         alg = X509_ALGOR_new();
378         if (!alg)
379             goto merr;
380         cms_DigestAlgorithm_set(alg, md);
381         if (!sk_X509_ALGOR_push(sd->digestAlgorithms, alg))
382         {
383             X509_ALGOR_free(alg);
384             goto merr;
385         }
386     }

388     if (pk->ameth && pk->ameth->pkey_ctrl)
389     {
390         i = pk->ameth->pkey_ctrl(pk, ASN1_PKEY_CTRL_CMS_SIGN,
391                                 0, si);

```

```

392     if (i == -2)
393     {
394         CMSerr(CMS_F_CMS_ADD1_SIGNER,
395             CMS_R_NOT_SUPPORTED_FOR_THIS_KEY_TYPE);
396         goto err;
397     }
398     if (i <= 0)
399     {
400         CMSerr(CMS_F_CMS_ADD1_SIGNER, CMS_R_CTRL_FAILURE);
401         goto err;
402     }
403 }
404
405 if (!(flags & CMS_NOATTR))
406 {
407     /* Initialize signed attributes structure so other
408     * attributes such as signing time etc are added later
409     * even if we add none here.
410     */
411     if (!si->signedAttrs)
412     {
413         si->signedAttrs = sk_X509_ATTRIBUTE_new_null();
414         if (!si->signedAttrs)
415             goto merr;
416     }
417
418     if (!(flags & CMS_NOSMIMECAP))
419     {
420         STACK_OF(X509_ALGOR) *smcap = NULL;
421         i = CMS_add_standard_smimecap(&smcap);
422         if (i)
423             i = CMS_add_smimecap(si, smcap);
424         sk_X509_ALGOR_pop_free(smcap, X509_ALGOR_free);
425         if (!i)
426             goto merr;
427     }
428     if (flags & CMS_REUSE_DIGEST)
429     {
430         if (!cms_copy_messageDigest(cms, si))
431             goto err;
432         if (!(flags & CMS_PARTIAL) &&
433             !CMS_SignerInfo_sign(si))
434             goto err;
435     }
436 }
437
438 if (!(flags & CMS_NOCERTS))
439 {
440     /* NB ignore -1 return for duplicate cert */
441     if (!CMS_add1_cert(cms, signer))
442         goto merr;
443 }
444
445 if (!sd->signerInfos)
446     sd->signerInfos = sk_CMS_SignerInfo_new_null();
447 if (!sd->signerInfos ||
448     !sk_CMS_SignerInfo_push(sd->signerInfos, si))
449     goto merr;
450
451 return si;
452
453 merr:
454 CMSerr(CMS_F_CMS_ADD1_SIGNER, ERR_R_MALLOC_FAILURE);
455 err:
456 if (si)
457     M_ASN1_free_of(si, CMS_SignerInfo);

```

```

458     return NULL;
459 }
460
461 static int cms_add1_signingTime(CMS_SignerInfo *si, ASN1_TIME *t)
462 {
463     ASN1_TIME *tt;
464     int r = 0;
465     if (t)
466         tt = t;
467     else
468         tt = X509_gmtime_adj(NULL, 0);
469
470     if (!tt)
471         goto merr;
472
473     if (CMS_signed_add1_attr_by_NID(si, NID_pkcs9_signingTime,
474                                     tt->type, tt, -1) <= 0)
475         goto merr;
476
477     r = 1;
478 merr:
479     if (!t)
480         ASN1_TIME_free(tt);
481
482     if (!r)
483         CMSerr(CMS_F_CMS_ADD1_SIGNINGTIME, ERR_R_MALLOC_FAILURE);
484
485     return r;
486 }
487
488 STACK_OF(CMS_SignerInfo) *CMS_get0_SignerInfos(CMS_ContentInfo *cms)
489 {
490     CMS_SignedData *sd;
491     sd = cms_get0_signed(cms);
492     if (!sd)
493         return NULL;
494     return sd->signerInfos;
495 }
496
497 STACK_OF(X509) *CMS_get0_signers(CMS_ContentInfo *cms)
498 {
499     STACK_OF(X509) *signers = NULL;
500     STACK_OF(CMS_SignerInfo) *sinfos;
501     CMS_SignerInfo *si;
502     int i;
503     sinfos = CMS_get0_SignerInfos(cms);
504     for (i = 0; i < sk_CMS_SignerInfo_num(sinfos); i++)
505     {
506         si = sk_CMS_SignerInfo_value(sinfos, i);
507         if (si->signer)
508         {
509             if (!signers)
510             {
511                 signers = sk_X509_new_null();
512                 if (!signers)
513                     return NULL;
514             }
515             if (!sk_X509_push(signers, si->signer))
516             {
517                 sk_X509_free(signers);
518                 return NULL;
519             }
520         }
521     }
522     return signers;
523 }

```



```

524     }
525     }
526     return signers;
527 }

529 void CMS_SignerInfo_set1_signer_cert(CMS_SignerInfo *si, X509 *signer)
530 {
531     if (signer)
532     {
533         CRYPTO_add(&signer->references, 1, CRYPTO_LOCK_X509);
534         if (si->pkey)
535             EVP_PKEY_free(si->pkey);
536         si->pkey = X509_get_pubkey(signer);
537     }
538     if (si->signer)
539         X509_free(si->signer);
540     si->signer = signer;
541 }

543 int CMS_SignerInfo_get0_signer_id(CMS_SignerInfo *si,
544                                   ASN1_OCTET_STRING **keyid,
545                                   X509_NAME **issuer, ASN1_INTEGER **sno)
546 {
547     return cms_SignerIdentifier_get0_signer_id(si->sid, keyid, issuer, sno);
548 }

550 int CMS_SignerInfo_cert_cmp(CMS_SignerInfo *si, X509 *cert)
551 {
552     return cms_SignerIdentifier_cert_cmp(si->sid, cert);
553 }

555 int CMS_set1_signers_certs(CMS_ContentInfo *cms, STACK_OF(X509) *scerts,
556                           unsigned int flags)
557 {
558     CMS_SignedData *sd;
559     CMS_SignerInfo *si;
560     CMS_CertificateChoices *cch;
561     STACK_OF(CMS_CertificateChoices) *certs;
562     X509 *x;
563     int i, j;
564     int ret = 0;
565     sd = cms_get0_signed(cms);
566     if (!sd)
567         return -1;
568     certs = sd->certificates;
569     for (i = 0; i < sk_CMS_SignerInfo_num(sd->signerInfos); i++)
570     {
571         si = sk_CMS_SignerInfo_value(sd->signerInfos, i);
572         if (si->signer)
573             continue;

575         for (j = 0; j < sk_X509_num(scerts); j++)
576         {
577             x = sk_X509_value(scerts, j);
578             if (CMS_SignerInfo_cert_cmp(si, x) == 0)
579             {
580                 CMS_SignerInfo_set1_signer_cert(si, x);
581                 ret++;
582                 break;
583             }
584         }

586         if (si->signer || (flags & CMS_NOINTERN))
587             continue;

589         for (j = 0; j < sk_CMS_CertificateChoices_num(certs); j++)

```

```

590     {
591         cch = sk_CMS_CertificateChoices_value(certs, j);
592         if (cch->type != 0)
593             continue;
594         x = cch->d.certificate;
595         if (CMS_SignerInfo_cert_cmp(si, x) == 0)
596         {
597             CMS_SignerInfo_set1_signer_cert(si, x);
598             ret++;
599             break;
600         }
601     }
602     return ret;
603 }
604

606 void CMS_SignerInfo_get0_algs(CMS_SignerInfo *si, EVP_PKEY **pk, X509 **signer,
607                               X509_ALGOR **pdig, X509_ALGOR **psig)
608 {
609     if (pk)
610         *pk = si->pkey;
611     if (signer)
612         *signer = si->signer;
613     if (pdig)
614         *pdig = si->digestAlgorithm;
615     if (psig)
616         *psig = si->signatureAlgorithm;
617 }

619 static int cms_SignerInfo_content_sign(CMS_ContentInfo *cms,
620                                        CMS_SignerInfo *si, BIO *chain)
621 {
622     EVP_MD_CTX mctx;
623     int r = 0;
624     EVP_MD_CTX_init(&mctx);

627     if (!si->pkey)
628     {
629         CMSerr(CMS_F_CMS_SIGNERINFO_CONTENT_SIGN, CMS_R_NO_PRIVATE_KEY);
630         return 0;
631     }

633     if (!cms_DigestAlgorithm_find_ctx(&mctx, chain, si->digestAlgorithm))
634         goto err;

636     /* If any signed attributes calculate and add messageDigest attribute */

638     if (CMS_signed_get_attr_count(si) >= 0)
639     {
640         ASN1_OBJECT *ctype =
641             cms->d.signedData->encapContentInfo->eContentType;
642         unsigned char md[EVP_MAX_MD_SIZE];
643         unsigned int mdlen;
644         if (!EVP_DigestFinal_ex(&mctx, md, &mdlen))
645             goto err;
646         if (!CMS_signed_add1_attr_by_NID(si, NID_pkcs9_messageDigest,
647                                         V_ASN1_OCTET_STRING,
648                                         md, mdlen))
649             goto err;

650         /* Copy content type across */
651         if (CMS_signed_add1_attr_by_NID(si, NID_pkcs9_contentType,
652                                         V_ASN1_OBJECT, ctype, -1) <= 0)
653             goto err;
654         if (!CMS_SignerInfo_sign(si))
655             goto err;

```

```

656     }
657     else
658     {
659         unsigned char *sig;
660         unsigned int siglen;
661         sig = OPENSSL_malloc(EVP_PKEY_size(si->pkey));
662         if (!sig)
663         {
664             CMSerr(CMS_F_CMS_SIGNERINFO_CONTENT_SIGN,
665                   ERR_R_MALLOC_FAILURE);
666             goto err;
667         }
668         if (!EVP_SignFinal(&mctx, sig, &siglen, si->pkey))
669         {
670             CMSerr(CMS_F_CMS_SIGNERINFO_CONTENT_SIGN,
671                   CMS_R_SIGNATURE_ERROR);
672             OPENSSL_free(sig);
673             goto err;
674         }
675         ASN1_STRING_set0(si->signature, sig, siglen);
676     }
677
678     r = 1;
679
680     err:
681     EVP_MD_CTX_cleanup(&mctx);
682     return r;
683 }
684
685 int cms_SignedData_final(CMS_ContentInfo *cms, BIO *chain)
686 {
687     STACK_OF(CMS_SignerInfo) *sinfos;
688     CMS_SignerInfo *si;
689     int i;
690     sinfos = CMS_get0_SignerInfos(cms);
691     for (i = 0; i < sk_CMS_SignerInfo_num(sinfos); i++)
692     {
693         si = sk_CMS_SignerInfo_value(sinfos, i);
694         if (!cms_SignerInfo_content_sign(cms, si, chain))
695             return 0;
696     }
697     cms->d.signedData->encapContentInfo->partial = 0;
698     return 1;
699 }
700
701 int CMS_SignerInfo_sign(CMS_SignerInfo *si)
702 {
703     EVP_MD_CTX mctx;
704     EVP_PKEY_CTX *pctx;
705     unsigned char *abuf = NULL;
706     int alen;
707     size_t siglen;
708     const EVP_MD *md = NULL;
709
710     md = EVP_get_digestbyobj(si->digestAlgorithm->algorithm);
711     if (md == NULL)
712         return 0;
713
714     EVP_MD_CTX_init(&mctx);
715
716     if (CMS_signed_get_attr_by_NID(si, NID_pkcs9_signingTime, -1) < 0)
717     {
718         if (!cms_add1_signingTime(si, NULL))
719             goto err;
720     }
721 }

```

```

723     if (EVP_DigestSignInit(&mctx, &pctx, md, NULL, si->pkey) <= 0)
724         goto err;
725
726     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_SIGN,
727                           EVP_PKEY_CTRL_CMS_SIGN, 0, si) <= 0)
728     {
729         CMSerr(CMS_F_CMS_SIGNERINFO_SIGN, CMS_R_CTRL_ERROR);
730         goto err;
731     }
732
733     alen = ASN1_item_i2d((ASN1_VALUE *)si->signedAttrs,&abuf,
734                          ASN1_ITEM_rptr(CMS_Attributes_Sign));
735     if (!abuf)
736         goto err;
737     if (EVP_DigestSignUpdate(&mctx, abuf, alen) <= 0)
738         goto err;
739     if (EVP_DigestSignFinal(&mctx, NULL, &siglen) <= 0)
740         goto err;
741     OPENSSL_free(abuf);
742     abuf = OPENSSL_malloc(siglen);
743     if (!abuf)
744         goto err;
745     if (EVP_DigestSignFinal(&mctx, abuf, &siglen) <= 0)
746         goto err;
747
748     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_SIGN,
749                           EVP_PKEY_CTRL_CMS_SIGN, 1, si) <= 0)
750     {
751         CMSerr(CMS_F_CMS_SIGNERINFO_SIGN, CMS_R_CTRL_ERROR);
752         goto err;
753     }
754
755     EVP_MD_CTX_cleanup(&mctx);
756
757     ASN1_STRING_set0(si->signature, abuf, siglen);
758
759     return 1;
760
761     err:
762     if (abuf)
763         OPENSSL_free(abuf);
764     EVP_MD_CTX_cleanup(&mctx);
765     return 0;
766 }
767
768 int CMS_SignerInfo_verify(CMS_SignerInfo *si)
769 {
770     EVP_MD_CTX mctx;
771     EVP_PKEY_CTX *pctx;
772     unsigned char *abuf = NULL;
773     int alen, r = -1;
774     const EVP_MD *md = NULL;
775
776     if (!si->pkey)
777     {
778         CMSerr(CMS_F_CMS_SIGNERINFO_VERIFY, CMS_R_NO_PUBLIC_KEY);
779         return -1;
780     }
781
782     md = EVP_get_digestbyobj(si->digestAlgorithm->algorithm);
783     if (md == NULL)
784         return -1;
785     EVP_MD_CTX_init(&mctx);
786     if (EVP_DigestVerifyInit(&mctx, &pctx, md, NULL, si->pkey) <= 0)

```

```
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_sd.c
```

```

854         if (!os)
855             {
856                 CMS_Serr(CMS_F_CMS_SIGNERINFO_VERIFY_CONTENT,
857                     CMS_R_ERROR_READING_MESSAGEDIGEST_ATTRIBUTE);
858                 goto err;
859             }
860     }

862     if (!cms_DigestAlgorithm_find_ctx(&mctx, chain, si->digestAlgorithm))
863         goto err;

865     /* If messageDigest found compare it */

867     if (os)
868     {
869         unsigned char mval[EVP_MAX_MD_SIZE];
870         unsigned int mlen;
871         if (EVP_DigestFinal_ex(&mctx, mval, &mlen) <= 0)
872         {
873             CMS_Serr(CMS_F_CMS_SIGNERINFO_VERIFY_CONTENT,
874                 CMS_R_UNABLE_TO_FINALIZE_CONTEXT);
875             goto err;
876         }
877         if (mlen != (unsigned int)os->length)
878         {
879             CMS_Serr(CMS_F_CMS_SIGNERINFO_VERIFY_CONTENT,
880                 CMS_R_MESSAGEDIGEST_ATTRIBUTE_WRONG_LENGTH);
881             goto err;
882         }

884         if (memcmp(mval, os->data, mlen))
885         {
886             CMS_Serr(CMS_F_CMS_SIGNERINFO_VERIFY_CONTENT,
887                 CMS_R_VERIFICATION_FAILURE);
888             r = 0;
889         }
890         else
891             r = 1;
892     }
893     else
894     {
895         r = EVP_VerifyFinal(&mctx, si->signature->data,
896             si->signature->length, si->pkey);
897         if (r <= 0)
898         {
899             CMS_Serr(CMS_F_CMS_SIGNERINFO_VERIFY_CONTENT,
900                 CMS_R_VERIFICATION_FAILURE);
901             r = 0;
902         }
903     }

905     err:
906     EVP_MD_CTX_cleanup(&mctx);
907     return r;

909 }

911 int CMS_add_smimecap(CMS_SignerInfo *si, STACK_OF(X509_ALGOR) *algs)
912 {
913     unsigned char *smder = NULL;
914     int smderlen, r;
915     smderlen = i2d_X509_ALGORS(algs, &smder);
916     if (smderlen <= 0)
917         return 0;
918     r = CMS_signed_add1_attr_by_NID(si, NID_SMIMECapabilities,
919         V_ASN1_SEQUENCE, smder, smderlen);

```

```

920     OPENSSL_free(smder);
921     return r;
922 }

924 int CMS_add_simple_smimecap(STACK_OF(X509_ALGOR) **algs,
925                             int algnid, int keysize)
926 {
927     X509_ALGOR *alg;
928     ASN1_INTEGER *key = NULL;
929     if (keysize > 0)
930     {
931         key = ASN1_INTEGER_new();
932         if (!key || !ASN1_INTEGER_set(key, keysize))
933             return 0;
934     }
935     alg = X509_ALGOR_new();
936     if (!alg)
937     {
938         if (key)
939             ASN1_INTEGER_free(key);
940         return 0;
941     }
942     X509_ALGOR_set0(alg, OBJ_nid2obj(algnid),
943                     key ? V_ASN1_INTEGER : V_ASN1_UNDEF, key);
944     if (!*algs)
945         *algs = sk_X509_ALGOR_new_null();
946     if (!*algs || !sk_X509_ALGOR_push(*algs, alg))
947     {
948         X509_ALGOR_free(alg);
949         return 0;
950     }
951     return 1;
952 }
953

955 /* Check to see if a cipher exists and if so add S/MIME capabilities */

957 static int cms_add_cipher_smcap(STACK_OF(X509_ALGOR) **sk, int nid, int arg)
958 {
959     if (EVP_get_cipherbynid(nid))
960         return CMS_add_simple_smimecap(sk, nid, arg);
961     return 1;
962 }

964 static int cms_add_digest_smcap(STACK_OF(X509_ALGOR) **sk, int nid, int arg)
965 {
966     if (EVP_get_digestbynid(nid))
967         return CMS_add_simple_smimecap(sk, nid, arg);
968     return 1;
969 }

971 int CMS_add_standard_smimecap(STACK_OF(X509_ALGOR) **smcap)
972 {
973     if (!cms_add_cipher_smcap(smcap, NID_aes_256_cbc, -1))
974         !cms_add_digest_smcap(smcap, NID_id_GostR3411_94, -1)
975         !cms_add_cipher_smcap(smcap, NID_id_Gost28147_89, -1)
976         !cms_add_cipher_smcap(smcap, NID_aes_192_cbc, -1)
977         !cms_add_cipher_smcap(smcap, NID_aes_128_cbc, -1)
978         !cms_add_cipher_smcap(smcap, NID_des_ede3_cbc, -1)
979         !cms_add_cipher_smcap(smcap, NID_rc2_cbc, 128)
980         !cms_add_cipher_smcap(smcap, NID_rc2_cbc, 64)
981         !cms_add_cipher_smcap(smcap, NID_des_cbc, -1)
982         !cms_add_cipher_smcap(smcap, NID_rc2_cbc, 40))
983         return 0;
984     return 1;
985 }

```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_smime.c

1

```
*****
19452 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/cms/cms_smime.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cms/cms_smime.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

54 #include "cryptlib.h"
55 #include <openssl/asn1t.h>
56 #include <openssl/x509.h>
57 #include <openssl/x509v3.h>
58 #include <openssl/err.h>
59 #include <openssl/cms.h>
60 #include "cms_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/cms/cms_smime.c

2

```
62 static int cms_copy_content(BIO *out, BIO *in, unsigned int flags)
63 {
64     unsigned char buf[4096];
65     int r = 0, i;
66     BIO *tmpout = NULL;
67
68     if (out == NULL)
69         tmpout = BIO_new(BIO_s_null());
70     else if (flags & CMS_TEXT)
71     {
72         tmpout = BIO_new(BIO_s_mem());
73         BIO_set_mem_eof_return(tmpout, 0);
74     }
75     else
76         tmpout = out;
77
78     if (!tmpout)
79     {
80         CMSerr(CMS_F_CMS_COPY_CONTENT, ERR_R_MALLOC_FAILURE);
81         goto err;
82     }
83
84     /* Read all content through chain to process digest, decrypt etc */
85     for (;;)
86     {
87         i=BIO_read(in, buf, sizeof(buf));
88         if (i <= 0)
89         {
90             if (BIO_method_type(in) == BIO_TYPE_CIPHER)
91             {
92                 if (!BIO_get_cipher_status(in))
93                     goto err;
94             }
95             if (i < 0)
96                 goto err;
97             break;
98         }
99
100         if (tmpout && (BIO_write(tmpout, buf, i) != i))
101             goto err;
102     }
103
104     if (flags & CMS_TEXT)
105     {
106         if (!SMIME_text(tmpout, out))
107         {
108             CMSerr(CMS_F_CMS_COPY_CONTENT, CMS_R_SMIME_TEXT_ERROR);
109             goto err;
110         }
111     }
112
113     r = 1;
114
115     err:
116     if (tmpout && (tmpout != out))
117         BIO_free(tmpout);
118     return r;
119
120 }

122 static int check_content(CMS_ContentInfo *cms)
123 {
124     ASN1_OCTET_STRING **pos = CMS_get0_content(cms);
125     if (!pos || !*pos)
126     {
127         CMSerr(CMS_F_CHECK_CONTENT, CMS_R_NO_CONTENT);
```

```

128         return 0;
129     }
130     return 1;
131 }

133 static void do_free_upto(BIO *f, BIO *upto)
134 {
135     if (upto)
136     {
137         BIO *tbio;
138         do
139         {
140             tbio = BIO_pop(f);
141             BIO_free(f);
142             f = tbio;
143         }
144         while (f != upto);
145     }
146     else
147         BIO_free_all(f);
148 }

150 int CMS_data(CMS_ContentInfo *cms, BIO *out, unsigned int flags)
151 {
152     BIO *cont;
153     int r;
154     if (OBJ_obj2nid(CMS_get0_type(cms)) != NID_pkcs7_data)
155     {
156         CMSerr(CMS_F_CMS_DATA, CMS_R_TYPE_NOT_DATA);
157         return 0;
158     }
159     cont = CMS_dataInit(cms, NULL);
160     if (!cont)
161         return 0;
162     r = cms_copy_content(out, cont, flags);
163     BIO_free_all(cont);
164     return r;
165 }

167 CMS_ContentInfo *CMS_data_create(BIO *in, unsigned int flags)
168 {
169     CMS_ContentInfo *cms;
170     cms = cms_Data_create();
171     if (!cms)
172         return NULL;

174     if ((flags & CMS_STREAM) || CMS_final(cms, in, NULL, flags))
175         return cms;

177     CMS_ContentInfo_free(cms);

179     return NULL;
180 }

182 int CMS_digest_verify(CMS_ContentInfo *cms, BIO *dcont, BIO *out,
183                      unsigned int flags)
184 {
185     BIO *cont;
186     int r;
187     if (OBJ_obj2nid(CMS_get0_type(cms)) != NID_pkcs7_digest)
188     {
189         CMSerr(CMS_F_CMS_DIGEST_VERIFY, CMS_R_TYPE_NOT_DIGESTED_DATA);
190         return 0;
191     }

193     if (!dcont && !check_content(cms))

```

```

194         return 0;

196     cont = CMS_dataInit(cms, dcont);
197     if (!cont)
198         return 0;
199     r = cms_copy_content(out, cont, flags);
200     if (r)
201         r = cms_DigestedData_do_final(cms, cont, 1);
202     do_free_upto(cont, dcont);
203     return r;
204 }

206 CMS_ContentInfo *CMS_digest_create(BIO *in, const EVP_MD *md,
207                                   unsigned int flags)
208 {
209     CMS_ContentInfo *cms;
210     if (!md)
211         md = EVP_sha1();
212     cms = cms_DigestedData_create(md);
213     if (!cms)
214         return NULL;

216     if(!(flags & CMS_DETACHED))
217         CMS_set_detached(cms, 0);

219     if ((flags & CMS_STREAM) || CMS_final(cms, in, NULL, flags))
220         return cms;

222     CMS_ContentInfo_free(cms);
223     return NULL;
224 }

226 int CMS_EncryptedData_decrypt(CMS_ContentInfo *cms,
227                               const unsigned char *key, size_t keylen,
228                               BIO *dcont, BIO *out, unsigned int flags)
229 {
230     BIO *cont;
231     int r;
232     if (OBJ_obj2nid(CMS_get0_type(cms)) != NID_pkcs7_encrypted)
233     {
234         CMSerr(CMS_F_CMS_ENCRYPTEDDATA_DECRYPT,
235               CMS_R_TYPE_NOT_ENCRYPTED_DATA);
236         return 0;
237     }

239     if (!dcont && !check_content(cms))
240         return 0;

242     if (CMS_EncryptedData_set1_key(cms, NULL, key, keylen) <= 0)
243         return 0;
244     cont = CMS_dataInit(cms, dcont);
245     if (!cont)
246         return 0;
247     r = cms_copy_content(out, cont, flags);
248     do_free_upto(cont, dcont);
249     return r;
250 }

252 CMS_ContentInfo *CMS_EncryptedData_encrypt(BIO *in, const EVP_CIPHER *cipher,
253                                             const unsigned char *key, size_t keylen,
254                                             unsigned int flags)
255 {
256     CMS_ContentInfo *cms;
257     if (!cipher)
258     {
259         CMSerr(CMS_F_CMS_ENCRYPTEDDATA_ENCRYPT, CMS_R_NO_CIPHER);

```

```

260         return NULL;
261     }
262     cms = CMS_ContentInfo_new();
263     if (!cms)
264         return NULL;
265     if (!CMS_EncryptedData_set1_key(cms, cipher, key, keylen))
266         return NULL;

268     if(!(flags & CMS_DETACHED))
269         CMS_set_detached(cms, 0);

271     if ((flags & (CMS_STREAM|CMS_PARTIAL))
272         || CMS_final(cms, in, NULL, flags))
273         return cms;

275     CMS_ContentInfo_free(cms);
276     return NULL;
277 }

279 static int cms_signerinfo_verify_cert(CMS_SignerInfo *si,
280                                       X509_STORE *store,
281                                       STACK_OF(X509) *certs,
282                                       STACK_OF(X509_CRL) *crls,
283                                       unsigned int flags)
284 {
285     X509_STORE_CTX ctx;
286     X509 *signer;
287     int i, j, r = 0;
288     CMS_SignerInfo_get0_algs(si, NULL, &signer, NULL, NULL);
289     if (!X509_STORE_CTX_init(&ctx, store, signer, certs))
290     {
291         CMSerr(CMS_F_CMS_SIGNERINFO_VERIFY_CERT,
292               CMS_R_STORE_INIT_ERROR);
293         goto err;
294     }
295     X509_STORE_CTX_set_default(&ctx, "smime_sign");
296     if (crls)
297         X509_STORE_CTX_set0_crls(&ctx, crls);

299     i = X509_verify_cert(&ctx);
300     if (i <= 0)
301     {
302         j = X509_STORE_CTX_get_error(&ctx);
303         CMSerr(CMS_F_CMS_SIGNERINFO_VERIFY_CERT,
304               CMS_R_CERTIFICATE_VERIFY_ERROR);
305         ERR_add_error_data(2, "Verify error:",
306                           X509_verify_cert_error_string(j));
307         goto err;
308     }
309     r = 1;
310     err:
311     X509_STORE_CTX_cleanup(&ctx);
312     return r;

314 }

316 int CMS_verify(CMS_ContentInfo *cms, STACK_OF(X509) *certs,
317               X509_STORE *store, BIO *dcont, BIO *out, unsigned int flags)
318 {
319     CMS_SignerInfo *si;
320     STACK_OF(CMS_SignerInfo) *sinfos;
321     STACK_OF(X509) *cms_certs = NULL;
322     STACK_OF(X509_CRL) *crls = NULL;
323     X509 *signer;
324     int i, scount = 0, ret = 0;
325     BIO *cmsbio = NULL, *tmpin = NULL;

```

```

327     if (!dcont && !check_content(cms))
328         return 0;

330     /* Attempt to find all signer certificates */

332     sinfos = CMS_get0_SignerInfos(cms);

334     if (sk_CMS_SignerInfo_num(sinfos) <= 0)
335     {
336         CMSerr(CMS_F_CMS_VERIFY, CMS_R_NO_SIGNERS);
337         goto err;
338     }

340     for (i = 0; i < sk_CMS_SignerInfo_num(sinfos); i++)
341     {
342         si = sk_CMS_SignerInfo_value(sinfos, i);
343         CMS_SignerInfo_get0_algs(si, NULL, &signer, NULL, NULL);
344         if (signer)
345             scount++;
346     }

348     if (scount != sk_CMS_SignerInfo_num(sinfos))
349         scount += CMS_set1_signers_certs(cms, certs, flags);

351     if (scount != sk_CMS_SignerInfo_num(sinfos))
352     {
353         CMSerr(CMS_F_CMS_VERIFY, CMS_R_SIGNER_CERTIFICATE_NOT_FOUND);
354         goto err;
355     }

357     /* Attempt to verify all signers certs */

359     if (!(flags & CMS_NO_SIGNER_CERT_VERIFY))
360     {
361         cms_certs = CMS_get1_certs(cms);
362         if (!(flags & CMS_NOCRL))
363             crls = CMS_get1_crls(cms);
364         for (i = 0; i < sk_CMS_SignerInfo_num(sinfos); i++)
365         {
366             si = sk_CMS_SignerInfo_value(sinfos, i);
367             if (!cms_signerinfo_verify_cert(si, store,
368                                             cms_certs, crls, flags))
369                 goto err;
370         }
371     }

373     /* Attempt to verify all SignerInfo signed attribute signatures */

375     if (!(flags & CMS_NO_ATTR_VERIFY))
376     {
377         for (i = 0; i < sk_CMS_SignerInfo_num(sinfos); i++)
378         {
379             si = sk_CMS_SignerInfo_value(sinfos, i);
380             if (CMS_signed_get_attr_count(si) < 0)
381                 continue;
382             if (CMS_SignerInfo_verify(si) <= 0)
383                 goto err;
384         }
385     }

387     /* Performance optimization: if the content is a memory BIO then
388     * store its contents in a temporary read only memory BIO. This
389     * avoids potentially large numbers of slow copies of data which will
390     * occur when reading from a read write memory BIO when signatures
391     * are calculated.

```

```

392     */
393
394     if (dcont && (BIO_method_type(dcont) == BIO_TYPE_MEM))
395     {
396         char *ptr;
397         long len;
398         len = BIO_get_mem_data(dcont, &ptr);
399         tmpin = BIO_new_mem_buf(ptr, len);
400         if (tmpin == NULL)
401         {
402             CMSerr(CMS_F_CMS_VERIFY, ERR_R_MALLOC_FAILURE);
403             return 0;
404         }
405     }
406     else
407         tmpin = dcont;
408
409
410     cmsbio=CMS_dataInit(cms, tmpin);
411     if (!cmsbio)
412         goto err;
413
414     if (!cms_copy_content(out, cmsbio, flags))
415         goto err;
416
417     if (!(flags & CMS_NO_CONTENT_VERIFY))
418     {
419         for (i = 0; i < sk_CMS_SignerInfo_num(sinfos); i++)
420         {
421             si = sk_CMS_SignerInfo_value(sinfos, i);
422             if (CMS_SignerInfo_verify_content(si, cmsbio) <= 0)
423             {
424                 CMSerr(CMS_F_CMS_VERIFY,
425                     CMS_R_CONTENT_VERIFY_ERROR);
426                 goto err;
427             }
428         }
429     }
430
431     ret = 1;
432
433     err:
434
435     if (dcont && (tmpin == dcont))
436         do_free_upto(cmsbio, dcont);
437     else
438         BIO_free_all(cmsbio);
439
440     if (cms_certs)
441         sk_X509_pop_free(cms_certs, X509_free);
442     if (crls)
443         sk_X509_CRL_pop_free(crls, X509_CRL_free);
444
445     return ret;
446 }
447
448 int CMS_verify_receipt(CMS_ContentInfo *rcms, CMS_ContentInfo *ocms,
449     STACK_OF(X509) *certs,
450     X509_STORE *store, unsigned int flags)
451 {
452     int r;
453     flags &= ~(CMS_DETACHED|CMS_TEXT);
454     r = CMS_verify(rcms, certs, store, NULL, NULL, flags);
455     if (r <= 0)
456         return r;
457     return cms_Receipt_verify(rcms, ocms);

```

```

458     }
459
460     CMS_ContentInfo *CMS_sign(X509 *signcert, EVP_PKEY *pkey, STACK_OF(X509) *certs,
461         BIO *data, unsigned int flags)
462     {
463         CMS_ContentInfo *cms;
464         int i;
465
466         cms = CMS_ContentInfo_new();
467         if (!cms || !CMS_SignedData_init(cms))
468             goto merr;
469
470         if (pkey && !CMS_add1_signer(cms, signcert, pkey, NULL, flags))
471         {
472             CMSerr(CMS_F_CMS_SIGN, CMS_R_ADD_SIGNER_ERROR);
473             goto err;
474         }
475
476         for (i = 0; i < sk_X509_num(certs); i++)
477         {
478             X509 *x = sk_X509_value(certs, i);
479             if (!CMS_add1_cert(cms, x))
480                 goto merr;
481         }
482
483         if(!(flags & CMS_DETACHED))
484             CMS_set_detached(cms, 0);
485
486         if ((flags & (CMS_STREAM|CMS_PARTIAL))
487             || CMS_final(cms, data, NULL, flags))
488             return cms;
489         else
490             goto err;
491
492     merr:
493     CMSerr(CMS_F_CMS_SIGN, ERR_R_MALLOC_FAILURE);
494
495     err:
496     if (cms)
497         CMS_ContentInfo_free(cms);
498     return NULL;
499 }
500
501 CMS_ContentInfo *CMS_sign_receipt(CMS_SignerInfo *si,
502     X509 *signcert, EVP_PKEY *pkey,
503     STACK_OF(X509) *certs,
504     unsigned int flags)
505 {
506     CMS_SignerInfo *rct_si;
507     CMS_ContentInfo *cms = NULL;
508     ASN1_OCTET_STRING **pos, *os;
509     BIO *rct_cont = NULL;
510     int r = 0;
511
512     flags &= ~(CMS_STREAM|CMS_TEXT);
513     /* Not really detached but avoids content being allocated */
514     flags |= CMS_PARTIAL|CMS_BINARY|CMS_DETACHED;
515     if (!pkey || !signcert)
516     {
517         CMSerr(CMS_F_CMS_SIGN_RECEIPT, CMS_R_NO_KEY_OR_CERT);
518         return NULL;
519     }
520
521     /* Initialize signed data */
522
523     cms = CMS_sign(NULL, NULL, certs, NULL, flags);

```



```

524     if (!cms)
525         goto err;

527     /* Set inner content type to signed receipt */
528     if (!CMS_set1_eContentType(cms, OBJ_nid2obj(NID_id_smime_ct_receipt)))
529         goto err;

531     rct_si = CMS_add1_signer(cms, signcert, pkey, NULL, flags);
532     if (!rct_si)
533     {
534         CMSerr(CMS_F_CMS_SIGN_RECEIPT, CMS_R_ADD_SIGNER_ERROR);
535         goto err;
536     }

538     os = cms_encode_Receipt(si);

540     if (!os)
541         goto err;

543     /* Set content to digest */
544     rct_cont = BIO_new_mem_buf(os->data, os->length);
545     if (!rct_cont)
546         goto err;

548     /* Add msgSigDigest attribute */

550     if (!cms_msgSigDigest_add1(rct_si, si))
551         goto err;

553     /* Finalize structure */
554     if (!CMS_final(cms, rct_cont, NULL, flags))
555         goto err;

557     /* Set embedded content */
558     pos = CMS_get0_content(cms);
559     *pos = os;

561     r = 1;

563     err:
564     if (rct_cont)
565         BIO_free(rct_cont);
566     if (r)
567         return cms;
568     CMS_ContentInfo_free(cms);
569     return NULL;

571 }

573 CMS_ContentInfo *CMS_encrypt(STACK_OF(X509) *certs, BIO *data,
574                             const EVP_CIPHER *cipher, unsigned int flags)
575 {
576     CMS_ContentInfo *cms;
577     int i;
578     X509 *recip;
579     cms = CMS_EnvelopedData_create(cipher);
580     if (!cms)
581         goto merr;
582     for (i = 0; i < sk_X509_num(certs); i++)
583     {
584         recip = sk_X509_value(certs, i);
585         if (!CMS_add1_recipient_cert(cms, recip, flags))
586         {
587             CMSerr(CMS_F_CMS_ENCRYPT, CMS_R_RECIPIENT_ERROR);
588             goto err;
589         }

```

```

590     }

592     if(!(flags & CMS_DETACHED))
593         CMS_set_detached(cms, 0);

595     if ((flags & (CMS_STREAM|CMS_PARTIAL))
596         || CMS_final(cms, data, NULL, flags))
597         return cms;
598     else
599         goto err;

601     merr:
602     CMSerr(CMS_F_CMS_ENCRYPT, ERR_R_MALLOC_FAILURE);
603     err:
604     if (cms)
605         CMS_ContentInfo_free(cms);
606     return NULL;
607 }

609 int CMS_decrypt_set1_pkey(CMS_ContentInfo *cms, EVP_PKEY *pk, X509 *cert)
610 {
611     STACK_OF(CMS_RecipientInfo) *ris;
612     CMS_RecipientInfo *ri;
613     int i, r;
614     int debug = 0;
615     ris = CMS_get0_RecipientInfos(cms);
616     if (ris)
617         debug = cms->d.envelopedData->encryptedContentInfo->debug;
618     for (i = 0; i < sk_CMS_RecipientInfo_num(ris); i++)
619     {
620         ri = sk_CMS_RecipientInfo_value(ris, i);
621         if (CMS_RecipientInfo_type(ri) != CMS_RECIPINFO_TRANS)
622             continue;
623         /* If we have a cert try matching RecipientInfo
624            * otherwise try them all.
625         */
626         if (!cert || (CMS_RecipientInfo_ktri_cert_cmp(ri, cert) == 0))
627         {
628             CMS_RecipientInfo_set0_pkey(ri, pk);
629             r = CMS_RecipientInfo_decrypt(cms, ri);
630             CMS_RecipientInfo_set0_pkey(ri, NULL);
631             if (cert)
632             {
633                 /* If not debugging clear any error and
634                  * return success to avoid leaking of
635                  * information useful to MMA
636                  */
637                 if (!debug)
638                 {
639                     ERR_clear_error();
640                     return 1;
641                 }
642                 if (r > 0)
643                     return 1;
644                 CMSerr(CMS_F_CMS_DECRYPT_SET1_PKEY,
645                     CMS_R_DECRYPT_ERROR);
646                 return 0;
647             }
648             /* If no cert and not debugging don't leave loop
649              * after first successful decrypt. Always attempt
650              * to decrypt all recipients to avoid leaking timing
651              * of a successful decrypt.
652             */
653             else if (r > 0 && debug)
654                 return 1;
655         }

```

```

656     }
657     /* If no cert and not debugging always return success */
658     if (!cert && !debug)
659     {
660         ERR_clear_error();
661         return 1;
662     }

664     CMSerr(CMS_F_CMS_DECRYPT_SET1_PKEY, CMS_R_NO_MATCHING_RECIPIENT);
665     return 0;

667 }

669 int CMS_decrypt_set1_key(CMS_ContentInfo *cms,
670                         unsigned char *key, size_t keylen,
671                         unsigned char *id, size_t idlen)
672 {
673     STACK_OF(CMS_RecipientInfo) *ris;
674     CMS_RecipientInfo *ri;
675     int i, r;
676     ris = CMS_get0_RecipientInfos(cms);
677     for (i = 0; i < sk_CMS_RecipientInfo_num(ris); i++)
678     {
679         ri = sk_CMS_RecipientInfo_value(ris, i);
680         if (CMS_RecipientInfo_type(ri) != CMS_RECIPINFO_KEY)
681             continue;

683         /* If we have an id try matching RecipientInfo
684          * otherwise try them all.
685          */
686         if (!id || (CMS_RecipientInfo_kekri_id_cmp(ri, id, idlen) == 0))
687         {
688             CMS_RecipientInfo_set0_key(ri, key, keylen);
689             r = CMS_RecipientInfo_decrypt(cms, ri);
690             CMS_RecipientInfo_set0_key(ri, NULL, 0);
691             if (r > 0)
692                 return 1;
693             if (id)
694             {
695                 CMSerr(CMS_F_CMS_DECRYPT_SET1_KEY,
696                       CMS_R_DECRYPT_ERROR);
697                 return 0;
698             }
699             ERR_clear_error();
700         }
701     }

703     CMSerr(CMS_F_CMS_DECRYPT_SET1_KEY, CMS_R_NO_MATCHING_RECIPIENT);
704     return 0;

706 }

708 int CMS_decrypt_set1_password(CMS_ContentInfo *cms,
709                              unsigned char *pass, ossl_ssize_t passlen)
710 {
711     STACK_OF(CMS_RecipientInfo) *ris;
712     CMS_RecipientInfo *ri;
713     int i, r;
714     ris = CMS_get0_RecipientInfos(cms);
715     for (i = 0; i < sk_CMS_RecipientInfo_num(ris); i++)
716     {
717         ri = sk_CMS_RecipientInfo_value(ris, i);
718         if (CMS_RecipientInfo_type(ri) != CMS_RECIPINFO_PASS)
719             continue;
720         CMS_RecipientInfo_set0_password(ri, pass, passlen);
721         r = CMS_RecipientInfo_decrypt(cms, ri);

```

```

722         CMS_RecipientInfo_set0_password(ri, NULL, 0);
723         if (r > 0)
724             return 1;
725     }

727     CMSerr(CMS_F_CMS_DECRYPT_SET1_PASSWORD, CMS_R_NO_MATCHING_RECIPIENT);
728     return 0;

730 }

731 int CMS_decrypt(CMS_ContentInfo *cms, EVP_PKEY *pk, X509 *cert,
732                BIO *dcont, BIO *out,
733                unsigned int flags)
734 {
735     int r;
736     BIO *cont;
737     if (OBJ_obj2nid(CMS_get0_type(cms)) != NID_pkcs7_enveloped)
738     {
739         CMSerr(CMS_F_CMS_DECRYPT, CMS_R_TYPE_NOT_ENVELOPED_DATA);
740         return 0;
741     }
742     if (!dcont && !check_content(cms))
743         return 0;
744     if (flags & CMS_DEBUG_DECRYPT)
745         cms->d.envelopedData->encryptedContentInfo->debug = 1;
746     else
747         cms->d.envelopedData->encryptedContentInfo->debug = 0;
748     if (!pk && !cert && !dcont && !out)
749         return 1;
750     if (pk && !CMS_decrypt_set1_pkey(cms, pk, cert))
751         return 0;
752     cont = CMS_dataInit(cms, dcont);
753     if (!cont)
754         return 0;
755     r = cms_copy_content(out, cont, flags);
756     do_free_upto(cont, dcont);
757     return r;
758 }

759

761 int CMS_final(CMS_ContentInfo *cms, BIO *data, BIO *dcont, unsigned int flags)
762 {
763     BIO *cmsbio;
764     int ret = 0;
765     if (!(cmsbio = CMS_dataInit(cms, dcont)))
766     {
767         CMSerr(CMS_F_CMS_FINAL, ERR_R_MALLOC_FAILURE);
768         return 0;
769     }

771     SMIME_crlf_copy(data, cmsbio, flags);

773     (void)BIO_flush(cmsbio);

776     if (!CMS_dataFinal(cms, cmsbio))
777     {
778         CMSerr(CMS_F_CMS_FINAL, CMS_R_CMS_DATAFINAL_ERROR);
779         goto err;
780     }

782     ret = 1;

784     err:
785     do_free_upto(cmsbio, dcont);

787     return ret;

```

```
789     }
791 #ifdef ZLIB
793 int CMS_uncompress(CMS_ContentInfo *cms, BIO *dcont, BIO *out,
794                   unsigned int flags)
795 {
796     BIO *cont;
797     int r;
798     if (OBJ_obj2nid(CMS_get0_type(cms)) != NID_id_smime_ct_compressedData)
799     {
800         CMSerr(CMS_F_CMS_UNCOMPRESS,
801               CMS_R_TYPE_NOT_COMPRESSED_DATA);
802         return 0;
803     }
805     if (!dcont && !check_content(cms))
806         return 0;
808     cont = CMS_dataInit(cms, dcont);
809     if (!cont)
810         return 0;
811     r = cms_copy_content(out, cont, flags);
812     do_free_upto(cont, dcont);
813     return r;
814 }
816 CMS_ContentInfo *CMS_compress(BIO *in, int comp_nid, unsigned int flags)
817 {
818     CMS_ContentInfo *cms;
819     if (comp_nid <= 0)
820         comp_nid = NID_zlib_compression;
821     cms = cms_CompressedData_create(comp_nid);
822     if (!cms)
823         return NULL;
825     if(!(flags & CMS_DETACHED))
826         CMS_set_detached(cms, 0);
828     if ((flags & CMS_STREAM) || CMS_final(cms, in, NULL, flags))
829         return cms;
831     CMS_ContentInfo_free(cms);
832     return NULL;
833 }
835 #else
837 int CMS_uncompress(CMS_ContentInfo *cms, BIO *dcont, BIO *out,
838                   unsigned int flags)
839 {
840     CMSerr(CMS_F_CMS_UNCOMPRESS, CMS_R_UNSUPPORTED_COMPRESSION_ALGORITHM);
841     return 0;
842 }
844 CMS_ContentInfo *CMS_compress(BIO *in, int comp_nid, unsigned int flags)
845 {
846     CMSerr(CMS_F_CMS_COMPRESS, CMS_R_UNSUPPORTED_COMPRESSION_ALGORITHM);
847     return NULL;
848 }
850 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/comp/c_rle.c

1

1151 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/comp/c_rle.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>
4 #include <openssl/objects.h>
5 #include <openssl/comp.h>

7 static int rle_compress_block(COMP_CTX *ctx, unsigned char *out,
8 unsigned int olen, unsigned char *in, unsigned int ilen);
9 static int rle_expand_block(COMP_CTX *ctx, unsigned char *out,
10 unsigned int olen, unsigned char *in, unsigned int ilen);

12 static COMP_METHOD rle_method={
13     NID_rle_compression,
14     LN_rle_compression,
15     NULL,
16     NULL,
17     rle_compress_block,
18     rle_expand_block,
19     NULL,
20     NULL,
21 };

23 COMP_METHOD *COMP_rle(void)
24 {
25     return(&rle_method);
26 }

28 static int rle_compress_block(COMP_CTX *ctx, unsigned char *out,
29 unsigned int olen, unsigned char *in, unsigned int ilen)
30 {
31     /* int i; */

33     if (ilen == 0 || olen < (ilen-1))
34     {
35         /* ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ */
36         return(-1);
37     }

39     *(out++)=0;
40     memcpy(out,in,ilen);
41     return(ilen+1);
42 }

44 static int rle_expand_block(COMP_CTX *ctx, unsigned char *out,
45 unsigned int olen, unsigned char *in, unsigned int ilen)
46 {
47     int i;

49     if (olen < (ilen-1))
50     {
51         /* ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ */
52         return(-1);
53     }

55     i= *(in++);
56     if (i == 0)
57     {
58         memcpy(out,in,ilen-1);
59     }
60     return(ilen-1);
61 }
```

new/usr/src/lib/openssl/libsunw_crypto/comp/c_rle.c

2

new/usr/src/lib/openssl/libsunw_crypto/comp/c_zlib.c

1

```
*****
18005 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/comp/c_zlib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>
4 #include <openssl/objects.h>
5 #include <openssl/comp.h>
6 #include <openssl/err.h>

8 COMP_METHOD *COMP_zlib(void );

10 static COMP_METHOD zlib_method_nozlib={
11     NID_undef,
12     "(undef)",
13     NULL,
14     NULL,
15     NULL,
16     NULL,
17     NULL,
18     NULL,
19     };

21 #ifndef ZLIB
22 #undef ZLIB_SHARED
23 #else

25 #include <zlib.h>

27 static int zlib_stateful_init(COMP_CTX *ctx);
28 static void zlib_stateful_finish(COMP_CTX *ctx);
29 static int zlib_stateful_compress_block(COMP_CTX *ctx, unsigned char *out,
30     unsigned int olen, unsigned char *in, unsigned int ilen);
31 static int zlib_stateful_expand_block(COMP_CTX *ctx, unsigned char *out,
32     unsigned int olen, unsigned char *in, unsigned int ilen);

35 /* memory allocations functions for zlib initialization */
36 static void* zlib_zalloc(void* opaque, unsigned int no, unsigned int size)
37 {
38     void *p;
39
40     p=OPENSSL_malloc(no*size);
41     if (p)
42         memset(p, 0, no*size);
43     return p;
44 }

47 static void zlib_zfree(void* opaque, void* address)
48 {
49     OPENSSL_free(address);
50 }

52 #if 0
53 static int zlib_compress_block(COMP_CTX *ctx, unsigned char *out,
54     unsigned int olen, unsigned char *in, unsigned int ilen);
55 static int zlib_expand_block(COMP_CTX *ctx, unsigned char *out,
56     unsigned int olen, unsigned char *in, unsigned int ilen);

58 static int zz_uncompress(Bytef *dest, uLongf *destLen, const Bytef *source,
59     uLong sourceLen);

61 static COMP_METHOD zlib_stateless_method={
```

new/usr/src/lib/openssl/libsunw_crypto/comp/c_zlib.c

2

```
62     NID_zlib_compression,
63     LN_zlib_compression,
64     NULL,
65     NULL,
66     zlib_compress_block,
67     zlib_expand_block,
68     NULL,
69     NULL,
70     };
71 #endif

73 static COMP_METHOD zlib_stateful_method={
74     NID_zlib_compression,
75     LN_zlib_compression,
76     zlib_stateful_init,
77     zlib_stateful_finish,
78     zlib_stateful_compress_block,
79     zlib_stateful_expand_block,
80     NULL,
81     NULL,
82     };

84 /*
85  * When OpenSSL is built on Windows, we do not want to require that
86  * the ZLIB.DLL be available in order for the OpenSSL DLLs to
87  * work. Therefore, all ZLIB routines are loaded at run time
88  * and we do not link to a .LIB file when ZLIB_SHARED is set.
89  */
90 #if defined(OPENSSL_SYS_WINDOWS) || defined(OPENSSL_SYS_WIN32)
91 #include <windows.h>
92 #endif /* !(OPENSSL_SYS_WINDOWS || OPENSSL_SYS_WIN32) */

94 #ifdef ZLIB_SHARED
95 #include <openssl/dso.h>

97 /* Function pointers */
98 typedef int (*compress_ft)(Bytef *dest,uLongf *destLen,
99     const Bytef *source, uLong sourceLen);
100 typedef int (*inflateEnd_ft)(z_streamp strm);
101 typedef int (*inflate_ft)(z_streamp strm, int flush);
102 typedef int (*inflateInit_ft)(z_streamp strm,
103     const char * version, int stream_size);
104 typedef int (*deflateEnd_ft)(z_streamp strm);
105 typedef int (*deflate_ft)(z_streamp strm, int flush);
106 typedef int (*deflateInit_ft)(z_streamp strm, int level,
107     const char * version, int stream_size);
108 typedef const char * (*zError_ft)(int err);
109 static compress_ft p_compress=NULL;
110 static inflateEnd_ft p_inflateEnd=NULL;
111 static inflate_ft p_inflate=NULL;
112 static inflateInit_ft p_inflateInit=NULL;
113 static deflateEnd_ft p_deflateEnd=NULL;
114 static deflate_ft p_deflate=NULL;
115 static deflateInit_ft p_deflateInit=NULL;
116 static zError_ft p_zError=NULL;

118 static int zlib_loaded = 0; /* only attempt to init func pts once */
119 static DSO *zlib_dso = NULL;

121 #define compress p_compress
122 #define inflateEnd p_inflateEnd
123 #define inflate p_inflate
124 #define inflateInit_ p_inflateInit_
125 #define deflateEnd p_deflateEnd
126 #define deflate p_deflate
127 #define deflateInit_ p_deflateInit_
```

```

128 #define zError                p_zError
129 #endif /* ZLIB_SHARED */

131 struct zlib_state
132 {
133     z_stream istream;
134     z_stream ostream;
135 };

137 static int zlib_stateful_ex_idx = -1;

139 static int zlib_stateful_init(COMP_CTX *ctx)
140 {
141     int err;
142     struct zlib_state *state =
143         (struct zlib_state *)OPENSSL_malloc(sizeof(struct zlib_state));

145     if (state == NULL)
146         goto err;

148     state->istream.zalloc = zlib_zalloc;
149     state->istream.zfree = zlib_zfree;
150     state->istream.opaque = Z_NULL;
151     state->istream.next_in = Z_NULL;
152     state->istream.next_out = Z_NULL;
153     state->istream.avail_in = 0;
154     state->istream.avail_out = 0;
155     err = inflateInit_(&state->istream,
156                       ZLIB_VERSION, sizeof(z_stream));
157     if (err != Z_OK)
158         goto err;

160     state->ostream.zalloc = zlib_zalloc;
161     state->ostream.zfree = zlib_zfree;
162     state->ostream.opaque = Z_NULL;
163     state->ostream.next_in = Z_NULL;
164     state->ostream.next_out = Z_NULL;
165     state->ostream.avail_in = 0;
166     state->ostream.avail_out = 0;
167     err = deflateInit_(&state->ostream, Z_DEFAULT_COMPRESSION,
168                       ZLIB_VERSION, sizeof(z_stream));
169     if (err != Z_OK)
170         goto err;

172     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_COMP, ctx, &ctx->ex_data);
173     CRYPTO_set_ex_data(&ctx->ex_data, zlib_stateful_ex_idx, state);
174     return 1;
175 err:
176     if (state) OPENSSL_free(state);
177     return 0;
178 }

180 static void zlib_stateful_finish(COMP_CTX *ctx)
181 {
182     struct zlib_state *state =
183         (struct zlib_state *)CRYPTO_get_ex_data(&ctx->ex_data,
184                                                zlib_stateful_ex_idx);
185     inflateEnd(&state->istream);
186     deflateEnd(&state->ostream);
187     OPENSSL_free(state);
188     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_COMP, ctx, &ctx->ex_data);
189 }

191 static int zlib_stateful_compress_block(COMP_CTX *ctx, unsigned char *out,
192 unsigned int olen, unsigned char *in, unsigned int ilen)
193 {

```

```

194     int err = Z_OK;
195     struct zlib_state *state =
196         (struct zlib_state *)CRYPTO_get_ex_data(&ctx->ex_data,
197                                                zlib_stateful_ex_idx);

199     if (state == NULL)
200         return -1;

202     state->ostream.next_in = in;
203     state->ostream.avail_in = ilen;
204     state->ostream.next_out = out;
205     state->ostream.avail_out = olen;
206     if (ilen > 0)
207         err = deflate(&state->ostream, Z_SYNC_FLUSH);
208     if (err != Z_OK)
209         return -1;

210 #ifdef DEBUG_ZLIB
211     fprintf(stderr, "compress(%4d)->%4d %s\n",
212            ilen, olen - state->ostream.avail_out,
213            (ilen != olen - state->ostream.avail_out)?"zlib":"clear");
214 #endif
215     return olen - state->ostream.avail_out;
216 }

218 static int zlib_stateful_expand_block(COMP_CTX *ctx, unsigned char *out,
219 unsigned int olen, unsigned char *in, unsigned int ilen)
220 {
221     int err = Z_OK;

223     struct zlib_state *state =
224         (struct zlib_state *)CRYPTO_get_ex_data(&ctx->ex_data,
225                                                zlib_stateful_ex_idx);

227     if (state == NULL)
228         return 0;

230     state->istream.next_in = in;
231     state->istream.avail_in = ilen;
232     state->istream.next_out = out;
233     state->istream.avail_out = olen;
234     if (ilen > 0)
235         err = inflate(&state->istream, Z_SYNC_FLUSH);
236     if (err != Z_OK)
237         return -1;

238 #ifdef DEBUG_ZLIB
239     fprintf(stderr, "expand(%4d)->%4d %s\n",
240            ilen, olen - state->istream.avail_out,
241            (ilen != olen - state->istream.avail_out)?"zlib":"clear");
242 #endif
243     return olen - state->istream.avail_out;
244 }

246 #if 0
247 static int zlib_compress_block(COMP_CTX *ctx, unsigned char *out,
248 unsigned int olen, unsigned char *in, unsigned int ilen)
249 {
250     unsigned long l;
251     int i;
252     int clear=1;

254     if (ilen > 128)
255     {
256         out[0]=1;
257         l=olen-1;
258         i=compress(&out[1], &l, in, (unsigned long)ilen);
259         if (i != Z_OK)

```

```

260         return(-1);
261     if (ilen > l)
262     {
263         clear=0;
264         l++;
265     }
266 }
267 if (clear)
268 {
269     out[0]=0;
270     memcpy(&(out[1]),in,ilen);
271     l=ilen+1;
272 }
273 #ifdef DEBUG_ZLIB
274 fprintf(stderr,"compress(%4d)->%4d %s\n",
275         ilen,(int)l,(clear?"clear":"zlib");
276 #endif
277 return((int)l);
278 }

280 static int zlib_expand_block(COMP_CTX *ctx, unsigned char *out,
281                             unsigned int olen, unsigned char *in, unsigned int ilen)
282 {
283     unsigned long l;
284     int i;

286     if (in[0])
287     {
288         l=olen;
289         i=zz_uncompress(out,&l,&(in[1]),(unsigned long)ilen-1);
290         if (i != Z_OK)
291             return(-1);
292     }
293     else
294     {
295         memcpy(out,&(in[1]),ilen-1);
296         l=ilen-1;
297     }
298 #ifdef DEBUG_ZLIB
299 fprintf(stderr,"expand (%4d)->%4d %s\n",
300         ilen,(int)l,in[0]?"zlib":"clear");
301 #endif
302 return((int)l);
303 }

305 static int zz_uncompress (Bytef *dest, uLongf *destLen, const Bytef *source,
306                          uLong sourceLen)
307 {
308     z_stream stream;
309     int err;

311     stream.next_in = (Bytef*)source;
312     stream.avail_in = (uInt)sourceLen;
313     /* Check for source > 64K on 16-bit machine: */
314     if ((uLong)stream.avail_in != sourceLen) return Z_BUF_ERROR;

316     stream.next_out = dest;
317     stream.avail_out = (uInt)*destLen;
318     if ((uLong)stream.avail_out != *destLen) return Z_BUF_ERROR;

320     stream.zalloc = (alloc_func)0;
321     stream.zfree = (free_func)0;

323     err = inflateInit_(&stream,
324                       ZLIB_VERSION, sizeof(z_stream));
325     if (err != Z_OK) return err;

```

```

327     err = inflate(&stream, Z_FINISH);
328     if (err != Z_STREAM_END) {
329         inflateEnd(&stream);
330         return err;
331     }
332     *destLen = stream.total_out;

334     err = inflateEnd(&stream);
335     return err;
336 }
337 #endif

339 #endif

341 COMP_METHOD *COMP_zlib(void)
342 {
343     COMP_METHOD *meth = &zlib_method_nozlib;

345 #ifdef ZLIB_SHARED
346     if (!zlib_loaded)
347     {
348         #if defined(OPENSSSL_SYS_WINDOWS) || defined(OPENSSSL_SYS_WIN32)
349             zlib_dso = DSO_load(NULL, "ZLIB1", NULL, 0);
350         #else
351             zlib_dso = DSO_load(NULL, "z", NULL, 0);
352         #endif
353         if (zlib_dso != NULL)
354         {
355             p_compress
356                 = (compress_ft) DSO_bind_func(zlib_dso,
357                                               "compress");
358             p_inflateEnd
359                 = (inflateEnd_ft) DSO_bind_func(zlib_dso,
360                                                  "inflateEnd");
361             p_inflate
362                 = (inflate_ft) DSO_bind_func(zlib_dso,
363                                              "inflate");
364             p_inflateInit_
365                 = (inflateInit_ft) DSO_bind_func(zlib_dso,
366                                                  "inflateInit_");
367             p_deflateEnd
368                 = (deflateEnd_ft) DSO_bind_func(zlib_dso,
369                                                  "deflateEnd");
370             p_deflate
371                 = (deflate_ft) DSO_bind_func(zlib_dso,
372                                              "deflate");
373             p_deflateInit_
374                 = (deflateInit_ft) DSO_bind_func(zlib_dso,
375                                                  "deflateInit_");
376             p_zError
377                 = (zError_ft) DSO_bind_func(zlib_dso,
378                                              "zError");

380             if (p_compress && p_inflateEnd && p_inflate
381                 && p_inflateInit_ && p_deflateEnd
382                 && p_deflate && p_deflateInit_ && p_zError)
383                 zlib_loaded++;
384         }
385     }

387 #endif
388 #ifdef ZLIB_SHARED
389     if (zlib_loaded)
390 #endif
391 #if defined(ZLIB) || defined(ZLIB_SHARED)

```

```

392     {
393         /* init zlib_stateful_ex_idx here so that in a multi-process
394          * application it's enough to initialize openssl before forking
395          * (idx will be inherited in all the children) */
396         if (zlib_stateful_ex_idx == -1)
397         {
398             CRYPTO_w_lock(CRYPTO_LOCK_COMP);
399             if (zlib_stateful_ex_idx == -1)
400                 zlib_stateful_ex_idx =
401                     CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_
402                                             0, NULL, NULL, NULL, NULL);
403             CRYPTO_w_unlock(CRYPTO_LOCK_COMP);
404             if (zlib_stateful_ex_idx == -1)
405                 goto err;
406         }
407
408         meth = &zlib_stateful_method;
409     }
410 err:
411 #endif
412
413     return(meth);
414 }
415
416 void COMP_zlib_cleanup(void)
417 {
418     #ifdef ZLIB_SHARED
419         if (zlib_dso)
420             DSO_free(zlib_dso);
421     #endif
422 }
423
424 #ifdef ZLIB
425
426 /* Zlib based compression/decompression filter BIO */
427
428 typedef struct
429 {
430     unsigned char *ibuf; /* Input buffer */
431     int ibufsize; /* Buffer size */
432     z_stream zin; /* Input decompress context */
433     unsigned char *obuf; /* Output buffer */
434     int obufsize; /* Output buffer size */
435     unsigned char *optr; /* Position in output buffer */
436     int ocount; /* Amount of data in output buffer */
437     int odone; /* deflate EOF */
438     int comp_level; /* Compression level to use */
439     z_stream zout; /* Output compression context */
440 } BIO_ZLIB_CTX;
441
442 #define ZLIB_DEFAULT_BUFSIZE 1024
443
444 static int bio_zlib_new(BIO *bi);
445 static int bio_zlib_free(BIO *bi);
446 static int bio_zlib_read(BIO *b, char *out, int outl);
447 static int bio_zlib_write(BIO *b, const char *in, int inl);
448 static long bio_zlib_ctrl(BIO *b, int cmd, long num, void *ptr);
449 static long bio_zlib_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp);
450
451 static BIO_METHOD bio_meth_zlib =
452 {
453     BIO_TYPE_COMP,
454     "zlib",
455     bio_zlib_write,
456     bio_zlib_read,
457     NULL,

```

```

458     NULL,
459     bio_zlib_ctrl,
460     bio_zlib_new,
461     bio_zlib_free,
462     bio_zlib_callback_ctrl
463 };
464
465 BIO_METHOD *BIO_f_zlib(void)
466 {
467     return &bio_meth_zlib;
468 }
469
470 static int bio_zlib_new(BIO *bi)
471 {
472     BIO_ZLIB_CTX *ctx;
473     #ifdef ZLIB_SHARED
474     (void)COMP_zlib();
475     if (!zlib_loaded)
476     {
477         COMPerr(COMP_F_BIO_ZLIB_NEW, COMP_R_ZLIB_NOT_SUPPORTED);
478         return 0;
479     }
480     #endif
481     ctx = OPENSSL_malloc(sizeof(BIO_ZLIB_CTX));
482     if (!ctx)
483     {
484         COMPerr(COMP_F_BIO_ZLIB_NEW, ERR_R_MALLOC_FAILURE);
485         return 0;
486     }
487     ctx->ibuf = NULL;
488     ctx->obuf = NULL;
489     ctx->ibufsize = ZLIB_DEFAULT_BUFSIZE;
490     ctx->obufsize = ZLIB_DEFAULT_BUFSIZE;
491     ctx->zin.zalloc = Z_NULL;
492     ctx->zin.zfree = Z_NULL;
493     ctx->zin.next_in = NULL;
494     ctx->zin.avail_in = 0;
495     ctx->zin.next_out = NULL;
496     ctx->zin.avail_out = 0;
497     ctx->zout.zalloc = Z_NULL;
498     ctx->zout.zfree = Z_NULL;
499     ctx->zout.next_in = NULL;
500     ctx->zout.avail_in = 0;
501     ctx->zout.next_out = NULL;
502     ctx->zout.avail_out = 0;
503     ctx->odone = 0;
504     ctx->comp_level = Z_DEFAULT_COMPRESSION;
505     bi->init = 1;
506     bi->ptr = (char *)ctx;
507     bi->flags = 0;
508     return 1;
509 }
510
511 static int bio_zlib_free(BIO *bi)
512 {
513     BIO_ZLIB_CTX *ctx;
514     if (!bi) return 0;
515     ctx = (BIO_ZLIB_CTX *)bi->ptr;
516     if (ctx->ibuf)
517     {
518         /* Destroy decompress context */
519         inflateEnd(&ctx->zin);
520         OPENSSL_free(ctx->ibuf);
521     }
522     if (ctx->obuf)

```



```

524     {
525         /* Destroy compress context */
526         deflateEnd(&ctx->zout);
527         OPENSSL_free(ctx->obuf);
528     }
529     OPENSSL_free(ctx);
530     bi->ptr = NULL;
531     bi->init = 0;
532     bi->flags = 0;
533     return 1;
534 }

536 static int bio_zlib_read(BIO *b, char *out, int outl)
537 {
538     BIO_ZLIB_CTX *ctx;
539     int ret;
540     z_stream *zin;
541     if(!out || !outl) return 0;
542     ctx = (BIO_ZLIB_CTX *)b->ptr;
543     zin = &ctx->zin;
544     BIO_clear_retry_flags(b);
545     if(!ctx->ibuf)
546     {
547         ctx->ibuf = OPENSSL_malloc(ctx->ibufsize);
548         if(!ctx->ibuf)
549         {
550             COMPerr(COMP_F_BIO_ZLIB_READ, ERR_R_MALLOC_FAILURE);
551             return 0;
552         }
553         inflateInit(zin);
554         zin->next_in = ctx->ibuf;
555         zin->avail_in = 0;
556     }

558     /* Copy output data directly to supplied buffer */
559     zin->next_out = (unsigned char *)out;
560     zin->avail_out = (unsigned int)outl;
561     for(;;)
562     {
563         /* Decompress while data available */
564         while(zin->avail_in)
565         {
566             ret = inflate(zin, 0);
567             if((ret != Z_OK) && (ret != Z_STREAM_END))
568             {
569                 COMPerr(COMP_F_BIO_ZLIB_READ,
570                     COMP_R_ZLIB_INFLATE_ERROR);
571                 ERR_add_error_data(2, "zlib error:",
572                     zError(ret));
573                 return 0;
574             }
575             /* If EOF or we've read everything then return */
576             if((ret == Z_STREAM_END) || !zin->avail_out)
577                 return outl - zin->avail_out;
578         }

580         /* No data in input buffer try to read some in,
581          * if an error then return the total data read.
582          */
583         ret = BIO_read(b->next_bio, ctx->ibuf, ctx->ibufsize);
584         if(ret <= 0)
585         {
586             /* Total data read */
587             int tot = outl - zin->avail_out;
588             BIO_copy_next_retry(b);
589             if(ret < 0) return (tot > 0) ? tot : ret;

```

```

590         return tot;
591     }
592     zin->avail_in = ret;
593     zin->next_in = ctx->ibuf;
594 }
595 }

597 static int bio_zlib_write(BIO *b, const char *in, int inl)
598 {
599     BIO_ZLIB_CTX *ctx;
600     int ret;
601     z_stream *zout;
602     if(!in || !inl) return 0;
603     ctx = (BIO_ZLIB_CTX *)b->ptr;
604     if(ctx->odone) return 0;
605     zout = &ctx->zout;
606     BIO_clear_retry_flags(b);
607     if(!ctx->obuf)
608     {
609         ctx->obuf = OPENSSL_malloc(ctx->obufsize);
610         /* Need error here */
611         if(!ctx->obuf)
612         {
613             COMPerr(COMP_F_BIO_ZLIB_WRITE, ERR_R_MALLOC_FAILURE);
614             return 0;
615         }
616         ctx->optr = ctx->obuf;
617         ctx->ocount = 0;
618         deflateInit(zout, ctx->comp_level);
619         zout->next_out = ctx->obuf;
620         zout->avail_out = ctx->obufsize;
621     }

622     /* Obtain input data directly from supplied buffer */
623     zout->next_in = (void *)in;
624     zout->avail_in = inl;
625     for(;;)
626     {
627         /* If data in output buffer write it first */
628         while(ctx->ocount) {
629             ret = BIO_write(b->next_bio, ctx->optr, ctx->ocount);
630             if(ret <= 0)
631             {
632                 /* Total data written */
633                 int tot = inl - zout->avail_in;
634                 BIO_copy_next_retry(b);
635                 if(ret < 0) return (tot > 0) ? tot : ret;
636                 return tot;
637             }
638             ctx->optr += ret;
639             ctx->ocount -= ret;
640         }

642         /* Have we consumed all supplied data? */
643         if(!zout->avail_in)
644             return inl;

646         /* Compress some more */

648         /* Reset buffer */
649         ctx->optr = ctx->obuf;
650         zout->next_out = ctx->obuf;
651         zout->avail_out = ctx->obufsize;
652         /* Compress some more */
653         ret = deflate(zout, 0);
654         if(ret != Z_OK)
655         {

```

```

656         COMPerr(COMP_F_BIO_ZLIB_WRITE,
657                 COMP_R_ZLIB_DEFLATE_ERROR);
658         ERR_add_error_data(2, "zlib error:", zError(ret));
659         return 0;
660     }
661     ctx->ocount = ctx->obufsize - zout->avail_out;
662 }
663 }

665 static int bio_zlib_flush(BIO *b)
666 {
667     BIO_ZLIB_CTX *ctx;
668     int ret;
669     Z_stream *zout;
670     ctx = (BIO_ZLIB_CTX *)b->ptr;
671     /* If no data written or already flush show success */
672     if(!ctx->obuf || (ctx->odone && !ctx->ocount)) return 1;
673     zout = &ctx->zout;
674     BIO_clear_retry_flags(b);
675     /* No more input data */
676     zout->next_in = NULL;
677     zout->avail_in = 0;
678     for(;;)
679     {
680         /* If data in output buffer write it first */
681         while(ctx->ocount)
682         {
683             ret = BIO_write(b->next_bio, ctx->optr, ctx->ocount);
684             if(ret <= 0)
685             {
686                 BIO_copy_next_retry(b);
687                 return ret;
688             }
689             ctx->optr += ret;
690             ctx->ocount -= ret;
691         }
692         if(ctx->odone) return 1;

694         /* Compress some more */

696         /* Reset buffer */
697         ctx->optr = ctx->obuf;
698         zout->next_out = ctx->obuf;
699         zout->avail_out = ctx->obufsize;
700         /* Compress some more */
701         ret = deflate(zout, Z_FINISH);
702         if(ret == Z_STREAM_END) ctx->odone = 1;
703         else if(ret != Z_OK)
704         {
705             COMPerr(COMP_F_BIO_ZLIB_FLUSH,
706                     COMP_R_ZLIB_DEFLATE_ERROR);
707             ERR_add_error_data(2, "zlib error:", zError(ret));
708             return 0;
709         }
710         ctx->ocount = ctx->obufsize - zout->avail_out;
711     }
712 }

714 static long bio_zlib_ctrl(BIO *b, int cmd, long num, void *ptr)
715 {
716     BIO_ZLIB_CTX *ctx;
717     int ret, *ip;
718     int ibs, obs;
719     if(!b->next_bio) return 0;
720     ctx = (BIO_ZLIB_CTX *)b->ptr;
721     switch (cmd)

```

```

722     {
723
724     case BIO_CTRL_RESET:
725         ctx->ocount = 0;
726         ctx->odone = 0;
727         ret = 1;
728         break;

730     case BIO_CTRL_FLUSH:
731         ret = bio_zlib_flush(b);
732         if (ret > 0)
733             ret = BIO_flush(b->next_bio);
734         break;

736     case BIO_C_SET_BUFF_SIZE:
737         ibs = -1;
738         obs = -1;
739         if (ptr != NULL)
740         {
741             ip = ptr;
742             if (*ip == 0)
743                 ibs = (int) num;
744             else
745                 obs = (int) num;
746         }
747         else
748         {
749             ibs = (int) num;
750             obs = ibs;
751         }

753         if (ibs != -1)
754         {
755             if (ctx->ibuf)
756             {
757                 OPENSSL_free(ctx->ibuf);
758                 ctx->ibuf = NULL;
759             }
760             ctx->ibufsize = ibs;
761         }

763         if (obs != -1)
764         {
765             if (ctx->obuf)
766             {
767                 OPENSSL_free(ctx->obuf);
768                 ctx->obuf = NULL;
769             }
770             ctx->obufsize = obs;
771         }
772         ret = 1;
773         break;

775     case BIO_C_DO_STATE_MACHINE:
776         BIO_clear_retry_flags(b);
777         ret = BIO_ctrl(b->next_bio, cmd, num, ptr);
778         BIO_copy_next_retry(b);
779         break;

781     default:
782         ret = BIO_ctrl(b->next_bio, cmd, num, ptr);
783         break;

785     }

787     return ret;

```

```
788     }

791 static long bio_zlib_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
792 {
793     if(!b->next_bio)
794         return 0;
795     return
796         BIO_callback_ctrl(b->next_bio, cmd, fp);
797 }

799 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/comp/comp_err.c

1

```
*****
3838 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/comp/comp_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/comp/comp_err.c */
2 /* =====
3 * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
10 * notice, this list of conditions and the following disclaimer.
11 *
12 * 2. Redistributions in binary form must reproduce the above copyright
13 * notice, this list of conditions and the following disclaimer in
14 * the documentation and/or other materials provided with the
15 * distribution.
16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
19 * "This product includes software developed by the OpenSSL Project
20 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23 * endorse or promote products derived from this software without
24 * prior written permission. For written permission, please contact
25 * openssl-core@OpenSSL.org.
26 *
27 * 5. Products derived from this software may not be called "OpenSSL"
28 * nor may "OpenSSL" appear in their names without prior written
29 * permission of the OpenSSL Project.
30 *
31 * 6. Redistributions of any form whatsoever must retain the following
32 * acknowledgment:
33 * "This product includes software developed by the OpenSSL Project
34 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35 *
36 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT 'AS IS' AND ANY
37 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */
60
61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/comp/comp_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/comp.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_COMP,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_COMP,0,reason)
70
71 static ERR_STRING_DATA COMP_str_functs[]=
72 {
73 {ERR_FUNC(COMP_F_BIO_ZLIB_FLUSH), "BIO_ZLIB_FLUSH"},
74 {ERR_FUNC(COMP_F_BIO_ZLIB_NEW), "BIO_ZLIB_NEW"},
75 {ERR_FUNC(COMP_F_BIO_ZLIB_READ), "BIO_ZLIB_READ"},
76 {ERR_FUNC(COMP_F_BIO_ZLIB_WRITE), "BIO_ZLIB_WRITE"},
77 {0,NULL}
78 };
79
80 static ERR_STRING_DATA COMP_str_reasons[]=
81 {
82 {ERR_REASON(COMP_R_ZLIB_DEFLATE_ERROR), "zlib deflate error"},
83 {ERR_REASON(COMP_R_ZLIB_INFLATE_ERROR), "zlib inflate error"},
84 {ERR_REASON(COMP_R_ZLIB_NOT_SUPPORTED), "zlib not supported"},
85 {0,NULL}
86 };
87
88 #endif
89
90 void ERR_load_COMP_strings(void)
91 {
92 #ifndef OPENSSL_NO_ERR
93
94 if (ERR_func_error_string(COMP_str_functs[0].error) == NULL)
95 {
96 ERR_load_strings(0,COMP_str_functs);
97 ERR_load_strings(0,COMP_str_reasons);
98 }
99 #endif
100 }
```

new/usr/src/lib/openssl/libsunw_crypto/comp/comp_lib.c

1

```
*****
1276 Fri May 30 18:31:40 2014
new/usr/src/lib/openssl/libsunw_crypto/comp/comp_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>
4 #include <openssl/objects.h>
5 #include <openssl/comp.h>

7 COMP_CTX *COMP_CTX_new(COMP_METHOD *meth)
8 {
9     COMP_CTX *ret;

11     if ((ret=(COMP_CTX *)OPENSSL_malloc(sizeof(COMP_CTX))) == NULL)
12     {
13         /* ZZZZZZZZZZZZZZZZZZ */
14         return(NULL);
15     }
16     memset(ret,0,sizeof(COMP_CTX));
17     ret->meth=meth;
18     if ((ret->meth->init != NULL) && !ret->meth->init(ret))
19     {
20         OPENSSL_free(ret);
21         ret=NULL;
22     }
23     return(ret);
24 }

26 void COMP_CTX_free(COMP_CTX *ctx)
27 {
28     if(ctx == NULL)
29         return;

31     if (ctx->meth->finish != NULL)
32         ctx->meth->finish(ctx);

34     OPENSSL_free(ctx);
35 }

37 int COMP_compress_block(COMP_CTX *ctx, unsigned char *out, int olen,
38 unsigned char *in, int ilen)
39 {
40     int ret;
41     if (ctx->meth->compress == NULL)
42     {
43         /* ZZZZZZZZZZZZZZZZZZ */
44         return(-1);
45     }
46     ret=ctx->meth->compress(ctx,out,olen,in,ilen);
47     if (ret > 0)
48     {
49         ctx->compress_in+=ilen;
50         ctx->compress_out+=ret;
51     }
52     return(ret);
53 }

55 int COMP_expand_block(COMP_CTX *ctx, unsigned char *out, int olen,
56 unsigned char *in, int ilen)
57 {
58     int ret;

60     if (ctx->meth->expand == NULL)
61     {
```

new/usr/src/lib/openssl/libsunw_crypto/comp/comp_lib.c

2

```
62         /* ZZZZZZZZZZZZZZZZZZ */
63         return(-1);
64     }
65     ret=ctx->meth->expand(ctx,out,olen,in,ilen);
66     if (ret > 0)
67     {
68         ctx->expand_in+=ilen;
69         ctx->expand_out+=ret;
70     }
71     return(ret);
72 }
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_api.c

1

```
*****
8520 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/conf/conf_api.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* conf_api.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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56 * [including the GNU Public Licence.]
57 */

59 /* Part of the code in here was originally in conf.c, which is now removed */

61 #ifndef CONF_DEBUG
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_api.c

2

```
62 # undef NDEBUG /* avoid conflicting definitions */
63 # define NDEBUG
64 #endif

66 #include <assert.h>
67 #include <stdlib.h>
68 #include <string.h>
69 #include <openssl/conf.h>
70 #include <openssl/conf_api.h>
71 #include "e_os.h"

73 static void value_free_hash_doall_arg(CONF_VALUE *a,
74                                       LHASH_OF(CONF_VALUE) *conf);
75 static void value_free_stack_doall(CONF_VALUE *a);
76 static IMPLEMENT_LHASH_DOALL_ARG_FN(value_free_hash, CONF_VALUE,
77                                     LHASH_OF(CONF_VALUE))
78 static IMPLEMENT_LHASH_DOALL_FN(value_free_stack, CONF_VALUE)

80 /* Up until OpenSSL 0.9.5a, this was get_section */
81 CONF_VALUE *_CONF_get_section(const CONF *conf, const char *section)
82 {
83     CONF_VALUE *v,vv;

85     if ((conf == NULL) || (section == NULL)) return(NULL);
86     vv.name=NULL;
87     vv.section=(char *)section;
88     v=lh_CONF_VALUE_retrieve(conf->data,&vv);
89     return(v);
90 }

92 /* Up until OpenSSL 0.9.5a, this was CONF_get_section */
93 STACK_OF(CONF_VALUE) *_CONF_get_section_values(const CONF *conf,
94                                                const char *section)
95 {
96     CONF_VALUE *v;

98     v=_CONF_get_section(conf,section);
99     if (v != NULL)
100         return((STACK_OF(CONF_VALUE) *)v->value);
101     else
102         return(NULL);
103 }

105 int _CONF_add_string(CONF *conf, CONF_VALUE *section, CONF_VALUE *value)
106 {
107     CONF_VALUE *v = NULL;
108     STACK_OF(CONF_VALUE) *ts;

110     ts = (STACK_OF(CONF_VALUE) *)section->value;

112     value->section=section->section;
113     if (!sk_CONF_VALUE_push(ts,value))
114     {
115         return 0;
116     }

118     v = lh_CONF_VALUE_insert(conf->data, value);
119     if (v != NULL)
120     {
121         (void)sk_CONF_VALUE_delete_ptr(ts,v);
122         OPENSSL_free(v->name);
123         OPENSSL_free(v->value);
124         OPENSSL_free(v);
125     }

126     return 1;
127 }
```

```

129 char *_CONF_get_string(const CONF *conf, const char *section, const char *name)
130 {
131     CONF_VALUE *v, vv;
132     char *p;

134     if (name == NULL) return(NULL);
135     if (conf != NULL)
136     {
137         if (section != NULL)
138         {
139             vv.name=(char *)name;
140             vv.section=(char *)section;
141             v=lh_CONF_VALUE_retrieve(conf->data,&vv);
142             if (v != NULL) return(v->value);
143             if (strcmp(section,"ENV") == 0)
144             {
145                 p=getenv(name);
146                 if (p != NULL) return(p);
147             }
148             vv.section="default";
149             vv.name=(char *)name;
150             v=lh_CONF_VALUE_retrieve(conf->data,&vv);
151             if (v != NULL)
152                 return(v->value);
153             else
154                 return(NULL);
155         }
156         else
157             return(getenv(name));
158     }
159 }

161 #if 0 /* There's no way to provide error checking with this function, so
162      force implementors of the higher levels to get a string and read
163      the number themselves. */
164 long _CONF_get_number(CONF *conf, char *section, char *name)
165 {
166     char *str;
167     long ret=0;

169     str=_CONF_get_string(conf,section,name);
170     if (str == NULL) return(0);
171     for (;;)
172     {
173         if (conf->meth->is_number(conf, *str))
174             ret=ret*10+conf->meth->to_int(conf, *str);
175         else
176             return(ret);
177         str++;
178     }
179 }
180 #endif

182 static unsigned long conf_value_hash(const CONF_VALUE *v)
183 {
184     return (lh_strhash(v->section)<<2)^lh_strhash(v->name);
185 }
186 static IMPLEMENT_LHASH_HASH_FN(conf_value, CONF_VALUE)

188 static int conf_value_cmp(const CONF_VALUE *a, const CONF_VALUE *b)
189 {
190     int i;

192     if (a->section != b->section)
193     {

```

```

194         i=strcmp(a->section,b->section);
195         if (i) return(i);
196     }

198     if ((a->name != NULL) && (b->name != NULL))
199     {
200         i=strcmp(a->name,b->name);
201         return(i);
202     }
203     else if (a->name == b->name)
204         return(0);
205     else
206         return((a->name == NULL)?-1:1);
207 }
208 static IMPLEMENT_LHASH_COMP_FN(conf_value, CONF_VALUE)

210 int _CONF_new_data(CONF *conf)
211 {
212     if (conf == NULL)
213     {
214         return 0;
215     }
216     if (conf->data == NULL)
217         if ((conf->data = lh_CONF_VALUE_new()) == NULL)
218             return 0;
219     return 1;
220 }

224 void _CONF_free_data(CONF *conf)
225 {
226     if (conf == NULL || conf->data == NULL) return;

228     lh_CONF_VALUE_down_load(conf->data)=0; /* evil thing to make
229                                             * sure the 'OPENSSL_free()' works as
230                                             * expected */
231     lh_CONF_VALUE_doall_arg(conf->data,
232                             LHASH_DOALL_ARG_FN(value_free_hash),
233                             LHASH_OF(CONF_VALUE), conf->data);

235     /* We now have only 'section' entries in the hash table.
236      * Due to problems with */

238     lh_CONF_VALUE_doall(conf->data, LHASH_DOALL_FN(value_free_stack));
239     lh_CONF_VALUE_free(conf->data);
240 }

242 static void value_free_hash_doall_arg(CONF_VALUE *a, LHASH_OF(CONF_VALUE) *conf)
243 {
244     if (a->name != NULL)
245         (void)lh_CONF_VALUE_delete(conf,a);
246 }

248 static void value_free_stack_doall(CONF_VALUE *a)
249 {
250     CONF_VALUE *vv;
251     STACK_OF(CONF_VALUE) *sk;
252     int i;

254     if (a->name != NULL) return;

256     sk=(STACK_OF(CONF_VALUE) *)a->value;
257     for (i=sk_CONF_VALUE_num(sk)-1; i>=0; i--)
258     {
259         vv=sk_CONF_VALUE_value(sk,i);

```

```
260         OPENSSL_free(vv->value);
261         OPENSSL_free(vv->name);
262         OPENSSL_free(vv);
263     }
264     if (sk != NULL) sk_CONF_VALUE_free(sk);
265     OPENSSL_free(a->section);
266     OPENSSL_free(a);
267 }
268
269 /* Up until OpenSSL 0.9.5a, this was new_section */
270 CONF_VALUE *_CONF_new_section(CONF *conf, const char *section)
271 {
272     STACK_OF(CONF_VALUE) *sk=NULL;
273     int ok=0,i;
274     CONF_VALUE *v=NULL,*vv;
275
276     if ((sk=sk_CONF_VALUE_new_null()) == NULL)
277         goto err;
278     if ((v=OPENSSL_malloc(sizeof(CONF_VALUE))) == NULL)
279         goto err;
280     i=strlen(section)+1;
281     if ((v->section=OPENSSL_malloc(i)) == NULL)
282         goto err;
283
284     memcpy(v->section,section,i);
285     v->name=NULL;
286     v->value=(char *)sk;
287
288     vv=lh_CONF_VALUE_insert(conf->data,v);
289     OPENSSL_assert(vv == NULL);
290     ok=1;
291 err:
292     if (!ok)
293     {
294         if (sk != NULL) sk_CONF_VALUE_free(sk);
295         if (v != NULL) OPENSSL_free(v);
296         v=NULL;
297     }
298     return(v);
299 }
300
301 IMPLEMENT_STACK_OF(CONF_VALUE)
```


new/usr/src/lib/openssl/libsunw_crypto/conf/conf_def.c

1

```
*****
16121 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/conf/conf_def.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/conf/conf.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
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31 * 3. All advertising materials mentioning features or use of this software
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 /* Part of the code in here was originally in conf.c, which is now removed */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_def.c

2

```
62 #include <string.h>
63 #include "cryptlib.h"
64 #include <openssl/stack.h>
65 #include <openssl/lhash.h>
66 #include <openssl/conf.h>
67 #include <openssl/conf_api.h>
68 #include "conf_def.h"
69 #include <openssl/buffer.h>
70 #include <openssl/err.h>

72 static char *eat_ws(CONF *conf, char *p);
73 static char *eat_alpha_numeric(CONF *conf, char *p);
74 static void clear_comments(CONF *conf, char *p);
75 static int str_copy(CONF *conf, char *section, char **to, char *from);
76 static char *scan_quote(CONF *conf, char *p);
77 static char *scan_dquote(CONF *conf, char *p);
78 #define scan_esc(conf, p) (((IS_EOF((conf), (p)[1]))?((p)+1):((p)+2)))

80 static CONF *def_create(CONF_METHOD *meth);
81 static int def_init_default(CONF *conf);
82 static int def_init_WIN32(CONF *conf);
83 static int def_destroy(CONF *conf);
84 static int def_destroy_data(CONF *conf);
85 static int def_load(CONF *conf, const char *name, long *eline);
86 static int def_load_bio(CONF *conf, BIO *bp, long *eline);
87 static int def_dump(const CONF *conf, BIO *bp);
88 static int def_is_number(const CONF *conf, char c);
89 static int def_to_int(const CONF *conf, char c);

91 const char CONF_def_version[]="CONF_def" OPENSSL_VERSION_PTEXT;

93 static CONF_METHOD default_method = {
94     "OpenSSL default",
95     def_create,
96     def_init_default,
97     def_destroy,
98     def_destroy_data,
99     def_load_bio,
100     def_dump,
101     def_is_number,
102     def_to_int,
103     def_load
104 };

106 static CONF_METHOD WIN32_method = {
107     "WIN32",
108     def_create,
109     def_init_WIN32,
110     def_destroy,
111     def_destroy_data,
112     def_load_bio,
113     def_dump,
114     def_is_number,
115     def_to_int,
116     def_load
117 };

119 CONF_METHOD *NCONF_default()
120 {
121     return &default_method;
122 }
123 CONF_METHOD *NCONF_WIN32()
124 {
125     return &WIN32_method;
126 }
```

```

128 static CONF *def_create(CONF_METHOD *meth)
129 {
130     CONF *ret;
131
132     ret = OPENSSL_malloc(sizeof(CONF) + sizeof(unsigned short *));
133     if (ret)
134         if (meth->init(ret) == 0)
135             {
136                 OPENSSL_free(ret);
137                 ret = NULL;
138             }
139     return ret;
140 }
141
142 static int def_init_default(CONF *conf)
143 {
144     if (conf == NULL)
145         return 0;
146
147     conf->meth = &default_method;
148     conf->meth_data = CONF_type_default;
149     conf->data = NULL;
150
151     return 1;
152 }
153
154 static int def_init_WIN32(CONF *conf)
155 {
156     if (conf == NULL)
157         return 0;
158
159     conf->meth = &WIN32_method;
160     conf->meth_data = (void *)CONF_type_win32;
161     conf->data = NULL;
162
163     return 1;
164 }
165
166 static int def_destroy(CONF *conf)
167 {
168     if (def_destroy_data(conf))
169     {
170         OPENSSL_free(conf);
171         return 1;
172     }
173     return 0;
174 }
175
176 static int def_destroy_data(CONF *conf)
177 {
178     if (conf == NULL)
179         return 0;
180     _CONF_free_data(conf);
181     return 1;
182 }
183
184 static int def_load(CONF *conf, const char *name, long *line)
185 {
186     int ret;
187     BIO *in=NULL;
188
189 #ifdef OPENSSL_SYS_VMS
190     in=BIO_new_file(name, "r");
191 #else
192     in=BIO_new_file(name, "rb");
193 #endif

```

```

194     if (in == NULL)
195     {
196         if (ERR_GET_REASON(ERR_peek_last_error()) == BIO_R_NO_SUCH_FILE)
197             CONFerr(CONF_F_DEF_LOAD,CONF_R_NO_SUCH_FILE);
198         else
199             CONFerr(CONF_F_DEF_LOAD,ERR_R_SYS_LIB);
200         return 0;
201     }
202
203     ret = def_load_bio(conf, in, line);
204     BIO_free(in);
205
206     return ret;
207 }
208
209 static int def_load_bio(CONF *conf, BIO *in, long *line)
210 {
211     /* The macro BUFSIZE conflicts with a system macro in VxWorks */
212     #define CONFBUFSIZE 512
213     int bufnum=0,i,ii;
214     BUF_MEM *buff=NULL;
215     char *s,*p,*end;
216     int again;
217     long eline=0;
218     char btmp[DECIMAL_SIZE(eline)+1];
219     CONF_VALUE *v=NULL,*tv;
220     CONF_VALUE *sv=NULL;
221     char *section=NULL,*buf;
222     char *start,*psection,*pname;
223     void *h = (void *) (conf->data);
224
225     if ((buff=BUF_MEM_new()) == NULL)
226     {
227         CONFerr(CONF_F_DEF_LOAD_BIO,ERR_R_BUF_LIB);
228         goto err;
229     }
230
231     section=(char *)OPENSSL_malloc(10);
232     if (section == NULL)
233     {
234         CONFerr(CONF_F_DEF_LOAD_BIO,ERR_R_MALLOC_FAILURE);
235         goto err;
236     }
237     BUF_strncpy(section,"default",10);
238
239     if (_CONF_new_data(conf) == 0)
240     {
241         CONFerr(CONF_F_DEF_LOAD_BIO,ERR_R_MALLOC_FAILURE);
242         goto err;
243     }
244
245     sv=_CONF_new_section(conf,section);
246     if (sv == NULL)
247     {
248         CONFerr(CONF_F_DEF_LOAD_BIO,
249                 CONF_R_UNABLE_TO_CREATE_NEW_SECTION);
250         goto err;
251     }
252
253     bufnum=0;
254     again=0;
255     for (;;)
256     {
257         if (!BUF_MEM_grow(buff,bufnum+CONFBUFSIZE))
258         {
259             CONFerr(CONF_F_DEF_LOAD_BIO,ERR_R_BUF_LIB);

```

```

260         goto err;
261     }
262     p = &(buff->data[bufnum]);
263     *p = '\0';
264     BIO_gets(in, p, CONFBUFSIZE-1);
265     p[CONFBUFSIZE-1] = '\0';
266     ii = i = strlen(p);
267     if (i == 0 && !again) break;
268     again = 0;
269     while (i > 0)
270     {
271         if ((p[i-1] != '\r') && (p[i-1] != '\n'))
272             break;
273         else
274             i--;
275     }
276     /* we removed some trailing stuff so there is a new
277     * line on the end. */
278     if (ii && i == ii)
279         again = 1; /* long line */
280     else
281     {
282         p[i] = '\0';
283         eline++; /* another input line */
284     }
285
286     /* we now have a line with trailing \r\n removed */
287
288     /* i is the number of bytes */
289     bufnum += i;
290
291     v = NULL;
292     /* check for line continuation */
293     if (bufnum >= 1)
294     {
295         /* If we have bytes and the last char '\\' and
296         * second last char is not '\\' */
297         p = &(buff->data[bufnum-1]);
298         if (IS_ESC(conf, p[0]) &&
299             ((bufnum <= 1) || !IS_ESC(conf, p[-1])))
300         {
301             bufnum--;
302             again = 1;
303         }
304     }
305     if (again) continue;
306     bufnum = 0;
307     buf = buff->data;
308
309     clear_comments(conf, buf);
310     s = eat_ws(conf, buf);
311     if (IS_EOF(conf, s)) continue; /* blank line */
312     if (*s == '[')
313     {
314         char *ss;
315
316         s++;
317         start = eat_ws(conf, s);
318         ss = start;
319     again:
320         end = eat_alpha_numeric(conf, ss);
321         p = eat_ws(conf, end);
322         if (*p != ']')
323         {
324             if (*p != '\0')
325                 goto err;

```

```

326         ss = p;
327         goto again;
328     }
329     CONFerr(CONF_F_DEF_LOAD_BIO,
330             CONF_R_MISSING_CLOSE_SQUARE_BRACKET);
331     goto err;
332 }
333 *end = '\0';
334 if (!str_copy(conf, NULL, &section, start)) goto err;
335 if ((sv = CONF_get_section(conf, section)) == NULL)
336     sv = CONF_new_section(conf, section);
337 if (sv == NULL)
338 {
339     CONFerr(CONF_F_DEF_LOAD_BIO,
340             CONF_R_UNABLE_TO_CREATE_NEW_SECTION);
341     goto err;
342 }
343 continue;
344 }
345
346 else
347 {
348     pname = s;
349     psection = NULL;
350     end = eat_alpha_numeric(conf, s);
351     if ((end[0] == ':') && (end[1] == ':'))
352     {
353         *end = '\0';
354         end += 2;
355         psection = pname;
356         pname = end;
357         end = eat_alpha_numeric(conf, end);
358     }
359     p = eat_ws(conf, end);
360     if (*p != '=')
361     {
362         CONFerr(CONF_F_DEF_LOAD_BIO,
363                 CONF_R_MISSING_EQUAL_SIGN);
364         goto err;
365     }
366     *end = '\0';
367     p++;
368     start = eat_ws(conf, p);
369     while (!IS_EOF(conf, *p))
370         p++;
371     p--;
372     while ((p != start) && (IS_WS(conf, *p)))
373         p--;
374     p++;
375     *p = '\0';
376
377     if (!(v = (CONF_VALUE *)OPENSSL_malloc(sizeof(CONF_VALUE)))
378         {
379         CONFerr(CONF_F_DEF_LOAD_BIO,
380                 ERR_R_MALLOC_FAILURE);
381         goto err;
382     }
383     if (psection == NULL) psection = section;
384     v->name = (char *)OPENSSL_malloc(strlen(pname)+1);
385     v->value = NULL;
386     if (v->name == NULL)
387     {
388         CONFerr(CONF_F_DEF_LOAD_BIO,
389                 ERR_R_MALLOC_FAILURE);
390         goto err;
391     }
392     BUF_strncpy(v->name, pname, strlen(pname)+1);

```

```

392         if (!str_copy(conf,psection,&(v->value),start)) goto err
394         if (strcmp(psection,section) != 0)
395         {
396             if ((tv= CONF_get_section(conf,psection))
397                 == NULL)
398                 tv= CONF_new_section(conf,psection);
399             if (tv == NULL)
400             {
401                 CONFerr(CONF_F_DEF_LOAD_BIO,
402                     CONF_R_UNABLE_TO_CREATE_NEW_SECTION);
403                 goto err;
404             }
405         }
406         else
407             tv=sv;
408 #if 1
409         if (_CONF_add_string(conf, tv, v) == 0)
410         {
411             CONFerr(CONF_F_DEF_LOAD_BIO,
412                 ERR_R_MALLOC_FAILURE);
413             goto err;
414         }
415 #else
416         v->section=tv->section;
417         if (!sk_CONF_VALUE_push(ts,v))
418         {
419             CONFerr(CONF_F_DEF_LOAD_BIO,
420                 ERR_R_MALLOC_FAILURE);
421             goto err;
422         }
423         vv=(CONF_VALUE *)lh_insert(conf->data,v);
424         if (vv != NULL)
425         {
426             sk_CONF_VALUE_delete_ptr(ts,vv);
427             OPENSSL_free(vv->name);
428             OPENSSL_free(vv->value);
429             OPENSSL_free(vv);
430         }
431 #endif
432         v=NULL;
433     }
434 }
435 if (buff != NULL) BUF_MEM_free(buff);
436 if (section != NULL) OPENSSL_free(section);
437 return(1);
438 err:
439 if (buff != NULL) BUF_MEM_free(buff);
440 if (section != NULL) OPENSSL_free(section);
441 if (line != NULL) *line=eline;
442 BIO_snprintf(btmp,sizeof btmp,"%ld",eline);
443 ERR_add_error_data(2,"line ",btmp);
444 if ((h != conf->data) && (conf->data != NULL))
445 {
446     CONF_free(conf->data);
447     conf->data=NULL;
448 }
449 if (v != NULL)
450 {
451     if (v->name != NULL) OPENSSL_free(v->name);
452     if (v->value != NULL) OPENSSL_free(v->value);
453     if (v != NULL) OPENSSL_free(v);
454 }
455 return(0);
456 }

```

```

458 static void clear_comments(CONF *conf, char *p)
459 {
460     for (;;)
461     {
462         if (IS_FCOMMENT(conf,*p))
463         {
464             *p='\0';
465             return;
466         }
467         if (!IS_WS(conf,*p))
468         {
469             break;
470         }
471         p++;
472     }
473 }
474
475 for (;;)
476 {
477     if (IS_COMMENT(conf,*p))
478     {
479         *p='\0';
480         return;
481     }
482     if (IS_DQUOTE(conf,*p))
483     {
484         p=scan_dquote(conf, p);
485         continue;
486     }
487     if (IS_QUOTE(conf,*p))
488     {
489         p=scan_quote(conf, p);
490         continue;
491     }
492     if (IS_ESC(conf,*p))
493     {
494         p=scan_esc(conf,p);
495         continue;
496     }
497     if (IS_EOF(conf,*p))
498         return;
499     else
500         p++;
501 }
502
503 static int str_copy(CONF *conf, char *section, char **pto, char *from)
504 {
505     int q,r,rr=0,to=0,len=0;
506     char *s,*e,*rp,*p,*rrp,*np,*cp,v;
507     BUF_MEM *buf;
508
509     if ((buf=BUF_MEM_new()) == NULL) return(0);
510
511     len=strlen(from)+1;
512     if (!BUF_MEM_grow(buf,len)) goto err;
513
514     for (;;)
515     {
516         if (IS_QUOTE(conf,*from))
517         {
518             q= *from;
519             from++;
520             while (!IS_EOF(conf,*from) && (*from != q))
521             {
522                 if (IS_ESC(conf,*from))
523                     {

```

```

524         from++;
525         if (IS_EOF(conf,*from)) break;
526     }
527     buf->data[to++] = *(from++);
528 }
529 if (*from == q) from++;
530 }
531 else if (IS_DQUOTE(conf,*from))
532 {
533     q = *from;
534     from++;
535     while (!IS_EOF(conf,*from))
536     {
537         if (*from == q)
538         {
539             if (*(from+1) == q)
540             {
541                 from++;
542             }
543             else
544             {
545                 break;
546             }
547         }
548         buf->data[to++] = *(from++);
549     }
550     if (*from == q) from++;
551 }
552 else if (IS_ESC(conf,*from))
553 {
554     from++;
555     v = *(from++);
556     if (IS_EOF(conf,v)) break;
557     else if (v == 'r') v = '\r';
558     else if (v == 'n') v = '\n';
559     else if (v == 'b') v = '\b';
560     else if (v == 't') v = '\t';
561     buf->data[to++] = v;
562 }
563 else if (IS_EOF(conf,*from))
564     break;
565 else if (*from == '$')
566 {
567     /* try to expand it */
568     rrp=NULL;
569     s = &(from[1]);
570     if (*s == '{')
571         q='}';
572     else if (*s == '(')
573         q=')';
574     else q=0;
575
576     if (q) s++;
577     cp=section;
578     e=np=s;
579     while (IS_ALPHA_NUMERIC(conf,*e))
580         e++;
581     if ((e[0] == ':') && (e[1] == ':'))
582     {
583         cp=np;
584         rrp=e;
585         rr= *e;
586         *rrp='\0';
587         e+=2;
588         np=e;
589         while (IS_ALPHA_NUMERIC(conf,*e))

```

```

590         e++;
591     }
592     r = *e;
593     *e = '\0';
594     rp = e;
595     if (q)
596     {
597         if (r != q)
598         {
599             CONFerr(CONF_F_STR_COPY,CONF_R_NO_CLOSE_
600                 goto err;
601         }
602         e++;
603     }
604     /* So at this point we have
605     * np which is the start of the name string which is
606     * '\0' terminated.
607     * cp which is the start of the section string which is
608     * '\0' terminated.
609     * e is the 'next point after'.
610     * r and rr are the chars replaced by the '\0'
611     * rp and rrp is where 'r' and 'rr' came from.
612     */
613     p = CONF_get_string(conf,cp,np);
614     if (rrp != NULL) *rrp=rr;
615     *rp=r;
616     if (p == NULL)
617     {
618         CONFerr(CONF_F_STR_COPY,CONF_R_VARIABLE_HAS_NO_V
619             goto err;
620     }
621     BUF_MEM_grow_clean(buf, (strlen(p)+buf->length-(e-from)))
622     while (*p)
623         buf->data[to++] = *(p++);
624
625     /* Since we change the pointer 'from', we also have
626     * to change the perceived length of the string it
627     * points at. /RL */
628     len -= e-from;
629     from=e;
630
631     /* In case there were no braces or parenthesis around
632     * the variable reference, we have to put back the
633     * character that was replaced with a '\0'. /RL */
634     *rp = r;
635 }
636 else
637     buf->data[to++] = *(from++);
638 }
639 buf->data[to]='\0';
640 if (*pto != NULL) OPENSSL_free(*pto);
641 *pto=buf->data;
642 OPENSSL_free(buf);
643 return(1);
644 err:
645 if (buf != NULL) BUF_MEM_free(buf);
646 return(0);
647 }
648
649 static char *eat_ws(CONF *conf, char *p)
650 {
651     while (IS_WS(conf,*p) && (!IS_EOF(conf,*p)))
652         p++;
653     return(p);
654 }

```

```

656 static char *eat_alpha_numeric(CONF *conf, char *p)
657 {
658     for (;;)
659     {
660         if (IS_ESC(conf, *p))
661         {
662             p=scan_esc(conf, p);
663             continue;
664         }
665         if (!IS_ALPHA_NUMERIC_PUNCT(conf, *p))
666             return(p);
667         p++;
668     }
669 }

671 static char *scan_quote(CONF *conf, char *p)
672 {
673     int q= *p;
674
675     p++;
676     while (!(IS_EOF(conf, *p)) && (*p != q))
677     {
678         if (IS_ESC(conf, *p))
679         {
680             p++;
681             if (IS_EOF(conf, *p)) return(p);
682         }
683         p++;
684     }
685     if (*p == q) p++;
686     return(p);
687 }

690 static char *scan_dquote(CONF *conf, char *p)
691 {
692     int q= *p;
693
694     p++;
695     while (!(IS_EOF(conf, *p)))
696     {
697         if (*p == q)
698         {
699             if (*(p+1) == q)
700             {
701                 p++;
702             }
703             else
704             {
705                 break;
706             }
707         }
708         p++;
709     }
710     if (*p == q) p++;
711     return(p);
712 }

714 static void dump_value_doall_arg(CONF_VALUE *a, BIO *out)
715 {
716     if (a->name)
717         BIO_printf(out, "[%s] %s=%s\n", a->section, a->name, a->value);
718     else
719         BIO_printf(out, "[[%s]]\n", a->section);
720 }

```

```

722 static IMPLEMENT_LHASH_DOALL_ARG_FN(dump_value, CONF_VALUE, BIO)

724 static int def_dump(const CONF *conf, BIO *out)
725 {
726     lh_CONF_VALUE_doall_arg(conf->data, LHASH_DOALL_ARG_FN(dump_value),
727                             BIO, out);
728     return 1;
729 }

731 static int def_is_number(const CONF *conf, char c)
732 {
733     return IS_NUMBER(conf, c);
734 }

736 static int def_to_int(const CONF *conf, char c)
737 {
738     return c - '0';
739 }

```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_err.c

1

```
*****
5638 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/conf/conf_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/conf/conf_err.c */
2 /* =====
3  * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
24  * prior written permission. For written permission, please contact
25  * openssl-core@OpenSSL.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
32  * acknowledgment:
33  * "This product includes software developed by the OpenSSL Project
34  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/conf.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_CONF,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_CONF,0,reason)

71 static ERR_STRING_DATA CONF_str_functs[]=
72 {
73 {ERR_FUNC(CONF_F_CONF_DUMP_FP), "CONF_dump_fp"},
74 {ERR_FUNC(CONF_F_CONF_LOAD), "CONF_load"},
75 {ERR_FUNC(CONF_F_CONF_LOAD_BIO), "CONF_load_bio"},
76 {ERR_FUNC(CONF_F_CONF_LOAD_FP), "CONF_load_fp"},
77 {ERR_FUNC(CONF_F_CONF_MODULES_LOAD), "CONF_modules_load"},
78 {ERR_FUNC(CONF_F_CONF_PARSE_LIST), "CONF_parse_list"},
79 {ERR_FUNC(CONF_F_DEF_LOAD), "DEF_LOAD"},
80 {ERR_FUNC(CONF_F_DEF_LOAD_BIO), "DEF_LOAD_BIO"},
81 {ERR_FUNC(CONF_F_MODULE_INIT), "MODULE_INIT"},
82 {ERR_FUNC(CONF_F_MODULE_LOAD_DSO), "MODULE_LOAD_DSO"},
83 {ERR_FUNC(CONF_F_MODULE_RUN), "MODULE_RUN"},
84 {ERR_FUNC(CONF_F_NCONF_DUMP_BIO), "NCONF_dump_bio"},
85 {ERR_FUNC(CONF_F_NCONF_DUMP_FP), "NCONF_dump_fp"},
86 {ERR_FUNC(CONF_F_NCONF_GET_NUMBER), "NCONF_get_number"},
87 {ERR_FUNC(CONF_F_NCONF_GET_NUMBER_E), "NCONF_get_number_e"},
88 {ERR_FUNC(CONF_F_NCONF_GET_SECTION), "NCONF_get_section"},
89 {ERR_FUNC(CONF_F_NCONF_GET_STRING), "NCONF_get_string"},
90 {ERR_FUNC(CONF_F_NCONF_LOAD), "NCONF_load"},
91 {ERR_FUNC(CONF_F_NCONF_LOAD_BIO), "NCONF_load_bio"},
92 {ERR_FUNC(CONF_F_NCONF_LOAD_FP), "NCONF_load_fp"},
93 {ERR_FUNC(CONF_F_NCONF_NEW), "NCONF_new"},
94 {ERR_FUNC(CONF_F_STR_COPY), "STR_COPY"},
95 {0,NULL}};

96

98 static ERR_STRING_DATA CONF_str_reasons[]=
99 {
100 {ERR_REASON(CONF_R_ERROR_LOADING_DSO), "error loading dso"},
101 {ERR_REASON(CONF_R_LIST_CANNOT_BE_NULL), "list cannot be null"},
102 {ERR_REASON(CONF_R_MISSING_CLOSE_SQUARE_BRACKET), "missing close square bracket"},
103 {ERR_REASON(CONF_R_MISSING_EQUAL_SIGN), "missing equal sign"},
104 {ERR_REASON(CONF_R_MISSING_FINISH_FUNCTION), "missing finish function"},
105 {ERR_REASON(CONF_R_MISSING_INIT_FUNCTION), "missing init function"},
106 {ERR_REASON(CONF_R_MODULE_INITIALIZATION_ERROR), "module initialization error"},
107 {ERR_REASON(CONF_R_NO_CLOSE_BRACE), "no close brace"},
108 {ERR_REASON(CONF_R_NO_CONF), "no conf"},
109 {ERR_REASON(CONF_R_NO_CONF_OR_ENVIRONMENT_VARIABLE), "no conf or environment vari"},
110 {ERR_REASON(CONF_R_NO_SECTION), "no section"},
111 {ERR_REASON(CONF_R_NO_SUCH_FILE), "no such file"},
112 {ERR_REASON(CONF_R_NO_VALUE), "no value"},
113 {ERR_REASON(CONF_R_UNABLE_TO_CREATE_NEW_SECTION), "unable to create new section"},
114 {ERR_REASON(CONF_R_UNKNOWN_MODULE_NAME), "unknown module name"},
115 {ERR_REASON(CONF_R_VARIABLE_HAS_NO_VALUE), "variable has no value"},
116 {0,NULL}};

117

119 #endif

121 void ERR_load_CONF_strings(void)
122 {
123 #ifndef OPENSSL_NO_ERR

125     if (ERR_func_error_string(CONF_str_functs[0].error) == NULL)
126     {
127         ERR_load_strings(0,CONF_str_functs);
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_err.c

3

```
128         ERR_load_strings(0,CONF_str_reasons);
129     }
130 #endif
131 }
```


new/usr/src/lib/openssl/libsunw_crypto/conf/conf_lib.c

1

```
*****
9523 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/conf/conf_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* conf_lib.c */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
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17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
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24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26 * endorse or promote products derived from this software without
27 * prior written permission. For written permission, please contact
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29 *
30 * 5. Products derived from this software may not be called "OpenSSL"
31 * nor may "OpenSSL" appear in their names without prior written
32 * permission of the OpenSSL Project.
33 *
34 * 6. Redistributions of any form whatsoever must retain the following
35 * acknowledgment:
36 * "This product includes software developed by the OpenSSL Project
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38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include <openssl/crypto.h>
61 #include <openssl/err.h>
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_lib.c

2

```
62 #include <openssl/conf.h>
63 #include <openssl/conf_api.h>
64 #include <openssl/lhash.h>

66 const char CONF_version[]="CONF" OPENSSL_VERSION_PTEXT;

68 static CONF_METHOD *default_CONF_method=NULL;

70 /* Init a 'CONF' structure from an old LHASH */

72 void CONF_set_nconf(CONF *conf, LHASH_OF(CONF_VALUE) *hash)
73 {
74     if (default_CONF_method == NULL)
75         default_CONF_method = NCONF_default();

77     default_CONF_method->init(conf);
78     conf->data = hash;
79 }

81 /* The following section contains the "CONF classic" functions,
82    rewritten in terms of the new CONF interface. */

84 int CONF_set_default_method(CONF_METHOD *meth)
85 {
86     default_CONF_method = meth;
87     return 1;
88 }

90 LHASH_OF(CONF_VALUE) *CONF_load(LHASH_OF(CONF_VALUE) *conf, const char *file,
91                                 long *eline)
92 {
93     LHASH_OF(CONF_VALUE) *ltmp;
94     BIO *in=NULL;

96 #ifdef OPENSSL_SYS_VMS
97     in=BIO_new_file(file, "r");
98 #else
99     in=BIO_new_file(file, "rb");
100 #endif
101     if (in == NULL)
102     {
103         CONFerr(CONF_F_CONF_LOAD,ERR_R_SYS_LIB);
104         return NULL;
105     }

107     ltmp = CONF_load_bio(conf, in, eline);
108     BIO_free(in);

110     return ltmp;
111 }

113 #ifndef OPENSSL_NO_FP_API
114 LHASH_OF(CONF_VALUE) *CONF_load_fp(LHASH_OF(CONF_VALUE) *conf, FILE *fp,
115                                    long *eline)
116 {
117     BIO *btmp;
118     LHASH_OF(CONF_VALUE) *ltmp;
119     if(!(btmp = BIO_new_fp(fp, BIO_NOCLOSE))) {
120         CONFerr(CONF_F_CONF_LOAD_FP,ERR_R_BUF_LIB);
121         return NULL;
122     }
123     ltmp = CONF_load_bio(conf, btmp, eline);
124     BIO_free(btmp);
125     return ltmp;
126 }
127 #endif
```

```

129 LHASH_OF(CONF_VALUE) *CONF_load_bio(LHASH_OF(CONF_VALUE) *conf, BIO *bp,
130                                     long *eline)
131 {
132     CONF ctmp;
133     int ret;
134
135     CONF_set_nconf(&ctmp, conf);
136
137     ret = NCONF_load_bio(&ctmp, bp, eline);
138     if (ret)
139         return ctmp.data;
140     return NULL;
141 }
142
143 STACK_OF(CONF_VALUE) *CONF_get_section(LHASH_OF(CONF_VALUE) *conf,
144                                       const char *section)
145 {
146     if (conf == NULL)
147     {
148         return NULL;
149     }
150     else
151     {
152         CONF ctmp;
153         CONF_set_nconf(&ctmp, conf);
154         return NCONF_get_section(&ctmp, section);
155     }
156 }
157
158 char *CONF_get_string(LHASH_OF(CONF_VALUE) *conf, const char *group,
159                      const char *name)
160 {
161     if (conf == NULL)
162     {
163         return NCONF_get_string(NULL, group, name);
164     }
165     else
166     {
167         CONF ctmp;
168         CONF_set_nconf(&ctmp, conf);
169         return NCONF_get_string(&ctmp, group, name);
170     }
171 }
172
173 long CONF_get_number(LHASH_OF(CONF_VALUE) *conf, const char *group,
174                     const char *name)
175 {
176     int status;
177     long result = 0;
178
179     if (conf == NULL)
180     {
181         status = NCONF_get_number_e(NULL, group, name, &result);
182     }
183     else
184     {
185         CONF ctmp;
186         CONF_set_nconf(&ctmp, conf);
187         status = NCONF_get_number_e(&ctmp, group, name, &result);
188     }
189
190     if (status == 0)
191     {
192         /* This function does not believe in errors... */
193         ERR_clear_error();

```

```

194     }
195     return result;
196 }
197
198 void CONF_free(LHASH_OF(CONF_VALUE) *conf)
199 {
200     CONF ctmp;
201     CONF_set_nconf(&ctmp, conf);
202     NCONF_free_data(&ctmp);
203 }
204
205 #ifndef OPENSSL_NO_FP_API
206 int CONF_dump_fp(LHASH_OF(CONF_VALUE) *conf, FILE *out)
207 {
208     BIO *btmp;
209     int ret;
210
211     if (!(btmp = BIO_new_fp(out, BIO_NOCLOSE))) {
212         CONFerr(CONF_F_CONF_DUMP_FP, ERR_R_BUF_LIB);
213         return 0;
214     }
215     ret = CONF_dump_bio(conf, btmp);
216     BIO_free(btmp);
217     return ret;
218 }
219 #endif
220
221 int CONF_dump_bio(LHASH_OF(CONF_VALUE) *conf, BIO *out)
222 {
223     CONF ctmp;
224     CONF_set_nconf(&ctmp, conf);
225     return NCONF_dump_bio(&ctmp, out);
226 }
227
228 /* The following section contains the "New CONF" functions. They are
229    completely centralised around a new CONF structure that may contain
230    basically anything, but at least a method pointer and a table of data.
231    These functions are also written in terms of the bridge functions used
232    by the "CONF classic" functions, for consistency. */
233
234 CONF *NCONF_new(CONF_METHOD *meth)
235 {
236     CONF *ret;
237
238     if (meth == NULL)
239         meth = NCONF_default();
240
241     ret = meth->create(meth);
242     if (ret == NULL)
243     {
244         CONFerr(CONF_F_NCONF_NEW, ERR_R_MALLOC_FAILURE);
245         return(NULL);
246     }
247
248     return ret;
249 }
250
251 void NCONF_free(CONF *conf)
252 {
253     if (conf == NULL)
254         return;
255     conf->meth->destroy(conf);
256 }
257
258 void NCONF_free_data(CONF *conf)
259 {

```

```

260     if (conf == NULL)
261         return;
262     conf->meth->destroy_data(conf);
263 }

265 int NCONF_load(CONF *conf, const char *file, long *eline)
266 {
267     if (conf == NULL)
268     {
269         CONFerr(CONF_F_NCONF_LOAD,CONF_R_NO_CONF);
270         return 0;
271     }

273     return conf->meth->load(conf, file, eline);
274 }

276 #ifndef OPENSSL_NO_FP_API
277 int NCONF_load_fp(CONF *conf, FILE *fp, long *eline)
278 {
279     BIO *btmp;
280     int ret;
281     if(!(btmp = BIO_new_fp(fp, BIO_NOCLOSE)))
282     {
283         CONFerr(CONF_F_NCONF_LOAD_FP,ERR_R_BUF_LIB);
284         return 0;
285     }
286     ret = NCONF_load_bio(conf, btmp, eline);
287     BIO_free(btmp);
288     return ret;
289 }
290 #endif

292 int NCONF_load_bio(CONF *conf, BIO *bp, long *eline)
293 {
294     if (conf == NULL)
295     {
296         CONFerr(CONF_F_NCONF_LOAD_BIO,CONF_R_NO_CONF);
297         return 0;
298     }

300     return conf->meth->load_bio(conf, bp, eline);
301 }

303 STACK_OF(CONF_VALUE) *NCONF_get_section(const CONF *conf, const char *section)
304 {
305     if (conf == NULL)
306     {
307         CONFerr(CONF_F_NCONF_GET_SECTION,CONF_R_NO_CONF);
308         return NULL;
309     }

311     if (section == NULL)
312     {
313         CONFerr(CONF_F_NCONF_GET_SECTION,CONF_R_NO_SECTION);
314         return NULL;
315     }

317     return _CONF_get_section_values(conf, section);
318 }

320 char *NCONF_get_string(const CONF *conf, const char *group, const char *name)
321 {
322     char *s = _CONF_get_string(conf, group, name);

324     /* Since we may get a value from an environment variable even
325        if conf is NULL, let's check the value first */

```

```

326     if (s) return s;

328     if (conf == NULL)
329     {
330         CONFerr(CONF_F_NCONF_GET_STRING,
331                 CONF_R_NO_CONF_OR_ENVIRONMENT_VARIABLE);
332         return NULL;
333     }
334     CONFerr(CONF_F_NCONF_GET_STRING,
335             CONF_R_NO_VALUE);
336     ERR_add_error_data(4, "group=", group, " name=", name);
337     return NULL;
338 }

340 int NCONF_get_number_e(const CONF *conf, const char *group, const char *name,
341                       long *result)
342 {
343     char *str;

345     if (result == NULL)
346     {
347         CONFerr(CONF_F_NCONF_GET_NUMBER_E, ERR_R_PASSED_NULL_PARAMETER);
348         return 0;
349     }

351     str = NCONF_get_string(conf, group, name);

353     if (str == NULL)
354         return 0;

356     for (*result = 0; conf->meth->is_number(conf, *str);)
357     {
358         *result = (*result)*10 + conf->meth->to_int(conf, *str);
359         str++;
360     }

362     return 1;
363 }

365 #ifndef OPENSSL_NO_FP_API
366 int NCONF_dump_fp(const CONF *conf, FILE *out)
367 {
368     BIO *btmp;
369     int ret;
370     if(!(btmp = BIO_new_fp(out, BIO_NOCLOSE))) {
371         CONFerr(CONF_F_NCONF_DUMP_FP,ERR_R_BUF_LIB);
372         return 0;
373     }
374     ret = NCONF_dump_bio(conf, btmp);
375     BIO_free(btmp);
376     return ret;
377 }
378 #endif

380 int NCONF_dump_bio(const CONF *conf, BIO *out)
381 {
382     if (conf == NULL)
383     {
384         CONFerr(CONF_F_NCONF_DUMP_BIO,CONF_R_NO_CONF);
385         return 0;
386     }

388     return conf->meth->dump(conf, out);
389 }

```

```
392 /* This function should be avoided */
393 #if 0
394 long NCONF_get_number(CONF *conf, char *group, char *name)
395 {
396     int status;
397     long ret=0;
398
399     status = NCONF_get_number_e(conf, group, name, &ret);
400     if (status == 0)
401     {
402         /* This function does not believe in errors... */
403         ERR_get_error();
404     }
405     return ret;
406 }
407 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_mall.c

1

```
*****
3191 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/conf/conf_mall.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* conf_mall.c */
2 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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20  * 3. All advertising materials mentioning features or use of this
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include <openssl/crypto.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_mall.c

2

```
62 #include <openssl/conf.h>
63 #include <openssl/dso.h>
64 #include <openssl/x509.h>
65 #include <openssl/asn1.h>
66 #ifndef OPENSSL_NO_ENGINE
67 #include <openssl/engine.h>
68 #endif

70 /* Load all OpenSSL builtin modules */

72 void OPENSSL_load_builtin_modules(void)
73 {
74     /* Add builtin modules here */
75     ASN1_add_oid_module();
76 #ifndef OPENSSL_NO_ENGINE
77     ENGINE_add_conf_module();
78 #endif
79     EVP_add_alg_module();
80 }
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_mod.c

1

```
*****
14388 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/conf/conf_mod.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* conf_mod.c */
2 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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20 * 3. All advertising materials mentioning features or use of this
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */

59 #include <stdio.h>
60 #include <ctype.h>
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_mod.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/conf.h>
64 #include <openssl/dso.h>
65 #include <openssl/x509.h>

68 #define DSO_mod_init_name "OPENSSL_init"
69 #define DSO_mod_finish_name "OPENSSL_finish"

72 /* This structure contains a data about supported modules.
73  * entries in this table correspond to either dynamic or
74  * static modules.
75  */

77 struct conf_module_st
78 {
79     /* DSO of this module or NULL if static */
80     DSO *dso;
81     /* Name of the module */
82     char *name;
83     /* Init function */
84     conf_init_func *init;
85     /* Finish function */
86     conf_finish_func *finish;
87     /* Number of successfully initialized modules */
88     int links;
89     void *usr_data;
90 };

93 /* This structure contains information about modules that have been
94  * successfully initialized. There may be more than one entry for a
95  * given module.
96  */

98 struct conf_imodule_st
99 {
100     CONF_MODULE *pmod;
101     char *name;
102     char *value;
103     unsigned long flags;
104     void *usr_data;
105 };

107 static STACK_OF(CONF_MODULE) *supported_modules = NULL;
108 static STACK_OF(CONF_IMODULE) *initialized_modules = NULL;

110 static void module_free(CONF_MODULE *md);
111 static void module_finish(CONF_IMODULE *imod);
112 static int module_run(const CONF *cnf, char *name, char *value,
113                     unsigned long flags);
114 static CONF_MODULE *module_add(DSO *dso, const char *name,
115                               conf_init_func *ifunc, conf_finish_func *ffunc);
116 static CONF_MODULE *module_find(char *name);
117 static int module_init(CONF_MODULE *pmod, char *name, char *value,
118                      const CONF *cnf);
119 static CONF_MODULE *module_load_dso(const CONF *cnf, char *name, char *value,
120                                   unsigned long flags);

122 /* Main function: load modules from a CONF structure */

124 int CONF_modules_load(const CONF *cnf, const char *appname,
125                     unsigned long flags)
126 {
127     STACK_OF(CONF_VALUE) *values;
```

```

128     CONF_VALUE *vl;
129     char *vsection = NULL;

131     int ret, i;

133     if (!cnf)
134         return 1;

136     if (appname)
137         vsection = NCONF_get_string(cnf, NULL, appname);

139     if (!appname || (!vsection && (flags & CONF_MFLAGS_DEFAULT_SECTION)))
140         vsection = NCONF_get_string(cnf, NULL, "openssl_conf");

142     if (!vsection)
143     {
144         ERR_clear_error();
145         return 1;
146     }

148     values = NCONF_get_section(cnf, vsection);

150     if (!values)
151         return 0;

153     for (i = 0; i < sk_CONF_VALUE_num(values); i++)
154     {
155         vl = sk_CONF_VALUE_value(values, i);
156         ret = module_run(cnf, vl->name, vl->value, flags);
157         if (ret <= 0)
158             if (!(flags & CONF_MFLAGS_IGNORE_ERRORS))
159                 return ret;
160     }

162     return 1;

164 }

166 int CONF_modules_load_file(const char *filename, const char *appname,
167                             unsigned long flags)
168 {
169     char *file = NULL;
170     CONF *cnf = NULL;
171     int ret = 0;
172     cnf = NCONF_new(NULL);
173     if (!cnf)
174         goto err;

176     if (filename == NULL)
177     {
178         file = CONF_get1_default_config_file();
179         if (!file)
180             goto err;
181     }
182     else
183         file = (char *)filename;

185     if (NCONF_load(cnf, file, NULL) <= 0)
186     {
187         if ((flags & CONF_MFLAGS_IGNORE_MISSING_FILE) &&
188             (ERR_GET_REASON(ERR_peek_last_error()) == CONF_R_NO_SUCH_FILE))
189         {
190             ERR_clear_error();
191             ret = 1;
192         }
193         goto err;

```

```

194     }

196     ret = CONF_modules_load(cnf, appname, flags);

198     err:
199     if (filename == NULL)
200         OPENSSL_free(file);
201     NCONF_free(cnf);

203     return ret;
204 }

206 static int module_run(const CONF *cnf, char *name, char *value,
207                       unsigned long flags)
208 {
209     CONF_MODULE *md;
210     int ret;

212     md = module_find(name);

214     /* Module not found: try to load DSO */
215     if (!md && !(flags & CONF_MFLAGS_NO_DSO))
216         md = module_load_dso(cnf, name, value, flags);

218     if (!md)
219     {
220         if (!(flags & CONF_MFLAGS_SILENT))
221         {
222             CONFerr(CONF_F_MODULE_RUN, CONF_R_UNKNOWN_MODULE_NAME);
223             ERR_add_error_data(2, "module=", name);
224         }
225         return -1;
226     }

228     ret = module_init(md, name, value, cnf);

230     if (ret <= 0)
231     {
232         if (!(flags & CONF_MFLAGS_SILENT))
233         {
234             char rcode[DECIMAL_SIZE(ret)+1];
235             CONFerr(CONF_F_MODULE_RUN, CONF_R_MODULE_INITIALIZATION
236                 BIO_snprintf(rcode, sizeof rcode, "%-8d", ret);
237             ERR_add_error_data(6, "module=", name, ", value=", value);
238         }
239     }

241     return ret;
242 }

244 /* Load a module from a DSO */
245 static CONF_MODULE *module_load_dso(const CONF *cnf, char *name, char *value,
246                                     unsigned long flags)
247 {
248     DSO *dso = NULL;
249     conf_init_func *ifunc;
250     conf_finish_func *ffunc;
251     char *path = NULL;
252     int errcode = 0;
253     CONF_MODULE *md;
254     /* Look for alternative path in module section */
255     path = NCONF_get_string(cnf, value, "path");
256     if (!path)
257     {
258         ERR_clear_error();
259         path = name;

```

```

260     }
261     dso = DSO_load(NULL, path, NULL, 0);
262     if (!dso)
263     {
264         errcode = CONF_R_ERROR_LOADING_DSO;
265         goto err;
266     }
267     ifunc = (conf_init_func *)DSO_bind_func(dso, DSO_mod_init_name);
268     if (!ifunc)
269     {
270         errcode = CONF_R_MISSING_INIT_FUNCTION;
271         goto err;
272     }
273     ffunc = (conf_finish_func *)DSO_bind_func(dso, DSO_mod_finish_name);
274     /* All OK, add module */
275     md = module_add(dso, name, ifunc, ffunc);
277     if (!md)
278         goto err;
280     return md;
282 err:
283     if (dso)
284         DSO_free(dso);
285     CONFerr(CONF_F_MODULE_LOAD_DSO, errcode);
286     ERR_add_error_data(4, "module=", name, ", path=", path);
287     return NULL;
288 }
290 /* add module to list */
291 static CONF_MODULE *module_add(DSO *dso, const char *name,
292                                conf_init_func *ifunc, conf_finish_func *ffunc)
293 {
294     CONF_MODULE *tmod = NULL;
295     if (supported_modules == NULL)
296         supported_modules = sk_CONF_MODULE_new_null();
297     if (supported_modules == NULL)
298         return NULL;
299     tmod = OPENSSL_malloc(sizeof(CONF_MODULE));
300     if (tmod == NULL)
301         return NULL;
303     tmod->dso = dso;
304     tmod->name = BUF_strdup(name);
305     tmod->init = ifunc;
306     tmod->finish = ffunc;
307     tmod->links = 0;
309     if (!sk_CONF_MODULE_push(supported_modules, tmod))
310     {
311         OPENSSL_free(tmod);
312         return NULL;
313     }
315     return tmod;
316 }
318 /* Find a module from the list. We allow module names of the
319  * form modname.XXXX to just search for modname to allow the
320  * same module to be initialized more than once.
321  */
323 static CONF_MODULE *module_find(char *name)
324 {
325     CONF_MODULE *tmod;

```

```

326     int i, nchar;
327     char *p;
328     p = strrchr(name, '.');
330     if (p)
331         nchar = p - name;
332     else
333         nchar = strlen(name);
335     for (i = 0; i < sk_CONF_MODULE_num(supported_modules); i++)
336     {
337         tmod = sk_CONF_MODULE_value(supported_modules, i);
338         if (!strcmp(tmod->name, name, nchar))
339             return tmod;
340     }
342     return NULL;
344 }
346 /* initialize a module */
347 static int module_init(CONF_MODULE *pmod, char *name, char *value,
348                       const CONF *cnf)
349 {
350     int ret = 1;
351     int init_called = 0;
352     CONF_IMODULE *imod = NULL;
354     /* Otherwise add initialized module to list */
355     imod = OPENSSL_malloc(sizeof(CONF_IMODULE));
356     if (!imod)
357         goto err;
359     imod->pmod = pmod;
360     imod->name = BUF_strdup(name);
361     imod->value = BUF_strdup(value);
362     imod->usr_data = NULL;
364     if (!imod->name || !imod->value)
365         goto memerr;
367     /* Try to initialize module */
368     if (pmod->init)
369     {
370         ret = pmod->init(imod, cnf);
371         init_called = 1;
372         /* Error occurred, exit */
373         if (ret <= 0)
374             goto err;
375     }
377     if (initialized_modules == NULL)
378     {
379         initialized_modules = sk_CONF_IMODULE_new_null();
380         if (!initialized_modules)
381         {
382             CONFerr(CONF_F_MODULE_INIT, ERR_R_MALLOC_FAILURE);
383             goto err;
384         }
385     }
387     if (!sk_CONF_IMODULE_push(initialized_modules, imod))
388     {
389         CONFerr(CONF_F_MODULE_INIT, ERR_R_MALLOC_FAILURE);
390         goto err;
391     }

```



```

393     pmod->links++;
395     return ret;
397     err:
399     /* We've started the module so we'd better finish it */
400     if (pmod->finish && init_called)
401         pmod->finish(imod);
403     memerr:
404     if (imod)
405     {
406         if (imod->name)
407             OPENSSL_free(imod->name);
408         if (imod->value)
409             OPENSSL_free(imod->value);
410         OPENSSL_free(imod);
411     }
413     return -1;
415 }
417 /* Unload any dynamic modules that have a link count of zero:
418  * i.e. have no active initialized modules. If 'all' is set
419  * then all modules are unloaded including static ones.
420  */
422 void CONF_modules_unload(int all)
423 {
424     int i;
425     CONF_MODULE *md;
426     CONF_modules_finish();
427     /* unload modules in reverse order */
428     for (i = sk_CONF_MODULE_num(supported_modules) - 1; i >= 0; i--)
429     {
430         md = sk_CONF_MODULE_value(supported_modules, i);
431         /* If static or in use and 'all' not set ignore it */
432         if (((md->links > 0) || !md->dso) && !all)
433             continue;
434         /* Since we're working in reverse this is OK */
435         (void)sk_CONF_MODULE_delete(supported_modules, i);
436         module_free(md);
437     }
438     if (sk_CONF_MODULE_num(supported_modules) == 0)
439     {
440         sk_CONF_MODULE_free(supported_modules);
441         supported_modules = NULL;
442     }
443 }
445 /* unload a single module */
446 static void module_free(CONF_MODULE *md)
447 {
448     if (md->dso)
449         DSO_free(md->dso);
450     OPENSSL_free(md->name);
451     OPENSSL_free(md);
452 }
454 /* finish and free up all modules instances */
456 void CONF_modules_finish(void)
457 {

```

```

458     CONF_IMODULE *imod;
459     while (sk_CONF_IMODULE_num(initialized_modules) > 0)
460     {
461         imod = sk_CONF_IMODULE_pop(initialized_modules);
462         module_finish(imod);
463     }
464     sk_CONF_IMODULE_free(initialized_modules);
465     initialized_modules = NULL;
466 }
468 /* finish a module instance */
470 static void module_finish(CONF_IMODULE *imod)
471 {
472     if (imod->pmod->finish)
473         imod->pmod->finish(imod);
474     imod->pmod->links--;
475     OPENSSL_free(imod->name);
476     OPENSSL_free(imod->value);
477     OPENSSL_free(imod);
478 }
480 /* Add a static module to OpenSSL */
482 int CONF_module_add(const char *name, conf_init_func *ifunc,
483                    conf_finish_func *ffunc)
484 {
485     if (module_add(NULL, name, ifunc, ffunc))
486         return 1;
487     else
488         return 0;
489 }
491 void CONF_modules_free(void)
492 {
493     CONF_modules_finish();
494     CONF_modules_unload(1);
495 }
497 /* Utility functions */
499 const char *CONF_imodule_get_name(const CONF_IMODULE *md)
500 {
501     return md->name;
502 }
504 const char *CONF_imodule_get_value(const CONF_IMODULE *md)
505 {
506     return md->value;
507 }
509 void *CONF_imodule_get_usr_data(const CONF_IMODULE *md)
510 {
511     return md->usr_data;
512 }
514 void CONF_imodule_set_usr_data(CONF_IMODULE *md, void *usr_data)
515 {
516     md->usr_data = usr_data;
517 }
519 CONF_MODULE *CONF_imodule_get_module(const CONF_IMODULE *md)
520 {
521     return md->pmod;
522 }

```

```

524 unsigned long CONF_imodule_get_flags(const CONF_IMODULE *md)
525 {
526     return md->flags;
527 }

529 void CONF_imodule_set_flags(CONF_IMODULE *md, unsigned long flags)
530 {
531     md->flags = flags;
532 }

534 void *CONF_module_get_usr_data(CONF_MODULE *pmod)
535 {
536     return pmod->usr_data;
537 }

539 void CONF_module_set_usr_data(CONF_MODULE *pmod, void *usr_data)
540 {
541     pmod->usr_data = usr_data;
542 }

544 /* Return default config file name */

546 char *CONF_get1_default_config_file(void)
547 {
548     char *file;
549     int len;

551     file = getenv("OPENSSL_CONF");
552     if (file)
553         return BUF_strdup(file);

555     len = strlen(X509_get_default_cert_area());
556 #ifndef OPENSSL_SYS_VMS
557     len++;
558 #endif
559     len += strlen(OPENSSL_CONF);

561     file = OPENSSL_malloc(len + 1);

563     if (!file)
564         return NULL;
565     BUF_strncpy(file, X509_get_default_cert_area(), len + 1);
566 #ifndef OPENSSL_SYS_VMS
567     BUF_strlcat(file, "/", len + 1);
568 #endif
569     BUF_strlcat(file, OPENSSL_CONF, len + 1);

571     return file;
572 }

574 /* This function takes a list separated by 'sep' and calls the
575  * callback function giving the start and length of each member
576  * optionally stripping leading and trailing whitespace. This can
577  * be used to parse comma separated lists for example.
578  */

580 int CONF_parse_list(const char *list_, int sep, int nospc,
581                    int (*list_cb)(const char *elem, int len, void *usr), void *arg)
582 {
583     int ret;
584     const char *lstart, *tmpend, *p;

586     if (list_ == NULL)
587     {
588         CONFerr(CONF_F_CONF_PARSE_LIST, CONF_R_LIST_CANNOT_BE_NULL);
589         return 0;

```

```

590     }

592     lstart = list_;
593     for(;;)
594     {
595         if (nospc)
596             while(*lstart && isspace((unsigned char)*lstart))
597                 lstart++;
599         p = strchr(lstart, sep);
600         if (p == lstart || !*lstart)
601             ret = list_cb(NULL, 0, arg);
602         else
603         {
604             if (p)
605                 tmpend = p - 1;
606             else
607                 tmpend = lstart + strlen(lstart) - 1;
608             if (nospc)
609             {
610                 while(isspace((unsigned char)*tmpend))
611                     tmpend--;
612             }
613             ret = list_cb(lstart, tmpend - lstart + 1, arg);
614         }
615         if (ret <= 0)
616             return ret;
617         if (p == NULL)
618             return 1;
619         lstart = p + 1;
620     }
622 }

```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_sap.c

1

```
*****
3901 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/conf/conf_sap.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* conf_sap.c */
2 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include <openssl/crypto.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/conf/conf_sap.c

2

```
62 #include <openssl/conf.h>
63 #include <openssl/dso.h>
64 #include <openssl/x509.h>
65 #include <openssl/asn1.h>
66 #ifndef OPENSSL_NO_ENGINE
67 #include <openssl/engine.h>
68 #endif

70 /* This is the automatic configuration loader: it is called automatically by
71  * OpenSSL when any of a number of standard initialisation functions are called,
72  * unless this is overridden by calling OPENSSL_no_config()
73  */

75 static int openssl_configured = 0;

77 void OPENSSL_config(const char *config_name)
78 {
79     if (openssl_configured)
80         return;

82     OPENSSL_load_builtin_modules();
83 #ifndef OPENSSL_NO_ENGINE
84     /* Need to load ENGINES */
85     ENGINE_load_builtin_engines();
86 #endif
87     /* Add others here? */

90     ERR_clear_error();
91     if (CONF_modules_load_file(NULL, config_name,
92         CONF_MFLAGS_DEFAULT_SECTION|CONF_MFLAGS_IGNORE_MISSING_FILE) <= 0)
93     {
94         BIO *bio_err;
95         ERR_load_crypto_strings();
96         if ((bio_err=BIO_new_fp(stderr, BIO_NOCLOSE)) != NULL)
97         {
98             BIO_printf(bio_err, "Auto configuration failed\n");
99             ERR_print_errors(bio_err);
100             BIO_free(bio_err);
101         }
102         exit(1);
103     }

105     return;
106 }

108 void OPENSSL_no_config()
109 {
110     openssl_configured = 1;
111 }
```

new/usr/src/lib/openssl/libsunw_crypto/cpt_err.c

1

```
*****
4215 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/cpt_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cpt_err.c */
2 /* =====
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48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/cpt_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/crypto.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_CRYPTO,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_CRYPTO,0,reason)

71 static ERR_STRING_DATA CRYPTO_str_functs[]=
72 {
73 {ERR_FUNC(CRYPTO_F_CRYPTO_GET_EX_NEW_INDEX), "CRYPTO_get_ex_new_index"},
74 {ERR_FUNC(CRYPTO_F_CRYPTO_GET_NEW_DYNLOCKID), "CRYPTO_get_new_dynlockid"},
75 {ERR_FUNC(CRYPTO_F_CRYPTO_GET_NEW_LOCKID), "CRYPTO_get_new_lockid"},
76 {ERR_FUNC(CRYPTO_F_CRYPTO_SET_EX_DATA), "CRYPTO_set_ex_data"},
77 {ERR_FUNC(CRYPTO_F_DEF_ADD_INDEX), "DEF_ADD_INDEX"},
78 {ERR_FUNC(CRYPTO_F_DEF_GET_CLASS), "DEF_GET_CLASS"},
79 {ERR_FUNC(CRYPTO_F_FIPS_MODE_SET), "FIPS_mode_set"},
80 {ERR_FUNC(CRYPTO_F_INT_DUP_EX_DATA), "INT_DUP_EX_DATA"},
81 {ERR_FUNC(CRYPTO_F_INT_FREE_EX_DATA), "INT_FREE_EX_DATA"},
82 {ERR_FUNC(CRYPTO_F_INT_NEW_EX_DATA), "INT_NEW_EX_DATA"},
83 {0,NULL}};
84 };

86 static ERR_STRING_DATA CRYPTO_str_reasons[]=
87 {
88 {ERR_REASON(CRYPTO_R_FIPS_MODE_NOT_SUPPORTED),"fips mode not supported"},
89 {ERR_REASON(CRYPTO_R_NO_DYNLOCK_CREATE_CALLBACK),"no dynlock create callback"},
90 {0,NULL}};
91 };

93 #endif

95 void ERR_load_CRYPTO_strings(void)
96 {
97 #ifndef OPENSSL_NO_ERR

99 if (ERR_func_error_string(CRYPTO_str_functs[0].error) == NULL)
100 {
101 ERR_load_strings(0,CRYPTO_str_functs);
102 ERR_load_strings(0,CRYPTO_str_reasons);
103 }
104 #endif
105 }
```

new/usr/src/lib/openssl/libsunw_crypto/cryptlib.c

1

```
*****
28445 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/cryptlib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/cryptlib.c */
2 /* =====
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48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
56 * All rights reserved.
57 *
58 * This package is an SSL implementation written
59 * by Eric Young (eay@cryptsoft.com).
60 * The implementation was written so as to conform with Netscapes SSL.
61 *
```

new/usr/src/lib/openssl/libsunw_crypto/cryptlib.c

2

```
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63 * the following conditions are aheared to. The following conditions
64 * apply to all code found in this distribution, be it the RC4, RSA,
65 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
66 * included with this distribution is covered by the same copyright terms
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71 * If this package is used in a product, Eric Young should be given attribution
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74 * in documentation (online or textual) provided with the package.
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102 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
103 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
104 * SUCH DAMAGE.
105 *
106 * The licence and distribution terms for any publically available version or
107 * derivative of this code cannot be changed. i.e. this code cannot simply be
108 * copied and put under another distribution licence
109 * [including the GNU Public Licence.]
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 * ECDH support in OpenSSL originally developed by
114 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
115 */

117 #include "cryptlib.h"
118 #include <openssl/safestack.h>
119 #include <pthread.h>

121 #if defined(OPENSSL_SYS_WIN32) || defined(OPENSSL_SYS_WIN16)
122 static double SSLeay_MSVC5_hack=0.0; /* and for VC1.5 */
123 #endif

125 DECLARE_STACK_OF(CRYPTO_dynlock)

127 /* real #defines in crypto.h, keep these upto date */
```

```

128 static const char* const lock_names[CRYPTO_NUM_LOCKS] =
129 {
130     "<<ERROR>>",
131     "err",
132     "ex_data",
133     "x509",
134     "x509_info",
135     "x509_pkey",
136     "x509_crl",
137     "x509_req",
138     "dsa",
139     "rsa",
140     "evp_pkey",
141     "x509_store",
142     "ssl_ctx",
143     "ssl_cert",
144     "ssl_session",
145     "ssl_sess_cert",
146     "ssl",
147     "ssl_method",
148     "rand",
149     "rand2",
150     "debug_malloc",
151     "BIO",
152     "gethostbyname",
153     "getservbyname",
154     "readdir",
155     "RSA_blinding",
156     "dh",
157     "debug_malloc2",
158     "dso",
159     "dynlock",
160     "engine",
161     "ui",
162     "ecdsa",
163     "ec",
164     "ecdh",
165     "bn",
166     "ec_pre_comp",
167     "store",
168     "comp",
169     "fips",
170     "fips2",
171 #if CRYPTO_NUM_LOCKS != 41
172 # error "Inconsistency between crypto.h and cryptlib.c"
173 #endif
174 };

176 /* This is for applications to allocate new type names in the non-dynamic
177    array of lock names. These are numbered with positive numbers. */
178 static STACK_OF(OPENSSL_STRING) *app_locks=NULL;

180 /* For applications that want a more dynamic way of handling threads, the
181    following stack is used. These are externally numbered with negative
182    numbers. */
183 static STACK_OF(CRYPTO_dynlock) *dyn_locks=NULL;

185 static pthread_mutex_t *solaris_openssl_locks;

187 static void (MS_FAR *locking_callback)(int mode,int type,
188     const char *file,int line)=0;
189 static int (MS_FAR *add_lock_callback)(int *pointer,int amount,
190     int type,const char *file,int line)=0;
191 #ifndef OPENSSL_NO_DEPRECATED
192 static unsigned long (MS_FAR *id_callback)(void)=0;
193 #endif

```

```

194 static void (MS_FAR *threadid_callback)(CRYPTO_THREADID *)=0;
195 static struct CRYPTO_dynlock_value *(MS_FAR *dynlock_create_callback)
196     (const char *file,int line)=0;
197 static void (MS_FAR *dynlock_lock_callback)(int mode,
198     struct CRYPTO_dynlock_value *l, const char *file,int line)=0;
199 static void (MS_FAR *dynlock_destroy_callback)(struct CRYPTO_dynlock_value *l,
200     const char *file,int line)=0;

202 int CRYPTO_get_new_lockid(char *name)
203 {
204     char *str;
205     int i;

207 #if defined(OPENSSL_SYS_WIN32) || defined(OPENSSL_SYS_WIN16)
208     /* A hack to make Visual C++ 5.0 work correctly when linking as
209        * a DLL using /MT. Without this, the application cannot use
210        * any floating point printf's.
211        * It also seems to be needed for Visual C 1.5 (win16) */
212     SSLeay_MSVC5_hack=(double)name[0]*(double)name[1];
213 #endif

215     if ((app_locks == NULL) && ((app_locks=sk_OPENSSL_STRING_new_null()) ==
216         {
217             CRYPTOerr(CRYPTO_F_CRYPT_GET_NEW_LOCKID,ERR_R_MALLOC_FAILURE);
218             return(0);
219         }
220     if ((str=BUF_strdup(name)) == NULL)
221     {
222         CRYPTOerr(CRYPTO_F_CRYPT_GET_NEW_LOCKID,ERR_R_MALLOC_FAILURE);
223         return(0);
224     }
225     i=sk_OPENSSL_STRING_push(app_locks,str);
226     if (!i)
227         OPENSSL_free(str);
228     else
229         i+=CRYPTO_NUM_LOCKS; /* gap of one :- ) */
230     return(i);
231 }

233 int CRYPTO_num_locks(void)
234 {
235     return CRYPTO_NUM_LOCKS;
236 }

238 int CRYPTO_get_new_dynlockid(void)
239 {
240     int i = 0;
241     CRYPTO_dynlock *pointer = NULL;

243     if (dynlock_create_callback == NULL)
244     {
245         CRYPTOerr(CRYPTO_F_CRYPT_GET_NEW_DYNLOCKID,CRYPTO_R_NO_DYNLOCK);
246         return(0);
247     }
248     CRYPTO_w_lock(CRYPTO_LOCK_DYNLOCK);
249     if ((dyn_locks == NULL)
250         && ((dyn_locks=sk_CRYPTO_dynlock_new_null()) == NULL))
251     {
252         CRYPTO_w_unlock(CRYPTO_LOCK_DYNLOCK);
253         CRYPTOerr(CRYPTO_F_CRYPT_GET_NEW_DYNLOCKID,ERR_R_MALLOC_FAILURE);
254         return(0);
255     }
256     CRYPTO_w_unlock(CRYPTO_LOCK_DYNLOCK);

258     pointer = (CRYPTO_dynlock *)OPENSSL_malloc(sizeof(CRYPTO_dynlock));
259     if (pointer == NULL)

```

```

260     {
261         CRYPTOerr(CRYPTO_F_CRYPT_GET_NEW_DYNLOCKID,ERR_R_MALLOC_FAILURE
262         return(0);
263     }
264     pointer->references = 1;
265     pointer->data = dynlock_create_callback(__FILE__,__LINE__);
266     if (pointer->data == NULL)
267     {
268         OPENSSL_free(pointer);
269         CRYPTOerr(CRYPTO_F_CRYPT_GET_NEW_DYNLOCKID,ERR_R_MALLOC_FAILURE
270         return(0);
271     }

273     CRYPTO_w_lock(CRYPTO_LOCK_DYNLOCK);
274     /* First, try to find an existing empty slot */
275     i=sk_CRYPTO_dynlock_find(dyn_locks,NULL);
276     /* If there was none, push, thereby creating a new one */
277     if (i == -1)
278         /* Since sk_push() returns the number of items on the
279         stack, not the location of the pushed item, we need
280         to transform the returned number into a position,
281         by decreasing it. */
282         i=sk_CRYPTO_dynlock_push(dyn_locks,pointer) - 1;
283     else
284         /* If we found a place with a NULL pointer, put our pointer
285         in it. */
286         (void)sk_CRYPTO_dynlock_set(dyn_locks,i,pointer);
287     CRYPTO_w_unlock(CRYPTO_LOCK_DYNLOCK);

289     if (i == -1)
290     {
291         dynlock_destroy_callback(pointer->data,__FILE__,__LINE__);
292         OPENSSL_free(pointer);
293     }
294     else
295         i += 1; /* to avoid 0 */
296     return -i;
297 }

299 void CRYPTO_destroy_dynlockid(int i)
300 {
301     CRYPTO_dynlock *pointer = NULL;
302     if (i)
303         i = -i-1;
304     if (dynlock_destroy_callback == NULL)
305         return;

307     CRYPTO_w_lock(CRYPTO_LOCK_DYNLOCK);

309     if (dyn_locks == NULL || i >= sk_CRYPTO_dynlock_num(dyn_locks))
310     {
311         CRYPTO_w_unlock(CRYPTO_LOCK_DYNLOCK);
312         return;
313     }
314     pointer = sk_CRYPTO_dynlock_value(dyn_locks, i);
315     if (pointer != NULL)
316     {
317         --pointer->references;
318     #ifdef REF_CHECK
319         if (pointer->references < 0)
320         {
321             fprintf(stderr,"CRYPTO_destroy_dynlockid, bad reference
322             abort();
323         }
324     }
325     #endif

```

```

326         if (pointer->references <= 0)
327         {
328             (void)sk_CRYPTO_dynlock_set(dyn_locks, i, NULL);
329         }
330         else
331             pointer = NULL;
332     }
333     CRYPTO_w_unlock(CRYPTO_LOCK_DYNLOCK);

335     if (pointer)
336     {
337         dynlock_destroy_callback(pointer->data,__FILE__,__LINE__);
338         OPENSSL_free(pointer);
339     }
340 }

342 struct CRYPTO_dynlock_value *CRYPTO_get_dynlock_value(int i)
343 {
344     CRYPTO_dynlock *pointer = NULL;
345     if (i)
346         i = -i-1;

348     CRYPTO_w_lock(CRYPTO_LOCK_DYNLOCK);

350     if (dyn_locks != NULL && i < sk_CRYPTO_dynlock_num(dyn_locks))
351         pointer = sk_CRYPTO_dynlock_value(dyn_locks, i);
352     if (pointer)
353         pointer->references++;

355     CRYPTO_w_unlock(CRYPTO_LOCK_DYNLOCK);

357     if (pointer)
358         return pointer->data;
359     return NULL;
360 }

362 struct CRYPTO_dynlock_value *(*CRYPTO_get_dynlock_create_callback(void))
363 (const char *file,int line)
364 {
365     return(dynlock_create_callback);
366 }

368 void (*CRYPTO_get_dynlock_lock_callback(void))(int mode,
369 struct CRYPTO_dynlock_value *l, const char *file,int line)
370 {
371     return(dynlock_lock_callback);
372 }

374 void (*CRYPTO_get_dynlock_destroy_callback(void))
375 (struct CRYPTO_dynlock_value *l, const char *file,int line)
376 {
377     return(dynlock_destroy_callback);
378 }

380 void CRYPTO_set_dynlock_create_callback(struct CRYPTO_dynlock_value *(*func)
381 (const char *file, int line))
382 {
383     dynlock_create_callback=func;
384 }

386 void CRYPTO_set_dynlock_lock_callback(void (*func)(int mode,
387 struct CRYPTO_dynlock_value *l, const char *file, int line))
388 {
389     dynlock_lock_callback=func;
390 }

```

```

392 void CRYPTO_set_dynlock_destroy_callback(void (*func)
393      (struct CRYPTO_dynlock_value *l, const char *file, int line))
394 {
395     dynlock_destroy_callback=func;
396 }

399 void (*CRYPTO_get_locking_callback(void))(int mode,int type,const char *file,
400      int line)
401 {
402     return(locking_callback);
403 }

405 int (*CRYPTO_get_add_lock_callback(void))(int *num,int mount,int type,
406      const char *file,int line)
407 {
408     return(add_lock_callback);
409 }

411 /*
412  * This is the locking callback function which all applications will be
413  * using when CRYPTO_lock() is called.
414  */
415 static void solaris_locking_callback(int mode, int type, const char *file,
416      int line)
417 {
418     if (mode & CRYPTO_LOCK)
419     {
420         pthread_mutex_lock(&solaris_openssl_locks[type]);
421     }
422     else
423     {
424         pthread_mutex_unlock(&solaris_openssl_locks[type]);
425     }
426 }

429 /*
430  * This function is called when a child process is forked to setup its own
431  * global locking callback function ptr and mutexes.
432  */
433 static void solaris_fork_child(void)
434 {
435     /*
436      * clear locking_callback to indicate that locks should
437      * be reinitialized.
438      */
439     locking_callback = NULL;
440     solaris_locking_setup();
441 }

443 /*
444  * This function allocates and initializes the global mutex array, and
445  * sets the locking callback.
446  */
447 void solaris_locking_setup()
448 {
449     int i;
450     int num_locks;

452     /* locking callback is already setup. Nothing to do */
453     if (locking_callback != NULL)
454     {
455         return;
456     }

```

```

458     /*
459      * Set atfork handler so that child can setup its own mutexes and
460      * locking callbacks when it is forked
461      */
462     (void) pthread_atfork(NULL, NULL, solaris_fork_child);

464     /* allocate locks needed by OpenSSL */
465     num_locks = CRYPTO_num_locks();
466     solaris_openssl_locks =
467         OPENSSL_malloc(sizeof (pthread_mutex_t) * num_locks);
468     if (solaris_openssl_locks == NULL)
469     {
470         fprintf(stderr,
471             "solaris_locking_setup: memory allocation failure.\n");
472         abort();
473     }

475     /* initialize openssl mutexes */
476     for (i = 0; i < num_locks; i++)
477     {
478         pthread_mutex_init(&solaris_openssl_locks[i], NULL);
479     }
480     locking_callback = solaris_locking_callback;
482 }

484 void CRYPTO_set_locking_callback(void (*func)(int mode,int type,
485      const char *file,int line))
486 {
487     /* Calling this here ensures initialisation before any threads
488      * are started.
489      */
490     OPENSSL_init();

492     /*
493      * we now setup our own locking callback and mutexes, and disallow
494      * setting of another locking callback.
495      */
496 }

498 void CRYPTO_set_add_lock_callback(int (*func)(int *num,int mount,int type,
499      const char *file,int line))
500 {
501     add_lock_callback=func;
502 }

504 /* the memset() here and in set_pointer() seem overkill, but for the sake of
505  * CRYPTO_THREADID_cmp() this avoids any platform silliness that might cause two
506  * "equal" THREADID structs to not be memcmp()-identical. */
507 void CRYPTO_THREADID_set_numeric(CRYPTO_THREADID *id, unsigned long val)
508 {
509     memset(id, 0, sizeof(*id));
510     id->val = val;
511 }

513 static const unsigned char hash_coeffs[] = { 3, 5, 7, 11, 13, 17, 19, 23 };
514 void CRYPTO_THREADID_set_pointer(CRYPTO_THREADID *id, void *ptr)
515 {
516     unsigned char *dest = (void *)&id->val;
517     unsigned int accum = 0;
518     unsigned char dnum = sizeof(id->val);

520     memset(id, 0, sizeof(*id));
521     id->ptr = ptr;
522     if (sizeof(id->val) >= sizeof(id->ptr))
523     {

```



```

524     /* 'ptr' can be embedded in 'val' without loss of uniqueness */
525     id->val = (unsigned long)id->ptr;
526     return;
527 }
528 /* hash ptr ==> val. Each byte of 'val' gets the mod-256 total of a
529 * linear function over the bytes in 'ptr', the co-efficients of which
530 * are a sequence of low-primes (hash_coefs is an 8-element cycle) -
531 * the starting prime for the sequence varies for each byte of 'val'
532 * (unique polynomials unless pointers are >64-bit). For added spice,
533 * the totals accumulate rather than restarting from zero, and the index
534 * of the 'val' byte is added each time (position dependence). If I was
535 * a black-belt, I'd scan big-endian pointers in reverse to give
536 * low-order bits more play, but this isn't crypto and I'd prefer nobody
537 * mistake it as such. Plus I'm lazy. */
538 while (dnum--)
539 {
540     const unsigned char *src = (void *)&id->ptr;
541     unsigned char snum = sizeof(id->ptr);
542     while (snum--)
543         accum += *(src++) * hash_coefs[(snum + dnum) & 7];
544     accum += dnum;
545     *(dest++) = accum & 255;
546 }
547 }

549 int CRYPTO_THREADID_set_callback(void (*func)(CRYPTO_THREADID *))
550 {
551     if (threadid_callback)
552         return 0;
553     threadid_callback = func;
554     return 1;
555 }

557 void (*CRYPTO_THREADID_get_callback(void))(CRYPTO_THREADID *)
558 {
559     return threadid_callback;
560 }

562 void CRYPTO_THREADID_current(CRYPTO_THREADID *id)
563 {
564     if (threadid_callback)
565     {
566         threadid_callback(id);
567         return;
568     }
569 #ifndef OPENSSL_NO_DEPRECATED
570     /* If the deprecated callback was set, fall back to that */
571     if (id_callback)
572     {
573         CRYPTO_THREADID_set_numeric(id, id_callback());
574         return;
575     }
576 #endif
577     /* Else pick a backup */
578 #ifdef OPENSSL_SYS_WIN16
579     CRYPTO_THREADID_set_numeric(id, (unsigned long)GetCurrentTask());
580 #elif defined(OPENSSL_SYS_WIN32)
581     CRYPTO_THREADID_set_numeric(id, (unsigned long)GetCurrentThreadId());
582 #elif defined(OPENSSL_SYS_BEOS)
583     CRYPTO_THREADID_set_numeric(id, (unsigned long)find_thread(NULL));
584 #else
585     /* For everything else, default to using the address of 'errno' */
586     CRYPTO_THREADID_set_pointer(id, (void*)&errno);
587 #endif
588 }

```

```

590 int CRYPTO_THREADID_cmp(const CRYPTO_THREADID *a, const CRYPTO_THREADID *b)
591 {
592     return memcmp(a, b, sizeof(*a));
593 }

595 void CRYPTO_THREADID_cpy(CRYPTO_THREADID *dest, const CRYPTO_THREADID *src)
596 {
597     memcpy(dest, src, sizeof(*src));
598 }

600 unsigned long CRYPTO_THREADID_hash(const CRYPTO_THREADID *id)
601 {
602     return id->val;
603 }

605 #ifndef OPENSSL_NO_DEPRECATED
606 unsigned long (*CRYPTO_get_id_callback(void))(void)
607 {
608     return(id_callback);
609 }

611 void CRYPTO_set_id_callback(unsigned long (*func)(void))
612 {
613     id_callback=func;
614 }

616 unsigned long CRYPTO_thread_id(void)
617 {
618     unsigned long ret=0;

620     if (id_callback == NULL)
621     {
622         #ifdef OPENSSL_SYS_WIN16
623             ret=(unsigned long)GetCurrentTask();
624         #elif defined(OPENSSL_SYS_WIN32)
625             ret=(unsigned long)GetCurrentThreadId();
626         #elif defined(GETPID_IS_MEANINGLESS)
627             ret=1L;
628         #elif defined(OPENSSL_SYS_BEOS)
629             ret=(unsigned long)find_thread(NULL);
630         #else
631             ret=(unsigned long)getpid();
632         #endif
633     }
634     else
635         ret=id_callback();
636     return(ret);
637 }
638 #endif

640 void CRYPTO_lock(int mode, int type, const char *file, int line)
641 {
642     #ifdef LOCK_DEBUG
643     {
644         CRYPTO_THREADID id;
645         char *rw_text,*operation_text;

647         if (mode & CRYPTO_LOCK)
648             operation_text="lock ";
649         else if (mode & CRYPTO_UNLOCK)
650             operation_text="unlock";
651         else
652             operation_text="ERROR ";

654         if (mode & CRYPTO_READ)
655             rw_text="r";

```

```

656         else if (mode & CRYPTO_WRITE)
657             rw_text="w";
658         else
659             rw_text="ERROR";
661         CRYPTO_THREADID_current(&id);
662         fprintf(stderr,"lock:%08lx: (%s)%s %-18s %s:%d\n",
663             CRYPTO_THREADID_hash(&id), rw_text, operation_text,
664             CRYPTO_get_lock_name(type), file, line);
665     }
666 #endif
667     if (type < 0)
668     {
669         if (dynlock_lock_callback != NULL)
670         {
671             struct CRYPTO_dynlock_value *pointer
672                 = CRYPTO_get_dynlock_value(type);
674             OPENSSSL_assert(pointer != NULL);
676             dynlock_lock_callback(mode, pointer, file, line);
678             CRYPTO_destroy_dynlockid(type);
679         }
680     }
681     else
682         if (locking_callback != NULL)
683             locking_callback(mode, type, file, line);
684 }
686 int CRYPTO_add_lock(int *pointer, int amount, int type, const char *file,
687     int line)
688 {
689     int ret = 0;
691     if (add_lock_callback != NULL)
692     {
693 #ifdef LOCK_DEBUG
694         int before= *pointer;
695 #endif
697         ret=add_lock_callback(pointer, amount, type, file, line);
698 #ifdef LOCK_DEBUG
699         {
700             CRYPTO_THREADID id;
701             CRYPTO_THREADID_current(&id);
702             fprintf(stderr,"ladd:%08lx:%2d+%2d->%2d %-18s %s:%d\n",
703                 CRYPTO_THREADID_hash(&id), before, amount, ret,
704                 CRYPTO_get_lock_name(type),
705                 file, line);
706         }
707 #endif
708     }
709     else
710     {
711         CRYPTO_lock(CRYPTO_LOCK|CRYPTO_WRITE, type, file, line);
713         ret= *pointer+amount;
714 #ifdef LOCK_DEBUG
715         {
716             CRYPTO_THREADID id;
717             CRYPTO_THREADID_current(&id);
718             fprintf(stderr,"ladd:%08lx:%2d+%2d->%2d %-18s %s:%d\n",
719                 CRYPTO_THREADID_hash(&id),
720                 *pointer, amount, ret,
721                 CRYPTO_get_lock_name(type),

```

```

722         file, line);
723     }
724 #endif
725     *pointer=ret;
726     CRYPTO_lock(CRYPTO_UNLOCK|CRYPTO_WRITE, type, file, line);
727 }
728     return(ret);
729 }
731 const char *CRYPTO_get_lock_name(int type)
732 {
733     if (type < 0)
734         return("dynamic");
735     else if (type < CRYPTO_NUM_LOCKS)
736         return(lock_names[type]);
737     else if (type-CRYPTO_NUM_LOCKS > sk_OPENSSL_STRING_num(app_locks))
738         return("ERROR");
739     else
740         return(sk_OPENSSL_STRING_value(app_locks, type-CRYPTO_NUM_LOCKS));
741 }
743 #if defined(__i386) || defined(__i386__) || defined(_M_IX86) || \
744     defined(__INTEL__) || \
745     defined(__x86_64) || defined(__x86_64__) || defined(_M_AMD64) || defined
747 unsigned int OPENSSSL_ia32cap_P[2];
748 unsigned long *OPENSSSL_ia32cap_loc(void)
749 {
750     if (sizeof(long)==4)
751     /*
752      * If 32-bit application pulls address of OPENSSSL_ia32cap_P[0]
753      * clear second element to maintain the illusion that vector
754      * is 32-bit.
755      */
756     OPENSSSL_ia32cap_P[1]=0;
757     return (unsigned long *)OPENSSSL_ia32cap_P;
758 }
759 #if defined(OPENSSSL_CPUID_OBJ) && !defined(OPENSSSL_NO_ASM) && !defined(I386_ONLY)
760 #define OPENSSSL_CPUID_SETUP
761 #if defined(_WIN32)
762 typedef unsigned __int64 IA32CAP;
763 #else
764 typedef unsigned long long IA32CAP;
765 #endif
766 void OPENSSSL_cpuid_setup(void)
767 {
768     static int trigger=0;
769     IA32CAP OPENSSSL_ia32_cpuid(void);
770     IA32CAP vec;
771     char *env;
772     if (trigger)
773         return;
774     trigger=1;
775     if ((env=getenv("OPENSSSL_ia32cap"))){
776         int off = (env[0]!='~')?1:0;
777         #if defined(_WIN32)
778             if (!sscanf(env+off, "%I64i", &vec)) vec = strtoul(env+off, NULL, 0);
779         #else
780             if (!sscanf(env+off, "%lli", (long long *)&vec)) vec = strtoul(env+off, NUL
781         #endif
782             if (off) vec = OPENSSSL_ia32_cpuid()&~vec;
783         }
784         else
785             vec = OPENSSSL_ia32_cpuid();
787     /*

```

```

788  * |(1<<10) sets a reserved bit to signal that variable
789  * was initialized already... This is to avoid interference
790  * with cpuid snippets in ELF .init segment.
791  */
792  OPENSSL_ia32cap_P[0] = (unsigned int)vec|(1<<10);
793  OPENSSL_ia32cap_P[1] = (unsigned int)(vec>>32);
794 }
795 #endif

797 #else
798 unsigned long *OPENSSL_ia32cap_loc(void) { return NULL; }
799 #endif
800 int OPENSSL_NONPIC_relocated = 0;
801 #if !defined(OPENSSL_CPUID_SETUP) && !defined(OPENSSL_CPUID_OBJ)
802 void OPENSSL_cpuid_setup(void) {}
803 #endif

805 #if (defined(_WIN32) || defined(__CYGWIN__)) && defined(_WINDLL)
806 #ifdef __CYGWIN__
807 /* pick DLL_[PROCESS|THREAD]_[ATTACH|DETACH] definitions */
808 #include <windows.h>
809 /* this has side-effect of _WIN32 getting defined, which otherwise
810  * is mutually exclusive with __CYGWIN__... */
811 #endif

813 /* All we really need to do is remove the 'error' state when a thread
814  * detaches */

816 BOOL WINAPI DllMain(HINSTANCE hinstDLL, DWORD fdwReason,
817                    LPVOID lpvReserved)
818 {
819     switch(fdwReason)
820     {
821     case DLL_PROCESS_ATTACH:
822         OPENSSL_cpuid_setup();
823 #if defined(_WIN32_WINNT)
824         {
825             IMAGE_DOS_HEADER *dos_header = (IMAGE_DOS_HEADER *)hinstDLL;
826             IMAGE_NT_HEADERS *nt_headers;

828             if (dos_header->e_magic==IMAGE_DOS_SIGNATURE)
829             {
830                 nt_headers = (IMAGE_NT_HEADERS *)((char *)dos_header
831                 + dos_header->e_lfanew);
832                 if (nt_headers->Signature==IMAGE_NT_SIGNATURE &&
833                     hinstDLL!=(HINSTANCE)(nt_headers->OptionalHeader.Ima
834                     OPENSSL_NONPIC_relocated=1;
835             }
836         }
837 #endif
838         break;
839     case DLL_THREAD_ATTACH:
840         break;
841     case DLL_THREAD_DETACH:
842         break;
843     case DLL_PROCESS_DETACH:
844         break;
845     }
846     return(TRUE);
847 }
848 #endif

850 #if defined(_WIN32) && !defined(__CYGWIN__)
851 #include <tchar.h>
852 #include <signal.h>
853 #ifdef __WATCOMC__

```

```

854 #if defined(_UNICODE) || defined(__UNICODE__)
855 #define _vsntprintf _vsnwprintf
856 #else
857 #define _vsntprintf _vsnprintf
858 #endif
859 #endif
860 #ifdef _MSC_VER
861 #define alloca _alloca
862 #endif

864 #if defined(_WIN32_WINNT) && _WIN32_WINNT>=0x0333
865 int OPENSSL_isservice(void)
866 {
867     HINSTANCE h;
868     DWORD len;
869     WCHAR *name;
870     static union { void *p; int (*f)(void); } _OPENSSL_isservice = { NULL };

871     if (_OPENSSL_isservice.p == NULL) {
872         HANDLE h = GetModuleHandle(NULL);
873         if (h != NULL)
874             _OPENSSL_isservice.p = GetProcAddress(h, "_OPENSSL_isservice");
875         if (_OPENSSL_isservice.p == NULL)
876             _OPENSSL_isservice.p = (void *)-1;
877     }

879     if (_OPENSSL_isservice.p != (void *)-1)
880         return (*_OPENSSL_isservice.f)();

882     (void)GetDesktopWindow(); /* return value is ignored */

884     h = GetProcessWindowStation();
885     if (h==NULL) return -1;

887     if (GetUserObjectInformationW (h,UOI_NAME,NULL,0,&len) ||
888         GetLastError() != ERROR_INSUFFICIENT_BUFFER)
889         return -1;

891     if (len>512) return -1; /* paranoia */
892     len++,len&=-1; /* paranoia */
893     name=(WCHAR *)alloca(len*sizeof(WCHAR));
894     if (!GetUserObjectInformationW (h,UOI_NAME,name,len,&len))
895         return -1;

897     len++,len&=-1; /* paranoia */
898     name[len/sizeof(WCHAR)]=L'\0'; /* paranoia */
899     #if 1
900     /* This doesn't cover "interactive" services [working with real
901      * WinSta0's] nor programs started non-interactively by Task
902      * Scheduler [those are working with SAWinSta]. */
903     if (wcsstr(name,L"Service-0x")) return 1;
904     #else
905     /* This covers all non-interactive programs such as services. */
906     if (!wcsstr(name,L"WinSta0")) return 1;
907     #endif
908     else
909         return 0;
910 }
911 #else
912 int OPENSSL_isservice(void) { return 0; }
913 #endif

914 void OPENSSL_showfatal (const char *fmta,...)
915 {
916     va_list ap;
917     TCHAR buf[256];
918     const TCHAR *fmt;
919     #ifdef STD_ERROR_HANDLE /* what a dirty trick! */
920     HANDLE h;

```

```

921     if ((h=GetStdHandle(STD_ERROR_HANDLE)) != NULL &&
922         GetFileType(h)!=FILE_TYPE_UNKNOWN)
923     { /* must be console application */
924         va_start (ap,fmta);
925         vfprintf (stderr,fmta,ap);
926         va_end (ap);
927         return;
928     }
929 #endif

931     if (sizeof(TCHAR)==sizeof(char))
932         fmt=(const TCHAR *)fmta;
933     else do
934     { int    keepgoing;
935       size_t len_0=strlen(fmta)+1,i;
936       WCHAR *fmtw;

938       fmtw = (WCHAR *)alloca(len_0*sizeof(WCHAR));
939       if (fmtw == NULL) { fmt=(const TCHAR *)L"no stack?"; break; }

941 #ifndef OPENSSSL_NO_MULTIBYTE
942     if (!MultiByteToWideChar(CP_ACP,0,fmta,len_0,fmtw,len_0))
943 #endif
944         for (i=0;i<len_0;i++) fmtw[i]=(WCHAR)fmta[i];

946     for (i=0;i<len_0;i++)
947     { if (fmtw[i]==L'%') do
948       { keepgoing=0;
949         switch (fmtw[i+1])
950         { case L'0': case L'1': case L'2': case L'3': case L'4':
951           case L'5': case L'6': case L'7': case L'8': case L'9':
952             case L'.' : case L'*':
953             case L'-' : i++; keepgoing=1; break;
954             case L's' : fmtw[i+1]=L'S'; break;
955             case L'S' : fmtw[i+1]=L's'; break;
956             case L'c' : fmtw[i+1]=L'C'; break;
957             case L'C' : fmtw[i+1]=L'c'; break;
958         }
959         } while (keepgoing);
960     }
961     fmt = (const TCHAR *)fmtw;
962 } while (0);

964     va_start (ap,fmta);
965     _vsntprintf (buf,sizeof(buf)/sizeof(TCHAR)-1,fmt,ap);
966     buf [sizeof(buf)/sizeof(TCHAR)-1] = _T('\0');
967     va_end (ap);

969 #if defined(_WIN32_WINNT) && _WIN32_WINNT>=0x0333
970 /* this -----v--- guards NT-specific calls */
971 if (check_winnt() && OPENSSSL_isservice() > 0)
972 { HANDLE h = RegisterEventSource(0,_T("OPENSSSL"));
973   const TCHAR *pmsg=buf;
974   ReportEvent(h,EVENTLOG_ERROR_TYPE,0,0,1,0,&pmsg,0);
975   DeregisterEventSource(h);
976 }
977 else
978 #endif
979     MessageBox (NULL,buf,_T("OpenSSL: FATAL"),MB_OK|MB_ICONSTOP);
980 }
981 #else
982 void OPENSSSL_showfatal (const char *fmta,...)
983 { va_list ap;

985     va_start (ap,fmta);

```

```

986     vfprintf (stderr,fmta,ap);
987     va_end (ap);
988 }
989 int OPENSSSL_isservice (void) { return 0; }
990 #endif

992 void OPENSSSLDie(const char *file,int line,const char *assertion)
993 {
994     OPENSSSL_showfatal(
995         "%s(%d): OpenSSL internal error, assertion failed: %s\n",
996         file,line,assertion);
997 #if !defined(_WIN32) || defined(__CYGWIN__)
998     abort();
999 #else
1000     /* Win32 abort() customarily shows a dialog, but we just did that... */
1001     raise(SIGABRT);
1002     _exit(3);
1003 #endif
1004 }

1006 void *OPENSSSL_stderr(void) { return stderr; }

1008 int CRYPTO_memcmp(const void *in_a, const void *in_b, size_t len)
1009 {
1010     size_t i;
1011     const unsigned char *a = in_a;
1012     const unsigned char *b = in_b;
1013     unsigned char x = 0;

1015     for (i = 0; i < len; i++)
1016         x |= a[i] ^ b[i];

1018     return x;
1019 }

```

new/usr/src/lib/openssl/libsunw_crypto/cversion.c

1

```
*****
4248 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/cversion.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/cversion.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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57 */
59 #include "cryptlib.h"
61 #ifndef NO_WINDOWS_BRAINDEATH
```

new/usr/src/lib/openssl/libsunw_crypto/cversion.c

2

```
62 #include "buildinf.h"
63 #endif
65 const char *SSLeay_version(int t)
66 {
67     if (t == SSLEAY_VERSION)
68         return OPENSSL_VERSION_TEXT;
69     if (t == SSLEAY_BUILT_ON)
70     {
71         #ifdef DATE
72             static char buf[sizeof(DATE)+11];
73
74             BIO_snprintf(buf, sizeof buf, "built on: %s", DATE);
75             return(buf);
76         #else
77             return("built on: date not available");
78         #endif
79     }
80     if (t == SSLEAY_CFLAGS)
81     {
82         #ifdef CFLAGS
83             static char buf[sizeof(CFLAGS)+11];
84
85             BIO_snprintf(buf, sizeof buf, "compiler: %s", CFLAGS);
86             return(buf);
87         #else
88             return("compiler: information not available");
89         #endif
90     }
91     if (t == SSLEAY_PLATFORM)
92     {
93         #ifdef PLATFORM
94             static char buf[sizeof(PLATFORM)+11];
95
96             BIO_snprintf(buf, sizeof buf, "platform: %s", PLATFORM);
97             return(buf);
98         #else
99             return("platform: information not available");
100         #endif
101     }
102     if (t == SSLEAY_DIR)
103     {
104         #ifdef OPENSLLDIR
105             return "OPENSLLDIR: \"\" OPENSLLDIR \"\"";
106         #else
107             return "OPENSLLDIR: N/A";
108         #endif
109     }
110     return("not available");
111 }
113 unsigned long SSLeay(void)
114 {
115     return(SSLEAY_VERSION_NUMBER);
116 }
```

```

*****
4294 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/des/cbc_cksm.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/cbc_cksm.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
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57 */
58
59 #include "des_locl.h"
60
61 DES_LONG DES_cbc_cksum(const unsigned char *in, DES_cblock *output,

```

```

62         long length, DES_key_schedule *schedule,
63         const_DES_cblock *ivec)
64     {
65         register DES_LONG tout0,tout1,tin0,tin1;
66         register long l=length;
67         DES_LONG tin[2];
68         unsigned char *out = &(*output)[0];
69         const unsigned char *iv = &(*ivec)[0];
70
71         c2l(iv,tout0);
72         c2l(iv,tout1);
73         for (; l>0; l-=8)
74             {
75                 if (l >= 8)
76                     {
77                         c2l(in,tin0);
78                         c2l(in,tin1);
79                     }
80                 else
81                     c2ln(in,tin0,tin1,l);
82
83                 tin0^=tout0; tin[0]=tin0;
84                 tin1^=tout1; tin[1]=tin1;
85                 DES_encrypt1((DES_LONG *)tin,schedule,DES_ENCRYPT);
86                 /* fix 15/10/91 eay - thanks to keithr@sco.COM */
87                 tout0=tin[0];
88                 tout1=tin[1];
89             }
90         if (out != NULL)
91             {
92                 l2c(tout0,out);
93                 l2c(tout1,out);
94             }
95         tout0=tin0=tin1=tin[0]=tin[1]=0;
96         /*
97          * Transform the data in tout1 so that it will
98          * match the return value that the MIT Kerberos
99          * mit_des_cbc_cksum API returns.
100         */
101         tout1 = ((tout1 >> 24L) & 0x000000FF)
102             | ((tout1 >> 8L) & 0x0000FF00)
103             | ((tout1 << 8L) & 0x00FF0000)
104             | ((tout1 << 24L) & 0xFF000000);
105         return(tout1);
106     }

```

new/usr/src/lib/openssl/libsunw_crypto/des/cbc_enc.c

1

3276 Fri May 30 18:31:41 2014
new/usr/src/lib/openssl/libsunw_crypto/des/cbc_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/des/cbc_enc.c */
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57 */

59 #define CBC_ENC_C__DONT_UPDATE_IV

61 #include "ncbc_enc.c" /* des_cbc_encrypt */
```

new/usr/src/lib/openssl/libsunw_crypto/des/cbc_enc.c

2

```

*****
6962 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/cfb64ede.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include "des_locl.h"
60 #include "e_os.h"

```

```

62 /* The input and output encrypted as though 64bit cfb mode is being
63  * used. The extra state information to record how much of the
64  * 64bit block we have used is contained in *num;
65  */
66
67 void DES_ede3_cfb64_encrypt(const unsigned char *in, unsigned char *out,
68                             long length, DES_key_schedule *ks1,
69                             DES_key_schedule *ks2, DES_key_schedule *ks3,
70                             DES_cblock *ivec, int *num, int enc)
71 {
72     register DES_LONG v0,v1;
73     register long l=length;
74     register int n= *num;
75     DES_LONG ti[2];
76     unsigned char *iv,c,cc;
77
78     iv=&(*ivec)[0];
79     if (enc)
80     {
81         while (l--)
82         {
83             if (n == 0)
84             {
85                 c2l(iv,v0);
86                 c2l(iv,v1);
87
88                 ti[0]=v0;
89                 ti[1]=v1;
90                 DES_encrypt3(ti,ks1,ks2,ks3);
91                 v0=ti[0];
92                 v1=ti[1];
93
94                 iv = &(*ivec)[0];
95                 l2c(v0,iv);
96                 l2c(v1,iv);
97                 iv = &(*ivec)[0];
98             }
99             c= *(in++)^iv[n];
100             *(out++)=c;
101             iv[n]=c;
102             n=(n+1)&0x07;
103         }
104     }
105     else
106     {
107         while (l--)
108         {
109             if (n == 0)
110             {
111                 c2l(iv,v0);
112                 c2l(iv,v1);
113
114                 ti[0]=v0;
115                 ti[1]=v1;
116                 DES_encrypt3(ti,ks1,ks2,ks3);
117                 v0=ti[0];
118                 v1=ti[1];
119
120                 iv = &(*ivec)[0];
121                 l2c(v0,iv);
122                 l2c(v1,iv);
123                 iv = &(*ivec)[0];
124             }
125             cc= *(in++);
126             c=iv[n];
127             iv[n]=cc;

```



```

128             *(out++)=c^cc;
129             n=(n+1)&0x07;
130         }
131     }
132     v0=v1=ti[0]=ti[1]=c=cc=0;
133     *num=n;
134 }

136 #ifndef undef /* MACRO */
137 void DES_ede2_cfb64_encrypt(unsigned char *in, unsigned char *out, long length,
138     DES_key_schedule ks1, DES_key_schedule ks2, DES_cblock (*ivec),
139     int *num, int enc)
140 {
141     DES_ede3_cfb64_encrypt(in, out, length, ks1, ks2, ks1, ivec, num, enc);
142 }
143 #endif

145 /* This is compatible with the single key CFB-r for DES, even though that's
146    * not what EVP needs.
147    */

149 void DES_ede3_cfb_encrypt(const unsigned char *in, unsigned char *out,
150     int numbits, long length, DES_key_schedule *ks1,
151     DES_key_schedule *ks2, DES_key_schedule *ks3,
152     DES_cblock *ivec, int enc)
153 {
154     register DES_LONG d0, d1, v0, v1;
155     register unsigned long l=length, n=((unsigned int)numbits+7)/8;
156     register int num=numbits, i;
157     DES_LONG ti[2];
158     unsigned char *iv;
159     unsigned char ovec[16];

161     if (num > 64) return;
162     iv = &(*ivec)[0];
163     c2l(iv, v0);
164     c2l(iv, v1);
165     if (enc)
166     {
167         while (l >= n)
168         {
169             l-=n;
170             ti[0]=v0;
171             ti[1]=v1;
172             DES_encrypt3(ti, ks1, ks2, ks3);
173             c2ln(in, d0, d1, n);
174             in+=n;
175             d0^=ti[0];
176             d1^=ti[1];
177             l2cn(d0, d1, out, n);
178             out+=n;
179             /* 30-08-94 - eay - changed because l>32 and
180              * l<32 are bad under gcc :- ( */
181             if (num == 32)
182             { v0=v1; v1=d0; }
183             else if (num == 64)
184             { v0=d0; v1=d1; }
185             else
186             {
187                 iv=&ovec[0];
188                 l2c(v0, iv);
189                 l2c(v1, iv);
190                 l2c(d0, iv);
191                 l2c(d1, iv);
192                 /* shift ovec left most of the bits... */
193                 memmove(ovec, ovec+num/8, 8+(num%8 ? 1 : 0));

```

```

194             /* now the remaining bits */
195             if (num%8 != 0)
196                 for (i=0 ; i < 8 ; ++i)
197                 {
198                     ovec[i]<=num%8;
199                     ovec[i]|=ovec[i+1]>>(8-num%8);
200                 }
201             iv=&ovec[0];
202             c2l(iv, v0);
203             c2l(iv, v1);
204         }
205     }
206 }
207 else
208 {
209     while (l >= n)
210     {
211         l-=n;
212         ti[0]=v0;
213         ti[1]=v1;
214         DES_encrypt3(ti, ks1, ks2, ks3);
215         c2ln(in, d0, d1, n);
216         in+=n;
217         /* 30-08-94 - eay - changed because l>32 and
218          * l<32 are bad under gcc :- ( */
219         if (num == 32)
220             { v0=v1; v1=d0; }
221         else if (num == 64)
222             { v0=d0; v1=d1; }
223         else
224         {
225             iv=&ovec[0];
226             l2c(v0, iv);
227             l2c(v1, iv);
228             l2c(d0, iv);
229             l2c(d1, iv);
230             /* shift ovec left most of the bits... */
231             memmove(ovec, ovec+num/8, 8+(num%8 ? 1 : 0));
232             /* now the remaining bits */
233             if (num%8 != 0)
234                 for (i=0 ; i < 8 ; ++i)
235                 {
236                     ovec[i]<=num%8;
237                     ovec[i]|=ovec[i+1]>>(8-num%8);
238                 }
239             iv=&ovec[0];
240             c2l(iv, v0);
241             c2l(iv, v1);
242         }
243         d0^=ti[0];
244         d1^=ti[1];
245         l2cn(d0, d1, out, n);
246         out+=n;
247     }
248 }
249 iv = &(*ivec)[0];
250 l2c(v0, iv);
251 l2c(v1, iv);
252 v0=v1=d0=d1=ti[0]=ti[1]=0;
253 }

```

```

*****
4408 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/cfb64enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/cfb64enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include "des_locl.h"
60
61 /* The input and output encrypted as though 64bit cfb mode is being

```

```

62 * used. The extra state information to record how much of the
63 * 64bit block we have used is contained in *num;
64 */
65
66 void DES_cfb64_encrypt(const unsigned char *in, unsigned char *out,
67                        long length, DES_key_schedule *schedule,
68                        DES_cblock *ivec, int *num, int enc)
69 {
70     register DES_LONG v0,v1;
71     register long l=length;
72     register int n= *num;
73     DES_LONG ti[2];
74     unsigned char *iv,c,cc;
75
76     iv = &(*ivec)[0];
77     if (enc)
78     {
79         while (l--)
80         {
81             if (n == 0)
82             {
83                 c2l(iv,v0); ti[0]=v0;
84                 c2l(iv,v1); ti[1]=v1;
85                 DES_encrypt1(ti,schedule,DES_ENCRYPT);
86                 iv = &(*ivec)[0];
87                 v0=ti[0]; l2c(v0,iv);
88                 v0=ti[1]; l2c(v0,iv);
89                 iv = &(*ivec)[0];
90             }
91             c= *(in++)^iv[n];
92             *(out++)=c;
93             iv[n]=c;
94             n=(n+1)&0x07;
95         }
96     }
97     else
98     {
99         while (l--)
100         {
101             if (n == 0)
102             {
103                 c2l(iv,v0); ti[0]=v0;
104                 c2l(iv,v1); ti[1]=v1;
105                 DES_encrypt1(ti,schedule,DES_ENCRYPT);
106                 iv = &(*ivec)[0];
107                 v0=ti[0]; l2c(v0,iv);
108                 v0=ti[1]; l2c(v0,iv);
109                 iv = &(*ivec)[0];
110             }
111             cc= *(in++);
112             c=iv[n];
113             iv[n]=cc;
114             *(out++)=c^cc;
115             n=(n+1)&0x07;
116         }
117     }
118     v0=v1=ti[0]=ti[1]=c=cc=0;
119     *num=n;
120 }

```

6154 Fri May 30 18:31:42 2014
 new/usr/src/lib/openssl/libsunw_crypto/des/cfb_enc.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/des/cfb_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include "e_os.h"
60 #include "des_locl.h"
61 #include <assert.h>

```

```

63 /* The input and output are loaded in multiples of 8 bits.
64  * What this means is that if you hame numbits=12 and length=2
65  * the first 12 bits will be retrieved from the first byte and half
66  * the second. The second 12 bits will come from the 3rd and half the 4th
67  * byte.
68  */
69 /* Until Aug 1 2003 this function did not correctly implement CFB-r, so it
70  * will not be compatible with any encryption prior to that date. Ben. */
71 void DES_cfb_encrypt(const unsigned char *in, unsigned char *out, int numbits,
72                     long length, DES_key_schedule *schedule, DES_cblock *ivec,
73                     int enc)
74 {
75     register DES_LONG d0,d1,v0,v1;
76     register unsigned long l=length;
77     register int num=numbits/8,n=(numbits+7)/8,i,rem=numbits%8;
78     DES_LONG ti[2];
79     unsigned char *iv;
80 #ifndef L_ENDIAN
81     unsigned char ovec[16];
82 #else
83     unsigned int sh[4];
84     unsigned char *ovec=(unsigned char *)sh;
85
86     /* I kind of count that compiler optimizes away this assertioni,*/
87     assert (sizeof(sh[0])==4); /* as this holds true for all, */
88                                /* but 16-bit platforms... */
89 #endif
90
91     if (numbits<=0 || numbits > 64) return;
92     iv = &(*ivec)[0];
93     c2l(iv,v0);
94     c2l(iv,v1);
95     if (enc)
96     {
97         while (l >= (unsigned long)n)
98         {
99             {
100                 l-=n;
101                 ti[0]=v0;
102                 ti[1]=v1;
103                 DES_encrypt1((DES_LONG *)ti,schedule,DES_ENCRYPT);
104                 c2ln(in,d0,d1,n);
105                 in+=n;
106                 d0^=ti[0];
107                 d1^=ti[1];
108                 l2cn(d0,d1,out,n);
109                 out+=n;
110                 /* 30-08-94 - eay - changed because l>32 and
111                  * l<32 are bad under gcc :-( */
112                 if (numbits == 32)
113                     { v0=v1; v1=d0; }
114                 else if (numbits == 64)
115                     { v0=d0; v1=d1; }
116                 else
117                 {
118                     #ifndef L_ENDIAN
119                         iv=&ovec[0];
120                         l2c(v0,iv);
121                         l2c(v1,iv);
122                         l2c(d0,iv);
123                         l2c(d1,iv);
124                     #else
125                         sh[0]=v0, sh[1]=v1, sh[2]=d0, sh[3]=d1;
126                     #endif
127                     if (rem==0)

```

```

128             memmove(ovec, ovec+num, 8);
129         else
130             for(i=0 ; i < 8 ; ++i)
131                 ovec[i]=ovec[i+num]<<rem |
132                 ovec[i+num+1]>>(8-rem);
133 #ifdef L_ENDIAN
134         v0=sh[0], v1=sh[1];
135 #else
136         iv=&ovec[0];
137         c2l(iv, v0);
138         c2l(iv, v1);
139 #endif
140     }
141 }
142
143 else
144 {
145     while (l >= (unsigned long)n)
146     {
147         l-=n;
148         ti[0]=v0;
149         ti[1]=v1;
150         DES_encrypt1((DES_LONG *)ti, schedule, DES_ENCRYPT);
151         c2ln(in, d0, d1, n);
152         in+=n;
153         /* 30-08-94 - eay - changed because l>>32 and
154          * l<<32 are bad under gcc :-( */
155         if (numbits == 32)
156             { v0=v1; v1=d0; }
157         else if (numbits == 64)
158             { v0=d0; v1=d1; }
159         else
160             {
161 #ifndef L_ENDIAN
162                 iv=&ovec[0];
163                 l2c(v0, iv);
164                 l2c(v1, iv);
165                 l2c(d0, iv);
166                 l2c(d1, iv);
167 #else
168                 sh[0]=v0, sh[1]=v1, sh[2]=d0, sh[3]=d1;
169 #endif
170                 if (rem==0)
171                     memmove(ovec, ovec+num, 8);
172                 else
173                     for(i=0 ; i < 8 ; ++i)
174                         ovec[i]=ovec[i+num]<<rem |
175                         ovec[i+num+1]>>(8-rem);
176 #ifdef L_ENDIAN
177                 v0=sh[0], v1=sh[1];
178 #else
179                 iv=&ovec[0];
180                 c2l(iv, v0);
181                 c2l(iv, v1);
182 #endif
183             }
184         d0^=ti[0];
185         d1^=ti[1];
186         l2cn(d0, d1, out, n);
187         out+=n;
188     }
189 }
190 iv = &(*ivec)[0];
191 l2c(v0, iv);
192 l2c(v1, iv);
193 v0=v1=d0=d1=ti[0]=ti[1]=0;

```

```

194     }

```

new/usr/src/lib/openssl/libsunw_crypto/des/des_enc.c

1

```
*****
19528 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/des_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/des/des_enc.c */
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4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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24 * modification, are permitted provided that the following conditions
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <des_locl.h>
60 #include <spr.h>
```

new/usr/src/lib/openssl/libsunw_crypto/des/des_enc.c

2

```
62 void DES_encrypt1(DES_LONG *data, DES_key_schedule *ks, int enc)
63 {
64     register DES_LONG l,r,t,u;
65     #ifdef DES_PTR
66     register const unsigned char *des_SP=(const unsigned char *)DES_SPtrans;
67     #endif
68     #ifndef DES_UNROLL
69     register int i;
70     #endif
71     register DES_LONG *s;

73     r=data[0];
74     l=data[1];

76     IP(r,l);
77     /* Things have been modified so that the initial rotate is
78     * done outside the loop. This required the
79     * DES_SPtrans values in sp.h to be rotated 1 bit to the right.
80     * One perl script later and things have a 5% speed up on a sparc2.
81     * Thanks to Richard Outerbridge <71755.204@CompuServe.COM>
82     * for pointing this out. */
83     /* clear the top bits on machines with 8byte longs */
84     /* shift left by 2 */
85     r=ROTATE(r,29)&0xffffffffL;
86     l=ROTATE(l,29)&0xffffffffL;

88     s=ks->ks->deslong;
89     /* I don't know if it is worth the effort of loop unrolling the
90     * inner loop */
91     if (enc)
92     {
93     #ifdef DES_UNROLL
94         D_ENCRYPT(l,r, 0); /* 1 */
95         D_ENCRYPT(r,l, 2); /* 2 */
96         D_ENCRYPT(l,r, 4); /* 3 */
97         D_ENCRYPT(r,l, 6); /* 4 */
98         D_ENCRYPT(l,r, 8); /* 5 */
99         D_ENCRYPT(r,l,10); /* 6 */
100        D_ENCRYPT(l,r,12); /* 7 */
101        D_ENCRYPT(r,l,14); /* 8 */
102        D_ENCRYPT(l,r,16); /* 9 */
103        D_ENCRYPT(r,l,18); /* 10 */
104        D_ENCRYPT(l,r,20); /* 11 */
105        D_ENCRYPT(r,l,22); /* 12 */
106        D_ENCRYPT(l,r,24); /* 13 */
107        D_ENCRYPT(r,l,26); /* 14 */
108        D_ENCRYPT(l,r,28); /* 15 */
109        D_ENCRYPT(r,l,30); /* 16 */
110    #else
111        for (i=0; i<32; i+=4)
112        {
113            D_ENCRYPT(l,r,i+0); /* 1 */
114            D_ENCRYPT(r,l,i+2); /* 2 */
115        }
116    #endif
117    }
118    else
119    {
120    #ifdef DES_UNROLL
121        D_ENCRYPT(l,r,30); /* 16 */
122        D_ENCRYPT(r,l,28); /* 15 */
123        D_ENCRYPT(l,r,26); /* 14 */
124        D_ENCRYPT(r,l,24); /* 13 */
125        D_ENCRYPT(l,r,22); /* 12 */
126        D_ENCRYPT(r,l,20); /* 11 */
127        D_ENCRYPT(l,r,18); /* 10 */
```

```

128     D_ENCRYPT(r,l,16); /* 9 */
129     D_ENCRYPT(l,r,14); /* 8 */
130     D_ENCRYPT(r,l,12); /* 7 */
131     D_ENCRYPT(l,r,10); /* 6 */
132     D_ENCRYPT(r,l, 8); /* 5 */
133     D_ENCRYPT(l,r, 6); /* 4 */
134     D_ENCRYPT(r,l, 4); /* 3 */
135     D_ENCRYPT(l,r, 2); /* 2 */
136     D_ENCRYPT(r,l, 0); /* 1 */
137 #else
138     for (i=30; i>0; i-=4)
139     {
140         D_ENCRYPT(l,r,i-0); /* 16 */
141         D_ENCRYPT(r,l,i-2); /* 15 */
142     }
143 #endif
144 }

146 /* rotate and clear the top bits on machines with 8byte longs */
147 l=ROTATE(l,3)&0xffffffffL;
148 r=ROTATE(r,3)&0xffffffffL;

150 FP(r,l);
151 data[0]=l;
152 data[1]=r;
153 l=r=t=u=0;
154 }

156 void DES_encrypt2(DES_LONG *data, DES_key_schedule *ks, int enc)
157 {
158     register DES_LONG l,r,t,u;
159 #ifdef DES_PTR
160     register const unsigned char *des_SP=(const unsigned char *)DES_SPtrans;
161 #endif
162 #ifndef DES_UNROLL
163     register int i;
164 #endif
165     register DES_LONG *s;

167     r=data[0];
168     l=data[1];

170     /* Things have been modified so that the initial rotate is
171      * done outside the loop. This required the
172      * DES_SPtrans values in sp.h to be rotated 1 bit to the right.
173      * One perl script later and things have a 5% speed up on a sparc2.
174      * Thanks to Richard Outerbridge <71755.204@CompuServe.COM>
175      * for pointing this out. */
176     /* clear the top bits on machines with 8byte longs */
177     r=ROTATE(r,29)&0xffffffffL;
178     l=ROTATE(l,29)&0xffffffffL;

180     s=ks->ks->deslong;
181     /* I don't know if it is worth the effort of loop unrolling the
182      * inner loop */
183     if (enc)
184     {
185 #ifdef DES_UNROLL
186         D_ENCRYPT(l,r, 0); /* 1 */
187         D_ENCRYPT(r,l, 2); /* 2 */
188         D_ENCRYPT(l,r, 4); /* 3 */
189         D_ENCRYPT(r,l, 6); /* 4 */
190         D_ENCRYPT(l,r, 8); /* 5 */
191         D_ENCRYPT(r,l,10); /* 6 */
192         D_ENCRYPT(l,r,12); /* 7 */
193         D_ENCRYPT(r,l,14); /* 8 */

```

```

194     D_ENCRYPT(l,r,16); /* 9 */
195     D_ENCRYPT(r,l,18); /* 10 */
196     D_ENCRYPT(l,r,20); /* 11 */
197     D_ENCRYPT(r,l,22); /* 12 */
198     D_ENCRYPT(l,r,24); /* 13 */
199     D_ENCRYPT(r,l,26); /* 14 */
200     D_ENCRYPT(l,r,28); /* 15 */
201     D_ENCRYPT(r,l,30); /* 16 */
202 #else
203     for (i=0; i<32; i+=4)
204     {
205         D_ENCRYPT(l,r,i+0); /* 1 */
206         D_ENCRYPT(r,l,i+2); /* 2 */
207     }
208 #endif
209 }
210 else
211 {
212 #ifdef DES_UNROLL
213     D_ENCRYPT(l,r,30); /* 16 */
214     D_ENCRYPT(r,l,28); /* 15 */
215     D_ENCRYPT(l,r,26); /* 14 */
216     D_ENCRYPT(r,l,24); /* 13 */
217     D_ENCRYPT(l,r,22); /* 12 */
218     D_ENCRYPT(r,l,20); /* 11 */
219     D_ENCRYPT(l,r,18); /* 10 */
220     D_ENCRYPT(r,l,16); /* 9 */
221     D_ENCRYPT(l,r,14); /* 8 */
222     D_ENCRYPT(r,l,12); /* 7 */
223     D_ENCRYPT(l,r,10); /* 6 */
224     D_ENCRYPT(r,l, 8); /* 5 */
225     D_ENCRYPT(l,r, 6); /* 4 */
226     D_ENCRYPT(r,l, 4); /* 3 */
227     D_ENCRYPT(l,r, 2); /* 2 */
228     D_ENCRYPT(r,l, 0); /* 1 */
229 #else
230     for (i=30; i>0; i-=4)
231     {
232         D_ENCRYPT(l,r,i-0); /* 16 */
233         D_ENCRYPT(r,l,i-2); /* 15 */
234     }
235 #endif
236 }
237 /* rotate and clear the top bits on machines with 8byte longs */
238 data[0]=ROTATE(l,3)&0xffffffffL;
239 data[1]=ROTATE(r,3)&0xffffffffL;
240 l=r=t=u=0;
241 }

243 void DES_encrypt3(DES_LONG *data, DES_key_schedule *ks1,
244                  DES_key_schedule *ks2, DES_key_schedule *ks3)
245 {
246     register DES_LONG l,r;

248     l=data[0];
249     r=data[1];
250     IP(l,r);
251     data[0]=l;
252     data[1]=r;
253     DES_encrypt2((DES_LONG *)data, ks1, DES_ENCRYPT);
254     DES_encrypt2((DES_LONG *)data, ks2, DES_DECRYPT);
255     DES_encrypt2((DES_LONG *)data, ks3, DES_ENCRYPT);
256     l=data[0];
257     r=data[1];
258     FP(r,l);
259     data[0]=l;

```

```

260     data[1]=r;
261 }

263 void DES_decrypt3(DES_LONG *data, DES_key_schedule *ks1,
264                   DES_key_schedule *ks2, DES_key_schedule *ks3)
265 {
266     register DES_LONG l,r;

268     l=data[0];
269     r=data[1];
270     IP(l,r);
271     data[0]=l;
272     data[1]=r;
273     DES_encrypt2((DES_LONG *)data, ks3, DES_DECRYPT);
274     DES_encrypt2((DES_LONG *)data, ks2, DES_ENCRYPT);
275     DES_encrypt2((DES_LONG *)data, ks1, DES_DECRYPT);
276     l=data[0];
277     r=data[1];
278     FP(r,l);
279     data[0]=l;
280     data[1]=r;
281 }

283 #ifndef DES_DEFAULT_OPTIONS

285 #undef CBC_ENC_C_DONT_UPDATE_IV
286 #include "ncbc_enc.c" /* DES_ncbc_encrypt */

288 void DES_ede3_cbc_encrypt(const unsigned char *input, unsigned char *output,
289                           long length, DES_key_schedule *ks1,
290                           DES_key_schedule *ks2, DES_key_schedule *ks3,
291                           DES_cblock *ivec, int enc)
292 {
293     register DES_LONG tin0,tin1;
294     register DES_LONG tout0,tout1,xor0,xor1;
295     register const unsigned char *in;
296     unsigned char *out;
297     register long l=length;
298     DES_LONG tin[2];
299     unsigned char *iv;

301     in=input;
302     out=output;
303     iv = &(*ivec)[0];

305     if (enc)
306     {
307         c2l(iv,tout0);
308         c2l(iv,tout1);
309         for (l-=8; l>=0; l-=8)
310         {
311             c2l(in,tin0);
312             c2l(in,tin1);
313             tin0^=tout0;
314             tin1^=tout1;

316             tin[0]=tin0;
317             tin[1]=tin1;
318             DES_encrypt3((DES_LONG *)tin, ks1, ks2, ks3);
319             tout0=tin[0];
320             tout1=tin[1];

322             l2c(tout0,out);
323             l2c(tout1,out);
324         }
325         if (l != -8)

```

```

326     {
327         c2ln(in,tin0,tin1,l+8);
328         tin0^=tout0;
329         tin1^=tout1;

331         tin[0]=tin0;
332         tin[1]=tin1;
333         DES_encrypt3((DES_LONG *)tin, ks1, ks2, ks3);
334         tout0=tin[0];
335         tout1=tin[1];

337         l2c(tout0,out);
338         l2c(tout1,out);
339     }
340     iv = &(*ivec)[0];
341     l2c(tout0,iv);
342     l2c(tout1,iv);
343 }
344 else
345 {
346     register DES_LONG t0,t1;

348     c2l(iv,xor0);
349     c2l(iv,xor1);
350     for (l-=8; l>=0; l-=8)
351     {
352         c2l(in,tin0);
353         c2l(in,tin1);

355         t0=tin0;
356         t1=tin1;

358         tin[0]=tin0;
359         tin[1]=tin1;
360         DES_decrypt3((DES_LONG *)tin, ks1, ks2, ks3);
361         tout0=tin[0];
362         tout1=tin[1];

364         tout0^=xor0;
365         tout1^=xor1;
366         l2c(tout0,out);
367         l2c(tout1,out);
368         xor0=t0;
369         xor1=t1;
370     }
371     if (l != -8)
372     {
373         c2l(in,tin0);
374         c2l(in,tin1);

376         t0=tin0;
377         t1=tin1;

379         tin[0]=tin0;
380         tin[1]=tin1;
381         DES_decrypt3((DES_LONG *)tin, ks1, ks2, ks3);
382         tout0=tin[0];
383         tout1=tin[1];

384         tout0^=xor0;
385         tout1^=xor1;
386         l2cn(tout0,tout1,out,l+8);
387         xor0=t0;
388         xor1=t1;
389     }
390 }

```

```
392         iv = &(*ivec)[0];
393         l2c(xor0, iv);
394         l2c(xor1, iv);
395     }
396     tin0=tin1=tout0=tout1=xor0=xor1=0;
397     tin[0]=tin[1]=0;
398 }
400 #endif /* DES_DEFAULT_OPTIONS */
```


new/usr/src/lib/openssl/libsunw_crypto/des/des_old.c

1

```
*****
19729 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/des_old.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/des/des_old.c *- mode:C; c-file-style: "eay" *- */

3 /* WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING
4 *
5 * The function names in here are deprecated and are only present to
6 * provide an interface compatible with libdes. OpenSSL now provides
7 * functions where "des_" has been replaced with "DES_" in the names,
8 * to make it possible to make incompatible changes that are needed
9 * for C type security and other stuff.
10 *
11 * Please consider starting to use the DES_ functions rather than the
12 * des_ ones. The des_ functions will dissapear completely before
13 * OpenSSL 1.0!
14 *
15 * WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING
16 */

18 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
19 * project 2001.
20 */
21 /* =====
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```

new/usr/src/lib/openssl/libsunw_crypto/des/des_old.c

2

```
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68 *
69 * This product includes cryptographic software written by Eric Young
70 * (eay@cryptsoft.com). This product includes software written by Tim
71 * Hudson (tjh@cryptsoft.com).
72 *
73 */

75 #define OPENSSL_DES_LIBDES_COMPATIBILITY
76 #include <openssl/des.h>
77 #include <openssl/rand.h>

79 const char *_ossl_old_des_options(void)
80 {
81     return DES_options();
82 }

83 void _ossl_old_des_ecb3_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
84     des_key_schedule ks1, des_key_schedule ks2,
85     des_key_schedule ks3, int enc)
86 {
87     DES_ecb3_encrypt((const_DES_cblock *)input, output,
88         (DES_key_schedule *)ks1, (DES_key_schedule *)ks2,
89         (DES_key_schedule *)ks3, enc);
90 }

91 DES_LONG _ossl_old_des_cbc_cksum(_ossl_old_des_cblock *input, _ossl_old_des_cblock
92     long length, des_key_schedule schedule, _ossl_old_des_cblock *ivec)
93 {
94     return DES_cbc_cksum((unsigned char *)input, output, length,
95         (DES_key_schedule *)schedule, ivec);
96 }

97 void _ossl_old_des_cbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
98     des_key_schedule schedule, _ossl_old_des_cblock *ivec, int enc)
99 {
100     DES_cbc_encrypt((unsigned char *)input, (unsigned char *)output,
101         length, (DES_key_schedule *)schedule, ivec, enc);
102 }

103 void _ossl_old_des_ncbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
104     des_key_schedule schedule, _ossl_old_des_cblock *ivec, int enc)
105 {
106     DES_ncbc_encrypt((unsigned char *)input, (unsigned char *)output,
107         length, (DES_key_schedule *)schedule, ivec, enc);
108 }

109 void _ossl_old_des_xcbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
110     des_key_schedule schedule, _ossl_old_des_cblock *ivec,
111     _ossl_old_des_cblock *inw, _ossl_old_des_cblock *outw, int enc)
112 {
113     DES_xcbc_encrypt((unsigned char *)input, (unsigned char *)output,
114         length, (DES_key_schedule *)schedule, ivec, inw, outw, enc);
115 }

116 void _ossl_old_des_cfb_encrypt(unsigned char *in, unsigned char *out, int numbits,
117     long length, des_key_schedule schedule, _ossl_old_des_cblock *ivec, int enc)
118 {
119     DES_cfb_encrypt(in, out, numbits, length,
120         (DES_key_schedule *)schedule, ivec, enc);
121 }

122 void _ossl_old_des_ecb_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
123     des_key_schedule ks, int enc)
124 {
125     DES_ecb_encrypt(input, output, (DES_key_schedule *)ks, enc);
126 }

127 void _ossl_old_des_encrypt(DES_LONG *data, des_key_schedule ks, int enc)
```

```

128     {
129         DES_encrypt1(data, (DES_key_schedule *)ks, enc);
130     }
131 void _ossl_old_des_encrypt2(DES_LONG *data, des_key_schedule ks, int enc)
132 {
133     DES_encrypt2(data, (DES_key_schedule *)ks, enc);
134 }
135 void _ossl_old_des_encrypt3(DES_LONG *data, des_key_schedule ks1,
136     des_key_schedule ks2, des_key_schedule ks3)
137 {
138     DES_encrypt3(data, (DES_key_schedule *)ks1, (DES_key_schedule *)ks2,
139         (DES_key_schedule *)ks3);
140 }
141 void _ossl_old_des_decrypt3(DES_LONG *data, des_key_schedule ks1,
142     des_key_schedule ks2, des_key_schedule ks3)
143 {
144     DES_decrypt3(data, (DES_key_schedule *)ks1, (DES_key_schedule *)ks2,
145         (DES_key_schedule *)ks3);
146 }
147 void _ossl_old_des_ede3_cbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_c
148     long length, des_key_schedule ks1, des_key_schedule ks2,
149     des_key_schedule ks3, _ossl_old_des_cblock *ivec, int enc)
150 {
151     DES_ede3_cbc_encrypt((unsigned char *)input, (unsigned char *)output,
152         length, (DES_key_schedule *)ks1, (DES_key_schedule *)ks2,
153         (DES_key_schedule *)ks3, ivec, enc);
154 }
155 void _ossl_old_des_ede3_cfb64_encrypt(unsigned char *in, unsigned char *out,
156     long length, des_key_schedule ks1, des_key_schedule ks2,
157     des_key_schedule ks3, _ossl_old_des_cblock *ivec, int *num, int enc)
158 {
159     DES_ede3_cfb64_encrypt(in, out, length,
160         (DES_key_schedule *)ks1, (DES_key_schedule *)ks2,
161         (DES_key_schedule *)ks3, ivec, num, enc);
162 }
163 void _ossl_old_des_ede3_ofb64_encrypt(unsigned char *in, unsigned char *out,
164     long length, des_key_schedule ks1, des_key_schedule ks2,
165     des_key_schedule ks3, _ossl_old_des_cblock *ivec, int *num)
166 {
167     DES_ede3_ofb64_encrypt(in, out, length,
168         (DES_key_schedule *)ks1, (DES_key_schedule *)ks2,
169         (DES_key_schedule *)ks3, ivec, num);
170 }
171
172 #if 0 /* broken code, preserved just in case anyone specifically looks for this
173 void _ossl_old_des_xwhite_in2out(_ossl_old_des_cblock (*des_key), _ossl_old_des
174     _ossl_old_des_cblock (*out_white))
175 {
176     DES_xwhite_in2out(des_key, in_white, out_white);
177 }
178 #endif
179
180 int _ossl_old_des_enc_read(int fd, char *buf, int len, des_key_schedule sched,
181     _ossl_old_des_cblock *iv)
182 {
183     return DES_enc_read(fd, buf, len, (DES_key_schedule *)sched, iv);
184 }
185 int _ossl_old_des_enc_write(int fd, char *buf, int len, des_key_schedule sched,
186     _ossl_old_des_cblock *iv)
187 {
188     return DES_enc_write(fd, buf, len, (DES_key_schedule *)sched, iv);
189 }
190 char *_ossl_old_des_fcrypt(const char *buf, const char *salt, char *ret)
191 {
192     return DES_fcrypt(buf, salt, ret);
193 }

```

```

194 char *_ossl_old_des_crypt(const char *buf, const char *salt)
195 {
196     return DES_crypt(buf, salt);
197 }
198 char *_ossl_old_crypt(const char *buf, const char *salt)
199 {
200     return DES_crypt(buf, salt);
201 }
202 void _ossl_old_des_ofb_encrypt(unsigned char *in, unsigned char *out,
203     int numbits, long length, des_key_schedule schedule, _ossl_old_des_cblock *
204     {
205     DES_ofb_encrypt(in, out, numbits, length, (DES_key_schedule *)schedule,
206         ivec);
207 }
208 void _ossl_old_des_pcbc_encrypt(_ossl_old_des_cblock *input, _ossl_old_des_cblock
209     des_key_schedule schedule, _ossl_old_des_cblock *ivec, int enc)
210 {
211     DES_pcbc_encrypt((unsigned char *)input, (unsigned char *)output,
212         length, (DES_key_schedule *)schedule, ivec, enc);
213 }
214 DES_LONG _ossl_old_des_quad_cksum(_ossl_old_des_cblock *input, _ossl_old_des_cblo
215     long length, int out_count, _ossl_old_des_cblock *seed)
216 {
217     return DES_quad_cksum((unsigned char *)input, output, length,
218         out_count, seed);
219 }
220 void _ossl_old_des_random_seed(_ossl_old_des_cblock key)
221 {
222     RAND_seed(key, sizeof(_ossl_old_des_cblock));
223 }
224 void _ossl_old_des_random_key(_ossl_old_des_cblock ret)
225 {
226     DES_random_key((DES_cblock *)ret);
227 }
228 int _ossl_old_des_read_password(_ossl_old_des_cblock *key, const char *prompt,
229     int verify)
230 {
231     return DES_read_password(key, prompt, verify);
232 }
233 int _ossl_old_des_read_2passwords(_ossl_old_des_cblock *key1, _ossl_old_des_cblo
234     const char *prompt, int verify)
235 {
236     return DES_read_2passwords(key1, key2, prompt, verify);
237 }
238 void _ossl_old_des_set_odd_parity(_ossl_old_des_cblock *key)
239 {
240     DES_set_odd_parity(key);
241 }
242 int _ossl_old_des_is_weak_key(_ossl_old_des_cblock *key)
243 {
244     return DES_is_weak_key(key);
245 }
246 int _ossl_old_des_set_key(_ossl_old_des_cblock *key, des_key_schedule schedule)
247 {
248     return DES_set_key(key, (DES_key_schedule *)schedule);
249 }
250 int _ossl_old_des_key_sched(_ossl_old_des_cblock *key, des_key_schedule schedule)
251 {
252     return DES_key_sched(key, (DES_key_schedule *)schedule);
253 }
254 void _ossl_old_des_string_to_key(char *str, _ossl_old_des_cblock *key)
255 {
256     DES_string_to_key(str, key);
257 }
258 void _ossl_old_des_string_to_2keys(char *str, _ossl_old_des_cblock *key1, _ossl_ol
259 {

```

```
260     DES_string_to_2keys(str, key1, key2);
261 }
262 void _ossl_old_des_cfb64_encrypt(unsigned char *in, unsigned char *out, long len
263     des_key_schedule schedule, _ossl_old_des_cblock *ivec, int *num, int enc
264     {
265     DES_cfb64_encrypt(in, out, length, (DES_key_schedule *)schedule,
266         ivec, num, enc);
267 }
268 void _ossl_old_des_ofb64_encrypt(unsigned char *in, unsigned char *out, long len
269     des_key_schedule schedule, _ossl_old_des_cblock *ivec, int *num)
270     {
271     DES_ofb64_encrypt(in, out, length, (DES_key_schedule *)schedule,
272         ivec, num);
273 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/des_old2.c

1

```
*****
3597 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/des_old2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/des_old.c -*- mode:C; c-file-style: "eay" -*- */

3 /* WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING
4  *
5  * The function names in here are deprecated and are only present to
6  * provide an interface compatible with OpenSSL 0.9.6c.  OpenSSL now
7  * provides functions where "des_" has been replaced with "DES_" in
8  * the names, to make it possible to make incompatible changes that
9  * are needed for C type security and other stuff.
10 *
11 * Please consider starting to use the DES_ functions rather than the
12 * des_ ones.  The des_ functions will dissapear completely before
13 * OpenSSL 1.0!
14 *
15 * WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING
16 */

18 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
19  * project 2001.
20 */
21 /* =====
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```

new/usr/src/lib/openssl/libsunw_crypto/des/des_old2.c

2

```
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67 * =====
68 *
69 * This product includes cryptographic software written by Eric Young
70 * (eay@cryptsoft.com).  This product includes software written by Tim
71 * Hudson (tjh@cryptsoft.com).
72 *
73 */

75 #undef OPENSSL_DES_LIBDES_COMPATIBILITY
76 #include <openssl/des.h>
77 #include <openssl/rand.h>

79 void _ossl_096_des_random_seed(DES_cblock *key)
80 {
81     RAND_seed(key, sizeof(DES_cblock));
82 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/ecb3_enc.c

1

```
*****
3694 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/ecb3_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/ecb3_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include "des_locl.h"
61 void DES_ecb3_encrypt(const_DES_cblock *input, DES_cblock *output,
```

new/usr/src/lib/openssl/libsunw_crypto/des/ecb3_enc.c

2

```
62         DES_key_schedule *ks1, DES_key_schedule *ks2,
63         DES_key_schedule *ks3,
64         int enc)
65 {
66     register DES_LONG l0,l1;
67     DES_LONG ll[2];
68     const unsigned char *in = &(*input)[0];
69     unsigned char *out = &(*output)[0];
71     c2l(in,l0);
72     c2l(in,l1);
73     ll[0]=l0;
74     ll[1]=l1;
75     if (enc)
76         DES_encrypt3(ll,ks1,ks2,ks3);
77     else
78         DES_decrypt3(ll,ks1,ks2,ks3);
79     l0=ll[0];
80     l1=ll[1];
81     l2c(l0,out);
82     l2c(l1,out);
83 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/ecb_enc.c

1

```
*****
4391 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/ecb_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/des/ecb_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include "des_locl.h"
60 #include "des_ver.h"
61 #include <openssl/opensslv.h>
```

new/usr/src/lib/openssl/libsunw_crypto/des/ecb_enc.c

2

```
62 #include <openssl/bio.h>

64 OPENSSL_GLOBAL const char libdes_version[]="libdes" OPENSSL_VERSION_PTEXT;
65 OPENSSL_GLOBAL const char DES_version[]="DES" OPENSSL_VERSION_PTEXT;

67 const char *DES_options(void)
68 {
69     static int init=1;
70     static char buf[32];

72     if (init)
73     {
74         const char *ptr,*unroll,*risc,*size;

76         #ifdef DES_PTR
77             ptr="ptr";
78         #else
79             ptr="idx";
80         #endif
81         #if defined(DES_RISC1) || defined(DES_RISC2)
82         #ifdef DES_RISC1
83             risc="risc1";
84         #endif
85         #ifdef DES_RISC2
86             risc="risc2";
87         #endif
88         #else
89             risc="cisc";
90         #endif
91         #ifdef DES_UNROLL
92             unroll="16";
93         #else
94             unroll="2";
95         #endif
96         if (sizeof(DES_LONG) != sizeof(long))
97             size="int";
98         else
99             size="long";
100         BIO_snprintf(buf,sizeof buf,"des(%s,%s,%s,%s)",ptr,risc,unroll,
101             size);
102         init=0;
103     }
104     return(buf);
105 }
106

108 void DES_ecb_encrypt(const DES_cblock *input, DES_cblock *output,
109     DES_key_schedule *ks, int enc)
110 {
111     register DES_LONG l;
112     DES_LONG ll[2];
113     const unsigned char *in = &(*input)[0];
114     unsigned char *out = &(*output)[0];

116     c2l(in,l); ll[0]=l;
117     c2l(in,l); ll[1]=l;
118     DES_encrypt1(ll,ks,enc);
119     l=ll[0]; l2c(l,out);
120     l=ll[1]; l2c(l,out);
121     l=ll[0]=ll[1]=0;
122 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/ede_cbc_m_enc.c

1

```
*****
5241 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/ede_cbc_m_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ede_cbc_m_enc.c */
2 /* Written by Ben Laurie <ben@algroup.co.uk> for the OpenSSL
3  * project 13 Feb 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 /*

61 This is an implementation of Triple DES Cipher Block Chaining with Output
```

new/usr/src/lib/openssl/libsunw_crypto/des/ede_cbc_m_enc.c

2

```
62 Feedback Masking, by Coppersmith, Johnson and Matyas, (IBM and Certicom).

64 Note that there is a known attack on this by Biham and Knudsen but it takes
65 a lot of work:

67 http://www.cs.technion.ac.il/users/wwwb/cgi-bin/tr-get.cgi/1998/CS/CS0928.ps.gz
68 */

71 #include <openssl/opensslconf.h> /* To see if OPENSSL_NO_DESCBCM is defined */

73 #ifndef OPENSSL_NO_DESCBCM
74 #include "des_locl.h"

76 void DES_ede3_cbc_m_encrypt(const unsigned char *in, unsigned char *out,
77                             long length, DES_key_schedule *ks1, DES_key_schedule *ks2,
78                             DES_key_schedule *ks3, DES_cblock *ivec1, DES_cblock *ivec2,
79                             int enc)
80 {
81     register DES_LONG tin0,tin1;
82     register DES_LONG tout0,tout1,xor0,xor1,m0,m1;
83     register long l=length;
84     DES_LONG tin[2];
85     unsigned char *iv1,*iv2;

87     iv1 = &(*ivec1)[0];
88     iv2 = &(*ivec2)[0];

90     if (enc)
91     {
92         c2l(iv1,m0);
93         c2l(iv1,m1);
94         c2l(iv2,tout0);
95         c2l(iv2,tout1);
96         for (l-=8; l>=-7; l-=8)
97         {
98             tin[0]=m0;
99             tin[1]=m1;
100             DES_encrypt1(tin,ks3,1);
101             m0=tin[0];
102             m1=tin[1];

104             if(l < 0)
105             {
106                 c2ln(in,tin0,tin1,l+8);
107             }
108             else
109             {
110                 c2l(in,tin0);
111                 c2l(in,tin1);
112             }
113             tin0^=tout0;
114             tin1^=tout1;

116             tin[0]=tin0;
117             tin[1]=tin1;
118             DES_encrypt1(tin,ks1,1);
119             tin[0]^=m0;
120             tin[1]^=m1;
121             DES_encrypt1(tin,ks2,0);
122             tin[0]^=m0;
123             tin[1]^=m1;
124             DES_encrypt1(tin,ks1,1);
125             tout0=tin[0];
126             tout1=tin[1];
```

```

128         l2c(tout0,out);
129         l2c(tout1,out);
130     }
131     iv1=&(*ivec1)[0];
132     l2c(m0,iv1);
133     l2c(m1,iv1);
134
135     iv2=&(*ivec2)[0];
136     l2c(tout0,iv2);
137     l2c(tout1,iv2);
138 }
139 else
140 {
141     register DES_LONG t0,t1;
142
143     c2l(iv1,m0);
144     c2l(iv1,m1);
145     c2l(iv2,xor0);
146     c2l(iv2,xor1);
147     for (l=8; l>=-7; l-=8)
148     {
149         tin[0]=m0;
150         tin[1]=m1;
151         DES_encrypt1(tin,ks3,1);
152         m0=tin[0];
153         m1=tin[1];
154
155         c2l(in,tin0);
156         c2l(in,tin1);
157
158         t0=tin0;
159         t1=tin1;
160
161         tin[0]=tin0;
162         tin[1]=tin1;
163         DES_encrypt1(tin,ks1,0);
164         tin[0]^=m0;
165         tin[1]^=m1;
166         DES_encrypt1(tin,ks2,1);
167         tin[0]^=m0;
168         tin[1]^=m1;
169         DES_encrypt1(tin,ks1,0);
170         tout0=tin[0];
171         tout1=tin[1];
172
173         tout0^=xor0;
174         tout1^=xor1;
175         if(l < 0)
176         {
177             l2cn(tout0,tout1,out,l+8);
178         }
179         else
180         {
181             l2c(tout0,out);
182             l2c(tout1,out);
183         }
184         xor0=t0;
185         xor1=t1;
186     }
187
188     iv1=&(*ivec1)[0];
189     l2c(m0,iv1);
190     l2c(m1,iv1);
191
192     iv2=&(*ivec2)[0];
193     l2c(xor0,iv2);

```

```

194         l2c(xor1,iv2);
195     }
196     tin0=tin1=tout0=tout1=xor0=xor1=0;
197     tin[0]=tin[1]=0;
198 }
199 #endif

```



```

*****
7558 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/enc_read.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/enc_read.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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24 * modification, are permitted provided that the following conditions
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"

```

```

62 #include "des_locl.h"

64 /* This has some uglies in it but it works - even over sockets. */
65 /*extern int errno;*/
66 OPENSSL_IMPLEMENT_GLOBAL(int, DES_rw_mode, DES_PCBC_MODE)

69 /*
70  * WARNINGS:
71  *
72  * - The data format used by DES_enc_write() and DES_enc_read()
73  * has a cryptographic weakness: When asked to write more
74  * than MAXWRITE bytes, DES_enc_write will split the data
75  * into several chunks that are all encrypted
76  * using the same IV. So don't use these functions unless you
77  * are sure you know what you do (in which case you might
78  * not want to use them anyway).
79  *
80  * - This code cannot handle non-blocking sockets.
81  *
82  * - This function uses an internal state and thus cannot be
83  * used on multiple files.
84  */

87 int DES_enc_read(int fd, void *buf, int len, DES_key_schedule *sched,
88                  DES_cblock *iv)
89 {
90     #if defined(OPENSSL_NO_POSIX_IO)
91         return(0);
92     #else
93         /* data to be unencrypted */
94         int net_num=0;
95         static unsigned char *net=NULL;
96         /* extra unencrypted data
97          * for when a block of 100 comes in but is des_read one byte at
98          * a time. */
99         static unsigned char *unnet=NULL;
100         static int unnet_start=0;
101         static int unnet_left=0;
102         static unsigned char *tmpbuf=NULL;
103         int i;
104         long num=0, rnum;
105         unsigned char *p;

107         if (tmpbuf == NULL)
108         {
109             tmpbuf=OPENSSL_malloc(BSIZE);
110             if (tmpbuf == NULL) return(-1);
111         }
112         if (net == NULL)
113         {
114             net=OPENSSL_malloc(BSIZE);
115             if (net == NULL) return(-1);
116         }
117         if (unnet == NULL)
118         {
119             unnet=OPENSSL_malloc(BSIZE);
120             if (unnet == NULL) return(-1);
121         }
122         /* left over data from last decrypt */
123         if (unnet_left != 0)
124         {
125             if (unnet_left < len)
126             {
127                 /* we still still need more data but will return

```

```

128         * with the number of bytes we have - should always
129         * check the return value */
130         memcpy(buf, &(unnet[unnet_start]),
131             unnet_left);
132         /* eay 26/08/92 I had the next 2 lines
133         * reversed :-( */
134         i=unnet_left;
135         unnet_start=unnet_left=0;
136     }
137     else
138     {
139         memcpy(buf, &(unnet[unnet_start]), len);
140         unnet_start+=len;
141         unnet_left-=len;
142         i=len;
143     }
144     return(i);
145 }

147 /* We need to get more data. */
148 if (len > MAXWRITE) len=MAXWRITE;

150 /* first - get the length */
151 while (net_num < HDRSIZE)
152 {
153 #ifndef OPENSSSL_SYS_WIN32
154     i=read(fd, (void *)&(net[net_num]), HDRSIZE-net_num);
155 #else
156     i=_read(fd, (void *)&(net[net_num]), HDRSIZE-net_num);
157 #endif
158 #ifdef EINTR
159     if ((i == -1) && (errno == EINTR)) continue;
160 #endif
161     if (i <= 0) return(0);
162     net_num+=i;
163 }

165 /* we now have at net_num bytes in net */
166 p=net;
167 /* num=0; */
168 n2l(p, num);
169 /* num should be rounded up to the next group of eight
170  * we make sure that we have read a multiple of 8 bytes from the net.
171  */
172 if ((num > MAXWRITE) || (num < 0)) /* error */
173     return(-1);
174 rnum=(num < 8)?8:((num+7)/8*8);

176 net_num=0;
177 while (net_num < rnum)
178 {
179 #ifndef OPENSSSL_SYS_WIN32
180     i=read(fd, (void *)&(net[net_num]), rnum-net_num);
181 #else
182     i=_read(fd, (void *)&(net[net_num]), rnum-net_num);
183 #endif
184 #ifdef EINTR
185     if ((i == -1) && (errno == EINTR)) continue;
186 #endif
187     if (i <= 0) return(0);
188     net_num+=i;
189 }

191 /* Check if there will be data left over. */
192 if (len < num)
193 {

```

```

194     if (DES_rw_mode & DES_PCBC_MODE)
195         DES_pcbc_encrypt(net, unnet, num, sched, iv, DES_DECRYPT);
196     else
197         DES_cbc_encrypt(net, unnet, num, sched, iv, DES_DECRYPT);
198     memcpy(buf, unnet, len);
199     unnet_start=len;
200     unnet_left=num-len;

202     /* The following line is done because we return num
203     * as the number of bytes read. */
204     num=len;
205 }
206 else
207 {
208     /* >output is a multiple of 8 bytes, if len < rnum
209     * >we must be careful. The user must be aware that this
210     * >routine will write more bytes than he asked for.
211     * >The length of the buffer must be correct.
212     * FIXED - Should be ok now 18-9-90 - eay */
213     if (len < rnum)
214     {
215         if (DES_rw_mode & DES_PCBC_MODE)
216             DES_pcbc_encrypt(net, tmpbuf, num, sched, iv,
217                 DES_DECRYPT);
218         else
219             DES_cbc_encrypt(net, tmpbuf, num, sched, iv,
220                 DES_DECRYPT);

222         /* eay 26/08/92 fix a bug that returned more
223         * bytes than you asked for (returned len bytes :-( */
224         memcpy(buf, tmpbuf, num);
225     }
226     else
227     {
228         if (DES_rw_mode & DES_PCBC_MODE)
229             DES_pcbc_encrypt(net, buf, num, sched, iv,
230                 DES_DECRYPT);
231         else
232             DES_cbc_encrypt(net, buf, num, sched, iv,
233                 DES_DECRYPT);
234     }
235 }
236 }
237 return num;
238 #endif /* OPENSSSL_NO_POSIX_IO */
239 }

```

new/usr/src/lib/openssl/libsunw_crypto/des/enc_writ.c

1

5758 Fri May 30 18:31:42 2014
new/usr/src/lib/openssl/libsunw_crypto/des/enc_writ.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/des/enc_writ.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <errno.h>
60 #include <time.h>
61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/des/enc_writ.c

2

```
62 #include "cryptlib.h"
63 #include "des_locl.h"
64 #include <openssl/rand.h>
65
66 /*
67  * WARNINGS:
68  *
69  * - The data format used by DES_enc_write() and DES_enc_read()
70  * has a cryptographic weakness: When asked to write more
71  * than MAXWRITE bytes, DES_enc_write will split the data
72  * into several chunks that are all encrypted
73  * using the same IV. So don't use these functions unless you
74  * are sure you know what you do (in which case you might
75  * not want to use them anyway).
76  *
77  * - This code cannot handle non-blocking sockets.
78 */
79
80 int DES_enc_write(int fd, const void *_buf, int len,
81                  DES_key_schedule *sched, DES_cblock *iv)
82 {
83     #if defined(OPENSSL_NO_POSIX_IO)
84         return (-1);
85     #else
86     #ifdef _LIBC
87         extern unsigned long time();
88         extern int write();
89     #endif
90         const unsigned char *buf=_buf;
91         long rnum;
92         int i,j,k,outnum;
93         static unsigned char *outbuf=NULL;
94         unsigned char shortbuf[8];
95         unsigned char *p;
96         const unsigned char *cp;
97         static int start=1;
98
99         if (outbuf == NULL)
100             {
101                 outbuf=OPENSSL_malloc(BSIZE+HDRSIZE);
102                 if (outbuf == NULL) return(-1);
103             }
104         /* If we are sending less than 8 bytes, the same char will look
105          * the same if we don't pad it out with random bytes */
106         if (start)
107             {
108                 start=0;
109             }
110
111         /* lets recurse if we want to send the data in small chunks */
112         if (len > MAXWRITE)
113             {
114                 j=0;
115                 for (i=0; i<len; i+=k)
116                     {
117                         k=DES_enc_write(fd,&(buf[i]),
118                                         ((len-i) > MAXWRITE)?MAXWRITE:(len-i),sched,iv);
119                         if (k < 0)
120                             return(k);
121                         else
122                             j+=k;
123                     }
124                 return(j);
125             }
126
127         /* write length first */
```

```
128     p=outbuf;
129     l2n(len,p);

131     /* pad short strings */
132     if (len < 8)
133     {
134         cp=shortbuf;
135         memcpy(shortbuf,buf,len);
136         RAND_pseudo_bytes(shortbuf+len, 8-len);
137         rnum=8;
138     }
139     else
140     {
141         cp=buf;
142         rnum=((len+7)/8*8); /* round up to nearest eight */
143     }

145     if (DES_rw_mode & DES_PCBC_MODE)
146         DES_pcbc_encrypt(cp,&(outbuf[HDRSIZE]),(len<8)?8:len,sched,iv,
147                         DES_ENCRYPT);
148     else
149         DES_cbc_encrypt(cp,&(outbuf[HDRSIZE]),(len<8)?8:len,sched,iv,
150                         DES_ENCRYPT);

152     /* output */
153     outnum=rnum+HDRSIZE;

155     for (j=0; j<outnum; j+=i)
156     {
157         /* eay 26/08/92 I was not doing writing from where we
158          * got up to. */
159 #ifndef _WIN32
160         i=write(fd,(void *)&(outbuf[j]),outnum-j);
161 #else
162         i=_write(fd,(void *)&(outbuf[j]),outnum-j);
163 #endif
164         if (i == -1)
165         {
166 #ifdef EINTR
167             if (errno == EINTR)
168                 i=0;
169             else
170 #endif
171                 /* This is really a bad error - very bad
172                  * It will stuff-up both ends. */
173                 return(-1);
174         }
175     }

177     return(len);
178 #endif /* OPENSSL_NO_POSIX_IO */
179 }
```



```
128 #endif
130 /* EAY
131 r=strlen(buf);
132 r=(r+7)/8;
133 */
134     for (i=0; i<8; i++)
135     {
136         c= *(buf++);
137         if (!c) break;
138         key[i]=(c<<1);
139     }
140     for (; i<8; i++)
141         key[i]=0;
143     DES_set_key_unchecked(&key,&ks);
144     fcrypt_body(&(out[0]),&ks,Eswap0,Eswap1);
146     ll=out[0]; l2c(ll,b);
147     ll=out[1]; l2c(ll,b);
148     y=0;
149     u=0x80;
150     bb[8]=0;
151     for (i=2; i<13; i++)
152     {
153         c=0;
154         for (j=0; j<6; j++)
155         {
156             c<<=1;
157             if (bb[y] & u) c|=1;
158             u>>=1;
159             if (!u)
160             {
161                 y++;
162                 u=0x80;
163             }
164         }
165         ret[i]=cov_2char[c];
166     }
167     ret[13]='\0';
168     return(ret);
169 }
```

```

*****
4950 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/fcrypt_b.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/des/fcrypt_b.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>

61 /* This version of crypt has been developed from my MIT compatible

```

```

62 * DES library.
63 * The library is available at pub/Crypto/DES at ftp.psy.uq.oz.au
64 * Eric Young (eay@cryptsoft.com)
65 */

67 #define DES_FCRYPT
68 #include "des_locl.h"
69 #undef DES_FCRYPT

71 #undef PERM_OP
72 #define PERM_OP(a,b,t,n,m) (((t)=(((a)>>(n))^(b))&(m))),\
73 (b)^(t),\
74 (a)^(t)<<(n)))

76 #undef HPERM_OP
77 #define HPERM_OP(a,t,n,m) (((t)=(((a)<<(16-(n)))^(a))&(m))),\
78 (a)=(a)^(t)^(t>>(16-(n))))\

80 void fcrypt_body(DES_LONG *out, DES_key_schedule *ks, DES_LONG Eswap0,
81                  DES_LONG Eswap1)
82 {
83     register DES_LONG l,r,t,u;
84 #ifdef DES_PTR
85     register const unsigned char *des_SP=(const unsigned char *)DES_SPtrans;
86 #endif
87     register DES_LONG *s;
88     register int j;
89     register DES_LONG E0,E1;

91     l=0;
92     r=0;

94     s=(DES_LONG *)ks;
95     E0=Eswap0;
96     E1=Eswap1;

98     for (j=0; j<25; j++)
99     {
100 #ifndef DES_UNROLL
101         register int i;

103         for (i=0; i<32; i+=4)
104         {
105             D_ENCRYPT(l,r,i+0); /* 1 */
106             D_ENCRYPT(r,l,i+2); /* 2 */
107         }
108 #else
109         D_ENCRYPT(l,r, 0); /* 1 */
110         D_ENCRYPT(r,l, 2); /* 2 */
111         D_ENCRYPT(l,r, 4); /* 3 */
112         D_ENCRYPT(r,l, 6); /* 4 */
113         D_ENCRYPT(l,r, 8); /* 5 */
114         D_ENCRYPT(r,l,10); /* 6 */
115         D_ENCRYPT(l,r,12); /* 7 */
116         D_ENCRYPT(r,l,14); /* 8 */
117         D_ENCRYPT(l,r,16); /* 9 */
118         D_ENCRYPT(r,l,18); /* 10 */
119         D_ENCRYPT(l,r,20); /* 11 */
120         D_ENCRYPT(r,l,22); /* 12 */
121         D_ENCRYPT(l,r,24); /* 13 */
122         D_ENCRYPT(r,l,26); /* 14 */
123         D_ENCRYPT(l,r,28); /* 15 */
124         D_ENCRYPT(r,l,30); /* 16 */
125 #endif

127         t=l;

```

```
128         l=r;
129         r=t;
130     }
131     l=ROTATE(l,3)&0xffffffffL;
132     r=ROTATE(r,3)&0xffffffffL;
133
134     PERM_OP(l,r,t, 1,0x55555555L);
135     PERM_OP(r,l,t, 8,0x00ff00ffL);
136     PERM_OP(l,r,t, 2,0x33333333L);
137     PERM_OP(r,l,t,16,0x0000ffffL);
138     PERM_OP(l,r,t, 4,0x0f0f0f0fL);
139
140     out[0]=r;
141     out[1]=l;
142 }
```

5176 Fri May 30 18:31:43 2014
 new/usr/src/lib/openssl/libsunw_crypto/des/ncbc_enc.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1  /* crypto/des/ncbc_enc.c */
2  /*
3   * #included by:
4   *   cbc_enc.c (DES_cbc_encrypt)
5   *   des_enc.c (DES_ncbc_encrypt)
6   */
7  /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
8   * All rights reserved.
9   *
10 * This package is an SSL implementation written
11 * by Eric Young (eay@cryptsoft.com).
12 * The implementation was written so as to conform with Netscapes SSL.
13 *
14 * This library is free for commercial and non-commercial use as long as
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35 *    documentation and/or other materials provided with the distribution.
36 * 3. All advertising materials mentioning features or use of this software
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52 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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54 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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60 * copied and put under another distribution licence
61 * [including the GNU Public Licence.]

```

62 */

64 #include "des_locl.h"

```

66 #ifdef CBC_ENC_C_DONT_UPDATE_IV
67 void DES_cbc_encrypt(const unsigned char *in, unsigned char *out, long length,
68                     DES_key_schedule *_schedule, DES_cblock *ivec, int enc)
69 #else
70 void DES_ncbc_encrypt(const unsigned char *in, unsigned char *out, long length,
71                      DES_key_schedule *_schedule, DES_cblock *ivec, int enc)
72 #endif
73 {
74     register DES_LONG tin0,tin1;
75     register DES_LONG tout0,tout1,xor0,xor1;
76     register long l=length;
77     DES_LONG tin[2];
78     unsigned char *iv;
79
80     iv = &(*ivec)[0];
81
82     if (enc)
83     {
84         c2l(iv,tout0);
85         c2l(iv,tout1);
86         for (l-=8; l>=0; l-=8)
87         {
88             c2l(in,tin0);
89             c2l(in,tin1);
90             tin0^=tout0; tin[0]=tin0;
91             tin1^=tout1; tin[1]=tin1;
92             DES_encrypt1((DES_LONG *)tin,_schedule,DES_ENCRYPT);
93             tout0=tin[0]; l2c(tout0,out);
94             tout1=tin[1]; l2c(tout1,out);
95         }
96         if (l != -8)
97         {
98             c2ln(in,tin0,tin1,l+8);
99             tin0^=tout0; tin[0]=tin0;
100            tin1^=tout1; tin[1]=tin1;
101            DES_encrypt1((DES_LONG *)tin,_schedule,DES_ENCRYPT);
102            tout0=tin[0]; l2c(tout0,out);
103            tout1=tin[1]; l2c(tout1,out);
104        }
105    }
106    #ifndef CBC_ENC_C_DONT_UPDATE_IV
107    iv = &(*ivec)[0];
108    l2c(tout0,iv);
109    l2c(tout1,iv);
110    #endif
111    }
112    else
113    {
114        c2l(iv,xor0);
115        c2l(iv,xor1);
116        for (l-=8; l>=0; l-=8)
117        {
118            c2l(in,tin0); tin[0]=tin0;
119            c2l(in,tin1); tin[1]=tin1;
120            DES_encrypt1((DES_LONG *)tin,_schedule,DES_DECRYPT);
121            tout0=tin[0]^xor0;
122            tout1=tin[1]^xor1;
123            l2c(tout0,out);
124            l2c(tout1,out);
125            xor0=tin0;
126            xor1=tin1;
127        }
128        if (l != -8)

```

```
128         {
129             c2l(in,tin0); tin[0]=tin0;
130             c2l(in,tin1); tin[1]=tin1;
131             DES_encrypt1((DES_LONG *)tin,_schedule,DES_DECRYPT);
132             tout0=tin[0]^xor0;
133             tout1=tin[1]^xor1;
134             l2cn(tout0,tout1,out,l+8);
135 #ifndef CBC_ENC_C__DONT_UPDATE_IV
136             xor0=tin0;
137             xor1=tin1;
138 #endif
139         }
140 #ifndef CBC_ENC_C__DONT_UPDATE_IV
141         iv = &(*ivec)[0];
142         l2c(xor0,iv);
143         l2c(xor1,iv);
144 #endif
145     }
146     tin0=tin1=tout0=tout1=xor0=xor1=0;
147     tin[0]=tin[1]=0;
148 }
```

```

*****
4557 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/ofb64ede.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/ofb64ede.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include "des_locl.h"
61 /* The input and output encrypted as though 64bit ofb mode is being

```

```

62 * used. The extra state information to record how much of the
63 * 64bit block we have used is contained in *num;
64 */
65 void DES_ede3_ofb64_encrypt(register const unsigned char *in,
66                             register unsigned char *out, long length,
67                             DES_key_schedule *k1, DES_key_schedule *k2,
68                             DES_key_schedule *k3, DES_cblock *ivec,
69                             int *num)
70 {
71     register DES_LONG v0,v1;
72     register int n= *num;
73     register long l=length;
74     DES_cblock d;
75     register char *dp;
76     DES_LONG ti[2];
77     unsigned char *iv;
78     int save=0;
79
80     iv = &(*ivec)[0];
81     c2l(iv,v0);
82     c2l(iv,v1);
83     ti[0]=v0;
84     ti[1]=v1;
85     dp=(char *)d;
86     l2c(v0,dp);
87     l2c(v1,dp);
88     while (l--)
89     {
90         if (n == 0)
91         {
92             /* ti[0]=v0; */
93             /* ti[1]=v1; */
94             DES_encrypt3(ti,k1,k2,k3);
95             v0=ti[0];
96             v1=ti[1];
97
98             dp=(char *)d;
99             l2c(v0,dp);
100            l2c(v1,dp);
101            save++;
102        }
103        *(out++)= *(in++)^d[n];
104        n=(n+1)&0x07;
105    }
106    if (save)
107    {
108        v0=ti[0];
109        v1=ti[1];
110        iv = &(*ivec)[0];
111        l2c(v0,iv);
112        l2c(v1,iv);
113    }
114    v0=v1=ti[0]=ti[1]=0;
115    *num=n;
116 }
117
118 #ifndef undef /* MACRO */
119 void DES_ede2_ofb64_encrypt(register unsigned char *in,
120                             register unsigned char *out, long length, DES_key_schedule k1,
121                             DES_key_schedule k2, DES_cblock (*ivec), int *num)
122 {
123     DES_ede3_ofb64_encrypt(in, out, length, k1,k2,k1, ivec, num);
124 }
125 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/des/ofb64enc.c

1

```
*****
4177 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/ofb64enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/ofb64enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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5  * This package is an SSL implementation written
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include "des_locl.h"
60
61 /* The input and output encrypted as though 64bit ofb mode is being
```

new/usr/src/lib/openssl/libsunw_crypto/des/ofb64enc.c

2

```
62 * used. The extra state information to record how much of the
63 * 64bit block we have used is contained in *num;
64 */
65 void DES_ofb64_encrypt(register const unsigned char *in,
66                        register unsigned char *out, long length,
67                        DES_key_schedule *schedule, DES_cblock *ivec, int *num)
68 {
69     register DES_LONG v0,v1,t;
70     register int n= *num;
71     register long l=length;
72     DES_cblock d;
73     register unsigned char *dp;
74     DES_LONG ti[2];
75     unsigned char *iv;
76     int save=0;
77
78     iv = &(*ivec)[0];
79     c2l(iv,v0);
80     c2l(iv,v1);
81     ti[0]=v0;
82     ti[1]=v1;
83     dp=d;
84     l2c(v0,dp);
85     l2c(v1,dp);
86     while (l--)
87     {
88         if (n == 0)
89         {
90             DES_encrypt1(ti,schedule,DES_ENCRYPT);
91             dp=d;
92             t=ti[0]; l2c(t,dp);
93             t=ti[1]; l2c(t,dp);
94             save++;
95         }
96         *(out++)= *(in++)^d[n];
97         n=(n+1)&0x07;
98     }
99     if (save)
100     {
101         v0=ti[0];
102         v1=ti[1];
103         iv = &(*ivec)[0];
104         l2c(v0,iv);
105         l2c(v1,iv);
106     }
107     t=v0=v1=ti[0]=ti[1]=0;
108     *num=n;
109 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/ofb_enc.c

1

4817 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/ofb_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/des/ofb_enc.c */
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57 */

59 #include "des_locl.h"

61 /* The input and output are loaded in multiples of 8 bits.
```

new/usr/src/lib/openssl/libsunw_crypto/des/ofb_enc.c

2

```
62 * What this means is that if you hame numbits=12 and length=2
63 * the first 12 bits will be retrieved from the first byte and half
64 * the second. The second 12 bits will come from the 3rd and half the 4th
65 * byte.
66 */
67 void DES_ofb_encrypt(const unsigned char *in, unsigned char *out, int numbits,
68                      long length, DES_key_schedule *schedule,
69                      DES_cblock *ivec)
70 {
71     register DES_LONG d0,d1,vv0,vv1,v0,v1,n=(numbits+7)/8;
72     register DES_LONG mask0,mask1;
73     register long l=length;
74     register int num=numbits;
75     DES_LONG ti[2];
76     unsigned char *iv;

78     if (num > 64) return;
79     if (num > 32)
80     {
81         mask0=0xffffffffL;
82         if (num >= 64)
83             mask1=mask0;
84         else
85             mask1=(1L<<(num-32))-1;
86     }
87     else
88     {
89         if (num == 32)
90             mask0=0xffffffffL;
91         else
92             mask0=(1L<<num)-1;
93         mask1=0x00000000L;
94     }

96     iv = &(*ivec)[0];
97     c2l(iv,v0);
98     c2l(iv,v1);
99     ti[0]=v0;
100    ti[1]=v1;
101    while (l-- > 0)
102    {
103        ti[0]=v0;
104        ti[1]=v1;
105        DES_encrypt1((DES_LONG *)ti,schedule,DES_ENCRYPT);
106        vv0=ti[0];
107        vv1=ti[1];
108        c2ln(in,d0,d1,n);
109        in+=n;
110        d0=(d0^vv0)&mask0;
111        d1=(d1^vv1)&mask1;
112        l2cn(d0,d1,out,n);
113        out+=n;

115        if (num == 32)
116            { v0=v1; v1=vv0; }
117        else if (num == 64)
118            { v0=vv0; v1=vv1; }
119        else if (num > 32) /* && num != 64 */
120        {
121            v0=((v1>>(num-32))|(vv0<<(64-num)))&0xffffffffL;
122            v1=((vv0>>(num-32))|(vv1<<(64-num)))&0xffffffffL;
123        }
124        else /* num < 32 */
125        {
126            v0=((v0>>num)|(v1<<(32-num)))&0xffffffffL;
127            v1=((v1>>num)|(vv0<<(32-num)))&0xffffffffL;
```

```
128         }  
129     }  
130     iv = &(*ivec)[0];  
131     l2c(v0, iv);  
132     l2c(v1, iv);  
133     v0=v1=d0=d1=ti[0]=ti[1]=vv0=vv1=0;  
134 }
```

```

*****
4413 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/pcbc_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/pcbc_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
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57 */
58
59 #include "des_locl.h"
60
61 void DES_pcbc_encrypt(const unsigned char *input, unsigned char *output,

```

```

62         long length, DES_key_schedule *schedule,
63         DES_cblock *ivec, int enc)
64     {
65         register DES_LONG sin0, sin1, xor0, xor1, tout0, tout1;
66         DES_LONG tin[2];
67         const unsigned char *in;
68         unsigned char *out, *iv;
69
70         in=input;
71         out=output;
72         iv = &(*ivec)[0];
73
74         if (enc)
75         {
76             c2l(iv, xor0);
77             c2l(iv, xor1);
78             for (; length>0; length-=8)
79             {
80                 if (length >= 8)
81                 {
82                     c2l(in, sin0);
83                     c2l(in, sin1);
84                 }
85                 else
86                     c2ln(in, sin0, sin1, length);
87                 tin[0]=sin0^xor0;
88                 tin[1]=sin1^xor1;
89                 DES_encrypt1((DES_LONG *)tin, schedule, DES_ENCRYPT);
90                 tout0=tin[0];
91                 tout1=tin[1];
92                 xor0=sin0^tout0;
93                 xor1=sin1^tout1;
94                 l2c(tout0, out);
95                 l2c(tout1, out);
96             }
97         }
98         else
99         {
100             c2l(iv, xor0); c2l(iv, xor1);
101             for (; length>0; length-=8)
102             {
103                 c2l(in, sin0);
104                 c2l(in, sin1);
105                 tin[0]=sin0;
106                 tin[1]=sin1;
107                 DES_encrypt1((DES_LONG *)tin, schedule, DES_DECRYPT);
108                 tout0=tin[0]^xor0;
109                 tout1=tin[1]^xor1;
110                 if (length >= 8)
111                 {
112                     l2c(tout0, out);
113                     l2c(tout1, out);
114                 }
115                 else
116                     l2cn(tout0, tout1, out, length);
117                 xor0=tout0^sin0;
118                 xor1=tout1^sin1;
119             }
120             tin[0]=tin[1]=0;
121             sin0=sin1=xor0=xor1=tout0=tout1=0;
122         }
123     }

```

new/usr/src/lib/openssl/libsunw_crypto/des/qud_cksm.c

1

5116 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/qud_cksm.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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7  * The implementation was written so as to conform with Netscapes SSL.
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57 */
58
59 /* From "Message Authentication" R.R. Jueneman, S.M. Matyas, C.H. Meyer
60 * IEEE Communications Magazine Sept 1985 Vol. 23 No. 9 p 29-40
61 * This module is only based on the code in this paper and is
```

new/usr/src/lib/openssl/libsunw_crypto/des/qud_cksm.c

2

```
62 * almost definitely not the same as the MIT implementation.
63 */
64 #include "des_locl.h"
65
66 /* bug fix for dos - 7/6/91 - Larry hughes@logos.ucsf.indiana.edu */
67 #define Q_B0(a) (((DES_LONG)(a)))
68 #define Q_B1(a) (((DES_LONG)(a))<<8)
69 #define Q_B2(a) (((DES_LONG)(a))<<16)
70 #define Q_B3(a) (((DES_LONG)(a))<<24)
71
72 /* used to scramble things a bit */
73 /* Got the value MIT uses via brute force :- ) 2/10/90 eay */
74 #define NOISE ((DES_LONG)83653421L)
75
76 DES_LONG DES_quad_cksum(const unsigned char *input, DES_cblock output[],
77                          long length, int out_count, DES_cblock *seed)
78 {
79     DES_LONG z0,z1,t0,t1;
80     int i;
81     long l;
82     const unsigned char *cp;
83     #ifdef _CRAY
84     struct lp_st { int a:32; int b:32; } *lp;
85     #else
86     DES_LONG *lp;
87     #endif
88
89     if (out_count < 1) out_count=1;
90     #ifdef _CRAY
91     lp = (struct lp_st *) &(output[0])[0];
92     #else
93     lp = (DES_LONG *) &(output[0])[0];
94     #endif
95
96     z0=Q_B0((*seed)[0])|Q_B1((*seed)[1])|Q_B2((*seed)[2])|Q_B3((*seed)[3]);
97     z1=Q_B0((*seed)[4])|Q_B1((*seed)[5])|Q_B2((*seed)[6])|Q_B3((*seed)[7]);
98
99     for (i=0; ((i<4)&&(i<out_count)); i++)
100     {
101         cp=input;
102         l=length;
103         while (l > 0)
104         {
105             if (l > 1)
106             {
107                 t0= (DES_LONG)*(cp++);
108                 t0|=(DES_LONG)Q_B1(*(cp++));
109                 l--;
110             }
111             else
112                 t0= (DES_LONG)*(cp++);
113             l--;
114             /* add */
115             t0+=z0;
116             t0&=0xffffffffL;
117             t1=z1;
118             /* square, well sort of square */
119             z0=(((t0*t0)&0xffffffffL)+((t1*t1)&0xffffffffL))
120                &0xffffffffL;
121             z1=((t0*((t1+NOISE)&0xffffffffL))&0xffffffffL)%0x7fffffff
122                ;
123             if (lp != NULL)
124             {
125                 /* The MIT library assumes that the checksum is
126                  * composed of 2*out_count 32 bit ints */
127                 #ifdef _CRAY
```



```
128             (*lp).a = z0;  
129             (*lp).b = z1;  
130             lp++;  
131 #else  
132             *lp++ = z0;  
133             *lp++ = z1;  
134 #endif  
135         }  
136     }  
137     return(z0);  
138 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/rand_key.c

1

```
*****
2918 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/rand_key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 #include <openssl/des.h>
57 #include <openssl/rand.h>
58
59 int DES_random_key(DES_cblock *ret)
60 {
61     do
```

new/usr/src/lib/openssl/libsunw_crypto/des/rand_key.c

2

```
62     {
63         if (RAND_bytes((unsigned char *)ret, sizeof(DES_cblock)) != 1)
64             return (0);
65         } while (DES_is_weak_key(ret));
66     DES_set_odd_parity(ret);
67     return (1);
68 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/read2pwd.c

1

```
*****
6538 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/read2pwd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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57  *
58  * This package is an SSL implementation written
59  * by Eric Young (eay@cryptsoft.com).
60  * The implementation was written so as to conform with Netscapes SSL.
61  *
```

new/usr/src/lib/openssl/libsunw_crypto/des/read2pwd.c

2

```
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107 * derivative of this code cannot be changed. i.e. this code cannot simply be
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110 */
111
112 #include <string.h>
113 #include <openssl/des.h>
114 #include <openssl/ui.h>
115 #include <openssl/crypto.h>
116
117 int DES_read_password(DES_cblock *key, const char *prompt, int verify)
118 {
119     int ok;
120     char buf[BUFSIZ], buff[BUFSIZ];
121
122     if ((ok=UI_UTIL_read_pw(buf, buff, BUFSIZ, prompt, verify)) == 0)
123         DES_string_to_key(buf, key);
124     OPENSSL_cleanse(buf, BUFSIZ);
125     OPENSSL_cleanse(buff, BUFSIZ);
126     return(ok);
127 }
```

```
129 int DES_read_2passwords(DES_cblock *key1, DES_cblock *key2, const char *prompt,
130                          int verify)
131 {
132     int ok;
133     char buf[BUFSIZ], buff[BUFSIZ];
134
135     if ((ok=UI_UTIL_read_pw(buf, buff, BUFSIZ, prompt, verify)) == 0)
136         DES_string_to_2keys(buf, key1, key2);
137     OPENSSL_cleanse(buf, BUFSIZ);
138     OPENSSL_cleanse(buff, BUFSIZ);
139     return(ok);
140 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/rpc_enc.c

1

```
*****
4216 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/rpc_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/des/rpc_enc.c */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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52 *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include "rpc_des.h"
60 #include "des_locl.h"
61 #include "des_ver.h"
```

new/usr/src/lib/openssl/libsunw_crypto/des/rpc_enc.c

2

```
63 int _des_crypt(char *buf,int len,struct desparams *desp);
64 int _des_crypt(char *buf, int len, struct desparams *desp)
65 {
66     DES_key_schedule ks;
67     int enc;
68
69     DES_set_key_unchecked(&desp->des_key,&ks);
70     enc=(desp->des_dir == ENCRYPT)?DES_ENCRYPT:DES_DECRYPT;
71
72     if (desp->des_mode == CBC)
73         DES_ecb_encrypt((const_DES_cblock *)desp->UDES.UDES_buf,
74                         (DES_cblock *)desp->UDES.UDES_buf,&ks,
75                         enc);
76     else
77     {
78         DES_ncbc_encrypt(desp->UDES.UDES_buf,desp->UDES.UDES_buf,
79                         len,&ks,&desp->des_ivec,enc);
80 #ifdef undef
81         /* len will always be %8 if called from common_crypt
82          * in secure_rpc.
83          * Libdes's cbc encrypt does not copy back the iv,
84          * so we have to do it here. */
85         /* It does now :-) eay 20/09/95 */
86
87         a=(char *)&(desp->UDES.UDES_buf[len-8]);
88         b=(char *)&(desp->des_ivec[0]);
89
90         *(a++)= *(b++); *(a++)= *(b++);
91         *(a++)= *(b++); *(a++)= *(b++);
92         *(a++)= *(b++); *(a++)= *(b++);
93         *(a++)= *(b++); *(a++)= *(b++);
94 #endif
95     }
96     return(1);
97 }
```

new/usr/src/lib/openssl/libsunw_crypto/des/set_key.c

1

16388 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/set_key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/des/set_key.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* set_key.c v 1.4 eay 24/9/91
60 * 1.4 Speed up by 400% :-)
61 * 1.3 added register declarations.
```

new/usr/src/lib/openssl/libsunw_crypto/des/set_key.c

2

```
62 * 1.2 unrolled make_key_sched a bit more
63 * 1.1 added norm_expand_bits
64 * 1.0 First working version
65 */
66 #include <openssl/crypto.h>
67 #include "des_locl.h"
68
69 OPENSSL_IMPLEMENT_GLOBAL(int,DES_check_key,0) /* defaults to false */
70
71 static const unsigned char odd_parity[256]={
72 1, 1, 2, 2, 4, 4, 7, 7, 8, 8, 11, 11, 13, 13, 14, 14,
73 16, 16, 19, 19, 21, 21, 22, 22, 25, 25, 26, 26, 28, 28, 31, 31,
74 32, 32, 35, 35, 37, 37, 38, 38, 41, 41, 42, 42, 44, 44, 47, 47,
75 49, 49, 50, 50, 52, 52, 55, 55, 56, 56, 59, 59, 61, 61, 62, 62,
76 64, 64, 67, 67, 69, 69, 70, 70, 73, 73, 74, 74, 76, 76, 79, 79,
77 81, 81, 82, 82, 84, 84, 87, 87, 88, 88, 91, 91, 93, 93, 94, 94,
78 97, 97, 98, 98, 100, 100, 103, 103, 104, 104, 107, 107, 109, 109, 110, 110,
79 112, 112, 115, 115, 117, 117, 118, 118, 121, 121, 122, 122, 124, 124, 127, 127,
80 128, 128, 131, 131, 133, 133, 134, 134, 137, 137, 138, 138, 140, 140, 143, 143,
81 145, 145, 146, 146, 148, 148, 151, 151, 152, 152, 155, 155, 157, 157, 158, 158,
82 161, 161, 162, 162, 164, 164, 167, 167, 168, 168, 171, 171, 173, 173, 174, 174,
83 176, 176, 179, 179, 181, 181, 182, 182, 185, 185, 186, 186, 188, 188, 191, 191,
84 193, 193, 194, 194, 196, 196, 199, 199, 200, 200, 203, 203, 205, 205, 206, 206,
85 208, 208, 211, 211, 213, 213, 214, 214, 217, 217, 218, 218, 220, 220, 223, 223,
86 224, 224, 227, 227, 229, 229, 230, 230, 233, 233, 234, 234, 236, 236, 239, 239,
87 241, 241, 242, 242, 244, 244, 247, 247, 248, 248, 251, 251, 253, 253, 254, 254};
88
89 void DES_set_odd_parity(DES_cblock *key)
90 {
91 unsigned int i;
92
93 for (i=0; i<DES_KEY_SZ; i++)
94 (*key)[i]=odd_parity[(*key)[i]];
95 }
96
97 int DES_check_key_parity(const DES_cblock *key)
98 {
99 unsigned int i;
100
101 for (i=0; i<DES_KEY_SZ; i++)
102 {
103 if ((*key)[i] != odd_parity[(*key)[i]])
104 return(0);
105 }
106 return(1);
107 }
108
109 /* Weak and semi weak keys as take from
110 * %A D.W. Davies
111 * %A W.L. Price
112 * %T Security for Computer Networks
113 * %I John Wiley & Sons
114 * %D 1984
115 * Many thanks to smb@ulysses.att.com (Steven Bellovin) for the reference
116 * (and actual cblock values).
117 */
118 #define NUM_WEAK_KEY 16
119 static const DES_cblock weak_keys[NUM_WEAK_KEY]={
120 /* weak keys */
121 {0x01,0x01,0x01,0x01,0x01,0x01,0x01,0x01},
122 {0xFE,0xFE,0xFE,0xFE,0xFE,0xFE,0xFE,0xFE},
123 {0x1F,0x1F,0x1F,0x1F,0x0E,0x0E,0x0E,0x0E},
124 {0xE0,0xE0,0xE0,0xE0,0xF1,0xF1,0xF1,0xF1},
125 /* semi-weak keys */
126 {0x01,0xFE,0x01,0xFE,0x01,0xFE,0x01,0xFE},
127 {0xFE,0x01,0xFE,0x01,0xFE,0x01,0xFE,0x01},
```

```

128     {0x1F,0xE0,0x1F,0xE0,0x0E,0xF1,0x0E,0xF1},
129     {0xE0,0x1F,0xE0,0x1F,0xF1,0x0E,0xF1,0x0E},
130     {0x01,0xE0,0x01,0xE0,0x01,0xF1,0x01,0xF1},
131     {0xE0,0x01,0xE0,0x01,0xF1,0x01,0xF1,0x01},
132     {0x1F,0xFE,0x1F,0xFE,0x0E,0xFE,0x0E,0xFE},
133     {0xFE,0x1F,0xFE,0x1F,0xFE,0x0E,0xFE,0x0E},
134     {0x01,0x1F,0x01,0x1F,0x01,0x0E,0x01,0x0E},
135     {0x1F,0x01,0x1F,0x01,0x0E,0x01,0x0E,0x01},
136     {0xE0,0xFE,0xE0,0xFE,0xF1,0xFE,0xF1,0xFE},
137     {0xFE,0xE0,0xFE,0xE0,0xFE,0xF1,0xFE,0xF1}};

139 int DES_is_weak_key(const DES_cblock *key)
140 {
141     int i;

143     for (i=0; i<NUM_WEAK_KEY; i++)
144         /* Added == 0 to comparison, I obviously don't run
145          * this section very often :-), thanks to
146          * engineering@MorningStar.Com for the fix
147          * eay 93/06/29
148          * Another problem, I was comparing only the first 4
149          * bytes, 97/03/18 */
150         if (memcmp(weak_keys[i],key,sizeof(DES_cblock)) == 0) return(1);
151     return(0);
152 }

154 /* NOW DEFINED IN des_local.h
155  * See ecb_encrypt.c for a pseudo description of these macros.
156  * #define PERM_OP(a,b,t,n,m) (((t)=(((a)>>(n))^(b))&(m))),\
157  *      (b)^(t),\
158  *      (a)=((a)^(t)<<(n))))
159  */

161 #define HPERM_OP(a,t,n,m) (((t)=(((a)<<(16-(n)))^(a))&(m)),\
162 (a)=(a)^(t)^(t>>(16-(n))))

164 static const DES_LONG des_skb[8][64]={
165     {
166         /* for C bits (numbered as per FIPS 46) 1 2 3 4 5 6 */
167         0x00000000L,0x00000010L,0x20000000L,0x20000010L,
168         0x00010000L,0x00010010L,0x20010000L,0x20010010L,
169         0x00000800L,0x00000810L,0x20000800L,0x20000810L,
170         0x00010800L,0x00010810L,0x20010800L,0x20010810L,
171         0x00000020L,0x00000030L,0x20000020L,0x20000030L,
172         0x00010020L,0x00010030L,0x20010020L,0x20010030L,
173         0x00000820L,0x00000830L,0x20000820L,0x20000830L,
174         0x00010820L,0x00010830L,0x20010820L,0x20010830L,
175         0x00000000L,0x00000010L,0x20000000L,0x20000010L,
176         0x00000000L,0x00000010L,0x20000000L,0x20000010L,
177         0x00000800L,0x00000810L,0x20000800L,0x20000810L,
178         0x00000800L,0x00000810L,0x20000800L,0x20000810L,
179         0x00000020L,0x00000030L,0x20000020L,0x20000030L,
180         0x00000020L,0x00000030L,0x20000020L,0x20000030L,
181         0x00000820L,0x00000830L,0x20000820L,0x20000830L,
182         0x00000820L,0x00000830L,0x20000820L,0x20000830L,
183     },{
184         /* for C bits (numbered as per FIPS 46) 7 8 10 11 12 13 */
185         0x00000000L,0x02000000L,0x00002000L,0x02002000L,
186         0x00200000L,0x02200000L,0x00202000L,0x02202000L,
187         0x00000040L,0x02000040L,0x00002040L,0x02002040L,
188         0x00200040L,0x02200040L,0x00202040L,0x02202040L,
189         0x00000400L,0x02000400L,0x00002400L,0x02002400L,
190         0x00200400L,0x02200400L,0x00202400L,0x02202400L,
191         0x00000404L,0x02000404L,0x00002404L,0x02002404L,
192         0x00200404L,0x02200404L,0x00202404L,0x02202404L,
193         0x10000000L,0x12000000L,0x10002000L,0x12002000L,

```

```

194     0x10200000L,0x12200000L,0x10202000L,0x12202000L,
195     0x10000004L,0x12000004L,0x10002004L,0x12002004L,
196     0x10200004L,0x12200004L,0x10202004L,0x12202004L,
197     0x10000400L,0x12000400L,0x10002400L,0x12002400L,
198     0x10200400L,0x12200400L,0x10202400L,0x12202400L,
199     0x10000404L,0x12000404L,0x10002404L,0x12002404L,
200     0x10200404L,0x12200404L,0x10202404L,0x12202404L,
201     },{
202         /* for C bits (numbered as per FIPS 46) 14 15 16 17 19 20 */
203         0x00000000L,0x00000001L,0x00040000L,0x00040001L,
204         0x01000000L,0x01000001L,0x01040000L,0x01040001L,
205         0x00000002L,0x00000003L,0x00040002L,0x00040003L,
206         0x01000002L,0x01000003L,0x01040002L,0x01040003L,
207         0x00000200L,0x00000201L,0x00040200L,0x00040201L,
208         0x01000200L,0x01000201L,0x01040200L,0x01040201L,
209         0x00000202L,0x00000203L,0x00040202L,0x00040203L,
210         0x01000202L,0x01000203L,0x01040202L,0x01040203L,
211         0x00000000L,0x00000001L,0x00040000L,0x00040001L,
212         0x00000000L,0x00000001L,0x00040000L,0x00040001L,
213         0x00000002L,0x00000003L,0x00040002L,0x00040003L,
214         0x00000002L,0x00000003L,0x00040002L,0x00040003L,
215         0x00000200L,0x00000201L,0x00040200L,0x00040201L,
216         0x00000200L,0x00000201L,0x00040200L,0x00040201L,
217         0x00000202L,0x00000203L,0x00040202L,0x00040203L,
218         0x00000202L,0x00000203L,0x00040202L,0x00040203L,
219     },{
220         /* for C bits (numbered as per FIPS 46) 21 23 24 26 27 28 */
221         0x00000000L,0x00100000L,0x00000100L,0x00100100L,
222         0x00000008L,0x00100008L,0x00000108L,0x00100108L,
223         0x00001000L,0x00101000L,0x00001100L,0x00101100L,
224         0x00001008L,0x00101008L,0x00001108L,0x00101108L,
225         0x04000000L,0x04100000L,0x04000100L,0x04100100L,
226         0x04000008L,0x04100008L,0x04000108L,0x04100108L,
227         0x04001000L,0x04101000L,0x04001100L,0x04101100L,
228         0x04001008L,0x04101008L,0x04001108L,0x04101108L,
229         0x00020000L,0x00120000L,0x00020100L,0x00120100L,
230         0x00020008L,0x00120008L,0x00020108L,0x00120108L,
231         0x00021000L,0x00121000L,0x00021100L,0x00121100L,
232         0x00021008L,0x00121008L,0x00021108L,0x00121108L,
233         0x04020000L,0x04120000L,0x04020100L,0x04120100L,
234         0x04020008L,0x04120008L,0x04020108L,0x04120108L,
235         0x04021000L,0x04121000L,0x04021100L,0x04121100L,
236         0x04021008L,0x04121008L,0x04021108L,0x04121108L,
237     },{
238         /* for D bits (numbered as per FIPS 46) 1 2 3 4 5 6 */
239         0x00000000L,0x10000000L,0x00010000L,0x10010000L,
240         0x00000040L,0x10000040L,0x00010040L,0x10010040L,
241         0x20000000L,0x30000000L,0x20010000L,0x30010000L,
242         0x20000040L,0x30000040L,0x20010040L,0x30010040L,
243         0x00010000L,0x10100000L,0x00110000L,0x10110000L,
244         0x00010040L,0x10100040L,0x00110040L,0x10110040L,
245         0x20100000L,0x30100000L,0x20110000L,0x30110000L,
246         0x20100040L,0x30100040L,0x20110040L,0x30110040L,
247         0x00001000L,0x10001000L,0x00011000L,0x10011000L,
248         0x00001040L,0x10001040L,0x00011040L,0x10011040L,
249         0x20001000L,0x30001000L,0x20011000L,0x30011000L,
250         0x20001040L,0x30001040L,0x20011040L,0x30011040L,
251         0x00101000L,0x10101000L,0x00111000L,0x10111000L,
252         0x00101040L,0x10101040L,0x00111040L,0x10111040L,
253         0x20101000L,0x30101000L,0x20111000L,0x30111000L,
254         0x20101040L,0x30101040L,0x20111040L,0x30111040L,
255     },{
256         /* for D bits (numbered as per FIPS 46) 8 9 11 12 13 14 */
257         0x00000000L,0x08000000L,0x00000080L,0x08000080L,
258         0x00000400L,0x08000400L,0x00000480L,0x08000480L,
259         0x00020000L,0x08020000L,0x00020080L,0x08020080L,

```

```

260 0x00020400L, 0x08020400L, 0x00020408L, 0x08020408L,
261 0x00000001L, 0x08000001L, 0x00000009L, 0x08000009L,
262 0x00000401L, 0x08000401L, 0x00000409L, 0x08000409L,
263 0x00020001L, 0x08020001L, 0x00020009L, 0x08020009L,
264 0x00020401L, 0x08020401L, 0x00020409L, 0x08020409L,
265 0x02000000L, 0x0A000000L, 0x02000008L, 0x0A000008L,
266 0x02000400L, 0x0A000400L, 0x02000408L, 0x0A000408L,
267 0x02020000L, 0x0A020000L, 0x02020008L, 0x0A020008L,
268 0x02020400L, 0x0A020400L, 0x02020408L, 0x0A020408L,
269 0x02000001L, 0x0A000001L, 0x02000009L, 0x0A000009L,
270 0x02000401L, 0x0A000401L, 0x02000409L, 0x0A000409L,
271 0x02020001L, 0x0A020001L, 0x02020009L, 0x0A020009L,
272 0x02020401L, 0x0A020401L, 0x02020409L, 0x0A020409L,
273 }, {
274 /* for D bits (numbered as per FIPS 46) 16 17 18 19 20 21 */
275 0x00000000L, 0x00000100L, 0x00080000L, 0x00080100L,
276 0x01000000L, 0x01000100L, 0x01080000L, 0x01080100L,
277 0x00000010L, 0x00000110L, 0x00080010L, 0x00080110L,
278 0x01000010L, 0x01000110L, 0x01080010L, 0x01080110L,
279 0x00200000L, 0x00200100L, 0x00280000L, 0x00280100L,
280 0x01200000L, 0x01200100L, 0x01280000L, 0x01280100L,
281 0x00200010L, 0x00200110L, 0x00280010L, 0x00280110L,
282 0x01200010L, 0x01200110L, 0x01280010L, 0x01280110L,
283 0x00000200L, 0x00000300L, 0x00080200L, 0x00080300L,
284 0x01000200L, 0x01000300L, 0x01080200L, 0x01080300L,
285 0x00000210L, 0x00000310L, 0x00080210L, 0x00080310L,
286 0x01000210L, 0x01000310L, 0x01080210L, 0x01080310L,
287 0x00200200L, 0x00200300L, 0x00280200L, 0x00280300L,
288 0x01200200L, 0x01200300L, 0x01280200L, 0x01280300L,
289 0x00200210L, 0x00200310L, 0x00280210L, 0x00280310L,
290 0x01200210L, 0x01200310L, 0x01280210L, 0x01280310L,
291 }, {
292 /* for D bits (numbered as per FIPS 46) 22 23 24 25 27 28 */
293 0x00000000L, 0x04000000L, 0x00040000L, 0x04040000L,
294 0x0000002L, 0x0400002L, 0x0004002L, 0x0404002L,
295 0x00002000L, 0x04002000L, 0x00042000L, 0x04042000L,
296 0x0000202L, 0x0400202L, 0x0004202L, 0x0404202L,
297 0x00000020L, 0x04000020L, 0x00040020L, 0x04040020L,
298 0x00000022L, 0x04000022L, 0x00040022L, 0x04040022L,
299 0x00002020L, 0x04002020L, 0x00042020L, 0x04042020L,
300 0x00002022L, 0x04002022L, 0x00042022L, 0x04042022L,
301 0x00000800L, 0x04000800L, 0x00040800L, 0x04040800L,
302 0x00000802L, 0x04000802L, 0x00040802L, 0x04040802L,
303 0x00002800L, 0x04002800L, 0x00042800L, 0x04042800L,
304 0x00002802L, 0x04002802L, 0x00042802L, 0x04042802L,
305 0x00000820L, 0x04000820L, 0x00040820L, 0x04040820L,
306 0x00000822L, 0x04000822L, 0x00040822L, 0x04040822L,
307 0x00002820L, 0x04002820L, 0x00042820L, 0x04042820L,
308 0x00002822L, 0x04002822L, 0x00042822L, 0x04042822L,
309 };
311 int DES_set_key(const DES_cblock *key, DES_key_schedule *schedule)
312 {
313     if (DES_check_key)
314     {
315         return DES_set_key_checked(key, schedule);
316     }
317     else
318     {
319         DES_set_key_unchecked(key, schedule);
320         return 0;
321     }
322 }
324 /* return 0 if key parity is odd (correct),
325  * return -1 if key parity error,

```

```

326 * return -2 if illegal weak key.
327 */
328 int DES_set_key_checked(const DES_cblock *key, DES_key_schedule *schedule)
329 {
330     if (!DES_check_key_parity(key))
331         return(-1);
332     if (DES_is_weak_key(key))
333         return(-2);
334     DES_set_key_unchecked(key, schedule);
335     return 0;
336 }
338 void DES_set_key_unchecked(const DES_cblock *key, DES_key_schedule *schedule)
339 #ifdef OPENSSL_FIPS
340 {
341     fips_cipher_abort(DES);
342     private DES_set_key_unchecked(key, schedule);
343 }
344 void private DES_set_key_unchecked(const DES_cblock *key, DES_key_schedule *sche
345 #endif
346 {
347     static const int shifts2[16]={0,0,1,1,1,1,1,1,0,1,1,1,1,1,1,0};
348     register DES_LONG c,d,t,s,t2;
349     register const unsigned char *in;
350     register DES_LONG *k;
351     register int i;
353 #ifdef OPENBSD_DEV_CRYPT
354     memcpy(schedule->key, key, sizeof schedule->key);
355     schedule->session=NULL;
356 #endif
357     k = &schedule->ks->deslong[0];
358     in = &(*key)[0];
360     c2l(in, c);
361     c2l(in, d);
363     /* do PC1 in 47 simple operations :- )
364      * Thanks to John Fletcher (john_fletcher@lccmail.ocf.llnl.gov)
365      * for the inspiration. :- ) */
366     PERM_OP(d, c, t, 4, 0xf0f0f0fL);
367     HPERM_OP(c, t, -2, 0xcccc0000L);
368     HPERM_OP(d, t, -2, 0xcccc0000L);
369     PERM_OP(d, c, t, 1, 0x55555555L);
370     PERM_OP(c, d, t, 8, 0x00ff00ffL);
371     PERM_OP(d, c, t, 1, 0x55555555L);
372     d = (((d&0x000000ffL)<<16L)|(d&0x0000ff00L) |
373          ((d&0x00ff0000L)>>16L)|((c&0xf0000000L)>>4L));
374     c&=0x0fffffL;
376     for (i=0; i<ITERATIONS; i++)
377     {
378         if (shifts2[i])
379             { c=((c>>2L)|((c<<26L))); d=((d>>2L)|((d<<26L))); }
380         else
381             { c=((c>>1L)|((c<<27L))); d=((d>>1L)|((d<<27L))); }
382         c&=0x0fffffL;
383         d&=0x0fffffL;
384         /* could be a few less shifts but I am too lazy at this
385          * point in time to investigate */
386         s = des_skb[0][ (c )&0x3f ] |
387            des_skb[1][ ((c>> 6L)&0x03) | ((c>> 7L)&0x3c) ] |
388            des_skb[2][ ((c>>13L)&0x0f) | ((c>>14L)&0x30) ] |
389            des_skb[3][ ((c>>20L)&0x01) | ((c>>21L)&0x06) ] |
390            des_skb[4][ (d )&0x3f ] |
391            des_skb[5][ ((d>> 6L)&0x03) | ((d>> 7L)&0x3c) ] |
392            des_skb[6][ ((d>>13L)&0x0f) | ((d>>14L)&0x30) ] |
393            des_skb[7][ ((d>>20L)&0x01) | ((d>>21L)&0x06) ] |
394            des_skb[8][ (c )&0x3f ] |
395            des_skb[9][ ((c>> 6L)&0x03) | ((c>> 7L)&0x3c) ] |
396            des_skb[10][ ((c>>13L)&0x0f) | ((c>>14L)&0x30) ] |
397            des_skb[11][ ((c>>20L)&0x01) | ((c>>21L)&0x06) ] |
398            des_skb[12][ (d )&0x3f ] |
399            des_skb[13][ ((d>> 6L)&0x03) | ((d>> 7L)&0x3c) ] |
400            des_skb[14][ ((d>>13L)&0x0f) | ((d>>14L)&0x30) ] |
401            des_skb[15][ ((d>>20L)&0x01) | ((d>>21L)&0x06) ] ;

```



```
392         des_skb[5][((d>> 7L)&0x03)|((d>> 8L)&0x3c)]|
393         des_skb[6][ (d>>15L)&0x3f          ]|
394         des_skb[7][((d>>21L)&0x0f)|((d>>22L)&0x30)];

396         /* table contained 0213 4657 */
397         t2=((t<<16L)|(s&0x0000ffffL))&0xfffffffffL;
398         *(k++)=ROTATE(t2,30)&0xfffffffffL;

400         t2=((s>>16L)|(t&0xffff0000L));
401         *(k++)=ROTATE(t2,26)&0xfffffffffL;
402     }
403 }

405 int DES_key_sched(const_DES_cblock *key, DES_key_schedule *schedule)
406 {
407     return(DES_set_key(key, schedule));
408 }
409 /*
410 #undef des_fixup_key_parity
411 void des_fixup_key_parity(des_cblock *key)
412 {
413     des_set_odd_parity(key);
414 }
415 */
```

new/usr/src/lib/openssl/libsunw_crypto/des/str2key.c

1

5588 Fri May 30 18:31:43 2014
new/usr/src/lib/openssl/libsunw_crypto/des/str2key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/des/str2key.c */
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <openssl/crypto.h>
60 #include "des_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/des/str2key.c

2

```
62 void DES_string_to_key(const char *str, DES_cblock *key)
63 {
64     DES_key_schedule ks;
65     int i, length;
66     register unsigned char j;
67
68     memset(key, 0, 8);
69     length=strlen(str);
70 #ifdef OLD_STR_TO_KEY
71     for (i=0; i<length; i++)
72         (*key)[i%8]^=(str[i]<<1);
73 #else /* MIT COMPATIBLE */
74     for (i=0; i<length; i++)
75     {
76         j=str[i];
77         if ((i%16) < 8)
78             (*key)[i%8]^=(j<<1);
79         else
80         {
81             /* Reverse the bit order 05/05/92 eay */
82             j=((j<<4)&0xf0)|((j>>4)&0x0f);
83             j=((j<<2)&0xcc)|((j>>2)&0x33);
84             j=((j<<1)&0xaa)|((j>>1)&0x55);
85             (*key)[7-(i%8)]^=j;
86         }
87     }
88 #endif
89     DES_set_odd_parity(key);
90 #ifdef EXPERIMENTAL_STR_TO_STRONG_KEY
91     if(DES_is_weak_key(key))
92         (*key)[7] ^= 0xf0;
93     DES_set_key(key, &ks);
94 #else
95     DES_set_key_unchecked(key, &ks);
96 #endif
97     DES_cbc_cksum((const unsigned char *)str, key, length, &ks, key);
98     OPENSSL_cleanse(&ks, sizeof(ks));
99     DES_set_odd_parity(key);
100 }
101
102 void DES_string_to_2keys(const char *str, DES_cblock *key1, DES_cblock *key2)
103 {
104     DES_key_schedule ks;
105     int i, length;
106     register unsigned char j;
107
108     memset(key1, 0, 8);
109     memset(key2, 0, 8);
110     length=strlen(str);
111 #ifdef OLD_STR_TO_KEY
112     if (length <= 8)
113     {
114         for (i=0; i<length; i++)
115         {
116             (*key2)[i]=(*key1)[i]=(str[i]<<1);
117         }
118     }
119     else
120     {
121         for (i=0; i<length; i++)
122         {
123             if ((i/8)&1)
124                 (*key2)[i%8]^=(str[i]<<1);
125             else
126                 (*key1)[i%8]^=(str[i]<<1);
127         }
128     }
129 }
```

```
128     }
129 #else /* MIT COMPATIBLE */
130     for (i=0; i<length; i++)
131     {
132         j=str[i];
133         if ((i%32) < 16)
134         {
135             if ((i%16) < 8)
136                 (*key1)[i%8]^=(j<<1);
137             else
138                 (*key2)[i%8]^=(j<<1);
139         }
140         else
141         {
142             j=((j<<4)&0xf0)|((j>>4)&0x0f);
143             j=((j<<2)&0xcc)|((j>>2)&0x33);
144             j=((j<<1)&0xaa)|((j>>1)&0x55);
145             if ((i%16) < 8)
146                 (*key1)[7-(i%8)]^=j;
147             else
148                 (*key2)[7-(i%8)]^=j;
149         }
150     }
151     if (length <= 8) memcpy(key2, key1, 8);
152 #endif
153     DES_set_odd_parity(key1);
154     DES_set_odd_parity(key2);
155 #ifdef EXPERIMENTAL_STR_TO_STRONG_KEY
156     if(DES_is_weak_key(key1))
157         (*key1)[7] ^= 0xF0;
158     DES_set_key(key1, &ks);
159 #else
160     DES_set_key_unchecked(key1, &ks);
161 #endif
162     DES_cbc_cksum((const unsigned char*)str, key1, length, &ks, key1);
163 #ifdef EXPERIMENTAL_STR_TO_STRONG_KEY
164     if(DES_is_weak_key(key2))
165         (*key2)[7] ^= 0xF0;
166     DES_set_key(key2, &ks);
167 #else
168     DES_set_key_unchecked(key2, &ks);
169 #endif
170     DES_cbc_cksum((const unsigned char*)str, key2, length, &ks, key2);
171     OPENSSL_cleanse(&ks, sizeof(ks));
172     DES_set_odd_parity(key1);
173     DES_set_odd_parity(key2);
174 }
```

```
*****
```

```
7165 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/des/xcbc_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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57 */

59 #include "des_locl.h"

61 /* RSA's DESX */
```

```
63 #if 0 /* broken code, preserved just in case anyone specifically looks for this
64 static const unsigned char desx_white_in2out[256]={
65 0xBD,0x56,0xEA,0xF2,0xA2,0xF1,0xAC,0x2A,0xB0,0x93,0xD1,0x9C,0x1B,0x33,0xFD,0xD0,
66 0x30,0x04,0xB6,0xDC,0x7D,0xDF,0x32,0x4B,0xF7,0xCB,0x45,0x9B,0x31,0xBB,0x21,0x5A,
67 0x41,0x9F,0xE1,0xD9,0x4A,0x4D,0x9E,0xDA,0xA0,0x68,0x2C,0xC3,0x27,0x5F,0x80,0x36,
68 0x3E,0xEE,0xFB,0x95,0x1A,0xFE,0xCE,0xA8,0x34,0xA9,0x13,0xF0,0xA6,0x3F,0xD8,0x0C,
69 0x78,0x24,0xAF,0x23,0x52,0xC1,0x67,0x17,0xF5,0x66,0x90,0xE7,0xE8,0x07,0xB8,0x60,
70 0x48,0xE6,0x1E,0x53,0xF3,0x92,0xA4,0x72,0x8C,0x08,0x15,0x6E,0x86,0x00,0x84,0xFA,
71 0xF4,0x7F,0x8A,0x42,0x19,0xF6,0xDB,0xCD,0x14,0x8D,0x50,0x12,0xBA,0x3C,0x06,0x4E,
72 0xEC,0xB3,0x35,0x11,0xA1,0x88,0x8E,0x2B,0x94,0x99,0xB7,0x71,0x74,0xD3,0xE4,0xBF,
73 0x3A,0xDE,0x96,0x0E,0xBC,0x0A,0xED,0x77,0xFC,0x37,0x6B,0x03,0x79,0x89,0x62,0xC6,
74 0xD7,0xC0,0xD2,0x7C,0x6A,0x8B,0x22,0xA3,0x5B,0x05,0x5D,0x02,0x75,0xD5,0x61,0xE3,
75 0x18,0x8F,0x55,0x51,0xAD,0x1F,0x0B,0x5E,0x85,0xE5,0xC2,0x57,0x63,0xCA,0x3D,0x6C,
76 0xB4,0xC5,0xCC,0x70,0xB2,0x91,0x59,0x0D,0x47,0x20,0xC8,0x4F,0x58,0xE0,0x01,0xE2,
77 0x16,0x38,0xC4,0x6F,0x3B,0x0F,0x65,0x46,0xBE,0x7E,0x2D,0x7B,0x82,0xF9,0x40,0xB5,
78 0x1D,0x73,0xF8,0xEB,0x26,0xC7,0x87,0x97,0x25,0x54,0xB1,0x28,0xAA,0x98,0x9D,0xA5,
79 0x64,0x6D,0x7A,0xD4,0x10,0x81,0x44,0xEF,0x49,0xD6,0xAE,0x2E,0xDD,0x76,0x5C,0x2F,
80 0xA7,0x1C,0xC9,0x09,0x69,0x9A,0x83,0xCF,0x29,0x39,0xB9,0xE9,0x4C,0xFF,0x43,0xAB,
81 };

83 void DES_xwhite_in2out(const DES_cblock *des_key, const DES_cblock *in_white,
84                       DES_cblock *out_white)
85 {
86     int out0,out1;
87     int i;
88     const unsigned char *key = &(*des_key)[0];
89     const unsigned char *in = &(*in_white)[0];
90     unsigned char *out = &(*out_white)[0];

92     out[0]=out[1]=out[2]=out[3]=out[4]=out[5]=out[6]=out[7]=0;
93     out0=out1=0;
94     for (i=0; i<8; i++)
95     {
96         out[i]=key[i]^desx_white_in2out[out0^out1];
97         out0=out1;
98         out1=(int)out[i&0x07];
99     }

101     out0=out[0];
102     out1=out[i]; /* BUG: out-of-bounds read */
103     for (i=0; i<8; i++)
104     {
105         out[i]=in[i]^desx_white_in2out[out0^out1];
106         out0=out1;
107         out1=(int)out[i&0x07];
108     }
109 }
110 #endif

112 void DES_xcbc_encrypt(const unsigned char *in, unsigned char *out,
113                      long length, DES_key_schedule *schedule,
114                      DES_cblock *ivec, const DES_cblock *inw,
115                      const DES_cblock *outw, int enc)
116 {
117     register DES_LONG tin0,tin1;
118     register DES_LONG tout0,tout1,xor0,xor1;
119     register DES_LONG inw0,inw1,outw0,outw1;
120     register const unsigned char *in2;
121     register long l=length;
122     DES_LONG tin[2];
123     unsigned char *iv;

125     in2 = &(*inw)[0];
126     c2l(in2,inw0);
127     c2l(in2,inw1);
```

```

128     in2 = &(*outw)[0];
129     c2l(in2,outw0);
130     c2l(in2,outw1);

132     iv = &(*ivec)[0];

134     if (enc)
135     {
136         c2l(iv,tout0);
137         c2l(iv,tout1);
138         for (l=-8; l>=0; l-=8)
139         {
140             c2l(in,tin0);
141             c2l(in,tin1);
142             tin0^=tout0^inw0; tin[0]=tin0;
143             tin1^=tout1^inw1; tin[1]=tin1;
144             DES_encrypt1(tin,schedule,DES_ENCRYPT);
145             tout0=tin[0]^outw0; l2c(tout0,out);
146             tout1=tin[1]^outw1; l2c(tout1,out);
147         }
148         if (l != -8)
149         {
150             c2ln(in,tin0,tin1,l+8);
151             tin0^=tout0^inw0; tin[0]=tin0;
152             tin1^=tout1^inw1; tin[1]=tin1;
153             DES_encrypt1(tin,schedule,DES_ENCRYPT);
154             tout0=tin[0]^outw0; l2c(tout0,out);
155             tout1=tin[1]^outw1; l2c(tout1,out);
156         }
157         iv = &(*ivec)[0];
158         l2c(tout0,iv);
159         l2c(tout1,iv);
160     }
161     else
162     {
163         c2l(iv,xor0);
164         c2l(iv,xor1);
165         for (l=-8; l>0; l-=8)
166         {
167             c2l(in,tin0); tin[0]=tin0^outw0;
168             c2l(in,tin1); tin[1]=tin1^outw1;
169             DES_encrypt1(tin,schedule,DES_DECRYPT);
170             tout0=tin[0]^xor0^inw0;
171             tout1=tin[1]^xor1^inw1;
172             l2c(tout0,out);
173             l2c(tout1,out);
174             xor0=tin0;
175             xor1=tin1;
176         }
177         if (l != -8)
178         {
179             c2l(in,tin0); tin[0]=tin0^outw0;
180             c2l(in,tin1); tin[1]=tin1^outw1;
181             DES_encrypt1(tin,schedule,DES_DECRYPT);
182             tout0=tin[0]^xor0^inw0;
183             tout1=tin[1]^xor1^inw1;
184             l2cn(tout0,tout1,out,l+8);
185             xor0=tin0;
186             xor1=tin1;
187         }

189         iv = &(*ivec)[0];
190         l2c(xor0,iv);
191         l2c(xor1,iv);
192     }
193     tin0=tin1=tout0=tout1=xor0=xor1=0;

```

```

194     inw0=inw1=outw0=outw1=0;
195     tin[0]=tin[1]=0;
196     }

```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_ameth.c

1

```
*****
11158 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_ameth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
2  * project 2006.
3  */
4 /* =====
5  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
6  *
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8  * modification, are permitted provided that the following conditions
9  * are met:
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44  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
45  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
46  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
47  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
48  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
49  * OF THE POSSIBILITY OF SUCH DAMAGE.
50  * =====
51  *
52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  *
56  */
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/x509.h>
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_ameth.c

2

```
62 #include <openssl/dh.h>
63 #include <openssl/bn.h>
64 #include "asn1_locl.h"
65
66 static void int_dh_free(EVP_PKEY *pkey)
67 {
68     DH_free(pkey->pkey.dh);
69 }
70
71 static int dh_pub_decode(EVP_PKEY *pkey, X509_PUBKEY *pubkey)
72 {
73     const unsigned char *p, *pm;
74     int pklen, pmlen;
75     int ptype;
76     void *pval;
77     ASN1_STRING *pstr;
78     X509_ALGOR *palg;
79     ASN1_INTEGER *public_key = NULL;
80
81     DH *dh = NULL;
82
83     if (!X509_PUBKEY_get0_param(NULL, &p, &pklen, &palg, pubkey))
84         return 0;
85     X509_ALGOR_get0(NULL, &ptype, &pval, palg);
86
87     if (ptype != V_ASN1_SEQUENCE)
88     {
89         Dherr(DH_F_DH_PUB_DECODE, DH_R_PARAMETER_ENCODING_ERROR);
90         goto err;
91     }
92
93     pstr = pval;
94     pm = pstr->data;
95     pmlen = pstr->length;
96
97     if (!(dh = d2i_DHparams(NULL, &pm, pmlen)))
98     {
99         Dherr(DH_F_DH_PUB_DECODE, DH_R_DECODE_ERROR);
100         goto err;
101     }
102
103     if (!(public_key = d2i_ASN1_INTEGER(NULL, &p, pklen)))
104     {
105         Dherr(DH_F_DH_PUB_DECODE, DH_R_DECODE_ERROR);
106         goto err;
107     }
108
109     /* We have parameters now set public key */
110     if (!(dh->pub_key = ASN1_INTEGER_to_BN(public_key, NULL)))
111     {
112         Dherr(DH_F_DH_PUB_DECODE, DH_R_BN_DECODE_ERROR);
113         goto err;
114     }
115
116     ASN1_INTEGER_free(public_key);
117     EVP_PKEY_assign_DH(pkey, dh);
118     return 1;
119
120 err:
121     if (public_key)
122         ASN1_INTEGER_free(public_key);
123     if (dh)
124         DH_free(dh);
125     return 0;
126
127 }
```

```

129 static int dh_pub_encode(X509_PUBKEY *pk, const EVP_PKEY *pkey)
130 {
131     DH *dh;
132     void *pval = NULL;
133     int ptype;
134     unsigned char *penc = NULL;
135     int penclen;
136     ASN1_STRING *str;
137     ASN1_INTEGER *pub_key = NULL;
138
139     dh=pkey->pkey.dh;
140
141     str = ASN1_STRING_new();
142     str->length = i2d_DHparams(dh, &str->data);
143     if (str->length <= 0)
144     {
145         DHerr(DH_F_DH_PUB_ENCODE, ERR_R_MALLOC_FAILURE);
146         goto err;
147     }
148     pval = str;
149     ptype = V_ASN1_SEQUENCE;
150
151     pub_key = BN_to_ASN1_INTEGER(dh->pub_key, NULL);
152     if (!pub_key)
153         goto err;
154
155     penclen = i2d_ASN1_INTEGER(pub_key, &penc);
156
157     ASN1_INTEGER_free(pub_key);
158
159     if (penclen <= 0)
160     {
161         DHerr(DH_F_DH_PUB_ENCODE, ERR_R_MALLOC_FAILURE);
162         goto err;
163     }
164
165     if (X509_PUBKEY_set0_param(pk, OBJ_nid2obj(EVP_PKEY_DH),
166                                ptype, pval, penc, penclen))
167         return 1;
168
169     err:
170     if (penc)
171         OPENSSL_free(penc);
172     if (pval)
173         ASN1_STRING_free(pval);
174
175     return 0;
176 }
177
178 /* PKCS#8 DH is defined in PKCS#11 of all places. It is similar to DH in
179  * that the AlgorithmIdentifier contains the paramaters, the private key
180  * is explicitly included and the pubkey must be recalculated.
181  */
182
183 static int dh_priv_decode(EVP_PKEY *pkey, PKCS8_PRIV_KEY_INFO *p8)
184 {
185     {
186         const unsigned char *p, *pm;
187         int pklen, pmlen;
188         int ptype;
189         void *pval;
190         ASN1_STRING *pstr;
191         X509_ALGOR *palg;
192         ASN1_INTEGER *privkey = NULL;

```

```

194     DH *dh = NULL;
195
196     if (!PKCS8_pkey_get0(NULL, &p, &pklen, &palg, p8))
197         return 0;
198
199     X509_ALGOR_get0(NULL, &ptype, &pval, palg);
200
201     if (ptype != V_ASN1_SEQUENCE)
202         goto decerr;
203
204     if (!(privkey=d2i_ASN1_INTEGER(NULL, &p, pklen)))
205         goto decerr;
206
207     pstr = pval;
208     pm = pstr->data;
209     pmlen = pstr->length;
210     if (!(dh = d2i_DHparams(NULL, &pm, pmlen)))
211         goto decerr;
212     /* We have parameters now set private key */
213     if (!(dh->priv_key = ASN1_INTEGER_to_BN(privkey, NULL)))
214     {
215         DHerr(DH_F_DH_PRIV_DECODE, DH_R_BN_ERROR);
216         goto dherr;
217     }
218     /* Calculate public key */
219     if (!DH_generate_key(dh))
220         goto dherr;
221
222     EVP_PKEY_assign_DH(pkey, dh);
223
224     ASN1_INTEGER_free(privkey);
225
226     return 1;
227
228     decerr:
229     DHerr(DH_F_DH_PRIV_DECODE, EVP_R_DECODE_ERROR);
230     dherr:
231     DH_free(dh);
232     return 0;
233 }
234
235 static int dh_priv_encode(PKCS8_PRIV_KEY_INFO *p8, const EVP_PKEY *pkey)
236 {
237     {
238         ASN1_STRING *params = NULL;
239         ASN1_INTEGER *prkey = NULL;
240         unsigned char *dp = NULL;
241         int dplen;
242
243         params = ASN1_STRING_new();
244
245         if (!params)
246         {
247             DHerr(DH_F_DH_PRIV_ENCODE, ERR_R_MALLOC_FAILURE);
248             goto err;
249         }
250
251         params->length = i2d_DHparams(pkey->pkey.dh, &params->data);
252         if (params->length <= 0)
253         {
254             DHerr(DH_F_DH_PRIV_ENCODE, ERR_R_MALLOC_FAILURE);
255             goto err;
256         }
257         params->type = V_ASN1_SEQUENCE;
258
259         /* Get private key into integer */

```

```

260     prkey = BN_to_ASN1_INTEGER(pkey->pkey.dh->priv_key, NULL);
262     if (!prkey)
263     {
264         DHerr(DH_F_DH_PRIV_ENCODE, DH_R_BN_ERROR);
265         goto err;
266     }
268     dplen = i2d_ASN1_INTEGER(prkey, &dp);
270     ASN1_INTEGER_free(prkey);
272     if (!PKCS8_pkey_set0(p8, OBJ_nid2obj(NID_dhKeyAgreement), 0,
273                          V_ASN1_SEQUENCE, params, dp, dplen))
274         goto err;
276     return 1;
278 err:
279     if (dp != NULL)
280         OPENSSL_free(dp);
281     if (params != NULL)
282         ASN1_STRING_free(params);
283     if (prkey != NULL)
284         ASN1_INTEGER_free(prkey);
285     return 0;
286 }

```

```

289 static void update_buflen(const BIGNUM *b, size_t *pbuflen)
290 {
291     size_t i;
292     if (!b)
293         return;
294     if (*pbuflen < (i = (size_t)BN_num_bytes(b)))
295         *pbuflen = i;
296 }

```

```

298 static int dh_param_decode(EVP_PKEY *pkey,
299                           const unsigned char **pder, int derlen)
300 {
301     DH *dh;
302     if (!(dh = d2i_DHparams(NULL, pder, derlen)))
303     {
304         DHerr(DH_F_DH_PARAM_DECODE, ERR_R_DH_LIB);
305         return 0;
306     }
307     EVP_PKEY_assign_DH(pkey, dh);
308     return 1;
309 }

```

```

311 static int dh_param_encode(const EVP_PKEY *pkey, unsigned char **pder)
312 {
313     return i2d_DHparams(pkey->pkey.dh, pder);
314 }

```

```

316 static int do_dh_print(BIO *bp, const DH *x, int indent,
317                       ASN1_PCTX *ctx, int ptype)
318 {
319     unsigned char *m=NULL;
320     int reason=ERR_R_BUF_LIB,ret=0;
321     size_t buf_len=0;
323     const char *ktype = NULL;
325     BIGNUM *priv_key, *pub_key;

```

```

327     if (ptype == 2)
328         priv_key = x->priv_key;
329     else
330         priv_key = NULL;
332     if (ptype > 0)
333         pub_key = x->pub_key;
334     else
335         pub_key = NULL;
337     update_buflen(x->p, &buf_len);
339     if (buf_len == 0)
340     {
341         reason = ERR_R_PASSED_NULL_PARAMETER;
342         goto err;
343     }
345     update_buflen(x->g, &buf_len);
346     update_buflen(pub_key, &buf_len);
347     update_buflen(priv_key, &buf_len);
349     if (ptype == 2)
350         ktype = "PKCS#3 DH Private-Key";
351     else if (ptype == 1)
352         ktype = "PKCS#3 DH Public-Key";
353     else
354         ktype = "PKCS#3 DH Parameters";
356     m= OPENSSL_malloc(buf_len+10);
357     if (m == NULL)
358     {
359         reason=ERR_R_MALLOC_FAILURE;
360         goto err;
361     }
363     BIO_indent(bp, indent, 128);
364     if (BIO_printf(bp,"%s: (%d bit)\n", ktype, BN_num_bits(x->p)) <= 0)
365         goto err;
366     indent += 4;
368     if (!ASN1_bn_print(bp,"private-key:",priv_key,m,indent)) goto err;
369     if (!ASN1_bn_print(bp,"public-key:",pub_key,m,indent)) goto err;
371     if (!ASN1_bn_print(bp,"prime:",x->p,m,indent)) goto err;
372     if (!ASN1_bn_print(bp,"generator:",x->g,m,indent)) goto err;
373     if (x->length != 0)
374     {
375         BIO_indent(bp, indent, 128);
376         if (BIO_printf(bp,"recommended-private-length: %d bits\n",
377                        (int)x->length) <= 0) goto err;
378     }
381     ret=1;
382     if (0)
383     {
384 err:
385         DHerr(DH_F_DO_DH_PRINT,reason);
386     }
387     if (m != NULL) OPENSSL_free(m);
388     return(ret);
389 }

```

```

391 static int int_dh_size(const EVP_PKEY *pkey)

```



```

392     {
393     return(DH_size(pkey->pkey.dh));
394     }

396 static int dh_bits(const EVP_PKEY *pkey)
397 {
398     return BN_num_bits(pkey->pkey.dh->p);
399 }

401 static int dh_cmp_parameters(const EVP_PKEY *a, const EVP_PKEY *b)
402 {
403     if (    BN_cmp(a->pkey.dh->p,b->pkey.dh->p) ||
404         BN_cmp(a->pkey.dh->g,b->pkey.dh->g))
405         return 0;
406     else
407         return 1;
408 }

410 static int dh_copy_parameters(EVP_PKEY *to, const EVP_PKEY *from)
411 {
412     BIGNUM *a;

414     if ((a=BN_dup(from->pkey.dh->p)) == NULL)
415         return 0;
416     if (to->pkey.dh->p != NULL)
417         BN_free(to->pkey.dh->p);
418     to->pkey.dh->p=a;

420     if ((a=BN_dup(from->pkey.dh->g)) == NULL)
421         return 0;
422     if (to->pkey.dh->g != NULL)
423         BN_free(to->pkey.dh->g);
424     to->pkey.dh->g=a;

426     return 1;
427 }

429 static int dh_missing_parameters(const EVP_PKEY *a)
430 {
431     if (!a->pkey.dh->p || !a->pkey.dh->g)
432         return 1;
433     return 0;
434 }

436 static int dh_pub_cmp(const EVP_PKEY *a, const EVP_PKEY *b)
437 {
438     if (dh_cmp_parameters(a, b) == 0)
439         return 0;
440     if (BN_cmp(b->pkey.dh->pub_key,a->pkey.dh->pub_key) != 0)
441         return 0;
442     else
443         return 1;
444 }

446 static int dh_param_print(BIO *bp, const EVP_PKEY *pkey, int indent,
447                          ASN1_PCTX *ctx)
448 {
449     return do_dh_print(bp, pkey->pkey.dh, indent, ctx, 0);
450 }

452 static int dh_public_print(BIO *bp, const EVP_PKEY *pkey, int indent,
453                          ASN1_PCTX *ctx)
454 {
455     return do_dh_print(bp, pkey->pkey.dh, indent, ctx, 1);
456 }

```

```

458 static int dh_private_print(BIO *bp, const EVP_PKEY *pkey, int indent,
459                          ASN1_PCTX *ctx)
460 {
461     return do_dh_print(bp, pkey->pkey.dh, indent, ctx, 2);
462 }

464 int DHparams_print(BIO *bp, const DH *x)
465 {
466     return do_dh_print(bp, x, 4, NULL, 0);
467 }

469 const EVP_PKEY_ASN1_METHOD dh_asn1_meth =
470 {
471     EVP_PKEY_DH,
472     EVP_PKEY_DH,
473     0,

475     "DH",
476     "OpenSSL PKCS#3 DH method",

478     dh_pub_decode,
479     dh_pub_encode,
480     dh_pub_cmp,
481     dh_public_print,

483     dh_priv_decode,
484     dh_priv_encode,
485     dh_private_print,

487     int_dh_size,
488     dh_bits,

490     dh_param_decode,
491     dh_param_encode,
492     dh_missing_parameters,
493     dh_copy_parameters,
494     dh_cmp_parameters,
495     dh_param_print,
496     0,

498     int_dh_free,
499     0
500 };

```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_asn1.c

1

```
*****
3560 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dh_asn1.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000-2005 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_asn1.c

2

```
62 #include <openssl/dh.h>
63 #include <openssl/objects.h>
64 #include <openssl/asn1t.h>
65
66 /* Override the default free and new methods */
67 static int dh_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
68                  void *exarg)
69 {
70     if(operation == ASN1_OP_NEW_PRE) {
71         *pval = (ASN1_VALUE *)DH_new();
72         if(*pval) return 2;
73         return 0;
74     } else if(operation == ASN1_OP_FREE_PRE) {
75         DH_free((DH *)*pval);
76         *pval = NULL;
77         return 2;
78     }
79     return 1;
80 }
81
82 ASN1_SEQUENCE_cb(DHparams, dh_cb) = {
83     ASN1_SIMPLE(DH, p, BIGNUM),
84     ASN1_SIMPLE(DH, g, BIGNUM),
85     ASN1_OPT(DH, length, ZLONG),
86 } ASN1_SEQUENCE_END_cb(DH, DHparams)
87
88 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(DH, DHparams, DHparams)
89
90 DH *DHparams_dup(DH *dh)
91 {
92     return ASN1_item_dup(ASN1_ITEM_rptr(DHparams), dh);
93 }
```

```

*****
4841 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_check.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/dh/dh_check.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>

```

```

62 #include <openssl/dh.h>
64 /* Check that p is a safe prime and
65  * if g is 2, 3 or 5, check that it is a suitable generator
66  * where
67  * for 2, p mod 24 == 11
68  * for 3, p mod 12 == 5
69  * for 5, p mod 10 == 3 or 7
70  * should hold.
71 */
73 int DH_check(const DH *dh, int *ret)
74 {
75     int ok=0;
76     BN_CTX *ctx=NULL;
77     BN_ULONG l;
78     BIGNUM *q=NULL;
79
80     *ret=0;
81     ctx=BN_CTX_new();
82     if (ctx == NULL) goto err;
83     q=BN_new();
84     if (q == NULL) goto err;
85
86     if (BN_is_word(dh->g, DH_GENERATOR_2))
87     {
88         l=BN_mod_word(dh->p, 24);
89         if (l != 11) *ret|=DH_NOT_SUITABLE_GENERATOR;
90     }
91     #if 0
92     else if (BN_is_word(dh->g, DH_GENERATOR_3))
93     {
94         l=BN_mod_word(dh->p, 12);
95         if (l != 5) *ret|=DH_NOT_SUITABLE_GENERATOR;
96     }
97     #endif
98     else if (BN_is_word(dh->g, DH_GENERATOR_5))
99     {
100         l=BN_mod_word(dh->p, 10);
101         if ((l != 3) && (l != 7))
102             *ret|=DH_NOT_SUITABLE_GENERATOR;
103     }
104     else
105         *ret|=DH_UNABLE_TO_CHECK_GENERATOR;
106
107     if (!BN_is_prime_ex(dh->p, BN_prime_checks, ctx, NULL))
108         *ret|=DH_CHECK_P_NOT_PRIME;
109     else
110     {
111         if (!BN_rshift1(q, dh->p)) goto err;
112         if (!BN_is_prime_ex(q, BN_prime_checks, ctx, NULL))
113             *ret|=DH_CHECK_P_NOT_SAFE_PRIME;
114     }
115     ok=1;
116 err:
117     if (ctx != NULL) BN_CTX_free(ctx);
118     if (q != NULL) BN_free(q);
119     return(ok);
120 }
122 int DH_check_pub_key(const DH *dh, const BIGNUM *pub_key, int *ret)
123 {
124     int ok=0;
125     BIGNUM *q=NULL;
126
127     *ret=0;

```

```
128     q=BN_new();
129     if (q == NULL) goto err;
130     BN_set_word(q,1);
131     if (BN_cmp(pub_key,q)<=0)
132         *ret|=DH_CHECK_PUBKEY_TOO_SMALL;
133     BN_copy(q,dh->p);
134     BN_sub_word(q,1);
135     if (BN_cmp(pub_key,q)>=0)
136         *ret|=DH_CHECK_PUBKEY_TOO_LARGE;
137
138     ok = 1;
139 err:
140     if (q != NULL) BN_free(q);
141     return(ok);
142 }
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_depr.c

1

```
*****
3232 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_depr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/dh/dh_depr.c */
2 /* =====
3 * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
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45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */

57 /* This file contains deprecated functions as wrappers to the new ones */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_depr.c

2

```
62 #include <openssl/dh.h>

64 static void *dummy=&dummy;

66 #ifndef OPENSSL_NO_DEPRECATED
67 DH *DH_generate_parameters(int prime_len, int generator,
68 void (*callback)(int,int,void *), void *cb_arg)
69 {
70 BN_GENCB cb;
71 DH *ret=NULL;

73 if((ret=DH_new()) == NULL)
74 return NULL;

76 BN_GENCB_set_old(&cb, callback, cb_arg);

78 if(DH_generate_parameters_ex(ret, prime_len, generator, &cb))
79 return ret;
80 DH_free(ret);
81 return NULL;
82 }
83 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_err.c

1

```
*****
5064 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/dh/dh_err.c */
2 /* =====
3  * Copyright (c) 1999-2011 The OpenSSL Project. All rights reserved.
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6  * modification, are permitted provided that the following conditions
7  * are met:
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47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/dh.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_DH,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_DH,0,reason)

71 static ERR_STRING_DATA DH_str_functs[]=
72 {
73 {ERR_FUNC(DH_F_COMPUTE_KEY), "COMPUTE_KEY"},
74 {ERR_FUNC(DH_F_DHPARAMS_PRINT_FP), "DHparams_print_fp"},
75 {ERR_FUNC(DH_F_DH_BUILTIN_GENPARAMS), "DH_BUILTIN_GENPARAMS"},
76 {ERR_FUNC(DH_F_DH_COMPUTE_KEY), "DH_compute_key"},
77 {ERR_FUNC(DH_F_DH_GENERATE_KEY), "DH_generate_key"},
78 {ERR_FUNC(DH_F_DH_GENERATE_PARAMETERS_EX), "DH_generate_parameters_ex"},
79 {ERR_FUNC(DH_F_DH_NEW_METHOD), "DH_new_method"},
80 {ERR_FUNC(DH_F_DH_PARAM_DECODE), "DH_PARAM_DECODE"},
81 {ERR_FUNC(DH_F_DH_PRIV_DECODE), "DH_PRIV_DECODE"},
82 {ERR_FUNC(DH_F_DH_PRIV_ENCODE), "DH_PRIV_ENCODE"},
83 {ERR_FUNC(DH_F_DH_PUB_DECODE), "DH_PUB_DECODE"},
84 {ERR_FUNC(DH_F_DH_PUB_ENCODE), "DH_PUB_ENCODE"},
85 {ERR_FUNC(DH_F_DO_DH_PRINT), "DO_DH_PRINT"},
86 {ERR_FUNC(DH_F_GENERATE_KEY), "GENERATE_KEY"},
87 {ERR_FUNC(DH_F_GENERATE_PARAMETERS), "GENERATE_PARAMETERS"},
88 {ERR_FUNC(DH_F_PKEY_DH_DERIVE), "PKEY_DH_DERIVE"},
89 {ERR_FUNC(DH_F_PKEY_DH_KEYGEN), "PKEY_DH_KEYGEN"},
90 {0, NULL}
91 };

93 static ERR_STRING_DATA DH_str_reasons[]=
94 {
95 {ERR_REASON(DH_R_BAD_GENERATOR), "bad generator"},
96 {ERR_REASON(DH_R_BN_DECODE_ERROR), "bn decode error"},
97 {ERR_REASON(DH_R_BN_ERROR), "bn error"},
98 {ERR_REASON(DH_R_DECODE_ERROR), "decode error"},
99 {ERR_REASON(DH_R_INVALID_PUBKEY), "invalid public key"},
100 {ERR_REASON(DH_R_KEYS_NOT_SET), "keys not set"},
101 {ERR_REASON(DH_R_KEY_SIZE_TOO_SMALL), "key size too small"},
102 {ERR_REASON(DH_R_MODULUS_TOO_LARGE), "modulus too large"},
103 {ERR_REASON(DH_R_NON_FIPS_METHOD), "non fips method"},
104 {ERR_REASON(DH_R_NO_PARAMETERS_SET), "no parameters set"},
105 {ERR_REASON(DH_R_NO_PRIVATE_VALUE), "no private value"},
106 {ERR_REASON(DH_R_PARAMETER_ENCODING_ERROR), "parameter encoding error"},
107 {0, NULL}
108 };

110 #endif

112 void ERR_load_DH_strings(void)
113 {
114 #ifndef OPENSSL_NO_ERR

116 if (ERR_func_error_string(DH_str_functs[0].error) == NULL)
117 {
118 ERR_load_strings(0,DH_str_functs);
119 ERR_load_strings(0,DH_str_reasons);
120 }
121 #endif
122 }
```

```

*****
6866 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_gen.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/dh/dh_gen.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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18 * If this package is used in a product, Eric Young should be given attribution
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21 * in documentation (online or textual) provided with the package.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* NB: These functions have been upgraded - the previous prototypes are in
60  * dh_depr.c as wrappers to these ones.
61  * - Geoff

```

```

62 */
63
64 #include <stdio.h>
65 #include "cryptlib.h"
66 #include <openssl/bn.h>
67 #include <openssl/dh.h>
68
69 #ifdef OPENSSL_FIPS
70 #include <openssl/fips.h>
71 #endif
72
73 static int dh_builtin_genparams(DH *ret, int prime_len, int generator, BN_GENCB
74
75 int DH_generate_parameters_ex(DH *ret, int prime_len, int generator, BN_GENCB *c
76 {
77 #ifdef OPENSSL_FIPS
78     if (FIPS_mode() && !(ret->meth->flags & DH_FLAG_FIPS_METHOD)
79         && !(ret->flags & DH_FLAG_NON_FIPS_ALLOW))
80     {
81         DHerr(DH_F_DH_GENERATE_PARAMETERS_EX, DH_R_NON_FIPS_METHOD);
82         return 0;
83     }
84 #endif
85     if (ret->meth->generate_params)
86         return ret->meth->generate_params(ret, prime_len, generator, cb)
87 #ifdef OPENSSL_FIPS
88     if (FIPS_mode())
89         return FIPS_dh_generate_parameters_ex(ret, prime_len,
90         generator, cb);
91 #endif
92     return dh_builtin_genparams(ret, prime_len, generator, cb);
93 }
94
95 /* We generate DH parameters as follows
96  * find a prime q which is prime_len/2 bits long.
97  * p=(2*q)+1 or (p-1)/2 = q
98  * For this case, g is a generator if
99  * g^((p-1)/q) mod p != 1 for values of q which are the factors of p-1.
100 * Since the factors of p-1 are q and 2, we just need to check
101 * g^2 mod p != 1 and g^q mod p != 1.
102 *
103 * Having said all that,
104 * there is another special case method for the generators 2, 3 and 5.
105 * for 2, p mod 24 == 11
106 * for 3, p mod 12 == 5 <<<< does not work for safe primes.
107 * for 5, p mod 10 == 3 or 7
108 *
109 * Thanks to Phil Karn <karn@qualcomm.com> for the pointers about the
110 * special generators and for answering some of my questions.
111 *
112 * I've implemented the second simple method :-).
113 * Since DH should be using a safe prime (both p and q are prime),
114 * this generator function can take a very very long time to run.
115 */
116 /* Actually there is no reason to insist that 'generator' be a generator.
117  * It's just as OK (and in some sense better) to use a generator of the
118  * order-q subgroup.
119 */
120 static int dh_builtin_genparams(DH *ret, int prime_len, int generator, BN_GENCB
121 {
122     BIGNUM *t1,*t2;
123     int g,ok=-1;
124     BN_CTX *ctx=NULL;
125
126     ctx=BN_CTX_new();
127     if (ctx == NULL) goto err;

```

```
128     BN_CTX_start(ctx);
129     t1 = BN_CTX_get(ctx);
130     t2 = BN_CTX_get(ctx);
131     if (t1 == NULL || t2 == NULL) goto err;

133     /* Make sure 'ret' has the necessary elements */
134     if(!ret->p && ((ret->p = BN_new()) == NULL)) goto err;
135     if(!ret->g && ((ret->g = BN_new()) == NULL)) goto err;
136
137     if (generator <= 1)
138     {
139         DHerr(DH_F_DH_BUILTIN_GENPARAMS, DH_R_BAD_GENERATOR);
140         goto err;
141     }
142     if (generator == DH_GENERATOR_2)
143     {
144         if (!BN_set_word(t1,24)) goto err;
145         if (!BN_set_word(t2,11)) goto err;
146         g=2;
147     }
148 #if 0 /* does not work for safe primes */
149     else if (generator == DH_GENERATOR_3)
150     {
151         if (!BN_set_word(t1,12)) goto err;
152         if (!BN_set_word(t2,5)) goto err;
153         g=3;
154     }
155 #endif
156     else if (generator == DH_GENERATOR_5)
157     {
158         if (!BN_set_word(t1,10)) goto err;
159         if (!BN_set_word(t2,3)) goto err;
160         /* BN_set_word(t3,7); just have to miss
161          * out on these ones :- ( */
162         g=5;
163     }
164     else
165     {
166         /* in the general case, don't worry if 'generator' is a
167          * generator or not: since we are using safe primes,
168          * it will generate either an order-q or an order-2q group,
169          * which both is OK */
170         if (!BN_set_word(t1,2)) goto err;
171         if (!BN_set_word(t2,1)) goto err;
172         g=generator;
173     }
174
175     if(!BN_generate_prime_ex(ret->p,prime_len,1,t1,t2,cb)) goto err;
176     if(!BN_GENCB_call(cb, 3, 0)) goto err;
177     if (!BN_set_word(ret->g,g)) goto err;
178     ok=1;
179 err:
180     if (ok == -1)
181     {
182         DHerr(DH_F_DH_BUILTIN_GENPARAMS, ERR_R_BN_LIB);
183         ok=0;
184     }
186     if (ctx != NULL)
187     {
188         BN_CTX_end(ctx);
189         BN_CTX_free(ctx);
190     }
191     return ok;
192 }
```



```

*****
7805 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/dh/dh_key.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>

```

```

62 #include <openssl/rand.h>
63 #include <openssl/dh.h>
64
65 static int generate_key(DH *dh);
66 static int compute_key(unsigned char *key, const BIGNUM *pub_key, DH *dh);
67 static int dh_bn_mod_exp(const DH *dh, BIGNUM *r,
68                          const BIGNUM *a, const BIGNUM *p,
69                          const BIGNUM *m, BN_CTX *ctx,
70                          BN_MONT_CTX *m_ctx);
71 static int dh_init(DH *dh);
72 static int dh_finish(DH *dh);
73
74 int DH_generate_key(DH *dh)
75 {
76 #ifdef OPENSSL_FIPS
77     if (FIPS_mode() && !(dh->meth->flags & DH_FLAG_FIPS_METHOD)
78         && !(dh->flags & DH_FLAG_NON_FIPS_ALLOW))
79     {
80         DHerr(DH_F_DH_GENERATE_KEY, DH_R_NON_FIPS_METHOD);
81         return 0;
82     }
83 #endif
84     return dh->meth->generate_key(dh);
85 }
86
87 int DH_compute_key(unsigned char *key, const BIGNUM *pub_key, DH *dh)
88 {
89 #ifdef OPENSSL_FIPS
90     if (FIPS_mode() && !(dh->meth->flags & DH_FLAG_FIPS_METHOD)
91         && !(dh->flags & DH_FLAG_NON_FIPS_ALLOW))
92     {
93         DHerr(DH_F_DH_COMPUTE_KEY, DH_R_NON_FIPS_METHOD);
94         return 0;
95     }
96 #endif
97     return dh->meth->compute_key(key, pub_key, dh);
98 }
99
100 static DH_METHOD dh_ossl = {
101     "OpenSSL DH Method",
102     generate_key,
103     compute_key,
104     dh_bn_mod_exp,
105     dh_init,
106     dh_finish,
107     0,
108     NULL,
109     NULL
110 };
111
112 const DH_METHOD *DH_OpenSSL(void)
113 {
114     return &dh_ossl;
115 }
116
117 static int generate_key(DH *dh)
118 {
119     int ok=0;
120     int generate_new_key=0;
121     unsigned l;
122     BN_CTX *ctx;
123     BN_MONT_CTX *mont=NULL;
124     BIGNUM *pub_key=NULL, *priv_key=NULL;
125
126     ctx = BN_CTX_new();
127     if (ctx == NULL) goto err;

```

```

129     if (dh->priv_key == NULL)
130     {
131         priv_key=BN_new();
132         if (priv_key == NULL) goto err;
133         generate_new_key=1;
134     }
135     else
136         priv_key=dh->priv_key;
137
138     if (dh->pub_key == NULL)
139     {
140         pub_key=BN_new();
141         if (pub_key == NULL) goto err;
142     }
143     else
144         pub_key=dh->pub_key;
145
146     if (dh->flags & DH_FLAG_CACHE_MONT_P)
147     {
148         mont = BN_MONT_CTX_set_locked(&dh->method_mont_p,
149                                     CRYPTO_LOCK_DH, dh->p, ctx);
150         if (!mont)
151             goto err;
152     }
153
154     if (generate_new_key)
155     {
156         if (dh->q)
157         {
158             do
159             {
160                 if (!BN_rand_range(priv_key, dh->q))
161                     goto err;
162             }
163             while (BN_is_zero(priv_key) || BN_is_one(priv_key));
164         }
165         else
166         {
167             /* secret exponent length */
168             l = dh->length ? dh->length : BN_num_bits(dh->p)-1;
169             if (!BN_rand(priv_key, l, 0, 0)) goto err;
170         }
171     }
172
173     {
174         BIGNUM local_prk;
175         BIGNUM *prk;
176
177         if ((dh->flags & DH_FLAG_NO_EXP_CONSTTIME) == 0)
178         {
179             BN_init(&local_prk);
180             prk = &local_prk;
181             BN_with_flags(prk, priv_key, BN_FLG_CONSTTIME);
182         }
183         else
184             prk = priv_key;
185
186         if (!dh->meth->bn_mod_exp(dh, pub_key, dh->g, prk, dh->p, ctx, m
187     }
188
189     dh->pub_key=pub_key;
190     dh->priv_key=priv_key;
191     ok=1;
192 err:

```

```

194     if (ok != 1)
195         DHerr(DH_F_GENERATE_KEY,ERR_R_BN_LIB);
196
197     if ((pub_key != NULL) && (dh->pub_key == NULL)) BN_free(pub_key);
198     if ((priv_key != NULL) && (dh->priv_key == NULL)) BN_free(priv_key);
199     BN_CTX_free(ctx);
200     return(ok);
201 }
202
203 static int compute_key(unsigned char *key, const BIGNUM *pub_key, DH *dh)
204 {
205     BN_CTX *ctx=NULL;
206     BN_MONT_CTX *mont=NULL;
207     BIGNUM *tmp;
208     int ret= -1;
209     int check_result;
210
211     if (BN_num_bits(dh->p) > OPENSSSL_DH_MAX_MODULUS_BITS)
212     {
213         DHerr(DH_F_COMPUTE_KEY,DH_R_MODULUS_TOO_LARGE);
214         goto err;
215     }
216
217     ctx = BN_CTX_new();
218     if (ctx == NULL) goto err;
219     BN_CTX_start(ctx);
220     tmp = BN_CTX_get(ctx);
221
222     if (dh->priv_key == NULL)
223     {
224         DHerr(DH_F_COMPUTE_KEY,DH_R_NO_PRIVATE_VALUE);
225         goto err;
226     }
227
228     if (dh->flags & DH_FLAG_CACHE_MONT_P)
229     {
230         mont = BN_MONT_CTX_set_locked(&dh->method_mont_p,
231                                     CRYPTO_LOCK_DH, dh->p, ctx);
232         if ((dh->flags & DH_FLAG_NO_EXP_CONSTTIME) == 0)
233         {
234             /* XXX */
235             BN_set_flags(dh->priv_key, BN_FLG_CONSTTIME);
236         }
237         if (!mont)
238             goto err;
239     }
240
241     if (!DH_check_pub_key(dh, pub_key, &check_result) || check_result)
242     {
243         DHerr(DH_F_COMPUTE_KEY,DH_R_INVALID_PUBKEY);
244         goto err;
245     }
246
247     if (!dh->meth->bn_mod_exp(dh, tmp, pub_key, dh->priv_key,dh->p,ctx,mont)
248     {
249         DHerr(DH_F_COMPUTE_KEY,ERR_R_BN_LIB);
250         goto err;
251     }
252
253     ret=BN_bn2bin(tmp,key);
254 err:
255     if (ctx != NULL)
256     {
257         BN_CTX_end(ctx);
258         BN_CTX_free(ctx);
259     }

```

```
260     return(ret);
261 }

263 static int dh_bn_mod_exp(const DH *dh, BIGNUM *r,
264                          const BIGNUM *a, const BIGNUM *p,
265                          const BIGNUM *m, BN_CTX *ctx,
266                          BN_MONT_CTX *m_ctx)
267 {
268     /* If a is only one word long and constant time is false, use the faster
269      * exponenentiation function.
270      */
271     if (a->top == 1 && ((dh->flags & DH_FLAG_NO_EXP_CONSTTIME) != 0))
272     {
273         BN_ULONG A = a->d[0];
274         return BN_mod_exp_mont_word(r, A, p, m, ctx, m_ctx);
275     }
276     else
277         return BN_mod_exp_mont(r, a, p, m, ctx, m_ctx);
278 }

281 static int dh_init(DH *dh)
282 {
283     dh->flags |= DH_FLAG_CACHE_MONT_P;
284     return(1);
285 }

287 static int dh_finish(DH *dh)
288 {
289     if(dh->method_mont_p)
290         BN_MONT_CTX_free(dh->method_mont_p);
291     return(1);
292 }
```

```
*****
```

```
7292 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/dh/dh_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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4  *
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6  * by Eric Young (eay@cryptsoft.com).
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8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

```
62 #include <openssl/dh.h>
63 #ifndef OPENSSL_NO_ENGINE
64 #include <openssl/engine.h>
65 #endif
66
67 #ifdef OPENSSL_FIPS
68 #include <openssl/fips.h>
69 #endif
70
71 const char DH_version[]="Diffie-Hellman" OPENSSL_VERSION_PTEXT;
72
73 static const DH_METHOD *default_DH_method = NULL;
74
75 void DH_set_default_method(const DH_METHOD *meth)
76 {
77     default_DH_method = meth;
78 }
79
80 const DH_METHOD *DH_get_default_method(void)
81 {
82     if(!default_DH_method)
83     {
84         #ifdef OPENSSL_FIPS
85             if (FIPS_mode())
86                 return FIPS_dh_openssl();
87             else
88                 return DH_OpenSSL();
89         #else
90             default_DH_method = DH_OpenSSL();
91         #endif
92     }
93     return default_DH_method;
94 }
95
96 int DH_set_method(DH *dh, const DH_METHOD *meth)
97 {
98     /* NB: The caller is specifically setting a method, so it's not up to us
99     * to deal with which ENGINE it comes from. */
100     const DH_METHOD *mtmp;
101     mtmp = dh->method;
102     if (mtmp->finish) mtmp->finish(dh);
103     #ifndef OPENSSL_NO_ENGINE
104     if (dh->engine)
105     {
106         ENGINE_finish(dh->engine);
107         dh->engine = NULL;
108     }
109     #endif
110     dh->meth = meth;
111     if (meth->init) meth->init(dh);
112     return 1;
113 }
114
115 DH *DH_new(void)
116 {
117     return DH_new_method(NULL);
118 }
119
120 DH *DH_new_method(ENGINE *engine)
121 {
122     DH *ret;
123
124     ret=(DH *)OPENSSL_malloc(sizeof(DH));
125     if (ret == NULL)
126     {
127         Dherr(DH_F_DH_NEW_METHOD, ERR_R_MALLOC_FAILURE);
128     }
129 }
```

```

128         return(NULL);
129     }

131     ret->meth = DH_get_default_method();
132 #ifndef OPENSSL_NO_ENGINE
133     if (engine)
134     {
135         if (!ENGINE_init(engine))
136         {
137             DHerr(DH_F_DH_NEW_METHOD, ERR_R_ENGINE_LIB);
138             OPENSSL_free(ret);
139             return NULL;
140         }
141         ret->engine = engine;
142     }
143 else
144     ret->engine = ENGINE_get_default_DH();
145 if(ret->engine)
146 {
147     ret->meth = ENGINE_get_DH(ret->engine);
148     if(!ret->meth)
149     {
150         DHerr(DH_F_DH_NEW_METHOD,ERR_R_ENGINE_LIB);
151         ENGINE_finish(ret->engine);
152         OPENSSL_free(ret);
153         return NULL;
154     }
155 }
156 #endif

158     ret->pad=0;
159     ret->version=0;
160     ret->p=NULL;
161     ret->q=NULL;
162     ret->length=0;
163     ret->pub_key=NULL;
164     ret->priv_key=NULL;
165     ret->q=NULL;
166     ret->j=NULL;
167     ret->seed = NULL;
168     ret->seedlen = 0;
169     ret->counter = NULL;
170     ret->method_mont_p=NULL;
171     ret->references = 1;
172     ret->flags=ret->meth->flags & ~DH_FLAG_NON_FIPS_ALLOW;
173     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_DH, ret, &ret->ex_data);
174     if ((ret->meth->init != NULL) && !ret->meth->init(ret))
175     {
176 #ifndef OPENSSL_NO_ENGINE
177         if (ret->engine)
178             ENGINE_finish(ret->engine);
179 #endif
180         CRYPTO_free_ex_data(CRYPTO_EX_INDEX_DH, ret, &ret->ex_data);
181         OPENSSL_free(ret);
182         ret=NULL;
183     }
184     return(ret);
185 }

187 void DH_free(DH *r)
188 {
189     int i;
190     if(r == NULL) return;
191     i = CRYPTO_add(&r->references, -1, CRYPTO_LOCK_DH);
192 #ifdef REF_PRINT
193     REF_PRINT("DH", r);

```

```

194 #endif
195     if (i > 0) return;
196 #ifdef REF_CHECK
197     if (i < 0)
198     {
199         fprintf(stderr,"DH_free, bad reference count\n");
200         abort();
201     }
202 #endif

204     if (r->meth->finish)
205         r->meth->finish(r);
206 #ifndef OPENSSL_NO_ENGINE
207     if (r->engine)
208         ENGINE_finish(r->engine);
209 #endif

211     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_DH, r, &r->ex_data);

213     if (r->p != NULL) BN_clear_free(r->p);
214     if (r->q != NULL) BN_clear_free(r->q);
215     if (r->j != NULL) BN_clear_free(r->j);
216     if (r->seed != NULL) BN_clear_free(r->seed);
217     if (r->counter != NULL) BN_clear_free(r->counter);
218     if (r->pub_key != NULL) BN_clear_free(r->pub_key);
219     if (r->priv_key != NULL) BN_clear_free(r->priv_key);
220     OPENSSL_free(r);
221 }

224 int DH_up_ref(DH *r)
225 {
226     int i = CRYPTO_add(&r->references, 1, CRYPTO_LOCK_DH);
227 #ifdef REF_PRINT
228     REF_PRINT("DH", r);
229 #endif
230 #ifdef REF_CHECK
231     if (i < 2)
232     {
233         fprintf(stderr, "DH_up, bad reference count\n");
234         abort();
235     }
236 #endif
237     return ((i > 1) ? 1 : 0);
238 }

240 int DH_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
241                         CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
242 {
243     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_DH, argl, argp,
244                                   new_func, dup_func, free_func);
245 }

247 int DH_set_ex_data(DH *d, int idx, void *arg)
248 {
249     return(CRYPTO_set_ex_data(&d->ex_data,idx,arg));
250 }

252 void *DH_get_ex_data(DH *d, int idx)
253 {
254     return(CRYPTO_get_ex_data(&d->ex_data,idx));
255 }

257 int DH_size(const DH *dh)
258 {
259     return(BN_num_bytes(dh->p));

```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_lib.c	5
260 }	

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_pmeth.c

1

```
*****
6148 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_pmeth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
2  * project 2006.
3  */
4 /* =====
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49  * OF THE POSSIBILITY OF SUCH DAMAGE.
50  * =====
51  *
52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  *
56  */
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/asn1t.h>
61 #include <openssl/x509.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_pmeth.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/dh.h>
64 #include <openssl/bn.h>
65 #include "evp_loc1.h"
67 /* DH pkey context structure */
69 typedef struct
70 {
71     /* Parameter gen parameters */
72     int prime_len;
73     int generator;
74     int use_dsa;
75     /* Keygen callback info */
76     int gentmp[2];
77     /* message digest */
78     } DH_PKEY_CTX;
80 static int pkey_dh_init(EVP_PKEY_CTX *ctx)
81 {
82     DH_PKEY_CTX *dctx;
83     dctx = OPENSSL_malloc(sizeof(DH_PKEY_CTX));
84     if (!dctx)
85         return 0;
86     dctx->prime_len = 1024;
87     dctx->generator = 2;
88     dctx->use_dsa = 0;
90     ctx->data = dctx;
91     ctx->keygen_info = dctx->gentmp;
92     ctx->keygen_info_count = 2;
93
94     return 1;
95 }
97 static int pkey_dh_copy(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src)
98 {
99     DH_PKEY_CTX *dctx, *sctx;
100     if (!pkey_dh_init(dst))
101         return 0;
102     sctx = src->data;
103     dctx = dst->data;
104     dctx->prime_len = sctx->prime_len;
105     dctx->generator = sctx->generator;
106     dctx->use_dsa = sctx->use_dsa;
107     return 1;
108 }
110 static void pkey_dh_cleanup(EVP_PKEY_CTX *ctx)
111 {
112     DH_PKEY_CTX *dctx = ctx->data;
113     if (dctx)
114         OPENSSL_free(dctx);
115 }
117 static int pkey_dh_ctrl(EVP_PKEY_CTX *ctx, int type, int p1, void *p2)
118 {
119     DH_PKEY_CTX *dctx = ctx->data;
120     switch (type)
121     {
122     case EVP_PKEY_CTRL_DH_PARAMGEN_PRIME_LEN:
123         if (p1 < 256)
124             return -2;
125         dctx->prime_len = p1;
126         return 1;
```

```

128         case EVP_PKEY_CTRL_DH_PARAMGEN_GENERATOR:
129             dctx->generator = p1;
130             return 1;

132         case EVP_PKEY_CTRL_PEER_KEY:
133             /* Default behaviour is OK */
134             return 1;

136         default:
137             return -2;

139     }
140 }

142 static int pkey_dh_ctrl_str(EVP_PKEY_CTX *ctx,
143                             const char *type, const char *value)
144 {
145     if (!strcmp(type, "dh_paramgen_prime_len"))
146     {
147         int len;
148         len = atoi(value);
149         return EVP_PKEY_CTX_set_dh_paramgen_prime_len(ctx, len);
150     }
151     if (!strcmp(type, "dh_paramgen_generator"))
152     {
153         int len;
154         len = atoi(value);
155         return EVP_PKEY_CTX_set_dh_paramgen_generator(ctx, len);
156     }
157     return -2;
158 }

161 static int pkey_dh_paramgen(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey)
162 {
163     DH *dh = NULL;
164     DH_PKEY_CTX *dctx = ctx->data;
165     BN_GENCB *pcb, cb;
166     int ret;
167     if (ctx->pkey_genctx)
168     {
169         pcb = &cb;
170         evp_pkey_set_cb_translate(pcb, ctx);
171     }
172     else
173         pcb = NULL;
174     dh = DH_new();
175     if (!dh)
176         return 0;
177     ret = DH_generate_parameters_ex(dh,
178                                     dctx->prime_len, dctx->generator, pcb);
179     if (ret)
180         EVP_PKEY_assign_DH(pkey, dh);
181     else
182         DH_free(dh);
183     return ret;
184 }

186 static int pkey_dh_keygen(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey)
187 {
188     DH *dh = NULL;
189     if (ctx->pkey == NULL)
190     {
191         DHerr(DH_F_PKEY_DH_KEYGEN, DH_R_NO_PARAMETERS_SET);
192         return 0;
193     }

```

```

194     dh = DH_new();
195     if (!dh)
196         return 0;
197     EVP_PKEY_assign_DH(pkey, dh);
198     /* Note: if error return, pkey is freed by parent routine */
199     if (!EVP_PKEY_copy_parameters(pkey, ctx->pkey))
200         return 0;
201     return DH_generate_key(pkey->pkey.dh);
202 }

204 static int pkey_dh_derive(EVP_PKEY_CTX *ctx, unsigned char *key, size_t *keylen)
205 {
206     int ret;
207     if (!ctx->pkey || !ctx->peerkey)
208     {
209         DHerr(DH_F_PKEY_DH_DERIVE, DH_R_KEYS_NOT_SET);
210         return 0;
211     }
212     ret = DH_compute_key(key, ctx->peerkey->pkey.dh->pub_key,
213                           ctx->pkey->pkey.dh);
214     if (ret < 0)
215         return ret;
216     *keylen = ret;
217     return 1;
218 }

220 const EVP_PKEY_METHOD dh_pkey_meth =
221 {
222     EVP_PKEY_DH,
223     EVP_PKEY_FLAG_AUTOARGLEN,
224     pkey_dh_init,
225     pkey_dh_copy,
226     pkey_dh_cleanup,

228     0,
229     pkey_dh_paramgen,

231     0,
232     pkey_dh_keygen,

234     0,
235     0,

237     0,
238     0,

240     0, 0,

242     0, 0, 0, 0,

244     0, 0,

246     0, 0,

248     0,
249     pkey_dh_derive,

251     pkey_dh_ctrl,
252     pkey_dh_ctrl_str

254     };

```


new/usr/src/lib/openssl/libsunw_crypto/dh/dh_prn.c

1

```
*****
3586 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dh/dh_prn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/asn1/t_pkey.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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21 * in documentation (online or textual) provided with the package.
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
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36 * being used are not cryptographic related :-).
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38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dh/dh_prn.c

2

```
62 #include <openssl/dh.h>
64 #ifndef OPENSSL_NO_FP_API
65 int DHparams_print_fp(FILE *fp, const DH *x)
66 {
67     BIO *b;
68     int ret;
69
70     if ((b=BIO_new(BIO_s_file())) == NULL)
71     {
72         DHerr(DH_F_DHPARAMS_PRINT_FP,ERR_R_BUF_LIB);
73         return(0);
74     }
75     BIO_set_fp(b,fp,BIO_NOCLOSE);
76     ret=DHparams_print(b, x);
77     BIO_free(b);
78     return(ret);
79 }
80 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_ameth.c

1

```
*****
15654 Fri May 30 18:31:44 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_ameth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
2  * project 2006.
3  */
4 /* =====
5  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
6  *
7  * Redistribution and use in source and binary forms, with or without
8  * modification, are permitted provided that the following conditions
9  * are met:
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13  *
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18  *
19  * 3. All advertising materials mentioning features or use of this
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38  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
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40  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
41  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
42  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
43  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
44  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
45  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
46  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
47  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
48  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
49  * OF THE POSSIBILITY OF SUCH DAMAGE.
50  * =====
51  *
52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  *
56  */
57
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/x509.h>
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_ameth.c

2

```
62 #include <openssl/dsa.h>
63 #include <openssl/bn.h>
64 #ifndef OPENSSL_NO_CMS
65 #include <openssl/cms.h>
66 #endif
67 #include "asn1_locl.h"
68
69 static int dsa_pub_decode(EVP_PKEY *pkey, X509_PUBKEY *pubkey)
70 {
71     const unsigned char *p, *pm;
72     int pklen, pmlen;
73     int ptype;
74     void *pval;
75     ASN1_STRING *pstr;
76     X509_ALGOR *palg;
77     ASN1_INTEGER *public_key = NULL;
78
79     DSA *dsa = NULL;
80
81     if (!X509_PUBKEY_get0_param(NULL, &p, &pklen, &palg, pubkey))
82         return 0;
83     X509_ALGOR_get0(NULL, &ptype, &pval, palg);
84
85     if (ptype == V_ASN1_SEQUENCE)
86     {
87         pstr = pval;
88         pm = pstr->data;
89         pmlen = pstr->length;
90
91         if (!(dsa = d2i_DSAParams(NULL, &pm, pmlen)))
92         {
93             DSAerr(DSA_F_DSA_PUB_DECODE, DSA_R_DECODE_ERROR);
94             goto err;
95         }
96     }
97
98     else if ((ptype == V_ASN1_NULL) || (ptype == V_ASN1_UNDEF))
99     {
100         if (!(dsa = DSA_new()))
101         {
102             DSAerr(DSA_F_DSA_PUB_DECODE, ERR_R_MALLOC_FAILURE);
103             goto err;
104         }
105     }
106     else
107     {
108         DSAerr(DSA_F_DSA_PUB_DECODE, DSA_R_PARAMETER_ENCODING_ERROR);
109         goto err;
110     }
111
112     if (!(public_key=d2i_ASN1_INTEGER(NULL, &p, pklen)))
113     {
114         DSAerr(DSA_F_DSA_PUB_DECODE, DSA_R_DECODE_ERROR);
115         goto err;
116     }
117
118     if (!(dsa->pub_key = ASN1_INTEGER_to_BN(public_key, NULL)))
119     {
120         DSAerr(DSA_F_DSA_PUB_DECODE, DSA_R_BN_DECODE_ERROR);
121         goto err;
122     }
123
124     ASN1_INTEGER_free(public_key);
125     EVP_PKEY_assign_DSA(pkey, dsa);
126     return 1;
127 }
```

```

129     err:
130     if (public_key)
131         ASN1_INTEGER_free(public_key);
132     if (dsa)
133         DSA_free(dsa);
134     return 0;
135 }
136
137 static int dsa_pub_encode(X509_PUBKEY *pk, const EVP_PKEY *pkey)
138 {
139     DSA *dsa;
140     void *pval = NULL;
141     int ptype;
142     unsigned char *penc = NULL;
143     int penclen;
144
145     dsa=pkey->pkey.dsa;
146     if (pkey->save_parameters && dsa->p && dsa->q && dsa->g)
147     {
148         ASN1_STRING *str;
149         str = ASN1_STRING_new();
150         str->length = i2d_DSAParams(dsa, &str->data);
151         if (str->length <= 0)
152             goto err;
153         DSAerr(DSA_F_DSA_PUB_ENCODE, ERR_R_MALLOC_FAILURE);
154         goto err;
155     }
156     pval = str;
157     ptype = V_ASN1_SEQUENCE;
158 }
159 else
160     ptype = V_ASN1_UNDEF;
161
162 dsa->write_params=0;
163
164 penclen = i2d_DSAPublicKey(dsa, &penc);
165
166 if (penclen <= 0)
167 {
168     DSAerr(DSA_F_DSA_PUB_ENCODE, ERR_R_MALLOC_FAILURE);
169     goto err;
170 }
171
172 if (X509_PUBKEY_set0_param(pk, OBJ_nid2obj(EVP_PKEY_DSA),
173                             ptype, pval, penc, penclen))
174     return 1;
175
176 err:
177 if (penc)
178     OPENSSL_free(penc);
179 if (pval)
180     ASN1_STRING_free(pval);
181
182 return 0;
183 }
184
185 /* In PKCS#8 DSA: you just get a private key integer and parameters in the
186  * AlgorithmIdentifier the pubkey must be recalculated.
187  */
188
189 static int dsa_priv_decode(EVP_PKEY *pkey, PKCS8_PRIV_KEY_INFO *p8)
190 {
191     const unsigned char *p, *pm;
192     int pklen, pmlen;

```

```

194     int ptype;
195     void *pval;
196     ASN1_STRING *pstr;
197     X509_ALGOR *palg;
198     ASN1_INTEGER *privkey = NULL;
199     BN_CTX *ctx = NULL;
200
201     STACK_OF(ASN1_TYPE) *ndsa = NULL;
202     DSA *dsa = NULL;
203
204     if (!PKCS8_pkey_get0(NULL, &p, &pklen, &palg, p8))
205         return 0;
206     X509_ALGOR_get0(NULL, &ptype, &pval, palg);
207
208     /* Check for broken DSA PKCS#8, UGH! */
209     if (*p == (V_ASN1_SEQUENCE|V_ASN1_CONSTRUCTED))
210     {
211         ASN1_TYPE *t1, *t2;
212         if (!ndsa = d2i_ASN1_SEQUENCE_ANY(NULL, &p, pklen))
213             goto decerr;
214         if (sk_ASN1_TYPE_num(ndsa) != 2)
215             goto decerr;
216         /* Handle Two broken types:
217          * SEQUENCE {parameters, priv_key}
218          * SEQUENCE {pub_key, priv_key}
219          */
220
221         t1 = sk_ASN1_TYPE_value(ndsa, 0);
222         t2 = sk_ASN1_TYPE_value(ndsa, 1);
223         if (t1->type == V_ASN1_SEQUENCE)
224         {
225             p8->broken = PKCS8_EMBEDDED_PARAM;
226             pval = t1->value.ptr;
227         }
228         else if (ptype == V_ASN1_SEQUENCE)
229             p8->broken = PKCS8_NS_DB;
230         else
231             goto decerr;
232
233         if (t2->type != V_ASN1_INTEGER)
234             goto decerr;
235
236         privkey = t2->value.integer;
237     }
238     else
239     {
240         const unsigned char *q = p;
241         if (!privkey=d2i_ASN1_INTEGER(NULL, &p, pklen))
242             goto decerr;
243         if (privkey->type == V_ASN1_NEG_INTEGER)
244         {
245             p8->broken = PKCS8_NEG_PRIVKEY;
246             ASN1_INTEGER_free(privkey);
247             if (!privkey=d2i_ASN1_UINTEGER(NULL, &q, pklen))
248                 goto decerr;
249         }
250         if (ptype != V_ASN1_SEQUENCE)
251             goto decerr;
252     }
253
254     pstr = pval;
255     pm = pstr->data;
256     pmlen = pstr->length;
257     if (!dsa = d2i_DSAParams(NULL, &pm, pmlen))
258         goto decerr;
259     /* We have parameters now set private key */

```

```

260     if (!(dsa->priv_key = ASN1_INTEGER_to_BN(privkey, NULL)))
261     {
262         DSAerr(DSA_F_DSA_PRIV_DECODE, DSA_R_BN_ERROR);
263         goto dsaerr;
264     }
265     /* Calculate public key */
266     if (!(dsa->pub_key = BN_new()))
267     {
268         DSAerr(DSA_F_DSA_PRIV_DECODE, ERR_R_MALLOC_FAILURE);
269         goto dsaerr;
270     }
271     if (!(ctx = BN_CTX_new()))
272     {
273         DSAerr(DSA_F_DSA_PRIV_DECODE, ERR_R_MALLOC_FAILURE);
274         goto dsaerr;
275     }
276
277     if (!BN_mod_exp(dsa->pub_key, dsa->g, dsa->priv_key, dsa->p, ctx))
278     {
279         DSAerr(DSA_F_DSA_PRIV_DECODE, DSA_R_BN_ERROR);
280         goto dsaerr;
281     }
282
283     EVP_PKEY_assign_DSA(pkey, dsa);
284     BN_CTX_free(ctx);
285     if(ndsa)
286         sk_ASN1_TYPE_pop_free(ndsa, ASN1_TYPE_free);
287     else
288         ASN1_INTEGER_free(privkey);
289
290     return 1;
291
292 decerr:
293 DSAerr(DSA_F_DSA_PRIV_DECODE, EVP_R_DECODE_ERROR);
294 dsaerr:
295 BN_CTX_free(ctx);
296 if (privkey)
297     ASN1_INTEGER_free(privkey);
298 sk_ASN1_TYPE_pop_free(ndsa, ASN1_TYPE_free);
299 DSA_free(dsa);
300 return 0;
301 }
302
303 static int dsa_priv_encode(PKCS8_PRIV_KEY_INFO *p8, const EVP_PKEY *pkey)
304 {
305     ASN1_STRING *params = NULL;
306     ASN1_INTEGER *prkey = NULL;
307     unsigned char *dp = NULL;
308     int dplen;
309
310     params = ASN1_STRING_new();
311
312     if (!params)
313     {
314         DSAerr(DSA_F_DSA_PRIV_ENCODE, ERR_R_MALLOC_FAILURE);
315         goto err;
316     }
317
318     params->length = i2d_DSAParams(pkey->pkey.dsa, &params->data);
319     if (params->length <= 0)
320     {
321         DSAerr(DSA_F_DSA_PRIV_ENCODE, ERR_R_MALLOC_FAILURE);
322         goto err;
323     }
324     params->type = V_ASN1_SEQUENCE;

```

```

326     /* Get private key into integer */
327     prkey = BN_to_ASN1_INTEGER(pkey->pkey.dsa->priv_key, NULL);
328
329     if (!prkey)
330     {
331         DSAerr(DSA_F_DSA_PRIV_ENCODE, DSA_R_BN_ERROR);
332         goto err;
333     }
334
335     dplen = i2d_ASN1_INTEGER(prkey, &dp);
336
337     ASN1_INTEGER_free(prkey);
338
339     if (!PKCS8_pkey_set0(p8, OBJ_nid2obj(NID_dsa), 0,
340                          V_ASN1_SEQUENCE, params, dp, dplen))
341         goto err;
342
343     return 1;
344
345 err:
346     if (dp != NULL)
347         OPENSSL_free(dp);
348     if (params != NULL)
349         ASN1_STRING_free(params);
350     if (prkey != NULL)
351         ASN1_INTEGER_free(prkey);
352     return 0;
353 }
354
355 static int int_dsa_size(const EVP_PKEY *pkey)
356 {
357     return(DSA_size(pkey->pkey.dsa));
358 }
359
360 static int dsa_bits(const EVP_PKEY *pkey)
361 {
362     return BN_num_bits(pkey->pkey.dsa->p);
363 }
364
365 static int dsa_missing_parameters(const EVP_PKEY *pkey)
366 {
367     DSA *dsa;
368     dsa=pkey->pkey.dsa;
369     if ((dsa->p == NULL) || (dsa->q == NULL) || (dsa->g == NULL))
370         return 1;
371     return 0;
372 }
373
374 static int dsa_copy_parameters(EVP_PKEY *to, const EVP_PKEY *from)
375 {
376     BIGNUM *a;
377
378     if ((a=BN_dup(from->pkey.dsa->p)) == NULL)
379         return 0;
380     if (to->pkey.dsa->p != NULL)
381         BN_free(to->pkey.dsa->p);
382     to->pkey.dsa->p=a;
383
384     if ((a=BN_dup(from->pkey.dsa->q)) == NULL)
385         return 0;
386     if (to->pkey.dsa->q != NULL)
387         BN_free(to->pkey.dsa->q);
388     to->pkey.dsa->q=a;
389
390     if ((a=BN_dup(from->pkey.dsa->g)) == NULL)
391         return 0;

```

```

392     if (to->pkey.dsa->g != NULL)
393         BN_free(to->pkey.dsa->g);
394     to->pkey.dsa->g=a;
395     return 1;
396 }

398 static int dsa_cmp_parameters(const EVP_PKEY *a, const EVP_PKEY *b)
399 {
400     if ( BN_cmp(a->pkey.dsa->p,b->pkey.dsa->p) ||
401         BN_cmp(a->pkey.dsa->q,b->pkey.dsa->q) ||
402         BN_cmp(a->pkey.dsa->g,b->pkey.dsa->g))
403         return 0;
404     else
405         return 1;
406 }

408 static int dsa_pub_cmp(const EVP_PKEY *a, const EVP_PKEY *b)
409 {
410     if (BN_cmp(b->pkey.dsa->pub_key,a->pkey.dsa->pub_key) != 0)
411         return 0;
412     else
413         return 1;
414 }

416 static void int_dsa_free(EVP_PKEY *pkey)
417 {
418     DSA_free(pkey->pkey.dsa);
419 }

421 static void update_buflen(const BIGNUM *b, size_t *pbuflen)
422 {
423     size_t i;
424     if (!b)
425         return;
426     if (*pbuflen < (i = (size_t)BN_num_bytes(b)))
427         *pbuflen = i;
428 }

430 static int do_dsa_print(BIO *bp, const DSA *x, int off, int ptype)
431 {
432     unsigned char *m=NULL;
433     int ret=0;
434     size_t buf_len=0;
435     const char *ktype = NULL;

437     const BIGNUM *priv_key, *pub_key;

439     if (ptype == 2)
440         priv_key = x->priv_key;
441     else
442         priv_key = NULL;

444     if (ptype > 0)
445         pub_key = x->pub_key;
446     else
447         pub_key = NULL;

449     if (ptype == 2)
450         ktype = "Private-Key";
451     else if (ptype == 1)
452         ktype = "Public-Key";
453     else
454         ktype = "DSA-Parameters";

456     update_buflen(x->p, &buf_len);
457     update_buflen(x->q, &buf_len);

```

```

458     update_buflen(x->g, &buf_len);
459     update_buflen(priv_key, &buf_len);
460     update_buflen(pub_key, &buf_len);

462     m=(unsigned char *)OPENSSL_malloc(buf_len+10);
463     if (m == NULL)
464     {
465         DSAerr(DSA_F_DO_DSA_PRINT,ERR_R_MALLOC_FAILURE);
466         goto err;
467     }

469     if (priv_key)
470     {
471         if(!BIO_indent(bp,off,128))
472             goto err;
473         if (BIO_printf(bp,"%s: (%d bit)\n",ktype, BN_num_bits(x->p))
474             <= 0) goto err;
475     }

477     if (!ASN1_bn_print(bp,"priv:",priv_key,m,off))
478         goto err;
479     if (!ASN1_bn_print(bp,"pub: ",pub_key,m,off))
480         goto err;
481     if (!ASN1_bn_print(bp,"P: ",x->p,m,off)) goto err;
482     if (!ASN1_bn_print(bp,"Q: ",x->q,m,off)) goto err;
483     if (!ASN1_bn_print(bp,"G: ",x->g,m,off)) goto err;
484     ret=1;
485 err:
486     if (m != NULL) OPENSSL_free(m);
487     return(ret);
488 }

490 static int dsa_param_decode(EVP_PKEY *pkey,
491                             const unsigned char **pder, int derlen)
492 {
493     DSA *dsa;
494     if (!(dsa = d2i_DSAParams(NULL, pder, derlen)))
495     {
496         DSAerr(DSA_F_DSA_PARAM_DECODE, ERR_R_DSA_LIB);
497         return 0;
498     }
499     EVP_PKEY_assign_DSA(pkey, dsa);
500     return 1;
501 }

503 static int dsa_param_encode(const EVP_PKEY *pkey, unsigned char **pder)
504 {
505     return i2d_DSAParams(pkey->pkey.dsa, pder);
506 }

508 static int dsa_param_print(BIO *bp, const EVP_PKEY *pkey, int indent,
509                             ASN1_PCTX *ctx)
510 {
511     return do_dsa_print(bp, pkey->pkey.dsa, indent, 0);
512 }

514 static int dsa_pub_print(BIO *bp, const EVP_PKEY *pkey, int indent,
515                             ASN1_PCTX *ctx)
516 {
517     return do_dsa_print(bp, pkey->pkey.dsa, indent, 1);
518 }

521 static int dsa_priv_print(BIO *bp, const EVP_PKEY *pkey, int indent,
522                             ASN1_PCTX *ctx)
523 {

```

```

524     return do_dsa_print(bp, pkey->pkey.dsa, indent, 2);
525 }

527 static int old_dsa_priv_decode(EVP_PKEY *pkey,
528                               const unsigned char **pder, int derlen)
529 {
530     DSA *dsa;
531     if (!(dsa = d2i_DSAPrivateKey (NULL, pder, derlen)))
532     {
533         DSAerr(DSA_F_OLD_DSA_PRIV_DECODE, ERR_R_DSA_LIB);
534         return 0;
535     }
536     EVP_PKEY_assign_DSA(pkey, dsa);
537     return 1;
538 }

540 static int old_dsa_priv_encode(const EVP_PKEY *pkey, unsigned char **pder)
541 {
542     return i2d_DSAPrivateKey(pkey->pkey.dsa, pder);
543 }

545 static int dsa_sig_print(BIO *bp, const X509_ALGOR *sigalg,
546                           const ASN1_STRING *sig,
547                           int indent, ASN1_PCTX *pctx)
548 {
549     DSA_SIG *dsa_sig;
550     const unsigned char *p;
551     if (!sig)
552     {
553         if (BIO_puts(bp, "\n") <= 0)
554             return 0;
555         else
556             return 1;
557     }
558     p = sig->data;
559     dsa_sig = d2i_DSA_SIG(NULL, &p, sig->length);
560     if (dsa_sig)
561     {
562         int rv = 0;
563         size_t buf_len = 0;
564         unsigned char *m=NULL;
565         update_buf_len(dsa_sig->r, &buf_len);
566         update_buf_len(dsa_sig->s, &buf_len);
567         m = OPENSSL_malloc(buf_len+10);
568         if (m == NULL)
569         {
570             DSAerr(DSA_F_DSA_SIG_PRINT, ERR_R_MALLOC_FAILURE);
571             goto err;
572         }

574         if (BIO_write(bp, "\n", 1) != 1)
575             goto err;

577         if (!ASN1_bn_print(bp, "r: ", dsa_sig->r, m, indent))
578             goto err;
579         if (!ASN1_bn_print(bp, "s: ", dsa_sig->s, m, indent))
580             goto err;
581         rv = 1;
582     err:
583         if (m)
584             OPENSSL_free(m);
585         DSA_SIG_free(dsa_sig);
586         return rv;
587     }
588     return X509_signature_dump(bp, sig, indent);
589 }

```

```

591 static int dsa_pkey_ctrl(EVP_PKEY *pkey, int op, long arg1, void *arg2)
592 {
593     switch (op)
594     {
595         case ASN1_PKEY_CTRL_PKCS7_SIGN:
596             if (arg1 == 0)
597             {
598                 int snid, hnid;
599                 X509_ALGOR *alg1, *alg2;
600                 PKCS7_SIGNER_INFO_get0_algs(arg2, NULL, &alg1, &alg2);
601                 if (alg1 == NULL || alg1->algorithm == NULL)
602                     return -1;
603                 hnid = OBJ_obj2nid(alg1->algorithm);
604                 if (hnid == NID_undef)
605                     return -1;
606                 if (!OBJ_find_sigid_by_algs(&snid, hnid, EVP_PKEY_id(pkey),
607                                             return -1;
608                 X509_ALGOR_set0(alg2, OBJ_nid2obj(snid), V_ASN1_UNDEF, 0
609                                 }
610             }
611             return 1;
612         #ifndef OPENSSL_NO_CMS
613         case ASN1_PKEY_CTRL_CMS_SIGN:
614             if (arg1 == 0)
615             {
616                 int snid, hnid;
617                 X509_ALGOR *alg1, *alg2;
618                 CMS_SignerInfo_get0_algs(arg2, NULL, NULL, &alg1, &alg2);
619                 if (alg1 == NULL || alg1->algorithm == NULL)
620                     return -1;
621                 hnid = OBJ_obj2nid(alg1->algorithm);
622                 if (hnid == NID_undef)
623                     return -1;
624                 if (!OBJ_find_sigid_by_algs(&snid, hnid, EVP_PKEY_id(pkey),
625                                             return -1;
626                 X509_ALGOR_set0(alg2, OBJ_nid2obj(snid), V_ASN1_UNDEF, 0
627                                 }
628             }
629             return 1;
630         #endif
631         case ASN1_PKEY_CTRL_DEFAULT_MD_NID:
632             *(int *)arg2 = NID_sha1;
633             return 2;
634         default:
635             return -2;
636     }
637 }

639 }

641 /* NB these are sorted in pkey_id order, lowest first */
643 const EVP_PKEY_ASN1_METHOD dsa_asn1_meths[] =
644 {
645     {
646         EVP_PKEY_DSA2,
647         EVP_PKEY_DSA,
648         ASN1_PKEY_ALIAS
649     },
650     {
651         EVP_PKEY_DSA1,
652         EVP_PKEY_DSA,
653         ASN1_PKEY_ALIAS
654     },
655     {

```

```
656         },
658         {
659             EVP_PKEY_DSA4,
660             EVP_PKEY_DSA,
661             ASN1_PKEY_ALIAS
662         },
664         {
665             EVP_PKEY_DSA3,
666             EVP_PKEY_DSA,
667             ASN1_PKEY_ALIAS
668         },
670         {
671             EVP_PKEY_DSA,
672             EVP_PKEY_DSA,
673             0,
675             "DSA",
676             "OpenSSL DSA method",
678             dsa_pub_decode,
679             dsa_pub_encode,
680             dsa_pub_cmp,
681             dsa_pub_print,
683             dsa_priv_decode,
684             dsa_priv_encode,
685             dsa_priv_print,
687             int_dsa_size,
688             dsa_bits,
690             dsa_param_decode,
691             dsa_param_encode,
692             dsa_missing_parameters,
693             dsa_copy_parameters,
694             dsa_cmp_parameters,
695             dsa_param_print,
696             dsa_sig_print,
698             int_dsa_free,
699             dsa_pkey_ctrl,
700             old_dsa_priv_decode,
701             old_dsa_priv_encode
702         }
703     };
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_asn1.c

1

```
*****
6058 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dsa_asn1.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000-2005 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/dsa.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_asn1.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/rand.h>
65
66 /* Override the default new methods */
67 static int sig_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
68                  void *exarg)
69 {
70     if(operation == ASN1_OP_NEW_PRE) {
71         DSA_SIG *sig;
72         sig = OPENSSL_malloc(sizeof(DSA_SIG));
73         if(!sig)
74             DSAerr(DSA_F_SIG_CB, ERR_R_MALLOC_FAILURE);
75         return 0;
76     }
77     sig->r = NULL;
78     sig->s = NULL;
79     *pval = (ASN1_VALUE *)sig;
80     return 2;
81 }
82
83 return 1;
84 }
85
86 ASN1_SEQUENCE_cb(DSA_SIG, sig_cb) = {
87     ASN1_SIMPLE(DSA_SIG, r, CBIGNUM),
88     ASN1_SIMPLE(DSA_SIG, s, CBIGNUM)
89 } ASN1_SEQUENCE_END_cb(DSA_SIG, DSA_SIG)
90
91 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(DSA_SIG, DSA_SIG, DSA_SIG)
92
93 /* Override the default free and new methods */
94 static int dsa_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
95                  void *exarg)
96 {
97     if(operation == ASN1_OP_NEW_PRE) {
98         *pval = (ASN1_VALUE *)DSA_new();
99         if(*pval) return 2;
100         return 0;
101     } else if(operation == ASN1_OP_FREE_PRE) {
102         DSA_free((DSA *)*pval);
103         *pval = NULL;
104         return 2;
105     }
106     return 1;
107 }
108
109 ASN1_SEQUENCE_cb(DSAPrivateKey, dsa_cb) = {
110     ASN1_SIMPLE(DSA, version, LONG),
111     ASN1_SIMPLE(DSA, p, BIGNUM),
112     ASN1_SIMPLE(DSA, q, BIGNUM),
113     ASN1_SIMPLE(DSA, g, BIGNUM),
114     ASN1_SIMPLE(DSA, pub_key, BIGNUM),
115     ASN1_SIMPLE(DSA, priv_key, BIGNUM)
116 } ASN1_SEQUENCE_END_cb(DSA, DSAPrivateKey)
117
118 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(DSA, DSAPrivateKey, DSAPrivateKey)
119
120 ASN1_SEQUENCE_cb(DSAPrivateKey, dsa_cb) = {
121     ASN1_SIMPLE(DSA, p, BIGNUM),
122     ASN1_SIMPLE(DSA, q, BIGNUM),
123     ASN1_SIMPLE(DSA, g, BIGNUM),
124 } ASN1_SEQUENCE_END_cb(DSA, DSAPrivateKey)
125
126 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(DSA, DSAPrivateKey, DSAPrivateKey)
```



```

128 /* DSA public key is a bit trickier... its effectively a CHOICE type
129  * decided by a field called write_params which can either write out
130  * just the public key as an INTEGER or the parameters and public key
131  * in a SEQUENCE
132  */

134 ASN1_SEQUENCE(dsa_pub_internal) = {
135     ASN1_SIMPLE(DSA, pub_key, BIGNUM),
136     ASN1_SIMPLE(DSA, p, BIGNUM),
137     ASN1_SIMPLE(DSA, q, BIGNUM),
138     ASN1_SIMPLE(DSA, g, BIGNUM)
139 } ASN1_SEQUENCE_END_name(DSA, dsa_pub_internal)

141 ASN1_CHOICE_cb(DSAPublicKey, dsa_cb) = {
142     ASN1_SIMPLE(DSA, pub_key, BIGNUM),
143     ASN1_EX_COMBINE(0, 0, dsa_pub_internal)
144 } ASN1_CHOICE_END_cb(DSA, DSAPublicKey, write_params)

146 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(DSA, DSAPublicKey, DSAPublicKey)

148 DSA *DSAParams_dup(DSA *dsa)
149 {
150     return ASN1_item_dup(ASN1_ITEM_rptr(DSAParams), dsa);
151 }

153 int DSA_sign(int type, const unsigned char *dgst, int dlen, unsigned char *sig,
154             unsigned int *siglen, DSA *dsa)
155 {
156     DSA_SIG *s;
157     RAND_seed(dgst, dlen);
158     s=DSA_do_sign(dgst,dlen,dsa);
159     if (s == NULL)
160     {
161         *siglen=0;
162         return(0);
163     }
164     *siglen=i2d_DSA_SIG(s,&sig);
165     DSA_SIG_free(s);
166     return(1);
167 }

169 /* data has already been hashed (probably with SHA or SHA-1). */
170 /* returns
171  * 1: correct signature
172  * 0: incorrect signature
173  * -1: error
174  */
175 int DSA_verify(int type, const unsigned char *dgst, int dgst_len,
176               const unsigned char *sigbuf, int siglen, DSA *dsa)
177 {
178     DSA_SIG *s;
179     int ret=-1;

181     s = DSA_SIG_new();
182     if (s == NULL) return(ret);
183     if (d2i_DSA_SIG(&s,&sigbuf,siglen) == NULL) goto err;
184     ret=DSA_do_verify(dgst,dgst_len,s,dsa);
185 err:
186     DSA_SIG_free(s);
187     return(ret);
188 }

```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_depr.c

1

```
*****
3872 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_depr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/dsa/dsa_depr.c */
2 /* =====
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49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com).  This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* This file contains deprecated function(s) that are now wrappers to the new
57  * version(s). */

59 #undef GENUINE_DSA

61 #ifdef GENUINE_DSA
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_depr.c

2

```
62 /* Parameter generation follows the original release of FIPS PUB 186,
63  * Appendix 2.2 (i.e. use SHA as defined in FIPS PUB 180) */
64 #define HASH      EVP_sha()
65 #else
66 /* Parameter generation follows the updated Appendix 2.2 for FIPS PUB 186,
67  * also Appendix 2.2 of FIPS PUB 186-1 (i.e. use SHA as defined in
68  * FIPS PUB 180-1) */
69 #define HASH      EVP_sha1()
70 #endif

72 static void *dummy=&dummy;

74 #ifndef OPENSSL_NO_SHA

76 #include <stdio.h>
77 #include <time.h>
78 #include "cryptlib.h"
79 #include <openssl/evp.h>
80 #include <openssl/bn.h>
81 #include <openssl/dsa.h>
82 #include <openssl/rand.h>
83 #include <openssl/sha.h>

85 #ifndef OPENSSL_NO_DEPRECATED
86 DSA *DSA_generate_parameters(int bits,
87                             unsigned char *seed_in, int seed_len,
88                             int *counter_ret, unsigned long *h_ret,
89                             void (*callback)(int, int, void *),
90                             void *cb_arg)
91 {
92     BN_GENCB cb;
93     DSA *ret;

95     if ((ret=DSA_new()) == NULL) return NULL;

97     BN_GENCB_set_old(&cb, callback, cb_arg);

99     if(DSA_generate_parameters_ex(ret, bits, seed_in, seed_len,
100                                counter_ret, h_ret, &cb))
101         return ret;
102     DSA_free(ret);
103     return NULL;
104 }
105 #endif
106 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_err.c

1

```
*****
5489 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/dsa/dsa_err.c */
2 /* =====
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48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/dsa.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_DSA, func, 0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_DSA, 0, reason)

71 static ERR_STRING_DATA DSA_str_functs[]=
72 {
73 {ERR_FUNC(DSA_F_D2I_DSA_SIG), "d2i_DSA_SIG"},
74 {ERR_FUNC(DSA_F_DO_DSA_PRINT), "do_DSA_PRINT"},
75 {ERR_FUNC(DSA_F_DSAPARAMS_PRINT), "DSAParams_print"},
76 {ERR_FUNC(DSA_F_DSAPARAMS_PRINT_FP), "DSAParams_print_fp"},
77 {ERR_FUNC(DSA_F_DSA_DO_SIGN), "DSA_do_sign"},
78 {ERR_FUNC(DSA_F_DSA_DO_VERIFY), "DSA_do_verify"},
79 {ERR_FUNC(DSA_F_DSA_GENERATE_KEY), "DSA_generate_key"},
80 {ERR_FUNC(DSA_F_DSA_GENERATE_PARAMETERS_EX), "DSA_generate_parameters_ex"},
81 {ERR_FUNC(DSA_F_DSA_NEW_METHOD), "DSA_new_method"},
82 {ERR_FUNC(DSA_F_DSA_PARAM_DECODE), "DSA_PARAM_DECODE"},
83 {ERR_FUNC(DSA_F_DSA_PRINT_FP), "DSA_print_fp"},
84 {ERR_FUNC(DSA_F_DSA_PRIV_DECODE), "DSA_PRIV_DECODE"},
85 {ERR_FUNC(DSA_F_DSA_PRIV_ENCODE), "DSA_PRIV_ENCODE"},
86 {ERR_FUNC(DSA_F_DSA_PUB_DECODE), "DSA_PUB_DECODE"},
87 {ERR_FUNC(DSA_F_DSA_PUB_ENCODE), "DSA_PUB_ENCODE"},
88 {ERR_FUNC(DSA_F_DSA_SIGN), "DSA_sign"},
89 {ERR_FUNC(DSA_F_DSA_SIGN_SETUP), "DSA_sign_setup"},
90 {ERR_FUNC(DSA_F_DSA_SIG_NEW), "DSA_SIG_new"},
91 {ERR_FUNC(DSA_F_DSA_SIG_PRINT), "DSA_SIG_PRINT"},
92 {ERR_FUNC(DSA_F_DSA_VERIFY), "DSA_verify"},
93 {ERR_FUNC(DSA_F_I2D_DSA_SIG), "i2d_DSA_SIG"},
94 {ERR_FUNC(DSA_F_OLD_DSA_PRIV_DECODE), "OLD_DSA_PRIV_DECODE"},
95 {ERR_FUNC(DSA_F_PKEY_DSA_CTRL), "PKEY_DSA_CTRL"},
96 {ERR_FUNC(DSA_F_PKEY_DSA_KEYGEN), "PKEY_DSA_KEYGEN"},
97 {ERR_FUNC(DSA_F_SIG_CB), "SIG_CB"},
98 {0, NULL}
99 };

101 static ERR_STRING_DATA DSA_str_reasons[]=
102 {
103 {ERR_REASON(DSA_R_BAD_Q_VALUE), "bad q value"},
104 {ERR_REASON(DSA_R_BN_DECODE_ERROR), "bn decode error"},
105 {ERR_REASON(DSA_R_BN_ERROR), "bn error"},
106 {ERR_REASON(DSA_R_DATA_TOO_LARGE_FOR_KEY_SIZE), "data too large for key size"},
107 {ERR_REASON(DSA_R_DECODE_ERROR), "decode error"},
108 {ERR_REASON(DSA_R_INVALID_DIGEST_TYPE), "invalid digest type"},
109 {ERR_REASON(DSA_R_MISSING_PARAMETERS), "missing parameters"},
110 {ERR_REASON(DSA_R_MODULUS_TOO_LARGE), "modulus too large"},
111 {ERR_REASON(DSA_R_NEED_NEW_SETUP_VALUES), "need new setup values"},
112 {ERR_REASON(DSA_R_NON_FIPS_DSA_METHOD), "non fips dsa method"},
113 {ERR_REASON(DSA_R_NO_PARAMETERS_SET), "no parameters set"},
114 {ERR_REASON(DSA_R_PARAMETER_ENCODING_ERROR), "parameter encoding error"},
115 {0, NULL}
116 };

118 #endif

120 void ERR_load_DSA_strings(void)
121 {
122 #ifndef OPENSSL_NO_ERR

124     if (ERR_func_error_string(DSA_str_functs[0].error) == NULL)
125     {
126         ERR_load_strings(0, DSA_str_functs);
127         ERR_load_strings(0, DSA_str_reasons);
128     }
129 #endif
130 }
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_err.c

3

```
128         }  
129 #endif  
130     }
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_gen.c

1

```
*****
10009 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_gen.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/dsa/dsa_gen.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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28 * 2. Redistributions in binary form must reproduce the above copyright
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #undef GENUINE_DSA

61 #ifndef GENUINE_DSA
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_gen.c

2

```
62 /* Parameter generation follows the original release of FIPS PUB 186,
63  * Appendix 2.2 (i.e. use SHA as defined in FIPS PUB 180) */
64 #define HASH      EVP_sha()
65 #else
66 /* Parameter generation follows the updated Appendix 2.2 for FIPS PUB 186,
67  * also Appendix 2.2 of FIPS PUB 186-1 (i.e. use SHA as defined in
68  * FIPS PUB 180-1) */
69 #define HASH      EVP_sha1()
70 #endif

72 #include <openssl/opensslconf.h> /* To see if OPENSSL_NO_SHA is defined */

74 #ifndef OPENSSL_NO_SHA

76 #include <stdio.h>
77 #include "cryptlib.h"
78 #include <openssl/evp.h>
79 #include <openssl/bn.h>
80 #include <openssl/rand.h>
81 #include <openssl/sha.h>
82 #include "dsa_locl.h"

84 #ifdef OPENSSL_FIPS
85 #include <openssl/fips.h>
86 #endif

88 int DSA_generate_parameters_ex(DSA *ret, int bits,
89                               const unsigned char *seed_in, int seed_len,
90                               int *counter_ret, unsigned long *h_ret, BN_GENCB *cb)
91 {
92     #ifndef OPENSSL_FIPS
93         if (FIPS_mode()) && !(ret->meth->flags & DSA_FLAG_FIPS_METHOD)
94             && !(ret->flags & DSA_FLAG_NON_FIPS_ALLOW))
95         {
96             DSAerr(DSA_F_DSA_GENERATE_PARAMETERS_EX, DSA_R_NON_FIPS_DSA_METH
97                 return 0;
98         }
99     #endif
100     if (ret->meth->dsa_paramgen)
101         return ret->meth->dsa_paramgen(ret, bits, seed_in, seed_len,
102                                         counter_ret, h_ret, cb);
103     #ifndef OPENSSL_FIPS
104         else if (FIPS_mode())
105         {
106             return FIPS_dsa_generate_parameters_ex(ret, bits,
107                                                     seed_in, seed_len,
108                                                     counter_ret, h_ret, cb);
109         }
110     #endif
111     else
112     {
113         const EVP_MD *evpmd;
114         size_t qbits = bits >= 2048 ? 256 : 160;

116         if (bits >= 2048)
117         {
118             qbits = 256;
119             evpmd = EVP_sha256();
120         }
121         else
122         {
123             qbits = 160;
124             evpmd = EVP_sha1();
125         }

127         return dsa_builtin_paramgen(ret, bits, qbits, evpmd,
```

```

128         seed_in, seed_len, NULL, counter_ret, h_ret, cb);
129     }
130 }

132 int dsa_builtin_paramgen(DSA *ret, size_t bits, size_t qbits,
133     const EVP_MD *evpmd, const unsigned char *seed_in, size_t seed_len,
134     unsigned char *seed_out,
135     int *counter_ret, unsigned long *h_ret, BN_GENCB *cb)
136 {
137     int ok=0;
138     unsigned char seed[SHA256_DIGEST_LENGTH];
139     unsigned char md[SHA256_DIGEST_LENGTH];
140     unsigned char buf[SHA256_DIGEST_LENGTH], buf2[SHA256_DIGEST_LENGTH];
141     BIGNUM *r0,*w,*x,*c,*test;
142     BIGNUM *g=NULL,*q=NULL,*p=NULL;
143     BN_MONT_CTX *mont=NULL;
144     int i, k, n=0, m=0, qsize = qbits >> 3;
145     int counter=0;
146     int r=0;
147     BN_CTX *ctx=NULL;
148     unsigned int h=2;

150     if (qsize != SHA_DIGEST_LENGTH && qsize != SHA224_DIGEST_LENGTH &&
151         qsize != SHA256_DIGEST_LENGTH)
152         /* invalid q size */
153         return 0;

155     if (evpmd == NULL)
156         /* use SHA1 as default */
157         evpmd = EVP_sha1();

159     if (bits < 512)
160         bits = 512;

162     bits = (bits+63)/64*64;

164     /* NB: seed_len == 0 is special case: copy generated seed to
165      * seed_in if it is not NULL.
166      */
167     if (seed_len && (seed_len < (size_t)qsize))
168         seed_in = NULL; /* seed buffer too small -- ignore */
169     if (seed_len > (size_t)qsize)
170         seed_len = qsize; /* App. 2.2 of FIPS PUB 186 allows large
171                          * but our internal buffers are restrict
172     if (seed_in != NULL)
173         memcpy(seed, seed_in, seed_len);

175     if ((ctx=BN_CTX_new()) == NULL)
176         goto err;

178     if ((mont=BN_MONT_CTX_new()) == NULL)
179         goto err;

181     BN_CTX_start(ctx);
182     r0 = BN_CTX_get(ctx);
183     g = BN_CTX_get(ctx);
184     w = BN_CTX_get(ctx);
185     q = BN_CTX_get(ctx);
186     x = BN_CTX_get(ctx);
187     c = BN_CTX_get(ctx);
188     p = BN_CTX_get(ctx);
189     test = BN_CTX_get(ctx);

191     if (!BN_lshift(test, BN_value_one(), bits-1))
192         goto err;

```

```

194     for (;;)
195     {
196         for (;;) /* find q */
197         {
198             int seed_is_random;

200             /* step 1 */
201             if(!BN_GENCB_call(cb, 0, m++))
202                 goto err;

204             if (!seed_len)
205             {
206                 RAND_pseudo_bytes(seed, qsize);
207                 seed_is_random = 1;
208             }
209             else
210             {
211                 seed_is_random = 0;
212                 seed_len=0; /* use random seed if 'seed_in' turn
213                 */
214             }
215             memcpy(buf, seed, qsize);
216             memcpy(buf2, seed, qsize);
217             /* precompute "SEED + 1" for step 7: */
218             for (i = qsize-1; i >= 0; i--)
219             {
220                 buf[i]++;
221                 if (buf[i] != 0)
222                     break;
223             }

224             /* step 2 */
225             if (!EVP_Digest(seed, qsize, md, NULL, evpmd, NULL))
226                 goto err;
227             if (!EVP_Digest(buf, qsize, buf2, NULL, evpmd, NULL))
228                 goto err;
229             for (i = 0; i < qsize; i++)
230                 md[i]^=buf2[i];

232             /* step 3 */
233             md[0] |= 0x80;
234             md[qsize-1] |= 0x01;
235             if (!BN_bin2bn(md, qsize, q))
236                 goto err;

238             /* step 4 */
239             r = BN_is_prime_fasttest_ex(q, DSS_prime_checks, ctx,
240                 seed_is_random, cb);
241             if (r > 0)
242                 break;
243             if (r != 0)
244                 goto err;

246             /* do a callback call */
247             /* step 5 */
248             }

250             if(!BN_GENCB_call(cb, 2, 0)) goto err;
251             if(!BN_GENCB_call(cb, 3, 0)) goto err;

253             /* step 6 */
254             counter=0;
255             /* "offset = 2" */

257             n=(bits-1)/160;

259             for (;;)

```

```

260     {
261         if ((counter != 0) && !BN_GENCB_call(cb, 0, counter))
262             goto err;
263
264         /* step 7 */
265         BN_zero(w);
266         /* now buf, contains "SEED + offset - 1" */
267         for (k=0; k<=n; k++)
268         {
269             /* obtain "SEED + offset + k" by incrementing: */
270             for (i = qsize-1; i >= 0; i--)
271             {
272                 buf[i]++;
273                 if (buf[i] != 0)
274                     break;
275             }
276
277             if (!EVP_Digest(buf, qsize, md, NULL, evpmd,
278                             NULL))
279                 goto err;
280
281             /* step 8 */
282             if (!BN_bin2bn(md, qsize, r0))
283                 goto err;
284             if (!BN_lshift(r0, r0, (qsize << 3)*k)) goto err;
285             if (!BN_add(w, w, r0)) goto err;
286         }
287
288         /* more of step 8 */
289         if (!BN_mask_bits(w, bits-1)) goto err;
290         if (!BN_copy(X, w)) goto err;
291         if (!BN_add(X, X, test)) goto err;
292
293         /* step 9 */
294         if (!BN_lshift1(r0, q)) goto err;
295         if (!BN_mod(c, X, r0, ctx)) goto err;
296         if (!BN_sub(r0, c, BN_value_one())) goto err;
297         if (!BN_sub(p, X, r0)) goto err;
298
299         /* step 10 */
300         if (BN_cmp(p, test) >= 0)
301         {
302             /* step 11 */
303             r = BN_is_prime_fasttest_ex(p, DSS_prime_checks,
304                                         ctx, 1, cb);
305             if (r > 0)
306                 goto end; /* found it */
307             if (r != 0)
308                 goto err;
309         }
310
311         /* step 13 */
312         counter++;
313         /* "offset = offset + n + 1" */
314
315         /* step 14 */
316         if (counter >= 4096) break;
317     }
318 }
319 end:
320 if(!BN_GENCB_call(cb, 2, 1))
321     goto err;
322
323 /* We now need to generate g */
324 /* Set r0=(p-1)/q */
325 if (!BN_sub(test, p, BN_value_one())) goto err;

```

```

326     if (!BN_div(r0, NULL, test, q, ctx)) goto err;
327
328     if (!BN_set_word(test, h)) goto err;
329     if (!BN_MONT_CTX_set(mont, p, ctx)) goto err;
330
331     for (;;)
332     {
333         /* g=test^r0%p */
334         if (!BN_mod_exp_mont(g, test, r0, p, ctx, mont)) goto err;
335         if (!BN_is_one(g)) break;
336         if (!BN_add(test, test, BN_value_one())) goto err;
337         h++;
338     }
339
340     if(!BN_GENCB_call(cb, 3, 1))
341         goto err;
342
343     ok=1;
344 err:
345     if (ok)
346     {
347         if(ret->p) BN_free(ret->p);
348         if(ret->q) BN_free(ret->q);
349         if(ret->g) BN_free(ret->g);
350         ret->p=BN_dup(p);
351         ret->q=BN_dup(q);
352         ret->g=BN_dup(g);
353         if (ret->p == NULL || ret->q == NULL || ret->g == NULL)
354         {
355             ok=0;
356             goto err;
357         }
358         if (counter_ret != NULL) *counter_ret=counter;
359         if (h_ret != NULL) *h_ret=h;
360         if (seed_out)
361             memcpy(seed_out, seed, qsize);
362     }
363     if(ctx)
364     {
365         BN_CTX_end(ctx);
366         BN_CTX_free(ctx);
367     }
368     if (mont != NULL) BN_MONT_CTX_free(mont);
369     return ok;
370 }
371 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_key.c

1

```
*****
4900 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/dsa/dsa_key.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
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24 * modification, are permitted provided that the following conditions
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <time.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_key.c

2

```
62 #ifndef OPENSSL_NO_SHA
63 #include <openssl/bn.h>
64 #include <openssl/dsa.h>
65 #include <openssl/rand.h>

67 #ifdef OPENSSL_FIPS
68 #include <openssl/fips.h>
69 #endif

71 static int dsa_builtin_keygen(DSA *dsa);

73 int DSA_generate_key(DSA *dsa)
74 {
75 #ifdef OPENSSL_FIPS
76     if (FIPS_mode() && !(dsa->meth->flags & DSA_FLAG_FIPS_METHOD)
77         && !(dsa->flags & DSA_FLAG_NON_FIPS_ALLOW))
78     {
79         DSAerr(DSA_F_DSA_GENERATE_KEY, DSA_R_NON_FIPS_DSA_METHOD);
80         return 0;
81     }
82 #endif
83     if (dsa->meth->dsa_keygen)
84         return dsa->meth->dsa_keygen(dsa);
85 #ifdef OPENSSL_FIPS
86     if (FIPS_mode())
87         return FIPS_dsa_generate_key(dsa);
88 #endif
89     return dsa_builtin_keygen(dsa);
90 }

92 static int dsa_builtin_keygen(DSA *dsa)
93 {
94     int ok=0;
95     BN_CTX *ctx=NULL;
96     BIGNUM *pub_key=NULL, *priv_key=NULL;

98     if ((ctx=BN_CTX_new()) == NULL) goto err;

100     if (dsa->priv_key == NULL)
101     {
102         if ((priv_key=BN_new()) == NULL) goto err;
103     }
104     else
105         priv_key=dsa->priv_key;

107     do
108         if (!BN_rand_range(priv_key,dsa->q)) goto err;
109     while (BN_is_zero(priv_key));

111     if (dsa->pub_key == NULL)
112     {
113         if ((pub_key=BN_new()) == NULL) goto err;
114     }
115     else
116         pub_key=dsa->pub_key;

117     {
118         BIGNUM local_prk;
119         BIGNUM *prk;

122         if ((dsa->flags & DSA_FLAG_NO_EXP_CONSTTIME) == 0)
123         {
124             BN_init(&local_prk);
125             prk = &local_prk;
126             BN_with_flags(prk, priv_key, BN_FLG_CONSTTIME);
127         }
128     }
```



```
128         else
129             prk = priv_key;
131         if (!BN_mod_exp(pub_key,dsa->g,prk,dsa->p,ctx)) goto err;
132     }
134     dsa->priv_key=priv_key;
135     dsa->pub_key=pub_key;
136     ok=1;
138 err:
139     if ((pub_key != NULL) && (dsa->pub_key == NULL)) BN_free(pub_key);
140     if ((priv_key != NULL) && (dsa->priv_key == NULL)) BN_free(priv_key);
141     if (ctx != NULL) BN_CTX_free(ctx);
142     return(ok);
143 }
144 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_lib.c

1

```
*****
8699 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/dsa/dsa_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 /* Original version from Steven Schoch <schoch@sheba.arc.nasa.gov> */
61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_lib.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/bn.h>
64 #include <openssl/dsa.h>
65 #include <openssl/asn1.h>
66 #ifndef OPENSSL_NO_ENGINE
67 #include <openssl/engine.h>
68 #endif
69 #ifndef OPENSSL_NO_DH
70 #include <openssl/dh.h>
71 #endif
73 #ifdef OPENSSL_FIPS
74 #include <openssl/fips.h>
75 #endif
77 const char DSA_version[]="DSA" OPENSSL_VERSION_PTEXT;
79 static const DSA_METHOD *default_DSA_method = NULL;
81 void DSA_set_default_method(const DSA_METHOD *meth)
82 {
83     default_DSA_method = meth;
84 }
86 const DSA_METHOD *DSA_get_default_method(void)
87 {
88     if(!default_DSA_method)
89     {
90 #ifdef OPENSSL_FIPS
91         if (FIPS_mode())
92             return FIPS_dsa_openssl();
93         else
94             return DSA_OpenSSL();
95 #else
96         default_DSA_method = DSA_OpenSSL();
97 #endif
98     }
99     return default_DSA_method;
100 }
102 DSA *DSA_new(void)
103 {
104     return DSA_new_method(NULL);
105 }
107 int DSA_set_method(DSA *dsa, const DSA_METHOD *meth)
108 {
109     /* NB: The caller is specifically setting a method, so it's not up to us
110      * to deal with which ENGINE it comes from. */
111     const DSA_METHOD *mtmp;
112     mtmp = dsa->meth;
113     if (mtmp->finish) mtmp->finish(dsa);
114 #ifndef OPENSSL_NO_ENGINE
115     if (dsa->engine)
116     {
117         ENGINE_finish(dsa->engine);
118         dsa->engine = NULL;
119     }
120 #endif
121     dsa->meth = meth;
122     if (meth->init) meth->init(dsa);
123     return 1;
124 }
126 DSA *DSA_new_method(ENGINE *engine)
127 {
```

```

128     DSA *ret;

130     ret=(DSA *)OPENSSL_malloc(sizeof(DSA));
131     if (ret == NULL)
132     {
133         DSAerr(DSA_F_DSA_NEW_METHOD,ERR_R_MALLOC_FAILURE);
134         return(NULL);
135     }
136     ret->meth = DSA_get_default_method();
137 #ifndef OPENSSL_NO_ENGINE
138     if (engine)
139     {
140         if (!ENGINE_init(engine))
141         {
142             DSAerr(DSA_F_DSA_NEW_METHOD, ERR_R_ENGINE_LIB);
143             OPENSSL_free(ret);
144             return NULL;
145         }
146         ret->engine = engine;
147     }
148     else
149         ret->engine = ENGINE_get_default_DSA();
150     if(ret->engine)
151     {
152         ret->meth = ENGINE_get_DSA(ret->engine);
153         if(!ret->meth)
154         {
155             DSAerr(DSA_F_DSA_NEW_METHOD,
156                   ERR_R_ENGINE_LIB);
157             ENGINE_finish(ret->engine);
158             OPENSSL_free(ret);
159             return NULL;
160         }
161     }
162 #endif

164     ret->pad=0;
165     ret->version=0;
166     ret->write_params=1;
167     ret->p=NULL;
168     ret->q=NULL;
169     ret->g=NULL;

171     ret->pub_key=NULL;
172     ret->priv_key=NULL;

174     ret->kinv=NULL;
175     ret->r=NULL;
176     ret->method_mont_p=NULL;

178     ret->references=1;
179     ret->flags=ret->meth->flags & ~DSA_FLAG_NON_FIPS_ALLOW;
180     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_DSA, ret, &ret->ex_data);
181     if ((ret->meth->init != NULL) && !ret->meth->init(ret))
182     {
183 #ifndef OPENSSL_NO_ENGINE
184         if (ret->engine)
185             ENGINE_finish(ret->engine);
186 #endif
187         CRYPTO_free_ex_data(CRYPTO_EX_INDEX_DSA, ret, &ret->ex_data);
188         OPENSSL_free(ret);
189         ret=NULL;
190     }
191
192     return(ret);
193 }

```

```

195 void DSA_free(DSA *r)
196 {
197     int i;

199     if (r == NULL) return;

201     i=CRYPTO_add(&r->references, -1, CRYPTO_LOCK_DSA);
202 #ifdef REF_PRINT
203     REF_PRINT("DSA",r);
204 #endif
205     if (i > 0) return;
206 #ifdef REF_CHECK
207     if (i < 0)
208     {
209         fprintf(stderr,"DSA_free, bad reference count\n");
210         abort();
211     }
212 #endif

214     if(r->meth->finish)
215         r->meth->finish(r);
216 #ifndef OPENSSL_NO_ENGINE
217     if(r->engine)
218         ENGINE_finish(r->engine);
219 #endif

221     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_DSA, r, &r->ex_data);

223     if (r->p != NULL) BN_clear_free(r->p);
224     if (r->q != NULL) BN_clear_free(r->q);
225     if (r->g != NULL) BN_clear_free(r->g);
226     if (r->pub_key != NULL) BN_clear_free(r->pub_key);
227     if (r->priv_key != NULL) BN_clear_free(r->priv_key);
228     if (r->kinv != NULL) BN_clear_free(r->kinv);
229     if (r->r != NULL) BN_clear_free(r->r);
230     OPENSSL_free(r);
231 }

233 int DSA_up_ref(DSA *r)
234 {
235     int i = CRYPTO_add(&r->references, 1, CRYPTO_LOCK_DSA);
236 #ifdef REF_PRINT
237     REF_PRINT("DSA",r);
238 #endif
239 #ifdef REF_CHECK
240     if (i < 2)
241     {
242         fprintf(stderr, "DSA_up_ref, bad reference count\n");
243         abort();
244     }
245 #endif
246     return ((i > 1) ? 1 : 0);
247 }

249 int DSA_size(const DSA *r)
250 {
251     int ret,i;
252     ASN1_INTEGER bs;
253     unsigned char buf[4]; /* 4 bytes looks really small.
254                            However, i2d_ASN1_INTEGER() will not look
255                            beyond the first byte, as long as the second
256                            parameter is NULL. */

258     i=BN_num_bits(r->q);
259     bs.length=(i+7)/8;

```

```

260     bs.data=buf;
261     bs.type=V_ASN1_INTEGER;
262     /* If the top bit is set the asn1 encoding is 1 larger. */
263     buf[0]=0xff;

265     i=i2d_ASN1_INTEGER(&bs,NULL);
266     i+=i; /* r and s */
267     ret=ASN1_object_size(1,i,V_ASN1_SEQUENCE);
268     return(ret);
269 }

271 int DSA_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
272     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
273 {
274     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_DSA, argl, argp,
275     new_func, dup_func, free_func);
276 }

278 int DSA_set_ex_data(DSA *d, int idx, void *arg)
279 {
280     return(CRYPTO_set_ex_data(&d->ex_data,idx,arg));
281 }

283 void *DSA_get_ex_data(DSA *d, int idx)
284 {
285     return(CRYPTO_get_ex_data(&d->ex_data,idx));
286 }

288 #ifndef OPENSSL_NO_DH
289 DH *DSA_dup_DH(const DSA *r)
290 {
291     /* DSA has p, q, g, optional pub_key, optional priv_key.
292     * DH has p, optional length, g, optional pub_key, optional priv_key,
293     * optional q.
294     */

296     DH *ret = NULL;

298     if (r == NULL)
299         goto err;
300     ret = DH_new();
301     if (ret == NULL)
302         goto err;
303     if (r->p != NULL)
304         if ((ret->p = BN_dup(r->p)) == NULL)
305             goto err;
306     if (r->q != NULL)
307     {
308         ret->length = BN_num_bits(r->q);
309         if ((ret->q = BN_dup(r->q)) == NULL)
310             goto err;
311     }
312     if (r->g != NULL)
313         if ((ret->g = BN_dup(r->g)) == NULL)
314             goto err;
315     if (r->pub_key != NULL)
316         if ((ret->pub_key = BN_dup(r->pub_key)) == NULL)
317             goto err;
318     if (r->priv_key != NULL)
319         if ((ret->priv_key = BN_dup(r->priv_key)) == NULL)
320             goto err;

322     return ret;

324 err:
325     if (ret != NULL)

```

```

326         DH_free(ret);
327     return NULL;
328 }
329 #endif

```

```
*****
```

```
11312 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_ossl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/dsa/dsa_ossl.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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17 * the code are not to be removed.
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21 * in documentation (online or textual) provided with the package.
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33 * "This product includes cryptographic software written by
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* Original version from Steven Schoch <schoch@sheba.arc.nasa.gov> */
60
61 #include <stdio.h>
```

```
62 #include "cryptlib.h"
63 #include <openssl/bn.h>
64 #include <openssl/sha.h>
65 #include <openssl/dsa.h>
66 #include <openssl/rand.h>
67 #include <openssl/asn1.h>
68
69 static DSA_SIG *dsa_do_sign(const unsigned char *dgst, int dlen, DSA *dsa);
70 static int dsa_sign_setup(DSA *dsa, BN_CTX *ctx_in, BIGNUM **kinvp, BIGNUM **rpp)
71 static int dsa_do_verify(const unsigned char *dgst, int dgst_len, DSA_SIG *sig,
72                          DSA *dsa);
73 static int dsa_init(DSA *dsa);
74 static int dsa_finish(DSA *dsa);
75
76 static DSA_METHOD openssl_dsa_meth = {
77     "OpenSSL DSA method",
78     dsa_do_sign,
79     dsa_sign_setup,
80     dsa_do_verify,
81     NULL, /* dsa_mod_exp, */
82     NULL, /* dsa_bn_mod_exp, */
83     dsa_init,
84     dsa_finish,
85     0,
86     NULL,
87     NULL,
88     NULL
89 };
90
91 /* These macro wrappers replace attempts to use the dsa_mod_exp() and
92  * bn_mod_exp() handlers in the DSA_METHOD structure. We avoid the problem of
93  * having a the macro work as an expression by bundling an "err_instr". So;
94  *
95  * if (!dsa->meth->bn_mod_exp(dsa, r, dsa->g, &k, dsa->p, ctx,
96  *                          dsa->method_mont_p)) goto err;
97  *
98  * can be replaced by;
99  *
100 * DSA_BN_MOD_EXP(goto err, dsa, r, dsa->g, &k, dsa->p, ctx,
101 *               dsa->method_mont_p);
102 */
103
104 #define DSA_MOD_EXP(err_instr,dsa,rr,a1,p1,a2,p2,m,ctx,in_mont) \
105     do { \
106         int _tmp_res53; \
107         if((dsa->meth->dsa_mod_exp) \
108             _tmp_res53 = (dsa->meth->dsa_mod_exp((dsa), (rr), (a1), (p1), \
109                                                 (a2), (p2), (m), (ctx), (in_mont))); \
110         else \
111             _tmp_res53 = BN_mod_exp2_mont((rr), (a1), (p1), (a2), (p2), \
112                                           (m), (ctx), (in_mont)); \
113         if(! _tmp_res53) err_instr; \
114     } while(0)
115 #define DSA_BN_MOD_EXP(err_instr,dsa,r,a,p,m,ctx,m_ctx) \
116     do { \
117         int _tmp_res53; \
118         if((dsa->meth->bn_mod_exp) \
119             _tmp_res53 = (dsa->meth->bn_mod_exp((dsa), (r), (a), (p), \
120                                                 (m), (ctx), (m_ctx)); \
121         else \
122             _tmp_res53 = BN_mod_exp_mont((r), (a), (p), (m), (ctx), (m_ctx)) \
123         if(! _tmp_res53) err_instr; \
124     } while(0)
125
126 const DSA_METHOD *DSA_OpenSSL(void)
127 {
```

```

128     return &openssl_dsa_meth;
129 }

131 static DSA_SIG *dsa_do_sign(const unsigned char *dgst, int dlen, DSA *dsa)
132 {
133     BIGNUM *kinv=NULL, *r=NULL, *s=NULL;
134     BIGNUM m;
135     BIGNUM xr;
136     BN_CTX *ctx=NULL;
137     int reason=ERR_R_BN_LIB;
138     DSA_SIG *ret=NULL;
139     int noredo = 0;

141     BN_init(&m);
142     BN_init(&xr);

144     if (!dsa->p || !dsa->q || !dsa->g)
145     {
146         reason=DSA_R_MISSING_PARAMETERS;
147         goto err;
148     }

150     s=BN_new();
151     if (s == NULL) goto err;
152     ctx=BN_CTX_new();
153     if (ctx == NULL) goto err;
154 redo:
155     if ((dsa->kinv == NULL) || (dsa->r == NULL))
156     {
157         if (!DSA_sign_setup(dsa, ctx, &kinv, &r)) goto err;
158     }
159     else
160     {
161         kinv=dsa->kinv;
162         dsa->kinv=NULL;
163         r=dsa->r;
164         dsa->r=NULL;
165         noredo = 1;
166     }

168     if (dlen > BN_num_bytes(dsa->q))
169         /* if the digest length is greater than the size of q use the
170          * BN_num_bits(dsa->q) leftmost bits of the digest, see
171          * fips 186-3, 4.2 */
172         dlen = BN_num_bytes(dsa->q);
173     if (BN_bin2bn(dgst, dlen, &m) == NULL)
174         goto err;
175

177     /* Compute s = inv(k) (m + xr) mod q */
178     if (!BN_mod_mul(&xr, dsa->priv_key, r, dsa->q, ctx)) goto err; /* s = xr */
179     if (!BN_add(s, &xr, &m)) goto err; /* s = m + xr */
180     if (BN_cmp(s, dsa->q) > 0)
181         if (!BN_sub(s, s, dsa->q)) goto err;
182     if (!BN_mod_mul(s, s, kinv, dsa->q, ctx)) goto err;

184     ret=DSA_SIG_new();
185     if (ret == NULL) goto err;
186     /* Redo if r or s is zero as required by FIPS 186-3: this is
187      * very unlikely.
188      */
189     if (BN_is_zero(r) || BN_is_zero(s))
190     {
191         if (noredo)
192         {
193             reason = DSA_R_NEED_NEW_SETUP_VALUES;

```

```

194         goto err;
195     }
196     goto redo;
197 }
198 ret->r = r;
199 ret->s = s;
200
201 err:
202     if (!ret)
203     {
204         DSAerr(DSA_F_DSA_DO_SIGN, reason);
205         BN_free(r);
206         BN_free(s);
207     }
208     if (ctx != NULL) BN_CTX_free(ctx);
209     BN_clear_free(&m);
210     BN_clear_free(&xr);
211     if (kinv != NULL) /* dsa->kinv is NULL now if we used it */
212         BN_clear_free(kinv);
213     return(ret);
214 }

216 static int dsa_sign_setup(DSA *dsa, BN_CTX *ctx_in, BIGNUM **kinvp, BIGNUM **rpp)
217 {
218     BN_CTX *ctx;
219     BIGNUM k, kq, *K, *kinv=NULL, *r=NULL;
220     int ret=0;

222     if (!dsa->p || !dsa->q || !dsa->g)
223     {
224         DSAerr(DSA_F_DSA_SIGN_SETUP, DSA_R_MISSING_PARAMETERS);
225         return 0;
226     }

228     BN_init(&k);
229     BN_init(&kq);

231     if (ctx_in == NULL)
232     {
233         if ((ctx=BN_CTX_new()) == NULL) goto err;
234     }
235     else
236         ctx=ctx_in;

238     if ((r=BN_new()) == NULL) goto err;

240     /* Get random k */
241     do
242     {
243         if (!BN_rand_range(&k, dsa->q)) goto err;
244         while (BN_is_zero(&k));
245         if ((dsa->flags & DSA_FLAG_NO_EXP_CONSTTIME) == 0)
246         {
247             BN_set_flags(&k, BN_FLG_CONSTTIME);
248         }

249         if (dsa->flags & DSA_FLAG_CACHE_MONT_P)
250         {
251             if (!BN_MONT_CTX_set_locked(&dsa->method_mont_p,
252                                         CRYPTO_LOCK_DSA,
253                                         dsa->p, ctx))
254                 goto err;
255         }

257         /* Compute r = (g^k mod p) mod q */
259         if ((dsa->flags & DSA_FLAG_NO_EXP_CONSTTIME) == 0)

```

```

260     {
261         if (!BN_copy(&kq, &k)) goto err;

263         /* We do not want timing information to leak the length of k,
264          * so we compute g^k using an equivalent exponent of fixed length
265          * (This is a kludge that we need because the BN_mod_exp_mont()
266          * does not let us specify the desired timing behaviour.) */

269         if (!BN_add(&kq, &kq, dsa->q)) goto err;
270         if (BN_num_bits(&kq) <= BN_num_bits(dsa->q))
271             {
272                 if (!BN_add(&kq, &kq, dsa->q)) goto err;
273             }

275         K = &kq;
276     }
277 else
278     {
279         K = &k;
280     }
281 DSA_MOD_EXP(goto err, dsa, r, dsa->g, K, dsa->p, ctx,
282             dsa->method_mont_p);
283 if (!BN_mod(r, r, dsa->q, ctx)) goto err;

285 /* Compute part of 's = inv(k) (m + xr) mod q' */
286 if ((kinv=BN_mod_inverse(NULL, &k, dsa->q, ctx)) == NULL) goto err;

288 if (*kinvp != NULL) BN_clear_free(*kinvp);
289 *kinvp=kinv;
290 kinv=NULL;
291 if (*rp != NULL) BN_clear_free(*rp);
292 *rp=r;
293 ret=1;
294 err:
295 if (!ret)
296     {
297         DSAerr(DSA_F_DSA_SIGN_SETUP, ERR_R_BN_LIB);
298         if (r != NULL)
299             BN_clear_free(r);
300     }
301 if (ctx_in == NULL) BN_CTX_free(ctx);
302 BN_clear_free(&k);
303 BN_clear_free(&kq);
304 return(ret);
305 }

307 static int dsa_do_verify(const unsigned char *dgst, int dgst_len, DSA_SIG *sig,
308                         DSA *dsa)
309 {
310     BN_CTX *ctx;
311     BIGNUM u1, u2, t1;
312     BN_MONT_CTX *mont=NULL;
313     int ret = -1, i;
314     if (!dsa->p || !dsa->q || !dsa->g)
315         {
316             DSAerr(DSA_F_DSA_DO_VERIFY, DSA_R_MISSING_PARAMETERS);
317             return -1;
318         }

320     i = BN_num_bits(dsa->q);
321     /* fips 186-3 allows only different sizes for q */
322     if (i != 160 && i != 224 && i != 256)
323     {
324         DSAerr(DSA_F_DSA_DO_VERIFY, DSA_R_BAD_Q_VALUE);
325         return -1;

```

```

326     }

328     if (BN_num_bits(dsa->p) > OPENSSL_DSA_MAX_MODULUS_BITS)
329     {
330         DSAerr(DSA_F_DSA_DO_VERIFY, DSA_R_MODULUS_TOO_LARGE);
331         return -1;
332     }
333     BN_init(&u1);
334     BN_init(&u2);
335     BN_init(&t1);

337     if ((ctx=BN_CTX_new()) == NULL) goto err;

339     if (BN_is_zero(sig->r) || BN_is_negative(sig->r) ||
340         BN_ucmp(sig->r, dsa->q) >= 0)
341     {
342         ret = 0;
343         goto err;
344     }
345     if (BN_is_zero(sig->s) || BN_is_negative(sig->s) ||
346         BN_ucmp(sig->s, dsa->q) >= 0)
347     {
348         ret = 0;
349         goto err;
350     }

352     /* Calculate W = inv(S) mod Q
353      * save W in u2 */
354     if ((BN_mod_inverse(&u2, sig->s, dsa->q, ctx)) == NULL) goto err;

356     /* save M in u1 */
357     if (dgst_len > (i >> 3))
358         /* if the digest length is greater than the size of q use the
359          * BN_num_bits(dsa->q) leftmost bits of the digest, see
360          * fips 186-3, 4.2 */
361         dgst_len = (i >> 3);
362     if (BN_bin2bn(dgst, dgst_len, &u1) == NULL) goto err;

364     /* u1 = M * w mod q */
365     if (!BN_mod_mul(&u1, &u1, &u2, dsa->q, ctx)) goto err;

367     /* u2 = r * w mod q */
368     if (!BN_mod_mul(&u2, sig->r, &u2, dsa->q, ctx)) goto err;

371     if (dsa->flags & DSA_FLAG_CACHE_MONT_P)
372     {
373         mont = BN_MONT_CTX_set_locked(&dsa->method_mont_p,
374                                       CRYPTO_LOCK_DSA, dsa->p, ctx);
375         if (!mont)
376             goto err;
377     }

380     DSA_MOD_EXP(goto err, dsa, &t1, dsa->g, &u1, dsa->pub_key, &u2, dsa->p,
381               /* BN_copy(&u1, &t1); */
382               /* let u1 = u1 mod q */
383               if (!BN_mod(&u1, &t1, dsa->q, ctx)) goto err;

385     /* V is now in u1. If the signature is correct, it will be
386      * equal to R. */
387     ret=(BN_ucmp(&u1, sig->r) == 0);

389     err:
390     /* XXX: surely this is wrong - if ret is 0, it just didn't verify;
391      * there is no error in BN. Test should be ret == -1 (Ben) */

```

```
392     if (ret != 1) DSAerr(DSA_F_DSA_DO_VERIFY,ERR_R_BN_LIB);
393     if (ctx != NULL) BN_CTX_free(ctx);
394     BN_free(&u1);
395     BN_free(&u2);
396     BN_free(&t1);
397     return(ret);
398 }

400 static int dsa_init(DSA *dsa)
401 {
402     dsa->flags|=DSA_FLAG_CACHE_MONT_P;
403     return(1);
404 }

406 static int dsa_finish(DSA *dsa)
407 {
408     if(dsa->method_mont_p)
409         BN_MONT_CTX_free(dsa->method_mont_p);
410     return(1);
411 }
```


new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_pmeth.c

1

```
*****
8246 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_pmeth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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2  * project 2006.
3  */
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52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  */
56
57 #include <stdio.h>
58 #include "cryptlib.h"
59 #include <openssl/asn1t.h>
60 #include <openssl/x509.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_pmeth.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/bn.h>
64 #include "evp_locl.h"
65 #include "dsa_locl.h"

67 /* DSA pkey context structure */

69 typedef struct
70 {
71     /* Parameter gen parameters */
72     int nbits; /* size of p in bits (default: 1024) */
73     int qbits; /* size of q in bits (default: 160) */
74     const EVP_MD *pmd; /* MD for parameter generation */
75     /* Keygen callback info */
76     int gentmp[2];
77     /* message digest */
78     const EVP_MD *md; /* MD for the signature */
79 } DSA_PKEY_CTX;

81 static int pkey_dsa_init(EVP_PKEY_CTX *ctx)
82 {
83     DSA_PKEY_CTX *dctx;
84     dctx = OPENSSL_malloc(sizeof(DSA_PKEY_CTX));
85     if (!dctx)
86         return 0;
87     dctx->nbits = 1024;
88     dctx->qbits = 160;
89     dctx->pmd = NULL;
90     dctx->md = NULL;

92     ctx->data = dctx;
93     ctx->keygen_info = dctx->gentmp;
94     ctx->keygen_info_count = 2;

95     return 1;
96 }

97

99 static int pkey_dsa_copy(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src)
100 {
101     DSA_PKEY_CTX *dctx, *sctx;
102     if (!pkey_dsa_init(dst))
103         return 0;
104     sctx = src->data;
105     dctx = dst->data;
106     dctx->nbits = sctx->nbits;
107     dctx->qbits = sctx->qbits;
108     dctx->pmd = sctx->pmd;
109     dctx->md = sctx->md;
110     return 1;
111 }

113 static void pkey_dsa_cleanup(EVP_PKEY_CTX *ctx)
114 {
115     DSA_PKEY_CTX *dctx = ctx->data;
116     if (dctx)
117         OPENSSL_free(dctx);
118 }

120 static int pkey_dsa_sign(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
121                          const unsigned char *tbs, size_t tbslen)
122 {
123     int ret, type;
124     unsigned int sltmp;
125     DSA_PKEY_CTX *dctx = ctx->data;
126     DSA *dsa = ctx->pkey->pkey.dsa;
```

```

128     if (dctx->md)
129         type = EVP_MD_type(dctx->md);
130     else
131         type = NID_sha1;
132
133     ret = DSA_sign(type, tbs, tbslen, sig, &sltmp, dsa);
134
135     if (ret <= 0)
136         return ret;
137     *siglen = sltmp;
138     return 1;
139 }
140
141 static int pkey_dsa_verify(EVP_PKEY_CTX *ctx,
142                          const unsigned char *sig, size_t siglen,
143                          const unsigned char *tbs, size_t tbslen)
144 {
145     int ret, type;
146     DSA_PKEY_CTX *dctx = ctx->data;
147     DSA *dsa = ctx->pkey->pkey.dsa;
148
149     if (dctx->md)
150         type = EVP_MD_type(dctx->md);
151     else
152         type = NID_sha1;
153
154     ret = DSA_verify(type, tbs, tbslen, sig, siglen, dsa);
155
156     return ret;
157 }
158
159 static int pkey_dsa_ctrl(EVP_PKEY_CTX *ctx, int type, int p1, void *p2)
160 {
161     DSA_PKEY_CTX *dctx = ctx->data;
162     switch (type)
163     {
164         case EVP_PKEY_CTRL_DSA_PARAMGEN_BITS:
165             if (p1 < 256)
166                 return -2;
167             dctx->nbits = p1;
168             return 1;
169
170         case EVP_PKEY_CTRL_DSA_PARAMGEN_Q_BITS:
171             if (p1 != 160 && p1 != 224 && p1 && p1 != 256)
172                 return -2;
173             dctx->qbits = p1;
174             return 1;
175
176         case EVP_PKEY_CTRL_DSA_PARAMGEN_MD:
177             if (EVP_MD_type((const EVP_MD *)p2) != NID_sha1 &&
178                 EVP_MD_type((const EVP_MD *)p2) != NID_sha224 &&
179                 EVP_MD_type((const EVP_MD *)p2) != NID_sha256)
180             {
181                 DSAerr(DSA_F_PKEY_DSA_CTRL, DSA_R_INVALID_DIGEST_TYPE);
182                 return 0;
183             }
184             dctx->md = p2;
185             return 1;
186
187         case EVP_PKEY_CTRL_MD:
188             if (EVP_MD_type((const EVP_MD *)p2) != NID_sha1 &&
189                 EVP_MD_type((const EVP_MD *)p2) != NID_dsa &&
190                 EVP_MD_type((const EVP_MD *)p2) != NID_dsaWithSHA &&
191                 EVP_MD_type((const EVP_MD *)p2) != NID_sha224 &&
192                 EVP_MD_type((const EVP_MD *)p2) != NID_sha256 &&
193                 EVP_MD_type((const EVP_MD *)p2) != NID_sha384 &&

```

```

194         EVP_MD_type((const EVP_MD *)p2) != NID_sha512)
195         {
196             DSAerr(DSA_F_PKEY_DSA_CTRL, DSA_R_INVALID_DIGEST_TYPE);
197             return 0;
198         }
199         dctx->md = p2;
200         return 1;
201
202         case EVP_PKEY_CTRL_DIGESTINIT:
203         case EVP_PKEY_CTRL_PKCS7_SIGN:
204         case EVP_PKEY_CTRL_CMS_SIGN:
205             return 1;
206
207         case EVP_PKEY_CTRL_PEER_KEY:
208             DSAerr(DSA_F_PKEY_DSA_CTRL,
209                   EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
210             return -2;
211         default:
212             return -2;
213     }
214 }
215
216 static int pkey_dsa_ctrl_str(EVP_PKEY_CTX *ctx,
217                             const char *type, const char *value)
218 {
219     if (!strcmp(type, "dsa_paramgen_bits"))
220     {
221         int nbits;
222         nbits = atoi(value);
223         return EVP_PKEY_CTX_set_dsa_paramgen_bits(ctx, nbits);
224     }
225     if (!strcmp(type, "dsa_paramgen_q_bits"))
226     {
227         int qbits = atoi(value);
228         return EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_DSA, EVP_PKEY_OP_PARAMGEN,
229                                 EVP_PKEY_CTRL_DSA_PARAMGEN_Q_BITS, qbit);
230     }
231     if (!strcmp(type, "dsa_paramgen_md"))
232     {
233         return EVP_PKEY_CTX_ctrl(ctx, EVP_PKEY_DSA, EVP_PKEY_OP_PARAMGEN,
234                                 EVP_PKEY_CTRL_DSA_PARAMGEN_MD, 0,
235                                 (void *)EVP_get_digestbyname(value));
236     }
237     return -2;
238 }
239
240 static int pkey_dsa_paramgen(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey)
241 {
242     DSA *dsa = NULL;
243     DSA_PKEY_CTX *dctx = ctx->data;
244     BN_GENCB *pcb, cb;
245     int ret;
246     if (ctx->pkey_genctx)
247     {
248         pcb = &cb;
249         evp_pkey_set_cb_translate(pcb, ctx);
250     }
251     else
252         pcb = NULL;
253     dsa = DSA_new();
254     if (!dsa)
255         return 0;
256     ret = dsa_builtin_paramgen(dsa, dctx->nbits, dctx->qbits, dctx->pmd,
257                              NULL, 0, NULL, NULL, NULL, NULL, pcb);
258     if (ret)

```

```
260     EVP_PKEY_assign_DSA(pkey, dsa);
261     else
262         DSA_free(dsa);
263     return ret;
264 }

266 static int pkey_dsa_keygen(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey)
267 {
268     DSA *dsa = NULL;
269     if (ctx->pkey == NULL)
270     {
271         DSAerr(DSA_F_PKEY_DSA_KEYGEN, DSA_R_NO_PARAMETERS_SET);
272         return 0;
273     }
274     dsa = DSA_new();
275     if (!dsa)
276         return 0;
277     EVP_PKEY_assign_DSA(pkey, dsa);
278     /* Note: if error return, pkey is freed by parent routine */
279     if (!EVP_PKEY_copy_parameters(pkey, ctx->pkey))
280         return 0;
281     return DSA_generate_key(pkey->pkey.dsa);
282 }

284 const EVP_PKEY_METHOD dsa_pkey_meth =
285 {
286     EVP_PKEY_DSA,
287     EVP_PKEY_FLAG_AUTOARGLEN,
288     pkey_dsa_init,
289     pkey_dsa_copy,
290     pkey_dsa_cleanup,

292     0,
293     pkey_dsa_paramgen,

295     0,
296     pkey_dsa_keygen,

298     0,
299     pkey_dsa_sign,

301     0,
302     pkey_dsa_verify,

304     0,0,

306     0,0,0,0,

308     0,0,

310     0,0,

312     0,0,

314     pkey_dsa_ctrl,
315     pkey_dsa_ctrl_str

318     };
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_prn.c

1

```
*****
3884 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_prn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/dsa/dsa_prn.c */
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4  */
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53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_prn.c

2

```
62 #include <openssl/dsa.h>
64 #ifndef OPENSSL_NO_FP_API
65 int DSA_print_fp(FILE *fp, const DSA *x, int off)
66 {
67     BIO *b;
68     int ret;
69
70     if ((b=BIO_new(BIO_s_file())) == NULL)
71     {
72         DSAerr(DSA_F_DSA_PRINT_FP,ERR_R_BUF_LIB);
73         return(0);
74     }
75     BIO_set_fp(b,fp,BIO_NOCLOSE);
76     ret=DSA_print(b,x,off);
77     BIO_free(b);
78     return(ret);
79 }
81 int DSAParams_print_fp(FILE *fp, const DSA *x)
82 {
83     BIO *b;
84     int ret;
85
86     if ((b=BIO_new(BIO_s_file())) == NULL)
87     {
88         DSAerr(DSA_F_DSAPARAMS_PRINT_FP,ERR_R_BUF_LIB);
89         return(0);
90     }
91     BIO_set_fp(b,fp,BIO_NOCLOSE);
92     ret=DSAParams_print(b, x);
93     BIO_free(b);
94     return(ret);
95 }
96 #endif
98 int DSA_print(BIO *bp, const DSA *x, int off)
99 {
100     EVP_PKEY *pk;
101     int ret;
102     pk = EVP_PKEY_new();
103     if (!pk || !EVP_PKEY_set1_DSA(pk, (DSA *)x))
104         return 0;
105     ret = EVP_PKEY_print_private(bp, pk, off, NULL);
106     EVP_PKEY_free(pk);
107     return ret;
108 }
110 int DSAParams_print(BIO *bp, const DSA *x)
111 {
112     EVP_PKEY *pk;
113     int ret;
114     pk = EVP_PKEY_new();
115     if (!pk || !EVP_PKEY_set1_DSA(pk, (DSA *)x))
116         return 0;
117     ret = EVP_PKEY_print_params(bp, pk, 4, NULL);
118     EVP_PKEY_free(pk);
119     return ret;
120 }
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_sign.c

1

```
*****
4370 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_sign.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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57 */

59 /* Original version from Steven Schoch <schoch@sheba.arc.nasa.gov> */

61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_sign.c

2

```
62 #include <openssl/dsa.h>
63 #include <openssl/rand.h>
64 #include <openssl/bn.h>

66 DSA_SIG * DSA_do_sign(const unsigned char *dgst, int dlen, DSA *dsa)
67 {
68 #ifdef OPENSSL_FIPS
69     if (FIPS_mode()) && !(dsa->meth->flags & DSA_FLAG_FIPS_METHOD)
70         && !(dsa->flags & DSA_FLAG_NON_FIPS_ALLOW))
71     {
72         DSAerr(DSA_F_DSA_DO_SIGN, DSA_R_NON_FIPS_DSA_METHOD);
73         return NULL;
74     }
75 #endif
76     return dsa->meth->dsa_do_sign(dgst, dlen, dsa);
77 }

79 int DSA_sign_setup(DSA *dsa, BN_CTX *ctx_in, BIGNUM **kinvp, BIGNUM **rp)
80 {
81 #ifdef OPENSSL_FIPS
82     if (FIPS_mode()) && !(dsa->meth->flags & DSA_FLAG_FIPS_METHOD)
83         && !(dsa->flags & DSA_FLAG_NON_FIPS_ALLOW))
84     {
85         DSAerr(DSA_F_DSA_SIGN_SETUP, DSA_R_NON_FIPS_DSA_METHOD);
86         return 0;
87     }
88 #endif
89     return dsa->meth->dsa_sign_setup(dsa, ctx_in, kinvp, rp);
90 }

92 DSA_SIG *DSA_SIG_new(void)
93 {
94     DSA_SIG *sig;
95     sig = OPENSSL_malloc(sizeof(DSA_SIG));
96     if (!sig)
97         return NULL;
98     sig->r = NULL;
99     sig->s = NULL;
100     return sig;
101 }

103 void DSA_SIG_free(DSA_SIG *sig)
104 {
105     if (sig)
106     {
107         if (sig->r)
108             BN_free(sig->r);
109         if (sig->s)
110             BN_free(sig->s);
111         OPENSSL_free(sig);
112     }
113 }
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_vrf.c

1

```
*****
3685 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_vrf.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 /* Original version from Steven Schoch <schoch@sheba.arc.nasa.gov> */
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/dsa/dsa_vrf.c

2

```
62 #include <openssl/dsa.h>
64 int DSA_do_verify(const unsigned char *dgst, int dgst_len, DSA_SIG *sig,
65                  DSA *dsa)
66 {
67     #ifdef OPENSSL_FIPS
68         if (FIPS_mode() && !(dsa->meth->flags & DSA_FLAG_FIPS_METHOD)
69             && !(dsa->flags & DSA_FLAG_NON_FIPS_ALLOW))
70             {
71                 DSAerr(DSA_F_DSA_DO_VERIFY, DSA_R_NON_FIPS_DSA_METHOD);
72                 return -1;
73             }
74     #endif
75     return dsa->meth->dsa_do_verify(dgst, dgst_len, sig, dsa);
76 }
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_beos.c

1

```
*****
7521 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_beos.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* dso_beos.c */
2 /* Written by Marcin Konicki (ahwayakchih@neoni.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
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9  * modification, are permitted provided that the following conditions
10  * are met:
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include <string.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_beos.c

2

```
62 #include <openssl/dso.h>

64 #if !defined(OPENSSSL_SYS_BEOS)
65 DSO_METHOD *DSO_METHOD_beos(void)
66 {
67     return NULL;
68 }
69 #else

71 #include <kernel/image.h>

73 static int beos_load(DSO *dso);
74 static int beos_unload(DSO *dso);
75 static void *beos_bind_var(DSO *dso, const char *symname);
76 static DSO_FUNC_TYPE beos_bind_func(DSO *dso, const char *symname);
77 #if 0
78 static int beos_unbind_var(DSO *dso, char *symname, void *symptr);
79 static int beos_unbind_func(DSO *dso, char *symname, DSO_FUNC_TYPE symptr);
80 static int beos_init(DSO *dso);
81 static int beos_finish(DSO *dso);
82 static long beos_ctrl(DSO *dso, int cmd, long larg, void *parg);
83 #endif
84 static char *beos_name_converter(DSO *dso, const char *filename);

86 static DSO_METHOD dso_meth_beos = {
87     "OpenSSL 'beos' shared library method",
88     beos_load,
89     beos_unload,
90     beos_bind_var,
91     beos_bind_func,
92     /* For now, "unbind" doesn't exist */
93     #if 0
94         NULL, /* unbind_var */
95         NULL, /* unbind_func */
96     #endif
97     NULL, /* ctrl */
98     beos_name_converter,
99     NULL, /* init */
100     NULL /* finish */
101 };

103 DSO_METHOD *DSO_METHOD_beos(void)
104 {
105     return(&dso_meth_beos);
106 }

108 /* For this DSO_METHOD, our meth_data STACK will contain;
109  * (i) a pointer to the handle (image_id) returned from
110  * load_add_on().
111  */

113 static int beos_load(DSO *dso)
114 {
115     image_id id;
116     /* See applicable comments from dso_dl.c */
117     char *filename = DSO_convert_filename(dso, NULL);

119     if(filename == NULL)
120     {
121         DSOerr(DSO_F_BEOS_LOAD,DSO_R_NO_FILENAME);
122         goto err;
123     }
124     id = load_add_on(filename);
125     if(id < 1)
126     {
127         DSOerr(DSO_F_BEOS_LOAD,DSO_R_LOAD_FAILED);
```

```

128         ERR_add_error_data(3, "filename(", filename, ")");
129         goto err;
130     }
131     if(!sk_push(dso->meth_data, (char *)id))
132     {
133         DSOerr(DSO_F_BEOS_LOAD,DSO_R_STACK_ERROR);
134         goto err;
135     }
136     /* Success */
137     dso->loaded_filename = filename;
138     return(1);
139 err:
140     /* Cleanup !*/
141     if(filename != NULL)
142         OPENSSL_free(filename);
143     if(id > 0)
144         unload_add_on(id);
145     return(0);
146 }

148 static int beos_unload(DSO *dso)
149 {
150     image_id id;
151     if(dso == NULL)
152     {
153         DSOerr(DSO_F_BEOS_UNLOAD,ERR_R_PASSED_NULL_PARAMETER);
154         return(0);
155     }
156     if(sk_num(dso->meth_data) < 1)
157         return(1);
158     id = (image_id)sk_pop(dso->meth_data);
159     if(id < 1)
160     {
161         DSOerr(DSO_F_BEOS_UNLOAD,DSO_R_NULL_HANDLE);
162         return(0);
163     }
164     if(unload_add_on(id) != B_OK)
165     {
166         DSOerr(DSO_F_BEOS_UNLOAD,DSO_R_UNLOAD_FAILED);
167         /* We should push the value back onto the stack in
168          * case of a retry. */
169         sk_push(dso->meth_data, (char *)id);
170         return(0);
171     }
172     return(1);
173 }

175 static void *beos_bind_var(DSO *dso, const char *symname)
176 {
177     image_id id;
178     void *sym;

180     if((dso == NULL) || (symname == NULL))
181     {
182         DSOerr(DSO_F_BEOS_BIND_VAR,ERR_R_PASSED_NULL_PARAMETER);
183         return(NULL);
184     }
185     if(sk_num(dso->meth_data) < 1)
186     {
187         DSOerr(DSO_F_BEOS_BIND_VAR,DSO_R_STACK_ERROR);
188         return(NULL);
189     }
190     id = (image_id)sk_value(dso->meth_data, sk_num(dso->meth_data) - 1);
191     if(id < 1)
192     {
193         DSOerr(DSO_F_BEOS_BIND_VAR,DSO_R_NULL_HANDLE);

```

```

194         return(NULL);
195     }
196     if(get_image_symbol(id, symname, B_SYMBOL_TYPE_DATA, &sym) != B_OK)
197     {
198         DSOerr(DSO_F_BEOS_BIND_VAR,DSO_R_SYM_FAILURE);
199         ERR_add_error_data(3, "symname(", symname, ")");
200         return(NULL);
201     }
202     return(sym);
203 }

205 static DSO_FUNC_TYPE beos_bind_func(DSO *dso, const char *symname)
206 {
207     image_id id;
208     void *sym;

210     if((dso == NULL) || (symname == NULL))
211     {
212         DSOerr(DSO_F_BEOS_BIND_FUNC,ERR_R_PASSED_NULL_PARAMETER);
213         return(NULL);
214     }
215     if(sk_num(dso->meth_data) < 1)
216     {
217         DSOerr(DSO_F_BEOS_BIND_FUNC,DSO_R_STACK_ERROR);
218         return(NULL);
219     }
220     id = (image_id)sk_value(dso->meth_data, sk_num(dso->meth_data) - 1);
221     if(id < 1)
222     {
223         DSOerr(DSO_F_BEOS_BIND_FUNC,DSO_R_NULL_HANDLE);
224         return(NULL);
225     }
226     if(get_image_symbol(id, symname, B_SYMBOL_TYPE_TEXT, &sym) != B_OK)
227     {
228         DSOerr(DSO_F_BEOS_BIND_FUNC,DSO_R_SYM_FAILURE);
229         ERR_add_error_data(3, "symname(", symname, ")");
230         return(NULL);
231     }
232     return((DSO_FUNC_TYPE)sym);
233 }

235 /* This one is the same as the one in dlfcn */
236 static char *beos_name_converter(DSO *dso, const char *filename)
237 {
238     char *translated;
239     int len, rsize, transform;

241     len = strlen(filename);
242     rsize = len + 1;
243     transform = (strstr(filename, "/") == NULL);
244     if(transform)
245     {
246         /* We will convert this to "%s.so" or "lib%s.so" */
247         rsize += 3; /* The length of ".so" */
248         if ((DSO_flags(dso) & DSO_FLAG_NAME_TRANSLATION_EXT_ONLY) == 0)
249             rsize += 3; /* The length of "lib" */
250     }
251     translated = OPENSSL_malloc(rsize);
252     if(translated == NULL)
253     {
254         DSOerr(DSO_F_BEOS_NAME_CONVERTER,
255                DSO_R_NAME_TRANSLATION_FAILED);
256         return(NULL);
257     }
258     if(transform)
259     {

```


new/usr/src/lib/openssl/libsunw_crypto/dso/dso_beos.c

5

```
260         if ((DSO_flags(dso) & DSO_FLAG_NAME_TRANSLATION_EXT_ONLY) == 0)
261             sprintf(translated, "lib%s.so", filename);
262         else
263             sprintf(translated, "%s.so", filename);
264     }
265     else
266         sprintf(translated, "%s", filename);
267     return(translated);
268 }

270 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_dl.c

1

```
*****
19953 Fri May 30 18:31:45 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_dl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* dso_dl.c -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/dso.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_dl.c

2

```
63 #ifndef DSO_DL
64 DSO_METHOD *DSO_METHOD_dl(void)
65 {
66     return NULL;
67 }
68 #else

70 #include <dl.h>

72 /* Part of the hack in "dl_load" ... */
73 #define DSO_MAX_TRANSLATED_SIZE 256

75 static int dl_load(DSO *dso);
76 static int dl_unload(DSO *dso);
77 static void *dl_bind_var(DSO *dso, const char *symname);
78 static DSO_FUNC_TYPE dl_bind_func(DSO *dso, const char *symname);
79 #if 0
80 static int dl_unbind_var(DSO *dso, char *symname, void *symptr);
81 static int dl_unbind_func(DSO *dso, char *symname, DSO_FUNC_TYPE symptr);
82 static int dl_init(DSO *dso);
83 static int dl_finish(DSO *dso);
84 static int dl_ctrl(DSO *dso, int cmd, long larg, void *parg);
85 #endif
86 static char *dl_name_converter(DSO *dso, const char *filename);
87 static char *dl_merger(DSO *dso, const char *filespec1, const char *filespec2);
88 static int dl_pathbyaddr(void *addr, char *path, int sz);
89 static void *dl_globallookup(const char *name);

91 static DSO_METHOD dso_meth_dl = {
92     "OpenSSL 'dl' shared library method",
93     dl_load,
94     dl_unload,
95     dl_bind_var,
96     dl_bind_func,
97     /* For now, "unbind" doesn't exist */
98     #if 0
99         NULL, /* unbind_var */
100         NULL, /* unbind_func */
101     #endif
102     NULL, /* ctrl */
103     dl_name_converter,
104     dl_merger,
105     NULL, /* init */
106     NULL, /* finish */
107     dl_pathbyaddr,
108     dl_globallookup
109 };

111 DSO_METHOD *DSO_METHOD_dl(void)
112 {
113     return(&dso_meth_dl);
114 }

116 /* For this DSO_METHOD, our meth_data STACK will contain;
117  * (i) the handle (shl_t) returned from shl_load().
118  * NB: I checked on HP-UX11 and shl_t is itself a pointer
119  * type so the cast is safe.
120  */

122 static int dl_load(DSO *dso)
123 {
124     shl_t ptr = NULL;
125     /* We don't do any fancy retries or anything, just take the method's
126      * (or DSO's if it has the callback set) best translation of the
127      * platform-independant filename and try once with that. */
128 }
```

```

128     char *filename= DSO_convert_filename(dso, NULL);
129
130     if(filename == NULL)
131     {
132         DSOerr(DSO_F_DL_LOAD,DSO_R_NO_FILENAME);
133         goto err;
134     }
135     ptr = shl_load(filename, BIND_IMMEDIATE |
136         (dso->flags&DSO_FLAG_NO_NAME_TRANSLATION?0:DYNAMIC_PATH), 0L);
137     if(ptr == NULL)
138     {
139         DSOerr(DSO_F_DL_LOAD,DSO_R_LOAD_FAILED);
140         ERR_add_error_data(4, "filename(", filename, "): ",
141             strerror(errno));
142         goto err;
143     }
144     if(!sk_push(dso->meth_data, (char *)ptr))
145     {
146         DSOerr(DSO_F_DL_LOAD,DSO_R_STACK_ERROR);
147         goto err;
148     }
149     /* Success, stick the converted filename we've loaded under into the DSO
150      * (it also serves as the indicator that we are currently loaded). */
151     dso->loaded_filename = filename;
152     return(1);
153 err:
154     /* Cleanup! */
155     if(filename != NULL)
156         OPENSSL_free(filename);
157     if(ptr != NULL)
158         shl_unload(ptr);
159     return(0);
160 }
161
162 static int dl_unload(DSO *dso)
163 {
164     shl_t ptr;
165     if(dso == NULL)
166     {
167         DSOerr(DSO_F_DL_UNLOAD,ERR_R_PASSED_NULL_PARAMETER);
168         return(0);
169     }
170     if(sk_num(dso->meth_data) < 1)
171         return(1);
172     /* Is this statement legal? */
173     ptr = (shl_t)sk_pop(dso->meth_data);
174     if(ptr == NULL)
175     {
176         DSOerr(DSO_F_DL_UNLOAD,DSO_R_NULL_HANDLE);
177         /* Should push the value back onto the stack in
178          * case of a retry. */
179         sk_push(dso->meth_data, (char *)ptr);
180         return(0);
181     }
182     shl_unload(ptr);
183     return(1);
184 }
185
186 static void dl_bind_var(DSO *dso, const char *symname)
187 {
188     shl_t ptr;
189     void *sym;
190
191     if((dso == NULL) || (symname == NULL))
192     {
193         DSOerr(DSO_F_DL_BIND_VAR,ERR_R_PASSED_NULL_PARAMETER);

```

```

194         return(NULL);
195     }
196     if(sk_num(dso->meth_data) < 1)
197     {
198         DSOerr(DSO_F_DL_BIND_VAR,DSO_R_STACK_ERROR);
199         return(NULL);
200     }
201     ptr = (shl_t)sk_value(dso->meth_data, sk_num(dso->meth_data) - 1);
202     if(ptr == NULL)
203     {
204         DSOerr(DSO_F_DL_BIND_VAR,DSO_R_NULL_HANDLE);
205         return(NULL);
206     }
207     if (shl_findsym(&ptr, symname, TYPE_UNDEFINED, &sym) < 0)
208     {
209         DSOerr(DSO_F_DL_BIND_VAR,DSO_R_SYM_FAILURE);
210         ERR_add_error_data(4, "symname(", symname, "): ",
211             strerror(errno));
212         return(NULL);
213     }
214     return(sym);
215 }
216
217 static DSO_FUNC_TYPE dl_bind_func(DSO *dso, const char *symname)
218 {
219     shl_t ptr;
220     void *sym;
221
222     if((dso == NULL) || (symname == NULL))
223     {
224         DSOerr(DSO_F_DL_BIND_FUNC,ERR_R_PASSED_NULL_PARAMETER);
225         return(NULL);
226     }
227     if(sk_num(dso->meth_data) < 1)
228     {
229         DSOerr(DSO_F_DL_BIND_FUNC,DSO_R_STACK_ERROR);
230         return(NULL);
231     }
232     ptr = (shl_t)sk_value(dso->meth_data, sk_num(dso->meth_data) - 1);
233     if(ptr == NULL)
234     {
235         DSOerr(DSO_F_DL_BIND_FUNC,DSO_R_NULL_HANDLE);
236         return(NULL);
237     }
238     if (shl_findsym(&ptr, symname, TYPE_UNDEFINED, &sym) < 0)
239     {
240         DSOerr(DSO_F_DL_BIND_FUNC,DSO_R_SYM_FAILURE);
241         ERR_add_error_data(4, "symname(", symname, "): ",
242             strerror(errno));
243         return(NULL);
244     }
245     return((DSO_FUNC_TYPE)sym);
246 }
247
248 static char *dl_merger(DSO *dso, const char *filespec1, const char *filespec2)
249 {
250     char *merged;
251
252     if(!filespec1 && !filespec2)
253     {
254         DSOerr(DSO_F_DL_MERGER,
255             ERR_R_PASSED_NULL_PARAMETER);
256         return(NULL);
257     }
258     /* If the first file specification is a rooted path, it rules.
259      * same goes if the second file specification is missing. */

```

```

260     if (!filespec2 || filespec1[0] == '/')
261     {
262         merged = OPENSSL_malloc(strlen(filespec1) + 1);
263         if(!merged)
264         {
265             DSOerr(DSO_F_DL_MERGER,
266                 ERR_R_MALLOC_FAILURE);
267             return(NULL);
268         }
269         strcpy(merged, filespec1);
270     }
271     /* If the first file specification is missing, the second one rules. */
272     else if (!filespec1)
273     {
274         merged = OPENSSL_malloc(strlen(filespec2) + 1);
275         if(!merged)
276         {
277             DSOerr(DSO_F_DL_MERGER,
278                 ERR_R_MALLOC_FAILURE);
279             return(NULL);
280         }
281         strcpy(merged, filespec2);
282     }
283     else
284     /* This part isn't as trivial as it looks. It assumes that
285      * the second file specification really is a directory, and
286      * makes no checks whatsoever. Therefore, the result becomes
287      * the concatenation of filespec2 followed by a slash followed
288      * by filespec1. */
289     {
290         int spec2len, len;
291
292         spec2len = (filespec2 ? strlen(filespec2) : 0);
293         len = spec2len + (filespec1 ? strlen(filespec1) : 0);
294
295         if(filespec2 && filespec2[spec2len - 1] == '/')
296         {
297             spec2len--;
298             len--;
299         }
300         merged = OPENSSL_malloc(len + 2);
301         if(!merged)
302         {
303             DSOerr(DSO_F_DL_MERGER,
304                 ERR_R_MALLOC_FAILURE);
305             return(NULL);
306         }
307         strcpy(merged, filespec2);
308         merged[spec2len] = '/';
309         strcpy(&merged[spec2len + 1], filespec1);
310     }
311     return(merged);
312 }
313
314 /* This function is identical to the one in dso_dlfcn.c, but as it is highly
315  * unlikely that both the "dl" and "dlfcn" variants are being compiled at the
316  * same time, there's no great duplicating the code. Figuring out an elegant
317  * way to share one copy of the code would be more difficult and would not
318  * leave the implementations independant. */
319 #if defined(__hpux)
320 static const char extension[] = ".sl";
321 #else
322 static const char extension[] = ".so";
323 #endif
324 static char *dl_name_converter(DSO *dso, const char *filename)
325 {

```

```

326     char *translated;
327     int len, rsize, transform;
328
329     len = strlen(filename);
330     rsize = len + 1;
331     transform = (strstr(filename, "/") == NULL);
332     {
333         /* We will convert this to "%s.s?" or "lib%s.s?" */
334         rsize += strlen(extension); /* The length of ".s?" */
335         if ((DSO_flags(dso) & DSO_FLAG_NAME_TRANSLATION_EXT_ONLY) == 0)
336             rsize += 3; /* The length of "lib" */
337     }
338     translated = OPENSSL_malloc(rsize);
339     if(translated == NULL)
340     {
341         DSOerr(DSO_F_DL_NAME_CONVERTER,
342             DSO_R_NAME_TRANSLATION_FAILED);
343         return(NULL);
344     }
345     if(transform)
346     {
347         if ((DSO_flags(dso) & DSO_FLAG_NAME_TRANSLATION_EXT_ONLY) == 0)
348             sprintf(translated, "lib%s%s", filename, extension);
349         else
350             sprintf(translated, "%s%s", filename, extension);
351     }
352     else
353         sprintf(translated, "%s", filename);
354     return(translated);
355 }
356
357 static int dl_pathbyaddr(void *addr, char *path, int sz)
358 {
359     struct shl_descriptor inf;
360     int i, len;
361
362     if (addr == NULL)
363     {
364         union { int(*f)(void*,char*,int); void *p; } t =
365             { dl_pathbyaddr };
366         addr = t.p;
367     }
368
369     for (i=-1; shl_get_r(i,&inf)==0;i++)
370     {
371         if (((size_t)addr >= inf.tstart && (size_t)addr < inf.tend) ||
372             ((size_t)addr >= inf.dstart && (size_t)addr < inf.dend))
373         {
374             len = (int)strlen(inf.filename);
375             if (sz <= 0) return len+1;
376             if (len >= sz) len=sz-1;
377             memcpy(path, inf.filename, len);
378             path[len++] = 0;
379             return len;
380         }
381     }
382
383     return -1;
384 }
385
386 static void *dl_globallookup(const char *name)
387 {
388     void *ret;
389     shl_t h = NULL;
390
391     return shl_findsym(&h, name, TYPE_UNDEFINED, &ret) ? NULL : ret;

```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_dl.c

7

```
392     }  
393 #endif /* DSO_DL */
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_dlfcn.c

1

```
*****
12984 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_dlfcn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dso_dlfcn.c -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
16 * notice, this list of conditions and the following disclaimer in
17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
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23 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
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38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
58
59 /* We need to do this early, because stdio.h includes the header files
60  * that handle _GNU_SOURCE and other similar macros. Defining it later
61  * is simply too late, because those headers are protected from re-
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_dlfcn.c

2

```
62 inclusion. */
63 #ifdef __linux
64 # ifnndef _GNU_SOURCE
65 # define _GNU_SOURCE /* make sure dladdr is declared */
66 # endif
67 #endif
68
69 #include <stdio.h>
70 #include "cryptlib.h"
71 #include <openssl/dso.h>
72
73 #ifndef DSO_DLFCN
74 DSO_METHOD *DSO_METHOD_dlfcn(void)
75 {
76     return NULL;
77 }
78 #else
79
80 #ifdef HAVE_DLFCN_H
81 # ifdef __osf__
82 # define _EXTENSIONS_
83 # endif
84 # include <dlfcn.h>
85 # define HAVE_DLINFO 1
86 # if defined(_AIX) || defined(__CYGWIN__) || \
87     defined(_SCO_VERSION_) || defined(_SCO_ELF) || \
88     (defined(__osf__) && !defined(RTLD_NEXT)) || \
89     (defined(__OpenBSD__) && !defined(RTLD_SELF)) || \
90     defined(__ANDROID__)
91 # undef HAVE_DLINFO
92 # endif
93 #endif
94
95 /* Part of the hack in "dlfcn_load" ... */
96 #define DSO_MAX_TRANSLATED_SIZE 256
97
98 static int dlfcn_load(DSO *dso);
99 static int dlfcn_unload(DSO *dso);
100 static void *dlfcn_bind_var(DSO *dso, const char *symname);
101 static DSO_FUNC_TYPE dlfcn_bind_func(DSO *dso, const char *symname);
102 #if 0
103 static int dlfcn_unbind(DSO *dso, char *symname, void *symptr);
104 static int dlfcn_init(DSO *dso);
105 static int dlfcn_finish(DSO *dso);
106 static long dlfcn_ctrl(DSO *dso, int cmd, long larg, void *parg);
107 #endif
108 static char *dlfcn_name_converter(DSO *dso, const char *filename);
109 static char *dlfcn_merger(DSO *dso, const char *filespec1,
110     const char *filespec2);
111 static int dlfcn_pathbyaddr(void *addr, char *path, int sz);
112 static void *dlfcn_globallookup(const char *name);
113
114 static DSO_METHOD dso_meth_dlfcn = {
115     "OpenSSL 'dlfcn' shared library method",
116     dlfcn_load,
117     dlfcn_unload,
118     dlfcn_bind_var,
119     dlfcn_bind_func,
120     /* For now, "unbind" doesn't exist */
121     #if 0
122     NULL, /* unbind_var */
123     NULL, /* unbind_func */
124     #endif
125     NULL, /* ctrl */
126     dlfcn_name_converter,
127     dlfcn_merger,
```

```

128     NULL, /* init */
129     NULL, /* finish */
130     dlfcn_pathbyaddr,
131     dlfcn_globallookup
132 };

134 DSO_METHOD *DSO_METHOD_dlfcn(void)
135 {
136     return(&dso_meth_dlfcn);
137 }

139 /* Prior to using the dlopen() function, we should decide on the flag
140  * we send. There's a few different ways of doing this and it's a
141  * messy venn-diagram to match up which platforms support what. So
142  * as we don't have autoconf yet, I'm implementing a hack that could
143  * be hacked further relatively easily to deal with cases as we find
144  * them. Initially this is to cope with OpenBSD. */
145 #if defined(__OpenBSD__) || defined(__NetBSD__)
146 #   ifdef DL_LAZY
147 #       define DLOPEN_FLAG DL_LAZY
148 #   else
149 #       ifdef RTLD_NOW
150 #           define DLOPEN_FLAG RTLD_NOW
151 #       else
152 #           define DLOPEN_FLAG 0
153 #       endif
154 #   endif
155 #else
156 #   ifdef OPENSSL_SYS_SUNOS
157 #       define DLOPEN_FLAG 1
158 #   else
159 #       define DLOPEN_FLAG RTLD_NOW /* Hope this works everywhere else */
160 #   endif
161 #endif

163 /* For this DSO_METHOD, our meth_data STACK will contain;
164  * (i) the handle (void*) returned from dlopen().
165  */

167 static int dlfcn_load(DSO *dso)
168 {
169     void *ptr = NULL;
170     /* See applicable comments in dso_dl.c */
171     char *filename = DSO_convert_filename(dso, NULL);
172     int flags = DLOPEN_FLAG;

174     if(filename == NULL)
175     {
176         DSOerr(DSO_F_DLFCN_LOAD, DSO_R_NO_FILENAME);
177         goto err;
178     }

180 #ifdef RTLD_GLOBAL
181     if (dso->flags & DSO_FLAG_GLOBAL_SYMBOLS)
182         flags |= RTLD_GLOBAL;
183 #endif
184     ptr = dlopen(filename, flags);
185     if(ptr == NULL)
186     {
187         DSOerr(DSO_F_DLFCN_LOAD, DSO_R_LOAD_FAILED);
188         ERR_add_error_data(4, "filename(", filename, "): ", dlerror());
189         goto err;
190     }
191     if(!sk_void_push(dso->meth_data, (char *)ptr))
192     {
193         DSOerr(DSO_F_DLFCN_LOAD, DSO_R_STACK_ERROR);

```

```

194         goto err;
195     }
196     /* Success */
197     dso->loaded_filename = filename;
198     return(1);
199 err:
200     /* Cleanup! */
201     if(filename != NULL)
202         OPENSSL_free(filename);
203     if(ptr != NULL)
204         dlclose(ptr);
205     return(0);
206 }

208 static int dlfcn_unload(DSO *dso)
209 {
210     void *ptr;
211     if(dso == NULL)
212     {
213         DSOerr(DSO_F_DLFCN_UNLOAD, ERR_R_PASSED_NULL_PARAMETER);
214         return(0);
215     }
216     if(sk_void_num(dso->meth_data) < 1)
217         return(1);
218     ptr = sk_void_pop(dso->meth_data);
219     if(ptr == NULL)
220     {
221         DSOerr(DSO_F_DLFCN_UNLOAD, DSO_R_NULL_HANDLE);
222         /* Should push the value back onto the stack in
223          * case of a retry. */
224         sk_void_push(dso->meth_data, ptr);
225         return(0);
226     }
227     /* For now I'm not aware of any errors associated with dlclose() */
228     dlclose(ptr);
229     return(1);
230 }

232 static void *dlfcn_bind_var(DSO *dso, const char *symname)
233 {
234     void *ptr, *sym;

236     if((dso == NULL) || (symname == NULL))
237     {
238         DSOerr(DSO_F_DLFCN_BIND_VAR, ERR_R_PASSED_NULL_PARAMETER);
239         return(NULL);
240     }
241     if(sk_void_num(dso->meth_data) < 1)
242     {
243         DSOerr(DSO_F_DLFCN_BIND_VAR, DSO_R_STACK_ERROR);
244         return(NULL);
245     }
246     ptr = sk_void_value(dso->meth_data, sk_void_num(dso->meth_data) - 1);
247     if(ptr == NULL)
248     {
249         DSOerr(DSO_F_DLFCN_BIND_VAR, DSO_R_NULL_HANDLE);
250         return(NULL);
251     }
252     sym = dlsym(ptr, symname);
253     if(sym == NULL)
254     {
255         DSOerr(DSO_F_DLFCN_BIND_VAR, DSO_R_SYM_FAILURE);
256         ERR_add_error_data(4, "symname(", symname, "): ", dlerror());
257         return(NULL);
258     }
259     return(sym);

```

```

260     }

262 static DSO_FUNC_TYPE dlfcn_bind_func(DSO *dso, const char *symname)
263 {
264     void *ptr;
265     union {
266         DSO_FUNC_TYPE sym;
267         void *dlret;
268     } u;

270     if((dso == NULL) || (symname == NULL))
271     {
272         DSOerr(DSO_F_DLFCN_BIND_FUNC, ERR_R_PASSED_NULL_PARAMETER);
273         return(NULL);
274     }
275     if(sk_void_num(dso->meth_data) < 1)
276     {
277         DSOerr(DSO_F_DLFCN_BIND_FUNC, DSO_R_STACK_ERROR);
278         return(NULL);
279     }
280     ptr = sk_void_value(dso->meth_data, sk_void_num(dso->meth_data) - 1);
281     if(ptr == NULL)
282     {
283         DSOerr(DSO_F_DLFCN_BIND_FUNC, DSO_R_NULL_HANDLE);
284         return(NULL);
285     }
286     u.dlret = dlsym(ptr, symname);
287     if(u.dlret == NULL)
288     {
289         DSOerr(DSO_F_DLFCN_BIND_FUNC, DSO_R_SYM_FAILURE);
290         ERR_add_error_data(4, "symname(", symname, "): ", dlerror());
291         return(NULL);
292     }
293     return u.sym;
294 }

296 static char *dlfcn_merger(DSO *dso, const char *filespec1,
297                          const char *filespec2)
298 {
299     char *merged;

301     if(!filespec1 && !filespec2)
302     {
303         DSOerr(DSO_F_DLFCN_MERGER,
304              ERR_R_PASSED_NULL_PARAMETER);
305         return(NULL);
306     }
307     /* If the first file specification is a rooted path, it rules.
308        same goes if the second file specification is missing. */
309     if (!filespec2 || (filespec1 != NULL && filespec1[0] == '/'))
310     {
311         merged = OPENSSL_malloc(strlen(filespec1) + 1);
312         if(!merged)
313         {
314             DSOerr(DSO_F_DLFCN_MERGER, ERR_R_MALLOC_FAILURE);
315             return(NULL);
316         }
317         strcpy(merged, filespec1);
318     }
319     /* If the first file specification is missing, the second one rules. */
320     else if (!filespec1)
321     {
322         merged = OPENSSL_malloc(strlen(filespec2) + 1);
323         if(!merged)
324         {
325             DSOerr(DSO_F_DLFCN_MERGER,

```

```

326             ERR_R_MALLOC_FAILURE);
327             return(NULL);
328         }
329         strcpy(merged, filespec2);
330     }
331     else
332     /* This part isn't as trivial as it looks. It assumes that
333        the second file specification really is a directory, and
334        makes no checks whatsoever. Therefore, the result becomes
335        the concatenation of filespec2 followed by a slash followed
336        by filespec1. */
337     {
338         int spec2len, len;

340         spec2len = strlen(filespec2);
341         len = spec2len + (filespec1 ? strlen(filespec1) : 0);

343         if(filespec2 && filespec2[spec2len - 1] == '/')
344         {
345             spec2len--;
346             len--;
347         }
348         merged = OPENSSL_malloc(len + 2);
349         if(!merged)
350         {
351             DSOerr(DSO_F_DLFCN_MERGER,
352                  ERR_R_MALLOC_FAILURE);
353             return(NULL);
354         }
355         strcpy(merged, filespec2);
356         merged[spec2len] = '/';
357         strcpy(&merged[spec2len + 1], filespec1);
358     }
359     return(merged);
360 }

362 #ifdef OPENSSL_SYS_MACOSX
363 #define DSO_ext ".dylib"
364 #define DSO_extlen 6
365 #else
366 #define DSO_ext ".so"
367 #define DSO_extlen 3
368 #endif

371 static char *dlfcn_name_converter(DSO *dso, const char *filename)
372 {
373     char *translated;
374     int len, rsize, transform;

376     len = strlen(filename);
377     rsize = len + 1;
378     transform = (strstr(filename, "/") == NULL);
379     if(transform)
380     {
381         /* We will convert this to "%s.so" or "lib%s.so" etc */
382         rsize += DSO_extlen; /* The length of ".so" */
383         if ((DSO_flags(dso) & DSO_FLAG_NAME_TRANSLATION_EXT_ONLY) == 0)
384             rsize += 3; /* The length of "lib" */
385     }
386     translated = OPENSSL_malloc(rsize);
387     if(translated == NULL)
388     {
389         DSOerr(DSO_F_DLFCN_NAME_CONVERTER,
390              DSO_R_NAME_TRANSLATION_FAILED);
391         return(NULL);

```



```

392     }
393     if(transform)
394     {
395         if ((DSO_flags(dso) & DSO_FLAG_NAME_TRANSLATION_EXT_ONLY) == 0)
396             sprintf(translated, "lib%s" DSO_ext, filename);
397         else
398             sprintf(translated, "%s" DSO_ext, filename);
399     }
400     else
401         sprintf(translated, "%s", filename);
402     return(translated);
403 }

405 #ifdef __sgi
406 /*
407 This is a quote from IRIX manual for dladdr(3c):

409 <dlfcn.h> does not contain a prototype for dladdr or definition of
410 DL_info. The #include <dlfcn.h> in the SYNOPSIS line is traditional,
411 but contains no dladdr prototype and no IRIX library contains an
412 implementation. Write your own declaration based on the code below.

414 The following code is dependent on internal interfaces that are not
415 part of the IRIX compatibility guarantee; however, there is no future
416 intention to change this interface, so on a practical level, the code
417 below is safe to use on IRIX.
418 */
419 #include <rld_interface.h>
420 #ifndef _RLD_INTERFACE_DLFCN_H_DLADDR
421 #define _RLD_INTERFACE_DLFCN_H_DLADDR
422 typedef struct DL_info {
423     const char * dli_fname;
424     void * dli_fbase;
425     const char * dli_sname;
426     void * dli_saddr;
427     int dli_version;
428     int dli_reserved1;
429     long dli_reserved[4];
430 } DL_info;
431 #else
432 typedef struct DL_info DL_info;
433 #endif
434 #define _RLD_DLADDR 14

436 static int dladdr(void *address, DL_info *dl)
437 {
438     void *v;
439     v = _rld_new_interface(_RLD_DLADDR, address, dl);
440     return (int)v;
441 }
442 #endif /* __sgi */

444 static int dlfcn_pathbyaddr(void *addr, char *path, int sz)
445 {
446     #ifdef HAVE_DLINFO
447     DL_info dli;
448     int len;

450     if (addr == NULL)
451     {
452         union { int(*f)(void*,char*,int); void *p; } t =
453             { dlfcn_pathbyaddr };
454         addr = t.p;
455     }

457     if (dladdr(addr, &dli))

```

```

458     {
459         len = (int)strlen(dli.dli_fname);
460         if (sz <= 0) return len+1;
461         if (len >= sz) len=sz-1;
462         memcpy(path, dli.dli_fname, len);
463         path[len++] = 0;
464         return len;
465     }

467     ERR_add_error_data(4, "dlfcn_pathbyaddr(): ", dlerror());
468 #endif
469     return -1;
470 }

472 static void *dlfcn_globallookup(const char *name)
473 {
474     void *ret = NULL, *handle = dlopen(NULL, RTLD_LAZY);
475
476     if (handle)
477     {
478         ret = dlsym(handle, name);
479         dlclose(handle);
480     }

482     return ret;
483 }
484 #endif /* DSO_DLFCN */

```

```

*****
7131 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/dso/dso_err.c */
2 /* =====
3  * Copyright (c) 1999-2006 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
24  * prior written permission. For written permission, please contact
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26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
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29  * permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
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34  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/dso.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_DSO,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_DSO,0,reason)

71 static ERR_STRING_DATA DSO_str_funcs[]=
72 {
73 {ERR_FUNC(DSO_F_BEOS_BIND_FUNC), "BEOS_BIND_FUNC"},
74 {ERR_FUNC(DSO_F_BEOS_BIND_VAR), "BEOS_BIND_VAR"},
75 {ERR_FUNC(DSO_F_BEOS_LOAD), "BEOS_LOAD"},
76 {ERR_FUNC(DSO_F_BEOS_NAME_CONVERTER), "BEOS_NAME_CONVERTER"},
77 {ERR_FUNC(DSO_F_BEOS_UNLOAD), "BEOS_UNLOAD"},
78 {ERR_FUNC(DSO_F_DLFCN_BIND_FUNC), "DLFCN_BIND_FUNC"},
79 {ERR_FUNC(DSO_F_DLFCN_BIND_VAR), "DLFCN_BIND_VAR"},
80 {ERR_FUNC(DSO_F_DLFCN_LOAD), "DLFCN_LOAD"},
81 {ERR_FUNC(DSO_F_DLFCN_MERGER), "DLFCN_MERGER"},
82 {ERR_FUNC(DSO_F_DLFCN_NAME_CONVERTER), "DLFCN_NAME_CONVERTER"},
83 {ERR_FUNC(DSO_F_DLFCN_UNLOAD), "DLFCN_UNLOAD"},
84 {ERR_FUNC(DSO_F_DL_BIND_FUNC), "DL_BIND_FUNC"},
85 {ERR_FUNC(DSO_F_DL_BIND_VAR), "DL_BIND_VAR"},
86 {ERR_FUNC(DSO_F_DL_LOAD), "DL_LOAD"},
87 {ERR_FUNC(DSO_F_DL_MERGER), "DL_MERGER"},
88 {ERR_FUNC(DSO_F_DL_NAME_CONVERTER), "DL_NAME_CONVERTER"},
89 {ERR_FUNC(DSO_F_DL_UNLOAD), "DL_UNLOAD"},
90 {ERR_FUNC(DSO_F_DSO_BIND_FUNC), "DSO_bind_func"},
91 {ERR_FUNC(DSO_F_DSO_BIND_VAR), "DSO_bind_var"},
92 {ERR_FUNC(DSO_F_DSO_CONVERT_FILENAME), "DSO_convert_filename"},
93 {ERR_FUNC(DSO_F_DSO_CTRL), "DSO_ctrl"},
94 {ERR_FUNC(DSO_F_DSO_FREE), "DSO_free"},
95 {ERR_FUNC(DSO_F_DSO_GET_FILENAME), "DSO_get_filename"},
96 {ERR_FUNC(DSO_F_DSO_GET_LOADED_FILENAME), "DSO_get_loaded_filename"},
97 {ERR_FUNC(DSO_F_DSO_GLOBAL_LOOKUP), "DSO_global_lookup"},
98 {ERR_FUNC(DSO_F_DSO_LOAD), "DSO_load"},
99 {ERR_FUNC(DSO_F_DSO_MERGE), "DSO_merge"},
100 {ERR_FUNC(DSO_F_DSO_NEW_METHOD), "DSO_new_method"},
101 {ERR_FUNC(DSO_F_DSO_PATHBYADDR), "DSO_pathbyaddr"},
102 {ERR_FUNC(DSO_F_DSO_SET_FILENAME), "DSO_set_filename"},
103 {ERR_FUNC(DSO_F_DSO_SET_NAME_CONVERTER), "DSO_set_name_converter"},
104 {ERR_FUNC(DSO_F_DSO_UP_REF), "DSO_up_ref"},
105 {ERR_FUNC(DSO_F_GLOBAL_LOOKUP_FUNC), "GLOBAL_LOOKUP_FUNC"},
106 {ERR_FUNC(DSO_F_PATHBYADDR), "PATHBYADDR"},
107 {ERR_FUNC(DSO_F_VMS_BIND_SYM), "VMS_BIND_SYM"},
108 {ERR_FUNC(DSO_F_VMS_LOAD), "VMS_LOAD"},
109 {ERR_FUNC(DSO_F_VMS_MERGER), "VMS_MERGER"},
110 {ERR_FUNC(DSO_F_VMS_UNLOAD), "VMS_UNLOAD"},
111 {ERR_FUNC(DSO_F_WIN32_BIND_FUNC), "WIN32_BIND_FUNC"},
112 {ERR_FUNC(DSO_F_WIN32_BIND_VAR), "WIN32_BIND_VAR"},
113 {ERR_FUNC(DSO_F_WIN32_GLOBALLOOKUP), "WIN32_GLOBALLOOKUP"},
114 {ERR_FUNC(DSO_F_WIN32_GLOBALLOOKUP_FUNC), "WIN32_GLOBALLOOKUP_FUNC"},
115 {ERR_FUNC(DSO_F_WIN32_JOINER), "WIN32_JOINER"},
116 {ERR_FUNC(DSO_F_WIN32_LOAD), "WIN32_LOAD"},
117 {ERR_FUNC(DSO_F_WIN32_MERGER), "WIN32_MERGER"},
118 {ERR_FUNC(DSO_F_WIN32_NAME_CONVERTER), "WIN32_NAME_CONVERTER"},
119 {ERR_FUNC(DSO_F_WIN32_PATHBYADDR), "WIN32_PATHBYADDR"},
120 {ERR_FUNC(DSO_F_WIN32_SPLITTER), "WIN32_SPLITTER"},
121 {ERR_FUNC(DSO_F_WIN32_UNLOAD), "WIN32_UNLOAD"},
122 {0,NULL}
123 };

125 static ERR_STRING_DATA DSO_str_reasons[]=
126 {
127 {ERR_REASON(DSO_R_CTRL_FAILED), "control command failed"},

```

```
128 {ERR_REASON(DSO_R_DSO_ALREADY_LOADED) , "dso already loaded"},
129 {ERR_REASON(DSO_R_EMPTY_FILE_STRUCTURE) , "empty file structure"},
130 {ERR_REASON(DSO_R_FAILURE) , "failure"},
131 {ERR_REASON(DSO_R_FILENAME_TOO_BIG) , "filename too big"},
132 {ERR_REASON(DSO_R_FINISH_FAILED) , "cleanup method function failed"},
133 {ERR_REASON(DSO_R_INCORRECT_FILE_SYNTAX) , "incorrect file syntax"},
134 {ERR_REASON(DSO_R_LOAD_FAILED) , "could not load the shared library"},
135 {ERR_REASON(DSO_R_NAME_TRANSLATION_FAILED) , "name translation failed"},
136 {ERR_REASON(DSO_R_NO_FILENAME) , "no filename"},
137 {ERR_REASON(DSO_R_NO_FILE_SPECIFICATION) , "no file specification"},
138 {ERR_REASON(DSO_R_NULL_HANDLE) , "a null shared library handle was used"},
139 {ERR_REASON(DSO_R_SET_FILENAME_FAILED) , "set filename failed"},
140 {ERR_REASON(DSO_R_STACK_ERROR) , "the meth_data stack is corrupt"},
141 {ERR_REASON(DSO_R_SYM_FAILURE) , "could not bind to the requested symbol"},
142 {ERR_REASON(DSO_R_UNLOAD_FAILED) , "could not unload the shared library"},
143 {ERR_REASON(DSO_R_UNSUPPORTED) , "functionality not supported"},
144 {0, NULL}
145 };

147 #endif

149 void ERR_load_DSO_strings(void)
150 {
151 #ifndef OPENSSL_NO_ERR
153     if (ERR_func_error_string(DSO_str_functs[0].error) == NULL)
154     {
155         ERR_load_strings(0, DSO_str_functs);
156         ERR_load_strings(0, DSO_str_reasons);
157     }
158 #endif
159 }
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_lib.c

1

```
*****
11922 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dso_lib.c -*- mode:c; c-file-style: "eay" -*- */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
59 #include <stdio.h>
60 #include <openssl/crypto.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_lib.c

2

```
62 #include <openssl/dso.h>
64 static DSO_METHOD *default_DSO_meth = NULL;
66 DSO *DSO_new(void)
67 {
68     return(DSO_new_method(NULL));
69 }
71 void DSO_set_default_method(DSO_METHOD *meth)
72 {
73     default_DSO_meth = meth;
74 }
76 DSO_METHOD *DSO_get_default_method(void)
77 {
78     return(default_DSO_meth);
79 }
81 DSO_METHOD *DSO_get_method(DSO *dso)
82 {
83     return(dso->meth);
84 }
86 DSO_METHOD *DSO_set_method(DSO *dso, DSO_METHOD *meth)
87 {
88     DSO_METHOD *mtmp;
89     mtmp = dso->meth;
90     dso->meth = meth;
91     return(mtmp);
92 }
94 DSO *DSO_new_method(DSO_METHOD *meth)
95 {
96     DSO *ret;
98     if(default_DSO_meth == NULL)
99         /* We default to DSO_METHOD_openssl() which in turn defaults
100          * to stealing the "best available" method. Will fallback
101          * to DSO_METHOD_null() in the worst case. */
102         default_DSO_meth = DSO_METHOD_openssl();
103     ret = (DSO *)OPENSSL_malloc(sizeof(DSO));
104     if(ret == NULL)
105     {
106         DSOerr(DSO_F_DSO_NEW_METHOD,ERR_R_MALLOC_FAILURE);
107         return(NULL);
108     }
109     memset(ret, 0, sizeof(DSO));
110     ret->meth_data = sk_void_new_null();
111     if(ret->meth_data == NULL)
112     {
113         /* sk_new doesn't generate any errors so we do */
114         DSOerr(DSO_F_DSO_NEW_METHOD,ERR_R_MALLOC_FAILURE);
115         OPENSSL_free(ret);
116         return(NULL);
117     }
118     if(meth == NULL)
119         ret->meth = default_DSO_meth;
120     else
121         ret->meth = meth;
122     ret->references = 1;
123     if((ret->meth->init != NULL) && !ret->meth->init(ret))
124     {
125         OPENSSL_free(ret);
126         ret=NULL;
127     }
```

```

128     return(ret);
129 }

131 int DSO_free(DSO *dso)
132 {
133     int i;
134
135     if(dso == NULL)
136     {
137         DSOerr(DSO_F_DSO_FREE,ERR_R_PASSED_NULL_PARAMETER);
138         return(0);
139     }
140
141     i=CRYPTO_add(&dso->references,-1,CRYPTO_LOCK_DSO);
142 #ifdef REF_PRINT
143     REF_PRINT("DSO",dso);
144 #endif
145     if(i > 0) return(1);
146 #ifdef REF_CHECK
147     if(i < 0)
148     {
149         fprintf(stderr,"DSO_free, bad reference count\n");
150         abort();
151     }
152 #endif

154     if((dso->meth->dso_unload != NULL) && !dso->meth->dso_unload(dso))
155     {
156         DSOerr(DSO_F_DSO_FREE,DSO_R_UNLOAD_FAILED);
157         return(0);
158     }

160     if((dso->meth->finish != NULL) && !dso->meth->finish(dso))
161     {
162         DSOerr(DSO_F_DSO_FREE,DSO_R_FINISH_FAILED);
163         return(0);
164     }

165     sk_void_free(dso->meth_data);
166     if(dso->filename != NULL)
167         OPENSSL_free(dso->filename);
168     if(dso->loaded_filename != NULL)
169         OPENSSL_free(dso->loaded_filename);
170
171     OPENSSL_free(dso);
172     return(1);
173 }

174

176 int DSO_flags(DSO *dso)
177 {
178     return((dso == NULL) ? 0 : dso->flags);
179 }

182 int DSO_up_ref(DSO *dso)
183 {
184     if (dso == NULL)
185     {
186         DSOerr(DSO_F_DSO_UP_REF,ERR_R_PASSED_NULL_PARAMETER);
187         return(0);
188     }

190     CRYPTO_add(&dso->references,1,CRYPTO_LOCK_DSO);
191     return(1);
192 }

```

```

194 DSO *DSO_load(DSO *dso, const char *filename, DSO_METHOD *meth, int flags)
195 {
196     DSO *ret;
197     int allocated = 0;

199     if(dso == NULL)
200     {
201         ret = DSO_new_method(meth);
202         if(ret == NULL)
203         {
204             DSOerr(DSO_F_DSO_LOAD,ERR_R_MALLOC_FAILURE);
205             goto err;
206         }
207         allocated = 1;
208         /* Pass the provided flags to the new DSO object */
209         if(DSO_ctrl(ret, DSO_CTRL_SET_FLAGS, flags, NULL) < 0)
210         {
211             DSOerr(DSO_F_DSO_LOAD,DSO_R_CTRL_FAILED);
212             goto err;
213         }
214     }
215     else
216     {
217         ret = dso;
218         /* Don't load if we're currently already loaded */
219         if(ret->filename != NULL)
220         {
221             DSOerr(DSO_F_DSO_LOAD,DSO_R_DSO_ALREADY_LOADED);
222             goto err;
223         }
224         /* filename can only be NULL if we were passed a dso that already has
225          * one set. */
226         if(filename != NULL)
227             if(!DSO_set_filename(ret, filename))
228             {
229                 DSOerr(DSO_F_DSO_LOAD,DSO_R_SET_FILENAME_FAILED);
230                 goto err;
231             }
232         filename = ret->filename;
233         if(filename == NULL)
234         {
235             DSOerr(DSO_F_DSO_LOAD,DSO_R_NO_FILENAME);
236             goto err;
237         }
238         if(ret->meth->dso_load == NULL)
239         {
240             DSOerr(DSO_F_DSO_LOAD,DSO_R_UNSUPPORTED);
241             goto err;
242         }
243         if(!ret->meth->dso_load(ret))
244         {
245             DSOerr(DSO_F_DSO_LOAD,DSO_R_LOAD_FAILED);
246             goto err;
247         }
248         /* Load succeeded */
249         return(ret);
250     err:
251         if(allocated)
252             DSO_free(ret);
253         return(NULL);
254     }

255 void *DSO_bind_var(DSO *dso, const char *symname)
256 {
257     void *ret = NULL;

259     if((dso == NULL) || (symname == NULL))

```

```

260     {
261         DSOerr(DSO_F_DSO_BIND_VAR,ERR_R_PASSED_NULL_PARAMETER);
262         return(NULL);
263     }
264     if(dso->meth->dso_bind_var == NULL)
265     {
266         DSOerr(DSO_F_DSO_BIND_VAR,DSO_R_UNSUPPORTED);
267         return(NULL);
268     }
269     if((ret = dso->meth->dso_bind_var(dso, symname)) == NULL)
270     {
271         DSOerr(DSO_F_DSO_BIND_VAR,DSO_R_SYM_FAILURE);
272         return(NULL);
273     }
274     /* Success */
275     return(ret);
276 }

278 DSO_FUNC_TYPE DSO_bind_func(DSO *dso, const char *symname)
279 {
280     DSO_FUNC_TYPE ret = NULL;

282     if((dso == NULL) || (symname == NULL))
283     {
284         DSOerr(DSO_F_DSO_BIND_FUNC,ERR_R_PASSED_NULL_PARAMETER);
285         return(NULL);
286     }
287     if(dso->meth->dso_bind_func == NULL)
288     {
289         DSOerr(DSO_F_DSO_BIND_FUNC,DSO_R_UNSUPPORTED);
290         return(NULL);
291     }
292     if((ret = dso->meth->dso_bind_func(dso, symname)) == NULL)
293     {
294         DSOerr(DSO_F_DSO_BIND_FUNC,DSO_R_SYM_FAILURE);
295         return(NULL);
296     }
297     /* Success */
298     return(ret);
299 }

301 /* I don't really like these *ctrl functions very much to be perfectly
302  * honest. For one thing, I think I have to return a negative value for
303  * any error because possible DSO_ctrl() commands may return values
304  * such as "size"s that can legitimately be zero (making the standard
305  * "if(DSO_cmd(...))" form that works almost everywhere else fail at
306  * odd times. I'd prefer "output" values to be passed by reference and
307  * the return value as success/failure like usual ... but we conform
308  * when we must... :-) */
309 long DSO_ctrl(DSO *dso, int cmd, long larg, void *parg)
310 {
311     if(dso == NULL)
312     {
313         DSOerr(DSO_F_DSO_CTRL,ERR_R_PASSED_NULL_PARAMETER);
314         return(-1);
315     }
316     /* We should intercept certain generic commands and only pass control
317      * to the method-specific ctrl() function if it's something we don't
318      * handle. */
319     switch(cmd)
320     {
321     case DSO_CTRL_GET_FLAGS:
322         return dso->flags;
323     case DSO_CTRL_SET_FLAGS:
324         dso->flags = (int)larg;
325         return(0);

```

```

326     case DSO_CTRL_OR_FLAGS:
327         dso->flags |= (int)larg;
328         return(0);
329     default:
330         break;
331     }
332     if((dso->meth == NULL) || (dso->meth->dso_ctrl == NULL))
333     {
334         DSOerr(DSO_F_DSO_CTRL,DSO_R_UNSUPPORTED);
335         return(-1);
336     }
337     return(dso->meth->dso_ctrl(dso,cmd, larg, parg));
338 }

340 int DSO_set_name_converter(DSO *dso, DSO_NAME_CONVERTER_FUNC cb,
341                             DSO_NAME_CONVERTER_FUNC *oldcb)
342 {
343     if(dso == NULL)
344     {
345         DSOerr(DSO_F_DSO_SET_NAME_CONVERTER,
346                 ERR_R_PASSED_NULL_PARAMETER);
347         return(0);
348     }
349     if(oldcb)
350         *oldcb = dso->name_converter;
351     dso->name_converter = cb;
352     return(1);
353 }

355 const char *DSO_get_filename(DSO *dso)
356 {
357     if(dso == NULL)
358     {
359         DSOerr(DSO_F_DSO_GET_FILENAME,ERR_R_PASSED_NULL_PARAMETER);
360         return(NULL);
361     }
362     return(dso->filename);
363 }

365 int DSO_set_filename(DSO *dso, const char *filename)
366 {
367     char *copied;

369     if((dso == NULL) || (filename == NULL))
370     {
371         DSOerr(DSO_F_DSO_SET_FILENAME,ERR_R_PASSED_NULL_PARAMETER);
372         return(0);
373     }
374     if(dso->loaded_filename)
375     {
376         DSOerr(DSO_F_DSO_SET_FILENAME,DSO_R_DSO_ALREADY_LOADED);
377         return(0);
378     }
379     /* We'll duplicate filename */
380     copied = OPENSSL_malloc(strlen(filename) + 1);
381     if(copied == NULL)
382     {
383         DSOerr(DSO_F_DSO_SET_FILENAME,ERR_R_MALLOC_FAILURE);
384         return(0);
385     }
386     BUF_strncpy(copied, filename, strlen(filename) + 1);
387     if(dso->filename)
388         OPENSSL_free(dso->filename);
389     dso->filename = copied;
390     return(1);
391 }

```

```

393 char *DSO_merge(DSO *dso, const char *filespec1, const char *filespec2)
394 {
395     char *result = NULL;
396
397     if(dso == NULL || filespec1 == NULL)
398     {
399         DSOerr(DSO_F_DSO_MERGE, ERR_R_PASSED_NULL_PARAMETER);
400         return(NULL);
401     }
402     if((dso->flags & DSO_FLAG_NO_NAME_TRANSLATION) == 0)
403     {
404         if(dso->merger != NULL)
405             result = dso->merger(dso, filespec1, filespec2);
406         else if(dso->meth->dso_merger != NULL)
407             result = dso->meth->dso_merger(dso,
408                 filespec1, filespec2);
409     }
410     return(result);
411 }
412
413 char *DSO_convert_filename(DSO *dso, const char *filename)
414 {
415     char *result = NULL;
416
417     if(dso == NULL)
418     {
419         DSOerr(DSO_F_DSO_CONVERT_FILENAME, ERR_R_PASSED_NULL_PARAMETER);
420         return(NULL);
421     }
422     if(filename == NULL)
423         filename = dso->filename;
424     if(filename == NULL)
425     {
426         DSOerr(DSO_F_DSO_CONVERT_FILENAME, DSO_R_NO_FILENAME);
427         return(NULL);
428     }
429     if((dso->flags & DSO_FLAG_NO_NAME_TRANSLATION) == 0)
430     {
431         if(dso->name_converter != NULL)
432             result = dso->name_converter(dso, filename);
433         else if(dso->meth->dso_name_converter != NULL)
434             result = dso->meth->dso_name_converter(dso, filename);
435     }
436     if(result == NULL)
437     {
438         result = OPENSSL_malloc(strlen(filename) + 1);
439         if(result == NULL)
440         {
441             DSOerr(DSO_F_DSO_CONVERT_FILENAME,
442                 ERR_R_MALLOC_FAILURE);
443             return(NULL);
444         }
445         BUF_strlcpy(result, filename, strlen(filename) + 1);
446     }
447     return(result);
448 }
449
450 const char *DSO_get_loaded_filename(DSO *dso)
451 {
452     if(dso == NULL)
453     {
454         DSOerr(DSO_F_DSO_GET_LOADED_FILENAME,
455             ERR_R_PASSED_NULL_PARAMETER);
456         return(NULL);
457     }

```

```

458     return(dso->loaded_filename);
459 }
460
461 int DSO_pathbyaddr(void *addr, char *path, int sz)
462 {
463     DSO_METHOD *meth = default_DSO_meth;
464     if (meth == NULL) meth = DSO_METHOD_openssl();
465     if (meth->pathbyaddr == NULL)
466     {
467         DSOerr(DSO_F_DSO_PATHBYADDR, DSO_R_UNSUPPORTED);
468         return -1;
469     }
470     return (*meth->pathbyaddr)(addr, path, sz);
471 }
472
473 void *DSO_global_lookup(const char *name)
474 {
475     DSO_METHOD *meth = default_DSO_meth;
476     if (meth == NULL) meth = DSO_METHOD_openssl();
477     if (meth->globallookup == NULL)
478     {
479         DSOerr(DSO_F_DSO_GLOBAL_LOOKUP, DSO_R_UNSUPPORTED);
480         return NULL;
481     }
482     return (*meth->globallookup)(name);
483 }

```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_null.c

1

```
*****
3408 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_null.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dso_null.c */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 /* This "NULL" method is provided as the fallback for systems that have
60 * no appropriate support for "shared-libraries". */
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_null.c

2

```
62 #include <stdio.h>
63 #include "cryptlib.h"
64 #include <openssl/dso.h>

66 static DSO_METHOD dso_meth_null = {
67     "NULL shared library method",
68     NULL, /* load */
69     NULL, /* unload */
70     NULL, /* bind_var */
71     NULL, /* bind_func */
72 /* For now, "unbind" doesn't exist */
73 #if 0
74     NULL, /* unbind_var */
75     NULL, /* unbind_func */
76 #endif
77     NULL, /* ctrl */
78     NULL, /* dso_name_converter */
79     NULL, /* dso_merger */
80     NULL, /* init */
81     NULL, /* finish */
82     NULL, /* pathbyaddr */
83     NULL, /* globallookup */
84 };

86 DSO_METHOD *DSO_METHOD_null(void)
87 {
88     return(&dso_meth_null);
89 }
```


new/usr/src/lib/openssl/libsunw_crypto/dso/dso_openssl.c

1

```
*****
3264 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_openssl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dso_openssl.c */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/dso.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_openssl.c

2

```
63 /* We just pinch the method from an appropriate "default" method. */
65 DSO_METHOD *DSO_METHOD_openssl(void)
66 {
67 #ifdef DEF_DSO_METHOD
68     return(DEF_DSO_METHOD());
69 #elif defined(DSO_DLFCN)
70     return(DSO_METHOD_dlfcn());
71 #elif defined(DSO_DL)
72     return(DSO_METHOD_dl());
73 #elif defined(DSO_WIN32)
74     return(DSO_METHOD_win32());
75 #elif defined(DSO_VMS)
76     return(DSO_METHOD_vms());
77 #elif defined(DSO_BEOS)
78     return(DSO_METHOD_beos());
79 #else
80     return(DSO_METHOD_null());
81 #endif
82 }
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_vms.c

1

```
*****
15324 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_vms.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dso_vms.c -*- mode:C; c-file-style:"eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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20  * 3. All advertising materials mentioning features or use of this
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include <string.h>
61 #include <errno.h>
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_vms.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/dso.h>
64 #ifdef OPENSSL_SYS_VMS
65 #pragma message disable DOLLARID
66 #include <rms.h>
67 #include <lib$ routines.h>
68 #include <stsdef.h>
69 #include <descrip.h>
70 #include <starlet.h>
71 #include "vms_rms.h"
72 #endif
73
74 /* Some compiler options may mask the declaration of "_malloc32". */
75 #if __INITIAL_POINTER_SIZE && defined _ANSI_C_SOURCE
76 # if __INITIAL_POINTER_SIZE == 64
77 # pragma pointer_size save
78 # pragma pointer_size 32
79 void *_malloc32 (__size_t);
80 # pragma pointer_size restore
81 # endif /* __INITIAL_POINTER_SIZE == 64 */
82 #endif /* __INITIAL_POINTER_SIZE && defined _ANSI_C_SOURCE */
83
84 #ifndef OPENSSL_SYS_VMS
85 DSO_METHOD *DSO_METHOD_vms(void)
86 {
87     return NULL;
88 }
89 #else
90 #pragma message disable DOLLARID
91
92 static int vms_load(DSO *dso);
93 static int vms_unload(DSO *dso);
94 static void *vms_bind_var(DSO *dso, const char *symname);
95 static DSO_FUNC_TYPE vms_bind_func(DSO *dso, const char *symname);
96 #if 0
97 static int vms_unbind_var(DSO *dso, char *symname, void *symptr);
98 static int vms_unbind_func(DSO *dso, char *symname, DSO_FUNC_TYPE symptr);
99 static int vms_init(DSO *dso);
100 static int vms_finish(DSO *dso);
101 static long vms_ctrl(DSO *dso, int cmd, long larg, void *parg);
102 #endif
103 static char *vms_name_converter(DSO *dso, const char *filename);
104 static char *vms_merger(DSO *dso, const char *filespec1,
105     const char *filespec2);
106
107 static DSO_METHOD dso_meth_vms = {
108     "OpenSSL 'VMS' shared library method",
109     vms_load,
110     NULL, /* unload */
111     vms_bind_var,
112     vms_bind_func,
113     /* For now, "unbind" doesn't exist */
114     #if 0
115     NULL, /* unbind_var */
116     NULL, /* unbind_func */
117     #endif
118     NULL, /* ctrl */
119     vms_name_converter,
120     vms_merger,
121     NULL, /* init */
122     NULL /* finish */
123 };
124
125 /* On VMS, the only "handle" is the file name. LIB$FIND_IMAGE_SYMBOL depends
126  * on the reference to the file name being the same for all calls regarding
```

```

128 * one shared image, so we'll just store it in an instance of the following
129 * structure and put a pointer to that instance in the meth_data stack.
130 */
131 typedef struct dso_internal_st
132 {
133     /* This should contain the name only, no directory,
134     * no extension, nothing but a name. */
135     struct dsc$descriptor_s filename_dsc;
136     char filename[ NAMX_MAXRSS+ 1];
137     /* This contains whatever is not in filename, if needed.
138     * Normally not defined. */
139     struct dsc$descriptor_s imagename_dsc;
140     char imagename[ NAMX_MAXRSS+ 1];
141 } DSO_VMS_INTERNAL;

143 DSO_METHOD *DSO_METHOD_vms(void)
144 {
145     return(&dso_meth_vms);
146 }

148 static int vms_load(DSO *dso)
149 {
150     void *ptr = NULL;
151     /* See applicable comments in dso_dl.c */
152     char *filename = DSO_convert_filename(dso, NULL);

154 /* Ensure 32-bit pointer for "p", and appropriate malloc() function. */
155 #if __INITIAL_POINTER_SIZE == 64
156 # define DSO_MALLOC _malloc32
157 # pragma pointer_size save
158 # pragma pointer_size 32
159 #else /* __INITIAL_POINTER_SIZE == 64 */
160 # define DSO_MALLOC OPENSSL_malloc
161 #endif /* __INITIAL_POINTER_SIZE == 64 [else] */

163     DSO_VMS_INTERNAL *p = NULL;

165 #if __INITIAL_POINTER_SIZE == 64
166 # pragma pointer_size restore
167 #endif /* __INITIAL_POINTER_SIZE == 64 */

169     const char *sp1, *sp2; /* Search result */

171     if(filename == NULL)
172     {
173         DSOerr(DSO_F_VMS_LOAD,DSO_R_NO_FILENAME);
174         goto err;
175     }

177     /* A file specification may look like this:
178     *
179     *      node::dev:[dir-spec]name.type;ver
180     *
181     * or (for compatibility with TOPS-20):
182     *
183     *      node::dev:<dir-spec>name.type;ver
184     *
185     * and the dir-spec uses '.' as separator. Also, a dir-spec
186     * may consist of several parts, with mixed use of [] and <>;
187     *
188     *      [dir1.]<dir2>
189     *
190     * We need to split the file specification into the name and
191     * the rest (both before and after the name itself).
192     */
193     /* Start with trying to find the end of a dir-spec, and save the

```

```

194     position of the byte after in sp1 */
195     sp1 = strrchr(filename, 'I');
196     sp2 = strrchr(filename, '>');
197     if (sp1 == NULL) sp1 = sp2;
198     if (sp2 != NULL && sp2 > sp1) sp1 = sp2;
199     if (sp1 == NULL) sp1 = strrchr(filename, ':');
200     if (sp1 == NULL)
201         sp1 = filename;
202     else
203         sp1++; /* The byte after the found character */
204     /* Now, let's see if there's a type, and save the position in sp2 */
205     sp2 = strchr(sp1, '.');
206     /* If we found it, that's where we'll cut. Otherwise, look for a
207     * version number and save the position in sp2 */
208     if (sp2 == NULL) sp2 = strchr(sp1, ';');
209     /* If there was still nothing to find, set sp2 to point at the end of
210     * the string */
211     if (sp2 == NULL) sp2 = sp1 + strlen(sp1);

213     /* Check that we won't get buffer overflows */
214     if (sp2 - sp1 > FILENAME_MAX
215         || (sp1 - filename) + strlen(sp2) > FILENAME_MAX)
216     {
217         DSOerr(DSO_F_VMS_LOAD,DSO_R_FILENAME_TOO_BIG);
218         goto err;
219     }

221     p = DSO_MALLOC(sizeof(DSO_VMS_INTERNAL));
222     if(p == NULL)
223     {
224         DSOerr(DSO_F_VMS_LOAD,ERR_R_MALLOC_FAILURE);
225         goto err;
226     }

228     strncpy(p->filename, sp1, sp2-sp1);
229     p->filename[sp2-sp1] = '\0';

231     strncpy(p->imagename, filename, sp1-filename);
232     p->imagename[sp1-filename] = '\0';
233     strcat(p->imagename, sp2);

235     p->filename_dsc.dsc$w_length = strlen(p->filename);
236     p->filename_dsc.dsc$b_dtype = DSC$K_DTYPE_T;
237     p->filename_dsc.dsc$b_class = DSC$K_CLASS_S;
238     p->filename_dsc.dsc$a_pointer = p->filename;
239     p->imagename_dsc.dsc$w_length = strlen(p->imagename);
240     p->imagename_dsc.dsc$b_dtype = DSC$K_DTYPE_T;
241     p->imagename_dsc.dsc$b_class = DSC$K_CLASS_S;
242     p->imagename_dsc.dsc$a_pointer = p->imagename;

244     if(!sk_void_push(dso->meth_data, (char *)p))
245     {
246         DSOerr(DSO_F_VMS_LOAD,DSO_R_STACK_ERROR);
247         goto err;
248     }

250     /* Success (for now, we lie. We actually do not know...) */
251     dso->loaded_filename = filename;
252     return(1);
253 err:
254     /* Cleanup! */
255     if(p != NULL)
256         OPENSSL_free(p);
257     if(filename != NULL)
258         OPENSSL_free(filename);
259     return(0);

```

```

260     }
262 /* Note that this doesn't actually unload the shared image, as there is no
263  * such thing in VMS. Next time it get loaded again, a new copy will
264  * actually be loaded.
265  */
266 static int vms_unload(DSO *dso)
267 {
268     DSO_VMS_INTERNAL *p;
269     if(dso == NULL)
270     {
271         DSOerr(DSO_F_VMS_UNLOAD,ERR_R_PASSED_NULL_PARAMETER);
272         return(0);
273     }
274     if(sk_void_num(dso->meth_data) < 1)
275         return(1);
276     p = (DSO_VMS_INTERNAL *)sk_void_pop(dso->meth_data);
277     if(p == NULL)
278     {
279         DSOerr(DSO_F_VMS_UNLOAD,DSO_R_NULL_HANDLE);
280         return(0);
281     }
282     /* Cleanup */
283     OPENSSL_free(p);
284     return(1);
285 }
287 /* We must do this in a separate function because of the way the exception
288  handler works (it makes this function return */
289 static int do_find_symbol(DSO_VMS_INTERNAL *ptr,
290                          struct dsc$descriptor_s *symname_dsc, void **sym,
291                          unsigned long flags)
292 {
293     /* Make sure that signals are caught and returned instead of
294      aborting the program. The exception handler gets unestablished
295      automatically on return from this function. */
296     lib$establish(lib$sig_to_ret);
298     if(ptr->imagename_dsc.dsc$w_length)
299         return lib$find_image_symbol(&ptr->filename_dsc,
300                                     symname_dsc, sym,
301                                     &ptr->imagename_dsc, flags);
302     else
303         return lib$find_image_symbol(&ptr->filename_dsc,
304                                     symname_dsc, sym,
305                                     0, flags);
306 }
308 void vms_bind_sym(DSO *dso, const char *symname, void **sym)
309 {
310     DSO_VMS_INTERNAL *ptr;
311     int status;
312     #if 0
313     int flags = (1<<4); /* LIB$M_FIS_MIXEDCASE, but this symbol isn't
314                          defined in VMS older than 7.0 or so */
315     #else
316     int flags = 0;
317     #endif
318     struct dsc$descriptor_s symname_dsc;
320     /* Arrange 32-bit pointer to (copied) string storage, if needed. */
321     #if __INITIAL_POINTER_SIZE == 64
322     # define SYMNAME symname_32p
323     # pragma pointer_size save
324     # pragma pointer_size 32
325     char *symname_32p;

```

```

326 # pragma pointer_size restore
327     char symname_32[ NAMX_MAXRSS+ 1];
328 #else /* __INITIAL_POINTER_SIZE == 64 */
329 # define SYMNAME ((char *) symname)
330 #endif /* __INITIAL_POINTER_SIZE == 64 [else] */
332     *sym = NULL;
334     if((dso == NULL) || (symname == NULL))
335     {
336         DSOerr(DSO_F_VMS_BIND_SYM,ERR_R_PASSED_NULL_PARAMETER);
337         return;
338     }
340     #if __INITIAL_POINTER_SIZE == 64
341     /* Copy the symbol name to storage with a 32-bit pointer. */
342     symname_32p = symname_32;
343     strcpy( symname_32p, symname);
344     #endif /* __INITIAL_POINTER_SIZE == 64 [else] */
346     symname_dsc.dsc$w_length = strlen(SYMNAME);
347     symname_dsc.dsc$b_dtype = DSC$K_DTYPE_T;
348     symname_dsc.dsc$b_class = DSC$K_CLASS_S;
349     symname_dsc.dsc$a_pointer = SYMNAME;
351     if(sk_void_num(dso->meth_data) < 1)
352     {
353         DSOerr(DSO_F_VMS_BIND_SYM,DSO_R_STACK_ERROR);
354         return;
355     }
356     ptr = (DSO_VMS_INTERNAL *)sk_void_value(dso->meth_data,
357                                              sk_void_num(dso->meth_data) - 1);
358     if(ptr == NULL)
359     {
360         DSOerr(DSO_F_VMS_BIND_SYM,DSO_R_NULL_HANDLE);
361         return;
362     }
364     if(dso->flags & DSO_FLAG_UPCASE_SYMBOL) flags = 0;
366     status = do_find_symbol(ptr, &symname_dsc, sym, flags);
368     if(!VMS_STATUS_SUCCESS(status))
369     {
370         unsigned short length;
371         char errstring[257];
372         struct dsc$descriptor_s errstring_dsc;
374         errstring_dsc.dsc$w_length = sizeof(errstring);
375         errstring_dsc.dsc$b_dtype = DSC$K_DTYPE_T;
376         errstring_dsc.dsc$b_class = DSC$K_CLASS_S;
377         errstring_dsc.dsc$a_pointer = errstring;
379         *sym = NULL;
381         status = sys$getmsg(status, &length, &errstring_dsc, 1, 0);
383         if(!VMS_STATUS_SUCCESS(status))
384             lib$signal(status); /* This is really bad. Abort! */
385         else
386         {
387             errstring[length] = '\0';
389             DSOerr(DSO_F_VMS_BIND_SYM,DSO_R_SYM_FAILURE);
390             if (ptr->imagename_dsc.dsc$w_length)
391                 ERR_add_error_data(9,

```

```

392         "Symbol ", symname,
393         " in ", ptr->filename,
394         " (" , ptr->imagename, ")",
395         ": ", errstring);
396     else
397         ERR_add_error_data(6,
398         "Symbol ", symname,
399         " in ", ptr->filename,
400         ": ", errstring);
401     }
402     return;
403 }
404 return;
405 }

407 static void *vms_bind_var(DSO *dso, const char *symname)
408 {
409     void *sym = 0;
410     vms_bind_sym(dso, symname, &sym);
411     return sym;
412 }

414 static DSO_FUNC_TYPE vms_bind_func(DSO *dso, const char *symname)
415 {
416     DSO_FUNC_TYPE sym = 0;
417     vms_bind_sym(dso, symname, (void **)&sym);
418     return sym;
419 }

422 static char *vms_merger(DSO *dso, const char *filespec1, const char *filespec2)
423 {
424     int status;
425     int filespec1len, filespec2len;
426     struct FAB fab;
427     struct NAMX_STRUCT nam;
428     char esa[ NAMX_MAXRSS+ 1];
429     char *merged;

431 /* Arrange 32-bit pointer to (copied) string storage, if needed. */
432 #if __INITIAL_POINTER_SIZE == 64
433 # define FILESPEC1 filespec1_32p;
434 # define FILESPEC2 filespec2_32p;
435 # pragma pointer_size save
436 # pragma pointer_size 32
437     char *filespec1_32p;
438     char *filespec2_32p;
439 # pragma pointer_size restore
440     char filespec1_32[ NAMX_MAXRSS+ 1];
441     char filespec2_32[ NAMX_MAXRSS+ 1];
442 #else /* __INITIAL_POINTER_SIZE == 64 */
443 # define FILESPEC1 ((char *) filespec1)
444 # define FILESPEC2 ((char *) filespec2)
445 #endif /* __INITIAL_POINTER_SIZE == 64 [else] */

447     if (!filespec1) filespec1 = "";
448     if (!filespec2) filespec2 = "";
449     filespec1len = strlen(filespec1);
450     filespec2len = strlen(filespec2);

452 #if __INITIAL_POINTER_SIZE == 64
453     /* Copy the file names to storage with a 32-bit pointer. */
454     filespec1_32p = filespec1_32;
455     filespec2_32p = filespec2_32;
456     strcpy( filespec1_32p, filespec1);
457     strcpy( filespec2_32p, filespec2);

```

```

458 #endif /* __INITIAL_POINTER_SIZE == 64 [else] */

460     fab = cc$rms_fab;
461     nam = CC_RMS_NAMX;

463     FAB_OR_NAML( fab, nam).FAB_OR_NAML_FNA = FILESPEC1;
464     FAB_OR_NAML( fab, nam).FAB_OR_NAML_FNS = filespec1len;
465     FAB_OR_NAML( fab, nam).FAB_OR_NAML_DNA = FILESPEC2;
466     FAB_OR_NAML( fab, nam).FAB_OR_NAML_DNS = filespec2len;
467     NAMX_DNA_FNA_SET( fab)

469     nam.NAMX_ESA = esa;
470     nam.NAMX_ESS = NAMX_MAXRSS;
471     nam.NAMX_NOP = NAMSM_SYNCHK | NAMSM_PWD;
472     SET_NAMX_NO_SHORT_UPCASE( nam);

474     fab.FAB_NAMX = &nam;

476     status = sys$parse(&fab, 0, 0);

478     if (!$VMS_STATUS_SUCCESS(status))
479     {
480         unsigned short length;
481         char errstring[257];
482         struct dsc$descriptor_s errstring_dsc;

484         errstring_dsc.dsc$w_length = sizeof(errstring);
485         errstring_dsc.dsc$b_dtype = DSCSK_DTYPE_T;
486         errstring_dsc.dsc$b_class = DSCSK_CLASS_S;
487         errstring_dsc.dsc$a_pointer = errstring;

489         status = sys$getmsg(status, &length, &errstring_dsc, 1, 0);

491         if (!$VMS_STATUS_SUCCESS(status))
492             lib$signal(status); /* This is really bad. Abort! */
493         else
494         {
495             errstring[length] = '\0';

497             DSOerr(DSO_F_VMS_MERGER, DSO_R_FAILURE);
498             ERR_add_error_data(7,
499             "filespec \"", filespec1, "\", ",
500             "defaults \"", filespec2, "\", ": ",
501             errstring);
502         }
503         return(NULL);
504     }

506     merged = OPENSSL_malloc( nam.NAMX_ESL+ 1);
507     if(!merged)
508         goto malloc_err;
509     strncpy( merged, nam.NAMX_ESA, nam.NAMX_ESL);
510     merged[ nam.NAMX_ESL] = '\0';
511     return(merged);
512 malloc_err:
513     DSOerr(DSO_F_VMS_MERGER,
514     ERR_R_MALLOC_FAILURE);
515 }

517 static char *vms_name_converter(DSO *dso, const char *filename)
518 {
519     int len = strlen(filename);
520     char *not_translated = OPENSSL_malloc(len+1);
521     strcpy(not_translated, filename);
522     return(not_translated);
523 }

```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_vms.c

9

```
525 #endif /* OPENSAL_SYS_VMS */
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_win32.c

1

```
*****
20880 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/dso/dso_win32.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* dso_win32.c - mode:C; c-file-style: "eay" - */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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13 * notice, this list of conditions and the following disclaimer.
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42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include <string.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/dso/dso_win32.c

2

```
62 #include <openssl/dso.h>
64 #if !defined(DSO_WIN32)
65 DSO_METHOD *DSO_METHOD_win32(void)
66 {
67     return NULL;
68 }
69 #else
71 #ifdef _WIN32_WCE
72 # if _WIN32_WCE < 300
73 static FARPROC GetProcAddressA(HMODULE hModule, LPCSTR lpProcName)
74 {
75     WCHAR lpProcNameW[64];
76     int i;
78     for (i=0; lpProcName[i] && i<64; i++)
79         lpProcNameW[i] = (WCHAR)lpProcName[i];
80     if (i==64) return NULL;
81     lpProcNameW[i] = 0;
83     return GetProcAddressW(hModule, lpProcNameW);
84 }
85 # endif
86 # undef GetProcAddress
87 # define GetProcAddress GetProcAddressA
89 static HINSTANCE LoadLibraryA(LPCSTR lpLibFileName)
90 {
91     WCHAR *fnamw;
92     size_t len_0=strlen(lpLibFileName)+1,i;
94 #ifdef _MSC_VER
95     fnamw = (WCHAR *)_alloca (len_0*sizeof(WCHAR));
96 #else
97     fnamw = (WCHAR *)alloca (len_0*sizeof(WCHAR));
98 #endif
99     if (fnamw == NULL)
100     {
101         SetLastError(ERROR_NOT_ENOUGH_MEMORY);
102         return NULL;
103     }
105 #if defined(_WIN32_WCE) && _WIN32_WCE>=101
106     if (!MultiByteToWideChar(CP_ACP,0,lpLibFileName,len_0,fnamw,len_0))
107 #endif
108         for (i=0;i<len_0;i++) fnamw[i]=(WCHAR)lpLibFileName[i];
110     return LoadLibraryW(fnamw);
111 }
112 #endif
114 /* Part of the hack in "win32_load" ... */
115 #define DSO_MAX_TRANSLATED_SIZE 256
117 static int win32_load(DSO *dso);
118 static int win32_unload(DSO *dso);
119 static void *win32_bind_var(DSO *dso, const char *symname);
120 static DSO_FUNC_TYPE win32_bind_func(DSO *dso, const char *symname);
121 #if 0
122 static int win32_unbind_var(DSO *dso, char *symname, void *symptr);
123 static int win32_unbind_func(DSO *dso, char *symname, DSO_FUNC_TYPE symptr);
124 static int win32_init(DSO *dso);
125 static int win32_finish(DSO *dso);
126 static long win32_ctrl(DSO *dso, int cmd, long larg, void *parg);
127 #endif
```

```

128 static char *win32_name_converter(DSO *dso, const char *filename);
129 static char *win32_merger(DSO *dso, const char *filespec1,
130     const char *filespec2);
131 static int win32_pathbyaddr(void *addr, char *path, int sz);
132 static void *win32_globallookup(const char *name);

134 static const char *openssl_strchr(const char *string, int c, size_t len);

136 static DSO_METHOD dso_meth_win32 = {
137     "OpenSSL 'win32' shared library method",
138     win32_load,
139     win32_unload,
140     win32_bind_var,
141     win32_bind_func,
142     /* For now, "unbind" doesn't exist */
143     #if 0
144         NULL, /* unbind_var */
145         NULL, /* unbind_func */
146     #endif
147     NULL, /* ctrl */
148     win32_name_converter,
149     win32_merger,
150     NULL, /* init */
151     NULL, /* finish */
152     win32_pathbyaddr,
153     win32_globallookup
154 };

156 DSO_METHOD *DSO_METHOD_win32(void)
157 {
158     return(&dso_meth_win32);
159 }

161 /* For this DSO_METHOD, our meth_data STACK will contain;
162  * (i) a pointer to the handle (HINSTANCE) returned from
163  * LoadLibrary(), and copied.
164  */

166 static int win32_load(DSO *dso)
167 {
168     HINSTANCE h = NULL, *p = NULL;
169     /* See applicable comments from dso_dl.c */
170     char *filename = DSO_convert_filename(dso, NULL);

172     if(filename == NULL)
173     {
174         DSOerr(DSO_F_WIN32_LOAD, DSO_R_NO_FILENAME);
175         goto err;
176     }
177     h = LoadLibraryA(filename);
178     if(h == NULL)
179     {
180         DSOerr(DSO_F_WIN32_LOAD, DSO_R_LOAD_FAILED);
181         ERR_add_error_data(3, "filename(", filename, ")");
182         goto err;
183     }
184     p = (HINSTANCE *)OPENSSL_malloc(sizeof(HINSTANCE));
185     if(p == NULL)
186     {
187         DSOerr(DSO_F_WIN32_LOAD, ERR_R_MALLOC_FAILURE);
188         goto err;
189     }
190     *p = h;
191     if(!sk_void_push(dso->meth_data, p))
192     {
193         DSOerr(DSO_F_WIN32_LOAD, DSO_R_STACK_ERROR);

```

```

194         goto err;
195     }
196     /* Success */
197     dso->loaded_filename = filename;
198     return(1);
199 err:
200     /* Cleanup !*/
201     if(filename != NULL)
202         OPENSSL_free(filename);
203     if(p != NULL)
204         OPENSSL_free(p);
205     if(h != NULL)
206         FreeLibrary(h);
207     return(0);
208 }

210 static int win32_unload(DSO *dso)
211 {
212     HINSTANCE *p;
213     if(dso == NULL)
214     {
215         DSOerr(DSO_F_WIN32_UNLOAD, ERR_R_PASSED_NULL_PARAMETER);
216         return(0);
217     }
218     if(sk_void_num(dso->meth_data) < 1)
219         return(1);
220     p = sk_void_pop(dso->meth_data);
221     if(p == NULL)
222     {
223         DSOerr(DSO_F_WIN32_UNLOAD, DSO_R_NULL_HANDLE);
224         return(0);
225     }
226     if(!FreeLibrary(*p))
227     {
228         DSOerr(DSO_F_WIN32_UNLOAD, DSO_R_UNLOAD_FAILED);
229         /* We should push the value back onto the stack in
230          * case of a retry. */
231         sk_void_push(dso->meth_data, p);
232         return(0);
233     }
234     /* Cleanup */
235     OPENSSL_free(p);
236     return(1);
237 }

239 /* Using GetProcAddress for variables? TODO: Check this out in
240  * the Win32 API docs, there's probably a variant for variables. */
241 static void *win32_bind_var(DSO *dso, const char *symname)
242 {
243     HINSTANCE *ptr;
244     void *sym;

246     if((dso == NULL) || (symname == NULL))
247     {
248         DSOerr(DSO_F_WIN32_BIND_VAR, ERR_R_PASSED_NULL_PARAMETER);
249         return(NULL);
250     }
251     if(sk_void_num(dso->meth_data) < 1)
252     {
253         DSOerr(DSO_F_WIN32_BIND_VAR, DSO_R_STACK_ERROR);
254         return(NULL);
255     }
256     ptr = sk_void_value(dso->meth_data, sk_void_num(dso->meth_data) - 1);
257     if(ptr == NULL)
258     {
259         DSOerr(DSO_F_WIN32_BIND_VAR, DSO_R_NULL_HANDLE);

```



```

260         return(NULL);
261     }
262     sym = GetProcAddress(*ptr, symname);
263     if(sym == NULL)
264     {
265         DSOerr(DSO_F_WIN32_BIND_FUNC, DSO_R_SYM_FAILURE);
266         ERR_add_error_data(3, "symname(", symname, ")");
267         return(NULL);
268     }
269     return(sym);
270 }

272 static DSO_FUNC_TYPE win32_bind_func(DSO *dso, const char *symname)
273 {
274     HINSTANCE *ptr;
275     void *sym;

277     if((dso == NULL) || (symname == NULL))
278     {
279         DSOerr(DSO_F_WIN32_BIND_FUNC, ERR_R_PASSED_NULL_PARAMETER);
280         return(NULL);
281     }
282     if(sk_void_num(dso->meth_data) < 1)
283     {
284         DSOerr(DSO_F_WIN32_BIND_FUNC, DSO_R_STACK_ERROR);
285         return(NULL);
286     }
287     ptr = sk_void_value(dso->meth_data, sk_void_num(dso->meth_data) - 1);
288     if(ptr == NULL)
289     {
290         DSOerr(DSO_F_WIN32_BIND_FUNC, DSO_R_NULL_HANDLE);
291         return(NULL);
292     }
293     sym = GetProcAddress(*ptr, symname);
294     if(sym == NULL)
295     {
296         DSOerr(DSO_F_WIN32_BIND_FUNC, DSO_R_SYM_FAILURE);
297         ERR_add_error_data(3, "symname(", symname, ")");
298         return(NULL);
299     }
300     return((DSO_FUNC_TYPE)sym);
301 }

303 struct file_st
304 {
305     const char *node; int nodelen;
306     const char *device; int devicelen;
307     const char *predir; int predirlen;
308     const char *dir; int dirlen;
309     const char *file; int filelen;
310 };

312 static struct file_st *win32_splitter(DSO *dso, const char *filename,
313 int assume_last_is_dir)
314 {
315     struct file_st *result = NULL;
316     enum { IN_NODE, IN_DEVICE, IN_FILE } position;
317     const char *start = filename;
318     char last;

320     if (!filename)
321     {
322         DSOerr(DSO_F_WIN32_SPLITTER, DSO_R_NO_FILENAME);
323         /*goto err;*/
324         return(NULL);
325     }

```

```

327     result = OPENSSL_malloc(sizeof(struct file_st));
328     if(result == NULL)
329     {
330         DSOerr(DSO_F_WIN32_SPLITTER,
331             ERR_R_MALLOC_FAILURE);
332         return(NULL);
333     }

335     memset(result, 0, sizeof(struct file_st));
336     position = IN_DEVICE;

338     if((filename[0] == '\\') && filename[1] == '\\')
339     || (filename[0] == '/' && filename[1] == '/')
340     {
341         position = IN_NODE;
342         filename += 2;
343         start = filename;
344         result->node = start;
345     }

347     do
348     {
349         last = filename[0];
350         switch(last)
351         {
352             case ':':
353                 if(position != IN_DEVICE)
354                 {
355                     DSOerr(DSO_F_WIN32_SPLITTER,
356                         DSO_R_INCORRECT_FILE_SYNTAX);
357                     /*goto err;*/
358                     OPENSSL_free(result);
359                     return(NULL);
360                 }
361                 result->device = start;
362                 result->devicelen = (int)(filename - start);
363                 position = IN_FILE;
364                 start = ++filename;
365                 result->dir = start;
366                 break;
367             case '\\':
368             case '/':
369                 if(position == IN_NODE)
370                 {
371                     result->nodelen = (int)(filename - start);
372                     position = IN_FILE;
373                     start = ++filename;
374                     result->dir = start;
375                 }
376                 else if(position == IN_DEVICE)
377                 {
378                     position = IN_FILE;
379                     filename++;
380                     result->dir = start;
381                     result->dirlen = (int)(filename - start);
382                     start = filename;
383                 }
384                 else
385                 {
386                     filename++;
387                     result->dirlen += (int)(filename - start);
388                     start = filename;
389                 }
390                 break;
391             case '\0':

```

```

392         if(position == IN_NODE)
393             {
394                 result->nodelen = (int)(filename - start);
395             }
396         else
397             {
398                 if(filename - start > 0)
399                     {
400                         if (assume_last_is_dir)
401                             {
402                                 if (position == IN_DEVICE)
403                                     {
404                                         result->dir = start;
405                                         result->dirlen = 0;
406                                     }
407                                 result->dirlen +=
408                                     (int)(filename - start);
409                             }
410                         else
411                             {
412                                 result->file = start;
413                                 result->filelen =
414                                     (int)(filename - start);
415                             }
416                     }
417             }
418         break;
419     default:
420         filename++;
421         break;
422     }
423 }
424 while(last);

426 if(!result->nodelen) result->node = NULL;
427 if(!result->devicelen) result->device = NULL;
428 if(!result->dirlen) result->dir = NULL;
429 if(!result->filelen) result->file = NULL;

431 return(result);
432 }

434 static char *win32_joiner(DSO *dso, const struct file_st *file_split)
435 {
436     int len = 0, offset = 0;
437     char *result = NULL;
438     const char *start;

440     if(!file_split)
441     {
442         DSOerr(DSO_F_WIN32_JOINER,
443             ERR_R_PASSED_NULL_PARAMETER);
444         return(NULL);
445     }
446     if(file_split->node)
447     {
448         len += 2 + file_split->nodelen; /* 2 for starting \\ */
449         if(file_split->predir || file_split->dir || file_split->file)
450             len++; /* 1 for ending \ */
451     }
452     else if(file_split->device)
453     {
454         len += file_split->devicelen + 1; /* 1 for ending : */
455     }
456     len += file_split->predirlen;
457     if(file_split->predir && (file_split->dir || file_split->file))

```

```

458         {
459             len++; /* 1 for ending \ */
460         }
461     len += file_split->dirlen;
462     if(file_split->dir && file_split->file)
463     {
464         len++; /* 1 for ending \ */
465     }
466     len += file_split->filelen;

468     if(!len)
469     {
470         DSOerr(DSO_F_WIN32_JOINER, DSO_R_EMPTY_FILE_STRUCTURE);
471         return(NULL);
472     }

474     result = OPENSSL_malloc(len + 1);
475     if (!result)
476     {
477         DSOerr(DSO_F_WIN32_JOINER,
478             ERR_R_MALLOC_FAILURE);
479         return(NULL);
480     }

482     if(file_split->node)
483     {
484         strcpy(&result[offset], "\\"); offset += 2;
485         strncpy(&result[offset], file_split->node,
486             file_split->nodelen); offset += file_split->nodelen;
487         if(file_split->predir || file_split->dir || file_split->file)
488         {
489             result[offset] = '\\'; offset++;
490         }
491     }
492     else if(file_split->device)
493     {
494         strncpy(&result[offset], file_split->device,
495             file_split->devicelen); offset += file_split->devicelen;
496         result[offset] = ':'; offset++;
497     }
498     start = file_split->predir;
499     while(file_split->predirlen > (start - file_split->predir))
500     {
501         const char *end = openssl_strnchr(start, '/',
502             file_split->predirlen - (start - file_split->predir));
503         if(!end)
504             end = start
505                 + file_split->predirlen
506                 - (start - file_split->predir);
507         strncpy(&result[offset], start,
508             end - start); offset += (int)(end - start);
509         result[offset] = '\\'; offset++;
510         start = end + 1;
511     }
512     #if 0 /* Not needed, since the directory converter above already appeneded
513         a backslash */
514     if(file_split->predir && (file_split->dir || file_split->file))
515     {
516         result[offset] = '\\'; offset++;
517     }
518     #endif

519     start = file_split->dir;
520     while(file_split->dirlen > (start - file_split->dir))
521     {
522         const char *end = openssl_strnchr(start, '/',
523             file_split->dirlen - (start - file_split->dir));

```

```

524         if(!end)
525             end = start
526             + file_split->dirlen
527             - (start - file_split->dir);
528         strncpy(&result[offset], start,
529             end - start); offset += (int)(end - start);
530         result[offset] = '\\'; offset++;
531         start = end + 1;
532     }
533     #if 0 /* Not needed, since the directory converter above already appeneded
534         a backslash */
535         if(file_split->dir && file_split->file)
536         {
537             result[offset] = '\\'; offset++;
538         }
539     #endif
540     strncpy(&result[offset], file_split->file,
541         file_split->filelen); offset += file_split->filelen;
542     result[offset] = '\\0';
543     return(result);
544 }

546 static char *win32_merger(DSO *dso, const char *filespec1, const char *filespec2
547 {
548     char *merged = NULL;
549     struct file_st *filespec1_split = NULL;
550     struct file_st *filespec2_split = NULL;

552     if(!filespec1 && !filespec2)
553     {
554         DSOerr(DSO_F_WIN32_MERGER,
555             ERR_R_PASSED_NULL_PARAMETER);
556         return(NULL);
557     }
558     if (!filespec2)
559     {
560         merged = OPENSSL_malloc(strlen(filespec1) + 1);
561         if(!merged)
562         {
563             DSOerr(DSO_F_WIN32_MERGER,
564                 ERR_R_MALLOC_FAILURE);
565             return(NULL);
566         }
567         strcpy(merged, filespec1);
568     }
569     else if (!filespec1)
570     {
571         merged = OPENSSL_malloc(strlen(filespec2) + 1);
572         if(!merged)
573         {
574             DSOerr(DSO_F_WIN32_MERGER,
575                 ERR_R_MALLOC_FAILURE);
576             return(NULL);
577         }
578         strcpy(merged, filespec2);
579     }
580     else
581     {
582         filespec1_split = win32_splitter(dso, filespec1, 0);
583         if (!filespec1_split)
584         {
585             DSOerr(DSO_F_WIN32_MERGER,
586                 ERR_R_MALLOC_FAILURE);
587             return(NULL);
588         }
589         filespec2_split = win32_splitter(dso, filespec2, 1);

```

```

590         if (!filespec2_split)
591         {
592             DSOerr(DSO_F_WIN32_MERGER,
593                 ERR_R_MALLOC_FAILURE);
594             OPENSSL_free(filespec1_split);
595             return(NULL);
596         }

598         /* Fill in into filespec1_split */
599         if (!filespec1_split->node && !filespec1_split->device)
600         {
601             filespec1_split->node = filespec2_split->node;
602             filespec1_split->nodelen = filespec2_split->nodelen;
603             filespec1_split->device = filespec2_split->device;
604             filespec1_split->devicelen = filespec2_split->devicelen;
605         }
606         if (!filespec1_split->dir)
607         {
608             filespec1_split->dir = filespec2_split->dir;
609             filespec1_split->dirlen = filespec2_split->dirlen;
610         }
611         else if (filespec1_split->dir[0] != '\\')
612             && filespec1_split->dir[0] != '/')
613         {
614             filespec1_split->predir = filespec2_split->dir;
615             filespec1_split->predirlen = filespec2_split->dirlen;
616         }
617         if (!filespec1_split->file)
618         {
619             filespec1_split->file = filespec2_split->file;
620             filespec1_split->filelen = filespec2_split->filelen;
621         }

623         merged = win32_joiner(dso, filespec1_split);
624     }
625     OPENSSL_free(filespec1_split);
626     OPENSSL_free(filespec2_split);
627     return(merged);
628 }

630 static char *win32_name_converter(DSO *dso, const char *filename)
631 {
632     char *translated;
633     int len, transform;

635     len = strlen(filename);
636     transform = ((strstr(filename, "/") == NULL) &&
637         (strstr(filename, "\\") == NULL) &&
638         (strstr(filename, ":") == NULL));
639     if(transform)
640         /* We will convert this to "%s.dll" */
641         translated = OPENSSL_malloc(len + 5);
642     else
643         /* We will simply duplicate filename */
644         translated = OPENSSL_malloc(len + 1);
645     if(translated == NULL)
646     {
647         DSOerr(DSO_F_WIN32_NAME_CONVERTER,
648             DSO_R_NAME_TRANSLATION_FAILED);
649         return(NULL);
650     }
651     if(transform)
652         sprintf(translated, "%s.dll", filename);
653     else
654         sprintf(translated, "%s", filename);
655     return(translated);

```

```

656     }
657
658 static const char *openssl_strnchr(const char *string, int c, size_t len)
659 {
660     size_t i;
661     const char *p;
662     for (i = 0, p = string; i < len && *p; i++, p++)
663     {
664         if (*p == c)
665             return p;
666     }
667     return NULL;
668 }
669
670 #include <tlhelp32.h>
671 #ifdef _WIN32_WCE
672 # define DLLNAME "TOOLHELP.DLL"
673 #else
674 # ifdef MODULEENTRY32
675 #  undef MODULEENTRY32 /* unmask the ASCII version! */
676 # endif
677 # define DLLNAME "KERNEL32.DLL"
678 #endif
679
680 typedef HANDLE (WINAPI *CREATETOOLHELP32SNAPSHOT)(DWORD, DWORD);
681 typedef BOOL (WINAPI *CLOSETOOLHELP32SNAPSHOT)(HANDLE);
682 typedef BOOL (WINAPI *MODULE32)(HANDLE, MODULEENTRY32 *);
683
684 static int win32_pathbyaddr(void *addr, char *path, int sz)
685 {
686     HMODULE dll;
687     HANDLE hModuleSnap = INVALID_HANDLE_VALUE;
688     MODULEENTRY32 me32;
689     CREATETOOLHELP32SNAPSHOT create_snap;
690     CLOSETOOLHELP32SNAPSHOT close_snap;
691     MODULE32 module_first, module_next;
692     int len;
693
694     if (addr == NULL)
695     {
696         union { int(*f)(void*,char*,int); void *p; } t =
697             { win32_pathbyaddr };
698         addr = t.p;
699     }
700
701     dll = LoadLibrary(TEXT(DLLNAME));
702     if (dll == NULL)
703     {
704         DSOerr(DSO_F_WIN32_PATHBYADDR, DSO_R_UNSUPPORTED);
705         return -1;
706     }
707
708     create_snap = (CREATETOOLHELP32SNAPSHOT)
709         GetProcAddress(dll, "CreateToolhelp32Snapshot");
710     if (create_snap == NULL)
711     {
712         FreeLibrary(dll);
713         DSOerr(DSO_F_WIN32_PATHBYADDR, DSO_R_UNSUPPORTED);
714         return -1;
715     }
716     /* We take the rest for granted... */
717 #ifdef _WIN32_WCE
718     close_snap = (CLOSETOOLHELP32SNAPSHOT)
719         GetProcAddress(dll, "CloseToolhelp32Snapshot");
720 #else
721     close_snap = (CLOSETOOLHELP32SNAPSHOT)CloseHandle;

```

```

722 #endif
723     module_first = (MODULE32)GetProcAddress(dll, "Module32First");
724     module_next = (MODULE32)GetProcAddress(dll, "Module32Next");
725
726     hModuleSnap = (*create_snap)(TH32CS_SNAPMODULE, 0);
727     if (hModuleSnap == INVALID_HANDLE_VALUE)
728     {
729         FreeLibrary(dll);
730         DSOerr(DSO_F_WIN32_PATHBYADDR, DSO_R_UNSUPPORTED);
731         return -1;
732     }
733
734     me32.dwSize = sizeof(me32);
735
736     if (!(*module_first)(hModuleSnap, &me32))
737     {
738         (*close_snap)(hModuleSnap);
739         FreeLibrary(dll);
740         DSOerr(DSO_F_WIN32_PATHBYADDR, DSO_R_FAILURE);
741         return -1;
742     }
743
744     do
745     {
746         if ((BYTE *)addr >= me32.modBaseAddr &&
747             (BYTE *)addr < me32.modBaseAddr+me32.modBaseSize)
748         {
749             (*close_snap)(hModuleSnap);
750             FreeLibrary(dll);
751             #ifdef _WIN32_WCE
752             # if _WIN32_WCE >= 101
753                 return WideCharToMultiByte(CP_ACP, 0, me32.szExePath, -1,
754                     path, sz, NULL, NULL);
755             # else
756                 len = (int)wcslen(me32.szExePath);
757                 if (sz <= 0) return len+1;
758                 if (len >= sz) len=sz-1;
759                 for(i=0;i<len;i++)
760                     path[i] = (char)me32.szExePath[i];
761                 path[len++] = 0;
762                 return len;
763             # endif
764             #else
765                 len = (int)strlen(me32.szExePath);
766                 if (sz <= 0) return len+1;
767                 if (len >= sz) len=sz-1;
768                 memcpy(path, me32.szExePath, len);
769                 path[len++] = 0;
770                 return len;
771             #endif
772         }
773     } while ((*module_next)(hModuleSnap, &me32));
774
775     (*close_snap)(hModuleSnap);
776     FreeLibrary(dll);
777     return 0;
778 }
779
780 static void *win32_globallookup(const char *name)
781 {
782     HMODULE dll;
783     HANDLE hModuleSnap = INVALID_HANDLE_VALUE;
784     MODULEENTRY32 me32;
785     CREATETOOLHELP32SNAPSHOT create_snap;
786     CLOSETOOLHELP32SNAPSHOT close_snap;
787     MODULE32 module_first, module_next;
788     FARPROC ret=NULL;

```

```

789     dll = LoadLibrary(TEXT(DLLNAME));
790     if (dll == NULL)
791     {
792         DSOerr(DSO_F_WIN32_GLOBALLOOKUP, DSO_R_UNSUPPORTED);
793         return NULL;
794     }

796     create_snap = (CREATETOOLHELP32SNAPSHOT)
797         GetProcAddress(dll, "CreateToolhelp32Snapshot");
798     if (create_snap == NULL)
799     {
800         FreeLibrary(dll);
801         DSOerr(DSO_F_WIN32_GLOBALLOOKUP, DSO_R_UNSUPPORTED);
802         return NULL;
803     }
804     /* We take the rest for granted... */
805 #ifdef _WIN32_WCE
806     close_snap = (CLOSETOOLHELP32SNAPSHOT)
807         GetProcAddress(dll, "CloseToolhelp32Snapshot");
808 #else
809     close_snap = (CLOSETOOLHELP32SNAPSHOT)CloseHandle;
810 #endif
811     module_first = (MODULE32)GetProcAddress(dll, "Module32First");
812     module_next = (MODULE32)GetProcAddress(dll, "Module32Next");

814     hModuleSnap = (*create_snap)(TH32CS_SNAPMODULE, 0);
815     if( hModuleSnap == INVALID_HANDLE_VALUE )
816     {
817         FreeLibrary(dll);
818         DSOerr(DSO_F_WIN32_GLOBALLOOKUP, DSO_R_UNSUPPORTED);
819         return NULL;
820     }

822     me32.dwSize = sizeof(me32);

824     if (!(*module_first)(hModuleSnap, &me32))
825     {
826         (*close_snap)(hModuleSnap);
827         FreeLibrary(dll);
828         return NULL;
829     }

831     do
832     {
833         if ((ret = GetProcAddress(me32.hModule, name)))
834         {
835             (*close_snap)(hModuleSnap);
836             FreeLibrary(dll);
837             return ret;
838         } while ((*module_next)(hModuleSnap, &me32));

840     (*close_snap)(hModuleSnap);
841     FreeLibrary(dll);
842     return NULL;
843 }
844 #endif /* DSO_WIN32 */

```

```

*****
11307 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/ebcdic.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ebcdic.c */

3 #ifndef CHARSET_EBCDIC

5 #include <openssl/e_os2.h>
6 #if defined(PEDANTIC) || defined(__DECC) || defined(OPENSSSL_SYS_MACOSX)
7 static void *dummy=&dummy;
8 #endif

10 #else /*CHARSET_EBCDIC*/

12 #include "ebcdic.h"
13 /* Initial Port for Apache-1.3 by <Martin.Kraemer@Mch.SNI.De>
14 * Adapted for OpenSSL-0.9.4 by <Martin.Kraemer@Mch.SNI.De>
15 */

17 #ifdef _OSD_POSIX
18 /*
19 "BS2000 OSD" is a POSIX subsystem on a main frame.
20 It is made by Siemens AG, Germany, for their BS2000 mainframe machines.
21 Within the POSIX subsystem, the same character set was chosen as in
22 "native BS2000", namely EBCDIC. (EDF04)

24 The name "ASCII" in these routines is misleading: actually, conversion
25 is not between EBCDIC and ASCII, but EBCDIC(EDF04) and ISO-8859.1;
26 that means that (western european) national characters are preserved.

28 This table is identical to the one used by rsh/rcp/ftp and other POSIX tools
29 */

31 /* Here's the bijective ebcdic-to-ascii table: */
32 const unsigned char os_toascii[256] = {
33 /*00*/ 0x00, 0x01, 0x02, 0x03, 0x05, 0x09, 0x08, 0x7f,
34 /*08*/ 0x87, 0x8d, 0x8e, 0x0b, 0x0c, 0x0d, 0x0e, 0x0f, /*.....*/
35 /*10*/ 0x10, 0x11, 0x12, 0x13, 0x8f, 0x0a, 0x08, 0x97,
36 /*18*/ 0x18, 0x19, 0x9c, 0x9d, 0x1c, 0x1d, 0x1e, 0x1f, /*.....*/
37 /*20*/ 0x80, 0x81, 0x82, 0x83, 0x84, 0x92, 0x17, 0x1b,
38 /*28*/ 0x88, 0x89, 0x8a, 0x8b, 0x8c, 0x05, 0x06, 0x07, /*.....*/
39 /*30*/ 0x90, 0x91, 0x16, 0x93, 0x94, 0x95, 0x96, 0x04,
40 /*38*/ 0x98, 0x99, 0x9a, 0x9b, 0x14, 0x15, 0x9e, 0x1a, /*.....*/
41 /*40*/ 0x20, 0xa0, 0xe2, 0xe4, 0xe0, 0xe1, 0xe3, 0xe5,
42 /*48*/ 0xe7, 0xf1, 0x60, 0x2e, 0x3c, 0x28, 0x2b, 0x7c, /*.....'<(+|*/
43 /*50*/ 0x26, 0xe9, 0xea, 0xeb, 0xe8, 0xed, 0xee, 0xef,
44 /*58*/ 0xec, 0xdf, 0x21, 0x24, 0x2a, 0x29, 0x3b, 0x9f, /*&.....!$*);.*/
45 /*60*/ 0x2d, 0x2f, 0xc2, 0xc4, 0xc0, 0xc1, 0xc3, 0xc5,
46 /*68*/ 0xc7, 0xd1, 0x5e, 0x2c, 0x25, 0x5f, 0x3e, 0x3f, /*-/.^,_%>?*/
47 /*70*/ 0xf8, 0xc9, 0xca, 0xcb, 0xc8, 0xcd, 0xce, 0xcf,
48 /*78*/ 0xcc, 0xa8, 0x3a, 0x23, 0x40, 0x27, 0x3d, 0x22, /*.....:#@'="*/
49 /*80*/ 0xd8, 0x61, 0x62, 0x63, 0x64, 0x65, 0x66, 0x67,
50 /*88*/ 0x68, 0x69, 0xab, 0xbb, 0xf0, 0xf6, 0xf7, /*.abcdefghijklmnopqrstuvwxyz.....*/
51 /*90*/ 0xb0, 0x6a, 0x6b, 0x6c, 0x6d, 0x6e, 0x6f, 0x70,
52 /*98*/ 0x71, 0x72, 0xaa, 0xba, 0xe6, 0xb8, 0xc6, 0xa4, /*.jklmnopqr.....*/
53 /*a0*/ 0xb5, 0xaf, 0x73, 0x74, 0x75, 0x76, 0x77, 0x78,
54 /*a8*/ 0x79, 0x7a, 0xa1, 0xbf, 0xd0, 0xdd, 0xde, 0xae, /*.stuvwxyz.....*/
55 /*b0*/ 0xa2, 0xa3, 0xa5, 0xb7, 0xa9, 0xaf, 0xb6, 0xbc,
56 /*b8*/ 0xbd, 0xbe, 0xac, 0x5b, 0x5c, 0x5d, 0xb4, 0xd7, /*.....[\]..*/
57 /*c0*/ 0xf9, 0x41, 0x42, 0x43, 0x44, 0x45, 0x46, 0x47,
58 /*c8*/ 0x48, 0x49, 0xad, 0xf4, 0xf6, 0xf2, 0xf3, 0xf5, /*.ABCDEFGH.....*/
59 /*d0*/ 0xa6, 0x4a, 0x4b, 0x4c, 0x4d, 0x4e, 0x4f, 0x50,
60 /*d8*/ 0x51, 0x52, 0xb9, 0xfb, 0xfc, 0xdb, 0xfa, 0xff, /*.JKLMNOPQR.....*/
61 /*e0*/ 0xd9, 0xf7, 0x53, 0x54, 0x55, 0x56, 0x57, 0x58,

```

```

62 /*05*/ 0x59, 0x5a, 0xb2, 0xd4, 0xd6, 0xd2, 0xd3, 0xd5, /*..STUVWXYZ.....*/
63 /*f0*/ 0x30, 0x31, 0x32, 0x33, 0x34, 0x35, 0x36, 0x37,
64 /*f8*/ 0x38, 0x39, 0xb3, 0x7b, 0xdc, 0x7d, 0xda, 0x7e /*0123456789.{.}~*/
65 };

68 /* The ascii-to-ebcdic table: */
69 const unsigned char os_toebcdic[256] = {
70 /*00*/ 0x00, 0x01, 0x02, 0x03, 0x37, 0x2d, 0x2e, 0x2f,
71 /*08*/ 0x16, 0x05, 0x15, 0x0b, 0x0c, 0x0d, 0x0e, 0x0f, /*.....*/
72 /*10*/ 0x10, 0x11, 0x12, 0x13, 0x3c, 0x3d, 0x32, 0x26,
73 /*18*/ 0x18, 0x19, 0x3f, 0x27, 0x1c, 0x1d, 0x1e, 0x1f, /*.....*/
74 /*20*/ 0x40, 0x5a, 0x7f, 0x7b, 0x5b, 0x6c, 0x50, 0x7d,
75 /*28*/ 0x4d, 0x5d, 0x5c, 0x4e, 0x6b, 0x60, 0x4b, 0x61, /* !"#%&'()*+,-./ */
76 /*30*/ 0xf0, 0xf1, 0xf2, 0xf3, 0xf4, 0xf5, 0xf6, 0xf7,
77 /*38*/ 0xf8, 0xf9, 0x7a, 0x5e, 0x4c, 0x7e, 0x6e, 0x6f, /*0123456789.;<=>?*/
78 /*40*/ 0x7c, 0xc1, 0xc2, 0xc3, 0xc4, 0xc5, 0xc6, 0xc7,
79 /*48*/ 0xc8, 0xc9, 0xd1, 0xd2, 0xd3, 0xd4, 0xd5, 0xd6, /*@ABCDEFGHIJKLMNO*/
80 /*50*/ 0xd7, 0xd8, 0xd9, 0xe2, 0xe3, 0xe4, 0xe5, 0xe6,
81 /*58*/ 0xe7, 0xe8, 0xe9, 0xbb, 0xbc, 0xbd, 0x6a, 0x6d, /*PQRSTUVWXYZ[\]^_*/
82 /*60*/ 0x4a, 0x81, 0x82, 0x83, 0x84, 0x85, 0x86, 0x87,
83 /*68*/ 0x88, 0x89, 0x91, 0x92, 0x93, 0x94, 0x95, 0x96, /*'abcdefghijklmnopqrstuvwxyz{~}*/
84 /*70*/ 0x97, 0x98, 0x99, 0xa2, 0xa3, 0xa4, 0xa5, 0xa6,
85 /*78*/ 0xa7, 0xa8, 0xa9, 0xfb, 0x4f, 0xfd, 0xff, 0x07, /*pqrstuvwxyz[~]~.*/
86 /*80*/ 0x20, 0x21, 0x22, 0x23, 0x24, 0x04, 0x06, 0x08,
87 /*88*/ 0x28, 0x29, 0x2a, 0x2b, 0x2c, 0x09, 0x0a, 0x14, /*.....*/
88 /*90*/ 0x30, 0x31, 0x25, 0x33, 0x34, 0x35, 0x36, 0x17,
89 /*98*/ 0x38, 0x39, 0x3a, 0x3b, 0x1a, 0x1b, 0x3e, 0x5f, /*.....*/
90 /*a0*/ 0x41, 0xaa, 0xb0, 0xb1, 0x9f, 0xb2, 0xd0, 0xb5,
91 /*a8*/ 0x79, 0xb4, 0x9a, 0x8a, 0xba, 0xca, 0xaf, 0xa1, /*.....*/
92 /*b0*/ 0x90, 0x8f, 0xea, 0xfa, 0xbe, 0xa0, 0xb6, 0xb3,
93 /*b8*/ 0x9d, 0xda, 0x9b, 0x8b, 0xb7, 0xb8, 0xb9, 0xab, /*.....*/
94 /*c0*/ 0x64, 0x65, 0x62, 0x66, 0x63, 0x67, 0x9e, 0x68,
95 /*c8*/ 0x74, 0x71, 0x72, 0x73, 0x78, 0x75, 0x76, 0x77, /*.....*/
96 /*d0*/ 0xac, 0x69, 0xed, 0xee, 0xeb, 0xef, 0xec, 0xbf,
97 /*d8*/ 0x80, 0xe0, 0xfe, 0xdd, 0xfc, 0xad, 0xae, 0x59, /*.....*/
98 /*e0*/ 0x44, 0x45, 0x42, 0x46, 0x43, 0x47, 0x9c, 0x48,
99 /*e8*/ 0x54, 0x51, 0x52, 0x53, 0x58, 0x55, 0x56, 0x57, /*.....*/
100 /*f0*/ 0x8c, 0x49, 0xcd, 0xce, 0xcb, 0xcf, 0xcc, 0xe1,
101 /*f8*/ 0x70, 0xc0, 0xde, 0xdb, 0xdc, 0x8d, 0x8e, 0xdf /*.....*/
102 };

104 #else /*_OSD_POSIX*/

106 /*
107 This code does basic character mapping for IBM's TPF and OS/390 operating system
108 It is a modified version of the BS2000 table.

110 Bijective EBCDIC (character set IBM-1047) to US-ASCII table:
111 This table is bijective - there are no ambiguous or duplicate characters.
112 */
113 const unsigned char os_toascii[256] = {
114 0x00, 0x01, 0x02, 0x03, 0x05, 0x09, 0x08, 0x7f, /* 00-0f: */
115 0x87, 0x8d, 0x8e, 0x0b, 0x0c, 0x0d, 0x0e, 0x0f, /* ..... */
116 0x10, 0x11, 0x12, 0x13, 0x8f, 0x0a, 0x08, 0x97, /* 10-1f: */
117 0x18, 0x19, 0x9c, 0x9d, 0x1c, 0x1d, 0x1e, 0x1f, /* ..... */
118 0x80, 0x81, 0x82, 0x83, 0x84, 0x92, 0x17, 0x1b, /* 20-2f: */
119 0x88, 0x89, 0x8a, 0x8b, 0x8c, 0x05, 0x06, 0x07, /* ..... */
120 0x90, 0x91, 0x16, 0x93, 0x94, 0x95, 0x96, 0x04, /* 30-3f: */
121 0x98, 0x99, 0x9a, 0x9b, 0x14, 0x15, 0x9e, 0x1a, /* ..... */
122 0x20, 0xa0, 0xe2, 0xe4, 0xe0, 0xe1, 0xe3, 0xe5, /* 40-4f: */
123 0xe7, 0xf1, 0xa2, 0x2e, 0x3c, 0x28, 0x2b, 0x7c, /* .....<(+| */
124 0x26, 0xe9, 0xea, 0xeb, 0xe8, 0xed, 0xee, 0xef, /* 50-5f: */
125 0xec, 0xdf, 0x21, 0x24, 0x2a, 0x29, 0x3b, 0x9f, /* &.....!$*);^ */
126 0x2d, 0x2f, 0xc2, 0xc4, 0xc0, 0xc1, 0xc3, 0xc5, /* 60-6f: */
127 0xc7, 0xd1, 0xa6, 0x2c, 0x25, 0x5f, 0x3e, 0x3f, /* -/.....,%>? */

```

```

128 0xf8, 0xc9, 0xca, 0xcb, 0xcd, 0xce, 0xcf, /* 70-7f: */
129 0xcc, 0x60, 0x3a, 0x23, 0x40, 0x27, 0x3d, 0x22, /* .....':#@'=" */
130 0xd8, 0x61, 0x62, 0x63, 0x64, 0x65, 0x66, 0x67, /* 80-8f: */
131 0x68, 0x69, 0xab, 0xbb, 0xfd, 0xfe, 0xb1, /* .abcdefghi..... */
132 0xb0, 0x6a, 0x6b, 0x6c, 0x6d, 0x6e, 0x6f, 0x70, /* 90-9f: */
133 0x71, 0x72, 0xaa, 0xba, 0xe6, 0xb8, 0xc6, 0xa4, /* .jklmnopqr..... */
134 0xb5, 0x7e, 0x73, 0x74, 0x75, 0x76, 0x77, 0x78, /* a0-af: */
135 0x79, 0x7a, 0xa1, 0xbf, 0xd0, 0x5b, 0xde, 0xae, /* .stuvwxyz...[.. */
136 0xac, 0xa3, 0xa5, 0xb7, 0xa9, 0xa7, 0xb6, 0xbc, /* b0-bf: */
137 0xbd, 0xbe, 0xdd, 0xa8, 0xaf, 0x5d, 0xb4, 0xd7, /* .....].. */
138 0x7b, 0x41, 0x42, 0x43, 0x44, 0x45, 0x46, 0x47, /* c0-cf: */
139 0x48, 0x49, 0xad, 0xf4, 0xf6, 0xf2, 0xf3, 0xf5, /* {ABCDEFGHI..... */
140 0x7d, 0x4a, 0x4b, 0x4c, 0x4d, 0x4e, 0x4f, 0x50, /* d0-df: */
141 0x51, 0x52, 0xb9, 0xfb, 0xfc, 0xf9, 0xfa, 0xff, /* }JKLMNOPQR..... */
142 0x5c, 0xf7, 0x53, 0x54, 0x55, 0x56, 0x57, 0x58, /* e0-ef: */
143 0x59, 0x5a, 0xb2, 0xd4, 0xd6, 0xd2, 0xd3, 0xd5, /* \.STUVWXYZ..... */
144 0x30, 0x31, 0x32, 0x33, 0x34, 0x35, 0x36, 0x37, /* f0-ff: */
145 0x38, 0x39, 0xb3, 0xdb, 0xdc, 0xd9, 0xda, 0x9f /* 0123456789..... */
146 };

149 /*
150 The US-ASCII to EBCDIC (character set IBM-1047) table:
151 This table is bijective (no ambiguous or duplicate characters)
152 */
153 const unsigned char os_toebcdic[256] = {
154 0x00, 0x01, 0x02, 0x03, 0x37, 0x2d, 0x2e, 0x2f, /* 00-0f: */
155 0x16, 0x05, 0x15, 0x0b, 0x0c, 0x0d, 0x0e, 0x0f, /* ..... */
156 0x10, 0x11, 0x12, 0x13, 0x3c, 0x3d, 0x32, 0x26, /* 10-1f: */
157 0x18, 0x19, 0x3f, 0x27, 0x1c, 0x1d, 0x1e, 0x1f, /* ..... */
158 0x40, 0x5a, 0x7f, 0x7b, 0x5b, 0x6c, 0x50, 0x7d, /* 20-2f: */
159 0x4d, 0x5d, 0x5c, 0x4e, 0x6b, 0x60, 0x4b, 0x61, /* !"#$%&'()*+,-./ */
160 0xf0, 0xf1, 0xf2, 0xf3, 0xf4, 0xf5, 0xf6, 0xf7, /* 30-3f: */
161 0xf8, 0xf9, 0x7a, 0x5e, 0x4c, 0x7e, 0x6e, 0x6f, /* 0123456789;,<=>? */
162 0x7c, 0xc1, 0xc2, 0xc3, 0xc4, 0xc5, 0xc6, 0xc7, /* 40-4f: */
163 0xc8, 0xc9, 0xd1, 0xd2, 0xd3, 0xd4, 0xd5, 0xd6, /* @ABCDEFGHIJKLMNO */
164 0xd7, 0xd8, 0xd9, 0xe2, 0xe3, 0xe4, 0xe5, 0xe6, /* 50-5f: */
165 0xe7, 0xe8, 0xe9, 0xad, 0xe0, 0xbd, 0x5f, 0x6d, /* PQRSTUVWXYZ[\]^_ */
166 0x79, 0x81, 0x82, 0x83, 0x84, 0x85, 0x86, 0x87, /* 60-6f: */
167 0x88, 0x89, 0x91, 0x92, 0x93, 0x94, 0x95, 0x96, /* 'abcdefghijklnmo */
168 0x97, 0x98, 0x99, 0xa2, 0xa3, 0xa4, 0xa5, 0xa6, /* 70-7f: */
169 0xa7, 0xa8, 0xa9, 0xc0, 0x4f, 0xd0, 0xa1, 0x07, /* pqrstuvwxy{~. */
170 0x20, 0x21, 0x22, 0x23, 0x24, 0x04, 0x06, 0x08, /* 80-8f: */
171 0x28, 0x29, 0x2a, 0x2b, 0x2c, 0x09, 0x0a, 0x14, /* ..... */
172 0x30, 0x31, 0x25, 0x33, 0x34, 0x35, 0x36, 0x17, /* 90-9f: */
173 0x38, 0x39, 0x3a, 0x3b, 0x1a, 0x1b, 0x3e, 0xff, /* ..... */
174 0x41, 0xaa, 0x4a, 0xb1, 0x9f, 0xb2, 0x6a, 0xb5, /* a0-af: */
175 0xbb, 0xb4, 0x9a, 0x8a, 0xb0, 0xca, 0xaf, 0xbc, /* ..... */
176 0x90, 0x8f, 0xea, 0xfa, 0xbe, 0xa0, 0xb6, 0xb3, /* b0-bf: */
177 0x9d, 0xda, 0x9b, 0x8b, 0xb7, 0xb8, 0xb9, 0xab, /* ..... */
178 0x64, 0x65, 0x62, 0x66, 0x63, 0x67, 0x9e, 0x68, /* c0-cf: */
179 0x74, 0x71, 0x72, 0x73, 0x78, 0x75, 0x76, 0x77, /* ..... */
180 0xac, 0x69, 0xed, 0xee, 0xeb, 0xef, 0xec, 0xbf, /* d0-df: */
181 0x80, 0xfd, 0xfe, 0xfb, 0xfc, 0xba, 0xae, 0x59, /* ..... */
182 0x44, 0x45, 0x42, 0x46, 0x43, 0x47, 0x9c, 0x48, /* e0-ef: */
183 0x54, 0x51, 0x52, 0x53, 0x58, 0x55, 0x56, 0x57, /* ..... */
184 0x8c, 0x49, 0xcd, 0xce, 0xcb, 0xcf, 0xcc, 0xe1, /* f0-ff: */
185 0x70, 0xdd, 0xde, 0xdb, 0xdc, 0x8d, 0x8e, 0xdf /* ..... */
186 };
187 #endif /* _OSD_POSIX*/

189 /* Translate a memory block from EBCDIC (host charset) to ASCII (net charset)
190 * dest and srce may be identical, or separate memory blocks, but
191 * should not overlap. These functions intentionally have an interface
192 * compatible to memcpy(3).
193 */

```

```

195 void *
196 ebcdic2ascii(void *dest, const void *srce, size_t count)
197 {
198     unsigned char *udest = dest;
199     const unsigned char *usrce = srce;

201     while (count-- != 0) {
202         *udest++ = os_toascii[*usrce++];
203     }

205     return dest;
206 }

208 void *
209 ascii2ebcdic(void *dest, const void *srce, size_t count)
210 {
211     unsigned char *udest = dest;
212     const unsigned char *usrce = srce;

214     while (count-- != 0) {
215         *udest++ = os_toebcdic[*usrce++];
216     }

218     return dest;
219 }

221 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_all.c

1

```
*****
4679 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_all.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/engine/eng_all.c -*- mode: C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte <richard@levitte.org> for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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7  *
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9  * modification, are permitted provided that the following conditions
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include "cryptlib.h"
60 #include "eng_int.h"
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_all.c

2

```
62 void ENGINE_load_builtin_engines(void)
63 {
64     /* Some ENGINES need this */
65     OPENSSL_cpuid_setup();
66     #if 0
67     /* There's no longer any need for an "openssl" ENGINE unless, one day,
68     * it is the *only* way for standard builtin implementations to be
69     * accessed (ie. it would be possible to statically link binaries with
70     * *no* builtin implementations). */
71     ENGINE_load_openssl();
72     #endif
73     #if !defined(OPENSSL_NO_HW) && (defined(__OpenBSD__) || defined(__FreeBSD__) ||
74     ENGINE_load_cryptodev());
75     #endif
76     #ifndef OPENSSL_NO_RSAX
77     ENGINE_load_rsax();
78     #endif
79     #ifndef OPENSSL_NO_RDRAND
80     ENGINE_load_rdrand();
81     #endif
82     ENGINE_load_dynamic();
83     #ifndef OPENSSL_NO_STATIC_ENGINE
84     #ifndef OPENSSL_NO_HW
85     #ifndef OPENSSL_NO_HW_4758_CCA
86     ENGINE_load_4758cca();
87     #endif
88     #ifndef OPENSSL_NO_HW_AEP
89     ENGINE_load_aep();
90     #endif
91     #ifndef OPENSSL_NO_HW_ATAALLA
92     ENGINE_load_atalla();
93     #endif
94     #ifndef OPENSSL_NO_HW_CSWIFT
95     ENGINE_load_cswift();
96     #endif
97     #ifndef OPENSSL_NO_HW_NCIPHER
98     ENGINE_load_chil();
99     #endif
100    #ifndef OPENSSL_NO_HW_NURON
101    ENGINE_load_nuron();
102    #endif
103    #ifndef OPENSSL_NO_HW_SUREWARE
104    ENGINE_load_sureware();
105    #endif
106    #ifndef OPENSSL_NO_HW_UBSEC
107    ENGINE_load_ubsec();
108    #endif
109    #ifndef OPENSSL_NO_HW_PADLOCK
110    ENGINE_load_padlock();
111    #endif
112    #ifndef OPENSSL_NO_HW_PKCS11
113    ENGINE_load_pk11();
114    #endif
115    #endif
116    #ifndef OPENSSL_NO_GOST
117    ENGINE_load_gost();
118    #endif
119    #ifndef OPENSSL_NO_GMP
120    ENGINE_load_gmp();
121    #endif
122    #if defined(OPENSSL_SYS_WIN32) && !defined(OPENSSL_NO_CAPIENG)
123    ENGINE_load_capi();
124    #endif
125    #endif
126    ENGINE_register_all_complete();
127 }
```



```
129 #if defined(__OpenBSD__) || defined(__FreeBSD__) || defined(HAVE_CRYPTODEV)
130 void ENGINE_setup_bsd_cryptodev(void) {
131     static int bsd_cryptodev_default_loaded = 0;
132     if (!bsd_cryptodev_default_loaded) {
133         ENGINE_load_cryptodev();
134         ENGINE_register_all_complete();
135     }
136     bsd_cryptodev_default_loaded=1;
137 }
138 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_cnf.c

1

```
*****
7093 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_cnf.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* eng_cnf.c */
2 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include "eng_int.h"
60 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_cnf.c

2

```
62 /* #define ENGINE_CONF_DEBUG */
64 /* ENGINE config module */
66 static char *skip_dot(char *name)
67 {
68     char *p;
69     p = strchr(name, '.');
70     if (p)
71         return p + 1;
72     return name;
73 }
75 static STACK_OF(ENGINE) *initialized_engines = NULL;
77 static int int_engine_init(ENGINE *e)
78 {
79     if (!ENGINE_init(e))
80         return 0;
81     if (!initialized_engines)
82         initialized_engines = sk_ENGINE_new_null();
83     if (!initialized_engines || !sk_ENGINE_push(initialized_engines, e))
84     {
85         ENGINE_finish(e);
86         return 0;
87     }
88     return 1;
89 }
90
92 static int int_engine_configure(char *name, char *value, const CONF *cnf)
93 {
94     int i;
95     int ret = 0;
96     long do_init = -1;
97     STACK_OF(CONF_VALUE) *ecmds;
98     CONF_VALUE *ecmd = NULL;
99     char *ctrlname, *ctrlvalue;
100     ENGINE *e = NULL;
101     int soft = 0;
102
103     name = skip_dot(name);
104 #ifdef ENGINE_CONF_DEBUG
105     fprintf(stderr, "Configuring engine %s\n", name);
106 #endif
107     /* Value is a section containing ENGINE commands */
108     ecmds = NCONF_get_section(cnf, value);
109
110     if (!ecmds)
111     {
112         ENGINEerr(ENGINE_F_INT_ENGINE_CONFIGURE, ENGINE_R_ENGINE_SECTION
113                 return 0;
114     }
115
116     for (i = 0; i < sk_CONF_VALUE_num(ecmds); i++)
117     {
118         ecmd = sk_CONF_VALUE_value(ecmds, i);
119         ctrlname = skip_dot(ecmd->name);
120         ctrlvalue = ecmd->value;
121 #ifdef ENGINE_CONF_DEBUG
122         fprintf(stderr, "ENGINE conf: doing ctrl(%s,%s)\n", ctrlname, ctrlvalue)
123 #endif
124
125         /* First handle some special pseudo ctrls */
126
127         /* Override engine name to use */
```

```

128     if (!strcmp(ctrlname, "engine_id"))
129         name = ctrlvalue;
130     else if (!strcmp(ctrlname, "soft_load"))
131         soft = 1;
132     /* Load a dynamic ENGINE */
133     else if (!strcmp(ctrlname, "dynamic_path"))
134     {
135         e = ENGINE_by_id("dynamic");
136         if (!e)
137             goto err;
138         if (!ENGINE_ctrl_cmd_string(e, "SO_PATH", ctrlvalue, 0))
139             goto err;
140         if (!ENGINE_ctrl_cmd_string(e, "LIST_ADD", "2", 0))
141             goto err;
142         if (!ENGINE_ctrl_cmd_string(e, "LOAD", NULL, 0))
143             goto err;
144     }
145     /* ... add other pseudos here ... */
146     else
147     {
148         /* At this point we need an ENGINE structural reference
149          * if we don't already have one.
150          */
151         if (!e)
152         {
153             e = ENGINE_by_id(name);
154             if (!e && soft)
155             {
156                 ERR_clear_error();
157                 return 1;
158             }
159             if (!e)
160                 goto err;
161         }
162         /* Allow "EMPTY" to mean no value: this allows a valid
163          * "value" to be passed to ctrls of type NO_INPUT
164          */
165         if (!strcmp(ctrlvalue, "EMPTY"))
166             ctrlvalue = NULL;
167         if (!strcmp(ctrlname, "init"))
168         {
169             if (!NCONF_get_number_e(cnf, value, "init", &do_init))
170                 goto err;
171             if (do_init == 1)
172             {
173                 if (!int_engine_init(e))
174                     goto err;
175             }
176             else if (do_init != 0)
177             {
178                 ENGINEerr(ENGINE_F_INT_ENGINE_CONFIGURE,
179                     goto err;
180             }
181         }
182         else if (!strcmp(ctrlname, "default_algorithms"))
183         {
184             if (!ENGINE_set_default_string(e, ctrlvalue))
185                 goto err;
186         }
187         else if (!ENGINE_ctrl_cmd_string(e,
188             ctrlname, ctrlvalue, 0))
189             goto err;
190     }

```

```

194     }
195     if (e && (do_init == -1) && !int_engine_init(e))
196     {
197         ecmd = NULL;
198         goto err;
199     }
200     ret = 1;
201     err:
202     if (ret != 1)
203     {
204         ENGINEerr(ENGINE_F_INT_ENGINE_CONFIGURE, ENGINE_R_ENGINE_CONFIGU
205         if (ecmd)
206             ERR_add_error_data(6, "section=", ecmd->section,
207                 ", name=", ecmd->name,
208                 ", value=", ecmd->value);
209     }
210     if (e)
211         ENGINE_free(e);
212     return ret;
213 }

```

```

216 static int int_engine_module_init(CONF_IMODULE *md, const CONF *cnf)
217 {
218     STACK_OF(CONF_VALUE) *elist;
219     CONF_VALUE *cval;
220     int i;
221     #ifdef ENGINE_CONF_DEBUG
222     fprintf(stderr, "Called engine module: name %s, value %s\n",
223         CONF_imodule_get_name(md), CONF_imodule_get_value(md));
224     #endif
225     /* Value is a section containing ENGINES to configure */
226     elist = NCONF_get_section(cnf, CONF_imodule_get_value(md));
227
228     if (!elist)
229     {
230         ENGINEerr(ENGINE_F_INT_ENGINE_MODULE_INIT, ENGINE_R_ENGINES_SECT
231         return 0;
232     }
233
234     for (i = 0; i < sk_CONF_VALUE_num(elist); i++)
235     {
236         cval = sk_CONF_VALUE_value(elist, i);
237         if (!int_engine_configure(cval->name, cval->value, cnf))
238             return 0;
239     }
240
241     return 1;
242 }

```

```

244 static void int_engine_module_finish(CONF_IMODULE *md)
245 {
246     ENGINE *e;
247     while ((e = sk_ENGINE_pop(initialized_engines)))
248         ENGINE_finish(e);
249     sk_ENGINE_free(initialized_engines);
250     initialized_engines = NULL;
251 }
252
254 void ENGINE_add_conf_module(void)
255 {
256     CONF_module_add("engines",
257         int_engine_module_init,
258         int_engine_module_finish);
259 }

```



```

*****
34938 Fri May 30 18:31:46 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_cryptodev.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Copyright (c) 2002 Bob Beck <beck@openbsd.org>
3  * Copyright (c) 2002 Theo de Raadt
4  * Copyright (c) 2002 Markus Friedl
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23 * ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
24 * (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
25 * THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
26 *
27 */

29 #include <openssl/objects.h>
30 #include <openssl/engine.h>
31 #include <openssl/evp.h>
32 #include <openssl/bn.h>

34 #if (defined(__unix__) || defined(unix)) && !defined(USG) && \
35     (defined(OpenBSD) || defined(__FreeBSD__))
36 #include <sys/param.h>
37 # if (OpenBSD >= 200112) || ((__FreeBSD_version >= 470101 && __FreeBSD_version <
38 #   define HAVE_CRYPTODEV
39 # endif
40 # if (OpenBSD >= 200110)
41 #   define HAVE_SYSLOG_R
42 # endif
43 #endif

45 #ifndef HAVE_CRYPTODEV

47 void
48 ENGINE_load_cryptodev(void)
49 {
50     /* This is a NOP on platforms without /dev/crypto */
51     return;
52 }

54 #else
55
56 #include <sys/types.h>
57 #include <crypto/cryptodev.h>
58 #include <crypto/dh/dh.h>
59 #include <crypto/dsa/dsa.h>
60 #include <crypto/err/err.h>
61 #include <crypto/rsa/rsa.h>

```

```

62 #include <sys/ioctl.h>
63 #include <errno.h>
64 #include <stdio.h>
65 #include <unistd.h>
66 #include <fcntl.h>
67 #include <stdarg.h>
68 #include <syslog.h>
69 #include <errno.h>
70 #include <string.h>

72 struct dev_crypto_state {
73     struct session_op d_sess;
74     int d_fd;

76 #ifdef USE_CRYPTODEV_DIGESTS
77     char dummy_mac_key[HASH_MAX_LEN];

79     unsigned char digest_res[HASH_MAX_LEN];
80     char *mac_data;
81     int mac_len;
82 #endif
83 };

85 static u_int32_t cryptodev_asymfeat = 0;

87 static int get_asym_dev_crypto(void);
88 static int open_dev_crypto(void);
89 static int get_dev_crypto(void);
90 static int get_cryptodev_ciphers(const int **cnids);
91 #ifdef USE_CRYPTODEV_DIGESTS
92 static int get_cryptodev_digests(const int **cnids);
93 #endif
94 static int cryptodev_usable_ciphers(const int **nids);
95 static int cryptodev_usable_digests(const int **nids);
96 static int cryptodev_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
97     const unsigned char *in, size_t inl);
98 static int cryptodev_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
99     const unsigned char *iv, int enc);
100 static int cryptodev_cleanup(EVP_CIPHER_CTX *ctx);
101 static int cryptodev_engine_ciphers(ENGINE *e, const EVP_CIPHER **cipher,
102     const int **nids, int nid);
103 static int cryptodev_engine_digests(ENGINE *e, const EVP_MD **digest,
104     const int **nids, int nid);
105 static int bn2cparam(const BIGNUM *a, struct crparam *crp);
106 static int crparam2bn(struct crparam *crp, BIGNUM *a);
107 static void zapparams(struct crypt_kop *kop);
108 static int cryptodev_asym(struct crypt_kop *kop, int rlen, BIGNUM *r,
109     int slen, BIGNUM *s);

111 static int cryptodev_bn_mod_exp(BIGNUM *r, const BIGNUM *a,
112     const BIGNUM *p, const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *m_ctx);
113 static int cryptodev_rsa_nocrt_mod_exp(BIGNUM *r0, const BIGNUM *I,
114     RSA *rsa, BN_CTX *ctx);
115 static int cryptodev_rsa_mod_exp(BIGNUM *r0, const BIGNUM *I, RSA *rsa, BN_CTX *
116 static int cryptodev_dsa_bn_mod_exp(DSA *dsa, BIGNUM *r, BIGNUM *a,
117     const BIGNUM *p, const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *m_ctx);
118 static int cryptodev_dsa_dsa_mod_exp(DSA *dsa, BIGNUM *t1, BIGNUM *g,
119     BIGNUM *u1, BIGNUM *pub_key, BIGNUM *u2, BIGNUM *p,
120     BN_CTX *ctx, BN_MONT_CTX *mont);
121 static DSA_SIG *cryptodev_dsa_do_sign(const unsigned char *dgst,
122     int dlen, DSA *dsa);
123 static int cryptodev_dsa_verify(const unsigned char *dgst, int dgst_len,
124     DSA_SIG *sig, DSA *dsa);
125 static int cryptodev_mod_exp_dh(const DH *dh, BIGNUM *r, const BIGNUM *a,
126     const BIGNUM *p, const BIGNUM *m, BN_CTX *ctx,
127     BN_MONT_CTX *m_ctx);

```

```

128 static int cryptodev_dh_compute_key(unsigned char *key,
129     const BIGNUM *pub_key, DH *dh);
130 static int cryptodev_ctrl(ENGINE *e, int cmd, long i, void *p,
131     void (*f)(void));
132 void ENGINE_load_cryptodev(void);

134 static const ENGINE_CMD_DEFN cryptodev_defns[] = {
135     { 0, NULL, NULL, 0 }
136 };

138 static struct {
139     int id;
140     int nid;
141     int ivmax;
142     int keylen;
143 } ciphers[] = {
144     { CRYPTO_ARC4,          NID_rc4,          0,      16, },
145     { CRYPTO_DES_CBC,       NID_des_cbc,       8,        8, },
146     { CRYPTO_3DES_CBC,      NID_des_ede3_cbc,   8,       24, },
147     { CRYPTO_AES_CBC,       NID_aes_128_cbc,   16,       16, },
148     { CRYPTO_AES_CBC,       NID_aes_192_cbc,   16,       24, },
149     { CRYPTO_AES_CBC,       NID_aes_256_cbc,   16,       32, },
150     { CRYPTO_BLF_CBC,       NID_bf_cbc,        8,       16, },
151     { CRYPTO_CAST_CBC,      NID_cast5_cbc,    8,       16, },
152     { CRYPTO_SKIPJACK_CBC,  NID_undef,    0,        0, },
153     { 0,                    NID_undef,    0,        0, },
154 };

156 #ifdef USE_CRYPTODEV_DIGESTS
157 static struct {
158     int id;
159     int nid;
160     int keylen;
161 } digests[] = {
162     { CRYPTO_MD5_HMAC,      NID_hmacWithMD5,    16},
163     { CRYPTO_SHA1_HMAC,     NID_hmacWithSHA1,   20},
164     { CRYPTO_RIPEMD160_HMAC, NID_ripemd160,    16/*??*/},
165     { CRYPTO_MD5_KDPK,      NID_undef,    0},
166     { CRYPTO_SHA1_KDPK,     NID_undef,    0},
167     { CRYPTO_MD5,           NID_md5,      16},
168     { CRYPTO_SHA1,          NID_sha1,     20},
169     { 0,                    NID_undef,    0},
170 };
171 #endif

173 /*
174  * Return a fd if /dev/crypto seems usable, 0 otherwise.
175  */
176 static int
177 open_dev_crypto(void)
178 {
179     static int fd = -1;

181     if (fd == -1) {
182         if ((fd = open("/dev/crypto", O_RDWR, 0)) == -1)
183             return (-1);
184         /* close on exec */
185         if (fcntl(fd, F_SETFD, 1) == -1) {
186             close(fd);
187             fd = -1;
188             return (-1);
189         }
190     }
191     return (fd);
192 }

```

```

194 static int
195 get_dev_crypto(void)
196 {
197     int fd, retfd;

199     if ((fd = open_dev_crypto()) == -1)
200         return (-1);
201 #ifndef CRYPTOGET_NOT_NEEDED
202     if (ioctl(fd, CRYPTOGET, &retfd) == -1)
203         return (-1);

205     /* close on exec */
206     if (fcntl(retfd, F_SETFD, 1) == -1) {
207         close(retfd);
208         return (-1);
209     }
210 #else
211     retfd = fd;
212 #endif
213     return (retfd);
214 }

216 static void put_dev_crypto(int fd)
217 {
218 #ifndef CRYPTOGET_NOT_NEEDED
219     close(fd);
220 #endif
221 }

223 /* Caching version for asym operations */
224 static int
225 get_asym_dev_crypto(void)
226 {
227     static int fd = -1;

229     if (fd == -1)
230         fd = get_dev_crypto();
231     return fd;
232 }

234 /*
235  * Find out what ciphers /dev/crypto will let us have a session for.
236  * XXX note, that some of these openssl doesn't deal with yet!
237  * returning them here is harmless, as long as we return NULL
238  * when asked for a handler in the cryptodev_engine_ciphers routine
239  */
240 static int
241 get_cryptodev_ciphers(const int **cnids)
242 {
243     static int nids[CRYPTO_ALGORITHM_MAX];
244     struct session_op sess;
245     int fd, i, count = 0;

247     if ((fd = get_dev_crypto()) < 0) {
248         *cnids = NULL;
249         return (0);
250     }
251     memset(&sess, 0, sizeof(sess));
252     sess.key = (caddr_t)"123456789abcdefghijklmnopqrstuvwxyz";

254     for (i = 0; ciphers[i].id && count < CRYPTO_ALGORITHM_MAX; i++) {
255         if (ciphers[i].nid == NID_undef)
256             continue;
257         sess.cipher = ciphers[i].id;
258         sess.keylen = ciphers[i].keylen;
259         sess.mac = 0;

```

```

260         if (ioctl(fd, CIOCGSESSION, &sess) != -1 &&
261             ioctl(fd, CIOCFSESSION, &sess.ses) != -1)
262             nids[count++] = ciphers[i].nid;
263     }
264     put_dev_crypto(fd);
265
266     if (count > 0)
267         *cnids = nids;
268     else
269         *cnids = NULL;
270     return (count);
271 }
272
273 #ifdef USE_CRYPTODEV_DIGESTS
274 /*
275  * Find out what digests /dev/crypto will let us have a session for.
276  * XXX note, that some of these openssl doesn't deal with yet!
277  * returning them here is harmless, as long as we return NULL
278  * when asked for a handler in the cryptodev_engine_digests routine
279  */
280 static int
281 get_cryptodev_digests(const int **cnids)
282 {
283     static int nids[CRYPTO_ALGORITHM_MAX];
284     struct session_op sess;
285     int fd, i, count = 0;
286
287     if ((fd = get_dev_crypto()) < 0) {
288         *cnids = NULL;
289         return (0);
290     }
291     memset(&sess, 0, sizeof(sess));
292     sess.mackey = (caddr_t)"123456789abcdefghijklmnopqrstuvwxyz";
293     for (i = 0; digests[i].id && count < CRYPTO_ALGORITHM_MAX; i++) {
294         if (digests[i].nid == NID_undef)
295             continue;
296         sess.mac = digests[i].id;
297         sess.mackeylen = digests[i].keylen;
298         sess.cipher = 0;
299         if (ioctl(fd, CIOCGSESSION, &sess) != -1 &&
300             ioctl(fd, CIOCFSESSION, &sess.ses) != -1)
301             nids[count++] = digests[i].nid;
302     }
303     put_dev_crypto(fd);
304
305     if (count > 0)
306         *cnids = nids;
307     else
308         *cnids = NULL;
309     return (count);
310 }
311 #endif /* 0 */
312
313 /*
314  * Find the useable ciphers|digests from dev/crypto - this is the first
315  * thing called by the engine init crud which determines what it
316  * can use for ciphers from this engine. We want to return
317  * only what we can do, anything else is handled by software.
318  *
319  * If we can't initialize the device to do anything useful for
320  * any reason, we want to return a NULL array, and 0 length,
321  * which forces everything to be done in software. By putting
322  * the initialization of the device in here, we ensure we can
323  * use this engine as the default, and if for whatever reason
324  * /dev/crypto won't do what we want it will just be done in
325  * software

```

```

326  *
327  * This can (should) be greatly expanded to perhaps take into
328  * account speed of the device, and what we want to do.
329  * (although the disabling of particular alg's could be controlled
330  * by the device driver with sysctl's.) - this is where we
331  * want most of the decisions made about what we actually want
332  * to use from /dev/crypto.
333  */
334 static int
335 cryptodev_usable_ciphers(const int **nids)
336 {
337     return (get_cryptodev_ciphers(nids));
338 }
339
340 static int
341 cryptodev_usable_digests(const int **nids)
342 {
343     #ifdef USE_CRYPTODEV_DIGESTS
344         return (get_cryptodev_digests(nids));
345     #else
346         /*
347          * XXXX just disable all digests for now, because it sucks.
348          * we need a better way to decide this - i.e. I may not
349          * want digests on slow cards like hifn on fast machines,
350          * but might want them on slow or loaded machines, etc.
351          * will also want them when using crypto cards that don't
352          * suck moose gonads - would be nice to be able to decide something
353          * as reasonable default without having hackery that's card dependent.
354          * of course, the default should probably be just do everything,
355          * with perhaps a sysctl to turn algorithms off (or have them off
356          * by default) on cards that generally suck like the hifn.
357          */
358         *nids = NULL;
359         return (0);
360     #endif
361 }
362
363 static int
364 cryptodev_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
365                 const unsigned char *in, size_t inl)
366 {
367     struct crypt_op cryp;
368     struct dev_crypto_state *state = ctx->cipher_data;
369     struct session_op *sess = &state->d_sess;
370     const void *iiv;
371     unsigned char save_iv[EVP_MAX_IV_LENGTH];
372
373     if (state->d_fd < 0)
374         return (0);
375     if (!inl)
376         return (1);
377     if ((inl % ctx->cipher->block_size) != 0)
378         return (0);
379
380     memset(&cryp, 0, sizeof(cryp));
381
382     cryp.ses = sess->ses;
383     cryp.flags = 0;
384     cryp.len = inl;
385     cryp.src = (caddr_t) in;
386     cryp.dst = (caddr_t) out;
387     cryp.mac = 0;
388
389     cryp.op = ctx->encrypt ? COP_ENCRYPT : COP_DECRYPT;
390
391     if (ctx->cipher->iv_len) {

```

```

392     cryp.iv = (caddr_t) ctx->iv;
393     if (!ctx->encrypt) {
394         iiv = in + inl - ctx->cipher->iv_len;
395         memcpy(save_iv, iiv, ctx->cipher->iv_len);
396     }
397 } else
398     cryp.iv = NULL;

400 if (ioctl(state->d_fd, CIOCCRYPT, &cryp) == -1) {
401     /* XXX need better error handling
402      * this can fail for a number of different reasons.
403      */
404     return (0);
405 }

407 if (ctx->cipher->iv_len) {
408     if (ctx->encrypt)
409         iiv = out + inl - ctx->cipher->iv_len;
410     else
411         iiv = save_iv;
412     memcpy(ctx->iv, iiv, ctx->cipher->iv_len);
413 }
414 return (1);
415 }

417 static int
418 cryptodev_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
419                   const unsigned char *iv, int enc)
420 {
421     struct dev_crypto_state *state = ctx->cipher_data;
422     struct session_op *sess = &state->d_sess;
423     int cipher = -1, i;

425     for (i = 0; ciphers[i].id; i++)
426         if (ctx->cipher->nid == ciphers[i].nid &&
427             ctx->cipher->iv_len <= ciphers[i].ivmax &&
428             ctx->key_len == ciphers[i].keylen) {
429             cipher = ciphers[i].id;
430             break;
431         }

433     if (!ciphers[i].id) {
434         state->d_fd = -1;
435         return (0);
436     }

438     memset(sess, 0, sizeof(struct session_op));

440     if ((state->d_fd = get_dev_crypto()) < 0)
441         return (0);

443     sess->key = (caddr_t)key;
444     sess->keylen = ctx->key_len;
445     sess->cipher = cipher;

447     if (ioctl(state->d_fd, CIOCGSESSION, sess) == -1) {
448         put_dev_crypto(state->d_fd);
449         state->d_fd = -1;
450         return (0);
451     }
452     return (1);
453 }

455 /*
456  * free anything we allocated earlier when initting a
457  * session, and close the session.

```

```

458 */
459 static int
460 cryptodev_cleanup(EVP_CIPHER_CTX *ctx)
461 {
462     int ret = 0;
463     struct dev_crypto_state *state = ctx->cipher_data;
464     struct session_op *sess = &state->d_sess;

466     if (state->d_fd < 0)
467         return (0);

469     /* XXX if this ioctl fails, something's wrong. the invoker
470      * may have called us with a bogus ctx, or we could
471      * have a device that for whatever reason just doesn't
472      * want to play ball - it's not clear what's right
473      * here - should this be an error? should it just
474      * increase a counter, hmm. For right now, we return
475      * 0 - I don't believe that to be "right". we could
476      * call the gorny openssl lib error handlers that
477      * print messages to users of the library. hmm..
478     */

480     if (ioctl(state->d_fd, CIOCFSESSION, &sess->ses) == -1) {
481         ret = 0;
482     } else {
483         ret = 1;
484     }
485     put_dev_crypto(state->d_fd);
486     state->d_fd = -1;

488     return (ret);
489 }

491 /*
492  * libcrypto EVP stuff - this is how we get wired to EVP so the engine
493  * gets called when libcrypto requests a cipher NID.
494  */

496 /* RC4 */
497 const EVP_CIPHER cryptodev_rc4 = {
498     NID_rc4,
499     1, 16, 0,
500     EVP_CIPH_VARIABLE_LENGTH,
501     cryptodev_init_key,
502     cryptodev_cipher,
503     cryptodev_cleanup,
504     sizeof(struct dev_crypto_state),
505     NULL,
506     NULL,
507     NULL
508 };

510 /* DES CBC EVP */
511 const EVP_CIPHER cryptodev_des_cbc = {
512     NID_des_cbc,
513     8, 8, 8,
514     EVP_CIPH_CBC_MODE,
515     cryptodev_init_key,
516     cryptodev_cipher,
517     cryptodev_cleanup,
518     sizeof(struct dev_crypto_state),
519     EVP_CIPHER_set_asn1_iv,
520     EVP_CIPHER_get_asn1_iv,
521     NULL
522 };

```



```

524 /* 3DES CBC EVP */
525 const EVP_CIPHER cryptodev_3des_cbc = {
526     NID_des_ede3_cbc,
527     8, 24, 8,
528     EVP_CIPH_CBC_MODE,
529     cryptodev_init_key,
530     cryptodev_cipher,
531     cryptodev_cleanup,
532     sizeof(struct dev_crypto_state),
533     EVP_CIPHER_set_asn1_iv,
534     EVP_CIPHER_get_asn1_iv,
535     NULL
536 };

538 const EVP_CIPHER cryptodev_bf_cbc = {
539     NID_bf_cbc,
540     8, 16, 8,
541     EVP_CIPH_CBC_MODE,
542     cryptodev_init_key,
543     cryptodev_cipher,
544     cryptodev_cleanup,
545     sizeof(struct dev_crypto_state),
546     EVP_CIPHER_set_asn1_iv,
547     EVP_CIPHER_get_asn1_iv,
548     NULL
549 };

551 const EVP_CIPHER cryptodev_cast_cbc = {
552     NID_cast5_cbc,
553     8, 16, 8,
554     EVP_CIPH_CBC_MODE,
555     cryptodev_init_key,
556     cryptodev_cipher,
557     cryptodev_cleanup,
558     sizeof(struct dev_crypto_state),
559     EVP_CIPHER_set_asn1_iv,
560     EVP_CIPHER_get_asn1_iv,
561     NULL
562 };

564 const EVP_CIPHER cryptodev_aes_cbc = {
565     NID_aes_128_cbc,
566     16, 16, 16,
567     EVP_CIPH_CBC_MODE,
568     cryptodev_init_key,
569     cryptodev_cipher,
570     cryptodev_cleanup,
571     sizeof(struct dev_crypto_state),
572     EVP_CIPHER_set_asn1_iv,
573     EVP_CIPHER_get_asn1_iv,
574     NULL
575 };

577 const EVP_CIPHER cryptodev_aes_192_cbc = {
578     NID_aes_192_cbc,
579     16, 24, 16,
580     EVP_CIPH_CBC_MODE,
581     cryptodev_init_key,
582     cryptodev_cipher,
583     cryptodev_cleanup,
584     sizeof(struct dev_crypto_state),
585     EVP_CIPHER_set_asn1_iv,
586     EVP_CIPHER_get_asn1_iv,
587     NULL
588 };

```

```

590 const EVP_CIPHER cryptodev_aes_256_cbc = {
591     NID_aes_256_cbc,
592     16, 32, 16,
593     EVP_CIPH_CBC_MODE,
594     cryptodev_init_key,
595     cryptodev_cipher,
596     cryptodev_cleanup,
597     sizeof(struct dev_crypto_state),
598     EVP_CIPHER_set_asn1_iv,
599     EVP_CIPHER_get_asn1_iv,
600     NULL
601 };

603 /*
604  * Registered by the ENGINE when used to find out how to deal with
605  * a particular NID in the ENGINE. this says what we'll do at the
606  * top level - note, that list is restricted by what we answer with
607  */
608 static int
609 cryptodev_engine_ciphers(ENGINE *e, const EVP_CIPHER **cipher,
610     const int **nids, int nid)
611 {
612     if (!cipher)
613         return (cryptodev_usable_ciphers(nids));

615     switch (nid) {
616     case NID_rc4:
617         *cipher = &cryptodev_rc4;
618         break;
619     case NID_des_ede3_cbc:
620         *cipher = &cryptodev_3des_cbc;
621         break;
622     case NID_des_cbc:
623         *cipher = &cryptodev_des_cbc;
624         break;
625     case NID_bf_cbc:
626         *cipher = &cryptodev_bf_cbc;
627         break;
628     case NID_cast5_cbc:
629         *cipher = &cryptodev_cast_cbc;
630         break;
631     case NID_aes_128_cbc:
632         *cipher = &cryptodev_aes_cbc;
633         break;
634     case NID_aes_192_cbc:
635         *cipher = &cryptodev_aes_192_cbc;
636         break;
637     case NID_aes_256_cbc:
638         *cipher = &cryptodev_aes_256_cbc;
639         break;
640     default:
641         *cipher = NULL;
642         break;
643     }
644     return (*cipher != NULL);
645 }

648 #ifdef USE_CRYPTODEV_DIGESTS

650 /* convert digest type to cryptodev */
651 static int
652 digest_nid_to_cryptodev(int nid)
653 {
654     int i;

```

```

656     for (i = 0; digests[i].id; i++)
657         if (digests[i].nid == nid)
658             return (digests[i].id);
659     return (0);
660 }

663 static int
664 digest_key_length(int nid)
665 {
666     int i;

668     for (i = 0; digests[i].id; i++)
669         if (digests[i].nid == nid)
670             return digests[i].keylen;
671     return (0);
672 }

675 static int cryptodev_digest_init(EVP_MD_CTX *ctx)
676 {
677     struct dev_crypto_state *state = ctx->md_data;
678     struct session_op *sess = &state->d_sess;
679     int digest;

681     if ((digest = digest_nid_to_cryptodev(ctx->digest->type)) == NID_undef){
682         printf("cryptodev_digest_init: Can't get digest \n");
683         return (0);
684     }

686     memset(state, 0, sizeof(struct dev_crypto_state));

688     if ((state->d_fd = get_dev_crypto()) < 0) {
689         printf("cryptodev_digest_init: Can't get Dev \n");
690         return (0);
691     }

693     sess->mackey = state->dummy_mac_key;
694     sess->mackeylen = digest_key_length(ctx->digest->type);
695     sess->mac = digest;

697     if (ioctl(state->d_fd, CIOCGSESSION, sess) < 0) {
698         put_dev_crypto(state->d_fd);
699         state->d_fd = -1;
700         printf("cryptodev_digest_init: Open session failed\n");
701         return (0);
702     }

704     return (1);
705 }

707 static int cryptodev_digest_update(EVP_MD_CTX *ctx, const void *data,
708     size_t count)
709 {
710     struct crypt_op cryp;
711     struct dev_crypto_state *state = ctx->md_data;
712     struct session_op *sess = &state->d_sess;

714     if (!data || state->d_fd < 0) {
715         printf("cryptodev_digest_update: illegal inputs \n");
716         return (0);
717     }

719     if (!count) {
720         return (0);
721     }

```

```

723     if (!(ctx->flags & EVP_MD_CTX_FLAG_ONESHOT)) {
724         /* if application doesn't support one buffer */
725         state->mac_data = OPENSSL_realloc(state->mac_data, state->mac_le

727         if (!state->mac_data) {
728             printf("cryptodev_digest_update: realloc failed\n");
729             return (0);
730         }

732         memcpy(state->mac_data + state->mac_len, data, count);
733         state->mac_len += count;

735         return (1);
736     }

738     memset(&cryp, 0, sizeof(cryp));

740     cryp.ses = sess->ses;
741     cryp.flags = 0;
742     cryp.len = count;
743     cryp.src = (caddr_t) data;
744     cryp.dst = NULL;
745     cryp.mac = (caddr_t) state->digest_res;
746     if (ioctl(state->d_fd, CIOCCRYPT, &cryp) < 0) {
747         printf("cryptodev_digest_update: digest failed\n");
748         return (0);
749     }
750     return (1);
751 }

754 static int cryptodev_digest_final(EVP_MD_CTX *ctx, unsigned char *md)
755 {
756     struct crypt_op cryp;
757     struct dev_crypto_state *state = ctx->md_data;
758     struct session_op *sess = &state->d_sess;

760     int ret = 1;

762     if (!md || state->d_fd < 0) {
763         printf("cryptodev_digest_final: illegal input\n");
764         return(0);
765     }

767     if (!(ctx->flags & EVP_MD_CTX_FLAG_ONESHOT)) {
768         /* if application doesn't support one buffer */
769         memset(&cryp, 0, sizeof(cryp));
770         cryp.ses = sess->ses;
771         cryp.flags = 0;
772         cryp.len = state->mac_len;
773         cryp.src = state->mac_data;
774         cryp.dst = NULL;
775         cryp.mac = (caddr_t)md;
776         if (ioctl(state->d_fd, CIOCCRYPT, &cryp) < 0) {
777             printf("cryptodev_digest_final: digest failed\n");
778             return (0);
779         }

781         return 1;
782     }

784     memcpy(md, state->digest_res, ctx->digest->md_size);

786     return (ret);
787 }

```

```

790 static int cryptodev_digest_cleanup(EVP_MD_CTX *ctx)
791 {
792     int ret = 1;
793     struct dev_crypto_state *state = ctx->md_data;
794     struct session_op *sess = &state->d_sess;
795
796     if (state == NULL)
797         return 0;
798
799     if (state->d_fd < 0) {
800         printf("cryptodev_digest_cleanup: illegal input\n");
801         return (0);
802     }
803
804     if (state->mac_data) {
805         OPENSSL_free(state->mac_data);
806         state->mac_data = NULL;
807         state->mac_len = 0;
808     }
809
810     if (ioctl(state->d_fd, CIOCFSESSION, &sess->ses) < 0) {
811         printf("cryptodev_digest_cleanup: failed to close session\n");
812         ret = 0;
813     } else {
814         ret = 1;
815     }
816     put_dev_crypto(state->d_fd);
817     state->d_fd = -1;
818
819     return (ret);
820 }
821
822 static int cryptodev_digest_copy(EVP_MD_CTX *to, const EVP_MD_CTX *from)
823 {
824     struct dev_crypto_state *fstate = from->md_data;
825     struct dev_crypto_state *dstate = to->md_data;
826     struct session_op *sess;
827     int digest;
828
829     if (dstate == NULL || fstate == NULL)
830         return 1;
831
832     memcpy(dstate, fstate, sizeof(struct dev_crypto_state));
833
834     sess = &dstate->d_sess;
835
836     digest = digest_nid_to_cryptodev(to->digest->type);
837
838     sess->mackey = dstate->dummy_mac_key;
839     sess->mackeylen = digest_key_length(to->digest->type);
840     sess->mac = digest;
841
842     dstate->d_fd = get_dev_crypto();
843
844     if (ioctl(dstate->d_fd, CIOCGSESSION, sess) < 0) {
845         put_dev_crypto(dstate->d_fd);
846         dstate->d_fd = -1;
847         printf("cryptodev_digest_init: Open session failed\n");
848         return (0);
849     }
850
851     if (fstate->mac_len != 0) {
852         if (fstate->mac_data != NULL)
853             {

```

```

854         dstate->mac_data = OPENSSL_malloc(fstate->mac_len);
855         memcpy(dstate->mac_data, fstate->mac_data, fstate->mac_l
856         dstate->mac_len = fstate->mac_len;
857     }
858 }
859
860     return 1;
861 }
862
863
864 const EVP_MD cryptodev_sha1 = {
865     NID_sha1,
866     NID_undef,
867     SHA_DIGEST_LENGTH,
868     EVP_MD_FLAG_ONESHOT,
869     cryptodev_digest_init,
870     cryptodev_digest_update,
871     cryptodev_digest_final,
872     cryptodev_digest_copy,
873     cryptodev_digest_cleanup,
874     EVP_PKEY_NULL_method,
875     SHA_CBLOCK,
876     sizeof(struct dev_crypto_state),
877 };
878
879 const EVP_MD cryptodev_md5 = {
880     NID_md5,
881     NID_undef,
882     16 /* MD5_DIGEST_LENGTH */,
883     EVP_MD_FLAG_ONESHOT,
884     cryptodev_digest_init,
885     cryptodev_digest_update,
886     cryptodev_digest_final,
887     cryptodev_digest_copy,
888     cryptodev_digest_cleanup,
889     EVP_PKEY_NULL_method,
890     64 /* MD5_CBLOCK */,
891     sizeof(struct dev_crypto_state),
892 };
893
894 #endif /* USE_CRYPTODEV_DIGESTS */
895
896
897 static int
898 cryptodev_engine_digests(ENGINE *e, const EVP_MD **digest,
899     const int **nids, int nid)
900 {
901     if (!digest)
902         return (cryptodev_usable_digests(nids));
903
904     switch (nid) {
905 #ifdef USE_CRYPTODEV_DIGESTS
906     case NID_md5:
907         *digest = &cryptodev_md5;
908         break;
909     case NID_sha1:
910         *digest = &cryptodev_sha1;
911         break;
912     default:
913 #endif /* USE_CRYPTODEV_DIGESTS */
914         *digest = NULL;
915         break;
916     }
917     return (*digest != NULL);
918 }

```

```

920 /*
921  * Convert a BIGNUM to the representation that /dev/crypto needs.
922  * Upon completion of use, the caller is responsible for freeing
923  * crp->crp_p.
924  */
925 static int
926 bn2crparam(const BIGNUM *a, struct crparam *crp)
927 {
928     int i, j, k;
929     ssize_t bytes, bits;
930     u_char *b;
931
932     crp->crp_p = NULL;
933     crp->crp_nbits = 0;
934
935     bits = BN_num_bits(a);
936     bytes = (bits + 7) / 8;
937
938     b = malloc(bytes);
939     if (b == NULL)
940         return (1);
941     memset(b, 0, bytes);
942
943     crp->crp_p = (caddr_t) b;
944     crp->crp_nbits = bits;
945
946     for (i = 0, j = 0; i < a->top; i++) {
947         for (k = 0; k < BN_BITS2 / 8; k++) {
948             if ((j + k) >= bytes)
949                 return (0);
950             b[j + k] = a->d[i] >> (k * 8);
951             j += BN_BITS2 / 8;
952         }
953     }
954     return (0);
955 }
956
957 /* Convert a /dev/crypto parameter to a BIGNUM */
958 static int
959 crparam2bn(struct crparam *crp, BIGNUM *a)
960 {
961     u_int8_t *pd;
962     int i, bytes;
963
964     bytes = (crp->crp_nbits + 7) / 8;
965
966     if (bytes == 0)
967         return (-1);
968
969     if ((pd = (u_int8_t *) malloc(bytes)) == NULL)
970         return (-1);
971
972     for (i = 0; i < bytes; i++)
973         pd[i] = crp->crp_p[bytes - i - 1];
974
975     BN_bin2bn(pd, bytes, a);
976     free(pd);
977     return (0);
978 }
979
980 static void
981 zapparams(struct crypt_kop *kop)
982 {
983     int i;

```

```

986     for (i = 0; i < kop->crk_iparams + kop->crk_oparams; i++) {
987         if (kop->crk_param[i].crp_p)
988             free(kop->crk_param[i].crp_p);
989         kop->crk_param[i].crp_p = NULL;
990         kop->crk_param[i].crp_nbits = 0;
991     }
992 }
993
994 static int
995 cryptodev_asym(struct crypt_kop *kop, int rlen, BIGNUM *r, int slen, BIGNUM *s)
996 {
997     int fd, ret = -1;
998
999     if ((fd = get_asym_dev_crypto()) < 0)
1000         return (ret);
1001
1002     if (r) {
1003         kop->crk_param[kop->crk_iparams].crp_p = calloc(rlen, sizeof(char));
1004         kop->crk_param[kop->crk_iparams].crp_nbits = rlen * 8;
1005         kop->crk_oparams++;
1006     }
1007     if (s) {
1008         kop->crk_param[kop->crk_iparams+1].crp_p = calloc(slen, sizeof(char));
1009         kop->crk_param[kop->crk_iparams+1].crp_nbits = slen * 8;
1010         kop->crk_oparams++;
1011     }
1012
1013     if (ioctl(fd, CIOCKEY, kop) == 0) {
1014         if (r)
1015             crparam2bn(&kop->crk_param[kop->crk_iparams], r);
1016         if (s)
1017             crparam2bn(&kop->crk_param[kop->crk_iparams+1], s);
1018         ret = 0;
1019     }
1020
1021     return (ret);
1022 }
1023
1024 static int
1025 cryptodev_bn_mod_exp(BIGNUM *r, const BIGNUM *a, const BIGNUM *p,
1026                     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *in_mont)
1027 {
1028     struct crypt_kop kop;
1029     int ret = 1;
1030
1031     /* Currently, we know we can do mod exp iff we can do any
1032      * asymmetric operations at all.
1033      */
1034     if (cryptodev_asymfeat == 0) {
1035         ret = BN_mod_exp(r, a, p, m, ctx);
1036         return (ret);
1037     }
1038
1039     memset(&kop, 0, sizeof kop);
1040     kop.crk_op = CRK_MOD_EXP;
1041
1042     /* inputs: a^p % m */
1043     if (bn2crparam(a, &kop.crk_param[0]))
1044         goto err;
1045     if (bn2crparam(p, &kop.crk_param[1]))
1046         goto err;
1047     if (bn2crparam(m, &kop.crk_param[2]))
1048         goto err;
1049     kop.crk_iparams = 3;
1050
1051     if (cryptodev_asym(&kop, BN_num_bytes(m), r, 0, NULL)) {

```

```

1052         const RSA_METHOD *meth = RSA_PKCS1_SSLeay();
1053         printf("OCF asym process failed, Running in software\n");
1054         ret = meth->bn_mod_exp(r, a, p, m, ctx, in_mont);

1056     } else if (ECANCELED == kop.crk_status) {
1057         const RSA_METHOD *meth = RSA_PKCS1_SSLeay();
1058         printf("OCF hardware operation cancelled. Running in Software\n");
1059         ret = meth->bn_mod_exp(r, a, p, m, ctx, in_mont);
1060     }
1061     /* else cryptodev operation worked ok ==> ret = 1*/

1063 err:
1064     zapparams(&kop);
1065     return (ret);
1066 }

1068 static int
1069 cryptodev_rsa_nocrt_mod_exp(BIGNUM *r0, const BIGNUM *I, RSA *rsa, BN_CTX *ctx)
1070 {
1071     int r;
1072     ctx = BN_CTX_new();
1073     r = cryptodev_bn_mod_exp(r0, I, rsa->d, rsa->n, ctx, NULL);
1074     BN_CTX_free(ctx);
1075     return (r);
1076 }

1078 static int
1079 cryptodev_rsa_mod_exp(BIGNUM *r0, const BIGNUM *I, RSA *rsa, BN_CTX *ctx)
1080 {
1081     struct crypt_kop kop;
1082     int ret = 1;

1084     if (!rsa->p || !rsa->q || !rsa->dmp1 || !rsa->dmq1 || !rsa->iqmp) {
1085         /* XXX 0 means failure?? */
1086         return (0);
1087     }

1089     memset(&kop, 0, sizeof kop);
1090     kop.crk_op = CRK_MOD_EXP_CRT;
1091     /* inputs: rsa->p rsa->q I rsa->dmp1 rsa->dmq1 rsa->iqmp */
1092     if (bn2crparam(rsa->p, &kop.crk_param[0]))
1093         goto err;
1094     if (bn2crparam(rsa->q, &kop.crk_param[1]))
1095         goto err;
1096     if (bn2crparam(I, &kop.crk_param[2]))
1097         goto err;
1098     if (bn2crparam(rsa->dmp1, &kop.crk_param[3]))
1099         goto err;
1100     if (bn2crparam(rsa->dmq1, &kop.crk_param[4]))
1101         goto err;
1102     if (bn2crparam(rsa->iqmp, &kop.crk_param[5]))
1103         goto err;
1104     kop.crk_iparams = 6;

1106     if (cryptodev_asym(&kop, BN_num_bytes(rsa->n), r0, 0, NULL)) {
1107         const RSA_METHOD *meth = RSA_PKCS1_SSLeay();
1108         printf("OCF asym process failed, running in Software\n");
1109         ret = (*meth->rsa_mod_exp)(r0, I, rsa, ctx);

1111     } else if (ECANCELED == kop.crk_status) {
1112         const RSA_METHOD *meth = RSA_PKCS1_SSLeay();
1113         printf("OCF hardware operation cancelled. Running in Software\n");
1114         ret = (*meth->rsa_mod_exp)(r0, I, rsa, ctx);
1115     }
1116     /* else cryptodev operation worked ok ==> ret = 1*/

```

```

1118 err:
1119     zapparams(&kop);
1120     return (ret);
1121 }

1123 static RSA_METHOD cryptodev_rsa = {
1124     "cryptodev RSA method",
1125     NULL, /* rsa_pub_enc */
1126     NULL, /* rsa_pub_dec */
1127     NULL, /* rsa_priv_enc */
1128     NULL, /* rsa_priv_dec */
1129     NULL,
1130     NULL,
1131     NULL, /* init */
1132     NULL, /* finish */
1133     0, /* flags */
1134     NULL, /* app_data */
1135     NULL, /* rsa_sign */
1136     NULL, /* rsa_verify */
1137 };

1139 static int
1140 cryptodev_dsa_bn_mod_exp(DSA *dsa, BIGNUM *r, BIGNUM *a, const BIGNUM *p,
1141     const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *m_ctx)
1142 {
1143     return (cryptodev_bn_mod_exp(r, a, p, m, ctx, m_ctx));
1144 }

1146 static int
1147 cryptodev_dsa_dsa_mod_exp(DSA *dsa, BIGNUM *t1, BIGNUM *g,
1148     BIGNUM *u1, BIGNUM *pub_key, BIGNUM *u2, BIGNUM *p,
1149     BN_CTX *ctx, BN_MONT_CTX *mont)
1150 {
1151     BIGNUM t2;
1152     int ret = 0;

1154     BN_init(&t2);

1156     /* v = ( g^u1 * y^u2 mod p ) mod q */
1157     /* let t1 = g ^ u1 mod p */
1158     ret = 0;

1160     if (!dsa->meth->bn_mod_exp(dsa, t1, dsa->g, u1, dsa->p, ctx, mont))
1161         goto err;

1163     /* let t2 = y ^ u2 mod p */
1164     if (!dsa->meth->bn_mod_exp(dsa, &t2, dsa->pub_key, u2, dsa->p, ctx, mont))
1165         goto err;
1166     /* let u1 = t1 * t2 mod p */
1167     if (!BN_mod_mul(u1, t1, &t2, dsa->p, ctx))
1168         goto err;

1170     BN_copy(t1, u1);

1172     ret = 1;
1173 err:
1174     BN_free(&t2);
1175     return(ret);
1176 }

1178 static DSA_SIG *
1179 cryptodev_dsa_do_sign(const unsigned char *dgst, int dlen, DSA *dsa)
1180 {
1181     struct crypt_kop kop;
1182     BIGNUM *r = NULL, *s = NULL;
1183     DSA_SIG *dsaret = NULL;

```

```

1185     if ((r = BN_new()) == NULL)
1186         goto err;
1187     if ((s = BN_new()) == NULL) {
1188         BN_free(r);
1189         goto err;
1190     }

1192     memset(&kop, 0, sizeof kop);
1193     kop.crk_op = CRK_DSA_SIGN;

1195     /* inputs: dgst dsa->p dsa->q dsa->g dsa->priv_key */
1196     kop.crk_param[0].crp_p = (caddr_t)dgst;
1197     kop.crk_param[0].crp_nbits = dlen * 8;
1198     if (bn2crparam(dsa->p, &kop.crk_param[1]))
1199         goto err;
1200     if (bn2crparam(dsa->q, &kop.crk_param[2]))
1201         goto err;
1202     if (bn2crparam(dsa->g, &kop.crk_param[3]))
1203         goto err;
1204     if (bn2crparam(dsa->priv_key, &kop.crk_param[4]))
1205         goto err;
1206     kop.crk_iparams = 5;

1208     if (cryptodev_asym(&kop, BN_num_bytes(dsa->q), r,
1209         BN_num_bytes(dsa->q), s) == 0) {
1210         dsaret = DSA_SIG_new();
1211         dsaret->r = r;
1212         dsaret->s = s;
1213     } else {
1214         const DSA_METHOD *meth = DSA_OpenSSL();
1215         BN_free(r);
1216         BN_free(s);
1217         dsaret = (meth->dsa_do_sign)(dgst, dlen, dsa);
1218     }
1219 err:
1220     kop.crk_param[0].crp_p = NULL;
1221     zapparams(&kop);
1222     return (dsaret);
1223 }

1225 static int
1226 cryptodev_dsa_verify(const unsigned char *dgst, int dlen,
1227     DSA_SIG *sig, DSA *dsa)
1228 {
1229     struct crypt_kop kop;
1230     int dsaret = 1;

1232     memset(&kop, 0, sizeof kop);
1233     kop.crk_op = CRK_DSA_VERIFY;

1235     /* inputs: dgst dsa->p dsa->q dsa->g dsa->pub_key sig->r sig->s */
1236     kop.crk_param[0].crp_p = (caddr_t)dgst;
1237     kop.crk_param[0].crp_nbits = dlen * 8;
1238     if (bn2crparam(dsa->p, &kop.crk_param[1]))
1239         goto err;
1240     if (bn2crparam(dsa->q, &kop.crk_param[2]))
1241         goto err;
1242     if (bn2crparam(dsa->g, &kop.crk_param[3]))
1243         goto err;
1244     if (bn2crparam(dsa->pub_key, &kop.crk_param[4]))
1245         goto err;
1246     if (bn2crparam(sig->r, &kop.crk_param[5]))
1247         goto err;
1248     if (bn2crparam(sig->s, &kop.crk_param[6]))
1249         goto err;

```

```

1250     kop.crk_iparams = 7;

1252     if (cryptodev_asym(&kop, 0, NULL, 0, NULL) == 0) {
1253         /*OCF success value is 0, if not zero, change dsaret to fail*/
1254         if(0 != kop.crk_status) dsaret = 0;
1255     } else {
1256         const DSA_METHOD *meth = DSA_OpenSSL();

1258         dsaret = (meth->dsa_do_verify)(dgst, dlen, sig, dsa);
1259     }
1260 err:
1261     kop.crk_param[0].crp_p = NULL;
1262     zapparams(&kop);
1263     return (dsaret);
1264 }

1266 static DSA_METHOD cryptodev_dsa = {
1267     "cryptodev DSA method",
1268     NULL,
1269     NULL, /* dsa_sign_setup */
1270     NULL,
1271     NULL, /* dsa_mod_exp */
1272     NULL,
1273     NULL, /* init */
1274     NULL, /* finish */
1275     0, /* flags */
1276     NULL /* app_data */
1277 };

1279 static int
1280 cryptodev_mod_exp_dh(const DH *dh, BIGNUM *r, const BIGNUM *a,
1281     const BIGNUM *p, const BIGNUM *m, BN_CTX *ctx,
1282     BN_MONT_CTX *m_ctx)
1283 {
1284     return (cryptodev_bn_mod_exp(r, a, p, m, ctx, m_ctx));
1285 }

1287 static int
1288 cryptodev_dh_compute_key(unsigned char *key, const BIGNUM *pub_key, DH *dh)
1289 {
1290     struct crypt_kop kop;
1291     int dhret = 1;
1292     int fd, keylen;

1294     if ((fd = get_asym_dev_crypto()) < 0) {
1295         const DH_METHOD *meth = DH_OpenSSL();

1297         return ((meth->compute_key)(key, pub_key, dh));
1298     }

1300     keylen = BN_num_bits(dh->p);

1302     memset(&kop, 0, sizeof kop);
1303     kop.crk_op = CRK_DH_COMPUTE_KEY;

1305     /* inputs: dh->priv_key pub_key dh->p key */
1306     if (bn2crparam(dh->priv_key, &kop.crk_param[0]))
1307         goto err;
1308     if (bn2crparam(pub_key, &kop.crk_param[1]))
1309         goto err;
1310     if (bn2crparam(dh->p, &kop.crk_param[2]))
1311         goto err;
1312     kop.crk_iparams = 3;

1314     kop.crk_param[3].crp_p = (caddr_t) key;
1315     kop.crk_param[3].crp_nbits = keylen * 8;

```

```

1316     kop.crk_oparams = 1;
1318     if (ioctl(fd, CIOCKEY, &kop) == -1) {
1319         const DH_METHOD *meth = DH_OpenSSL();
1321         dhret = (meth->compute_key)(key, pub_key, dh);
1322     }
1323 err:
1324     kop.crk_param[3].crp_p = NULL;
1325     zapparams(&kop);
1326     return (dhret);
1327 }

1329 static DH_METHOD cryptodev_dh = {
1330     "cryptodev DH method",
1331     NULL, /* cryptodev_dh_generate_key */
1332     NULL,
1333     NULL,
1334     NULL,
1335     NULL,
1336     0, /* flags */
1337     NULL /* app_data */
1338 };

1340 /*
1341  * ctrl right now is just a wrapper that doesn't do much
1342  * but I expect we'll want some options soon.
1343  */
1344 static int
1345 cryptodev_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)(void))
1346 {
1347     #ifdef HAVE_SYSLOG_R
1348         struct syslog_data sd = SYSLOG_DATA_INIT;
1349     #endif

1351     switch (cmd) {
1352     default:
1353     #ifdef HAVE_SYSLOG_R
1354         syslog_r(LOG_ERR, &sd,
1355             "cryptodev_ctrl: unknown command %d", cmd);
1356     #else
1357         syslog(LOG_ERR, "cryptodev_ctrl: unknown command %d", cmd);
1358     #endif
1359         break;
1360     }
1361     return (1);
1362 }

1364 void
1365 ENGINE_load_cryptodev(void)
1366 {
1367     ENGINE *engine = ENGINE_new();
1368     int fd;

1370     if (engine == NULL)
1371         return;
1372     if ((fd = get_dev_crypto()) < 0) {
1373         ENGINE_free(engine);
1374         return;
1375     }

1377     /*
1378      * find out what asymmetric crypto algorithms we support
1379      */
1380     if (ioctl(fd, CIOCASYMFEAT, &cryptodev_asymfeat) == -1) {
1381         put_dev_crypto(fd);

```

```

1382         ENGINE_free(engine);
1383         return;
1384     }
1385     put_dev_crypto(fd);

1387     if (!ENGINE_set_id(engine, "cryptodev") ||
1388         !ENGINE_set_name(engine, "BSD cryptodev engine") ||
1389         !ENGINE_set_ciphers(engine, cryptodev_engine_ciphers) ||
1390         !ENGINE_set_digests(engine, cryptodev_engine_digests) ||
1391         !ENGINE_set_ctrl_function(engine, cryptodev_ctrl) ||
1392         !ENGINE_set_cmd_defns(engine, cryptodev_defns)) {
1393         ENGINE_free(engine);
1394         return;
1395     }

1397     if (ENGINE_set_RSA(engine, &cryptodev_rsa)) {
1398         const RSA_METHOD *rsa_meth = RSA_PKCS1_SSLeay();

1400         cryptodev_rsa.bn_mod_exp = rsa_meth->bn_mod_exp;
1401         cryptodev_rsa.rsa_mod_exp = rsa_meth->rsa_mod_exp;
1402         cryptodev_rsa.rsa_pub_enc = rsa_meth->rsa_pub_enc;
1403         cryptodev_rsa.rsa_pub_dec = rsa_meth->rsa_pub_dec;
1404         cryptodev_rsa.rsa_priv_enc = rsa_meth->rsa_priv_enc;
1405         cryptodev_rsa.rsa_priv_dec = rsa_meth->rsa_priv_dec;
1406         if (cryptodev_asymfeat & CRF_MOD_EXP) {
1407             cryptodev_rsa.bn_mod_exp = cryptodev_bn_mod_exp;
1408             if (cryptodev_asymfeat & CRF_MOD_EXP_CRT)
1409                 cryptodev_rsa.rsa_mod_exp =
1410                     cryptodev_rsa_mod_exp;
1411             else
1412                 cryptodev_rsa.rsa_mod_exp =
1413                     cryptodev_rsa_nocrt_mod_exp;
1414         }
1415     }

1417     if (ENGINE_set_DSA(engine, &cryptodev_dsa)) {
1418         const DSA_METHOD *meth = DSA_OpenSSL();

1420         memcpy(&cryptodev_dsa, meth, sizeof(DSA_METHOD));
1421         if (cryptodev_asymfeat & CRF_DSA_SIGN)
1422             cryptodev_dsa.dsa_do_sign = cryptodev_dsa_do_sign;
1423         if (cryptodev_asymfeat & CRF_MOD_EXP) {
1424             cryptodev_dsa.bn_mod_exp = cryptodev_dsa_bn_mod_exp;
1425             cryptodev_dsa.dsa_mod_exp = cryptodev_dsa_dsa_mod_exp;
1426         }
1427         if (cryptodev_asymfeat & CRF_DSA_VERIFY)
1428             cryptodev_dsa.dsa_do_verify = cryptodev_dsa_verify;
1429     }

1431     if (ENGINE_set_DH(engine, &cryptodev_dh)){
1432         const DH_METHOD *dh_meth = DH_OpenSSL();

1434         cryptodev_dh.generate_key = dh_meth->generate_key;
1435         cryptodev_dh.compute_key = dh_meth->compute_key;
1436         cryptodev_dh.bn_mod_exp = dh_meth->bn_mod_exp;
1437         if (cryptodev_asymfeat & CRF_MOD_EXP) {
1438             cryptodev_dh.bn_mod_exp = cryptodev_mod_exp_dh;
1439             if (cryptodev_asymfeat & CRF_DH_COMPUTE_KEY)
1440                 cryptodev_dh.compute_key =
1441                     cryptodev_dh_compute_key;
1442         }
1443     }

1445     ENGINE_add(engine);
1446     ENGINE_free(engine);
1447     ERR_clear_error();

```

```
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_cryptodev.c
```

23

```
1448 }
```

```
1450 #endif /* HAVE_CRYPTODEV */
```


new/usr/src/lib/openssl/libsunw_crypto/engine/eng_ctrl.c

1

```
*****
12340 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_ctrl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/engine/eng_ctrl.c */
2 /* =====
3 * Copyright (c) 1999-2001 The OpenSSL Project. All rights reserved.
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46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 #include "eng_int.h"
57
58 /* When querying a ENGINE-specific control command's 'description', this string
59 * is used if the ENGINE_CMD_DEFN has cmd_desc set to NULL. */
60 static const char *int_no_description = "";
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_ctrl.c

2

```
62 /* These internal functions handle 'CMD'-related control commands when the
63 * ENGINE in question has asked us to take care of it (ie. the ENGINE did not
64 * set the ENGINE_FLAGS_MANUAL_CMD_CTRL flag. */
65
66 static int int_ctrl_cmd_is_null(const ENGINE_CMD_DEFN *defn)
67 {
68     if((defn->cmd_num == 0) || (defn->cmd_name == NULL))
69         return 1;
70     return 0;
71 }
72
73 static int int_ctrl_cmd_by_name(const ENGINE_CMD_DEFN *defn, const char *s)
74 {
75     int idx = 0;
76     while(!int_ctrl_cmd_is_null(defn) && (strcmp(defn->cmd_name, s) != 0))
77     {
78         idx++;
79         defn++;
80     }
81     if(int_ctrl_cmd_is_null(defn))
82         /* The given name wasn't found */
83         return -1;
84     return idx;
85 }
86
87 static int int_ctrl_cmd_by_num(const ENGINE_CMD_DEFN *defn, unsigned int num)
88 {
89     int idx = 0;
90     /* NB: It is stipulated that 'cmd_defn' lists are ordered by cmd_num. So
91      * our searches don't need to take any longer than necessary. */
92     while(!int_ctrl_cmd_is_null(defn) && (defn->cmd_num < num))
93     {
94         idx++;
95         defn++;
96     }
97     if(defn->cmd_num == num)
98         return idx;
99     /* The given cmd_num wasn't found */
100     return -1;
101 }
102
103 static int int_ctrl_helper(ENGINE *e, int cmd, long i, void *p,
104                          void (*f)(void))
105 {
106     int idx;
107     char *s = (char *)p;
108     /* Take care of the easy one first (eg. it requires no searches) */
109     if(cmd == ENGINE_CTRL_GET_FIRST_CMD_TYPE)
110     {
111         if((e->cmd_defns == NULL) || int_ctrl_cmd_is_null(e->cmd_defns))
112             return 0;
113         return e->cmd_defns->cmd_num;
114     }
115     /* One or two commands require that "p" be a valid string buffer */
116     if((cmd == ENGINE_CTRL_GET_CMD_FROM_NAME) ||
117        (cmd == ENGINE_CTRL_GET_NAME_FROM_CMD) ||
118        (cmd == ENGINE_CTRL_GET_DESC_FROM_CMD))
119     {
120         if(s == NULL)
121         {
122             ENGINEerr(ENGINE_F_INT_CTRL_HELPER,
123                      ERR_R_PASSED_NULL_PARAMETER);
124             return -1;
125         }
126     }
127     /* Now handle cmd_name -> cmd_num conversion */
128 }
```

```

128     if(cmd == ENGINE_CTRL_GET_CMD_FROM_NAME)
129     {
130         if((e->cmd_defns == NULL) || ((idx = int_ctrl_cmd_by_name(
131             e->cmd_defns, s)) < 0))
132         {
133             ENGINEerr(ENGINE_F_INT_CTRL_HELPER,
134                 ENGINE_R_INVALID_CMD_NAME);
135             return -1;
136         }
137         return e->cmd_defns[idx].cmd_num;
138     }
139     /* For the rest of the commands, the 'long' argument must specify a
140     * value command number - so we need to conduct a search. */
141     if((e->cmd_defns == NULL) || ((idx = int_ctrl_cmd_by_num(e->cmd_defns,
142         (unsigned int)i)) < 0))
143     {
144         ENGINEerr(ENGINE_F_INT_CTRL_HELPER,
145             ENGINE_R_INVALID_CMD_NUMBER);
146         return -1;
147     }
148     /* Now the logic splits depending on command type */
149     switch(cmd)
150     {
151     case ENGINE_CTRL_GET_NEXT_CMD_TYPE:
152         idx++;
153         if(int_ctrl_cmd_is_null(e->cmd_defns + idx))
154             /* end-of-list */
155             return 0;
156         else
157             return e->cmd_defns[idx].cmd_num;
158     case ENGINE_CTRL_GET_NAME_LEN_FROM_CMD:
159         return strlen(e->cmd_defns[idx].cmd_name);
160     case ENGINE_CTRL_GET_NAME_FROM_CMD:
161         return BIO_snprintf(s, strlen(e->cmd_defns[idx].cmd_name) + 1,
162             "%s", e->cmd_defns[idx].cmd_name);
163     case ENGINE_CTRL_GET_DESC_LEN_FROM_CMD:
164         if(e->cmd_defns[idx].cmd_desc)
165             return strlen(e->cmd_defns[idx].cmd_desc);
166         return strlen(int_no_description);
167     case ENGINE_CTRL_GET_DESC_FROM_CMD:
168         if(e->cmd_defns[idx].cmd_desc)
169             return BIO_snprintf(s,
170                 strlen(e->cmd_defns[idx].cmd_desc) +
171                 "%s", e->cmd_defns[idx].cmd_desc);
172         return BIO_snprintf(s, strlen(int_no_description) + 1, "%s",
173             int_no_description);
174     case ENGINE_CTRL_GET_CMD_FLAGS:
175         return e->cmd_defns[idx].cmd_flags;
176     }
177     /* Shouldn't really be here ... */
178     ENGINEerr(ENGINE_F_INT_CTRL_HELPER, ENGINE_R_INTERNAL_LIST_ERROR);
179     return -1;
180 }

182 int ENGINE_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)(void))
183 {
184     int ctrl_exists, ref_exists;
185     if(e == NULL)
186     {
187         ENGINEerr(ENGINE_F_ENGINE_CTRL, ERR_R_PASSED_NULL_PARAMETER);
188         return 0;
189     }
190     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
191     ref_exists = ((e->struct_ref > 0) ? 1 : 0);
192     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
193     ctrl_exists = ((e->ctrl == NULL) ? 0 : 1);

```

```

194     if(!ref_exists)
195     {
196         ENGINEerr(ENGINE_F_ENGINE_CTRL, ENGINE_R_NO_REFERENCE);
197         return 0;
198     }
199     /* Intercept any "root-level" commands before trying to hand them on to
200     * ctrl() handlers. */
201     switch(cmd)
202     {
203     case ENGINE_CTRL_HAS_CTRL_FUNCTION:
204         return ctrl_exists;
205     case ENGINE_CTRL_GET_FIRST_CMD_TYPE:
206     case ENGINE_CTRL_GET_NEXT_CMD_TYPE:
207     case ENGINE_CTRL_GET_CMD_FROM_NAME:
208     case ENGINE_CTRL_GET_NAME_LEN_FROM_CMD:
209     case ENGINE_CTRL_GET_NAME_FROM_CMD:
210     case ENGINE_CTRL_GET_DESC_LEN_FROM_CMD:
211     case ENGINE_CTRL_GET_DESC_FROM_CMD:
212     case ENGINE_CTRL_GET_CMD_FLAGS:
213         if(ctrl_exists && !(e->flags & ENGINE_FLAGS_MANUAL_CMD_CTRL))
214             return int_ctrl_helper(e, cmd, i, p, f);
215         if(!ctrl_exists)
216         {
217             ENGINEerr(ENGINE_F_ENGINE_CTRL, ENGINE_R_NO_CONTROL_FUNCNT);
218             /* For these cmd-related functions, failure is indicated
219             * by a -1 return value (because 0 is used as a valid
220             * return in some places). */
221             return -1;
222         }
223     default:
224         break;
225     }
226     /* Anything else requires a ctrl() handler to exist. */
227     if(!ctrl_exists)
228     {
229         ENGINEerr(ENGINE_F_ENGINE_CTRL, ENGINE_R_NO_CONTROL_FUNCTION);
230         return 0;
231     }
232     return e->ctrl(e, cmd, i, p, f);
233 }

235 int ENGINE_cmd_is_executable(ENGINE *e, int cmd)
236 {
237     int flags;
238     if((flags = ENGINE_ctrl(e, ENGINE_CTRL_GET_CMD_FLAGS, cmd, NULL, NULL))
239     {
240         ENGINEerr(ENGINE_F_ENGINE_CMD_IS_EXECUTABLE,
241             ENGINE_R_INVALID_CMD_NUMBER);
242         return 0;
243     }
244     if(!(flags & ENGINE_CMD_FLAG_NO_INPUT) &&
245         !(flags & ENGINE_CMD_FLAG_NUMERIC) &&
246         !(flags & ENGINE_CMD_FLAG_STRING))
247         return 0;
248     return 1;
249 }

251 int ENGINE_ctrl_cmd(ENGINE *e, const char *cmd_name,
252     long i, void *p, void (*f)(void), int cmd_optional)
253 {
254     int num;

256     if((e == NULL) || (cmd_name == NULL))
257     {
258         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD,
259             ERR_R_PASSED_NULL_PARAMETER);

```

```

260     return 0;
261 }
262 if((e->ctrl == NULL) || ((num = ENGINE_ctrl(e,
263     ENGINE_CTRL_GET_CMD_FROM_NAME,
264     0, (void *)cmd_name, NULL)) <= 0))
265 {
266     /* If the command didn't *have* to be supported, we fake
267     * success. This allows certain settings to be specified for
268     * multiple ENGINES and only require a change of ENGINE id
269     * (without having to selectively apply settings). Eg. changing
270     * from a hardware device back to the regular software ENGINE
271     * without editing the config file, etc. */
272     if(cmd_optional)
273     {
274         ERR_clear_error();
275         return 1;
276     }
277     ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD,
278         ENGINE_R_INVALID_CMD_NAME);
279     return 0;
280 }
281 /* Force the result of the control command to 0 or 1, for the reasons
282 * mentioned before. */
283 if (ENGINE_ctrl(e, num, i, p, f) > 0)
284     return 1;
285 return 0;
286 }

288 int ENGINE_ctrl_cmd_string(ENGINE *e, const char *cmd_name, const char *arg,
289     int cmd_optional)
290 {
291     int num, flags;
292     long l;
293     char *ptr;
294     if((e == NULL) || (cmd_name == NULL))
295     {
296         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
297             ERR_R_PASSED_NULL_PARAMETER);
298         return 0;
299     }
300     if((e->ctrl == NULL) || ((num = ENGINE_ctrl(e,
301         ENGINE_CTRL_GET_CMD_FROM_NAME,
302         0, (void *)cmd_name, NULL)) <= 0))
303     {
304         /* If the command didn't *have* to be supported, we fake
305         * success. This allows certain settings to be specified for
306         * multiple ENGINES and only require a change of ENGINE id
307         * (without having to selectively apply settings). Eg. changing
308         * from a hardware device back to the regular software ENGINE
309         * without editing the config file, etc. */
310         if(cmd_optional)
311         {
312             ERR_clear_error();
313             return 1;
314         }
315         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
316             ENGINE_R_INVALID_CMD_NAME);
317         return 0;
318     }
319     if(!ENGINE_cmd_is_executable(e, num))
320     {
321         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
322             ENGINE_R_CMD_NOT_EXECUTABLE);
323         return 0;
324     }
325     if((flags = ENGINE_ctrl(e, ENGINE_CTRL_GET_CMD_FLAGS, num, NULL, NULL))

```

```

326     {
327         /* Shouldn't happen, given that ENGINE_cmd_is_executable()
328         * returned success. */
329         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
330             ENGINE_R_INTERNAL_LIST_ERROR);
331         return 0;
332     }
333     /* If the command takes no input, there must be no input. And vice
334     * versa. */
335     if(flags & ENGINE_CMD_FLAG_NO_INPUT)
336     {
337         if(arg != NULL)
338         {
339             ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
340                 ENGINE_R_COMMAND_TAKES_NO_INPUT);
341             return 0;
342         }
343         /* We deliberately force the result of ENGINE_ctrl() to 0 or 1
344         * rather than returning it as "return data". This is to ensure
345         * usage of these commands is consistent across applications and
346         * that certain applications don't understand it one way, and
347         * others another. */
348         if(ENGINE_ctrl(e, num, 0, (void *)arg, NULL) > 0)
349             return 1;
350         return 0;
351     }
352     /* So, we require input */
353     if(arg == NULL)
354     {
355         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
356             ENGINE_R_COMMAND_TAKES_INPUT);
357         return 0;
358     }
359     /* If it takes string input, that's easy */
360     if(flags & ENGINE_CMD_FLAG_STRING)
361     {
362         /* Same explanation as above */
363         if(ENGINE_ctrl(e, num, 0, (void *)arg, NULL) > 0)
364             return 1;
365         return 0;
366     }
367     /* If it doesn't take numeric either, then it is unsupported for use in
368     * a config-setting situation, which is what this function is for. This
369     * should never happen though, because ENGINE_cmd_is_executable() was
370     * used. */
371     if(!(flags & ENGINE_CMD_FLAG_NUMERIC))
372     {
373         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
374             ENGINE_R_INTERNAL_LIST_ERROR);
375         return 0;
376     }
377     l = strtol(arg, &ptr, 10);
378     if((arg == ptr) || (*ptr != '\0'))
379     {
380         ENGINEerr(ENGINE_F_ENGINE_CTRL_CMD_STRING,
381             ENGINE_R_ARGUMENT_IS_NOT_A_NUMBER);
382         return 0;
383     }
384     /* Force the result of the control command to 0 or 1, for the reasons
385     * mentioned before. */
386     if(ENGINE_ctrl(e, num, l, NULL, NULL) > 0)
387         return 1;
388     return 0;
389 }

```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_dyn.c

1

```
*****
18040 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_dyn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/eng_dyn.c */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 1999-2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */

60 #include "eng_int.h"
61 #include <openssl/dso.h>
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_dyn.c

2

```
63 /* Shared libraries implementing ENGINES for use by the "dynamic" ENGINE loader
64  * should implement the hook-up functions with the following prototypes. */

65 /* Our ENGINE handlers */
66 static int dynamic_init(ENGINE *e);
67 static int dynamic_finish(ENGINE *e);
68 static int dynamic_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)(void));
69 /* Predeclare our context type */
70 typedef struct st_dynamic_data_ctx dynamic_data_ctx;
71 /* The implementation for the important control command */
72 static int dynamic_load(ENGINE *e, dynamic_data_ctx *ctx);

73 #define DYNAMIC_CMD_SO_PATH ENGINE_CMD_BASE
74 #define DYNAMIC_CMD_NO_VCHECK (ENGINE_CMD_BASE + 1)
75 #define DYNAMIC_CMD_ID (ENGINE_CMD_BASE + 2)
76 #define DYNAMIC_CMD_LIST_ADD (ENGINE_CMD_BASE + 3)
77 #define DYNAMIC_CMD_DIR_LOAD (ENGINE_CMD_BASE + 4)
78 #define DYNAMIC_CMD_DIR_ADD (ENGINE_CMD_BASE + 5)
79 #define DYNAMIC_CMD_LOAD (ENGINE_CMD_BASE + 6)

80 /* The constants used when creating the ENGINE */
81 static const char *engine_dynamic_id = "dynamic";
82 static const char *engine_dynamic_name = "Dynamic engine loading support";
83 static const ENGINE_CMD_DEFN dynamic_cmd_defns[] = {
84     {DYNAMIC_CMD_SO_PATH,
85      "SO_PATH",
86      "Specifies the path to the new ENGINE shared library",
87      ENGINE_CMD_FLAG_STRING},
88     {DYNAMIC_CMD_NO_VCHECK,
89      "NO_VCHECK",
90      "Specifies to continue even if version checking fails (boolean)",
91      ENGINE_CMD_FLAG_NUMERIC},
92     {DYNAMIC_CMD_ID,
93      "ID",
94      "Specifies an ENGINE id name for loading",
95      ENGINE_CMD_FLAG_STRING},
96     {DYNAMIC_CMD_LIST_ADD,
97      "LIST_ADD",
98      "Whether to add a loaded ENGINE to the internal list (0=no,1=yes)",
99      ENGINE_CMD_FLAG_NUMERIC},
100     {DYNAMIC_CMD_DIR_LOAD,
101      "DIR_LOAD",
102      "Specifies whether to load from 'DIR_ADD' directories (0=no,1=yes)",
103      ENGINE_CMD_FLAG_NUMERIC},
104     {DYNAMIC_CMD_DIR_ADD,
105      "DIR_ADD",
106      "Adds a directory from which ENGINES can be loaded",
107      ENGINE_CMD_FLAG_STRING},
108     {DYNAMIC_CMD_LOAD,
109      "LOAD",
110      "Load up the ENGINE specified by other settings",
111      ENGINE_CMD_FLAG_NO_INPUT},
112     {0, NULL, NULL, 0}
113 };
114 static const ENGINE_CMD_DEFN dynamic_cmd_defns_empty[] = {
115     {0, NULL, NULL, 0}
116 };

121 /* Loading code stores state inside the ENGINE structure via the "ex_data"
122  * element. We load all our state into a single structure and use that as a
123  * single context in the "ex_data" stack. */
124 struct st_dynamic_data_ctx
125 {
126     /* The DSO object we load that supplies the ENGINE code */
127     DSO *dynamic_dso;
```

```

128 /* The function pointer to the version checking shared library function
129 dynamic_v_check_fn v_check;
130 /* The function pointer to the engine-binding shared library function */
131 dynamic_bind_engine bind_engine;
132 /* The default name/path for loading the shared library */
133 const char *DYNAMIC_LIBNAME;
134 /* Whether to continue loading on a version check failure */
135 int no_vcheck;
136 /* If non-NULL, stipulates the 'id' of the ENGINE to be loaded */
137 const char *engine_id;
138 /* If non-zero, a successfully loaded ENGINE should be added to the inte
139 * ENGINE list. If 2, the add must succeed or the entire load should fai
140 int list_add_value;
141 /* The symbol name for the version checking function */
142 const char *DYNAMIC_F1;
143 /* The symbol name for the "initialise ENGINE structure" function */
144 const char *DYNAMIC_F2;
145 /* Whether to never use 'dirs', use 'dirs' as a fallback, or only use
146 * 'dirs' for loading. Default is to use 'dirs' as a fallback. */
147 int dir_load;
148 /* A stack of directories from which ENGINES could be loaded */
149 STACK_OF(OPENSSSL_STRING) *dirs;
150 };

152 /* This is the "ex_data" index we obtain and reserve for use with our context
153 * structure. */
154 static int dynamic_ex_data_idx = -1;

156 static void int_free_str(char *s) { OPENSSSL_free(s); }
157 /* Because our ex_data element may or may not get allocated depending on whether
158 * a "first-use" occurs before the ENGINE is freed, we have a memory leak
159 * problem to solve. We can't declare a "new" handler for the ex_data as we
160 * don't want a dynamic_data_ctx in *all* ENGINE structures of all types (this
161 * is a bug in the design of CRYPTO_EX_DATA). As such, we just declare a "free"
162 * handler and that will get called if an ENGINE is being destroyed and there
163 * was an ex_data element corresponding to our context type. */
164 static void dynamic_data_ctx_free_func(void *parent, void *ptr,
165                                       CRYPTO_EX_DATA *ad, int idx, long argl, void *argp)
166 {
167     if(ptr)
168     {
169         dynamic_data_ctx *ctx = (dynamic_data_ctx *)ptr;
170         if(ctx->dynamic_dso)
171             DSO_free(ctx->dynamic_dso);
172         if(ctx->DYNAMIC_LIBNAME)
173             OPENSSSL_free((void*)ctx->DYNAMIC_LIBNAME);
174         if(ctx->engine_id)
175             OPENSSSL_free((void*)ctx->engine_id);
176         if(ctx->dirs)
177             sk_OPENSSSL_STRING_pop_free(ctx->dirs, int_free_str);
178         OPENSSSL_free(ctx);
179     }
180 }

182 /* Construct the per-ENGINE context. We create it blindly and then use a lock to
183 * check for a race - if so, all but one of the threads "racing" will have
184 * wasted their time. The alternative involves creating everything inside the
185 * lock which is far worse. */
186 static int dynamic_set_data_ctx(ENGINE *e, dynamic_data_ctx **ctx)
187 {
188     dynamic_data_ctx *c;
189     c = OPENSSSL_malloc(sizeof(dynamic_data_ctx));
190     if(!c)
191     {
192         ENGINEerr(ENGINE_F_DYNAMIC_SET_DATA_CTX,ERR_R_MALLOC_FAILURE);
193         return 0;

```

```

194     }
195     memset(c, 0, sizeof(dynamic_data_ctx));
196     c->dynamic_dso = NULL;
197     c->v_check = NULL;
198     c->bind_engine = NULL;
199     c->DYNAMIC_LIBNAME = NULL;
200     c->no_vcheck = 0;
201     c->engine_id = NULL;
202     c->list_add_value = 0;
203     c->DYNAMIC_F1 = "v_check";
204     c->DYNAMIC_F2 = "bind_engine";
205     c->dir_load = 1;
206     c->dirs = sk_OPENSSSL_STRING_new_null();
207     if(!c->dirs)
208     {
209         ENGINEerr(ENGINE_F_DYNAMIC_SET_DATA_CTX,ERR_R_MALLOC_FAILURE);
210         OPENSSSL_free(c);
211         return 0;
212     }
213     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
214     if((*ctx = (dynamic_data_ctx *)ENGINE_get_ex_data(e,
215                                                       dynamic_ex_data_idx)) == NULL)
216     {
217         /* Good, we're the first */
218         ENGINE_set_ex_data(e, dynamic_ex_data_idx, c);
219         *ctx = c;
220         c = NULL;
221     }
222     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
223     /* If we lost the race to set the context, c is non-NULL and *ctx is the
224     * context of the thread that won. */
225     if(c)
226         OPENSSSL_free(c);
227     return 1;
228 }

230 /* This function retrieves the context structure from an ENGINE's "ex_data", or
231 * if it doesn't exist yet, sets it up. */
232 static dynamic_data_ctx *dynamic_get_data_ctx(ENGINE *e)
233 {
234     dynamic_data_ctx *ctx;
235     if(dynamic_ex_data_idx < 0)
236     {
237         /* Create and register the ENGINE ex_data, and associate our
238         * "free" function with it to ensure any allocated contexts get
239         * freed when an ENGINE goes underground. */
240         int new_idx = ENGINE_get_ex_new_index(0, NULL, NULL, NULL,
241                                               dynamic_data_ctx_free_func);
242         if(new_idx == -1)
243         {
244             ENGINEerr(ENGINE_F_DYNAMIC_GET_DATA_CTX,ENGINE_R_NO_INDE
245                       return NULL;
246         }
247         CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
248         /* Avoid a race by checking again inside this lock */
249         if(dynamic_ex_data_idx < 0)
250         {
251             /* Good, someone didn't beat us to it */
252             dynamic_ex_data_idx = new_idx;
253             new_idx = -1;
254         }
255         CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
256         /* In theory we could "give back" the index here if
257         * (new_idx>-1), but it's not possible and wouldn't gain us much
258         * if it were. */
259     }

```

```

260     ctx = (dynamic_data_ctx *)ENGINE_get_ex_data(e, dynamic_ex_data_idx);
261     /* Check if the context needs to be created */
262     if((ctx == NULL) && !dynamic_set_data_ctx(e, &ctx))
263         /* "set_data" will set errors if necessary */
264         return NULL;
265     return ctx;
266 }

268 static ENGINE *engine_dynamic(void)
269 {
270     ENGINE *ret = ENGINE_new();
271     if(!ret)
272         return NULL;
273     if(!ENGINE_set_id(ret, engine_dynamic_id) ||
274        !ENGINE_set_name(ret, engine_dynamic_name) ||
275        !ENGINE_set_init_function(ret, dynamic_init) ||
276        !ENGINE_set_finish_function(ret, dynamic_finish) ||
277        !ENGINE_set_ctrl_function(ret, dynamic_ctrl) ||
278        !ENGINE_set_flags(ret, ENGINE_FLAGS_BY_ID_COPY) ||
279        !ENGINE_set_cmd_defns(ret, dynamic_cmd_defns))
280     {
281         ENGINE_free(ret);
282         return NULL;
283     }
284     return ret;
285 }

287 void ENGINE_load_dynamic(void)
288 {
289     ENGINE *toadd = engine_dynamic();
290     if(!toadd) return;
291     ENGINE_add(toadd);
292     /* If the "add" worked, it gets a structural reference. So either way,
293      * we release our just-created reference. */
294     ENGINE_free(toadd);
295     /* If the "add" didn't work, it was probably a conflict because it was
296      * already added (eg. someone calling ENGINE_load_blah then calling
297      * ENGINE_load_builtin_engines() perhaps). */
298     ERR_clear_error();
299 }

301 static int dynamic_init(ENGINE *e)
302 {
303     /* We always return failure - the "dynamic" engine itself can't be used
304      * for anything. */
305     return 0;
306 }

308 static int dynamic_finish(ENGINE *e)
309 {
310     /* This should never be called on account of "dynamic_init" always
311      * failing. */
312     return 0;
313 }

315 static int dynamic_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)(void))
316 {
317     dynamic_data_ctx *ctx = dynamic_get_data_ctx(e);
318     int initialised;
319     if(!ctx)
320     {
321         ENGINEerr(ENGINE_F_DYNAMIC_CTRL, ENGINE_R_NOT_LOADED);
322         return 0;
323     }
324     initialised = ((ctx->dynamic_dso == NULL) ? 0 : 1);

```

```

326     /* All our control commands require the ENGINE to be uninitialised */
327     if(initialised)
328     {
329         ENGINEerr(ENGINE_F_DYNAMIC_CTRL,
330                  ENGINE_R_ALREADY_LOADED);
331         return 0;
332     }
333     switch(cmd)
334     {
335     case DYNAMIC_CMD_SO_PATH:
336         /* a NULL 'p' or a string of zero-length is the same thing */
337         if(p && (strlen((const char *)p) < 1))
338             p = NULL;
339         if(ctx->DYNAMIC_LIBNAME)
340             OPENSSL_free((void*)ctx->DYNAMIC_LIBNAME);
341         if(p)
342             ctx->DYNAMIC_LIBNAME = BUF_strdup(p);
343         else
344             ctx->DYNAMIC_LIBNAME = NULL;
345         return (ctx->DYNAMIC_LIBNAME ? 1 : 0);
346     case DYNAMIC_CMD_NO_VCHECK:
347         ctx->no_vcheck = ((i == 0) ? 0 : 1);
348         return 1;
349     case DYNAMIC_CMD_ID:
350         /* a NULL 'p' or a string of zero-length is the same thing */
351         if(p && (strlen((const char *)p) < 1))
352             p = NULL;
353         if(ctx->engine_id)
354             OPENSSL_free((void*)ctx->engine_id);
355         if(p)
356             ctx->engine_id = BUF_strdup(p);
357         else
358             ctx->engine_id = NULL;
359         return (ctx->engine_id ? 1 : 0);
360     case DYNAMIC_CMD_LIST_ADD:
361         if((i < 0) || (i > 2))
362         {
363             ENGINEerr(ENGINE_F_DYNAMIC_CTRL,
364                      ENGINE_R_INVALID_ARGUMENT);
365             return 0;
366         }
367         ctx->list_add_value = (int)i;
368         return 1;
369     case DYNAMIC_CMD_LOAD:
370         return dynamic_load(e, ctx);
371     case DYNAMIC_CMD_DIR_LOAD:
372         if((i < 0) || (i > 2))
373         {
374             ENGINEerr(ENGINE_F_DYNAMIC_CTRL,
375                      ENGINE_R_INVALID_ARGUMENT);
376             return 0;
377         }
378         ctx->dir_load = (int)i;
379         return 1;
380     case DYNAMIC_CMD_DIR_ADD:
381         /* a NULL 'p' or a string of zero-length is the same thing */
382         if(!p || (strlen((const char *)p) < 1))
383         {
384             ENGINEerr(ENGINE_F_DYNAMIC_CTRL,
385                      ENGINE_R_INVALID_ARGUMENT);
386             return 0;
387         }
388         {
389             char *tmp_str = BUF_strdup(p);
390             if(!tmp_str)
391                 return 0;

```

```

392         ENGINEerr(ENGINE_F_DYNAMIC_CTRL,
393                   ERR_R_MALLOC_FAILURE);
394         return 0;
395     }
396     sk_OPENSSL_STRING_insert(ctx->dirs, tmp_str, -1);
397 }
398 return 1;
399 default:
400     break;
401 }
402 ENGINEerr(ENGINE_F_DYNAMIC_CTRL,ENGINE_R_CTRL_COMMAND_NOT_IMPLEMENTED);
403 return 0;
404 }

406 static int int_load(dynamic_data_ctx *ctx)
407 {
408     int num, loop;
409     /* Unless told not to, try a direct load */
410     if((ctx->dir_load != 2) && (DSO_load(ctx->dynamic_dso,
411                                         ctx->DYNAMIC_LIBNAME, NULL, 0)) != NULL)
412         return 1;
413     /* If we're not allowed to use 'dirs' or we have none, fail */
414     if(!ctx->dir_load || (num = sk_OPENSSL_STRING_num(ctx->dirs)) < 1)
415         return 0;
416     for(loop = 0; loop < num; loop++)
417     {
418         const char *s = sk_OPENSSL_STRING_value(ctx->dirs, loop);
419         char *merge = DSO_merge(ctx->dynamic_dso, ctx->DYNAMIC_LIBNAME,
420                                if(!merge)
421                                    return 0;
422                                if(DSO_load(ctx->dynamic_dso, merge, NULL, 0))
423                                    {
424                                        /* Found what we're looking for */
425                                        OPENSSL_free(merge);
426                                        return 1;
427                                    }
428                                OPENSSL_free(merge);
429                            }
430     }
431     return 0;
432 }

433 static int dynamic_load(ENGINE *e, dynamic_data_ctx *ctx)
434 {
435     ENGINE cpy;
436     dynamic_fns fns;

438     if(!ctx->dynamic_dso)
439         ctx->dynamic_dso = DSO_new();
440     if(!ctx->DYNAMIC_LIBNAME)
441     {
442         if(!ctx->engine_id)
443             return 0;
444         ctx->DYNAMIC_LIBNAME =
445             DSO_convert_filename(ctx->dynamic_dso, ctx->engine_id);
446     }
447     if(!int_load(ctx))
448     {
449         ENGINEerr(ENGINE_F_DYNAMIC_LOAD,
450                   ENGINE_R_DSO_NOT_FOUND);
451         DSO_free(ctx->dynamic_dso);
452         ctx->dynamic_dso = NULL;
453         return 0;
454     }
455     /* We have to find a bind function otherwise it'll always end badly */
456     if(!(ctx->bind_engine = (dynamic_bind_engine)DSO_bind_func(
457         ctx->dynamic_dso, ctx->DYNAMIC_F2)))

```

```

458     {
459         ctx->bind_engine = NULL;
460         DSO_free(ctx->dynamic_dso);
461         ctx->dynamic_dso = NULL;
462         ENGINEerr(ENGINE_F_DYNAMIC_LOAD,
463                   ENGINE_R_DSO_FAILURE);
464         return 0;
465     }
466     /* Do we perform version checking? */
467     if(!ctx->no_vcheck)
468     {
469         unsigned long vcheck_res = 0;
470         /* Now we try to find a version checking function and decide how
471          * to cope with failure if/when it fails. */
472         ctx->v_check = (dynamic_v_check_fn)DSO_bind_func(
473             ctx->dynamic_dso, ctx->DYNAMIC_F1);
474         if(ctx->v_check)
475             vcheck_res = ctx->v_check(OSSL_DYNAMIC_VERSION);
476         /* We fail if the version checker veto'd the load *or* if it is
477          * deferring to us (by returning its version) and we think it is
478          * too old. */
479         if(vcheck_res < OSSL_DYNAMIC_OLDEST)
480         {
481             /* Fail */
482             ctx->bind_engine = NULL;
483             ctx->v_check = NULL;
484             DSO_free(ctx->dynamic_dso);
485             ctx->dynamic_dso = NULL;
486             ENGINEerr(ENGINE_F_DYNAMIC_LOAD,
487                       ENGINE_R_VERSION_INCOMPATIBILITY);
488             return 0;
489         }
490     }
491     /* First binary copy the ENGINE structure so that we can roll back if
492     * the hand-over fails */
493     memcpy(&cpy, e, sizeof(ENGINE));
494     /* Provide the ERR, "ex_data", memory, and locking callbacks so the
495     * loaded library uses our state rather than its own. FIXME: As noted in
496     * engine.h, much of this would be simplified if each area of code
497     * provided its own "summary" structure of all related callbacks. It
498     * would also increase opaqueness. */
499     fns.static_state = ENGINE_get_static_state();
500     fns.err_fns = ERR_get_implementation();
501     fns.ex_data_fns = CRYPTO_get_ex_data_implementation();
502     CRYPTO_get_mem_functions(&fns.mem_fns.malloc_cb,
503                             &fns.mem_fns.realloc_cb,
504                             &fns.mem_fns.free_cb);
505     fns.lock_fns.lock_locking_cb = CRYPTO_get_locking_callback();
506     fns.lock_fns.lock_add_lock_cb = CRYPTO_get_add_lock_callback();
507     fns.lock_fns.dynlock_create_cb = CRYPTO_get_dynlock_create_callback();
508     fns.lock_fns.dynlock_lock_cb = CRYPTO_get_dynlock_lock_callback();
509     fns.lock_fns.dynlock_destroy_cb = CRYPTO_get_dynlock_destroy_callback();
510     /* Now that we've loaded the dynamic engine, make sure no "dynamic"
511     * ENGINE elements will show through. */
512     engine_set_all_null(e);

514     /* Try to bind the ENGINE onto our own ENGINE structure */
515     if(!ctx->bind_engine(e, ctx->engine_id, &fns))
516     {
517         ctx->bind_engine = NULL;
518         ctx->v_check = NULL;
519         DSO_free(ctx->dynamic_dso);
520         ctx->dynamic_dso = NULL;
521         ENGINEerr(ENGINE_F_DYNAMIC_LOAD,ENGINE_R_INIT_FAILED);
522         /* Copy the original ENGINE structure back */
523         memcpy(e, &cpy, sizeof(ENGINE));

```

```
524         return 0;
525     }
526     /* Do we try to add this ENGINE to the internal list too? */
527     if(ctx->list_add_value > 0)
528     {
529         if(!ENGINE_add(e))
530         {
531             /* Do we tolerate this or fail? */
532             if(ctx->list_add_value > 1)
533             {
534                 /* Fail - NB: By this time, it's too late to
535                  * rollback, and trying to do so allows the
536                  * bind_engine() code to have created leaks. We
537                  * just have to fail where we are, after the
538                  * ENGINE has changed. */
539                 ENGINEerr(ENGINE_F_DYNAMIC_LOAD,
540                          ENGINE_R_CONFLICTING_ENGINE_ID);
541                 return 0;
542             }
543             /* Tolerate */
544             ERR_clear_error();
545         }
546     }
547     return 1;
548 }
```



```

*****
8620 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/eng_err.c */
2 /* =====
3  * Copyright (c) 1999-2010 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
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10  * notice, this list of conditions and the following disclaimer.
11  *
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17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
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22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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26  *
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31  * 6. Redistributions of any form whatsoever must retain the following
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35  *
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38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/engine.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_ENGINE,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_ENGINE,0,reason)

71 static ERR_STRING_DATA ENGINE_str_functs[]=
72 {
73 {ERR_FUNC(ENGINE_F_DYNAMIC_CTRL), "DYNAMIC_CTRL"},
74 {ERR_FUNC(ENGINE_F_DYNAMIC_GET_DATA_CTX), "DYNAMIC_GET_DATA_CTX"},
75 {ERR_FUNC(ENGINE_F_DYNAMIC_LOAD), "DYNAMIC_LOAD"},
76 {ERR_FUNC(ENGINE_F_DYNAMIC_SET_DATA_CTX), "DYNAMIC_SET_DATA_CTX"},
77 {ERR_FUNC(ENGINE_F_ENGINE_ADD), "ENGINE_add"},
78 {ERR_FUNC(ENGINE_F_ENGINE_BY_ID), "ENGINE_by_id"},
79 {ERR_FUNC(ENGINE_F_ENGINE_CMD_IS_EXECUTABLE), "ENGINE_cmd_is_executable"},
80 {ERR_FUNC(ENGINE_F_ENGINE_CTRL), "ENGINE_ctrl"},
81 {ERR_FUNC(ENGINE_F_ENGINE_CTRL_CMD), "ENGINE_ctrl_cmd"},
82 {ERR_FUNC(ENGINE_F_ENGINE_CTRL_CMD_STRING), "ENGINE_ctrl_cmd_string"},
83 {ERR_FUNC(ENGINE_F_ENGINE_FINISH), "ENGINE_finish"},
84 {ERR_FUNC(ENGINE_F_ENGINE_FREE_UTIL), "ENGINE_free_util"},
85 {ERR_FUNC(ENGINE_F_ENGINE_GET_CIPHER), "ENGINE_get_cipher"},
86 {ERR_FUNC(ENGINE_F_ENGINE_GET_DEFAULT_TYPE), "ENGINE_get_default_type"},
87 {ERR_FUNC(ENGINE_F_ENGINE_GET_DIGEST), "ENGINE_get_digest"},
88 {ERR_FUNC(ENGINE_F_ENGINE_GET_NEXT), "ENGINE_get_next"},
89 {ERR_FUNC(ENGINE_F_ENGINE_GET_PKEY_ASN1_METH), "ENGINE_get_pkey_asn1_meth"},
90 {ERR_FUNC(ENGINE_F_ENGINE_GET_PKEY_METH), "ENGINE_get_pkey_meth"},
91 {ERR_FUNC(ENGINE_F_ENGINE_GET_PREV), "ENGINE_get_prev"},
92 {ERR_FUNC(ENGINE_F_ENGINE_INIT), "ENGINE_init"},
93 {ERR_FUNC(ENGINE_F_ENGINE_LIST_ADD), "ENGINE_list_add"},
94 {ERR_FUNC(ENGINE_F_ENGINE_LIST_REMOVE), "ENGINE_list_remove"},
95 {ERR_FUNC(ENGINE_F_ENGINE_LOAD_PRIVATE_KEY), "ENGINE_load_private_key"},
96 {ERR_FUNC(ENGINE_F_ENGINE_LOAD_PUBLIC_KEY), "ENGINE_load_public_key"},
97 {ERR_FUNC(ENGINE_F_ENGINE_LOAD_SSL_CLIENT_CERT), "ENGINE_load_ssl_client"},
98 {ERR_FUNC(ENGINE_F_ENGINE_NEW), "ENGINE_new"},
99 {ERR_FUNC(ENGINE_F_ENGINE_REMOVE), "ENGINE_remove"},
100 {ERR_FUNC(ENGINE_F_ENGINE_SET_DEFAULT_STRING), "ENGINE_set_default_string"},
101 {ERR_FUNC(ENGINE_F_ENGINE_SET_DEFAULT_TYPE), "ENGINE_set_default_type"},
102 {ERR_FUNC(ENGINE_F_ENGINE_SET_ID), "ENGINE_set_id"},
103 {ERR_FUNC(ENGINE_F_ENGINE_SET_NAME), "ENGINE_set_name"},
104 {ERR_FUNC(ENGINE_F_ENGINE_TABLE_REGISTER), "ENGINE_table_register"},
105 {ERR_FUNC(ENGINE_F_ENGINE_UNLOAD_KEY), "ENGINE_unload_key"},
106 {ERR_FUNC(ENGINE_F_ENGINE_UNLOCKED_FINISH), "ENGINE_unlocked_finish"},
107 {ERR_FUNC(ENGINE_F_ENGINE_UP_REF), "ENGINE_up_ref"},
108 {ERR_FUNC(ENGINE_F_INT_CTRL_HELPER), "INT_CTRL_HELPER"},
109 {ERR_FUNC(ENGINE_F_INT_ENGINE_CONFIGURE), "INT_ENGINE_CONFIGURE"},
110 {ERR_FUNC(ENGINE_F_INT_ENGINE_MODULE_INIT), "INT_ENGINE_MODULE_INIT"},
111 {ERR_FUNC(ENGINE_F_LOG_MESSAGE), "LOG_MESSAGE"},
112 {0,NULL}};
113 };

115 static ERR_STRING_DATA ENGINE_str_reasons[]=
116 {
117 {ERR_REASON(ENGINE_R_ALREADY_LOADED), "already loaded"},
118 {ERR_REASON(ENGINE_R_ARGUMENT_IS_NOT_A_NUMBER), "argument is not a number"},
119 {ERR_REASON(ENGINE_R_CMD_NOT_EXECUTABLE), "cmd not executable"},
120 {ERR_REASON(ENGINE_R_COMMAND_TAKES_INPUT), "command takes input"},
121 {ERR_REASON(ENGINE_R_COMMAND_TAKES_NO_INPUT), "command takes no input"},
122 {ERR_REASON(ENGINE_R_CONFLICTING_ENGINE_ID), "conflicting engine id"},
123 {ERR_REASON(ENGINE_R_CTRL_COMMAND_NOT_IMPLEMENTED), "ctrl command not implemented"},
124 {ERR_REASON(ENGINE_R_DH_NOT_IMPLEMENTED), "dh not implemented"},
125 {ERR_REASON(ENGINE_R_DSA_NOT_IMPLEMENTED), "dsa not implemented"},
126 {ERR_REASON(ENGINE_R_DSO_FAILURE), "DSO failure"},
127 {ERR_REASON(ENGINE_R_DSO_NOT_FOUND), "dso not found"},

```

```
128 {ERR_REASON(ENGINE_R_ENGINES_SECTION_ERROR),"engines section error"},
129 {ERR_REASON(ENGINE_R_ENGINE_CONFIGURATION_ERROR),"engine configuration error"},
130 {ERR_REASON(ENGINE_R_ENGINE_IS_NOT_IN_LIST),"engine is not in the list"},
131 {ERR_REASON(ENGINE_R_ENGINE_SECTION_ERROR),"engine section error"},
132 {ERR_REASON(ENGINE_R_FAILED_LOADING_PRIVATE_KEY),"failed loading private key"},
133 {ERR_REASON(ENGINE_R_FAILED_LOADING_PUBLIC_KEY),"failed loading public key"},
134 {ERR_REASON(ENGINE_R_FINISH_FAILED),"finish failed"},
135 {ERR_REASON(ENGINE_R_GET_HANDLE_FAILED),"could not obtain hardware handle"},
136 {ERR_REASON(ENGINE_R_ID_OR_NAME_MISSING),"id' or 'name' missing"},
137 {ERR_REASON(ENGINE_R_INIT_FAILED),"init failed"},
138 {ERR_REASON(ENGINE_R_INTERNAL_LIST_ERROR),"internal list error"},
139 {ERR_REASON(ENGINE_R_INVALID_ARGUMENT),"invalid argument"},
140 {ERR_REASON(ENGINE_R_INVALID_CMD_NAME),"invalid cmd name"},
141 {ERR_REASON(ENGINE_R_INVALID_CMD_NUMBER),"invalid cmd number"},
142 {ERR_REASON(ENGINE_R_INVALID_INIT_VALUE),"invalid init value"},
143 {ERR_REASON(ENGINE_R_INVALID_STRING),"invalid string"},
144 {ERR_REASON(ENGINE_R_NOT_INITIALISED),"not initialised"},
145 {ERR_REASON(ENGINE_R_NOT_LOADED),"not loaded"},
146 {ERR_REASON(ENGINE_R_NO_CONTROL_FUNCTION),"no control function"},
147 {ERR_REASON(ENGINE_R_NO_INDEX),"no index"},
148 {ERR_REASON(ENGINE_R_NO_LOAD_FUNCTION),"no load function"},
149 {ERR_REASON(ENGINE_R_NO_REFERENCE),"no reference"},
150 {ERR_REASON(ENGINE_R_NO_SUCH_ENGINE),"no such engine"},
151 {ERR_REASON(ENGINE_R_NO_UNLOAD_FUNCTION),"no unload function"},
152 {ERR_REASON(ENGINE_R_PROVIDE_PARAMETERS),"provide parameters"},
153 {ERR_REASON(ENGINE_R_RSA_NOT_IMPLEMENTED),"rsa not implemented"},
154 {ERR_REASON(ENGINE_R_UNIMPLEMENTED_CIPHER),"unimplemented cipher"},
155 {ERR_REASON(ENGINE_R_UNIMPLEMENTED_DIGEST),"unimplemented digest"},
156 {ERR_REASON(ENGINE_R_UNIMPLEMENTED_PUBLIC_KEY_METHOD),"unimplemented public key"},
157 {ERR_REASON(ENGINE_R_VERSION_INCOMPATIBILITY),"version incompatibility"},
158 {0,NULL}
159 };

161 #endif

163 void ERR_load_ENGINE_strings(void)
164 {
165 #ifndef OPENSSL_NO_ERR
166
167     if (ERR_func_error_string(ENGINE_str_functs[0].error) == NULL)
168     {
169         ERR_load_strings(0,ENGINE_str_functs);
170         ERR_load_strings(0,ENGINE_str_reasons);
171     }
172 #endif
173 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_fat.c

1

```
*****
6091 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_fat.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/eng_fat.c */
2 /* =====
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47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */
55 /* =====
56  * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
57  * ECDH support in OpenSSL originally developed by
58  * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
59  */

61 #include "eng_int.h"
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_fat.c

2

```
62 #include <openssl/conf.h>

64 int ENGINE_set_default(ENGINE *e, unsigned int flags)
65 {
66     if((flags & ENGINE_METHOD_CIPHERS) && !ENGINE_set_default_ciphers(e))
67         return 0;
68     if((flags & ENGINE_METHOD_DIGESTS) && !ENGINE_set_default_digests(e))
69         return 0;
70 #ifndef OPENSSL_NO_RSA
71     if((flags & ENGINE_METHOD_RSA) && !ENGINE_set_default_RSA(e))
72         return 0;
73 #endif
74 #ifndef OPENSSL_NO_DSA
75     if((flags & ENGINE_METHOD_DSA) && !ENGINE_set_default_DSA(e))
76         return 0;
77 #endif
78 #ifndef OPENSSL_NO_DH
79     if((flags & ENGINE_METHOD_DH) && !ENGINE_set_default_DH(e))
80         return 0;
81 #endif
82 #ifndef OPENSSL_NO_ECDH
83     if((flags & ENGINE_METHOD_ECDH) && !ENGINE_set_default_ECDH(e))
84         return 0;
85 #endif
86 #ifndef OPENSSL_NO_ECDSA
87     if((flags & ENGINE_METHOD_ECDSA) && !ENGINE_set_default_ECDSA(e))
88         return 0;
89 #endif
90     if((flags & ENGINE_METHOD_RAND) && !ENGINE_set_default_RAND(e))
91         return 0;
92     if((flags & ENGINE_METHOD_PKEY_METHS)
93         && !ENGINE_set_default_pkey_meths(e))
94         return 0;
95     if((flags & ENGINE_METHOD_PKEY_ASN1_METHS)
96         && !ENGINE_set_default_pkey_asn1_meths(e))
97         return 0;
98     return 1;
99 }

101 /* Set default algorithms using a string */

103 static int int_def_cb(const char *alg, int len, void *arg)
104 {
105     unsigned int *pflags = arg;
106     if (!strcmp(alg, "ALL", len))
107         *pflags |= ENGINE_METHOD_ALL;
108     else if (!strcmp(alg, "RSA", len))
109         *pflags |= ENGINE_METHOD_RSA;
110     else if (!strcmp(alg, "DSA", len))
111         *pflags |= ENGINE_METHOD_DSA;
112     else if (!strcmp(alg, "ECDH", len))
113         *pflags |= ENGINE_METHOD_ECDH;
114     else if (!strcmp(alg, "ECDSA", len))
115         *pflags |= ENGINE_METHOD_ECDSA;
116     else if (!strcmp(alg, "DH", len))
117         *pflags |= ENGINE_METHOD_DH;
118     else if (!strcmp(alg, "RAND", len))
119         *pflags |= ENGINE_METHOD_RAND;
120     else if (!strcmp(alg, "CIPHERS", len))
121         *pflags |= ENGINE_METHOD_CIPHERS;
122     else if (!strcmp(alg, "DIGESTS", len))
123         *pflags |= ENGINE_METHOD_DIGESTS;
124     else if (!strcmp(alg, "PKEY", len))
125         *pflags |=
126             ENGINE_METHOD_PKEY_METHS|ENGINE_METHOD_PKEY_ASN1_METHS;
127     else if (!strcmp(alg, "PKEY-CRYPTO", len))
```

```
128     *pflags |= ENGINE_METHOD_PKEY_METHS;
129     else if (!strcmp(alg, "PKEY_ASN1", len))
130         *pflags |= ENGINE_METHOD_PKEY_ASN1_METHS;
131     else
132         return 0;
133     return 1;
134 }

137 int ENGINE_set_default_string(ENGINE *e, const char *def_list)
138 {
139     unsigned int flags = 0;
140     if (!CONF_parse_list(def_list, ',', 1, int_def_cb, &flags))
141     {
142         ENGINEerr(ENGINE_F_ENGINE_SET_DEFAULT_STRING,
143                  ENGINE_R_INVALID_STRING);
144         ERR_add_error_data(2, "str=", def_list);
145         return 0;
146     }
147     return ENGINE_set_default(e, flags);
148 }

150 int ENGINE_register_complete(ENGINE *e)
151 {
152     ENGINE_register_ciphers(e);
153     ENGINE_register_digests(e);
154 #ifndef OPENSSL_NO_RSA
155     ENGINE_register_RSA(e);
156 #endif
157 #ifndef OPENSSL_NO_DSA
158     ENGINE_register_DSA(e);
159 #endif
160 #ifndef OPENSSL_NO_DH
161     ENGINE_register_DH(e);
162 #endif
163 #ifndef OPENSSL_NO_ECDH
164     ENGINE_register_ECDH(e);
165 #endif
166 #ifndef OPENSSL_NO_ECDSA
167     ENGINE_register_ECDSA(e);
168 #endif
169     ENGINE_register_RAND(e);
170     ENGINE_register_pkey_meths(e);
171     return 1;
172 }

174 int ENGINE_register_all_complete(void)
175 {
176     ENGINE *e;
177
178     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
179         if (!(e->flags & ENGINE_FLAGS_NO_REGISTER_ALL))
180             ENGINE_register_complete(e);
181     return 1;
182 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_init.c

1

```
*****
5200 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_init.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/engine/eng_init.c */
2 /* =====
3 * Copyright (c) 1999-2001 The OpenSSL Project. All rights reserved.
4 *
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6 * modification, are permitted provided that the following conditions
7 * are met:
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15 * distribution.
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45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */

56 #include "eng_int.h"

58 /* Initialise a engine type for use (or up its functional reference count
59 * if it's already in use). This version is only used internally. */
60 int engine_unlocked_init(ENGINE *e)
61 {
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_init.c

2

```
62     int to_return = 1;

64     if((e->func_ref == 0) && e->init)
65         /* This is the first functional reference and the engine
66          * requires initialisation so we do it now. */
67         to_return = e->init(e);
68     if(to_return)
69     {
70         /* OK, we return a functional reference which is also a
71          * structural reference. */
72         e->struct_ref++;
73         e->func_ref++;
74         engine_ref_debug(e, 0, 1)
75         engine_ref_debug(e, 1, 1)
76     }
77     return to_return;
78 }

80 /* Free a functional reference to a engine type. This version is only used
81 * internally. */
82 int engine_unlocked_finish(ENGINE *e, int unlock_for_handlers)
83 {
84     int to_return = 1;

86     /* Reduce the functional reference count here so if it's the terminating
87      * case, we can release the lock safely and call the finish() handler
88      * without risk of a race. We get a race if we leave the count until
89      * after and something else is calling "finish" at the same time -
90      * there's a chance that both threads will together take the count from
91      * 2 to 0 without either calling finish(). */
92     e->func_ref--;
93     engine_ref_debug(e, 1, -1);
94     if((e->func_ref == 0) && e->finish)
95     {
96         if(unlock_for_handlers)
97             CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
98         to_return = e->finish(e);
99         if(unlock_for_handlers)
100             CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
101         if(!to_return)
102             return 0;
103     }
104 #ifdef REF_CHECK
105     if(e->func_ref < 0)
106     {
107         fprintf(stderr, "ENGINE_finish, bad functional reference count\n");
108         abort();
109     }
110 #endif
111     /* Release the structural reference too */
112     if(!engine_free_util(e, 0))
113     {
114         ENGINEerr(ENGINE_F_ENGINE_UNLOCKED_FINISH, ENGINE_R_FINISH_FAILED);
115         return 0;
116     }
117     return to_return;
118 }

120 /* The API (locked) version of "init" */
121 int ENGINE_init(ENGINE *e)
122 {
123     int ret;
124     if(e == NULL)
125     {
126         ENGINEerr(ENGINE_F_ENGINE_INIT, ERR_R_PASSED_NULL_PARAMETER);
127         return 0;
```

```
128     }
129     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
130     ret = engine_unlocked_init(e);
131     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
132     return ret;
133 }
134
135 /* The API (locked) version of "finish" */
136 int ENGINE_finish(ENGINE *e)
137 {
138     int to_return = 1;
139
140     if(e == NULL)
141     {
142         ENGINEerr(ENGINE_F_ENGINE_FINISH, ERR_R_PASSED_NULL_PARAMETER);
143         return 0;
144     }
145     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
146     to_return = engine_unlocked_finish(e, 1);
147     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
148     if(!to_return)
149     {
150         ENGINEerr(ENGINE_F_ENGINE_FINISH, ENGINE_R_FINISH_FAILED);
151         return 0;
152     }
153     return to_return;
154 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_lib.c

1

```
*****
8789 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/eng_lib.c */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 1999-2001 The OpenSSL Project. All rights reserved.
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43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include "eng_int.h"
60 #include <openssl/rand.h>
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_lib.c

2

```
62 /* The "new"/"free" stuff first */

64 ENGINE *ENGINE_new(void)
65 {
66     ENGINE *ret;

68     ret = (ENGINE *)OPENSSL_malloc(sizeof(ENGINE));
69     if(ret == NULL)
70     {
71         ENGINEerr(ENGINE_F_ENGINE_NEW, ERR_R_MALLOC_FAILURE);
72         return NULL;
73     }
74     memset(ret, 0, sizeof(ENGINE));
75     ret->struct_ref = 1;
76     engine_ref_debug(ret, 0, 1)
77     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_ENGINE, ret, &ret->ex_data);
78     return ret;
79 }

81 /* Placed here (close proximity to ENGINE_new) so that modifications to the
82  * elements of the ENGINE structure are more likely to be caught and changed
83  * here. */
84 void engine_set_all_null(ENGINE *e)
85 {
86     e->id = NULL;
87     e->name = NULL;
88     e->rsa_meth = NULL;
89     e->dsa_meth = NULL;
90     e->dh_meth = NULL;
91     e->rand_meth = NULL;
92     e->store_meth = NULL;
93     e->ciphers = NULL;
94     e->digests = NULL;
95     e->destroy = NULL;
96     e->init = NULL;
97     e->finish = NULL;
98     e->ctrl = NULL;
99     e->load_privkey = NULL;
100    e->load_pubkey = NULL;
101    e->cmd_defns = NULL;
102    e->flags = 0;
103 }

105 int engine_free_util(ENGINE *e, int locked)
106 {
107     int i;

109     if(e == NULL)
110     {
111         ENGINEerr(ENGINE_F_ENGINE_FREE_UTIL,
112                 ERR_R_PASSED_NULL_PARAMETER);
113         return 0;
114     }
115     if(locked)
116         i = CRYPTO_add(&e->struct_ref, -1, CRYPTO_LOCK_ENGINE);
117     else
118         i = --e->struct_ref;
119     engine_ref_debug(e, 0, -1)
120     if (i > 0) return 1;
121 #ifdef REF_CHECK
122     if (i < 0)
123     {
124         fprintf(stderr, "ENGINE_free, bad structural reference count\n");
125         abort();
126     }
127 #endif
```

```

128 /* Free up any dynamically allocated public key methods */
129 engine_pkey_meths_free(e);
130 engine_pkey_asn1_meths_free(e);
131 /* Give the ENGINE a chance to do any structural cleanup corresponding
132  * to allocation it did in its constructor (eg. unload error strings) */
133 if(e->destroy)
134     e->destroy(e);
135 CRYPTO_free_ex_data(CRYPTO_EX_INDEX_ENGINE, e, &e->ex_data);
136 OPENSSL_free(e);
137 return 1;
138 }

140 int ENGINE_free(ENGINE *e)
141 {
142     return engine_free_util(e, 1);
143 }

145 /* Cleanup stuff */

147 /* ENGINE_cleanup() is coded such that anything that does work that will need
148  * cleanup can register a "cleanup" callback here. That way we don't get linker
149  * bloat by referring to all *possible* cleanups, but any linker bloat into code
150  * "X" will cause X's cleanup function to end up here. */
151 static STACK_OF(ENGINE_CLEANUP_ITEM) *cleanup_stack = NULL;
152 static int int_cleanup_check(int create)
153 {
154     if(cleanup_stack) return 1;
155     if(!create) return 0;
156     cleanup_stack = sk_ENGINE_CLEANUP_ITEM_new_null();
157     return (cleanup_stack ? 1 : 0);
158 }
159 static ENGINE_CLEANUP_ITEM *int_cleanup_item(ENGINE_CLEANUP_CB *cb)
160 {
161     ENGINE_CLEANUP_ITEM *item = OPENSSL_malloc(sizeof(
162         ENGINE_CLEANUP_ITEM));
163     if(!item) return NULL;
164     item->cb = cb;
165     return item;
166 }
167 void engine_cleanup_add_first(ENGINE_CLEANUP_CB *cb)
168 {
169     ENGINE_CLEANUP_ITEM *item;
170     if(!int_cleanup_check(1)) return;
171     item = int_cleanup_item(cb);
172     if(item)
173         sk_ENGINE_CLEANUP_ITEM_insert(cleanup_stack, item, 0);
174 }
175 void engine_cleanup_add_last(ENGINE_CLEANUP_CB *cb)
176 {
177     ENGINE_CLEANUP_ITEM *item;
178     if(!int_cleanup_check(1)) return;
179     item = int_cleanup_item(cb);
180     if(item)
181         sk_ENGINE_CLEANUP_ITEM_push(cleanup_stack, item);
182 }
183 /* The API function that performs all cleanup */
184 static void engine_cleanup_cb_free(ENGINE_CLEANUP_ITEM *item)
185 {
186     (*(item->cb))();
187     OPENSSL_free(item);
188 }
189 void ENGINE_cleanup(void)
190 {
191     if(int_cleanup_check(0))
192     {
193         sk_ENGINE_CLEANUP_ITEM_pop_free(cleanup_stack,

```

```

194         engine_cleanup_cb_free);
195         cleanup_stack = NULL;
196     }
197     /* FIXME: This should be handled (somehow) through RAND, eg. by it
198     * registering a cleanup callback. */
199     RAND_set_rand_method(NULL);
200 }

202 /* Now the "ex_data" support */

204 int ENGINE_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
205     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
206 {
207     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_ENGINE, argl, argp,
208         new_func, dup_func, free_func);
209 }

211 int ENGINE_set_ex_data(ENGINE *e, int idx, void *arg)
212 {
213     return(CRYPTO_set_ex_data(&e->ex_data, idx, arg));
214 }

216 void *ENGINE_get_ex_data(const ENGINE *e, int idx)
217 {
218     return(CRYPTO_get_ex_data(&e->ex_data, idx));
219 }

221 /* Functions to get/set an ENGINE's elements - mainly to avoid exposing the
222  * ENGINE structure itself. */

224 int ENGINE_set_id(ENGINE *e, const char *id)
225 {
226     if(id == NULL)
227     {
228         ENGINEerr(ENGINE_F_ENGINE_SET_ID,
229             ERR_R_PASSED_NULL_PARAMETER);
230         return 0;
231     }
232     e->id = id;
233     return 1;
234 }

236 int ENGINE_set_name(ENGINE *e, const char *name)
237 {
238     if(name == NULL)
239     {
240         ENGINEerr(ENGINE_F_ENGINE_SET_NAME,
241             ERR_R_PASSED_NULL_PARAMETER);
242         return 0;
243     }
244     e->name = name;
245     return 1;
246 }

248 int ENGINE_set_destroy_function(ENGINE *e, ENGINE_GEN_INT_FUNC_PTR destroy_f)
249 {
250     e->destroy = destroy_f;
251     return 1;
252 }

254 int ENGINE_set_init_function(ENGINE *e, ENGINE_GEN_INT_FUNC_PTR init_f)
255 {
256     e->init = init_f;
257     return 1;
258 }

```



```
260 int ENGINE_set_finish_function(ENGINE *e, ENGINE_GEN_INT_FUNC_PTR finish_f)
261 {
262     e->finish = finish_f;
263     return 1;
264 }

266 int ENGINE_set_ctrl_function(ENGINE *e, ENGINE_CTRL_FUNC_PTR ctrl_f)
267 {
268     e->ctrl = ctrl_f;
269     return 1;
270 }

272 int ENGINE_set_flags(ENGINE *e, int flags)
273 {
274     e->flags = flags;
275     return 1;
276 }

278 int ENGINE_set_cmd_defns(ENGINE *e, const ENGINE_CMD_DEFN *defns)
279 {
280     e->cmd_defns = defns;
281     return 1;
282 }

284 const char *ENGINE_get_id(const ENGINE *e)
285 {
286     return e->id;
287 }

289 const char *ENGINE_get_name(const ENGINE *e)
290 {
291     return e->name;
292 }

294 ENGINE_GEN_INT_FUNC_PTR ENGINE_get_destroy_function(const ENGINE *e)
295 {
296     return e->destroy;
297 }

299 ENGINE_GEN_INT_FUNC_PTR ENGINE_get_init_function(const ENGINE *e)
300 {
301     return e->init;
302 }

304 ENGINE_GEN_INT_FUNC_PTR ENGINE_get_finish_function(const ENGINE *e)
305 {
306     return e->finish;
307 }

309 ENGINE_CTRL_FUNC_PTR ENGINE_get_ctrl_function(const ENGINE *e)
310 {
311     return e->ctrl;
312 }

314 int ENGINE_get_flags(const ENGINE *e)
315 {
316     return e->flags;
317 }

319 const ENGINE_CMD_DEFN *ENGINE_get_cmd_defns(const ENGINE *e)
320 {
321     return e->cmd_defns;
322 }

324 /* eng_lib.o is pretty much linked into anything that touches ENGINE already, so
325  * put the "static_state" hack here. */
```

```
327 static int internal_static_hack = 0;

329 void *ENGINE_get_static_state(void)
330 {
331     return &internal_static_hack;
332 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_list.c

1

```
*****
11841 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_list.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/eng_list.c */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57 /* =====
58 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
59 * ECDH support in OpenSSL originally developed by
60 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_list.c

2

```
62 */
64 #include "eng_int.h"

66 /* The linked-list of pointers to engine types. engine_list_head
67  * incorporates an implicit structural reference but engine_list_tail
68  * does not - the latter is a computational niceity and only points
69  * to something that is already pointed to by its predecessor in the
70  * list (or engine_list_head itself). In the same way, the use of the
71  * "prev" pointer in each ENGINE is to save excessive list iteration,
72  * it doesn't correspond to an extra structural reference. Hence,
73  * engine_list_head, and each non-null "next" pointer account for
74  * the list itself assuming exactly 1 structural reference on each
75  * list member. */
76 static ENGINE *engine_list_head = NULL;
77 static ENGINE *engine_list_tail = NULL;

79 /* This cleanup function is only needed internally. If it should be called, we
80  * register it with the "ENGINE_cleanup()" stack to be called during cleanup. */

82 static void engine_list_cleanup(void)
83 {
84     ENGINE *iterator = engine_list_head;

86     while(iterator != NULL)
87     {
88         ENGINE_remove(iterator);
89         iterator = engine_list_head;
90     }
91     return;
92 }

94 /* These static functions starting with a lower case "engine_" always
95  * take place when CRYPTO_LOCK_ENGINE has been locked up. */
96 static int engine_list_add(ENGINE *e)
97 {
98     int conflict = 0;
99     ENGINE *iterator = NULL;

101     if(e == NULL)
102     {
103         ENGINEerr(ENGINE_F_ENGINE_LIST_ADD,
104                  ERR_R_PASSED_NULL_PARAMETER);
105         return 0;
106     }
107     iterator = engine_list_head;
108     while(iterator && !conflict)
109     {
110         conflict = (strcmp(iterator->id, e->id) == 0);
111         iterator = iterator->next;
112     }
113     if(conflict)
114     {
115         ENGINEerr(ENGINE_F_ENGINE_LIST_ADD,
116                  ENGINE_R_CONFLICTING_ENGINE_ID);
117         return 0;
118     }
119     if(engine_list_head == NULL)
120     {
121         /* We are adding to an empty list. */
122         if(engine_list_tail)
123         {
124             ENGINEerr(ENGINE_F_ENGINE_LIST_ADD,
125                      ENGINE_R_INTERNAL_LIST_ERROR);
126             return 0;
127         }
128     }
129 }
```

```

128     engine_list_head = e;
129     e->prev = NULL;
130     /* The first time the list allocates, we should register the
131      * cleanup. */
132     engine_cleanup_add_last(engine_list_cleanup);
133 }
134 else
135 {
136     /* We are adding to the tail of an existing list. */
137     if((engine_list_tail == NULL) ||
138        (engine_list_tail->next != NULL))
139     {
140         ENGINEerr(ENGINE_F_ENGINE_LIST_ADD,
141                  ENGINE_R_INTERNAL_LIST_ERROR);
142         return 0;
143     }
144     engine_list_tail->next = e;
145     e->prev = engine_list_tail;
146 }
147 /* Having the engine in the list assumes a structural
148  * reference. */
149 e->struct_ref++;
150 engine_ref_debug(e, 0, 1)
151 /* However it came to be, e is the last item in the list. */
152 engine_list_tail = e;
153 e->next = NULL;
154 return 1;
155 }
156
157 static int engine_list_remove(ENGINE *e)
158 {
159     ENGINE *iterator;
160
161     if(e == NULL)
162     {
163         ENGINEerr(ENGINE_F_ENGINE_LIST_REMOVE,
164                  ERR_R_PASSED_NULL_PARAMETER);
165         return 0;
166     }
167     /* We need to check that e is in our linked list! */
168     iterator = engine_list_head;
169     while(iterator && (iterator != e))
170         iterator = iterator->next;
171     if(iterator == NULL)
172     {
173         ENGINEerr(ENGINE_F_ENGINE_LIST_REMOVE,
174                  ENGINE_R_ENGINE_IS_NOT_IN_LIST);
175         return 0;
176     }
177     /* un-link e from the chain. */
178     if(e->next)
179         e->next->prev = e->prev;
180     if(e->prev)
181         e->prev->next = e->next;
182     /* Correct our head/tail if necessary. */
183     if(engine_list_head == e)
184         engine_list_head = e->next;
185     if(engine_list_tail == e)
186         engine_list_tail = e->prev;
187     engine_free_util(e, 0);
188     return 1;
189 }
190
191 /* Get the first/last "ENGINE" type available. */
192 ENGINE *ENGINE_get_first(void)
193 {

```

```

194     ENGINE *ret;
195
196     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
197     ret = engine_list_head;
198     if(ret)
199     {
200         ret->struct_ref++;
201         engine_ref_debug(ret, 0, 1)
202     }
203     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
204     return ret;
205 }
206
207 ENGINE *ENGINE_get_last(void)
208 {
209     ENGINE *ret;
210
211     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
212     ret = engine_list_tail;
213     if(ret)
214     {
215         ret->struct_ref++;
216         engine_ref_debug(ret, 0, 1)
217     }
218     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
219     return ret;
220 }
221
222 /* Iterate to the next/previous "ENGINE" type (NULL = end of the list). */
223 ENGINE *ENGINE_get_next(ENGINE *e)
224 {
225     ENGINE *ret = NULL;
226     if(e == NULL)
227     {
228         ENGINEerr(ENGINE_F_ENGINE_GET_NEXT,
229                  ERR_R_PASSED_NULL_PARAMETER);
230         return 0;
231     }
232     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
233     ret = e->next;
234     if(ret)
235     {
236         /* Return a valid structural reference to the next ENGINE */
237         ret->struct_ref++;
238         engine_ref_debug(ret, 0, 1)
239     }
240     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
241     /* Release the structural reference to the previous ENGINE */
242     ENGINE_free(e);
243     return ret;
244 }
245
246 ENGINE *ENGINE_get_prev(ENGINE *e)
247 {
248     ENGINE *ret = NULL;
249     if(e == NULL)
250     {
251         ENGINEerr(ENGINE_F_ENGINE_GET_PREV,
252                  ERR_R_PASSED_NULL_PARAMETER);
253         return 0;
254     }
255     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
256     ret = e->prev;
257     if(ret)
258     {
259         /* Return a valid structural reference to the next ENGINE */

```

```

260         ret->struct_ref++;
261         engine_ref_debug(ret, 0, 1)
262     }
263     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
264     /* Release the structural reference to the previous ENGINE */
265     ENGINE_free(e);
266     return ret;
267 }

269 /* Add another "ENGINE" type into the list. */
270 int ENGINE_add(ENGINE *e)
271 {
272     int to_return = 1;
273     if(e == NULL)
274     {
275         ENGINEerr(ENGINE_F_ENGINE_ADD,
276                 ERR_R_PASSED_NULL_PARAMETER);
277         return 0;
278     }
279     if((e->id == NULL) || (e->name == NULL))
280     {
281         ENGINEerr(ENGINE_F_ENGINE_ADD,
282                 ENGINE_R_ID_OR_NAME_MISSING);
283     }
284     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
285     if(!engine_list_add(e))
286     {
287         ENGINEerr(ENGINE_F_ENGINE_ADD,
288                 ENGINE_R_INTERNAL_LIST_ERROR);
289         to_return = 0;
290     }
291     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
292     return to_return;
293 }

295 /* Remove an existing "ENGINE" type from the array. */
296 int ENGINE_remove(ENGINE *e)
297 {
298     int to_return = 1;
299     if(e == NULL)
300     {
301         ENGINEerr(ENGINE_F_ENGINE_REMOVE,
302                 ERR_R_PASSED_NULL_PARAMETER);
303         return 0;
304     }
305     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
306     if(!engine_list_remove(e))
307     {
308         ENGINEerr(ENGINE_F_ENGINE_REMOVE,
309                 ENGINE_R_INTERNAL_LIST_ERROR);
310         to_return = 0;
311     }
312     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
313     return to_return;
314 }

316 static void engine_cpy(ENGINE *dest, const ENGINE *src)
317 {
318     dest->id = src->id;
319     dest->name = src->name;
320     #ifndef OPENSSL_NO_RSA
321     dest->rsa_meth = src->rsa_meth;
322     #endif
323     #ifndef OPENSSL_NO_DSA
324     dest->dsa_meth = src->dsa_meth;
325     #endif

```

```

326 #ifndef OPENSSL_NO_DH
327     dest->dh_meth = src->dh_meth;
328 #endif
329 #ifndef OPENSSL_NO_ECDH
330     dest->ecdh_meth = src->ecdh_meth;
331 #endif
332 #ifndef OPENSSL_NO_ECDSA
333     dest->ecdsa_meth = src->ecdsa_meth;
334 #endif
335     dest->rand_meth = src->rand_meth;
336     dest->store_meth = src->store_meth;
337     dest->ciphers = src->ciphers;
338     dest->digests = src->digests;
339     dest->pkey_meths = src->pkey_meths;
340     dest->destroy = src->destroy;
341     dest->init = src->init;
342     dest->finish = src->finish;
343     dest->ctrl = src->ctrl;
344     dest->load_privkey = src->load_privkey;
345     dest->load_pubkey = src->load_pubkey;
346     dest->cmd_defns = src->cmd_defns;
347     dest->flags = src->flags;
348 }

350 ENGINE *ENGINE_by_id(const char *id)
351 {
352     ENGINE *iterator;
353     char *load_dir = NULL;
354     if(id == NULL)
355     {
356         ENGINEerr(ENGINE_F_ENGINE_BY_ID,
357                 ERR_R_PASSED_NULL_PARAMETER);
358         return NULL;
359     }
360     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
361     iterator = engine_list_head;
362     while(iterator && (strcmp(id, iterator->id) != 0))
363         iterator = iterator->next;
364     if(iterator)
365     {
366         /* We need to return a structural reference. If this is an
367          * ENGINE type that returns copies, make a duplicate - otherwise
368          * increment the existing ENGINE's reference count. */
369         if(iterator->flags & ENGINE_FLAGS_BY_ID_COPY)
370         {
371             ENGINE *cp = ENGINE_new();
372             if(!cp)
373                 iterator = NULL;
374             else
375             {
376                 engine_cpy(cp, iterator);
377                 iterator = cp;
378             }
379         }
380         else
381         {
382             iterator->struct_ref++;
383             engine_ref_debug(iterator, 0, 1)
384         }
385     }
386     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
387     #if 0
388     if(iterator == NULL)
389     {
390         ENGINEerr(ENGINE_F_ENGINE_BY_ID,
391                 ENGINE_R_NO_SUCH_ENGINE);

```

```
392         ERR_add_error_data(2, "id=", id);
393     }
394     return iterator;
395 #else
396     /* EEK! Experimental code starts */
397     if(iterator) return iterator;
398     /* Prevent infinite recursion if we're looking for the dynamic engine. */
399     if (strcmp(id, "dynamic"))
400     {
401 #ifdef OPENSSL_SYS_VMS
402         if((load_dir = getenv("OPENSSL_ENGINES")) == 0) load_dir = "SSLR
403 #else
404         if((load_dir = getenv("OPENSSL_ENGINES")) == 0) load_dir = ENGIN
405 #endif
406         iterator = ENGINE_by_id("dynamic");
407         if(!iterator || !ENGINE_ctrl_cmd_string(iterator, "ID", id, 0) |
408             !ENGINE_ctrl_cmd_string(iterator, "DIR_LOAD", "2
409             !ENGINE_ctrl_cmd_string(iterator, "DIR_ADD",
410             load_dir, 0) ||
411             !ENGINE_ctrl_cmd_string(iterator, "LIST_ADD", "1
412             !ENGINE_ctrl_cmd_string(iterator, "LOAD", NULL,
413             goto notfound;
414         return iterator;
415     }
416 notfound:
417     ENGINE_free(iterator);
418     ENGINEerr(ENGINE_F_ENGINE_BY_ID,ENGINE_R_NO_SUCH_ENGINE);
419     ERR_add_error_data(2, "id=", id);
420     return NULL;
421     /* EEK! Experimental code ends */
422 #endif
423 }

425 int ENGINE_up_ref(ENGINE *e)
426 {
427     if (e == NULL)
428     {
429         ENGINEerr(ENGINE_F_ENGINE_UP_REF,ERR_R_PASSED_NULL_PARAMETER);
430         return 0;
431     }
432     CRYPTO_add(&e->struct_ref,1,CRYPTO_LOCK_ENGINE);
433     return 1;
434 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_openssl.c

1

```
*****
11632 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_openssl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/engine/eng_openssl.c */
2 /* Written by Geoff Thorpe (geoff@geoffthorpe.net) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 1999-2001 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57 /* =====
58  * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
59  * ECDH support in OpenSSL originally developed by
60  * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_openssl.c

2

```
62 */
63
64 #include <stdio.h>
65 #include <openssl/crypto.h>
66 #include "cryptlib.h"
67 #include <openssl/engine.h>
68 #include <openssl/dso.h>
69 #include <openssl/pem.h>
70 #include <openssl/evp.h>
71 #include <openssl/rand.h>
72 #ifndef OPENSSL_NO_RSA
73 #include <openssl/rsa.h>
74 #endif
75 #ifndef OPENSSL_NO_DSA
76 #include <openssl/dsa.h>
77 #endif
78 #ifndef OPENSSL_NO_DH
79 #include <openssl/dh.h>
80 #endif
81
82 /* This testing gunk is implemented (and explained) lower down. It also assumes
83  * the application explicitly calls "ENGINE_load_openssl()" because this is no
84  * longer automatic in ENGINE_load_builtin_engines(). */
85 #define TEST_ENGINE_OPENSSSL_RC4
86 #define TEST_ENGINE_OPENSSSL_PKEY
87 /* #define TEST_ENGINE_OPENSSSL_RC4_OTHERS */
88 #define TEST_ENGINE_OPENSSSL_RC4_P_INIT
89 /* #define TEST_ENGINE_OPENSSSL_RC4_P_CIPHER */
90 #define TEST_ENGINE_OPENSSSL_SHA
91 /* #define TEST_ENGINE_OPENSSSL_SHA_OTHERS */
92 /* #define TEST_ENGINE_OPENSSSL_SHA_P_INIT */
93 /* #define TEST_ENGINE_OPENSSSL_SHA_P_UPDATE */
94 /* #define TEST_ENGINE_OPENSSSL_SHA_P_FINAL */
95
96 /* Now check what of those algorithms are actually enabled */
97 #ifndef OPENSSL_NO_RC4
98 #undef TEST_ENGINE_OPENSSSL_RC4
99 #undef TEST_ENGINE_OPENSSSL_RC4_OTHERS
100 #undef TEST_ENGINE_OPENSSSL_RC4_P_INIT
101 #undef TEST_ENGINE_OPENSSSL_RC4_P_CIPHER
102 #endif
103 #if defined(OPENSSL_NO_SHA) || defined(OPENSSL_NO_SHA0) || defined(OPENSSL_NO_SH
104 #undef TEST_ENGINE_OPENSSSL_SHA
105 #undef TEST_ENGINE_OPENSSSL_SHA_OTHERS
106 #undef TEST_ENGINE_OPENSSSL_SHA_P_INIT
107 #undef TEST_ENGINE_OPENSSSL_SHA_P_UPDATE
108 #undef TEST_ENGINE_OPENSSSL_SHA_P_FINAL
109 #endif
110
111 #if TEST_ENGINE_OPENSSSL_RC4
112 static int openssl_ciphers(ENGINE *e, const EVP_CIPHER **cipher,
113                          const int **nids, int nid);
114 #endif
115 #if TEST_ENGINE_OPENSSSL_SHA
116 static int openssl_digests(ENGINE *e, const EVP_MD **digest,
117                          const int **nids, int nid);
118 #endif
119
120 #if TEST_ENGINE_OPENSSSL_PKEY
121 static EVP_PKEY *openssl_load_privkey(ENGINE *eng, const char *key_id,
122                                       UI_METHOD *ui_method, void *callback_data);
123 #endif
124
125 /* The constants used when creating the ENGINE */
126 static const char *engine_openssl_id = "openssl";
```

```

128 static const char *engine_openssl_name = "Software engine support";

130 /* This internal function is used by ENGINE_openssl() and possibly by the
131  * "dynamic" ENGINE support too */
132 static int bind_helper(ENGINE *e)
133 {
134     if(!ENGINE_set_id(e, engine_openssl_id)
135         || !ENGINE_set_name(e, engine_openssl_name)
136 #ifndef TEST_ENG_OPENSSL_NO_ALGORITHMS
137 #ifndef OPENSSL_NO_RSA
138         || !ENGINE_set_RSA(e, RSA_get_default_method())
139 #endif
140 #ifndef OPENSSL_NO_DSA
141         || !ENGINE_set_DSA(e, DSA_get_default_method())
142 #endif
143 #ifndef OPENSSL_NO_ECDH
144         || !ENGINE_set_ECDH(e, ECDH_OpenSSL())
145 #endif
146 #ifndef OPENSSL_NO_ECDSA
147         || !ENGINE_set_ECDSA(e, ECDSA_OpenSSL())
148 #endif
149 #ifndef OPENSSL_NO_DH
150         || !ENGINE_set_DH(e, DH_get_default_method())
151 #endif
152         || !ENGINE_set RAND(e, RAND_SSLeay())
153 #ifndef TEST_ENG_OPENSSL_RC4
154         || !ENGINE_set_ciphers(e, openssl_ciphers)
155 #endif
156 #ifndef TEST_ENG_OPENSSL_SHA
157         || !ENGINE_set_digests(e, openssl_digests)
158 #endif
159 #endif
160 #ifndef TEST_ENG_OPENSSL_PKEY
161         || !ENGINE_set_load_privkey_function(e, openssl_load_pri
162 #endif
163     )
164     return 0;
165     /* If we add errors to this ENGINE, ensure the error handling is setup h
166     /* openssl_load_error_strings(); */
167     return 1;
168 }

170 static ENGINE *engine_openssl(void)
171 {
172     ENGINE *ret = ENGINE_new();
173     if(!ret)
174         return NULL;
175     if(!bind_helper(ret))
176     {
177         ENGINE_free(ret);
178         return NULL;
179     }
180     return ret;
181 }

183 void ENGINE_load_openssl(void)
184 {
185     ENGINE *toadd = engine_openssl();
186     if(!toadd) return;
187     ENGINE_add(toadd);
188     /* If the "add" worked, it gets a structural reference. So either way,
189     * we release our just-created reference. */
190     ENGINE_free(toadd);
191     ERR_clear_error();
192 }

```

```

194 /* This stuff is needed if this ENGINE is being compiled into a self-contained
195  * shared-library. */
196 #ifdef ENGINE_DYNAMIC_SUPPORT
197 static int bind_fn(ENGINE *e, const char *id)
198 {
199     if(id && (strcmp(id, engine_openssl_id) != 0))
200         return 0;
201     if(!bind_helper(e))
202         return 0;
203     return 1;
204 }
205 IMPLEMENT_DYNAMIC_CHECK_FN()
206 IMPLEMENT_DYNAMIC_BIND_FN(bind_fn)
207 #endif /* ENGINE_DYNAMIC_SUPPORT */

209 #ifndef TEST_ENG_OPENSSL_RC4
210 /* This section of code compiles an "alternative implementation" of two modes of
211  * RC4 into this ENGINE. The result is that EVP_CIPHER operation for "rc4"
212  * should under normal circumstances go via this support rather than the default
213  * EVP support. There are other symbols to tweak the testing;
214  * TEST_ENC_OPENSSL_RC4_OTHERS - print a one line message to stderr each time
215  * we're asked for a cipher we don't support (should not happen).
216  * TEST_ENG_OPENSSL_RC4_P_INIT - print a one line message to stderr each time
217  * the "init_key" handler is called.
218  * TEST_ENG_OPENSSL_RC4_P_CIPHER - ditto for the "cipher" handler.
219  */
220 #include <openssl/rc4.h>
221 #define TEST_RC4_KEY_SIZE 16
222 static int test_cipher_nids[] = {NID_rc4, NID_rc4_40};
223 static int test_cipher_nids_number = 2;
224 typedef struct {
225     unsigned char key[TEST_RC4_KEY_SIZE];
226     RC4_KEY ks;
227 } TEST_RC4_KEY;
228 #define test(ctx) ((TEST_RC4_KEY *) (ctx)->cipher_data)
229 static int test_rc4_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
230                             const unsigned char *iv, int enc)
231 {
232     #ifdef TEST_ENG_OPENSSL_RC4_P_INIT
233     fprintf(stderr, "(TEST_ENG_OPENSSL_RC4) test_init_key() called\n");
234     #endif
235     memcpy(&test(ctx)->key[0], key, EVP_CIPHER_CTX_key_length(ctx));
236     RC4_set_key(&test(ctx)->ks, EVP_CIPHER_CTX_key_length(ctx),
237               test(ctx)->key);
238     return 1;
239 }
240 static int test_rc4_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
241                           const unsigned char *in, size_t inl)
242 {
243     #ifdef TEST_ENG_OPENSSL_RC4_P_CIPHER
244     fprintf(stderr, "(TEST_ENG_OPENSSL_RC4) test_cipher() called\n");
245     #endif
246     RC4(&test(ctx)->ks, inl, in, out);
247     return 1;
248 }
249 static const EVP_CIPHER test_r4_cipher=
250 {
251     NID_rc4,
252     1, TEST_RC4_KEY_SIZE, 0,
253     EVP_CIPH_VARIABLE_LENGTH,
254     test_rc4_init_key,
255     test_rc4_cipher,
256     NULL,
257     sizeof(TEST_RC4_KEY),
258     NULL,
259     NULL,

```

```

260     NULL,
261     NULL
262 };
263 static const EVP_CIPHER test_r4_40_cipher=
264 {
265     NID_rc4_40,
266     1,5 /* 40 bit */,0,
267     EVP_CIPH_VARIABLE_LENGTH,
268     test_rc4_init_key,
269     test_rc4_cipher,
270     NULL,
271     sizeof(TEST_RC4_KEY),
272     NULL,
273     NULL,
274     NULL,
275     NULL
276 };
277 static int openssl_ciphers(ENGINE *e, const EVP_CIPHER **cipher,
278                          const int **nids, int nid)
279 {
280     if(!cipher)
281     {
282         /* We are returning a list of supported nids */
283         *nids = test_cipher_nids;
284         return test_cipher_nids_number;
285     }
286     /* We are being asked for a specific cipher */
287     if(nid == NID_rc4)
288         *cipher = &test_r4_cipher;
289     else if(nid == NID_rc4_40)
290         *cipher = &test_r4_40_cipher;
291     else
292     {
293 #ifdef TEST_ENG_OPENSSL_RC4_OTHERS
294         fprintf(stderr, "(TEST_ENG_OPENSSL_RC4) returning NULL for "
295                "nid %d\n", nid);
296 #endif
297         *cipher = NULL;
298         return 0;
299     }
300     return 1;
301 }
302 #endif
303
304 #ifdef TEST_ENG_OPENSSL_SHA
305 /* Much the same sort of comment as for TEST_ENG_OPENSSL_RC4 */
306 #include <openssl/sha.h>
307 static int test_digest_nids[] = {NID_sha1};
308 static int test_digest_nids_number = 1;
309 static int test_sha1_init(EVP_MD_CTX *ctx)
310 {
311 #ifdef TEST_ENG_OPENSSL_SHA_P_INIT
312     fprintf(stderr, "(TEST_ENG_OPENSSL_SHA) test_sha1_init() called\n");
313 #endif
314     return SHA1_Init(ctx->md_data);
315 }
316 static int test_sha1_update(EVP_MD_CTX *ctx, const void *data, size_t count)
317 {
318 #ifdef TEST_ENG_OPENSSL_SHA_P_UPDATE
319     fprintf(stderr, "(TEST_ENG_OPENSSL_SHA) test_sha1_update() called\n");
320 #endif
321     return SHA1_Update(ctx->md_data, data, count);
322 }
323 static int test_sha1_final(EVP_MD_CTX *ctx, unsigned char *md)
324 {
325 #ifdef TEST_ENG_OPENSSL_SHA_P_FINAL

```

```

326     fprintf(stderr, "(TEST_ENG_OPENSSL_SHA) test_sha1_final() called\n");
327 #endif
328     return SHA1_Final(md, ctx->md_data);
329 }
330 static const EVP_MD test_sha_md=
331 {
332     NID_sha1,
333     NID_sha1withRSAEncryption,
334     SHA_DIGEST_LENGTH,
335     0,
336     test_sha1_init,
337     test_sha1_update,
338     test_sha1_final,
339     NULL,
340     NULL,
341     EVP_PKEY_RSA_method,
342     SHA_CBLOCK,
343     sizeof(EVP_MD *)+sizeof(SHA_CTX),
344     };
345 static int openssl_digests(ENGINE *e, const EVP_MD **digest,
346                          const int **nids, int nid)
347 {
348     if(!digest)
349     {
350         /* We are returning a list of supported nids */
351         *nids = test_digest_nids;
352         return test_digest_nids_number;
353     }
354     /* We are being asked for a specific digest */
355     if(nid == NID_sha1)
356         *digest = &test_sha_md;
357     else
358     {
359 #ifdef TEST_ENG_OPENSSL_SHA_OTHERS
360         fprintf(stderr, "(TEST_ENG_OPENSSL_SHA) returning NULL for "
361                "nid %d\n", nid);
362 #endif
363         *digest = NULL;
364         return 0;
365     }
366     return 1;
367 }
368 #endif
369
370 #ifdef TEST_ENG_OPENSSL_PKEY
371 static EVP_PKEY *openssl_load_privkey(ENGINE *eng, const char *key_id,
372                                       UI_METHOD *ui_method, void *callback_data)
373 {
374     BIO *in;
375     EVP_PKEY *key;
376     fprintf(stderr, "(TEST_ENG_OPENSSL_PKEY) Loading Private key %s\n", key_id);
377     in = BIO_new_file(key_id, "r");
378     if (!in)
379         return NULL;
380     key = PEM_read_bio_PrivateKey(in, NULL, 0, NULL);
381     BIO_free(in);
382     return key;
383 }
384 #endif

```


new/usr/src/lib/openssl/libsunw_crypto/engine/eng_pkey.c

1

5846 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_pkey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/engine/eng_pkey.c */
2 /* =====
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48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */

56 #include "eng_int.h"

58 /* Basic get/set stuff */

60 int ENGINE_set_load_privkey_function(ENGINE *e, ENGINE_LOAD_KEY_PTR loadpriv_f)
61 {
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_pkey.c

2

```
62     e->load_privkey = loadpriv_f;
63     return 1;
64 }

66 int ENGINE_set_load_pubkey_function(ENGINE *e, ENGINE_LOAD_KEY_PTR loadpub_f)
67 {
68     e->load_pubkey = loadpub_f;
69     return 1;
70 }

72 int ENGINE_set_load_ssl_client_cert_function(ENGINE *e,
73                                              ENGINE_SSL_CLIENT_CERT_PTR loadssl_f)
74 {
75     e->load_ssl_client_cert = loadssl_f;
76     return 1;
77 }

79 ENGINE_LOAD_KEY_PTR ENGINE_get_load_privkey_function(const ENGINE *e)
80 {
81     return e->load_privkey;
82 }

84 ENGINE_LOAD_KEY_PTR ENGINE_get_load_pubkey_function(const ENGINE *e)
85 {
86     return e->load_pubkey;
87 }

89 ENGINE_SSL_CLIENT_CERT_PTR ENGINE_get_ssl_client_cert_function(const ENGINE *e)
90 {
91     return e->load_ssl_client_cert;
92 }

94 /* API functions to load public/private keys */

96 EVP_PKEY *ENGINE_load_private_key(ENGINE *e, const char *key_id,
97                                  UI_METHOD *ui_method, void *callback_data)
98 {
99     EVP_PKEY *pkey;

101     if(e == NULL)
102     {
103         ENGINEerr(ENGINE_F_ENGINE_LOAD_PRIVATE_KEY,
104                  ERR_R_PASSED_NULL_PARAMETER);
105         return 0;
106     }
107     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
108     if(e->func_ref == 0)
109     {
110         CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
111         ENGINEerr(ENGINE_F_ENGINE_LOAD_PRIVATE_KEY,
112                  ENGINE_R_NOT_INITIALISED);
113         return 0;
114     }
115     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
116     if (!e->load_privkey)
117     {
118         ENGINEerr(ENGINE_F_ENGINE_LOAD_PRIVATE_KEY,
119                  ENGINE_R_NO_LOAD_FUNCTION);
120         return 0;
121     }
122     pkey = e->load_privkey(e, key_id, ui_method, callback_data);
123     if (!pkey)
124     {
125         ENGINEerr(ENGINE_F_ENGINE_LOAD_PRIVATE_KEY,
126                  ENGINE_R_FAILED_LOADING_PRIVATE_KEY);
127         return 0;
128     }
129 }
```

```

128     }
129     return pkey;
130 }

132 EVP_PKEY *ENGINE_load_public_key(ENGINE *e, const char *key_id,
133     UI_METHOD *ui_method, void *callback_data)
134 {
135     EVP_PKEY *pkey;

137     if(e == NULL)
138     {
139         ENGINEerr(ENGINE_F_ENGINE_LOAD_PUBLIC_KEY,
140             ERR_R_PASSED_NULL_PARAMETER);
141         return 0;
142     }
143     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
144     if(e->funct_ref == 0)
145     {
146         CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
147         ENGINEerr(ENGINE_F_ENGINE_LOAD_PUBLIC_KEY,
148             ENGINE_R_NOT_INITIALISED);
149         return 0;
150     }
151     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
152     if (!e->load_pubkey)
153     {
154         ENGINEerr(ENGINE_F_ENGINE_LOAD_PUBLIC_KEY,
155             ENGINE_R_NO_LOAD_FUNCTION);
156         return 0;
157     }
158     pkey = e->load_pubkey(e, key_id, ui_method, callback_data);
159     if (!pkey)
160     {
161         ENGINEerr(ENGINE_F_ENGINE_LOAD_PUBLIC_KEY,
162             ENGINE_R_FAILED_LOADING_PUBLIC_KEY);
163         return 0;
164     }
165     return pkey;
166 }

168 int ENGINE_load_ssl_client_cert(ENGINE *e, SSL *s,
169     STACK_OF(X509_NAME) *ca_dn, X509 **pcert, EVP_PKEY **ppkey,
170     STACK_OF(X509) **pother, UI_METHOD *ui_method, void *callback_data)
171 {
172
173     if(e == NULL)
174     {
175         ENGINEerr(ENGINE_F_ENGINE_LOAD_SSL_CLIENT_CERT,
176             ERR_R_PASSED_NULL_PARAMETER);
177         return 0;
178     }
179     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
180     if(e->funct_ref == 0)
181     {
182         CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
183         ENGINEerr(ENGINE_F_ENGINE_LOAD_SSL_CLIENT_CERT,
184             ENGINE_R_NOT_INITIALISED);
185         return 0;
186     }
187     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
188     if (!e->load_ssl_client_cert)
189     {
190         ENGINEerr(ENGINE_F_ENGINE_LOAD_SSL_CLIENT_CERT,
191             ENGINE_R_NO_LOAD_FUNCTION);
192         return 0;
193     }

```

```

194     return e->load_ssl_client_cert(e, s, ca_dn, pcert, ppkey, pother,
195         ui_method, callback_data);
196 }

```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_rdrand.c

1

```
*****
4338 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_rdrand.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 */
50 #include <openssl/opensslconf.h>
52 #include <stdio.h>
53 #include <string.h>
54 #include <openssl/engine.h>
55 #include <openssl/rand.h>
56 #include <openssl/err.h>
58 #if (defined(_i386) || defined(_i386_) || defined(_M_I386) || \
59     defined(_x86_64) || defined(_x86_64_) || \
60     defined(_M_AMD64) || defined(_M_X64)) && defined(OPENSAL_CPUID_OBJ)
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_rdrand.c

2

```
62 size_t OPENSSL_ia32_rdrand(void);
64 static int get_random_bytes (unsigned char *buf, int num)
65 {
66     size_t rnd;
68     while (num>=(int)sizeof(size_t)) {
69         if ((rnd = OPENSSL_ia32_rdrand()) == 0) return 0;
71         *((size_t *)buf) = rnd;
72         buf += sizeof(size_t);
73         num -= sizeof(size_t);
74     }
75     if (num) {
76         if ((rnd = OPENSSL_ia32_rdrand()) == 0) return 0;
78         memcpy (buf,&rnd,num);
79     }
81     return 1;
82 }
84 static int random_status (void)
85 {
86     return 1;
87 }
88 static RAND_METHOD rdrand_meth =
89 {
90     NULL, /* seed */
91     get_random_bytes,
92     NULL, /* cleanup */
93     NULL, /* add */
94     get_random_bytes,
95     random_status,
96 };
97 static int rdrand_init(ENGINE *e)
98 {
99     return 1;
100 }
101 static const char *engine_e_rdrand_id = "rdrand";
102 static const char *engine_e_rdrand_name = "Intel RDRAND engine";
103 static int bind_helper(ENGINE *e)
104 {
105     if (!ENGINE_set_id(e, engine_e_rdrand_id) ||
106         !ENGINE_set_name(e, engine_e_rdrand_name) ||
107         !ENGINE_set_flags(e, ENGINE_FLAGS_NO_REGISTER_ALL) ||
108         !ENGINE_set_init_function(e, rdrand_init) ||
109         !ENGINE_set_RAND(e, &rdrand_meth) )
110         return 0;
112     return 1;
113 }
114 static ENGINE *ENGINE_rdrand(void)
115 {
116     ENGINE *ret = ENGINE_new();
117     if(!ret)
118         return NULL;
119     if(!bind_helper(ret))
120     {
121         ENGINE_free(ret);
122         return NULL;
123     }
124     return ret;
125 }
126 }
```

```
128 void ENGINE_load_rdrand (void)
129 {
130     extern unsigned int OPENSSL_ia32cap_P[];
131
132     if (OPENSSL_ia32cap_P[1] & (1<=(62-32)))
133     {
134         ENGINE *toadd = ENGINE_rdrand();
135         if(!toadd) return;
136         ENGINE_add(toadd);
137         ENGINE_free(toadd);
138         ERR_clear_error();
139     }
140 }
141 #else
142 void ENGINE_load_rdrand (void) {}
143 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_rsax.c

1

```
*****
17913 Fri May 30 18:31:47 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_rsax.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/eng_rsax.c */
2 /* Copyright (c) 2010-2010 Intel Corp.
3  * Author: Vinodh.Gopal@intel.com
4  * Jim Guilford
5  * Erdinc.Ozturk@intel.com
6  * Maxim.Perminov@intel.com
7  * Ying.Huang@intel.com
8  *
9  * More information about algorithm used can be found at:
10 * http://www.cse.buffalo.edu/srds2009/escs2009_submission_Gopal.pdf
11 */
12 /* =====
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60 * This product includes cryptographic software written by Eric Young
61 * (eay@cryptsoft.com). This product includes software written by Tim
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_rsax.c

2

```
62 * Hudson (tjh@cryptsoft.com).
63 */

65 #include <openssl/opensslconf.h>

67 #include <stdio.h>
68 #include <string.h>
69 #include <openssl/crypto.h>
70 #include <openssl/buffer.h>
71 #include <openssl/engine.h>
72 #ifndef OPENSSL_NO_RSA
73 #include <openssl/rsa.h>
74 #endif
75 #include <openssl/bn.h>
76 #include <openssl/err.h>

78 /* RSAX is available **ONLY* on x86_64 CPUs */
79 #undef COMPILE_RSAX

81 #if (defined(__x86_64) || defined(__x86_64__) || \
82      defined(_M_AMD64) || defined(_M_X64)) && !defined(OPENSSL_NO_ASM)
83 #define COMPILE_RSAX
84 static ENGINE *ENGINE_rsax (void);
85 #endif

87 void ENGINE_load_rsax (void)
88 {
89 /* On non-x86 CPUs it just returns. */
90 #ifdef COMPILE_RSAX
91     ENGINE *toadd = ENGINE_rsax();
92     if(!toadd) return;
93     ENGINE_add(toadd);
94     ENGINE_free(toadd);
95     ERR_clear_error();
96 #endif
97 }

99 #ifdef COMPILE_RSAX
100 #define E_RSAX_LIB_NAME "rsax engine"

102 static int e_rsax_destroy(ENGINE *e);
103 static int e_rsax_init(ENGINE *e);
104 static int e_rsax_finish(ENGINE *e);
105 static int e_rsax_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)(void));

107 #ifndef OPENSSL_NO_RSA
108 /* RSA stuff */
109 static int e_rsax_rsa_mod_exp(BIGNUM *r, const BIGNUM *I, RSA *rsa, BN_CTX *ctx)
110 static int e_rsax_rsa_finish(RSA *r);
111 #endif

113 static const ENGINE_CMD_DEFN e_rsax_cmd_defns[] = {
114     {0, NULL, NULL, 0}
115 };

117 #ifndef OPENSSL_NO_RSA
118 /* Our internal RSA_METHOD that we provide pointers to */
119 static RSA_METHOD e_rsax_rsa =
120 {
121     "Intel RSA-X method",
122     NULL,
123     NULL,
124     NULL,
125     NULL,
126     e_rsax_rsa_mod_exp,
127     NULL,
```

```

128     NULL,
129     e_rsax_rsa_finish,
130     RSA_FLAG_CACHE_PUBLIC|RSA_FLAG_CACHE_PRIVATE,
131     NULL,
132     NULL,
133     NULL,
134     };
135 #endif

137 /* Constants used when creating the ENGINE */
138 static const char *engine_e_rsax_id = "rsax";
139 static const char *engine_e_rsax_name = "RSAX engine support";

141 /* This internal function is used by ENGINE_rsax() */
142 static int bind_helper(ENGINE *e)
143 {
144     #ifndef OPENSSL_NO_RSA
145         const RSA_METHOD *meth1;
146     #endif
147     if(!ENGINE_set_id(e, engine_e_rsax_id) ||
148         !ENGINE_set_name(e, engine_e_rsax_name) ||
149     #ifndef OPENSSL_NO_RSA
150         !ENGINE_set_RSA(e, &e_rsax_rsa) ||
151     #endif
152         !ENGINE_set_destroy_function(e, e_rsax_destroy) ||
153         !ENGINE_set_init_function(e, e_rsax_init) ||
154         !ENGINE_set_finish_function(e, e_rsax_finish) ||
155         !ENGINE_set_ctrl_function(e, e_rsax_ctrl) ||
156         !ENGINE_set_cmd_defns(e, e_rsax_cmd_defns))
157         return 0;

159     #ifndef OPENSSL_NO_RSA
160         meth1 = RSA_PKCS1_SSLeay();
161         e_rsax_rsa.rsa_pub_enc = meth1->rsa_pub_enc;
162         e_rsax_rsa.rsa_pub_dec = meth1->rsa_pub_dec;
163         e_rsax_rsa.rsa_priv_enc = meth1->rsa_priv_enc;
164         e_rsax_rsa.rsa_priv_dec = meth1->rsa_priv_dec;
165         e_rsax_rsa.bn_mod_exp = meth1->bn_mod_exp;
166     #endif
167     return 1;
168 }

170 static ENGINE *ENGINE_rsax(void)
171 {
172     ENGINE *ret = ENGINE_new();
173     if(!ret)
174         return NULL;
175     if(!bind_helper(ret))
176     {
177         ENGINE_free(ret);
178         return NULL;
179     }
180     return ret;
181 }

183 #ifndef OPENSSL_NO_RSA
184 /* Used to attach our own key-data to an RSA structure */
185 static int rsax_ex_data_idx = -1;
186 #endif

188 static int e_rsax_destroy(ENGINE *e)
189 {
190     return 1;
191 }

193 /* (de)initialisation functions. */

```

```

194 static int e_rsax_init(ENGINE *e)
195 {
196     #ifndef OPENSSL_NO_RSA
197         if (rsax_ex_data_idx == -1)
198             rsax_ex_data_idx = RSA_get_ex_new_index(0,
199             NULL,
200             NULL, NULL, NULL);
201     #endif
202     if (rsax_ex_data_idx == -1)
203         return 0;
204     return 1;
205 }

207 static int e_rsax_finish(ENGINE *e)
208 {
209     return 1;
210 }

212 static int e_rsax_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)(void))
213 {
214     int to_return = 1;

216     switch(cmd)
217     {
218         /* The command isn't understood by this engine */
219         default:
220             to_return = 0;
221             break;
222     }

224     return to_return;
225 }

228 #ifndef OPENSSL_NO_RSA

230 #ifdef _WIN32
231     typedef unsigned __int64 UINT64;
232 #else
233     typedef unsigned long long UINT64;
234 #endif
235     typedef unsigned short UINT16;

237 /* Table t is interleaved in the following manner:
238  * The order in memory is t[0][0], t[0][1], ..., t[0][7], t[1][0], ...
239  * A particular 512-bit value is stored in t[][index] rather than the more
240  * normal t[index][]; i.e. the qwords of a particular entry in t are not
241  * adjacent in memory
242  */

244 /* Init BIGNUM b from the interleaved UINT64 array */
245 static int interleaved_array_to_bn_512(BIGNUM* b, UINT64 *array);

247 /* Extract array elements from BIGNUM b
248  * To set the whole array from b, call with n=8
249  */
250 static int bn_extract_to_array_512(const BIGNUM* b, unsigned int n, UINT64 *arra

252 struct mod_ctx_512 {
253     UINT64 t[8][8];
254     UINT64 m[8];
255     UINT64 m1[8]; /* 2^278 % m */
256     UINT64 m2[8]; /* 2^640 % m */
257     UINT64 k1[2]; /* (- 1/m) % 2^128 */
258 };

```

```

260 static int mod_exp_pre_compute_data_512(UINT64 *m, struct mod_ctx_512 *data);

262 void mod_exp_512(UINT64 *result, /* 512 bits, 8 qwords */
263                 UINT64 *g, /* 512 bits, 8 qwords */
264                 UINT64 *exp, /* 512 bits, 8 qwords */
265                 struct mod_ctx_512 *data);

267 typedef struct st_e_rsax_mod_ctx
268 {
269     UINT64 type;
270     union {
271         struct mod_ctx_512 b512;
272     } ctx;
273 } E_RSAX_MOD_CTX;

274 } E_RSAX_MOD_CTX;

276 static E_RSAX_MOD_CTX *e_rsax_get_ctx(RSA *rsa, int idx, BIGNUM* m)
277 {
278     E_RSAX_MOD_CTX *hpctr;

280     if (idx < 0 || idx > 2)
281         return NULL;

283     hpctr = RSA_get_ex_data(rsa, rsax_ex_data_idx);
284     if (!hpctr) {
285         hpctr = OPENSSL_malloc(3*sizeof(E_RSAX_MOD_CTX));
286         if (!hpctr) return NULL;
287         hpctr[2].type = hpctr[1].type = hpctr[0].type = 0;
288         RSA_set_ex_data(rsa, rsax_ex_data_idx, hpctr);
289     }

291     if (hpctr[idx].type == (UINT64)BN_num_bits(m))
292         return hpctr+idx;

294     if (BN_num_bits(m) == 512) {
295         UINT64 _m[8];
296         bn_extract_to_array_512(m, 8, _m);
297         memset(&hpctr[idx].ctx.b512, 0, sizeof(struct mod_ctx_512));
298         mod_exp_pre_compute_data_512(_m, &hpctr[idx].ctx.b512);
299     }

301     hpctr[idx].type = BN_num_bits(m);
302     return hpctr+idx;
303 }

305 static int e_rsax_rsa_finish(RSA *rsa)
306 {
307     E_RSAX_MOD_CTX *hpctr = RSA_get_ex_data(rsa, rsax_ex_data_idx);
308     if (hpctr) {
309         OPENSSL_free(hpctr);
310         RSA_set_ex_data(rsa, rsax_ex_data_idx, NULL);
311     }
312     if (rsa->_method_mod_n)
313         BN_MONT_CTX_free(rsa->_method_mod_n);
314     if (rsa->_method_mod_p)
315         BN_MONT_CTX_free(rsa->_method_mod_p);
316     if (rsa->_method_mod_q)
317         BN_MONT_CTX_free(rsa->_method_mod_q);
318     return 1;
319 }

323 static int e_rsax_bn_mod_exp(BIGNUM *r, const BIGNUM *g, const BIGNUM *e,
324                             const BIGNUM *m, BN_CTX *ctx, BN_MONT_CTX *in_mont, E_RSAX_M
325 {

```

```

326     if (rsax_mod_ctx && BN_get_flags(e, BN_FLG_CONSTTIME) != 0) {
327         if (BN_num_bits(m) == 512) {
328             UINT64 _r[8];
329             UINT64 _g[8];
330             UINT64 _e[8];

332             /* Init the arrays from the BIGNUMs */
333             bn_extract_to_array_512(g, 8, _g);
334             bn_extract_to_array_512(e, 8, _e);

336             mod_exp_512(_r, _g, _e, &rsax_mod_ctx->ctx.b512);
337             /* Return the result in the BIGNUM */
338             interleaved_array_to_bn_512(r, _r);
339             return 1;
340         }
341     }

343     return BN_mod_exp_mont(r, g, e, m, ctx, in_mont);
344 }

346 /* Declares for the Intel CIAP 512-bit / CRT / 1024 bit RSA modular
347 * exponentiation routine precalculations and a structure to hold the
348 * necessary values. These files are meant to live in crypto/rsa/ in
349 * the target openssl.
350 */

352 /*
353 * Local method: extracts a piece from a BIGNUM, to fit it into
354 * an array. Call with n=8 to extract an entire 512-bit BIGNUM
355 */
356 static int bn_extract_to_array_512(const BIGNUM* b, unsigned int n, UINT64 *arra
357 {
358     int i;
359     UINT64 tmp;
360     unsigned char bn_buff[64];
361     memset(bn_buff, 0, 64);
362     if (BN_num_bytes(b) > 64) {
363         printf("Can't support this byte size\n");
364         return 0;
365     }
366     if (BN_num_bytes(b) != 0) {
367         if (!BN_bn2bin(b, bn_buff+(64-BN_num_bytes(b)))) {
368             printf("Error's in bn2bin\n");
369             /* We have to error, here */
370             return 0;
371         }
372     }
373     while (n-- > 0) {
374         array[n] = 0;
375         for (i=7; i>=0; i--) {
376             tmp = bn_buff[63-(n*8+i)];
377             array[n] |= tmp << (8*i);
378         }
379     }
380     return 1;
381 }

382 /* Init a 512-bit BIGNUM from the UINT64* (8 * 64) interleaved array */
383 static int interleaved_array_to_bn_512(BIGNUM* b, UINT64 *array)
384 {
385     unsigned char tmp[64];
386     int n=8;
387     int i;
388     while (n-- > 0) {
389         for (i = 7; i>=0; i--) {
390             tmp[63-(n*8+i)] = (unsigned char)(array[n]>>(8*i));
391         }
392     }
393     BN_bin2bn(tmp, 64, b);
394     return 0;
395 }

```

```

392 /* The main 512bit precompute call */
393 static int mod_exp_pre_compute_data_512(UINT64 *m, struct mod_ctx_512 *data)
394 {
395     BIGNUM two_768, two_640, two_128, two_512, tmp, _m, tmp2;

397     /* We need a BN_CTX for the modulo functions */
398     BN_CTX* ctx;
399     /* Some tmps */
400     UINT64 _t[8];
401     int i, j, ret = 0;

403     /* Init _m with m */
404     BN_init(&_m);
405     interleaved_array_to_bn_512(&_m, m);
406     memset(_t, 0, 64);

408     /* Inits */
409     BN_init(&two_768);
410     BN_init(&two_640);
411     BN_init(&two_128);
412     BN_init(&two_512);
413     BN_init(&tmp);
414     BN_init(&tmp2);

416     /* Create our context */
417     if ((ctx=BN_CTX_new()) == NULL) { goto err; }
418     BN_CTX_start(ctx);

420     /*
421      * For production, if you care, these only need to be set once,
422      * and may be made constants.
423      */
424     BN_lshift(&two_768, BN_value_one(), 768);
425     BN_lshift(&two_640, BN_value_one(), 640);
426     BN_lshift(&two_128, BN_value_one(), 128);
427     BN_lshift(&two_512, BN_value_one(), 512);

429     if (0 == (m[7] & 0x8000000000000000)) {
430         exit(1);
431     }
432     if (0 == (m[0] & 0x1)) { /* Odd modulus required for Mont */
433         exit(1);
434     }

436     /* Precompute m1 */
437     BN_mod(&tmp, &two_768, &_m, ctx);
438     if (!bn_extract_to_array_512(&tmp, 8, &data->m1[0])) {
439         goto err; }

441     /* Precompute m2 */
442     BN_mod(&tmp, &two_640, &_m, ctx);
443     if (!bn_extract_to_array_512(&tmp, 8, &data->m2[0])) {
444         goto err; }
445     }

447     /*
448      * Precompute k1, a 128b number = ((-1)* m-1 ) mod 2128; k1 should
449      * be non-negative.
450      */
451     BN_mod_inverse(&tmp, &_m, &two_128, ctx);
452     if (!BN_is_zero(&tmp)) { BN_sub(&tmp, &two_128, &tmp); }
453     if (!bn_extract_to_array_512(&tmp, 2, &data->k1[0])) {
454         goto err; }

456     /* Precompute t */
457     for (i=0; i<8; i++) {

```

```

458     BN_zero(&tmp);
459     if (i & 1) { BN_add(&tmp, &two_512, &tmp); }
460     if (i & 2) { BN_add(&tmp, &two_512, &tmp); }
461     if (i & 4) { BN_add(&tmp, &two_640, &tmp); }

463     BN_nnmod(&tmp2, &tmp, &_m, ctx);
464     if (!bn_extract_to_array_512(&tmp2, 8, _t)) {
465         goto err; }
466     for (j=0; j<8; j++) data->t[j][i] = _t[j]; }

468     /* Precompute m */
469     for (i=0; i<8; i++) {
470         data->m[i] = m[i]; }

472     ret = 1;

474 err:
475     /* Cleanup */
476     if (ctx != NULL) {
477         BN_CTX_end(ctx); BN_CTX_free(ctx); }
478     BN_free(&two_768);
479     BN_free(&two_640);
480     BN_free(&two_128);
481     BN_free(&two_512);
482     BN_free(&tmp);
483     BN_free(&tmp2);
484     BN_free(&_m);

486     return ret;
487 }

490 static int e_rsax_rsa_mod_exp(BIGNUM *r0, const BIGNUM *I, RSA *rsa, BN_CTX *ctx)
491 {
492     BIGNUM *r1, *m1, *vrfy;
493     BIGNUM local_dmp1, local_dm1, local_c, local_r1;
494     BIGNUM *dmp1, *dm1, *c, *pr1;
495     int ret=0;

497     BN_CTX_start(ctx);
498     r1 = BN_CTX_get(ctx);
499     m1 = BN_CTX_get(ctx);
500     vrfy = BN_CTX_get(ctx);

502     {
503         BIGNUM local_p, local_q;
504         BIGNUM *p = NULL, *q = NULL;
505         int error = 0;

507         /* Make sure BN_mod_inverse in Montgomery
508          * initialization uses the BN_FLG_CONSTTIME flag
509          * (unless RSA_FLAG_NO_CONSTTIME is set)
510          */
511         if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
512         {
513             BN_init(&local_p);
514             p = &local_p;
515             BN_with_flags(p, rsa->p, BN_FLG_CONSTTIME);

517             BN_init(&local_q);
518             q = &local_q;
519             BN_with_flags(q, rsa->q, BN_FLG_CONSTTIME);
520         }
521         else
522         {
523             p = rsa->p;

```



```

524         q = rsa->q;
525     }

527     if (rsa->flags & RSA_FLAG_CACHE_PRIVATE)
528     {
529         if (!BN_MONT_CTX_set_locked(&rsa->method_mod_p, CRYPTO_
530             error = 1;
531         if (!BN_MONT_CTX_set_locked(&rsa->method_mod_q, CRYPTO_
532             error = 1;
533     }

535     /* clean up */
536     if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
537     {
538         BN_free(&local_p);
539         BN_free(&local_q);
540     }
541     if (error)
542         goto err;
543 }

545 if (rsa->flags & RSA_FLAG_CACHE_PUBLIC)
546     if (!BN_MONT_CTX_set_locked(&rsa->method_mod_n, CRYPTO_LOCK_RSA
547         goto err;

549 /* compute I mod q */
550 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
551 {
552     c = &local_c;
553     BN_with_flags(c, I, BN_FLG_CONSTTIME);
554     if (!BN_mod(r1, c, rsa->q, ctx)) goto err;
555 }
556 else
557 {
558     if (!BN_mod(r1, I, rsa->q, ctx)) goto err;
559 }

561 /* compute r1^dmq1 mod q */
562 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
563 {
564     dmq1 = &local_dmq1;
565     BN_with_flags(dmq1, rsa->dmq1, BN_FLG_CONSTTIME);
566 }
567 else
568     dmq1 = rsa->dmq1;

570 if (!e_rsax_bn_mod_exp(m1, r1, dmq1, rsa->q, ctx,
571     rsa->method_mod_q, e_rsax_get_ctx(rsa, 0, rsa->q)) goto err;

573 /* compute I mod p */
574 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
575 {
576     c = &local_c;
577     BN_with_flags(c, I, BN_FLG_CONSTTIME);
578     if (!BN_mod(r1, c, rsa->p, ctx)) goto err;
579 }
580 else
581 {
582     if (!BN_mod(r1, I, rsa->p, ctx)) goto err;
583 }

585 /* compute r1^dmp1 mod p */
586 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
587 {
588     dmp1 = &local_dmp1;
589     BN_with_flags(dmp1, rsa->dmp1, BN_FLG_CONSTTIME);

```

```

590     }
591     else
592         dmp1 = rsa->dmp1;

594     if (!e_rsax_bn_mod_exp(r0, r1, dmp1, rsa->p, ctx,
595         rsa->method_mod_p, e_rsax_get_ctx(rsa, 1, rsa->p)) goto err;

597     if (!BN_sub(r0, r0, m1)) goto err;
598     /* This will help stop the size of r0 increasing, which does
599     * affect the multiply if it optimised for a power of 2 size */
600     if (BN_is_negative(r0))
601         if (!BN_add(r0, r0, rsa->p)) goto err;

603     if (!BN_mul(r1, r0, rsa->iqmp, ctx)) goto err;

605     /* Turn BN_FLG_CONSTTIME flag on before division operation */
606     if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
607     {
608         pr1 = &local_r1;
609         BN_with_flags(pr1, r1, BN_FLG_CONSTTIME);
610     }
611     else
612         pr1 = r1;
613     if (!BN_mod(r0, pr1, rsa->p, ctx)) goto err;

615     /* If p < q it is occasionally possible for the correction of
616     * adding 'p' if r0 is negative above to leave the result still
617     * negative. This can break the private key operations: the following
618     * second correction should *always* correct this rare occurrence.
619     * This will *never* happen with OpenSSL generated keys because
620     * they ensure p > q [steve]
621     */
622     if (BN_is_negative(r0))
623         if (!BN_add(r0, r0, rsa->p)) goto err;
624     if (!BN_mul(r1, r0, rsa->q, ctx)) goto err;
625     if (!BN_add(r0, r1, m1)) goto err;

627     if (rsa->e && rsa->n)
628     {
629         if (!e_rsax_bn_mod_exp(vrfy, r0, rsa->e, rsa->n, ctx, rsa->method_mo
630             goto err;

632         /* If 'I' was greater than (or equal to) rsa->n, the operation
633         * will be equivalent to using 'I mod n'. However, the result of
634         * the verify will *always* be less than 'n' so we don't check
635         * for absolute equality, just congruency. */
636         if (!BN_sub(vrfy, vrfy, I)) goto err;
637         if (!BN_mod(vrfy, vrfy, rsa->n, ctx)) goto err;
638         if (BN_is_negative(vrfy))
639             if (!BN_add(vrfy, vrfy, rsa->n)) goto err;
640         if (!BN_is_zero(vrfy))
641         {
642             /* 'I' and 'vrfy' aren't congruent mod n. Don't leak
643             * miscalculated CRT output, just do a raw (slower)
644             * mod_exp and return that instead. */

646             BIGNUM local_d;
647             BIGNUM *d = NULL;

649             if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
650             {
651                 d = &local_d;
652                 BN_with_flags(d, rsa->d, BN_FLG_CONSTTIME);
653             }
654             else
655                 d = rsa->d;

```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_rsax.c

11

```
656             if (!e_rsax_bn_mod_exp(r0,I,d,rsa->n,ctx,
657                                     rsa->_method_mod_n, e_rsax_ge
658             )
659         }
660     ret=1;

662 err:
663     BN_CTX_end(ctx);

665     return ret;
666 }
667 #endif /* !OPENSSL_NO_RSA */
668 #endif /* !COMPILE_RSAX */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_table.c

1

```
*****
10125 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/eng_table.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
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14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
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20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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29 *
30 * 6. Redistributions of any form whatsoever must retain the following
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33 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
34 *
35 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
37 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
38 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
39 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
40 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
41 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
42 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "cryptlib.h"
56 #include <openssl/evp.h>
57 #include <openssl/lhash.h>
58 #include "eng_int.h"

60 /* The type of the items in the table */
61 typedef struct st_engine_pile
```

new/usr/src/lib/openssl/libsunw_crypto/engine/eng_table.c

2

```
62 {
63     /* The 'nid' of this algorithm/mode */
64     int nid;
65     /* ENGINES that implement this algorithm/mode. */
66     STACK_OF(ENGINE) *sk;
67     /* The default ENGINE to perform this algorithm/mode. */
68     ENGINE *funct;
69     /* Zero if 'sk' is newer than the cached 'funct', non-zero otherwise */
70     int uptodate;
71     } ENGINE_PILE;

73 DECLARE_LHASH_OF(ENGINE_PILE);

75 /* The type exposed in eng_int.h */
76 struct st_engine_table
77 {
78     LHASH_OF(ENGINE_PILE) piles;
79     }; /* ENGINE_TABLE */

82 typedef struct st_engine_pile_doall
83 {
84     engine_table_doall_cb *cb;
85     void *arg;
86     } ENGINE_PILE_DOALL;

88 /* Global flags (ENGINE_TABLE_FLAG_*). */
89 static unsigned int table_flags = 0;

92 /* API function manipulating 'table_flags' */
93 unsigned int ENGINE_get_table_flags(void)
94 {
95     return table_flags;
96     }

98 void ENGINE_set_table_flags(unsigned int flags)
99 {
100     table_flags = flags;
101     }

103 /* Internal functions for the "piles" hash table */
104 static unsigned long engine_pile_hash(const ENGINE_PILE *c)
105 {
106     return c->nid;
107     }

109 static int engine_pile_cmp(const ENGINE_PILE *a, const ENGINE_PILE *b)
110 {
111     return a->nid - b->nid;
112     }

113 static IMPLEMENT_LHASH_HASH_FN(engine_pile, ENGINE_PILE)
114 static IMPLEMENT_LHASH_COMP_FN(engine_pile, ENGINE_PILE)

116 static int int_table_check(ENGINE_TABLE **t, int create)
117 {
118     LHASH_OF(ENGINE_PILE) *lh;

120     if(*t) return 1;
121     if(!create) return 0;
122     if((lh = lh_ENGINE_PILE_new()) == NULL)
123         return 0;
124     *t = (ENGINE_TABLE *)lh;
125     return 1;
126     }
```

```

128 /* Privately exposed (via eng_int.h) functions for adding and/or removing
129  * ENGINES from the implementation table */
130 int engine_table_register(ENGINE_TABLE **table, ENGINE_CLEANUP_CB *cleanup,
131                          ENGINE *e, const int *nids, int num_nids, int setdefault)
132 {
133     int ret = 0, added = 0;
134     ENGINE_PILE tmlate, *fnd;
135     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
136     if(!(*table))
137         added = 1;
138     if(!int_table_check(table, 1))
139         goto end;
140     if(added)
141         /* The cleanup callback needs to be added */
142         engine_cleanup_add_first(cleanup);
143     while(num_nids--)
144     {
145         tmlate.nid = *nids;
146         fnd = lh_ENGINE_PILE_retrieve(&(*table)->piles, &tmlate);
147         if(!fnd)
148         {
149             fnd = OPENSSL_malloc(sizeof(ENGINE_PILE));
150             if(!fnd) goto end;
151             fnd->uptodate = 1;
152             fnd->nid = *nids;
153             fnd->sk = sk_ENGINE_new_null();
154             if(!fnd->sk)
155             {
156                 OPENSSL_free(fnd);
157                 goto end;
158             }
159             fnd->funcnt = NULL;
160             (void)lh_ENGINE_PILE_insert(&(*table)->piles, fnd);
161         }
162         /* A registration shouldn't add duplicate entries */
163         (void)sk_ENGINE_delete_ptr(fnd->sk, e);
164         /* if 'setdefault', this ENGINE goes to the head of the list */
165         if(!sk_ENGINE_push(fnd->sk, e))
166             goto end;
167         /* "touch" this ENGINE_PILE */
168         fnd->uptodate = 0;
169         if(setdefault)
170         {
171             if(!engine_unlocked_init(e))
172             {
173                 ENGINEerr(ENGINE_F_ENGINE_TABLE_REGISTER,
174                          ENGINE_R_INIT_FAILED);
175                 goto end;
176             }
177             if(fnd->funcnt)
178                 engine_unlocked_finish(fnd->funcnt, 0);
179             fnd->funcnt = e;
180             fnd->uptodate = 1;
181         }
182         nids++;
183     }
184     ret = 1;
185 end:
186     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
187     return ret;
188 }
189 static void int_unregister_cb_doall_arg(ENGINE_PILE *pile, ENGINE *e)
190 {
191     int n;
192     /* Iterate the 'c->sk' stack removing any occurrence of 'e' */
193     while((n = sk_ENGINE_find(pile->sk, e)) >= 0)

```

```

194     {
195         (void)sk_ENGINE_delete(pile->sk, n);
196         pile->uptodate = 0;
197     }
198     if(pile->funcnt == e)
199     {
200         engine_unlocked_finish(e, 0);
201         pile->funcnt = NULL;
202     }
203 }
204 static IMPLEMENT_LHASH_DOALL_ARG_FN(int_unregister_cb, ENGINE_PILE, ENGINE)
205
206 void engine_table_unregister(ENGINE_TABLE **table, ENGINE *e)
207 {
208     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
209     if(int_table_check(table, 0))
210         lh_ENGINE_PILE_doall_arg(&(*table)->piles,
211                                LHASH_DOALL_ARG_FN(int_unregister_cb),
212                                ENGINE, e);
213     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
214 }
215
216 static void int_cleanup_cb_doall(ENGINE_PILE *p)
217 {
218     sk_ENGINE_free(p->sk);
219     if(p->funcnt)
220         engine_unlocked_finish(p->funcnt, 0);
221     OPENSSL_free(p);
222 }
223 static IMPLEMENT_LHASH_DOALL_FN(int_cleanup_cb, ENGINE_PILE)
224
225 void engine_table_cleanup(ENGINE_TABLE **table)
226 {
227     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
228     if(*table)
229     {
230         lh_ENGINE_PILE_doall(&(*table)->piles,
231                             LHASH_DOALL_FN(int_cleanup_cb));
232         lh_ENGINE_PILE_free(&(*table)->piles);
233         *table = NULL;
234     }
235     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
236 }
237
238 /* return a functional reference for a given 'nid' */
239 #ifndef ENGINE_TABLE_DEBUG
240 ENGINE *engine_table_select(ENGINE_TABLE **table, int nid)
241 #else
242 ENGINE *engine_table_select_tmp(ENGINE_TABLE **table, int nid, const char *f, in
243 #endif
244 {
245     ENGINE *ret = NULL;
246     ENGINE_PILE tmlate, *fnd=NULL;
247     int initres, loop = 0;
248
249     if(!(*table))
250     {
251         #ifdef ENGINE_TABLE_DEBUG
252             fprintf(stderr, "engine_table_dbg: %s:%d, nid=%d, nothing "
253                     "registered!\n", f, l, nid);
254         #endif
255         return NULL;
256     }
257     ERR_set_mark();
258     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
259     /* Check again inside the lock otherwise we could race against cleanup

```

```

260     * operations. But don't worry about a fprintf(stderr). */
261     if(!int_table_check(table, 0)) goto end;
262     tmplate.nid = nid;
263     fnd = lh_ENGINE_PILE_retrieve(&(*table)->piles, &tmplate);
264     if(!fnd) goto end;
265     if(fnd->funct && engine_unlocked_init(fnd->funct))
266     {
267 #ifdef ENGINE_TABLE_DEBUG
268         fprintf(stderr, "engine_table_dbg: %s:%d, nid=%d, using "
269             "ENGINE '%s' cached\n", f, l, nid, fnd->funct->id);
270 #endif
271         ret = fnd->funct;
272         goto end;
273     }
274     if(fnd->uptodate)
275     {
276         ret = fnd->funct;
277         goto end;
278     }
279 trynext:
280     ret = sk_ENGINE_value(fnd->sk, loop++);
281     if(!ret)
282     {
283 #ifdef ENGINE_TABLE_DEBUG
284         fprintf(stderr, "engine_table_dbg: %s:%d, nid=%d, no "
285             "registered implementations would initialise\n",
286             f, l, nid);
287 #endif
288         goto end;
289     }
290     /* Try to initialise the ENGINE? */
291     if((ret->funct_ref > 0) || !(table_flags & ENGINE_TABLE_FLAG_NOINIT))
292         initres = engine_unlocked_init(ret);
293     else
294         initres = 0;
295     if(initres)
296     {
297         /* Update 'funct' */
298         if((fnd->funct != ret) && engine_unlocked_init(ret))
299         {
300             /* If there was a previous default we release it. */
301             if(fnd->funct)
302                 engine_unlocked_finish(fnd->funct, 0);
303             fnd->funct = ret;
304 #ifdef ENGINE_TABLE_DEBUG
305             fprintf(stderr, "engine_table_dbg: %s:%d, nid=%d, "
306                 "setting default to '%s'\n", f, l, nid, ret->id)
307 #endif
308         }
309 #ifdef ENGINE_TABLE_DEBUG
310         fprintf(stderr, "engine_table_dbg: %s:%d, nid=%d, using "
311             "newly initialised '%s'\n", f, l, nid, ret->id);
312 #endif
313         goto end;
314     }
315     goto trynext;
316 end:
317     /* If it failed, it is unlikely to succeed again until some future
318     * registrations have taken place. In all cases, we cache. */
319     if(fnd) fnd->uptodate = 1;
320 #ifdef ENGINE_TABLE_DEBUG
321     if(ret)
322         fprintf(stderr, "engine_table_dbg: %s:%d, nid=%d, caching "
323             "ENGINE '%s'\n", f, l, nid, ret->id);
324     else
325         fprintf(stderr, "engine_table_dbg: %s:%d, nid=%d, caching "

```

```

326         "'no matching ENGINE'\n", f, l, nid);
327 #endif
328     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
329     /* Whatever happened, any failed init()s are not failures in this
330     * context, so clear our error state. */
331     ERR_pop_to_mark();
332     return ret;
333 }
334
335 /* Table enumeration */
336
337 static void int_cb_doall_arg(ENGINE_PILE *pile, ENGINE_PILE_DOALL *dall)
338 {
339     dall->cb(pile->nid, pile->sk, pile->funct, dall->arg);
340 }
341 static IMPLEMENT_LHASH_DOALL_ARG_FN(int_cb, ENGINE_PILE,ENGINE_PILE_DOALL)
342
343 void engine_table_doall(ENGINE_TABLE *table, engine_table_doall_cb *cb,
344     void *arg)
345 {
346     ENGINE_PILE_DOALL dall;
347     dall.cb = cb;
348     dall.arg = arg;
349     lh_ENGINE_PILE_doall_arg(&table->piles, LHASH_DOALL_ARG_FN(int_cb),
350         ENGINE_PILE_DOALL, &dall);
351 }

```

new/usr/src/lib/openssl/libsunw_crypto/engine/hw_pk11.c

1

```
*****
92357 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/hw_pk11.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
3  * Use is subject to license terms.
4  */

6 /* crypto/engine/hw_pk11.c */
7 /*
8  * This product includes software developed by the OpenSSL Project for
9  * use in the OpenSSL Toolkit (http://www.openssl.org/).
10 *
11 * This project also referenced hw_pkcs11-0.9.7b.patch written by
12 * Afchine Madjlessi.
13 */
14 /*
15 * =====
16 * Copyright (c) 2000-2001 The OpenSSL Project. All rights reserved.
17 *
18 * Redistribution and use in source and binary forms, with or without
19 * modification, are permitted provided that the following conditions
20 * are met:
21 *
22 * 1. Redistributions of source code must retain the above copyright
23 * notice, this list of conditions and the following disclaimer.
24 *
25 * 2. Redistributions in binary form must reproduce the above copyright
26 * notice, this list of conditions and the following disclaimer in
27 * the documentation and/or other materials provided with the
28 * distribution.
29 *
30 * 3. All advertising materials mentioning features or use of this
31 * software must display the following acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
34 *
35 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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47 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
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49 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT ``AS IS'' AND ANY
50 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
51 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
52 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
53 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
54 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
55 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
56 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
57 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
58 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
59 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
60 * OF THE POSSIBILITY OF SUCH DAMAGE.
61 * =====
```

new/usr/src/lib/openssl/libsunw_crypto/engine/hw_pk11.c

2

```
62 *
63 * This product includes cryptographic software written by Eric Young
64 * (eay@cryptsoft.com). This product includes software written by Tim
65 * Hudson (tjh@cryptsoft.com).
66 *
67 */

69 #include <stdio.h>
70 #include <stdlib.h>
71 #include <string.h>
72 #include <sys/types.h>
73 #include <unistd.h>

75 #include <openssl/opensslconf.h>
76 #include <openssl/e_os2.h>
77 #include <openssl/crypto.h>
78 #include <openssl/engine.h>
79 #include <openssl/dso.h>
80 #include <openssl/err.h>
81 #include <openssl/bn.h>
82 #include <openssl/md5.h>
83 #include <openssl/pem.h>
84 #ifndef OPENSSL_NO_RSA
85 #include <openssl/rsa.h>
86 #endif
87 #ifndef OPENSSL_NO_DSA
88 #include <openssl/dsa.h>
89 #endif
90 #ifndef OPENSSL_NO_DH
91 #include <openssl/dh.h>
92 #endif
93 #include <openssl/rand.h>
94 #include <openssl/objects.h>
95 #include <openssl/x509.h>
96 #include <openssl/aes.h>
97 #include <cryptlib.h>
98 #include <dlfcn.h>
99 #include <pthread.h>

101 #ifndef OPENSSL_NO_HW
102 #ifndef OPENSSL_NO_HW_PK11

104 /* label for debug messages printed on stderr */
105 #define PK11_DBG "PKCS#11 ENGINE DEBUG"
106 /* prints a lot of debug messages on stderr about slot selection process */
107 #undef DEBUG_SLOT_SELECTION
108 /*
109 * Solaris specific code. See comment at check_hw_mechanisms() for more
110 * information.
111 */
112 #if defined (__SVR4) && defined (__sun)
113 #define SOLARIS_HW_SLOT_SELECTION
114 #endif

116 /*
117 * AES counter mode is not supported in the OpenSSL EVP API yet and neither
118 * there are official OIDs for mechanisms based on this mode. With our changes,
119 * an application can define its own EVP calls for AES counter mode and then
120 * it can make use of hardware acceleration through this engine. However, it's
121 * better if we keep AES CTR support code under ifdef's.
122 */
123 #define SOLARIS_AES_CTR

125 #include "cryptoki.h"
126 #include "pkcs11.h"
127 #include "hw_pk11_err.c"
```

```

129 #ifdef SOLARIS_HW_SLOT_SELECTION
130 /*
131  * Tables for symmetric ciphers and digest mechs found in the pkcs11_kernel
132  * library. See comment at check_hw_mechanisms() for more information.
133  */
134 int *hw_cnids;
135 int *hw_dnids;
136 #endif /* SOLARIS_HW_SLOT_SELECTION */

138 /* PKCS#11 session caches and their locks for all operation types */
139 static PK11_CACHE session_cache[OP_MAX];

141 /*
142  * As stated in v2.20, 11.7 Object Management Function, in section for
143  * C_FindObjectsInit(), at most one search operation may be active at a given
144  * time in a given session. Therefore, C_Find{,Init,Final}Objects() should be
145  * grouped together to form one atomic search operation. This is already
146  * ensured by the property of unique PKCS#11 session handle used for each
147  * PK11_SESSION object.
148  *
149  * This is however not the biggest concern - maintaining consistency of the
150  * underlying object store is more important. The same section of the spec also
151  * says that one thread can be in the middle of a search operation while another
152  * thread destroys the object matching the search template which would result in
153  * invalid handle returned from the search operation.
154  *
155  * Hence, the following locks are used for both protection of the object stores.
156  * They are also used for active list protection.
157  */
158 pthread_mutex_t *find_lock[OP_MAX] = { NULL };

160 /*
161  * lists of asymmetric key handles which are active (referenced by at least one
162  * PK11_SESSION structure, either held by a thread or present in free_session
163  * list) for given algorithm type
164  */
165 PK11_active *active_list[OP_MAX] = { NULL };

167 /*
168  * Create all secret key objects in a global session so that they are available
169  * to use for other sessions. These other sessions may be opened or closed
170  * without losing the secret key objects.
171  */
172 static CK_SESSION_HANDLE      global_session = CK_INVALID_HANDLE;

174 /* ENGINE level stuff */
175 static int pk11_init(ENGINE *e);
176 static int pk11_library_init(ENGINE *e);
177 static int pk11_finish(ENGINE *e);
178 static int pk11_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)());
179 static int pk11_destroy(ENGINE *e);

181 /* RAND stuff */
182 static void pk11_rand_seed(const void *buf, int num);
183 static void pk11_rand_add(const void *buf, int num, double add_entropy);
184 static void pk11_rand_cleanup(void);
185 static int pk11_rand_bytes(unsigned char *buf, int num);
186 static int pk11_rand_status(void);

188 /* These functions are also used in other files */
189 PK11_SESSION *pk11_get_session(PK11_OPTYPE optype);
190 void pk11_return_session(PK11_SESSION *sp, PK11_OPTYPE optype);

192 /* active list manipulation functions used in this file */
193 extern int pk11_active_delete(CK_OBJECT_HANDLE h, PK11_OPTYPE type);

```

```

194 extern void pk11_free_active_list(PK11_OPTYPE type);

196 #ifndef OPENSSL_NO_RSA
197 int pk11_destroy_rsa_key_objects(PK11_SESSION *session);
198 int pk11_destroy_rsa_object_pub(PK11_SESSION *sp, CK_BBOOL uselock);
199 int pk11_destroy_rsa_object_priv(PK11_SESSION *sp, CK_BBOOL uselock);
200 #endif
201 #ifndef OPENSSL_NO_DSA
202 int pk11_destroy_dsa_key_objects(PK11_SESSION *session);
203 int pk11_destroy_dsa_object_pub(PK11_SESSION *sp, CK_BBOOL uselock);
204 int pk11_destroy_dsa_object_priv(PK11_SESSION *sp, CK_BBOOL uselock);
205 #endif
206 #ifndef OPENSSL_NO_DH
207 int pk11_destroy_dh_key_objects(PK11_SESSION *session);
208 int pk11_destroy_dh_object(PK11_SESSION *session, CK_BBOOL uselock);
209 #endif

211 /* Local helper functions */
212 static int pk11_free_all_sessions(void);
213 static int pk11_free_session_list(PK11_OPTYPE optype);
214 static int pk11_setup_session(PK11_SESSION *sp, PK11_OPTYPE optype);
215 static int pk11_destroy_cipher_key_objects(PK11_SESSION *session);
216 static int pk11_destroy_object(CK_SESSION_HANDLE session,
217                               CK_OBJECT_HANDLE oh);
218 static const char *get_PK11_LIBNAME(void);
219 static void free_PK11_LIBNAME(void);
220 static long set_PK11_LIBNAME(const char *name);

222 /* Symmetric cipher and digest support functions */
223 static int cipher_nid_to_pk11(int nid);
224 #ifdef SOLARIS_AES_CTR
225 static int pk11_add_aes_ctr_NIDs(void);
226 #endif /* SOLARIS_AES_CTR */
227 static int pk11_usable_ciphers(const int **nids);
228 static int pk11_usable_digests(const int **nids);
229 static int pk11_cipher_init(EVP_CIPHER_CTX *ctx, const unsigned char *key,
230                             const unsigned char *iv, int enc);
231 static int pk11_cipher_final(PK11_SESSION *sp);
232 static int pk11_cipher_do_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
233                                 const unsigned char *in, size_t inl);
234 static int pk11_cipher_cleanup(EVP_CIPHER_CTX *ctx);
235 static int pk11_engine_ciphers(ENGINE *e, const EVP_CIPHER **cipher,
236                               const int **nids, int nid);
237 static int pk11_engine_digests(ENGINE *e, const EVP_MD **digest,
238                               const int **nids, int nid);
239 static CK_OBJECT_HANDLE pk11_get_cipher_key(EVP_CIPHER_CTX *ctx,
240                                             const unsigned char *key, CK_KEY_TYPE key_type, PK11_SESSION *sp);
241 static int check_new_cipher_key(PK11_SESSION *sp, const unsigned char *key,
242                                 int key_len);
243 static int md_nid_to_pk11(int nid);
244 static int pk11_digest_init(EVP_MD_CTX *ctx);
245 static int pk11_digest_update(EVP_MD_CTX *ctx, const void *data,
246                               size_t count);
247 static int pk11_digest_final(EVP_MD_CTX *ctx, unsigned char *md);
248 static int pk11_digest_copy(EVP_MD_CTX *to, const EVP_MD_CTX *from);
249 static int pk11_digest_cleanup(EVP_MD_CTX *ctx);

251 static int pk11_choose_slots(int *any_slot_found);
252 static void pk11_find_symmetric_ciphers(CK_FUNCTION_LIST_PTR pflist,
253                                         CK_SLOT_ID current_slot, int *current_slot_n_cipher,
254                                         int *local_cipher_nids);
255 static void pk11_find_digests(CK_FUNCTION_LIST_PTR pflist,
256                               CK_SLOT_ID current_slot, int *current_slot_n_digest,
257                               int *local_digest_nids);
258 static void pk11_get_symmetric_cipher(CK_FUNCTION_LIST_PTR, int slot_id,
259                                       CK_MECHANISM_TYPE mech, int *current_slot_n_cipher, int *local_cipher_nids,

```



```

393 /*
394  * Structure to be used for the cipher_data/md_data in
395  * EVP_CIPHER_CTX/EVP_MD_CTX structures in order to use the same pk11
396  * session in multiple cipher_update calls
397  */
398 typedef struct PK11_CIPHER_STATE_st
399 {
400     PK11_SESSION *sp;
401 } PK11_CIPHER_STATE;

404 /*
405  * libcrypto EVP stuff - this is how we get wired to EVP so the engine gets
406  * called when libcrypto requests a cipher NID.
407  *
408  * Note how the PK11_CIPHER_STATE is used here.
409  */

411 /* DES CBC EVP */
412 static const EVP_CIPHER pk11_des_cbc =
413 {
414     NID_des_cbc,
415     8, 8, 8,
416     EVP_CIPH_CBC_MODE,
417     pk11_cipher_init,
418     pk11_cipher_do_cipher,
419     pk11_cipher_cleanup,
420     sizeof (PK11_CIPHER_STATE),
421     EVP_CIPHER_set_asn1_iv,
422     EVP_CIPHER_get_asn1_iv,
423     NULL
424 };

426 /* 3DES CBC EVP */
427 static const EVP_CIPHER pk11_3des_cbc =
428 {
429     NID_des_ede3_cbc,
430     8, 24, 8,
431     EVP_CIPH_CBC_MODE,
432     pk11_cipher_init,
433     pk11_cipher_do_cipher,
434     pk11_cipher_cleanup,
435     sizeof (PK11_CIPHER_STATE),
436     EVP_CIPHER_set_asn1_iv,
437     EVP_CIPHER_get_asn1_iv,
438     NULL
439 };

441 /*
442  * ECB modes don't use an Initial Vector so that's why set_asn1_parameters and
443  * get_asn1_parameters fields are set to NULL.
444  */
445 static const EVP_CIPHER pk11_des_ecb =
446 {
447     NID_des_ecb,
448     8, 8, 8,
449     EVP_CIPH_ECB_MODE,
450     pk11_cipher_init,
451     pk11_cipher_do_cipher,
452     pk11_cipher_cleanup,
453     sizeof (PK11_CIPHER_STATE),
454     NULL,
455     NULL,
456     NULL
457 };

```

```

459 static const EVP_CIPHER pk11_3des_ecb =
460 {
461     NID_des_ede3_ecb,
462     8, 24, 8,
463     EVP_CIPH_ECB_MODE,
464     pk11_cipher_init,
465     pk11_cipher_do_cipher,
466     pk11_cipher_cleanup,
467     sizeof (PK11_CIPHER_STATE),
468     NULL,
469     NULL,
470     NULL
471 };

474 static const EVP_CIPHER pk11_aes_128_cbc =
475 {
476     NID_aes_128_cbc,
477     16, 16, 16,
478     EVP_CIPH_CBC_MODE,
479     pk11_cipher_init,
480     pk11_cipher_do_cipher,
481     pk11_cipher_cleanup,
482     sizeof (PK11_CIPHER_STATE),
483     EVP_CIPHER_set_asn1_iv,
484     EVP_CIPHER_get_asn1_iv,
485     NULL
486 };

488 static const EVP_CIPHER pk11_aes_192_cbc =
489 {
490     NID_aes_192_cbc,
491     16, 24, 16,
492     EVP_CIPH_CBC_MODE,
493     pk11_cipher_init,
494     pk11_cipher_do_cipher,
495     pk11_cipher_cleanup,
496     sizeof (PK11_CIPHER_STATE),
497     EVP_CIPHER_set_asn1_iv,
498     EVP_CIPHER_get_asn1_iv,
499     NULL
500 };

502 static const EVP_CIPHER pk11_aes_256_cbc =
503 {
504     NID_aes_256_cbc,
505     16, 32, 16,
506     EVP_CIPH_CBC_MODE,
507     pk11_cipher_init,
508     pk11_cipher_do_cipher,
509     pk11_cipher_cleanup,
510     sizeof (PK11_CIPHER_STATE),
511     EVP_CIPHER_set_asn1_iv,
512     EVP_CIPHER_get_asn1_iv,
513     NULL
514 };

516 /*
517  * ECB modes don't use IV so that's why set_asn1_parameters and
518  * get_asn1_parameters are set to NULL.
519  */
520 static const EVP_CIPHER pk11_aes_128_ecb =
521 {
522     NID_aes_128_ecb,
523     16, 16, 0,

```

```

524     EVP_CIPH_ECB_MODE,
525     pk11_cipher_init,
526     pk11_cipher_do_cipher,
527     pk11_cipher_cleanup,
528     sizeof (PK11_CIPHER_STATE),
529     NULL,
530     NULL,
531     NULL
532 };

534 static const EVP_CIPHER pk11_aes_192_ecb =
535 {
536     NID_aes_192_ecb,
537     16, 24, 0,
538     EVP_CIPH_ECB_MODE,
539     pk11_cipher_init,
540     pk11_cipher_do_cipher,
541     pk11_cipher_cleanup,
542     sizeof (PK11_CIPHER_STATE),
543     NULL,
544     NULL,
545     NULL
546 };

548 static const EVP_CIPHER pk11_aes_256_ecb =
549 {
550     NID_aes_256_ecb,
551     16, 32, 0,
552     EVP_CIPH_ECB_MODE,
553     pk11_cipher_init,
554     pk11_cipher_do_cipher,
555     pk11_cipher_cleanup,
556     sizeof (PK11_CIPHER_STATE),
557     NULL,
558     NULL,
559     NULL
560 };

562 #ifdef SOLARIS_AES_CTR
563 /*
564  * NID_undef's will be changed to the AES counter mode NIDs as soon they are
565  * created in pk11_library_init(). Note that the need to change these structures
566  * is the reason why we don't define them with the const keyword.
567  */
568 static EVP_CIPHER pk11_aes_128_ctr =
569 {
570     NID_undef,
571     16, 16, 16,
572     EVP_CIPH_CBC_MODE,
573     pk11_cipher_init,
574     pk11_cipher_do_cipher,
575     pk11_cipher_cleanup,
576     sizeof (PK11_CIPHER_STATE),
577     EVP_CIPHER_set_asn1_iv,
578     EVP_CIPHER_get_asn1_iv,
579     NULL
580 };

582 static EVP_CIPHER pk11_aes_192_ctr =
583 {
584     NID_undef,
585     16, 24, 16,
586     EVP_CIPH_CBC_MODE,
587     pk11_cipher_init,
588     pk11_cipher_do_cipher,
589     pk11_cipher_cleanup,

```

```

590     sizeof (PK11_CIPHER_STATE),
591     EVP_CIPHER_set_asn1_iv,
592     EVP_CIPHER_get_asn1_iv,
593     NULL
594 };

596 static EVP_CIPHER pk11_aes_256_ctr =
597 {
598     NID_undef,
599     16, 32, 16,
600     EVP_CIPH_CBC_MODE,
601     pk11_cipher_init,
602     pk11_cipher_do_cipher,
603     pk11_cipher_cleanup,
604     sizeof (PK11_CIPHER_STATE),
605     EVP_CIPHER_set_asn1_iv,
606     EVP_CIPHER_get_asn1_iv,
607     NULL
608 };
609 #endif /* SOLARIS_AES_CTR */

611 static const EVP_CIPHER pk11_bf_cbc =
612 {
613     NID_bf_cbc,
614     8, 16, 8,
615     EVP_CIPH_VARIABLE_LENGTH,
616     pk11_cipher_init,
617     pk11_cipher_do_cipher,
618     pk11_cipher_cleanup,
619     sizeof (PK11_CIPHER_STATE),
620     EVP_CIPHER_set_asn1_iv,
621     EVP_CIPHER_get_asn1_iv,
622     NULL
623 };

625 static const EVP_CIPHER pk11_rc4 =
626 {
627     NID_rc4,
628     1, 16, 0,
629     EVP_CIPH_VARIABLE_LENGTH,
630     pk11_cipher_init,
631     pk11_cipher_do_cipher,
632     pk11_cipher_cleanup,
633     sizeof (PK11_CIPHER_STATE),
634     NULL,
635     NULL,
636     NULL
637 };

639 static const EVP_MD pk11_md5 =
640 {
641     NID_md5,
642     NID_md5WithRSAEncryption,
643     MD5_DIGEST_LENGTH,
644     0,
645     pk11_digest_init,
646     pk11_digest_update,
647     pk11_digest_final,
648     pk11_digest_copy,
649     pk11_digest_cleanup,
650     EVP_PKEY_RSA_method,
651     MD5_CBLOCK,
652     sizeof (PK11_CIPHER_STATE),
653 };

655 static const EVP_MD pk11_sha1 =

```

```

656     {
657         NID_sha1,
658         NID_sha1withRSAEncryption,
659         SHA_DIGEST_LENGTH,
660         0,
661         pk11_digest_init,
662         pk11_digest_update,
663         pk11_digest_final,
664         pk11_digest_copy,
665         pk11_digest_cleanup,
666         EVP_PKEY_RSA_method,
667         SHA_CBLOCK,
668         sizeof (PK11_CIPHER_STATE),
669     };

671 static const EVP_MD pk11_sha224 =
672 {
673     NID_sha224,
674     NID_sha224withRSAEncryption,
675     SHA224_DIGEST_LENGTH,
676     0,
677     pk11_digest_init,
678     pk11_digest_update,
679     pk11_digest_final,
680     pk11_digest_copy,
681     pk11_digest_cleanup,
682     EVP_PKEY_RSA_method,
683     /* SHA-224 uses the same cblock size as SHA-256 */
684     SHA256_CBLOCK,
685     sizeof (PK11_CIPHER_STATE),
686 };

688 static const EVP_MD pk11_sha256 =
689 {
690     NID_sha256,
691     NID_sha256withRSAEncryption,
692     SHA256_DIGEST_LENGTH,
693     0,
694     pk11_digest_init,
695     pk11_digest_update,
696     pk11_digest_final,
697     pk11_digest_copy,
698     pk11_digest_cleanup,
699     EVP_PKEY_RSA_method,
700     SHA256_CBLOCK,
701     sizeof (PK11_CIPHER_STATE),
702 };

704 static const EVP_MD pk11_sha384 =
705 {
706     NID_sha384,
707     NID_sha384withRSAEncryption,
708     SHA384_DIGEST_LENGTH,
709     0,
710     pk11_digest_init,
711     pk11_digest_update,
712     pk11_digest_final,
713     pk11_digest_copy,
714     pk11_digest_cleanup,
715     EVP_PKEY_RSA_method,
716     /* SHA-384 uses the same cblock size as SHA-512 */
717     SHA512_CBLOCK,
718     sizeof (PK11_CIPHER_STATE),
719 };

721 static const EVP_MD pk11_sha512 =

```

```

722     {
723         NID_sha512,
724         NID_sha512withRSAEncryption,
725         SHA512_DIGEST_LENGTH,
726         0,
727         pk11_digest_init,
728         pk11_digest_update,
729         pk11_digest_final,
730         pk11_digest_copy,
731         pk11_digest_cleanup,
732         EVP_PKEY_RSA_method,
733         SHA512_CBLOCK,
734         sizeof (PK11_CIPHER_STATE),
735     };

737 /*
738  * Initialization function. Sets up various PKCS#11 library components.
739  * The definitions for control commands specific to this engine
740  */
741 #define PK11_CMD_SO_PATH ENGINE_CMD_BASE
742 static const ENGINE_CMD_DEFN pk11_cmd_defns[] =
743 {
744     {
745         PK11_CMD_SO_PATH,
746         "SO_PATH",
747         "Specifies the path to the 'pkcs#11' shared library",
748         ENGINE_CMD_FLAG_STRING
749     },
750     {0, NULL, NULL, 0}
751 };

754 static RAND_METHOD pk11_random =
755 {
756     pk11_rand_seed,
757     pk11_rand_bytes,
758     pk11_rand_cleanup,
759     pk11_rand_add,
760     pk11_rand_bytes,
761     pk11_rand_status
762 };

765 /* Constants used when creating the ENGINE */
766 static const char *engine_pk11_id = "pkcs11";
767 static const char *engine_pk11_name = "PKCS #11 engine support";

769 CK_FUNCTION_LIST_PTR pFuncList = NULL;
770 static const char PK11_GET_FUNCTION_LIST[] = "C_GetFunctionList";

772 /*
773  * These is the static string constant for the DSO file name and the function
774  * symbol names to bind to.
775  */
776 static const char def_PK11_LIBNAME[] = PK11_LIB_LOCATION;

778 static CK_BBOOL true = TRUE;
779 static CK_BBOOL false = FALSE;
780 static CK_SLOT_ID pubkey_SLOTID = 0;
781 static CK_SLOT_ID rand_SLOTID = 0;
782 static CK_SLOT_ID SLOTID = 0;
783 static CK_BBOOL pk11_library_initialized = FALSE;
784 static CK_BBOOL pk11_atfork_initialized = FALSE;
785 static int pk11_pid = 0;

787 static DSO *pk11_dso = NULL;

```

```

789 /* allocate and initialize all locks used by the engine itself */
790 static int pk11_init_all_locks(void)
791 {
792     int type;

794 #ifndef OPENSSSL_NO_RSA
795     find_lock[OP_RSA] = OPENSSSL_malloc(sizeof (pthread_mutex_t));
796     if (find_lock[OP_RSA] == NULL)
797         goto malloc_err;
798     (void) pthread_mutex_init(find_lock[OP_RSA], NULL);
799 #endif /* OPENSSSL_NO_RSA */

801 #ifndef OPENSSSL_NO_DSA
802     find_lock[OP_DSA] = OPENSSSL_malloc(sizeof (pthread_mutex_t));
803     if (find_lock[OP_DSA] == NULL)
804         goto malloc_err;
805     (void) pthread_mutex_init(find_lock[OP_DSA], NULL);
806 #endif /* OPENSSSL_NO_DSA */

808 #ifndef OPENSSSL_NO_DH
809     find_lock[OP_DH] = OPENSSSL_malloc(sizeof (pthread_mutex_t));
810     if (find_lock[OP_DH] == NULL)
811         goto malloc_err;
812     (void) pthread_mutex_init(find_lock[OP_DH], NULL);
813 #endif /* OPENSSSL_NO_DH */

815     for (type = 0; type < OP_MAX; type++)
816     {
817         session_cache[type].lock =
818             OPENSSSL_malloc(sizeof (pthread_mutex_t));
819         if (session_cache[type].lock == NULL)
820             goto malloc_err;
821         (void) pthread_mutex_init(session_cache[type].lock, NULL);
822     }

824     return (1);

826 malloc_err:
827     pk11_free_all_locks();
828     PK11err(PK11_F_INIT_ALL_LOCKS, PK11_R_MALLOC_FAILURE);
829     return (0);
830 }

832 static void pk11_free_all_locks(void)
833 {
834     int type;

836 #ifndef OPENSSSL_NO_RSA
837     if (find_lock[OP_RSA] != NULL)
838     {
839         (void) pthread_mutex_destroy(find_lock[OP_RSA]);
840         OPENSSSL_free(find_lock[OP_RSA]);
841         find_lock[OP_RSA] = NULL;
842     }
843 #endif /* OPENSSSL_NO_RSA */
844 #ifndef OPENSSSL_NO_DSA
845     if (find_lock[OP_DSA] != NULL)
846     {
847         (void) pthread_mutex_destroy(find_lock[OP_DSA]);
848         OPENSSSL_free(find_lock[OP_DSA]);
849         find_lock[OP_DSA] = NULL;
850     }
851 #endif /* OPENSSSL_NO_DSA */
852 #ifndef OPENSSSL_NO_DH
853     if (find_lock[OP_DH] != NULL)

```

```

854     {
855         (void) pthread_mutex_destroy(find_lock[OP_DH]);
856         OPENSSSL_free(find_lock[OP_DH]);
857         find_lock[OP_DH] = NULL;
858     }
859 #endif /* OPENSSSL_NO_DH */

861     for (type = 0; type < OP_MAX; type++)
862     {
863         if (session_cache[type].lock != NULL)
864         {
865             (void) pthread_mutex_destroy(session_cache[type].lock);
866             OPENSSSL_free(session_cache[type].lock);
867             session_cache[type].lock = NULL;
868         }
869     }
870 }

872 /*
873  * This internal function is used by ENGINE_pk11() and "dynamic" ENGINE support.
874  */
875 static int bind_pk11(ENGINE *e)
876 {
877 #ifndef OPENSSSL_NO_RSA
878     const RSA_METHOD *rsa = NULL;
879     RSA_METHOD *pk11_rsa = PK11_RSA();
880 #endif /* OPENSSSL_NO_RSA */
881     if (!pk11_library_initialized)
882         if (!pk11_library_init(e))
883             return (0);

885     if (!ENGINE_set_id(e, engine_pk11_id) ||
886         !ENGINE_set_name(e, engine_pk11_name) ||
887         !ENGINE_set_ciphers(e, pk11_engine_ciphers) ||
888         !ENGINE_set_digests(e, pk11_engine_digests))
889         return (0);
890 #ifndef OPENSSSL_NO_RSA
891     if (pk11_have_rsa == CK_TRUE)
892     {
893         if (!ENGINE_set_RSA(e, PK11_RSA()) ||
894             !ENGINE_set_load_privkey_function(e, pk11_load_privkey) ||
895             !ENGINE_set_load_pubkey_function(e, pk11_load_pubkey))
896             return (0);
897 #ifdef DEBUG_SLOT_SELECTION
898         fprintf(stderr, "%s: registered RSA\n", PK11_DBG);
899 #endif /* DEBUG_SLOT_SELECTION */
900     }
901 #endif /* OPENSSSL_NO_RSA */
902 #ifndef OPENSSSL_NO_DSA
903     if (pk11_have_dsa == CK_TRUE)
904     {
905         if (!ENGINE_set_DSA(e, PK11_DSA()))
906             return (0);
907 #ifdef DEBUG_SLOT_SELECTION
908         fprintf(stderr, "%s: registered DSA\n", PK11_DBG);
909 #endif /* DEBUG_SLOT_SELECTION */
910     }
911 #endif /* OPENSSSL_NO_DSA */
912 #ifndef OPENSSSL_NO_DH
913     if (pk11_have_dh == CK_TRUE)
914     {
915         if (!ENGINE_set_DH(e, PK11_DH()))
916             return (0);
917 #ifdef DEBUG_SLOT_SELECTION
918         fprintf(stderr, "%s: registered DH\n", PK11_DBG);
919 #endif /* DEBUG_SLOT_SELECTION */

```

```

920     }
921 #endif /* OPENSSSL_NO_DH */
922     if (pk11_have_random)
923     {
924         if (!ENGINE_set RAND(e, &pk11_random))
925             return (0);
926 #ifdef DEBUG_SLOT_SELECTION
927         fprintf(stderr, "%s: registered random\n", PK11_DBG);
928 #endif /* DEBUG_SLOT_SELECTION */
929     }
930     if (!ENGINE_set_init_function(e, pk11_init) ||
931         !ENGINE_set_destroy_function(e, pk11_destroy) ||
932         !ENGINE_set_finish_function(e, pk11_finish) ||
933         !ENGINE_set_ctrl_function(e, pk11_ctrl) ||
934         !ENGINE_set_cmd_defns(e, pk11_cmd_defns))
935         return (0);
936
937 /*
938  * Apache calls OpenSSL function RSA_blinding_on() once during startup
939  * which in turn calls bn_mod_exp. Since we do not implement bn_mod_exp
940  * here, we wire it back to the OpenSSL software implementation.
941  * Since it is used only once, performance is not a concern.
942  */
943 #ifndef OPENSSSL_NO_RSA
944     rsa = RSA_PKCS1_SSLeay();
945     pk11_rsa->rsa_mod_exp = rsa->rsa_mod_exp;
946     pk11_rsa->bn_mod_exp = rsa->bn_mod_exp;
947 #endif /* OPENSSSL_NO_RSA */
948
949     /* Ensure the pk11 error handling is set up */
950     ERR_load_pk11_strings();
951
952     return (1);
953 }
954
955 /* Dynamic engine support is disabled at a higher level for Solaris */
956 #ifdef ENGINE_DYNAMIC_SUPPORT
957 static int bind_helper(ENGINE *e, const char *id)
958 {
959     if (id && (strcmp(id, engine_pk11_id) != 0))
960         return (0);
961
962     if (!bind_pk11(e))
963         return (0);
964
965     return (1);
966 }
967
968 IMPLEMENT_DYNAMIC_CHECK_FN()
969 IMPLEMENT_DYNAMIC_BIND_FN(bind_helper)
970
971 #else
972 static ENGINE *engine_pk11(void)
973 {
974     ENGINE *ret = ENGINE_new();
975
976     if (!ret)
977         return (NULL);
978
979     if (!bind_pk11(ret))
980     {
981         ENGINE_free(ret);
982         return (NULL);
983     }
984
985     return (ret);

```

```

986     }
987
988 void
989 ENGINE_load_pk11(void)
990 {
991     ENGINE *e_pk11 = NULL;
992
993     /*
994      * Do not use dynamic PKCS#11 library on Solaris due to
995      * security reasons. We will link it in statically.
996      */
997     /* Attempt to load PKCS#11 library */
998     if (!pk11_dso)
999         pk11_dso = DSO_load(NULL, get_PK11_LIBNAME(), NULL, 0);
1000
1001     if (pk11_dso == NULL)
1002     {
1003         PK11err(PK11_F_LOAD, PK11_R_DSO_FAILURE);
1004         return;
1005     }
1006
1007     e_pk11 = engine_pk11();
1008     if (!e_pk11)
1009     {
1010         DSO_free(pk11_dso);
1011         pk11_dso = NULL;
1012         return;
1013     }
1014
1015     /*
1016      * At this point, the pk11 shared library is either dynamically
1017      * loaded or statically linked in. So, initialize the pk11
1018      * library before calling ENGINE_set_default since the latter
1019      * needs cipher and digest algorithm information
1020      */
1021     if (!pk11_library_init(e_pk11))
1022     {
1023         DSO_free(pk11_dso);
1024         pk11_dso = NULL;
1025         ENGINE_free(e_pk11);
1026         return;
1027     }
1028
1029     ENGINE_add(e_pk11);
1030
1031     ENGINE_free(e_pk11);
1032     ERR_clear_error();
1033 }
1034 #endif /* ENGINE_DYNAMIC_SUPPORT */
1035
1036 /*
1037  * These are the static string constants for the DSO file name and
1038  * the function symbol names to bind to.
1039  */
1040 static const char *PK11_LIBNAME = NULL;
1041
1042 static const char *get_PK11_LIBNAME(void)
1043 {
1044     if (PK11_LIBNAME)
1045         return (PK11_LIBNAME);
1046
1047     return (def_PK11_LIBNAME);
1048 }
1049
1050 static void free_PK11_LIBNAME(void)
1051 {

```

```

1052     if (PK11_LIBNAME)
1053         OPENSSL_free((void*)PK11_LIBNAME);

1055     PK11_LIBNAME = NULL;
1056 }

1058 static long set_PK11_LIBNAME(const char *name)
1059 {
1060     free_PK11_LIBNAME();

1062     return ((PK11_LIBNAME = BUF_strdup(name)) != NULL ? 1 : 0);
1063 }

1065 /* acquire all engine specific mutexes before fork */
1066 static void pk11_fork_prepare(void)
1067 {
1068     int i;

1070     if (!pk11_library_initialized)
1071         return;

1073     LOCK_OBJSTORE(OP_RSA);
1074     LOCK_OBJSTORE(OP_DSA);
1075     LOCK_OBJSTORE(OP_DH);
1076     for (i = 0; i < OP_MAX; i++)
1077     {
1078         (void) pthread_mutex_lock(session_cache[i].lock);
1079     }
1080 }

1082 /* release all engine specific mutexes */
1083 static void pk11_fork_parent(void)
1084 {
1085     int i;

1087     if (!pk11_library_initialized)
1088         return;

1090     for (i = OP_MAX - 1; i >= 0; i--)
1091     {
1092         (void) pthread_mutex_unlock(session_cache[i].lock);
1093     }
1094     UNLOCK_OBJSTORE(OP_DH);
1095     UNLOCK_OBJSTORE(OP_DSA);
1096     UNLOCK_OBJSTORE(OP_RSA);
1097 }

1099 /*
1100  * same situation as in parent - we need to unlock all locks to make them
1101  * accessible to all threads.
1102  */
1103 static void pk11_fork_child(void)
1104 {
1105     int i;

1107     if (!pk11_library_initialized)
1108         return;

1110     for (i = OP_MAX - 1; i >= 0; i--)
1111     {
1112         (void) pthread_mutex_unlock(session_cache[i].lock);
1113     }
1114     UNLOCK_OBJSTORE(OP_DH);
1115     UNLOCK_OBJSTORE(OP_DSA);
1116     UNLOCK_OBJSTORE(OP_RSA);
1117 }

```

```

1119 /* Initialization function for the pk11 engine */
1120 static int pk11_init(ENGINE *e)
1121 {
1122     return (pk11_library_init(e));
1123 }

1125 /*
1126  * Initialization function. Sets up various PKCS#11 library components.
1127  * It selects a slot based on predefined criteria. In the process, it also
1128  * count how many ciphers and digests to support. Since the cipher and
1129  * digest information is needed when setting default engine, this function
1130  * needs to be called before calling ENGINE_set_default.
1131  */
1132 /* ARGSUSED */
1133 static int pk11_library_init(ENGINE *e)
1134 {
1135     CK_C_GetFunctionList p;
1136     CK_RV rv = CKR_OK;
1137     CK_INFO info;
1138     CK_ULONG ul_state_len;
1139     int any_slot_found;
1140     int i;

1142     /*
1143      * pk11_library_initialized is set to 0 in pk11_finish() which is called
1144      * from ENGINE_finish(). However, if there is still at least one
1145      * existing functional reference to the engine (see engine(3) for more
1146      * information), pk11_finish() is skipped. For example, this can happen
1147      * if an application forgets to clear one cipher context. In case of a
1148      * fork() when the application is finishing the engine so that it can be
1149      * reinitialized in the child, forgotten functional reference causes
1150      * pk11_library_initialized to stay 1. In that case we need the PID
1151      * check so that we properly initialize the engine again.
1152      */
1153     if (pk11_library_initialized)
1154     {
1155         if (pk11_pid == getpid())
1156         {
1157             return (1);
1158         }
1159         else
1160         {
1161             global_session = CK_INVALID_HANDLE;
1162             /*
1163              * free the locks first to prevent memory leak in case
1164              * the application calls fork() without finishing the
1165              * engine first.
1166              */
1167             pk11_free_all_locks();
1168         }
1169     }

1171     if (pk11_dso == NULL)
1172     {
1173         PK11err(PK11_F_LIBRARY_INIT, PK11_R_DSO_FAILURE);
1174         goto err;
1175     }

1177 #ifdef SOLARIS_AES_CTR
1178     /*
1179      * We must do this before we start working with slots since we need all
1180      * NIDs there.
1181      */
1182     if (pk11_add_aes_ctr_NIDs() == 0)
1183         goto err;

```

```

1184 #endif /* SOLARIS_AES_CTR */

1186 #ifdef SOLARIS_HW_SLOT_SELECTION
1187 if (check_hw_mechanisms() == 0)
1188     goto err;
1189 #endif /* SOLARIS_HW_SLOT_SELECTION */

1191 /* get the C_GetFunctionList function from the loaded library */
1192 p = (CK_C_GetFunctionList)DSO_bind_func(pk11_dso,
1193     PK11_GET_FUNCTION_LIST);
1194 if (!p)
1195 {
1196     PK11err(PK11_F_LIBRARY_INIT, PK11_R_DSO_FAILURE);
1197     goto err;
1198 }

1200 /* get the full function list from the loaded library */
1201 rv = p(&pFuncList);
1202 if (rv != CKR_OK)
1203 {
1204     PK11err_add_data(PK11_F_LIBRARY_INIT, PK11_R_DSO_FAILURE, rv);
1205     goto err;
1206 }

1208 rv = pFuncList->C_Initialize(NULL_PTR);
1209 if ((rv != CKR_OK) && (rv != CKR_CRYPTOKI_ALREADY_INITIALIZED))
1210 {
1211     PK11err_add_data(PK11_F_LIBRARY_INIT, PK11_R_INITIALIZE, rv);
1212     goto err;
1213 }

1215 rv = pFuncList->C_GetInfo(&info);
1216 if (rv != CKR_OK)
1217 {
1218     PK11err_add_data(PK11_F_LIBRARY_INIT, PK11_R_GETINFO, rv);
1219     goto err;
1220 }

1222 if (pk11_choose_slots(&any_slot_found) == 0)
1223     goto err;

1225 /*
1226  * The library we use, set in def_PK11_LIBNAME, may not offer any
1227  * slot(s). In that case, we must not proceed but we must not return an
1228  * error. The reason is that applications that try to set up the PKCS#11
1229  * engine don't exit on error during the engine initialization just
1230  * because no slot was present.
1231  */
1232 if (any_slot_found == 0)
1233     return (1);

1235 if (global_session == CK_INVALID_HANDLE)
1236 {
1237     /* Open the global session for the new process */
1238     rv = pFuncList->C_OpenSession(SLOTID, CKF_SERIAL_SESSION,
1239         NULL_PTR, NULL_PTR, &global_session);
1240     if (rv != CKR_OK)
1241     {
1242         PK11err_add_data(PK11_F_LIBRARY_INIT,
1243             PK11_R_OPENSESSION, rv);
1244         goto err;
1245     }
1246 }

1248 /*
1249  * Disable digest if C_GetOperationState is not supported since

```

```

1250     * this function is required by OpenSSL digest copy function
1251     */
1252 if (pFuncList->C_GetOperationState(global_session, NULL, &ul_state_len)
1253     == CKR_FUNCTION_NOT_SUPPORTED) {
1254 #ifdef DEBUG_SLOT_SELECTION
1255     fprintf(stderr, "%s: C_GetOperationState() not supported, "
1256         "setting digest_count to 0\n", PK11_DBG);
1257 #endif /* DEBUG_SLOT_SELECTION */
1258     digest_count = 0;
1259 }

1261 pk11_library_initialized = TRUE;
1262 pk11_pid = getpid();
1263 /*
1264  * if initialization of the locks fails pk11_init_all_locks()
1265  * will do the cleanup.
1266  */
1267 if (!pk11_init_all_locks())
1268     goto err;
1269 for (i = 0; i < OP_MAX; i++)
1270     session_cache[i].head = NULL;
1271 /*
1272  * initialize active lists. We only use active lists
1273  * for asymmetric ciphers.
1274  */
1275 for (i = 0; i < OP_MAX; i++)
1276     active_list[i] = NULL;

1278 if (!pk11_atfork_initialized)
1279 {
1280     if (pthread_atfork(pk11_fork_prepare, pk11_fork_parent,
1281         pk11_fork_child) != 0)
1282     {
1283         PK11err(PK11_F_LIBRARY_INIT, PK11_R_ATFORK_FAILED);
1284         goto err;
1285     }
1286     pk11_atfork_initialized = TRUE;
1287 }

1289 return (1);

1291 err:
1292     return (0);
1293 }

1295 /* Destructor (complements the "ENGINE_pk11()" constructor) */
1296 /* ARGSUSED */
1297 static int pk11_destroy(ENGINE *e)
1298 {
1299     free_PK11_LIBNAME();
1300     ERR_unload_pk11_strings();
1301     return (1);
1302 }

1304 /*
1305  * Termination function to clean up the session, the token, and the pk11
1306  * library.
1307  */
1308 /* ARGSUSED */
1309 static int pk11_finish(ENGINE *e)
1310 {
1311     int i;

1313     if (pk11_dso == NULL)
1314     {
1315         PK11err(PK11_F_FINISH, PK11_R_NOT_LOADED);

```

```

1316         goto err;
1317     }

1319     OPENSSL_assert(pFuncList != NULL);

1321     if (pk11_free_all_sessions() == 0)
1322         goto err;

1324     /* free all active lists */
1325     for (i = 0; i < OP_MAX; i++)
1326         pk11_free_active_list(i);

1328     pFuncList->C_CloseSession(global_session);
1329     global_session = CK_INVALID_HANDLE;

1331     /*
1332      * Since we are part of a library (libcrypto.so), calling this function
1333      * may have side-effects.
1334      */
1335     #if 0
1336     pFuncList->C_Finalize(NULL);
1337     #endif

1339     if (!DSO_free(pk11_dso))
1340     {
1341         PK11err(PK11_F_FINISH, PK11_R_DSO_FAILURE);
1342         goto err;
1343     }
1344     pk11_dso = NULL;
1345     pFuncList = NULL;
1346     pk11_library_initialized = FALSE;
1347     pk11_pid = 0;
1348     /*
1349      * There is no way how to unregister atfork handlers (other than
1350      * unloading the library) so we just free the locks. For this reason
1351      * the atfork handlers check if the engine is initialized and bail out
1352      * immediately if not. This is necessary in case a process finishes
1353      * the engine before calling fork().
1354      */
1355     pk11_free_all_locks();

1357     return (1);

1359 err:
1360     return (0);
1361 }

1363 /* Standard engine interface function to set the dynamic library path */
1364 /* ARGSUSED */
1365 static int pk11_ctrl(ENGINE *e, int cmd, long i, void *p, void (*f)())
1366 {
1367     int initialized = ((pk11_dso == NULL) ? 0 : 1);

1369     switch (cmd)
1370     {
1371     case PK11_CMD_SO_PATH:
1372         if (p == NULL)
1373         {
1374             PK11err(PK11_F_CTRL, ERR_R_PASSED_NULL_PARAMETER);
1375             return (0);
1376         }

1378         if (initialized)
1379         {
1380             PK11err(PK11_F_CTRL, PK11_R_ALREADY_LOADED);
1381             return (0);

```

```

1382     }

1384     return (set_PK11_LIBNAME((const char *)p));
1385 default:
1386     break;
1387 }

1389     PK11err(PK11_F_CTRL, PK11_R_CTRL_COMMAND_NOT_IMPLEMENTED);

1391     return (0);
1392 }

1395 /* Required function by the engine random interface. It does nothing here */
1396 static void pk11_rand_cleanup(void)
1397 {
1398     return;
1399 }

1401 /* ARGSUSED */
1402 static void pk11_rand_add(const void *buf, int num, double add)
1403 {
1404     PK11_SESSION *sp;

1406     if ((sp = pk11_get_session(OP_RAND)) == NULL)
1407         return;

1409     /*
1410      * Ignore any errors (e.g. CKR_RANDOM_SEED_NOT_SUPPORTED) since
1411      * the calling functions do not care anyway
1412      */
1413     pFuncList->C_SeedRandom(sp->session, (unsigned char *) buf, num);
1414     pk11_return_session(sp, OP_RAND);

1416     return;
1417 }

1419 static void pk11_rand_seed(const void *buf, int num)
1420 {
1421     pk11_rand_add(buf, num, 0);
1422 }

1424 static int pk11_rand_bytes(unsigned char *buf, int num)
1425 {
1426     CK_RV rv;
1427     PK11_SESSION *sp;

1429     if ((sp = pk11_get_session(OP_RAND)) == NULL)
1430         return (0);

1432     rv = pFuncList->C_GenerateRandom(sp->session, buf, num);
1433     if (rv != CKR_OK)
1434     {
1435         PK11err_add_data(PK11_F_RAND_BYTES, PK11_R_GENERATERANDOM, rv);
1436         pk11_return_session(sp, OP_RAND);
1437         return (0);
1438     }

1440     pk11_return_session(sp, OP_RAND);
1441     return (1);
1442 }

1444 /* Required function by the engine random interface. It does nothing here */
1445 static int pk11_rand_status(void)
1446 {
1447     return (1);

```



```

1448     }
1450 /* Free all BIGNUM structures from PK11_SESSION. */
1451 static void pk11_free_nums(PK11_SESSION *sp, PK11_OPTYPE optype)
1452 {
1453     switch (optype)
1454     {
1455 #ifndef OPENSSL_NO_RSA
1456         case OP_RSA:
1457             if (sp->opdata_rsa_n_num != NULL)
1458             {
1459                 BN_free(sp->opdata_rsa_n_num);
1460                 sp->opdata_rsa_n_num = NULL;
1461             }
1462             if (sp->opdata_rsa_e_num != NULL)
1463             {
1464                 BN_free(sp->opdata_rsa_e_num);
1465                 sp->opdata_rsa_e_num = NULL;
1466             }
1467             if (sp->opdata_rsa_d_num != NULL)
1468             {
1469                 BN_free(sp->opdata_rsa_d_num);
1470                 sp->opdata_rsa_d_num = NULL;
1471             }
1472             break;
1473 #endif
1474 #ifndef OPENSSL_NO_DSA
1475         case OP_DSA:
1476             if (sp->opdata_dsa_pub_num != NULL)
1477             {
1478                 BN_free(sp->opdata_dsa_pub_num);
1479                 sp->opdata_dsa_pub_num = NULL;
1480             }
1481             if (sp->opdata_dsa_priv_num != NULL)
1482             {
1483                 BN_free(sp->opdata_dsa_priv_num);
1484                 sp->opdata_dsa_priv_num = NULL;
1485             }
1486             break;
1487 #endif
1488 #ifndef OPENSSL_NO_DH
1489         case OP_DH:
1490             if (sp->opdata_dh_priv_num != NULL)
1491             {
1492                 BN_free(sp->opdata_dh_priv_num);
1493                 sp->opdata_dh_priv_num = NULL;
1494             }
1495             break;
1496 #endif
1497         default:
1498             break;
1499     }
1500 }

1502 /*
1503  * Get new PK11_SESSION structure ready for use. Every process must have
1504  * its own freelist of PK11_SESSION structures so handle fork() here
1505  * by destroying the old and creating new freelist.
1506  * The returned PK11_SESSION structure is disconnected from the freelist.
1507  */
1508 PK11_SESSION *
1509 pk11_get_session(PK11_OPTYPE optype)
1510 {
1511     PK11_SESSION *sp = NULL, *sp1, *freelist;
1512     pthread_mutex_t *freelist_lock;
1513     CK_RV rv;

```

```

1515     switch (optype)
1516     {
1517         case OP_RSA:
1518         case OP_DSA:
1519         case OP_DH:
1520         case OP_RAND:
1521         case OP_DIGEST:
1522         case OP_CIPHER:
1523             freelist_lock = session_cache[optype].lock;
1524             break;
1525         default:
1526             PK11err(PK11_F_GET_SESSION,
1527                    PK11_R_INVALID_OPERATION_TYPE);
1528             return (NULL);
1529     }
1530     (void) pthread_mutex_lock(freelist_lock);
1531     freelist = session_cache[optype].head;
1532     sp = freelist;

1534 /*
1535  * If the free list is empty, allocate new uninitialized (filled
1536  * with zeroes) PK11_SESSION structure otherwise return first
1537  * structure from the freelist.
1538  */
1539     if (sp == NULL)
1540     {
1541         if ((sp = OPENSSL_malloc(sizeof (PK11_SESSION))) == NULL)
1542         {
1543             PK11err(PK11_F_GET_SESSION,
1544                    PK11_R_MALLOC_FAILURE);
1545             goto err;
1546         }
1547         (void) memset(sp, 0, sizeof (PK11_SESSION));
1548     }
1549     else
1550     {
1551         freelist = sp->next;
1552     }

1554     if (sp->pid != 0 && sp->pid != getpid())
1555     {
1556         /*
1557          * We are a new process and thus need to free any inherited
1558          * PK11_SESSION objects.
1559          */
1560         while ((sp1 = freelist) != NULL)
1561         {
1562             freelist = sp1->next;
1563             /*
1564              * NOTE: we do not want to call pk11_free_all_sessions()
1565              * here because it would close underlying PKCS#11
1566              * sessions and destroy all objects.
1567              */
1568             pk11_free_nums(sp1, optype);
1569             OPENSSL_free(sp1);
1570         }

1572         /* we have to free the active list as well. */
1573         pk11_free_active_list(optype);

1575         /* Initialize the process */
1576         rv = pFuncList->C_Initialize(NULL_PTR);
1577         if ((rv != CKR_OK) && (rv != CKR_CRYPTOKI_ALREADY_INITIALIZED))
1578         {
1579             PK11err_add_data(PK11_F_GET_SESSION, PK11_R_INITIALIZE,

```

```

1580         rv);
1581         OPENSSL_free(sp);
1582         sp = NULL;
1583         goto err;
1584     }

1586     /*
1587     * Choose slot here since the slot table is different on this
1588     * process. If we are here then we must have found at least one
1589     * usable slot before so we don't need to check any_slot_found.
1590     * See pk11_library_init()'s usage of this function for more
1591     * information.
1592     */
1593 #ifdef SOLARIS_HW_SLOT_SELECTION
1594     if (check_hw_mechanisms() == 0)
1595         goto err;
1596 #endif /* SOLARIS_HW_SLOT_SELECTION */
1597     if (pk11_choose_slots(NULL) == 0)
1598         goto err;

1600     /* Open the global_session for the new process */
1601     rv = pFuncList->C_OpenSession(SLOTID, CKF_SERIAL_SESSION,
1602     NULL_PTR, NULL_PTR, &global_session);
1603     if (rv != CKR_OK)
1604     {
1605         PK11err_add_data(PK11_F_GET_SESSION, PK11_R_OPENSESSION,
1606         rv);
1607         OPENSSL_free(sp);
1608         sp = NULL;
1609         goto err;
1610     }

1612     /* It is an inherited session and needs re-initialization. */
1613     if (pk11_setup_session(sp, optype) == 0)
1614     {
1615         OPENSSL_free(sp);
1616         sp = NULL;
1617     }
1618 }
1619 if (sp->pid == 0)
1620 {
1621     /* It is a new session and needs initialization. */
1622     if (pk11_setup_session(sp, optype) == 0)
1623     {
1624         OPENSSL_free(sp);
1625         sp = NULL;
1626     }
1627 }

1629 /* set new head for the list of PK11_SESSION objects */
1630 session_cache[optype].head = freelist;

1632 err:
1633 if (sp != NULL)
1634     sp->next = NULL;

1636 (void) pthread_mutex_unlock(freelist_lock);

1638 return (sp);
1639 }

1642 void
1643 pk11_return_session(PK11_SESSION *sp, PK11_OPTYPE optype)
1644 {
1645     pthread_mutex_t *freelist_lock;

```

```

1646     PK11_SESSION *freelist;

1648     if (sp == NULL || sp->pid != getpid())
1649         return;

1651     switch (optype)
1652     {
1653     case OP_RSA:
1654     case OP_DSA:
1655     case OP_DH:
1656     case OP_RAND:
1657     case OP_DIGEST:
1658     case OP_CIPHER:
1659         freelist_lock = session_cache[optype].lock;
1660         break;
1661     default:
1662         PK11err(PK11_F_RETURN_SESSION,
1663         PK11_R_INVALID_OPERATION_TYPE);
1664         return;
1665     }

1667     (void) pthread_mutex_lock(freelist_lock);
1668     freelist = session_cache[optype].head;
1669     sp->next = freelist;
1670     session_cache[optype].head = sp;
1671     (void) pthread_mutex_unlock(freelist_lock);
1672 }

1675 /* Destroy all objects. This function is called when the engine is finished */
1676 static int pk11_free_all_sessions()
1677 {
1678     int ret = 1;
1679     int type;

1681 #ifndef OPENSSL_NO_RSA
1682     (void) pk11_destroy_rsa_key_objects(NULL);
1683 #endif /* OPENSSL_NO_RSA */
1684 #ifndef OPENSSL_NO_DSA
1685     (void) pk11_destroy_dsa_key_objects(NULL);
1686 #endif /* OPENSSL_NO_DSA */
1687 #ifndef OPENSSL_NO_DH
1688     (void) pk11_destroy_dh_key_objects(NULL);
1689 #endif /* OPENSSL_NO_DH */
1690     (void) pk11_destroy_cipher_key_objects(NULL);

1692     /*
1693     * We try to release as much as we can but any error means that we will
1694     * return 0 on exit.
1695     */
1696     for (type = 0; type < OP_MAX; type++)
1697     {
1698         if (pk11_free_session_list(type) == 0)
1699             ret = 0;
1700     }

1702     return (ret);
1703 }

1705 /*
1706 * Destroy session structures from the linked list specified. Free as many
1707 * sessions as possible but any failure in C_CloseSession() means that we
1708 * return an error on return.
1709 */
1710 static int pk11_free_session_list(PK11_OPTYPE optype)
1711 {

```

```

1712     CK_RV rv;
1713     PK11_SESSION *sp = NULL;
1714     PK11_SESSION *freelist = NULL;
1715     pid_t mypid = getpid();
1716     pthread_mutex_t *freelist_lock;
1717     int ret = 1;

1719     switch (optype)
1720     {
1721     case OP_RSA:
1722     case OP_DSA:
1723     case OP_DH:
1724     case OP_RAND:
1725     case OP_DIGEST:
1726     case OP_CIPHER:
1727         freelist_lock = session_cache[optype].lock;
1728         break;
1729     default:
1730         PK11err(PK11_F_FREE_ALL_SESSIONS,
1731                PK11_R_INVALID_OPERATION_TYPE);
1732         return (0);
1733     }

1735     (void) pthread_mutex_lock(freelist_lock);
1736     freelist = session_cache[optype].head;
1737     while ((sp = freelist) != NULL)
1738     {
1739         if (sp->session != CK_INVALID_HANDLE && sp->pid == mypid)
1740         {
1741             rv = pFuncList->C_CloseSession(sp->session);
1742             if (rv != CKR_OK)
1743             {
1744                 PK11err_add_data(PK11_F_FREE_ALL_SESSIONS,
1745                                PK11_R_CLOSESESSION, rv);
1746                 ret = 0;
1747             }
1748         }
1749         freelist = sp->next;
1750         pk11_free_nums(sp, optype);
1751         OPENSSL_free(sp);
1752     }

1754     (void) pthread_mutex_unlock(freelist_lock);
1755     return (ret);
1756 }

```

```

1759 static int pk11_setup_session(PK11_SESSION *sp, PK11_OPTYPE optype)
1760 {
1761     CK_RV rv;
1762     CK_SLOT_ID myslot;

1764     switch (optype)
1765     {
1766     case OP_RSA:
1767     case OP_DSA:
1768     case OP_DH:
1769         myslot = pubkey_SLOTID;
1770         break;
1771     case OP_RAND:
1772         myslot = rand_SLOTID;
1773         break;
1774     case OP_DIGEST:
1775     case OP_CIPHER:
1776         myslot = SLOTID;
1777         break;

```

```

1778         default:
1779             PK11err(PK11_F_SETUP_SESSION,
1780                    PK11_R_INVALID_OPERATION_TYPE);
1781             return (0);
1782     }

1784     sp->session = CK_INVALID_HANDLE;
1785     #ifdef DEBUG_SLOT_SELECTION
1786     fprintf(stderr, "%s: myslot=%d optype=%d\n", PK11_DBG, myslot, optype);
1787     #endif
1788     /* DEBUG_SLOT_SELECTION */
1789     rv = pFuncList->C_OpenSession(myslot, CKF_SERIAL_SESSION,
1790                                  NULL_PTR, NULL_PTR, &sp->session);
1791     if (rv == CKR_CRYPTOKI_NOT_INITIALIZED)
1792     {
1793         /* We are probably a child process so force the
1794          * reinitialize of the session
1795          */
1796         pk11_library_initialized = FALSE;
1797         if (!pk11_library_init(NULL))
1798             return (0);
1799         rv = pFuncList->C_OpenSession(myslot, CKF_SERIAL_SESSION,
1800                                      NULL_PTR, NULL_PTR, &sp->session);
1801     }
1802     if (rv != CKR_OK)
1803     {
1804         PK11err_add_data(PK11_F_SETUP_SESSION, PK11_R_OPENSESSION, rv);
1805         return (0);
1806     }

1808     sp->pid = getpid();

1810     switch (optype)
1811     {
1812     #ifndef OPENSSSL_NO_RSA
1813     case OP_RSA:
1814         sp->opdata_rsa_pub_key = CK_INVALID_HANDLE;
1815         sp->opdata_rsa_priv_key = CK_INVALID_HANDLE;
1816         sp->opdata_rsa_pub = NULL;
1817         sp->opdata_rsa_n_num = NULL;
1818         sp->opdata_rsa_e_num = NULL;
1819         sp->opdata_rsa_priv = NULL;
1820         sp->opdata_rsa_d_num = NULL;
1821         break;
1822     #endif /* OPENSSSL_NO_RSA */
1823     #ifndef OPENSSSL_NO_DSA
1824     case OP_DSA:
1825         sp->opdata_dsa_pub_key = CK_INVALID_HANDLE;
1826         sp->opdata_dsa_priv_key = CK_INVALID_HANDLE;
1827         sp->opdata_dsa_pub = NULL;
1828         sp->opdata_dsa_pub_num = NULL;
1829         sp->opdata_dsa_priv = NULL;
1830         sp->opdata_dsa_priv_num = NULL;
1831         break;
1832     #endif /* OPENSSSL_NO_DSA */
1833     #ifndef OPENSSSL_NO_DH
1834     case OP_DH:
1835         sp->opdata_dh_key = CK_INVALID_HANDLE;
1836         sp->opdata_dh = NULL;
1837         sp->opdata_dh_priv_num = NULL;
1838         break;
1839     #endif /* OPENSSSL_NO_DH */
1840     case OP_CIPHER:
1841         sp->opdata_cipher_key = CK_INVALID_HANDLE;
1842         sp->opdata_encrypt = -1;
1843         break;

```

```

1844     }
1846     return (1);
1847 }

1849 #ifndef OPENSSSL_NO_RSA
1850 /* Destroy RSA public key from single session. */
1851 int
1852 pk11_destroy_rsa_object_pub(PK11_SESSION *sp, CK_BBOOL uselock)
1853 {
1854     int ret = 0;

1856     if (sp->opdata_rsa_pub_key != CK_INVALID_HANDLE)
1857     {
1858         TRY_OBJ_DESTROY(sp->session, sp->opdata_rsa_pub_key,
1859             ret, uselock, OP_RSA);
1860         sp->opdata_rsa_pub_key = CK_INVALID_HANDLE;
1861         sp->opdata_rsa_pub = NULL;
1862         if (sp->opdata_rsa_n_num != NULL)
1863         {
1864             BN_free(sp->opdata_rsa_n_num);
1865             sp->opdata_rsa_n_num = NULL;
1866         }
1867         if (sp->opdata_rsa_e_num != NULL)
1868         {
1869             BN_free(sp->opdata_rsa_e_num);
1870             sp->opdata_rsa_e_num = NULL;
1871         }
1872     }

1874     return (ret);
1875 }

1877 /* Destroy RSA private key from single session. */
1878 int
1879 pk11_destroy_rsa_object_priv(PK11_SESSION *sp, CK_BBOOL uselock)
1880 {
1881     int ret = 0;

1883     if (sp->opdata_rsa_priv_key != CK_INVALID_HANDLE)
1884     {
1885         TRY_OBJ_DESTROY(sp->session, sp->opdata_rsa_priv_key,
1886             ret, uselock, OP_RSA);
1887         sp->opdata_rsa_priv_key = CK_INVALID_HANDLE;
1888         sp->opdata_rsa_priv = NULL;
1889         if (sp->opdata_rsa_d_num != NULL)
1890         {
1891             BN_free(sp->opdata_rsa_d_num);
1892             sp->opdata_rsa_d_num = NULL;
1893         }
1894     }

1896     return (ret);
1897 }

1899 /*
1900  * Destroy RSA key object wrapper. If session is NULL, try to destroy all
1901  * objects in the free list.
1902  */
1903 int
1904 pk11_destroy_rsa_key_objects(PK11_SESSION *session)
1905 {
1906     int ret = 1;
1907     PK11_SESSION *sp = NULL;
1908     PK11_SESSION *local_free_session;
1909     CK_BBOOL uselock = TRUE;

```

```

1911     if (session != NULL)
1912         local_free_session = session;
1913     else
1914     {
1915         (void) pthread_mutex_lock(&session_cache[OP_RSA].lock);
1916         local_free_session = session_cache[OP_RSA].head;
1917         uselock = FALSE;
1918     }

1920     /*
1921      * go through the list of sessions and delete key objects
1922      */
1923     while ((sp = local_free_session) != NULL)
1924     {
1925         local_free_session = sp->next;

1927         /*
1928          * Do not terminate list traversal if one of the
1929          * destroy operations fails.
1930          */
1931         if (pk11_destroy_rsa_object_pub(sp, uselock) == 0)
1932         {
1933             ret = 0;
1934             continue;
1935         }
1936         if (pk11_destroy_rsa_object_priv(sp, uselock) == 0)
1937         {
1938             ret = 0;
1939             continue;
1940         }
1941     }

1943     if (session == NULL)
1944         (void) pthread_mutex_unlock(&session_cache[OP_RSA].lock);

1946     return (ret);
1947 }
1948 #endif /* OPENSSSL_NO_RSA */

1950 #ifndef OPENSSSL_NO_DSA
1951 /* Destroy DSA public key from single session. */
1952 int
1953 pk11_destroy_dsa_object_pub(PK11_SESSION *sp, CK_BBOOL uselock)
1954 {
1955     int ret = 0;

1957     if (sp->opdata_dsa_pub_key != CK_INVALID_HANDLE)
1958     {
1959         TRY_OBJ_DESTROY(sp->session, sp->opdata_dsa_pub_key,
1960             ret, uselock, OP_DSA);
1961         sp->opdata_dsa_pub_key = CK_INVALID_HANDLE;
1962         sp->opdata_dsa_pub = NULL;
1963         if (sp->opdata_dsa_pub_num != NULL)
1964         {
1965             BN_free(sp->opdata_dsa_pub_num);
1966             sp->opdata_dsa_pub_num = NULL;
1967         }
1968     }

1970     return (ret);
1971 }

1973 /* Destroy DSA private key from single session. */
1974 int
1975 pk11_destroy_dsa_object_priv(PK11_SESSION *sp, CK_BBOOL uselock)

```

```

1976     {
1977         int ret = 0;

1979         if (sp->opdata_dsa_priv_key != CK_INVALID_HANDLE)
1980         {
1981             TRY_OBJ_DESTROY(sp->session, sp->opdata_dsa_priv_key,
1982                 ret, uselock, OP_DSA);
1983             sp->opdata_dsa_priv_key = CK_INVALID_HANDLE;
1984             sp->opdata_dsa_priv = NULL;
1985             if (sp->opdata_dsa_priv_num != NULL)
1986             {
1987                 BN_free(sp->opdata_dsa_priv_num);
1988                 sp->opdata_dsa_priv_num = NULL;
1989             }
1990         }

1992         return (ret);
1993     }

1995 /*
1996  * Destroy DSA key object wrapper. If session is NULL, try to destroy all
1997  * objects in the free list.
1998  */
1999 int
2000 pk11_destroy_dsa_key_objects(PK11_SESSION *session)
2001 {
2002     int ret = 1;
2003     PK11_SESSION *sp = NULL;
2004     PK11_SESSION *local_free_session;
2005     CK_BBOOL uselock = TRUE;

2007     if (session != NULL)
2008         local_free_session = session;
2009     else
2010     {
2011         (void) pthread_mutex_lock(session_cache[OP_DSA].lock);
2012         local_free_session = session_cache[OP_DSA].head;
2013         uselock = FALSE;
2014     }

2016     /*
2017      * go through the list of sessions and delete key objects
2018      */
2019     while ((sp = local_free_session) != NULL)
2020     {
2021         local_free_session = sp->next;

2023         /*
2024          * Do not terminate list traversal if one of the
2025          * destroy operations fails.
2026          */
2027         if (pk11_destroy_dsa_object_pub(sp, uselock) == 0)
2028         {
2029             ret = 0;
2030             continue;
2031         }
2032         if (pk11_destroy_dsa_object_priv(sp, uselock) == 0)
2033         {
2034             ret = 0;
2035             continue;
2036         }
2037     }

2039     if (session == NULL)
2040         (void) pthread_mutex_unlock(session_cache[OP_DSA].lock);

```

```

2042         return (ret);
2043     }
2044 #endif /* OPENSSSL_NO_DSA */

2046 #ifndef OPENSSSL_NO_DH
2047 /* Destroy DH key from single session. */
2048 int
2049 pk11_destroy_dh_object(PK11_SESSION *sp, CK_BBOOL uselock)
2050 {
2051     int ret = 0;

2053     if (sp->opdata_dh_key != CK_INVALID_HANDLE)
2054     {
2055         TRY_OBJ_DESTROY(sp->session, sp->opdata_dh_key,
2056             ret, uselock, OP_DH);
2057         sp->opdata_dh_key = CK_INVALID_HANDLE;
2058         sp->opdata_dh = NULL;
2059         if (sp->opdata_dh_priv_num != NULL)
2060         {
2061             BN_free(sp->opdata_dh_priv_num);
2062             sp->opdata_dh_priv_num = NULL;
2063         }
2064     }

2066     return (ret);
2067 }

2069 /*
2070  * Destroy DH key object wrapper.
2071  * arg0: pointer to PKCS#11 engine session structure
2072  * if session is NULL, try to destroy all objects in the free list
2073  */
2074 int
2075 pk11_destroy_dh_key_objects(PK11_SESSION *session)
2076 {
2077     int ret = 1;
2078     PK11_SESSION *sp = NULL;
2079     PK11_SESSION *local_free_session;
2080     CK_BBOOL uselock = TRUE;

2083     if (session != NULL)
2084         local_free_session = session;
2085     else
2086     {
2087         (void) pthread_mutex_lock(session_cache[OP_DH].lock);
2088         local_free_session = session_cache[OP_DH].head;
2089         uselock = FALSE;
2090     }

2092     while ((sp = local_free_session) != NULL)
2093     {
2094         local_free_session = sp->next;

2096         /*
2097          * Do not terminate list traversal if one of the
2098          * destroy operations fails.
2099          */
2100         if (pk11_destroy_dh_object(sp, uselock) == 0)
2101         {
2102             ret = 0;
2103             continue;
2104         }
2105     }
2106     if (session == NULL)
2107         (void) pthread_mutex_unlock(session_cache[OP_DH].lock);

```

```

2109     return (ret);
2110 }
2111 #endif /* OPENSSSL_NO_DH */

2113 static int pk11_destroy_object(CK_SESSION_HANDLE session, CK_OBJECT_HANDLE oh)
2114 {
2115     CK_RV rv;
2116     rv = pFuncList->C_DestroyObject(session, oh);
2117     if (rv != CKR_OK)
2118     {
2119         PK11err_add_data(PK11_F_DESTROY_OBJECT, PK11_R_DESTROYOBJECT,
2120             rv);
2121         return (0);
2122     }

2124     return (1);
2125 }

2128 /* Symmetric ciphers and digests support functions */

2130 static int
2131 cipher_nid_to_pk11(int nid)
2132 {
2133     int i;

2135     for (i = 0; i < PK11_CIPHER_MAX; i++)
2136         if (ciphers[i].nid == nid)
2137             return (ciphers[i].id);
2138     return (-1);
2139 }

2141 static int
2142 pk11_usable_ciphers(const int **nids)
2143 {
2144     if (cipher_count > 0)
2145         *nids = cipher_nids;
2146     else
2147         *nids = NULL;
2148     return (cipher_count);
2149 }

2151 static int
2152 pk11_usable_digests(const int **nids)
2153 {
2154     if (digest_count > 0)
2155         *nids = digest_nids;
2156     else
2157         *nids = NULL;
2158     return (digest_count);
2159 }

2161 /*
2162  * Init context for encryption or decryption using a symmetric key.
2163  */
2164 static int pk11_init_symmetric(EVP_CIPHER_CTX *ctx, PK11_CIPHER *pcipher,
2165     PK11_SESSION *sp, CK_MECHANISM_PTR pmech)
2166 {
2167     CK_RV rv;
2168 #ifdef SOLARIS_AES_CTR
2169     CK_AES_CTR_PARAMS ctr_params;
2170 #endif /* SOLARIS_AES_CTR */

2172     /*
2173      * We expect pmech->mechanism to be already set and

```

```

2174     * pParameter/ulParameterLen initialized to NULL/0 before
2175     * pk11_init_symmetric() is called.
2176     */
2177     OPENSSSL_assert(pmech->mechanism != NULL);
2178     OPENSSSL_assert(pmech->pParameter == NULL);
2179     OPENSSSL_assert(pmech->ulParameterLen == 0);

2181 #ifdef SOLARIS_AES_CTR
2182     if (ctx->cipher->nid == NID_aes_128_ctr ||
2183         ctx->cipher->nid == NID_aes_192_ctr ||
2184         ctx->cipher->nid == NID_aes_256_ctr)
2185     {
2186         pmech->pParameter = (void *)&ctr_params;
2187         pmech->ulParameterLen = sizeof (ctr_params);
2188         /*
2189          * For now, we are limited to the fixed length of the counter,
2190          * it covers the whole counter block. That's what RFC 4344
2191          * needs. For more information on internal structure of the
2192          * counter block, see RFC 3686. If needed in the future, we can
2193          * add code so that the counter length can be set via
2194          * ENGINE_ctrl() function.
2195          */
2196         ctr_params.ulCounterBits = AES_BLOCK_SIZE * 8;
2197         OPENSSSL_assert(pcipher->iv_len == AES_BLOCK_SIZE);
2198         (void) memcpy(ctr_params.cb, ctx->iv, AES_BLOCK_SIZE);
2199     }
2200     else
2201 #endif /* SOLARIS_AES_CTR */
2202     {
2203         if (pcipher->iv_len > 0)
2204         {
2205             pmech->pParameter = (void *)ctx->iv;
2206             pmech->ulParameterLen = pcipher->iv_len;
2207         }
2208     }

2210     /* if we get here, the encryption needs to be reinitialized */
2211     if (ctx->encrypt)
2212         rv = pFuncList->C_EncryptInit(sp->session, pmech,
2213             sp->opdata_cipher_key);
2214     else
2215         rv = pFuncList->C_DecryptInit(sp->session, pmech,
2216             sp->opdata_cipher_key);

2218     if (rv != CKR_OK)
2219     {
2220         PK11err_add_data(PK11_F_CIPHER_INIT, ctx->encrypt ?
2221             PK11_R_ENCRYPTINIT : PK11_R_DECRYPTINIT, rv);
2222         pk11_return_session(sp, OP_CIPHER);
2223         return (0);
2224     }

2226     return (1);
2227 }

2229 /* ARGSUSED */
2230 static int
2231 pk11_cipher_init(EVP_CIPHER_CTX *ctx, const unsigned char *key,
2232     const unsigned char *iv, int enc)
2233 {
2234     CK_MECHANISM mech;
2235     int index;
2236     PK11_CIPHER_STATE *state = (PK11_CIPHER_STATE *) ctx->cipher_data;
2237     PK11_SESSION *sp;
2238     PK11_CIPHER *p_ciph_table_row;

```

```

2240     state->sp = NULL;

2242     index = cipher_nid_to_pk11(ctx->cipher->nid);
2243     if (index < 0 || index >= PK11_CIPHER_MAX)
2244         return (0);

2246     p_ciph_table_row = &ciphers[index];
2247     /*
2248     * iv_len in the ctx->cipher structure is the maximum IV length for the
2249     * current cipher and it must be less or equal to the IV length in our
2250     * ciphers table. The key length must be in the allowed interval. From
2251     * all cipher modes that the PKCS#11 engine supports only RC4 allows a
2252     * key length to be in some range, all other NIDs have a precise key
2253     * length. Every application can define its own EVP functions so this
2254     * code serves as a sanity check.
2255     *
2256     * Note that the reason why the IV length in ctx->cipher might be
2257     * greater than the actual length is that OpenSSL uses BLOCK_CIPHER_defs
2258     * macro to define functions that return EVP structures for all DES
2259     * modes. So, even ECB modes get 8 byte IV.
2260     */
2261     if (ctx->cipher->iv_len < p_ciph_table_row->iv_len ||
2262         ctx->key_len < p_ciph_table_row->min_key_len ||
2263         ctx->key_len > p_ciph_table_row->max_key_len) {
2264         PK11err(PK11_F_CIPHER_INIT, PK11_R_KEY_OR_IV_LEN_PROBLEM);
2265         return (0);
2266     }

2268     if ((sp = pk11_get_session(OP_CIPHER)) == NULL)
2269         return (0);

2271     /* if applicable, the mechanism parameter is used for IV */
2272     mech.mechanism = p_ciph_table_row->mech_type;
2273     mech.pParameter = NULL;
2274     mech.ulParameterLen = 0;

2276     /* The key object is destroyed here if it is not the current key. */
2277     (void) check_new_cipher_key(sp, key, ctx->key_len);

2279     /*
2280     * If the key is the same and the encryption is also the same, then
2281     * just reuse it. However, we must not forget to reinitialize the
2282     * context that was finalized in pk11_cipher_cleanup().
2283     */
2284     if (sp->opdata_cipher_key != CK_INVALID_HANDLE &&
2285         sp->opdata_encrypt == ctx->encrypt)
2286     {
2287         state->sp = sp;
2288         if (pk11_init_symmetric(ctx, p_ciph_table_row, sp, &mech) == 0)
2289             return (0);

2291         return (1);
2292     }

2294     /*
2295     * Check if the key has been invalidated. If so, a new key object
2296     * needs to be created.
2297     */
2298     if (sp->opdata_cipher_key == CK_INVALID_HANDLE)
2299     {
2300         sp->opdata_cipher_key = pk11_get_cipher_key(
2301             ctx, key, p_ciph_table_row->key_type, sp);
2302     }

2304     if (sp->opdata_encrypt != ctx->encrypt && sp->opdata_encrypt != -1)
2305     {

```

```

2306         /*
2307         * The previous encryption/decryption is different. Need to
2308         * terminate the previous * active encryption/decryption here.
2309         */
2310         if (!pk11_cipher_final(sp))
2311         {
2312             pk11_return_session(sp, OP_CIPHER);
2313             return (0);
2314         }
2315     }

2317     if (sp->opdata_cipher_key == CK_INVALID_HANDLE)
2318     {
2319         pk11_return_session(sp, OP_CIPHER);
2320         return (0);
2321     }

2323     /* now initialize the context with a new key */
2324     if (pk11_init_symmetric(ctx, p_ciph_table_row, sp, &mech) == 0)
2325         return (0);

2327     sp->opdata_encrypt = ctx->encrypt;
2328     state->sp = sp;

2330     return (1);
2331 }

2333 /*
2334 * When reusing the same key in an encryption/decryption session for a
2335 * decryption/encryption session, we need to close the active session
2336 * and recreate a new one. Note that the key is in the global session so
2337 * that it needs not be recreated.
2338 *
2339 * It is more appropriate to use C_EncryptFinish here. At the time of this
2340 * development, these two functions in the PKCS#11 libraries used return
2341 * unexpected errors when passing in 0 length output. It may be a good
2342 * idea to try them again if performance is a problem here and fix
2343 * C_EncryptFinal if there are bugs there causing the problem.
2344 */
2345 static int
2346 pk11_cipher_final(PK11_SESSION *sp)
2347 {
2348     CK_RV rv;

2350     rv = pFuncList->C_CloseSession(sp->session);
2351     if (rv != CKR_OK)
2352     {
2353         PK11err_add_data(PK11_F_CIPHER_FINAL, PK11_R_CLOSESESSION, rv);
2354         return (0);
2355     }

2357     rv = pFuncList->C_OpenSession(SLOTID, CKF_SERIAL_SESSION,
2358         NULL_PTR, NULL_PTR, &sp->session);
2359     if (rv != CKR_OK)
2360     {
2361         PK11err_add_data(PK11_F_CIPHER_FINAL, PK11_R_OPENSESSION, rv);
2362         return (0);
2363     }

2365     return (1);
2366 }

2368 /*
2369 * An engine interface function. The calling function allocates sufficient
2370 * memory for the output buffer "out" to hold the results.
2371 */

```

```

2372 static int
2373 pk11_cipher_do_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
2374                       const unsigned char *in, size_t inl)
2375 {
2376     PK11_CIPHER_STATE *state = (PK11_CIPHER_STATE *) ctx->cipher_data;
2377     PK11_SESSION *sp;
2378     CK_RV rv;
2379     unsigned long outl = inl;

2381     if (state == NULL || state->sp == NULL)
2382         return (0);

2384     sp = (PK11_SESSION *) state->sp;

2386     if (!inl)
2387         return (1);

2389     /* RC4 is the only stream cipher we support */
2390     if (ctx->cipher->nid != NID_rc4 && (inl % ctx->cipher->block_size) != 0)
2391         return (0);

2393     if (ctx->encrypt)
2394     {
2395         rv = pFuncList->C_EncryptUpdate(sp->session,
2396                                         (unsigned char *)in, inl, out, &outl);

2398         if (rv != CKR_OK)
2399         {
2400             PK11err_add_data(PK11_F_CIPHER_DO_CIPHER,
2401                             PK11_R_ENCRYPTUPDATE, rv);
2402             return (0);
2403         }
2404     }
2405     else
2406     {
2407         rv = pFuncList->C_DecryptUpdate(sp->session,
2408                                         (unsigned char *)in, inl, out, &outl);

2410         if (rv != CKR_OK)
2411         {
2412             PK11err_add_data(PK11_F_CIPHER_DO_CIPHER,
2413                             PK11_R_DECRYPTUPDATE, rv);
2414             return (0);
2415         }
2416     }

2418     /*
2419     * For DES_CBC, DES3_CBC, AES_CBC, and RC4, the output size is always
2420     * the same size of input.
2421     * The application has guaranteed to call the block ciphers with
2422     * correctly aligned buffers.
2423     */
2424     if (inl != outl)
2425         return (0);

2427     return (1);
2428 }

2430 /*
2431 * Return the session to the pool. Calling C_EncryptFinal() and C_DecryptFinal()
2432 * here is the right thing because in EVP_DecryptFinal_ex(), engine's
2433 * do_cipher() is not even called, and in EVP_EncryptFinal_ex() it is called but
2434 * the engine can't find out that it's the finalizing call. We wouldn't
2435 * necessarily have to finalize the context here since reinitializing it with
2436 * C_(Encrypt|Decrypt)Init() should be fine but for the sake of correctness,
2437 * let's do it. Some implementations might leak memory if the previously used

```

```

2438 * context is initialized without finalizing it first.
2439 */
2440 static int
2441 pk11_cipher_cleanup(EVP_CIPHER_CTX *ctx)
2442 {
2443     CK_RV rv;
2444     CK_ULONG len = EVP_MAX_BLOCK_LENGTH;
2445     CK_BYTE buf[EVP_MAX_BLOCK_LENGTH];
2446     PK11_CIPHER_STATE *state = ctx->cipher_data;

2448     if (state != NULL && state->sp != NULL)
2449     {
2450         /*
2451          * We are not interested in the data here, we just need to get
2452          * rid of the context.
2453          */
2454         if (ctx->encrypt)
2455             rv = pFuncList->C_EncryptFinal(
2456                 state->sp->session, buf, &len);
2457         else
2458             rv = pFuncList->C_DecryptFinal(
2459                 state->sp->session, buf, &len);

2461         if (rv != CKR_OK)
2462         {
2463             PK11err_add_data(PK11_F_CIPHER_CLEANUP, ctx->encrypt ?
2464                             PK11_R_ENCRYPTFINAL : PK11_R_DECRYPTFINAL, rv);
2465             pk11_return_session(state->sp, OP_CIPHER);
2466             return (0);
2467         }

2469         pk11_return_session(state->sp, OP_CIPHER);
2470         state->sp = NULL;
2471     }

2473     return (1);
2474 }

2476 /*
2477 * Registered by the ENGINE when used to find out how to deal with
2478 * a particular NID in the ENGINE. This says what we'll do at the
2479 * top level - note, that list is restricted by what we answer with
2480 */
2481 /* ARGSUSED */
2482 static int
2483 pk11_engine_ciphers(ENGINE *e, const EVP_CIPHER **cipher,
2484                     const int **nids, int nid)
2485 {
2486     if (!cipher)
2487         return (pk11_usable_ciphers(nids));

2489     switch (nid)
2490     {
2491         case NID_des_ede3_cbc:
2492             *cipher = &pk11_3des_cbc;
2493             break;
2494         case NID_des_cbc:
2495             *cipher = &pk11_des_cbc;
2496             break;
2497         case NID_des_ede3_ecb:
2498             *cipher = &pk11_3des_ecb;
2499             break;
2500         case NID_des_ecb:
2501             *cipher = &pk11_des_ecb;
2502             break;
2503         case NID_aes_128_cbc:

```



```

2504         *cipher = &pk11_aes_128_cbc;
2505         break;
2506     case NID_aes_192_cbc:
2507         *cipher = &pk11_aes_192_cbc;
2508         break;
2509     case NID_aes_256_cbc:
2510         *cipher = &pk11_aes_256_cbc;
2511         break;
2512     case NID_aes_128_ecb:
2513         *cipher = &pk11_aes_128_ecb;
2514         break;
2515     case NID_aes_192_ecb:
2516         *cipher = &pk11_aes_192_ecb;
2517         break;
2518     case NID_aes_256_ecb:
2519         *cipher = &pk11_aes_256_ecb;
2520         break;
2521     case NID_bf_cbc:
2522         *cipher = &pk11_bf_cbc;
2523         break;
2524     case NID_rc4:
2525         *cipher = &pk11_rc4;
2526         break;
2527     default:
2528 #ifdef SOLARIS_AES_CTR
2529         /*
2530          * These can't be in separated cases because the NIDs
2531          * here are not constants.
2532          */
2533         if (nid == NID_aes_128_ctr)
2534             *cipher = &pk11_aes_128_ctr;
2535         else if (nid == NID_aes_192_ctr)
2536             *cipher = &pk11_aes_192_ctr;
2537         else if (nid == NID_aes_256_ctr)
2538             *cipher = &pk11_aes_256_ctr;
2539         else
2540 #endif /* SOLARIS_AES_CTR */
2541             *cipher = NULL;
2542         break;
2543     }
2544     return (*cipher != NULL);
2545 }

2547 /* ARGSUSED */
2548 static int
2549 pk11_engine_digests(ENGINE *e, const EVP_MD **digest,
2550                    const int **nids, int nid)
2551 {
2552     if (!digest)
2553         return (pk11_usable_digests(nids));
2554
2555     switch (nid)
2556     {
2557     case NID_md5:
2558         *digest = &pk11_md5;
2559         break;
2560     case NID_sha1:
2561         *digest = &pk11_sha1;
2562         break;
2563     case NID_sha224:
2564         *digest = &pk11_sha224;
2565         break;
2566     case NID_sha256:
2567         *digest = &pk11_sha256;
2568         break;
2569     case NID_sha384:

```

```

2570         *digest = &pk11_sha384;
2571         break;
2572     case NID_sha512:
2573         *digest = &pk11_sha512;
2574         break;
2575     default:
2576         *digest = NULL;
2577         break;
2578     }
2579     return (*digest != NULL);
2580 }

2583 /* Create a secret key object in a PKCS#11 session */
2584 static CK_OBJECT_HANDLE pk11_get_cipher_key(EVP_CIPHER_CTX *ctx,
2585                                             const unsigned char *key, CK_KEY_TYPE key_type, PK11_SESSION *sp)
2586 {
2587     CK_RV rv;
2588     CK_OBJECT_HANDLE h_key = CK_INVALID_HANDLE;
2589     CK_OBJECT_CLASS obj_key = CKO_SECRET_KEY;
2590     CK_ULONG ul_key_attr_count = 6;

2592     CK_ATTRIBUTE a_key_template[] =
2593     {
2594         {CKA_CLASS, (void*) NULL, sizeof (CK_OBJECT_CLASS)},
2595         {CKA_KEY_TYPE, (void*) NULL, sizeof (CK_KEY_TYPE)},
2596         {CKA_TOKEN, &false, sizeof (false)},
2597         {CKA_ENCRYPT, &true, sizeof (true)},
2598         {CKA_DECRYPT, &true, sizeof (true)},
2599         {CKA_VALUE, (void*) NULL, 0},
2600     };

2602     /*
2603      * Create secret key object in global session. All other sessions
2604      * can use the key handles. Here is why:
2605      * OpenSSL will call EncryptInit and EncryptUpdate using a secret key.
2606      * It may then call DecryptInit and DecryptUpdate using the same key.
2607      * To use the same key object, we need to call EncryptFinal with
2608      * a 0 length message. Currently, this does not work for 3DES
2609      * mechanism. To get around this problem, we close the session and
2610      * then create a new session to use the same key object. When a session
2611      * is closed, all the object handles will be invalid. Thus, create key
2612      * objects in a global session, an individual session may be closed to
2613      * terminate the active operation.
2614      */
2615     CK_SESSION_HANDLE session = global_session;
2616     a_key_template[0].pValue = &obj_key;
2617     a_key_template[1].pValue = &key_type;
2618     a_key_template[5].pValue = (void *) key;
2619     a_key_template[5].ulValueLen = (unsigned long) ctx->key_len;

2621     rv = pFuncList->C_CreateObject(session,
2622                                   a_key_template, ul_key_attr_count, &h_key);
2623     if (rv != CKR_OK)
2624     {
2625         PK11err_add_data(PK11_F_GET_CIPHER_KEY, PK11_R_CREATEOBJECT,
2626                        rv);
2627         goto err;
2628     }

2630     /*
2631      * Save the key information used in this session.
2632      * The max can be saved is PK11_KEY_LEN_MAX.
2633      */
2634     sp->opdata_key_len = ctx->key_len > PK11_KEY_LEN_MAX ?
2635         PK11_KEY_LEN_MAX : ctx->key_len;

```

```

2636     (void) memcpy(sp->opdata_key, key, sp->opdata_key_len);
2637 err:
2638
2639     return (h_key);
2640 }
2641
2642 static int
2643 md_nid_to_pk11(int nid)
2644 {
2645     int i;
2646
2647     for (i = 0; i < PK11_DIGEST_MAX; i++)
2648         if (digests[i].nid == nid)
2649             return (digests[i].id);
2650     return (-1);
2651 }
2652
2653 static int
2654 pk11_digest_init(EVP_MD_CTX *ctx)
2655 {
2656     CK_RV rv;
2657     CK_MECHANISM mech;
2658     int index;
2659     PK11_SESSION *sp;
2660     PK11_DIGEST *pdp;
2661     PK11_CIPHER_STATE *state = (PK11_CIPHER_STATE *) ctx->md_data;
2662
2663     state->sp = NULL;
2664
2665     index = md_nid_to_pk11(ctx->digest->type);
2666     if (index < 0 || index >= PK11_DIGEST_MAX)
2667         return (0);
2668
2669     pdp = &digests[index];
2670     if ((sp = pk11_get_session(OP_DIGEST)) == NULL)
2671         return (0);
2672
2673     /* at present, no parameter is needed for supported digests */
2674     mech.mechanism = pdp->mech_type;
2675     mech.pParameter = NULL;
2676     mech.ulParameterLen = 0;
2677
2678     rv = pFuncList->C_DigestInit(sp->session, &mech);
2679
2680     if (rv != CKR_OK)
2681     {
2682         PK11err_add_data(PK11_F_DIGEST_INIT, PK11_R_DIGESTINIT, rv);
2683         pk11_return_session(sp, OP_DIGEST);
2684         return (0);
2685     }
2686
2687     state->sp = sp;
2688
2689     return (1);
2690 }
2691
2692 static int
2693 pk11_digest_update(EVP_MD_CTX *ctx, const void *data, size_t count)
2694 {
2695     CK_RV rv;
2696     PK11_CIPHER_STATE *state = (PK11_CIPHER_STATE *) ctx->md_data;
2697
2698     /* 0 length message will cause a failure in C_DigestFinal */
2699     if (count == 0)
2700         return (1);

```

```

2702     if (state == NULL || state->sp == NULL)
2703         return (0);
2704
2705     rv = pFuncList->C_DigestUpdate(state->sp->session, (CK_BYTE *) data,
2706                                     count);
2707
2708     if (rv != CKR_OK)
2709     {
2710         PK11err_add_data(PK11_F_DIGEST_UPDATE, PK11_R_DIGESTUPDATE, rv);
2711         pk11_return_session(state->sp, OP_DIGEST);
2712         state->sp = NULL;
2713         return (0);
2714     }
2715
2716     return (1);
2717 }
2718
2719 static int
2720 pk11_digest_final(EVP_MD_CTX *ctx, unsigned char *md)
2721 {
2722     CK_RV rv;
2723     unsigned long len;
2724     PK11_CIPHER_STATE *state = (PK11_CIPHER_STATE *) ctx->md_data;
2725     len = ctx->digest->md_size;
2726
2727     if (state == NULL || state->sp == NULL)
2728         return (0);
2729
2730     rv = pFuncList->C_DigestFinal(state->sp->session, md, &len);
2731
2732     if (rv != CKR_OK)
2733     {
2734         PK11err_add_data(PK11_F_DIGEST_FINAL, PK11_R_DIGESTFINAL, rv);
2735         pk11_return_session(state->sp, OP_DIGEST);
2736         state->sp = NULL;
2737         return (0);
2738     }
2739
2740     if (ctx->digest->md_size != len)
2741         return (0);
2742
2743     /*
2744      * Final is called and digest is returned, so return the session
2745      * to the pool
2746      */
2747     pk11_return_session(state->sp, OP_DIGEST);
2748     state->sp = NULL;
2749
2750     return (1);
2751 }
2752
2753 static int
2754 pk11_digest_copy(EVP_MD_CTX *to, const EVP_MD_CTX *from)
2755 {
2756     CK_RV rv;
2757     int ret = 0;
2758     PK11_CIPHER_STATE *state, *state_to;
2759     CK_BYTE_PTR pstate = NULL;
2760     CK_ULONG ul_state_len;
2761
2762     /* The copy-from state */
2763     state = (PK11_CIPHER_STATE *) from->md_data;
2764     if (state == NULL || state->sp == NULL)
2765         goto err;
2766
2767     /* Initialize the copy-to state */

```

```

2768     if (!pk11_digest_init(to))
2769         goto err;
2770     state_to = (PK11_CIPHER_STATE *) to->md_data;

2772     /* Get the size of the operation state of the copy-from session */
2773     rv = pFuncList->C_GetOperationState(state->sp->session, NULL,
2774         &ul_state_len);

2776     if (rv != CKR_OK)
2777     {
2778         PK11err_add_data(PK11_F_DIGEST_COPY, PK11_R_GET_OPERATION_STATE,
2779             rv);
2780         goto err;
2781     }
2782     if (ul_state_len == 0)
2783     {
2784         goto err;
2785     }

2787     pstate = OPENSSL_malloc(ul_state_len);
2788     if (pstate == NULL)
2789     {
2790         PK11err(PK11_F_DIGEST_COPY, PK11_R_MALLOC_FAILURE);
2791         goto err;
2792     }

2794     /* Get the operation state of the copy-from session */
2795     rv = pFuncList->C_GetOperationState(state->sp->session, pstate,
2796         &ul_state_len);

2798     if (rv != CKR_OK)
2799     {
2800         PK11err_add_data(PK11_F_DIGEST_COPY, PK11_R_GET_OPERATION_STATE,
2801             rv);
2802         goto err;
2803     }

2805     /* Set the operation state of the copy-to session */
2806     rv = pFuncList->C_SetOperationState(state_to->sp->session, pstate,
2807         ul_state_len, 0, 0);

2809     if (rv != CKR_OK)
2810     {
2811         PK11err_add_data(PK11_F_DIGEST_COPY,
2812             PK11_R_SET_OPERATION_STATE, rv);
2813         goto err;
2814     }

2816     ret = 1;
2817 err:
2818     if (pstate != NULL)
2819         OPENSSL_free(pstate);

2821     return (ret);
2822 }

2824 /* Return any pending session state to the pool */
2825 static int
2826 pk11_digest_cleanup(EVP_MD_CTX *ctx)
2827 {
2828     PK11_CIPHER_STATE *state = ctx->md_data;
2829     unsigned char buf[EVP_MAX_MD_SIZE];

2831     if (state != NULL && state->sp != NULL)
2832     {
2833         /*

```

```

2834         * If state->sp is not NULL then pk11_digest_final() has not
2835         * been called yet. We must call it now to free any memory
2836         * that might have been allocated in the token when
2837         * pk11_digest_init() was called. pk11_digest_final()
2838         * will return the session to the cache.
2839         */
2840         if (!pk11_digest_final(ctx, buf))
2841             return (0);
2842     }

2844     return (1);
2845 }

2847 /*
2848  * Check if the new key is the same as the key object in the session. If the key
2849  * is the same, no need to create a new key object. Otherwise, the old key
2850  * object needs to be destroyed and a new one will be created. Return 1 for
2851  * cache hit, 0 for cache miss. Note that we must check the key length first
2852  * otherwise we could end up reusing a different, longer key with the same
2853  * prefix.
2854  */
2855 static int check_new_cipher_key(PK11_SESSION *sp, const unsigned char *key,
2856     int key_len)
2857 {
2858     if (sp->opdata_key_len != key_len ||
2859         memcmp(sp->opdata_key, key, key_len) != 0)
2860     {
2861         (void) pk11_destroy_cipher_key_objects(sp);
2862         return (0);
2863     }
2864     return (1);
2865 }

2867 /* Destroy one or more secret key objects. */
2868 static int pk11_destroy_cipher_key_objects(PK11_SESSION *session)
2869 {
2870     int ret = 0;
2871     PK11_SESSION *sp = NULL;
2872     PK11_SESSION *local_free_session;

2874     if (session != NULL)
2875         local_free_session = session;
2876     else
2877     {
2878         (void) pthread_mutex_lock(session_cache[OP_CIPHER].lock);
2879         local_free_session = session_cache[OP_CIPHER].head;
2880     }

2882     while ((sp = local_free_session) != NULL)
2883     {
2884         local_free_session = sp->next;

2886         if (sp->opdata_cipher_key != CK_INVALID_HANDLE)
2887         {
2888             /*
2889              * The secret key object is created in the
2890              * global_session. See pk11_get_cipher_key
2891              */
2892             if (pk11_destroy_object(global_session,
2893                 sp->opdata_cipher_key) == 0)
2894                 goto err;
2895             sp->opdata_cipher_key = CK_INVALID_HANDLE;
2896         }
2897     }
2898     ret = 1;
2899 err:

```

```

2901     if (session == NULL)
2902         (void) pthread_mutex_unlock(session_cache[OP_CIPHER].lock);

2904     return (ret);
2905 }

2908 /*
2909  * Public key mechanisms optionally supported
2910  *
2911  * CKM_RSA_X_509
2912  * CKM_RSA_PKCS
2913  * CKM_DSA
2914  *
2915  * The first slot that supports at least one of those mechanisms is chosen as a
2916  * public key slot.
2917  *
2918  * Symmetric ciphers optionally supported
2919  *
2920  * CKM_DES3_CBC
2921  * CKM_DES_CBC
2922  * CKM_AES_CBC
2923  * CKM_DES3_ECB
2924  * CKM_DES_ECB
2925  * CKM_AES_ECB
2926  * CKM_AES_CTR
2927  * CKM_RC4
2928  * CKM_BLOWFISH_CBC
2929  *
2930  * Digests optionally supported
2931  *
2932  * CKM_MD5
2933  * CKM_SHA_1
2934  * CKM_SHA224
2935  * CKM_SHA256
2936  * CKM_SHA384
2937  * CKM_SHA512
2938  *
2939  * The output of this function is a set of global variables indicating which
2940  * mechanisms from RSA, DSA, DH and RAND are present, and also two arrays of
2941  * mechanisms, one for symmetric ciphers and one for digests. Also, 3 global
2942  * variables carry information about which slot was chosen for (a) public key
2943  * mechanisms, (b) random operations, and (c) symmetric ciphers and digests.
2944  */
2945 static int
2946 pk11_choose_slots(int *any_slot_found)
2947 {
2948     CK_SLOT_ID_PTR pSlotList = NULL_PTR;
2949     CK_ULONG ulSlotCount = 0;
2950     CK_MECHANISM_INFO mech_info;
2951     CK_TOKEN_INFO token_info;
2952     int i;
2953     CK_RV rv;
2954     CK_SLOT_ID best_slot_sofar = 0;
2955     CK_BBOOL found_candidate_slot = CK_FALSE;
2956     int slot_n_cipher = 0;
2957     int slot_n_digest = 0;
2958     CK_SLOT_ID current_slot = 0;
2959     int current_slot_n_cipher = 0;
2960     int current_slot_n_digest = 0;

2962     int local_cipher_nids[PK11_CIPHER_MAX];
2963     int local_digest_nids[PK11_DIGEST_MAX];

2965     /* let's initialize the output parameter */

```

```

2966     if (any_slot_found != NULL)
2967         *any_slot_found = 0;

2969     /* Get slot list for memory allocation */
2970     rv = pFuncList->C_GetSlotList(0, NULL_PTR, &ulSlotCount);

2972     if (rv != CKR_OK)
2973     {
2974         PK11err_add_data(PK11_F_CHOOSE_SLOT, PK11_R_GETSLOTLIST, rv);
2975         return (0);
2976     }

2978     /* it's not an error if we didn't find any providers */
2979     if (ulSlotCount == 0)
2980     {
2981 #ifdef DEBUG_SLOT_SELECTION
2982         fprintf(stderr, "%s: no crypto providers found\n", PK11_DBG);
2983 #endif /* DEBUG_SLOT_SELECTION */
2984         return (1);
2985     }

2987     pSlotList = OPENSSL_malloc(ulSlotCount * sizeof(CK_SLOT_ID));

2989     if (pSlotList == NULL)
2990     {
2991         PK11err(PK11_F_CHOOSE_SLOT, PK11_R_MALLOC_FAILURE);
2992         return (0);
2993     }

2995     /* Get the slot list for processing */
2996     rv = pFuncList->C_GetSlotList(0, pSlotList, &ulSlotCount);
2997     if (rv != CKR_OK)
2998     {
2999         PK11err_add_data(PK11_F_CHOOSE_SLOT, PK11_R_GETSLOTLIST, rv);
3000         OPENSSL_free(pSlotList);
3001         return (0);
3002     }

3004 #ifdef DEBUG_SLOT_SELECTION
3005     fprintf(stderr, "%s: provider: %s\n", PK11_DBG, def_PK11_LIBNAME);
3006     fprintf(stderr, "%s: number of slots: %d\n", PK11_DBG, ulSlotCount);

3008     fprintf(stderr, "%s: == checking rand slots ==\n", PK11_DBG);
3009 #endif /* DEBUG_SLOT_SELECTION */
3010     for (i = 0; i < ulSlotCount; i++)
3011     {
3012         current_slot = pSlotList[i];

3014 #ifdef DEBUG_SLOT_SELECTION
3015         fprintf(stderr, "%s: checking slot: %d\n", PK11_DBG, i);
3016 #endif /* DEBUG_SLOT_SELECTION */
3017         /* Check if slot has random support. */
3018         rv = pFuncList->C_GetTokenInfo(current_slot, &token_info);
3019         if (rv != CKR_OK)
3020             continue;

3022 #ifdef DEBUG_SLOT_SELECTION
3023         fprintf(stderr, "%s: token label: %.32s\n", PK11_DBG, token_info.label);
3024 #endif /* DEBUG_SLOT_SELECTION */

3026         if (token_info.flags & CKF_RNG)
3027         {
3028 #ifdef DEBUG_SLOT_SELECTION
3029             fprintf(stderr, "%s: this token has CKF_RNG flag\n", PK11_DBG);
3030 #endif /* DEBUG_SLOT_SELECTION */
3031             pk11_have_random = CK_TRUE;

```

```

3032         rand_SLOTID = current_slot;
3033         break;
3034     }
3035 }

3037 #ifdef DEBUG_SLOT_SELECTION
3038 fprintf(stderr, "%s: == checking pubkey slots ==\n", PK11_DBG);
3039 #endif /* DEBUG_SLOT_SELECTION */

3041 pubkey_SLOTID = pSlotList[0];
3042 for (i = 0; i < ulSlotCount; i++)
3043 {
3044     CK_BBOOL slot_has_rsa = CK_FALSE;
3045     CK_BBOOL slot_has_dsa = CK_FALSE;
3046     CK_BBOOL slot_has_dh = CK_FALSE;
3047     current_slot = pSlotList[i];

3049 #ifdef DEBUG_SLOT_SELECTION
3050 fprintf(stderr, "%s: checking slot: %d\n", PK11_DBG, i);
3051 #endif /* DEBUG_SLOT_SELECTION */
3052 rv = pFuncList->C_GetTokenInfo(current_slot, &token_info);
3053 if (rv != CKR_OK)
3054     continue;

3056 #ifdef DEBUG_SLOT_SELECTION
3057 fprintf(stderr, "%s: token label: %.32s\n", PK11_DBG, token_info.label);
3058 #endif /* DEBUG_SLOT_SELECTION */

3060 #ifndef OPENSSSL_NO_RSA
3061 /*
3062  * Check if this slot is capable of signing and
3063  * verifying with CKM_RSA_PKCS.
3064  */
3065 rv = pFuncList->C_GetMechanismInfo(current_slot, CKM_RSA_PKCS,
3066     &mech_info);

3068 if (rv == CKR_OK && ((mech_info.flags & CKF_SIGN) &&
3069     (mech_info.flags & CKF_VERIFY)))
3070 {
3071     /*
3072     * Check if this slot is capable of encryption,
3073     * decryption, sign, and verify with CKM_RSA_X_509.
3074     */
3075     rv = pFuncList->C_GetMechanismInfo(current_slot,
3076         CKM_RSA_X_509, &mech_info);

3078     if (rv == CKR_OK && ((mech_info.flags & CKF_SIGN) &&
3079         (mech_info.flags & CKF_VERIFY) &&
3080         (mech_info.flags & CKF_ENCRYPT) &&
3081         (mech_info.flags & CKF_VERIFY_RECOVER) &&
3082         (mech_info.flags & CKF_DECRYPT)))
3083     {
3084         slot_has_rsa = CK_TRUE;
3085     }
3086 }
3087 #endif /* OPENSSSL_NO_RSA */

3089 #ifndef OPENSSSL_NO_DSA
3090 /*
3091  * Check if this slot is capable of signing and
3092  * verifying with CKM_DSA.
3093  */
3094 rv = pFuncList->C_GetMechanismInfo(current_slot, CKM_DSA,
3095     &mech_info);
3096 if (rv == CKR_OK && ((mech_info.flags & CKF_SIGN) &&
3097     (mech_info.flags & CKF_VERIFY)))

```

```

3098     {
3099         slot_has_dsa = CK_TRUE;
3100     }

3102 #endif /* OPENSSSL_NO_DSA */

3104 #ifndef OPENSSSL_NO_DH
3105 /*
3106  * Check if this slot is capable of DH key generation and
3107  * derivation.
3108  */
3109 rv = pFuncList->C_GetMechanismInfo(current_slot,
3110     CKM_DH_PKCS_KEY_PAIR_GEN, &mech_info);

3112 if (rv == CKR_OK && (mech_info.flags & CKF_GENERATE_KEY_PAIR))
3113 {
3114     rv = pFuncList->C_GetMechanismInfo(current_slot,
3115         CKM_DH_PKCS_DERIVE, &mech_info);
3116     if (rv == CKR_OK && (mech_info.flags & CKF_DERIVE))
3117     {
3118         slot_has_dh = CK_TRUE;
3119     }
3120 }
3121 #endif /* OPENSSSL_NO_DH */

3123 if (!found_candidate_slot &&
3124     (slot_has_rsa || slot_has_dsa || slot_has_dh))
3125 {
3126 #ifdef DEBUG_SLOT_SELECTION
3127     fprintf(stderr,
3128         "%s: potential slot: %d\n", PK11_DBG, current_slot);
3129 #endif /* DEBUG_SLOT_SELECTION */
3130     best_slot_sofar = current_slot;
3131     pk11_have_rsa = slot_has_rsa;
3132     pk11_have_dsa = slot_has_dsa;
3133     pk11_have_dh = slot_has_dh;
3134     found_candidate_slot = CK_TRUE;
3135 #ifdef DEBUG_SLOT_SELECTION
3136     fprintf(stderr,
3137         "%s: setting found_candidate_slot to CK_TRUE\n",
3138         PK11_DBG);
3139     fprintf(stderr,
3140         "%s: best so far slot: %d\n", PK11_DBG,
3141         best_slot_sofar);
3142 }
3143 else
3144 {
3145     fprintf(stderr,
3146         "%s: no rsa/dsa/dh\n", PK11_DBG);
3147 }
3148 #else
3149 } /* if */
3150 #endif /* DEBUG_SLOT_SELECTION */
3151 } /* for */

3153 if (found_candidate_slot)
3154 {
3155     pubkey_SLOTID = best_slot_sofar;
3156 }

3158 found_candidate_slot = CK_FALSE;
3159 best_slot_sofar = 0;

3161 #ifdef DEBUG_SLOT_SELECTION
3162 fprintf(stderr, "%s: == checking cipher/digest ==\n", PK11_DBG);
3163 #endif /* DEBUG_SLOT_SELECTION */

```

```

3165     SLOTID = pSlotList[0];
3166     for (i = 0; i < ulSlotCount; i++)
3167     {
3168 #ifdef DEBUG_SLOT_SELECTION
3169         fprintf(stderr, "%s: checking slot: %d\n", PK11_DBG, i);
3170 #endif /* DEBUG_SLOT_SELECTION */

3172         current_slot = pSlotList[i];
3173         current_slot_n_cipher = 0;
3174         current_slot_n_digest = 0;
3175         (void) memset(local_cipher_nids, 0, sizeof (local_cipher_nids));
3176         (void) memset(local_digest_nids, 0, sizeof (local_digest_nids));

3178         pk11_find_symmetric_ciphers(pFuncList, current_slot,
3179                                     &current_slot_n_cipher, local_cipher_nids);

3181         pk11_find_digests(pFuncList, current_slot,
3182                           &current_slot_n_digest, local_digest_nids);

3184 #ifdef DEBUG_SLOT_SELECTION
3185         fprintf(stderr, "%s: current_slot_n_cipher %d\n", PK11_DBG,
3186                 current_slot_n_cipher);
3187         fprintf(stderr, "%s: current_slot_n_digest %d\n", PK11_DBG,
3188                 current_slot_n_digest);
3189         fprintf(stderr, "%s: best so far cipher/digest slot: %d\n",
3190                 PK11_DBG, best_slot_sofar);
3191 #endif /* DEBUG_SLOT_SELECTION */

3193         /*
3194          * If the current slot supports more ciphers/digests than
3195          * the previous best one we change the current best to this one,
3196          * otherwise leave it where it is.
3197          */
3198         if ((current_slot_n_cipher + current_slot_n_digest) >
3199             (slot_n_cipher + slot_n_digest))
3200         {
3201 #ifdef DEBUG_SLOT_SELECTION
3202             fprintf(stderr,
3203                     "%s: changing best so far slot to %d\n",
3204                     PK11_DBG, current_slot);
3205 #endif /* DEBUG_SLOT_SELECTION */
3206             best_slot_sofar = SLOTID = current_slot;
3207             cipher_count = slot_n_cipher = current_slot_n_cipher;
3208             digest_count = slot_n_digest = current_slot_n_digest;
3209             (void) memcpy(cipher_nids, local_cipher_nids,
3210                          sizeof (local_cipher_nids));
3211             (void) memcpy(digest_nids, local_digest_nids,
3212                          sizeof (local_digest_nids));
3213         }
3214     }

3216 #ifdef DEBUG_SLOT_SELECTION
3217     fprintf(stderr,
3218             "%s: chosen pubkey slot: %d\n", PK11_DBG, pubkey_SLOTID);
3219     fprintf(stderr,
3220             "%s: chosen rand slot: %d\n", PK11_DBG, rand_SLOTID);
3221     fprintf(stderr,
3222             "%s: chosen cipher/digest slot: %d\n", PK11_DBG, SLOTID);
3223     fprintf(stderr,
3224             "%s: pk11_have_rsa %d\n", PK11_DBG, pk11_have_rsa);
3225     fprintf(stderr,
3226             "%s: pk11_have_dsa %d\n", PK11_DBG, pk11_have_dsa);
3227     fprintf(stderr,
3228             "%s: pk11_have_dh %d\n", PK11_DBG, pk11_have_dh);
3229     fprintf(stderr,

```

```

3230         "%s: pk11_have_random %d\n", PK11_DBG, pk11_have_random);
3231     fprintf(stderr,
3232             "%s: cipher_count %d\n", PK11_DBG, cipher_count);
3233     fprintf(stderr,
3234             "%s: digest_count %d\n", PK11_DBG, digest_count);
3235 #endif /* DEBUG_SLOT_SELECTION */

3237     if (pSlotList != NULL)
3238         OPENSSL_free(pSlotList);

3240 #ifdef SOLARIS_HW_SLOT_SELECTION
3241     OPENSSL_free(hw_cnids);
3242     OPENSSL_free(hw_dnids);
3243 #endif /* SOLARIS_HW_SLOT_SELECTION */

3245     if (any_slot_found != NULL)
3246         *any_slot_found = 1;
3247     return (1);
3248 }

3250 static void pk11_get_symmetric_cipher(CK_FUNCTION_LIST_PTR pflist,
3251                                       int slot_id, CK_MECHANISM_TYPE mech, int *current_slot_n_cipher,
3252                                       int *local_cipher_nids, int id)
3253 {
3254     CK_MECHANISM_INFO mech_info;
3255     CK_RV rv;

3257 #ifdef DEBUG_SLOT_SELECTION
3258     fprintf(stderr, "%s: checking mech: %x", PK11_DBG, mech);
3259 #endif /* DEBUG_SLOT_SELECTION */
3260     rv = pflist->C_GetMechanismInfo(slot_id, mech, &mech_info);

3262     if (rv != CKR_OK)
3263     {
3264 #ifdef DEBUG_SLOT_SELECTION
3265         fprintf(stderr, " not found\n");
3266 #endif /* DEBUG_SLOT_SELECTION */
3267         return;
3268     }

3270     if ((mech_info.flags & CKF_ENCRYPT) &&
3271         (mech_info.flags & CKF_DECRYPT))
3272     {
3273 #ifdef SOLARIS_HW_SLOT_SELECTION
3274         if (nid_in_table(ciphers[id].nid, hw_cnids))
3275 #endif /* SOLARIS_HW_SLOT_SELECTION */
3276     {
3277 #ifdef DEBUG_SLOT_SELECTION
3278         fprintf(stderr, " usable\n");
3279 #endif /* DEBUG_SLOT_SELECTION */
3280         local_cipher_nids[(*current_slot_n_cipher)++] =
3281             ciphers[id].nid;
3282     }
3283 #ifdef SOLARIS_HW_SLOT_SELECTION
3284 #endif /* SOLARIS_HW_SLOT_SELECTION */
3285     else
3286     {
3287         fprintf(stderr, " rejected, software implementation only\n");
3288     }
3289 #endif /* DEBUG_SLOT_SELECTION */
3290 #endif /* SOLARIS_HW_SLOT_SELECTION */
3291 }

3292 #ifdef DEBUG_SLOT_SELECTION
3293 else
3294 {
3295     fprintf(stderr, " unusable\n");

```

```

3296     }
3297 #endif /* DEBUG_SLOT_SELECTION */

3299     return;
3300 }

3302 static void pk11_get_digest(CK_FUNCTION_LIST_PTR pflist, int slot_id,
3303 CK_MECHANISM_TYPE mech, int *current_slot_n_digest, int *local_digest_nids,
3304 int id)
3305 {
3306     CK_MECHANISM_INFO mech_info;
3307     CK_RV rv;

3309 #ifdef DEBUG_SLOT_SELECTION
3310     fprintf(stderr, "%s: checking mech: %x", PK11_DBG, mech);
3311 #endif /* DEBUG_SLOT_SELECTION */
3312     rv = pflist->C_GetMechanismInfo(slot_id, mech, &mech_info);

3314     if (rv != CKR_OK)
3315     {
3316 #ifdef DEBUG_SLOT_SELECTION
3317         fprintf(stderr, " not found\n");
3318 #endif /* DEBUG_SLOT_SELECTION */
3319         return;
3320     }

3322     if (mech_info.flags & CKF_DIGEST)
3323     {
3324 #ifdef SOLARIS_HW_SLOT_SELECTION
3325         if (nid_in_table(digests[id].nid, hw_dnids))
3326 #endif /* SOLARIS_HW_SLOT_SELECTION */
3327     {
3328 #ifdef DEBUG_SLOT_SELECTION
3329         fprintf(stderr, " usable\n");
3330 #endif /* DEBUG_SLOT_SELECTION */
3331         local_digest_nids[(*current_slot_n_digest)++] =
3332             digests[id].nid;
3333     }
3334 #ifdef SOLARIS_HW_SLOT_SELECTION
3335 #endif /* SOLARIS_HW_SLOT_SELECTION */
3336     else
3337     {
3338         fprintf(stderr, " rejected, software implementation only\n");
3339     }
3340 #endif /* DEBUG_SLOT_SELECTION */
3341 #endif /* SOLARIS_HW_SLOT_SELECTION */
3342 }
3343 #ifdef DEBUG_SLOT_SELECTION
3344 else
3345 {
3346     fprintf(stderr, " unusable\n");
3347 }
3348 #endif /* DEBUG_SLOT_SELECTION */

3350     return;
3351 }

3353 #ifdef SOLARIS_AES_CTR
3354 /*
3355  * Create new NIDs for AES counter mode. OpenSSL doesn't support them now so we
3356  * have to help ourselves here.
3357  */
3358 static int pk11_add_aes_ctr_NIDs(void)
3359 {
3360     /* are we already set? */
3361     if (NID_aes_256_ctr != NID_undef)

```

```

3362         return (1);

3364     /*
3365      * There are no official names for AES counter modes yet so we just
3366      * follow the format of those that exist.
3367      */
3368     ciphers[PK11_AES_128_CTR].nid = pk11_aes_128_ctr.nid = NID_aes_128_ctr;
3369     ciphers[PK11_AES_192_CTR].nid = pk11_aes_192_ctr.nid = NID_aes_192_ctr;
3370     ciphers[PK11_AES_256_CTR].nid = pk11_aes_256_ctr.nid = NID_aes_256_ctr;
3371     return (1);

3373 }
3374 #endif /* SOLARIS_AES_CTR */

3376 /* Find what symmetric ciphers this slot supports. */
3377 static void pk11_find_symmetric_ciphers(CK_FUNCTION_LIST_PTR pflist,
3378 CK_SLOT_ID current_slot, int *current_slot_n_cipher, int *local_cipher_nids)
3379 {
3380     int i;

3382     for (i = 0; i < PK11_CIPHER_MAX; ++i)
3383     {
3384         pk11_get_symmetric_cipher(pflist, current_slot,
3385             ciphers[i].mech_type, current_slot_n_cipher,
3386             local_cipher_nids, ciphers[i].id);
3387     }
3388 }

3390 /* Find what digest algorithms this slot supports. */
3391 static void pk11_find_digests(CK_FUNCTION_LIST_PTR pflist,
3392 CK_SLOT_ID current_slot, int *current_slot_n_digest, int *local_digest_nids)
3393 {
3394     int i;

3396     for (i = 0; i < PK11_DIGEST_MAX; ++i)
3397     {
3398         pk11_get_digest(pflist, current_slot, digests[i].mech_type,
3399             current_slot_n_digest, local_digest_nids, digests[i].id);
3400     }
3401 }

3403 #ifdef SOLARIS_HW_SLOT_SELECTION
3404 /*
3405  * It would be great if we could use pkcs11_kernel directly since this library
3406  * offers hardware slots only. That's the easiest way to achieve the situation
3407  * where we use the hardware accelerators when present and OpenSSL native code
3408  * otherwise. That presumes the fact that OpenSSL native code is faster than the
3409  * code in the soft token. It's a logical assumption - Crypto Framework has some
3410  * inherent overhead so going there for the software implementation of a
3411  * mechanism should be logically slower in contrast to the OpenSSL native code,
3412  * presuming that both implementations are of similar speed. For example, the
3413  * soft token for AES is roughly three times slower than OpenSSL for 64 byte
3414  * blocks and still 20% slower for 8KB blocks. So, if we want to ship products
3415  * that use the PKCS#11 engine by default, we must somehow avoid that regression
3416  * on machines without hardware acceleration. That's why switching to the
3417  * pkcs11_kernel library seems like a very good idea.
3418  *
3419  * The problem is that OpenSSL built with SunStudio is roughly 2x slower for
3420  * asymmetric operations (RSA/DSA/DH) than the soft token built with the same
3421  * compiler. That means that if we switched to pkcs11_kernel from the libpkcs11
3422  * library, we would have had a performance regression on machines without
3423  * hardware acceleration for asymmetric operations for all applications that use
3424  * the PKCS#11 engine. There is one such application - Apache web server since
3425  * it's shipped configured to use the PKCS#11 engine by default. Having said
3426  * that, we can't switch to the pkcs11_kernel library now and have to come with
3427  * a solution that, on non-accelerated machines, uses the OpenSSL native code

```

```

3428 * for all symmetric ciphers and digests while it uses the soft token for
3429 * asymmetric operations.
3430 *
3431 * This is the idea: dlopen() pkcs11_kernel directly and find out what
3432 * mechanisms are there. We don't care about duplications (more slots can
3433 * support the same mechanism), we just want to know what mechanisms can be
3434 * possibly supported in hardware on that particular machine. As said before,
3435 * pkcs11_kernel will show you hardware providers only.
3436 *
3437 * Then, we rely on the fact that since we use libpkcs11 library we will find
3438 * the metaslot. When we go through the metaslot's mechanisms for symmetric
3439 * ciphers and digests, we check that any found mechanism is in the table
3440 * created using the pkcs11_kernel library. So, as a result we have two arrays
3441 * of mechanisms that were advertised as supported in hardware which was the
3442 * goal of that whole exercise. Thus, we can use libpkcs11 but avoid soft token
3443 * code for symmetric ciphers and digests. See pk11_choose_slots() for more
3444 * information.
3445 *
3446 * This is Solaris specific code, if SOLARIS_HW_SLOT_SELECTION is not defined
3447 * the code won't be used.
3448 */
3449 #if defined(__sparcv9) || defined(__x86_64) || defined(__amd64)
3450 static const char pkcs11_kernel[] = "/usr/lib/security/64/pkcs11_kernel.so.1";
3451 #else
3452 static const char pkcs11_kernel[] = "/usr/lib/security/pkcs11_kernel.so.1";
3453 #endif
3454
3455 /*
3456 * Check hardware capabilities of the machines. The output are two lists,
3457 * hw_cnids and hw_dnids, that contain hardware mechanisms found in all hardware
3458 * providers together. They are not sorted and may contain duplicate mechanisms.
3459 */
3460 static int check_hw_mechanisms(void)
3461 {
3462     int i;
3463     CK_RV rv;
3464     void *handle;
3465     CK_C_GetFunctionList p;
3466     CK_TOKEN_INFO token_info;
3467     CK_ULONG ulSlotCount = 0;
3468     int n_cipher = 0, n_digest = 0;
3469     CK_FUNCTION_LIST_PTR pflist = NULL;
3470     CK_SLOT_ID_PTR pSlotList = NULL_PTR;
3471     int *tmp_hw_cnids=NULL, *tmp_hw_dnids=NULL;
3472     int hw_ctable_size, hw_dtable_size;
3473
3474     #ifdef DEBUG_SLOT_SELECTION
3475     fprintf(stderr, "%s: SOLARIS_HW_SLOT_SELECTION code running\n",
3476             PK11_DBG);
3477     #endif
3478     if ((handle = dlopen(pkcs11_kernel, RTLD_LAZY)) == NULL)
3479     {
3480         PK11err(PK11_F_CHECK_HW_MECHANISMS, PK11_R_DSO_FAILURE);
3481         goto err;
3482     }
3483
3484     if ((p = (CK_C_GetFunctionList)dlsym(handle,
3485             PK11_GET_FUNCTION_LIST)) == NULL)
3486     {
3487         PK11err(PK11_F_CHECK_HW_MECHANISMS, PK11_R_DSO_FAILURE);
3488         goto err;
3489     }
3490
3491     /* get the full function list from the loaded library */
3492     if (p(&pflist) != CKR_OK)
3493     {

```

```

3494         PK11err(PK11_F_CHECK_HW_MECHANISMS, PK11_R_DSO_FAILURE);
3495         goto err;
3496     }
3497
3498     rv = pflist->C_Initialize(NULL_PTR);
3499     if ((rv != CKR_OK) && (rv != CKR_CRYPTOKI_ALREADY_INITIALIZED))
3500     {
3501         PK11err_add_data(PK11_F_CHECK_HW_MECHANISMS,
3502             PK11_R_INITIALIZE, rv);
3503         goto err;
3504     }
3505
3506     if (pflist->C_GetSlotList(0, NULL_PTR, &ulSlotCount) != CKR_OK)
3507     {
3508         PK11err(PK11_F_CHECK_HW_MECHANISMS, PK11_R_GETSLOTLIST);
3509         goto err;
3510     }
3511
3512     /* no slots, set the hw mechanism tables as empty */
3513     if (ulSlotCount == 0)
3514     {
3515         #ifdef DEBUG_SLOT_SELECTION
3516         fprintf(stderr, "%s: no hardware mechanisms found\n", PK11_DBG);
3517         #endif
3518         hw_cnids = OPENSSL_malloc(sizeof(int));
3519         hw_dnids = OPENSSL_malloc(sizeof(int));
3520         if (hw_cnids == NULL || hw_dnids == NULL)
3521         {
3522             PK11err(PK11_F_CHECK_HW_MECHANISMS,
3523                 PK11_R_MALLOC_FAILURE);
3524             return (0);
3525         }
3526         /* this means empty tables */
3527         hw_cnids[0] = NID_undef;
3528         hw_dnids[0] = NID_undef;
3529         return (1);
3530     }
3531
3532     pSlotList = OPENSSL_malloc(ulSlotCount * sizeof(CK_SLOT_ID));
3533     if (pSlotList == NULL)
3534     {
3535         PK11err(PK11_F_CHECK_HW_MECHANISMS, PK11_R_MALLOC_FAILURE);
3536         goto err;
3537     }
3538
3539     /* Get the slot list for processing */
3540     if (pflist->C_GetSlotList(0, pSlotList, &ulSlotCount) != CKR_OK)
3541     {
3542         PK11err(PK11_F_CHECK_HW_MECHANISMS, PK11_R_GETSLOTLIST);
3543         goto err;
3544     }
3545
3546     /*
3547     * We don't care about duplicat mechanisms in multiple slots and also
3548     * reserve one slot for the terminal NID_undef which we use to stop the
3549     * search.
3550     */
3551     hw_ctable_size = ulSlotCount * PK11_CIPHER_MAX + 1;
3552     hw_dtable_size = ulSlotCount * PK11_DIGEST_MAX + 1;
3553     tmp_hw_cnids = OPENSSL_malloc(hw_ctable_size * sizeof(int));
3554     tmp_hw_dnids = OPENSSL_malloc(hw_dtable_size * sizeof(int));
3555     if (tmp_hw_cnids == NULL || tmp_hw_dnids == NULL)
3556     {
3557         PK11err(PK11_F_CHECK_HW_MECHANISMS, PK11_R_MALLOC_FAILURE);
3558         goto err;
3559     }

```



```

3561     /*
3562     * Do not use memset since we should not rely on the fact that NID_undef
3563     * is zero now.
3564     */
3565     for (i = 0; i < hw_ctable_size; ++i)
3566         tmp_hw_cnids[i] = NID_undef;
3567     for (i = 0; i < hw_dtable_size; ++i)
3568         tmp_hw_dnids[i] = NID_undef;

3570 #ifdef DEBUG_SLOT_SELECTION
3571     fprintf(stderr, "%s: provider: %s\n", PK11_DBG, pkcs11_kernel);
3572     fprintf(stderr, "%s: found %d hardware slots\n", PK11_DBG, ulSlotCount);
3573     fprintf(stderr, "%s: now looking for mechs supported in hw\n",
3574             PK11_DBG);
3575 #endif /* DEBUG_SLOT_SELECTION */

3577     for (i = 0; i < ulSlotCount; i++)
3578     {
3579         if (pflist->C_GetTokenInfo(pSlotList[i], &token_info) != CKR_OK)
3580             continue;

3582 #ifdef DEBUG_SLOT_SELECTION
3583     fprintf(stderr, "%s: token label: %.32s\n", PK11_DBG, token_info.label);
3584 #endif /* DEBUG_SLOT_SELECTION */

3586     /*
3587     * We are filling the hw mech tables here. Global tables are
3588     * still NULL so all mechanisms are put into tmp tables.
3589     */
3590     pk11_find_symmetric_ciphers(pflist, pSlotList[i],
3591                                &n_cipher, tmp_hw_cnids);
3592     pk11_find_digests(pflist, pSlotList[i],
3593                       &n_digest, tmp_hw_dnids);
3594     }

3596     /*
3597     * Since we are part of a library (libcrypto.so), calling this function
3598     * may have side-effects. Also, C_Finalize() is triggered by
3599     * dlclose(3C).
3600     */
3601     #if 0
3602     pflist->C_Finalize(NULL);
3603     #endif
3604     OPENSSL_free(pSlotList);
3605     (void) dlclose(handle);
3606     hw_cnids = tmp_hw_cnids;
3607     hw_dnids = tmp_hw_dnids;

3609 #ifdef DEBUG_SLOT_SELECTION
3610     fprintf(stderr, "%s: hw mechs check complete\n", PK11_DBG);
3611 #endif /* DEBUG_SLOT_SELECTION */
3612     return (1);

3614 err:
3615     if (pSlotList != NULL)
3616         OPENSSL_free(pSlotList);
3617     if (tmp_hw_cnids != NULL)
3618         OPENSSL_free(tmp_hw_cnids);
3619     if (tmp_hw_dnids != NULL)
3620         OPENSSL_free(tmp_hw_dnids);

3622     return (0);
3623 }

3625 /*

```

```

3626     * Check presence of a NID in the table of NIDs. The table may be NULL (i.e.,
3627     * non-existent).
3628     */
3629     static int nid_in_table(int nid, int *nid_table)
3630     {
3631         int i = 0;

3633         /*
3634         * a special case. NULL means that we are initializing a new
3635         * table.
3636         */
3637         if (nid_table == NULL)
3638             return (1);

3640         /*
3641         * the table is never full, there is always at least one
3642         * NID_undef.
3643         */
3644         while (nid_table[i] != NID_undef)
3645         {
3646             if (nid_table[i++] == nid)
3647             {
3648                 #ifdef DEBUG_SLOT_SELECTION
3649                     fprintf(stderr, "(NID %d in hw table, idx %d)", nid, i);
3650                 #endif /* DEBUG_SLOT_SELECTION */
3651                 return (1);
3652             }
3653         }

3655         return (0);
3656     }
3657 #endif /* SOLARIS_HW_SLOT_SELECTION */

3659 #endif /* OPENSSL_NO_HW_PK11 */
3660 #endif /* OPENSSL_NO_HW */

```

```

*****
11334 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/hw_pk11_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
3  * Use is subject to license terms.
4  */

6 /* crypto/engine/hw_pk11_err.c */
7 /*
8  * This product includes software developed by the OpenSSL Project for
9  * use in the OpenSSL Toolkit (http://www.openssl.org/).
10 *
11 * This project also referenced hw_pkcs11-0.9.7b.patch written by
12 * Afchine Madjlessi.
13 */
14 /*
15 * =====
16 * Copyright (c) 2000-2001 The OpenSSL Project. All rights reserved.
17 *
18 * Redistribution and use in source and binary forms, with or without
19 * modification, are permitted provided that the following conditions
20 * are met:
21 *
22 * 1. Redistributions of source code must retain the above copyright
23 * notice, this list of conditions and the following disclaimer.
24 *
25 * 2. Redistributions in binary form must reproduce the above copyright
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28 * distribution.
29 *
30 * 3. All advertising materials mentioning features or use of this
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49 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT 'AS IS' AND ANY
50 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
51 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
52 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
53 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
54 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
55 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
56 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
57 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
58 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
59 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
60 * OF THE POSSIBILITY OF SUCH DAMAGE.
61 * =====

```

```

62 *
63 * This product includes cryptographic software written by Eric Young
64 * (eay@cryptsoft.com). This product includes software written by Tim
65 * Hudson (tjh@cryptsoft.com).
66 *
67 */

69 #include <stdio.h>
70 #include <openssl/opensslconf.h>
71 #include <openssl/err.h>
72 #include "hw_pk11_err.h"

74 /* BEGIN ERROR CODES */
75 #ifndef OPENSSL_NO_ERR
76 static ERR_STRING_DATA pk11_str_functs[]=
77 {
78 { ERR_PACK(0, PK11_F_INIT, 0), "PK11_INIT"},
79 { ERR_PACK(0, PK11_F_FINISH, 0), "PK11_FINISH"},
80 { ERR_PACK(0, PK11_F_DESTROY, 0), "PK11_DESTROY"},
81 { ERR_PACK(0, PK11_F_CTRL, 0), "PK11_CTRL"},
82 { ERR_PACK(0, PK11_F_RSA_INIT, 0), "PK11_RSA_INIT"},
83 { ERR_PACK(0, PK11_F_RSA_FINISH, 0), "PK11_RSA_FINISH"},
84 { ERR_PACK(0, PK11_F_GET_PUB_RSA_KEY, 0), "PK11_GET_PUB_RSA_KEY"},
85 { ERR_PACK(0, PK11_F_GET_PRIV_RSA_KEY, 0), "PK11_GET_PRIV_RSA_KEY"},
86 { ERR_PACK(0, PK11_F_RSA_GEN_KEY, 0), "PK11_RSA_GEN_KEY"},
87 { ERR_PACK(0, PK11_F_RSA_PUB_ENC, 0), "PK11_RSA_PUB_ENC"},
88 { ERR_PACK(0, PK11_F_RSA_PRIV_ENC, 0), "PK11_RSA_PRIV_ENC"},
89 { ERR_PACK(0, PK11_F_RSA_PUB_DEC, 0), "PK11_RSA_PUB_DEC"},
90 { ERR_PACK(0, PK11_F_RSA_PRIV_DEC, 0), "PK11_RSA_PRIV_DEC"},
91 { ERR_PACK(0, PK11_F_RSA_SIGN, 0), "PK11_RSA_SIGN"},
92 { ERR_PACK(0, PK11_F_RSA_VERIFY, 0), "PK11_RSA_VERIFY"},
93 { ERR_PACK(0, PK11_F_RAND_ADD, 0), "PK11_RAND_ADD"},
94 { ERR_PACK(0, PK11_F_RAND_BYTES, 0), "PK11_RAND_BYTES"},
95 { ERR_PACK(0, PK11_F_GET_SESSION, 0), "PK11_GET_SESSION"},
96 { ERR_PACK(0, PK11_F_FREE_SESSION, 0), "PK11_FREE_SESSION"},
97 { ERR_PACK(0, PK11_F_LOAD_PUBKEY, 0), "PK11_LOAD_PUBKEY"},
98 { ERR_PACK(0, PK11_F_LOAD_PRIVKEY, 0), "PK11_LOAD_PRIV_KEY"},
99 { ERR_PACK(0, PK11_F_RSA_PUB_ENC_LOW, 0), "PK11_RSA_PUB_ENC_LOW"},
100 { ERR_PACK(0, PK11_F_RSA_PRIV_ENC_LOW, 0), "PK11_RSA_PRIV_ENC_LOW"},
101 { ERR_PACK(0, PK11_F_RSA_PUB_DEC_LOW, 0), "PK11_RSA_PUB_DEC_LOW"},
102 { ERR_PACK(0, PK11_F_RSA_PRIV_DEC_LOW, 0), "PK11_RSA_PRIV_DEC_LOW"},
103 { ERR_PACK(0, PK11_F_DSA_SIGN, 0), "PK11_DSA_SIGN"},
104 { ERR_PACK(0, PK11_F_DSA_VERIFY, 0), "PK11_DSA_VERIFY"},
105 { ERR_PACK(0, PK11_F_DSA_INIT, 0), "PK11_DSA_INIT"},
106 { ERR_PACK(0, PK11_F_DSA_FINISH, 0), "PK11_DSA_FINISH"},
107 { ERR_PACK(0, PK11_F_GET_PUB_DSA_KEY, 0), "PK11_GET_PUB_DSA_KEY"},
108 { ERR_PACK(0, PK11_F_GET_PRIV_DSA_KEY, 0), "PK11_GET_PRIV_DSA_KEY"},
109 { ERR_PACK(0, PK11_F_DH_INIT, 0), "PK11_DH_INIT"},
110 { ERR_PACK(0, PK11_F_DH_FINISH, 0), "PK11_DH_FINISH"},
111 { ERR_PACK(0, PK11_F_MOD_EXP_DH, 0), "PK11_MOD_EXP_DH"},
112 { ERR_PACK(0, PK11_F_GET_DH_KEY, 0), "PK11_GET_DH_KEY"},
113 { ERR_PACK(0, PK11_F_FREE_ALL_SESSIONS, 0), "PK11_FREE_ALL_SESSIONS"},
114 { ERR_PACK(0, PK11_F_SETUP_SESSION, 0), "PK11_SETUP_SESSION"},
115 { ERR_PACK(0, PK11_F_DESTROY_OBJECT, 0), "PK11_DESTROY_OBJECT"},
116 { ERR_PACK(0, PK11_F_CIPHER_INIT, 0), "PK11_CIPHER_INIT"},
117 { ERR_PACK(0, PK11_F_CIPHER_DO_CIPHER, 0), "PK11_CIPHER_DO_CIPHER"},
118 { ERR_PACK(0, PK11_F_GET_CIPHER_KEY, 0), "PK11_GET_CIPHER_KEY"},
119 { ERR_PACK(0, PK11_F_DIGEST_INIT, 0), "PK11_DIGEST_INIT"},
120 { ERR_PACK(0, PK11_F_DIGEST_UPDATE, 0), "PK11_DIGEST_UPDATE"},
121 { ERR_PACK(0, PK11_F_DIGEST_FINAL, 0), "PK11_DIGEST_FINAL"},
122 { ERR_PACK(0, PK11_F_CHOOSE_SLOT, 0), "PK11_CHOOSE_SLOT"},
123 { ERR_PACK(0, PK11_F_CIPHER_FINAL, 0), "PK11_CIPHER_FINAL"},
124 { ERR_PACK(0, PK11_F_LIBRARY_INIT, 0), "PK11_LIBRARY_INIT"},
125 { ERR_PACK(0, PK11_F_LOAD, 0), "ENGINE_LOAD_PK11"},
126 { ERR_PACK(0, PK11_F_DH_GEN_KEY, 0), "PK11_DH_GEN_KEY"},
127 { ERR_PACK(0, PK11_F_DH_COMP_KEY, 0), "PK11_DH_COMP_KEY"},

```

```

128 { ERR_PACK(0, PK11_F_DIGEST_COPY, 0), "PK11_DIGEST_COPY"},
129 { ERR_PACK(0, PK11_F_CIPHER_CLEANUP, 0), "PK11_CIPHER_CLEANUP"},
130 { ERR_PACK(0, PK11_F_ACTIVE_ADD, 0), "PK11_ACTIVE_ADD"},
131 { ERR_PACK(0, PK11_F_ACTIVE_DELETE, 0), "PK11_ACTIVE_DELETE"},
132 { ERR_PACK(0, PK11_F_CHECK_HW_MECHANISMS, 0), "PK11_CHECK_HW_MECHANISMS"},
133 { ERR_PACK(0, PK11_F_INIT_SYMMETRIC, 0), "PK11_INIT_SYMMETRIC"},
134 { ERR_PACK(0, PK11_F_ADD_AES_CTR_NIDS, 0), "PK11_ADD_AES_CTR_NIDS"},
135 { 0, NULL}
136 };

```

```

138 static ERR_STRING_DATA pk11_str_reasons[]=

```

```

139 {
140     PK11_R_ALREADY_LOADED, "PKCS#11 DSO already loaded"},
141     PK11_R_DSO_FAILURE, "unable to load PKCS#11 DSO"},
142     PK11_R_NOT_LOADED, "PKCS#11 DSO not loaded"},
143     PK11_R_PASSED_NULL_PARAMETER, "null parameter passed"},
144     PK11_R_COMMAND_NOT_IMPLEMENTED, "command not implemented"},
145     PK11_R_INITIALIZE, "C.Initialize failed"},
146     PK11_R_FINALIZE, "C.Finalize failed"},
147     PK11_R_GETINFO, "C.GetInfo failed"},
148     PK11_R_GETSLOTLIST, "C.GetSlotList failed"},
149     PK11_R_NO_MODULUS_OR_NO_EXPONENT, "no modulus or no exponent"},
150     PK11_R_ATTRIBUT_SENSITIVE_OR_INVALID, "attr sensitive or invalid"},
151     PK11_R_GETATTRIBUTVALUE, "C.GetAttributeValue failed"},
152     PK11_R_NO_MODULUS, "no modulus"},
153     PK11_R_NO_EXPONENT, "no exponent"},
154     PK11_R_FINDOBJECTSINIT, "C.FindObjectsInit failed"},
155     PK11_R_FINDOBJECTS, "C.FindObjects failed"},
156     PK11_R_FINDOBJECTSFINAL, "C.FindObjectsFinal failed"},
157     PK11_R_CREATEOBJECT, "C.CreateObject failed"},
158     PK11_R_DESTROYOBJECT, "C.DestroyObject failed"},
159     PK11_R_OPENSESSION, "C.OpenSession failed"},
160     PK11_R_CLOSESESSION, "C.CloseSession failed"},
161     PK11_R_ENCRYPTINIT, "C.EncryptInit failed"},
162     PK11_R_ENCRYPT, "C.Encrypt failed"},
163     PK11_R_SIGNINIT, "C.SignInit failed"},
164     PK11_R_SIGN, "C.Sign failed"},
165     PK11_R_DECRYPTINIT, "C.DecryptInit failed"},
166     PK11_R_DECRYPT, "C.Decrypt failed"},
167     PK11_R_VERIFYINIT, "C.VerifyRecover failed"},
168     PK11_R_VERIFY, "C.Verify failed"},
169     PK11_R_VERIFYRECOVERINIT, "C.VerifyRecoverInit failed"},
170     PK11_R_VERIFYRECOVER, "C.VerifyRecover failed"},
171     PK11_R_GEN_KEY, "C.GenerateKeyPair failed"},
172     PK11_R_SEEDRANDOM, "C.SeedRandom failed"},
173     PK11_R_GENERATERANDOM, "C.GenerateRandom failed"},
174     PK11_R_INVALID_MESSAGE_LENGTH, "invalid message length"},
175     PK11_R_UNKNOWN_ALGORITHM_TYPE, "unknown algorithm type"},
176     PK11_R_UNKNOWN_ASN1_OBJECT_ID, "unknown asn1 object id"},
177     PK11_R_UNKNOWN_PADDING_TYPE, "unknown padding type"},
178     PK11_R_PADDING_CHECK_FAILED, "padding check failed"},
179     PK11_R_DIGEST_TOO_BIG, "digest too big"},
180     PK11_R_MALLOC_FAILURE, "malloc failure"},
181     PK11_R_CTRL_COMMAND_NOT_IMPLEMENTED, "ctl command not implemented"},
182     PK11_R_DATA_GREATER_THAN_MOD_LEN, "data is bigger than mod"},
183     PK11_R_DATA_TOO_LARGE_FOR_MODULUS, "data is too larger for mod"},
184     PK11_R_MISSING_KEY_COMPONENT, "a dsa component is missing"},
185     PK11_R_INVALID_SIGNATURE_LENGTH, "invalid signature length"},
186     PK11_R_INVALID_DSA_SIGNATURE_R, "missing r in dsa verify"},
187     PK11_R_INVALID_DSA_SIGNATURE_S, "missing s in dsa verify"},
188     PK11_R_INCONSISTENT_KEY, "inconsistent key type"},
189     PK11_R_ENCRYPTUPDATE, "C.EncryptUpdate failed"},
190     PK11_R_DECRYPTUPDATE, "C.DecryptUpdate failed"},
191     PK11_R_DIGESTINIT, "C.DigestInit failed"},
192     PK11_R_DIGESTUPDATE, "C.DigestUpdate failed"},
193     PK11_R_DIGESTFINAL, "C.DigestFinal failed"},

```

```

194 { PK11_R_ENCRYPTFINAL, "C.EncryptFinal failed"},
195 { PK11_R_DECRYPTFINAL, "C.DecryptFinal failed"},
196 { PK11_R_NO_PRNG_SUPPORT, "Slot does not support PRNG"},
197 { PK11_R_GETTOKENINFO, "C.GetTokenInfo failed"},
198 { PK11_R_DERIVEKEY, "C.DeriveKey failed"},
199 { PK11_R_GET_OPERATION_STATE, "C.GetOperationState failed"},
200 { PK11_R_SET_OPERATION_STATE, "C.SetOperationState failed"},
201 { PK11_R_INVALID_HANDLE, "invalid PKCS#11 object handle"},
202 { PK11_R_KEY_OR_IV_LEN_PROBLEM, "IV or key length incorrect"},
203 { PK11_R_INVALID_OPERATION_TYPE, "invalid operation type"},
204 { PK11_R_ADD_NID_FAILED, "failed to add NID"},
205 { 0, NULL}
206 };
207 #endif /* OPENSSEL_NO_ERR */

```

```

209 static int pk11_lib_error_code = 0;
210 static int pk11_error_init = 1;

```

```

212 static void
213 ERR_load_pk11_strings(void)
214 {
215     if (pk11_lib_error_code == 0)
216         pk11_lib_error_code = ERR_get_next_error_library();
217
218     if (pk11_error_init)
219     {
220         pk11_error_init = 0;
221         #ifndef OPENSSEL_NO_ERR
222             ERR_load_strings(pk11_lib_error_code, pk11_str_funcs);
223             ERR_load_strings(pk11_lib_error_code, pk11_str_reasons);
224         #endif
225     }
226 }

```

```

228 static void
229 ERR_unload_pk11_strings(void)
230 {
231     if (pk11_error_init == 0)
232     {
233         #ifndef OPENSSEL_NO_ERR
234             ERR_unload_strings(pk11_lib_error_code, pk11_str_funcs);
235             ERR_unload_strings(pk11_lib_error_code, pk11_str_reasons);
236         #endif
237         pk11_error_init = 1;
238     }
239 }

```

```

241 void
242 ERR_pk11_error(int function, int reason, char *file, int line)
243 {
244     if (pk11_lib_error_code == 0)
245         pk11_lib_error_code = ERR_get_next_error_library();
246     ERR_PUT_error(pk11_lib_error_code, function, reason, file, line);
247 }

```

```

249 void
250 PK11err_add_data(int function, int reason, CK_RV rv)
251 {
252     char tmp_buf[20];
253
254     PK11err(function, reason);
255     (void) snprintf(tmp_buf, sizeof(tmp_buf), "%lx", rv);
256     ERR_add_error_data(2, "PK11 CK_RV=0X", tmp_buf);
257 }

```

new/usr/src/lib/openssl/libsunw_crypto/engine/hw_pk11_pub.c

1

```
*****
70067 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/hw_pk11_pub.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*
2  * Copyright 2008 Sun Microsystems, Inc. All rights reserved.
3  * Use is subject to license terms.
4  */

6 /* crypto/engine/hw_pk11_pub.c */
7 /*
8  * This product includes software developed by the OpenSSL Project for
9  * use in the OpenSSL Toolkit (http://www.openssl.org/).
10 *
11 * This project also referenced hw_pkcs11-0.9.7b.patch written by
12 * Afchine Madjlessi.
13 */
14 /*
15 * =====
16 * Copyright (c) 2000-2001 The OpenSSL Project. All rights reserved.
17 *
18 * Redistribution and use in source and binary forms, with or without
19 * modification, are permitted provided that the following conditions
20 * are met:
21 *
22 * 1. Redistributions of source code must retain the above copyright
23 * notice, this list of conditions and the following disclaimer.
24 *
25 * 2. Redistributions in binary form must reproduce the above copyright
26 * notice, this list of conditions and the following disclaimer in
27 * the documentation and/or other materials provided with the
28 * distribution.
29 *
30 * 3. All advertising materials mentioning features or use of this
31 * software must display the following acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
34 *
35 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
36 * endorse or promote products derived from this software without
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41 * nor may "OpenSSL" appear in their names without prior written
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44 * 6. Redistributions of any form whatsoever must retain the following
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47 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
48 *
49 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT ''AS IS'' AND ANY
50 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
51 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
52 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
53 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
54 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
55 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
56 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
57 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
58 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
59 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
60 * OF THE POSSIBILITY OF SUCH DAMAGE.
61 * =====
```

new/usr/src/lib/openssl/libsunw_crypto/engine/hw_pk11_pub.c

2

```
62 *
63 * This product includes cryptographic software written by Eric Young
64 * (eay@cryptsoft.com). This product includes software written by Tim
65 * Hudson (tjh@cryptsoft.com).
66 *
67 */

69 #include <stdio.h>
70 #include <stdlib.h>
71 #include <string.h>
72 #include <sys/types.h>
73 #include <unistd.h>

75 #include <openssl/e_os2.h>
76 #include <openssl/crypto.h>
77 #include <openssl/engine.h>
78 #include <openssl/dso.h>
79 #include <openssl/err.h>
80 #include <openssl/bn.h>
81 #include <openssl/pem.h>
82 #ifndef OPENSSL_NO_RSA
83 #include <openssl/rsa.h>
84 #endif /* OPENSSL_NO_RSA */
85 #ifndef OPENSSL_NO_DSA
86 #include <openssl/dsa.h>
87 #endif /* OPENSSL_NO_DSA */
88 #ifndef OPENSSL_NO_DH
89 #include <openssl/dh.h>
90 #endif /* OPENSSL_NO_DH */
91 #include <openssl/rand.h>
92 #include <openssl/objects.h>
93 #include <openssl/x509.h>
94 #include <cryptlib.h>
95 #include <pthread.h>

97 #ifndef OPENSSL_NO_HW
98 #ifndef OPENSSL_NO_HW_PK11

100 #include "cryptoki.h"
101 #include "pkcs11.h"
102 #include "hw_pk11_err.h"

104 #ifndef OPENSSL_NO_RSA
105 /* RSA stuff */
106 static int pk11_RSA_public_encrypt(int flen, const unsigned char *from,
107     unsigned char *to, RSA *rsa, int padding);
108 static int pk11_RSA_private_encrypt(int flen, const unsigned char *from,
109     unsigned char *to, RSA *rsa, int padding);
110 static int pk11_RSA_public_decrypt(int flen, const unsigned char *from,
111     unsigned char *to, RSA *rsa, int padding);
112 static int pk11_RSA_private_decrypt(int flen, const unsigned char *from,
113     unsigned char *to, RSA *rsa, int padding);
114 static int pk11_RSA_init(RSA *rsa);
115 static int pk11_RSA_finish(RSA *rsa);
116 static int pk11_RSA_sign(int type, const unsigned char *m, unsigned int m_len,
117     unsigned char *sigret, unsigned int *siglen, const RSA *rsa);
118 static int pk11_RSA_verify(int dtype, const unsigned char *m,
119     unsigned int m_len, const unsigned char *sigbuf, unsigned int siglen,
120     const RSA *rsa);
121 EVP_PKEY *pk11_load_privkey(ENGINE*, const char *pubkey_file,
122     UI_METHOD *ui_method, void *callback_data);
123 EVP_PKEY *pk11_load_pubkey(ENGINE*, const char *pubkey_file,
124     UI_METHOD *ui_method, void *callback_data);

126 static int pk11_RSA_public_encrypt_low(int flen, const unsigned char *from,
127     unsigned char *to, RSA *rsa);
```

```

128 static int pk11_RSA_private_encrypt_low(int flen, const unsigned char *from,
129 unsigned char *to, RSA *rsa);
130 static int pk11_RSA_public_decrypt_low(int flen, const unsigned char *from,
131 unsigned char *to, RSA *rsa);
132 static int pk11_RSA_private_decrypt_low(int flen, const unsigned char *from,
133 unsigned char *to, RSA *rsa);

135 static CK_OBJECT_HANDLE pk11_get_public_rsa_key(RSA* rsa, RSA** key_ptr,
136 BIGNUM **rsa_n_num, BIGNUM **rsa_e_num, CK_SESSION_HANDLE session);
137 static CK_OBJECT_HANDLE pk11_get_private_rsa_key(RSA* rsa, RSA** key_ptr,
138 BIGNUM **rsa_d_num, CK_SESSION_HANDLE session);

140 static int check_new_rsa_key_pub(PK11_SESSION *sp, const RSA *rsa);
141 static int check_new_rsa_key_priv(PK11_SESSION *sp, const RSA *rsa);
142 #endif

144 /* DSA stuff */
145 #ifndef OPENSSL_NO_DSA
146 static int pk11_DSA_init(DSA *dsa);
147 static int pk11_DSA_finish(DSA *dsa);
148 static DSA_SIG *pk11_dsa_do_sign(const unsigned char *dgst, int dlen,
149 DSA *dsa);
150 static int pk11_dsa_do_verify(const unsigned char *dgst, int dgst_len,
151 DSA_SIG *sig, DSA *dsa);

153 static CK_OBJECT_HANDLE pk11_get_public_dsa_key(DSA* dsa, DSA **key_ptr,
154 BIGNUM **dsa_pub_num, CK_SESSION_HANDLE session);
155 static CK_OBJECT_HANDLE pk11_get_private_dsa_key(DSA* dsa, DSA **key_ptr,
156 BIGNUM **dsa_priv_num, CK_SESSION_HANDLE session);

158 static int check_new_dsa_key_pub(PK11_SESSION *sp, DSA *dsa);
159 static int check_new_dsa_key_priv(PK11_SESSION *sp, DSA *dsa);
160 #endif

162 /* DH stuff */
163 #ifndef OPENSSL_NO_DH
164 static int pk11_DH_init(DH *dh);
165 static int pk11_DH_finish(DH *dh);
166 static int pk11_DH_generate_key(DH *dh);
167 static int pk11_DH_compute_key(unsigned char *key,
168 const BIGNUM *pub_key, DH *dh);

170 static CK_OBJECT_HANDLE pk11_get_dh_key(DH* dh, DH **key_ptr,
171 BIGNUM **priv_key, CK_SESSION_HANDLE session);

173 static int check_new_dh_key(PK11_SESSION *sp, DH *dh);
174 #endif

176 static int init_template_value(BIGNUM *bn, CK_VOID_PTR *pValue,
177 CK_ULONG *ulValueLen);

179 /* Read mode string to be used for fopen() */
180 #if SOLARIS_OPENSSL
181 static char *read_mode_flags = "rF";
182 #else
183 static char *read_mode_flags = "r";
184 #endif

186 /*
187 * increment/create reference for an asymmetric key handle via active list
188 * manipulation. If active list operation fails, unlock (if locked), set error
189 * variable and jump to the specified label.
190 */
191 #define KEY_HANDLE_REFHOLD(key_handle, alg_type, unlock, var, label) \
192 { \
193 if (sunw_pk11_active_add(key_handle, alg_type) < 0)

```

```

194 { \
195     var = TRUE; \
196     if (unlock) \
197         UNLOCK_OBJSTORE(alg_type); \
198     goto label; \
199 } \
200 }

202 /*
203 * Find active list entry according to object handle and return pointer to the
204 * entry otherwise return NULL.
205 *
206 * This function presumes it is called with lock protecting the active list
207 * held.
208 */
209 static PK11_active *pk11_active_find(CK_OBJECT_HANDLE h, PK11_OPTYPE type)
210 {
211     PK11_active *entry;

213     for (entry = active_list[type]; entry != NULL; entry = entry->next)
214         if (entry->h == h)
215             return (entry);

217     return (NULL);
218 }

220 /*
221 * Search for an entry in the active list using PKCS#11 object handle as a
222 * search key and return refcnt of the found/created entry or -1 in case of
223 * failure.
224 *
225 * This function presumes it is called with lock protecting the active list
226 * held.
227 */
228 int
229 sunw_pk11_active_add(CK_OBJECT_HANDLE h, PK11_OPTYPE type)
230 {
231     PK11_active *entry = NULL;

233     if (h == CK_INVALID_HANDLE)
234     {
235         PK11err(PK11_F_ACTIVE_ADD, PK11_R_INVALID_HANDLE);
236         return (-1);
237     }

239     /* search for entry in the active list */
240     if ((entry = pk11_active_find(h, type)) != NULL)
241         entry->refcnt++;
242     else
243     {
244         /* not found, create new entry and add it to the list */
245         entry = OPENSSL_malloc(sizeof(PK11_active));
246         if (entry == NULL)
247         {
248             PK11err(PK11_F_ACTIVE_ADD, PK11_R_MALLOC_FAILURE);
249             return (-1);
250         }
251         entry->h = h;
252         entry->refcnt = 1;
253         entry->prev = NULL;
254         entry->next = NULL;
255         /* connect the newly created entry to the list */
256         if (active_list[type] == NULL)
257             active_list[type] = entry;
258         else /* make the entry first in the list */
259             {

```

```

260         entry->next = active_list[type];
261         active_list[type]->prev = entry;
262         active_list[type] = entry;
263     }
264 }
265
266     return (entry->refcnt);
267 }
268
269 /*
270  * Remove active list entry from the list and free it.
271  * This function presumes it is called with lock protecting the active list
272  * held.
273  */
274 void
275 sunw_pk11_active_remove(PK11_active *entry, PK11_OPTYPE type)
276 {
277     PK11_active *prev_entry;
278
279     /* remove the entry from the list and free it */
280     if ((prev_entry = entry->prev) != NULL)
281     {
282         prev_entry->next = entry->next;
283         if (entry->next != NULL)
284             entry->next->prev = prev_entry;
285     }
286     else
287     {
288         active_list[type] = entry->next;
289         /* we were the first but not the only one */
290         if (entry->next != NULL)
291             entry->next->prev = NULL;
292     }
293
294     /* sanitization */
295     entry->h = CK_INVALID_HANDLE;
296     entry->prev = NULL;
297     entry->next = NULL;
298     OPENSSL_free(entry);
299 }
300
301 /* Free all entries from the active list. */
302 void
303 sunw_pk11_free_active_list(PK11_OPTYPE type)
304 {
305     PK11_active *entry;
306
307     /* only for asymmetric types since only they have C_Find* locks. */
308     switch (type)
309     {
310         case OP_RSA:
311         case OP_DSA:
312         case OP_DH:
313             break;
314         default:
315             return;
316     }
317
318     /* see find_lock array definition for more info on object locking */
319     LOCK_OBJSTORE(type);
320     while ((entry = active_list[type]) != NULL)
321         sunw_pk11_active_remove(entry, type);
322     UNLOCK_OBJSTORE(type);
323 }
324

```

```

326 /*
327  * Search for active list entry associated with given PKCS#11 object handle,
328  * decrement its refcnt and if it drops to 0, disconnect the entry and free it.
329  *
330  * Return 1 if the PKCS#11 object associated with the entry has no references,
331  * return 0 if there is at least one reference, -1 on error.
332  *
333  * This function presumes it is called with lock protecting the active list
334  * held.
335  */
336 int
337 sunw_pk11_active_delete(CK_OBJECT_HANDLE h, PK11_OPTYPE type)
338 {
339     PK11_active *entry = NULL;
340
341     if ((entry = pk11_active_find(h, type)) == NULL)
342     {
343         PK11err(PK11_F_ACTIVE_DELETE, PK11_R_INVALID_HANDLE);
344         return (-1);
345     }
346
347     OPENSSL_assert(entry->refcnt > 0);
348     entry->refcnt--;
349     if (entry->refcnt == 0)
350     {
351         sunw_pk11_active_remove(entry, type);
352         return (1);
353     }
354
355     return (0);
356 }
357
358 #ifndef OPENSSL_NO_RSA
359 /* Our internal RSA_METHOD that we provide pointers to */
360 static RSA_METHOD pk11_rsa =
361 {
362     "PKCS#11 RSA method",
363     pk11_RSA_public_encrypt,      /* rsa_pub_encrypt */
364     pk11_RSA_public_decrypt,     /* rsa_pub_decrypt */
365     pk11_RSA_private_encrypt,    /* rsa_priv_encrypt */
366     pk11_RSA_private_decrypt,   /* rsa_priv_decrypt */
367     NULL,                        /* rsa_mod_exp */
368     NULL,                        /* bn_mod_exp */
369     pk11_RSA_init,              /* init */
370     pk11_RSA_finish,            /* finish */
371     RSA_FLAG_SIGN_VER,          /* flags */
372     NULL,                        /* app_data */
373     pk11_RSA_sign,              /* rsa_sign */
374     pk11_RSA_verify,            /* rsa_verify */
375 };
376
377 RSA_METHOD *
378 PK11_RSA(void)
379 {
380     return (&pk11_rsa);
381 }
382 #endif
383
384 #ifndef OPENSSL_NO_DSA
385 /* Our internal DSA_METHOD that we provide pointers to */
386 static DSA_METHOD pk11_dsa =
387 {
388     "PKCS#11 DSA method",
389     pk11_dsa_do_sign,            /* dsa_do_sign */
390     NULL,                        /* dsa_sign_setup */
391     pk11_dsa_do_verify,          /* dsa_do_verify */

```

```

392     NULL,                /* dsa_mod_exp */
393     NULL,                /* bn_mod_exp */
394     pk11_DSA_init,       /* init */
395     pk11_DSA_finish,     /* finish */
396     0,                   /* flags */
397     NULL,                 /* app_data */
398 };

400 DSA_METHOD *
401 PK11_DSA(void)
402 {
403     return (&pk11_dsa);
404 }
405 #endif

407 #ifndef OPENSSL_NO_DH
408 /*
409  * PKCS #11 V2.20, section 11.2 specifies that the number of bytes needed for
410  * output buffer may somewhat exceed the precise number of bytes needed, but
411  * should not exceed it by a large amount. That may be caused, for example, by
412  * rounding it up to multiple of X in the underlying bignum library. 8 should be
413  * enough.
414  */
415 #define DH_BUF_RESERVE 8

417 /* Our internal DH_METHOD that we provide pointers to */
418 static DH_METHOD pk11_dh =
419 {
420     "PKCS#11 DH method",
421     pk11_DH_generate_key, /* generate_key */
422     pk11_DH_compute_key, /* compute_key */
423     NULL,                 /* bn_mod_exp */
424     pk11_DH_init,         /* init */
425     pk11_DH_finish,       /* finish */
426     0,                    /* flags */
427     NULL,                 /* app_data */
428     NULL,                 /* generate_params */
429 };

431 DH_METHOD *
432 PK11_DH(void)
433 {
434     return (&pk11_dh);
435 }
436 #endif

438 /* Size of an SSL signature: MD5+SHA1 */
439 #define SSL_SIG_LENGTH 36

441 /* Lengths of DSA data and signature */
442 #define DSA_DATA_LEN 20
443 #define DSA_SIGNATURE_LEN 40

445 static CK_BBOOL true = TRUE;
446 static CK_BBOOL false = FALSE;

448 #ifndef OPENSSL_NO_RSA
449 /*
450  * Similar to OpenSSL to take advantage of the paddings. The goal is to
451  * support all paddings in this engine although PK11 library does not
452  * support all the paddings used in OpenSSL.
453  * The input errors should have been checked in the padding functions.
454  */
455 static int pk11_RSA_public_encrypt(int flen, const unsigned char *from,
456     unsigned char *to, RSA *rsa, int padding)
457 {

```

```

458     int i, num = 0, r = -1;
459     unsigned char *buf = NULL;

461     num = BN_num_bytes(rsa->n);
462     if ((buf = (unsigned char *)OPENSSL_malloc(num)) == NULL)
463     {
464         RSAerr(PK11_F_RSA_PUB_ENC, PK11_R_MALLOC_FAILURE);
465         goto err;
466     }

468     switch (padding)
469     {
470     case RSA_PKCS1_PADDING:
471         i = RSA_padding_add_PKCS1_type_2(buf, num, from, flen);
472         break;
473 #ifndef OPENSSL_NO_SHA
474     case RSA_PKCS1_OAEP_PADDING:
475         i = RSA_padding_add_PKCS1_OAEP(buf, num, from, flen, NULL, 0);
476         break;
477 #endif
478     case RSA_SSLV23_PADDING:
479         i = RSA_padding_add_SSLV23(buf, num, from, flen);
480         break;
481     case RSA_NO_PADDING:
482         i = RSA_padding_add_none(buf, num, from, flen);
483         break;
484     default:
485         RSAerr(PK11_F_RSA_PUB_ENC, PK11_R_UNKNOWN_PADDING_TYPE);
486         goto err;
487     }
488     if (i <= 0) goto err;

490     /* PK11 functions are called here */
491     r = pk11_RSA_public_encrypt_low(num, buf, to, rsa);
492 err:
493     if (buf != NULL)
494     {
495         OPENSSL_cleanse(buf, num);
496         OPENSSL_free(buf);
497     }
498     return (r);
499 }

502 /*
503  * Similar to OpenSSL to take advantage of the paddings. The input errors
504  * should be caught in the padding functions
505  */
506 static int pk11_RSA_private_encrypt(int flen, const unsigned char *from,
507     unsigned char *to, RSA *rsa, int padding)
508 {
509     int i, num = 0, r = -1;
510     unsigned char *buf = NULL;

512     num = BN_num_bytes(rsa->n);
513     if ((buf = (unsigned char *)OPENSSL_malloc(num)) == NULL)
514     {
515         RSAerr(PK11_F_RSA_PRIV_ENC, PK11_R_MALLOC_FAILURE);
516         goto err;
517     }

519     switch (padding)
520     {
521     case RSA_PKCS1_PADDING:
522         i = RSA_padding_add_PKCS1_type_1(buf, num, from, flen);
523         break;

```

```

524     case RSA_NO_PADDING:
525         i = RSA_padding_add_none(buf, num, from, flen);
526         break;
527     case RSA_SSLV23_PADDING:
528     default:
529         RSAerr(PK11_F_RSA_PRIV_ENC, PK11_R_UNKNOWN_PADDING_TYPE);
530         goto err;
531     }
532     if (i <= 0) goto err;

534     /* PK11 functions are called here */
535     r = pk11_RSA_private_encrypt_low(num, buf, to, rsa);
536 err:
537     if (buf != NULL)
538     {
539         OPENSSL_cleanse(buf, num);
540         OPENSSL_free(buf);
541     }
542     return (r);
543 }

545 /* Similar to OpenSSL code. Input errors are also checked here */
546 static int pk11_RSA_private_decrypt(int flen, const unsigned char *from,
547     unsigned char *to, RSA *rsa, int padding)
548 {
549     BIGNUM f;
550     int j, num = 0, r = -1;
551     unsigned char *p;
552     unsigned char *buf = NULL;

554     BN_init(&f);

556     num = BN_num_bytes(rsa->n);

558     if ((buf = (unsigned char *)OPENSSL_malloc(num)) == NULL)
559     {
560         RSAerr(PK11_F_RSA_PRIV_DEC, PK11_R_MALLOC_FAILURE);
561         goto err;
562     }

564     /*
565      * This check was for equality but PGP does evil things
566      * and chops off the top '0' bytes
567      */
568     if (flen > num)
569     {
570         RSAerr(PK11_F_RSA_PRIV_DEC,
571             PK11_R_DATA_GREATER_THAN_MOD_LEN);
572         goto err;
573     }

575     /* make data into a big number */
576     if (BN_bin2bn(from, (int)flen, &f) == NULL)
577         goto err;

579     if (BN_ucmp(&f, rsa->n) >= 0)
580     {
581         RSAerr(PK11_F_RSA_PRIV_DEC,
582             PK11_R_DATA_TOO_LARGE_FOR_MODULUS);
583         goto err;
584     }

586     /* PK11 functions are called here */
587     r = pk11_RSA_private_decrypt_low(flen, from, buf, rsa);
589     /*

```

```

590     * PK11 CKM_RSA_X_509 mechanism pads 0's at the beginning.
591     * Needs to skip these 0's paddings here.
592     */
593     for (j = 0; j < r; j++)
594         if (buf[j] != 0)
595             break;

597     p = buf + j;
598     j = r - j; /* j is only used with no-padding mode */

600     switch (padding)
601     {
602     case RSA_PKCS1_PADDING:
603         r = RSA_padding_check_PKCS1_type_2(to, num, p, j, num);
604         break;
605 #ifndef OPENSSL_NO_SHA
606     case RSA_PKCS1_OAEP_PADDING:
607         r = RSA_padding_check_PKCS1_OAEP(to, num, p, j, num, NULL, 0);
608         break;
609 #endif
610     case RSA_SSLV23_PADDING:
611         r = RSA_padding_check_SSLv23(to, num, p, j, num);
612         break;
613     case RSA_NO_PADDING:
614         r = RSA_padding_check_none(to, num, p, j, num);
615         break;
616     default:
617         RSAerr(PK11_F_RSA_PRIV_DEC, PK11_R_UNKNOWN_PADDING_TYPE);
618         goto err;
619     }
620     if (r < 0)
621         RSAerr(PK11_F_RSA_PRIV_DEC, PK11_R_PADDING_CHECK_FAILED);

623 err:
624     BN_clear_free(&f);
625     if (buf != NULL)
626     {
627         OPENSSL_cleanse(buf, num);
628         OPENSSL_free(buf);
629     }
630     return (r);
631 }

633 /* Similar to OpenSSL code. Input errors are also checked here */
634 static int pk11_RSA_public_decrypt(int flen, const unsigned char *from,
635     unsigned char *to, RSA *rsa, int padding)
636 {
637     BIGNUM f;
638     int i, num = 0, r = -1;
639     unsigned char *p;
640     unsigned char *buf = NULL;

642     BN_init(&f);
643     num = BN_num_bytes(rsa->n);
644     buf = (unsigned char *)OPENSSL_malloc(num);
645     if (buf == NULL)
646     {
647         RSAerr(PK11_F_RSA_PUB_DEC, PK11_R_MALLOC_FAILURE);
648         goto err;
649     }

651     /*
652      * This check was for equality but PGP does evil things
653      * and chops off the top '0' bytes
654      */
655     if (flen > num)

```



```

656     {
657         RSAerr(PK11_F_RSA_PUB_DEC, PK11_R_DATA_GREATER_THAN_MOD_LEN);
658         goto err;
659     }

661     if (BN_bin2bn(from, flen, &f) == NULL)
662         goto err;

664     if (BN_ucmp(&f, rsa->n) >= 0)
665     {
666         RSAerr(PK11_F_RSA_PUB_DEC,
667             PK11_R_DATA_TOO_LARGE_FOR_MODULUS);
668         goto err;
669     }

671     /* PK11 functions are called here */
672     r = pk11_RSA_public_decrypt_low(flen, from, buf, rsa);

674     /*
675      * PK11 CKM_RSA_X_509 mechanism pads 0's at the beginning.
676      * Needs to skip these 0's here
677      */
678     for (i = 0; i < r; i++)
679         if (buf[i] != 0)
680             break;

682     p = buf + i;
683     i = r - i; /* i is only used with no-padding mode */

685     switch (padding)
686     {
687     case RSA_PKCS1_PADDING:
688         r = RSA_padding_check_PKCS1_type_1(to, num, p, i, num);
689         break;
690     case RSA_NO_PADDING:
691         r = RSA_padding_check_none(to, num, p, i, num);
692         break;
693     default:
694         RSAerr(PK11_F_RSA_PUB_DEC, PK11_R_UNKNOWN_PADDING_TYPE);
695         goto err;
696     }
697     if (r < 0)
698         RSAerr(PK11_F_RSA_PUB_DEC, PK11_R_PADDING_CHECK_FAILED);

700 err:
701     BN_clear_free(&f);
702     if (buf != NULL)
703     {
704         OPENSSL_cleanse(buf, num);
705         OPENSSL_free(buf);
706     }
707     return (r);
708 }

710 /*
711  * This function implements RSA public encryption using C_EncryptInit and
712  * C_Encrypt pk11 interfaces. Note that the CKM_RSA_X_509 is used here.
713  * The calling function allocated sufficient memory in "to" to store results.
714  */
715 static int pk11_RSA_public_encrypt_low(int flen,
716     const unsigned char *from, unsigned char *to, RSA *rsa)
717 {
718     CK_ULONG bytes_encrypted = flen;
719     int retval = -1;
720     CK_RV rv;
721     CK_MECHANISM mech_rsa = {CKM_RSA_X_509, NULL, 0};

```

```

722     CK_MECHANISM *p_mech = &mech_rsa;
723     CK_OBJECT_HANDLE h_pub_key = CK_INVALID_HANDLE;
724     PK11_SESSION *sp;

726     if ((sp = pk11_get_session(OP_RSA)) == NULL)
727         return (-1);

729     (void) check_new_rsa_key_pub(sp, rsa);

731     h_pub_key = sp->opdata_rsa_pub_key;
732     if (h_pub_key == CK_INVALID_HANDLE)
733         h_pub_key = sp->opdata_rsa_pub_key =
734             pk11_get_public_rsa_key(rsa, &sp->opdata_rsa_pub,
735                 &sp->opdata_rsa_n_num, &sp->opdata_rsa_e_num,
736                 sp->session);

738     if (h_pub_key != CK_INVALID_HANDLE)
739     {
740         rv = pFuncList->C_EncryptInit(sp->session, p_mech,
741             h_pub_key);

743         if (rv != CKR_OK)
744         {
745             PK11err_add_data(PK11_F_RSA_PUB_ENC_LOW,
746                 PK11_R_ENCRYPTINIT, rv);
747             pk11_return_session(sp, OP_RSA);
748             return (-1);
749         }

751         rv = pFuncList->C_Encrypt(sp->session,
752             (unsigned char *)from, flen, to, &bytes_encrypted);

754         if (rv != CKR_OK)
755         {
756             PK11err_add_data(PK11_F_RSA_PUB_ENC_LOW,
757                 PK11_R_ENCRYPT, rv);
758             pk11_return_session(sp, OP_RSA);
759             return (-1);
760         }
761         retval = bytes_encrypted;
762     }

764     pk11_return_session(sp, OP_RSA);
765     return (retval);
766 }

769 /*
770  * This function implements RSA private encryption using C_SignInit and
771  * C_Sign pk11 APIs. Note that CKM_RSA_X_509 is used here.
772  * The calling function allocated sufficient memory in "to" to store results.
773  */
774 static int pk11_RSA_private_encrypt_low(int flen,
775     const unsigned char *from, unsigned char *to, RSA *rsa)
776 {
777     CK_ULONG ul_sig_len = flen;
778     int retval = -1;
779     CK_RV rv;
780     CK_MECHANISM mech_rsa = {CKM_RSA_X_509, NULL, 0};
781     CK_MECHANISM *p_mech = &mech_rsa;
782     CK_OBJECT_HANDLE h_priv_key = CK_INVALID_HANDLE;
783     PK11_SESSION *sp;

785     if ((sp = pk11_get_session(OP_RSA)) == NULL)
786         return (-1);

```

```

788     (void) check_new_rsa_key_priv(sp, rsa);

790     h_priv_key = sp->opdata_rsa_priv_key;
791     if (h_priv_key == CK_INVALID_HANDLE)
792         h_priv_key = sp->opdata_rsa_priv_key =
793             pk11_get_private_rsa_key(rsa, &sp->opdata_rsa_priv,
794                                     &sp->opdata_rsa_d_num, sp->session);

796     if (h_priv_key != CK_INVALID_HANDLE)
797     {
798         rv = pFuncList->C_SignInit(sp->session, p_mech,
799                                   h_priv_key);

801         if (rv != CKR_OK)
802         {
803             PK11err_add_data(PK11_F_RSA_PRIV_ENC_LOW,
804                             PK11_R_SIGNINIT, rv);
805             pk11_return_session(sp, OP_RSA);
806             return (-1);
807         }

809         rv = pFuncList->C_Sign(sp->session,
810                               (unsigned char *)from, flen, to, &ul_sig_len);

812         if (rv != CKR_OK)
813         {
814             PK11err_add_data(PK11_F_RSA_PRIV_ENC_LOW, PK11_R_SIGN,
815                             rv);
816             pk11_return_session(sp, OP_RSA);
817             return (-1);
818         }

820         retval = ul_sig_len;
821     }

823     pk11_return_session(sp, OP_RSA);
824     return (retval);
825 }

828 /*
829  * This function implements RSA private decryption using C_DecryptInit and
830  * C_Decrypt pk11 APIs. Note that CKM_RSA_X_509 mechanism is used here.
831  * The calling function allocated sufficient memory in "to" to store results.
832  */
833 static int pk11_RSA_private_decrypt_low(int flen,
834                                         const unsigned char *from, unsigned char *to, RSA *rsa)
835 {
836     CK_ULONG bytes_decrypted = flen;
837     int retval = -1;
838     CK_RV rv;
839     CK_MECHANISM mech_rsa = {CKM_RSA_X_509, NULL, 0};
840     CK_MECHANISM *p_mech = &mech_rsa;
841     CK_OBJECT_HANDLE h_priv_key;
842     PK11_SESSION *sp;

844     if ((sp = pk11_get_session(OP_RSA)) == NULL)
845         return (-1);

847     (void) check_new_rsa_key_priv(sp, rsa);

849     h_priv_key = sp->opdata_rsa_priv_key;
850     if (h_priv_key == CK_INVALID_HANDLE)
851         h_priv_key = sp->opdata_rsa_priv_key =
852             pk11_get_private_rsa_key(rsa, &sp->opdata_rsa_priv,
853                                     &sp->opdata_rsa_d_num, sp->session);

```

```

855     if (h_priv_key != CK_INVALID_HANDLE)
856     {
857         rv = pFuncList->C_DecryptInit(sp->session, p_mech,
858                                       h_priv_key);

860         if (rv != CKR_OK)
861         {
862             PK11err_add_data(PK11_F_RSA_PRIV_DEC_LOW,
863                             PK11_R_DECRYPTINIT, rv);
864             pk11_return_session(sp, OP_RSA);
865             return (-1);
866         }

868         rv = pFuncList->C_Decrypt(sp->session,
869                                   (unsigned char *)from, flen, to, &bytes_decrypted);

871         if (rv != CKR_OK)
872         {
873             PK11err_add_data(PK11_F_RSA_PRIV_DEC_LOW,
874                             PK11_R_DECRYPT, rv);
875             pk11_return_session(sp, OP_RSA);
876             return (-1);
877         }
878         retval = bytes_decrypted;
879     }

881     pk11_return_session(sp, OP_RSA);
882     return (retval);
883 }

886 /*
887  * This function implements RSA public decryption using C_VerifyRecoverInit
888  * and C_VerifyRecover pk11 APIs. Note that CKM_RSA_X_509 is used here.
889  * The calling function allocated sufficient memory in "to" to store results.
890  */
891 static int pk11_RSA_public_decrypt_low(int flen,
892                                         const unsigned char *from, unsigned char *to, RSA *rsa)
893 {
894     CK_ULONG bytes_decrypted = flen;
895     int retval = -1;
896     CK_RV rv;
897     CK_MECHANISM mech_rsa = {CKM_RSA_X_509, NULL, 0};
898     CK_MECHANISM *p_mech = &mech_rsa;
899     CK_OBJECT_HANDLE h_pub_key = CK_INVALID_HANDLE;
900     PK11_SESSION *sp;

902     if ((sp = pk11_get_session(OP_RSA)) == NULL)
903         return (-1);

905     (void) check_new_rsa_key_pub(sp, rsa);

907     h_pub_key = sp->opdata_rsa_pub_key;
908     if (h_pub_key == CK_INVALID_HANDLE)
909         h_pub_key = sp->opdata_rsa_pub_key =
910             pk11_get_public_rsa_key(rsa, &sp->opdata_rsa_pub,
911                                     &sp->opdata_rsa_n_num, &sp->opdata_rsa_e_num,
912                                     sp->session);

914     if (h_pub_key != CK_INVALID_HANDLE)
915     {
916         rv = pFuncList->C_VerifyRecoverInit(sp->session,
917                                             p_mech, h_pub_key);

919         if (rv != CKR_OK)

```

```

920     {
921         PK11err_add_data(PK11_F_RSA_PUB_DEC_LOW,
922             PK11_R_VERIFYRECOVERINIT, rv);
923         pk11_return_session(sp, OP_RSA);
924         return (-1);
925     }

927     rv = pFuncList->C_VerifyRecover(sp->session,
928         (unsigned char *)from, flen, to, &bytes_decrypted);

930     if (rv != CKR_OK)
931     {
932         PK11err_add_data(PK11_F_RSA_PUB_DEC_LOW,
933             PK11_R_VERIFYRECOVER, rv);
934         pk11_return_session(sp, OP_RSA);
935         return (-1);
936     }
937     retval = bytes_decrypted;
938 }

940 pk11_return_session(sp, OP_RSA);
941 return (retval);
942 }

944 static int pk11_RSA_init(RSA *rsa)
945 {
946     /*
947      * This flag in the RSA_METHOD enables the new rsa_sign,
948      * rsa_verify functions. See rsa.h for details.
949      */
950     rsa->flags |= RSA_FLAG_SIGN_VER;

952     return (1);
953 }

955 static int pk11_RSA_finish(RSA *rsa)
956 {
957     /*
958      * Since we are overloading OpenSSL's native RSA_eay_finish() we need
959      * to do the same as in the original function, i.e. to free bignum
960      * structures.
961      */
962     if (rsa->method_mod_n != NULL)
963         BN_MONT_CTX_free(rsa->method_mod_n);
964     if (rsa->method_mod_p != NULL)
965         BN_MONT_CTX_free(rsa->method_mod_p);
966     if (rsa->method_mod_q != NULL)
967         BN_MONT_CTX_free(rsa->method_mod_q);

969     return (1);
970 }

972 /*
973  * Standard engine interface function. Majority codes here are from
974  * rsa/rsa_sign.c. We replaced the decrypt function call by C_Sign of PKCS#11.
975  * See more details in rsa/rsa_sign.c
976  */
977 static int pk11_RSA_sign(int type, const unsigned char *m, unsigned int m_len,
978     unsigned char *sigret, unsigned int *siglen, const RSA *rsa)
979 {
980     X509_SIG sig;
981     ASN1_TYPE parameter;
982     int i, j=0;
983     unsigned char *p, *s = NULL;
984     X509_ALGOR algor;
985     ASN1_OCTET_STRING digest;

```

```

986     CK_RV rv;
987     CK_MECHANISM mech_rsa = {CKM_RSA_PKCS, NULL, 0};
988     CK_MECHANISM *p_mech = &mech_rsa;
989     CK_OBJECT_HANDLE h_priv_key;
990     PK11_SESSION *sp = NULL;
991     int ret = 0;
992     unsigned long ulsiglen;

994     /* Encode the digest */
995     /* Special case: SSL signature, just check the length */
996     if (type == NID_md5_sha1)
997     {
998         if (m_len != SSL_SIG_LENGTH)
999         {
1000             PK11err(PK11_F_RSA_SIGN,
1001                 PK11_R_INVALID_MESSAGE_LENGTH);
1002             goto err;
1003         }
1004         i = SSL_SIG_LENGTH;
1005         s = (unsigned char *)m;
1006     }
1007     else
1008     {
1009         sig.algor = &algor;
1010         sig.algor->algorithm = OBJ_nid2obj(type);
1011         if (sig.algor->algorithm == NULL)
1012         {
1013             PK11err(PK11_F_RSA_SIGN,
1014                 PK11_R_UNKNOWN_ALGORITHM_TYPE);
1015             goto err;
1016         }
1017         if (sig.algor->algorithm->length == 0)
1018         {
1019             PK11err(PK11_F_RSA_SIGN,
1020                 PK11_R_UNKNOWN_ASN1_OBJECT_ID);
1021             goto err;
1022         }
1023         parameter.type = V_ASN1_NULL;
1024         parameter.value.ptr = NULL;
1025         sig.algor->parameter = &parameter;

1027         sig.digest = &digest;
1028         sig.digest->data = (unsigned char *)m;
1029         sig.digest->length = m_len;

1031         i = i2d_X509_SIG(&sig, NULL);
1032     }

1034     j = RSA_size(rsa);
1035     if ((i - RSA_PKCS1_PADDING) > j)
1036     {
1037         PK11err(PK11_F_RSA_SIGN, PK11_R_DIGEST_TOO_BIG);
1038         goto err;
1039     }

1041     if (type != NID_md5_sha1)
1042     {
1043         s = (unsigned char *)OPENSSL_malloc((unsigned int)(j + 1));
1044         if (s == NULL)
1045         {
1046             PK11err(PK11_F_RSA_SIGN, PK11_R_MALLOC_FAILURE);
1047             goto err;
1048         }
1049         p = s;
1050         (void) i2d_X509_SIG(&sig, &p);
1051     }

```

```
1116      /* Encode the digest      */
1117      /* Special case: SSL signature, just check the length */
```

```

1118 if (type == NID_md5_sha1)
1119 {
1120     if (m_len != SSL_SIG_LENGTH)
1121     {
1122         PK11err(PK11_F_RSA_VERIFY,
1123             PK11_R_INVALID_MESSAGE_LENGTH);
1124         goto err;
1125     }
1126     i = SSL_SIG_LENGTH;
1127     s = (unsigned char *)m;
1128 }
1129 else
1130 {
1131     sig.algor = &algor;
1132     sig.algor->algorithm = OBJ_nid2obj(type);
1133     if (sig.algor->algorithm == NULL)
1134     {
1135         PK11err(PK11_F_RSA_VERIFY,
1136             PK11_R_UNKNOWN_ALGORITHM_TYPE);
1137         goto err;
1138     }
1139     if (sig.algor->algorithm->length == 0)
1140     {
1141         PK11err(PK11_F_RSA_VERIFY,
1142             PK11_R_UNKNOWN_ASN1_OBJECT_ID);
1143         goto err;
1144     }
1145     parameter.type = V_ASN1_NULL;
1146     parameter.value.ptr = NULL;
1147     sig.algor->parameter = &parameter;
1148     sig.digest = &digest;
1149     sig.digest->data = (unsigned char *)m;
1150     sig.digest->length = m_len;
1151     i = i2d_X509_SIG(&sig, NULL);
1152 }
1153
1154 j = RSA_size(rsa);
1155 if ((i - RSA_PKCS1_PADDING) > j)
1156 {
1157     PK11err(PK11_F_RSA_VERIFY, PK11_R_DIGEST_TOO_BIG);
1158     goto err;
1159 }
1160
1161 if (type != NID_md5_sha1)
1162 {
1163     s = (unsigned char *)OPENSSL_malloc((unsigned int)(j + 1));
1164     if (s == NULL)
1165     {
1166         PK11err(PK11_F_RSA_VERIFY, PK11_R_MALLOC_FAILURE);
1167         goto err;
1168     }
1169     p = s;
1170     (void) i2d_X509_SIG(&sig, &p);
1171 }
1172
1173 if ((sp = pk11_get_session(OP_RSA)) == NULL)
1174     goto err;
1175
1176 (void) check_new_rsa_key_pub(sp, rsa);
1177
1178 h_pub_key = sp->opdata_rsa_pub_key;
1179 if (h_pub_key == CK_INVALID_HANDLE)
1180     h_pub_key = sp->opdata_rsa_pub_key =
1181         pk11_get_public_rsa_key((RSA *)rsa, &sp->opdata_rsa_pub,
1182             &sp->opdata_rsa_n_num, &sp->opdata_rsa_e_num,
1183             sp->session);

```

```

1185     if (h_pub_key != CK_INVALID_HANDLE)
1186     {
1187         rv = pFuncList->C_VerifyInit(sp->session, p_mech,
1188                                     h_pub_key);
1189
1190         if (rv != CKR_OK)
1191         {
1192             PK11err_add_data(PK11_F_RSA_VERIFY, PK11_R_VERIFYINIT,
1193                             rv);
1194             goto err;
1195         }
1196         rv = pFuncList->C_Verify(sp->session, s, i, (CK_BYTE_PTR) sigbuf
1197                                (CK_ULONG)siglen);
1198
1199         if (rv != CKR_OK)
1200         {
1201             PK11err_add_data(PK11_F_RSA_VERIFY, PK11_R_VERIFY, rv);
1202             goto err;
1203         }
1204         ret = 1;
1205     }
1206
1207 err:
1208     if (type != NID_md5_sha1)
1209     {
1210         (void) memset(s, 0, (unsigned int)siglen);
1211         OPENSSL_free(s);
1212     }
1213
1214     pk11_return_session(sp, OP_RSA);
1215     return (ret);
1216 }
1217
1218 /* load RSA private key from a file */
1219 /* ARGSUSED */
1220 EVP_PKEY *pk11_load_privkey(ENGINE* e, const char *privkey_file,
1221                             UI_METHOD *ui_method, void *callback_data)
1222 {
1223     EVP_PKEY *pkey = NULL;
1224     FILE *pubkey;
1225     CK_OBJECT_HANDLE h_priv_key = CK_INVALID_HANDLE;
1226     RSA *rsa;
1227     PK11_SESSION *sp;
1228
1229     if ((sp = pk11_get_session(OP_RSA)) == NULL)
1230         return (NULL);
1231
1232     if ((pubkey = fopen(privkey_file, read_mode_flags)) != NULL)
1233     {
1234         pkey = PEM_read_PrivateKey(pubkey, NULL, NULL, NULL);
1235         (void) fclose(pubkey);
1236         if (pkey != NULL)
1237         {
1238             rsa = EVP_PKEY_get1_RSA(pkey);
1239             if (rsa != NULL)
1240             {
1241                 (void) check_new_rsa_key_priv(sp, rsa);
1242
1243                 h_priv_key = sp->opdata_rsa_priv_key =
1244                     pk11_get_private_rsa_key(rsa,
1245                                             &sp->opdata_rsa_priv, &sp->opdata_rsa_d_num,
1246                                             sp->session);
1247                 if (h_priv_key == CK_INVALID_HANDLE)
1248                 {
1249                     EVP_PKEY_free(pkey);

```

```

1250                                     pkey = NULL;
1251                                     }
1252     }
1253     else
1254     {
1255         EVP_PKEY_free(pkey);
1256         pkey = NULL;
1257     }
1258 }
1259
1260 pk11_return_session(sp, OP_RSA);
1261 return (pkey);
1262 }
1263
1264 /* load RSA public key from a file */
1265 /* ARGSUSED */
1266 EVP_PKEY *pk11_load_pubkey(ENGINE* e, const char *pubkey_file,
1267                             UI_METHOD *ui_method, void *callback_data)
1268 {
1269     EVP_PKEY *pkey = NULL;
1270     FILE *pubkey;
1271     CK_OBJECT_HANDLE h_pub_key = CK_INVALID_HANDLE;
1272     RSA *rsa;
1273     PK11_SESSION *sp;
1274
1275     if ((sp = pk11_get_session(OP_RSA)) == NULL)
1276         return (NULL);
1277
1278     if ((pubkey = fopen(pubkey_file, read_mode_flags)) != NULL)
1279     {
1280         pkey = PEM_read_PUBKEY(pubkey, NULL, NULL, NULL);
1281         (void) fclose(pubkey);
1282         if (pkey != NULL)
1283         {
1284             rsa = EVP_PKEY_get1_RSA(pkey);
1285             if (rsa != NULL)
1286             {
1287                 (void) check_new_rsa_key_pub(sp, rsa);
1288
1289                 h_pub_key = sp->opdata_rsa_pub_key =
1290                     pk11_get_public_rsa_key(rsa,
1291                                             &sp->opdata_rsa_pub, &sp->opdata_rsa_n_num,
1292                                             &sp->opdata_rsa_e_num, sp->session);
1293                 if (h_pub_key == CK_INVALID_HANDLE)
1294                 {
1295                     EVP_PKEY_free(pkey);
1296                     pkey = NULL;
1297                 }
1298             }
1299         }
1300     }
1301     else
1302     {
1303         EVP_PKEY_free(pkey);
1304         pkey = NULL;
1305     }
1306 }
1307
1308 pk11_return_session(sp, OP_RSA);
1309 return (pkey);
1310 }
1311
1312 /*
1313  * Create a public key object in a session from a given rsa structure.
1314  * The *rsa_n_num and *rsa_e_num pointers are non-NULL for RSA public keys.
1315  */

```

```

1316 static CK_OBJECT_HANDLE pk11_get_public_rsa_key(RSA* rsa,
1317 RSA** key_ptr, BIGNUM **rsa_n_num, BIGNUM **rsa_e_num,
1318 CK_SESSION_HANDLE session)
1319 {
1320     CK_RV rv;
1321     CK_OBJECT_HANDLE h_key = CK_INVALID_HANDLE;
1322     CK_ULONG found;
1323     CK_OBJECT_CLASS o_key = CKO_PUBLIC_KEY;
1324     CK_KEY_TYPE k_type = CKK_RSA;
1325     CK_ULONG ul_key_attr_count = 7;
1326     CK_BBOOL rollback = FALSE;

1328     CK_ATTRIBUTE a_key_template[] =
1329     {
1330         {CKA_CLASS, (void *) NULL, sizeof (CK_OBJECT_CLASS)},
1331         {CKA_KEY_TYPE, (void *) NULL, sizeof (CK_KEY_TYPE)},
1332         {CKA_TOKEN, &false, sizeof (true)},
1333         {CKA_ENCRYPT, &true, sizeof (true)},
1334         {CKA_VERIFY_RECOVER, &true, sizeof (true)},
1335         {CKA_MODULUS, (void *) NULL, 0},
1336         {CKA_PUBLIC_EXPONENT, (void *) NULL, 0}
1337     };

1339     int i;

1341     a_key_template[0].pValue = &o_key;
1342     a_key_template[1].pValue = &k_type;

1344     a_key_template[5].ulValueLen = BN_num_bytes(rsa->n);
1345     a_key_template[5].pValue = (CK_VOID_PTR)OPENSSL_malloc(
1346         (size_t)a_key_template[5].ulValueLen);
1347     if (a_key_template[5].pValue == NULL)
1348     {
1349         PK11err(PK11_F_GET_PUB_RSA_KEY, PK11_R_MALLOC_FAILURE);
1350         goto malloc_err;
1351     }

1353     BN_bn2bin(rsa->n, a_key_template[5].pValue);

1355     a_key_template[6].ulValueLen = BN_num_bytes(rsa->e);
1356     a_key_template[6].pValue = (CK_VOID_PTR)OPENSSL_malloc(
1357         (size_t)a_key_template[6].ulValueLen);
1358     if (a_key_template[6].pValue == NULL)
1359     {
1360         PK11err(PK11_F_GET_PUB_RSA_KEY, PK11_R_MALLOC_FAILURE);
1361         goto malloc_err;
1362     }

1364     BN_bn2bin(rsa->e, a_key_template[6].pValue);

1366     /* see find_lock array definition for more info on object locking */
1367     LOCK_OBJSTORE(OP_RSA);
1368     rv = pFuncList->C_FindObjectsInit(session, a_key_template,
1369         ul_key_attr_count);

1371     if (rv != CKR_OK)
1372     {
1373         PK11err_add_data(PK11_F_GET_PUB_RSA_KEY, PK11_R_FINDOBJECTSINIT,
1374             rv);
1375         goto err;
1376     }

1378     rv = pFuncList->C_FindObjects(session, &h_key, 1, &found);

1380     if (rv != CKR_OK)
1381     {

```

```

1382         PK11err_add_data(PK11_F_GET_PUB_RSA_KEY,
1383             PK11_R_FINDOBJECTS, rv);
1384         goto err;
1385     }

1387     rv = pFuncList->C_FindObjectsFinal(session);

1389     if (rv != CKR_OK)
1390     {
1391         PK11err_add_data(PK11_F_GET_PUB_RSA_KEY,
1392             PK11_R_FINDOBJECTSFINAL, rv);
1393         goto err;
1394     }

1396     if (found == 0)
1397     {
1398         rv = pFuncList->C_CreateObject(session,
1399             a_key_template, ul_key_attr_count, &h_key);
1400         if (rv != CKR_OK)
1401         {
1402             PK11err_add_data(PK11_F_GET_PUB_RSA_KEY,
1403                 PK11_R_CREATEOBJECT, rv);
1404             goto err;
1405         }
1406     }

1408     if (rsa_n_num != NULL)
1409     {
1410         if ((*rsa_n_num = BN_dup(rsa->n)) == NULL)
1411         {
1412             PK11err(PK11_F_GET_PUB_RSA_KEY, PK11_R_MALLOC_FAILURE);
1413             rollback = TRUE;
1414             goto err;
1415         }
1416     }
1417     if (rsa_e_num != NULL)
1418     {
1419         if ((*rsa_e_num = BN_dup(rsa->e)) == NULL)
1420         {
1421             PK11err(PK11_F_GET_PUB_RSA_KEY, PK11_R_MALLOC_FAILURE);
1422             BN_free(*rsa_n_num);
1423             *rsa_n_num = NULL;
1424             rollback = TRUE;
1425             goto err;
1426         }
1427     }

1425     /* LINTED: E_CONSTANT_CONDITION */
1426     KEY_HANDLE_REFHOLD(h_key, OP_RSA, FALSE, rollback, err);
1427     if (key_ptr != NULL)
1428         *key_ptr = rsa;

1430 err:
1431     if (rollback)
1432     {
1433         /*
1434          * We do not care about the return value from C_DestroyObject()
1435          * since we are doing rollback.
1436          */
1437         if (found == 0)
1438             (void) pFuncList->C_DestroyObject(session, h_key);
1439         h_key = CK_INVALID_HANDLE;
1440     }

1442     UNLOCK_OBJSTORE(OP_RSA);

1444 malloc_err:
1445     for (i = 5; i <= 6; i++)
1446     {
1447         if (a_key_template[i].pValue != NULL)

```

```

1448         {
1449             OPENSSL_free(a_key_template[i].pValue);
1450             a_key_template[i].pValue = NULL;
1451         }
1452     }
1453
1454     return (h_key);
1455 }
1456
1457 /*
1458  * Create a private key object in the session from a given rsa structure.
1459  * The *rsa_d_num pointer is non-NULL for RSA private keys.
1460  */
1461 static CK_OBJECT_HANDLE pk11_get_private_rsa_key(RSA* rsa,
1462     RSA** key_ptr, BIGNUM **rsa_d_num, CK_SESSION_HANDLE session)
1463 {
1464     CK_RV rv;
1465     CK_OBJECT_HANDLE h_key = CK_INVALID_HANDLE;
1466     int i;
1467     CK_ULONG found;
1468     CK_OBJECT_CLASS o_key = CKO_PRIVATE_KEY;
1469     CK_KEY_TYPE k_type = CKK_RSA;
1470     CK_ULONG ul_key_attr_count = 14;
1471     CK_BBOOL rollback = FALSE;
1472
1473     /* Both CKA_TOKEN and CKA_SENSITIVE have to be FALSE for session keys */
1474     CK_ATTRIBUTE a_key_template[] =
1475     {
1476         {CKA_CLASS, (void *) NULL, sizeof (CK_OBJECT_CLASS)},
1477         {CKA_KEY_TYPE, (void *) NULL, sizeof (CK_KEY_TYPE)},
1478         {CKA_TOKEN, &false, sizeof (true)},
1479         {CKA_SENSITIVE, &false, sizeof (true)},
1480         {CKA_DECRYPT, &true, sizeof (true)},
1481         {CKA_SIGN, &true, sizeof (true)},
1482         {CKA_MODULUS, (void *)NULL, 0},
1483         {CKA_PUBLIC_EXPONENT, (void *)NULL, 0},
1484         {CKA_PRIVATE_EXPONENT, (void *)NULL, 0},
1485         {CKA_PRIME_1, (void *)NULL, 0},
1486         {CKA_PRIME_2, (void *)NULL, 0},
1487         {CKA_EXPONENT_1, (void *)NULL, 0},
1488         {CKA_EXPONENT_2, (void *)NULL, 0},
1489         {CKA_COEFFICIENT, (void *)NULL, 0}
1490     };
1491
1492     a_key_template[0].pValue = &o_key;
1493     a_key_template[1].pValue = &k_type;
1494
1495     /* Put the private key components into the template */
1496     if (init_template_value(rsa->n, &a_key_template[6].pValue,
1497         &a_key_template[6].ulValueLen) == 0 ||
1498         init_template_value(rsa->e, &a_key_template[7].pValue,
1499             &a_key_template[7].ulValueLen) == 0 ||
1500         init_template_value(rsa->d, &a_key_template[8].pValue,
1501             &a_key_template[8].ulValueLen) == 0 ||
1502         init_template_value(rsa->p, &a_key_template[9].pValue,
1503             &a_key_template[9].ulValueLen) == 0 ||
1504         init_template_value(rsa->q, &a_key_template[10].pValue,
1505             &a_key_template[10].ulValueLen) == 0 ||
1506         init_template_value(rsa->dmp1, &a_key_template[11].pValue,
1507             &a_key_template[11].ulValueLen) == 0 ||
1508         init_template_value(rsa->dmq1, &a_key_template[12].pValue,
1509             &a_key_template[12].ulValueLen) == 0 ||
1510         init_template_value(rsa->iqmp, &a_key_template[13].pValue,
1511             &a_key_template[13].ulValueLen) == 0)
1512     {
1513         PK11err(PK11_F_GET_PRIV_RSA_KEY, PK11_R_MALLOC_FAILURE);

```

```

1514         goto malloc_err;
1515     }
1516
1517     /* see find_lock array definition for more info on object locking */
1518     LOCK_OBJSTORE(OP_RSA);
1519     rv = pFuncList->C_FindObjectsInit(session, a_key_template,
1520         ul_key_attr_count);
1521
1522     if (rv != CKR_OK)
1523     {
1524         PK11err_add_data(PK11_F_GET_PRIV_RSA_KEY,
1525             PK11_R_FINDOBJECTSINIT, rv);
1526         goto err;
1527     }
1528
1529     rv = pFuncList->C_FindObjects(session, &h_key, 1, &found);
1530
1531     if (rv != CKR_OK)
1532     {
1533         PK11err_add_data(PK11_F_GET_PRIV_RSA_KEY,
1534             PK11_R_FINDOBJECTS, rv);
1535         goto err;
1536     }
1537
1538     rv = pFuncList->C_FindObjectsFinal(session);
1539
1540     if (rv != CKR_OK)
1541     {
1542         PK11err_add_data(PK11_F_GET_PRIV_RSA_KEY,
1543             PK11_R_FINDOBJECTSFINAL, rv);
1544         goto err;
1545     }
1546
1547     if (found == 0)
1548     {
1549         rv = pFuncList->C_CreateObject(session,
1550             a_key_template, ul_key_attr_count, &h_key);
1551         if (rv != CKR_OK)
1552         {
1553             PK11err_add_data(PK11_F_GET_PRIV_RSA_KEY,
1554                 PK11_R_CREATEOBJECT, rv);
1555             goto err;
1556         }
1557     }
1558
1559     if (rsa_d_num != NULL)
1560         if ((*rsa_d_num = BN_dup(rsa->d)) == NULL)
1561         {
1562             PK11err(PK11_F_GET_PRIV_RSA_KEY, PK11_R_MALLOC_FAILURE);
1563             rollback = TRUE;
1564             goto err;
1565         }
1566
1567     /* LINTED: E_CONSTANT_CONDITION */
1568     KEY_HANDLE_REFHOLD(h_key, OP_RSA, FALSE, rollback, err);
1569     if (key_ptr != NULL)
1570         *key_ptr = rsa;
1571
1572 err:
1573     if (rollback)
1574     {
1575         /*
1576          * We do not care about the return value from C_DestroyObject()
1577          * since we are doing rollback.
1578          */
1579         if (found == 0)

```

```

1580         (void) pFuncList->C_DestroyObject(session, h_key);
1581         h_key = CK_INVALID_HANDLE;
1582     }

1584     UNLOCK_OBJSTORE(OP_RSA);

1586 malloc_err:
1587     /*
1588      * 6 to 13 entries in the key template are key components.
1589      * They need to be freed upon exit or error.
1590      */
1591     for (i = 6; i <= 13; i++)
1592     {
1593         if (a_key_template[i].pValue != NULL)
1594         {
1595             (void) memset(a_key_template[i].pValue, 0,
1596                 a_key_template[i].ulValueLen);
1597             OPENSSL_free(a_key_template[i].pValue);
1598             a_key_template[i].pValue = NULL;
1599         }
1600     }

1602     return (h_key);
1603 }

1605 /*
1606  * Check for cache miss and clean the object pointer and handle
1607  * in such case. Return 1 for cache hit, 0 for cache miss.
1608  */
1609 static int check_new_rsa_key_pub(PK11_SESSION *sp, const RSA *rsa)
1610 {
1611     /*
1612      * Provide protection against RSA structure reuse by making the
1613      * check for cache hit stronger. Only public components of RSA
1614      * key matter here so it is sufficient to compare them with values
1615      * cached in PK11_SESSION structure.
1616      */
1617     if ((sp->opdata_rsa_pub != rsa) ||
1618         (BN_cmp(sp->opdata_rsa_n_num, rsa->n) != 0) ||
1619         (BN_cmp(sp->opdata_rsa_e_num, rsa->e) != 0))
1620     {
1621         /*
1622          * We do not check the return value because even in case of
1623          * failure the sp structure will have both key pointer
1624          * and object handle cleaned and pk11_destroy_object()
1625          * reports the failure to the OpenSSL error message buffer.
1626          */
1627         (void) pk11_destroy_rsa_object_pub(sp, TRUE);
1628         return (0);
1629     }
1630     return (1);
1631 }

1633 /*
1634  * Check for cache miss and clean the object pointer and handle
1635  * in such case. Return 1 for cache hit, 0 for cache miss.
1636  */
1637 static int check_new_rsa_key_priv(PK11_SESSION *sp, const RSA *rsa)
1638 {
1639     /*
1640      * Provide protection against RSA structure reuse by making the
1641      * check for cache hit stronger. Comparing private exponent of RSA
1642      * key with value cached in PK11_SESSION structure should
1643      * be sufficient.
1644      */
1645     if ((sp->opdata_rsa_priv != rsa) ||

```

```

1646         (BN_cmp(sp->opdata_rsa_d_num, rsa->d) != 0))
1647     {
1648         /*
1649          * We do not check the return value because even in case of
1650          * failure the sp structure will have both key pointer
1651          * and object handle cleaned and pk11_destroy_object()
1652          * reports the failure to the OpenSSL error message buffer.
1653          */
1654         (void) pk11_destroy_rsa_object_priv(sp, TRUE);
1655         return (0);
1656     }
1657     return (1);
1658 }
1659 #endif

1661 #ifndef OPENSSL_NO_DSA
1662 /* The DSA function implementation */
1663 /* ARGSUSED */
1664 static int pk11_DSA_init(DSA *dsa)
1665 {
1666     return (1);
1667 }

1669 /* ARGSUSED */
1670 static int pk11_DSA_finish(DSA *dsa)
1671 {
1672     return (1);
1673 }

1676 static DSA_SIG *
1677 pk11_dsa_do_sign(const unsigned char *dgst, int dlen, DSA *dsa)
1678 {
1679     BIGNUM *r = NULL, *s = NULL;
1680     int i;
1681     DSA_SIG *dsa_sig = NULL;

1683     CK_RV rv;
1684     CK_MECHANISM Mechanism_dsa = {CKM_DSA, NULL, 0};
1685     CK_MECHANISM *p_mech = &Mechanism_dsa;
1686     CK_OBJECT_HANDLE h_priv_key;

1688     /*
1689      * The signature is the concatenation of r and s,
1690      * each is 20 bytes long
1691      */
1692     unsigned char sigret[DSA_SIGNATURE_LEN];
1693     unsigned long siglen = DSA_SIGNATURE_LEN;
1694     unsigned int siglen2 = DSA_SIGNATURE_LEN / 2;

1696     PK11_SESSION *sp = NULL;

1698     if ((dsa->p == NULL) || (dsa->q == NULL) || (dsa->g == NULL))
1699     {
1700         PK11err(PK11_F_DSA_SIGN, PK11_R_MISSING_KEY_COMPONENT);
1701         goto ret;
1702     }

1704     i = BN_num_bytes(dsa->q); /* should be 20 */
1705     if (dlen > i)
1706     {
1707         PK11err(PK11_F_DSA_SIGN, PK11_R_INVALID_SIGNATURE_LENGTH);
1708         goto ret;
1709     }

1711     if ((sp = pk11_get_session(OP_DSA)) == NULL)

```



```

1712         goto ret;
1714         (void) check_new_dsa_key_priv(sp, dsa);
1716         h_priv_key = sp->opdata_dsa_priv_key;
1717         if (h_priv_key == CK_INVALID_HANDLE)
1718             h_priv_key = sp->opdata_dsa_priv_key =
1719                 pk11_get_private_dsa_key((DSA *)dsa,
1720                     &sp->opdata_dsa_priv,
1721                     &sp->opdata_dsa_priv_num, sp->session);
1723         if (h_priv_key != CK_INVALID_HANDLE)
1724         {
1725             rv = pFuncList->C_SignInit(sp->session, p_mech, h_priv_key);
1727             if (rv != CKR_OK)
1728             {
1729                 PK11err_add_data(PK11_F_DSA_SIGN, PK11_R_SIGNINIT, rv);
1730                 goto ret;
1731             }
1733             (void) memset(sigret, 0, siglen);
1734             rv = pFuncList->C_Sign(sp->session,
1735                 (unsigned char *) dgst, dlen, sigret,
1736                 (CK_ULONG_PTR) &siglen);
1738             if (rv != CKR_OK)
1739             {
1740                 PK11err_add_data(PK11_F_DSA_SIGN, PK11_R_SIGN, rv);
1741                 goto ret;
1742             }
1743         }
1746         if ((s = BN_new()) == NULL)
1747         {
1748             PK11err(PK11_F_DSA_SIGN, PK11_R_MALLOC_FAILURE);
1749             goto ret;
1750         }
1752         if ((r = BN_new()) == NULL)
1753         {
1754             PK11err(PK11_F_DSA_SIGN, PK11_R_MALLOC_FAILURE);
1755             goto ret;
1756         }
1758         if ((dsa_sig = DSA_SIG_new()) == NULL)
1759         {
1760             PK11err(PK11_F_DSA_SIGN, PK11_R_MALLOC_FAILURE);
1761             goto ret;
1762         }
1764         if (BN_bin2bn(sigret, siglen2, r) == NULL ||
1765             BN_bin2bn(&sigret[siglen2], siglen2, s) == NULL)
1766         {
1767             PK11err(PK11_F_DSA_SIGN, PK11_R_MALLOC_FAILURE);
1768             goto ret;
1769         }
1771         dsa_sig->r = r;
1772         dsa_sig->s = s;
1774 ret:
1775         if (dsa_sig == NULL)
1776         {
1777             if (r != NULL)

```

```

1778             BN_free(r);
1779             if (s != NULL)
1780                 BN_free(s);
1781         }
1783         pk11_return_session(sp, OP_DSA);
1784         return (dsa_sig);
1785     }
1787 static int
1788 pk11_dsa_do_verify(const unsigned char *dgst, int dlen, DSA_SIG *sig,
1789     DSA *dsa)
1790 {
1791     int i;
1792     CK_RV rv;
1793     int retval = 0;
1794     CK_MECHANISM Mechanism_dsa = {CKM_DSA, NULL, 0};
1795     CK_MECHANISM *p_mech = &Mechanism_dsa;
1796     CK_OBJECT_HANDLE h_pub_key;
1798     unsigned char sigbuf[DSA_SIGNATURE_LEN];
1799     unsigned long siglen = DSA_SIGNATURE_LEN;
1800     unsigned long siglen2 = DSA_SIGNATURE_LEN/2;
1802     PK11_SESSION *sp = NULL;
1804     if (BN_is_zero(sig->r) || sig->r->neg || BN_ucmp(sig->r, dsa->q) >= 0)
1805     {
1806         PK11err(PK11_F_DSA_VERIFY,
1807             PK11_R_INVALID_DSA_SIGNATURE_R);
1808         goto ret;
1809     }
1811     if (BN_is_zero(sig->s) || sig->s->neg || BN_ucmp(sig->s, dsa->q) >= 0)
1812     {
1813         PK11err(PK11_F_DSA_VERIFY,
1814             PK11_R_INVALID_DSA_SIGNATURE_S);
1815         goto ret;
1816     }
1818     i = BN_num_bytes(dsa->q); /* should be 20 */
1820     if (dlen > i)
1821     {
1822         PK11err(PK11_F_DSA_VERIFY,
1823             PK11_R_INVALID_SIGNATURE_LENGTH);
1824         goto ret;
1825     }
1827     if ((sp = pk11_get_session(OP_DSA)) == NULL)
1828         goto ret;
1830     (void) check_new_dsa_key_pub(sp, dsa);
1832     h_pub_key = sp->opdata_dsa_pub_key;
1833     if (h_pub_key == CK_INVALID_HANDLE)
1834         h_pub_key = sp->opdata_dsa_pub_key =
1835             pk11_get_public_dsa_key((DSA *)dsa, &sp->opdata_dsa_pub,
1836                 &sp->opdata_dsa_pub_num, sp->session);
1838     if (h_pub_key != CK_INVALID_HANDLE)
1839     {
1840         rv = pFuncList->C_VerifyInit(sp->session, p_mech,
1841             h_pub_key);
1843         if (rv != CKR_OK)

```

```

1844         {
1845             PK11err_add_data(PK11_F_DSA_VERIFY, PK11_R_VERIFYINIT,
1846                             rv);
1847             goto ret;
1848         }
1849
1850     /*
1851     * The representation of each of the two big numbers could
1852     * be shorter than DSA_SIGNATURE_LEN/2 bytes so we need
1853     * to act accordingly and shift if necessary.
1854     */
1855     (void) memset(sigbuf, 0, siglen);
1856     BN_bn2bin(sig->r, sigbuf + siglen2 - BN_num_bytes(sig->r));
1857     BN_bn2bin(sig->s, &sigbuf[siglen2] + siglen2 -
1858               BN_num_bytes(sig->s));
1859
1860     rv = pFuncList->C_Verify(sp->session,
1861                             (unsigned char *) dgst, dlen, sigbuf, (CK_ULONG)siglen);
1862
1863     if (rv != CKR_OK)
1864     {
1865         PK11err_add_data(PK11_F_DSA_VERIFY, PK11_R_VERIFY, rv);
1866         goto ret;
1867     }
1868
1869     }
1870
1871     retval = 1;
1872 ret:
1873
1874     pk11_return_session(sp, OP_DSA);
1875     return (retval);
1876 }
1877
1878 /*
1879 * Create a public key object in a session from a given dsa structure.
1880 * The *dsa_pub_num pointer is non-NULL for DSA public keys.
1881 */
1882 static CK_OBJECT_HANDLE pk11_get_public_dsa_key(DSA* dsa,
1883          DSA **key_ptr, BIGNUM **dsa_pub_num, CK_SESSION_HANDLE session)
1884 {
1885     CK_RV rv;
1886     CK_OBJECT_CLASS o_key = CKO_PUBLIC_KEY;
1887     CK_OBJECT_HANDLE h_key = CK_INVALID_HANDLE;
1888     CK_ULONG found;
1889     CK_KEY_TYPE k_type = CKK_DSA;
1890     CK_ULONG ul_key_attr_count = 8;
1891     CK_BBOOL rollback = FALSE;
1892     int i;
1893
1894     CK_ATTRIBUTE a_key_template[] =
1895     {
1896         {CKA_CLASS, (void *) NULL, sizeof(CK_OBJECT_CLASS)},
1897         {CKA_KEY_TYPE, (void *) NULL, sizeof(CK_KEY_TYPE)},
1898         {CKA_TOKEN, &false, sizeof(true)},
1899         {CKA_VERIFY, &true, sizeof(true)},
1900         {CKA_PRIME, (void *)NULL, 0},          /* p */
1901         {CKA_SUBPRIME, (void *)NULL, 0},        /* q */
1902         {CKA_BASE, (void *)NULL, 0},            /* g */
1903         {CKA_VALUE, (void *)NULL, 0},          /* pub_key - y */
1904     };
1905
1906     a_key_template[0].pValue = &o_key;
1907     a_key_template[1].pValue = &k_type;
1908
1909     if (init_template_value(dsa->p, &a_key_template[4].pValue,

```

```

1910         &a_key_template[4].ulValueLen) == 0 ||
1911         init_template_value(dsa->q, &a_key_template[5].pValue,
1912                             &a_key_template[5].ulValueLen) == 0 ||
1913         init_template_value(dsa->g, &a_key_template[6].pValue,
1914                             &a_key_template[6].ulValueLen) == 0 ||
1915         init_template_value(dsa->pub_key, &a_key_template[7].pValue,
1916                             &a_key_template[7].ulValueLen) == 0)
1917     {
1918         PK11err(PK11_F_GET_PUB_DSA_KEY, PK11_R_MALLOC_FAILURE);
1919         goto malloc_err;
1920     }
1921
1922     /* see find_lock array definition for more info on object locking */
1923     LOCK_OBJSTORE(OP_DSA);
1924     rv = pFuncList->C_FindObjectsInit(session, a_key_template,
1925                                     ul_key_attr_count);
1926
1927     if (rv != CKR_OK)
1928     {
1929         PK11err_add_data(PK11_F_GET_PUB_DSA_KEY, PK11_R_FINDOBJECTSINIT,
1930                         rv);
1931         goto err;
1932     }
1933
1934     rv = pFuncList->C_FindObjects(session, &h_key, 1, &found);
1935
1936     if (rv != CKR_OK)
1937     {
1938         PK11err_add_data(PK11_F_GET_PUB_DSA_KEY,
1939                         PK11_R_FINDOBJECTS, rv);
1940         goto err;
1941     }
1942
1943     rv = pFuncList->C_FindObjectsFinal(session);
1944
1945     if (rv != CKR_OK)
1946     {
1947         PK11err_add_data(PK11_F_GET_PUB_DSA_KEY,
1948                         PK11_R_FINDOBJECTSFINAL, rv);
1949         goto err;
1950     }
1951
1952     if (found == 0)
1953     {
1954         rv = pFuncList->C_CreateObject(session,
1955                                     a_key_template, ul_key_attr_count, &h_key);
1956         if (rv != CKR_OK)
1957         {
1958             PK11err_add_data(PK11_F_GET_PUB_DSA_KEY,
1959                             PK11_R_CREATEOBJECT, rv);
1960             goto err;
1961         }
1962     }
1963
1964     if (dsa_pub_num != NULL)
1965         if ((*dsa_pub_num = BN_dup(dsa->pub_key)) == NULL)
1966         {
1967             PK11err(PK11_F_GET_PUB_DSA_KEY, PK11_R_MALLOC_FAILURE);
1968             rollback = TRUE;
1969             goto err;
1970         }
1971
1972     /* LINTED: E_CONSTANT_CONDITION */
1973     KEY_HANDLE_REFHOLD(h_key, OP_DSA, FALSE, rollback, err);
1974     if (key_ptr != NULL)
1975         *key_ptr = dsa;

```

```

1977 err:
1978     if (rollback)
1979     {
1980         /*
1981          * We do not care about the return value from C_DestroyObject()
1982          * since we are doing rollback.
1983          */
1984         if (found == 0)
1985             (void) pFuncList->C_DestroyObject(session, h_key);
1986         h_key = CK_INVALID_HANDLE;
1987     }
1988
1989     UNLOCK_OBJSTORE(OP_DSA);
1990
1991 malloc_err:
1992     for (i = 4; i <= 7; i++)
1993     {
1994         if (a_key_template[i].pValue != NULL)
1995         {
1996             OPENSSL_free(a_key_template[i].pValue);
1997             a_key_template[i].pValue = NULL;
1998         }
1999     }
2000
2001     return (h_key);
2002 }
2003
2004 /*
2005  * Create a private key object in the session from a given dsa structure
2006  * The *dsa_priv_num pointer is non-NULL for DSA private keys.
2007  */
2008 static CK_OBJECT_HANDLE pk11_get_private_dsa_key(DSA* dsa,
2009 DSA **key_ptr, BIGNUM **dsa_priv_num, CK_SESSION_HANDLE session)
2010 {
2011     CK_RV rv;
2012     CK_OBJECT_HANDLE h_key = CK_INVALID_HANDLE;
2013     CK_OBJECT_CLASS o_key = CKO_PRIVATE_KEY;
2014     int i;
2015     CK_ULONG found;
2016     CK_KEY_TYPE k_type = CKK_DSA;
2017     CK_ULONG ul_key_attr_count = 9;
2018     CK_BBOOL rollback = FALSE;
2019
2020     /* Both CKA_TOKEN and CKA_SENSITIVE have to be FALSE for session keys */
2021     CK_ATTRIBUTE a_key_template[] =
2022     {
2023         {CKA_CLASS, (void *) NULL, sizeof (CK_OBJECT_CLASS)},
2024         {CKA_KEY_TYPE, (void *) NULL, sizeof (CK_KEY_TYPE)},
2025         {CKA_TOKEN, &false, sizeof (true)},
2026         {CKA_SENSITIVE, &false, sizeof (true)},
2027         {CKA_SIGN, &true, sizeof (true)},
2028         {CKA_PRIME, (void *) NULL, 0}, /* p */
2029         {CKA_SUBPRIME, (void *) NULL, 0}, /* q */
2030         {CKA_BASE, (void *) NULL, 0}, /* g */
2031         {CKA_VALUE, (void *) NULL, 0} /* priv_key - x */
2032     };
2033
2034     a_key_template[0].pValue = &o_key;
2035     a_key_template[1].pValue = &k_type;
2036
2037     /* Put the private key components into the template */
2038     if (init_template_value(dsa->p, &a_key_template[5].pValue,
2039 &a_key_template[5].ulValueLen) == 0 ||
2040 init_template_value(dsa->q, &a_key_template[6].pValue,
2041 &a_key_template[6].ulValueLen) == 0 ||

```

```

2042     init_template_value(dsa->g, &a_key_template[7].pValue,
2043 &a_key_template[7].ulValueLen) == 0 ||
2044 init_template_value(dsa->priv_key, &a_key_template[8].pValue,
2045 &a_key_template[8].ulValueLen) == 0)
2046 {
2047     PK11err(PK11_F_GET_PRIV_DSA_KEY, PK11_R_MALLOC_FAILURE);
2048     goto malloc_err;
2049 }
2050
2051 /* see find_lock array definition for more info on object locking */
2052 LOCK_OBJSTORE(OP_DSA);
2053 rv = pFuncList->C_FindObjectsInit(session, a_key_template,
2054 ul_key_attr_count);
2055
2056 if (rv != CKR_OK)
2057 {
2058     PK11err_add_data(PK11_F_GET_PRIV_DSA_KEY,
2059 PK11_R_FINDOBJECTSINIT, rv);
2060     goto err;
2061 }
2062
2063 rv = pFuncList->C_FindObjects(session, &h_key, 1, &found);
2064
2065 if (rv != CKR_OK)
2066 {
2067     PK11err_add_data(PK11_F_GET_PRIV_DSA_KEY,
2068 PK11_R_FINDOBJECTS, rv);
2069     goto err;
2070 }
2071
2072 rv = pFuncList->C_FindObjectsFinal(session);
2073
2074 if (rv != CKR_OK)
2075 {
2076     PK11err_add_data(PK11_F_GET_PRIV_DSA_KEY,
2077 PK11_R_FINDOBJECTSFINAL, rv);
2078     goto err;
2079 }
2080
2081 if (found == 0)
2082 {
2083     rv = pFuncList->C_CreateObject(session,
2084 a_key_template, ul_key_attr_count, &h_key);
2085     if (rv != CKR_OK)
2086     {
2087         PK11err_add_data(PK11_F_GET_PRIV_DSA_KEY,
2088 PK11_R_CREATEOBJECT, rv);
2089         goto err;
2090     }
2091 }
2092
2093 if (dsa_priv_num != NULL)
2094     if ((*dsa_priv_num = BN_dup(dsa->priv_key)) == NULL)
2095     {
2096         PK11err(PK11_F_GET_PRIV_DSA_KEY, PK11_R_MALLOC_FAILURE);
2097         rollback = TRUE;
2098         goto err;
2099     }
2100
2101 /* LINTED: E_CONSTANT_CONDITION */
2102 KEY_HANDLE_REFHOLD(h_key, OP_DSA, FALSE, rollback, err);
2103 if (key_ptr != NULL)
2104     *key_ptr = dsa;
2105
2106 err:
2107 if (rollback)

```

```

2108     {
2109     /*
2110     * We do not care about the return value from C_DestroyObject()
2111     * since we are doing rollback.
2112     */
2113     if (found == 0)
2114         (void) pFuncList->C_DestroyObject(session, h_key);
2115     h_key = CK_INVALID_HANDLE;
2116     }
2118     UNLOCK_OBJSTORE(OP_DSA);
2120 malloc_err:
2121 /*
2122 * 5 to 8 entries in the key template are key components.
2123 * They need to be freed upon exit or error.
2124 */
2125 for (i = 5; i <= 8; i++)
2126 {
2127     if (a_key_template[i].pValue != NULL)
2128     {
2129         (void) memset(a_key_template[i].pValue, 0,
2130             a_key_template[i].ulValueLen);
2131         OPENSSL_free(a_key_template[i].pValue);
2132         a_key_template[i].pValue = NULL;
2133     }
2134 }
2136 return (h_key);
2137 }
2139 /*
2140 * Check for cache miss and clean the object pointer and handle
2141 * in such case. Return 1 for cache hit, 0 for cache miss.
2142 */
2143 static int check_new_dsa_key_pub(PK11_SESSION *sp, DSA *dsa)
2144 {
2145 /*
2146 * Provide protection against DSA structure reuse by making the
2147 * check for cache hit stronger. Only public key component of DSA
2148 * key matters here so it is sufficient to compare it with value
2149 * cached in PK11_SESSION structure.
2150 */
2151 if ((sp->opdata_dsa_pub != dsa) ||
2152     (BN_cmp(sp->opdata_dsa_pub_num, dsa->pub_key) != 0))
2153 {
2154 /*
2155 * We do not check the return value because even in case of
2156 * failure the sp structure will have both key pointer
2157 * and object handle cleaned and pk11_destroy_object()
2158 * reports the failure to the OpenSSL error message buffer.
2159 */
2160 (void) pk11_destroy_dsa_object_pub(sp, TRUE);
2161 return (0);
2162 }
2163 return (1);
2164 }
2166 /*
2167 * Check for cache miss and clean the object pointer and handle
2168 * in such case. Return 1 for cache hit, 0 for cache miss.
2169 */
2170 static int check_new_dsa_key_priv(PK11_SESSION *sp, DSA *dsa)
2171 {
2172 /*
2173 * Provide protection against DSA structure reuse by making the

```

```

2174     * check for cache hit stronger. Only private key component of DSA
2175     * key matters here so it is sufficient to compare it with value
2176     * cached in PK11_SESSION structure.
2177     */
2178     if ((sp->opdata_dsa_priv != dsa) ||
2179         (BN_cmp(sp->opdata_dsa_priv_num, dsa->priv_key) != 0))
2180     {
2181     /*
2182     * We do not check the return value because even in case of
2183     * failure the sp structure will have both key pointer
2184     * and object handle cleaned and pk11_destroy_object()
2185     * reports the failure to the OpenSSL error message buffer.
2186     */
2187     (void) pk11_destroy_dsa_object_priv(sp, TRUE);
2188     return (0);
2189     }
2190     return (1);
2191 }
2192 #endif
2195 #ifndef OPENSSL_NO_DH
2196 /* The DH function implementation */
2197 /* ARGSUSED */
2198 static int pk11_DH_init(DH *dh)
2199 {
2200     return (1);
2201 }
2203 /* ARGSUSED */
2204 static int pk11_DH_finish(DH *dh)
2205 {
2206     return (1);
2207 }
2209 /*
2210 * Generate DH key-pair.
2211 *
2212 * Warning: Unlike OpenSSL's DH_generate_key(3) we ignore dh->priv_key
2213 * and override it even if it is set. OpenSSL does not touch dh->priv_key
2214 * if set and just computes dh->pub_key. It looks like PKCS#11 standard
2215 * is not capable of providing this functionality. This could be a problem
2216 * for applications relying on OpenSSL's semantics.
2217 */
2218 static int pk11_DH_generate_key(DH *dh)
2219 {
2220     CK_ULONG i;
2221     CK_RV rv, rv1;
2222     int reuse_mem_len = 0, ret = 0;
2223     PK11_SESSION *sp = NULL;
2224     CK_BYTE_PTR reuse_mem;
2226     CK_MECHANISM mechanism = {CKM_DH_PKCS_KEY_PAIR_GEN, NULL_PTR, 0};
2227     CK_OBJECT_HANDLE h_pub_key = CK_INVALID_HANDLE;
2228     CK_OBJECT_HANDLE h_priv_key = CK_INVALID_HANDLE;
2230     CK_ULONG ul_pub_key_attr_count = 3;
2231     CK_ATTRIBUTE pub_key_template[] =
2232     {
2233         {CKA_PRIVATE, &false, sizeof (false)},
2234         {CKA_PRIME, (void *)NULL, 0},
2235         {CKA_BASE, (void *)NULL, 0}
2236     };
2238     CK_ULONG ul_priv_key_attr_count = 3;
2239     CK_ATTRIBUTE priv_key_template[] =

```

```

2240     {
2241         {CKA_PRIVATE, &false, sizeof (false)},
2242         {CKA_SENSITIVE, &false, sizeof (false)},
2243         {CKA_DERIVE, &true, sizeof (true)}
2244     };

2246     CK_ULONG pub_key_attr_result_count = 1;
2247     CK_ATTRIBUTE pub_key_result[] =
2248     {
2249         {CKA_VALUE, (void *)NULL, 0}
2250     };

2252     CK_ULONG priv_key_attr_result_count = 1;
2253     CK_ATTRIBUTE priv_key_result[] =
2254     {
2255         {CKA_VALUE, (void *)NULL, 0}
2256     };

2258     pub_key_template[1].ulValueLen = BN_num_bytes(dh->p);
2259     if (pub_key_template[1].ulValueLen > 0)
2260     {
2261         /*
2262          * We must not increase ulValueLen by DH_BUF_RESERVE since that
2263          * could cause the same rounding problem. See definition of
2264          * DH_BUF_RESERVE above.
2265          */
2266         pub_key_template[1].pValue =
2267             OPENSSL_malloc(pub_key_template[1].ulValueLen +
2268                 DH_BUF_RESERVE);
2269         if (pub_key_template[1].pValue == NULL)
2270         {
2271             PK11err(PK11_F_DH_GEN_KEY, PK11_R_MALLOC_FAILURE);
2272             goto err;
2273         }

2275         i = BN_bn2bin(dh->p, pub_key_template[1].pValue);
2276     }
2277     else
2278         goto err;

2280     pub_key_template[2].ulValueLen = BN_num_bytes(dh->g);
2281     if (pub_key_template[2].ulValueLen > 0)
2282     {
2283         pub_key_template[2].pValue =
2284             OPENSSL_malloc(pub_key_template[2].ulValueLen +
2285                 DH_BUF_RESERVE);
2286         if (pub_key_template[2].pValue == NULL)
2287         {
2288             PK11err(PK11_F_DH_GEN_KEY, PK11_R_MALLOC_FAILURE);
2289             goto err;
2290         }

2292         i = BN_bn2bin(dh->g, pub_key_template[2].pValue);
2293     }
2294     else
2295         goto err;

2297     /*
2298      * Note: we are only using PK11_SESSION structure for getting
2299      * a session handle. The objects created in this function are
2300      * destroyed before return and thus not cached.
2301      */
2302     if ((sp = pk11_get_session(OP_DH)) == NULL)
2303         goto err;

2305     rv = pFuncList->C_GenerateKeyPair(sp->session,

```

```

2306         &mechanism,
2307         pub_key_template,
2308         ul_pub_key_attr_count,
2309         priv_key_template,
2310         ul_priv_key_attr_count,
2311         &h_pub_key,
2312         &h_priv_key);
2313     if (rv != CKR_OK)
2314     {
2315         PK11err_add_data(PK11_F_DH_GEN_KEY, PK11_R_GEN_KEY, rv);
2316         goto err;
2317     }

2319     /*
2320      * Reuse the larger memory allocated. We know the larger memory
2321      * should be sufficient for reuse.
2322      */
2323     if (pub_key_template[1].ulValueLen > pub_key_template[2].ulValueLen)
2324     {
2325         reuse_mem = pub_key_template[1].pValue;
2326         reuse_mem_len = pub_key_template[1].ulValueLen + DH_BUF_RESERVE;
2327     }
2328     else
2329     {
2330         reuse_mem = pub_key_template[2].pValue;
2331         reuse_mem_len = pub_key_template[2].ulValueLen + DH_BUF_RESERVE;
2332     }

2334     rv = pFuncList->C_GetAttributeValue(sp->session, h_pub_key,
2335         pub_key_result, pub_key_attr_result_count);
2336     rv1 = pFuncList->C_GetAttributeValue(sp->session, h_priv_key,
2337         priv_key_result, priv_key_attr_result_count);

2339     if (rv != CKR_OK || rv1 != CKR_OK)
2340     {
2341         rv = (rv != CKR_OK) ? rv : rv1;
2342         PK11err_add_data(PK11_F_DH_GEN_KEY,
2343             PK11_R_GETATTRIBUTVALUE, rv);
2344         goto err;
2345     }

2347     if (((CK_LONG) pub_key_result[0].ulValueLen) <= 0 ||
2348         ((CK_LONG) priv_key_result[0].ulValueLen) <= 0)
2349     {
2350         PK11err(PK11_F_DH_GEN_KEY, PK11_R_GETATTRIBUTVALUE);
2351         goto err;
2352     }

2354     /* Reuse the memory allocated */
2355     pub_key_result[0].pValue = reuse_mem;
2356     pub_key_result[0].ulValueLen = reuse_mem_len;

2358     rv = pFuncList->C_GetAttributeValue(sp->session, h_pub_key,
2359         pub_key_result, pub_key_attr_result_count);

2361     if (rv != CKR_OK)
2362     {
2363         PK11err_add_data(PK11_F_DH_GEN_KEY,
2364             PK11_R_GETATTRIBUTVALUE, rv);
2365         goto err;
2366     }

2368     if (pub_key_result[0].type == CKA_VALUE)
2369     {
2370         if (dh->pub_key == NULL)
2371             if ((dh->pub_key = BN_new()) == NULL)

```

```

2372         {
2373             PK11err(PK11_F_DH_GEN_KEY,
2374                 PK11_R_MALLOC_FAILURE);
2375             goto err;
2376         }
2377         dh->pub_key = BN_bin2bn(pub_key_result[0].pValue,
2378             pub_key_result[0].ulValueLen, dh->pub_key);
2379         if (dh->pub_key == NULL)
2380         {
2381             PK11err(PK11_F_DH_GEN_KEY, PK11_R_MALLOC_FAILURE);
2382             goto err;
2383         }
2384     }

2386     /* Reuse the memory allocated */
2387     priv_key_result[0].pValue = reuse_mem;
2388     priv_key_result[0].ulValueLen = reuse_mem_len;

2390     rv = pFuncList->C_GetAttributeValue(sp->session, h_priv_key,
2391         priv_key_result, priv_key_attr_result_count);

2393     if (rv != CKR_OK)
2394     {
2395         PK11err_add_data(PK11_F_DH_GEN_KEY,
2396             PK11_R_GETATTRIBUTVALUE, rv);
2397         goto err;
2398     }

2400     if (priv_key_result[0].type == CKA_VALUE)
2401     {
2402         if (dh->priv_key == NULL)
2403             if ((dh->priv_key = BN_new()) == NULL)
2404             {
2405                 PK11err(PK11_F_DH_GEN_KEY,
2406                     PK11_R_MALLOC_FAILURE);
2407                 goto err;
2408             }
2409         dh->priv_key = BN_bin2bn(priv_key_result[0].pValue,
2410             priv_key_result[0].ulValueLen, dh->priv_key);
2411         if (dh->priv_key == NULL)
2412         {
2413             PK11err(PK11_F_DH_GEN_KEY, PK11_R_MALLOC_FAILURE);
2414             goto err;
2415         }
2416     }

2418     ret = 1;

2420 err:

2422     if (h_pub_key != CK_INVALID_HANDLE)
2423     {
2424         rv = pFuncList->C_DestroyObject(sp->session, h_pub_key);
2425         if (rv != CKR_OK)
2426         {
2427             PK11err_add_data(PK11_F_DH_GEN_KEY,
2428                 PK11_R_DESTROYOBJECT, rv);
2429         }
2430     }

2432     if (h_priv_key != CK_INVALID_HANDLE)
2433     {
2434         rv = pFuncList->C_DestroyObject(sp->session, h_priv_key);
2435         if (rv != CKR_OK)
2436         {
2437             PK11err_add_data(PK11_F_DH_GEN_KEY,

```

```

2438         PK11_R_DESTROYOBJECT, rv);
2439     }
2440 }

2442     for (i = 1; i <= 2; i++)
2443     {
2444         if (pub_key_template[i].pValue != NULL)
2445         {
2446             OPENSSL_free(pub_key_template[i].pValue);
2447             pub_key_template[i].pValue = NULL;
2448         }
2449     }

2451     pk11_return_session(sp, OP_DH);
2452     return (ret);
2453 }

2455 static int pk11_DH_compute_key(unsigned char *key, const BIGNUM *pub_key,
2456     DH *dh)
2457 {
2458     int i;
2459     CK_MECHANISM mechanism = {CKM_DH_PKCS_DERIVE, NULL_PTR, 0};
2460     CK_OBJECT_CLASS key_class = CKO_SECRET_KEY;
2461     CK_KEY_TYPE key_type = CKK_GENERIC_SECRET;
2462     CK_OBJECT_HANDLE h_derived_key = CK_INVALID_HANDLE;
2463     CK_OBJECT_HANDLE h_key = CK_INVALID_HANDLE;

2465     CK_ULONG ul_priv_key_attr_count = 2;
2466     CK_ATTRIBUTE priv_key_template[] =
2467     {
2468         {CKA_CLASS, (void*) NULL, sizeof (key_class)},
2469         {CKA_KEY_TYPE, (void*) NULL, sizeof (key_type)},
2470     };

2472     CK_ULONG priv_key_attr_result_count = 1;
2473     CK_ATTRIBUTE priv_key_result[] =
2474     {
2475         {CKA_VALUE, (void *)NULL, 0}
2476     };

2478     CK_RV rv;
2479     int ret = -1;
2480     PK11_SESSION *sp = NULL;

2482     if (dh->priv_key == NULL)
2483         goto err;

2485     priv_key_template[0].pValue = &key_class;
2486     priv_key_template[1].pValue = &key_type;

2488     if ((sp = pk11_get_session(OP_DH)) == NULL)
2489         goto err;

2491     mechanism.ulParameterLen = BN_num_bytes(pub_key);
2492     mechanism.pParameter = OPENSSL_malloc(mechanism.ulParameterLen);
2493     if (mechanism.pParameter == NULL)
2494     {
2495         PK11err(PK11_F_DH_COMP_KEY, PK11_R_MALLOC_FAILURE);
2496         goto err;
2497     }
2498     BN_bn2bin(pub_key, mechanism.pParameter);

2500     (void) check_new_dh_key(sp, dh);

2502     h_key = sp->opdata_dh_key;
2503     if (h_key == CK_INVALID_HANDLE)

```

```

2504     h_key = sp->opdata_dh_key =
2505         pk11_get_dh_key((DH*) dh, &sp->opdata_dh,
2506             &sp->opdata_dh_priv_num, sp->session);

2508     if (h_key == CK_INVALID_HANDLE)
2509     {
2510         PK11err(PK11_F_DH_COMP_KEY, PK11_R_CREATEOBJECT);
2511         goto err;
2512     }

2514     rv = pFuncList->C_DeriveKey(sp->session,
2515         &mechanism,
2516         h_key,
2517         priv_key_template,
2518         ul_priv_key_attr_count,
2519         &h_derived_key);
2520     if (rv != CKR_OK)
2521     {
2522         PK11err_add_data(PK11_F_DH_COMP_KEY, PK11_R_DERIVEKEY, rv);
2523         goto err;
2524     }

2526     rv = pFuncList->C_GetAttributeValue(sp->session, h_derived_key,
2527         priv_key_result, priv_key_attr_result_count);

2529     if (rv != CKR_OK)
2530     {
2531         PK11err_add_data(PK11_F_DH_COMP_KEY, PK11_R_GETATTRIBUTVALUE,
2532             rv);
2533         goto err;
2534     }

2536     if (((CK_LONG) priv_key_result[0].ulValueLen) <= 0)
2537     {
2538         PK11err(PK11_F_DH_COMP_KEY, PK11_R_GETATTRIBUTVALUE);
2539         goto err;
2540     }
2541     priv_key_result[0].pValue =
2542         OPENSSL_malloc(priv_key_result[0].ulValueLen);
2543     if (!priv_key_result[0].pValue)
2544     {
2545         PK11err(PK11_F_DH_COMP_KEY, PK11_R_MALLOC_FAILURE);
2546         goto err;
2547     }

2549     rv = pFuncList->C_GetAttributeValue(sp->session, h_derived_key,
2550         priv_key_result, priv_key_attr_result_count);

2552     if (rv != CKR_OK)
2553     {
2554         PK11err_add_data(PK11_F_DH_COMP_KEY, PK11_R_GETATTRIBUTVALUE,
2555             rv);
2556         goto err;
2557     }

2559     /*
2560     * OpenSSL allocates the output buffer 'key' which is the same
2561     * length of the public key. It is long enough for the derived key
2562     */
2563     if (priv_key_result[0].type == CKA_VALUE)
2564     {
2565         /*
2566         * CKM_DH_PKCS_DERIVE mechanism is not supposed to strip
2567         * leading zeros from a computed shared secret. However,
2568         * OpenSSL always did it so we must do the same here. The
2569         * vagueness of the spec regarding leading zero bytes was

```

```

2570         * finally cleared with TLS 1.1 (RFC 4346) saying that leading
2571         * zeros are stripped before the computed data is used as the
2572         * pre-master secret.
2573         */
2574         for (i = 0; i < priv_key_result[0].ulValueLen; ++i)
2575         {
2576             if (((char *)priv_key_result[0].pValue)[i] != 0)
2577                 break;
2578         }

2580         (void) memcpy(key, ((char *)priv_key_result[0].pValue) + i,
2581             priv_key_result[0].ulValueLen - i);
2582         ret = priv_key_result[0].ulValueLen - i;
2583     }

2585 err:

2587     if (h_derived_key != CK_INVALID_HANDLE)
2588     {
2589         rv = pFuncList->C_DestroyObject(sp->session, h_derived_key);
2590         if (rv != CKR_OK)
2591         {
2592             PK11err_add_data(PK11_F_DH_COMP_KEY,
2593                 PK11_R_DESTROYOBJECT, rv);
2594         }
2595     }
2596     if (priv_key_result[0].pValue)
2597     {
2598         OPENSSL_free(priv_key_result[0].pValue);
2599         priv_key_result[0].pValue = NULL;
2600     }

2602     if (mechanism.pParameter)
2603     {
2604         OPENSSL_free(mechanism.pParameter);
2605         mechanism.pParameter = NULL;
2606     }

2608     pk11_return_session(sp, OP_DH);
2609     return (ret);
2610 }

2613 static CK_OBJECT_HANDLE pk11_get_dh_key(DH* dh,
2614     DH **key_ptr, BIGNUM **dh_priv_num, CK_SESSION_HANDLE session)
2615 {
2616     CK_RV rv;
2617     CK_OBJECT_HANDLE h_key = CK_INVALID_HANDLE;
2618     CK_OBJECT_CLASS class = CKO_PRIVATE_KEY;
2619     CK_KEY_TYPE key_type = CKK_DH;
2620     CK_ULONG found;
2621     CK_BBOOL rollback = FALSE;
2622     int i;

2624     CK_ULONG ul_key_attr_count = 7;
2625     CK_ATTRIBUTE key_template[] =
2626     {
2627         {CKA_CLASS, (void*) NULL, sizeof (class)},
2628         {CKA_KEY_TYPE, (void*) NULL, sizeof (key_type)},
2629         {CKA_DERIVE, &true, sizeof (true)},
2630         {CKA_PRIVATE, &false, sizeof (false)},
2631         {CKA_PRIME, (void *) NULL, 0},
2632         {CKA_BASE, (void *) NULL, 0},
2633         {CKA_VALUE, (void *) NULL, 0},
2634     };

```

```

2636     key_template[0].pValue = &class;
2637     key_template[1].pValue = &key_type;

2639     key_template[4].ulValueLen = BN_num_bytes(dh->p);
2640     key_template[4].pValue = (CK_VOID_PTR)OPENSSL_malloc(
2641         (size_t)key_template[4].ulValueLen);
2642     if (key_template[4].pValue == NULL)
2643     {
2644         PK11err(PK11_F_GET_DH_KEY, PK11_R_MALLOC_FAILURE);
2645         goto malloc_err;
2646     }

2648     BN_bn2bin(dh->p, key_template[4].pValue);

2650     key_template[5].ulValueLen = BN_num_bytes(dh->g);
2651     key_template[5].pValue = (CK_VOID_PTR)OPENSSL_malloc(
2652         (size_t)key_template[5].ulValueLen);
2653     if (key_template[5].pValue == NULL)
2654     {
2655         PK11err(PK11_F_GET_DH_KEY, PK11_R_MALLOC_FAILURE);
2656         goto malloc_err;
2657     }

2659     BN_bn2bin(dh->g, key_template[5].pValue);

2661     key_template[6].ulValueLen = BN_num_bytes(dh->priv_key);
2662     key_template[6].pValue = (CK_VOID_PTR)OPENSSL_malloc(
2663         (size_t)key_template[6].ulValueLen);
2664     if (key_template[6].pValue == NULL)
2665     {
2666         PK11err(PK11_F_GET_DH_KEY, PK11_R_MALLOC_FAILURE);
2667         goto malloc_err;
2668     }

2670     BN_bn2bin(dh->priv_key, key_template[6].pValue);

2672     /* see find_lock array definition for more info on object locking */
2673     LOCK_OBJSTORE(OP_DH);
2674     rv = pFuncList->C_FindObjectsInit(session, key_template,
2675         ul_key_attr_count);

2677     if (rv != CKR_OK)
2678     {
2679         PK11err_add_data(PK11_F_GET_DH_KEY, PK11_R_FINDOBJECTSINIT, rv);
2680         goto err;
2681     }

2683     rv = pFuncList->C_FindObjects(session, &h_key, 1, &found);

2685     if (rv != CKR_OK)
2686     {
2687         PK11err_add_data(PK11_F_GET_DH_KEY, PK11_R_FINDOBJECTS, rv);
2688         goto err;
2689     }

2691     rv = pFuncList->C_FindObjectsFinal(session);

2693     if (rv != CKR_OK)
2694     {
2695         PK11err_add_data(PK11_F_GET_DH_KEY, PK11_R_FINDOBJECTSFINAL,
2696             rv);
2697         goto err;
2698     }

2700     if (found == 0)
2701     {

```

```

2702         rv = pFuncList->C_CreateObject(session,
2703             key_template, ul_key_attr_count, &h_key);
2704         if (rv != CKR_OK)
2705         {
2706             PK11err_add_data(PK11_F_GET_DH_KEY, PK11_R_CREATEOBJECT,
2707                 rv);
2708             goto err;
2709         }
2710     }

2712     if (dh_priv_num != NULL)
2713         if ((*dh_priv_num = BN_dup(dh->priv_key)) == NULL)
2714         {
2715             PK11err(PK11_F_GET_DH_KEY, PK11_R_MALLOC_FAILURE);
2716             rollback = TRUE;
2717             goto err;
2718         }

2720     /* LINTED: E_CONSTANT_CONDITION */
2721     KEY_HANDLE_REFHOLD(h_key, OP_DH, FALSE, rollback, err);
2722     if (key_ptr != NULL)
2723         *key_ptr = dh;

2725 err:
2726     if (rollback)
2727     {
2728         /*
2729          * We do not care about the return value from C_DestroyObject()
2730          * since we are doing rollback.
2731          */
2732         if (found == 0)
2733             (void) pFuncList->C_DestroyObject(session, h_key);
2734         h_key = CK_INVALID_HANDLE;
2735     }

2737     UNLOCK_OBJSTORE(OP_DH);

2739 malloc_err:
2740     for (i = 4; i <= 6; i++)
2741     {
2742         if (key_template[i].pValue != NULL)
2743         {
2744             OPENSSL_free(key_template[i].pValue);
2745             key_template[i].pValue = NULL;
2746         }
2747     }

2749     return (h_key);
2750 }

2752 /*
2753  * Check for cache miss and clean the object pointer and handle
2754  * in such case. Return 1 for cache hit, 0 for cache miss.
2755  *
2756  * Note: we rely on pk11_destroy_dh_key_objects() to set sp->opdata_dh
2757  * to CK_INVALID_HANDLE even when it fails to destroy the object.
2758  */
2759 static int check_new_dh_key(PK11_SESSION *sp, DH *dh)
2760 {
2761     /*
2762      * Provide protection against DH structure reuse by making the
2763      * check for cache hit stronger. Private key component of DH key
2764      * is unique so it is sufficient to compare it with value cached
2765      * in PK11_SESSION structure.
2766      */
2767     if ((sp->opdata_dh != dh) ||

```



```
2768     (BN_cmp(sp->opdata_dh_priv_num, dh->priv_key) != 0))
2769     {
2770     /*
2771      * We do not check the return value because even in case of
2772      * failure the sp structure will have both key pointer
2773      * and object handle cleaned and pk11_destroy_object()
2774      * reports the failure to the OpenSSL error message buffer.
2775      */
2776     (void) pk11_destroy_dh_object(sp, TRUE);
2777     return (0);
2778     }
2779     return (1);
2780 }
2781 #endif

2783 /*
2784  * Local function to simplify key template population
2785  * Return 0 -- error, 1 -- no error
2786  */
2787 static int init_template_value(BIGNUM *bn, CK_VOID_PTR *p_value,
2788 CK_ULONG *ul_value_len)
2789 {
2790     CK_ULONG len = BN_num_bytes(bn);
2791     if (len == 0)
2792         return (1);

2794     *ul_value_len = len;
2795     *p_value = (CK_VOID_PTR)OPENSSL_malloc((size_t)*ul_value_len);
2796     if (*p_value == NULL)
2797         return (0);

2799     BN_bn2bin(bn, *p_value);

2801     return (1);
2802 }

2804 #endif /* OPENSSL_NO_HW_PK11 */
2805 #endif /* OPENSSL_NO_HW */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_asnmth.c

1

```
*****
7447 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_asnmth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"
56 #include "asn1_locl.h"
57 #include <openssl/evp.h>

59 /* If this symbol is defined then ENGINE_get_pkey_asn1_meth_engine(), the
60 * function that is used by EVP to hook in pkey_asn1_meth code and cache
61 * defaults (etc), will display brief debugging summaries to stderr with the
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_asnmth.c

2

```
62 * 'nid'. */
63 /* #define ENGINE_PKEY_ASN1_METH_DEBUG */

65 static ENGINE_TABLE *pkey_asn1_meth_table = NULL;

67 void ENGINE_unregister_pkey_asn1_meths(ENGINE *e)
68 {
69     engine_table_unregister(&pkey_asn1_meth_table, e);
70 }

72 static void engine_unregister_all_pkey_asn1_meths(void)
73 {
74     engine_table_cleanup(&pkey_asn1_meth_table);
75 }

77 int ENGINE_register_pkey_asn1_meths(ENGINE *e)
78 {
79     if(e->pkey_asn1_meths)
80     {
81         const int *nids;
82         int num_nids = e->pkey_asn1_meths(e, NULL, &nids, 0);
83         if(num_nids > 0)
84             return engine_table_register(&pkey_asn1_meth_table,
85                                         engine_unregister_all_pkey_asn1_meths, e, nids,
86                                         num_nids, 0);
87     }
88     return 1;
89 }

91 void ENGINE_register_all_pkey_asn1_meths(void)
92 {
93     ENGINE *e;

95     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
96         ENGINE_register_pkey_asn1_meths(e);
97 }

99 int ENGINE_set_default_pkey_asn1_meths(ENGINE *e)
100 {
101     if(e->pkey_asn1_meths)
102     {
103         const int *nids;
104         int num_nids = e->pkey_asn1_meths(e, NULL, &nids, 0);
105         if(num_nids > 0)
106             return engine_table_register(&pkey_asn1_meth_table,
107                                         engine_unregister_all_pkey_asn1_meths, e, nids,
108                                         num_nids, 1);
109     }
110     return 1;
111 }

113 /* Exposed API function to get a functional reference from the implementation
114 * table (ie. try to get a functional reference from the tabled structural
115 * references) for a given pkey_asn1_meth 'nid' */
116 ENGINE *ENGINE_get_pkey_asn1_meth_engine(int nid)
117 {
118     return engine_table_select(&pkey_asn1_meth_table, nid);
119 }

121 /* Obtains a pkey_asn1_meth implementation from an ENGINE functional reference */
122 const EVP_PKEY_ASN1_METHOD *ENGINE_get_pkey_asn1_meth(ENGINE *e, int nid)
123 {
124     EVP_PKEY_ASN1_METHOD *ret;
125     ENGINE_PKEY_ASN1_METHS_PTR fn = ENGINE_get_pkey_asn1_meths(e);
126     if(!fn || !fn(e, &ret, NULL, nid))
127         return NULL;
128 }
```

```

128         ENGINEerr(ENGINE_F_ENGINE_GET_PKEY_ASN1_METH,
129                   ENGINE_R_UNIMPLEMENTED_PUBLIC_KEY_METHOD);
130         return NULL;
131     }
132     return ret;
133 }

135 /* Gets the pkey_asn1_meth callback from an ENGINE structure */
136 ENGINE_PKEY_ASN1_METHS_PTR ENGINE_get_pkey_asn1_meths(const ENGINE *e)
137 {
138     return e->pkey_asn1_meths;
139 }

141 /* Sets the pkey_asn1_meth callback in an ENGINE structure */
142 int ENGINE_set_pkey_asn1_meths(ENGINE *e, ENGINE_PKEY_ASN1_METHS_PTR f)
143 {
144     e->pkey_asn1_meths = f;
145     return 1;
146 }

148 /* Internal function to free up EVP_PKEY_ASN1_METHOD structures before an
149  * ENGINE is destroyed
150  */

152 void engine_pkey_asn1_meths_free(ENGINE *e)
153 {
154     int i;
155     EVP_PKEY_ASN1_METHOD *pkm;
156     if (e->pkey_asn1_meths)
157     {
158         const int *pkuids;
159         int npkuids;
160         npkuids = e->pkey_asn1_meths(e, NULL, &pkuids, 0);
161         for (i = 0; i < npkuids; i++)
162             if (e->pkey_asn1_meths(e, &pkm, NULL, pkuids[i]))
163                 EVP_PKEY_asn1_free(pkm);
164     }
165 }

167 }

168 }

169 }

171 /* Find a method based on a string. This does a linear search through
172  * all implemented algorithms. This is OK in practice because only
173  * a small number of algorithms are likely to be implemented in an engine
174  * and it is not used for speed critical operations.
175  */

177 const EVP_PKEY_ASN1_METHOD *ENGINE_get_pkey_asn1_meth_str(ENGINE *e,
178                                                           const char *str, int len)
179 {
180     int i, nidcount;
181     const int *nids;
182     EVP_PKEY_ASN1_METHOD *ameth;
183     if (!e->pkey_asn1_meths)
184         return NULL;
185     if (len == -1)
186         len = strlen(str);
187     nidcount = e->pkey_asn1_meths(e, NULL, &nids, 0);
188     for (i = 0; i < nidcount; i++)
189     {
190         e->pkey_asn1_meths(e, &ameth, NULL, nids[i]);
191         if (((int)strlen(ameth->pem_str) == len) &&
192             !strncasecmp(ameth->pem_str, str, len))
193             return ameth;

```

```

194     }
195     return NULL;
196 }

198 typedef struct
199 {
200     ENGINE *e;
201     const EVP_PKEY_ASN1_METHOD *ameth;
202     const char *str;
203     int len;
204 } ENGINE_FIND_STR;

206 static void look_str_cb(int nid, STACK_OF(ENGINE) *sk, ENGINE *def, void *arg)
207 {
208     ENGINE_FIND_STR *lk = arg;
209     int i;
210     if (lk->ameth)
211         return;
212     for (i = 0; i < sk_ENGINE_num(sk); i++)
213     {
214         ENGINE *e = sk_ENGINE_value(sk, i);
215         EVP_PKEY_ASN1_METHOD *ameth;
216         e->pkey_asn1_meths(e, &ameth, NULL, nid);
217         if (((int)strlen(ameth->pem_str) == lk->len) &&
218             !strncasecmp(ameth->pem_str, lk->str, lk->len))
219         {
220             lk->e = e;
221             lk->ameth = ameth;
222             return;
223         }
224     }
225 }

227 const EVP_PKEY_ASN1_METHOD *ENGINE_pkey_asn1_find_str(ENGINE **pe,
228                                                         const char *str, int len)
229 {
230     ENGINE_FIND_STR fstr;
231     fstr.e = NULL;
232     fstr.ameth = NULL;
233     fstr.str = str;
234     fstr.len = len;
235     CRYPTO_w_lock(CRYPTO_LOCK_ENGINE);
236     engine_table_doall(pkey_asn1_meth_table, look_str_cb, &fstr);
237     /* If found obtain a structural reference to engine */
238     if (fstr.e)
239     {
240         fstr.e->struct_ref++;
241         engine_ref_debug(fstr.e, 0, 1)
242     }
243     *pe = fstr.e;
244     CRYPTO_w_unlock(CRYPTO_LOCK_ENGINE);
245     return fstr.ameth;
246 }

```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_cipher.c

1

4762 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_cipher.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_cipher_engine(), the function that
58 * is used by EVP to hook in cipher code and cache defaults (etc), will display
59 * brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_CIPHER_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_cipher.c

2

```
62 static ENGINE_TABLE *cipher_table = NULL;

64 void ENGINE_unregister_ciphers(ENGINE *e)
65 {
66     engine_table_unregister(&cipher_table, e);
67 }

69 static void engine_unregister_all_ciphers(void)
70 {
71     engine_table_cleanup(&cipher_table);
72 }

74 int ENGINE_register_ciphers(ENGINE *e)
75 {
76     if(e->ciphers)
77     {
78         const int *nids;
79         int num_nids = e->ciphers(e, NULL, &nids, 0);
80         if(num_nids > 0)
81             return engine_table_register(&cipher_table,
82                                         engine_unregister_all_ciphers, e, nids,
83                                         num_nids, 0);
84     }
85     return 1;
86 }

88 void ENGINE_register_all_ciphers()
89 {
90     ENGINE *e;

92     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
93         ENGINE_register_ciphers(e);
94 }

96 int ENGINE_set_default_ciphers(ENGINE *e)
97 {
98     if(e->ciphers)
99     {
100         const int *nids;
101         int num_nids = e->ciphers(e, NULL, &nids, 0);
102         if(num_nids > 0)
103             return engine_table_register(&cipher_table,
104                                         engine_unregister_all_ciphers, e, nids,
105                                         num_nids, 1);
106     }
107     return 1;
108 }

110 /* Exposed API function to get a functional reference from the implementation
111 * table (ie. try to get a functional reference from the tabled structural
112 * references) for a given cipher 'nid' */
113 ENGINE *ENGINE_get_cipher_engine(int nid)
114 {
115     return engine_table_select(&cipher_table, nid);
116 }

118 /* Obtains a cipher implementation from an ENGINE functional reference */
119 const EVP_CIPHER *ENGINE_get_cipher(ENGINE *e, int nid)
120 {
121     const EVP_CIPHER *ret;
122     ENGINE_CIPHERS_PTR fn = ENGINE_get_ciphers(e);
123     if(!fn || !fn(e, &ret, NULL, nid))
124     {
125         ENGINEerr(ENGINE_F_ENGINE_GET_CIPHER,
126                  ENGINE_R_UNIMPLEMENTED_CIPHER);
127         return NULL;
128     }
129 }
```

```
128     }
129     return ret;
130 }

132 /* Gets the cipher callback from an ENGINE structure */
133 ENGINE_CIPHERS_PTR ENGINE_get_ciphers(const ENGINE *e)
134 {
135     return e->ciphers;
136 }

138 /* Sets the cipher callback in an ENGINE structure */
139 int ENGINE_set_ciphers(ENGINE *e, ENGINE_CIPHERS_PTR f)
140 {
141     e->ciphers = f;
142     return 1;
143 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_dh.c

1

```
*****
4159 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_dh.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_default_DH(), the function that is
58  * used by DH to hook in implementation code and cache defaults (etc), will
59  * display brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_DH_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_dh.c

2

```
62 static ENGINE_TABLE *dh_table = NULL;
63 static const int dummy_nid = 1;

65 void ENGINE_unregister_DH(ENGINE *e)
66 {
67     engine_table_unregister(&dh_table, e);
68 }

70 static void engine_unregister_all_DH(void)
71 {
72     engine_table_cleanup(&dh_table);
73 }

75 int ENGINE_register_DH(ENGINE *e)
76 {
77     if(e->dh_meth)
78         return engine_table_register(&dh_table,
79                                     engine_unregister_all_DH, e, &dummy_nid, 1, 0);
80     return 1;
81 }

83 void ENGINE_register_all_DH()
84 {
85     ENGINE *e;

87     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
88         ENGINE_register_DH(e);
89 }

91 int ENGINE_set_default_DH(ENGINE *e)
92 {
93     if(e->dh_meth)
94         return engine_table_register(&dh_table,
95                                     engine_unregister_all_DH, e, &dummy_nid, 1, 1);
96     return 1;
97 }

99 /* Exposed API function to get a functional reference from the implementation
100  * table (ie. try to get a functional reference from the tabled structural
101  * references). */
102 ENGINE *ENGINE_get_default_DH(void)
103 {
104     return engine_table_select(&dh_table, dummy_nid);
105 }

107 /* Obtains an DH implementation from an ENGINE functional reference */
108 const DH_METHOD *ENGINE_get_DH(const ENGINE *e)
109 {
110     return e->dh_meth;
111 }

113 /* Sets an DH implementation in an ENGINE structure */
114 int ENGINE_set_DH(ENGINE *e, const DH_METHOD *dh_meth)
115 {
116     e->dh_meth = dh_meth;
117     return 1;
118 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_digest.c

1

4754 Fri May 30 18:31:48 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_digest.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_digest_engine(), the function that
58 * is used by EVP to hook in digest code and cache defaults (etc), will display
59 * brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_DIGEST_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_digest.c

2

```
62 static ENGINE_TABLE *digest_table = NULL;

64 void ENGINE_unregister_digests(ENGINE *e)
65 {
66     engine_table_unregister(&digest_table, e);
67 }

69 static void engine_unregister_all_digests(void)
70 {
71     engine_table_cleanup(&digest_table);
72 }

74 int ENGINE_register_digests(ENGINE *e)
75 {
76     if(e->digests)
77     {
78         const int *nids;
79         int num_nids = e->digests(e, NULL, &nids, 0);
80         if(num_nids > 0)
81             return engine_table_register(&digest_table,
82                                         engine_unregister_all_digests, e, nids,
83                                         num_nids, 0);
84     }
85     return 1;
86 }

88 void ENGINE_register_all_digests()
89 {
90     ENGINE *e;

92     for(e=ENGINE_get_first(); e ; e=ENGINE_get_next(e))
93         ENGINE_register_digests(e);
94 }

96 int ENGINE_set_default_digests(ENGINE *e)
97 {
98     if(e->digests)
99     {
100         const int *nids;
101         int num_nids = e->digests(e, NULL, &nids, 0);
102         if(num_nids > 0)
103             return engine_table_register(&digest_table,
104                                         engine_unregister_all_digests, e, nids,
105                                         num_nids, 1);
106     }
107     return 1;
108 }

110 /* Exposed API function to get a functional reference from the implementation
111 * table (ie. try to get a functional reference from the tabled structural
112 * references) for a given digest 'nid' */
113 ENGINE *ENGINE_get_digest_engine(int nid)
114 {
115     return engine_table_select(&digest_table, nid);
116 }

118 /* Obtains a digest implementation from an ENGINE functional reference */
119 const EVP_MD *ENGINE_get_digest(ENGINE *e, int nid)
120 {
121     const EVP_MD *ret;
122     ENGINE_DIGESTS_PTR fn = ENGINE_get_digests(e);
123     if(!fn || !fn(e, &ret, NULL, nid))
124     {
125         ENGINEerr(ENGINE_F_ENGINE_GET_DIGEST,
126                 ENGINE_R_UNIMPLEMENTED_DIGEST);
127         return NULL;
128     }
129 }
```

```
128     }
129     return ret;
130 }

132 /* Gets the digest callback from an ENGINE structure */
133 ENGINE_DIGESTS_PTR ENGINE_get_digests(const ENGINE *e)
134 {
135     return e->digests;
136 }

138 /* Sets the digest callback in an ENGINE structure */
139 int ENGINE_set_digests(ENGINE *e, ENGINE_DIGESTS_PTR f)
140 {
141     e->digests = f;
142     return 1;
143 }
```


new/usr/src/lib/openssl/libsunw_crypto/engine/tb_dsa.c

1

```
*****
4189 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_dsa.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_default_DSA(), the function that is
58 * used by DSA to hook in implementation code and cache defaults (etc), will
59 * display brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_DSA_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_dsa.c

2

```
62 static ENGINE_TABLE *dsa_table = NULL;
63 static const int dummy_nid = 1;

65 void ENGINE_unregister_DSA(ENGINE *e)
66 {
67     engine_table_unregister(&dsa_table, e);
68 }

70 static void engine_unregister_all_DSA(void)
71 {
72     engine_table_cleanup(&dsa_table);
73 }

75 int ENGINE_register_DSA(ENGINE *e)
76 {
77     if(e->dsa_meth)
78         return engine_table_register(&dsa_table,
79                                     engine_unregister_all_DSA, e, &dummy_nid, 1, 0);
80     return 1;
81 }

83 void ENGINE_register_all_DSA()
84 {
85     ENGINE *e;

87     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
88         ENGINE_register_DSA(e);
89 }

91 int ENGINE_set_default_DSA(ENGINE *e)
92 {
93     if(e->dsa_meth)
94         return engine_table_register(&dsa_table,
95                                     engine_unregister_all_DSA, e, &dummy_nid, 1, 1);
96     return 1;
97 }

99 /* Exposed API function to get a functional reference from the implementation
100 * table (ie. try to get a functional reference from the tabled structural
101 * references). */
102 ENGINE *ENGINE_get_default_DSA(void)
103 {
104     return engine_table_select(&dsa_table, dummy_nid);
105 }

107 /* Obtains an DSA implementation from an ENGINE functional reference */
108 const DSA_METHOD *ENGINE_get_DSA(const ENGINE *e)
109 {
110     return e->dsa_meth;
111 }

113 /* Sets an DSA implementation in an ENGINE structure */
114 int ENGINE_set_DSA(ENGINE *e, const DSA_METHOD *dsa_meth)
115 {
116     e->dsa_meth = dsa_meth;
117     return 1;
118 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_ecdh.c

1

```
*****
4779 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_ecdh.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/engine/tb_ecdh.c */
2 /* =====
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4  *
5  * The Elliptic Curve Public-Key Crypto Library (ECC Code) included
6  * herein is developed by SUN MICROSYSTEMS, INC., and is contributed
7  * to the OpenSSL project.
8  *
9  * The ECC Code is licensed pursuant to the OpenSSL open source
10 * license provided below.
11 *
12 * The ECDH engine software is originally written by Nils Gura and
13 * Douglas Stebila of Sun Microsystems Laboratories.
14 *
15 */
16 /* =====
17 * Copyright (c) 2000-2002 The OpenSSL Project. All rights reserved.
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61 * OF THE POSSIBILITY OF SUCH DAMAGE.
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_ecdh.c

2

```
62 * =====
63 *
64 * This product includes cryptographic software written by Eric Young
65 * (eay@cryptsoft.com). This product includes software written by Tim
66 * Hudson (tjh@cryptsoft.com).
67 *
68 */

70 #include "eng_int.h"

72 /* If this symbol is defined then ENGINE_get_default_ECDH(), the function that i
73 * used by ECDH to hook in implementation code and cache defaults (etc), will
74 * display brief debugging summaries to stderr with the 'nid'. */
75 /* #define ENGINE_ECDH_DEBUG */

77 static ENGINE_TABLE *ecdh_table = NULL;
78 static const int dummy_nid = 1;

80 void ENGINE_unregister_ECDH(ENGINE *e)
81 {
82     engine_table_unregister(&ecdh_table, e);
83 }

85 static void engine_unregister_all_ECDH(void)
86 {
87     engine_table_cleanup(&ecdh_table);
88 }

90 int ENGINE_register_ECDH(ENGINE *e)
91 {
92     if(e->ecdh_meth)
93         return engine_table_register(&ecdh_table,
94                                     engine_unregister_all_ECDH, e, &dummy_nid, 1, 0)
95     return 1;
96 }

98 void ENGINE_register_all_ECDH()
99 {
100     ENGINE *e;

102     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
103         ENGINE_register_ECDH(e);
104 }

106 int ENGINE_set_default_ECDH(ENGINE *e)
107 {
108     if(e->ecdh_meth)
109         return engine_table_register(&ecdh_table,
110                                     engine_unregister_all_ECDH, e, &dummy_nid, 1, 1)
111     return 1;
112 }

114 /* Exposed API function to get a functional reference from the implementation
115 * table (ie. try to get a functional reference from the tabled structural
116 * references). */
117 ENGINE *ENGINE_get_default_ECDH(void)
118 {
119     return engine_table_select(&ecdh_table, dummy_nid);
120 }

122 /* Obtains an ECDH implementation from an ENGINE functional reference */
123 const ECDH_METHOD *ENGINE_get_ECDH(const ENGINE *e)
124 {
125     return e->ecdh_meth;
126 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_ecdh.c

3

```
128 /* Sets an ECDH implementation in an ENGINE structure */
129 int ENGINE_set_ECDH(ENGINE *e, const ECDH_METHOD *ecdh_meth)
130 {
131     e->ecdh_meth = ecdh_meth;
132     return 1;
133 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_ecdsa.c

1

```
*****
4254 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_ecdsa.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
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47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_default_ECDSA(), the function that
58 * used by ECDSA to hook in implementation code and cache defaults (etc), will
59 * display brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_ECDSA_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_ecdsa.c

2

```
62 static ENGINE_TABLE *ecdsa_table = NULL;
63 static const int dummy_nid = 1;

65 void ENGINE_unregister_ECDSA(ENGINE *e)
66 {
67     engine_table_unregister(&ecdsa_table, e);
68 }

70 static void engine_unregister_all_ECDSA(void)
71 {
72     engine_table_cleanup(&ecdsa_table);
73 }

75 int ENGINE_register_ECDSA(ENGINE *e)
76 {
77     if(e->ecdsa_meth)
78         return engine_table_register(&ecdsa_table,
79                                     engine_unregister_all_ECDSA, e, &dummy_nid, 1, 0);
80     return 1;
81 }

83 void ENGINE_register_all_ECDSA()
84 {
85     ENGINE *e;

87     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
88         ENGINE_register_ECDSA(e);
89 }

91 int ENGINE_set_default_ECDSA(ENGINE *e)
92 {
93     if(e->ecdsa_meth)
94         return engine_table_register(&ecdsa_table,
95                                     engine_unregister_all_ECDSA, e, &dummy_nid, 1, 1);
96     return 1;
97 }

99 /* Exposed API function to get a functional reference from the implementation
100 * table (ie. try to get a functional reference from the tabled structural
101 * references). */
102 ENGINE *ENGINE_get_default_ECDSA(void)
103 {
104     return engine_table_select(&ecdsa_table, dummy_nid);
105 }

107 /* Obtains an ECDSA implementation from an ENGINE functional reference */
108 const ECDSA_METHOD *ENGINE_get_ECDSA(const ENGINE *e)
109 {
110     return e->ecdsa_meth;
111 }

113 /* Sets an ECDSA implementation in an ENGINE structure */
114 int ENGINE_set_ECDSA(ENGINE *e, const ECDSA_METHOD *ecdsa_meth)
115 {
116     e->ecdsa_meth = ecdsa_meth;
117     return 1;
118 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_pkmeth.c

1

```
*****
5325 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_pkmeth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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47 * =====
48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"
56 #include <openssl/evp.h>

58 /* If this symbol is defined then ENGINE_get_pkey_meth_engine(), the function
59  * that is used by EVP to hook in pkey_meth code and cache defaults (etc), will
60  * display brief debugging summaries to stderr with the 'nid'. */
61 /* #define ENGINE_PKEY_METH_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_pkmeth.c

2

```
63 static ENGINE_TABLE *pkey_meth_table = NULL;

65 void ENGINE_unregister_pkey_meths(ENGINE *e)
66 {
67     engine_table_unregister(&pkey_meth_table, e);
68 }

70 static void engine_unregister_all_pkey_meths(void)
71 {
72     engine_table_cleanup(&pkey_meth_table);
73 }

75 int ENGINE_register_pkey_meths(ENGINE *e)
76 {
77     if(e->pkey_meths)
78     {
79         const int *nids;
80         int num_nids = e->pkey_meths(e, NULL, &nids, 0);
81         if(num_nids > 0)
82             return engine_table_register(&pkey_meth_table,
83                                         engine_unregister_all_pkey_meths, e, nids,
84                                         num_nids, 0);
85     }
86     return 1;
87 }

89 void ENGINE_register_all_pkey_meths()
90 {
91     ENGINE *e;

93     for(e=ENGINE_get_first(); e ; e=ENGINE_get_next(e))
94         ENGINE_register_pkey_meths(e);
95 }

97 int ENGINE_set_default_pkey_meths(ENGINE *e)
98 {
99     if(e->pkey_meths)
100     {
101         const int *nids;
102         int num_nids = e->pkey_meths(e, NULL, &nids, 0);
103         if(num_nids > 0)
104             return engine_table_register(&pkey_meth_table,
105                                         engine_unregister_all_pkey_meths, e, nids,
106                                         num_nids, 1);
107     }
108     return 1;
109 }

111 /* Exposed API function to get a functional reference from the implementation
112  * table (ie. try to get a functional reference from the tabled structural
113  * references) for a given pkey_meth 'nid' */
114 ENGINE *ENGINE_get_pkey_meth_engine(int nid)
115 {
116     return engine_table_select(&pkey_meth_table, nid);
117 }

119 /* Obtains a pkey_meth implementation from an ENGINE functional reference */
120 const EVP_PKEY_METHOD *ENGINE_get_pkey_meth(ENGINE *e, int nid)
121 {
122     EVP_PKEY_METHOD *ret;
123     ENGINE_PKEY_METHS_PTR fn = ENGINE_get_pkey_meths(e);
124     if(!fn || !fn(e, &ret, NULL, nid))
125     {
126         ENGINEerr(ENGINE_F_ENGINE_GET_PKEY_METH,
127                  ENGINE_R_UNIMPLEMENTED_PUBLIC_KEY_METHOD);
128     }
129 }
```

```
128         return NULL;
129     }
130     return ret;
131 }

133 /* Gets the pkey_meth callback from an ENGINE structure */
134 ENGINE_PKEY_METHS_PTR ENGINE_get_pkey_meths(const ENGINE *e)
135 {
136     return e->pkey_meths;
137 }

139 /* Sets the pkey_meth callback in an ENGINE structure */
140 int ENGINE_set_pkey_meths(ENGINE *e, ENGINE_PKEY_METHS_PTR f)
141 {
142     e->pkey_meths = f;
143     return 1;
144 }

146 /* Internal function to free up EVP_PKEY_METHOD structures before an
147  * ENGINE is destroyed
148  */

150 void engine_pkey_meths_free(ENGINE *e)
151 {
152     int i;
153     EVP_PKEY_METHOD *pkm;
154     if (e->pkey_meths)
155     {
156         const int *pknids;
157         int npknids;
158         npknids = e->pkey_meths(e, NULL, &pknids, 0);
159         for (i = 0; i < npknids; i++)
160         {
161             if (e->pkey_meths(e, &pkm, NULL, pknids[i]))
162             {
163                 EVP_PKEY_meth_free(pkm);
164             }
165         }
166     }
167 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_rand.c

1

```
*****
4219 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_rand.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
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50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_default RAND(), the function that i
58 * used by RAND to hook in implementation code and cache defaults (etc), will
59 * display brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_RAND_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_rand.c

2

```
62 static ENGINE_TABLE *rand_table = NULL;
63 static const int dummy_nid = 1;

65 void ENGINE_unregister_RAND(ENGINE *e)
66 {
67     engine_table_unregister(&rand_table, e);
68 }

70 static void engine_unregister_all_RAND(void)
71 {
72     engine_table_cleanup(&rand_table);
73 }

75 int ENGINE_register_RAND(ENGINE *e)
76 {
77     if(e->rand_meth)
78         return engine_table_register(&rand_table,
79                                     engine_unregister_all_RAND, e, &dummy_nid, 1, 0)
80     return 1;
81 }

83 void ENGINE_register_all_RAND()
84 {
85     ENGINE *e;

87     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
88         ENGINE_register_RAND(e);
89 }

91 int ENGINE_set_default_RAND(ENGINE *e)
92 {
93     if(e->rand_meth)
94         return engine_table_register(&rand_table,
95                                     engine_unregister_all_RAND, e, &dummy_nid, 1, 1)
96     return 1;
97 }

99 /* Exposed API function to get a functional reference from the implementation
100 * table (ie. try to get a functional reference from the tabled structural
101 * references). */
102 ENGINE *ENGINE_get_default_RAND(void)
103 {
104     return engine_table_select(&rand_table, dummy_nid);
105 }

107 /* Obtains an RAND implementation from an ENGINE functional reference */
108 const RAND_METHOD *ENGINE_get_RAND(const ENGINE *e)
109 {
110     return e->rand_meth;
111 }

113 /* Sets an RAND implementation in an ENGINE structure */
114 int ENGINE_set_RAND(ENGINE *e, const RAND_METHOD *rand_meth)
115 {
116     e->rand_meth = rand_meth;
117     return 1;
118 }
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_rsa.c

1

```
*****
4189 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_rsa.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
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48 *
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50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_default_RSA(), the function that is
58  * used by RSA to hook in implementation code and cache defaults (etc), will
59  * display brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_RSA_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_rsa.c

2

```
62 static ENGINE_TABLE *rsa_table = NULL;
63 static const int dummy_nid = 1;

65 void ENGINE_unregister_RSA(ENGINE *e)
66 {
67     engine_table_unregister(&rsa_table, e);
68 }

70 static void engine_unregister_all_RSA(void)
71 {
72     engine_table_cleanup(&rsa_table);
73 }

75 int ENGINE_register_RSA(ENGINE *e)
76 {
77     if(e->rsa_meth)
78         return engine_table_register(&rsa_table,
79                                     engine_unregister_all_RSA, e, &dummy_nid, 1, 0);
80     return 1;
81 }

83 void ENGINE_register_all_RSA()
84 {
85     ENGINE *e;

87     for(e=ENGINE_get_first(); e; e=ENGINE_get_next(e))
88         ENGINE_register_RSA(e);
89 }

91 int ENGINE_set_default_RSA(ENGINE *e)
92 {
93     if(e->rsa_meth)
94         return engine_table_register(&rsa_table,
95                                     engine_unregister_all_RSA, e, &dummy_nid, 1, 1);
96     return 1;
97 }

99 /* Exposed API function to get a functional reference from the implementation
100  * table (ie. try to get a functional reference from the tabled structural
101  * references). */
102 ENGINE *ENGINE_get_default_RSA(void)
103 {
104     return engine_table_select(&rsa_table, dummy_nid);
105 }

107 /* Obtains an RSA implementation from an ENGINE functional reference */
108 const RSA_METHOD *ENGINE_get_RSA(const ENGINE *e)
109 {
110     return e->rsa_meth;
111 }

113 /* Sets an RSA implementation in an ENGINE structure */
114 int ENGINE_set_RSA(ENGINE *e, const RSA_METHOD *rsa_meth)
115 {
116     e->rsa_meth = rsa_meth;
117     return 1;
118 }
```


new/usr/src/lib/openssl/libsunw_crypto/engine/tb_store.c

1

```
*****
4346 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/engine/tb_store.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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48 *
49 * This product includes cryptographic software written by Eric Young
50 * (eay@cryptsoft.com). This product includes software written by Tim
51 * Hudson (tjh@cryptsoft.com).
52 *
53 */

55 #include "eng_int.h"

57 /* If this symbol is defined then ENGINE_get_default_STORE(), the function that
58  * used by STORE to hook in implementation code and cache defaults (etc), will
59  * display brief debugging summaries to stderr with the 'nid'. */
60 /* #define ENGINE_STORE_DEBUG */
```

new/usr/src/lib/openssl/libsunw_crypto/engine/tb_store.c

2

```
62 static ENGINE_TABLE *store_table = NULL;
63 static const int dummy_nid = 1;

65 void ENGINE_unregister_STORE(ENGINE *e)
66 {
67     engine_table_unregister(&store_table, e);
68 }

70 static void engine_unregister_all_STORE(void)
71 {
72     engine_table_cleanup(&store_table);
73 }

75 int ENGINE_register_STORE(ENGINE *e)
76 {
77     if(e->store_meth)
78         return engine_table_register(&store_table,
79                                     engine_unregister_all_STORE, e, &dummy_nid, 1, 0);
80     return 1;
81 }

83 void ENGINE_register_all_STORE()
84 {
85     ENGINE *e;

87     for(e=ENGINE_get_first(); e ; e=ENGINE_get_next(e))
88         ENGINE_register_STORE(e);
89 }

91 /* The following two functions are removed because they're useless. */
92 #if 0
93 int ENGINE_set_default_STORE(ENGINE *e)
94 {
95     if(e->store_meth)
96         return engine_table_register(&store_table,
97                                     engine_unregister_all_STORE, e, &dummy_nid, 1, 1);
98     return 1;
99 }
100 #endif

102 #if 0
103 /* Exposed API function to get a functional reference from the implementation
104  * table (ie. try to get a functional reference from the tabled structural
105  * references). */
106 ENGINE *ENGINE_get_default_STORE(void)
107 {
108     return engine_table_select(&store_table, dummy_nid);
109 }
110 #endif

112 /* Obtains an STORE implementation from an ENGINE functional reference */
113 const STORE_METHOD *ENGINE_get_STORE(const ENGINE *e)
114 {
115     return e->store_meth;
116 }

118 /* Sets an STORE implementation in an ENGINE structure */
119 int ENGINE_set_STORE(ENGINE *e, const STORE_METHOD *store_meth)
120 {
121     e->store_meth = store_meth;
122     return 1;
123 }
```

new/usr/src/lib/openssl/libsunw_crypto/err/err.c

1

```
*****
30145 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/err/err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/err/err.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright (c) 1998-2006 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without
```

new/usr/src/lib/openssl/libsunw_crypto/err/err.c

2

```
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102 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
103 * OF THE POSSIBILITY OF SUCH DAMAGE.
104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include <stdarg.h>
114 #include <string.h>
115 #include "cryptlib.h"
116 #include <openssl/lhash.h>
117 #include <openssl/crypto.h>
118 #include <openssl/buffer.h>
119 #include <openssl/bio.h>
120 #include <openssl/err.h>
121
122 DECLARE_LHASH_OF(ERR_STRING_DATA);
123 DECLARE_LHASH_OF(ERR_STATE);
124
125 static void err_load_strings(int lib, ERR_STRING_DATA *str);
126
127 static void ERR_STATE_free(ERR_STATE *s);
```

```

128 #ifndef OPENSSSL_NO_ERR
129 static ERR_STRING_DATA ERR_str_libraries[]=
130 {
131     {ERR_PACK(ERR_LIB_NONE,0,0),      "unknown library"},
132     {ERR_PACK(ERR_LIB_SYS,0,0),        "system library"},
133     {ERR_PACK(ERR_LIB_BN,0,0),         "bignum routines"},
134     {ERR_PACK(ERR_LIB_RSA,0,0),        "rsa routines"},
135     {ERR_PACK(ERR_LIB_DH,0,0),         "Diffie-Hellman routines"},
136     {ERR_PACK(ERR_LIB_EVP,0,0),        "digital envelope routines"},
137     {ERR_PACK(ERR_LIB_BUF,0,0),        "memory buffer routines"},
138     {ERR_PACK(ERR_LIB_OBJ,0,0),        "object identifier routines"},
139     {ERR_PACK(ERR_LIB_PEM,0,0),        "PEM routines"},
140     {ERR_PACK(ERR_LIB_DSA,0,0),        "dsa routines"},
141     {ERR_PACK(ERR_LIB_X509,0,0),       "x509 certificate routines"},
142     {ERR_PACK(ERR_LIB_ASN1,0,0),       "asn1 encoding routines"},
143     {ERR_PACK(ERR_LIB_CONF,0,0),       "configuration file routines"},
144     {ERR_PACK(ERR_LIB_CRYPT,0,0),      "common libcrypto routines"},
145     {ERR_PACK(ERR_LIB_EC,0,0),         "elliptic curve routines"},
146     {ERR_PACK(ERR_LIB_SSL,0,0),        "SSL routines"},
147     {ERR_PACK(ERR_LIB_BIO,0,0),        "BIO routines"},
148     {ERR_PACK(ERR_LIB_PKCS7,0,0),      "PKCS7 routines"},
149     {ERR_PACK(ERR_LIB_X509V3,0,0),     "X509 V3 routines"},
150     {ERR_PACK(ERR_LIB_PKCS12,0,0),     "PKCS12 routines"},
151     {ERR_PACK(ERR_LIB_RAND,0,0),       "random number generator"},
152     {ERR_PACK(ERR_LIB_DSO,0,0),        "DSO support routines"},
153     {ERR_PACK(ERR_LIB_TS,0,0),         "time stamp routines"},
154     {ERR_PACK(ERR_LIB_ENGINE,0,0),     "engine routines"},
155     {ERR_PACK(ERR_LIB_OCSP,0,0),       "OCSP routines"},
156     {ERR_PACK(ERR_LIB_FIPS,0,0),       "FIPS routines"},
157     {ERR_PACK(ERR_LIB_CMS,0,0),        "CMS routines"},
158     {ERR_PACK(ERR_LIB_HMAC,0,0),       "HMAC routines"},
159     {0,NULL},
160 };
161
162 static ERR_STRING_DATA ERR_str_funcs[]=
163 {
164     {ERR_PACK(0,SYS_F_FOPEN,0),        "fopen"},
165     {ERR_PACK(0,SYS_F_CONNECT,0),      "connect"},
166     {ERR_PACK(0,SYS_F_GETSERVBYNAME,0), "getservbyname"},
167     {ERR_PACK(0,SYS_F_SOCKET,0),       "socket"},
168     {ERR_PACK(0,SYS_F_IOCTL_SOCKET,0),  "ioctlsocket"},
169     {ERR_PACK(0,SYS_F_BIND,0),         "bind"},
170     {ERR_PACK(0,SYS_F_LISTEN,0),       "listen"},
171     {ERR_PACK(0,SYS_F_ACCEPT,0),       "accept"},
172 #ifdef OPENSSSL_SYS_WINDOWS
173     {ERR_PACK(0,SYS_F_WSASTARTUP,0),    "WSAStartup"},
174 #endif
175     {ERR_PACK(0,SYS_F_OPENDIR,0),       "opendir"},
176     {ERR_PACK(0,SYS_F_FREAD,0),        "fread"},
177     {0,NULL},
178 };
179
180 static ERR_STRING_DATA ERR_str_reasons[]=
181 {
182     {ERR_R_SYS_LIB,      "system lib"},
183     {ERR_R_BN_LIB,       "BN lib"},
184     {ERR_R_RSA_LIB,      "RSA lib"},
185     {ERR_R_DH_LIB,       "DH lib"},
186     {ERR_R_EVP_LIB,      "EVP lib"},
187     {ERR_R_BUF_LIB,      "BUF lib"},
188     {ERR_R_OBJ_LIB,      "OBJ lib"},
189     {ERR_R_PEM_LIB,      "PEM lib"},
190     {ERR_R_DSA_LIB,      "DSA lib"},
191     {ERR_R_X509_LIB,     "X509 lib"},
192     {ERR_R_ASN1_LIB,     "ASN1 lib"},
193     {ERR_R_CONF_LIB,    "CONF lib"},

```

```

194 {ERR_R_CRYPT_LIB,      "CRYPTO lib"},
195 {ERR_R_EC_LIB,         "EC lib"},
196 {ERR_R_SSL_LIB,        "SSL lib"},
197 {ERR_R_BIO_LIB,        "BIO lib"},
198 {ERR_R_PKCS7_LIB,      "PKCS7 lib"},
199 {ERR_R_X509V3_LIB,     "X509V3 lib"},
200 {ERR_R_PKCS12_LIB,     "PKCS12 lib"},
201 {ERR_R_RAND_LIB,       "RAND lib"},
202 {ERR_R_DSO_LIB,        "DSO lib"},
203 {ERR_R_ENGINE_LIB,     "ENGINE lib"},
204 {ERR_R_OCSP_LIB,       "OCSP lib"},
205 {ERR_R_TS_LIB,         "TS lib"},
206
207 {ERR_R_NESTED_ASN1_ERROR, "nested asn1 error"},
208 {ERR_R_BAD_ASN1_OBJECT_HEADER, "bad asn1 object header"},
209 {ERR_R_BAD_GET_ASN1_OBJECT_CALL, "bad get asn1 object call"},
210 {ERR_R_EXPECTING_AN_ASN1_SEQUENCE, "expecting an asn1 sequence"},
211 {ERR_R_ASN1_LENGTH_MISMATCH, "asn1 length mismatch"},
212 {ERR_R_MISSING_ASN1_EOS, "missing asn1 eos"},
213
214 {ERR_R_FATAL,          "fatal"},
215 {ERR_R_MALLOC_FAILURE, "malloc failure"},
216 {ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED, "called a function you should not call"},
217 {ERR_R_PASSED_NULL_PARAMETER, "passed a null parameter"},
218 {ERR_R_INTERNAL_ERROR, "internal error"},
219 {ERR_R_DISABLED,       "called a function that was disabled at"},
220
221 {0,NULL},
222 };
223 #endif
224
225 /* Define the predeclared (but externally opaque) "ERR_FNS" type */
226 struct st_ERR_FNS
227 {
228     /* Works on the "error_hash" string table */
229     LHASH_OF(ERR_STRING_DATA) *(*cb_err_get)(int create);
230     void (*cb_err_del)(void);
231     ERR_STRING_DATA *(*cb_err_get_item)(const ERR_STRING_DATA *);
232     ERR_STRING_DATA *(*cb_err_set_item)(ERR_STRING_DATA *);
233     ERR_STRING_DATA *(*cb_err_del_item)(ERR_STRING_DATA *);
234     /* Works on the "thread_hash" error-state table */
235     LHASH_OF(ERR_STATE) *(*cb_thread_get)(int create);
236     void (*cb_thread_release)(LHASH_OF(ERR_STATE) **hash);
237     ERR_STATE *(*cb_thread_get_item)(const ERR_STATE *);
238     ERR_STATE *(*cb_thread_set_item)(ERR_STATE *);
239     void (*cb_thread_del_item)(const ERR_STATE *);
240     /* Returns the next available error "library" numbers */
241     int (*cb_get_next_lib)(void);
242 };
243
244 /* Predeclarations of the "err_defaults" functions */
245 static LHASH_OF(ERR_STRING_DATA) *int_err_get(int create);
246 static void int_err_del(void);
247 static ERR_STRING_DATA *int_err_get_item(const ERR_STRING_DATA *);
248 static ERR_STRING_DATA *int_err_set_item(ERR_STRING_DATA *);
249 static ERR_STRING_DATA *int_err_del_item(ERR_STRING_DATA *);
250 static LHASH_OF(ERR_STATE) *int_thread_get(int create);
251 static void int_thread_release(LHASH_OF(ERR_STATE) **hash);
252 static ERR_STATE *int_thread_get_item(const ERR_STATE *);
253 static ERR_STATE *int_thread_set_item(ERR_STATE *);
254 static void int_thread_del_item(const ERR_STATE *);
255 static int int_err_get_next_lib(void);
256 /* The static ERR_FNS table using these defaults functions */
257 static const ERR_FNS err_defaults =
258 {
259     {

```

```

260     int_err_get,
261     int_err_del,
262     int_err_get_item,
263     int_err_set_item,
264     int_err_del_item,
265     int_thread_get,
266     int_thread_release,
267     int_thread_get_item,
268     int_thread_set_item,
269     int_thread_del_item,
270     int_err_get_next_lib
271 };

273 /* The replacable table of ERR_FNS functions we use at run-time */
274 static const ERR_FNS *err_fns = NULL;

276 /* Eg. rather than using "err_get()", use "ERRFN(err_get)()". */
277 #define ERRFN(a) err_fns->cb_##a

279 /* The internal state used by "err_defaults" - as such, the setting, reading,
280  * creating, and deleting of this data should only be permitted via the
281  * "err_defaults" functions. This way, a linked module can completely defer all
282  * ERR state operation (together with requisite locking) to the implementations
283  * and state in the loading application. */
284 static LHASH_OF(ERR_STRING_DATA) *int_error_hash = NULL;
285 static LHASH_OF(ERR_STATE) *int_thread_hash = NULL;
286 static int int_thread_hash_references = 0;
287 static int int_err_library_number= ERR_LIB_USER;

289 /* Internal function that checks whether "err_fns" is set and if not, sets it to
290  * the defaults. */
291 static void err_fns_check(void)
292 {
293     if (err_fns) return;
294
295     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
296     if (!err_fns)
297         err_fns = &err_defaults;
298     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);
299 }

301 /* API functions to get or set the underlying ERR functions. */

303 const ERR_FNS *ERR_get_implementation(void)
304 {
305     err_fns_check();
306     return err_fns;
307 }

309 int ERR_set_implementation(const ERR_FNS *fns)
310 {
311     int ret = 0;

313     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
314     /* It's too late if 'err_fns' is non-NULL. BTW: not much point setting
315      * an error is there?! */
316     if (!err_fns)
317     {
318         err_fns = fns;
319         ret = 1;
320     }
321     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);
322     return ret;
323 }

325 /* These are the callbacks provided to "lh_new()" when creating the LHASH tables

```

```

326  * internal to the "err_defaults" implementation. */

328 static unsigned long get_error_values(int inc,int top,const char **file,int *lin
329                                     const char **data,int *flags);

331 /* The internal functions used in the "err_defaults" implementation */

333 static unsigned long err_string_data_hash(const ERR_STRING_DATA *a)
334 {
335     unsigned long ret,l;

337     l=a->error;
338     ret=l^ERR_GET_LIB(l)^ERR_GET_FUNC(l);
339     return(ret^ret%19*13);
340 }
341 static IMPLEMENT_LHASH_HASH_FN(err_string_data, ERR_STRING_DATA)

343 static int err_string_data_cmp(const ERR_STRING_DATA *a,
344                               const ERR_STRING_DATA *b)
345 {
346     return (int)(a->error - b->error);
347 }
348 static IMPLEMENT_LHASH_COMP_FN(err_string_data, ERR_STRING_DATA)

350 static LHASH_OF(ERR_STRING_DATA) *int_err_get(int create)
351 {
352     LHASH_OF(ERR_STRING_DATA) *ret = NULL;

354     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
355     if (!int_error_hash && create)
356     {
357         CRYPTO_push_info("int_err_get (err.c)");
358         int_error_hash = lh_ERR_STRING_DATA_new();
359         CRYPTO_pop_info();
360     }
361     if (int_error_hash)
362         ret = int_error_hash;
363     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);

365     return ret;
366 }

368 static void int_err_del(void)
369 {
370     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
371     if (int_error_hash)
372     {
373         lh_ERR_STRING_DATA_free(int_error_hash);
374         int_error_hash = NULL;
375     }
376     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);
377 }

379 static ERR_STRING_DATA *int_err_get_item(const ERR_STRING_DATA *d)
380 {
381     ERR_STRING_DATA *p;
382     LHASH_OF(ERR_STRING_DATA) *hash;

384     err_fns_check();
385     hash = ERRFN(err_get)(0);
386     if (!hash)
387         return NULL;

389     CRYPTO_r_lock(CRYPTO_LOCK_ERR);
390     p = lh_ERR_STRING_DATA_retrieve(hash, d);
391     CRYPTO_r_unlock(CRYPTO_LOCK_ERR);

```

```

393     return p;
394 }

396 static ERR_STRING_DATA *int_err_set_item(ERR_STRING_DATA *d)
397 {
398     ERR_STRING_DATA *p;
399     LHASH_OF(ERR_STRING_DATA) *hash;

401     err_fns_check();
402     hash = ERRFN(err_get)(1);
403     if (!hash)
404         return NULL;

406     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
407     p = lh_ERR_STRING_DATA_insert(hash, d);
408     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);

410     return p;
411 }

413 static ERR_STRING_DATA *int_err_del_item(ERR_STRING_DATA *d)
414 {
415     ERR_STRING_DATA *p;
416     LHASH_OF(ERR_STRING_DATA) *hash;

418     err_fns_check();
419     hash = ERRFN(err_get)(0);
420     if (!hash)
421         return NULL;

423     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
424     p = lh_ERR_STRING_DATA_delete(hash, d);
425     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);

427     return p;
428 }

430 static unsigned long err_state_hash(const ERR_STATE *a)
431 {
432     return CRYPTO_THREADID_hash(&a->tid) * 13;
433 }
434 static IMPLEMENT_LHASH_HASH_FN(err_state, ERR_STATE)

436 static int err_state_cmp(const ERR_STATE *a, const ERR_STATE *b)
437 {
438     return CRYPTO_THREADID_cmp(&a->tid, &b->tid);
439 }
440 static IMPLEMENT_LHASH_COMP_FN(err_state, ERR_STATE)

442 static LHASH_OF(ERR_STATE) *int_thread_get(int create)
443 {
444     LHASH_OF(ERR_STATE) *ret = NULL;

446     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
447     if (!int_thread_hash && create)
448     {
449         CRYPTO_push_info("int_thread_get (err.c)");
450         int_thread_hash = lh_ERR_STATE_new();
451         CRYPTO_pop_info();
452     }
453     if (int_thread_hash)
454     {
455         int_thread_hash_references++;
456         ret = int_thread_hash;
457     }

```

```

458     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);
459     return ret;
460 }

462 static void int_thread_release(LHASH_OF(ERR_STATE) **hash)
463 {
464     int i;

466     if (hash == NULL || *hash == NULL)
467         return;

469     i = CRYPTO_add(&int_thread_hash_references, -1, CRYPTO_LOCK_ERR);

471 #ifdef REF_PRINT
472     fprintf(stderr, "%4d:%s\n", int_thread_hash_references, "ERR");
473 #endif
474     if (i > 0) return;
475 #ifdef REF_CHECK
476     if (i < 0)
477     {
478         fprintf(stderr, "int_thread_release, bad reference count\n");
479         abort(); /* ok */
480     }
481 #endif
482     *hash = NULL;
483 }

485 static ERR_STATE *int_thread_get_item(const ERR_STATE *d)
486 {
487     ERR_STATE *p;
488     LHASH_OF(ERR_STATE) *hash;

490     err_fns_check();
491     hash = ERRFN(thread_get)(0);
492     if (!hash)
493         return NULL;

495     CRYPTO_r_lock(CRYPTO_LOCK_ERR);
496     p = lh_ERR_STATE_retrieve(hash, d);
497     CRYPTO_r_unlock(CRYPTO_LOCK_ERR);

499     ERRFN(thread_release)(&hash);
500     return p;
501 }

503 static ERR_STATE *int_thread_set_item(ERR_STATE *d)
504 {
505     ERR_STATE *p;
506     LHASH_OF(ERR_STATE) *hash;

508     err_fns_check();
509     hash = ERRFN(thread_get)(1);
510     if (!hash)
511         return NULL;

513     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
514     p = lh_ERR_STATE_insert(hash, d);
515     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);

517     ERRFN(thread_release)(&hash);
518     return p;
519 }

521 static void int_thread_del_item(const ERR_STATE *d)
522 {
523     ERR_STATE *p;

```

```

524     LHASH_OF(ERR_STATE) *hash;

526     err_fns_check();
527     hash = ERRFN(thread_get)(0);
528     if (!hash)
529         return;

531     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
532     p = lh_ERR_STATE_delete(hash, d);
533     /* make sure we don't leak memory */
534     if (int_thread_hash_references == 1
535         && int_thread_hash && lh_ERR_STATE_num_items(int_thread_hash) == 0)
536     {
537         lh_ERR_STATE_free(int_thread_hash);
538         int_thread_hash = NULL;
539     }
540     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);

542     ERRFN(thread_release)(amp;hash);
543     if (p)
544         ERR_STATE_free(p);
545 }

547 static int int_err_get_next_lib(void)
548 {
549     int ret;

551     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
552     ret = int_err_library_number++;
553     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);

555     return ret;
556 }

559 #ifndef OPENSSL_NO_ERR
560 #define NUM_SYS_STR_REASONS 127
561 #define LEN_SYS_STR_REASON 32

563 static ERR_STRING_DATA SYS_str_reasons[NUM_SYS_STR_REASONS + 1];
564 /* SYS_str_reasons is filled with copies of strerror() results at
565  * initialization.
566  * 'errno' values up to 127 should cover all usual errors,
567  * others will be displayed numerically by ERR_error_string.
568  * It is crucial that we have something for each reason code
569  * that occurs in ERR_str_reasons, or bogus reason strings
570  * will be returned for SYSerr(), which always gets an errno
571  * value and never one of those 'standard' reason codes. */

573 static void build_SYS_str_reasons(void)
574 {
575     /* OPENSSL_malloc cannot be used here, use static storage instead */
576     static char strerror_tab[NUM_SYS_STR_REASONS][LEN_SYS_STR_REASON];
577     int i;
578     static int init = 1;

580     CRYPTO_r_lock(CRYPTO_LOCK_ERR);
581     if (!init)
582     {
583         CRYPTO_r_unlock(CRYPTO_LOCK_ERR);
584         return;
585     }
586     CRYPTO_r_unlock(CRYPTO_LOCK_ERR);
587     CRYPTO_w_lock(CRYPTO_LOCK_ERR);
588     if (!init)

```

```

590     {
591         CRYPTO_w_unlock(CRYPTO_LOCK_ERR);
592         return;
593     }

595     for (i = 1; i <= NUM_SYS_STR_REASONS; i++)
596     {
597         ERR_STRING_DATA *str = &SYS_str_reasons[i - 1];

599         str->error = (unsigned long)i;
600         if (str->string == NULL)
601         {
602             char (*dest)[LEN_SYS_STR_REASON] = &(strerror_tab[i - 1]
603             char *src = strerror(i);
604             if (src != NULL)
605             {
606                 strncpy(*dest, src, sizeof *dest);
607                 (*dest)[sizeof *dest - 1] = '\0';
608                 str->string = *dest;
609             }
610             if (str->string == NULL)
611                 str->string = "unknown";
612         }
613     }

615     /* Now we still have SYS_str_reasons[NUM_SYS_STR_REASONS] = {0, NULL},
616      * as required by ERR_load_strings. */

618     init = 0;

619     CRYPTO_w_unlock(CRYPTO_LOCK_ERR);
620 }
621 #endif

624 #define err_clear_data(p,i) \
625 do { \
626     if (((p)->err_data[i] != NULL) && \
627         (p)->err_data_flags[i] & ERR_TXT_MALLOCED) \
628     { \
629         OPENSSL_free((p)->err_data[i]); \
630         (p)->err_data[i]=NULL; \
631     } \
632     (p)->err_data_flags[i]=0; \
633 } while(0)

635 #define err_clear(p,i) \
636 do { \
637     (p)->err_flags[i]=0; \
638     (p)->err_buffer[i]=0; \
639     err_clear_data(p,i); \
640     (p)->err_file[i]=NULL; \
641     (p)->err_line[i]= -1; \
642 } while(0)

644 static void ERR_STATE_free(ERR_STATE *s)
645 {
646     int i;

648     if (s == NULL)
649         return;

651     for (i=0; i<ERR_NUM_ERRORS; i++)
652     {
653         err_clear_data(s,i);
654     }
655     OPENSSL_free(s);

```

```

722     end = &file[strlen(file)-1];
723     if (*end == '\0')
724         *end = '\0';
725     /* Optional: use the basename of the path only. */
726     if ((end = strrchr(file, '/')) != NULL)
727         file = &end[1];
728 }
729 #endif
730 es=ERR_get_state();

732 es->top=(es->top+1)%ERR_NUM_ERRORS;
733 if (es->top == es->bottom)
734     es->bottom=(es->bottom+1)%ERR_NUM_ERRORS;
735 es->err_flags[es->top]=0;
736 es->err_buffer[es->top]=ERR_PACK(lib,func,reason);
737 es->err_file[es->top]=file;
738 es->err_line[es->top]=line;
739 err_clear_data(es,es->top);
740 }

742 void ERR_clear_error(void)
743 {
744     int i;
745     ERR_STATE *es;

747     es=ERR_get_state();

749     for (i=0; i<ERR_NUM_ERRORS; i++)
750     {
751         err_clear(es,i);
752     }
753     es->top=es->bottom=0;
754 }

757 unsigned long ERR_get_error(void)
758 { return(get_error_values(1,0,NULL,NULL,NULL,NULL)); }

760 unsigned long ERR_get_error_line(const char **file,
761     int *line)
762 { return(get_error_values(1,0,file,line,NULL,NULL)); }

764 unsigned long ERR_get_error_line_data(const char **file, int *line,
765     const char **data, int *flags)
766 { return(get_error_values(1,0,file,line,data,flags)); }

769 unsigned long ERR_peek_error(void)
770 { return(get_error_values(0,0,NULL,NULL,NULL,NULL)); }

772 unsigned long ERR_peek_error_line(const char **file, int *line)
773 { return(get_error_values(0,0,file,line,NULL,NULL)); }

775 unsigned long ERR_peek_error_line_data(const char **file, int *line,
776     const char **data, int *flags)
777 { return(get_error_values(0,0,file,line,data,flags)); }

780 unsigned long ERR_peek_last_error(void)
781 { return(get_error_values(0,1,NULL,NULL,NULL,NULL)); }

783 unsigned long ERR_peek_last_error_line(const char **file, int *line)
784 { return(get_error_values(0,1,file,line,NULL,NULL)); }

786 unsigned long ERR_peek_last_error_line_data(const char **file, int *line,
787     const char **data, int *flags)

```

```

788     { return(get_error_values(0,1,file,line,data,flags)); }

791 static unsigned long get_error_values(int inc, int top, const char **file, int *
792     const char **data, int *flags)
793 {
794     int i=0;
795     ERR_STATE *es;
796     unsigned long ret;

798     es=ERR_get_state();

800     if (inc && top)
801     {
802         if (file) *file = "";
803         if (line) *line = 0;
804         if (data) *data = "";
805         if (flags) *flags = 0;
806
807         return ERR_R_INTERNAL_ERROR;
808     }

810     if (es->bottom == es->top) return 0;
811     if (top)
812         i=es->top;          /* last error */
813     else
814         i=(es->bottom+1)%ERR_NUM_ERRORS; /* first error */

816     ret=es->err_buffer[i];
817     if (inc)
818     {
819         es->bottom=i;
820         es->err_buffer[i]=0;
821     }

823     if ((file != NULL) && (line != NULL))
824     {
825         if (es->err_file[i] == NULL)
826         {
827             *file="NA";
828             if (line != NULL) *line=0;
829         }
830         else
831         {
832             *file=es->err_file[i];
833             if (line != NULL) *line=es->err_line[i];
834         }
835     }

837     if (data == NULL)
838     {
839         if (inc)
840         {
841             err_clear_data(es, i);
842         }
843     }
844     else
845     {
846         if (es->err_data[i] == NULL)
847         {
848             *data="";
849             if (flags != NULL) *flags=0;
850         }
851         else
852         {
853             *data=es->err_data[i];

```

```

854         if (flags != NULL) *flags=es->err_data_flags[i];
855     }
856 }
857 return ret;
858 }

860 void ERR_error_string_n(unsigned long e, char *buf, size_t len)
861 {
862     char lsbuff[64], fsbuff[64], rsbuff[64];
863     const char *ls,*fs,*rs;
864     unsigned long l,f,r;

866     l=ERR_GET_LIB(e);
867     f=ERR_GET_FUNC(e);
868     r=ERR_GET_REASON(e);

870     ls=ERR_lib_error_string(e);
871     fs=ERR_func_error_string(e);
872     rs=ERR_reason_error_string(e);

874     if (ls == NULL)
875         BIO_snprintf(lsbuff, sizeof(lsbuff), "lib(%lu)", l);
876     if (fs == NULL)
877         BIO_snprintf(fsbuff, sizeof(fsbuff), "func(%lu)", f);
878     if (rs == NULL)
879         BIO_snprintf(rsbuff, sizeof(rsbuff), "reason(%lu)", r);

881     BIO_snprintf(buf, len,"error:%08lx:%s:%s:%s", e, ls?ls:lsbuff,
882         fs?fs:fsbuff, rs?rs:rsbuff);
883     if (strlen(buf) == len-1)
884     {
885         /* output may be truncated; make sure we always have 5
886         * colon-separated fields, i.e. 4 colons ... */
887         #define NUM_COLONS 4
888         if (len > NUM_COLONS) /* ... if possible */
889         {
890             int i;
891             char *s = buf;
892
893             for (i = 0; i < NUM_COLONS; i++)
894             {
895                 char *colon = strchr(s, ':');
896                 if (colon == NULL || colon > &buf[len-1] - NUM_C
897                     {
898                     /* set colon no. i at last possible posi
899                     * (buf[len-1] is the terminating 0)*/
900                     colon = &buf[len-1] - NUM_COLONS + i;
901                     *colon = ':';
902                 }
903                 s = colon + 1;
904             }
905         }
906     }
907 }

909 /* BAD for multi-threading: uses a local buffer if ret == NULL */
910 /* ERR_error_string_n should be used instead for ret != NULL
911 * as ERR_error_string cannot know how large the buffer is */
912 char *ERR_error_string(unsigned long e, char *ret)
913 {
914     static char buf[256];

916     if (ret == NULL) ret=buf;
917     ERR_error_string_n(e, ret, 256);

919     return ret;

```



```

920     }

922 LHASH_OF(ERR_STRING_DATA) *ERR_get_string_table(void)
923 {
924     err_fns_check();
925     return ERRFN(err_get)(0);
926 }

928 LHASH_OF(ERR_STATE) *ERR_get_err_state_table(void)
929 {
930     err_fns_check();
931     return ERRFN(thread_get)(0);
932 }

934 void ERR_release_err_state_table(LHASH_OF(ERR_STATE) **hash)
935 {
936     err_fns_check();
937     ERRFN(thread_release)(hash);
938 }

940 const char *ERR_lib_error_string(unsigned long e)
941 {
942     ERR_STRING_DATA d,*p;
943     unsigned long l;

945     err_fns_check();
946     l=ERR_GET_LIB(e);
947     d.error=ERR_PACK(l,0,0);
948     p=ERRFN(err_get_item)(&d);
949     return((p == NULL)?NULL:p->string);
950 }

952 const char *ERR_func_error_string(unsigned long e)
953 {
954     ERR_STRING_DATA d,*p;
955     unsigned long l,f;

957     err_fns_check();
958     l=ERR_GET_LIB(e);
959     f=ERR_GET_FUNC(e);
960     d.error=ERR_PACK(l,f,0);
961     p=ERRFN(err_get_item)(&d);
962     return((p == NULL)?NULL:p->string);
963 }

965 const char *ERR_reason_error_string(unsigned long e)
966 {
967     ERR_STRING_DATA d,*p=NULL;
968     unsigned long l,r;

970     err_fns_check();
971     l=ERR_GET_LIB(e);
972     r=ERR_GET_REASON(e);
973     d.error=ERR_PACK(l,0,r);
974     p=ERRFN(err_get_item)(&d);
975     if (!p)
976     {
977         d.error=ERR_PACK(0,0,r);
978         p=ERRFN(err_get_item)(&d);
979     }
980     return((p == NULL)?NULL:p->string);
981 }

983 void ERR_remove_thread_state(const CRYPTO_THREADID *id)
984 {
985     ERR_STATE tmp;

```

```

987     if (id)
988         CRYPTO_THREADID_cpy(&tmp.tid, id);
989     else
990         CRYPTO_THREADID_current(&tmp.tid);
991     err_fns_check();
992     /* thread_del_item automatically destroys the LHASH if the number of
993      * items reaches zero. */
994     ERRFN(thread_del_item)(&tmp);
995 }

997 #ifndef OPENSSL_NO_DEPRECATED
998 void ERR_remove_state(unsigned long pid)
999 {
1000     ERR_remove_thread_state(NULL);
1001 }
1002 #endif

1004 ERR_STATE *ERR_get_state(void)
1005 {
1006     static ERR_STATE fallback;
1007     ERR_STATE *ret,tmp,*tmpp=NULL;
1008     int i;
1009     CRYPTO_THREADID tid;

1011     err_fns_check();
1012     CRYPTO_THREADID_current(&tid);
1013     CRYPTO_THREADID_cpy(&tmp.tid, &tid);
1014     ret=ERRFN(thread_get_item)(&tmp);

1016     /* ret == the error state, if NULL, make a new one */
1017     if (ret == NULL)
1018     {
1019         ret=(ERR_STATE *)OPENSSL_malloc(sizeof(ERR_STATE));
1020         if (ret == NULL) return(&fallback);
1021         CRYPTO_THREADID_cpy(&ret->tid, &tid);
1022         ret->top=0;
1023         ret->bottom=0;
1024         for (i=0; i<ERR_NUM_ERRORS; i++)
1025         {
1026             ret->err_data[i]=NULL;
1027             ret->err_data_flags[i]=0;
1028         }
1029         tmpp = ERRFN(thread_set_item)(ret);
1030         /* To check if insertion failed, do a get. */
1031         if (ERRFN(thread_get_item)(ret) != ret)
1032         {
1033             ERR_STATE_free(ret); /* could not insert it */
1034             return(&fallback);
1035         }
1036         /* If a race occurred in this function and we came second, tmpp
1037          * is the first one that we just replaced. */
1038         if (tmpp)
1039             ERR_STATE_free(tmpp);
1040     }
1041     return ret;
1042 }

1044 int ERR_get_next_error_library(void)
1045 {
1046     err_fns_check();
1047     return ERRFN(get_next_lib)();
1048 }

1050 void ERR_set_error_data(char *data, int flags)
1051 {

```

```

1052     ERR_STATE *es;
1053     int i;

1055     es=ERR_get_state();

1057     i=es->top;
1058     if (i == 0)
1059         i=ERR_NUM_ERRORS-1;

1061     err_clear_data(es,i);
1062     es->err_data[i]=data;
1063     es->err_data_flags[i]=flags;
1064 }

1066 void ERR_add_error_data(int num, ...)
1067 {
1068     va_list args;
1069     va_start(args, num);
1070     ERR_add_error_vdata(num, args);
1071     va_end(args);
1072 }

1074 void ERR_add_error_vdata(int num, va_list args)
1075 {
1076     int i,n,s;
1077     char *str,*p,*a;

1079     s=80;
1080     str=OPENSSL_malloc(s+1);
1081     if (str == NULL) return;
1082     str[0]='\0';

1084     n=0;
1085     for (i=0; i<num; i++)
1086     {
1087         a=va_arg(args, char*);
1088         /* ignore NULLs, thanks to Bob Beck <beck@obtuse.com> */
1089         if (a != NULL)
1090         {
1091             n+=strlen(a);
1092             if (n > s)
1093             {
1094                 s=n+20;
1095                 p=OPENSSL_realloc(str,s+1);
1096                 if (p == NULL)
1097                 {
1098                     OPENSSL_free(str);
1099                     return;
1100                 }
1101                 else
1102                     str=p;
1103             }
1104             BUF_strlcat(str,a,(size_t)s+1);
1105         }
1106     }
1107     ERR_set_error_data(str,ERR_TXT_MALLOCED|ERR_TXT_STRING);
1108 }

1110 int ERR_set_mark(void)
1111 {
1112     ERR_STATE *es;

1114     es=ERR_get_state();

1116     if (es->bottom == es->top) return 0;
1117     es->err_flags[es->top]=ERR_FLAG_MARK;

```

```

1118     return 1;
1119 }

1121 int ERR_pop_to_mark(void)
1122 {
1123     ERR_STATE *es;

1125     es=ERR_get_state();

1127     while(es->bottom != es->top
1128           && (es->err_flags[es->top] & ERR_FLAG_MARK) == 0)
1129     {
1130         err_clear(es,es->top);
1131         es->top--;
1132         if (es->top == -1) es->top=ERR_NUM_ERRORS-1;
1133     }

1135     if (es->bottom == es->top) return 0;
1136     es->err_flags[es->top]&=~ERR_FLAG_MARK;
1137     return 1;
1138 }

```

new/usr/src/lib/openssl/libsunw_crypto/err/err_all.c

1

5560 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/err/err_all.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/err/err_all.c */
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <openssl/asn1.h>
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/err/err_all.c

2

```
62 #ifndef OPENSSL_NO_EC
63 #include <openssl/ec.h>
64 #endif
65 #include <openssl/buffer.h>
66 #include <openssl/bio.h>
67 #ifndef OPENSSL_NO_COMP
68 #include <openssl/comp.h>
69 #endif
70 #ifndef OPENSSL_NO_RSA
71 #include <openssl/rsa.h>
72 #endif
73 #ifndef OPENSSL_NO_DH
74 #include <openssl/dh.h>
75 #endif
76 #ifndef OPENSSL_NO_DSA
77 #include <openssl/dsa.h>
78 #endif
79 #ifndef OPENSSL_NO_ECDSA
80 #include <openssl/ecdsa.h>
81 #endif
82 #ifndef OPENSSL_NO_ECDH
83 #include <openssl/ecdh.h>
84 #endif
85 #include <openssl/evp.h>
86 #include <openssl/objects.h>
87 #include <openssl/pem2.h>
88 #include <openssl/x509.h>
89 #include <openssl/x509v3.h>
90 #include <openssl/conf.h>
91 #include <openssl/pkcs12.h>
92 #include <openssl/rand.h>
93 #include <openssl/dso.h>
94 #ifndef OPENSSL_NO_ENGINE
95 #include <openssl/engine.h>
96 #endif
97 #include <openssl/ui.h>
98 #include <openssl/ocsp.h>
99 #include <openssl/err.h>
100 #ifdef OPENSSL_FIPS
101 #include <openssl/fips.h>
102 #endif
103 #include <openssl/ts.h>
104 #ifndef OPENSSL_NO_CMS
105 #include <openssl/cms.h>
106 #endif
107 #ifndef OPENSSL_NO_JPAKE
108 #include <openssl/jpake.h>
109 #endif
111 void ERR_load_crypto_strings(void)
112 {
113     #ifndef OPENSSL_NO_ERR
114     ERR_load_ERR_strings(); /* include error strings for SYSerr */
115     ERR_load_BN_strings();
116     #ifndef OPENSSL_NO_RSA
117     ERR_load_RSA_strings();
118     #endif
119     #ifndef OPENSSL_NO_DH
120     ERR_load_DH_strings();
121     #endif
122     ERR_load_EVP_strings();
123     ERR_load_BUF_strings();
124     ERR_load_OBJ_strings();
125     ERR_load_PEM_strings();
126     #ifndef OPENSSL_NO_DSA
127     ERR_load_DSA_strings();
```

```
128 #endif
129     ERR_load_X509_strings();
130     ERR_load_ASN1_strings();
131     ERR_load_CONF_strings();
132     ERR_load_CRYPT0_strings();
133 #ifndef OPENSSL_NO_COMP
134     ERR_load_COMP_strings();
135 #endif
136 #ifndef OPENSSL_NO_EC
137     ERR_load_EC_strings();
138 #endif
139 #ifndef OPENSSL_NO_ECDSA
140     ERR_load_ECDSA_strings();
141 #endif
142 #ifndef OPENSSL_NO_ECDH
143     ERR_load_ECDH_strings();
144 #endif
145     /* skip ERR_load_SSL_strings() because it is not in this library */
146     ERR_load_BIO_strings();
147     ERR_load_PKCS7_strings();
148     ERR_load_X509V3_strings();
149     ERR_load_PKCS12_strings();
150     ERR_load_RAND_strings();
151     ERR_load_DSO_strings();
152     ERR_load_TS_strings();
153 #ifndef OPENSSL_NO_ENGINE
154     ERR_load_ENGINE_strings();
155 #endif
156     ERR_load_OCSP_strings();
157     ERR_load_UI_strings();
158 #ifdef OPENSSL_FIPS
159     ERR_load_FIPS_strings();
160 #endif
161 #ifndef OPENSSL_NO_CMS
162     ERR_load_CMS_strings();
163 #endif
164 #ifndef OPENSSL_NO_JPAKE
165     ERR_load_JPAKE_strings();
166 #endif
167 #endif
168 }
```

4437 Fri May 30 18:31:49 2014
 new/usr/src/lib/openssl/libsunw_crypto/err/err_prn.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/lhash.h>

```

```

62 #include <openssl/crypto.h>
63 #include <openssl/buffer.h>
64 #include <openssl/err.h>

66 void ERR_print_errors_cb(int (*cb)(const char *str, size_t len, void *u),
67                          void *u)
68 {
69     unsigned long l;
70     char buf[256];
71     char buf2[4096];
72     const char *file,*data;
73     int line,flags;
74     unsigned long es;
75     CRYPTO_THREADID cur;

77     CRYPTO_THREADID_current(&cur);
78     es=CRYPTO_THREADID_hash(&cur);
79     while ((l=ERR_get_error_line_data(&file,&line,&data,&flags)) != 0)
80     {
81         ERR_error_string_n(l, buf, sizeof(buf));
82         BIO_snprintf(buf2, sizeof(buf2), "%lu:%s:%s:%d:%s\n", es, buf,
83                        file, line, (flags & ERR_TXT_STRING) ? data : "");
84         if (cb(buf2, strlen(buf2), u) <= 0)
85             break; /* abort outputting the error report */
86     }
87 }

89 #ifndef OPENSSL_NO_FP_API
90 static int print_fp(const char *str, size_t len, void *fp)
91 {
92     BIO bio;

94     BIO_set(&bio,BIO_s_file());
95     BIO_set_fp(&bio,fp,BIO_NOCLOSE);

97     return BIO_printf(&bio, "%s", str);
98 }
99 void ERR_print_errors_fp(FILE *fp)
100 {
101     ERR_print_errors_cb(print_fp, fp);
102 }
103 #endif

105 static int print_bio(const char *str, size_t len, void *bp)
106 {
107     return BIO_write((BIO *)bp, str, len);
108 }
109 void ERR_print_errors(BIO *bp)
110 {
111     ERR_print_errors_cb(print_bio, bp);
112 }

114

```

new/usr/src/lib/openssl/libsunw_crypto/evp/bio_b64.c

1

14417 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/bio_b64.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/bio_b64.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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21 * in documentation (online or textual) provided with the package.
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51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/bio_b64.c

2

```
62 #include <openssl/buffer.h>
63 #include <openssl/evp.h>
64
65 static int b64_write(BIO *h, const char *buf, int num);
66 static int b64_read(BIO *h, char *buf, int size);
67 static int b64_puts(BIO *h, const char *str);
68 /*static int b64_gets(BIO *h, char *str, int size); */
69 static long b64_ctrl(BIO *h, int cmd, long arg1, void *arg2);
70 static int b64_new(BIO *h);
71 static int b64_free(BIO *data);
72 static long b64_callback_ctrl(BIO *h,int cmd,bio_info_cb *fp);
73 #define B64_BLOCK_SIZE 1024
74 #define B64_BLOCK_SIZE2 768
75 #define B64_NONE 0
76 #define B64_ENCODE 1
77 #define B64_DECODE 2
78
79 typedef struct b64_struct
80 {
81     /*BIO *bio; moved to the BIO structure */
82     int buf_len;
83     int buf_off;
84     int tmp_len; /* used to find the start when decoding */
85     int tmp_nl; /* If true, scan until '\n' */
86     int encode;
87     int start; /* have we started decoding yet? */
88     int cont; /* <= 0 when finished */
89     EVP_ENCODE_CTX base64;
90     char buf[EVP_ENCODE_LENGTH(B64_BLOCK_SIZE)+10];
91     char tmp[B64_BLOCK_SIZE];
92 } BIO_B64_CTX;
93
94 static BIO_METHOD methods_b64=
95 {
96     BIO_TYPE_BASE64,"base64 encoding",
97     b64_write,
98     b64_read,
99     b64_puts,
100     NULL, /* b64_gets, */
101     b64_ctrl,
102     b64_new,
103     b64_free,
104     b64_callback_ctrl,
105 };
106
107 BIO_METHOD *BIO_f_base64(void)
108 {
109     return(&methods_b64);
110 }
111
112 static int b64_new(BIO *bi)
113 {
114     BIO_B64_CTX *ctx;
115
116     ctx=(BIO_B64_CTX *)OPENSSL_malloc(sizeof(BIO_B64_CTX));
117     if (ctx == NULL) return(0);
118
119     ctx->buf_len=0;
120     ctx->tmp_len=0;
121     ctx->tmp_nl=0;
122     ctx->buf_off=0;
123     ctx->cont=1;
124     ctx->start=1;
125     ctx->encode=0;
126
127     bi->init=1;
```

```

128     bi->ptr=(char *)ctx;
129     bi->flags=0;
130     bi->num = 0;
131     return(1);
132 }

134 static int b64_free(BIO *a)
135 {
136     if (a == NULL) return(0);
137     OPENSSL_free(a->ptr);
138     a->ptr=NULL;
139     a->init=0;
140     a->flags=0;
141     return(1);
142 }

144 static int b64_read(BIO *b, char *out, int outl)
145 {
146     int ret=0,i,ii,j,k,x,n,num,ret_code=0;
147     BIO_B64_CTX *ctx;
148     unsigned char *p,*q;

150     if (out == NULL) return(0);
151     ctx=(BIO_B64_CTX *)b->ptr;

153     if ((ctx == NULL) || (b->next_bio == NULL)) return(0);

155     BIO_clear_retry_flags(b);

157     if (ctx->encode != B64_DECODE)
158     {
159         ctx->encode=B64_DECODE;
160         ctx->buf_len=0;
161         ctx->buf_off=0;
162         ctx->tmp_len=0;
163         EVP_DecodeInit(&(ctx->base64));
164     }

166     /* First check if there are bytes decoded/encoded */
167     if (ctx->buf_len > 0)
168     {
169         OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
170         i=ctx->buf_len-ctx->buf_off;
171         if (i > outl) i=outl;
172         OPENSSL_assert(ctx->buf_off+i < (int)sizeof(ctx->buf));
173         memcpy(out,&(ctx->buf[ctx->buf_off]),i);
174         ret=i;
175         out+=i;
176         outl-=i;
177         ctx->buf_off+=i;
178         if (ctx->buf_len == ctx->buf_off)
179         {
180             ctx->buf_len=0;
181             ctx->buf_off=0;
182         }
183     }

185     /* At this point, we have room of outl bytes and an empty
186      * buffer, so we should read in some more. */

188     ret_code=0;
189     while (outl > 0)
190     {
191         if (ctx->cont <= 0)
192             break;

```

```

194     i=BIO_read(b->next_bio,&(ctx->tmp[ctx->tmp_len]),
195               B64_BLOCK_SIZE-ctx->tmp_len);

197     if (i <= 0)
198     {
199         ret_code=i;

201         /* Should we continue next time we are called? */
202         if (!BIO_should_retry(b->next_bio))
203         {
204             ctx->cont=i;
205             /* If buffer empty break */
206             if (ctx->tmp_len == 0)
207                 break;
208             /* Fall through and process what we have */
209             else
210                 i = 0;
211         }
212         /* else we retry and add more data to buffer */
213         else
214             break;
215     }
216     i+=ctx->tmp_len;
217     ctx->tmp_len = i;

219     /* We need to scan, a line at a time until we
220      * have a valid line if we are starting. */
221     if (ctx->start && (BIO_get_flags(b) & BIO_FLAGS_BASE64_NO_NL))
222     {
223         /* ctx->start=1; */
224         ctx->tmp_len=0;
225     }
226     else if (ctx->start)
227     {
228         q=p=(unsigned char *)ctx->tmp;
229         for (j=0; j<i; j++)
230         {
231             if (*(q++) != '\n') continue;

233             /* due to a previous very long line,
234              * we need to keep on scanning for a '\n'
235              * before we even start looking for
236              * base64 encoded stuff. */
237             if (ctx->tmp_n1)
238             {
239                 p=q;
240                 ctx->tmp_n1=0;
241                 continue;
242             }

244             k=EVP_DecodeUpdate(&(ctx->base64),
245                               (unsigned char *)ctx->buf,
246                               &num,p,q-p);
247             if ((k <= 0) && (num == 0) && (ctx->start))
248                 EVP_DecodeInit(&(ctx->base64));
249             else
250             {
251                 if (p != (unsigned char *)
252                     &(ctx->tmp[0]))
253                 {
254                     i-=(p- (unsigned char *)
255                         &(ctx->tmp[0]));
256                     for (x=0; x < i; x++)
257                         ctx->tmp[x]=p[x];
258                 }
259                 EVP_DecodeInit(&(ctx->base64));

```

```

260         ctx->start=0;
261         break;
262     }
263     p=q;
264 }
265
266 /* we fell off the end without starting */
267 if ((j == i) && (num == 0))
268 {
269     /* Is this is one long chunk?, if so, keep on
270     * reading until a new line. */
271     if (p == (unsigned char *)&(ctx->tmp[0]))
272     {
273         /* Check buffer full */
274         if (i == B64_BLOCK_SIZE)
275         {
276             ctx->tmp_nl=1;
277             ctx->tmp_len=0;
278         }
279     }
280     else if (p != q) /* finished on a '\n' */
281     {
282         n=q-p;
283         for (ii=0; ii<n; ii++)
284             ctx->tmp[ii]=p[ii];
285         ctx->tmp_len=n;
286     }
287     /* else finished on a '\n' */
288     continue;
289 }
290 else
291 {
292     ctx->tmp_len=0;
293 }
294 }
295 else if ((i < B64_BLOCK_SIZE) && (ctx->cont > 0))
296 {
297     /* If buffer isn't full and we can retry then
298     * restart to read in more data.
299     */
300     continue;
301 }
302
303 if (BIO_get_flags(b) & BIO_FLAGS_BASE64_NO_NL)
304 {
305     int z,jj;
306
307     #if 0
308     jj=(i>>2)<<2;
309     #else
310     jj = i & ~3; /* process per 4 */
311     #endif
312     z=EVP_DecodeBlock((unsigned char *)ctx->buf,
313                      (unsigned char *)ctx->tmp,jj);
314     if (jj > 2)
315     {
316         if (ctx->tmp[jj-1] == '=')
317         {
318             z--;
319             if (ctx->tmp[jj-2] == '=')
320                 z--;
321         }
322     }
323     /* z is now number of output bytes and jj is the
324     * number consumed */
325     if (jj != i)

```

```

326     {
327         memmove(ctx->tmp, &ctx->tmp[jj], i-jj);
328         ctx->tmp_len=i-jj;
329     }
330     ctx->buf_len=0;
331     if (z > 0)
332     {
333         ctx->buf_len=z;
334     }
335     i=z;
336 }
337 else
338 {
339     i=EVP_DecodeUpdate(&(ctx->base64),
340                      (unsigned char *)ctx->buf,&ctx->buf_len,
341                      (unsigned char *)ctx->tmp,i);
342     ctx->tmp_len = 0;
343 }
344 ctx->buf_off=0;
345 if (i < 0)
346 {
347     ret_code=0;
348     ctx->buf_len=0;
349     break;
350 }
351
352 if (ctx->buf_len <= outl)
353     i=ctx->buf_len;
354 else
355     i=outl;
356
357 memcpy(out,ctx->buf,i);
358 ret+=i;
359 ctx->buf_off=i;
360 if (ctx->buf_off == ctx->buf_len)
361 {
362     ctx->buf_len=0;
363     ctx->buf_off=0;
364 }
365 outl-=i;
366 out+=i;
367 }
368 /* BIO_clear_retry_flags(b); */
369 BIO_copy_next_retry(b);
370 return((ret == 0)?ret_code:ret);
371 }
372
373 static int b64_write(BIO *b, const char *in, int inl)
374 {
375     int ret=0;
376     int n;
377     int i;
378     BIO_B64_CTX *ctx;
379
380     ctx=(BIO_B64_CTX *)b->ptr;
381     BIO_clear_retry_flags(b);
382
383     if (ctx->encode != B64_ENCODE)
384     {
385         ctx->encode=B64_ENCODE;
386         ctx->buf_len=0;
387         ctx->buf_off=0;
388         ctx->tmp_len=0;
389         EVP_EncodeInit(&(ctx->base64));
390     }

```



```

392     OPENSSL_assert(ctx->buf_off < (int)sizeof(ctx->buf));
393     OPENSSL_assert(ctx->buf_len <= (int)sizeof(ctx->buf));
394     OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
395     n=ctx->buf_len-ctx->buf_off;
396     while (n > 0)
397     {
398         i=BIO_write(b->next_bio,&(ctx->buf[ctx->buf_off]),n);
399         if (i <= 0)
400         {
401             BIO_copy_next_retry(b);
402             return(i);
403         }
404         OPENSSL_assert(i <= n);
405         ctx->buf_off+=i;
406         OPENSSL_assert(ctx->buf_off <= (int)sizeof(ctx->buf));
407         OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
408         n-=i;
409     }
410     /* at this point all pending data has been written */
411     ctx->buf_off=0;
412     ctx->buf_len=0;
413
414     if ((in == NULL) || (inl <= 0)) return(0);
415
416     while (inl > 0)
417     {
418         n=(inl > B64_BLOCK_SIZE)?B64_BLOCK_SIZE:inl;
419
420         if (BIO_get_flags(b) & BIO_FLAGS_BASE64_NO_NL)
421         {
422             if (ctx->tmp_len > 0)
423             {
424                 OPENSSL_assert(ctx->tmp_len <= 3);
425                 n=3-ctx->tmp_len;
426                 /* There's a theoretical possibility for this */
427                 if (n > inl)
428                     n=inl;
429                 memcpy(&(ctx->tmp[ctx->tmp_len]),in,n);
430                 ctx->tmp_len+=n;
431                 ret += n;
432                 if (ctx->tmp_len < 3)
433                     break;
434                 ctx->buf_len=EVP_EncodeBlock((unsigned char *)ct
435                 OPENSSL_assert(ctx->buf_len <= (int)sizeof(ctx->
436                 OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
437                 /* Since we're now done using the temporary
438                 buffer, the length should be 0'd */
439                 ctx->tmp_len=0;
440             }
441             else
442             {
443                 if (n < 3)
444                 {
445                     memcpy(ctx->tmp,in,n);
446                     ctx->tmp_len=n;
447                     ret += n;
448                     break;
449                 }
450                 n-=n%3;
451                 ctx->buf_len=EVP_EncodeBlock((unsigned char *)ct
452                 OPENSSL_assert(ctx->buf_len <= (int)sizeof(ctx->
453                 OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
454                 ret += n;
455             }
456         }
457         else

```

```

458     {
459         EVP_EncodeUpdate(&(ctx->base64),
460             (unsigned char *)ctx->buf,&ctx->buf_len,
461             (unsigned char *)in,n);
462         OPENSSL_assert(ctx->buf_len <= (int)sizeof(ctx->buf));
463         OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
464         ret += n;
465     }
466     inl-=n;
467     in+=n;
468
469     ctx->buf_off=0;
470     n=ctx->buf_len;
471     while (n > 0)
472     {
473         i=BIO_write(b->next_bio,&(ctx->buf[ctx->buf_off]),n);
474         if (i <= 0)
475         {
476             BIO_copy_next_retry(b);
477             return((ret == 0)?i:ret);
478         }
479         OPENSSL_assert(i <= n);
480         n-=i;
481         ctx->buf_off+=i;
482         OPENSSL_assert(ctx->buf_off <= (int)sizeof(ctx->buf));
483         OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
484     }
485     ctx->buf_len=0;
486     ctx->buf_off=0;
487 }
488 return(ret);
489 }
490
491 static long b64_ctrl(BIO *b, int cmd, long num, void *ptr)
492 {
493     BIO_B64_CTX *ctx;
494     long ret=1;
495     int i;
496
497     ctx=(BIO_B64_CTX *)b->ptr;
498
499     switch (cmd)
500     {
501     case BIO_CTRL_RESET:
502         ctx->cont=1;
503         ctx->start=1;
504         ctx->encode=B64_NONE;
505         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
506         break;
507     case BIO_CTRL_EOF: /* More to read */
508         if (ctx->cont <= 0)
509             ret=1;
510         else
511             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
512         break;
513     case BIO_CTRL_WPENDING: /* More to write in buffer */
514         OPENSSL_assert(ctx->buf_len >= ctx->buf_off);
515         ret=ctx->buf_len-ctx->buf_off;
516         if ((ret == 0) && (ctx->encode != B64_NONE)
517             && (ctx->base64.num != 0))
518             ret=1;
519         else if (ret <= 0)
520             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
521         break;
522     case BIO_CTRL_PENDING: /* More to read in buffer */
523         OPENSSL_assert(ctx->buf_len >= ctx->buf_off);

```

```

524         ret=ctx->buf_len-ctx->buf_off;
525         if (ret <= 0)
526             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
527         break;
528     case BIO_CTRL_FLUSH:
529         /* do a final write */
530 again:
531         while (ctx->buf_len != ctx->buf_off)
532             {
533                 i=b64_write(b,NULL,0);
534                 if (i < 0)
535                     return i;
536             }
537         if (BIO_get_flags(b) & BIO_FLAGS_BASE64_NO_NL)
538             {
539                 if (ctx->tmp_len != 0)
540                     {
541                         ctx->buf_len=EVP_EncodeBlock(
542                             (unsigned char *)ctx->buf,
543                             (unsigned char *)ctx->tmp,
544                             ctx->tmp_len);
545                         ctx->buf_off=0;
546                         ctx->tmp_len=0;
547                         goto again;
548                     }
549             }
550         else if (ctx->encode != B64_NONE && ctx->base64.num != 0)
551             {
552                 ctx->buf_off=0;
553                 EVP_EncodeFinal(&(ctx->base64),
554                     (unsigned char *)ctx->buf,
555                     &(ctx->buf_len));
556                 /* push out the bytes */
557                 goto again;
558             }
559         /* Finally flush the underlying BIO */
560         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
561         break;
562
563     case BIO_C_DO_STATE_MACHINE:
564         BIO_clear_retry_flags(b);
565         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
566         BIO_copy_next_retry(b);
567         break;
568
569     case BIO_CTRL_DUP:
570         break;
571     case BIO_CTRL_INFO:
572     case BIO_CTRL_GET:
573     case BIO_CTRL_SET:
574     default:
575         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
576         break;
577     }
578     return(ret);
579 }
580
581 static long b64_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
582 {
583     long ret=1;
584
585     if (b->next_bio == NULL) return(0);
586     switch (cmd)
587     {
588     default:
589         ret=BIO_callback_ctrl(b->next_bio,cmd,fp);

```

```

590         break;
591     }
592     return(ret);
593 }
594
595 static int b64_puts(BIO *b, const char *str)
596 {
597     return b64_write(b,str,strlen(str));
598 }

```

```

*****
10750 Fri May 30 18:31:49 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/bio_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/bio_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"

```

```

62 #include <openssl/buffer.h>
63 #include <openssl/evp.h>
64
65 static int enc_write(BIO *h, const char *buf, int num);
66 static int enc_read(BIO *h, char *buf, int size);
67 /*static int enc_puts(BIO *h, const char *str); */
68 /*static int enc_gets(BIO *h, char *str, int size); */
69 static long enc_ctrl(BIO *h, int cmd, long arg1, void *arg2);
70 static int enc_new(BIO *h);
71 static int enc_free(BIO *data);
72 static long enc_callback_ctrl(BIO *h, int cmd, bio_info_cb *fp);
73 #define ENC_BLOCK_SIZE (1024*4)
74 #define BUF_OFFSET (EVP_MAX_BLOCK_LENGTH*2)
75
76 typedef struct enc_struct
77 {
78     int buf_len;
79     int buf_off;
80     int cont; /* <= 0 when finished */
81     int finished;
82     int ok; /* bad decrypt */
83     EVP_CIPHER_CTX cipher;
84     /* buf is larger than ENC_BLOCK_SIZE because EVP_DecryptUpdate
85      * can return up to a block more data than is presented to it
86      */
87     char buf[ENC_BLOCK_SIZE+BUF_OFFSET+2];
88 } BIO_ENC_CTX;
89
90 static BIO_METHOD methods_enc=
91 {
92     BIO_TYPE_CIPHER,"cipher",
93     enc_write,
94     enc_read,
95     NULL, /* enc_puts, */
96     NULL, /* enc_gets, */
97     enc_ctrl,
98     enc_new,
99     enc_free,
100     enc_callback_ctrl,
101 };
102
103 BIO_METHOD *BIO_f_cipher(void)
104 {
105     return(&methods_enc);
106 }
107
108 static int enc_new(BIO *bi)
109 {
110     BIO_ENC_CTX *ctx;
111
112     ctx=(BIO_ENC_CTX *)OPENSSL_malloc(sizeof(BIO_ENC_CTX));
113     if (ctx == NULL) return(0);
114     EVP_CIPHER_CTX_init(&ctx->cipher);
115
116     ctx->buf_len=0;
117     ctx->buf_off=0;
118     ctx->cont=1;
119     ctx->finished=0;
120     ctx->ok=1;
121
122     bi->init=0;
123     bi->ptr=(char *)ctx;
124     bi->flags=0;
125     return(1);
126 }

```

```

128 static int enc_free(BIO *a)
129 {
130     BIO_ENC_CTX *b;
131
132     if (a == NULL) return(0);
133     b=(BIO_ENC_CTX *)a->ptr;
134     EVP_CIPHER_CTX_cleanup(&(b->cipher));
135     OPENSSL_cleanse(a->ptr, sizeof(BIO_ENC_CTX));
136     OPENSSL_free(a->ptr);
137     a->ptr=NULL;
138     a->init=0;
139     a->flags=0;
140     return(1);
141 }
142
143 static int enc_read(BIO *b, char *out, int outl)
144 {
145     int ret=0,i;
146     BIO_ENC_CTX *ctx;
147
148     if (out == NULL) return(0);
149     ctx=(BIO_ENC_CTX *)b->ptr;
150
151     if ((ctx == NULL) || (b->next_bio == NULL)) return(0);
152
153     /* First check if there are bytes decoded/encoded */
154     if (ctx->buf_len > 0)
155     {
156         i=ctx->buf_len-ctx->buf_off;
157         if (i > outl) i=outl;
158         memcpy(out,&(ctx->buf[ctx->buf_off]),i);
159         ret=i;
160         out+=i;
161         outl-=i;
162         ctx->buf_off+=i;
163         if (ctx->buf_len == ctx->buf_off)
164         {
165             ctx->buf_len=0;
166             ctx->buf_off=0;
167         }
168     }
169
170     /* At this point, we have room of outl bytes and an empty
171      * buffer, so we should read in some more. */
172
173     while (outl > 0)
174     {
175         if (ctx->cont <= 0) break;
176
177         /* read in at IV offset, read the EVP_Cipher
178          * documentation about why */
179         i=BIO_read(b->next_bio,&(ctx->buf[BUF_OFFSET]),ENC_BLOCK_SIZE);
180
181         if (i <= 0)
182         {
183             /* Should be continue next time we are called? */
184             if (!BIO_should_retry(b->next_bio))
185             {
186                 ctx->cont=i;
187                 i=EVP_CipherFinal_ex(&(ctx->cipher),
188                                     (unsigned char *)ctx->buf,
189                                     &(ctx->buf_len));
190                 ctx->ok=i;
191                 ctx->buf_off=0;
192             }
193             else

```

```

194         {
195             ret=(ret == 0)?i:ret;
196             break;
197         }
198     }
199     else
200     {
201         EVP_CipherUpdate(&(ctx->cipher),
202                         (unsigned char *)ctx->buf,&ctx->buf_len,
203                         (unsigned char *)&(ctx->buf[BUF_OFFSET]),i);
204         ctx->cont=1;
205         /* Note: it is possible for EVP_CipherUpdate to
206          * decrypt zero bytes because this is or looks like
207          * the final block: if this happens we should retry
208          * and either read more data or decrypt the final
209          * block
210          */
211         if(ctx->buf_len == 0) continue;
212     }
213
214     if (ctx->buf_len <= outl)
215         i=ctx->buf_len;
216     else
217         i=outl;
218     if (i <= 0) break;
219     memcpy(out,ctx->buf,i);
220     ret+=i;
221     ctx->buf_off=i;
222     outl-=i;
223     out+=i;
224 }
225
226 BIO_clear_retry_flags(b);
227 BIO_copy_next_retry(b);
228 return((ret == 0)?ctx->cont:ret);
229
230
231 static int enc_write(BIO *b, const char *in, int inl)
232 {
233     int ret=0,n,i;
234     BIO_ENC_CTX *ctx;
235
236     ctx=(BIO_ENC_CTX *)b->ptr;
237     ret=inl;
238
239     BIO_clear_retry_flags(b);
240     n=ctx->buf_len-ctx->buf_off;
241     while (n > 0)
242     {
243         i=BIO_write(b->next_bio,&(ctx->buf[ctx->buf_off]),n);
244         if (i <= 0)
245         {
246             BIO_copy_next_retry(b);
247             return(i);
248         }
249         ctx->buf_off+=i;
250         n-=i;
251     }
252     /* at this point all pending data has been written */
253
254     if ((in == NULL) || (inl <= 0)) return(0);
255
256     ctx->buf_off=0;
257     while (inl > 0)
258     {
259         n=(inl > ENC_BLOCK_SIZE)?ENC_BLOCK_SIZE:inl;

```

```

260     EVP_CipherUpdate(&(ctx->cipher),
261                     (unsigned char *)ctx->buf,&ctx->buf_len,
262                     (unsigned char *)in,n);
263     inl-=n;
264     in+=n;

266     ctx->buf_off=0;
267     n=ctx->buf_len;
268     while (n > 0)
269     {
270         i=BIO_write(b->next_bio,&(ctx->buf[ctx->buf_off]),n);
271         if (i <= 0)
272         {
273             BIO_copy_next_retry(b);
274             return (ret == inl) ? i : ret - inl;
275         }
276         n-=i;
277         ctx->buf_off+=i;
278     }
279     ctx->buf_len=0;
280     ctx->buf_off=0;
281 }
282 BIO_copy_next_retry(b);
283 return(ret);
284 }

286 static long enc_ctrl(BIO *b, int cmd, long num, void *ptr)
287 {
288     BIO *dbio;
289     BIO_ENC_CTX *ctx,*dctx;
290     long ret=1;
291     int i;
292     EVP_CIPHER_CTX **c_ctx;

294     ctx=(BIO_ENC_CTX *)b->ptr;

296     switch (cmd)
297     {
298     case BIO_CTRL_RESET:
299         ctx->ok=1;
300         ctx->finished=0;
301         EVP_CipherInit_ex(&(ctx->cipher),NULL,NULL,NULL,NULL,
302                         ctx->cipher.encrypt);
303         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
304         break;
305     case BIO_CTRL_EOF: /* More to read */
306         if (ctx->cont <= 0)
307             ret=1;
308         else
309             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
310         break;
311     case BIO_CTRL_WPENDING:
312         ret=ctx->buf_len-ctx->buf_off;
313         if (ret <= 0)
314             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
315         break;
316     case BIO_CTRL_PENDING: /* More to read in buffer */
317         ret=ctx->buf_len-ctx->buf_off;
318         if (ret <= 0)
319             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
320         break;
321     case BIO_CTRL_FLUSH:
322         /* do a final write */
323     again:
324         while (ctx->buf_len != ctx->buf_off)
325         {

```

```

326         i=enc_write(b,NULL,0);
327         if (i < 0)
328             return i;
329     }

331     if (!ctx->finished)
332     {
333         ctx->finished=1;
334         ctx->buf_off=0;
335         ret=EVP_CipherFinal_ex(&(ctx->cipher),
336                               (unsigned char *)ctx->buf,
337                               &(ctx->buf_len));
338         ctx->ok=(int)ret;
339         if (ret <= 0) break;

341         /* push out the bytes */
342         goto again;
343     }

344     /* Finally flush the underlying BIO */
345     ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
346     break;
347 case BIO_C_GET_CIPHER_STATUS:
348     ret=(long)ctx->ok;
349     break;
350 case BIO_C_DO_STATE_MACHINE:
351     BIO_clear_retry_flags(b);
352     ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
353     BIO_copy_next_retry(b);
354     break;
355 case BIO_C_GET_CIPHER_CTX:
356     c_ctx=(EVP_CIPHER_CTX **)ptr;
357     (*c_ctx)= &(ctx->cipher);
358     b->init=1;
359     break;
360 case BIO_CTRL_DUP:
361     dbio=(BIO *)ptr;
362     dctx=(BIO_ENC_CTX *)dbio->ptr;
363     EVP_CIPHER_CTX_init(&dctx->cipher);
364     ret = EVP_CIPHER_CTX_copy(&dctx->cipher,&ctx->cipher);
365     if (ret)
366         dbio->init=1;
367     break;
368 default:
369     ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
370     break;
371 }
372 return(ret);
373 }
374 }

376 static long enc_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
377 {
378     long ret=1;

380     if (b->next_bio == NULL) return(0);
381     switch (cmd)
382     {
383     default:
384         ret=BIO_callback_ctrl(b->next_bio,cmd,fp);
385         break;
386     }
387     return(ret);
388 }

390 /*
391 void BIO_set_cipher_ctx(b,c)

```

```
392 BIO *b;
393 EVP_CIPHER_CTX *c;
394 {
395     if (b == NULL) return;
396
397     if ((b->callback != NULL) &&
398         (b->callback(b,BIO_CB_CTRL,(char *)c,BIO_CTRL_SET,e,0L) <= 0))
399         return;
400
401     b->init=1;
402     ctx=(BIO_ENC_CTX *)b->ptr;
403     memcpy(ctx->cipher,c,sizeof(EVP_CIPHER_CTX));
404
405     if (b->callback != NULL)
406         b->callback(b,BIO_CB_CTRL,(char *)c,BIO_CTRL_SET,e,1L);
407 }
408 */
409
410 void BIO_set_cipher(BIO *b, const EVP_CIPHER *c, const unsigned char *k,
411                    const unsigned char *i, int e)
412 {
413     BIO_ENC_CTX *ctx;
414
415     if (b == NULL) return;
416
417     if ((b->callback != NULL) &&
418         (b->callback(b,BIO_CB_CTRL,(const char *)c,BIO_CTRL_SET,e,0L) <=
419          return;
420
421     b->init=1;
422     ctx=(BIO_ENC_CTX *)b->ptr;
423     EVP_CipherInit_ex(&(ctx->cipher),c,NULL, k,i,e);
424
425     if (b->callback != NULL)
426         b->callback(b,BIO_CB_CTRL,(const char *)c,BIO_CTRL_SET,e,1L);
427 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/bio_md.c

1

```
*****
6864 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/bio_md.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
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56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <errno.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/bio_md.c

2

```
62 #include <openssl/buffer.h>
63 #include <openssl/evp.h>
64
65 /* BIO_put and BIO_get both add to the digest,
66  * BIO_gets returns the digest */
67
68 static int md_write(BIO *h, char const *buf, int num);
69 static int md_read(BIO *h, char *buf, int size);
70 /*static int md_puts(BIO *h, const char *str); */
71 static int md_gets(BIO *h, char *str, int size);
72 static long md_ctrl(BIO *h, int cmd, long arg1, void *arg2);
73 static int md_new(BIO *h);
74 static int md_free(BIO *data);
75 static long md_callback_ctrl(BIO *h,int cmd,bio_info_cb *fp);
76
77 static BIO_METHOD methods_md=
78 {
79     BIO_TYPE_MD, "message digest",
80     md_write,
81     md_read,
82     NULL, /* md_puts, */
83     md_gets,
84     md_ctrl,
85     md_new,
86     md_free,
87     md_callback_ctrl,
88 };
89
90 BIO_METHOD *BIO_f_md(void)
91 {
92     return(&methods_md);
93 }
94
95 static int md_new(BIO *bi)
96 {
97     EVP_MD_CTX *ctx;
98
99     ctx=EVP_MD_CTX_create();
100    if (ctx == NULL) return(0);
101
102    bi->init=0;
103    bi->ptr=(char *)ctx;
104    bi->flags=0;
105    return(1);
106 }
107
108 static int md_free(BIO *a)
109 {
110     if (a == NULL) return(0);
111     EVP_MD_CTX_destroy(a->ptr);
112     a->ptr=NULL;
113     a->init=0;
114     a->flags=0;
115     return(1);
116 }
117
118 static int md_read(BIO *b, char *out, int outl)
119 {
120     int ret=0;
121     EVP_MD_CTX *ctx;
122
123     if (out == NULL) return(0);
124     ctx=b->ptr;
125
126     if ((ctx == NULL) || (b->next_bio == NULL)) return(0);
```

```

128     ret=BIO_read(b->next_bio,out,outl);
129     if (b->init)
130     {
131         if (ret > 0)
132         {
133             if (EVP_DigestUpdate(ctx,(unsigned char *)out,
134                 (unsigned int)ret)<=0) return (-1);
135         }
136     }
137     BIO_clear_retry_flags(b);
138     BIO_copy_next_retry(b);
139     return(ret);
140 }

142 static int md_write(BIO *b, const char *in, int inl)
143 {
144     int ret=0;
145     EVP_MD_CTX *ctx;

147     if ((in == NULL) || (inl <= 0)) return(0);
148     ctx=b->ptr;

150     if ((ctx != NULL) && (b->next_bio != NULL))
151         ret=BIO_write(b->next_bio,in,inl);
152     if (b->init)
153     {
154         if (ret > 0)
155         {
156             if (!EVP_DigestUpdate(ctx,(const unsigned char *)in,
157                 (unsigned int)ret))
158             {
159                 BIO_clear_retry_flags(b);
160                 return 0;
161             }
162         }
163     }
164     if(b->next_bio != NULL)
165     {
166         BIO_clear_retry_flags(b);
167         BIO_copy_next_retry(b);
168     }
169     return(ret);
170 }

172 static long md_ctrl(BIO *b, int cmd, long num, void *ptr)
173 {
174     EVP_MD_CTX *ctx,*dctx,**pctx;
175     const EVP_MD **ppmd;
176     EVP_MD *md;
177     long ret=1;
178     BIO *dbio;

180     ctx=b->ptr;

182     switch (cmd)
183     {
184     case BIO_CTRL_RESET:
185         if (b->init)
186             ret = EVP_DigestInit_ex(ctx,ctx->digest, NULL);
187         else
188             ret=0;
189         if (ret > 0)
190             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
191         break;
192     case BIO_C_GET_MD:
193         if (b->init)

```

```

194         {
195             ppmd=ptr;
196             *ppmd=ctx->digest;
197         }
198     else
199         ret=0;
200     break;
201 case BIO_C_GET_MD_CTX:
202     pctx=ptr;
203     *pctx=ctx;
204     b->init = 1;
205     break;
206 case BIO_C_SET_MD_CTX:
207     if (b->init)
208         b->ptr=ptr;
209     else
210         ret=0;
211     break;
212 case BIO_C_DO_STATE_MACHINE:
213     BIO_clear_retry_flags(b);
214     ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
215     BIO_copy_next_retry(b);
216     break;

218 case BIO_C_SET_MD:
219     md=ptr;
220     ret = EVP_DigestInit_ex(ctx,md, NULL);
221     if (ret > 0)
222         b->init=1;
223     break;
224 case BIO_CTRL_DUP:
225     dbio=ptr;
226     dctx=dbio->ptr;
227     if (!EVP_MD_CTX_copy_ex(dctx,ctx))
228         return 0;
229     b->init=1;
230     break;
231 default:
232     ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
233     break;
234 }
235 return(ret);
236 }

238 static long md_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
239 {
240     long ret=1;

242     if (b->next_bio == NULL) return(0);
243     switch (cmd)
244     {
245     default:
246         ret=BIO_callback_ctrl(b->next_bio,cmd,fp);
247         break;
248     }
249     return(ret);
250 }

252 static int md_gets(BIO *bp, char *buf, int size)
253 {
254     EVP_MD_CTX *ctx;
255     unsigned int ret;

258     ctx=bp->ptr;
259     if (size < ctx->digest->md_size)

```



```
260         return(0);
261     if (EVP_DigestFinal_ex(ctx, (unsigned char *)buf, &ret) <= 0)
262         return -1;
263
264     return((int)ret);
265 }
266
267 /*
268 static int md_puts(bp, str)
269 BIO *bp;
270 char *str;
271 {
272     return(-1);
273 }
274 */
```

new/usr/src/lib/openssl/libsunw_crypto/evp/bio_ok.c

1

15847 Fri May 30 18:31:50 2014

new/usr/src/lib/openssl/libsunw_crypto/evp/bio_ok.c

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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57 */
```

```
59 /*
60 From: Arne Ansper <arne@cyber.ee>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/bio_ok.c

2

```
62 Why BIO_f_reliable?

64 I wrote function which took BIO* as argument, read data from it
65 and processed it. Then I wanted to store the input file in
66 encrypted form. OK I pushed BIO_f_cipher to the BIO stack
67 and everything was OK. BUT if user types wrong password
68 BIO_f_cipher outputs only garbage and my function crashes. Yes
69 I can and I should fix my function, but BIO_f_cipher is
70 easy way to add encryption support to many existing applications
71 and it's hard to debug and fix them all.

73 So I wanted another BIO which would catch the incorrect passwords and
74 file damages which cause garbage on BIO_f_cipher's output.

76 The easy way is to push the BIO_f_md and save the checksum at
77 the end of the file. However there are several problems with this
78 approach:

80 1) you must somehow separate checksum from actual data.
81 2) you need lot's of memory when reading the file, because you
82 must read to the end of the file and verify the checksum before
83 letting the application to read the data.
84
85 BIO_f_reliable tries to solve both problems, so that you can
86 read and write arbitrary long streams using only fixed amount
87 of memory.

89 BIO_f_reliable splits data stream into blocks. Each block is prefixed
90 with it's length and suffixed with it's digest. So you need only
91 several Kbytes of memory to buffer single block before verifying
92 it's digest.

94 BIO_f_reliable goes further and adds several important capabilities:

96 1) the digest of the block is computed over the whole stream
97 -- so nobody can rearrange the blocks or remove or replace them.

99 2) to detect invalid passwords right at the start BIO_f_reliable
100 adds special prefix to the stream. In order to avoid known plain-text
101 attacks this prefix is generated as follows:

103 *) digest is initialized with random seed instead of
104 standardized one.
105 *) same seed is written to output
106 *) well-known text is then hashed and the output
107 of the digest is also written to output.

109 reader can now read the seed from stream, hash the same string
110 and then compare the digest output.

112 Bad things: BIO_f_reliable knows what's going on in EVP_Digest. I
113 initially wrote and tested this code on x86 machine and wrote the
114 digests out in machine-dependent order :( There are people using
115 this code and I cannot change this easily without making existing
116 data files unreadable.

118 */

120 #include <stdio.h>
121 #include <errno.h>
122 #include <assert.h>
123 #include "cryptlib.h"
124 #include <openssl/buffer.h>
125 #include <openssl/bio.h>
126 #include <openssl/evp.h>
127 #include <openssl/rand.h>
```

```

129 static int ok_write(BIO *h, const char *buf, int num);
130 static int ok_read(BIO *h, char *buf, int size);
131 static long ok_ctrl(BIO *h, int cmd, long arg1, void *arg2);
132 static int ok_new(BIO *h);
133 static int ok_free(BIO *data);
134 static long ok_callback_ctrl(BIO *h, int cmd, bio_info_cb *fp);

136 static int sig_out(BIO* b);
137 static int sig_in(BIO* b);
138 static int block_out(BIO* b);
139 static int block_in(BIO* b);
140 #define OK_BLOCK_SIZE (1024*4)
141 #define OK_BLOCK_BLOCK 4
142 #define IOBS (OK_BLOCK_SIZE+ OK_BLOCK_BLOCK+ 3*EVP_MAX_MD_SIZE)
143 #define WELLKNOWN "The quick brown fox jumped over the lazy dog's back."

145 typedef struct ok_struct
146 {
147     size_t buf_len;
148     size_t buf_off;
149     size_t buf_len_save;
150     size_t buf_off_save;
151     int cont;
152     int finished;
153     EVP_MD_CTX md;
154     int blockout;
155     int sigio;
156     unsigned char buf[IOBS];
157 } BIO_OK_CTX;

159 static BIO_METHOD methods_ok=
160 {
161     BIO_TYPE_CIPHER,"reliable",
162     ok_write,
163     ok_read,
164     NULL, /* ok_puts, */
165     NULL, /* ok_gets, */
166     ok_ctrl,
167     ok_new,
168     ok_free,
169     ok_callback_ctrl,
170 };

172 BIO_METHOD *BIO_f_reliable(void)
173 {
174     return(&methods_ok);
175 }

177 static int ok_new(BIO *bi)
178 {
179     BIO_OK_CTX *ctx;
180
181     ctx=(BIO_OK_CTX *)OPENSSL_malloc(sizeof(BIO_OK_CTX));
182     if (ctx == NULL) return(0);

184     ctx->buf_len=0;
185     ctx->buf_off=0;
186     ctx->buf_len_save=0;
187     ctx->buf_off_save=0;
188     ctx->cont=1;
189     ctx->finished=0;
190     ctx->blockout= 0;
191     ctx->sigio=1;

193     EVP_MD_CTX_init(&ctx->md);

```

```

195     bi->init=0;
196     bi->ptr=(char *)ctx;
197     bi->flags=0;
198     return(1);
199 }

201 static int ok_free(BIO *a)
202 {
203     if (a == NULL) return(0);
204     EVP_MD_CTX_cleanup(&((BIO_OK_CTX *)a->ptr)->md);
205     OPENSSL_cleanse(a->ptr, sizeof(BIO_OK_CTX));
206     OPENSSL_free(a->ptr);
207     a->ptr=NULL;
208     a->init=0;
209     a->flags=0;
210     return(1);
211 }

213 static int ok_read(BIO *b, char *out, int outl)
214 {
215     int ret=0,i,n;
216     BIO_OK_CTX *ctx;

218     if (out == NULL) return(0);
219     ctx=(BIO_OK_CTX *)b->ptr;

221     if ((ctx == NULL) || (b->next_bio == NULL) || (b->init == 0)) return(0);

223     while(outl > 0)
224     {
226         /* copy clean bytes to output buffer */
227         if (ctx->blockout)
228         {
229             i=ctx->buf_len-ctx->buf_off;
230             if (i > outl) i=outl;
231             memcpy(out,&(ctx->buf[ctx->buf_off]),i);
232             ret+=i;
233             out+=i;
234             outl-=i;
235             ctx->buf_off+=i;

237             /* all clean bytes are out */
238             if (ctx->buf_len == ctx->buf_off)
239             {
240                 ctx->buf_off=0;

242                 /* copy start of the next block into proper place
243                  if (ctx->buf_len_save- ctx->buf_off_save > 0)
244                  {
245                      ctx->buf_len= ctx->buf_len_save- ctx->buf_off_save;
246                      memmove(ctx->buf, &(ctx->buf[ctx->buf_off_save]),
247                              ctx->buf_len);
248                  }
249                 else
250                 {
251                     ctx->buf_len=0;
252                 }
253                 ctx->blockout= 0;
254             }
255         }

257         /* output buffer full -- cancel */
258         if (outl == 0) break;

```

```

260      /* no clean bytes in buffer -- fill it */
261      n=IOBS- ctx->buf_len;
262      i=BIO_read(b->next_bio,&(ctx->buf[ctx->buf_len]),n);

264      if (i <= 0) break;      /* nothing new */

266      ctx->buf_len+= i;

268      /* no signature yet -- check if we got one */
269      if (ctx->sigio == 1)
270      {
271          if (!sig_in(b))
272          {
273              BIO_clear_retry_flags(b);
274              return 0;
275          }
276      }

278      /* signature ok -- check if we got block */
279      if (ctx->sigio == 0)
280      {
281          if (!block_in(b))
282          {
283              BIO_clear_retry_flags(b);
284              return 0;
285          }
286      }

288      /* invalid block -- cancel */
289      if (ctx->cont <= 0) break;

291      }

293      BIO_clear_retry_flags(b);
294      BIO_copy_next_retry(b);
295      return(ret);
296      }

298 static int ok_write(BIO *b, const char *in, int inl)
299 {
300     int ret=0,n,i;
301     BIO_OK_CTX *ctx;

303     if (inl <= 0) return inl;

305     ctx=(BIO_OK_CTX *)b->ptr;
306     ret=inl;

308     if ((ctx == NULL) || (b->next_bio == NULL) || (b->init == 0)) return(0);

310     if (ctx->sigio && !sig_out(b))
311         return 0;

313     do{
314         BIO_clear_retry_flags(b);
315         n=ctx->buf_len-ctx->buf_off;
316         while (ctx->blockout && n > 0)
317         {
318             i=BIO_write(b->next_bio,&(ctx->buf[ctx->buf_off]),n);
319             if (i <= 0)
320             {
321                 BIO_copy_next_retry(b);
322                 if(!BIO_should_retry(b))
323                     ctx->cont= 0;
324                 return(i);
325             }

```

```

326         ctx->buf_off+=i;
327         n-=i;
328     }

330     /* at this point all pending data has been written */
331     ctx->blockout= 0;
332     if (ctx->buf_len == ctx->buf_off)
333     {
334         ctx->buf_len=OK_BLOCK_BLOCK;
335         ctx->buf_off=0;
336     }

337     if ((in == NULL) || (inl <= 0)) return(0);

340     n= (inl+ ctx->buf_len > OK_BLOCK_SIZE+ OK_BLOCK_BLOCK) ?
341         (int)(OK_BLOCK_SIZE+OK_BLOCK_BLOCK-ctx->buf_len) : inl;

343     memcpy((unsigned char *)&(ctx->buf[ctx->buf_len]),(unsigned char *)in,n);
344     ctx->buf_len+= n;
345     inl-=n;
346     in+=n;

348     if (ctx->buf_len >= OK_BLOCK_SIZE+ OK_BLOCK_BLOCK)
349     {
350         if (!block_out(b))
351         {
352             BIO_clear_retry_flags(b);
353             return 0;
354         }
355     }
356     }while(inl > 0);

358     BIO_clear_retry_flags(b);
359     BIO_copy_next_retry(b);
360     return(ret);
361     }

363 static long ok_ctrl(BIO *b, int cmd, long num, void *ptr)
364 {
365     BIO_OK_CTX *ctx;
366     EVP_MD *md;
367     const EVP_MD **ppmd;
368     long ret=1;
369     int i;

371     ctx=b->ptr;

373     switch (cmd)
374     {
375     case BIO_CTRL_RESET:
376         ctx->buf_len=0;
377         ctx->buf_off=0;
378         ctx->buf_len_save=0;
379         ctx->buf_off_save=0;
380         ctx->cont=1;
381         ctx->finished=0;
382         ctx->blockout= 0;
383         ctx->sigio=1;
384         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
385         break;
386     case BIO_CTRL_EOF:      /* More to read */
387         if (ctx->cont <= 0)
388             ret=1;
389         else
390             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
391         break;

```

```

392     case BIO_CTRL_PENDING: /* More to read in buffer */
393     case BIO_CTRL_WPENDING: /* More to read in buffer */
394         ret=ctx->blockout ? ctx->buf_len-ctx->buf_off : 0;
395         if (ret <= 0)
396             ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
397         break;
398     case BIO_CTRL_FLUSH:
399         /* do a final write */
400         if(ctx->blockout == 0)
401             if (!block_out(b))
402                 return 0;
403
404         while (ctx->blockout)
405         {
406             i=ok_write(b,NULL,0);
407             if (i < 0)
408             {
409                 ret=i;
410                 break;
411             }
412         }
413
414         ctx->finished=1;
415         ctx->buf_off=ctx->buf_len=0;
416         ctx->cont=(int)ret;
417
418         /* Finally flush the underlying BIO */
419         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
420         break;
421     case BIO_C_DO_STATE_MACHINE:
422         BIO_clear_retry_flags(b);
423         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
424         BIO_copy_next_retry(b);
425         break;
426     case BIO_CTRL_INFO:
427         ret=(long)ctx->cont;
428         break;
429     case BIO_C_SET_MD:
430         md=ptr;
431         if (!EVP_DigestInit_ex(&ctx->md, md, NULL))
432             return 0;
433         b->init=1;
434         break;
435     case BIO_C_GET_MD:
436         if (b->init)
437         {
438             ppmd=ptr;
439             *ppmd=ctx->md.digest;
440         }
441         else
442             ret=0;
443         break;
444     default:
445         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
446         break;
447     }
448     return(ret);
449 }
450
451 static long ok_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
452 {
453     long ret=1;
454
455     if (b->next_bio == NULL) return(0);
456     switch (cmd)
457     {

```

```

458     default:
459         ret=BIO_callback_ctrl(b->next_bio,cmd,fp);
460         break;
461     }
462     return(ret);
463 }
464
465 static void longswap(void *_ptr, size_t len)
466 {
467     const union { long one; char little; } is_endian = {1};
468
469     if (is_endian.little) {
470         size_t i;
471         unsigned char *p=_ptr,c;
472
473         for(i= 0;i < len;i+= 4) {
474             c=p[0],p[0]=p[3],p[3]=c;
475             c=p[1],p[1]=p[2],p[2]=c;
476         }
477     }
478 }
479
480 static int sig_out(BIO* b)
481 {
482     BIO_OK_CTX *ctx;
483     EVP_MD_CTX *md;
484
485     ctx=b->ptr;
486     md=&ctx->md;
487
488     if(ctx->buf_len+ 2* md->digest->md_size > OK_BLOCK_SIZE) return 1;
489
490     if (!EVP_DigestInit_ex(md, md->digest, NULL))
491         goto berr;
492     /* FIXME: there's absolutely no guarantee this makes any sense at all,
493      * particularly now EVP_MD_CTX has been restructured.
494      */
495     RAND_pseudo_bytes(md->md_data, md->digest->md_size);
496     memcpy(&ctx->buf[ctx->buf_len], md->md_data, md->digest->md_size);
497     longswap(&ctx->buf[ctx->buf_len], md->digest->md_size);
498     ctx->buf_len+= md->digest->md_size;
499
500     if (!EVP_DigestUpdate(md, WELLKNOWN, strlen(WELLKNOWN)))
501         goto berr;
502     if (!EVP_DigestFinal_ex(md, &ctx->buf[ctx->buf_len], NULL))
503         goto berr;
504     ctx->buf_len+= md->digest->md_size;
505     ctx->blockout= 1;
506     ctx->sigio= 0;
507     return 1;
508     berr:
509     BIO_clear_retry_flags(b);
510     return 0;
511 }
512
513 static int sig_in(BIO* b)
514 {
515     BIO_OK_CTX *ctx;
516     EVP_MD_CTX *md;
517     unsigned char tmp[EVP_MAX_MD_SIZE];
518     int ret= 0;
519
520     ctx=b->ptr;
521     md=&ctx->md;
522
523     if(((int)(ctx->buf_len-ctx->buf_off) < 2*md->digest->md_size) return 1;

```

```

524     if (!EVP_DigestInit_ex(md, md->digest, NULL))
525         goto berr;
526     memcpy(md->md_data, &(ctx->buf[ctx->buf_off]), md->digest->md_size);
527     longswap(md->md_data, md->digest->md_size);
528     ctx->buf_off+= md->digest->md_size;

530     if (!EVP_DigestUpdate(md, WELLKNOWN, strlen(WELLKNOWN)))
531         goto berr;
532     if (!EVP_DigestFinal_ex(md, tmp, NULL))
533         goto berr;
534     ret= memcmp(&(ctx->buf[ctx->buf_off]), tmp, md->digest->md_size) == 0;
535     ctx->buf_off+= md->digest->md_size;
536     if(ret == 1)
537     {
538         ctx->sigio= 0;
539         if(ctx->buf_len != ctx->buf_off)
540             memmove(ctx->buf, &(ctx->buf[ctx->buf_off]), ctx->buf_le
541             }
542         ctx->buf_len-= ctx->buf_off;
543         ctx->buf_off= 0;
544     }
545     else
546     {
547         ctx->cont= 0;
548     }
549     return 1;
550 berr:
551     BIO_clear_retry_flags(b);
552     return 0;
553 }
554
556 static int block_out(BIO* b)
557 {
558     BIO_OK_CTX *ctx;
559     EVP_MD_CTX *md;
560     unsigned long tl;

562     ctx=b->ptr;
563     md=&ctx->md;

565     tl= ctx->buf_len- OK_BLOCK_BLOCK;
566     ctx->buf[0]=(unsigned char)(tl>>24);
567     ctx->buf[1]=(unsigned char)(tl>>16);
568     ctx->buf[2]=(unsigned char)(tl>>8);
569     ctx->buf[3]=(unsigned char)(tl);
570     if (!EVP_DigestUpdate(md,
571         (unsigned char*) &(ctx->buf[OK_BLOCK_BLOCK]), tl))
572         goto berr;
573     if (!EVP_DigestFinal_ex(md, &(ctx->buf[ctx->buf_len]), NULL))
574         goto berr;
575     ctx->buf_len+= md->digest->md_size;
576     ctx->blockout= 1;
577     return 1;
578 berr:
579     BIO_clear_retry_flags(b);
580     return 0;
581 }

583 static int block_in(BIO* b)
584 {
585     BIO_OK_CTX *ctx;
586     EVP_MD_CTX *md;
587     unsigned long tl= 0;
588     unsigned char tmp[EVP_MAX_MD_SIZE];

```

```

590     ctx=b->ptr;
591     md=&ctx->md;

593     assert(sizeof(tl)>=OK_BLOCK_BLOCK); /* always true */
594     tl =ctx->buf[0]; tl<=8;
595     tl|=ctx->buf[1]; tl<=8;
596     tl|=ctx->buf[2]; tl<=8;
597     tl|=ctx->buf[3];

599     if (ctx->buf_len < tl+ OK_BLOCK_BLOCK+ md->digest->md_size) return 1;
600
601     if (!EVP_DigestUpdate(md,
602         (unsigned char*) &(ctx->buf[OK_BLOCK_BLOCK]), tl))
603         goto berr;
604     if (!EVP_DigestFinal_ex(md, tmp, NULL))
605         goto berr;
606     if(memcmp(&(ctx->buf[tl+ OK_BLOCK_BLOCK]), tmp, md->digest->md_size) ==
607     {
608         /* there might be parts from next block lurking around ! */
609         ctx->buf_off_save= tl+ OK_BLOCK_BLOCK+ md->digest->md_size;
610         ctx->buf_len_save= ctx->buf_len;
611         ctx->buf_off= OK_BLOCK_BLOCK;
612         ctx->buf_len= tl+ OK_BLOCK_BLOCK;
613         ctx->blockout= 1;
614     }
615     else
616     {
617         ctx->cont= 0;
618     }
619     return 1;
620 berr:
621     BIO_clear_retry_flags(b);
622     return 0;
623 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/c_all.c

1

3867 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/c_all.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/c_all.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/c_all.c

2

```
62 #ifndef OPENSSL_NO_ENGINE
63 #include <openssl/engine.h>
64 #endif
65
66 #if 0
67 #undef OpenSSL_add_all_algorithms
68
69 void OpenSSL_add_all_algorithms(void)
70 {
71     OpenSSL_add_all_algorithms_noconf();
72 }
73 #endif
74
75 void OPENSSL_add_all_algorithms_noconf(void)
76 {
77     /*
78      * For the moment OPENSSL_cpuid_setup does something
79      * only on IA-32, but we reserve the option for all
80      * platforms...
81      */
82     OPENSSL_cpuid_setup();
83     OpenSSL_add_all_ciphers();
84     OpenSSL_add_all_digests();
85 #ifndef OPENSSL_NO_ENGINE
86 # if defined(__OpenBSD__) || defined(__FreeBSD__) || defined(HAVE_CRYPTODEV)
87     ENGINE_setup_bsd_cryptodev();
88 # endif
89 #endif
90 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/c_allc.c

1

8665 Fri May 30 18:31:50 2014
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3  * All rights reserved.
4  *
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6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/c_allc.c

2

```
62 #include <openssl/pkcs12.h>
63 #include <openssl/objects.h>
64
65 void OpenSSL_add_all_ciphers(void)
66 {
67
68 #ifndef OPENSSL_NO_DES
69     EVP_add_cipher(EVP_des_cfb());
70     EVP_add_cipher(EVP_des_cfb1());
71     EVP_add_cipher(EVP_des_cfb8());
72     EVP_add_cipher(EVP_des_ede_cfb());
73     EVP_add_cipher(EVP_des_ede3_cfb());
74     EVP_add_cipher(EVP_des_ede3_cfb1());
75     EVP_add_cipher(EVP_des_ede3_cfb8());
76
77     EVP_add_cipher(EVP_des_ofb());
78     EVP_add_cipher(EVP_des_ede_ofb());
79     EVP_add_cipher(EVP_des_ede3_ofb());
80
81     EVP_add_cipher(EVP_desx_cbc());
82     EVP_add_cipher_alias(SN_desx_cbc, "DESX");
83     EVP_add_cipher_alias(SN_desx_cbc, "desx");
84
85     EVP_add_cipher(EVP_des_cbc());
86     EVP_add_cipher_alias(SN_des_cbc, "DES");
87     EVP_add_cipher_alias(SN_des_cbc, "des");
88     EVP_add_cipher(EVP_des_ede_cbc());
89     EVP_add_cipher(EVP_des_ede3_cbc());
90     EVP_add_cipher_alias(SN_des_ede3_cbc, "DES3");
91     EVP_add_cipher_alias(SN_des_ede3_cbc, "des3");
92
93     EVP_add_cipher(EVP_des_ecb());
94     EVP_add_cipher(EVP_des_ede());
95     EVP_add_cipher(EVP_des_ede3());
96 #endif
97
98 #ifndef OPENSSL_NO_RC4
99     EVP_add_cipher(EVP_rc4());
100     EVP_add_cipher(EVP_rc4_40());
101 #ifndef OPENSSL_NO_MD5
102     EVP_add_cipher(EVP_rc4_hmac_md5());
103 #endif
104 #endif
105
106 #ifndef OPENSSL_NO_IDEA
107     EVP_add_cipher(EVP_idea_ecb());
108     EVP_add_cipher(EVP_idea_cfb());
109     EVP_add_cipher(EVP_idea_ofb());
110     EVP_add_cipher(EVP_idea_cbc());
111     EVP_add_cipher_alias(SN_idea_cbc, "IDEA");
112     EVP_add_cipher_alias(SN_idea_cbc, "idea");
113 #endif
114
115 #ifndef OPENSSL_NO_SEED
116     EVP_add_cipher(EVP_seed_ecb());
117     EVP_add_cipher(EVP_seed_cfb());
118     EVP_add_cipher(EVP_seed_ofb());
119     EVP_add_cipher(EVP_seed_cbc());
120     EVP_add_cipher_alias(SN_seed_cbc, "SEED");
121     EVP_add_cipher_alias(SN_seed_cbc, "seed");
122 #endif
123
124 #ifndef OPENSSL_NO_RC2
125     EVP_add_cipher(EVP_rc2_ecb());
126     EVP_add_cipher(EVP_rc2_cfb());
127     EVP_add_cipher(EVP_rc2_ofb());
```



```

128     EVP_add_cipher(EVP_rc2_cbc());
129     EVP_add_cipher(EVP_rc2_40_cbc());
130     EVP_add_cipher(EVP_rc2_64_cbc());
131     EVP_add_cipher_alias(SN_rc2_cbc, "RC2");
132     EVP_add_cipher_alias(SN_rc2_cbc, "rc2");
133 #endif

135 #ifndef OPENSSSL_NO_BF
136     EVP_add_cipher(EVP_bf_ecb());
137     EVP_add_cipher(EVP_bf_cfb());
138     EVP_add_cipher(EVP_bf_ofb());
139     EVP_add_cipher(EVP_bf_cbc());
140     EVP_add_cipher_alias(SN_bf_cbc, "BF");
141     EVP_add_cipher_alias(SN_bf_cbc, "bf");
142     EVP_add_cipher_alias(SN_bf_cbc, "blowfish");
143 #endif

145 #ifndef OPENSSSL_NO_CAST
146     EVP_add_cipher(EVP_cast5_ecb());
147     EVP_add_cipher(EVP_cast5_cfb());
148     EVP_add_cipher(EVP_cast5_ofb());
149     EVP_add_cipher(EVP_cast5_cbc());
150     EVP_add_cipher_alias(SN_cast5_cbc, "CAST");
151     EVP_add_cipher_alias(SN_cast5_cbc, "cast");
152     EVP_add_cipher_alias(SN_cast5_cbc, "CAST-cbc");
153     EVP_add_cipher_alias(SN_cast5_cbc, "cast-cbc");
154 #endif

156 #ifndef OPENSSSL_NO_RC5
157     EVP_add_cipher(EVP_rc5_32_12_16_ecb());
158     EVP_add_cipher(EVP_rc5_32_12_16_cfb());
159     EVP_add_cipher(EVP_rc5_32_12_16_ofb());
160     EVP_add_cipher(EVP_rc5_32_12_16_cbc());
161     EVP_add_cipher_alias(SN_rc5_cbc, "rc5");
162     EVP_add_cipher_alias(SN_rc5_cbc, "RC5");
163 #endif

165 #ifndef OPENSSSL_NO_AES
166     EVP_add_cipher(EVP_aes_128_ecb());
167     EVP_add_cipher(EVP_aes_128_cbc());
168     EVP_add_cipher(EVP_aes_128_cfb());
169     EVP_add_cipher(EVP_aes_128_cfb1());
170     EVP_add_cipher(EVP_aes_128_cfb8());
171     EVP_add_cipher(EVP_aes_128_ofb());
172     EVP_add_cipher(EVP_aes_128_ctr());
173     EVP_add_cipher(EVP_aes_128_gcm());
174     EVP_add_cipher(EVP_aes_128_xts());
175     EVP_add_cipher_alias(SN_aes_128_cbc, "AES128");
176     EVP_add_cipher_alias(SN_aes_128_cbc, "aes128");
177     EVP_add_cipher(EVP_aes_192_ecb());
178     EVP_add_cipher(EVP_aes_192_cbc());
179     EVP_add_cipher(EVP_aes_192_cfb());
180     EVP_add_cipher(EVP_aes_192_cfb1());
181     EVP_add_cipher(EVP_aes_192_cfb8());
182     EVP_add_cipher(EVP_aes_192_ofb());
183     EVP_add_cipher(EVP_aes_192_ctr());
184     EVP_add_cipher(EVP_aes_192_gcm());
185     EVP_add_cipher_alias(SN_aes_192_cbc, "AES192");
186     EVP_add_cipher_alias(SN_aes_192_cbc, "aes192");
187     EVP_add_cipher(EVP_aes_256_ecb());
188     EVP_add_cipher(EVP_aes_256_cbc());
189     EVP_add_cipher(EVP_aes_256_cfb());
190     EVP_add_cipher(EVP_aes_256_cfb1());
191     EVP_add_cipher(EVP_aes_256_cfb8());
192     EVP_add_cipher(EVP_aes_256_ofb());
193     EVP_add_cipher(EVP_aes_256_ctr());

```

```

194     EVP_add_cipher(EVP_aes_256_gcm());
195     EVP_add_cipher(EVP_aes_256_xts());
196     EVP_add_cipher_alias(SN_aes_256_cbc, "AES256");
197     EVP_add_cipher_alias(SN_aes_256_cbc, "aes256");
198 #if !defined(OPENSSSL_NO_SHA) && !defined(OPENSSSL_NO_SHA1)
199     EVP_add_cipher(EVP_aes_128_cbc_hmac_sha1());
200     EVP_add_cipher(EVP_aes_256_cbc_hmac_sha1());
201 #endif
202 #endif

204 #ifndef OPENSSSL_NO_CAMELLIA
205     EVP_add_cipher(EVP_camellia_128_ecb());
206     EVP_add_cipher(EVP_camellia_128_cbc());
207     EVP_add_cipher(EVP_camellia_128_cfb());
208     EVP_add_cipher(EVP_camellia_128_cfb1());
209     EVP_add_cipher(EVP_camellia_128_cfb8());
210     EVP_add_cipher(EVP_camellia_128_ofb());
211     EVP_add_cipher_alias(SN_camellia_128_cbc, "CAMELLIA128");
212     EVP_add_cipher_alias(SN_camellia_128_cbc, "camellia128");
213     EVP_add_cipher(EVP_camellia_192_ecb());
214     EVP_add_cipher(EVP_camellia_192_cbc());
215     EVP_add_cipher(EVP_camellia_192_cfb());
216     EVP_add_cipher(EVP_camellia_192_cfb1());
217     EVP_add_cipher(EVP_camellia_192_cfb8());
218     EVP_add_cipher(EVP_camellia_192_ofb());
219     EVP_add_cipher_alias(SN_camellia_192_cbc, "CAMELLIA192");
220     EVP_add_cipher_alias(SN_camellia_192_cbc, "camellia192");
221     EVP_add_cipher(EVP_camellia_256_ecb());
222     EVP_add_cipher(EVP_camellia_256_cbc());
223     EVP_add_cipher(EVP_camellia_256_cfb());
224     EVP_add_cipher(EVP_camellia_256_cfb1());
225     EVP_add_cipher(EVP_camellia_256_cfb8());
226     EVP_add_cipher(EVP_camellia_256_ofb());
227     EVP_add_cipher_alias(SN_camellia_256_cbc, "CAMELLIA256");
228     EVP_add_cipher_alias(SN_camellia_256_cbc, "camellia256");
229 #endif
230 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/c_alld.c

1

4696 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/c_alld.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/c_alld.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/c_alld.c

2

```
62 #include <openssl/pkcs12.h>
63 #include <openssl/objects.h>
64
65 void OpenSSL_add_all_digests(void)
66 {
67 #ifndef OPENSSL_NO_MD4
68     EVP_add_digest(EVP_md4());
69 #endif
70 #ifndef OPENSSL_NO_MD5
71     EVP_add_digest(EVP_md5());
72     EVP_add_digest_alias(SN_md5,"ssl2-md5");
73     EVP_add_digest_alias(SN_md5,"ssl3-md5");
74 #endif
75 #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_SHA0)
76     EVP_add_digest(EVP_sha());
77 #ifndef OPENSSL_NO_DSA
78     EVP_add_digest(EVP_dss());
79 #endif
80 #endif
81 #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_SHA1)
82     EVP_add_digest(EVP_sha1());
83     EVP_add_digest_alias(SN_sha1,"ssl3-sha1");
84     EVP_add_digest_alias(SN_sha1WithRSAEncryption,SN_sha1WithRSA);
85 #ifndef OPENSSL_NO_DSA
86     EVP_add_digest(EVP_dss1());
87     EVP_add_digest_alias(SN_dsaWithSHA1,SN_dsaWithSHA1_2);
88     EVP_add_digest_alias(SN_dsaWithSHA1,"DSS1");
89     EVP_add_digest_alias(SN_dsaWithSHA1,"dss1");
90 #endif
91 #ifndef OPENSSL_NO_ECDSA
92     EVP_add_digest(EVP_ecdsa());
93 #endif
94 #endif
95 #if !defined(OPENSSL_NO_MDC2) && !defined(OPENSSL_NO_DES)
96     EVP_add_digest(EVP_mdc2());
97 #endif
98 #ifndef OPENSSL_NO_RIPEMD
99     EVP_add_digest(EVP_ripemd160());
100     EVP_add_digest_alias(SN_ripemd160,"ripemd");
101     EVP_add_digest_alias(SN_ripemd160,"rmd160");
102 #endif
103 #ifndef OPENSSL_NO_SHA256
104     EVP_add_digest(EVP_sha224());
105     EVP_add_digest(EVP_sha256());
106 #endif
107 #ifndef OPENSSL_NO_SHA512
108     EVP_add_digest(EVP_sha384());
109     EVP_add_digest(EVP_sha512());
110 #endif
111 #ifndef OPENSSL_NO_WHIRLPOOL
112     EVP_add_digest(EVP_whirlpool());
113 #endif
114 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/digest.c

1

12754 Fri May 30 18:31:50 2014

new/usr/src/lib/openssl/libsunw_crypto/evp/digest.c

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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```

new/usr/src/lib/openssl/libsunw_crypto/evp/digest.c

2

```
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107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include "cryptlib.h"
114 #include <openssl/objects.h>
115 #include <openssl/evp.h>
116 #ifndef OPENSSL_NO_ENGINE
117 #include <openssl/engine.h>
118 #endif
119
120 #ifdef OPENSSL_FIPS
121 #include <openssl/fips.h>
122 #endif
123
124 void EVP_MD_CTX_init(EVP_MD_CTX *ctx)
125 {
126     memset(ctx, '\0', sizeof *ctx);
127 }
```

```

129 EVP_MD_CTX *EVP_MD_CTX_create(void)
130 {
131     EVP_MD_CTX *ctx=OPENSSL_malloc(sizeof *ctx);
132
133     if (ctx)
134         EVP_MD_CTX_init(ctx);
135
136     return ctx;
137 }
138
139 int EVP_DigestInit(EVP_MD_CTX *ctx, const EVP_MD *type)
140 {
141     EVP_MD_CTX_init(ctx);
142     return EVP_DigestInit_ex(ctx, type, NULL);
143 }
144
145 int EVP_DigestInit_ex(EVP_MD_CTX *ctx, const EVP_MD *type, ENGINE *impl)
146 {
147     EVP_MD_CTX_clear_flags(ctx,EVP_MD_CTX_FLAG_CLEARED);
148 #ifndef OPENSSL_NO_ENGINE
149     /* Whether it's nice or not, "Inits" can be used on "Final"'d contexts
150      * so this context may already have an ENGINE! Try to avoid releasing
151      * the previous handle, re-querying for an ENGINE, and having a
152      * reinitialisation, when it may all be unnecessary. */
153     if (ctx->engine && ctx->digest && (!type ||
154         (type && (type->type == ctx->digest->type))))
155         goto skip_to_init;
156     if (type)
157     {
158         /* Ensure an ENGINE left lying around from last time is cleared
159          * (the previous check attempted to avoid this if the same
160          * ENGINE and EVP_MD could be used). */
161         if(ctx->engine)
162             ENGINE_finish(ctx->engine);
163         if(impl)
164         {
165             if (!ENGINE_init(impl))
166             {
167                 EVPerr(EVP_F_EVP_DIGESTINIT_EX,EVP_R_INITIALIZAT
168                     return 0;
169             }
170         }
171         else
172             /* Ask if an ENGINE is reserved for this job */
173             impl = ENGINE_get_digest_engine(type->type);
174         if(impl)
175         {
176             /* There's an ENGINE for this job ... (apparently) */
177             const EVP_MD *d = ENGINE_get_digest(impl, type->type);
178             if(!d)
179             {
180                 /* Same comment from evp_enc.c */
181                 EVPerr(EVP_F_EVP_DIGESTINIT_EX,EVP_R_INITIALIZAT
182                     ENGINE_finish(impl);
183                     return 0;
184             }
185             /* We'll use the ENGINE's private digest definition */
186             type = d;
187             /* Store the ENGINE functional reference so we know
188              * 'type' came from an ENGINE and we need to release
189              * it when done. */
190             ctx->engine = impl;
191         }
192     }
193     else
194         ctx->engine = NULL;

```

```

194     }
195     else
196     if(!ctx->digest)
197     {
198         EVPerr(EVP_F_EVP_DIGESTINIT_EX,EVP_R_NO_DIGEST_SET);
199         return 0;
200     }
201 #endif
202     if (ctx->digest != type)
203     {
204         if (ctx->digest && ctx->digest->ctx_size)
205             OPENSSL_free(ctx->md_data);
206         ctx->digest=type;
207         if (!(ctx->flags & EVP_MD_CTX_FLAG_NO_INIT) && type->ctx_size)
208         {
209             ctx->update = type->update;
210             ctx->md_data=OPENSSL_malloc(type->ctx_size);
211             if (ctx->md_data == NULL)
212             {
213                 EVPerr(EVP_F_EVP_DIGESTINIT_EX,
214                     ERR_R_MALLOC_FAILURE);
215                 return 0;
216             }
217         }
218     }
219 #ifndef OPENSSL_NO_ENGINE
220 skip_to_init:
221 #endif
222     if (ctx->pctx)
223     {
224         int r;
225         r = EVP_PKEY_CTX_ctrl(ctx->pctx, -1, EVP_PKEY_OP_TYPE_SIG,
226             EVP_PKEY_CTRL_DIGESTINIT, 0, ctx);
227         if (r <= 0 && (r != -2))
228             return 0;
229     }
230     if (ctx->flags & EVP_MD_CTX_FLAG_NO_INIT)
231         return 1;
232 #ifdef OPENSSL_FIPS
233     if (FIPS_mode())
234     {
235         if (FIPS_digestinit(ctx, type))
236             return 1;
237         OPENSSL_free(ctx->md_data);
238         ctx->md_data = NULL;
239         return 0;
240     }
241 #endif
242     return ctx->digest->init(ctx);
243 }
244
245 int EVP_DigestUpdate(EVP_MD_CTX *ctx, const void *data, size_t count)
246 {
247     #ifdef OPENSSL_FIPS
248     return FIPS_digestupdate(ctx, data, count);
249     #else
250     return ctx->update(ctx,data,count);
251     #endif
252 }
253
254 /* The caller can assume that this removes any secret data from the context */
255 int EVP_DigestFinal(EVP_MD_CTX *ctx, unsigned char *md, unsigned int *size)
256 {
257     int ret;
258     ret = EVP_DigestFinal_ex(ctx, md, size);
259     EVP_MD_CTX_cleanup(ctx);

```

```

260     return ret;
261 }

263 /* The caller can assume that this removes any secret data from the context */
264 int EVP_DigestFinal_ex(EVP_MD_CTX *ctx, unsigned char *md, unsigned int *size)
265 {
266     #ifdef OPENSSL_FIPS
267     return FIPS_digestfinal(ctx, md, size);
268     #else
269     int ret;

271     OPENSSL_assert(ctx->digest->md_size <= EVP_MAX_MD_SIZE);
272     ret=ctx->digest->final(ctx,md);
273     if (size != NULL)
274         *size=ctx->digest->md_size;
275     if (ctx->digest->cleanup)
276     {
277         ctx->digest->cleanup(ctx);
278         EVP_MD_CTX_set_flags(ctx,EVP_MD_CTX_FLAG_CLEANED);
279     }
280     memset(ctx->md_data,0,ctx->digest->ctx_size);
281     return ret;
282     #endif
283 }

285 int EVP_MD_CTX_copy(EVP_MD_CTX *out, const EVP_MD_CTX *in)
286 {
287     EVP_MD_CTX_init(out);
288     return EVP_MD_CTX_copy_ex(out, in);
289 }

291 int EVP_MD_CTX_copy_ex(EVP_MD_CTX *out, const EVP_MD_CTX *in)
292 {
293     unsigned char *tmp_buf;
294     if ((in == NULL) || (in->digest == NULL))
295     {
296         EVPerr(EVP_F_EVP_MD_CTX_COPY_EX,EVP_R_INPUT_NOT_INITIALIZED);
297         return 0;
298     }
299     #ifndef OPENSSL_NO_ENGINE
300     /* Make sure it's safe to copy a digest context using an ENGINE */
301     if (in->engine && !ENGINE_init(in->engine))
302     {
303         EVPerr(EVP_F_EVP_MD_CTX_COPY_EX,ERR_R_ENGINE_LIB);
304         return 0;
305     }
306     #endif

308     if (out->digest == in->digest)
309     {
310         tmp_buf = out->md_data;
311         EVP_MD_CTX_set_flags(out,EVP_MD_CTX_FLAG_REUSE);
312     }
313     else tmp_buf = NULL;
314     EVP_MD_CTX_cleanup(out);
315     memcpy(out,in,sizeof *out);

317     if (in->md_data && out->digest->ctx_size)
318     {
319         if (tmp_buf)
320             out->md_data = tmp_buf;
321         else
322         {
323             out->md_data=OPENSSL_malloc(out->digest->ctx_size);
324             if (!out->md_data)
325                 {

```

```

326             EVPerr(EVP_F_EVP_MD_CTX_COPY_EX,ERR_R_MALLOC_FAIL);
327             return 0;
328         }
329     }
330     memcpy(out->md_data,in->md_data,out->digest->ctx_size);
331 }

333     out->update = in->update;

335     if (in->pctx)
336     {
337         out->pctx = EVP_PKEY_CTX_dup(in->pctx);
338         if (!out->pctx)
339         {
340             EVP_MD_CTX_cleanup(out);
341             return 0;
342         }
343     }

345     if (out->digest->copy)
346         return out->digest->copy(out,in);
347
348     return 1;
349 }

351 int EVP_Digest(const void *data, size_t count,
352                unsigned char *md, unsigned int *size, const EVP_MD *type, ENGINE
353                {
354     EVP_MD_CTX ctx;
355     int ret;

357     EVP_MD_CTX_init(&ctx);
358     EVP_MD_CTX_set_flags(&ctx,EVP_MD_CTX_FLAG_ONESHOT);
359     ret=EVP_DigestInit_ex(&ctx, type, impl)
360         && EVP_DigestUpdate(&ctx, data, count)
361         && EVP_DigestFinal_ex(&ctx, md, size);
362     EVP_MD_CTX_cleanup(&ctx);

364     return ret;
365 }

367 void EVP_MD_CTX_destroy(EVP_MD_CTX *ctx)
368 {
369     if (ctx)
370     {
371         EVP_MD_CTX_cleanup(ctx);
372         OPENSSL_free(ctx);
373     }
374 }

376 /* This call frees resources associated with the context */
377 int EVP_MD_CTX_cleanup(EVP_MD_CTX *ctx)
378 {
379     #ifndef OPENSSL_FIPS
380     /* Don't assume ctx->md_data was cleaned in EVP_Digest_Final,
381      * because sometimes only copies of the context are ever finalised.
382      */
383     if (ctx->digest && ctx->digest->cleanup
384         && !EVP_MD_CTX_test_flags(ctx,EVP_MD_CTX_FLAG_CLEANED))
385         ctx->digest->cleanup(ctx);
386     if (ctx->digest && ctx->digest->ctx_size && ctx->md_data
387         && !EVP_MD_CTX_test_flags(ctx, EVP_MD_CTX_FLAG_REUSE))
388     {
389         OPENSSL_cleanse(ctx->md_data,ctx->digest->ctx_size);
390         OPENSSL_free(ctx->md_data);
391     }

```

```
392 #endif
393     if (ctx->pctx)
394         EVP_PKEY_CTX_free(ctx->pctx);
395 #ifndef OPENSSL_NO_ENGINE
396     if(ctx->engine)
397         /* The EVP_MD we used belongs to an ENGINE, release the
398          * functional reference we held for this reason. */
399         ENGINE_finish(ctx->engine);
400 #endif
401 #ifdef OPENSSL_FIPS
402     FIPS_md_ctx_cleanup(ctx);
403 #endif
404     memset(ctx, '\0', sizeof *ctx);
406     return 1;
407 }
```

```

*****
35238 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_aes.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 2001-2011 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
19 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
22 * endorse or promote products derived from this software without
23 * prior written permission. For written permission, please contact
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25 *
26 * 5. Products derived from this software may not be called "OpenSSL"
27 * nor may "OpenSSL" appear in their names without prior written
28 * permission of the OpenSSL Project.
29 *
30 * 6. Redistributions of any form whatsoever must retain the following
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33 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
34 *
35 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
37 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
38 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
39 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
40 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
41 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
42 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 */
49
51 #include <openssl/opensslconf.h>
52 #ifndef OPENSSL_NO_AES
53 #include <openssl/evp.h>
54 #include <openssl/err.h>
55 #include <string.h>
56 #include <assert.h>
57 #include <openssl/aes.h>
58 #include "evp_locl.h"
59 #ifndef OPENSSL_FIPS
60 #include "modes_lcl.h"
61 #include <openssl/rand.h>

```

```

63 typedef struct
64 {
65     AES_KEY ks;
66     block128_f block;
67     union {
68         cbc128_f cbc;
69         ctr128_f ctr;
70     } stream;
71 } EVP_AES_KEY;

73 typedef struct
74 {
75     AES_KEY ks; /* AES key schedule to use */
76     int key_set; /* Set if key initialised */
77     int iv_set; /* Set if an iv is set */
78     GCM128_CONTEXT gcm;
79     unsigned char *iv; /* Temporary IV store */
80     int ivlen; /* IV length */
81     int taglen;
82     int iv_gen; /* It is OK to generate IVs */
83     int tls_aad_len; /* TLS AAD length */
84     ctr128_f ctr;
85 } EVP_AES_GCM_CTX;

87 typedef struct
88 {
89     AES_KEY ks1, ks2; /* AES key schedules to use */
90     XTS128_CONTEXT xts;
91     void (*stream)(const unsigned char *in,
92                   unsigned char *out, size_t length,
93                   const AES_KEY *key1, const AES_KEY *key2,
94                   const unsigned char iv[16]);
95 } EVP_AES_XTS_CTX;

97 typedef struct
98 {
99     AES_KEY ks; /* AES key schedule to use */
100     int key_set; /* Set if key initialised */
101     int iv_set; /* Set if an iv is set */
102     int tag_set; /* Set if tag is valid */
103     int len_set; /* Set if message length set */
104     int L, M; /* L and M parameters from RFC3610 */
105     CCM128_CONTEXT ccm;
106     ccm128_f str;
107 } EVP_AES_CCM_CTX;

109 #define MAXBITCHUNK ((size_t)1<<(sizeof(size_t)*8-4))

111 #ifdef VPAES_ASM
112 int vpaes_set_encrypt_key(const unsigned char *userKey, int bits,
113                          AES_KEY *key);
114 int vpaes_set_decrypt_key(const unsigned char *userKey, int bits,
115                          AES_KEY *key);

117 void vpaes_encrypt(const unsigned char *in, unsigned char *out,
118                  const AES_KEY *key);
119 void vpaes_decrypt(const unsigned char *in, unsigned char *out,
120                  const AES_KEY *key);

122 void vpaes_cbc_encrypt(const unsigned char *in,
123                      unsigned char *out,
124                      size_t length,
125                      const AES_KEY *key,
126                      unsigned char *ivec, int enc);
127 #endif

```

```

128 #ifdef BSAES_ASM
129 void bsaes_cbc_encrypt(const unsigned char *in, unsigned char *out,
130                        size_t length, const AES_KEY *key,
131                        unsigned char ivec[16], int enc);
132 void bsaes_ctr32_encrypt_blocks(const unsigned char *in, unsigned char *out,
133                                size_t len, const AES_KEY *key,
134                                const unsigned char ivec[16]);
135 void bsaes_xts_encrypt(const unsigned char *inp, unsigned char *out,
136                       size_t len, const AES_KEY *key1,
137                       const AES_KEY *key2, const unsigned char iv[16]);
138 void bsaes_xts_decrypt(const unsigned char *inp, unsigned char *out,
139                       size_t len, const AES_KEY *key1,
140                       const AES_KEY *key2, const unsigned char iv[16]);
141 #endif
142 #ifdef AES_CTR_ASM
143 void AES_ctr32_encrypt(const unsigned char *in, unsigned char *out,
144                       size_t blocks, const AES_KEY *key,
145                       const unsigned char ivec[AES_BLOCK_SIZE]);
146 #endif
147 #ifdef AES_XTS_ASM
148 void AES_xts_encrypt(const char *inp, char *out, size_t len,
149                    const AES_KEY *key1, const AES_KEY *key2,
150                    const unsigned char iv[16]);
151 void AES_xts_decrypt(const char *inp, char *out, size_t len,
152                    const AES_KEY *key1, const AES_KEY *key2,
153                    const unsigned char iv[16]);
154 #endif

156 #if defined(AES_ASM) && !defined(I386_ONLY) && ( \
157     ((defined(__i386) || defined(__i386_)) || \
158      defined(__M_I386)) && defined(OPENSSL_IA32_SSE2)) || \
159     defined(__x86_64) || defined(__x86_64_) || \
160     defined(__M_AMD64) || defined(__M_X64) || \
161     defined(__INTEL_))

163 extern unsigned int OPENSSL_ia32cap_P[2];

165 #ifdef VPAES_ASM
166 #define VPAES_CAPABLE (OPENSSL_ia32cap_P[1]&(1<<(41-32)))
167 #endif
168 #ifdef BSAES_ASM
169 #define BSAES_CAPABLE VPAES_CAPABLE
170 #endif
171 /*
172  * AES-NI section
173  */
174 #define AESNI_CAPABLE (OPENSSL_ia32cap_P[1]&(1<<(57-32)))

176 int aesni_set_encrypt_key(const unsigned char *userKey, int bits,
177                          AES_KEY *key);
178 int aesni_set_decrypt_key(const unsigned char *userKey, int bits,
179                          AES_KEY *key);

181 void aesni_encrypt(const unsigned char *in, unsigned char *out,
182                   const AES_KEY *key);
183 void aesni_decrypt(const unsigned char *in, unsigned char *out,
184                   const AES_KEY *key);

186 void aesni_ecb_encrypt(const unsigned char *in,
187                       unsigned char *out,
188                       size_t length,
189                       const AES_KEY *key,
190                       int enc);
191 void aesni_cbc_encrypt(const unsigned char *in,
192                       unsigned char *out,
193                       size_t length,

```

```

194     const AES_KEY *key,
195     unsigned char *ivec, int enc);

197 void aesni_ctr32_encrypt_blocks(const unsigned char *in,
198                                unsigned char *out,
199                                size_t blocks,
200                                const void *key,
201                                const unsigned char *ivec);

203 void aesni_xts_encrypt(const unsigned char *in,
204                       unsigned char *out,
205                       size_t length,
206                       const AES_KEY *key1, const AES_KEY *key2,
207                       const unsigned char iv[16]);

209 void aesni_xts_decrypt(const unsigned char *in,
210                       unsigned char *out,
211                       size_t length,
212                       const AES_KEY *key1, const AES_KEY *key2,
213                       const unsigned char iv[16]);

215 void aesni_ccm64_encrypt_blocks(const unsigned char *in,
216                                unsigned char *out,
217                                size_t blocks,
218                                const void *key,
219                                const unsigned char ivec[16],
220                                unsigned char cmac[16]);

222 void aesni_ccm64_decrypt_blocks(const unsigned char *in,
223                                unsigned char *out,
224                                size_t blocks,
225                                const void *key,
226                                const unsigned char ivec[16],
227                                unsigned char cmac[16]);

229 static int aesni_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
230                          const unsigned char *iv, int enc)
231 {
232     int ret, mode;
233     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;

235     mode = ctx->cipher->flags & EVP_CIPH_MODE;
236     if ((mode == EVP_CIPH_ECB_MODE || mode == EVP_CIPH_CBC_MODE)
237         && !enc)
238     {
239         ret = aesni_set_decrypt_key(key, ctx->key_len*8, ctx->cipher_dat
240         dat->block = (block128_f)aesni_decrypt;
241         dat->stream.cbc = mode==EVP_CIPH_CBC_MODE ?
242             (cbc128_f)aesni_cbc_encrypt :
243             NULL;
244     }
245     else
246     {
247         ret = aesni_set_encrypt_key(key, ctx->key_len*8, ctx->cipher_dat
248         dat->block = (block128_f)aesni_encrypt;
249         if (mode==EVP_CIPH_CBC_MODE)
250             dat->stream.cbc = (cbc128_f)aesni_cbc_encrypt;
251         else if (mode==EVP_CIPH_CTR_MODE)
252             dat->stream.ctr = (ctr128_f)aesni_ctr32_encrypt_blocks;
253         else
254             dat->stream.cbc = NULL;
255     }

256     if(ret < 0)
257     {
258         EVPerr(EVP_F_AESNI_INIT_KEY, EVP_R_AES_KEY_SETUP_FAILED);
259         return 0;

```



```

260     }
262     return 1;
263 }
265 static int aesni_cbc_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
266     const unsigned char *in, size_t len)
267 {
268     aesni_cbc_encrypt(in, out, len, ctx->cipher_data, ctx->iv, ctx->encrypt);
270     return 1;
271 }
273 static int aesni_ecb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
274     const unsigned char *in, size_t len)
275 {
276     size_t bl = ctx->cipher->block_size;
278     if (len < bl)    return 1;
280     aesni_ecb_encrypt(in, out, len, ctx->cipher_data, ctx->encrypt);
282     return 1;
283 }
285 #define aesni_ofb_cipher aes_ofb_cipher
286 static int aesni_ofb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
287     const unsigned char *in, size_t len);
289 #define aesni_cfb_cipher aes_cfb_cipher
290 static int aesni_cfb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
291     const unsigned char *in, size_t len);
293 #define aesni_cfb8_cipher aes_cfb8_cipher
294 static int aesni_cfb8_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
295     const unsigned char *in, size_t len);
297 #define aesni_cfb1_cipher aes_cfb1_cipher
298 static int aesni_cfb1_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
299     const unsigned char *in, size_t len);
301 #define aesni_ctr_cipher aes_ctr_cipher
302 static int aesni_ctr_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
303     const unsigned char *in, size_t len);
305 static int aesni_gcm_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
306     const unsigned char *iv, int enc)
307 {
308     EVP_AES_GCM_CTX *gctx = ctx->cipher_data;
309     if (!iv && !key)
310         return 1;
311     if (key)
312     {
313         aesni_set_encrypt_key(key, ctx->key_len * 8, &gctx->ks);
314         CRYPTO_gcm128_init(&gctx->gcm, &gctx->ks,
315             (block128_f)aesni_encrypt);
316         gctx->ctr = (ctr128_f)aesni_ctr32_encrypt_blocks;
317         /* If we have an iv can set it directly, otherwise use
318          * saved IV.
319          */
320         if (iv == NULL && gctx->iv_set)
321             iv = gctx->iv;
322         if (iv)
323         {
324             CRYPTO_gcm128_setiv(&gctx->gcm, iv, gctx->ivlen);
325             gctx->iv_set = 1;

```

```

326     }
327     gctx->key_set = 1;
328 }
329 else
330 {
331     /* If key set use IV, otherwise copy */
332     if (gctx->key_set)
333         CRYPTO_gcm128_setiv(&gctx->gcm, iv, gctx->ivlen);
334     else
335         memcpy(gctx->iv, iv, gctx->ivlen);
336     gctx->iv_set = 1;
337     gctx->iv_gen = 0;
338 }
339 return 1;
340 }
342 #define aesni_gcm_cipher aes_gcm_cipher
343 static int aesni_gcm_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
344     const unsigned char *in, size_t len);
346 static int aesni_xts_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
347     const unsigned char *iv, int enc)
348 {
349     EVP_AES_XTS_CTX *xctx = ctx->cipher_data;
350     if (!iv && !key)
351         return 1;
353     if (key)
354     {
355         /* key_len is two AES keys */
356         if (enc)
357         {
358             aesni_set_encrypt_key(key, ctx->key_len * 4, &xctx->ks1);
359             xctx->xts.block1 = (block128_f)aesni_encrypt;
360             xctx->stream = aesni_xts_encrypt;
361         }
362         else
363         {
364             aesni_set_decrypt_key(key, ctx->key_len * 4, &xctx->ks1);
365             xctx->xts.block1 = (block128_f)aesni_decrypt;
366             xctx->stream = aesni_xts_decrypt;
367         }
369         aesni_set_encrypt_key(key + ctx->key_len/2,
370             ctx->key_len * 4, &xctx->ks2);
371         xctx->xts.block2 = (block128_f)aesni_encrypt;
373         xctx->xts.key1 = &xctx->ks1;
374     }
376     if (iv)
377     {
378         xctx->xts.key2 = &xctx->ks2;
379         memcpy(ctx->iv, iv, 16);
380     }
382     return 1;
383 }
385 #define aesni_xts_cipher aes_xts_cipher
386 static int aesni_xts_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
387     const unsigned char *in, size_t len);
389 static int aesni_ccm_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
390     const unsigned char *iv, int enc)
391 {

```



```

524 #endif
525         {
526             ret = AES_set_decrypt_key(key, ctx->key_len*8, &dat->ks);
527             dat->block = (block128_f)AES_decrypt;
528             dat->stream.cbc = mode==EVP_CIPH_CBC_MODE ?
529                 (cbc128_f)AES_cbc_encrypt :
530                 NULL;
531         }
532     else
533 #ifdef BSAES_CAPABLE
534         if (BSAES_CAPABLE && mode==EVP_CIPH_CTR_MODE)
535         {
536             ret = AES_set_encrypt_key(key, ctx->key_len*8, &dat->ks);
537             dat->block = (block128_f)AES_encrypt;
538             dat->stream.ctr = (ctr128_f)bsaes_ctr32_encrypt_blocks;
539         }
540     else
541 #endif
542 #ifdef VPAES_CAPABLE
543         if (VPAES_CAPABLE)
544         {
545             ret = vpaes_set_encrypt_key(key, ctx->key_len*8, &dat->ks);
546             dat->block = (block128_f)vpaes_encrypt;
547             dat->stream.cbc = mode==EVP_CIPH_CBC_MODE ?
548                 (cbc128_f)vpaes_cbc_encrypt :
549                 NULL;
550         }
551     else
552 #endif
553         {
554             ret = AES_set_encrypt_key(key, ctx->key_len*8, &dat->ks);
555             dat->block = (block128_f)AES_encrypt;
556             dat->stream.cbc = mode==EVP_CIPH_CBC_MODE ?
557                 (cbc128_f)AES_cbc_encrypt :
558                 NULL;
559 #ifdef AES_CTR_ASM
560             if (mode==EVP_CIPH_CTR_MODE)
561                 dat->stream.ctr = (ctr128_f)AES_ctr32_encrypt;
562 #endif
563         }
564
565     if (ret < 0)
566     {
567         EVPerr(EVP_F_AES_INIT_KEY, EVP_R_AES_KEY_SETUP_FAILED);
568         return 0;
569     }
570
571     return 1;
572 }
573
574 static int aes_cbc_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
575                          const unsigned char *in, size_t len)
576 {
577     size_t bl = ctx->cipher->block_size;
578     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;
579
580     if (len < bl) return 1;
581
582     if (dat->stream.cbc)
583         (*dat->stream.cbc)(in, out, len, &dat->ks, ctx->iv, ctx->encrypt);
584     else if (ctx->encrypt)
585         CRYPTO_cbc128_encrypt(in, out, len, &dat->ks, ctx->iv, dat->block);
586     else
587         CRYPTO_cbc128_encrypt(in, out, len, &dat->ks, ctx->iv, dat->block);
588
589     return 1;

```

```

590 }
591
592 static int aes_ecb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
593                          const unsigned char *in, size_t len)
594 {
595     size_t bl = ctx->cipher->block_size;
596     size_t i;
597     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;
598
599     if (len < bl) return 1;
600
601     for (i=0, len-=bl; i<len; i+=bl)
602         (*dat->block)(in+i, out+i, &dat->ks);
603
604     return 1;
605 }
606
607 static int aes_ofb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
608                          const unsigned char *in, size_t len)
609 {
610     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;
611
612     CRYPTO_ofb128_encrypt(in, out, len, &dat->ks,
613                          ctx->iv, &ctx->num, dat->block);
614     return 1;
615 }
616
617 static int aes_cfb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
618                          const unsigned char *in, size_t len)
619 {
620     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;
621
622     CRYPTO_cfb128_encrypt(in, out, len, &dat->ks,
623                          ctx->iv, &ctx->num, ctx->encrypt, dat->block);
624     return 1;
625 }
626
627 static int aes_cfb8_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
628                          const unsigned char *in, size_t len)
629 {
630     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;
631
632     CRYPTO_cfb128_8_encrypt(in, out, len, &dat->ks,
633                          ctx->iv, &ctx->num, ctx->encrypt, dat->block);
634     return 1;
635 }
636
637 static int aes_cfb1_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
638                          const unsigned char *in, size_t len)
639 {
640     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;
641
642     if (ctx->flags & EVP_CIPH_FLAG_LENGTH_BITS) {
643         CRYPTO_cfb128_1_encrypt(in, out, len, &dat->ks,
644                                ctx->iv, &ctx->num, ctx->encrypt, dat->block);
645         return 1;
646     }
647
648     while (len >= MAXBITCHUNK) {
649         CRYPTO_cfb128_1_encrypt(in, out, MAXBITCHUNK*8, &dat->ks,
650                                ctx->iv, &ctx->num, ctx->encrypt, dat->block);
651         len -= MAXBITCHUNK;
652     }
653     if (len)
654         CRYPTO_cfb128_1_encrypt(in, out, len*8, &dat->ks,
655                                ctx->iv, &ctx->num, ctx->encrypt, dat->block);

```

```

656     return 1;
657 }
658
660 static int aes_ctr_cipher (EVP_CIPHER_CTX *ctx, unsigned char *out,
661     const unsigned char *in, size_t len)
662 {
663     unsigned int num = ctx->num;
664     EVP_AES_KEY *dat = (EVP_AES_KEY *)ctx->cipher_data;
665
666     if (dat->stream.ctr)
667         CRYPTO_ctr128_encrypt_ctr32(in, out, len, &dat->ks,
668             ctx->iv, ctx->buf, &num, dat->stream.ctr);
669     else
670         CRYPTO_ctr128_encrypt(in, out, len, &dat->ks,
671             ctx->iv, ctx->buf, &num, dat->block);
672     ctx->num = (size_t)num;
673     return 1;
674 }
675
676 BLOCK_CIPHER_generic_pack(NID_aes, 128, EVP_CIPHER_FLAG_FIPS)
677 BLOCK_CIPHER_generic_pack(NID_aes, 192, EVP_CIPHER_FLAG_FIPS)
678 BLOCK_CIPHER_generic_pack(NID_aes, 256, EVP_CIPHER_FLAG_FIPS)
679
680 static int aes_gcm_cleanup(EVP_CIPHER_CTX *c)
681 {
682     EVP_AES_GCM_CTX *gctx = c->cipher_data;
683     OPENSSL_cleanse(&gctx->gcm, sizeof(gctx->gcm));
684     if (gctx->iv != c->iv)
685         OPENSSL_free(gctx->iv);
686     return 1;
687 }
688
689 /* increment counter (64-bit int) by 1 */
690 static void ctr64_inc(unsigned char *counter) {
691     int n=8;
692     unsigned char c;
693
694     do {
695         --n;
696         c = counter[n];
697         ++c;
698         counter[n] = c;
699         if (c) return;
700     } while (n);
701 }
702
703 static int aes_gcm_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr)
704 {
705     EVP_AES_GCM_CTX *gctx = c->cipher_data;
706     switch (type)
707     {
708     case EVP_CTRL_INIT:
709         gctx->key_set = 0;
710         gctx->iv_set = 0;
711         gctx->ivlen = c->cipher->ivlen;
712         gctx->iv = c->iv;
713         gctx->taglen = -1;
714         gctx->iv_gen = 0;
715         gctx->tls_aad_len = -1;
716         return 1;
717
718     case EVP_CTRL_GCM_SET_IVLEN:
719         if (arg <= 0)
720             return 0;
721 #ifdef OPENSSL_FIPS

```

```

722         if (FIPS_module_mode() && !(c->flags & EVP_CIPHER_FLAG_NON_FIPS_AL
723             && arg < 12)
724             return 0;
725 #endif
726         /* Allocate memory for IV if needed */
727         if ((arg > EVP_MAX_IV_LENGTH) && (arg > gctx->ivlen))
728             {
729                 if (gctx->iv != c->iv)
730                     OPENSSL_free(gctx->iv);
731                 gctx->iv = OPENSSL_malloc(arg);
732                 if (!gctx->iv)
733                     return 0;
734             }
735         gctx->ivlen = arg;
736         return 1;
737
738     case EVP_CTRL_GCM_SET_TAG:
739         if (arg <= 0 || arg > 16 || c->encrypt)
740             return 0;
741         memcpy(c->buf, ptr, arg);
742         gctx->taglen = arg;
743         return 1;
744
745     case EVP_CTRL_GCM_GET_TAG:
746         if (arg <= 0 || arg > 16 || !c->encrypt || gctx->taglen < 0)
747             return 0;
748         memcpy(ptr, c->buf, arg);
749         return 1;
750
751     case EVP_CTRL_GCM_SET_IV_FIXED:
752         /* Special case: -1 length restores whole IV */
753         if (arg == -1)
754             {
755                 memcpy(gctx->iv, ptr, gctx->ivlen);
756                 gctx->iv_gen = 1;
757                 return 1;
758             }
759         /* Fixed field must be at least 4 bytes and invocation field
760            * at least 8.
761            */
762         if ((arg < 4) || (gctx->ivlen - arg) < 8)
763             return 0;
764         if (arg)
765             memcpy(gctx->iv, ptr, arg);
766         if (c->encrypt &&
767             RAND_bytes(gctx->iv + arg, gctx->ivlen - arg) <= 0)
768             return 0;
769         gctx->iv_gen = 1;
770         return 1;
771
772     case EVP_CTRL_GCM_IV_GEN:
773         if (gctx->iv_gen == 0 || gctx->key_set == 0)
774             return 0;
775         CRYPTO_gcm128_setiv(&gctx->gcm, gctx->iv, gctx->ivlen);
776         if (arg <= 0 || arg > gctx->ivlen)
777             arg = gctx->ivlen;
778         memcpy(ptr, gctx->iv + gctx->ivlen - arg, arg);
779         /* Invocation field will be at least 8 bytes in size and
780            * so no need to check wrap around or increment more than
781            * last 8 bytes.
782            */
783         ctr64_inc(gctx->iv + gctx->ivlen - 8);
784         gctx->iv_set = 1;
785         return 1;
786
787     case EVP_CTRL_GCM_SET_IV_INV:

```

```

788     if (gctx->iv_gen == 0 || gctx->key_set == 0 || c->encrypt)
789         return 0;
790     memcpy(gctx->iv + gctx->ivlen - arg, ptr, arg);
791     CRYPTO_gcm128_setiv(&gctx->gcm, gctx->iv, gctx->ivlen);
792     gctx->iv_set = 1;
793     return 1;

795 case EVP_CTRL_AEAD_TLS1_AAD:
796     /* Save the AAD for later use */
797     if (arg != 13)
798         return 0;
799     memcpy(c->buf, ptr, arg);
800     gctx->tls_aad_len = arg;
801     {
802         unsigned int len=c->buf[arg-2]<<8|c->buf[arg-1];
803         /* Correct length for explicit IV */
804         len -= EVP_GCM_TLS_EXPLICIT_IV_LEN;
805         /* If decrypting correct for tag too */
806         if (!c->encrypt)
807             len -= EVP_GCM_TLS_TAG_LEN;
808         c->buf[arg-2] = len>>8;
809         c->buf[arg-1] = len & 0xff;
810     }
811     /* Extra padding: tag appended to record */
812     return EVP_GCM_TLS_TAG_LEN;

814 default:
815     return -1;
816 }

817 }
818 }

820 static int aes_gcm_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
821                             const unsigned char *iv, int enc)
822 {
823     EVP_AES_GCM_CTX *gctx = ctx->cipher_data;
824     if (!iv && !key)
825         return 1;
826     if (key)
827     { do {
828 #ifdef BSAES_CAPABLE
829         if (BSAES_CAPABLE)
830         {
831             AES_set_encrypt_key(key, ctx->key_len*8, &gctx->ks);
832             CRYPTO_gcm128_init(&gctx->gcm, &gctx->ks,
833                               (block128_f)AES_encrypt);
834             gctx->ctr = (ctr128_f)bsaes_ctr32_encrypt_blocks;
835             break;
836         }
837     else
838 #endif
839 #ifdef VPAES_CAPABLE
840         if (VPAES_CAPABLE)
841         {
842             vpaes_set_encrypt_key(key, ctx->key_len*8, &gctx->ks);
843             CRYPTO_gcm128_init(&gctx->gcm, &gctx->ks,
844                               (block128_f)vpaes_encrypt);
845             gctx->ctr = NULL;
846             break;
847         }
848     else
849 #endif
850         (void)0; /* terminate potentially open 'else' */

852     AES_set_encrypt_key(key, ctx->key_len * 8, &gctx->ks);
853     CRYPTO_gcm128_init(&gctx->gcm, &gctx->ks, (block128_f)AES_encrypt);

```

```

854 #ifdef AES_CTR_ASM
855     gctx->ctr = (ctr128_f)AES_ctr32_encrypt;
856 #else
857     gctx->ctr = NULL;
858 #endif
859 } while (0);

861 /* If we have an iv can set it directly, otherwise use
862    * saved IV.
863    */
864 if (iv == NULL && gctx->iv_set)
865     iv = gctx->iv;
866 if (iv)
867     {
868         CRYPTO_gcm128_setiv(&gctx->gcm, iv, gctx->ivlen);
869         gctx->iv_set = 1;
870     }
871 gctx->key_set = 1;
872 }
873 else
874 {
875     /* If key set use IV, otherwise copy */
876     if (gctx->key_set)
877         CRYPTO_gcm128_setiv(&gctx->gcm, iv, gctx->ivlen);
878     else
879         memcpy(gctx->iv, iv, gctx->ivlen);
880     gctx->iv_set = 1;
881     gctx->iv_gen = 0;
882 }
883 return 1;
884 }

886 /* Handle TLS GCM packet format. This consists of the last portion of the IV
887    * followed by the payload and finally the tag. On encrypt generate IV,
888    * encrypt payload and write the tag. On verify retrieve IV, decrypt payload
889    * and verify tag.
890    */

892 static int aes_gcm_tls_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
893                                const unsigned char *in, size_t len)
894 {
895     EVP_AES_GCM_CTX *gctx = ctx->cipher_data;
896     int rv = -1;
897     /* Encrypt/decrypt must be performed in place */
898     if (out != in || len < (EVP_GCM_TLS_EXPLICIT_IV_LEN+EVP_GCM_TLS_TAG_LEN))
899         return -1;
900     /* Set IV from start of buffer or generate IV and write to start
901        * of buffer.
902        */
903     if (EVP_CIPHER_CTX_ctrl(ctx, ctx->encrypt ?
904                             EVP_CTRL_GCM_IV_GEN : EVP_CTRL_GCM_SET_IV_INV,
905                             EVP_GCM_TLS_EXPLICIT_IV_LEN, out) <= 0)
906         goto err;
907     /* Use saved AAD */
908     if (CRYPTO_gcm128_aad(&gctx->gcm, ctx->buf, gctx->tls_aad_len))
909         goto err;
910     /* Fix buffer and length to point to payload */
911     in += EVP_GCM_TLS_EXPLICIT_IV_LEN;
912     out += EVP_GCM_TLS_EXPLICIT_IV_LEN;
913     len -= EVP_GCM_TLS_EXPLICIT_IV_LEN + EVP_GCM_TLS_TAG_LEN;
914     if (ctx->encrypt)
915     {
916         /* Encrypt payload */
917         if (gctx->ctr)
918         {
919             if (CRYPTO_gcm128_encrypt_ctr32(&gctx->gcm,

```

```

920             in, out, len,
921             gctx->ctr))
922             goto err;
923         }
924     else
925     {
926         if (CRYPTO_gcm128_encrypt(&gctx->gcm, in, out, len))
927             goto err;
928         out += len;
929         /* Finally write tag */
930         CRYPTO_gcm128_tag(&gctx->gcm, out, EVP_GCM_TLS_TAG_LEN);
931         rv = len + EVP_GCM_TLS_EXPLICIT_IV_LEN + EVP_GCM_TLS_TAG_LEN;
932     }
933 else
934 {
935     /* Decrypt */
936     if (gctx->ctr)
937     {
938         if (CRYPTO_gcm128_decrypt_ctr32(&gctx->gcm,
939                                         in, out, len,
940                                         gctx->ctr))
941             goto err;
942     }
943     else
944     {
945         if (CRYPTO_gcm128_decrypt(&gctx->gcm, in, out, len))
946             goto err;
947     }
948     /* Retrieve tag */
949     CRYPTO_gcm128_tag(&gctx->gcm, ctx->buf,
950                      EVP_GCM_TLS_TAG_LEN);
951     /* If tag mismatch wipe buffer */
952     if (memcmp(ctx->buf, in + len, EVP_GCM_TLS_TAG_LEN))
953     {
954         OPENSSL_cleanse(out, len);
955         goto err;
956     }
957     rv = len;
958 }
959 err:
960 gctx->iv_set = 0;
961 gctx->tls_aad_len = -1;
962 return rv;
963 }
964
965 static int aes_gcm_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
966                          const unsigned char *in, size_t len)
967 {
968     EVP_AES_GCM_CTX *gctx = ctx->cipher_data;
969     /* If not set up, return error */
970     if (!gctx->key_set)
971         return -1;
972
973     if (gctx->tls_aad_len >= 0)
974         return aes_gcm_tls_cipher(ctx, out, in, len);
975
976     if (!gctx->iv_set)
977         return -1;
978     if (in)
979     {
980         if (out == NULL)
981         {
982             if (CRYPTO_gcm128_aad(&gctx->gcm, in, len))
983                 return -1;
984         }
985         else if (ctx->encrypt)

```

```

986         {
987             if (gctx->ctr)
988             {
989                 if (CRYPTO_gcm128_encrypt_ctr32(&gctx->gcm,
990                                                 in, out, len,
991                                                 gctx->ctr))
992                     return -1;
993             }
994             else
995             {
996                 if (CRYPTO_gcm128_encrypt(&gctx->gcm, in, out, len))
997                     return -1;
998             }
999         }
1000     else
1001     {
1002         if (gctx->ctr)
1003         {
1004             if (CRYPTO_gcm128_decrypt_ctr32(&gctx->gcm,
1005                                             in, out, len,
1006                                             gctx->ctr))
1007                 return -1;
1008         }
1009         else
1010         {
1011             if (CRYPTO_gcm128_decrypt(&gctx->gcm, in, out, len))
1012                 return -1;
1013         }
1014     }
1015     return len;
1016 }
1017 else
1018 {
1019     if (!ctx->encrypt)
1020     {
1021         if (gctx->taglen < 0)
1022             return -1;
1023         if (CRYPTO_gcm128_finish(&gctx->gcm,
1024                                ctx->buf, gctx->taglen) != 0)
1025             return -1;
1026         gctx->iv_set = 0;
1027         return 0;
1028     }
1029     CRYPTO_gcm128_tag(&gctx->gcm, ctx->buf, 16);
1030     gctx->taglen = 16;
1031     /* Don't reuse the IV */
1032     gctx->iv_set = 0;
1033     return 0;
1034 }
1035
1036 #define CUSTOM_FLAGS (EVP_CIPH_FLAG_DEFAULT_ASN1 \
1037                      | EVP_CIPH_CUSTOM_IV | EVP_CIPH_FLAG_CUSTOM_CIPHER \
1038                      | EVP_CIPH_ALWAYS_CALL_INIT | EVP_CIPH_CTRL_INIT)
1039
1040 BLOCK_CIPHER_custom(NID_aes, 128, 1, 12, gcm, GCM,
1041                    EVP_CIPH_FLAG_FIPS|EVP_CIPH_FLAG_AEAD_CIPHER|CUSTOM_FLAGS)
1042 BLOCK_CIPHER_custom(NID_aes, 192, 1, 12, gcm, GCM,
1043                    EVP_CIPH_FLAG_FIPS|EVP_CIPH_FLAG_AEAD_CIPHER|CUSTOM_FLAGS)
1044 BLOCK_CIPHER_custom(NID_aes, 256, 1, 12, gcm, GCM,
1045                    EVP_CIPH_FLAG_FIPS|EVP_CIPH_FLAG_AEAD_CIPHER|CUSTOM_FLAGS)
1046
1047 static int aes_xts_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr)
1048 {
1049     EVP_AES_XTS_CTX *xctx = c->cipher_data;
1050     if (type != EVP_CTRL_INIT)
1051         return -1;

```

```

1052     /* key1 and key2 are used as an indicator both key and IV are set */
1053     xctx->xts.key1 = NULL;
1054     xctx->xts.key2 = NULL;
1055     return 1;
1056 }

1058 static int aes_xts_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
1059                             const unsigned char *iv, int enc)
1060 {
1061     EVP_AES_XTS_CTX *xctx = ctx->cipher_data;
1062     if (!iv && !key)
1063         return 1;

1065     if (key) do
1066     {
1067 #ifdef AES_XTS_ASM
1068         xctx->stream = enc ? AES_xts_encrypt : AES_xts_decrypt;
1069 #else
1070         xctx->stream = NULL;
1071 #endif
1072         /* key_len is two AES keys */
1073 #ifdef BSAES_CAPABLE
1074         if (BSAES_CAPABLE)
1075             xctx->stream = enc ? bsaes_xts_encrypt : bsaes_xts_decrypt;
1076         else
1077 #endif
1078 #ifdef VP_AES_CAPABLE
1079         if (VP_AES_CAPABLE)
1080         {
1081             if (enc)
1082             {
1083                 vpaes_set_encrypt_key(key, ctx->key_len * 4, &xctx->ks1);
1084                 xctx->xts.block1 = (block128_f)vpaes_encrypt;
1085             }
1086             else
1087             {
1088                 vpaes_set_decrypt_key(key, ctx->key_len * 4, &xctx->ks1);
1089                 xctx->xts.block1 = (block128_f)vpaes_decrypt;
1090             }

1092             vpaes_set_encrypt_key(key + ctx->key_len/2,
1093                                   ctx->key_len * 4, &xctx->ks2);
1094             xctx->xts.block2 = (block128_f)vpaes_encrypt;

1096             xctx->xts.key1 = &xctx->ks1;
1097             break;
1098         }
1099     else
1100 #endif
1101     {
1102         (void)0; /* terminate potentially open 'else' */
1103     }

1104     if (enc)
1105     {
1106         AES_set_encrypt_key(key, ctx->key_len * 4, &xctx->ks1);
1107         xctx->xts.block1 = (block128_f)AES_encrypt;
1108     }
1109     else
1110     {
1111         AES_set_decrypt_key(key, ctx->key_len * 4, &xctx->ks1);
1112         xctx->xts.block1 = (block128_f)AES_decrypt;
1113     }

1114     AES_set_encrypt_key(key + ctx->key_len/2,
1115                         ctx->key_len * 4, &xctx->ks2);
1116     xctx->xts.block2 = (block128_f)AES_encrypt;

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```

1118         xctx->xts.key1 = &xctx->ks1;
1119     } while (0);

1121     if (iv)
1122     {
1123         xctx->xts.key2 = &xctx->ks2;
1124         memcpy(ctx->iv, iv, 16);
1125     }

1127     return 1;
1128 }

1130 static int aes_xts_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
1131                           const unsigned char *in, size_t len)
1132 {
1133     EVP_AES_XTS_CTX *xctx = ctx->cipher_data;
1134     if (!xctx->xts.key1 || !xctx->xts.key2)
1135         return 0;
1136     if (!out || !in || len < AES_BLOCK_SIZE)
1137         return 0;
1138 #ifdef OPENSSL_FIPS
1139     /* Requirement of SP800-38E */
1140     if (FIPS_module_mode() && !(ctx->flags & EVP_CIPHER_FLAG_NON_FIPS_ALLOW) &
1141         (len > (1UL<<20)*16))
1142     {
1143         EVPerr(EVP_F_AES_XTS_CIPHER, EVP_R_TOO_LARGE);
1144         return 0;
1145     }
1146 #endif
1147     if (xctx->stream)
1148         (*xctx->stream)(in, out, len,
1149                        xctx->xts.key1, xctx->xts.key2, ctx->iv);
1150     else if (CRYPTO_xts128_encrypt(&xctx->xts, ctx->iv, in, out, len,
1151                                   ctx->encrypt))
1152         return 0;
1153     return 1;
1154 }

1156 #define aes_xts_cleanup NULL

1158 #define XTS_FLAGS (EVP_CIPHER_FLAG_DEFAULT_ASN1 | EVP_CIPHER_CUSTOM_IV \
1159                  | EVP_CIPHER_ALWAYS_CALL_INIT | EVP_CIPHER_CTRL_INIT)

1161 BLOCK_CIPHER_custom(NID_aes, 128, 1, 16, xts, XTS, EVP_CIPHER_FLAG_FIPS|XTS_FLAGS)
1162 BLOCK_CIPHER_custom(NID_aes, 256, 1, 16, xts, XTS, EVP_CIPHER_FLAG_FIPS|XTS_FLAGS)

1164 static int aes_ccm_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr)
1165 {
1166     EVP_AES_CCM_CTX *cctx = c->cipher_data;
1167     switch (type)
1168     {
1169     case EVP_CTRL_INIT:
1170         cctx->key_set = 0;
1171         cctx->iv_set = 0;
1172         cctx->L = 8;
1173         cctx->M = 12;
1174         cctx->tag_set = 0;
1175         cctx->len_set = 0;
1176         return 1;

1178     case EVP_CTRL_CCM_SET_IVLEN:
1179         arg = 15 - arg;
1180     case EVP_CTRL_CCM_SET_L:
1181         if (arg < 2 || arg > 8)
1182             return 0;
1183         cctx->L = arg;

```

```

1184         return 1;
1186     case EVP_CTRL_CCM_SET_TAG:
1187         if ((arg & 1) || arg < 4 || arg > 16)
1188             return 0;
1189         if ((c->encrypt && ptr) || (!c->encrypt && !ptr))
1190             return 0;
1191         if (ptr)
1192             {
1193                 cctx->tag_set = 1;
1194                 memcpy(c->buf, ptr, arg);
1195             }
1196         cctx->M = arg;
1197         return 1;
1199     case EVP_CTRL_CCM_GET_TAG:
1200         if (!c->encrypt || !cctx->tag_set)
1201             return 0;
1202         if (!CRYPTO_ccm128_tag(&cctx->ccm, ptr, (size_t)arg))
1203             return 0;
1204         cctx->tag_set = 0;
1205         cctx->iv_set = 0;
1206         cctx->len_set = 0;
1207         return 1;
1209     default:
1210         return -1;
1212     }
1213 }
1215 static int aes_ccm_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
1216                             const unsigned char *iv, int enc)
1217 {
1218     EVP_AES_CCM_CTX *cctx = ctx->cipher_data;
1219     if (!iv && !key)
1220         return 1;
1221     if (key) do
1222     {
1223 #ifdef VPAES_CAPABLE
1224         if (VPAES_CAPABLE)
1225             {
1226                 vpaes_set_encrypt_key(key, ctx->key_len*8, &cctx->ks);
1227                 CRYPTO_ccm128_init(&cctx->ccm, cctx->M, cctx->L,
1228                                     &cctx->ks, (block128_f)vpaes_encrypt);
1229                 cctx->str = NULL;
1230                 cctx->key_set = 1;
1231                 break;
1232             }
1233 #endif
1234         AES_set_encrypt_key(key, ctx->key_len * 8, &cctx->ks);
1235         CRYPTO_ccm128_init(&cctx->ccm, cctx->M, cctx->L,
1236                             &cctx->ks, (block128_f)AES_encrypt);
1237         cctx->str = NULL;
1238         cctx->key_set = 1;
1239     } while (0);
1240     if (iv)
1241     {
1242         memcpy(ctx->iv, iv, 15 - cctx->L);
1243         cctx->iv_set = 1;
1244     }
1245     return 1;
1246 }
1248 static int aes_ccm_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
1249                           const unsigned char *in, size_t len)

```

```

1250     {
1251         EVP_AES_CCM_CTX *cctx = ctx->cipher_data;
1252         CCM128_CONTEXT *ccm = &cctx->ccm;
1253         /* If not set up, return error */
1254         if (!cctx->iv_set && !cctx->key_set)
1255             return -1;
1256         if (!cctx->encrypt && !cctx->tag_set)
1257             return -1;
1258         if (!out)
1259             {
1260                 if (!in)
1261                     {
1262                         if (CRYPTO_ccm128_setiv(ccm, ctx->iv, 15 - cctx->L, len))
1263                             return -1;
1264                         cctx->len_set = 1;
1265                         return len;
1266                     }
1267                 /* If have AAD need message length */
1268                 if (!cctx->len_set && len)
1269                     return -1;
1270                 CRYPTO_ccm128_aad(ccm, in, len);
1271                 return len;
1272             }
1273         /* EVP_Final() doesn't return any data */
1274         if (!in)
1275             return 0;
1276         /* If not set length yet do it */
1277         if (!cctx->len_set)
1278             {
1279                 if (CRYPTO_ccm128_setiv(ccm, ctx->iv, 15 - cctx->L, len))
1280                     return -1;
1281                 cctx->len_set = 1;
1282             }
1283         if (ctx->encrypt)
1284             {
1285                 if (cctx->str ? CRYPTO_ccm128_encrypt_ccm64(ccm, in, out, len,
1286                                                             cctx->str) :
1287                     CRYPTO_ccm128_encrypt(ccm, in, out, len))
1288                     return -1;
1289                 cctx->tag_set = 1;
1290                 return len;
1291             }
1292         else
1293             {
1294                 int rv = -1;
1295                 if (cctx->str ? !CRYPTO_ccm128_decrypt_ccm64(ccm, in, out, len,
1296                                                             cctx->str) :
1297                     !CRYPTO_ccm128_decrypt(ccm, in, out, len))
1298                     {
1299                         unsigned char tag[16];
1300                         if (CRYPTO_ccm128_tag(ccm, tag, cctx->M))
1301                             {
1302                                 if (!memcmp(tag, ctx->buf, cctx->M))
1303                                     rv = len;
1304                             }
1305                         }
1306                 if (rv == -1)
1307                     OPENSSL_cleanse(out, len);
1308                 cctx->iv_set = 0;
1309                 cctx->tag_set = 0;
1310                 cctx->len_set = 0;
1311                 return rv;
1312             }
1314     }

```


new/usr/src/lib/openssl/libsunw_crypto/evp/e_aes.c

21

```
1316 #define aes_ccm_cleanup NULL
```

```
1318 BLOCK_CIPHER_custom(NID_aes,128,1,12,ccm,CCM,EVP_CIPH_FLAG_FIPS|CUSTOM_FLAGS)  
1319 BLOCK_CIPHER_custom(NID_aes,192,1,12,ccm,CCM,EVP_CIPH_FLAG_FIPS|CUSTOM_FLAGS)  
1320 BLOCK_CIPHER_custom(NID_aes,256,1,12,ccm,CCM,EVP_CIPH_FLAG_FIPS|CUSTOM_FLAGS)
```

```
1322 #endif  
1323 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_aes_cbc_hmac_sha1.c

1

```
*****
15525 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_aes_cbc_hmac_sha1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 */

50 #include <openssl/opensslconf.h>

52 #include <stdio.h>
53 #include <string.h>

55 #if !defined(OPENSSL_NO_AES) && !defined(OPENSSL_NO_SHA1)

57 #include <openssl/evp.h>
58 #include <openssl/objects.h>
59 #include <openssl/aes.h>
60 #include <openssl/sha.h>
61 #include "evp_loc1.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_aes_cbc_hmac_sha1.c

2

```
63 #ifndef EVP_CIPH_FLAG_AEAD_CIPHER
64 #define EVP_CIPH_FLAG_AEAD_CIPHER 0x200000
65 #define EVP_CTRL_AEAD_TLS1_AAD 0x16
66 #define EVP_CTRL_AEAD_SET_MAC_KEY 0x17
67 #endif

69 #if !defined(EVP_CIPH_FLAG_DEFAULT_ASN1)
70 #define EVP_CIPH_FLAG_DEFAULT_ASN1 0
71 #endif

73 #define TLS1_1_VERSION 0x0302

75 typedef struct
76 {
77     AES_KEY ks;
78     SHA_CTX head,tail,md;
79     size_t payload_length; /* AAD length in decrypt case */
80     union {
81         unsigned int tls_ver;
82         unsigned char tls_aad[16]; /* 13 used */
83     } aux;
84     EVP_AES_HMAC_SHA1;
85 } EVP_AES_HMAC_SHA1;

86 #define NO_PAYLOAD_LENGTH ((size_t)-1)

88 #if defined(AES_ASM) && \
89     defined(__x86_64) || defined(__x86_64__) || \
90     defined(_M_AMD64) || defined(_M_X64) || \
91     defined(_INTEL_)

93 #if defined(__GNUC__) && __GNUC__ >= 2 && !defined(PEDANTIC)
94 # define BSWAP(x) ({ unsigned int r=(x); __asm__ ("bswapl %0": "=r"(r): "0"(r)); r
95 #endif

97 extern unsigned int OPENSSL_ia32cap_P[2];
98 #define AESNI_CAPABLE (1<<(57-32))

100 int aesni_set_encrypt_key(const unsigned char *userKey, int bits,
101     AES_KEY *key);
102 int aesni_set_decrypt_key(const unsigned char *userKey, int bits,
103     AES_KEY *key);

105 void aesni_cbc_encrypt(const unsigned char *in,
106     unsigned char *out,
107     size_t length,
108     const AES_KEY *key,
109     unsigned char *ivec, int enc);

111 void aesni_cbc_sha1_enc (const void *inp, void *out, size_t blocks,
112     const AES_KEY *key, unsigned char iv[16],
113     SHA_CTX *ctx,const void *in0);

115 #define data(ctx) ((EVP_AES_HMAC_SHA1 *) (ctx)->cipher_data)

117 static int aesni_cbc_hmac_sha1_init_key(EVP_CIPHER_CTX *ctx,
118     const unsigned char *inkey,
119     const unsigned char *iv, int enc)
120 {
121     EVP_AES_HMAC_SHA1 *key = data(ctx);
122     int ret;

124     if (enc)
125         ret=aesni_set_encrypt_key(inkey, ctx->key_len*8, &key->ks);
126     else
127         ret=aesni_set_decrypt_key(inkey, ctx->key_len*8, &key->ks);
```

```

129     SHA1_Init(&key->head); /* handy when benchmarking */
130     key->tail = key->head;
131     key->md = key->head;

133     key->payload_length = NO_PAYLOAD_LENGTH;

135     return ret<0?0:1;
136 }

138 #define STITCHED_CALL

140 #if !defined(STITCHED_CALL)
141 #define aes_off 0
142 #endif

144 void sha1_block_data_order (void *c, const void *p, size_t len);

146 static void sha1_update(SHA_CTX *c, const void *data, size_t len)
147 {
148     const unsigned char *ptr = data;
149     size_t res;

150     if ((res = c->num)) {
151         res = SHA_CBLOCK-res;
152         if (len<res) res=len;
153         SHA1_Update (c, ptr, res);
154         ptr += res;
155         len -= res;
156     }

158     res = len % SHA_CBLOCK;
159     len -= res;

161     if (len) {
162         sha1_block_data_order(c, ptr, len/SHA_CBLOCK);

164         ptr += len;
165         c->Nh += len>>29;
166         c->Nl += len<<=3;
167         if (c->Nl<(unsigned int)len) c->Nh++;
168     }

170     if (res)
171         SHA1_Update(c, ptr, res);
172 }

174 #ifdef SHA1_Update
175 #undef SHA1_Update
176 #endif
177 #define SHA1_Update sha1_update

179 static int aesni_cbc_hmac_sha1_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
180     const unsigned char *in, size_t len)
181 {
182     EVP_AES_HMAC_SHA1 *key = data(ctx);
183     unsigned int l;
184     size_t plen = key->payload_length,
185     iv = 0, /* explicit IV in TLS 1.1 and later */
186     sha_off = 0;
187 #if defined(STITCHED_CALL)
188     size_t aes_off = 0,
189     blocks;

191     sha_off = SHA_CBLOCK-key->md.num;
192 #endif

```

```

194     key->payload_length = NO_PAYLOAD_LENGTH;

196     if (len%AES_BLOCK_SIZE) return 0;

198     if (ctx->encrypt) {
199         if (plen==NO_PAYLOAD_LENGTH)
200             plen = len;
201         else if (len!=((plen+SHA_DIGEST_LENGTH+AES_BLOCK_SIZE)&-AES_BLOCK_SIZE))
202             return 0;
203         else if (key->aux.tls_ver >= TLS1_1_VERSION)
204             iv = AES_BLOCK_SIZE;

206 #if defined(STITCHED_CALL)
207     if (plen>(sha_off+iv) && (blocks=(plen-(sha_off+iv))/SHA_CBLOCK))
208         SHA1_Update(&key->md, in+iv, sha_off);

210         aesni_cbc_sha1_enc(in, out, blocks, &key->ks,
211             ctx->iv, &key->md, in+iv+sha_off);
212         blocks *= SHA_CBLOCK;
213         aes_off += blocks;
214         sha_off += blocks;
215         key->md.Nh += blocks>>29;
216         key->md.Nl += blocks<<=3;
217         if (key->md.Nl<(unsigned int)blocks) key->md.Nh++;
218     } else {
219         sha_off = 0;
220     }
221 #endif

222     sha_off += iv;
223     SHA1_Update(&key->md, in+sha_off, plen-sha_off);

225     if (plen!=len) { /* "TLS" mode of operation */
226         if (in!=out)
227             memcpy(out+aes_off, in+aes_off, plen-aes_off);

229         /* calculate HMAC and append it to payload */
230         SHA1_Final(out+plen, &key->md);
231         key->md = key->tail;
232         SHA1_Update(&key->md, out+plen, SHA_DIGEST_LENGTH);
233         SHA1_Final(out+plen, &key->md);

235         /* pad the payload|hmac */
236         plen += SHA_DIGEST_LENGTH;
237         for (l=len-plen-1; plen<len; plen++) out[plen]=l;
238         /* encrypt HMAC|padding at once */
239         aesni_cbc_encrypt(out+aes_off, out+aes_off, len-aes_off,
240             &key->ks, ctx->iv, 1);

241     } else {
242         aesni_cbc_encrypt(in+aes_off, out+aes_off, len-aes_off,
243             &key->ks, ctx->iv, 1);
244     }
245 } else {
246     union { unsigned int u[SHA_DIGEST_LENGTH/sizeof(unsigned int)];
247             unsigned char c[32+SHA_DIGEST_LENGTH]; } mac, *pmac;

249     /* arrange cache line alignment */
250     pmac = (void *)(((size_t)mac.c+31)&((size_t)0-32));

252     /* decrypt HMAC|padding at once */
253     aesni_cbc_encrypt(in, out, len,
254         &key->ks, ctx->iv, 0);

256     if (plen) { /* "TLS" mode of operation */
257         size_t inplen, mask, j, i;
258         unsigned int res, maxpad, pad, bitlen;
259         int ret = 1;

```

```

260     union { unsigned int  u[SHA_LBLOCK];
261             unsigned char c[SHA_CBLOCK]; }
262             *data = (void *)key->md.data;

264     if ((key->aux.tls_aad[plen-4]<<8|key->aux.tls_aad[plen-3]
265         >= TLS1_1_VERSION)
266         iv = AES_BLOCK_SIZE;

268     if (len<(iv+SHA_DIGEST_LENGTH+1))
269         return 0;

271     /* omit explicit iv */
272     out += iv;
273     len -= iv;

275     /* figure out payload length */
276     pad = out[len-1];
277     maxpad = len-(SHA_DIGEST_LENGTH+1);
278     maxpad |= (255-maxpad)>>(sizeof(maxpad)*8-8);
279     maxpad &= 255;

281     inp_len = len - (SHA_DIGEST_LENGTH+pad+1);
282     mask = (0-((inp_len-len)>>(sizeof(inp_len)*8-1)));
283     inp_len &= mask;
284     ret &= (int)mask;

286     key->aux.tls_aad[plen-2] = inp_len>>8;
287     key->aux.tls_aad[plen-1] = inp_len;

289     /* calculate HMAC */
290     key->md = key->head;
291     SHA1_Update(&key->md, key->aux.tls_aad, plen);

293 #if 1
294     len -= SHA_DIGEST_LENGTH;          /* amend mac */
295     if (len>=(256+SHA_CBLOCK)) {
296         j = (len-(256+SHA_CBLOCK))&(0-SHA_CBLOCK);
297         j += SHA_CBLOCK-key->md.num;
298         SHA1_Update(&key->md, out, j);
299         out += j;
300         len -= j;
301         inp_len -= j;
302     }

304     /* but pretend as if we hashed padded payload */
305     bitlen = key->md.Nl+(inp_len<<3);    /* at most 18 bi
306 #ifdef BSWAP
307     bitlen = BSWAP(bitlen);
308 #else
309     mac.c[0] = 0;
310     mac.c[1] = (unsigned char)(bitlen>>16);
311     mac.c[2] = (unsigned char)(bitlen>>8);
312     mac.c[3] = (unsigned char)bitlen;
313     bitlen = mac.u[0];
314 #endif

316     pmac->u[0]=0;
317     pmac->u[1]=0;
318     pmac->u[2]=0;
319     pmac->u[3]=0;
320     pmac->u[4]=0;

322     for (res=key->md.num, j=0;j<len;j++) {
323         size_t c = out[j];
324         mask = (j-inp_len)>>(sizeof(j)*8-8);
325         c &= mask;

```

```

326     c |= 0x80&~mask&~((inp_len-j)>>(sizeof(j)*8-8));
327     data->c[res++]=c;

329     if (res!=SHA_CBLOCK) continue;

331     /* j is not incremented yet */
332     mask = 0-((inp_len+7-j)>>(sizeof(j)*8-1));
333     data->u[SHA_LBLOCK-1] |= bitlen&mask;
334     sha1_block_data_order(&key->md, data, 1);
335     mask &= 0-((j-inp_len-72)>>(sizeof(j)*8-1));
336     pmac->u[0] |= key->md.h0 & mask;
337     pmac->u[1] |= key->md.h1 & mask;
338     pmac->u[2] |= key->md.h2 & mask;
339     pmac->u[3] |= key->md.h3 & mask;
340     pmac->u[4] |= key->md.h4 & mask;
341     res=0;
342 }

344     for(i=res;i<SHA_CBLOCK;i++,j++) data->c[i]=0;

346     if (res>SHA_CBLOCK-8) {
347         mask = 0-((inp_len+8-j)>>(sizeof(j)*8-1));
348         data->u[SHA_LBLOCK-1] |= bitlen&mask;
349         sha1_block_data_order(&key->md, data, 1);
350         mask &= 0-((j-inp_len-73)>>(sizeof(j)*8-1));
351         pmac->u[0] |= key->md.h0 & mask;
352         pmac->u[1] |= key->md.h1 & mask;
353         pmac->u[2] |= key->md.h2 & mask;
354         pmac->u[3] |= key->md.h3 & mask;
355         pmac->u[4] |= key->md.h4 & mask;

357         memset(data, 0, SHA_CBLOCK);
358         j+=64;
359     }
360     data->u[SHA_LBLOCK-1] = bitlen;
361     sha1_block_data_order(&key->md, data, 1);
362     mask = 0-((j-inp_len-73)>>(sizeof(j)*8-1));
363     pmac->u[0] |= key->md.h0 & mask;
364     pmac->u[1] |= key->md.h1 & mask;
365     pmac->u[2] |= key->md.h2 & mask;
366     pmac->u[3] |= key->md.h3 & mask;
367     pmac->u[4] |= key->md.h4 & mask;

369 #ifdef BSWAP
370     pmac->u[0] = BSWAP(pmac->u[0]);
371     pmac->u[1] = BSWAP(pmac->u[1]);
372     pmac->u[2] = BSWAP(pmac->u[2]);
373     pmac->u[3] = BSWAP(pmac->u[3]);
374     pmac->u[4] = BSWAP(pmac->u[4]);
375 #else
376     for (i=0;i<5;i++) {
377         res = pmac->u[i];
378         pmac->c[4*i+0]=(unsigned char)(res>>24);
379         pmac->c[4*i+1]=(unsigned char)(res>>16);
380         pmac->c[4*i+2]=(unsigned char)(res>>8);
381         pmac->c[4*i+3]=(unsigned char)res;
382     }
383 #endif
384     #else
385     len += SHA_DIGEST_LENGTH;

386     SHA1_Update(&key->md, out, inp_len);
387     res = key->md.num;
388     SHA1_Final(pmac->c, &key->md);

390     {
391         unsigned int inp_blocks, pad_blocks;

```

```

393      /* but pretend as if we hashed padded payload */
394      inp_blocks = 1+((SHA_CBLOCK-9-res)>>(sizeof(res)*8-1));
395      res += (unsigned int)(len-inp_len);
396      pad_blocks = res / SHA_CBLOCK;
397      res %= SHA_CBLOCK;
398      pad_blocks += 1+((SHA_CBLOCK-9-res)>>(sizeof(res)*8-1));
399      for (;inp_blocks<pad_blocks;inp_blocks++)
400          sha1_block_data_order(&key->md,data,1);
401      }
402 #endif
403      key->md = key->tail;
404      SHA1_Update(&key->md,pmac->c,SHA_DIGEST_LENGTH);
405      SHA1_Final(pmac->c,&key->md);
406
407      /* verify HMAC */
408      out += inp_len;
409      len -= inp_len;
410 #if 1
411      {
412          unsigned char *p = out+len-1-maxpad-SHA_DIGEST_LENGTH;
413          size_t off = out-p;
414          unsigned int c, cmask;
415
416          maxpad += SHA_DIGEST_LENGTH;
417          for (res=0,i=0,j=0;j<maxpad;j++) {
418              c = p[j];
419              cmask = ((int)(j-off-SHA_DIGEST_LENGTH)>>(sizeof(int)*8-1));
420              res |= (c^pad)&~cmask; /* ... and padding */
421              cmask &= ((int)(off-1-j))>>(sizeof(int)*8-1);
422              res |= (c^pmac->c[i])&cmask;
423              i += 1&cmask;
424          }
425          maxpad -= SHA_DIGEST_LENGTH;
426
427          res = 0-((0-res)>>(sizeof(res)*8-1));
428          ret &= (int)~res;
429      }
430 #else
431      for (res=0,i=0;i<SHA_DIGEST_LENGTH;i++)
432          res |= out[i]^pmac->c[i];
433      res = 0-((0-res)>>(sizeof(res)*8-1));
434      ret &= (int)~res;
435
436      /* verify padding */
437      pad = (pad&~res) | (maxpad&res);
438      out = out+len-1-pad;
439      for (res=0,i=0;i<pad;i++)
440          res |= out[i]^pad;
441
442      res = (0-res)>>(sizeof(res)*8-1);
443      ret &= (int)~res;
444 #endif
445      return ret;
446   } else {
447       SHA1_Update(&key->md,out,len);
448   }
449 }
450
451 return 1;
452 }
453
454 static int aesni_cbc_hmac_sha1_ctrl(EVP_CIPHER_CTX *ctx, int type, int arg, void
455 {
456     EVP_AES_HMAC_SHA1 *key = data(ctx);

```

```

458     switch (type)
459     {
460     case EVP_CTRL_AEAD_SET_MAC_KEY:
461     {
462         unsigned int i;
463         unsigned char hmac_key[64];
464
465         memset (hmac_key,0,sizeof(hmac_key));
466
467         if (arg > (int)sizeof(hmac_key)) {
468             SHA1_Init(&key->head);
469             SHA1_Update(&key->head,ptr,arg);
470             SHA1_Final(hmac_key,&key->head);
471         } else {
472             memcpy(hmac_key,ptr,arg);
473         }
474
475         for (i=0;i<sizeof(hmac_key);i++)
476             hmac_key[i] ^= 0x36; /* ipad */
477         SHA1_Init(&key->head);
478         SHA1_Update(&key->head,hmac_key,sizeof(hmac_key));
479
480         for (i=0;i<sizeof(hmac_key);i++)
481             hmac_key[i] ^= 0x36^0x5c; /* opad */
482         SHA1_Init(&key->tail);
483         SHA1_Update(&key->tail,hmac_key,sizeof(hmac_key));
484
485         OPENSSL_cleanse(hmac_key,sizeof(hmac_key));
486
487         return 1;
488     }
489     case EVP_CTRL_AEAD_TLS1_AAD:
490     {
491         unsigned char *p=ptr;
492         unsigned int len=p[arg-2]<<8|p[arg-1];
493
494         if (ctx->encrypt)
495         {
496             key->payload_length = len;
497             if ((key->aux.tls_ver=p[arg-4]<<8|p[arg-3]) >= TLS1_1_VE
498                 len -= AES_BLOCK_SIZE;
499             p[arg-2] = len>>8;
500             p[arg-1] = len;
501         }
502         key->md = key->head;
503         SHA1_Update(&key->md,p,arg);
504
505         return (int)((((len+SHA_DIGEST_LENGTH+AES_BLOCK_SIZE)&-AE
506             - len));
507     }
508     else
509     {
510         if (arg>13) arg = 13;
511         memcpy(key->aux.tls_aad,ptr,arg);
512         key->payload_length = arg;
513
514         return SHA_DIGEST_LENGTH;
515     }
516 }
517 default:
518     return -1;
519 }
520 }
521
522 static EVP_CIPHER aesni_128_cbc_hmac_sha1_cipher =
523 {

```

```
524 #ifdef NID_aes_128_cbc_hmac_sha1
525     NID_aes_128_cbc_hmac_sha1,
526 #else
527     NID_undef,
528 #endif
529     16,16,16,
530     EVP_CIPH_CBC_MODE|EVP_CIPH_FLAG_DEFAULT_ASN1|EVP_CIPH_FLAG_AEAD_CIPHER,
531     aesni_cbc_hmac_sha1_init_key,
532     aesni_cbc_hmac_sha1_cipher,
533     NULL,
534     sizeof(EVP_AES_HMAC_SHA1),
535     EVP_CIPH_FLAG_DEFAULT_ASN1?NULL:EVP_CIPHER_set_asn1_iv,
536     EVP_CIPH_FLAG_DEFAULT_ASN1?NULL:EVP_CIPHER_get_asn1_iv,
537     aesni_cbc_hmac_sha1_ctrl,
538     NULL
539 };

541 static EVP_CIPHER aesni_256_cbc_hmac_sha1_cipher =
542 {
543 #ifdef NID_aes_256_cbc_hmac_sha1
544     NID_aes_256_cbc_hmac_sha1,
545 #else
546     NID_undef,
547 #endif
548     16,32,16,
549     EVP_CIPH_CBC_MODE|EVP_CIPH_FLAG_DEFAULT_ASN1|EVP_CIPH_FLAG_AEAD_CIPHER,
550     aesni_cbc_hmac_sha1_init_key,
551     aesni_cbc_hmac_sha1_cipher,
552     NULL,
553     sizeof(EVP_AES_HMAC_SHA1),
554     EVP_CIPH_FLAG_DEFAULT_ASN1?NULL:EVP_CIPHER_set_asn1_iv,
555     EVP_CIPH_FLAG_DEFAULT_ASN1?NULL:EVP_CIPHER_get_asn1_iv,
556     aesni_cbc_hmac_sha1_ctrl,
557     NULL
558 };

560 const EVP_CIPHER *EVP_aes_128_cbc_hmac_sha1(void)
561 {
562     return(OPENSSSL_ia32cap_P[1]&AESNI_CAPABLE?
563         &aesni_128_cbc_hmac_sha1_cipher:NULL);
564 }

566 const EVP_CIPHER *EVP_aes_256_cbc_hmac_sha1(void)
567 {
568     return(OPENSSSL_ia32cap_P[1]&AESNI_CAPABLE?
569         &aesni_256_cbc_hmac_sha1_cipher:NULL);
570 }
571 #else
572 const EVP_CIPHER *EVP_aes_128_cbc_hmac_sha1(void)
573 {
574     return NULL;
575 }
576 const EVP_CIPHER *EVP_aes_256_cbc_hmac_sha1(void)
577 {
578     return NULL;
579 }
580 #endif
581 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_bf.c

1

```
*****
3950 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_bf.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/evp/e_bf.c */
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4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
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32 * must display the following acknowledgement:
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34 * Eric Young (eay@cryptsoft.com)"
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #ifndef OPENSSL_NO_BF
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_bf.c

2

```
62 #include <openssl/evp.h>
63 #include "evp_locl.h"
64 #include <openssl/objects.h>
65 #include <openssl/blowfish.h>
66
67 static int bf_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
68                       const unsigned char *iv, int enc);
69
70 typedef struct
71 {
72     BF_KEY ks;
73 } EVP_BF_KEY;
74
75 #define data(ctx)      EVP_C_DATA(EVP_BF_KEY,ctx)
76
77 IMPLEMENT_BLOCK_CIPHER(bf, ks, BF, EVP_BF_KEY, NID_bf, 8, 16, 8, 64,
78                       EVP_CIPH_VARIABLE_LENGTH, bf_init_key, NULL,
79                       EVP_CIPHER_set_asn1_iv, EVP_CIPHER_get_asn1_iv, NULL)
80
81 static int bf_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
82                       const unsigned char *iv, int enc)
83 {
84     BF_set_key(&data(ctx)->ks,EVP_CIPHER_CTX_key_length(ctx),key);
85     return 1;
86 }
87
88 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_camellia.c

1

```
*****
4494 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_camellia.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/e_camellia.c *- mode:C; c-file-style: "eay" *- */
2 /* =====
3 * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
4 *
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49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
56 #include <openssl/opensslconf.h>
57 #ifndef OPENSSL_NO_CAMELLIA
58 #include <openssl/evp.h>
59 #include <openssl/err.h>
60 #include <string.h>
61 #include <assert.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_camellia.c

2

```
62 #include <openssl/camellia.h>
63 #include "evp_locl.h"
65 static int camellia_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
66                             const unsigned char *iv, int enc);
68 /* Camellia subkey Structure */
69 typedef struct
70 {
71     CAMELLIA_KEY ks;
72 } EVP_CAMELLIA_KEY;
74 /* Attribute operation for Camellia */
75 #define data(ctx) EVP_C_DATA(EVP_CAMELLIA_KEY,ctx)
77 IMPLEMENT_BLOCK_CIPHER(camellia_128, ks, Camellia, EVP_CAMELLIA_KEY,
78 NID_camellia_128, 16, 16, 16, 128,
79 0, camellia_init_key, NULL,
80 EVP_CIPHER_set_asn1_iv,
81 EVP_CIPHER_get_asn1_iv,
82 NULL)
83 IMPLEMENT_BLOCK_CIPHER(camellia_192, ks, Camellia, EVP_CAMELLIA_KEY,
84 NID_camellia_192, 16, 24, 16, 128,
85 0, camellia_init_key, NULL,
86 EVP_CIPHER_set_asn1_iv,
87 EVP_CIPHER_get_asn1_iv,
88 NULL)
89 IMPLEMENT_BLOCK_CIPHER(camellia_256, ks, Camellia, EVP_CAMELLIA_KEY,
90 NID_camellia_256, 16, 32, 16, 128,
91 0, camellia_init_key, NULL,
92 EVP_CIPHER_set_asn1_iv,
93 EVP_CIPHER_get_asn1_iv,
94 NULL)
96 #define IMPLEMENT_CAMELLIA_CFBR(ksize,cbits) IMPLEMENT_CFBR(camellia,Camellia
98 IMPLEMENT_CAMELLIA_CFBR(128,1)
99 IMPLEMENT_CAMELLIA_CFBR(192,1)
100 IMPLEMENT_CAMELLIA_CFBR(256,1)
102 IMPLEMENT_CAMELLIA_CFBR(128,8)
103 IMPLEMENT_CAMELLIA_CFBR(192,8)
104 IMPLEMENT_CAMELLIA_CFBR(256,8)
108 /* The subkey for Camellia is generated. */
109 static int camellia_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
110                             const unsigned char *iv, int enc)
111 {
112     int ret;
114     ret=Camellia_set_key(key, ctx->key_len * 8, ctx->cipher_data);
116     if(ret < 0)
117     {
118         EVPerr(EVP_F_CAMELLIA_INIT_KEY,EVP_R_CAMELLIA_KEY_SETUP_FAILED);
119         return 0;
120     }
122     return 1;
123 }
125 #else
127 # ifdef PEDANTIC
```


new/usr/src/lib/openssl/libsunw_crypto/evp/e_camellia.c

3

```
128 static void *dummy=&dummy;  
129 # endif  
  
131 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_cast.c

1

3982 Fri May 30 18:31:50 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_cast.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/e_cast.c */
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57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_cast.c

2

```
62 #ifndef OPENSSL_NO_CAST
63 #include <openssl/evp.h>
64 #include <openssl/objects.h>
65 #include "evp_locl.h"
66 #include <openssl/cast.h>
67
68 static int cast_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
69                          const unsigned char *iv,int enc);
70
71 typedef struct
72 {
73     CAST_KEY ks;
74 } EVP_CAST_KEY;
75
76 #define data(ctx)      EVP_C_DATA(EVP_CAST_KEY,ctx)
77
78 IMPLEMENT_BLOCK_CIPHER(cast5, ks, CAST, EVP_CAST_KEY,
79                        NID_cast5, 8, CAST_KEY_LENGTH, 8, 64,
80                        EVP_CIPH_VARIABLE_LENGTH, cast_init_key, NULL,
81                        EVP_CIPHER_set_asn1_iv, EVP_CIPHER_get_asn1_iv, NULL)
82
83 static int cast_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
84                          const unsigned char *iv, int enc)
85 {
86     CAST_set_key(&data(ctx)->ks,EVP_CIPHER_CTX_key_length(ctx),key);
87     return 1;
88 }
89
90 #endif
```

```
*****
```

```
7503 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_des.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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5  * This package is an SSL implementation written
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
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57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #ifndef OPENSSL_NO_DES
```

```
62 #include <openssl/evp.h>
63 #include <openssl/objects.h>
64 #include "evp_locl.h"
65 #include <openssl/des.h>
66 #include <openssl/rand.h>
67
68 static int des_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
69                        const unsigned char *iv, int enc);
70 static int des_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr);
71
72 /* Because of various casts and different names can't use IMPLEMENT_BLOCK_CIPHER
73
74 static int des_ecb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
75                          const unsigned char *in, size_t inl)
76 {
77     BLOCK_CIPHER_ecb_loop()
78     DES_ecb_encrypt((DES_cblock *)in + i, (DES_cblock *)out + i),
79     return 1;
80 }
81
82 static int des_ofb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
83                          const unsigned char *in, size_t inl)
84 {
85     while(inl>=EVP_MAXCHUNK)
86     {
87         DES_ofb64_encrypt(in, out, (long)EVP_MAXCHUNK, ctx->cipher_data,
88                          (DES_cblock *)ctx->iv, &ctx->num);
89         inl-=EVP_MAXCHUNK;
90         in +=EVP_MAXCHUNK;
91         out+=EVP_MAXCHUNK;
92     }
93     if (inl)
94         DES_ofb64_encrypt(in, out, (long)inl, ctx->cipher_data,
95                          (DES_cblock *)ctx->iv, &ctx->num);
96     return 1;
97 }
98
99 static int des_cbc_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
100                          const unsigned char *in, size_t inl)
101 {
102     while(inl>=EVP_MAXCHUNK)
103     {
104         DES_ncbc_encrypt(in, out, (long)EVP_MAXCHUNK, ctx->cipher_data,
105                          (DES_cblock *)ctx->iv, ctx->encrypt);
106         inl-=EVP_MAXCHUNK;
107         in +=EVP_MAXCHUNK;
108         out+=EVP_MAXCHUNK;
109     }
110     if (inl)
111         DES_ncbc_encrypt(in, out, (long)inl, ctx->cipher_data,
112                          (DES_cblock *)ctx->iv, ctx->encrypt);
113     return 1;
114 }
115
116 static int des_cfb64_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
117                            const unsigned char *in, size_t inl)
118 {
119     while(inl>=EVP_MAXCHUNK)
120     {
121         DES_cfb64_encrypt(in,out, (long)EVP_MAXCHUNK, ctx->cipher_data,
122                          (DES_cblock *)ctx->iv, &ctx->num, ctx->encrypt);
123         inl-=EVP_MAXCHUNK;
124         in +=EVP_MAXCHUNK;
125         out+=EVP_MAXCHUNK;
126     }
127     if (inl)
```

```

128     DES_cfb64_encrypt(in, out, (long)inl, ctx->cipher_data,
129                       (DES_cblock *)ctx->iv, &ctx->num, ctx->encrypt);
130     return 1;
131 }

133 /* Although we have a CFB-r implementation for DES, it doesn't pack the right
134    way, so wrap it here */
135 static int des_cfb1_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
136                           const unsigned char *in, size_t inl)
137 {
138     size_t n, chunk=EVP_MAXCHUNK/8;
139     unsigned char c[1], d[1];

141     if (inl<chunk) chunk=inl;

143     while (inl && inl>=chunk)
144     {
145         for(n=0 ; n < chunk*8; ++n)
146         {
147             c[0]=(in[n/8]&(1 << (7-n%8))) ? 0x80 : 0;
148             DES_cfb_encrypt(c,d,1,1,ctx->cipher_data, (DES_cblock *)ctx->iv,
149                           ctx->encrypt);
150             out[n/8]=(out[n/8]&~(0x80 >> (unsigned int)(n%8))) |
151                     ((d[0]&0x80) >> (unsigned int)(n%8));
152         }
153         inl-=chunk;
154         in +=chunk;
155         out+=chunk;
156         if (inl<chunk) chunk=inl;
157     }

159     return 1;
160 }

162 static int des_cfb8_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
163                           const unsigned char *in, size_t inl)
164 {
165     while (inl>=EVP_MAXCHUNK)
166     {
167         DES_cfb_encrypt(in,out,8,(long)EVP_MAXCHUNK,ctx->cipher_data,
168                         (DES_cblock *)ctx->iv,ctx->encrypt);
169         inl-=EVP_MAXCHUNK;
170         in +=EVP_MAXCHUNK;
171         out+=EVP_MAXCHUNK;
172     }
173     if (inl)
174         DES_cfb_encrypt(in,out,8,(long)inl,ctx->cipher_data,
175                         (DES_cblock *)ctx->iv,ctx->encrypt);
176     return 1;
177 }

179 BLOCK_CIPHER_defs(des, DES_key_schedule, NID_des, 8, 8, 8, 64,
180                   EVP_CIPH_RAND_KEY, des_init_key, NULL,
181                   EVP_CIPHER_set_asn1_iv,
182                   EVP_CIPHER_get_asn1_iv,
183                   des_ctrl)

185 BLOCK_CIPHER_def_cfb(des,DES_key_schedule,NID_des,8,8,1,
186                      EVP_CIPH_RAND_KEY, des_init_key,NULL,
187                      EVP_CIPHER_set_asn1_iv,
188                      EVP_CIPHER_get_asn1_iv,des_ctrl)

190 BLOCK_CIPHER_def_cfb(des,DES_key_schedule,NID_des,8,8,8,
191                      EVP_CIPH_RAND_KEY,des_init_key,NULL,
192                      EVP_CIPHER_set_asn1_iv,
193                      EVP_CIPHER_get_asn1_iv,des_ctrl)

```

```

195 static int des_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
196                         const unsigned char *iv, int enc)
197 {
198     DES_cblock *deskey = (DES_cblock *)key;
199 #ifdef EVP_CHECK_DES_KEY
200     if(DES_set_key_checked(deskey,ctx->cipher_data) != 0)
201         return 0;
202 #else
203     DES_set_key_unchecked(deskey,ctx->cipher_data);
204 #endif
205     return 1;
206 }

208 static int des_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr)
209 {
210     switch(type)
211     {
212     case EVP_CTRL_RAND_KEY:
213         if (RAND_bytes(ptr, 8) <= 0)
214             return 0;
215         DES_set_odd_parity((DES_cblock *)ptr);
216         return 1;
217     default:
218         return -1;
219     }
220 }
221
224 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_des3.c

1

10310 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_des3.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/e_des3.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #ifndef OPENSSL_NO_DES
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_des3.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/objects.h>
64 #include "evp_locl.h"
65 #include <openssl/des.h>
66 #include <openssl/rand.h>
67
68 #ifndef OPENSSL_FIPS
69
70 static int des_ede_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
71                             const unsigned char *iv,int enc);
72
73 static int des_ede3_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
74                              const unsigned char *iv,int enc);
75
76 static int des3_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr);
77
78 typedef struct
79 {
80     DES_key_schedule ks1; /* key schedule */
81     DES_key_schedule ks2; /* key schedule (for ede) */
82     DES_key_schedule ks3; /* key schedule (for ede3) */
83 } DES_EDE_KEY;
84
85 #define data(ctx) ((DES_EDE_KEY *) (ctx)->cipher_data)
86
87 /* Because of various casts and different args can't use IMPLEMENT_BLOCK_CIPHER
88
89 static int des_ede_ecb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
90                               const unsigned char *in, size_t inl)
91 {
92     BLOCK_CIPHER_ecb_loop()
93     DES_ecb3_encrypt((const_DES_cblock *) (in + i),
94                      (DES_cblock *) (out + i),
95                      &data(ctx)->ks1, &data(ctx)->ks2,
96                      &data(ctx)->ks3,
97                      ctx->encrypt);
98     return 1;
99 }
100
101 static int des_ede_ofb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
102                               const unsigned char *in, size_t inl)
103 {
104     while (inl>=EVP_MAXCHUNK)
105     {
106         DES_ede3_ofb64_encrypt(in, out, (long)EVP_MAXCHUNK,
107                                &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
108                                (DES_cblock *) ctx->iv, &ctx->num);
109         inl-=EVP_MAXCHUNK;
110         in +=EVP_MAXCHUNK;
111         out+=EVP_MAXCHUNK;
112     }
113     if (inl)
114         DES_ede3_ofb64_encrypt(in, out, (long)inl,
115                                &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
116                                (DES_cblock *) ctx->iv, &ctx->num);
117
118     return 1;
119 }
120
121 static int des_ede_cbc_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
122                               const unsigned char *in, size_t inl)
123 {
124     #ifdef KSSL_DEBUG
125     {
126         int i;
127         char *cp;
```

```

128     printf("des_ede_cbc_cipher(ctx=%lx, buflen=%d)\n", ctx, ctx->buf_len);
129     printf("\t iv= ");
130     for(i=0;i<8;i++)
131         printf("%02X", ctx->iv[i]);
132     printf("\n");
133 }
134 #endif /* KSSL_DEBUG */
135 while (inl >= EVP_MAXCHUNK)
136 {
137     DES_ede3_cbc_encrypt(in, out, (long)EVP_MAXCHUNK,
138                          &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
139                          (DES_cblock *)ctx->iv, ctx->encrypt);
140     inl -= EVP_MAXCHUNK;
141     in += EVP_MAXCHUNK;
142     out += EVP_MAXCHUNK;
143 }
144 if (inl)
145     DES_ede3_cbc_encrypt(in, out, (long)inl,
146                          &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
147                          (DES_cblock *)ctx->iv, ctx->encrypt);
148 return 1;
149 }

151 static int des_ede_cfb64_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
152                                 const unsigned char *in, size_t inl)
153 {
154     while (inl >= EVP_MAXCHUNK)
155     {
156         DES_ede3_cfb64_encrypt(in, out, (long)EVP_MAXCHUNK,
157                                &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
158                                (DES_cblock *)ctx->iv, &ctx->num, ctx->encrypt);
159         inl -= EVP_MAXCHUNK;
160         in += EVP_MAXCHUNK;
161         out += EVP_MAXCHUNK;
162     }
163     if (inl)
164         DES_ede3_cfb64_encrypt(in, out, (long)inl,
165                                &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
166                                (DES_cblock *)ctx->iv, &ctx->num, ctx->encrypt);
167     return 1;
168 }

170 /* Although we have a CFB-r implementation for 3-DES, it doesn't pack the right
171    way, so wrap it here */
172 static int des_ede3_cfb1_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
173                                 const unsigned char *in, size_t inl)
174 {
175     size_t n;
176     unsigned char c[1], d[1];

177     for(n=0; n < inl; ++n)
178     {
179         c[0] = (in[n/8] & (1 << (7-n%8))) ? 0x80 : 0;
180         DES_ede3_cfb_encrypt(c, d, 1, 1,
181                              &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
182                              (DES_cblock *)ctx->iv, ctx->encrypt);
183         out[n/8] = (out[n/8] & ~(0x80 >> (unsigned int)(n%8))) |
184                   ((d[0] & 0x80) >> (unsigned int)(n%8));
185     }
186 }

188 return 1;
189 }

191 static int des_ede3_cfb8_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
192                                 const unsigned char *in, size_t inl)
193 {

```

```

194     while (inl >= EVP_MAXCHUNK)
195     {
196         DES_ede3_cfb_encrypt(in, out, 8, (long)EVP_MAXCHUNK,
197                              &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
198                              (DES_cblock *)ctx->iv, ctx->encrypt);
199         inl -= EVP_MAXCHUNK;
200         in += EVP_MAXCHUNK;
201         out += EVP_MAXCHUNK;
202     }
203     if (inl)
204         DES_ede3_cfb_encrypt(in, out, 8, (long)inl,
205                              &data(ctx)->ks1, &data(ctx)->ks2, &data(ctx)->ks3,
206                              (DES_cblock *)ctx->iv, ctx->encrypt);
207     return 1;
208 }

210 BLOCK_CIPHER_defs(des_ede, DES_EDE_KEY, NID_des_ede, 8, 16, 8, 64,
211                  EVP_CIPH_RAND_KEY, des_ede_init_key, NULL,
212                  EVP_CIPHER_set_asn1_iv,
213                  EVP_CIPHER_get_asn1_iv,
214                  des3_ctrl)

216 #define des_ede3_cfb64_cipher des_ede_cfb64_cipher
217 #define des_ede3_ofb_cipher des_ede_ofb_cipher
218 #define des_ede3_cbc_cipher des_ede_cbc_cipher
219 #define des_ede3_ecb_cipher des_ede_ecb_cipher

221 BLOCK_CIPHER_defs(des_ede3, DES_EDE_KEY, NID_des_ede3, 8, 24, 8, 64,
222                  EVP_CIPH_RAND_KEY, des_ede3_init_key, NULL,
223                  EVP_CIPHER_set_asn1_iv,
224                  EVP_CIPHER_get_asn1_iv,
225                  des3_ctrl)

227 BLOCK_CIPHER_def_cfb(des_ede3, DES_EDE_KEY, NID_des_ede3, 24, 8, 1,
228                      EVP_CIPH_RAND_KEY, des_ede3_init_key, NULL,
229                      EVP_CIPHER_set_asn1_iv,
230                      EVP_CIPHER_get_asn1_iv,
231                      des3_ctrl)

233 BLOCK_CIPHER_def_cfb(des_ede3, DES_EDE_KEY, NID_des_ede3, 24, 8, 8,
234                      EVP_CIPH_RAND_KEY, des_ede3_init_key, NULL,
235                      EVP_CIPHER_set_asn1_iv,
236                      EVP_CIPHER_get_asn1_iv,
237                      des3_ctrl)

239 static int des_ede_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
240                             const unsigned char *iv, int enc)
241 {
242     DES_cblock *deskey = (DES_cblock *)key;
243     #ifndef EVP_CHECK_DES_KEY
244     if (DES_set_key_checked(&deskey[0], &data(ctx)->ks1)
245         || DES_set_key_checked(&deskey[1], &data(ctx)->ks2))
246         return 0;
247     #else
248     DES_set_key_unchecked(&deskey[0], &data(ctx)->ks1);
249     DES_set_key_unchecked(&deskey[1], &data(ctx)->ks2);
250     #endif
251     memcpy(&data(ctx)->ks3, &data(ctx)->ks1,
252           sizeof(data(ctx)->ks1));
253     return 1;
254 }

256 static int des_ede3_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
257                             const unsigned char *iv, int enc)
258 {
259     DES_cblock *deskey = (DES_cblock *)key;

```

```
260 #ifdef KSSL_DEBUG
261 {
262     int i;
263     printf("des_ed3_init_key(ctx=%lx)\n", ctx);
264     printf("\tKEY= ");
265     for(i=0;i<24;i++) printf("%02X",key[i]); printf("\n");
266     printf("\t IV= ");
267     for(i=0;i<8;i++) printf("%02X",iv[i]); printf("\n");
268 }
269 #endif /* KSSL_DEBUG */

271 #ifdef EVP_CHECK_KEY
272     if (DES_set_key_checked(&deskey[0],&data(ctx)->ks1)
273         || DES_set_key_checked(&deskey[1],&data(ctx)->ks2)
274         || DES_set_key_checked(&deskey[2],&data(ctx)->ks3))
275         return 0;
276 #else
277     DES_set_key_unchecked(&deskey[0],&data(ctx)->ks1);
278     DES_set_key_unchecked(&deskey[1],&data(ctx)->ks2);
279     DES_set_key_unchecked(&deskey[2],&data(ctx)->ks3);
280 #endif
281     return 1;
282 }

284 static int des3_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr)
285 {
286     DES_cblock *deskey = ptr;
287
288     switch(type)
289     {
290     case EVP_CTRL_RAND_KEY:
291         if (RAND_bytes(ptr, c->key_len) <= 0)
292             return 0;
293         DES_set_odd_parity(deskey);
294         if (c->key_len >= 16)
295             DES_set_odd_parity(deskey + 1);
296         if (c->key_len >= 24)
297             DES_set_odd_parity(deskey + 2);
298         return 1;
299
300     default:
301         return -1;
302     }
303 }
304

306 const EVP_CIPHER *EVP_des_ed3(void)
307 {
308     return &des_ed3_ecb;
309 }

311 const EVP_CIPHER *EVP_des_ed3(void)
312 {
313     return &des_ed3_ecb;
314 }
315 #endif
316 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_idea.c

1

```
*****
4765 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_idea.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/e_idea.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_idea.c

2

```
62 #ifndef OPENSSL_NO_IDEA
63 #include <openssl/evp.h>
64 #include <openssl/objects.h>
65 #include "evp_locl.h"
66 #include <openssl/idea.h>
67
68 static int idea_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
69                          const unsigned char *iv, int enc);
70
71 /* NB idea_ecb_encrypt doesn't take an 'encrypt' argument so we treat it as a sp
72  * case
73  */
74
75 static int idea_ecb_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
76                            const unsigned char *in, size_t inl)
77 {
78     BLOCK_CIPHER_ecb_loop()
79     idea_ecb_encrypt(in + i, out + i, ctx->cipher_data);
80     return 1;
81 }
82
83 /* Can't use IMPLEMENT_BLOCK_CIPHER because idea_ecb_encrypt is different */
84
85 typedef struct
86 {
87     IDEA_KEY_SCHEDULE ks;
88 } EVP_IDEA_KEY;
89
90 BLOCK_CIPHER_func_cbc(idea, idea, EVP_IDEA_KEY, ks)
91 BLOCK_CIPHER_func_ofb(idea, idea, 64, EVP_IDEA_KEY, ks)
92 BLOCK_CIPHER_func_cfb(idea, idea, 64, EVP_IDEA_KEY, ks)
93
94 BLOCK_CIPHER_defs(idea, IDEA_KEY_SCHEDULE, NID_idea, 8, 16, 8, 64,
95                  0, idea_init_key, NULL,
96                  EVP_CIPHER_set_asn1_iv, EVP_CIPHER_get_asn1_iv, NULL)
97
98 static int idea_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
99                          const unsigned char *iv, int enc)
100 {
101     if(!enc) {
102         if (EVP_CIPHER_CTX_mode(ctx) == EVP_CIPH_OFB_MODE) enc = 1;
103         else if (EVP_CIPHER_CTX_mode(ctx) == EVP_CIPH_CFB_MODE) enc = 1;
104     }
105     if (enc) idea_set_encrypt_key(key, ctx->cipher_data);
106     else
107     {
108         IDEA_KEY_SCHEDULE tmp;
109
110         idea_set_encrypt_key(key, &tmp);
111         idea_set_decrypt_key(&tmp, ctx->cipher_data);
112         OPENSSL_cleanse((unsigned char *)&tmp,
113                        sizeof(IDEA_KEY_SCHEDULE));
114     }
115     return 1;
116 }
117
118 #endif
```


new/usr/src/lib/openssl/libsunw_crypto/evp/e_null.c

1

4085 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_null.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/e_null.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
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17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
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21 * in documentation (online or textual) provided with the package.
22 *
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_null.c

2

```
62 #include <openssl/objects.h>
63
64 #ifndef OPENSSL_FIPS
65
66 static int null_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
67                          const unsigned char *iv, int enc);
68 static int null_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
69                       const unsigned char *in, size_t inl);
70 static const EVP_CIPHER n_cipher=
71 {
72     NID_undef,
73     1,0,0,
74     0,
75     null_init_key,
76     null_cipher,
77     NULL,
78     0,
79     NULL,
80     NULL,
81     NULL,
82     NULL,
83 };
84
85 const EVP_CIPHER *EVP_enc_null(void)
86 {
87     return(&n_cipher);
88 }
89
90 static int null_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
91                          const unsigned char *iv, int enc)
92 {
93     /* memset(&(ctx->c),0,sizeof(ctx->c)); */
94     return 1;
95 }
96
97 static int null_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
98                       const unsigned char *in, size_t inl)
99 {
100     if (in != out)
101         memcpy((char *)out,(const char *)in,inl);
102     return 1;
103 }
104 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_old.c

1

```
*****
4801 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_old.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/e_old.c -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2004.
4  */
5 /* =====
6  * Copyright (c) 2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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16  * notice, this list of conditions and the following disclaimer in
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18  * distribution.
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20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
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25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #ifndef OPENSSL_NO_DEPRECATED
60 static void *dummy = &dummy;
61 #else
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_old.c

2

```
63 #include <openssl/evp.h>

65 /* Define some deprecated functions, so older programs
66  * don't crash and burn too quickly. On Windows and VMS,
67  * these will never be used, since functions and variables
68  * in shared libraries are selected by entry point location,
69  * not by name. */

71 #ifndef OPENSSL_NO_BF
72 #undef EVP_bf_cfb
73 const EVP_CIPHER *EVP_bf_cfb(void);
74 const EVP_CIPHER *EVP_bf_cfb(void) { return EVP_bf_cfb64(); }
75 #endif

77 #ifndef OPENSSL_NO_DES
78 #undef EVP_des_cfb
79 const EVP_CIPHER *EVP_des_cfb(void);
80 const EVP_CIPHER *EVP_des_cfb(void) { return EVP_des_cfb64(); }
81 #undef EVP_des_ede3_cfb
82 const EVP_CIPHER *EVP_des_ede3_cfb(void);
83 const EVP_CIPHER *EVP_des_ede3_cfb(void) { return EVP_des_ede3_cfb64(); }
84 #undef EVP_des_ede_cfb
85 const EVP_CIPHER *EVP_des_ede_cfb(void);
86 const EVP_CIPHER *EVP_des_ede_cfb(void) { return EVP_des_ede_cfb64(); }
87 #endif

89 #ifndef OPENSSL_NO_IDEA
90 #undef EVP_idea_cfb
91 const EVP_CIPHER *EVP_idea_cfb(void);
92 const EVP_CIPHER *EVP_idea_cfb(void) { return EVP_idea_cfb64(); }
93 #endif

95 #ifndef OPENSSL_NO_RC2
96 #undef EVP_rc2_cfb
97 const EVP_CIPHER *EVP_rc2_cfb(void);
98 const EVP_CIPHER *EVP_rc2_cfb(void) { return EVP_rc2_cfb64(); }
99 #endif

101 #ifndef OPENSSL_NO_CAST
102 #undef EVP_cast5_cfb
103 const EVP_CIPHER *EVP_cast5_cfb(void);
104 const EVP_CIPHER *EVP_cast5_cfb(void) { return EVP_cast5_cfb64(); }
105 #endif

107 #ifndef OPENSSL_NO_RC5
108 #undef EVP_rc5_32_12_16_cfb
109 const EVP_CIPHER *EVP_rc5_32_12_16_cfb(void);
110 const EVP_CIPHER *EVP_rc5_32_12_16_cfb(void) { return EVP_rc5_32_12_16_cfb64(); }
111 #endif

113 #ifndef OPENSSL_NO_AES
114 #undef EVP_aes_128_cfb
115 const EVP_CIPHER *EVP_aes_128_cfb(void);
116 const EVP_CIPHER *EVP_aes_128_cfb(void) { return EVP_aes_128_cfb128(); }
117 #undef EVP_aes_192_cfb
118 const EVP_CIPHER *EVP_aes_192_cfb(void);
119 const EVP_CIPHER *EVP_aes_192_cfb(void) { return EVP_aes_192_cfb128(); }
120 #undef EVP_aes_256_cfb
121 const EVP_CIPHER *EVP_aes_256_cfb(void);
122 const EVP_CIPHER *EVP_aes_256_cfb(void) { return EVP_aes_256_cfb128(); }
123 #endif

125 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc2.c

1

7118 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/e_rc2.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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21 * in documentation (online or textual) provided with the package.
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25 * are met:
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29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc2.c

2

62 #ifndef OPENSSL_NO_RC2

```
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include "evp_loc1.h"
67 #include <openssl/rc2.h>
68
69 static int rc2_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
70                        const unsigned char *iv, int enc);
71 static int rc2_meth_to_magic(EVP_CIPHER_CTX *ctx);
72 static int rc2_magic_to_meth(int i);
73 static int rc2_set_asn1_type_and_iv(EVP_CIPHER_CTX *c, ASN1_TYPE *type);
74 static int rc2_get_asn1_type_and_iv(EVP_CIPHER_CTX *c, ASN1_TYPE *type);
75 static int rc2_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr);
76
77 typedef struct
78 {
79     int key_bits; /* effective key bits */
80     RC2_KEY ks; /* key schedule */
81 } EVP_RC2_KEY;
82
83 #define data(ctx) ((EVP_RC2_KEY *) (ctx)->cipher_data)
84
85 IMPLEMENT_BLOCK_CIPHER(rc2, ks, RC2, EVP_RC2_KEY, NID_rc2,
86                        8,
87                        RC2_KEY_LENGTH, 8, 64,
88                        EVP_CIPH_VARIABLE_LENGTH | EVP_CIPH_CTRL_INIT,
89                        rc2_init_key, NULL,
90                        rc2_set_asn1_type_and_iv, rc2_get_asn1_type_and_iv,
91                        rc2_ctrl)
92
93 #define RC2_40_MAGIC 0xa0
94 #define RC2_64_MAGIC 0x78
95 #define RC2_128_MAGIC 0x3a
96
97 static const EVP_CIPHER r2_64_cbc_cipher=
98 {
99     NID_rc2_64_cbc,
100     8, 8 /* 64 bit */, 8,
101     EVP_CIPH_CBC_MODE | EVP_CIPH_VARIABLE_LENGTH | EVP_CIPH_CTRL_INIT,
102     rc2_init_key,
103     rc2_cbc_cipher,
104     NULL,
105     sizeof(EVP_RC2_KEY),
106     rc2_set_asn1_type_and_iv,
107     rc2_get_asn1_type_and_iv,
108     rc2_ctrl,
109     NULL
110 };
111
112 static const EVP_CIPHER r2_40_cbc_cipher=
113 {
114     NID_rc2_40_cbc,
115     8, 5 /* 40 bit */, 8,
116     EVP_CIPH_CBC_MODE | EVP_CIPH_VARIABLE_LENGTH | EVP_CIPH_CTRL_INIT,
117     rc2_init_key,
118     rc2_cbc_cipher,
119     NULL,
120     sizeof(EVP_RC2_KEY),
121     rc2_set_asn1_type_and_iv,
122     rc2_get_asn1_type_and_iv,
123     rc2_ctrl,
124     NULL
125 };
126
127 const EVP_CIPHER *EVP_rc2_64_cbc(void)
```

```

128     {
129         return(&r2_64_cbc_cipher);
130     }

132 const EVP_CIPHER *EVP_rc2_40_cbc(void)
133 {
134     return(&r2_40_cbc_cipher);
135 }

137 static int rc2_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
138                        const unsigned char *iv, int enc)
139 {
140     RC2_set_key(&data(ctx)->ks,EVP_CIPHER_CTX_key_length(ctx),
141                key,data(ctx)->key_bits);
142     return 1;
143 }

145 static int rc2_meth_to_magic(EVP_CIPHER_CTX *e)
146 {
147     int i;

149     EVP_CIPHER_CTX_ctrl(e, EVP_CTRL_GET_RC2_KEY_BITS, 0, &i);
150     if (i == 128) return(RC2_128_MAGIC);
151     else if (i == 64) return(RC2_64_MAGIC);
152     else if (i == 40) return(RC2_40_MAGIC);
153     else return(0);
154 }

156 static int rc2_magic_to_meth(int i)
157 {
158     if (i == RC2_128_MAGIC) return 128;
159     else if (i == RC2_64_MAGIC) return 64;
160     else if (i == RC2_40_MAGIC) return 40;
161     else
162     {
163         EVPerr(EVP_F_RC2_MAGIC_TO_METH,EVP_R_UNSUPPORTED_KEY_SIZE);
164         return(0);
165     }
166 }

168 static int rc2_get_asn1_type_and_iv(EVP_CIPHER_CTX *c, ASN1_TYPE *type)
169 {
170     long num=0;
171     int i=0;
172     int key_bits;
173     unsigned int l;
174     unsigned char iv[EVP_MAX_IV_LENGTH];

176     if (type != NULL)
177     {
178         l=EVP_CIPHER_CTX_iv_length(c);
179         OPENSSL_assert(l <= sizeof(iv));
180         i=ASN1_TYPE_get_int_octetstring(type,&num,iv,l);
181         if (i != (int)l)
182             return(-1);
183         key_bits =rc2_magic_to_meth((int)num);
184         if (!key_bits)
185             return(-1);
186         if(i > 0 && !EVP_CipherInit_ex(c, NULL, NULL, NULL, iv, -1))
187             return -1;
188         EVP_CIPHER_CTX_ctrl(c, EVP_CTRL_SET_RC2_KEY_BITS, key_bits, NULL
189         EVP_CIPHER_CTX_set_key_length(c, key_bits / 8);
190     }
191     return(i);
192 }

```

```

194 static int rc2_set_asn1_type_and_iv(EVP_CIPHER_CTX *c, ASN1_TYPE *type)
195 {
196     long num;
197     int i=0,j;

199     if (type != NULL)
200     {
201         num=rc2_meth_to_magic(c);
202         j=EVP_CIPHER_CTX_iv_length(c);
203         i=ASN1_TYPE_set_int_octetstring(type,num,c->oiv,j);
204     }
205     return(i);
206 }

208 static int rc2_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr)
209 {
210     switch(type)
211     {
212     case EVP_CTRL_INIT:
213         data(c)->key_bits = EVP_CIPHER_CTX_key_length(c) * 8;
214         return 1;

216     case EVP_CTRL_GET_RC2_KEY_BITS:
217         *(int *)ptr = data(c)->key_bits;
218         return 1;

219     case EVP_CTRL_SET_RC2_KEY_BITS:
220         if(arg > 0)
221         {
222             data(c)->key_bits = arg;
223             return 1;
224         }
225         return 0;

227 #ifdef PBE_PRF_TEST
228     case EVP_CTRL_PBE_PRF_NID:
229         *(int *)ptr = NID_hmacWithMD5;
230         return 1;
231 #endif

233     default:
234         return -1;
235     }
236 }

238 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc4.c

1

4657 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc4.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/e_rc4.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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21 * in documentation (online or textual) provided with the package.
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc4.c

2

62 #ifndef OPENSSL_NO_RC4

```
64 #include <openssl/evp.h>
65 #include "evp_locl.h"
66 #include <openssl/objects.h>
67 #include <openssl/rc4.h>
68
69 /* FIXME: surely this is available elsewhere? */
70 #define EVP_RC4_KEY_SIZE 16
71
72 typedef struct
73 {
74     RC4_KEY ks; /* working key */
75 } EVP_RC4_KEY;
76
77 #define data(ctx) ((EVP_RC4_KEY *) (ctx)->cipher_data)
78
79 static int rc4_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
80                        const unsigned char *iv, int enc);
81 static int rc4_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
82                      const unsigned char *in, size_t inl);
83 static const EVP_CIPHER r4_cipher=
84 {
85     NID_rc4,
86     1, EVP_RC4_KEY_SIZE, 0,
87     EVP_CIPH_VARIABLE_LENGTH,
88     rc4_init_key,
89     rc4_cipher,
90     NULL,
91     sizeof(EVP_RC4_KEY),
92     NULL,
93     NULL,
94     NULL,
95     NULL
96 };
97
98 static const EVP_CIPHER r4_40_cipher=
99 {
100     NID_rc4_40,
101     1, 5 /* 40 bit */, 0,
102     EVP_CIPH_VARIABLE_LENGTH,
103     rc4_init_key,
104     rc4_cipher,
105     NULL,
106     sizeof(EVP_RC4_KEY),
107     NULL,
108     NULL,
109     NULL,
110     NULL
111 };
112
113 const EVP_CIPHER *EVP_rc4(void)
114 {
115     return(&r4_cipher);
116 }
117
118 const EVP_CIPHER *EVP_rc4_40(void)
119 {
120     return(&r4_40_cipher);
121 }
122
123 static int rc4_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
124                        const unsigned char *iv, int enc)
125 {
126     RC4_set_key(&data(ctx)->ks, EVP_CIPHER_CTX_key_length(ctx),
127                key);
128 }
```

```
128     return 1;
129 }

131 static int rc4_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
132                      const unsigned char *in, size_t inl)
133 {
134     RC4(&data(ctx)->ks,inl,in,out);
135     return 1;
136 }
137 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc4_hmac_md5.c

1

```
*****
8367 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc4_hmac_md5.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 */

50 #include <openssl/opensslconf.h>

52 #include <stdio.h>
53 #include <string.h>

55 #if !defined(OPENSSL_NO_RC4) && !defined(OPENSSL_NO_MD5)

57 #include <openssl/evp.h>
58 #include <openssl/objects.h>
59 #include <openssl/rc4.h>
60 #include <openssl/md5.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc4_hmac_md5.c

2

```
62 #ifndef EVP_CIPH_FLAG_AEAD_CIPHER
63 #define EVP_CIPH_FLAG_AEAD_CIPHER 0x200000
64 #define EVP_CTRL_AEAD_TLS1_AAD 0x16
65 #define EVP_CTRL_AEAD_SET_MAC_KEY 0x17
66 #endif

68 /* FIXME: surely this is available elsewhere? */
69 #define EVP_RC4_KEY_SIZE 16

71 typedef struct
72 {
73     RC4_KEY ks;
74     MD5_CTX head,tail,md;
75     size_t payload_length;
76 } EVP_RC4_HMAC_MD5;

78 #define NO_PAYLOAD_LENGTH ((size_t)-1)

80 void rc4_md5_enc (RC4_KEY *key, const void *in0, void *out,
81                  MD5_CTX *ctx,const void *inp,size_t blocks);

83 #define data(ctx) ((EVP_RC4_HMAC_MD5 *) (ctx)->cipher_data)

85 static int rc4_hmac_md5_init_key(EVP_CIPHER_CTX *ctx,
86                                   const unsigned char *inkey,
87                                   const unsigned char *iv, int enc)
88 {
89     EVP_RC4_HMAC_MD5 *key = data(ctx);

91     RC4_set_key(&key->ks,EVP_CIPHER_CTX_key_length(ctx),
92                inkey);

94     MD5_Init(&key->head); /* handy when benchmarking */
95     key->tail = key->head;
96     key->md = key->head;

98     key->payload_length = NO_PAYLOAD_LENGTH;

100     return 1;
101 }

103 #if !defined(OPENSSL_NO_ASM) && ( \
104     defined(__x86_64) || defined(__x86_64__) || \
105     defined(_M_AMD64) || defined(_M_X64) || \
106     defined(_INTEL_) ) && \
107     !(defined(__APPLE__) && defined(__MACH__))
108 #define STITCHED_CALL
109 #endif

111 #if !defined(STITCHED_CALL)
112 #define rc4_off 0
113 #define md5_off 0
114 #endif

116 static int rc4_hmac_md5_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
117                                const unsigned char *in, size_t len)
118 {
119     EVP_RC4_HMAC_MD5 *key = data(ctx);
120     #if defined(STITCHED_CALL)
121         size_t rc4_off = 32-1-(key->ks.x&(32-1)), /* 32 is $MOD from rc4_m
122             md5_off = MD5_CBLOCK-key->md.num,
123             blocks;
124         unsigned int l;
125         extern unsigned int OPENSSL_ia32cap_P[];
126     #endif
127     size_t plen = key->payload_length;
```

```

129     if (plen!=NO_PAYLOAD_LENGTH && len!=(plen+MD5_DIGEST_LENGTH)) return 0;

131     if (ctx->encrypt) {
132         if (plen==NO_PAYLOAD_LENGTH) plen = len;
133         #if defined(STITCHED_CALL)
134             /* cipher has to "fall behind" */
135             if (rc4_off>md5_off) md5_off+=MD5_CBLOCK;

137         if (plen>md5_off && (blocks=(plen-md5_off)/MD5_CBLOCK) &&
138             (OPENSSL_ia32cap_P[0]&(1<<20))!=0) {
139             MD5_Update(&key->md,in,md5_off);
140             RC4(&key->ks,rc4_off,in,out);

142             rc4_md5_enc(&key->ks,in+rc4_off,out+rc4_off,
143                 &key->md,in+md5_off,blocks);
144             blocks *= MD5_CBLOCK;
145             rc4_off += blocks;
146             md5_off += blocks;
147             key->md.Nh += blocks>>29;
148             key->md.Nl += blocks<<3;
149             if (key->md.Nl<(unsigned int)blocks) key->md.Nh++;
150         } else {
151             rc4_off = 0;
152             md5_off = 0;
153         }
154     #endif
155     MD5_Update(&key->md,in+md5_off,plen-md5_off);

157     if (plen!=len) {          /* "TLS" mode of operation */
158         if (in!=out)
159             memcpy(out+rc4_off,in+rc4_off,plen-rc4_off);

161         /* calculate HMAC and append it to payload */
162         MD5_Final(out+plen,&key->md);
163         key->md = key->tail;
164         MD5_Update(&key->md,out+plen,MD5_DIGEST_LENGTH);
165         MD5_Final(out+plen,&key->md);
166         /* encrypt HMAC at once */
167         RC4(&key->ks,len-rc4_off,out+rc4_off,out+rc4_off);
168     } else {
169         RC4(&key->ks,len-rc4_off,in+rc4_off,out+rc4_off);
170     }
171 } else {
172     unsigned char mac[MD5_DIGEST_LENGTH];
173     #if defined(STITCHED_CALL)
174         /* digest has to "fall behind" */
175         if (md5_off>rc4_off) rc4_off += 2*MD5_CBLOCK;
176         else rc4_off += MD5_CBLOCK;

178     if (len>rc4_off && (blocks=(len-rc4_off)/MD5_CBLOCK) &&
179         (OPENSSL_ia32cap_P[0]&(1<<20))!=0) {
180         RC4(&key->ks,rc4_off,in,out);
181         MD5_Update(&key->md,out,md5_off);

183         rc4_md5_enc(&key->ks,in+rc4_off,out+rc4_off,
184             &key->md,out+md5_off,blocks);
185         blocks *= MD5_CBLOCK;
186         rc4_off += blocks;
187         md5_off += blocks;
188         l = (key->md.Nl+(blocks<<3))&0xffffffffu;
189         if (l<key->md.Nl) key->md.Nh++;
190         key->md.Nl = l;
191         key->md.Nh += blocks>>29;
192     } else {
193         md5_off=0;

```

```

194         rc4_off=0;
195     }
196 #endif
197     /* decrypt HMAC at once */
198     RC4(&key->ks,len-rc4_off,in+rc4_off,out+rc4_off);
199     if (plen!=NO_PAYLOAD_LENGTH) { /* "TLS" mode of operation */
200         MD5_Update(&key->md,out+md5_off,plen-md5_off);

202         /* calculate HMAC and verify it */
203         MD5_Final(mac,&key->md);
204         key->md = key->tail;
205         MD5_Update(&key->md,mac,MD5_DIGEST_LENGTH);
206         MD5_Final(mac,&key->md);

208         if (memcmp(out+plen,mac,MD5_DIGEST_LENGTH))
209             return 0;
210     } else {
211         MD5_Update(&key->md,out+md5_off,len-md5_off);
212     }
213 }

215     key->payload_length = NO_PAYLOAD_LENGTH;

217     return 1;
218 }

220 static int rc4_hmac_md5_ctrl(EVP_CIPHER_CTX *ctx, int type, int arg, void *ptr)
221 {
222     EVP_RC4_HMAC_MD5 *key = data(ctx);

224     switch (type)
225     {
226     case EVP_CTRL_AEAD_SET_MAC_KEY:
227     {
228         unsigned int i;
229         unsigned char hmac_key[64];

231         memset (hmac_key,0,sizeof(hmac_key));

233         if (arg > (int)sizeof(hmac_key)) {
234             MD5_Init(&key->head);
235             MD5_Update(&key->head,ptr,arg);
236             MD5_Final(hmac_key,&key->head);
237         } else {
238             memcpy(hmac_key,ptr,arg);
239         }

241         for (i=0;i<sizeof(hmac_key);i++)
242             hmac_key[i] ^= 0x36;          /* ipad */
243         MD5_Init(&key->head);
244         MD5_Update(&key->head,hmac_key,sizeof(hmac_key));

246         for (i=0;i<sizeof(hmac_key);i++)
247             hmac_key[i] ^= 0x36^0x5c;    /* opad */
248         MD5_Init(&key->tail);
249         MD5_Update(&key->tail,hmac_key,sizeof(hmac_key));

251         return 1;
252     }
253     case EVP_CTRL_AEAD_TLS1_AAD:
254     {
255         unsigned char *p=ptr;
256         unsigned int len=p[arg-2]<<8|p[arg-1];

258         if (!ctx->encrypt)
259             {

```



```
260         len -= MD5_DIGEST_LENGTH;
261         p[arg-2] = len>>8;
262         p[arg-1] = len;
263     }
264     key->payload_length=len;
265     key->md = key->head;
266     MD5_Update(&key->md,p,arg);
267
268     return MD5_DIGEST_LENGTH;
269 }
270 default:
271     return -1;
272 }
273
274 static EVP_CIPHER r4_hmac_md5_cipher=
275 {
276     #ifdef NID_rc4_hmac_md5
277     NID_rc4_hmac_md5,
278     #else
279     NID_undef,
280     #endif
281     1,EVP_RC4_KEY_SIZE,0,
282     EVP_CIPH_STREAM_CIPHER|EVP_CIPH_VARIABLE_LENGTH|EVP_CIPH_FLAG_AEAD_CIPHE
283     rc4_hmac_md5_init_key,
284     rc4_hmac_md5_cipher,
285     NULL,
286     sizeof(EVP_RC4_HMAC_MD5),
287     NULL,
288     NULL,
289     rc4_hmac_md5_ctrl,
290     NULL
291 };
292
293 const EVP_CIPHER *EVP_rc4_hmac_md5(void)
294 {
295     return(&r4_hmac_md5_cipher);
296 }
297
298 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc5.c

1

4702 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc5.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/e_rc5.c */
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_rc5.c

2

62 #ifndef OPENSSL_NO_RC5

```
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include "evp_locl.h"
67 #include <openssl/rc5.h>
68
69 static int r_32_12_16_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
70                                const unsigned char *iv, int enc);
71 static int rc5_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr);
72
73 typedef struct
74 {
75     int rounds; /* number of rounds */
76     RC5_32_KEY ks; /* key schedule */
77 } EVP_RC5_KEY;
78
79 #define data(ctx) EVP_C_DATA(EVP_RC5_KEY, ctx)
80
81 IMPLEMENT_BLOCK_CIPHER(rc5_32_12_16, ks, RC5_32, EVP_RC5_KEY, NID_rc5,
82                        8, RC5_32_KEY_LENGTH, 8, 64,
83                        EVP_CIPH_VARIABLE_LENGTH | EVP_CIPH_CTRL_INIT,
84                        r_32_12_16_init_key, NULL,
85                        NULL, NULL, rc5_ctrl)
86
87 static int rc5_ctrl(EVP_CIPHER_CTX *c, int type, int arg, void *ptr)
88 {
89     switch(type)
90     {
91     case EVP_CTRL_INIT:
92         data(c)->rounds = RC5_12_ROUNDS;
93         return 1;
94
95     case EVP_CTRL_GET_RC5_ROUNDS:
96         *(int *)ptr = data(c)->rounds;
97         return 1;
98
99     case EVP_CTRL_SET_RC5_ROUNDS:
100         switch(arg)
101         {
102             case RC5_8_ROUNDS:
103             case RC5_12_ROUNDS:
104             case RC5_16_ROUNDS:
105                 data(c)->rounds = arg;
106                 return 1;
107
108             default:
109                 EVPerr(EVP_F_RC5_CTRL, EVP_R_UNSUPPORTED_NUMBER_OF_ROUNDS);
110                 return 0;
111         }
112
113     default:
114         return -1;
115     }
116 }
117
118 static int r_32_12_16_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
119                                const unsigned char *iv, int enc)
120 {
121     RC5_32_set_key(&data(ctx)->ks, EVP_CIPHER_CTX_key_length(ctx),
122                   key, data(ctx)->rounds);
123     return 1;
124 }
125
126 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_seed.c

1

```
*****
3406 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_seed.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
56 #include <openssl/opensslconf.h>
57 #ifndef OPENSSL_NO_SEED
58 #include <openssl/evp.h>
59 #include <openssl/err.h>
60 #include <string.h>
61 #include <assert.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/e_seed.c

2

```
62 #include <openssl/seed.h>
63 #include "evp_locl.h"
65 static int seed_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key, const un

67 typedef struct
68 {
69     SEED_KEY_SCHEDULE ks;
70 } EVP_SEED_KEY;

72 IMPLEMENT_BLOCK_CIPHER(seed, ks, SEED, EVP_SEED_KEY, NID_seed,
73                        16, 16, 16, 128,
74                        0, seed_init_key, 0, 0, 0, 0)

76 static int seed_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
77                          const unsigned char *iv, int enc)
78 {
79     SEED_set_key(key, ctx->cipher_data);
80     return 1;
81 }

83 #endif
```

```
*****
```

```
4920 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/e_xcbc_d.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
```

```
62 #ifndef OPENSSSL_NO_DES
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include "evp_locl.h"
67 #include <openssl/des.h>
69 static int desx_cbc_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
70                             const unsigned char *iv, int enc);
71 static int desx_cbc_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
72                             const unsigned char *in, size_t inl);
75 typedef struct
76 {
77     DES_key_schedule ks; /* key schedule */
78     DES_cblock inw;
79     DES_cblock outw;
80     } DESX_CBC_KEY;
82 #define data(ctx) ((DESX_CBC_KEY *) (ctx)->cipher_data)
84 static const EVP_CIPHER d_xcbc_cipher=
85 {
86     NID_desx_cbc,
87     8, 24, 8,
88     EVP_CIPH_CBC_MODE,
89     desx_cbc_init_key,
90     desx_cbc_cipher,
91     NULL,
92     sizeof(DESX_CBC_KEY),
93     EVP_CIPHER_set_asn1_iv,
94     EVP_CIPHER_get_asn1_iv,
95     NULL,
96     NULL
97 };
99 const EVP_CIPHER *EVP_desx_cbc(void)
100 {
101     return(&d_xcbc_cipher);
102 }
103
104 static int desx_cbc_init_key(EVP_CIPHER_CTX *ctx, const unsigned char *key,
105                             const unsigned char *iv, int enc)
106 {
107     DES_cblock *deskey = (DES_cblock *)key;
109     DES_set_key_unchecked(deskey, &data(ctx)->ks);
110     memcpy(&data(ctx)->inw[0], &key[8], 8);
111     memcpy(&data(ctx)->outw[0], &key[16], 8);
113     return 1;
114 }
116 static int desx_cbc_cipher(EVP_CIPHER_CTX *ctx, unsigned char *out,
117                             const unsigned char *in, size_t inl)
118 {
119     while (inl >= EVP_MAXCHUNK)
120     {
121         DES_xcbc_encrypt(in, out, (long)EVP_MAXCHUNK, &data(ctx)->ks,
122                         (DES_cblock *) &(ctx->iv[0]),
123                         &data(ctx)->inw,
124                         &data(ctx)->outw,
125                         ctx->encrypt);
126         inl -= EVP_MAXCHUNK;
127         in += EVP_MAXCHUNK;
```

```
128         out+=EVP_MAXCHUNK;
129     }
130     if (inl)
131         DES_xcbc_encrypt(in,out,(long)inl,&data(ctx)->ks,
132             (DES_cblock *)&(ctx->iv[0]),
133             &data(ctx)->inw,
134             &data(ctx)->outw,
135             ctx->encrypt);
136     return 1;
137 }
138 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/encode.c

1

```
*****
11580 Fri May 30 18:31:51 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/encode.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/evp/encode.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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21 * in documentation (online or textual) provided with the package.
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33 * "This product includes cryptographic software written by
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36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
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40 *
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/encode.c

2

```
63 #ifndef CHARSET_EBCDIC
64 #define conv_bin2ascii(a) (data_bin2ascii[(a)&0x3f])
65 #define conv_ascii2bin(a) (data_ascii2bin[(a)&0x7f])
66 #else
67 /* We assume that PEM encoded files are EBCDIC files
68  * (i.e., printable text files). Convert them here while decoding.
69  * When encoding, output is EBCDIC (text) format again.
70  * (No need for conversion in the conv_bin2ascii macro, as the
71  * underlying textstring data_bin2ascii[] is already EBCDIC)
72  */
73 #define conv_bin2ascii(a) (data_bin2ascii[(a)&0x3f])
74 #define conv_ascii2bin(a) (data_ascii2bin[os_toascii[a]&0x7f])
75 #endif
76
77 /* 64 char lines
78  * pad input with 0
79  * left over chars are set to =
80  * 1 byte => xx==
81  * 2 bytes => xxx=
82  * 3 bytes => xxxx
83  */
84 #define BIN_PER_LINE (64/4*3)
85 #define CHUNKS_PER_LINE (64/4)
86 #define CHAR_PER_LINE (64+1)
87
88 static const unsigned char data_bin2ascii[65]="ABCDEFGHIJKLMNOPQRSTUVWXYZ\
89 abcdefghijklmnopqrstuvwxyz0123456789+/";
90
91 /* 0xF0 is a EOLN
92  * 0xF1 is ignore but next needs to be 0xF0 (for \r\n processing).
93  * 0xF2 is EOF
94  * 0xE0 is ignore at start of line.
95  * 0xFF is error
96  */
97
98 #define B64_EOLN 0xF0
99 #define B64_CR 0xF1
100 #define B64_EOF 0xF2
101 #define B64_WS 0xE0
102 #define B64_ERROR 0xFF
103 #define B64_NOT_BASE64(a) (((a)|0x13) == 0xF3)
104
105 static const unsigned char data_ascii2bin[128]={
106 0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
107 0xFF,0xE0,0xF0,0xFF,0xFF,0xF1,0xFF,0xFF,
108 0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
109 0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
110 0xE0,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,
111 0xFF,0xFF,0xFF,0x3E,0xFF,0xF2,0xFF,0x3F,
112 0x34,0x35,0x36,0x37,0x38,0x39,0x3A,0x3B,
113 0x3C,0x3D,0xFF,0xFF,0xFF,0x00,0xFF,0xFF,
114 0xFF,0x00,0x01,0x02,0x03,0x04,0x05,0x06,
115 0x07,0x08,0x09,0x0A,0x0B,0x0C,0x0D,0x0E,
116 0x0F,0x10,0x11,0x12,0x13,0x14,0x15,0x16,
117 0x17,0x18,0x19,0xFF,0xFF,0xFF,0xFF,0xFF,
118 0xFF,0x1A,0x1B,0x1C,0x1D,0x1E,0x1F,0x20,
119 0x21,0x22,0x23,0x24,0x25,0x26,0x27,0x28,
120 0x29,0x2A,0x2B,0x2C,0x2D,0x2E,0x2F,0x30,
121 0x31,0x32,0x33,0xFF,0xFF,0xFF,0xFF,0xFF,
122 };
123
124 void EVP_EncodeInit(EVP_ENCODE_CTX *ctx)
125 {
126 ctx->length=48;
127 ctx->num=0;
```

```

128     ctx->line_num=0;
129 }

131 void EVP_EncodeUpdate(EVP_ENCODE_CTX *ctx, unsigned char *out, int *outl,
132     const unsigned char *in, int inl)
133 {
134     int i,j;
135     unsigned int total=0;

137     *outl=0;
138     if (inl == 0) return;
139     OPENSSL_assert(ctx->length <= (int)sizeof(ctx->enc_data));
140     if ((ctx->num+inl) < ctx->length)
141     {
142         memcpy(&(ctx->enc_data[ctx->num]),in,inl);
143         ctx->num+=inl;
144         return;
145     }
146     if (ctx->num != 0)
147     {
148         i=ctx->length-ctx->num;
149         memcpy(&(ctx->enc_data[ctx->num]),in,i);
150         in+=i;
151         inl-=i;
152         j=EVP_EncodeBlock(out,ctx->enc_data,ctx->length);
153         ctx->num=0;
154         out+=j;
155         *(out++)='\n';
156         *out='\0';
157         total=j+1;
158     }
159     while (inl >= ctx->length)
160     {
161         j=EVP_EncodeBlock(out,in,ctx->length);
162         in+=ctx->length;
163         inl-=ctx->length;
164         out+=j;
165         *(out++)='\n';
166         *out='\0';
167         total+=j+1;
168     }
169     if (inl != 0)
170         memcpy(&(ctx->enc_data[0]),in,inl);
171     ctx->num=inl;
172     *outl=total;
173 }

175 void EVP_EncodeFinal(EVP_ENCODE_CTX *ctx, unsigned char *out, int *outl)
176 {
177     unsigned int ret=0;

179     if (ctx->num != 0)
180     {
181         ret=EVP_EncodeBlock(out,ctx->enc_data,ctx->num);
182         out[ret++]='\n';
183         out[ret]='\0';
184         ctx->num=0;
185     }
186     *outl=ret;
187 }

189 int EVP_EncodeBlock(unsigned char *t, const unsigned char *f, int dlen)
190 {
191     int i,ret=0;
192     unsigned long l;

```

```

194     for (i=dlen; i > 0; i-=3)
195     {
196         if (i >= 3)
197         {
198             l=((unsigned long)f[0])<<16L|
199             (((unsigned long)f[1])<< 8L)|f[2];
200             *(t++)=conv_bin2ascii(l>>18L);
201             *(t++)=conv_bin2ascii(l>>12L);
202             *(t++)=conv_bin2ascii(l>> 6L);
203             *(t++)=conv_bin2ascii(l);
204         }
205         else
206         {
207             l=((unsigned long)f[0])<<16L;
208             if (i == 2) l|=((unsigned long)f[1]<<8L);

210             *(t++)=conv_bin2ascii(l>>18L);
211             *(t++)=conv_bin2ascii(l>>12L);
212             *(t++)=(i == 1)?':':conv_bin2ascii(l>> 6L);
213             *(t++)='';
214         }
215         ret+=4;
216         f+=3;
217     }

219     *t='\0';
220     return(ret);
221 }

223 void EVP_DecodeInit(EVP_ENCODE_CTX *ctx)
224 {
225     ctx->length=30;
226     ctx->num=0;
227     ctx->line_num=0;
228     ctx->expect_nl=0;
229 }

231 /* -1 for error
232  *  0 for last line
233  *  1 for full line
234  */
235 int EVP_DecodeUpdate(EVP_ENCODE_CTX *ctx, unsigned char *out, int *outl,
236     const unsigned char *in, int inl)
237 {
238     int seof= -1,eof=0,rv= -1,ret=0,i,v,tmp,n,ln,exp_nl;
239     unsigned char *d;

241     n=ctx->num;
242     d=ctx->enc_data;
243     ln=ctx->line_num;
244     exp_nl=ctx->expect_nl;

246     /* last line of input. */
247     if ((inl == 0) || ((n == 0) && (conv_ascii2bin(in[0]) == B64_E0F)))
248         { rv=0; goto end; }

249     /* We parse the input data */
250     for (i=0; i<inl; i++)
251     {
252         /* If the current line is > 80 characters, scream alot */
253         if (ln >= 80) { rv= -1; goto end; }

255         /* Get char and put it into the buffer */
256         tmp= *(in++);
257         v=conv_ascii2bin(tmp);
258         /* only save the good data :- ) */
259

```

```

260     if (!B64_NOT_BASE64(v))
261     {
262         OPENSSSL_assert(n < (int)sizeof(ctx->enc_data));
263         d[n++] = tmp;
264         ln++;
265     }
266     else if (v == B64_ERROR)
267     {
268         rv = -1;
269         goto end;
270     }

272     /* have we seen a '=' which is 'definitely' the last
273     * input line. seof will point to the character that
274     * holds it. and eof will hold how many characters to
275     * chop off. */
276     if (tmp == '=')
277     {
278         if (seof == -1) seof = n;
279         eof++;
280     }

282     if (v == B64_CR)
283     {
284         ln = 0;
285         if (exp_nl)
286             continue;
287     }

289     /* eoln */
290     if (v == B64_EOLN)
291     {
292         ln = 0;
293         if (exp_nl)
294         {
295             exp_nl = 0;
296             continue;
297         }
298     }
299     exp_nl = 0;

301     /* If we are at the end of input and it looks like a
302     * line, process it. */
303     if (((i+1) == inl) && (((n&3) == 0) || eof))
304     {
305         v = B64_EOF;
306         /* In case things were given us in really small
307         records (so two '=' were given in separate
308         updates), eof may contain the incorrect number
309         of ending bytes to skip, so let's redo the count */
310         eof = 0;
311         if (d[n-1] == '=') eof++;
312         if (d[n-2] == '=') eof++;
313         /* There will never be more than two '=' */
314     }

316     if ((v == B64_EOF && (n&3) == 0) || (n >= 64))
317     {
318         /* This is needed to work correctly on 64 byte input
319         * lines. We process the line and then need to
320         * accept the '\n' */
321         if ((v != B64_EOF) && (n >= 64)) exp_nl = 1;
322         if (n > 0)
323         {
324             v = EVP_DecodeBlock(out, d, n);
325             n = 0;

```

```

326         if (v < 0) { rv = 0; goto end; }
327         ret += (v - eof);
328     }
329     else
330     {
331         eof = 1;
332         v = 0;
333     }

335     /* This is the case where we have had a short
336     * but valid input line */
337     if ((v < ctx->length) && eof)
338     {
339         rv = 0;
340         goto end;
341     }
342     else
343         ctx->length = v;

345     if (seof >= 0) { rv = 0; goto end; }
346     out += v;
347 }
348
349     rv = 1;
350 end:
351     *outl = ret;
352     ctx->num = n;
353     ctx->line_num = ln;
354     ctx->expect_nl = exp_nl;
355     return(rv);
356 }

358 int EVP_DecodeBlock(unsigned char *t, const unsigned char *f, int n)
359 {
360     int i, ret = 0, a, b, c, d;
361     unsigned long l;

363     /* trim white space from the start of the line. */
364     while ((conv_ascii2bin(*f) == B64_WS) && (n > 0))
365     {
366         f++;
367         n--;
368     }

370     /* strip off stuff at the end of the line
371     * ascii2bin values B64_WS, B64_EOLN, B64_EOLN and B64_EOF */
372     while ((n > 3) && (B64_NOT_BASE64(conv_ascii2bin(f[n-1]))))
373         n--;

375     if (n%4 != 0) return(-1);

377     for (i = 0; i < n; i += 4)
378     {
379         a = conv_ascii2bin(*(f++));
380         b = conv_ascii2bin(*(f++));
381         c = conv_ascii2bin(*(f++));
382         d = conv_ascii2bin(*(f++));
383         if ((a & 0x80) || (b & 0x80) ||
384             (c & 0x80) || (d & 0x80))
385             return(-1);
386         l = (((unsigned long)a) << 18L) |
387             (((unsigned long)b) << 12L) |
388             (((unsigned long)c) << 6L) |
389             (((unsigned long)d));
390         *(t++) = (unsigned char)(l >> 16L) & 0xff;
391         *(t++) = (unsigned char)(l >> 8L) & 0xff;

```



```
392         *(t++)=(unsigned char)(l      )&0xff;
393         ret+=3;
394     }
395     return(ret);
396 }

398 int EVP_DecodeFinal(EVP_ENCODE_CTX *ctx, unsigned char *out, int *outl)
399 {
400     int i;

402     *outl=0;
403     if (ctx->num != 0)
404     {
405         i=EVP_DecodeBlock(out,ctx->enc_data,ctx->num);
406         if (i < 0) return(-1);
407         ctx->num=0;
408         *outl=i;
409         return(1);
410     }
411     else
412         return(1);
413 }

415 #ifdef undef
416 int EVP_DecodeValid(unsigned char *buf, int len)
417 {
418     int i,num=0,bad=0;

420     if (len == 0) return(-1);
421     while (conv_ascii2bin(*buf) == B64_WS)
422     {
423         buf++;
424         len--;
425         if (len == 0) return(-1);
426     }

428     for (i=len; i >= 4; i-=4)
429     {
430         if ( (conv_ascii2bin(buf[0]) >= 0x40) ||
431             (conv_ascii2bin(buf[1]) >= 0x40) ||
432             (conv_ascii2bin(buf[2]) >= 0x40) ||
433             (conv_ascii2bin(buf[3]) >= 0x40))
434             return(-1);
435         buf+=4;
436         num+=1+(buf[2] != '=')+(buf[3] != '=');
437     }
438     if ((i == 1) && (conv_ascii2bin(buf[0]) == B64_EOLN))
439         return(num);
440     if ((i == 2) && (conv_ascii2bin(buf[0]) == B64_EOLN) &&
441         (conv_ascii2bin(buf[1]) == B64_EOLN))
442         return(num);
443     return(1);
444 }
445 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_acnf.c

1

```
*****
3041 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_acnf.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* evp_acnf.c */
2 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
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19 *
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46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include "cryptlib.h"
60 #include <openssl/evp.h>
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_acnf.c

2

```
64 /* Load all algorithms and configure OpenSSL.
65  * This function is called automatically when
66  * OPENSSL_LOAD_CONF is set.
67  */
69 void OPENSSL_add_all_algorithms_conf(void)
70 {
71     OPENSSL_add_all_algorithms_noconf();
72     OPENSSL_config(NULL);
73 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_cnf.c

1

```
*****
4161 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_cnf.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* evp_cnf.c */
2 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
3  * project 2007.
4  */
5 /* =====
6  * Copyright (c) 2007 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
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33 *
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
59 #include <stdio.h>
60 #include <ctype.h>
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_cnf.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/conf.h>
64 #include <openssl/dso.h>
65 #include <openssl/x509.h>
66 #include <openssl/x509v3.h>
67 #ifdef OPENSSL_FIPS
68 #include <openssl/fips.h>
69 #endif

72 /* Algorithm configuration module. */

74 static int alg_module_init(CONF_IMODULE *md, const CONF *cnf)
75 {
76     int i;
77     const char *oid_section;
78     STACK_OF(CONF_VALUE) *sktmp;
79     CONF_VALUE *oval;
80     oid_section = CONF_imodule_get_value(md);
81     if (!(sktmp = NCONF_get_section(cnf, oid_section)))
82     {
83         EVPerr(EVP_F_ALG_MODULE_INIT, EVP_R_ERROR_LOADING_SECTION);
84         return 0;
85     }
86     for(i = 0; i < sk_CONF_VALUE_num(sktmp); i++)
87     {
88         oval = sk_CONF_VALUE_value(sktmp, i);
89         if (!strcmp(oval->name, "fips_mode"))
90         {
91             int m;
92             if (!X509V3_get_value_bool(oval, &m))
93             {
94                 EVPerr(EVP_F_ALG_MODULE_INIT, EVP_R_INVALID_FIPS);
95                 return 0;
96             }
97             if (m > 0)
98             {
99 #ifdef OPENSSL_FIPS
100                 if (!FIPS_mode() && !FIPS_mode_set(1))
101                 {
102                     EVPerr(EVP_F_ALG_MODULE_INIT, EVP_R_ERROR_LOADING_SECTION);
103                     return 0;
104                 }
105 #else
106                 EVPerr(EVP_F_ALG_MODULE_INIT, EVP_R_FIPS_MODE_NO);
107                 return 0;
108 #endif
109             }
110         }
111         else
112         {
113             EVPerr(EVP_F_ALG_MODULE_INIT, EVP_R_UNKNOWN_OPTION);
114             ERR_add_error_data(4, "name=", oval->name,
115                             ", value=", oval->value);
116         }
117     }
118     return 1;
119 }

122 void EVP_add_alg_module(void)
123 {
124     CONF_module_add("alg_section", alg_module_init, 0);
125 }
```

```

*****
16741 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/evp_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/rand.h>
64 #ifndef OPENSSL_NO_ENGINE
65 #include <openssl/engine.h>
66 #endif
67 #ifdef OPENSSL_FIPS
68 #include <openssl/fips.h>
69 #endif
70 #include "evp_locl.h"
71
72 #ifdef OPENSSL_FIPS
73 #define M_do_cipher(ctx, out, in, inl) FIPS_cipher(ctx, out, in, inl)
74 #else
75 #define M_do_cipher(ctx, out, in, inl) ctx->cipher->do_cipher(ctx, out, in, inl)
76 #endif
77
78
79 const char EVP_version[]="EVP" OPENSSL_VERSION_PTEXT;
80
81 void EVP_CIPHER_CTX_init(EVP_CIPHER_CTX *ctx)
82 {
83     memset(ctx,0,sizeof(EVP_CIPHER_CTX));
84     /* ctx->cipher=NULL; */
85 }
86
87 EVP_CIPHER_CTX *EVP_CIPHER_CTX_new(void)
88 {
89     EVP_CIPHER_CTX *ctx=OPENSSL_malloc(sizeof *ctx);
90     if (ctx)
91         EVP_CIPHER_CTX_init(ctx);
92     return ctx;
93 }
94
95 int EVP_CipherInit(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *cipher,
96                   const unsigned char *key, const unsigned char *iv, int enc)
97 {
98     if (cipher)
99         EVP_CIPHER_CTX_init(ctx);
100     return EVP_CipherInit_ex(ctx,cipher,NULL,key,iv,enc);
101 }
102
103 int EVP_CipherInit_ex(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *cipher, ENGINE *imp,
104                      const unsigned char *key, const unsigned char *iv, int enc)
105 {
106     if (enc == -1)
107         enc = ctx->encrypt;
108     else
109     {
110         if (enc)
111             enc = 1;
112         ctx->encrypt = enc;
113     }
114 #ifndef OPENSSL_NO_ENGINE
115     /* Whether it's nice or not, "Inits" can be used on "Final"d contexts
116      * so this context may already have an ENGINE! Try to avoid releasing
117      * the previous handle, re-querying for an ENGINE, and having a
118      * reinitialisation, when it may all be unnecessary. */
119     if (ctx->engine && ctx->cipher && (!cipher ||
120         (cipher && (cipher->nid == ctx->cipher->nid))))
121         goto skip_to_init;
122 #endif
123     if (cipher)
124     {
125         /* Ensure a context left lying around from last time is cleared
126          * (the previous check attempted to avoid this if the same
127          * ENGINE and EVP_CIPHER could be used). */

```

```

128     if (ctx->cipher)
129     {
130         unsigned long flags = ctx->flags;
131         EVP_CIPHER_CTX_cleanup(ctx);
132         /* Restore encrypt and flags */
133         ctx->encrypt = enc;
134         ctx->flags = flags;
135     }
136 #ifndef OPENSSL_NO_ENGINE
137     if(impl)
138     {
139         if (!ENGINE_init(impl))
140         {
141             EVPerr(EVP_F_EVP_CIPHERINIT_EX, EVP_R_INITIALIZATION_ERROR);
142             return 0;
143         }
144     }
145     else
146     /* Ask if an ENGINE is reserved for this job */
147     impl = ENGINE_get_cipher_engine(cipher->nid);
148     if(impl)
149     {
150         /* There's an ENGINE for this job ... (apparently) */
151         const EVP_CIPHER *c = ENGINE_get_cipher(impl, cipher->nid);
152         if(!c)
153         {
154             /* One positive side-effect of US's export
155              * control history, is that we should at least
156              * be able to avoid using US misspellings of
157              * "initialisation"? */
158             EVPerr(EVP_F_EVP_CIPHERINIT_EX, EVP_R_INITIALIZATION_ERROR);
159             return 0;
160         }
161         /* We'll use the ENGINE's private cipher definition */
162         cipher = c;
163         /* Store the ENGINE functional reference so we know
164          * 'cipher' came from an ENGINE and we need to release
165          * it when done. */
166         ctx->engine = impl;
167     }
168     else
169         ctx->engine = NULL;
170 #endif

172 #ifdef OPENSSL_FIPS
173     if (FIPS_mode())
174         return FIPS_cipherinit(ctx, cipher, key, iv, enc);
175 #endif

176     ctx->cipher=cipher;
177     if (ctx->cipher->ctx_size)
178     {
179         ctx->cipher_data=OPENSSL_malloc(ctx->cipher->ctx_size);
180         if (!ctx->cipher_data)
181         {
182             EVPerr(EVP_F_EVP_CIPHERINIT_EX, ERR_R_MALLOC_FAILURE);
183             return 0;
184         }
185     }
186     else
187     {
188         ctx->cipher_data = NULL;
189     }
190     ctx->key_len = cipher->key_len;
191     ctx->flags = 0;
192     if(ctx->cipher->flags & EVP_CIPHER_CTRL_INIT)
193     {

```

```

194         if(!EVP_CIPHER_CTX_ctrl(ctx, EVP_CTRL_INIT, 0, NULL))
195         {
196             EVPerr(EVP_F_EVP_CIPHERINIT_EX, EVP_R_INITIALIZATION_ERROR);
197             return 0;
198         }
199     }
200 }
201 else if(!ctx->cipher)
202 {
203     EVPerr(EVP_F_EVP_CIPHERINIT_EX, EVP_R_NO_CIPHER_SET);
204     return 0;
205 }
206 #ifndef OPENSSL_NO_ENGINE
207 skip_to_init:
208 #endif
209 #ifdef OPENSSL_FIPS
210     if (FIPS_mode())
211         return FIPS_cipherinit(ctx, cipher, key, iv, enc);
212 #endif
213 /* we assume block size is a power of 2 in *cryptUpdate */
214 OPENSSL_assert(ctx->cipher->block_size == 1
215               || ctx->cipher->block_size == 8
216               || ctx->cipher->block_size == 16);
217
218     if(!(EVP_CIPHER_CTX_flags(ctx) & EVP_CIPHER_CUSTOM_IV)) {
219         switch(EVP_CIPHER_CTX_mode(ctx)) {
220
221             case EVP_CIPHER_STREAM_CIPHER:
222             case EVP_CIPHER_ECB_MODE:
223                 break;
224
225             case EVP_CIPHER_CFB_MODE:
226             case EVP_CIPHER_OFB_MODE:
227
228                 ctx->num = 0;
229                 /* fall-through */
230
231             case EVP_CIPHER_CBC_MODE:
232
233                 OPENSSL_assert(EVP_CIPHER_CTX_iv_length(ctx) <=
234                               (int)sizeof(ctx->iv));
235                 if(iv) memcpy(ctx->iv, iv, EVP_CIPHER_CTX_iv_length(ctx));
236                 memcpy(ctx->iv, ctx->iv, EVP_CIPHER_CTX_iv_length(ctx));
237                 break;
238
239             case EVP_CIPHER_CTR_MODE:
240                 ctx->num = 0;
241                 /* Don't reuse IV for CTR mode */
242                 if(iv)
243                     memcpy(ctx->iv, iv, EVP_CIPHER_CTX_iv_length(ctx));
244                 break;
245
246             default:
247                 return 0;
248             break;
249         }
250     }
251
252     if(key || (ctx->cipher->flags & EVP_CIPHER_ALWAYS_CALL_INIT)) {
253         if(!ctx->cipher->init(ctx, key, iv, enc)) return 0;
254     }
255     ctx->buf_len=0;
256     ctx->final_used=0;
257     ctx->block_mask=ctx->cipher->block_size-1;
258     return 1;
259 }

```

```

261 int EVP_CipherUpdate(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl,
262     const unsigned char *in, int inl)
263 {
264     if (ctx->encrypt)
265         return EVP_EncryptUpdate(ctx, out, outl, in, inl);
266     else
267         return EVP_DecryptUpdate(ctx, out, outl, in, inl);
268 }
269
270 int EVP_CipherFinal_ex(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
271 {
272     if (ctx->encrypt)
273         return EVP_EncryptFinal_ex(ctx, out, outl);
274     else
275         return EVP_DecryptFinal_ex(ctx, out, outl);
276 }
277
278 int EVP_CipherFinal(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
279 {
280     if (ctx->encrypt)
281         return EVP_EncryptFinal(ctx, out, outl);
282     else
283         return EVP_DecryptFinal(ctx, out, outl);
284 }
285
286 int EVP_EncryptInit(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *cipher,
287     const unsigned char *key, const unsigned char *iv)
288 {
289     return EVP_CipherInit(ctx, cipher, key, iv, 1);
290 }
291
292 int EVP_EncryptInit_ex(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *cipher, ENGINE *imp,
293     const unsigned char *key, const unsigned char *iv)
294 {
295     return EVP_CipherInit_ex(ctx, cipher, impl, key, iv, 1);
296 }
297
298 int EVP_DecryptInit(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *cipher,
299     const unsigned char *key, const unsigned char *iv)
300 {
301     return EVP_CipherInit(ctx, cipher, key, iv, 0);
302 }
303
304 int EVP_DecryptInit_ex(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *cipher, ENGINE *im,
305     const unsigned char *key, const unsigned char *iv)
306 {
307     return EVP_CipherInit_ex(ctx, cipher, impl, key, iv, 0);
308 }
309
310 int EVP_EncryptUpdate(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl,
311     const unsigned char *in, int inl)
312 {
313     int i, j, bl;
314
315     if (ctx->cipher->flags & EVP_CIPH_FLAG_CUSTOM_CIPHER)
316     {
317         i = M_do_cipher(ctx, out, in, inl);
318         if (i < 0)
319             return 0;
320         else
321             *outl = i;
322         return 1;
323     }
324
325     if (inl <= 0)
326     {
327         *outl = 0;
328         return inl == 0;
329     }

```

```

326     }
327
328     if (ctx->buf_len == 0 && (inl & (ctx->block_mask)) == 0)
329     {
330         if (M_do_cipher(ctx, out, in, inl))
331         {
332             *outl = inl;
333             return 1;
334         }
335         else
336         {
337             *outl = 0;
338             return 0;
339         }
340     }
341     i = ctx->buf_len;
342     bl = ctx->cipher->block_size;
343     OPENSSL_assert(bl <= (int)sizeof(ctx->buf));
344     if (i != 0)
345     {
346         if (i + inl < bl)
347         {
348             memcpy(&(ctx->buf[i]), in, inl);
349             ctx->buf_len += inl;
350             *outl = 0;
351             return 1;
352         }
353         else
354         {
355             j = bl - i;
356             memcpy(&(ctx->buf[i]), in, j);
357             if (!M_do_cipher(ctx, out, ctx->buf, bl)) return 0;
358             inl -= j;
359             in += j;
360             out += bl;
361             *outl = bl;
362         }
363     }
364     else
365     {
366         *outl = 0;
367         i = inl & (bl - 1);
368         inl -= i;
369         if (inl > 0)
370         {
371             if (!M_do_cipher(ctx, out, in, inl)) return 0;
372             *outl += inl;
373         }
374     }
375     if (i != 0)
376     {
377         memcpy(ctx->buf, &(in[inl]), i);
378         ctx->buf_len = i;
379         return 1;
380     }
381
382 int EVP_EncryptFinal(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
383 {
384     int ret;
385     ret = EVP_EncryptFinal_ex(ctx, out, outl);
386     return ret;
387 }
388
389 int EVP_EncryptFinal_ex(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
390 {
391     int n, ret;
392     unsigned int i, b, bl;

```

```

392     if (ctx->cipher->flags & EVP_CIPH_FLAG_CUSTOM_CIPHER)
393     {
394         ret = M_do_cipher(ctx, out, NULL, 0);
395         if (ret < 0)
396             return 0;
397     }
398     else
399     {
400         *outl = ret;
401         return 1;
402     }
403     b=ctx->cipher->block_size;
404     OPENSSL_assert(b <= sizeof ctx->buf);
405     if (b == 1)
406     {
407         *outl=0;
408         return 1;
409     }
410     bl=ctx->buf_len;
411     if (ctx->flags & EVP_CIPH_NO_PADDING)
412     {
413         if(bl)
414         {
415             EVPerr(EVP_F_EVP_ENCRYPTFINAL_EX,EVP_R_DATA_NOT_MULTIPLE
416                 return 0;
417         }
418         *outl = 0;
419         return 1;
420     }
421     n=b-bl;
422     for (i=bl; i<b; i++)
423         ctx->buf[i]=n;
424     ret=M_do_cipher(ctx,out,ctx->buf,b);
425
426     if(ret)
427         *outl=b;
428
429     return ret;
430 }
431
432 int EVP_DecryptUpdate(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl,
433     const unsigned char *in, int inl)
434 {
435     int fix_len;
436     unsigned int b;
437
438     if (ctx->cipher->flags & EVP_CIPH_FLAG_CUSTOM_CIPHER)
439     {
440         fix_len = M_do_cipher(ctx, out, in, inl);
441         if (fix_len < 0)
442         {
443             *outl = 0;
444             return 0;
445         }
446     }
447     else
448     {
449         *outl = fix_len;
450         return 1;
451     }
452
453     if (inl <= 0)
454     {
455         *outl = 0;
456         return inl == 0;
457     }

```

```

458     if (ctx->flags & EVP_CIPH_NO_PADDING)
459         return EVP_EncryptUpdate(ctx, out, outl, in, inl);
460
461     b=ctx->cipher->block_size;
462     OPENSSL_assert(b <= sizeof ctx->final);
463
464     if(ctx->final_used)
465     {
466         memcpy(out,ctx->final,b);
467         out+=b;
468         fix_len = 1;
469     }
470     else
471         fix_len = 0;
472
473     if(!EVP_EncryptUpdate(ctx,out,outl,in,inl))
474         return 0;
475
476     /* if we have 'decrypted' a multiple of block size, make sure
477      * we have a copy of this last block */
478     if (b > 1 && !ctx->buf_len)
479     {
480         *outl=b;
481         ctx->final_used=1;
482         memcpy(ctx->final,&out[*outl],b);
483     }
484     else
485         ctx->final_used = 0;
486
487     if (fix_len)
488         *outl += b;
489
490     return 1;
491 }
492
493 int EVP_DecryptFinal(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
494 {
495     int ret;
496     ret = EVP_DecryptFinal_ex(ctx, out, outl);
497     return ret;
498 }
499
500 int EVP_DecryptFinal_ex(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
501 {
502     int i,n;
503     unsigned int b;
504     *outl=0;
505
506     if (ctx->cipher->flags & EVP_CIPH_FLAG_CUSTOM_CIPHER)
507     {
508         i = M_do_cipher(ctx, out, NULL, 0);
509         if (i < 0)
510             return 0;
511         else
512             *outl = i;
513         return 1;
514     }
515
516     b=ctx->cipher->block_size;
517     if (ctx->flags & EVP_CIPH_NO_PADDING)
518     {
519         if(ctx->buf_len)
520         {
521             EVPerr(EVP_F_EVP_DECRYPTFINAL_EX,EVP_R_DATA_NOT_MULTIPLE
522                 return 0;
523         }

```

```

524     }
525     *outl = 0;
526     return 1;
527 }
528 if (b > 1)
529 {
530     if (ctx->buf_len || !ctx->final_used)
531     {
532         EVPerr(EVP_F_EVP_DECRYPTFINAL_EX, EVP_R_WRONG_FINAL_BLOCK);
533         return(0);
534     }
535     OPENSSL_assert(b <= sizeof ctx->final);
536     n=ctx->final[b-1];
537     if (n == 0 || n > (int)b)
538     {
539         EVPerr(EVP_F_EVP_DECRYPTFINAL_EX, EVP_R_BAD_DECRYPT);
540         return(0);
541     }
542     for (i=0; i<n; i++)
543     {
544         if (ctx->final[--b] != n)
545         {
546             EVPerr(EVP_F_EVP_DECRYPTFINAL_EX, EVP_R_BAD_DECRY);
547             return(0);
548         }
549     }
550     n=ctx->cipher->block_size-n;
551     for (i=0; i<n; i++)
552         out[i]=ctx->final[i];
553     *outl=n;
554 }
555 else
556     *outl=0;
557 return(1);
558 }
559
560 void EVP_CIPHER_CTX_free(EVP_CIPHER_CTX *ctx)
561 {
562     if (ctx)
563     {
564         EVP_CIPHER_CTX_cleanup(ctx);
565         OPENSSL_free(ctx);
566     }
567 }
568
569 int EVP_CIPHER_CTX_cleanup(EVP_CIPHER_CTX *c)
570 {
571     #ifndef OPENSSL_FIPS
572     if (c->cipher != NULL)
573     {
574         if (c->cipher->cleanup && !c->cipher->cleanup(c))
575             return 0;
576         /* Cleanse cipher context data */
577         if (c->cipher_data)
578             OPENSSL_cleanse(c->cipher_data, c->cipher->ctx_size);
579     }
580     if (c->cipher_data)
581         OPENSSL_free(c->cipher_data);
582     #endif
583     #ifndef OPENSSL_NO_ENGINE
584     if (c->engine)
585         /* The EVP_CIPHER we used belongs to an ENGINE, release the
586          * functional reference we held for this reason. */
587         ENGINE_finish(c->engine);
588     #endif
589     #ifdef OPENSSL_FIPS

```

```

590     FIPS_cipher_ctx_cleanup(c);
591 #endif
592     memset(c, 0, sizeof(EVP_CIPHER_CTX));
593     return 1;
594 }
595
596 int EVP_CIPHER_CTX_set_key_length(EVP_CIPHER_CTX *c, int keylen)
597 {
598     if (c->cipher->flags & EVP_CIPH_CUSTOM_KEY_LENGTH)
599         return EVP_CIPHER_CTX_ctrl(c, EVP_CTRL_SET_KEY_LENGTH, keylen, N);
600     if (c->key_len == keylen) return 1;
601     if ((keylen > 0) && (c->cipher->flags & EVP_CIPH_VARIABLE_LENGTH))
602     {
603         c->key_len = keylen;
604         return 1;
605     }
606     EVPerr(EVP_F_EVP_CIPHER_CTX_SET_KEY_LENGTH, EVP_R_INVALID_KEY_LENGTH);
607     return 0;
608 }
609
610 int EVP_CIPHER_CTX_set_padding(EVP_CIPHER_CTX *ctx, int pad)
611 {
612     if (pad) ctx->flags &= ~EVP_CIPH_NO_PADDING;
613     else ctx->flags |= EVP_CIPH_NO_PADDING;
614     return 1;
615 }
616
617 int EVP_CIPHER_CTX_ctrl(EVP_CIPHER_CTX *ctx, int type, int arg, void *ptr)
618 {
619     int ret;
620     if (!ctx->cipher) {
621         EVPerr(EVP_F_EVP_CIPHER_CTX_CTRL, EVP_R_NO_CIPHER_SET);
622         return 0;
623     }
624
625     if (!ctx->cipher->ctrl) {
626         EVPerr(EVP_F_EVP_CIPHER_CTX_CTRL, EVP_R_CTRL_NOT_IMPLEMENTED);
627         return 0;
628     }
629
630     ret = ctx->cipher->ctrl(ctx, type, arg, ptr);
631     if (ret == -1) {
632         EVPerr(EVP_F_EVP_CIPHER_CTX_CTRL, EVP_R_CTRL_OPERATION_NOT_IMPLEMENTED);
633         return 0;
634     }
635     return ret;
636 }
637
638 int EVP_CIPHER_CTX_rand_key(EVP_CIPHER_CTX *ctx, unsigned char *key)
639 {
640     if (ctx->cipher->flags & EVP_CIPH RAND_KEY)
641         return EVP_CIPHER_CTX_ctrl(ctx, EVP_CTRL_RAND_KEY, 0, key);
642     if (RAND_bytes(key, ctx->key_len) <= 0)
643         return 0;
644     return 1;
645 }
646
647 int EVP_CIPHER_CTX_copy(EVP_CIPHER_CTX *out, const EVP_CIPHER_CTX *in)
648 {
649     if ((in == NULL) || (in->cipher == NULL))
650     {
651         EVPerr(EVP_F_EVP_CIPHER_CTX_COPY, EVP_R_INPUT_NOT_INITIALIZED);
652         return 0;
653     }
654     #ifndef OPENSSL_NO_ENGINE
655     /* Make sure it's safe to copy a cipher context using an ENGINE */

```



```
656     if (in->engine && !ENGINE_init(in->engine))
657     {
658         EVPerr(EVP_F_EVP_CIPHER_CTX_COPY,ERR_R_ENGINE_LIB);
659         return 0;
660     }
661 #endif
662
663     EVP_CIPHER_CTX_cleanup(out);
664     memcpy(out,in,sizeof *out);
665
666     if (in->cipher_data && in->cipher->ctx_size)
667     {
668         out->cipher_data=OPENSSL_malloc(in->cipher->ctx_size);
669         if (!out->cipher_data)
670         {
671             EVPerr(EVP_F_EVP_CIPHER_CTX_COPY,ERR_R_MALLOC_FAILURE);
672             return 0;
673         }
674         memcpy(out->cipher_data,in->cipher_data,in->cipher->ctx_size);
675     }
676
677     if (in->cipher->flags & EVP_CIPH_CUSTOM_COPY)
678         return in->cipher->ctrl((EVP_CIPHER_CTX *)in, EVP_CTRL_COPY, 0,
679         return 1;
680     }
```

```

*****
12656 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/evp/evp_err.c */
2 /* =====
3  * Copyright (c) 1999-2011 The OpenSSL Project. All rights reserved.
4  *
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6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
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10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
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16  *
17  * 3. All advertising materials mentioning features or use of this
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21  *
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31  * 6. Redistributions of any form whatsoever must retain the following
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40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/evp.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_EVP,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_EVP,0,reason)

71 static ERR_STRING_DATA EVP_str_functs[]=
72 {
73 {ERR_FUNC(EVP_F_AESNI_INIT_KEY), "AESNI_INIT_KEY"},
74 {ERR_FUNC(EVP_F_AESNI_XTS_CIPHER), "AESNI_XTS_CIPHER"},
75 {ERR_FUNC(EVP_F_AES_INIT_KEY), "AES_INIT_KEY"},
76 {ERR_FUNC(EVP_F_AES_XTS), "AES_XTS"},
77 {ERR_FUNC(EVP_F_AES_XTS_CIPHER), "AES_XTS_CIPHER"},
78 {ERR_FUNC(EVP_F_ALG_MODULE_INIT), "ALG_MODULE_INIT"},
79 {ERR_FUNC(EVP_F_CAMELLIA_INIT_KEY), "CAMELLIA_INIT_KEY"},
80 {ERR_FUNC(EVP_F_CMAC_INIT), "CMAC_INIT"},
81 {ERR_FUNC(EVP_F_D2I_PKEY), "D2I_PKEY"},
82 {ERR_FUNC(EVP_F_DO_SIGVER_INIT), "DO_SIGVER_INIT"},
83 {ERR_FUNC(EVP_F_DSAPKEY2PKCS8), "DSAPKEY2PKCS8"},
84 {ERR_FUNC(EVP_F_DSA_PKEY2PKCS8), "DSA_PKEY2PKCS8"},
85 {ERR_FUNC(EVP_F_ECDSA_PKEY2PKCS8), "ECDSA_PKEY2PKCS8"},
86 {ERR_FUNC(EVP_F_ECKEY_PKEY2PKCS8), "ECKEY_PKEY2PKCS8"},
87 {ERR_FUNC(EVP_F_EVP_CIPHERINIT_EX), "EVP_CipherInit_ex"},
88 {ERR_FUNC(EVP_F_EVP_CIPHER_CTX_COPY), "EVP_CIPHER_CTX_copy"},
89 {ERR_FUNC(EVP_F_EVP_CIPHER_CTX_CTRL), "EVP_CIPHER_CTX_ctrl"},
90 {ERR_FUNC(EVP_F_EVP_CIPHER_CTX_SET_KEY_LENGTH), "EVP_CIPHER_CTX_set_key_length"},
91 {ERR_FUNC(EVP_F_EVP_DECRYPTFINAL_EX), "EVP_DecryptFinal_ex"},
92 {ERR_FUNC(EVP_F_EVP_DIGESTINIT_EX), "EVP_DigestInit_ex"},
93 {ERR_FUNC(EVP_F_EVP_ENCRYPTFINAL_EX), "EVP_EncryptFinal_ex"},
94 {ERR_FUNC(EVP_F_EVP_MD_CTX_COPY_EX), "EVP_MD_CTX_copy_ex"},
95 {ERR_FUNC(EVP_F_EVP_MD_SIZE), "EVP_MD_size"},
96 {ERR_FUNC(EVP_F_EVP_OPENINIT), "EVP_OpenInit"},
97 {ERR_FUNC(EVP_F_EVP_PBE_ALG_ADD), "EVP_PBE_alg_add"},
98 {ERR_FUNC(EVP_F_EVP_PBE_ALG_ADD_TYPE), "EVP_PBE_alg_add_type"},
99 {ERR_FUNC(EVP_F_EVP_PBE_CIPHERINIT), "EVP_PBE_CipherInit"},
100 {ERR_FUNC(EVP_F_EVP_PKCS82PKEY), "EVP_PKCS82PKEY"},
101 {ERR_FUNC(EVP_F_EVP_PKCS82PKEY_BROKEN), "EVP_PKCS82PKEY_BROKEN"},
102 {ERR_FUNC(EVP_F_EVP_PKEY2PKCS8_BROKEN), "EVP_PKEY2PKCS8_broken"},
103 {ERR_FUNC(EVP_F_EVP_PKEY_COPY_PARAMETERS), "EVP_PKEY_copy_parameters"},
104 {ERR_FUNC(EVP_F_EVP_PKEY_CTX_CTRL), "EVP_PKEY_CTX_ctrl"},
105 {ERR_FUNC(EVP_F_EVP_PKEY_CTX_CTRL_STR), "EVP_PKEY_CTX_ctrl_str"},
106 {ERR_FUNC(EVP_F_EVP_PKEY_CTX_DUP), "EVP_PKEY_CTX_dup"},
107 {ERR_FUNC(EVP_F_EVP_PKEY_DECRYPT), "EVP_PKEY_decrypt"},
108 {ERR_FUNC(EVP_F_EVP_PKEY_DECRYPT_INIT), "EVP_PKEY_decrypt_init"},
109 {ERR_FUNC(EVP_F_EVP_PKEY_DECRYPT_OLD), "EVP_PKEY_decrypt_old"},
110 {ERR_FUNC(EVP_F_EVP_PKEY_DERIVE), "EVP_PKEY_derive"},
111 {ERR_FUNC(EVP_F_EVP_PKEY_DERIVE_INIT), "EVP_PKEY_derive_init"},
112 {ERR_FUNC(EVP_F_EVP_PKEY_DERIVE_SET_PEER), "EVP_PKEY_derive_set_peer"},
113 {ERR_FUNC(EVP_F_EVP_PKEY_ENCRYPT), "EVP_PKEY_encrypt"},
114 {ERR_FUNC(EVP_F_EVP_PKEY_ENCRYPT_INIT), "EVP_PKEY_encrypt_init"},
115 {ERR_FUNC(EVP_F_EVP_PKEY_ENCRYPT_OLD), "EVP_PKEY_encrypt_old"},
116 {ERR_FUNC(EVP_F_EVP_PKEY_GET1_DH), "EVP_PKEY_get1_DH"},
117 {ERR_FUNC(EVP_F_EVP_PKEY_GET1_DSA), "EVP_PKEY_get1_DSA"},
118 {ERR_FUNC(EVP_F_EVP_PKEY_GET1_ECDSA), "EVP_PKEY_get1_ECDSA"},
119 {ERR_FUNC(EVP_F_EVP_PKEY_GET1_EC_KEY), "EVP_PKEY_get1_EC_KEY"},
120 {ERR_FUNC(EVP_F_EVP_PKEY_GET1_RSA), "EVP_PKEY_get1_RSA"},
121 {ERR_FUNC(EVP_F_EVP_PKEY_KEYGEN), "EVP_PKEY_keygen"},
122 {ERR_FUNC(EVP_F_EVP_PKEY_KEYGEN_INIT), "EVP_PKEY_keygen_init"},
123 {ERR_FUNC(EVP_F_EVP_PKEY_NEW), "EVP_PKEY_new"},
124 {ERR_FUNC(EVP_F_EVP_PKEY_PARAMGEN), "EVP_PKEY_paramgen"},
125 {ERR_FUNC(EVP_F_EVP_PKEY_PARAMGEN_INIT), "EVP_PKEY_paramgen_init"},
126 {ERR_FUNC(EVP_F_EVP_PKEY_SIGN), "EVP_PKEY_sign"},
127 {ERR_FUNC(EVP_F_EVP_PKEY_SIGN_INIT), "EVP_PKEY_sign_init"},

```

```

128 {ERR_FUNC(EVP_F_EVP_PKEY_VERIFY), "EVP_PKEY_verify"},
129 {ERR_FUNC(EVP_F_EVP_PKEY_VERIFY_INIT), "EVP_PKEY_verify_init"},
130 {ERR_FUNC(EVP_F_EVP_PKEY_VERIFY_RECOVER), "EVP_PKEY_verify_recover"},
131 {ERR_FUNC(EVP_F_EVP_PKEY_VERIFY_RECOVER_INIT), "EVP_PKEY_verify_recover_init"},
132 {ERR_FUNC(EVP_F_EVP_RIJNDAEL), "EVP_RIJNDAEL"},
133 {ERR_FUNC(EVP_F_EVP_SIGNFINAL), "EVP_SignFinal"},
134 {ERR_FUNC(EVP_F_EVP_VERIFYFINAL), "EVP_VerifyFinal"},
135 {ERR_FUNC(EVP_F_FIPS_CIPHERINIT), "FIPS_CIPHERINIT"},
136 {ERR_FUNC(EVP_F_FIPS_CIPHER_CTX_COPY), "FIPS_CIPHER_CTX_COPY"},
137 {ERR_FUNC(EVP_F_FIPS_CIPHER_CTX_CTRL), "FIPS_CIPHER_CTX_CTRL"},
138 {ERR_FUNC(EVP_F_FIPS_CIPHER_CTX_SET_KEY_LENGTH), "FIPS_CIPHER_CTX_SET_KEY"},
139 {ERR_FUNC(EVP_F_FIPS_DIGESTINIT), "FIPS_DIGESTINIT"},
140 {ERR_FUNC(EVP_F_FIPS_MD_CTX_COPY), "FIPS_MD_CTX_COPY"},
141 {ERR_FUNC(EVP_F_HMAC_INIT_EX), "HMAC_Init_ex"},
142 {ERR_FUNC(EVP_F_INT_CTX_NEW), "INT_CTX_NEW"},
143 {ERR_FUNC(EVP_F_PKCS5_PBE_KEYIVGEN), "PKCS5_PBE_keyivgen"},
144 {ERR_FUNC(EVP_F_PKCS5_V2_PBE_KEYIVGEN), "PKCS5_v2_PBE_keyivgen"},
145 {ERR_FUNC(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN), "PKCS5_v2_PBKDF2_KEYIVGEN"},
146 {ERR_FUNC(EVP_F_PKCS8_SET_BROKEN), "PKCS8_set_broken"},
147 {ERR_FUNC(EVP_F_PKEY_SET_TYPE), "PKEY_SET_TYPE"},
148 {ERR_FUNC(EVP_F_RC2_MAGIC_TO_METH), "RC2_MAGIC_TO_METH"},
149 {ERR_FUNC(EVP_F_RC5_CTRL), "RC5_CTRL"},
150 {0, NULL}
151 };

```

```

153 static ERR_STRING_DATA EVP_str_reasons[] =
154 {
155 {ERR_REASON(EVP_R_AES_IV_SETUP_FAILED), "aes iv setup failed"},
156 {ERR_REASON(EVP_R_AES_KEY_SETUP_FAILED), "aes key setup failed"},
157 {ERR_REASON(EVP_R_ASN1_LIB), "asn1 lib"},
158 {ERR_REASON(EVP_R_BAD_BLOCK_LENGTH), "bad block length"},
159 {ERR_REASON(EVP_R_BAD_DECRYPT), "bad decrypt"},
160 {ERR_REASON(EVP_R_BAD_KEY_LENGTH), "bad key length"},
161 {ERR_REASON(EVP_R_BN_DECODE_ERROR), "bn decode error"},
162 {ERR_REASON(EVP_R_BN_PUBKEY_ERROR), "bn pubkey error"},
163 {ERR_REASON(EVP_R_BUFFER_TOO_SMALL), "buffer too small"},
164 {ERR_REASON(EVP_R_CAMELLIA_KEY_SETUP_FAILED), "camellia key setup failed"},
165 {ERR_REASON(EVP_R_CIPHER_PARAMETER_ERROR), "cipher parameter error"},
166 {ERR_REASON(EVP_R_COMMAND_NOT_SUPPORTED), "command not supported"},
167 {ERR_REASON(EVP_R_CTRL_NOT_IMPLEMENTED), "ctrl not implemented"},
168 {ERR_REASON(EVP_R_CTRL_OPERATION_NOT_IMPLEMENTED), "ctrl operation not implemented"},
169 {ERR_REASON(EVP_R_DATA_NOT_MULTIPLE_OF_BLOCK_LENGTH), "data not multiple of block"},
170 {ERR_REASON(EVP_R_DECODE_ERROR), "decode error"},
171 {ERR_REASON(EVP_R_DIFFERENT_KEY_TYPES), "different key types"},
172 {ERR_REASON(EVP_R_DIFFERENT_PARAMETERS), "different parameters"},
173 {ERR_REASON(EVP_R_DISABLED_FOR_FIPS), "disabled for fips"},
174 {ERR_REASON(EVP_R_ENCODE_ERROR), "encode error"},
175 {ERR_REASON(EVP_R_ERROR_LOADING_SECTION), "error loading section"},
176 {ERR_REASON(EVP_R_ERROR_SETTING_FIPS_MODE), "error setting fips mode"},
177 {ERR_REASON(EVP_R_EVP_PBE_CIPHERINIT_ERROR), "evp pbe cipherinit error"},
178 {ERR_REASON(EVP_R_EXPECTING_A_RSA_KEY), "expecting an rsa key"},
179 {ERR_REASON(EVP_R_EXPECTING_A_DH_KEY), "expecting a dh key"},
180 {ERR_REASON(EVP_R_EXPECTING_A_DSA_KEY), "expecting a dsa key"},
181 {ERR_REASON(EVP_R_EXPECTING_A_ECDSA_KEY), "expecting a ecdsa key"},
182 {ERR_REASON(EVP_R_EXPECTING_A_EC_KEY), "expecting a ec key"},
183 {ERR_REASON(EVP_R_FIPS_MODE_NOT_SUPPORTED), "fips mode not supported"},
184 {ERR_REASON(EVP_R_INITIALIZATION_ERROR), "initialization error"},
185 {ERR_REASON(EVP_R_INPUT_NOT_INITIALIZED), "input not initialized"},
186 {ERR_REASON(EVP_R_INVALID_DIGEST), "invalid digest"},
187 {ERR_REASON(EVP_R_INVALID_FIPS_MODE), "invalid fips mode"},
188 {ERR_REASON(EVP_R_INVALID_KEY_LENGTH), "invalid key length"},
189 {ERR_REASON(EVP_R_INVALID_OPERATION), "invalid operation"},
190 {ERR_REASON(EVP_R_IV_TOO_LARGE), "iv too large"},
191 {ERR_REASON(EVP_R_KEYGEN_FAILURE), "keygen failure"},
192 {ERR_REASON(EVP_R_MESSAGE_DIGEST_IS_NULL), "message digest is null"},
193 {ERR_REASON(EVP_R_METHOD_NOT_SUPPORTED), "method not supported"},

```

```

194 {ERR_REASON(EVP_R_MISSING_PARAMETERS), "missing parameters"},
195 {ERR_REASON(EVP_R_NO_CIPHER_SET), "no cipher set"},
196 {ERR_REASON(EVP_R_NO_DEFAULT_DIGEST), "no default digest"},
197 {ERR_REASON(EVP_R_NO_DIGEST_SET), "no digest set"},
198 {ERR_REASON(EVP_R_NO_DSA_PARAMETERS), "no dsa parameters"},
199 {ERR_REASON(EVP_R_NO_KEY_SET), "no key set"},
200 {ERR_REASON(EVP_R_NO_OPERATION_SET), "no operation set"},
201 {ERR_REASON(EVP_R_NO_SIGN_FUNCTION_CONFIGURED), "no sign function configured"},
202 {ERR_REASON(EVP_R_NO_VERIFY_FUNCTION_CONFIGURED), "no verify function configured"},
203 {ERR_REASON(EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE), "operation not supported"},
204 {ERR_REASON(EVP_R_OPERATION_NOT_INITIALIZED), "operation not initialized"},
205 {ERR_REASON(EVP_R_PKCS8_UNKNOWN_BROKEN_TYPE), "pkcs8 unknown broken type"},
206 {ERR_REASON(EVP_R_PRIVATE_KEY_DECODE_ERROR), "private key decode error"},
207 {ERR_REASON(EVP_R_PRIVATE_KEY_ENCODE_ERROR), "private key encode error"},
208 {ERR_REASON(EVP_R_PUBLIC_KEY_NOT_RSA), "public key not rsa"},
209 {ERR_REASON(EVP_R_TOO_LARGE), "too large"},
210 {ERR_REASON(EVP_R_UNKNOWN_CIPHER), "unknown cipher"},
211 {ERR_REASON(EVP_R_UNKNOWN_DIGEST), "unknown digest"},
212 {ERR_REASON(EVP_R_UNKNOWN_OPTION), "unknown option"},
213 {ERR_REASON(EVP_R_UNKNOWN_PBE_ALGORITHM), "unknown pbe algorithm"},
214 {ERR_REASON(EVP_R_UNSUPPORTED_NUMBER_OF_ROUNDS), "unsupported number of rounds"},
215 {ERR_REASON(EVP_R_UNSUPPORTED_ALGORITHM), "unsupported algorithm"},
216 {ERR_REASON(EVP_R_UNSUPPORTED_CIPHER), "unsupported cipher"},
217 {ERR_REASON(EVP_R_UNSUPPORTED_KEYLENGTH), "unsupported keylength"},
218 {ERR_REASON(EVP_R_UNSUPPORTED_KEY_DERIVATION_FUNCTION), "unsupported key derivation"},
219 {ERR_REASON(EVP_R_UNSUPPORTED_KEY_SIZE), "unsupported key size"},
220 {ERR_REASON(EVP_R_UNSUPPORTED_PRF), "unsupported prf"},
221 {ERR_REASON(EVP_R_UNSUPPORTED_PRIVATE_KEY_ALGORITHM), "unsupported private key algorithm"},
222 {ERR_REASON(EVP_R_UNSUPPORTED_SALT_TYPE), "unsupported salt type"},
223 {ERR_REASON(EVP_R_WRONG_FINAL_BLOCK_LENGTH), "wrong final block length"},
224 {ERR_REASON(EVP_R_WRONG_PUBLIC_KEY_TYPE), "wrong public key type"},
225 {0, NULL}
226 };

```

```
228 #endif
```

```
230 void ERR_load_EVP_strings(void)
```

```
231 {
```

```
232 #ifndef OPENSSL_NO_ERR
```

```
234     if (ERR_func_error_string(EVP_str_funcs[0].error) == NULL)
```

```
235     {
```

```
236         ERR_load_strings(0, EVP_str_funcs);
```

```
237         ERR_load_strings(0, EVP_str_reasons);
```

```
238     }
```

```
239 #endif
```

```
240 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_fips.c

1

```
*****
6353 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_fips.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/evp/evp_fips.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2011 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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19  *
20  * 3. All advertising materials mentioning features or use of this
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
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47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */

55 #include <openssl/evp.h>

57 #ifdef OPENSSL_FIPS
58 #include <openssl/fips.h>

60 const EVP_CIPHER *EVP_aes_128_cbc(void) { return FIPS_evp_aes_128_cbc(); }
61 const EVP_CIPHER *EVP_aes_128_ccm(void) { return FIPS_evp_aes_128_ccm(); }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_fips.c

2

```
62 const EVP_CIPHER *EVP_aes_128_cfb1(void) { return FIPS_evp_aes_128_cfb1(); }
63 const EVP_CIPHER *EVP_aes_128_cfb128(void) { return FIPS_evp_aes_128_cfb128(); }
64 const EVP_CIPHER *EVP_aes_128_cfb8(void) { return FIPS_evp_aes_128_cfb8(); }
65 const EVP_CIPHER *EVP_aes_128_ctr(void) { return FIPS_evp_aes_128_ctr(); }
66 const EVP_CIPHER *EVP_aes_128_ecb(void) { return FIPS_evp_aes_128_ecb(); }
67 const EVP_CIPHER *EVP_aes_128_gcm(void) { return FIPS_evp_aes_128_gcm(); }
68 const EVP_CIPHER *EVP_aes_128_ofb(void) { return FIPS_evp_aes_128_ofb(); }
69 const EVP_CIPHER *EVP_aes_128_xts(void) { return FIPS_evp_aes_128_xts(); }
70 const EVP_CIPHER *EVP_aes_192_cbc(void) { return FIPS_evp_aes_192_cbc(); }
71 const EVP_CIPHER *EVP_aes_192_ccm(void) { return FIPS_evp_aes_192_ccm(); }
72 const EVP_CIPHER *EVP_aes_192_cfb1(void) { return FIPS_evp_aes_192_cfb1(); }
73 const EVP_CIPHER *EVP_aes_192_cfb128(void) { return FIPS_evp_aes_192_cfb128(); }
74 const EVP_CIPHER *EVP_aes_192_cfb8(void) { return FIPS_evp_aes_192_cfb8(); }
75 const EVP_CIPHER *EVP_aes_192_ctr(void) { return FIPS_evp_aes_192_ctr(); }
76 const EVP_CIPHER *EVP_aes_192_ecb(void) { return FIPS_evp_aes_192_ecb(); }
77 const EVP_CIPHER *EVP_aes_192_gcm(void) { return FIPS_evp_aes_192_gcm(); }
78 const EVP_CIPHER *EVP_aes_192_ofb(void) { return FIPS_evp_aes_192_ofb(); }
79 const EVP_CIPHER *EVP_aes_256_cbc(void) { return FIPS_evp_aes_256_cbc(); }
80 const EVP_CIPHER *EVP_aes_256_ccm(void) { return FIPS_evp_aes_256_ccm(); }
81 const EVP_CIPHER *EVP_aes_256_cfb1(void) { return FIPS_evp_aes_256_cfb1(); }
82 const EVP_CIPHER *EVP_aes_256_cfb128(void) { return FIPS_evp_aes_256_cfb128(); }
83 const EVP_CIPHER *EVP_aes_256_cfb8(void) { return FIPS_evp_aes_256_cfb8(); }
84 const EVP_CIPHER *EVP_aes_256_ctr(void) { return FIPS_evp_aes_256_ctr(); }
85 const EVP_CIPHER *EVP_aes_256_ecb(void) { return FIPS_evp_aes_256_ecb(); }
86 const EVP_CIPHER *EVP_aes_256_gcm(void) { return FIPS_evp_aes_256_gcm(); }
87 const EVP_CIPHER *EVP_aes_256_ofb(void) { return FIPS_evp_aes_256_ofb(); }
88 const EVP_CIPHER *EVP_aes_256_xts(void) { return FIPS_evp_aes_256_xts(); }
89 const EVP_CIPHER *EVP_des_ede(void) { return FIPS_evp_des_ede(); }
90 const EVP_CIPHER *EVP_des_ede3(void) { return FIPS_evp_des_ede3(); }
91 const EVP_CIPHER *EVP_des_ede3_cbc(void) { return FIPS_evp_des_ede3_cbc(); }
92 const EVP_CIPHER *EVP_des_ede3_cfb1(void) { return FIPS_evp_des_ede3_cfb1(); }
93 const EVP_CIPHER *EVP_des_ede3_cfb64(void) { return FIPS_evp_des_ede3_cfb64(); }
94 const EVP_CIPHER *EVP_des_ede3_cfb8(void) { return FIPS_evp_des_ede3_cfb8(); }
95 const EVP_CIPHER *EVP_des_ede3_ecb(void) { return FIPS_evp_des_ede3_ecb(); }
96 const EVP_CIPHER *EVP_des_ede3_ofb(void) { return FIPS_evp_des_ede3_ofb(); }
97 const EVP_CIPHER *EVP_des_ede_cbc(void) { return FIPS_evp_des_ede_cbc(); }
98 const EVP_CIPHER *EVP_des_ede_cfb64(void) { return FIPS_evp_des_ede_cfb64(); }
99 const EVP_CIPHER *EVP_des_ede_ecb(void) { return FIPS_evp_des_ede_ecb(); }
100 const EVP_CIPHER *EVP_des_ede_ofb(void) { return FIPS_evp_des_ede_ofb(); }
101 const EVP_CIPHER *EVP_enc_null(void) { return FIPS_evp_enc_null(); }

103 const EVP_MD *EVP_sha1(void) { return FIPS_evp_sha1(); }
104 const EVP_MD *EVP_sha224(void) { return FIPS_evp_sha224(); }
105 const EVP_MD *EVP_sha256(void) { return FIPS_evp_sha256(); }
106 const EVP_MD *EVP_sha384(void) { return FIPS_evp_sha384(); }
107 const EVP_MD *EVP_sha512(void) { return FIPS_evp_sha512(); }

109 const EVP_MD *EVP_dss(void) { return FIPS_evp_dss(); }
110 const EVP_MD *EVP_dss1(void) { return FIPS_evp_dss1(); }
111 const EVP_MD *EVP_ecdsa(void) { return FIPS_evp_ecdsa(); }

113 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_key.c

1

6042 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/evp_key.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/x509.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_key.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/ui.h>
65
66 /* should be init to zeros. */
67 static char prompt_string[80];
68
69 void EVP_set_pw_prompt(const char *prompt)
70 {
71     if (prompt == NULL)
72         prompt_string[0]='\0';
73     else
74     {
75         strncpy(prompt_string,prompt,79);
76         prompt_string[79]='\0';
77     }
78 }
79
80 char *EVP_get_pw_prompt(void)
81 {
82     if (prompt_string[0] == '\0')
83         return(NULL);
84     else
85         return(prompt_string);
86 }
87
88 /* For historical reasons, the standard function for reading passwords is
89  * in the DES library -- if someone ever wants to disable DES,
90  * this function will fail */
91 int EVP_read_pw_string(char *buf, int len, const char *prompt, int verify)
92 {
93     return EVP_read_pw_string_min(buf, 0, len, prompt, verify);
94 }
95
96 int EVP_read_pw_string_min(char *buf, int min, int len, const char *prompt, int
97 {
98     int ret;
99     char buff[BUFSIZ];
100     UI *ui;
101
102     if ((prompt == NULL) && (prompt_string[0] != '\0'))
103         prompt=prompt_string;
104     ui = UI_new();
105     UI_add_input_string(ui,prompt,0,buf,min,(len>=BUFSIZ)?BUFSIZ-1:len);
106     if (verify)
107         UI_add_verify_string(ui,prompt,0,
108             buff,min,(len>=BUFSIZ)?BUFSIZ-1:len,buf);
109     ret = UI_process(ui);
110     UI_free(ui);
111     OPENSSL_cleanse(buff,BUFSIZ);
112     return ret;
113 }
114
115 int EVP_BytesToKey(const EVP_CIPHER *type, const EVP_MD *md,
116     const unsigned char *salt, const unsigned char *data, int datal,
117     int count, unsigned char *key, unsigned char *iv)
118 {
119     EVP_MD_CTX c;
120     unsigned char md_buf[EVP_MAX_MD_SIZE];
121     int niv,nkey,addmd=0;
122     unsigned int mds=0,i;
123     int rv = 0;
124     nkey=type->key_len;
125     niv=type->iv_len;
126     OPENSSL_assert(nkey <= EVP_MAX_KEY_LENGTH);
127     OPENSSL_assert(niv <= EVP_MAX_IV_LENGTH);
```

```

129     if (data == NULL) return(nkey);
131     EVP_MD_CTX_init(&c);
132     for (;;)
133     {
134         if (!EVP_DigestInit_ex(&c,md, NULL))
135             return 0;
136         if (addmd++)
137             if (!EVP_DigestUpdate(&c,&(md_buf[0]),mds))
138                 goto err;
139         if (!EVP_DigestUpdate(&c,data,data1))
140             goto err;
141         if (salt != NULL)
142             if (!EVP_DigestUpdate(&c,salt,PKCS5_SALT_LEN))
143                 goto err;
144         if (!EVP_DigestFinal_ex(&c,&(md_buf[0]),&mds))
145             goto err;

147         for (i=1; i<(unsigned int)count; i++)
148         {
149             if (!EVP_DigestInit_ex(&c,md, NULL))
150                 goto err;
151             if (!EVP_DigestUpdate(&c,&(md_buf[0]),mds))
152                 goto err;
153             if (!EVP_DigestFinal_ex(&c,&(md_buf[0]),&mds))
154                 goto err;
155         }
156         i=0;
157         if (nkey)
158         {
159             for (;;)
160             {
161                 if (nkey == 0) break;
162                 if (i == mds) break;
163                 if (key != NULL)
164                     *(key++)=md_buf[i];
165                 nkey--;
166                 i++;
167             }
168         }
169         if (niv && (i != mds))
170         {
171             for (;;)
172             {
173                 if (niv == 0) break;
174                 if (i == mds) break;
175                 if (iv != NULL)
176                     *(iv++)=md_buf[i];
177                 niv--;
178                 i++;
179             }
180         }
181         if ((nkey == 0) && (niv == 0)) break;
182     }
183     rv = type->key_len;
184     err:
185     EVP_MD_CTX_cleanup(&c);
186     OPENSSL_cleanse(&(md_buf[0]),EVP_MAX_MD_SIZE);
187     return rv;
188 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_lib.c

1

7884 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/evp_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_lib.c

2

```
62 #include <openssl/objects.h>
64 int EVP_CIPHER_param_to_asn1(EVP_CIPHER_CTX *c, ASN1_TYPE *type)
65 {
66     int ret;
67
68     if (c->cipher->set_asn1_parameters != NULL)
69         ret=c->cipher->set_asn1_parameters(c,type);
70     else if (c->cipher->flags & EVP_CIPH_FLAG_DEFAULT_ASN1)
71         ret=EVP_CIPHER_set_asn1_iv(c, type);
72     else
73         ret=-1;
74     return(ret);
75 }
77 int EVP_CIPHER_asn1_to_param(EVP_CIPHER_CTX *c, ASN1_TYPE *type)
78 {
79     int ret;
80
81     if (c->cipher->get_asn1_parameters != NULL)
82         ret=c->cipher->get_asn1_parameters(c,type);
83     else if (c->cipher->flags & EVP_CIPH_FLAG_DEFAULT_ASN1)
84         ret=EVP_CIPHER_get_asn1_iv(c, type);
85     else
86         ret=-1;
87     return(ret);
88 }
90 int EVP_CIPHER_get_asn1_iv(EVP_CIPHER_CTX *c, ASN1_TYPE *type)
91 {
92     int i=0;
93     unsigned int l;
94
95     if (type != NULL)
96     {
97         l=EVP_CIPHER_CTX_iv_length(c);
98         OPENSSL_assert(l <= sizeof(c->iv));
99         i=ASN1_TYPE_get_octetstring(type,c->oiv,l);
100         if (i != (int)l)
101             return(-1);
102         else if (i > 0)
103             memcpy(c->iv,c->oiv,l);
104     }
105     return(i);
106 }
108 int EVP_CIPHER_set_asn1_iv(EVP_CIPHER_CTX *c, ASN1_TYPE *type)
109 {
110     int i=0;
111     unsigned int j;
112
113     if (type != NULL)
114     {
115         j=EVP_CIPHER_CTX_iv_length(c);
116         OPENSSL_assert(j <= sizeof(c->iv));
117         i=ASN1_TYPE_set_octetstring(type,c->oiv,j);
118     }
119     return(i);
120 }
122 /* Convert the various cipher NIDs and dummies to a proper OID NID */
123 int EVP_CIPHER_type(const EVP_CIPHER *ctx)
124 {
125     int nid;
126     ASN1_OBJECT *otmp;
127     nid = EVP_CIPHER_nid(ctx);
```

```

129     switch(nid) {
131         case NID_rc2_cbc:
132         case NID_rc2_64_cbc:
133         case NID_rc2_40_cbc:
135             return NID_rc2_cbc;
137
138         case NID_rc4:
139         case NID_rc4_40:
141             return NID_rc4;
142
143         case NID_aes_128_cfb128:
144         case NID_aes_128_cfb8:
145         case NID_aes_128_cfb1:
147             return NID_aes_128_cfb128;
148
149         case NID_aes_192_cfb128:
150         case NID_aes_192_cfb8:
151         case NID_aes_192_cfb1:
153             return NID_aes_192_cfb128;
154
155         case NID_aes_256_cfb128:
156         case NID_aes_256_cfb8:
157         case NID_aes_256_cfb1:
159             return NID_aes_256_cfb128;
160
161         case NID_des_cfb64:
162         case NID_des_cfb8:
163         case NID_des_cfb1:
165             return NID_des_cfb64;
166
167         case NID_des_ede3_cfb64:
168         case NID_des_ede3_cfb8:
169         case NID_des_ede3_cfb1:
171             return NID_des_ede3_cfb64;
172
173         default:
174             /* Check it has an OID and it is valid */
175             otmp = OBJ_nid2obj(nid);
176             if(!otmp || !otmp->data) nid = NID_undef;
177             ASN1_OBJECT_free(otmp);
178             return nid;
179     }
180
181 int EVP_CIPHER_block_size(const EVP_CIPHER *e)
182 {
183     return e->block_size;
184 }
185
186 int EVP_CIPHER_CTX_block_size(const EVP_CIPHER_CTX *ctx)
187 {
188     return ctx->cipher->block_size;
189 }
190
191 int EVP_Cipher(EVP_CIPHER_CTX *ctx, unsigned char *out, const unsigned char *in,
192               int inl)
193 {
194     return ctx->cipher->do_cipher(ctx, out, in, inl);
195 }

```

```

194     }
195
196 const EVP_CIPHER *EVP_CIPHER_CTX_cipher(const EVP_CIPHER_CTX *ctx)
197 {
198     return ctx->cipher;
199 }
200
201 unsigned long EVP_CIPHER_flags(const EVP_CIPHER *cipher)
202 {
203     return cipher->flags;
204 }
205
206 unsigned long EVP_CIPHER_CTX_flags(const EVP_CIPHER_CTX *ctx)
207 {
208     return ctx->cipher->flags;
209 }
210
211 void *EVP_CIPHER_CTX_get_app_data(const EVP_CIPHER_CTX *ctx)
212 {
213     return ctx->app_data;
214 }
215
216 void EVP_CIPHER_CTX_set_app_data(EVP_CIPHER_CTX *ctx, void *data)
217 {
218     ctx->app_data = data;
219 }
220
221 int EVP_CIPHER_iv_length(const EVP_CIPHER *cipher)
222 {
223     return cipher->iv_len;
224 }
225
226 int EVP_CIPHER_CTX_iv_length(const EVP_CIPHER_CTX *ctx)
227 {
228     return ctx->cipher->iv_len;
229 }
230
231 int EVP_CIPHER_key_length(const EVP_CIPHER *cipher)
232 {
233     return cipher->key_len;
234 }
235
236 int EVP_CIPHER_CTX_key_length(const EVP_CIPHER_CTX *ctx)
237 {
238     return ctx->key_len;
239 }
240
241 int EVP_CIPHER_nid(const EVP_CIPHER *cipher)
242 {
243     return cipher->nid;
244 }
245
246 int EVP_CIPHER_CTX_nid(const EVP_CIPHER_CTX *ctx)
247 {
248     return ctx->cipher->nid;
249 }
250
251 int EVP_MD_block_size(const EVP_MD *md)
252 {
253     return md->block_size;
254 }
255
256 int EVP_MD_type(const EVP_MD *md)
257 {
258     return md->type;
259 }

```



```
261 int EVP_MD_pkey_type(const EVP_MD *md)
262 {
263     return md->pkey_type;
264 }

266 int EVP_MD_size(const EVP_MD *md)
267 {
268     if (!md)
269     {
270         EVPerr(EVP_F_EVP_MD_SIZE, EVP_R_MESSAGE_DIGEST_IS_NULL);
271         return -1;
272     }
273     return md->md_size;
274 }

276 unsigned long EVP_MD_flags(const EVP_MD *md)
277 {
278     return md->flags;
279 }

281 const EVP_MD *EVP_MD_CTX_md(const EVP_MD_CTX *ctx)
282 {
283     if (!ctx)
284         return NULL;
285     return ctx->digest;
286 }

288 void EVP_MD_CTX_set_flags(EVP_MD_CTX *ctx, int flags)
289 {
290     ctx->flags |= flags;
291 }

293 void EVP_MD_CTX_clear_flags(EVP_MD_CTX *ctx, int flags)
294 {
295     ctx->flags &= ~flags;
296 }

298 int EVP_MD_CTX_test_flags(const EVP_MD_CTX *ctx, int flags)
299 {
300     return (ctx->flags & flags);
301 }

303 void EVP_CIPHER_CTX_set_flags(EVP_CIPHER_CTX *ctx, int flags)
304 {
305     ctx->flags |= flags;
306 }

308 void EVP_CIPHER_CTX_clear_flags(EVP_CIPHER_CTX *ctx, int flags)
309 {
310     ctx->flags &= ~flags;
311 }

313 int EVP_CIPHER_CTX_test_flags(const EVP_CIPHER_CTX *ctx, int flags)
314 {
315     return (ctx->flags & flags);
316 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_pbe.c

1

```
*****
9141 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_pbe.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* evp_pbe.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_pbe.c

2

```
62 #include <openssl/pkcs12.h>
63 #include <openssl/x509.h>
64 #include "evp_loc1.h"

66 /* Password based encryption (PBE) functions */

68 DECLARE_STACK_OF(EVP_PBE_CTL)
69 static STACK_OF(EVP_PBE_CTL) *pbe_algs;

71 /* Setup a cipher context from a PBE algorithm */

73 typedef struct
74 {
75     int pbe_type;
76     int pbe_nid;
77     int cipher_nid;
78     int md_nid;
79     EVP_PBE_KEYGEN *keygen;
80 } EVP_PBE_CTL;

82 static const EVP_PBE_CTL builtin_pbe[] =
83 {
84     {EVP_PBE_TYPE_OUTER, NID_pbewithMD2AndDES_CBC,
85      NID_des_cbc, NID_md2, PKCS5_PBE_keyivgen},
86     {EVP_PBE_TYPE_OUTER, NID_pbewithMD5AndDES_CBC,
87      NID_des_cbc, NID_md5, PKCS5_PBE_keyivgen},
88     {EVP_PBE_TYPE_OUTER, NID_pbewithSHA1AndRC2_CBC,
89      NID_rc2_64_cbc, NID_sha1, PKCS5_PBE_keyivgen},

91 #ifndef OPENSSL_NO_HMAC
92     {EVP_PBE_TYPE_OUTER, NID_id_pbkdf2, -1, -1, PKCS5_v2_PBKDF2_keyivgen},
93 #endif

95     {EVP_PBE_TYPE_OUTER, NID_pbe_withSHA1And128BitRC4,
96      NID_rc4, NID_sha1, PKCS12_PBE_keyivgen},
97     {EVP_PBE_TYPE_OUTER, NID_pbe_withSHA1And40BitRC4,
98      NID_rc4_40, NID_sha1, PKCS12_PBE_keyivgen},
99     {EVP_PBE_TYPE_OUTER, NID_pbe_withSHA1And3_Key_TripleDES_CBC,
100      NID_des_ede3_cbc, NID_sha1, PKCS12_PBE_keyivgen},
101     {EVP_PBE_TYPE_OUTER, NID_pbe_withSHA1And2_Key_TripleDES_CBC,
102      NID_des_ede_cbc, NID_sha1, PKCS12_PBE_keyivgen},
103     {EVP_PBE_TYPE_OUTER, NID_pbe_withSHA1And128BitRC2_CBC,
104      NID_rc2_cbc, NID_sha1, PKCS12_PBE_keyivgen},
105     {EVP_PBE_TYPE_OUTER, NID_pbe_withSHA1And40BitRC2_CBC,
106      NID_rc2_40_cbc, NID_sha1, PKCS12_PBE_keyivgen},

108 #ifndef OPENSSL_NO_HMAC
109     {EVP_PBE_TYPE_OUTER, NID_pbess2, -1, -1, PKCS5_v2_PBE_keyivgen},
110 #endif

111     {EVP_PBE_TYPE_OUTER, NID_pbewithMD2AndRC2_CBC,
112      NID_rc2_64_cbc, NID_md2, PKCS5_PBE_keyivgen},
113     {EVP_PBE_TYPE_OUTER, NID_pbewithMD5AndRC2_CBC,
114      NID_rc2_64_cbc, NID_md5, PKCS5_PBE_keyivgen},
115     {EVP_PBE_TYPE_OUTER, NID_pbewithSHA1AndDES_CBC,
116      NID_des_cbc, NID_sha1, PKCS5_PBE_keyivgen},

119     {EVP_PBE_TYPE_PRF, NID_hmacWithSHA1, -1, NID_sha1, 0},
120     {EVP_PBE_TYPE_PRF, NID_hmacWithMD5, -1, NID_md5, 0},
121     {EVP_PBE_TYPE_PRF, NID_hmacWithSHA224, -1, NID_sha224, 0},
122     {EVP_PBE_TYPE_PRF, NID_hmacWithSHA256, -1, NID_sha256, 0},
123     {EVP_PBE_TYPE_PRF, NID_hmacWithSHA384, -1, NID_sha384, 0},
124     {EVP_PBE_TYPE_PRF, NID_hmacWithSHA512, -1, NID_sha512, 0},
125     {EVP_PBE_TYPE_PRF, NID_id_HMACGOSTR3411_94, -1, NID_id_GOSTR3411_94, 0},
126     };
```

```

128 #ifdef TEST
129 int main(int argc, char **argv)
130 {
131     int i, nid_md, nid_cipher;
132     EVP_PBE_CTL *tpbe, *tpbe2;
133     /*OpenSSL_add_all_algorithms();*/

135     for (i = 0; i < sizeof(builtin_pbe)/sizeof(EVP_PBE_CTL); i++)
136     {
137         tpbe = builtin_pbe + i;
138         fprintf(stderr, "%d %d %s ", tpbe->pbe_type, tpbe->pbe_nid,
139             OBJ_nid2sn(tpbe->pbe_nid));
140         if (EVP_PBE_find(tpbe->pbe_type, tpbe->pbe_nid,
141             &nid_cipher, &nid_md, 0))
142             fprintf(stderr, "Found %s %s\n",
143                 OBJ_nid2sn(nid_cipher),
144                 OBJ_nid2sn(nid_md));
145         else
146             fprintf(stderr, "Find ERROR!!\n");
147     }

149     return 0;
150 }
151 #endif
152

155 int EVP_PBE_CipherInit(ASN1_OBJECT *pbe_obj, const char *pass, int passlen,
156     ASN1_TYPE *param, EVP_CIPHER_CTX *ctx, int en_de)
157 {
158     const EVP_CIPHER *cipher;
159     const EVP_MD *md;
160     int cipher_nid, md_nid;
161     EVP_PBE_KEYGEN *keygen;

163     if (!EVP_PBE_find(EVP_PBE_TYPE_OUTER, OBJ_obj2nid(pbe_obj),
164         &cipher_nid, &md_nid, &keygen))
165     {
166         char obj_tmp[80];
167         EVPerr(EVP_F_EVP_PBE_CIPHERINIT, EVP_R_UNKNOWN_PBE_ALGORITHM);
168         if (!pbe_obj) BUF_strlcpy(obj_tmp, "NULL", sizeof obj_tmp);
169         else i2t_ASN1_OBJECT(obj_tmp, sizeof obj_tmp, pbe_obj);
170         ERR_add_error_data(2, "TYPE=", obj_tmp);
171         return 0;
172     }

174     if(!pass)
175         passlen = 0;
176     else if (passlen == -1)
177         passlen = strlen(pass);

179     if (cipher_nid == -1)
180         cipher = NULL;
181     else
182     {
183         cipher = EVP_get_cipherbynid(cipher_nid);
184         if (!cipher)
185         {
186             EVPerr(EVP_F_EVP_PBE_CIPHERINIT, EVP_R_UNKNOWN_CIPHER);
187             return 0;
188         }
189     }

191     if (md_nid == -1)
192         md = NULL;
193     else

```

```

194     {
195         md = EVP_get_digestbynid(md_nid);
196         if (!md)
197         {
198             EVPerr(EVP_F_EVP_PBE_CIPHERINIT, EVP_R_UNKNOWN_DIGEST);
199             return 0;
200         }
201     }

203     if (!keygen(ctx, pass, passlen, param, cipher, md, en_de))
204     {
205         EVPerr(EVP_F_EVP_PBE_CIPHERINIT, EVP_R_KEYGEN_FAILURE);
206         return 0;
207     }
208     return 1;
209 }

211 DECLARE_OBJ_BSEARCH_CMP_FN(EVP_PBE_CTL, EVP_PBE_CTL, pbe2);

213 static int pbe2_cmp(const EVP_PBE_CTL *pbe1, const EVP_PBE_CTL *pbe2)
214 {
215     int ret = pbe1->pbe_type - pbe2->pbe_type;
216     if (ret)
217         return ret;
218     else
219         return pbe1->pbe_nid - pbe2->pbe_nid;
220 }

222 IMPLEMENT_OBJ_BSEARCH_CMP_FN(EVP_PBE_CTL, EVP_PBE_CTL, pbe2);

224 static int pbe_cmp(const EVP_PBE_CTL * const *a, const EVP_PBE_CTL * const *b)
225 {
226     int ret = (*a)->pbe_type - (*b)->pbe_type;
227     if (ret)
228         return ret;
229     else
230         return (*a)->pbe_nid - (*b)->pbe_nid;
231 }

233 /* Add a PBE algorithm */

235 int EVP_PBE_alg_add_type(int pbe_type, int pbe_nid, int cipher_nid, int md_nid,
236     EVP_PBE_KEYGEN *keygen)
237 {
238     EVP_PBE_CTL *pbe_tmp;
239     if (!pbe_algs)
240         pbe_algs = sk_EVP_PBE_CTL_new(pbe_cmp);
241     if (!(pbe_tmp = (EVP_PBE_CTL*) OPENSSL_malloc (sizeof(EVP_PBE_CTL))))
242     {
243         EVPerr(EVP_F_EVP_PBE_ALG_ADD_TYPE, ERR_R_MALLOC_FAILURE);
244         return 0;
245     }
246     pbe_tmp->pbe_type = pbe_type;
247     pbe_tmp->pbe_nid = pbe_nid;
248     pbe_tmp->cipher_nid = cipher_nid;
249     pbe_tmp->md_nid = md_nid;
250     pbe_tmp->keygen = keygen;

253     sk_EVP_PBE_CTL_push (pbe_algs, pbe_tmp);
254     return 1;
255 }

257 int EVP_PBE_alg_add(int nid, const EVP_CIPHER *cipher, const EVP_MD *md,
258     EVP_PBE_KEYGEN *keygen)
259 {

```

```
260     int cipher_nid, md_nid;
261     if (cipher)
262         cipher_nid = EVP_CIPHER_type(cipher);
263     else
264         cipher_nid = -1;
265     if (md)
266         md_nid = EVP_MD_type(md);
267     else
268         md_nid = -1;
269
270     return EVP_PBE_alg_add_type(EVP_PBE_TYPE_OUTER, nid,
271                                cipher_nid, md_nid, keygen);
272 }
273
274 int EVP_PBE_find(int type, int pbe_nid,
275                  int *pcnid, int *pmnid, EVP_PBE_KEYGEN **pkeygen)
276 {
277     EVP_PBE_CTL *pbetmp = NULL, pbelu;
278     int i;
279     if (pbe_nid == NID_undef)
280         return 0;
281
282     pbelu.pbe_type = type;
283     pbelu.pbe_nid = pbe_nid;
284
285     if (pbe_algs)
286     {
287         i = sk_EVP_PBE_CTL_find(pbe_algs, &pbelu);
288         if (i != -1)
289             pbetmp = sk_EVP_PBE_CTL_value (pbe_algs, i);
290     }
291     if (pbetmp == NULL)
292     {
293         pbetmp = OBJ_bsearch_pbe2(&pbelu, builtin_pbe,
294                                  sizeof(builtin_pbe)/sizeof(EVP_PBE_CTL));
295     }
296     if (pbetmp == NULL)
297         return 0;
298     if (pcnid)
299         *pcnid = pbetmp->cipher_nid;
300     if (pmnid)
301         *pmnid = pbetmp->md_nid;
302     if (pkeygen)
303         *pkeygen = pbetmp->keygen;
304     return 1;
305 }
306
307 static void free_evp_pbe_ctl(EVP_PBE_CTL *pbe)
308 {
309     OPENSSL_freeFunc(pbe);
310 }
311
312 void EVP_PBE_cleanup(void)
313 {
314     sk_EVP_PBE_CTL_pop_free(pbe_algs, free_evp_pbe_ctl);
315     pbe_algs = NULL;
316 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_pkey.c

1

```
*****
6602 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/evp_pkey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* evp_pkey.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */

59 #include <stdio.h>
60 #include <stdlib.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/evp_pkey.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/rand.h>
64 #include "asn1_locl.h"

66 /* Extract a private key from a PKCS8 structure */

68 EVP_PKEY *EVP_PKCS82PKEY(PKCS8_PRIV_KEY_INFO *p8)
69 {
70     EVP_PKEY *pkey = NULL;
71     ASN1_OBJECT *algoid;
72     char obj_tmp[80];

74     if (!PKCS8_pkey_get0(&algoid, NULL, NULL, NULL, p8))
75         return NULL;

77     if (!(pkey = EVP_PKEY_new())) {
78         EVPerr(EVP_F_EVP_PKCS82PKEY, ERR_R_MALLOC_FAILURE);
79         return NULL;
80     }

82     if (!EVP_PKEY_set_type(pkey, OBJ_obj2nid(algoid)))
83     {
84         EVPerr(EVP_F_EVP_PKCS82PKEY, EVP_R_UNSUPPORTED_PRIVATE_KEY_ALGOR
85             i2t_ASN1_OBJECT(obj_tmp, 80, algoid);
86             ERR_add_error_data(2, "TYPE=", obj_tmp);
87             goto error;
88     }

90     if (pkey->ameth->priv_decode)
91     {
92         if (!pkey->ameth->priv_decode(pkey, p8))
93         {
94             EVPerr(EVP_F_EVP_PKCS82PKEY,
95                 EVP_R_PRIVATE_KEY_DECODE_ERROR);
96             goto error;
97         }
98     }
99     else
100     {
101         EVPerr(EVP_F_EVP_PKCS82PKEY, EVP_R_METHOD_NOT_SUPPORTED);
102         goto error;
103     }

105     return pkey;

107     error:
108     EVP_PKEY_free(pkey);
109     return NULL;
110 }

112 PKCS8_PRIV_KEY_INFO *EVP_PKEY2PKCS8(EVP_PKEY *pkey)
113 {
114     return EVP_PKEY2PKCS8_broken(pkey, PKCS8_OK);
115 }

117 /* Turn a private key into a PKCS8 structure */

119 PKCS8_PRIV_KEY_INFO *EVP_PKEY2PKCS8_broken(EVP_PKEY *pkey, int broken)
120 {
121     PKCS8_PRIV_KEY_INFO *p8;

123     if (!(p8 = PKCS8_PRIV_KEY_INFO_new())) {
124         EVPerr(EVP_F_EVP_PKEY2PKCS8_BROKEN, ERR_R_MALLOC_FAILURE);
125         return NULL;
126     }
127     p8->broken = broken;
```

```

129     if (pkey->ameth)
130     {
131         if (pkey->ameth->priv_encode)
132         {
133             if (!pkey->ameth->priv_encode(p8, pkey))
134             {
135                 EVPerr(EVP_F_EVP_PKEY2PKCS8_BROKEN,
136                     EVP_R_PRIVATE_KEY_ENCODE_ERROR);
137                 goto error;
138             }
139         }
140         else
141         {
142             EVPerr(EVP_F_EVP_PKEY2PKCS8_BROKEN,
143                 EVP_R_METHOD_NOT_SUPPORTED);
144             goto error;
145         }
146     }
147     else
148     {
149         EVPerr(EVP_F_EVP_PKEY2PKCS8_BROKEN,
150             EVP_R_UNSUPPORTED_PRIVATE_KEY_ALGORITHM);
151         goto error;
152     }
153     RAND_add(p8->pkey->value.octet_string->data,
154             p8->pkey->value.octet_string->length, 0.0);
155     return p8;
156 error:
157     PKCS8_PRIV_KEY_INFO_free(p8);
158     return NULL;
159 }

161 PKCS8_PRIV_KEY_INFO *PKCS8_set_broken(PKCS8_PRIV_KEY_INFO *p8, int broken)
162 {
163     switch (broken) {
164
165         case PKCS8_OK:
166             p8->broken = PKCS8_OK;
167             return p8;
168             break;
169
170         case PKCS8_NO_OCTET:
171             p8->broken = PKCS8_NO_OCTET;
172             p8->pkey->type = V_ASN1_SEQUENCE;
173             return p8;
174             break;
175
176         default:
177             EVPerr(EVP_F_PKCS8_SET_BROKEN, EVP_R_PKCS8_UNKNOWN_BROKEN_TYPE);
178             return NULL;
179     }
180 }

182 /* EVP_PKEY attribute functions */

184 int EVP_PKEY_get_attr_count(const EVP_PKEY *key)
185 {
186     return X509at_get_attr_count(key->attributes);
187 }

189 int EVP_PKEY_get_attr_by_NID(const EVP_PKEY *key, int nid,
190                             int lastpos)
191 {
192     return X509at_get_attr_by_NID(key->attributes, nid, lastpos);
193 }

```

```

195 int EVP_PKEY_get_attr_by_OBJ(const EVP_PKEY *key, ASN1_OBJECT *obj,
196                             int lastpos)
197 {
198     return X509at_get_attr_by_OBJ(key->attributes, obj, lastpos);
199 }

201 X509_ATTRIBUTE *EVP_PKEY_get_attr(const EVP_PKEY *key, int loc)
202 {
203     return X509at_get_attr(key->attributes, loc);
204 }

206 X509_ATTRIBUTE *EVP_PKEY_delete_attr(EVP_PKEY *key, int loc)
207 {
208     return X509at_delete_attr(key->attributes, loc);
209 }

211 int EVP_PKEY_add1_attr(EVP_PKEY *key, X509_ATTRIBUTE *attr)
212 {
213     if(X509at_add1_attr(&key->attributes, attr)) return 1;
214     return 0;
215 }

217 int EVP_PKEY_add1_attr_by_OBJ(EVP_PKEY *key,
218                             const ASN1_OBJECT *obj, int type,
219                             const unsigned char *bytes, int len)
220 {
221     if(X509at_add1_attr_by_OBJ(&key->attributes, obj,
222                             type, bytes, len)) return 1;
223     return 0;
224 }

226 int EVP_PKEY_add1_attr_by_NID(EVP_PKEY *key,
227                             int nid, int type,
228                             const unsigned char *bytes, int len)
229 {
230     if(X509at_add1_attr_by_NID(&key->attributes, nid,
231                             type, bytes, len)) return 1;
232     return 0;
233 }

235 int EVP_PKEY_add1_attr_by_txt(EVP_PKEY *key,
236                             const char *attrname, int type,
237                             const unsigned char *bytes, int len)
238 {
239     if(X509at_add1_attr_by_txt(&key->attributes, attrname,
240                             type, bytes, len)) return 1;
241     return 0;
242 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_dss.c

1

3987 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_dss.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/m_dss.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_dss.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/sha.h>
64 #ifndef OPENSSL_NO_DSA
65 #include <openssl/dsa.h>
66 #endif
67
68 #ifndef OPENSSL_NO_SHA
69 #ifndef OPENSSL_FIPS
70
71 static int init(EVP_MD_CTX *ctx)
72 { return SHA1_Init(ctx->md_data); }
73
74 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
75 { return SHA1_Update(ctx->md_data, data, count); }
76
77 static int final(EVP_MD_CTX *ctx, unsigned char *md)
78 { return SHA1_Final(md, ctx->md_data); }
79
80 static const EVP_MD dsa_md=
81 {
82     NID_dsaWithSHA,
83     NID_dsaWithSHA,
84     SHA_DIGEST_LENGTH,
85     EVP_MD_FLAG_PKEY_DIGEST,
86     init,
87     update,
88     final,
89     NULL,
90     NULL,
91     EVP_PKEY_DSA_method,
92     SHA_CBLOCK,
93     sizeof(EVP_MD *)+sizeof(SHA_CTX),
94     };
95
96 const EVP_MD *EVP_dss(void)
97 {
98     return(&dsa_md);
99 }
100 #endif
101 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_dss1.c

1

3988 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_dss1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/m_dss1.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_dss1.c

2

```
62 #ifndef OPENSSL_NO_SHA
63
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include <openssl/sha.h>
67 #ifndef OPENSSL_NO_DSA
68 #include <openssl/dsa.h>
69 #endif
70
71 #ifndef OPENSSL_FIPS
72
73 static int init(EVP_MD_CTX *ctx)
74 { return SHA1_Init(ctx->md_data); }
75
76 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
77 { return SHA1_Update(ctx->md_data, data, count); }
78
79 static int final(EVP_MD_CTX *ctx, unsigned char *md)
80 { return SHA1_Final(md, ctx->md_data); }
81
82 static const EVP_MD dss1_md=
83 {
84     NID_dsa,
85     NID_dsaWithSHA1,
86     SHA_DIGEST_LENGTH,
87     EVP_MD_FLAG_PKEY_DIGEST,
88     init,
89     update,
90     final,
91     NULL,
92     NULL,
93     EVP_PKEY_DSA_method,
94     SHA_CBLOCK,
95     sizeof(EVP_MD *)+sizeof(SHA_CTX),
96     };
97
98 const EVP_MD *EVP_dss1(void)
99 {
100     return(&dss1_md);
101 }
102 #endif
103 #endif
```


new/usr/src/lib/openssl/libsunw_crypto/evp/m_ecdsa.c

1

```
*****
6587 Fri May 30 18:31:52 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_ecdsa.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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52 * Hudson (tjh@cryptsoft.com).
53 *
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57  *
58  * This package is an SSL implementation written
59  * by Eric Young (eay@cryptsoft.com).
60  * The implementation was written so as to conform with Netscapes SSL.
61  *
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_ecdsa.c

2

```
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109 * [including the GNU Public Licence.]
110 */

112 #include <stdio.h>
113 #include "cryptlib.h"
114 #include <openssl/evp.h>
115 #include <openssl/objects.h>
116 #include <openssl/x509.h>

118 #ifndef OPENSSL_NO_SHA
119 #ifndef OPENSSL_FIPS

121 static int init(EVP_MD_CTX *ctx)
122 { return SHA1_Init(ctx->md_data); }

124 static int update(EVP_MD_CTX *ctx,const void *data,size_t count)
125 { return SHA1_Update(ctx->md_data,data,count); }

127 static int final(EVP_MD_CTX *ctx,unsigned char *md)
```

```
128     { return SHA1_Final(md,ctx->md_data); }

130 static const EVP_MD ecdsa_md=
131 {
132     NID_ecdsa_with_SHA1,
133     NID_ecdsa_with_SHA1,
134     SHA_DIGEST_LENGTH,
135     EVP_MD_FLAG_PKEY_DIGEST,
136     init,
137     update,
138     final,
139     NULL,
140     NULL,
141     EVP_PKEY_ECDSA_method,
142     SHA_CBLOCK,
143     sizeof(EVP_MD *)+sizeof(SHA_CTX),
144 };

146 const EVP_MD *EVP_ecdsa(void)
147 {
148     return(&ecdsa_md);
149 }
150 #endif
151 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_md2.c

1

3963 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_md2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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7  * The implementation was written so as to conform with Netscapes SSL.
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_md2.c

2

62 #ifndef OPENSSL_NO_MD2

```
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include <openssl/x509.h>
67 #include <openssl/md2.h>
68 #ifndef OPENSSL_NO_RSA
69 #include <openssl/rsa.h>
70 #endif
71
72 static int init(EVP_MD_CTX *ctx)
73 { return MD2_Init(ctx->md_data); }
74
75 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
76 { return MD2_Update(ctx->md_data, data, count); }
77
78 static int final(EVP_MD_CTX *ctx, unsigned char *md)
79 { return MD2_Final(md, ctx->md_data); }
80
81 static const EVP_MD md2_md=
82 {
83     NID_md2,
84     NID_md2WithRSAEncryption,
85     MD2_DIGEST_LENGTH,
86     0,
87     init,
88     update,
89     final,
90     NULL,
91     NULL,
92     EVP_PKEY_RSA_method,
93     MD2_BLOCK,
94     sizeof(EVP_MD *)+sizeof(MD2_CTX),
95     };
96
97 const EVP_MD *EVP_md2(void)
98 {
99     return(&md2_md);
100 }
101 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_md4.c

1

3987 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_md4.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_md4.c

2

62 #ifndef OPENSSL_NO_MD4

```
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include <openssl/x509.h>
67 #include <openssl/md4.h>
68 #ifndef OPENSSL_NO_RSA
69 #include <openssl/rsa.h>
70 #endif
```

72 #include "evp_locl.h"

```
74 static int init(EVP_MD_CTX *ctx)
75 { return MD4_Init(ctx->md_data); }
```

```
77 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
78 { return MD4_Update(ctx->md_data, data, count); }
```

```
80 static int final(EVP_MD_CTX *ctx, unsigned char *md)
81 { return MD4_Final(md, ctx->md_data); }
```

```
83 static const EVP_MD md4_md=
84 {
85     NID_md4,
86     NID_md4WithRSAEncryption,
87     MD4_DIGEST_LENGTH,
88     0,
89     init,
90     update,
91     final,
92     NULL,
93     NULL,
94     EVP_PKEY_RSA_method,
95     MD4_CBLOCK,
96     sizeof(EVP_MD *)+sizeof(MD4_CTX),
97     };
```

```
99 const EVP_MD *EVP_md4(void)
100 {
101     return(&md4_md);
102 }
103 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_md5.c

1

3986 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_md5.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_md5.c

2

62 #ifndef OPENSSL_NO_MD5

```
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include <openssl/x509.h>
67 #include <openssl/md5.h>
68 #ifndef OPENSSL_NO_RSA
69 #include <openssl/rsa.h>
70 #endif
71 #include "evp_locl.h"
72
73 static int init(EVP_MD_CTX *ctx)
74 { return MD5_Init(ctx->md_data); }
75
76 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
77 { return MD5_Update(ctx->md_data, data, count); }
78
79 static int final(EVP_MD_CTX *ctx, unsigned char *md)
80 { return MD5_Final(md, ctx->md_data); }
81
82 static const EVP_MD md5_md=
83 {
84     NID_md5,
85     NID_md5WithRSAEncryption,
86     MD5_DIGEST_LENGTH,
87     0,
88     init,
89     update,
90     final,
91     NULL,
92     NULL,
93     EVP_PKEY_RSA_method,
94     MD5_CBLOCK,
95     sizeof(EVP_MD *)+sizeof(MD5_CTX),
96     };
97
98 const EVP_MD *EVP_md5(void)
99 {
100     return(&md5_md);
101 }
102 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_mdcc2.c

1

4008 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_mdcc2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/m_mdcc2.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_mdcc2.c

2

62 #ifndef OPENSLL_NO_MDC2

```
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include <openssl/x509.h>
67 #include <openssl/mdc2.h>
68 #ifndef OPENSLL_NO_RSA
69 #include <openssl/rsa.h>
70 #endif
72 #include "evp_locl.h"
74 static int init(EVP_MD_CTX *ctx)
75 { return MDC2_Init(ctx->md_data); }
77 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
78 { return MDC2_Update(ctx->md_data, data, count); }
80 static int final(EVP_MD_CTX *ctx, unsigned char *md)
81 { return MDC2_Final(md, ctx->md_data); }
83 static const EVP_MD mdc2_md=
84 {
85     NID_mdc2,
86     NID_mdc2withRSA,
87     MDC2_DIGEST_LENGTH,
88     0,
89     init,
90     update,
91     final,
92     NULL,
93     NULL,
94     EVP_PKEY_RSA_ASN1_OCTET_STRING_method,
95     MDC2_BLOCK,
96     sizeof(EVP_MD *)+sizeof(MDC2_CTX),
97 };
99 const EVP_MD *EVP_mdc2(void)
100 {
101     return(&mdc2_md);
102 }
103 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_null.c

1

```
*****
3728 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_null.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/m_null.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_null.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64
65 static int init(EVP_MD_CTX *ctx)
66 { return 1; }
67
68 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
69 { return 1; }
70
71 static int final(EVP_MD_CTX *ctx, unsigned char *md)
72 { return 1; }
73
74 static const EVP_MD null_md=
75 {
76     NID_undef,
77     NID_undef,
78     0,
79     0,
80     init,
81     update,
82     final,
83     NULL,
84     NULL,
85     EVP_PKEY_NULL_method,
86     0,
87     sizeof(EVP_MD *),
88 };
89
90 const EVP_MD *EVP_md_null(void)
91 {
92     return(&null_md);
93 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_ripemd.c

1

4051 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_ripemd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_ripemd.c

2

62 #ifndef OPENSSL_NO_RIPEMD

```
64 #include <openssl/ripemd.h>
65 #include <openssl/evp.h>
66 #include <openssl/objects.h>
67 #include <openssl/x509.h>
68 #ifndef OPENSSL_NO_RSA
69 #include <openssl/rsa.h>
70 #endif
71 #include "evp_locl.h"
72
73 static int init(EVP_MD_CTX *ctx)
74 { return RIPEMD160_Init(ctx->md_data); }
75
76 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
77 { return RIPEMD160_Update(ctx->md_data, data, count); }
78
79 static int final(EVP_MD_CTX *ctx, unsigned char *md)
80 { return RIPEMD160_Final(md, ctx->md_data); }
81
82 static const EVP_MD ripemd160_md=
83 {
84     NID_ripemd160,
85     NID_ripemd160withRSA,
86     RIPEMD160_DIGEST_LENGTH,
87     0,
88     init,
89     update,
90     final,
91     NULL,
92     NULL,
93     EVP_PKEY_RSA_method,
94     RIPEMD160_CBLOCK,
95     sizeof(EVP_MD *)+sizeof(RIPEMD160_CTX),
96 };
97
98 const EVP_MD *EVP_ripemd160(void)
99 {
100     return(&ripemd160_md);
101 }
102 #endif
```


new/usr/src/lib/openssl/libsunw_crypto/evp/m_sha.c

1

3996 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_sha.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_sha.c

2

```
62 #if !defined(OPENSSSL_NO_SHA) && !defined(OPENSSSL_NO_SHA0)
```

```
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include <openssl/x509.h>
67 #ifndef OPENSSSL_NO_RSA
68 #include <openssl/rsa.h>
69 #endif
70 #include "evp_locl.h"
71
72 static int init(EVP_MD_CTX *ctx)
73 { return SHA_Init(ctx->md_data); }
74
75 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
76 { return SHA_Update(ctx->md_data, data, count); }
77
78 static int final(EVP_MD_CTX *ctx, unsigned char *md)
79 { return SHA_Final(md, ctx->md_data); }
80
81 static const EVP_MD sha_md=
82 {
83     NID_sha,
84     NID_shaWithRSAEncryption,
85     SHA_DIGEST_LENGTH,
86     0,
87     init,
88     update,
89     final,
90     NULL,
91     NULL,
92     EVP_PKEY_RSA_method,
93     SHA_CBLOCK,
94     sizeof(EVP_MD *)+sizeof(SHA_CTX),
95 };
96
97 const EVP_MD *EVP_sha(void)
98 {
99     return(&sha_md);
100 }
101 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_sha1.c

1

```
*****
6527 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_sha1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_sha1.c

2

```
62 #ifndef OPENSSL_FIPS
63
64 #ifndef OPENSSL_NO_SHA
65
66 #include <openssl/evp.h>
67 #include <openssl/objects.h>
68 #include <openssl/sha.h>
69 #ifndef OPENSSL_NO_RSA
70 #include <openssl/rsa.h>
71 #endif
72
73 static int init(EVP_MD_CTX *ctx)
74 { return SHA1_Init(ctx->md_data); }
75
76 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
77 { return SHA1_Update(ctx->md_data, data, count); }
78
79 static int final(EVP_MD_CTX *ctx, unsigned char *md)
80 { return SHA1_Final(md, ctx->md_data); }
81
82 static const EVP_MD sha1_md=
83 {
84     NID_sha1,
85     NID_sha1withRSAEncryption,
86     SHA_DIGEST_LENGTH,
87     EVP_MD_FLAG_PKEY_METHOD_SIGNATURE|EVP_MD_FLAG_DIGALGID_ABSENT,
88     init,
89     update,
90     final,
91     NULL,
92     NULL,
93     EVP_PKEY_RSA_method,
94     SHA_CBLOCK,
95     sizeof(EVP_MD *)+sizeof(SHA_CTX),
96     };
97
98 const EVP_MD *EVP_sha1(void)
99 {
100     return(&sha1_md);
101 }
102 #endif
103
104 #ifndef OPENSSL_NO_SHA256
105 static int init224(EVP_MD_CTX *ctx)
106 { return SHA224_Init(ctx->md_data); }
107 static int init256(EVP_MD_CTX *ctx)
108 { return SHA256_Init(ctx->md_data); }
109
110 /*
111  * Even though there're separate SHA224_[Update|Final], we call
112  * SHA256 functions even in SHA224 context. This is what happens
113  * there anyway, so we can spare few CPU cycles:-)
114  */
115 static int update256(EVP_MD_CTX *ctx, const void *data, size_t count)
116 { return SHA256_Update(ctx->md_data, data, count); }
117 static int final256(EVP_MD_CTX *ctx, unsigned char *md)
118 { return SHA256_Final(md, ctx->md_data); }
119
120 static const EVP_MD sha224_md=
121 {
122     NID_sha224,
123     NID_sha224withRSAEncryption,
124     SHA224_DIGEST_LENGTH,
125     EVP_MD_FLAG_PKEY_METHOD_SIGNATURE|EVP_MD_FLAG_DIGALGID_ABSENT,
126     init224,
127     update256,
```

```

128     final256,
129     NULL,
130     NULL,
131     EVP_PKEY_RSA_method,
132     SHA256_CBLOCK,
133     sizeof(EVP_MD *)+sizeof(SHA256_CTX),
134     };

136 const EVP_MD *EVP_sha224(void)
137     { return(&sha224_md); }

139 static const EVP_MD sha256_md=
140     {
141         NID_sha256,
142         NID_sha256WithRSAEncryption,
143         SHA256_DIGEST_LENGTH,
144         EVP_MD_FLAG_PKEY_METHOD_SIGNATURE|EVP_MD_FLAG_DIGALGID_ABSENT,
145         init256,
146         update256,
147         final256,
148         NULL,
149         NULL,
150         EVP_PKEY_RSA_method,
151         SHA256_CBLOCK,
152         sizeof(EVP_MD *)+sizeof(SHA256_CTX),
153     };

155 const EVP_MD *EVP_sha256(void)
156     { return(&sha256_md); }
157 #endif /* ifndef OPENSSSL_NO_SHA256 */

159 #ifndef OPENSSSL_NO_SHA512
160 static int init384(EVP_MD_CTX *ctx)
161     { return SHA384_Init(ctx->md_data); }
162 static int init512(EVP_MD_CTX *ctx)
163     { return SHA512_Init(ctx->md_data); }
164 /* See comment in SHA224/256 section */
165 static int update512(EVP_MD_CTX *ctx,const void *data,size_t count)
166     { return SHA512_Update(ctx->md_data,data,count); }
167 static int final512(EVP_MD_CTX *ctx,unsigned char *md)
168     { return SHA512_Final(md,ctx->md_data); }

170 static const EVP_MD sha384_md=
171     {
172         NID_sha384,
173         NID_sha384WithRSAEncryption,
174         SHA384_DIGEST_LENGTH,
175         EVP_MD_FLAG_PKEY_METHOD_SIGNATURE|EVP_MD_FLAG_DIGALGID_ABSENT,
176         init384,
177         update512,
178         final512,
179         NULL,
180         NULL,
181         EVP_PKEY_RSA_method,
182         SHA512_CBLOCK,
183         sizeof(EVP_MD *)+sizeof(SHA512_CTX),
184     };

186 const EVP_MD *EVP_sha384(void)
187     { return(&sha384_md); }

189 static const EVP_MD sha512_md=
190     {
191         NID_sha512,
192         NID_sha512WithRSAEncryption,
193         SHA512_DIGEST_LENGTH,

```

```

194     EVP_MD_FLAG_PKEY_METHOD_SIGNATURE|EVP_MD_FLAG_DIGALGID_ABSENT,
195     init512,
196     update512,
197     final512,
198     NULL,
199     NULL,
200     EVP_PKEY_RSA_method,
201     SHA512_CBLOCK,
202     sizeof(EVP_MD *)+sizeof(SHA512_CTX),
203     };

205 const EVP_MD *EVP_sha512(void)
206     { return(&sha512_md); }
207 #endif /* ifndef OPENSSSL_NO_SHA512 */

209 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_sigver.c

1

```
*****
5883 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/m_sigver.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* m_sigver.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
6  * Copyright (c) 2006,2007 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
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19 *
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21 * software must display the following acknowledgment:
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34 * 6. Redistributions of any form whatsoever must retain the following
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39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
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42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_sigver.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64 #include "evp_loc1.h"
65
66 static int do_sigver_init(EVP_MD_CTX *ctx, EVP_PKEY_CTX **pctx,
67                          const EVP_MD *type, ENGINE *e, EVP_PKEY *pkey,
68                          int ver)
69 {
70     if (ctx->pctx == NULL)
71         ctx->pctx = EVP_PKEY_CTX_new(pkey, e);
72     if (ctx->pctx == NULL)
73         return 0;
74
75     if (type == NULL)
76     {
77         int def_nid;
78         if (EVP_PKEY_get_default_digest_nid(pkey, &def_nid) > 0)
79             type = EVP_get_digestbynid(def_nid);
80     }
81
82     if (type == NULL)
83     {
84         EVPerr(EVP_F_DO_SIGVER_INIT, EVP_R_NO_DEFAULT_DIGEST);
85         return 0;
86     }
87
88     if (ver)
89     {
90         if (ctx->pctx->pmeth->verifyctx_init)
91         {
92             if (ctx->pctx->pmeth->verifyctx_init(ctx->pctx, ctx) <= 0)
93                 return 0;
94             ctx->pctx->operation = EVP_PKEY_OP_VERIFYCTX;
95         }
96         else if (EVP_PKEY_verify_init(ctx->pctx) <= 0)
97             return 0;
98     }
99     else
100     {
101         if (ctx->pctx->pmeth->signctx_init)
102         {
103             if (ctx->pctx->pmeth->signctx_init(ctx->pctx, ctx) <= 0)
104                 return 0;
105             ctx->pctx->operation = EVP_PKEY_OP_SIGNCTX;
106         }
107         else if (EVP_PKEY_sign_init(ctx->pctx) <= 0)
108             return 0;
109     }
110     if (EVP_PKEY_CTX_set_signature_md(ctx->pctx, type) <= 0)
111         return 0;
112     if (pctx)
113         *pctx = ctx->pctx;
114     if (!EVP_DigestInit_ex(ctx, type, e))
115         return 0;
116     return 1;
117 }
118
119 int EVP_DigestSignInit(EVP_MD_CTX *ctx, EVP_PKEY_CTX **pctx,
120                       const EVP_MD *type, ENGINE *e, EVP_PKEY *pkey)
121 {
122     return do_sigver_init(ctx, pctx, type, e, pkey, 0);
123 }
124
125 int EVP_DigestVerifyInit(EVP_MD_CTX *ctx, EVP_PKEY_CTX **pctx,
126                        const EVP_MD *type, ENGINE *e, EVP_PKEY *pkey)
127 {
128 }
```

```

128     return do_sigver_init(ctx, pctx, type, e, pkey, 1);
129 }

131 int EVP_DigestSignFinal(EVP_MD_CTX *ctx, unsigned char *sigret, size_t *siglen)
132 {
133     int sctx, r = 0;
134     if (ctx->pctx->pmeth->signctx)
135         sctx = 1;
136     else
137         sctx = 0;
138     if (sigret)
139     {
140         EVP_MD_CTX tmp_ctx;
141         unsigned char md[EVP_MAX_MD_SIZE];
142         unsigned int mdlen;
143         EVP_MD_CTX_init(&tmp_ctx);
144         if (!EVP_MD_CTX_copy_ex(&tmp_ctx, ctx))
145             return 0;
146         if (sctx)
147             r = tmp_ctx.pctx->pmeth->signctx(tmp_ctx.pctx,
148                                             sigret, siglen, &tmp_ctx);
149         else
150             r = EVP_DigestFinal_ex(&tmp_ctx, md, &mdlen);
151         EVP_MD_CTX_cleanup(&tmp_ctx);
152         if (sctx || !r)
153             return r;
154         if (EVP_PKEY_sign(ctx->pctx, sigret, siglen, md, mdlen) <= 0)
155             return 0;
156     }
157     else
158     {
159         if (sctx)
160         {
161             if (ctx->pctx->pmeth->signctx(ctx->pctx, sigret, siglen,
162                                         return 0;
163         }
164         else
165         {
166             int s = EVP_MD_size(ctx->digest);
167             if (s < 0 || EVP_PKEY_sign(ctx->pctx, sigret, siglen, NU
168                 return 0;
169         }
170     }
171     return 1;
172 }

174 int EVP_DigestVerifyFinal(EVP_MD_CTX *ctx, unsigned char *sig, size_t siglen)
175 {
176     EVP_MD_CTX tmp_ctx;
177     unsigned char md[EVP_MAX_MD_SIZE];
178     int r;
179     unsigned int mdlen;
180     int vctx;

182     if (ctx->pctx->pmeth->verifyctx)
183         vctx = 1;
184     else
185         vctx = 0;
186     EVP_MD_CTX_init(&tmp_ctx);
187     if (!EVP_MD_CTX_copy_ex(&tmp_ctx, ctx))
188         return -1;
189     if (vctx)
190     {
191         r = tmp_ctx.pctx->pmeth->verifyctx(tmp_ctx.pctx,
192                                           sig, siglen, &tmp_ctx);
193     }

```

```

194     else
195         r = EVP_DigestFinal_ex(&tmp_ctx, md, &mdlen);
196     EVP_MD_CTX_cleanup(&tmp_ctx);
197     if (vctx || !r)
198         return r;
199     return EVP_PKEY_verify(ctx->pctx, sig, siglen, md, mdlen);
200 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/m_wp.c

1

812 Fri May 30 18:31:53 2014

new/usr/src/lib/openssl/libsunw_crypto/evp/m_wp.c

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/m_wp.c */
3 #include <stdio.h>
4 #include "cryptlib.h"
6 #ifndef OPENSSL_NO_WHIRLPOOL
8 #include <openssl/evp.h>
9 #include <openssl/objects.h>
10 #include <openssl/x509.h>
11 #include <openssl/whirlpool.h>
12 #include "evp_locl.h"
14 static int init(EVP_MD_CTX *ctx)
15     { return WHIRLPOOL_Init(ctx->md_data); }
17 static int update(EVP_MD_CTX *ctx, const void *data, size_t count)
18     { return WHIRLPOOL_Update(ctx->md_data, data, count); }
20 static int final(EVP_MD_CTX *ctx, unsigned char *md)
21     { return WHIRLPOOL_Final(md, ctx->md_data); }
23 static const EVP_MD whirlpool_md=
24     {
25         NID_whirlpool,
26         0,
27         WHIRLPOOL_DIGEST_LENGTH,
28         0,
29         init,
30         update,
31         final,
32         NULL,
33         NULL,
34         EVP_PKEY_NULL_method,
35         WHIRLPOOL_BBLOCK/8,
36         sizeof(EVP_MD *)+sizeof(WHIRLPOOL_CTX),
37     };
39 const EVP_MD *EVP_whirlpool(void)
40     {
41         return(&whirlpool_md);
42     }
43 #endif
```

6678 Fri May 30 18:31:53 2014
 new/usr/src/lib/openssl/libsunw_crypto/evp/names.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/evp/names.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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36 * being used are not cryptographic related :-).
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38 * the apps directory (application code) you must include an acknowledgement:
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>

```

```

62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64
65 int EVP_add_cipher(const EVP_CIPHER *c)
66 {
67     int r;
68
69     if (c == NULL) return 0;
70
71     OPENSSL_init();
72
73     r=OBJ_NAME_add(OBJ_nid2sn(c->nid),OBJ_NAME_TYPE_CIPHER_METH,(const char *)c->name);
74     if (r == 0) return(0);
75     check_defer(c->nid);
76     r=OBJ_NAME_add(OBJ_nid2ln(c->nid),OBJ_NAME_TYPE_CIPHER_METH,(const char *)c->name);
77     return(r);
78 }
79
80 int EVP_add_digest(const EVP_MD *md)
81 {
82     int r;
83     const char *name;
84     OPENSSL_init();
85
86     name=OBJ_nid2sn(md->type);
87     r=OBJ_NAME_add(name,OBJ_NAME_TYPE_MD_METH,(const char *)md->name);
88     if (r == 0) return(0);
89     check_defer(md->type);
90     r=OBJ_NAME_add(OBJ_nid2ln(md->type),OBJ_NAME_TYPE_MD_METH,(const char *)md->name);
91     if (r == 0) return(0);
92
93     if (md->pkey_type && md->type != md->pkey_type)
94     {
95         r=OBJ_NAME_add(OBJ_nid2sn(md->pkey_type),OBJ_NAME_TYPE_MD_METH|OBJ_NAME_ALIAS,name);
96         if (r == 0) return(0);
97         check_defer(md->pkey_type);
98         r=OBJ_NAME_add(OBJ_nid2ln(md->pkey_type),OBJ_NAME_TYPE_MD_METH|OBJ_NAME_ALIAS,name);
99     }
100     return(r);
101 }
102
103 const EVP_CIPHER *EVP_get_cipherbyname(const char *name)
104 {
105     const EVP_CIPHER *cp;
106
107     cp=(const EVP_CIPHER *)OBJ_NAME_get(name,OBJ_NAME_TYPE_CIPHER_METH);
108     return(cp);
109 }
110
111 const EVP_MD *EVP_get_digestbyname(const char *name)
112 {
113     const EVP_MD *cp;
114
115     cp=(const EVP_MD *)OBJ_NAME_get(name,OBJ_NAME_TYPE_MD_METH);
116     return(cp);
117 }
118
119 void EVP_cleanup(void)
120 {
121     OBJ_NAME_cleanup(OBJ_NAME_TYPE_CIPHER_METH);
122     OBJ_NAME_cleanup(OBJ_NAME_TYPE_MD_METH);
123     /* The above calls will only clean out the contents of the name
124      * hash table, but not the hash table itself. The following line

```

```

128     does that part. -- Richard Levitte */
129     OBJ_NAME_cleanup(-1);

131     EVP_PBE_cleanup();
132     if (obj_cleanup_defer == 2)
133     {
134         obj_cleanup_defer = 0;
135         OBJ_cleanup();
136     }
137     OBJ_sigid_free();
138 }

140 struct doall_cipher
141 {
142     void *arg;
143     void (*fn)(const EVP_CIPHER *ciph,
144               const char *from, const char *to, void *arg);
145 };

147 static void do_all_cipher_fn(const OBJ_NAME *nm, void *arg)
148 {
149     struct doall_cipher *dc = arg;
150     if (nm->alias)
151         dc->fn(NULL, nm->name, nm->data, dc->arg);
152     else
153         dc->fn((const EVP_CIPHER *)nm->data, nm->name, NULL, dc->arg);
154 }

156 void EVP_CIPHER_do_all(void (*fn)(const EVP_CIPHER *ciph,
157                                   const char *from, const char *to, void *x), void *arg)
158 {
159     struct doall_cipher dc;
160     dc.fn = fn;
161     dc.arg = arg;
162     OBJ_NAME_do_all(OBJ_NAME_TYPE_CIPHER_METH, do_all_cipher_fn, &dc);
163 }

165 void EVP_CIPHER_do_all_sorted(void (*fn)(const EVP_CIPHER *ciph,
166                                           const char *from, const char *to, void *x), void *arg)
167 {
168     struct doall_cipher dc;
169     dc.fn = fn;
170     dc.arg = arg;
171     OBJ_NAME_do_all_sorted(OBJ_NAME_TYPE_CIPHER_METH, do_all_cipher_fn, &dc);
172 }

174 struct doall_md
175 {
176     void *arg;
177     void (*fn)(const EVP_MD *ciph,
178               const char *from, const char *to, void *arg);
179 };

181 static void do_all_md_fn(const OBJ_NAME *nm, void *arg)
182 {
183     struct doall_md *dc = arg;
184     if (nm->alias)
185         dc->fn(NULL, nm->name, nm->data, dc->arg);
186     else
187         dc->fn((const EVP_MD *)nm->data, nm->name, NULL, dc->arg);
188 }

190 void EVP_MD_do_all(void (*fn)(const EVP_MD *md,
191                               const char *from, const char *to, void *x), void *arg)
192 {
193     struct doall_md dc;

```

```

194     dc.fn = fn;
195     dc.arg = arg;
196     OBJ_NAME_do_all(OBJ_NAME_TYPE_MD_METH, do_all_md_fn, &dc);
197 }

199 void EVP_MD_do_all_sorted(void (*fn)(const EVP_MD *md,
200                                     const char *from, const char *to, void *x), void *arg)
201 {
202     struct doall_md dc;
203     dc.fn = fn;
204     dc.arg = arg;
205     OBJ_NAME_do_all_sorted(OBJ_NAME_TYPE_MD_METH, do_all_md_fn, &dc);
206 }

```


new/usr/src/lib/openssl/libsunw_crypto/evp/p5_crpt.c

1

```
*****
5005 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p5_crpt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p5_crpt.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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20 * 3. All advertising materials mentioning features or use of this
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45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p5_crpt.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/evp.h>
64
65 /* Doesn't do anything now: Builtin PBE algorithms in static table.
66 */
67
68 void PKCS5_PBE_add(void)
69 {
70 }
71
72 int PKCS5_PBE_keyivgen(EVP_CIPHER_CTX *cctx, const char *pass, int passlen,
73                        ASN1_TYPE *param, const EVP_CIPHER *cipher, const EVP_M
74                        int en_de)
75 {
76     EVP_MD_CTX ctx;
77     unsigned char md_tmp[EVP_MAX_MD_SIZE];
78     unsigned char key[EVP_MAX_KEY_LENGTH], iv[EVP_MAX_IV_LENGTH];
79     int i;
80     PBEPARAM *pbe;
81     int saltlen, iter;
82     unsigned char *salt;
83     const unsigned char *pbuf;
84     int mdsz;
85     int rv = 0;
86     EVP_MD_CTX_init(&ctx);
87
88     /* Extract useful info from parameter */
89     if (param == NULL || param->type != V_ASN1_SEQUENCE ||
90         param->value.sequence == NULL) {
91         EVPerr(EVP_F_PKCS5_PBE_KEYIVGEN, EVP_R_DECODE_ERROR);
92         return 0;
93     }
94
95     pbuf = param->value.sequence->data;
96     if (!pbe = d2i_PBEPARAM(NULL, &pbuf, param->value.sequence->length)) {
97         EVPerr(EVP_F_PKCS5_PBE_KEYIVGEN, EVP_R_DECODE_ERROR);
98         return 0;
99     }
100
101     if (!pbe->iter) iter = 1;
102     else iter = ASN1_INTEGER_get (pbe->iter);
103     salt = pbe->salt->data;
104     saltlen = pbe->salt->length;
105
106     if(!pass) passlen = 0;
107     else if(passlen == -1) passlen = strlen(pass);
108
109     if (!EVP_DigestInit_ex(&ctx, md, NULL))
110         goto err;
111     if (!EVP_DigestUpdate(&ctx, pass, passlen))
112         goto err;
113     if (!EVP_DigestUpdate(&ctx, salt, saltlen))
114         goto err;
115     PBEPARAM_free(pbe);
116     if (!EVP_DigestFinal_ex(&ctx, md_tmp, NULL))
117         goto err;
118     mdsz = EVP_MD_size(md);
119     if (mdsz < 0)
120         return 0;
121     for (i = 1; i < iter; i++) {
122         if (!EVP_DigestInit_ex(&ctx, md, NULL))
123             goto err;
124         if (!EVP_DigestUpdate(&ctx, md_tmp, mdsz))
125             goto err;
126         if (!EVP_DigestFinal_ex (&ctx, md_tmp, NULL))
127             goto err;
```

```
128     }
129     OPENSSL_assert(EVP_CIPHER_key_length(cipher) <= (int)sizeof(md_tmp));
130     memcpy(key, md_tmp, EVP_CIPHER_key_length(cipher));
131     OPENSSL_assert(EVP_CIPHER_iv_length(cipher) <= 16);
132     memcpy(iv, md_tmp + (16 - EVP_CIPHER_iv_length(cipher)),
133            EVP_CIPHER_iv_length(cipher));
134     if (!EVP_CipherInit_ex(ctx, cipher, NULL, key, iv, en_de))
135         goto err;
136     OPENSSL_cleanse(md_tmp, EVP_MAX_MD_SIZE);
137     OPENSSL_cleanse(key, EVP_MAX_KEY_LENGTH);
138     OPENSSL_cleanse(iv, EVP_MAX_IV_LENGTH);
139     rv = 1;
140     err:
141     EVP_MD_CTX_cleanup(&ctx);
142     return rv;
143 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p5_crpt2.c

1

```
*****
10002 Fri May 30 18:31:53 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p5_crpt2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* p5_crpt2.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999-2006 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57 #include <stdio.h>
58 #include <stdlib.h>
59 #include "cryptlib.h"
60 #if !defined(OPENSSL_NO_HMAC) && !defined(OPENSSL_NO_SHA)
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p5_crpt2.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/evp.h>
64 #include <openssl/hmac.h>
65 #include "evp_loc1.h"

67 /* set this to print out info about the keygen algorithm */
68 #define DEBUG_PKCS5V2 */

70 #ifdef DEBUG_PKCS5V2
71     static void h_dump (const unsigned char *p, int len);
72 #endif

74 /* This is an implementation of PKCS#5 v2.0 password based encryption key
75  * derivation function PBKDF2.
76  * SHA1 version verified against test vectors posted by Peter Gutmann
77  * <pgut001@cs.auckland.ac.nz> to the PKCS-TNG <pkcs-tng@rsa.com> mailing list.
78 */

80 int PKCS5_PBKDF2_HMAC(const char *pass, int passlen,
81                       const unsigned char *salt, int saltlen, int iter,
82                       const EVP_MD *digest,
83                       int keylen, unsigned char *out)
84 {
85     unsigned char digtmp[EVP_MAX_MD_SIZE], *p, itmp[4];
86     int clen, j, k, tkeylen, mdlen;
87     unsigned long i = 1;
88     HMAC_CTX hctx_tpl, hctx;

90     mdlen = EVP_MD_size(digest);
91     if (mdlen < 0)
92         return 0;

94     HMAC_CTX_init(&hctx_tpl);
95     p = out;
96     tkeylen = keylen;
97     if (!pass)
98         passlen = 0;
99     else if (passlen == -1)
100         passlen = strlen(pass);
101     if (!HMAC_Init_ex(&hctx_tpl, pass, passlen, digest, NULL))
102     {
103         HMAC_CTX_cleanup(&hctx_tpl);
104         return 0;
105     }
106     while (tkeylen)
107     {
108         if (tkeylen > mdlen)
109             clen = mdlen;
110         else
111             clen = tkeylen;
112         /* We are unlikely to ever use more than 256 blocks (5120 bits!)
113          * but just in case...
114          */
115         itmp[0] = (unsigned char)((i >> 24) & 0xff);
116         itmp[1] = (unsigned char)((i >> 16) & 0xff);
117         itmp[2] = (unsigned char)((i >> 8) & 0xff);
118         itmp[3] = (unsigned char)(i & 0xff);
119         if (!HMAC_CTX_copy(&hctx, &hctx_tpl))
120         {
121             HMAC_CTX_cleanup(&hctx_tpl);
122             return 0;
123         }
124         if (!HMAC_Update(&hctx, salt, saltlen)
125             || !HMAC_Update(&hctx, itmp, 4)
126             || !HMAC_Final(&hctx, digtmp, NULL))
127         {
```

```

128     HMAC_CTX_cleanup(&hctx_tpl);
129     HMAC_CTX_cleanup(&hctx);
130     return 0;
131 }
132 HMAC_CTX_cleanup(&hctx);
133 memcpy(p, digtmp, cplen);
134 for(j = 1; j < iter; j++)
135 {
136     if (!HMAC_CTX_copy(&hctx, &hctx_tpl))
137     {
138         HMAC_CTX_cleanup(&hctx_tpl);
139         return 0;
140     }
141     if (!HMAC_Update(&hctx, digtmp, mdlen)
142         || !HMAC_Final(&hctx, digtmp, NULL))
143     {
144         HMAC_CTX_cleanup(&hctx_tpl);
145         HMAC_CTX_cleanup(&hctx);
146         return 0;
147     }
148     HMAC_CTX_cleanup(&hctx);
149     for(k = 0; k < cplen; k++)
150         p[k] ^= digtmp[k];
151 }
152 tkeylen -= cplen;
153 i++;
154 p += cplen;
155 }
156 HMAC_CTX_cleanup(&hctx_tpl);
157 #ifdef DEBUG_PKCS5V2
158 fprintf(stderr, "Password:\n");
159 h_dump(pass, passlen);
160 fprintf(stderr, "Salt:\n");
161 h_dump(salt, saltlen);
162 fprintf(stderr, "Iteration count %d\n", iter);
163 fprintf(stderr, "Key:\n");
164 h_dump(out, keylen);
165 #endif
166 return 1;
167 }
168
169 int PKCS5_PBKDF2_HMAC_SHA1(const char *pass, int passlen,
170                             const unsigned char *salt, int saltlen, int iter,
171                             int keylen, unsigned char *out)
172 {
173     return PKCS5_PBKDF2_HMAC(pass, passlen, salt, saltlen, iter, EVP_sha1(),
174                               keylen, out);
175 }
176
177 #ifdef DO_TEST
178 main()
179 {
180     unsigned char out[4];
181     unsigned char salt[] = {0x12, 0x34, 0x56, 0x78};
182     PKCS5_PBKDF2_HMAC_SHA1("password", -1, salt, 4, 5, 4, out);
183     fprintf(stderr, "Out %02X %02X %02X %02X\n",
184             out[0], out[1], out[2], out[3]);
185 }
186
187 #endif
188
189 /* Now the key derivation function itself. This is a bit evil because
190  * it has to check the ASN1 parameters are valid: and there are quite a
191  * few of them...
192  */

```

```

194 int PKCS5_v2_PBE_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
195                             ASN1_TYPE *param, const EVP_CIPHER *c, const EVP_MD *md,
196                             int en_de)
197 {
198     const unsigned char *pbuf;
199     int plen;
200     PBE2PARAM *pbe2 = NULL;
201     const EVP_CIPHER *cipher;
202
203     int rv = 0;
204
205     if (param == NULL || param->type != V_ASN1_SEQUENCE ||
206         param->value.sequence == NULL) {
207         EVPerr(EVP_F_PKCS5_V2_PBE_KEYIVGEN, EVP_R_DECODE_ERROR);
208         goto err;
209     }
210
211     pbuf = param->value.sequence->data;
212     plen = param->value.sequence->length;
213     if (!(pbe2 = d2i_PBE2PARAM(NULL, &pbuf, plen))) {
214         EVPerr(EVP_F_PKCS5_V2_PBE_KEYIVGEN, EVP_R_DECODE_ERROR);
215         goto err;
216     }
217
218     /* See if we recognise the key derivation function */
219
220     if (OBJ_obj2nid(pbe2->keyfunc->algorithm) != NID_id_pbkdf2) {
221         EVPerr(EVP_F_PKCS5_V2_PBE_KEYIVGEN,
222                 EVP_R_UNSUPPORTED_KEY_DERIVATION_FUNCTION);
223         goto err;
224     }
225
226     /* lets see if we recognise the encryption algorithm.
227     */
228
229     cipher = EVP_get_cipherbyobj(pbe2->encryption->algorithm);
230
231     if (!cipher) {
232         EVPerr(EVP_F_PKCS5_V2_PBE_KEYIVGEN,
233                 EVP_R_UNSUPPORTED_CIPHER);
234         goto err;
235     }
236
237     /* Fixup cipher based on AlgorithmIdentifier */
238     if (!EVP_CipherInit_ex(ctx, cipher, NULL, NULL, NULL, en_de))
239         goto err;
240     if (EVP_CIPHER_asn1_to_param(ctx, pbe2->encryption->parameter) < 0) {
241         EVPerr(EVP_F_PKCS5_V2_PBE_KEYIVGEN,
242                 EVP_R_CIPHER_PARAMETER_ERROR);
243         goto err;
244     }
245     rv = PKCS5_v2_PBKDF2_keyivgen(ctx, pass, passlen,
246                                     pbe2->keyfunc->parameter, c, md, en_de);
247     err:
248     PBE2PARAM_free(pbe2);
249     return rv;
250 }
251
252 int PKCS5_v2_PBKDF2_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
253                               ASN1_TYPE *param,
254                               const EVP_CIPHER *c, const EVP_MD *md, int en_de)
255 {
256     unsigned char *salt, key[EVP_MAX_KEY_LENGTH];
257     const unsigned char *pbuf;
258     int saltlen, iter, plen;
259     int rv = 0;

```

```

260 unsigned int keylen = 0;
261 int prf_nid, hmac_md_nid;
262 PBKDF2PARAM *kdf = NULL;
263 const EVP_MD *prfmd;

265 if (EVP_CIPHER_CTX_cipher(ctx) == NULL)
266 {
267     EVPerr(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN, EVP_R_NO_CIPHER_SET);
268     goto err;
269 }
270 keylen = EVP_CIPHER_CTX_key_length(ctx);
271 OPENSSL_assert(keylen <= sizeof key);

273 /* Decode parameter */

275 if(!param || (param->type != V_ASN1_SEQUENCE))
276 {
277     EVPerr(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN, EVP_R_DECODE_ERROR);
278     goto err;
279 }

281 pbuf = param->value.sequence->data;
282 plen = param->value.sequence->length;

284 if(!(kdf = d2i_PBKDF2PARAM(NULL, &pbuf, plen)) ) {
285     EVPerr(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN, EVP_R_DECODE_ERROR);
286     goto err;
287 }

289 keylen = EVP_CIPHER_CTX_key_length(ctx);

291 /* Now check the parameters of the kdf */

293 if(kdf->keylength && (ASN1_INTEGER_get(kdf->keylength) != (int)keylen)){
294     EVPerr(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN,
295           EVP_R_UNSUPPORTED_KEYLENGTH);
296     goto err;
297 }

299 if (kdf->prf)
300     prf_nid = OBJ_obj2nid(kdf->prf->algorithm);
301 else
302     prf_nid = NID_hmacWithSHA1;

304 if (!EVP_PBE_find(EVP_PBE_TYPE_PRF, prf_nid, NULL, &hmac_md_nid, 0))
305 {
306     EVPerr(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN, EVP_R_UNSUPPORTED_PRF);
307     goto err;
308 }

310 prfmd = EVP_get_digestbynid(hmac_md_nid);
311 if (prfmd == NULL)
312 {
313     EVPerr(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN, EVP_R_UNSUPPORTED_PRF);
314     goto err;
315 }

317 if(kdf->salt->type != V_ASN1_OCTET_STRING) {
318     EVPerr(EVP_F_PKCS5_V2_PBKDF2_KEYIVGEN,
319           EVP_R_UNSUPPORTED_SALT_TYPE);
320     goto err;
321 }

323 /* it seems that its all OK */
324 salt = kdf->salt->value.octet_string->data;
325 saltlen = kdf->salt->value.octet_string->length;

```

```

326 iter = ASN1_INTEGER_get(kdf->iter);
327 if(!PKCS5_PBKDF2_HMAC(pass, passlen, salt, saltlen, iter, prfmd,
328                       keylen, key))
329     goto err;
330 rv = EVP_CipherInit_ex(ctx, NULL, NULL, key, NULL, en_de);
331 err:
332     OPENSSL_cleanse(key, keylen);
333     PBKDF2PARAM_free(kdf);
334     return rv;
335 }

337 #ifdef DEBUG_PKCS5V2
338 static void h_dump (const unsigned char *p, int len)
339 {
340     for (; len --; p++) fprintf(stderr, "%02X ", *p);
341     fprintf(stderr, "\n");
342 }
343 #endif
344 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_dec.c

1

3802 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p_dec.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/p_dec.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/rand.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_dec.c

2

```
62 #ifndef OPENSSL_NO_RSA
63 #include <openssl/rsa.h>
64 #endif
65 #include <openssl/evp.h>
66 #include <openssl/objects.h>
67 #include <openssl/x509.h>
68
69 int EVP_PKEY_decrypt_old(unsigned char *key, const unsigned char *ek, int ekl,
70                          EVP_PKEY *priv)
71 {
72     int ret= -1;
73
74     #ifndef OPENSSL_NO_RSA
75     if (priv->type != EVP_PKEY_RSA)
76         {
77             #endif
78             EVPerr(EVP_F_EVP_PKEY_DECRYPT_OLD,EVP_R_PUBLIC_KEY_NOT_RSA);
79             #ifndef OPENSSL_NO_RSA
80             goto err;
81             }
82
83     ret=RSA_private_decrypt(ekl,ek,key,priv->pkey.rsa,RSA_PKCS1_PADDING);
84 err:
85 #endif
86     return(ret);
87 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_enc.c

1

3792 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/p_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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21 * in documentation (online or textual) provided with the package.
22 *
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28 * 2. Redistributions in binary form must reproduce the above copyright
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/rand.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_enc.c

2

```
62 #ifndef OPENSSL_NO_RSA
63 #include <openssl/rsa.h>
64 #endif
65 #include <openssl/evp.h>
66 #include <openssl/objects.h>
67 #include <openssl/x509.h>
68
69 int EVP_PKEY_encrypt_old(unsigned char *ek, const unsigned char *key, int key_len,
70                          EVP_PKEY *pubk)
71 {
72     int ret=0;
73
74     #ifndef OPENSSL_NO_RSA
75     if (pubk->type != EVP_PKEY_RSA)
76     {
77         #endif
78         EVPerr(EVP_F_EVP_PKEY_ENCRYPT_OLD, EVP_R_PUBLIC_KEY_NOT_RSA);
79     #ifndef OPENSSL_NO_RSA
80         goto err;
81     }
82     ret=RSA_public_encrypt(key_len, key, ek, pubk->pkey.rsa, RSA_PKCS1_PADDING);
83 err:
84     #endif
85     return(ret);
86 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_lib.c

1

11305 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/evp/p_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_lib.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65 #include <openssl/asn1_mac.h>
66 #include <openssl/x509.h>
67 #ifndef OPENSSL_NO_RSA
68 #include <openssl/rsa.h>
69 #endif
70 #ifndef OPENSSL_NO_DSA
71 #include <openssl/dsa.h>
72 #endif
73 #ifndef OPENSSL_NO_DH
74 #include <openssl/dh.h>
75 #endif
76
77 #ifndef OPENSSL_NO_ENGINE
78 #include <openssl/engine.h>
79 #endif
80
81 #include "asn1_locl.h"
82
83 static void EVP_PKEY_free_it(EVP_PKEY *x);
84
85 int EVP_PKEY_bits(EVP_PKEY *pkey)
86 {
87     if (pkey && pkey->ameth && pkey->ameth->pkey_bits)
88         return pkey->ameth->pkey_bits(pkey);
89     return 0;
90 }
91
92 int EVP_PKEY_size(EVP_PKEY *pkey)
93 {
94     if (pkey && pkey->ameth && pkey->ameth->pkey_size)
95         return pkey->ameth->pkey_size(pkey);
96     return 0;
97 }
98
99 int EVP_PKEY_save_parameters(EVP_PKEY *pkey, int mode)
100 {
101     #ifndef OPENSSL_NO_DSA
102     if (pkey->type == EVP_PKEY_DSA)
103     {
104         int ret=pkey->save_parameters;
105
106         if (mode >= 0)
107             pkey->save_parameters=mode;
108         return(ret);
109     }
110     #endif
111     #ifndef OPENSSL_NO_EC
112     if (pkey->type == EVP_PKEY_EC)
113     {
114         int ret = pkey->save_parameters;
115
116         if (mode >= 0)
117             pkey->save_parameters = mode;
118         return(ret);
119     }
120     #endif
121     return(0);
122 }
123
124 int EVP_PKEY_copy_parameters(EVP_PKEY *to, const EVP_PKEY *from)
125 {
126     if (to->type != from->type)
127     {
```



```

128     EVPerr(EVP_F_EVP_PKEY_COPY_PARAMETERS,EVP_R_DIFFERENT_KEY_TYPES)
129     goto err;
130 }

132 if (EVP_PKEY_missing_parameters(from))
133 {
134     EVPerr(EVP_F_EVP_PKEY_COPY_PARAMETERS,EVP_R_MISSING_PARAMETERS);
135     goto err;
136 }
137 if (from->ameth && from->ameth->param_copy)
138     return from->ameth->param_copy(to, from);
139 err:
140     return 0;
141 }

143 int EVP_PKEY_missing_parameters(const EVP_PKEY *pkey)
144 {
145     if (pkey->ameth && pkey->ameth->param_missing)
146         return pkey->ameth->param_missing(pkey);
147     return 0;
148 }

150 int EVP_PKEY_cmp_parameters(const EVP_PKEY *a, const EVP_PKEY *b)
151 {
152     if (a->type != b->type)
153         return -1;
154     if (a->ameth && a->ameth->param_cmp)
155         return a->ameth->param_cmp(a, b);
156     return -2;
157 }

159 int EVP_PKEY_cmp(const EVP_PKEY *a, const EVP_PKEY *b)
160 {
161     if (a->type != b->type)
162         return -1;

164     if (a->ameth)
165     {
166         int ret;
167         /* Compare parameters if the algorithm has them */
168         if (a->ameth->param_cmp)
169         {
170             ret = a->ameth->param_cmp(a, b);
171             if (ret <= 0)
172                 return ret;
173         }

175         if (a->ameth->pub_cmp)
176             return a->ameth->pub_cmp(a, b);
177     }

179     return -2;
180 }

182 EVP_PKEY *EVP_PKEY_new(void)
183 {
184     EVP_PKEY *ret;

186     ret=(EVP_PKEY *)OPENSSL_malloc(sizeof(EVP_PKEY));
187     if (ret == NULL)
188     {
189         EVPerr(EVP_F_EVP_PKEY_NEW,ERR_R_MALLOC_FAILURE);
190         return(NULL);
191     }
192     ret->type=EVP_PKEY_NONE;
193     ret->save_type=EVP_PKEY_NONE;

```

```

194     ret->references=1;
195     ret->ameth=NULL;
196     ret->engine=NULL;
197     ret->pkey.ptr=NULL;
198     ret->attributes=NULL;
199     ret->save_parameters=1;
200     return(ret);
201 }

203 /* Setup a public key ASN1 method and ENGINE from a NID or a string.
204  * If pkey is NULL just return 1 or 0 if the algorithm exists.
205  */

207 static int pkey_set_type(EVP_PKEY *pkey, int type, const char *str, int len)
208 {
209     const EVP_PKEY_ASN1_METHOD *ameth;
210     ENGINE *e = NULL;
211     if (pkey)
212     {
213         if (pkey->pkey.ptr)
214             EVP_PKEY_free_it(pkey);
215         /* If key type matches and a method exists then this
216          * lookup has succeeded once so just indicate success.
217          */
218         if ((type == pkey->save_type) && pkey->ameth)
219             return 1;
220 #ifndef OPENSSL_NO_ENGINE
221         /* If we have an ENGINE release it */
222         if (pkey->engine)
223         {
224             ENGINE_finish(pkey->engine);
225             pkey->engine = NULL;
226         }
227 #endif
228     }
229     if (str)
230         ameth = EVP_PKEY_asn1_find_str(&e, str, len);
231     else
232         ameth = EVP_PKEY_asn1_find(&e, type);
233 #ifndef OPENSSL_NO_ENGINE
234     if (!pkey && e)
235         ENGINE_finish(e);
236 #endif
237     if (!ameth)
238     {
239         EVPerr(EVP_F_PKEY_SET_TYPE, EVP_R_UNSUPPORTED_ALGORITHM);
240         return 0;
241     }
242     if (pkey)
243     {
244         pkey->ameth = ameth;
245         pkey->engine = e;

247         pkey->type = pkey->ameth->pkey_id;
248         pkey->save_type=type;
249     }
250     return 1;
251 }

253 int EVP_PKEY_set_type(EVP_PKEY *pkey, int type)
254 {
255     return pkey_set_type(pkey, type, NULL, -1);
256 }

258 int EVP_PKEY_set_type_str(EVP_PKEY *pkey, const char *str, int len)
259 {

```

```

260     return pkey_set_type(pkey, EVP_PKEY_NONE, str, len);
261 }

263 int EVP_PKEY_assign(EVP_PKEY *pkey, int type, void *key)
264 {
265     if (!EVP_PKEY_set_type(pkey, type))
266         return 0;
267     pkey->pkey.ptr=key;
268     return (key != NULL);
269 }

271 void *EVP_PKEY_get0(EVP_PKEY *pkey)
272 {
273     return pkey->pkey.ptr;
274 }

276 #ifndef OPENSSL_NO_RSA
277 int EVP_PKEY_set1_RSA(EVP_PKEY *pkey, RSA *key)
278 {
279     int ret = EVP_PKEY_assign_RSA(pkey, key);
280     if (ret)
281         RSA_up_ref(key);
282     return ret;
283 }

285 RSA *EVP_PKEY_get1_RSA(EVP_PKEY *pkey)
286 {
287     if (pkey->type != EVP_PKEY_RSA) {
288         EVPerr(EVP_F_EVP_PKEY_GET1_RSA, EVP_R_EXPECTING_AN_RSA_KEY);
289         return NULL;
290     }
291     RSA_up_ref(pkey->pkey.rsa);
292     return pkey->pkey.rsa;
293 }
294 #endif

296 #ifndef OPENSSL_NO_DSA
297 int EVP_PKEY_set1_DSA(EVP_PKEY *pkey, DSA *key)
298 {
299     int ret = EVP_PKEY_assign_DSA(pkey, key);
300     if (ret)
301         DSA_up_ref(key);
302     return ret;
303 }

305 DSA *EVP_PKEY_get1_DSA(EVP_PKEY *pkey)
306 {
307     if (pkey->type != EVP_PKEY_DSA) {
308         EVPerr(EVP_F_EVP_PKEY_GET1_DSA, EVP_R_EXPECTING_A_DSA_KEY);
309         return NULL;
310     }
311     DSA_up_ref(pkey->pkey.dsa);
312     return pkey->pkey.dsa;
313 }
314 #endif

316 #ifndef OPENSSL_NO_EC
318 int EVP_PKEY_set1_EC_KEY(EVP_PKEY *pkey, EC_KEY *key)
319 {
320     int ret = EVP_PKEY_assign_EC_KEY(pkey, key);
321     if (ret)
322         EC_KEY_up_ref(key);
323     return ret;
324 }

```

```

326 EC_KEY *EVP_PKEY_get1_EC_KEY(EVP_PKEY *pkey)
327 {
328     if (pkey->type != EVP_PKEY_EC)
329     {
330         EVPerr(EVP_F_EVP_PKEY_GET1_EC_KEY, EVP_R_EXPECTING_A_EC_KEY);
331         return NULL;
332     }
333     EC_KEY_up_ref(pkey->pkey.ec);
334     return pkey->pkey.ec;
335 }
336 #endif

339 #ifndef OPENSSL_NO_DH
341 int EVP_PKEY_set1_DH(EVP_PKEY *pkey, DH *key)
342 {
343     int ret = EVP_PKEY_assign_DH(pkey, key);
344     if (ret)
345         DH_up_ref(key);
346     return ret;
347 }

349 DH *EVP_PKEY_get1_DH(EVP_PKEY *pkey)
350 {
351     if (pkey->type != EVP_PKEY_DH) {
352         EVPerr(EVP_F_EVP_PKEY_GET1_DH, EVP_R_EXPECTING_A_DH_KEY);
353         return NULL;
354     }
355     DH_up_ref(pkey->pkey.dh);
356     return pkey->pkey.dh;
357 }
358 #endif

360 int EVP_PKEY_type(int type)
361 {
362     int ret;
363     const EVP_PKEY_ASN1_METHOD *ameth;
364     ENGINE *e;
365     ameth = EVP_PKEY_asn1_find(&e, type);
366     if (ameth)
367         ret = ameth->pkey_id;
368     else
369         ret = NID_undef;
370 #ifndef OPENSSL_NO_ENGINE
371     if (e)
372         ENGINE_finish(e);
373 #endif
374     return ret;
375 }

377 int EVP_PKEY_id(const EVP_PKEY *pkey)
378 {
379     return pkey->type;
380 }

382 int EVP_PKEY_base_id(const EVP_PKEY *pkey)
383 {
384     return EVP_PKEY_type(pkey->type);
385 }

387 void EVP_PKEY_free(EVP_PKEY *x)
388 {
389     int i;
391     if (x == NULL) return;

```

```

393     i=CRYPTO_add(&x->references, -1, CRYPTO_LOCK_EVP_PKEY);
394 #ifdef REF_PRINT
395     REF_PRINT("EVP_PKEY", x);
396 #endif
397     if (i > 0) return;
398 #ifdef REF_CHECK
399     if (i < 0)
400     {
401         fprintf(stderr, "EVP_PKEY_free, bad reference count\n");
402         abort();
403     }
404 #endif
405     EVP_PKEY_free_it(x);
406     if (x->attributes)
407         sk_X509_ATTRIBUTE_pop_free(x->attributes, X509_ATTRIBUTE_free);
408     OPENSSL_free(x);
409 }

411 static void EVP_PKEY_free_it(EVP_PKEY *x)
412 {
413     if (x->ameth && x->ameth->pkey_free)
414     {
415         x->ameth->pkey_free(x);
416         x->pkey.ptr = NULL;
417     }
418 #ifndef OPENSSL_NO_ENGINE
419     if (x->engine)
420     {
421         ENGINE_finish(x->engine);
422         x->engine = NULL;
423     }
424 #endif
425 }

427 static int unsup_alg(BIO *out, const EVP_PKEY *pkey, int indent,
428                     const char *kstr)
429 {
430     BIO_indent(out, indent, 128);
431     BIO_printf(out, "%s algorithm \"%s\" unsupported\n",
432               kstr, OBJ_nid2ln(pkey->type));
433     return 1;
434 }

436 int EVP_PKEY_print_public(BIO *out, const EVP_PKEY *pkey,
437                          int indent, ASN1_PCTX *pctx)
438 {
439     if (pkey->ameth && pkey->ameth->pub_print)
440         return pkey->ameth->pub_print(out, pkey, indent, pctx);
441     return unsup_alg(out, pkey, indent, "Public Key");
442 }

445 int EVP_PKEY_print_private(BIO *out, const EVP_PKEY *pkey,
446                          int indent, ASN1_PCTX *pctx)
447 {
448     if (pkey->ameth && pkey->ameth->priv_print)
449         return pkey->ameth->priv_print(out, pkey, indent, pctx);
450     return unsup_alg(out, pkey, indent, "Private Key");
451 }

454 int EVP_PKEY_print_params(BIO *out, const EVP_PKEY *pkey,
455                          int indent, ASN1_PCTX *pctx)
456 {
457     if (pkey->ameth && pkey->ameth->param_print)

```

```

458         return pkey->ameth->param_print(out, pkey, indent, pctx);
459     return unsup_alg(out, pkey, indent, "Parameters");
460 }

462 int EVP_PKEY_get_default_digest_nid(EVP_PKEY *pkey, int *pnid)
463 {
464     if (!pkey->ameth || !pkey->ameth->pkey_ctrl)
465         return -2;
466     return pkey->ameth->pkey_ctrl(pkey, ASN1_PKEY_CTRL_DEFAULT_MD_NID,
467                                0, pnid);
468 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_open.c

1

```
*****
4562 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p_open.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/evp/p_open.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_open.c

2

```
62 #ifndef OPENSSL_NO_RSA
64 #include <openssl/evp.h>
65 #include <openssl/objects.h>
66 #include <openssl/x509.h>
67 #include <openssl/rsa.h>
69 int EVP_OpenInit(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *type,
70                 const unsigned char *ek, int ekl, const unsigned char *iv,
71                 EVP_PKEY *priv)
72 {
73     unsigned char *key=NULL;
74     int i,size=0,ret=0;
76     if(type) {
77         EVP_CIPHER_CTX_init(ctx);
78         if(!EVP_DecryptInit_ex(ctx,type,NULL, NULL,NULL)) return 0;
79     }
81     if(!priv) return 1;
83     if (priv->type != EVP_PKEY_RSA)
84     {
85         EVPerr(EVP_F_EVP_OPENINIT,EVP_R_PUBLIC_KEY_NOT_RSA);
86         goto err;
87     }
89     size=RSA_size(priv->pkey.rsa);
90     key=(unsigned char *)OPENSSL_malloc(size+2);
91     if (key == NULL)
92     {
93         /* ERROR */
94         EVPerr(EVP_F_EVP_OPENINIT,ERR_R_MALLOC_FAILURE);
95         goto err;
96     }
98     i=EVP_PKEY_decrypt_old(key,ek,ekl,priv);
99     if ((i <= 0) || !EVP_CIPHER_CTX_set_key_length(ctx, i))
100     {
101         /* ERROR */
102         goto err;
103     }
104     if(!EVP_DecryptInit_ex(ctx,NULL,NULL,key,iv)) goto err;
106     ret=1;
107 err:
108     if (key != NULL) OPENSSL_cleanse(key,size);
109     OPENSSL_free(key);
110     return(ret);
111 }
113 int EVP_OpenFinal(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
114 {
115     int i;
117     i=EVP_DecryptFinal_ex(ctx,out,outl);
118     if (i)
119         i = EVP_DecryptInit_ex(ctx,NULL,NULL,NULL,NULL);
120     return(i);
121 }
122 #else /* !OPENSSL_NO_RSA */
124 # ifdef PEDANTIC
125 static void *dummy=&dummy;
126 # endif
```


new/usr/src/lib/openssl/libsunw_crypto/evp/p_seal.c

1

```
*****
4493 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p_seal.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/rand.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_seal.c

2

```
62 #ifndef OPENSSL_NO_RSA
63 #include <openssl/rsa.h>
64 #endif
65 #include <openssl/evp.h>
66 #include <openssl/objects.h>
67 #include <openssl/x509.h>
68
69 int EVP_SealInit(EVP_CIPHER_CTX *ctx, const EVP_CIPHER *type, unsigned char **ek,
70                 int *ekl, unsigned char *iv, EVP_PKEY **pubk, int npubk)
71 {
72     unsigned char key[EVP_MAX_KEY_LENGTH];
73     int i;
74
75     if(type) {
76         EVP_CIPHER_CTX_init(ctx);
77         if(!EVP_EncryptInit_ex(ctx,type,NULL,NULL,NULL)) return 0;
78     }
79     if ((npubk <= 0) || !pubk)
80         return 1;
81     if (EVP_CIPHER_CTX_rand_key(ctx, key) <= 0)
82         return 0;
83     if (EVP_CIPHER_CTX_iv_length(ctx))
84         RAND_pseudo_bytes(iv,EVP_CIPHER_CTX_iv_length(ctx));
85
86     if(!EVP_EncryptInit_ex(ctx,NULL,NULL,key,iv)) return 0;
87
88     for (i=0; i<npubk; i++)
89     {
90         ekl[i]=EVP_PKEY_encrypt_old(ek[i],key,EVP_CIPHER_CTX_key_length(
91             pubk[i]));
92         if (ekl[i] <= 0) return(-1);
93     }
94     return(npubk);
95 }
96
97 /* MACRO
98 void EVP_SealUpdate(ctx,out,outl,in,inl)
99 EVP_CIPHER_CTX *ctx;
100 unsigned char *out;
101 int *outl;
102 unsigned char *in;
103 int inl;
104 {
105     EVP_EncryptUpdate(ctx,out,outl,in,inl);
106 }
107 */
108
109 int EVP_SealFinal(EVP_CIPHER_CTX *ctx, unsigned char *out, int *outl)
110 {
111     int i;
112     i = EVP_EncryptFinal_ex(ctx,out,outl);
113     if (i)
114         i = EVP_EncryptInit_ex(ctx,NULL,NULL,NULL,NULL);
115     return i;
116 }
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_sign.c

1

```
*****
4879 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p_sign.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/p_sign.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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32 * must display the following acknowledgement:
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34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/evp/p_sign.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64
65 #ifdef undef
66 void EVP_SignInit(EVP_MD_CTX *ctx, EVP_MD *type)
67 {
68     EVP_DigestInit_ex(ctx, type);
69 }
70
71 void EVP_SignUpdate(EVP_MD_CTX *ctx, unsigned char *data,
72                    unsigned int count)
73 {
74     EVP_DigestUpdate(ctx, data, count);
75 }
76 #endif
77
78 int EVP_SignFinal(EVP_MD_CTX *ctx, unsigned char *sigret, unsigned int *siglen,
79                  EVP_PKEY *pkey)
80 {
81     unsigned char m[EVP_MAX_MD_SIZE];
82     unsigned int m_len;
83     int i = 0, ok = 0, v;
84     EVP_MD_CTX tmp_ctx;
85     EVP_PKEY_CTX *pkctx = NULL;
86
87     *siglen=0;
88     EVP_MD_CTX_init(&tmp_ctx);
89     if (!EVP_MD_CTX_copy_ex(&tmp_ctx, ctx))
90         goto err;
91     if (!EVP_DigestFinal_ex(&tmp_ctx, &m[0], &m_len))
92         goto err;
93     EVP_MD_CTX_cleanup(&tmp_ctx);
94
95     if (ctx->digest->flags & EVP_MD_FLAG_PKEY_METHOD_SIGNATURE)
96     {
97         size_t sltmp = (size_t)EVP_PKEY_size(pkey);
98         i = 0;
99         pkctx = EVP_PKEY_CTX_new(pkey, NULL);
100         if (!pkctx)
101             goto err;
102         if (EVP_PKEY_sign_init(pkctx) <= 0)
103             goto err;
104         if (EVP_PKEY_CTX_set_signature_md(pkctx, ctx->digest) <= 0)
105             goto err;
106         if (EVP_PKEY_sign(pkctx, sigret, &sltmp, m, m_len) <= 0)
107             goto err;
108         *siglen = sltmp;
109         i = 1;
110         err:
111         EVP_PKEY_CTX_free(pkctx);
112         return i;
113     }
114
115     for (i=0; i<4; i++)
116     {
117         v=ctx->digest->required_pkey_type[i];
118         if (v == 0) break;
119         if (pkey->type == v)
120         {
121             ok=1;
122             break;
123         }
124     }
125     if (!ok)
126     {
127         EVPerr(EVP_F_EVP_SIGNFINAL, EVP_R_WRONG_PUBLIC_KEY_TYPE);
```



```

*****
4591 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/p_verify.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/evp/p_verify.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
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33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>

```

```

62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64
65 int EVP_VerifyFinal(EVP_MD_CTX *ctx, const unsigned char *sigbuf,
66                    unsigned int siglen, EVP_PKEY *pkey)
67 {
68     unsigned char m[EVP_MAX_MD_SIZE];
69     unsigned int m_len;
70     int i = 0, ok = 0, v;
71     EVP_MD_CTX tmp_ctx;
72     EVP_PKEY_CTX *pkctx = NULL;
73
74     EVP_MD_CTX_init(&tmp_ctx);
75     if (!EVP_MD_CTX_copy_ex(&tmp_ctx, ctx))
76         goto err;
77     if (!EVP_DigestFinal_ex(&tmp_ctx, &(m[0]), &m_len))
78         goto err;
79     EVP_MD_CTX_cleanup(&tmp_ctx);
80
81     if (ctx->digest->flags & EVP_MD_FLAG_PKEY_METHOD_SIGNATURE)
82     {
83         i = -1;
84         pkctx = EVP_PKEY_CTX_new(pkey, NULL);
85         if (!pkctx)
86             goto err;
87         if (EVP_PKEY_verify_init(pkctx) <= 0)
88             goto err;
89         if (EVP_PKEY_CTX_set_signature_md(pkctx, ctx->digest) <= 0)
90             goto err;
91         i = EVP_PKEY_verify(pkctx, sigbuf, siglen, m, m_len);
92         err:
93         EVP_PKEY_CTX_free(pkctx);
94         return i;
95     }
96
97     for (i=0; i<4; i++)
98     {
99         v=ctx->digest->required_pkey_type[i];
100         if (v == 0) break;
101         if (pkey->type == v)
102         {
103             ok=1;
104             break;
105         }
106     }
107     if (!ok)
108     {
109         EVPerr(EVP_F_EVP_VERIFYFINAL, EVP_R_WRONG_PUBLIC_KEY_TYPE);
110         return(-1);
111     }
112     if (ctx->digest->verify == NULL)
113     {
114         EVPerr(EVP_F_EVP_VERIFYFINAL, EVP_R_NO_VERIFY_FUNCTION_CONFIGURED);
115         return(0);
116     }
117
118     return(ctx->digest->verify(ctx->digest->type, m, m_len,
119                               sigbuf, siglen, pkey->pkey.ptr));
120 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_fn.c

1

```
*****
10546 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_fn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* pmeth_fn.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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20  * 3. All advertising materials mentioning features or use of this
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57

59 #include <stdio.h>
60 #include <stdlib.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_fn.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include "evp_locl.h"

66 #define M_check_autoarg(ctx, arg, arglen, err) \
67     if (ctx->pmeth->flags & EVP_PKEY_FLAG_AUTOARGLEN) \
68     { \
69         size_t pksize = (size_t)EVP_PKEY_size(ctx->pkey); \
70         if (!arg) \
71         { \
72             *arglen = pksize; \
73             return 1; \
74         } \
75         else if (*arglen < pksize) \
76         { \
77             EVPerr(err, EVP_R_BUFFER_TOO_SMALL); /*ckerr_ignore*/ \
78             return 0; \
79         } \
80     }

82 int EVP_PKEY_sign_init(EVP_PKEY_CTX *ctx)
83 {
84     int ret;
85     if (!ctx || !ctx->pmeth || !ctx->pmeth->sign)
86     {
87         EVPerr(EVP_F_EVP_PKEY_SIGN_INIT,
88             EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
89         return -2;
90     }
91     ctx->operation = EVP_PKEY_OP_SIGN;
92     if (!ctx->pmeth->sign_init)
93         return 1;
94     ret = ctx->pmeth->sign_init(ctx);
95     if (ret <= 0)
96         ctx->operation = EVP_PKEY_OP_UNDEFINED;
97     return ret;
98 }

100 int EVP_PKEY_sign(EVP_PKEY_CTX *ctx,
101     unsigned char *sig, size_t *siglen,
102     const unsigned char *tbs, size_t tbslen)
103 {
104     if (!ctx || !ctx->pmeth || !ctx->pmeth->sign)
105     {
106         EVPerr(EVP_F_EVP_PKEY_SIGN,
107             EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
108         return -2;
109     }
110     if (ctx->operation != EVP_PKEY_OP_SIGN)
111     {
112         EVPerr(EVP_F_EVP_PKEY_SIGN, EVP_R_OPERATION_NOT_INITIALIZED);
113         return -1;
114     }
115     M_check_autoarg(ctx, sig, siglen, EVP_F_EVP_PKEY_SIGN)
116     return ctx->pmeth->sign(ctx, sig, siglen, tbs, tbslen);
117 }

119 int EVP_PKEY_verify_init(EVP_PKEY_CTX *ctx)
120 {
121     int ret;
122     if (!ctx || !ctx->pmeth || !ctx->pmeth->verify)
123     {
124         EVPerr(EVP_F_EVP_PKEY_VERIFY_INIT,
125             EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
126         return -2;
127     }
128 }
```

```

128     ctx->operation = EVP_PKEY_OP_VERIFY;
129     if (!ctx->pmeth->verify_init)
130         return 1;
131     ret = ctx->pmeth->verify_init(ctx);
132     if (ret <= 0)
133         ctx->operation = EVP_PKEY_OP_UNDEFINED;
134     return ret;
135 }

137 int EVP_PKEY_verify(EVP_PKEY_CTX *ctx,
138                     const unsigned char *sig, size_t siglen,
139                     const unsigned char *tbs, size_t tbslen)
140 {
141     if (!ctx || !ctx->pmeth || !ctx->pmeth->verify)
142     {
143         EVPerr(EVP_F_EVP_PKEY_VERIFY,
144               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
145         return -2;
146     }
147     if (ctx->operation != EVP_PKEY_OP_VERIFY)
148     {
149         EVPerr(EVP_F_EVP_PKEY_VERIFY, EVP_R_OPERATON_NOT_INITIALIZED);
150         return -1;
151     }
152     return ctx->pmeth->verify(ctx, sig, siglen, tbs, tbslen);
153 }

155 int EVP_PKEY_verify_recover_init(EVP_PKEY_CTX *ctx)
156 {
157     int ret;
158     if (!ctx || !ctx->pmeth || !ctx->pmeth->verify_recover)
159     {
160         EVPerr(EVP_F_EVP_PKEY_VERIFY_RECOVER_INIT,
161               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
162         return -2;
163     }
164     ctx->operation = EVP_PKEY_OP_VERIFYRECOVER;
165     if (!ctx->pmeth->verify_recover_init)
166         return 1;
167     ret = ctx->pmeth->verify_recover_init(ctx);
168     if (ret <= 0)
169         ctx->operation = EVP_PKEY_OP_UNDEFINED;
170     return ret;
171 }

173 int EVP_PKEY_verify_recover(EVP_PKEY_CTX *ctx,
174                             unsigned char *rout, size_t *routlen,
175                             const unsigned char *sig, size_t siglen)
176 {
177     if (!ctx || !ctx->pmeth || !ctx->pmeth->verify_recover)
178     {
179         EVPerr(EVP_F_EVP_PKEY_VERIFY_RECOVER,
180               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
181         return -2;
182     }
183     if (ctx->operation != EVP_PKEY_OP_VERIFYRECOVER)
184     {
185         EVPerr(EVP_F_EVP_PKEY_VERIFY_RECOVER, EVP_R_OPERATON_NOT_INITIAL
186               );
187         return -1;
188     }
189     M_check_autoarg(ctx, rout, routlen, EVP_F_EVP_PKEY_VERIFY_RECOVER)
190     return ctx->pmeth->verify_recover(ctx, rout, routlen, sig, siglen);
191 }

192 int EVP_PKEY_encrypt_init(EVP_PKEY_CTX *ctx)
193 {

```

```

194     int ret;
195     if (!ctx || !ctx->pmeth || !ctx->pmeth->encrypt)
196     {
197         EVPerr(EVP_F_EVP_PKEY_ENCRYPT_INIT,
198               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
199         return -2;
200     }
201     ctx->operation = EVP_PKEY_OP_ENCRYPT;
202     if (!ctx->pmeth->encrypt_init)
203         return 1;
204     ret = ctx->pmeth->encrypt_init(ctx);
205     if (ret <= 0)
206         ctx->operation = EVP_PKEY_OP_UNDEFINED;
207     return ret;
208 }

210 int EVP_PKEY_encrypt(EVP_PKEY_CTX *ctx,
211                     unsigned char *out, size_t *outlen,
212                     const unsigned char *in, size_t inlen)
213 {
214     if (!ctx || !ctx->pmeth || !ctx->pmeth->encrypt)
215     {
216         EVPerr(EVP_F_EVP_PKEY_ENCRYPT,
217               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
218         return -2;
219     }
220     if (ctx->operation != EVP_PKEY_OP_ENCRYPT)
221     {
222         EVPerr(EVP_F_EVP_PKEY_ENCRYPT, EVP_R_OPERATON_NOT_INITIALIZED);
223         return -1;
224     }
225     M_check_autoarg(ctx, out, outlen, EVP_F_EVP_PKEY_ENCRYPT)
226     return ctx->pmeth->encrypt(ctx, out, outlen, in, inlen);
227 }

229 int EVP_PKEY_decrypt_init(EVP_PKEY_CTX *ctx)
230 {
231     int ret;
232     if (!ctx || !ctx->pmeth || !ctx->pmeth->decrypt)
233     {
234         EVPerr(EVP_F_EVP_PKEY_DECRYPT_INIT,
235               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
236         return -2;
237     }
238     ctx->operation = EVP_PKEY_OP_DECRYPT;
239     if (!ctx->pmeth->decrypt_init)
240         return 1;
241     ret = ctx->pmeth->decrypt_init(ctx);
242     if (ret <= 0)
243         ctx->operation = EVP_PKEY_OP_UNDEFINED;
244     return ret;
245 }

247 int EVP_PKEY_decrypt(EVP_PKEY_CTX *ctx,
248                     unsigned char *out, size_t *outlen,
249                     const unsigned char *in, size_t inlen)
250 {
251     if (!ctx || !ctx->pmeth || !ctx->pmeth->decrypt)
252     {
253         EVPerr(EVP_F_EVP_PKEY_DECRYPT,
254               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
255         return -2;
256     }
257     if (ctx->operation != EVP_PKEY_OP_DECRYPT)
258     {
259         EVPerr(EVP_F_EVP_PKEY_DECRYPT, EVP_R_OPERATON_NOT_INITIALIZED);

```

```

260         return -1;
261     }
262     M_check_autoarg(ctx, out, outlen, EVP_F_EVP_PKEY_DECRYPT)
263     return ctx->pmeth->decrypt(ctx, out, outlen, in, inlen);
264 }

267 int EVP_PKEY_derive_init(EVP_PKEY_CTX *ctx)
268 {
269     int ret;
270     if (!ctx || !ctx->pmeth || !ctx->pmeth->derive)
271     {
272         EVPerr(EVP_F_EVP_PKEY_DERIVE_INIT,
273               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
274         return -2;
275     }
276     ctx->operation = EVP_PKEY_OP_DERIVE;
277     if (!ctx->pmeth->derive_init)
278         return 1;
279     ret = ctx->pmeth->derive_init(ctx);
280     if (ret <= 0)
281         ctx->operation = EVP_PKEY_OP_UNDEFINED;
282     return ret;
283 }

285 int EVP_PKEY_derive_set_peer(EVP_PKEY_CTX *ctx, EVP_PKEY *peer)
286 {
287     int ret;
288     if (!ctx || !ctx->pmeth || !(ctx->pmeth->derive || ctx->pmeth->encrypt || ct
289     {
290         EVPerr(EVP_F_EVP_PKEY_DERIVE_SET_PEER,
291               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
292         return -2;
293     }
294     if (ctx->operation != EVP_PKEY_OP_DERIVE && ctx->operation != EVP_PKEY_O
295     {
296         EVPerr(EVP_F_EVP_PKEY_DERIVE_SET_PEER,
297               EVP_R_OPERATON_NOT_INITIALIZED);
298         return -1;
299     }

301     ret = ctx->pmeth->ctrl(ctx, EVP_PKEY_CTRL_PEER_KEY, 0, peer);

303     if (ret <= 0)
304         return ret;

306     if (ret == 2)
307         return 1;

309     if (!ctx->pkey)
310     {
311         EVPerr(EVP_F_EVP_PKEY_DERIVE_SET_PEER, EVP_R_NO_KEY_SET);
312         return -1;
313     }

315     if (ctx->pkey->type != peer->type)
316     {
317         EVPerr(EVP_F_EVP_PKEY_DERIVE_SET_PEER,
318               EVP_R_DIFFERENT_KEY_TYPES);
319         return -1;
320     }

322     /* ran@cryptocom.ru: For clarity. The error is if parameters in peer ar
323     * present (!missing) but don't match. EVP_PKEY_cmp parameters may retu
324     * 1 (match), 0 (don't match) and -2 (comparison is not defined). -1
325     * (different key types) is impossible here because it is checked earlie

```

```

326     * -2 is OK for us here, as well as 1, so we can check for 0 only. */
327     if (!EVP_PKEY_missing_parameters(peer) &&
328         !EVP_PKEY_cmp_parameters(ctx->pkey, peer))
329     {
330         EVPerr(EVP_F_EVP_PKEY_DERIVE_SET_PEER,
331               EVP_R_DIFFERENT_PARAMETERS);
332         return -1;
333     }

335     if (ctx->peerkey)
336         EVP_PKEY_free(ctx->peerkey);
337     ctx->peerkey = peer;

339     ret = ctx->pmeth->ctrl(ctx, EVP_PKEY_CTRL_PEER_KEY, 1, peer);

341     if (ret <= 0)
342     {
343         ctx->peerkey = NULL;
344         return ret;
345     }

347     CRYPTO_add(&peer->references, 1, CRYPTO_LOCK_EVP_PKEY);
348     return 1;
349 }

352 int EVP_PKEY_derive(EVP_PKEY_CTX *ctx, unsigned char *key, size_t *pkeylen)
353 {
354     if (!ctx || !ctx->pmeth || !ctx->pmeth->derive)
355     {
356         EVPerr(EVP_F_EVP_PKEY_DERIVE,
357               EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
358         return -2;
359     }
360     if (ctx->operation != EVP_PKEY_OP_DERIVE)
361     {
362         EVPerr(EVP_F_EVP_PKEY_DERIVE, EVP_R_OPERATON_NOT_INITIALIZED);
363         return -1;
364     }
365     M_check_autoarg(ctx, key, pkeylen, EVP_F_EVP_PKEY_DERIVE)
366     return ctx->pmeth->derive(ctx, key, pkeylen);
367 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_gn.c

1

```
*****
6131 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_gn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pmeth_gn.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_gn.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/bn.h>
65 #include "evp_locl.h"
66
67 int EVP_PKEY_paramgen_init(EVP_PKEY_CTX *ctx)
68 {
69     int ret;
70     if (!ctx || !ctx->pmeth || !ctx->pmeth->paramgen)
71     {
72         EVPerr(EVP_F_EVP_PKEY_PARAMGEN_INIT,
73                EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
74         return -2;
75     }
76     ctx->operation = EVP_PKEY_OP_PARAMGEN;
77     if (!ctx->pmeth->paramgen_init)
78         return 1;
79     ret = ctx->pmeth->paramgen_init(ctx);
80     if (ret <= 0)
81         ctx->operation = EVP_PKEY_OP_UNDEFINED;
82     return ret;
83 }
84
85 int EVP_PKEY_paramgen(EVP_PKEY_CTX *ctx, EVP_PKEY **ppkey)
86 {
87     int ret;
88     if (!ctx || !ctx->pmeth || !ctx->pmeth->paramgen)
89     {
90         EVPerr(EVP_F_EVP_PKEY_PARAMGEN,
91                EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
92         return -2;
93     }
94
95     if (ctx->operation != EVP_PKEY_OP_PARAMGEN)
96     {
97         EVPerr(EVP_F_EVP_PKEY_PARAMGEN, EVP_R_OPERATION_NOT_INITIALIZED);
98         return -1;
99     }
100
101     if (!ppkey)
102         return -1;
103
104     if (!*ppkey)
105         *ppkey = EVP_PKEY_new();
106
107     ret = ctx->pmeth->paramgen(ctx, *ppkey);
108     if (ret <= 0)
109     {
110         EVP_PKEY_free(*ppkey);
111         *ppkey = NULL;
112     }
113     return ret;
114 }
115
116 int EVP_PKEY_keygen_init(EVP_PKEY_CTX *ctx)
117 {
118     int ret;
119     if (!ctx || !ctx->pmeth || !ctx->pmeth->keygen)
120     {
121         EVPerr(EVP_F_EVP_PKEY_KEYGEN_INIT,
122                EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
123         return -2;
124     }
125     ctx->operation = EVP_PKEY_OP_KEYGEN;
126     if (!ctx->pmeth->keygen_init)
127         return 1;
```

```

128     ret = ctx->pmeth->keygen_init(ctx);
129     if (ret <= 0)
130         ctx->operation = EVP_PKEY_OP_UNDEFINED;
131     return ret;
132 }

134 int EVP_PKEY_keygen(EVP_PKEY_CTX *ctx, EVP_PKEY **ppkey)
135 {
136     int ret;

138     if (!ctx || !ctx->pmeth || !ctx->pmeth->keygen)
139     {
140         EVPerr(EVP_F_EVP_PKEY_KEYGEN,
141             EVP_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
142         return -2;
143     }
144     if (ctx->operation != EVP_PKEY_OP_KEYGEN)
145     {
146         EVPerr(EVP_F_EVP_PKEY_KEYGEN, EVP_R_OPERATION_NOT_INITIALIZED);
147         return -1;
148     }

150     if (!ppkey)
151         return -1;

153     if (!*ppkey)
154         *ppkey = EVP_PKEY_new();

156     ret = ctx->pmeth->keygen(ctx, *ppkey);
157     if (ret <= 0)
158     {
159         EVP_PKEY_free(*ppkey);
160         *ppkey = NULL;
161     }
162     return ret;
163 }

165 void EVP_PKEY_CTX_set_cb(EVP_PKEY_CTX *ctx, EVP_PKEY_gen_cb *cb)
166 {
167     ctx->pkey_gencb = cb;
168 }

170 EVP_PKEY_gen_cb *EVP_PKEY_CTX_get_cb(EVP_PKEY_CTX *ctx)
171 {
172     return ctx->pkey_gencb;
173 }

175 /* "translation callback" to call EVP_PKEY_CTX callbacks using BN_GENCB
176  * style callbacks.
177  */

179 static int trans_cb(int a, int b, BN_GENCB *gcb)
180 {
181     EVP_PKEY_CTX *ctx = gcb->arg;
182     ctx->keygen_info[0] = a;
183     ctx->keygen_info[1] = b;
184     return ctx->pkey_gencb(ctx);
185 }

187 void evp_pkey_set_cb_translate(BN_GENCB *cb, EVP_PKEY_CTX *ctx)
188 {
189     BN_GENCB_set(cb, trans_cb, ctx)
190 }

192 int EVP_PKEY_CTX_get_keygen_info(EVP_PKEY_CTX *ctx, int idx)
193 {

```

```

194     if (idx == -1)
195         return ctx->keygen_info_count;
196     if (idx < 0 || idx > ctx->keygen_info_count)
197         return 0;
198     return ctx->keygen_info[idx];
199 }

201 EVP_PKEY *EVP_PKEY_new_mac_key(int type, ENGINE *e,
202                                 const unsigned char *key, int keylen)
203 {
204     EVP_PKEY_CTX *mac_ctx = NULL;
205     EVP_PKEY *mac_key = NULL;
206     mac_ctx = EVP_PKEY_CTX_new_id(type, e);
207     if (!mac_ctx)
208         return NULL;
209     if (EVP_PKEY_keygen_init(mac_ctx) <= 0)
210         goto merr;
211     if (EVP_PKEY_CTX_ctrl(mac_ctx, -1, EVP_PKEY_OP_KEYGEN,
212                         EVP_PKEY_CTRL_SET_MAC_KEY,
213                         keylen, (void *)key) <= 0)
214         goto merr;
215     if (EVP_PKEY_keygen(mac_ctx, &mac_key) <= 0)
216         goto merr;
217 merr:
218     if (mac_ctx)
219         EVP_PKEY_CTX_free(mac_ctx);
220     return mac_key;
221 }

```

new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_lib.c

1

```
*****
15000 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* pmeth_lib.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include <stdlib.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/evp/pmeth_lib.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #ifndef OPENSSL_NO_ENGINE
65 #include <openssl/engine.h>
66 #endif
67 #include "asn1_locl.h"
68 #include "evp_locl.h"

70 typedef int sk_cmp_fn_type(const char * const *a, const char * const *b);

72 DECLARE_STACK_OF(EVP_PKEY_METHOD)
73 STACK_OF(EVP_PKEY_METHOD) *app_pkey_methods = NULL;

75 extern const EVP_PKEY_METHOD rsa_pkey_meth, dh_pkey_meth, dsa_pkey_meth;
76 extern const EVP_PKEY_METHOD ec_pkey_meth, hmac_pkey_meth, cmac_pkey_meth;

78 static const EVP_PKEY_METHOD *standard_methods[] =
79 {
80 #ifndef OPENSSL_NO_RSA
81     &rsa_pkey_meth,
82 #endif
83 #ifndef OPENSSL_NO_DH
84     &dh_pkey_meth,
85 #endif
86 #ifndef OPENSSL_NO_DSA
87     &dsa_pkey_meth,
88 #endif
89 #ifndef OPENSSL_NO_EC
90     &ec_pkey_meth,
91 #endif
92     &hmac_pkey_meth,
93     &cmac_pkey_meth
94 };

96 DECLARE_OBJ_BSEARCH_CMP_FN(const EVP_PKEY_METHOD *, const EVP_PKEY_METHOD *,
97                             pmeth);

99 static int pmeth_cmp(const EVP_PKEY_METHOD * const *a,
100                     const EVP_PKEY_METHOD * const *b)
101 {
102     return ((*a)->pkey_id - (*b)->pkey_id);
103 }

105 IMPLEMENT_OBJ_BSEARCH_CMP_FN(const EVP_PKEY_METHOD *, const EVP_PKEY_METHOD *,
106                             pmeth);

108 const EVP_PKEY_METHOD *EVP_PKEY_meth_find(int type)
109 {
110     EVP_PKEY_METHOD tmp;
111     const EVP_PKEY_METHOD *t = &tmp, **ret;
112     tmp.pkey_id = type;
113     if (app_pkey_methods)
114     {
115         int idx;
116         idx = sk_EVP_PKEY_METHOD_find(app_pkey_methods, &tmp);
117         if (idx >= 0)
118             return sk_EVP_PKEY_METHOD_value(app_pkey_methods, idx);
119     }
120     ret = OBJ_bsearch_pmeth(&t, standard_methods,
121                             sizeof(standard_methods)/sizeof(EVP_PKEY_METHOD *));
122     if (!ret || !*ret)
123         return NULL;
124     return *ret;
125 }

127 static EVP_PKEY_CTX *int_ctx_new(EVP_PKEY *pkey, ENGINE *e, int id)
```

```

128     {
129         EVP_PKEY_CTX *ret;
130         const EVP_PKEY_METHOD *pmeth;
131         if (id == -1)
132             {
133                 if (!pkey || !pkey->ameth)
134                     return NULL;
135                 id = pkey->ameth->pkey_id;
136             }
137 #ifndef OPENSSL_NO_ENGINE
138         if (pkey && pkey->engine)
139             e = pkey->engine;
140         /* Try to find an ENGINE which implements this method */
141         if (e)
142             {
143                 if (!ENGINE_init(e))
144                     {
145                         EVPerr(EVP_F_INT_CTX_NEW, ERR_R_ENGINE_LIB);
146                         return NULL;
147                     }
148             }
149         else
150             e = ENGINE_get_pkey_meth_engine(id);
151
152         /* If an ENGINE handled this method look it up. Otherwise
153          * use internal tables.
154          */
155
156         if (e)
157             pmeth = ENGINE_get_pkey_meth(e, id);
158         else
159 #endif
160             pmeth = EVP_PKEY_meth_find(id);
161
162         if (pmeth == NULL)
163             {
164                 EVPerr(EVP_F_INT_CTX_NEW, EVP_R_UNSUPPORTED_ALGORITHM);
165                 return NULL;
166             }
167
168         ret = OPENSSL_malloc(sizeof(EVP_PKEY_CTX));
169         if (!ret)
170             {
171 #ifndef OPENSSL_NO_ENGINE
172                 if (e)
173                     ENGINE_finish(e);
174 #endif
175                 EVPerr(EVP_F_INT_CTX_NEW, ERR_R_MALLOC_FAILURE);
176                 return NULL;
177             }
178         ret->engine = e;
179         ret->pmeth = pmeth;
180         ret->operation = EVP_PKEY_OP_UNDEFINED;
181         ret->pkey = pkey;
182         ret->peerkey = NULL;
183         ret->pkey_gencb = 0;
184         if (pkey)
185             CRYPTO_add(&pkey->references, 1, CRYPTO_LOCK_EVP_PKEY);
186         ret->data = NULL;
187
188         if (pmeth->init)
189             {
190                 if (pmeth->init(ret) <= 0)
191                     {
192                         EVP_PKEY_CTX_free(ret);
193                         return NULL;

```

```

194         }
195     }
196
197     return ret;
198 }
199
200 EVP_PKEY_METHOD* EVP_PKEY_meth_new(int id, int flags)
201 {
202     EVP_PKEY_METHOD *pmeth;
203     pmeth = OPENSSL_malloc(sizeof(EVP_PKEY_METHOD));
204     if (!pmeth)
205         return NULL;
206
207     memset(pmeth, 0, sizeof(EVP_PKEY_METHOD));
208
209     pmeth->pkey_id = id;
210     pmeth->flags = flags | EVP_PKEY_FLAG_DYNAMIC;
211
212     pmeth->init = 0;
213     pmeth->copy = 0;
214     pmeth->cleanup = 0;
215     pmeth->paramgen_init = 0;
216     pmeth->paramgen = 0;
217     pmeth->keygen_init = 0;
218     pmeth->keygen = 0;
219     pmeth->sign_init = 0;
220     pmeth->sign = 0;
221     pmeth->verify_init = 0;
222     pmeth->verify = 0;
223     pmeth->verify_recover_init = 0;
224     pmeth->verify_recover = 0;
225     pmeth->signctx_init = 0;
226     pmeth->signctx = 0;
227     pmeth->verifyctx_init = 0;
228     pmeth->verifyctx = 0;
229     pmeth->encrypt_init = 0;
230     pmeth->encrypt = 0;
231     pmeth->decrypt_init = 0;
232     pmeth->decrypt = 0;
233     pmeth->derive_init = 0;
234     pmeth->derive = 0;
235     pmeth->ctrl = 0;
236     pmeth->ctrl_str = 0;
237
238     return pmeth;
239 }
240
241 void EVP_PKEY_meth_get0_info(int *ppkey_id, int *pflags,
242                             const EVP_PKEY_METHOD *meth)
243 {
244     if (ppkey_id)
245         *ppkey_id = meth->pkey_id;
246     if (pflags)
247         *pflags = meth->flags;
248 }
249
250 void EVP_PKEY_meth_copy(EVP_PKEY_METHOD *dst, const EVP_PKEY_METHOD *src)
251 {
252
253     dst->init = src->init;
254     dst->copy = src->copy;
255     dst->cleanup = src->cleanup;
256
257     dst->paramgen_init = src->paramgen_init;
258     dst->paramgen = src->paramgen;

```



```

260     dst->keygen_init = src->keygen_init;
261     dst->keygen = src->keygen;

263     dst->sign_init = src->sign_init;
264     dst->sign = src->sign;

266     dst->verify_init = src->verify_init;
267     dst->verify = src->verify;

269     dst->verify_recover_init = src->verify_recover_init;
270     dst->verify_recover = src->verify_recover;

272     dst->signctx_init = src->signctx_init;
273     dst->signctx = src->signctx;

275     dst->verifyctx_init = src->verifyctx_init;
276     dst->verifyctx = src->verifyctx;

278     dst->encrypt_init = src->encrypt_init;
279     dst->encrypt = src->encrypt;

281     dst->decrypt_init = src->decrypt_init;
282     dst->decrypt = src->decrypt;

284     dst->derive_init = src->derive_init;
285     dst->derive = src->derive;

287     dst->ctrl = src->ctrl;
288     dst->ctrl_str = src->ctrl_str;
289     }

291 void EVP_PKEY_meth_free(EVP_PKEY_METHOD *pmeth)
292 {
293     if (pmeth && (pmeth->flags & EVP_PKEY_FLAG_DYNAMIC))
294         OPENSSL_free(pmeth);
295     }

297 EVP_PKEY_CTX *EVP_PKEY_CTX_new(EVP_PKEY *pkey, ENGINE *e)
298 {
299     return int_ctx_new(pkey, e, -1);
300     }

302 EVP_PKEY_CTX *EVP_PKEY_CTX_new_id(int id, ENGINE *e)
303 {
304     return int_ctx_new(NULL, e, id);
305     }

307 EVP_PKEY_CTX *EVP_PKEY_CTX_dup(EVP_PKEY_CTX *pctx)
308 {
309     EVP_PKEY_CTX *rctx;
310     if (!pctx->pmeth || !pctx->pmeth->copy)
311         return NULL;
312 #ifndef OPENSSL_NO_ENGINE
313     /* Make sure it's safe to copy a pkey context using an ENGINE */
314     if (pctx->engine && !ENGINE_init(pctx->engine))
315     {
316         EVPerr(EVP_F_EVP_PKEY_CTX_DUP, ERR_R_ENGINE_LIB);
317         return 0;
318     }
319 #endif
320     rctx = OPENSSL_malloc(sizeof(EVP_PKEY_CTX));
321     if (!rctx)
322         return NULL;

324     rctx->pmeth = pctx->pmeth;
325 #ifndef OPENSSL_NO_ENGINE

```

```

326     rctx->engine = pctx->engine;
327 #endif

329     if (pctx->pkey)
330         CRYPTO_add(&pctx->pkey->references, 1, CRYPTO_LOCK_EVP_PKEY);

332     rctx->pkey = pctx->pkey;

334     if (pctx->peerkey)
335         CRYPTO_add(&pctx->peerkey->references, 1, CRYPTO_LOCK_EVP_PKEY);

337     rctx->peerkey = pctx->peerkey;

339     rctx->data = NULL;
340     rctx->app_data = NULL;
341     rctx->operation = pctx->operation;

343     if (pctx->pmeth->copy(rctx, pctx) > 0)
344         return rctx;

346     EVP_PKEY_CTX_free(rctx);
347     return NULL;

349     }

351 int EVP_PKEY_meth_add0(const EVP_PKEY_METHOD *pmeth)
352 {
353     if (app_pkey_methods == NULL)
354     {
355         app_pkey_methods = sk_EVP_PKEY_METHOD_new(pmeth_cmp);
356         if (!app_pkey_methods)
357             return 0;
358     }
359     if (!sk_EVP_PKEY_METHOD_push(app_pkey_methods, pmeth))
360         return 0;
361     sk_EVP_PKEY_METHOD_sort(app_pkey_methods);
362     return 1;
363     }

365 void EVP_PKEY_CTX_free(EVP_PKEY_CTX *ctx)
366 {
367     if (ctx == NULL)
368         return;
369     if (ctx->pmeth && ctx->pmeth->cleanup)
370         ctx->pmeth->cleanup(ctx);
371     if (ctx->pkey)
372         EVP_PKEY_free(ctx->pkey);
373     if (ctx->peerkey)
374         EVP_PKEY_free(ctx->peerkey);
375 #ifndef OPENSSL_NO_ENGINE
376     if (ctx->engine)
377         /* The EVP_PKEY_CTX we used belongs to an ENGINE, release the
378          * functional reference we held for this reason. */
379         ENGINE_finish(ctx->engine);
380 #endif
381     OPENSSL_free(ctx);
382     }

384 int EVP_PKEY_CTX_ctrl(EVP_PKEY_CTX *ctx, int keytype, int optype,
385                      int cmd, int p1, void *p2)
386 {
387     int ret;
388     if (!ctx || !ctx->pmeth || !ctx->pmeth->ctrl)
389     {
390         EVPerr(EVP_F_EVP_PKEY_CTX_CTRL, EVP_R_COMMAND_NOT_SUPPORTED);
391         return -2;

```

```

392     }
393     if ((keytype != -1) && (ctx->pmeth->pkey_id != keytype))
394         return -1;
395
396     if (ctx->operation == EVP_PKEY_OP_UNDEFINED)
397     {
398         EVPerr(EVP_F_EVP_PKEY_CTX_CTRL, EVP_R_NO_OPERATION_SET);
399         return -1;
400     }
401
402     if ((optype != -1) && !(ctx->operation & optype))
403     {
404         EVPerr(EVP_F_EVP_PKEY_CTX_CTRL, EVP_R_INVALID_OPERATION);
405         return -1;
406     }
407
408     ret = ctx->pmeth->ctrl(ctx, cmd, p1, p2);
409
410     if (ret == -2)
411         EVPerr(EVP_F_EVP_PKEY_CTX_CTRL, EVP_R_COMMAND_NOT_SUPPORTED);
412
413     return ret;
414 }
415
417 int EVP_PKEY_CTX_ctrl_str(EVP_PKEY_CTX *ctx,
418                           const char *name, const char *value)
419 {
420     if (!ctx || !ctx->pmeth || !ctx->pmeth->ctrl_str)
421     {
422         EVPerr(EVP_F_EVP_PKEY_CTX_CTRL_STR,
423               EVP_R_COMMAND_NOT_SUPPORTED);
424         return -2;
425     }
426     if (!strcmp(name, "digest"))
427     {
428         const EVP_MD *md;
429         if (!value || !(md = EVP_get_digestbyname(value)))
430         {
431             EVPerr(EVP_F_EVP_PKEY_CTX_CTRL_STR,
432                   EVP_R_INVALID_DIGEST);
433             return 0;
434         }
435         return EVP_PKEY_CTX_set_signature_md(ctx, md);
436     }
437     return ctx->pmeth->ctrl_str(ctx, name, value);
438 }
439
440 int EVP_PKEY_CTX_get_operation(EVP_PKEY_CTX *ctx)
441 {
442     return ctx->operation;
443 }
444
445 void EVP_PKEY_CTX_set0_keygen_info(EVP_PKEY_CTX *ctx, int *dat, int datlen)
446 {
447     ctx->keygen_info = dat;
448     ctx->keygen_info_count = datlen;
449 }
450
451 void EVP_PKEY_CTX_set_data(EVP_PKEY_CTX *ctx, void *data)
452 {
453     ctx->data = data;
454 }
455
456 void *EVP_PKEY_CTX_get_data(EVP_PKEY_CTX *ctx)
457 {

```

```

458     return ctx->data;
459 }
460
461 EVP_PKEY *EVP_PKEY_CTX_get0_pkey(EVP_PKEY_CTX *ctx)
462 {
463     return ctx->pkey;
464 }
465
466 EVP_PKEY *EVP_PKEY_CTX_get0_peerkey(EVP_PKEY_CTX *ctx)
467 {
468     return ctx->peerkey;
469 }
470
471 void EVP_PKEY_CTX_set_app_data(EVP_PKEY_CTX *ctx, void *data)
472 {
473     ctx->app_data = data;
474 }
475
476 void *EVP_PKEY_CTX_get_app_data(EVP_PKEY_CTX *ctx)
477 {
478     return ctx->app_data;
479 }
480
481 void EVP_PKEY_meth_set_init(EVP_PKEY_METHOD *pmeth,
482                             int (*init)(EVP_PKEY_CTX *ctx))
483 {
484     pmeth->init = init;
485 }
486
487 void EVP_PKEY_meth_set_copy(EVP_PKEY_METHOD *pmeth,
488                             int (*copy)(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src))
489 {
490     pmeth->copy = copy;
491 }
492
493 void EVP_PKEY_meth_set_cleanup(EVP_PKEY_METHOD *pmeth,
494                                void (*cleanup)(EVP_PKEY_CTX *ctx))
495 {
496     pmeth->cleanup = cleanup;
497 }
498
499 void EVP_PKEY_meth_set_paramgen(EVP_PKEY_METHOD *pmeth,
500                                 int (*paramgen_init)(EVP_PKEY_CTX *ctx),
501                                 int (*paramgen)(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey))
502 {
503     pmeth->paramgen_init = paramgen_init;
504     pmeth->paramgen = paramgen;
505 }
506
507 void EVP_PKEY_meth_set_keygen(EVP_PKEY_METHOD *pmeth,
508                               int (*keygen_init)(EVP_PKEY_CTX *ctx),
509                               int (*keygen)(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey))
510 {
511     pmeth->keygen_init = keygen_init;
512     pmeth->keygen = keygen;
513 }
514
515 void EVP_PKEY_meth_set_sign(EVP_PKEY_METHOD *pmeth,
516                             int (*sign_init)(EVP_PKEY_CTX *ctx),
517                             int (*sign)(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
518                                           const unsigned char *tbs, size_t tbslen))
519 {
520     pmeth->sign_init = sign_init;
521     pmeth->sign = sign;
522 }

```

```

524 void EVP_PKEY_meth_set_verify(EVP_PKEY_METHOD *pmeth,
525     int (*verify_init)(EVP_PKEY_CTX *ctx),
526     int (*verify)(EVP_PKEY_CTX *ctx, const unsigned char *sig, size_t siglen,
527         const unsigned char *tbs, size_t tbslen))
528 {
529     pmeth->verify_init = verify_init;
530     pmeth->verify = verify;
531 }

533 void EVP_PKEY_meth_set_verify_recover(EVP_PKEY_METHOD *pmeth,
534     int (*verify_recover_init)(EVP_PKEY_CTX *ctx),
535     int (*verify_recover)(EVP_PKEY_CTX *ctx,
536         unsigned char *sig, size_t *siglen,
537         const unsigned char *tbs, size_t tbslen))
538 {
539     pmeth->verify_recover_init = verify_recover_init;
540     pmeth->verify_recover = verify_recover;
541 }

543 void EVP_PKEY_meth_set_signctx(EVP_PKEY_METHOD *pmeth,
544     int (*signctx_init)(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx),
545     int (*signctx)(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
546         EVP_MD_CTX *mctx))
547 {
548     pmeth->signctx_init = signctx_init;
549     pmeth->signctx = signctx;
550 }

552 void EVP_PKEY_meth_set_verifyctx(EVP_PKEY_METHOD *pmeth,
553     int (*verifyctx_init)(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx),
554     int (*verifyctx)(EVP_PKEY_CTX *ctx, const unsigned char *sig, int siglen,
555         EVP_MD_CTX *mctx))
556 {
557     pmeth->verifyctx_init = verifyctx_init;
558     pmeth->verifyctx = verifyctx;
559 }

561 void EVP_PKEY_meth_set_encrypt(EVP_PKEY_METHOD *pmeth,
562     int (*encrypt_init)(EVP_PKEY_CTX *ctx),
563     int (*encryptfn)(EVP_PKEY_CTX *ctx, unsigned char *out, size_t *outlen,
564         const unsigned char *in, size_t inlen))
565 {
566     pmeth->encrypt_init = encrypt_init;
567     pmeth->encrypt = encryptfn;
568 }

570 void EVP_PKEY_meth_set_decrypt(EVP_PKEY_METHOD *pmeth,
571     int (*decrypt_init)(EVP_PKEY_CTX *ctx),
572     int (*decrypt)(EVP_PKEY_CTX *ctx, unsigned char *out, size_t *outlen,
573         const unsigned char *in, size_t inlen))
574 {
575     pmeth->decrypt_init = decrypt_init;
576     pmeth->decrypt = decrypt;
577 }

579 void EVP_PKEY_meth_set_derive(EVP_PKEY_METHOD *pmeth,
580     int (*derive_init)(EVP_PKEY_CTX *ctx),
581     int (*derive)(EVP_PKEY_CTX *ctx, unsigned char *key, size_t *keylen))
582 {
583     pmeth->derive_init = derive_init;
584     pmeth->derive = derive;
585 }

587 void EVP_PKEY_meth_set_ctrl(EVP_PKEY_METHOD *pmeth,
588     int (*ctrl)(EVP_PKEY_CTX *ctx, int type, int p1, void *p2),
589     int (*ctrl_str)(EVP_PKEY_CTX *ctx, const char *type, const char *value))

```

```

590     {
591         pmeth->ctrl = ctrl;
592         pmeth->ctrl_str = ctrl_str;
593     }

```

```

*****
21405 Fri May 30 18:31:54 2014
new/usr/src/lib/openssl/libsunw_crypto/ex_data.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/ex_data.c */
2
3 /*
4  * Overhaul notes;
5  *
6  * This code is now *mostly* thread-safe. It is now easier to understand in what
7  * ways it is safe and in what ways it is not, which is an improvement. Firstly,
8  * all per-class stacks and index-counters for ex_data are stored in the same
9  * global LHASH table (keyed by class). This hash table uses locking for all
10 * access with the exception of CRYPTO_cleanup_all_ex_data(), which must only be
11 * called when no other threads can possibly race against it (even if it was
12 * locked, the race would mean it's possible the hash table might have been
13 * recreated after the cleanup). As classes can only be added to the hash table,
14 * and within each class, the stack of methods can only be incremented, the
15 * locking mechanics are simpler than they would otherwise be. For example, the
16 * new/dup/free ex_data functions will lock the hash table, copy the method
17 * pointers it needs from the relevant class, then unlock the hash table before
18 * actually applying those method pointers to the task of the new/dup/free
19 * operations. As they can't be removed from the method-stack, only
20 * supplemented, there's no race conditions associated with using them outside
21 * the lock. The get/set_ex_data functions are not locked because they do not
22 * involve this global state at all - they operate directly with a previously
23 * obtained per-class method index and a particular "ex_data" variable. These
24 * variables are usually instantiated per-context (eg. each RSA structure has
25 * one) so locking on read/write access to that variable can be locked locally
26 * if required (eg. using the "RSA" lock to synchronise access to a
27 * per-RSA-structure ex_data variable if required).
28 * [Geoff]
29 */
30
31 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
32  * All rights reserved.
33  *
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35  * by Eric Young (eay@cryptsoft.com).
36  * The implementation was written so as to conform with Netscapes SSL.
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```

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133 * =====
134 *
135 * This product includes cryptographic software written by Eric Young
136 * (eay@cryptsoft.com). This product includes software written by Tim
137 * Hudson (tjh@cryptsoft.com).
138 *
139 */

141 #include <cryptlib.h>
142 #include <openssl/lhash.h>

144 /* What an "implementation of ex_data functionality" looks like */
145 struct st_CRYPTO_EX_DATA_IMPL
146 {
147     /* =====
148     /* GLOBAL OPERATIONS */
149     /* Return a new class index */
150     int (*cb_new_class)(void);
151     /* Cleanup all state used by the implementation */
152     void (*cb_cleanup)(void);
153     /* =====
154     /* PER-CLASS OPERATIONS */
155     /* Get a new method index within a class */
156     int (*cb_get_new_index)(int class_index, long argl, void *argp,
157                             CRYPTO_EX_new *new_func, CRYPTO_EX_dup *dup_func,
158                             CRYPTO_EX_free *free_func);
159     /* Initialise a new CRYPTO_EX_DATA of a given class */
160     int (*cb_new_ex_data)(int class_index, void *obj,
161                           CRYPTO_EX_DATA *ad);
162     /* Duplicate a CRYPTO_EX_DATA of a given class onto a copy */
163     int (*cb_dup_ex_data)(int class_index, CRYPTO_EX_DATA *to,
164                           CRYPTO_EX_DATA *from);
165     /* Cleanup a CRYPTO_EX_DATA of a given class */
166     void (*cb_free_ex_data)(int class_index, void *obj,
167                             CRYPTO_EX_DATA *ad);
168     };

170 /* The implementation we use at run-time */
171 static const CRYPTO_EX_DATA_IMPL *impl = NULL;

173 /* To call "impl" functions, use this macro rather than referring to 'impl' dire
174  * EX_IMPL(get_new_index)(...); */
175 #define EX_IMPL(a) impl->cb_##a

177 /* Predeclare the "default" ex_data implementation */
178 static int int_new_class(void);
179 static void int_cleanup(void);
180 static int int_get_new_index(int class_index, long argl, void *argp,
181                              CRYPTO_EX_new *new_func, CRYPTO_EX_dup *dup_func,
182                              CRYPTO_EX_free *free_func);
183 static int int_new_ex_data(int class_index, void *obj,
184                             CRYPTO_EX_DATA *ad);
185 static int int_dup_ex_data(int class_index, CRYPTO_EX_DATA *to,
186                             CRYPTO_EX_DATA *from);
187 static void int_free_ex_data(int class_index, void *obj,
188                              CRYPTO_EX_DATA *ad);
189 static CRYPTO_EX_DATA_IMPL impl_default =
190 {
191     int_new_class,
192     int_cleanup,
193     int_get_new_index,

```

```

194     int_new_ex_data,
195     int_dup_ex_data,
196     int_free_ex_data
197 };

199 /* Internal function that checks whether "impl" is set and if not, sets it to
200  * the default. */
201 static void impl_check(void)
202 {
203     CRYPTO_w_lock(CRYPTO_LOCK_EX_DATA);
204     if(!impl)
205         impl = &impl_default;
206     CRYPTO_w_unlock(CRYPTO_LOCK_EX_DATA);
207 }

208 /* A macro wrapper for impl_check that first uses a non-locked test before
209  * invoking the function (which checks again inside a lock). */
210 #define IMPL_CHECK if(!impl) impl_check();

212 /* API functions to get/set the "ex_data" implementation */
213 const CRYPTO_EX_DATA_IMPL *CRYPTO_get_ex_data_implementation(void)
214 {
215     IMPL_CHECK
216     return impl;
217 }

218 int CRYPTO_set_ex_data_implementation(const CRYPTO_EX_DATA_IMPL *i)
219 {
220     int toret = 0;
221     CRYPTO_w_lock(CRYPTO_LOCK_EX_DATA);
222     if(!impl)
223     {
224         impl = i;
225         toret = 1;
226     }
227     CRYPTO_w_unlock(CRYPTO_LOCK_EX_DATA);
228     return toret;
229 }

231 /* =====
232 /* Internal (default) implementation of "ex_data" support. API functions are
233  * further down. */

235 /* The type that represents what each "class" used to implement locally. A STACK
236  * of CRYPTO_EX_DATA_FUNCS plus a index-counter. The 'class_index' is the global
237  * value representing the class that is used to distinguish these items. */
238 typedef struct st_ex_class_item {
239     int class_index;
240     STACK_OF(CRYPTO_EX_DATA_FUNCS) *meth;
241     int meth_num;
242 } EX_CLASS_ITEM;

244 /* When assigning new class indexes, this is our counter */
245 static int ex_class = CRYPTO_EX_INDEX_USER;

247 /* The global hash table of EX_CLASS_ITEM items */
248 DECLARE_LHASH_OF(EX_CLASS_ITEM);
249 static LHASH_OF(EX_CLASS_ITEM) *ex_data = NULL;

251 /* The callbacks required in the "ex_data" hash table */
252 static unsigned long ex_class_item_hash(const EX_CLASS_ITEM *a)
253 {
254     return a->class_index;
255 }
256 static IMPLEMENT_LHASH_HASH_FN(ex_class_item, EX_CLASS_ITEM)

258 static int ex_class_item_cmp(const EX_CLASS_ITEM *a, const EX_CLASS_ITEM *b)
259 {

```

```
325 CRYPTO w unlock(CRYPTO LOCK EX DATA);
```

```
391 {
```

```

392 EX_CLASS_ITEM *item = def_get_class(class_index);
393 if(!item)
394     return -1;
395 return def_add_index(item, argl, argp, new_func, dup_func, free_func);
396 }

398 /* Thread-safe by copying a class's array of "CRYPTO_EX_DATA_FUNCS" entries in
399  * the lock, then using them outside the lock. NB: Thread-safety only applies to
400  * the global "ex_data" state (ie. class definitions), not thread-safe on 'ad'
401  * itself. */
402 static int int_new_ex_data(int class_index, void *obj,
403     CRYPTO_EX_DATA *ad)
404 {
405     int mx,i;
406     void *ptr;
407     CRYPTO_EX_DATA_FUNCS **storage = NULL;
408     EX_CLASS_ITEM *item = def_get_class(class_index);
409     if(!item)
410         /* error is already set */
411         return 0;
412     ad->sk = NULL;
413     CRYPTO_r_lock(CRYPTO_LOCK_EX_DATA);
414     mx = sk_CRYPTO_EX_DATA_FUNCS_num(item->meth);
415     if(mx > 0)
416     {
417         storage = OPENSSL_malloc(mx * sizeof(CRYPTO_EX_DATA_FUNCS*));
418         if(!storage)
419             goto skip;
420         for(i = 0; i < mx; i++)
421             storage[i] = sk_CRYPTO_EX_DATA_FUNCS_value(item->meth,i)
422     }
423 skip:
424     CRYPTO_r_unlock(CRYPTO_LOCK_EX_DATA);
425     if((mx > 0) && !storage)
426     {
427         CRYPTOerr(CRYPTO_F_INT_NEW_EX_DATA,ERR_R_MALLOC_FAILURE);
428         return 0;
429     }
430     for(i = 0; i < mx; i++)
431     {
432         if(storage[i] && storage[i]->new_func)
433         {
434             ptr = CRYPTO_get_ex_data(ad, i);
435             storage[i]->new_func(obj,ptr,ad,i,
436                 storage[i]->argl,storage[i]->argp);
437         }
438     }
439     if(storage)
440         OPENSSL_free(storage);
441     return 1;
442 }

444 /* Same thread-safety notes as for "int_new_ex_data" */
445 static int int_dup_ex_data(int class_index, CRYPTO_EX_DATA *to,
446     CRYPTO_EX_DATA *from)
447 {
448     int mx, j, i;
449     char *ptr;
450     CRYPTO_EX_DATA_FUNCS **storage = NULL;
451     EX_CLASS_ITEM *item;
452     if(!from->sk)
453         /* 'to' should be "blank" which *is* just like 'from' */
454         return 1;
455     if((item = def_get_class(class_index)) == NULL)
456         return 0;
457     CRYPTO_r_lock(CRYPTO_LOCK_EX_DATA);

```

```

458     mx = sk_CRYPTO_EX_DATA_FUNCS_num(item->meth);
459     j = sk_void_num(from->sk);
460     if(j < mx)
461         mx = j;
462     if(mx > 0)
463     {
464         storage = OPENSSL_malloc(mx * sizeof(CRYPTO_EX_DATA_FUNCS*));
465         if(!storage)
466             goto skip;
467         for(i = 0; i < mx; i++)
468             storage[i] = sk_CRYPTO_EX_DATA_FUNCS_value(item->meth,i)
469     }
470 skip:
471     CRYPTO_r_unlock(CRYPTO_LOCK_EX_DATA);
472     if((mx > 0) && !storage)
473     {
474         CRYPTOerr(CRYPTO_F_INT_DUP_EX_DATA,ERR_R_MALLOC_FAILURE);
475         return 0;
476     }
477     for(i = 0; i < mx; i++)
478     {
479         ptr = CRYPTO_get_ex_data(from, i);
480         if(storage[i] && storage[i]->dup_func)
481             storage[i]->dup_func(to, from,&ptr,i,
482                 storage[i]->argl,storage[i]->argp);
483         CRYPTO_set_ex_data(to,i,ptr);
484     }
485     if(storage)
486         OPENSSL_free(storage);
487     return 1;
488 }

490 /* Same thread-safety notes as for "int_new_ex_data" */
491 static void int_free_ex_data(int class_index, void *obj,
492     CRYPTO_EX_DATA *ad)
493 {
494     int mx,i;
495     EX_CLASS_ITEM *item;
496     void *ptr;
497     CRYPTO_EX_DATA_FUNCS **storage = NULL;
498     if((item = def_get_class(class_index)) == NULL)
499         return;
500     CRYPTO_r_lock(CRYPTO_LOCK_EX_DATA);
501     mx = sk_CRYPTO_EX_DATA_FUNCS_num(item->meth);
502     if(mx > 0)
503     {
504         storage = OPENSSL_malloc(mx * sizeof(CRYPTO_EX_DATA_FUNCS*));
505         if(!storage)
506             goto skip;
507         for(i = 0; i < mx; i++)
508             storage[i] = sk_CRYPTO_EX_DATA_FUNCS_value(item->meth,i)
509     }
510 skip:
511     CRYPTO_r_unlock(CRYPTO_LOCK_EX_DATA);
512     if((mx > 0) && !storage)
513     {
514         CRYPTOerr(CRYPTO_F_INT_FREE_EX_DATA,ERR_R_MALLOC_FAILURE);
515         return;
516     }
517     for(i = 0; i < mx; i++)
518     {
519         if(storage[i] && storage[i]->free_func)
520         {
521             ptr = CRYPTO_get_ex_data(ad,i);
522             storage[i]->free_func(obj,ptr,ad,i,
523                 storage[i]->argl,storage[i]->argp);

```

```

524     }
525     }
526     if(storage)
527         OPENSSL_free(storage);
528     if(ad->sk)
529     {
530         sk_void_free(ad->sk);
531         ad->sk=NULL;
532     }
533 }

535 /*****
536  * API functions that defer all "state" operations to the "ex_data"
537  * implementation we have set. */

539 /* Obtain an index for a new class (not the same as getting a new index within
540  * an existing class - this is actually getting a new *class*) */
541 int CRYPTO_ex_data_new_class(void)
542 {
543     IMPL_CHECK
544     return EX_IMPL(new_class());
545 }

547 /* Release all "ex_data" state to prevent memory leaks. This can't be made
548  * thread-safe without overhauling a lot of stuff, and shouldn't really be
549  * called under potential race-conditions anyway (it's for program shutdown
550  * after all). */
551 void CRYPTO_cleanup_all_ex_data(void)
552 {
553     IMPL_CHECK
554     EX_IMPL(cleanup());
555 }

557 /* Inside an existing class, get/register a new index. */
558 int CRYPTO_get_ex_new_index(int class_index, long argl, void *argp,
559                             CRYPTO_EX_new *new_func, CRYPTO_EX_dup *dup_func,
560                             CRYPTO_EX_free *free_func)
561 {
562     int ret = -1;

564     IMPL_CHECK
565     ret = EX_IMPL(get_new_index)(class_index,
566                                 argl, argp, new_func, dup_func, free_func);
567     return ret;
568 }

570 /* Initialise a new CRYPTO_EX_DATA for use in a particular class - including
571  * calling new() callbacks for each index in the class used by this variable */
572 int CRYPTO_new_ex_data(int class_index, void *obj, CRYPTO_EX_DATA *ad)
573 {
574     IMPL_CHECK
575     return EX_IMPL(new_ex_data)(class_index, obj, ad);
576 }

578 /* Duplicate a CRYPTO_EX_DATA variable - including calling dup() callbacks for
579  * each index in the class used by this variable */
580 int CRYPTO_dup_ex_data(int class_index, CRYPTO_EX_DATA *to,
581                       CRYPTO_EX_DATA *from)
582 {
583     IMPL_CHECK
584     return EX_IMPL(dup_ex_data)(class_index, to, from);
585 }

587 /* Cleanup a CRYPTO_EX_DATA variable - including calling free() callbacks for
588  * each index in the class used by this variable */
589 void CRYPTO_free_ex_data(int class_index, void *obj, CRYPTO_EX_DATA *ad)

```

```

590     {
591         IMPL_CHECK
592         EX_IMPL(free_ex_data)(class_index, obj, ad);
593     }

595 /* For a given CRYPTO_EX_DATA variable, set the value corresponding to a
596  * particular index in the class used by this variable */
597 int CRYPTO_set_ex_data(CRYPTO_EX_DATA *ad, int idx, void *val)
598 {
599     int i;

601     if (ad->sk == NULL)
602     {
603         if ((ad->sk=sk_void_new_null()) == NULL)
604         {
605             CRYPTOerr(CRYPTO_F_CRYPT0_SET_EX_DATA,ERR_R_MALLOC_FAILU
606                       return(0);
607         }
608     }
609     i=sk_void_num(ad->sk);

611     while (i <= idx)
612     {
613         if (!sk_void_push(ad->sk,NULL))
614         {
615             CRYPTOerr(CRYPTO_F_CRYPT0_SET_EX_DATA,ERR_R_MALLOC_FAILU
616                       return(0);
617         }
618         i++;
619     }
620     sk_void_set(ad->sk,idx,val);
621     return(1);
622 }

624 /* For a given CRYPTO_EX_DATA variable, get the value corresponding to a
625  * particular index in the class used by this variable */
626 void *CRYPTO_get_ex_data(const CRYPTO_EX_DATA *ad, int idx)
627 {
628     if (ad->sk == NULL)
629         return(0);
630     else if (idx >= sk_void_num(ad->sk))
631         return(0);
632     else
633         return(sk_void_value(ad->sk,idx));
634 }

636 IMPLEMENT_STACK_OF(CRYPTO_EX_DATA_FUNCS)

```


new/usr/src/lib/openssl/libsunw_crypto/fips_ers.c

1

```
*****
117 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/fips_ers.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 #include <openssl/opensslconf.h>
3 #ifdef OPENSSL_FIPS
4 # include "fips_err.h"
5 #else
6 static void *dummy=&dummy;
7 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/hmac/hm_ameth.c

1

```
*****
4636 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/hmac/hm_ameth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
2  * project 2007.
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52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  *
56  */
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/evp.h>
61 #include "asn1_locl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/hmac/hm_ameth.c

2

```
63 #define HMAC_TEST_PRIVATE_KEY_FORMAT

65 /* HMAC "ASN1" method. This is just here to indicate the
66  * maximum HMAC output length and to free up an HMAC
67  * key.
68  */

70 static int hmac_size(const EVP_PKEY *pkey)
71 {
72     return EVP_MAX_MD_SIZE;
73 }

75 static void hmac_key_free(EVP_PKEY *pkey)
76 {
77     ASN1_OCTET_STRING *os = (ASN1_OCTET_STRING *)pkey->pkey.ptr;
78     if (os)
79     {
80         if (os->data)
81             OPENSSL_cleanse(os->data, os->length);
82         ASN1_OCTET_STRING_free(os);
83     }
84 }

87 static int hmac_pkey_ctrl(EVP_PKEY *pkey, int op, long arg1, void *arg2)
88 {
89     switch (op)
90     {
91         case ASN1_PKEY_CTRL_DEFAULT_MD_NID:
92             *(int *)arg2 = NID_sha1;
93             return 1;

95         default:
96             return -2;
97     }
98 }

100 #ifdef HMAC_TEST_PRIVATE_KEY_FORMAT
101 /* A bogus private key format for test purposes. This is simply the
102  * HMAC key with "HMAC PRIVATE KEY" in the headers. When enabled the
103  * genpkey utility can be used to "generate" HMAC keys.
104  */

106 static int old_hmac_decode(EVP_PKEY *pkey,
107                             const unsigned char **pder, int derlen)
108 {
109     ASN1_OCTET_STRING *os;
110     os = ASN1_OCTET_STRING_new();
111     if (!os || !ASN1_OCTET_STRING_set(os, *pder, derlen))
112         return 0;
113     EVP_PKEY_assign(pkey, EVP_PKEY_HMAC, os);
114     return 1;
115 }

117 static int old_hmac_encode(const EVP_PKEY *pkey, unsigned char **pder)
118 {
119     int inc;
120     ASN1_OCTET_STRING *os = (ASN1_OCTET_STRING *)pkey->pkey.ptr;
121     if (pder)
122     {
123         if (!*pder)
124         {
125             *pder = OPENSSL_malloc(os->length);
126             inc = 0;
127         }
128     }
129 }
```

```
128         else inc = 1;
130         memcpy(*pder, os->data, os->length);
132         if (inc)
133             *pder += os->length;
134     }
135     return os->length;
136 }
137
139 #endif
141 const EVP_PKEY_ASN1_METHOD hmac_asn1_meth =
142 {
143     EVP_PKEY_HMAC,
144     EVP_PKEY_HMAC,
145     0,
146     "HMAC",
147     "OpenSSL HMAC method",
148     0,0,0,0,
149     0,0,0,
150     hmac_size,
151     0,
152     0,0,0,0,0,0,
153     hmac_key_free,
154     hmac_pkey_ctrl,
155 #ifdef HMAC_TEST_PRIVATE_KEY_FORMAT
156     old_hmac_decode,
157     old_hmac_encode
158 #else
159     0,0
160 #endif
161 };
```

new/usr/src/lib/openssl/libsunw_crypto/hmac/hm_pmeth.c

1

```
*****
6670 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/hmac/hm_pmeth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
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49  * OF THE POSSIBILITY OF SUCH DAMAGE.
50  * =====
51  *
52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  */
56
57 #include <stdio.h>
58 #include "cryptlib.h"
59 #include <openssl/x509.h>
60 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/hmac/hm_pmeth.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/hmac.h>
64 #include "evp_loc1.h"
65
66 /* HMAC pkey context structure */
67
68 typedef struct
69 {
70     const EVP_MD *md; /* MD for HMAC use */
71     ASN1_OCTET_STRING ktmp; /* Temp storage for key */
72     HMAC_CTX ctx;
73 } HMAC_PKEY_CTX;
74
75 static int pkey_hmac_init(EVP_PKEY_CTX *ctx)
76 {
77     HMAC_PKEY_CTX *hctx;
78     hctx = OPENSSL_malloc(sizeof(HMAC_PKEY_CTX));
79     if (!hctx)
80         return 0;
81     hctx->md = NULL;
82     hctx->ktmp.data = NULL;
83     hctx->ktmp.length = 0;
84     hctx->ktmp.flags = 0;
85     hctx->ktmp.type = V_ASN1_OCTET_STRING;
86     HMAC_CTX_init(&hctx->ctx);
87
88     ctx->data = hctx;
89     ctx->keygen_info_count = 0;
90
91     return 1;
92 }
93
94 static int pkey_hmac_copy(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src)
95 {
96     HMAC_PKEY_CTX *sctx, *dctx;
97     if (!pkey_hmac_init(dst))
98         return 0;
99     sctx = src->data;
100     dctx = dst->data;
101     dctx->md = sctx->md;
102     HMAC_CTX_init(&dctx->ctx);
103     if (!HMAC_CTX_copy(&dctx->ctx, &sctx->ctx))
104         return 0;
105     if (sctx->ktmp.data)
106     {
107         if (!ASN1_OCTET_STRING_set(&dctx->ktmp,
108                                   sctx->ktmp.data, sctx->ktmp.length))
109             return 0;
110     }
111     return 1;
112 }
113
114 static void pkey_hmac_cleanup(EVP_PKEY_CTX *ctx)
115 {
116     HMAC_PKEY_CTX *hctx = ctx->data;
117     HMAC_CTX_cleanup(&hctx->ctx);
118     if (hctx->ktmp.data)
119     {
120         if (hctx->ktmp.length)
121             OPENSSL_cleanse(hctx->ktmp.data, hctx->ktmp.length);
122         OPENSSL_free(hctx->ktmp.data);
123         hctx->ktmp.data = NULL;
124     }
125     OPENSSL_free(hctx);
126 }
```

```

128 static int pkey_hmac_keygen(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey)
129 {
130     ASN1_OCTET_STRING *hkey = NULL;
131     HMAC_PKEY_CTX *hctx = ctx->data;
132     if (!hctx->ktmp.data)
133         return 0;
134     hkey = ASN1_OCTET_STRING_dup(&hctx->ktmp);
135     if (!hkey)
136         return 0;
137     EVP_PKEY_assign(pkey, EVP_PKEY_HMAC, hkey);
138
139     return 1;
140 }
141
142 static int int_update(EVP_MD_CTX *ctx, const void *data, size_t count)
143 {
144     HMAC_PKEY_CTX *hctx = ctx->pctx->data;
145     if (!HMAC_Update(&hctx->ctx, data, count))
146         return 0;
147     return 1;
148 }
149
150 static int hmac_signctx_init(EVP_PKEY_CTX *ctx, EVP_MD_CTX *mctx)
151 {
152     HMAC_PKEY_CTX *hctx = ctx->data;
153     HMAC_CTX_set_flags(&hctx->ctx, mctx->flags & ~EVP_MD_CTX_FLAG_NO_INIT);
154     EVP_MD_CTX_set_flags(mctx, EVP_MD_CTX_FLAG_NO_INIT);
155     mctx->update = int_update;
156     return 1;
157 }
158
159 static int hmac_signctx(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
160                         EVP_MD_CTX *mctx)
161 {
162     unsigned int hlen;
163     HMAC_PKEY_CTX *hctx = ctx->data;
164     int l = EVP_MD_CTX_size(mctx);
165
166     if (l < 0)
167         return 0;
168     *siglen = l;
169     if (!sig)
170         return 1;
171
172     if (!HMAC_Final(&hctx->ctx, sig, &hlen))
173         return 0;
174     *siglen = (size_t)hlen;
175     return 1;
176 }
177
178 static int pkey_hmac_ctrl(EVP_PKEY_CTX *ctx, int type, int p1, void *p2)
179 {
180     HMAC_PKEY_CTX *hctx = ctx->data;
181     ASN1_OCTET_STRING *key;
182     switch (type)
183     {
184
185     case EVP_PKEY_CTRL_SET_MAC_KEY:
186         if ((p2 && p1 > 0) || (p1 < -1))
187             return 0;
188         if (!ASN1_OCTET_STRING_set(&hctx->ktmp, p2, p1))
189             return 0;
190         break;
191
192     case EVP_PKEY_CTRL_MD:
193         hctx->md = p2;

```

```

194         break;
195
196     case EVP_PKEY_CTRL_DIGESTINIT:
197         key = (ASN1_OCTET_STRING *)ctx->pkey->pkey.ptr;
198         if (!HMAC_Init_ex(&hctx->ctx, key->data, key->length, hctx->md,
199                           ctx->engine))
200             return 0;
201         break;
202
203     default:
204         return -2;
205
206     }
207     return 1;
208 }
209
210 static int pkey_hmac_ctrl_str(EVP_PKEY_CTX *ctx,
211                               const char *type, const char *value)
212 {
213     if (!value)
214     {
215         return 0;
216     }
217     if (!strcmp(type, "key"))
218     {
219         void *p = (void *)value;
220         return pkey_hmac_ctrl(ctx, EVP_PKEY_CTRL_SET_MAC_KEY,
221                               -1, p);
222     }
223     if (!strcmp(type, "hexkey"))
224     {
225         unsigned char *key;
226         int r;
227         long keylen;
228         key = string_to_hex(value, &keylen);
229         if (!key)
230             return 0;
231         r = pkey_hmac_ctrl(ctx, EVP_PKEY_CTRL_SET_MAC_KEY, keylen, key);
232         OPENSSL_free(key);
233         return r;
234     }
235     return -2;
236 }
237
238 const EVP_PKEY_METHOD hmac_pkey_meth =
239 {
240     EVP_PKEY_HMAC,
241     0,
242     pkey_hmac_init,
243     pkey_hmac_copy,
244     pkey_hmac_cleanup,
245
246     0, 0,
247
248     0,
249     pkey_hmac_keygen,
250
251     0, 0,
252
253     0, 0,
254
255     0, 0,
256
257     hmac_signctx_init,
258     hmac_signctx,

```

new/usr/src/lib/openssl/libsunw_crypto/hmac/hm_pmeth.c

5

```
260      0, 0,  
262      0, 0,  
264      0, 0,  
266      0, 0,  
268      pkey_hmac_ctrl,  
269      pkey_hmac_ctrl_str  
271      };
```

 7549 Fri May 30 18:31:55 2014

new/usr/src/lib/openssl/libsunw_crypto/hmac/hmac.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

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4  *
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 #include <stdio.h>
59 #include <stdlib.h>
60 #include <string.h>
61 #include "cryptlib.h"

```

```

62 #include <openssl/hmac.h>
63
64 #ifdef OPENSSSL_FIPS
65 #include <openssl/fips.h>
66 #endif
67
68 int HMAC_Init_ex(HMAC_CTX *ctx, const void *key, int len,
69                 const EVP_MD *md, ENGINE *impl)
70 {
71     int i,j,reset=0;
72     unsigned char pad[HMAC_MAX_MD_CBLOCK];
73
74 #ifdef OPENSSSL_FIPS
75     if (FIPS_mode())
76     {
77         /* If we have an ENGINE need to allow non FIPS */
78         if ((impl || ctx->i_ctx.engine)
79             && !(ctx->i_ctx.flags & EVP_CIPH_FLAG_NON_FIPS_ALLOW))
80         {
81             EVPerr(EVP_F_HMAC_INIT_EX, EVP_R_DISABLED_FOR_FIPS);
82             return 0;
83         }
84         /* Other algorithm blocking will be done in FIPS_cmac_init,
85          * via FIPS_hmac_init_ex().
86          */
87         if (!impl && !ctx->i_ctx.engine)
88             return FIPS_hmac_init_ex(ctx, key, len, md, NULL);
89     }
90 #endif
91
92     if (md != NULL)
93     {
94         reset=1;
95         ctx->md=md;
96     }
97     else
98         md=ctx->md;
99
100     if (key != NULL)
101     {
102         reset=1;
103         j=EVP_MD_block_size(md);
104         OPENSSL_assert(j <= (int)sizeof(ctx->key));
105         if (j < len)
106         {
107             if (!EVP_DigestInit_ex(&ctx->md_ctx,md, impl))
108                 goto err;
109             if (!EVP_DigestUpdate(&ctx->md_ctx,key, len))
110                 goto err;
111             if (!EVP_DigestFinal_ex(&(ctx->md_ctx),ctx->key,
112                                   &ctx->key_length))
113                 goto err;
114         }
115         else
116         {
117             OPENSSL_assert(len>=0 && len<=(int)sizeof(ctx->key));
118             memcpy(ctx->key,key, len);
119             ctx->key_length=len;
120         }
121         if (ctx->key_length != HMAC_MAX_MD_CBLOCK)
122             memset(&ctx->key[ctx->key_length], 0,
123                  HMAC_MAX_MD_CBLOCK - ctx->key_length);
124     }
125
126     if (reset)
127     {

```

```

128         for (i=0; i<HMAC_MAX_MD_CBLOCK; i++)
129             pad[i]=0x36^ctx->key[i];
130         if (!EVP_DigestInit_ex(&ctx->i_ctx,md, impl))
131             goto err;
132         if (!EVP_DigestUpdate(&ctx->i_ctx,pad,EVP_MD_block_size(md)))
133             goto err;

135         for (i=0; i<HMAC_MAX_MD_CBLOCK; i++)
136             pad[i]=0x5c^ctx->key[i];
137         if (!EVP_DigestInit_ex(&ctx->o_ctx,md, impl))
138             goto err;
139         if (!EVP_DigestUpdate(&ctx->o_ctx,pad,EVP_MD_block_size(md)))
140             goto err;
141     }
142     if (!EVP_MD_CTX_copy_ex(&ctx->md_ctx,&ctx->i_ctx))
143         goto err;
144     return 1;
145 err:
146     return 0;
147 }

149 int HMAC_Init(HMAC_CTX *ctx, const void *key, int len, const EVP_MD *md)
150 {
151     if(key && md)
152         HMAC_CTX_init(ctx);
153     return HMAC_Init_ex(ctx,key,len,md, NULL);
154 }

156 int HMAC_Update(HMAC_CTX *ctx, const unsigned char *data, size_t len)
157 {
158     #ifdef OPENSSL_FIPS
159         if (FIPS_mode() && !ctx->i_ctx.engine)
160             return FIPS_hmac_update(ctx, data, len);
161     #endif
162     return EVP_DigestUpdate(&ctx->md_ctx,data,len);
163 }

165 int HMAC_Final(HMAC_CTX *ctx, unsigned char *md, unsigned int *len)
166 {
167     unsigned int i;
168     unsigned char buf[EVP_MAX_MD_SIZE];
169     #ifdef OPENSSL_FIPS
170         if (FIPS_mode() && !ctx->i_ctx.engine)
171             return FIPS_hmac_final(ctx, md, len);
172     #endif
173     if (!EVP_DigestFinal_ex(&ctx->md_ctx,buf,&i))
174         goto err;
175     if (!EVP_MD_CTX_copy_ex(&ctx->md_ctx,&ctx->o_ctx))
176         goto err;
177     if (!EVP_DigestUpdate(&ctx->md_ctx,buf,i))
178         goto err;
179     if (!EVP_DigestFinal_ex(&ctx->md_ctx,md,len))
180         goto err;
181     return 1;
182 err:
183     return 0;
184 }

187 void HMAC_CTX_init(HMAC_CTX *ctx)
188 {
189     EVP_MD_CTX_init(&ctx->i_ctx);
190     EVP_MD_CTX_init(&ctx->o_ctx);
191     EVP_MD_CTX_init(&ctx->md_ctx);
192 }

```

```

194 int HMAC_CTX_copy(HMAC_CTX *dctx, HMAC_CTX *sctx)
195 {
196     if (!EVP_MD_CTX_copy(&dctx->i_ctx, &sctx->i_ctx))
197         goto err;
198     if (!EVP_MD_CTX_copy(&dctx->o_ctx, &sctx->o_ctx))
199         goto err;
200     if (!EVP_MD_CTX_copy(&dctx->md_ctx, &sctx->md_ctx))
201         goto err;
202     memcpy(dctx->key, sctx->key, HMAC_MAX_MD_CBLOCK);
203     dctx->key_length = sctx->key_length;
204     dctx->md = sctx->md;
205     return 1;
206 err:
207     return 0;
208 }

210 void HMAC_CTX_cleanup(HMAC_CTX *ctx)
211 {
212     #ifdef OPENSSL_FIPS
213         if (FIPS_mode() && !ctx->i_ctx.engine)
214             {
215                 FIPS_hmac_ctx_cleanup(ctx);
216                 return;
217             }
218     #endif
219     EVP_MD_CTX_cleanup(&ctx->i_ctx);
220     EVP_MD_CTX_cleanup(&ctx->o_ctx);
221     EVP_MD_CTX_cleanup(&ctx->md_ctx);
222     memset(ctx,0,sizeof *ctx);
223 }

225 unsigned char *HMAC(const EVP_MD *evp_md, const void *key, int key_len,
226                     const unsigned char *d, size_t n, unsigned char *md,
227                     unsigned int *md_len)
228 {
229     HMAC_CTX c;
230     static unsigned char m[EVP_MAX_MD_SIZE];

232     if (md == NULL) md=m;
233     HMAC_CTX_init(&c);
234     if (!HMAC_Init(&c,key,key_len,evp_md))
235         goto err;
236     if (!HMAC_Update(&c,d,n))
237         goto err;
238     if (!HMAC_Final(&c,md,&md_len))
239         goto err;
240     HMAC_CTX_cleanup(&c);
241     return md;
242 err:
243     return NULL;
244 }

246 void HMAC_CTX_set_flags(HMAC_CTX *ctx, unsigned long flags)
247 {
248     EVP_MD_CTX_set_flags(&ctx->i_ctx, flags);
249     EVP_MD_CTX_set_flags(&ctx->o_ctx, flags);
250     EVP_MD_CTX_set_flags(&ctx->md_ctx, flags);
251 }

```


new/usr/src/lib/openssl/libsunw_crypto/i386/Makefile

1

1820 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/i386/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
23 # Use is subject to license terms.
24 #
```

```
26 # aes/*.s
27 ASM_SOURCES = x86cpuid.s \
28 aes-586.s \
29 aesni-x86.s \
30 vpaes-x86.s \
31 bf-586.s \
32 bn-586.s \
33 co-586.s \
34 x86-gf2m.s \
35 x86-mont.s \
36 cml1-x86.s \
37 crypt586.s \
38 des-586.s \
39 md5-586.s \
40 ghash-x86.s \
41 rc4-586.s \
42 rmd-586.s \
43 sha1-586.s \
44 sha256-586.s \
45 sha512-586.s
```

```
47 OBJECTS += $(ASM_SOURCES:.s=%.o)
```

```
49 CLEANFILES += $(ASM_SOURCES)
```

```
51 include ../Makefile.com
```

```
53 CPPFLAGS += -DL_ENDIAN
54 CPPFLAGS += -DOPENSSL_NO_INLINE_ASM
55 CPPFLAGS += -DOPENSSL_BN_ASM_PART_WORDS
56 CPPFLAGS += -DOPENSSL_IA32_SSE2
57 CPPFLAGS += -DRMD160_ASM
58 CPPFLAGS += -DAES_ASM
59 CPPFLAGS += -DPK11_LIB_LOCATION=\"usr/lib/libpkcs11.so.1\"
```

```
61 PERL_CPPFLAGS += -DOPENSSL_IA32_SSE2
```

new/usr/src/lib/openssl/libsunw_crypto/i386/Makefile

2

```
62 PERL_CPPFLAGS += -fPIC
```

```
64 # OpenSSL interface is a mess
65 MAPFILES =
```

```
67 .KEEP_STATE:
```

```
69 all: $(ROOTLIBDIR) $(LIBS) $(LIBLINKS)
```

```
71 $(LIBLINKS): FRC
72 $(RM) $@; $(SYMLINK) $(DYNLIB) $@
```

```
74 $(ROOTLIBDIR):
75 $(INS.dir)
```

```
77 install: all $(ROOTLIBS) $(ROOTLINKS)
```

```
79 FRC:
```

new/usr/src/lib/openssl/libsunw_crypto/i386/cml1-x86_64.s

1

```
*****
37886 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/i386/cml1-x86_64.s
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 .text

4 .globl sunw_Camellia_EncryptBlock
5 .type sunw_Camellia_EncryptBlock,@function
6 .align 16
7 sunw_Camellia_EncryptBlock:
8     movl    $128,%eax
9     subl    %edi,%eax
10    movl    $3,%edi
11    adcl    $0,%edi
12    jmp     .Lenc_rounds
13 .size sunw_Camellia_EncryptBlock,.-sunw_Camellia_EncryptBlock

15 .globl sunw_Camellia_EncryptBlock_Rounds
16 .type sunw_Camellia_EncryptBlock_Rounds,@function
17 .align 16
18 .Lenc_rounds:
19 sunw_Camellia_EncryptBlock_Rounds:
20     pushq   %rbx
21     pushq   %rbp
22     pushq   %r13
23     pushq   %r14
24     pushq   %r15
25 .Lenc_prologue:

28     movq    %rcx,%r13
29     movq    %rdx,%r14

31     shll    $6,%edi
32     leaq    .LCamellia_SBOX(%rip),%rbp
33     leaq    (%r14,%rdi,1),%r15

35     movl    0(%rsi),%r8d
36     movl    4(%rsi),%r9d
37     movl    8(%rsi),%r10d
38     bswapl  %r8d
39     movl    12(%rsi),%r11d
40     bswapl  %r9d
41     bswapl  %r10d
42     bswapl  %r11d

44     call    _x86_64_Camellia_encrypt

46     bswapl  %r8d
47     bswapl  %r9d
48     bswapl  %r10d
49     movl    %r8d,0(%r13)
50     bswapl  %r11d
51     movl    %r9d,4(%r13)
52     movl    %r10d,8(%r13)
53     movl    %r11d,12(%r13)

55     movq    0(%rsp),%r15
56     movq    8(%rsp),%r14
57     movq    16(%rsp),%r13
58     movq    24(%rsp),%rbp
59     movq    32(%rsp),%rbx
60     leaq    40(%rsp),%rsp
61 .Lenc_epilogue:
```

new/usr/src/lib/openssl/libsunw_crypto/i386/cml1-x86_64.s

2

```
62     .byte   0xf3,0xc3
63 .size sunw_Camellia_EncryptBlock_Rounds,.-sunw_Camellia_EncryptBlock_Rounds

65 .type _x86_64_Camellia_encrypt,@function
66 .align 16
67 _x86_64_Camellia_encrypt:
68     xorl    0(%r14),%r9d
69     xorl    4(%r14),%r8d
70     xorl    8(%r14),%r11d
71     xorl    12(%r14),%r10d
72 .align 16
73 .Leloop:
74     movl    16(%r14),%ebx
75     movl    20(%r14),%eax

77     xorl    %r8d,%eax
78     xorl    %r9d,%ebx
79     movzbl  %ah,%esi
80     movzbl  %bl,%edi
81     movl    2052(%rbp,%rsi,8),%edx
82     movl    0(%rbp,%rdi,8),%ecx
83     movzbl  %al,%esi
84     shr     $16,%eax
85     movzbl  %bh,%edi
86     xorl    4(%rbp,%rsi,8),%edx
87     shr     $16,%ebx
88     xorl    4(%rbp,%rdi,8),%ecx
89     movzbl  %ah,%esi
90     movzbl  %bl,%edi
91     xorl    0(%rbp,%rsi,8),%edx
92     xorl    2052(%rbp,%rdi,8),%ecx
93     movzbl  %al,%esi
94     movzbl  %bh,%edi
95     xorl    2048(%rbp,%rsi,8),%edx
96     xorl    2048(%rbp,%rdi,8),%ecx
97     movl    24(%r14),%ebx
98     movl    28(%r14),%eax
99     xorl    %edx,%ecx
100    ror     $8,%edx
101    xorl    %ecx,%r10d
102    xorl    %ecx,%r11d
103    xorl    %edx,%r11d
104    xorl    %r10d,%eax
105    xorl    %r11d,%ebx
106    movzbl  %ah,%esi
107    movzbl  %bl,%edi
108    movl    2052(%rbp,%rsi,8),%edx
109    movl    0(%rbp,%rdi,8),%ecx
110    movzbl  %al,%esi
111    shr     $16,%eax
112    movzbl  %bh,%edi
113    xorl    4(%rbp,%rsi,8),%edx
114    shr     $16,%ebx
115    xorl    4(%rbp,%rdi,8),%ecx
116    movzbl  %ah,%esi
117    movzbl  %bl,%edi
118    xorl    0(%rbp,%rsi,8),%edx
119    xorl    2052(%rbp,%rdi,8),%ecx
120    movzbl  %al,%esi
121    movzbl  %bh,%edi
122    xorl    2048(%rbp,%rsi,8),%edx
123    xorl    2048(%rbp,%rdi,8),%ecx
124    movl    32(%r14),%ebx
125    movl    36(%r14),%eax
126    xorl    %edx,%ecx
127    ror     $8,%edx
```

```

128    xorl    %ecx,%r8d
129    xorl    %ecx,%r9d
130    xorl    %edx,%r9d
131    xorl    %r8d,%eax
132    xorl    %r9d,%ebx
133    movzbl  %ah,%esi
134    movzbl  %bl,%edi
135    movl    2052(%rbp,%rsi,8),%edx
136    movl    0(%rbp,%rdi,8),%ecx
137    movzbl  %al,%esi
138    shrl    $16,%eax
139    movzbl  %bh,%edi
140    xorl    4(%rbp,%rsi,8),%edx
141    shrl    $16,%ebx
142    xorl    4(%rbp,%rdi,8),%ecx
143    movzbl  %ah,%esi
144    movzbl  %bl,%edi
145    xorl    0(%rbp,%rsi,8),%edx
146    xorl    2052(%rbp,%rdi,8),%ecx
147    movzbl  %al,%esi
148    movzbl  %bh,%edi
149    xorl    2048(%rbp,%rsi,8),%edx
150    xorl    2048(%rbp,%rdi,8),%ecx
151    movl    40(%r14),%ebx
152    movl    44(%r14),%eax
153    xorl    %edx,%ecx
154    rorl    $8,%edx
155    xorl    %ecx,%r10d
156    xorl    %ecx,%r11d
157    xorl    %edx,%r11d
158    xorl    %r10d,%eax
159    xorl    %r11d,%ebx
160    movzbl  %ah,%esi
161    movzbl  %bl,%edi
162    movl    2052(%rbp,%rsi,8),%edx
163    movl    0(%rbp,%rdi,8),%ecx
164    movzbl  %al,%esi
165    shrl    $16,%eax
166    movzbl  %bh,%edi
167    xorl    4(%rbp,%rsi,8),%edx
168    shrl    $16,%ebx
169    xorl    4(%rbp,%rdi,8),%ecx
170    movzbl  %ah,%esi
171    movzbl  %bl,%edi
172    xorl    0(%rbp,%rsi,8),%edx
173    xorl    2052(%rbp,%rdi,8),%ecx
174    movzbl  %al,%esi
175    movzbl  %bh,%edi
176    xorl    2048(%rbp,%rsi,8),%edx
177    xorl    2048(%rbp,%rdi,8),%ecx
178    movl    48(%r14),%ebx
179    movl    52(%r14),%eax
180    xorl    %edx,%ecx
181    rorl    $8,%edx
182    xorl    %ecx,%r8d
183    xorl    %ecx,%r9d
184    xorl    %edx,%r9d
185    xorl    %r8d,%eax
186    xorl    %r9d,%ebx
187    movzbl  %ah,%esi
188    movzbl  %bl,%edi
189    movl    2052(%rbp,%rsi,8),%edx
190    movl    0(%rbp,%rdi,8),%ecx
191    movzbl  %al,%esi
192    shrl    $16,%eax
193    movzbl  %bh,%edi

```

```

194    xorl    4(%rbp,%rsi,8),%edx
195    shrl    $16,%ebx
196    xorl    4(%rbp,%rdi,8),%ecx
197    movzbl  %ah,%esi
198    movzbl  %bl,%edi
199    xorl    0(%rbp,%rsi,8),%edx
200    xorl    2052(%rbp,%rdi,8),%ecx
201    movzbl  %al,%esi
202    movzbl  %bh,%edi
203    xorl    2048(%rbp,%rsi,8),%edx
204    xorl    2048(%rbp,%rdi,8),%ecx
205    movl    56(%r14),%ebx
206    movl    60(%r14),%eax
207    xorl    %edx,%ecx
208    rorl    $8,%edx
209    xorl    %ecx,%r10d
210    xorl    %ecx,%r11d
211    xorl    %r10d,%eax
212    xorl    %r11d,%ebx
213    movzbl  %ah,%esi
214    movzbl  %bl,%edi
215    movl    2052(%rbp,%rsi,8),%edx
216    movl    0(%rbp,%rdi,8),%ecx
217    movzbl  %al,%esi
218    shrl    $16,%eax
219    movzbl  %bh,%edi
220    xorl    4(%rbp,%rsi,8),%edx
221    shrl    $16,%ebx
222    xorl    4(%rbp,%rdi,8),%ecx
223    movzbl  %ah,%esi
224    movzbl  %bl,%edi
225    xorl    0(%rbp,%rsi,8),%edx
226    xorl    2052(%rbp,%rdi,8),%ecx
227    movzbl  %al,%esi
228    movzbl  %bh,%edi
229    xorl    2048(%rbp,%rsi,8),%edx
230    xorl    2048(%rbp,%rdi,8),%ecx
231    movl    64(%r14),%ebx
232    movl    68(%r14),%eax
233    xorl    %edx,%ecx
234    rorl    $8,%edx
235    xorl    %ecx,%r8d
236    xorl    %ecx,%r9d
237    xorl    %edx,%r9d
238    leaq    64(%r14),%r14
239    cmpq    %r15,%r14
240    movl    8(%r14),%edx
241    movl    12(%r14),%ecx
242    je      .Ledone
243
244
245    andl    %r8d,%eax
246    orl     %r11d,%edx
247    roll    $1,%eax
248    xorl    %edx,%r10d
249    xorl    %eax,%r9d
250    andl    %r10d,%ecx
251    orl     %r9d,%ebx
252    roll    $1,%ecx
253    xorl    %ebx,%r8d
254    xorl    %ecx,%r11d
255    jmp     .Leloop

257 .align 16
258 .Ledone:
259    xorl    %r10d,%eax

```

```

260     xorl    %r11d,%ebx
261     xorl    %r8d,%ecx
262     xorl    %r9d,%edx

264     movl    %eax,%r8d
265     movl    %ebx,%r9d
266     movl    %ecx,%r10d
267     movl    %edx,%r11d

269 .byte    0xf3,0xc3
270 .size    _x86_64_Camellia_encrypt,.-_x86_64_Camellia_encrypt

273 .globl   sunw_Camellia_DecryptBlock
274 .type    sunw_Camellia_DecryptBlock,@function
275 .align   16
276 sunw_Camellia_DecryptBlock:
277     movl    $128,%eax
278     subl    %edi,%eax
279     movl    $3,%edi
280     adcl    $0,%edi
281     jmp     .Ldec_rounds
282 .size    sunw_Camellia_DecryptBlock,.-sunw_Camellia_DecryptBlock

284 .globl   sunw_Camellia_DecryptBlock_Rounds
285 .type    sunw_Camellia_DecryptBlock_Rounds,@function
286 .align   16
287 .Ldec_rounds:
288 sunw_Camellia_DecryptBlock_Rounds:
289     pushq   %rbx
290     pushq   %rbp
291     pushq   %r13
292     pushq   %r14
293     pushq   %r15
294 .Ldec_prologue:

297     movq    %rcx,%r13
298     movq    %rdx,%r15

300     shll    $6,%edi
301     leaq    .LCamellia_SBOX(%rip),%rbp
302     leaq    (%r15,%rdi,1),%r14

304     movl    0(%rsi),%r8d
305     movl    4(%rsi),%r9d
306     movl    8(%rsi),%r10d
307     bswapl  %r8d
308     movl    12(%rsi),%r11d
309     bswapl  %r9d
310     bswapl  %r10d
311     bswapl  %r11d

313     call    _x86_64_Camellia_decrypt

315     bswapl  %r8d
316     bswapl  %r9d
317     bswapl  %r10d
318     movl    %r8d,0(%r13)
319     bswapl  %r11d
320     movl    %r9d,4(%r13)
321     movl    %r10d,8(%r13)
322     movl    %r11d,12(%r13)

324     movq    0(%rsp),%r15
325     movq    8(%rsp),%r14

```

```

326     movq    16(%rsp),%r13
327     movq    24(%rsp),%rbp
328     movq    32(%rsp),%rbx
329     leaq    40(%rsp),%rsp
330 .Ldec_epilogue:
331     .byte    0xf3,0xc3
332 .size    sunw_Camellia_DecryptBlock_Rounds,.-sunw_Camellia_DecryptBlock_Rounds

334 .type    _x86_64_Camellia_decrypt,@function
335 .align   16
336 _x86_64_Camellia_decrypt:
337     xorl    0(%r14),%r9d
338     xorl    4(%r14),%r8d
339     xorl    8(%r14),%r11d
340     xorl    12(%r14),%r10d
341 .align   16
342 .Ldloop:
343     movl    -8(%r14),%ebx
344     movl    -4(%r14),%eax

346     xorl    %r8d,%eax
347     xorl    %r9d,%ebx
348     movzbl  %ah,%esi
349     movzbl  %bl,%edi
350     movl    2052(%rbp,%rsi,8),%edx
351     movl    0(%rbp,%rdi,8),%ecx
352     movzbl  %al,%esi
353     shrl    $16,%eax
354     movzbl  %bh,%edi
355     xorl    4(%rbp,%rsi,8),%edx
356     shrl    $16,%ebx
357     xorl    4(%rbp,%rdi,8),%ecx
358     movzbl  %ah,%esi
359     movzbl  %bl,%edi
360     xorl    0(%rbp,%rsi,8),%edx
361     xorl    2052(%rbp,%rdi,8),%ecx
362     movzbl  %al,%esi
363     movzbl  %bh,%edi
364     xorl    2048(%rbp,%rsi,8),%edx
365     xorl    2048(%rbp,%rdi,8),%ecx
366     movl    -16(%r14),%ebx
367     movl    -12(%r14),%eax
368     xorl    %edx,%ecx
369     rorl    $8,%edx
370     xorl    %ecx,%r10d
371     xorl    %ecx,%r11d
372     xorl    %edx,%r11d
373     xorl    %r10d,%eax
374     xorl    %r11d,%ebx
375     movzbl  %ah,%esi
376     movzbl  %bl,%edi
377     movl    2052(%rbp,%rsi,8),%edx
378     movl    0(%rbp,%rdi,8),%ecx
379     movzbl  %al,%esi
380     shrl    $16,%eax
381     movzbl  %bh,%edi
382     xorl    4(%rbp,%rsi,8),%edx
383     shrl    $16,%ebx
384     xorl    4(%rbp,%rdi,8),%ecx
385     movzbl  %ah,%esi
386     movzbl  %bl,%edi
387     xorl    0(%rbp,%rsi,8),%edx
388     xorl    2052(%rbp,%rdi,8),%ecx
389     movzbl  %al,%esi
390     movzbl  %bh,%edi
391     xorl    2048(%rbp,%rsi,8),%edx

```

```

392     xorl    %eax,%edi
393     movl    -24(%r14),%ebx
394     movl    -20(%r14),%eax
395     xorl    %edx,%ecx
396     rorl    $8,%edx
397     xorl    %ecx,%r8d
398     xorl    %ecx,%r9d
399     xorl    %edx,%r9d
400     xorl    %r8d,%eax
401     xorl    %r9d,%ebx
402     movzbl  %ah,%esi
403     movzbl  %bl,%edi
404     movl    2052(%rbp,%rsi,8),%edx
405     movl    0(%rbp,%rdi,8),%ecx
406     movzbl  %al,%esi
407     shrl    $16,%eax
408     movzbl  %bh,%edi
409     xorl    4(%rbp,%rsi,8),%edx
410     shrl    $16,%ebx
411     xorl    4(%rbp,%rdi,8),%ecx
412     movzbl  %ah,%esi
413     movzbl  %bl,%edi
414     xorl    0(%rbp,%rsi,8),%edx
415     xorl    2052(%rbp,%rdi,8),%ecx
416     movzbl  %al,%esi
417     movzbl  %bh,%edi
418     xorl    2048(%rbp,%rsi,8),%edx
419     xorl    2048(%rbp,%rdi,8),%ecx
420     movl    -32(%r14),%ebx
421     movl    -28(%r14),%eax
422     xorl    %edx,%ecx
423     rorl    $8,%edx
424     xorl    %ecx,%r10d
425     xorl    %ecx,%r11d
426     xorl    %edx,%r11d
427     xorl    %r10d,%eax
428     xorl    %r11d,%ebx
429     movzbl  %ah,%esi
430     movzbl  %bl,%edi
431     movl    2052(%rbp,%rsi,8),%edx
432     movl    0(%rbp,%rdi,8),%ecx
433     movzbl  %al,%esi
434     shrl    $16,%eax
435     movzbl  %bh,%edi
436     xorl    4(%rbp,%rsi,8),%edx
437     shrl    $16,%ebx
438     xorl    4(%rbp,%rdi,8),%ecx
439     movzbl  %ah,%esi
440     movzbl  %bl,%edi
441     xorl    0(%rbp,%rsi,8),%edx
442     xorl    2052(%rbp,%rdi,8),%ecx
443     movzbl  %al,%esi
444     movzbl  %bh,%edi
445     xorl    2048(%rbp,%rsi,8),%edx
446     xorl    2048(%rbp,%rdi,8),%ecx
447     movl    -40(%r14),%ebx
448     movl    -36(%r14),%eax
449     xorl    %edx,%ecx
450     rorl    $8,%edx
451     xorl    %ecx,%r8d
452     xorl    %ecx,%r9d
453     xorl    %edx,%r9d
454     xorl    %r8d,%eax
455     xorl    %r9d,%ebx
456     movzbl  %ah,%esi
457     movzbl  %bl,%edi

```

```

458     movl    2052(%rbp,%rsi,8),%edx
459     movl    0(%rbp,%rdi,8),%ecx
460     movzbl  %al,%esi
461     shrl    $16,%eax
462     movzbl  %bh,%edi
463     xorl    4(%rbp,%rsi,8),%edx
464     shrl    $16,%ebx
465     xorl    4(%rbp,%rdi,8),%ecx
466     movzbl  %ah,%esi
467     movzbl  %bl,%edi
468     xorl    0(%rbp,%rsi,8),%edx
469     xorl    2052(%rbp,%rdi,8),%ecx
470     movzbl  %al,%esi
471     movzbl  %bh,%edi
472     xorl    2048(%rbp,%rsi,8),%edx
473     xorl    2048(%rbp,%rdi,8),%ecx
474     movl    -48(%r14),%ebx
475     movl    -44(%r14),%eax
476     xorl    %edx,%ecx
477     rorl    $8,%edx
478     xorl    %ecx,%r10d
479     xorl    %ecx,%r11d
480     xorl    %edx,%r11d
481     xorl    %r10d,%eax
482     xorl    %r11d,%ebx
483     movzbl  %ah,%esi
484     movzbl  %bl,%edi
485     movl    2052(%rbp,%rsi,8),%edx
486     movl    0(%rbp,%rdi,8),%ecx
487     movzbl  %al,%esi
488     shrl    $16,%eax
489     movzbl  %bh,%edi
490     xorl    4(%rbp,%rsi,8),%edx
491     shrl    $16,%ebx
492     xorl    4(%rbp,%rdi,8),%ecx
493     movzbl  %ah,%esi
494     movzbl  %bl,%edi
495     xorl    0(%rbp,%rsi,8),%edx
496     xorl    2052(%rbp,%rdi,8),%ecx
497     movzbl  %al,%esi
498     movzbl  %bh,%edi
499     xorl    2048(%rbp,%rsi,8),%edx
500     xorl    2048(%rbp,%rdi,8),%ecx
501     movl    -56(%r14),%ebx
502     movl    -52(%r14),%eax
503     xorl    %edx,%ecx
504     rorl    $8,%edx
505     xorl    %ecx,%r8d
506     xorl    %ecx,%r9d
507     xorl    %edx,%r9d
508     leaq    -64(%r14),%r14
509     cmpq    %r15,%r14
510     movl    0(%r14),%edx
511     movl    4(%r14),%ecx
512     je      .Lddone

514     andl    %r8d,%eax
515     orl     %r11d,%edx
516     roll    $1,%eax
517     xorl    %edx,%r10d
518     xorl    %eax,%r9d
519     andl    %r10d,%ecx
520     orl     %r9d,%ebx
521     roll    $1,%ecx
522     xorl    %ebx,%r8d
523     xorl    %ecx,%r11d

```

```

525      jmp      .Ldloop

527 .align 16
528 .Lddone:
529     xorl     %r10d,%ecx
530     xorl     %r11d,%edx
531     xorl     %r8d,%eax
532     xorl     %r9d,%ebx

534     movl     %ecx,%r8d
535     movl     %edx,%r9d
536     movl     %eax,%r10d
537     movl     %ebx,%r11d

539 .byte 0xf3,0xc3
540 .size _x86_64_Camellia_decrypt,.-_x86_64_Camellia_decrypt
541 .globl sunw_Camellia_Ekeygen
542 .type sunw_Camellia_Ekeygen,@function
543 .align 16
544 sunw_Camellia_Ekeygen:
545     pushq    %rbx
546     pushq    %rbp
547     pushq    %r13
548     pushq    %r14
549     pushq    %r15
550 .Lkey_prologue:

552     movq     %rdi,%r15
553     movq     %rdx,%r13

555     movl     0(%rsi),%r8d
556     movl     4(%rsi),%r9d
557     movl     8(%rsi),%r10d
558     movl     12(%rsi),%r11d

560     bswapl   %r8d
561     bswapl   %r9d
562     bswapl   %r10d
563     bswapl   %r11d
564     movl     %r9d,0(%r13)
565     movl     %r8d,4(%r13)
566     movl     %r11d,8(%r13)
567     movl     %r10d,12(%r13)
568     cmpq     $128,%r15
569     je       .L1st128

571     movl     16(%rsi),%r8d
572     movl     20(%rsi),%r9d
573     cmpq     $192,%r15
574     je       .L1st192
575     movl     24(%rsi),%r10d
576     movl     28(%rsi),%r11d
577     jmp      .L1st256

578 .L1st192:
579     movl     %r8d,%r10d
580     movl     %r9d,%r11d
581     notl     %r10d
582     notl     %r11d
583 .L1st256:
584     bswapl   %r8d
585     bswapl   %r9d
586     bswapl   %r10d
587     bswapl   %r11d
588     movl     %r9d,32(%r13)
589     movl     %r8d,36(%r13)

```

```

590     movl     %r11d,40(%r13)
591     movl     %r10d,44(%r13)
592     xorl     0(%r13),%r9d
593     xorl     4(%r13),%r8d
594     xorl     8(%r13),%r11d
595     xorl     12(%r13),%r10d

597 .L1st128:
598     leaq     .LCamellia_SIGMA(%rip),%r14
599     leaq     .LCamellia_SBOX(%rip),%rbp

601     movl     0(%r14),%ebx
602     movl     4(%r14),%eax
603     xorl     %r8d,%eax
604     xorl     %r9d,%ebx
605     movzbl   %ah,%esi
606     movzbl   %bl,%edi
607     movl     2052(%rbp,%rsi,8),%edx
608     movl     0(%rbp,%rdi,8),%ecx
609     movzbl   %al,%esi
610     shrl     $16,%eax
611     movzbl   %bh,%edi
612     xorl     4(%rbp,%rsi,8),%edx
613     shrl     $16,%ebx
614     xorl     4(%rbp,%rdi,8),%ecx
615     movzbl   %ah,%esi
616     movzbl   %bl,%edi
617     xorl     0(%rbp,%rsi,8),%edx
618     xorl     2052(%rbp,%rdi,8),%ecx
619     movzbl   %al,%esi
620     movzbl   %bh,%edi
621     xorl     2048(%rbp,%rsi,8),%edx
622     xorl     2048(%rbp,%rdi,8),%ecx
623     movl     8(%r14),%ebx
624     movl     12(%r14),%eax
625     xorl     %edx,%ecx
626     rorl     $8,%edx
627     xorl     %ecx,%r10d
628     xorl     %ecx,%r11d
629     xorl     %edx,%r11d
630     xorl     %r10d,%eax
631     xorl     %r11d,%ebx
632     movzbl   %ah,%esi
633     movzbl   %bl,%edi
634     movl     2052(%rbp,%rsi,8),%edx
635     movl     0(%rbp,%rdi,8),%ecx
636     movzbl   %al,%esi
637     shrl     $16,%eax
638     movzbl   %bh,%edi
639     xorl     4(%rbp,%rsi,8),%edx
640     shrl     $16,%ebx
641     xorl     4(%rbp,%rdi,8),%ecx
642     movzbl   %ah,%esi
643     movzbl   %bl,%edi
644     xorl     0(%rbp,%rsi,8),%edx
645     xorl     2052(%rbp,%rdi,8),%ecx
646     movzbl   %al,%esi
647     movzbl   %bh,%edi
648     xorl     2048(%rbp,%rsi,8),%edx
649     xorl     2048(%rbp,%rdi,8),%ecx
650     movl     16(%r14),%ebx
651     movl     20(%r14),%eax
652     xorl     %edx,%ecx
653     rorl     $8,%edx
654     xorl     %ecx,%r8d
655     xorl     %ecx,%r9d

```

```

656     xorl    %edx,%r9d
657     xorl    0(%r13),%r9d
658     xorl    4(%r13),%r8d
659     xorl    8(%r13),%r11d
660     xorl    12(%r13),%r10d
661     xorl    %r8d,%eax
662     xorl    %r9d,%ebx
663     movzbl  %ah,%esi
664     movzbl  %bl,%edi
665     movl    2052(%rbp,%rsi,8),%edx
666     movl    0(%rbp,%rdi,8),%ecx
667     movzbl  %al,%esi
668     shrl    $16,%eax
669     movzbl  %bh,%edi
670     xorl    4(%rbp,%rsi,8),%edx
671     shrl    $16,%ebx
672     xorl    4(%rbp,%rdi,8),%ecx
673     movzbl  %ah,%esi
674     movzbl  %bl,%edi
675     xorl    0(%rbp,%rsi,8),%edx
676     xorl    2052(%rbp,%rdi,8),%ecx
677     movzbl  %al,%esi
678     movzbl  %bh,%edi
679     xorl    2048(%rbp,%rsi,8),%edx
680     xorl    2048(%rbp,%rdi,8),%ecx
681     movl    24(%r14),%ebx
682     movl    28(%r14),%eax
683     xorl    %edx,%ecx
684     rorl    $8,%edx
685     xorl    %ecx,%r10d
686     xorl    %ecx,%r11d
687     xorl    %edx,%r11d
688     xorl    %r10d,%eax
689     xorl    %r11d,%ebx
690     movzbl  %ah,%esi
691     movzbl  %bl,%edi
692     movl    2052(%rbp,%rsi,8),%edx
693     movl    0(%rbp,%rdi,8),%ecx
694     movzbl  %al,%esi
695     shrl    $16,%eax
696     movzbl  %bh,%edi
697     xorl    4(%rbp,%rsi,8),%edx
698     shrl    $16,%ebx
699     xorl    4(%rbp,%rdi,8),%ecx
700     movzbl  %ah,%esi
701     movzbl  %bl,%edi
702     xorl    0(%rbp,%rsi,8),%edx
703     xorl    2052(%rbp,%rdi,8),%ecx
704     movzbl  %al,%esi
705     movzbl  %bh,%edi
706     xorl    2048(%rbp,%rsi,8),%edx
707     xorl    2048(%rbp,%rdi,8),%ecx
708     movl    32(%r14),%ebx
709     movl    36(%r14),%eax
710     xorl    %edx,%ecx
711     rorl    $8,%edx
712     xorl    %ecx,%r8d
713     xorl    %ecx,%r9d
714     xorl    %edx,%r9d
715     cmpq    $128,%r15
716     jne     .L2nd256

718     leaq    128(%r13),%r13
719     shlq    $32,%r8
720     shlq    $32,%r10
721     orq     %r9,%r8

```

```

722     orq     %r11,%r10
723     movq    -128(%r13),%rax
724     movq    -120(%r13),%rbx
725     movq    %r8,-112(%r13)
726     movq    %r10,-104(%r13)
727     movq    %rax,%r11
728     shlq    $15,%rax
729     movq    %rbx,%r9
730     shrq    $49,%r9
731     shrq    $49,%r11
732     orq     %r9,%rax
733     shlq    $15,%rbx
734     orq     %r11,%rbx
735     movq    %rax,-96(%r13)
736     movq    %rbx,-88(%r13)
737     movq    %r8,%r11
738     shlq    $15,%r8
739     movq    %r10,%r9
740     shrq    $49,%r9
741     shrq    $49,%r11
742     orq     %r9,%r8
743     shlq    $15,%r10
744     orq     %r11,%r10
745     movq    %r8,-80(%r13)
746     movq    %r10,-72(%r13)
747     movq    %r8,%r11
748     shlq    $15,%r8
749     movq    %r10,%r9
750     shrq    $49,%r9
751     shrq    $49,%r11
752     orq     %r9,%r8
753     shlq    $15,%r10
754     orq     %r11,%r10
755     movq    %r8,-64(%r13)
756     movq    %r10,-56(%r13)
757     movq    %rax,%r11
758     shlq    $30,%rax
759     movq    %rbx,%r9
760     shrq    $34,%r9
761     shrq    $34,%r11
762     orq     %r9,%rax
763     shlq    $30,%rbx
764     orq     %r11,%rbx
765     movq    %rax,-48(%r13)
766     movq    %rbx,-40(%r13)
767     movq    %r8,%r11
768     shlq    $15,%r8
769     movq    %r10,%r9
770     shrq    $49,%r9
771     shrq    $49,%r11
772     orq     %r9,%r8
773     shlq    $15,%r10
774     orq     %r11,%r10
775     movq    %r8,-32(%r13)
776     movq    %rax,%r11
777     shlq    $15,%rax
778     movq    %rbx,%r9
779     shrq    $49,%r9
780     shrq    $49,%r11
781     orq     %r9,%rax
782     shlq    $15,%rbx
783     orq     %r11,%rbx
784     movq    %rbx,-24(%r13)
785     movq    %r8,%r11
786     shlq    $15,%r8
787     movq    %r10,%r9

```

```

788      shrq    $49,%r9
789      shrq    $49,%r11
790      orq     %r9,%r8
791      shlq    $15,%r10
792      orq     %r11,%r10
793      movq    %r8,-16(%r13)
794      movq    %r10,-8(%r13)
795      movq    %rax,%r11
796      shlq    $17,%rax
797      movq    %rbx,%r9
798      shrq    $47,%r9
799      shrq    $47,%r11
800      orq     %r9,%rax
801      shlq    $17,%rbx
802      orq     %r11,%rbx
803      movq    %rax,0(%r13)
804      movq    %rbx,8(%r13)
805      movq    %rax,%r11
806      shlq    $17,%rax
807      movq    %rbx,%r9
808      shrq    $47,%r9
809      shrq    $47,%r11
810      orq     %r9,%rax
811      shlq    $17,%rbx
812      orq     %r11,%rbx
813      movq    %rax,16(%r13)
814      movq    %rbx,24(%r13)
815      movq    %r8,%r11
816      shlq    $34,%r8
817      movq    %r10,%r9
818      shrq    $30,%r9
819      shrq    $30,%r11
820      orq     %r9,%r8
821      shlq    $34,%r10
822      orq     %r11,%r10
823      movq    %r8,32(%r13)
824      movq    %r10,40(%r13)
825      movq    %rax,%r11
826      shlq    $17,%rax
827      movq    %rbx,%r9
828      shrq    $47,%r9
829      shrq    $47,%r11
830      orq     %r9,%rax
831      shlq    $17,%rbx
832      orq     %r11,%rbx
833      movq    %rax,48(%r13)
834      movq    %rbx,56(%r13)
835      movq    %r8,%r11
836      shlq    $17,%r8
837      movq    %r10,%r9
838      shrq    $47,%r9
839      shrq    $47,%r11
840      orq     %r9,%r8
841      shlq    $17,%r10
842      orq     %r11,%r10
843      movq    %r8,64(%r13)
844      movq    %r10,72(%r13)
845      movl    $3,%eax
846      jmp     .Ldone
847      .align 16
848      .L2nd256:
849      movl    %r9d,48(%r13)
850      movl    %r8d,52(%r13)
851      movl    %r11d,56(%r13)
852      movl    %r10d,60(%r13)
853      xorl    $32(%r13),%r9d

```

```

854      xorl    $36(%r13),%r8d
855      xorl    $40(%r13),%r11d
856      xorl    $44(%r13),%r10d
857      xorl    %r8d,%eax
858      xorl    %r9d,%ebx
859      movzbl  %ah,%esi
860      movzbl  %bl,%edi
861      movl    2052(%rbp,%rsi,8),%edx
862      movl    0(%rbp,%rdi,8),%ecx
863      movzbl  %al,%esi
864      shrl    $16,%eax
865      movzbl  %bh,%edi
866      xorl    4(%rbp,%rsi,8),%edx
867      shrl    $16,%ebx
868      xorl    4(%rbp,%rdi,8),%ecx
869      movzbl  %ah,%esi
870      movzbl  %bl,%edi
871      xorl    0(%rbp,%rsi,8),%edx
872      xorl    2052(%rbp,%rdi,8),%ecx
873      movzbl  %al,%esi
874      movzbl  %bh,%edi
875      xorl    2048(%rbp,%rsi,8),%edx
876      xorl    2048(%rbp,%rdi,8),%ecx
877      movl    40(%r14),%ebx
878      movl    44(%r14),%eax
879      xorl    %edx,%ecx
880      rorl    $8,%edx
881      xorl    %ecx,%r10d
882      xorl    %ecx,%r11d
883      xorl    %edx,%r11d
884      xorl    %r10d,%eax
885      xorl    %r11d,%ebx
886      movzbl  %ah,%esi
887      movzbl  %bl,%edi
888      movl    2052(%rbp,%rsi,8),%edx
889      movl    0(%rbp,%rdi,8),%ecx
890      movzbl  %al,%esi
891      shrl    $16,%eax
892      movzbl  %bh,%edi
893      xorl    4(%rbp,%rsi,8),%edx
894      shrl    $16,%ebx
895      xorl    4(%rbp,%rdi,8),%ecx
896      movzbl  %ah,%esi
897      movzbl  %bl,%edi
898      xorl    0(%rbp,%rsi,8),%edx
899      xorl    2052(%rbp,%rdi,8),%ecx
900      movzbl  %al,%esi
901      movzbl  %bh,%edi
902      xorl    2048(%rbp,%rsi,8),%edx
903      xorl    2048(%rbp,%rdi,8),%ecx
904      movl    48(%r14),%ebx
905      movl    52(%r14),%eax
906      xorl    %edx,%ecx
907      rorl    $8,%edx
908      xorl    %ecx,%r8d
909      xorl    %ecx,%r9d
910      xorl    %edx,%r9d
911      movq    0(%r13),%rax
912      movq    8(%r13),%rbx
913      movq    32(%r13),%rcx
914      movq    40(%r13),%rdx
915      movq    48(%r13),%r14
916      movq    56(%r13),%r15
917      leaq    128(%r13),%r13
918      shlq    $32,%r8
919      shlq    $32,%r10

```



```

920    orq    %r9,%r8
921    orq    %r11,%r10
922    movq   %r8,-112(%r13)
923    movq   %r10,-104(%r13)
924    movq   %rcx,%r11
925    shlq   $15,%rcx
926    movq   %rdx,%r9
927    shrq   $49,%r9
928    shrq   $49,%r11
929    orq    %r9,%rcx
930    shlq   $15,%rdx
931    orq    %r11,%rdx
932    movq   %rcx,-96(%r13)
933    movq   %rdx,-88(%r13)
934    movq   %r14,%r11
935    shlq   $15,%r14
936    movq   %r15,%r9
937    shrq   $49,%r9
938    shrq   $49,%r11
939    orq    %r9,%r14
940    shlq   $15,%r15
941    orq    %r11,%r15
942    movq   %r14,-80(%r13)
943    movq   %r15,-72(%r13)
944    movq   %rcx,%r11
945    shlq   $15,%rcx
946    movq   %rdx,%r9
947    shrq   $49,%r9
948    shrq   $49,%r11
949    orq    %r9,%rcx
950    shlq   $15,%rdx
951    orq    %r11,%rdx
952    movq   %rcx,-64(%r13)
953    movq   %rdx,-56(%r13)
954    movq   %r8,%r11
955    shlq   $30,%r8
956    movq   %r10,%r9
957    shrq   $34,%r9
958    shrq   $34,%r11
959    orq    %r9,%r8
960    shlq   $30,%r10
961    orq    %r11,%r10
962    movq   %r8,-48(%r13)
963    movq   %r10,-40(%r13)
964    movq   %rax,%r11
965    shlq   $45,%rax
966    movq   %rbx,%r9
967    shrq   $19,%r9
968    shrq   $19,%r11
969    orq    %r9,%rax
970    shlq   $45,%rbx
971    orq    %r11,%rbx
972    movq   %rax,-32(%r13)
973    movq   %rbx,-24(%r13)
974    movq   %r14,%r11
975    shlq   $30,%r14
976    movq   %r15,%r9
977    shrq   $34,%r9
978    shrq   $34,%r11
979    orq    %r9,%r14
980    shlq   $30,%r15
981    orq    %r11,%r15
982    movq   %r14,-16(%r13)
983    movq   %r15,-8(%r13)
984    movq   %rax,%r11
985    shlq   $15,%rax

```

```

986    movq   %rbx,%r9
987    shrq   $49,%r9
988    shrq   $49,%r11
989    orq    %r9,%rax
990    shlq   $15,%rbx
991    orq    %r11,%rbx
992    movq   %rax,0(%r13)
993    movq   %rbx,8(%r13)
994    movq   %rcx,%r11
995    shlq   $30,%rcx
996    movq   %rdx,%r9
997    shrq   $34,%r9
998    shrq   $34,%r11
999    orq    %r9,%rcx
1000    shlq   $30,%rdx
1001    orq    %r11,%rdx
1002    movq   %rcx,16(%r13)
1003    movq   %rdx,24(%r13)
1004    movq   %r8,%r11
1005    shlq   $30,%r8
1006    movq   %r10,%r9
1007    shrq   $34,%r9
1008    shrq   $34,%r11
1009    orq    %r9,%r8
1010    shlq   $30,%r10
1011    orq    %r11,%r10
1012    movq   %r8,32(%r13)
1013    movq   %r10,40(%r13)
1014    movq   %rax,%r11
1015    shlq   $17,%rax
1016    movq   %rbx,%r9
1017    shrq   $47,%r9
1018    shrq   $47,%r11
1019    orq    %r9,%rax
1020    shlq   $17,%rbx
1021    orq    %r11,%rbx
1022    movq   %rax,48(%r13)
1023    movq   %rbx,56(%r13)
1024    movq   %r14,%r11
1025    shlq   $32,%r14
1026    movq   %r15,%r9
1027    shrq   $32,%r9
1028    shrq   $32,%r11
1029    orq    %r9,%r14
1030    shlq   $32,%r15
1031    orq    %r11,%r15
1032    movq   %r14,64(%r13)
1033    movq   %r15,72(%r13)
1034    movq   %rcx,%r11
1035    shlq   $34,%rcx
1036    movq   %rdx,%r9
1037    shrq   $30,%r9
1038    shrq   $30,%r11
1039    orq    %r9,%rcx
1040    shlq   $34,%rdx
1041    orq    %r11,%rdx
1042    movq   %rcx,80(%r13)
1043    movq   %rdx,88(%r13)
1044    movq   %r14,%r11
1045    shlq   $17,%r14
1046    movq   %r15,%r9
1047    shrq   $47,%r9
1048    shrq   $47,%r11
1049    orq    %r9,%r14
1050    shlq   $17,%r15
1051    orq    %r11,%r15

```

```

1052      movq    %r14,96(%r13)
1053      movq    %r15,104(%r13)
1054      movq    %rax,%r11
1055      shlq    $34,%rax
1056      movq    %rbx,%r9
1057      shrq    $30,%r9
1058      shrq    $30,%r11
1059      orq     %r9,%rax
1060      shlq    $34,%rbx
1061      orq     %r11,%rbx
1062      movq    %rax,112(%r13)
1063      movq    %rbx,120(%r13)
1064      movq    %r8,%r11
1065      shlq    $51,%r8
1066      movq    %r10,%r9
1067      shrq    $13,%r9
1068      shrq    $13,%r11
1069      orq     %r9,%r8
1070      shlq    $51,%r10
1071      orq     %r11,%r10
1072      movq    %r8,128(%r13)
1073      movq    %r10,136(%r13)
1074      movl    $4,%eax
1075  .Ldone:
1076      movq    0(%rsp),%r15
1077      movq    8(%rsp),%r14
1078      movq    16(%rsp),%r13
1079      movq    24(%rsp),%rbp
1080      movq    32(%rsp),%rbx
1081      leaq    40(%rsp),%rsp
1082  .Lkey_epilogue:
1083      .byte    0xf3,0xc3
1084  .size    sunw_Camellia_Ekeygen,.-sunw_Camellia_Ekeygen
1085  .align    64
1086  .LCamellia_SIGMA:
1087  .long    0x3bcc908b, 0xa09e667f, 0x4caa73b2, 0xb67ae858
1088  .long    0xe94f82be, 0xc6ef372f, 0xf1d36f1c, 0x54ff53a5
1089  .long    0xde682d1d, 0x10e527fa, 0xb3e6c1fd, 0xb05688c2
1090  .long    0, 0, 0, 0
1091  .LCamellia_SBOX:
1092  .long    0x70707000, 0x70700070
1093  .long    0x82828200, 0x2c2c002c
1094  .long    0x2c2c2c00, 0xb3b300b3
1095  .long    0xececece0, 0xc0c000c0
1096  .long    0xb3b3b300, 0xe4e400e4
1097  .long    0x27272700, 0x57570057
1098  .long    0xc0c0c000, 0xeaea00ea
1099  .long    0xe5e5e500, 0xaeae00ae
1100  .long    0xe4e4e400, 0x23230023
1101  .long    0x85858500, 0x6b6b006b
1102  .long    0x57575700, 0x45450045
1103  .long    0x35353500, 0xa5a500a5
1104  .long    0xeaeaea00, 0xeded00ed
1105  .long    0x0c0c0c00, 0x4f4f004f
1106  .long    0xaeaeae00, 0x1d1d001d
1107  .long    0x41414100, 0x92920092
1108  .long    0x23232300, 0x86860086
1109  .long    0xefefef00, 0xafaf00af
1110  .long    0x6b6b6b00, 0x7c7c007c
1111  .long    0x93939300, 0xf1f100f1
1112  .long    0x45454500, 0x3e3e003e
1113  .long    0x19191900, 0xdcdc00dc
1114  .long    0xa5a5a500, 0x5e5e005e
1115  .long    0x21212100, 0xb0b000b0
1116  .long    0xededed00, 0xa6a600a6
1117  .long    0x0e0e0e00, 0x39390039

```

```

1118  .long    0x4f4f4f00, 0xd5d500d5
1119  .long    0x4e4e4e00, 0x5d5d005d
1120  .long    0x1d1d1d00, 0xd9d900d9
1121  .long    0x65656500, 0x5a5a005a
1122  .long    0x92929200, 0x51510051
1123  .long    0xbdbdbd00, 0x6c6c006c
1124  .long    0x86868600, 0x8b8b008b
1125  .long    0xb8b8b800, 0x9a9a009a
1126  .long    0xafafaf00, 0xfbfb00fb
1127  .long    0x8f8f8f00, 0xb0b000b0
1128  .long    0x7c7c7c00, 0x74740074
1129  .long    0xeb8eb800, 0x2b2b002b
1130  .long    0x1f1f1f00, 0xf0f000f0
1131  .long    0xcecece00, 0x84840084
1132  .long    0x3e3e3e00, 0xdfdf00df
1133  .long    0x30303000, 0xc0c000c0
1134  .long    0xdcddcd00, 0x34340034
1135  .long    0x5f5f5f00, 0x76760076
1136  .long    0x5e5e5e00, 0x6d6d006d
1137  .long    0xc5c5c500, 0xa9a900a9
1138  .long    0xb0b0b000, 0xd1d100d1
1139  .long    0x1a1a1a00, 0x04040004
1140  .long    0xa6a6a600, 0x14140014
1141  .long    0xe1e1e100, 0x3a3a003a
1142  .long    0x39393900, 0xdede00de
1143  .long    0xcacaca00, 0x11110011
1144  .long    0xd5d5d500, 0x32320032
1145  .long    0x47474700, 0x9c9c009c
1146  .long    0x5d5d5d00, 0x53530053
1147  .long    0x3d3d3d00, 0xf2f200f2
1148  .long    0xd9d9d900, 0xfefe00fe
1149  .long    0x01010100, 0xcfcf00cf
1150  .long    0x5a5a5a00, 0xc3c300c3
1151  .long    0xd6d6d600, 0x7a7a007a
1152  .long    0x51515100, 0x24240024
1153  .long    0x56565600, 0xe8e800e8
1154  .long    0x6c6c6c00, 0x60600060
1155  .long    0x4d4d4d00, 0x69690069
1156  .long    0x8b8b8b00, 0xaaaa00aa
1157  .long    0xd0d0d000, 0xa0a000a0
1158  .long    0x9a9a9a00, 0xa1a100a1
1159  .long    0x66666600, 0x62620062
1160  .long    0xfbfbf000, 0x54540054
1161  .long    0xc0c0c000, 0x1e1e001e
1162  .long    0xb0b0b000, 0xe0e000e0
1163  .long    0x2d2d2d00, 0x64640064
1164  .long    0x74747400, 0x10100010
1165  .long    0x12121200, 0x00000000
1166  .long    0x2b2b2b00, 0xa3a300a3
1167  .long    0x20202000, 0x75750075
1168  .long    0xf0f0f000, 0x8a8a008a
1169  .long    0xb1b1b100, 0xe6e600e6
1170  .long    0x84848400, 0x09090009
1171  .long    0x99999900, 0xdddd00dd
1172  .long    0xdfdfdf00, 0x87870087
1173  .long    0x4c4c4c00, 0x83830083
1174  .long    0xc0c0c000, 0xcdcd00cd
1175  .long    0xc2c2c200, 0x90900090
1176  .long    0x34343400, 0x73730073
1177  .long    0x7e7e7e00, 0xf6f600f6
1178  .long    0x76767600, 0x9d9d009d
1179  .long    0x05050500, 0xbfbf00bf
1180  .long    0x6d6d6d00, 0x52520052
1181  .long    0xb7b7b700, 0xd8d800d8
1182  .long    0xa9a9a900, 0xc8c800c8
1183  .long    0x31313100, 0xc6c600c6

```

```
1184 . long 0xd1d1d100,0x81810081
1185 . long 0x17171700,0x6f6f006f
1186 . long 0x04040400,0x13130013
1187 . long 0xd7d7d700,0x63630063
1188 . long 0x14141400,0xe9e900e9
1189 . long 0x58585800,0xa7a700a7
1190 . long 0x3a3a3a00,0x9f9f009f
1191 . long 0x61616100,0xbcbcb0bc
1192 . long 0xdededede00,0x29290029
1193 . long 0x1b1b1b00,0xf9f900f9
1194 . long 0x11111100,0x2f2f002f
1195 . long 0x1c1c1c00,0xb4b400b4
1196 . long 0x32323200,0x78780078
1197 . long 0x0f0f0f00,0x06060006
1198 . long 0x9c9c9c00,0xe7e700e7
1199 . long 0x16161600,0x71710071
1200 . long 0x53535300,0xd4d400d4
1201 . long 0x18181800,0xabab00ab
1202 . long 0xf2f2f200,0x88880088
1203 . long 0x22222200,0x8d8d008d
1204 . long 0xfefefefe00,0x72720072
1205 . long 0x44444400,0xb9b900b9
1206 . long 0xcfcfcf00,0xf8f800f8
1207 . long 0xb2b2b200,0xacac00ac
1208 . long 0xc3c3c300,0x36360036
1209 . long 0xb5b5b500,0x2a2a002a
1210 . long 0x7a7a7a00,0x3c3c003c
1211 . long 0x91919100,0xf1f100f1
1212 . long 0x24242400,0xa0a000a0
1213 . long 0x08080800,0xd3d300d3
1214 . long 0xe8e8e800,0xbbbb00bb
1215 . long 0xa8a8a800,0x43430043
1216 . long 0x60606000,0x15150015
1217 . long 0xfcfcfc00,0xadad00ad
1218 . long 0x69696900,0x77770077
1219 . long 0x50505000,0x80800080
1220 . long 0xaaaaaaaa00,0x82820082
1221 . long 0xd0d0d000,0xecec00ec
1222 . long 0xa0a0a000,0x27270027
1223 . long 0x7d7d7d00,0xe5e500e5
1224 . long 0xa1a1a100,0x85850085
1225 . long 0x89898900,0x35350035
1226 . long 0x62626200,0x0c0c000c
1227 . long 0x97979700,0x41410041
1228 . long 0x54545400,0xefef00ef
1229 . long 0x5b5b5b00,0x93930093
1230 . long 0x1e1e1e00,0x19190019
1231 . long 0x95959500,0x21210021
1232 . long 0xe0e0e000,0x0e0e000e
1233 . long 0xffffffff00,0x4e4e004e
1234 . long 0x64646400,0x65650065
1235 . long 0xd2d2d200,0xbdbd00bd
1236 . long 0x10101000,0xb8b800b8
1237 . long 0xc4c4c400,0xf8f800f8
1238 . long 0x00000000,0xeb00eb
1239 . long 0x48484800,0xcece00ce
1240 . long 0xa3a3a300,0x30300030
1241 . long 0xf7f7f700,0x5f5f005f
1242 . long 0x75757500,0xc5c500c5
1243 . long 0xdbdbdb00,0x1a1a001a
1244 . long 0x8a8a8a00,0xe1e100e1
1245 . long 0x03030300,0xcaca00ca
1246 . long 0xe6e6e600,0x47470047
1247 . long 0xdadada00,0x3d3d003d
1248 . long 0x09090900,0x01010001
1249 . long 0x3f3f3f00,0xd6d600d6
```

```
1250 . long 0xdddddd00,0x56560056
1251 . long 0x94949400,0x4d4d004d
1252 . long 0x87878700,0x0d0d000d
1253 . long 0x5c5c5c00,0x66660066
1254 . long 0x83838300,0xcccc00cc
1255 . long 0x02020200,0x2d2d002d
1256 . long 0xcdcdcd00,0x12120012
1257 . long 0x4a4a4a00,0x20200020
1258 . long 0x90909000,0xb1b100b1
1259 . long 0x33333300,0x99990099
1260 . long 0x73737300,0x4c4c004c
1261 . long 0x67676700,0xc2c200c2
1262 . long 0xf6f6f600,0x7e7e007e
1263 . long 0xf3f3f300,0x05050005
1264 . long 0x9d9d9d00,0xb7b700b7
1265 . long 0x7f7f7f00,0x31310031
1266 . long 0xbfbfbf00,0x17170017
1267 . long 0xe2e2e200,0xd7d700d7
1268 . long 0x52525200,0x58580058
1269 . long 0x9b9b9b00,0x61610061
1270 . long 0xd8d8d800,0x1b1b001b
1271 . long 0x26262600,0x1c1c001c
1272 . long 0xc8c8c800,0xf0f000f0
1273 . long 0x37373700,0x16160016
1274 . long 0xc6c6c600,0x18180018
1275 . long 0x3b3b3b00,0x22220022
1276 . long 0x81818100,0x44440044
1277 . long 0x96969600,0xb2b200b2
1278 . long 0x6f6f6f00,0xb5b500b5
1279 . long 0x4b4b4b00,0x91910091
1280 . long 0x13131300,0x08080008
1281 . long 0xbebebe00,0xa8a800a8
1282 . long 0x63636300,0xfcfc00fc
1283 . long 0x2e2e2e00,0x50500050
1284 . long 0xe9e9e900,0xd0d000d0
1285 . long 0x79797900,0x7d7d007d
1286 . long 0xa7a7a700,0x89890089
1287 . long 0x8c8c8c00,0x97970097
1288 . long 0x9f9f9f00,0x5b5b005b
1289 . long 0x6e6e6e00,0x95950095
1290 . long 0xbcbcbcb00,0xfffff0ff
1291 . long 0x8e8e8e00,0xd2d200d2
1292 . long 0x29292900,0xc4c400c4
1293 . long 0xf5f5f500,0x48480048
1294 . long 0xf9f9f900,0xf7f700f7
1295 . long 0xb6b6b600,0xdbdb00db
1296 . long 0x2f2f2f00,0x03030003
1297 . long 0xfdfdfd00,0xdada00da
1298 . long 0xb4b4b400,0x3f3f003f
1299 . long 0x59595900,0x94940094
1300 . long 0x78787800,0x5c5c005c
1301 . long 0x98989800,0x02020002
1302 . long 0x06060600,0x4a4a004a
1303 . long 0x6a6a6a00,0x33330033
1304 . long 0xe7e7e700,0x67670067
1305 . long 0x46464600,0xf3f300f3
1306 . long 0x71717100,0x7f7f007f
1307 . long 0xbababab00,0xe2e200e2
1308 . long 0xd4d4d400,0x9b9b009b
1309 . long 0x25252500,0x26260026
1310 . long 0xababab00,0x37370037
1311 . long 0x42424200,0x3b3b003b
1312 . long 0x88888800,0x96960096
1313 . long 0xa2a2a200,0x4b4b004b
1314 . long 0x8d8d8d00,0xbebe00be
1315 . long 0xfafafafa00,0x2e2e002e
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```
1316 . long 0x72727200,0x79790079
1317 . long 0x07070700,0x8c8c008c
1318 . long 0xb9b9b900,0x6e6e006e
1319 . long 0x55555500,0x8e8e008e
1320 . long 0xf8f8f800,0xf5f500f5
1321 . long 0xe0000000,0xb6b600b6
1322 . long 0xacacac00,0xfdfdf0fd
1323 . long 0x0a0a0a00,0x59590059
1324 . long 0x36363600,0x98980098
1325 . long 0x49494900,0x6a6a006a
1326 . long 0x2a2a2a00,0x46460046
1327 . long 0x68686800,0xbaba00ba
1328 . long 0x3c3c3c00,0x25250025
1329 . long 0x38383800,0x42420042
1330 . long 0xf1f1f100,0xa2a200a2
1331 . long 0xa4a4a400,0xfafa00fa
1332 . long 0x40404000,0x07070007
1333 . long 0x28282800,0x55550055
1334 . long 0xd3d3d300,0xe00000e0
1335 . long 0x7b7b7b00,0x0a0a000a
1336 . long 0xbbbbbb00,0x49490049
1337 . long 0xc9c9c900,0x68680068
1338 . long 0x43434300,0x38380038
1339 . long 0xc1c1c100,0xa4a400a4
1340 . long 0x15151500,0x28280028
1341 . long 0xe3e3e300,0x7b7b007b
1342 . long 0xadadad00,0xc9c900c9
1343 . long 0xf4f4f400,0xc1c100c1
1344 . long 0x77777700,0xe3e300e3
1345 . long 0xc7c7c700,0xf4f400f4
1346 . long 0x80808000,0xc7c700c7
1347 . long 0x9e9e9e00,0x9e9e009e
1348 . long 0x00e0e000,0x38003838
1349 . long 0x00050505,0x41004141
1350 . long 0x00585858,0x16001616
1351 . long 0x00d9d9d9,0x76007676
1352 . long 0x00676767,0xd9d900d9
1353 . long 0x004e4e4e,0x93009393
1354 . long 0x00818181,0x60006060
1355 . long 0x00cbcbcb,0xf200f2f2
1356 . long 0x00c9c9c9,0x72007272
1357 . long 0x00b0b0b0,0xc200c2c2
1358 . long 0x00aeaeae,0xab00abab
1359 . long 0x006a6a6a,0x9a009a9a
1360 . long 0x00d5d5d5,0x75007575
1361 . long 0x00181818,0x06000606
1362 . long 0x005d5d5d,0x57005757
1363 . long 0x00828282,0xa000a0a0
1364 . long 0x00464646,0x91009191
1365 . long 0x00dfdfdf,0xf700f7f7
1366 . long 0x00d6d6d6,0xb500b5b5
1367 . long 0x00272727,0xc900c9c9
1368 . long 0x008a8a8a,0xa200a2a2
1369 . long 0x00323232,0x8c008c8c
1370 . long 0x004b4b4b,0xd200d2d2
1371 . long 0x00424242,0x90009090
1372 . long 0x00dbdbdb,0xf600f6f6
1373 . long 0x001c1c1c,0x07000707
1374 . long 0x009e9e9e,0xa700a7a7
1375 . long 0x009c9c9c,0x27002727
1376 . long 0x003a3a3a,0x8e008e8e
1377 . long 0x00cacaca,0xb200b2b2
1378 . long 0x00252525,0x49004949
1379 . long 0x007b7b7b,0xde00dede
1380 . long 0x000d0d0d,0x43004343
1381 . long 0x00717171,0x5c005c5c
```

```
1382 . long 0x005f5f5f,0xd700d7d7
1383 . long 0x001f1f1f,0xc700c7c7
1384 . long 0x00f8f8f8,0x3e003e3e
1385 . long 0x00d7d7d7,0xf500f5f5
1386 . long 0x003e3e3e,0xf800f8f8
1387 . long 0x009d9d9d,0x67006767
1388 . long 0x007c7c7c,0x1f001f1f
1389 . long 0x00606060,0x18001818
1390 . long 0x00b9b9b9,0x6e006e6e
1391 . long 0x00bebebe,0xaf00afaf
1392 . long 0x00bcbcbcb,0xf200f2f2
1393 . long 0x008b8b8b,0xe200e2e2
1394 . long 0x00161616,0x85008585
1395 . long 0x00343434,0xd000d0d0
1396 . long 0x004d4d4d,0x53005353
1397 . long 0x00c3c3c3,0xf000f0f0
1398 . long 0x00727272,0x9c009c9c
1399 . long 0x00959595,0x65006565
1400 . long 0x00ababab,0xea00eaea
1401 . long 0x008e8e8e,0xa300a3a3
1402 . long 0x00bababa,0xae00aeae
1403 . long 0x007a7a7a,0x9e009e9e
1404 . long 0x00b3b3b3,0xec00ec00
1405 . long 0x00020202,0x80008080
1406 . long 0x00b4b4b4,0xd200d2d2
1407 . long 0x00adadad,0x6b006b6b
1408 . long 0x00a2a2a2,0xa800a8a8
1409 . long 0x00acacac,0xb200b2b2
1410 . long 0x00d8d8d8,0x36003636
1411 . long 0x009a9a9a,0xa600a6a6
1412 . long 0x00171717,0xc500c5c5
1413 . long 0x001a1a1a,0x86008686
1414 . long 0x00353535,0x4d004d4d
1415 . long 0x00cccccc,0x33003333
1416 . long 0x00f7f7f7,0xfd00fdfd
1417 . long 0x00999999,0x66006666
1418 . long 0x00616161,0x58005858
1419 . long 0x005a5a5a,0x96009696
1420 . long 0x00e8e8e8,0xa300a3a3
1421 . long 0x00242424,0x09000909
1422 . long 0x00565656,0x95009595
1423 . long 0x00404040,0x10001010
1424 . long 0x00e1e1e1,0x78007878
1425 . long 0x00636363,0xd800d8d8
1426 . long 0x00909090,0x42004242
1427 . long 0x00333333,0xcc00cccc
1428 . long 0x00fbfbfb,0xef00efef
1429 . long 0x00989898,0x26002626
1430 . long 0x00979797,0xe500e5e5
1431 . long 0x00858585,0x61006161
1432 . long 0x00686868,0x1a001a1a
1433 . long 0x00fcfcfc,0x3f003f3f
1434 . long 0x00ec00ec,0x3b003b3b
1435 . long 0x00a0a0a0,0x82008282
1436 . long 0x00dadada,0xb600b6b6
1437 . long 0x006f6f6f,0xdb00dbdb
1438 . long 0x00535353,0xd400d4d4
1439 . long 0x00626262,0x98009898
1440 . long 0x00a3a3a3,0xe800e8e8
1441 . long 0x002e2e2e,0xb000b0b0
1442 . long 0x00808080,0x02000202
1443 . long 0x00afafaf,0xeb00eb00
1444 . long 0x00282828,0xa000a0a0
1445 . long 0x00b0b0b0,0xc200c2c2
1446 . long 0x00747474,0x1d001d1d
1447 . long 0x00c2c2c2,0xb000b0b0
```

```
1448 .long 0x00bdbdbd,0x6f006f6f
1449 .long 0x00363636,0x8d008d8d
1450 .long 0x00222222,0x88008888
1451 .long 0x00383838,0x0e000e0e
1452 .long 0x00646464,0x19001919
1453 .long 0x001e1e1e,0x87008787
1454 .long 0x00393939,0x4e004e4e
1455 .long 0x002c2c2c,0x0b000b0b
1456 .long 0x00a6a6a6,0xa900a9a9
1457 .long 0x00303030,0x0c000c0c
1458 .long 0x00e5e5e5,0x79007979
1459 .long 0x00444444,0x11001111
1460 .long 0x00fddfdd,0x7f007f7f
1461 .long 0x00888888,0x22002222
1462 .long 0x009f9f9f,0xe700e7e7
1463 .long 0x00656565,0x59005959
1464 .long 0x00878787,0xe100e1e1
1465 .long 0x006b6b6b,0xda00dada
1466 .long 0x00f4f4f4,0x3d003d3d
1467 .long 0x00232323,0xc800c8c8
1468 .long 0x00484848,0x12001212
1469 .long 0x00101010,0x04000404
1470 .long 0x00d1d1d1,0x74007474
1471 .long 0x00515151,0x54005454
1472 .long 0x00c0c0c0,0x30003030
1473 .long 0x00f9f9f9,0x7e007e7e
1474 .long 0x00d2d2d2,0xb400b4b4
1475 .long 0x00a0a0a0,0x28002828
1476 .long 0x00555555,0x55005555
1477 .long 0x00a1a1a1,0x68006868
1478 .long 0x00414141,0x50005050
1479 .long 0x00fafafa,0xbe00bebe
1480 .long 0x00434343,0xd000d0d0
1481 .long 0x00131313,0xc400c4c4
1482 .long 0x00c4c4c4,0x31003131
1483 .long 0x002f2f2f,0xcb00cbcb
1484 .long 0x00a8a8a8,0x2a002a2a
1485 .long 0x00b6b6b6,0xad00adad
1486 .long 0x003c3c3c,0xf000f0f0
1487 .long 0x002b2b2b,0xca00caca
1488 .long 0x00c1c1c1,0x70007070
1489 .long 0x00ffffff,0xff00ffff
1490 .long 0x00c8c8c8,0x32003232
1491 .long 0x00a5a5a5,0x69006969
1492 .long 0x00202020,0x08000808
1493 .long 0x00898989,0x62006262
1494 .long 0x00000000,0x00000000
1495 .long 0x00999999,0x24002424
1496 .long 0x00474747,0xd100d1d1
1497 .long 0x00efefef,0xfb00fbfb
1498 .long 0x00eaeaea,0xba00baba
1499 .long 0x00b7b7b7,0xed00eded
1500 .long 0x00151515,0x45004545
1501 .long 0x00060606,0x81008181
1502 .long 0x00cdcdcd,0x73007373
1503 .long 0x00b5b5b5,0x6d006d6d
1504 .long 0x00121212,0x84008484
1505 .long 0x007e7e7e,0x9f009f9f
1506 .long 0x00bbbbbb,0xee00eeee
1507 .long 0x00292929,0x4a004a4a
1508 .long 0x000f0f0f,0xc300c3c3
1509 .long 0x00b8b8b8,0x2e002e2e
1510 .long 0x00070707,0xc100c1c1
1511 .long 0x00040404,0x01000101
1512 .long 0x009b9b9b,0xe600e6e6
1513 .long 0x00949494,0x25002525
```

```
1514 .long 0x00212121,0x48004848
1515 .long 0x00666666,0x99009999
1516 .long 0x00e6e6e6,0xb900b9b9
1517 .long 0x00cecece,0xb300b3b3
1518 .long 0x00ededed,0x7b007b7b
1519 .long 0x00e7e7e7,0xf900f9f9
1520 .long 0x003b3b3b,0xce00cece
1521 .long 0x00fefefe,0xbf00bfbf
1522 .long 0x007f7f7f,0xdf00dfff
1523 .long 0x00c5c5c5,0x71007171
1524 .long 0x00a4a4a4,0x29002929
1525 .long 0x00373737,0xcd00cdcd
1526 .long 0x00b1b1b1,0x6c006c6c
1527 .long 0x004c4c4c,0x13001313
1528 .long 0x00919191,0x64006464
1529 .long 0x006e6e6e,0x9b009b9b
1530 .long 0x008d8d8d,0x63006363
1531 .long 0x00767676,0x9d009d9d
1532 .long 0x00030303,0xc000c0c0
1533 .long 0x002d2d2d,0x4b004b4b
1534 .long 0x00dedede,0xb700b7b7
1535 .long 0x00969696,0xa500a5a5
1536 .long 0x00262626,0x89008989
1537 .long 0x007d7d7d,0x5f005fff
1538 .long 0x00c6c6c6,0xb100b1b1
1539 .long 0x005c5c5c,0x17001717
1540 .long 0x00d3d3d3,0xf400f4f4
1541 .long 0x00f2f2f2,0xbc00bcbcb
1542 .long 0x004f4f4f,0xd300d3d3
1543 .long 0x00191919,0x46004646
1544 .long 0x003f3f3f,0xcf00cfcf
1545 .long 0x00dcdcdc,0x37003737
1546 .long 0x00797979,0x5e005e5e
1547 .long 0x001d1d1d,0x47004747
1548 .long 0x00525252,0x94009494
1549 .long 0x00ebebeb,0xfa00fafafa
1550 .long 0x00f3f3f3,0xfc00fcfc
1551 .long 0x006d6d6d,0x5b005b5b
1552 .long 0x005e5e5e,0x97009797
1553 .long 0x00fbfbfb,0xfe00fefefe
1554 .long 0x00696969,0x5a005a5a
1555 .long 0x00b2b2b2,0xac00acac
1556 .long 0x00f0f0f0,0x3c003c3c
1557 .long 0x00313131,0x4c004c4c
1558 .long 0x000c0c0c,0x03000303
1559 .long 0x00d4d4d4,0x35003535
1560 .long 0x00cfcfcf,0xf300f3f3
1561 .long 0x008c8c8c,0x23002323
1562 .long 0x00e2e2e2,0xb800b8b8
1563 .long 0x00757575,0x5d005d5d
1564 .long 0x00a9a9a9,0x6a006a6a
1565 .long 0x004a4a4a,0x92009292
1566 .long 0x00575757,0xd500d5d5
1567 .long 0x00848484,0x21002121
1568 .long 0x00111111,0x44004444
1569 .long 0x00454545,0x51005151
1570 .long 0x001b1b1b,0xc600c6c6
1571 .long 0x00f5f5f5,0x7d007d7d
1572 .long 0x00e4e4e4,0x39003939
1573 .long 0x000e0e0e,0x83008383
1574 .long 0x00737373,0xdc00dcdc
1575 .long 0x00aaaaaa,0xaa00aaaa
1576 .long 0x00f1f1f1,0x7c007c7c
1577 .long 0x00dddddd,0x77007777
1578 .long 0x00595959,0x56005656
1579 .long 0x00141414,0x05000505
```

```

1580 .long 0x006c6c6c,0x1b001b1b
1581 .long 0x00929292,0xa400a4a4
1582 .long 0x00545454,0x15001515
1583 .long 0x00d0d0d0,0x34003434
1584 .long 0x00787878,0x1e001e1e
1585 .long 0x00707070,0x1c001c1c
1586 .long 0x00e3e3e3,0xf800f8f8
1587 .long 0x00494949,0x52005252
1588 .long 0x00808080,0x20002020
1589 .long 0x00505050,0x14001414
1590 .long 0x00a7a7a7,0xe900e9e9
1591 .long 0x00f6f6f6,0xbd00bdbd
1592 .long 0x00777777,0xdd00dddd
1593 .long 0x00939393,0xe400e4e4
1594 .long 0x00868686,0xa100a1a1
1595 .long 0x00838383,0xe000e0e0
1596 .long 0x002a2a2a,0x8a008a8a
1597 .long 0x00c7c7c7,0xf100f1f1
1598 .long 0x005b5b5b,0xd600d6d6
1599 .long 0x00e9e9e9,0x7a007a7a
1600 .long 0x00eeeeee,0xbb00bbbb
1601 .long 0x008f8f8f,0xe300e3e3
1602 .long 0x00010101,0x40004040
1603 .long 0x003d3d3d,0x4f004f4f
1604 .globl sunw_Camellia_cbc_encrypt
1605 .type sunw_Camellia_cbc_encrypt,@function
1606 .align 16
1607 sunw_Camellia_cbc_encrypt:
1608     cmpq    $0,%rdx
1609     je      .Lcbc_abort
1610     pushq   %rbx
1611     pushq   %rbp
1612     pushq   %r12
1613     pushq   %r13
1614     pushq   %r14
1615     pushq   %r15
1616 .Lcbc_prologue:
1617
1618     movq    %rsp,%rbp
1619     subq    $64,%rsp
1620     andq    $-64,%rsp
1621
1622
1623
1624     leaq    -64-63(%rcx),%r10
1625     subq    %rsp,%r10
1626     negq    %r10
1627     andq    $960,%r10
1628     subq    %r10,%rsp
1629
1630
1631     movq    %rdi,%r12
1632     movq    %rsi,%r13
1633     movq    %r8,%rbx
1634     movq    %rcx,%r14
1635     movl    272(%rcx),%r15d
1636
1637     movq    %r8,40(%rsp)
1638     movq    %rbp,48(%rsp)
1639
1640 .Lcbc_body:
1641     leaq    .LCamellia_SBOX(%rip),%rbp
1642
1643     movl    $32,%ecx
1644 .align 4
1645 .Lcbc_prefetch_sbox:

```

```

1646     movq    0(%rbp),%rax
1647     movq    32(%rbp),%rsi
1648     movq    64(%rbp),%rdi
1649     movq    96(%rbp),%r11
1650     leaq    128(%rbp),%rbp
1651     loop    .Lcbc_prefetch_sbox
1652     subq    $4096,%rbp
1653     shlq    $6,%r15
1654     movq    %rdx,%rcx
1655     leaq    (%r14,%r15,1),%r15
1656
1657     cmpl    $0,%r9d
1658     je      .LCBC_DECRYPT
1659
1660     andq    $-16,%rdx
1661     andq    $15,%rcx
1662     leaq    (%r12,%rdx,1),%rdx
1663     movq    %r14,0(%rsp)
1664     movq    %rdx,8(%rsp)
1665     movq    %rcx,16(%rsp)
1666
1667     cmpq    %r12,%rdx
1668     movl    0(%rbx),%r8d
1669     movl    4(%rbx),%r9d
1670     movl    8(%rbx),%r10d
1671     movl    12(%rbx),%r11d
1672     je      .Lcbc_enc_tail
1673     jmp     .Lcbc_e_loop
1674
1675 .align 16
1676 .Lcbc_e_loop:
1677     xorl    0(%r12),%r8d
1678     xorl    4(%r12),%r9d
1679     xorl    8(%r12),%r10d
1680     bswapl  %r8d
1681     xorl    12(%r12),%r11d
1682     bswapl %r9d
1683     bswapl %r10d
1684     bswapl %r11d
1685
1686     call    _x86_64_Camellia_encrypt
1687
1688     movq    0(%rsp),%r14
1689     bswapl  %r8d
1690     movq    8(%rsp),%rdx
1691     bswapl  %r9d
1692     movq    16(%rsp),%rcx
1693     bswapl  %r10d
1694     movl    %r8d,0(%r13)
1695     bswapl  %r11d
1696     movl    %r9d,4(%r13)
1697     movl    %r10d,8(%r13)
1698     leaq    16(%r12),%r12
1699     movl    %r11d,12(%r13)
1700     cmpq    %rdx,%r12
1701     leaq    16(%r13),%r13
1702     jne     .Lcbc_e_loop
1703
1704     cmpq    $0,%rcx
1705     jne     .Lcbc_enc_tail
1706
1707     movq    40(%rsp),%r13
1708     movl    %r8d,0(%r13)
1709     movl    %r9d,4(%r13)
1710     movl    %r10d,8(%r13)
1711     movl    %r11d,12(%r13)

```

```

1712      jmp      .Lcbc_done

1714 .align 16
1715 .Lcbc_enc_tail:
1716     xorq     %rax,%rax
1717     movq     %rax,0+24(%rsp)
1718     movq     %rax,8+24(%rsp)
1719     movq     %rax,16(%rsp)

1721 .Lcbc_enc_pushf:
1722     pushfq
1723     cld
1724     movq     %r12,%rsi
1725     leaq     8+24(%rsp),%rdi
1726 .long      0x9066A4F3
1727     popfq
1728 .Lcbc_enc_popf:

1730     leaq     24(%rsp),%r12
1731     leaq     16+24(%rsp),%rax
1732     movq     %rax,8(%rsp)
1733     jmp      .Lcbc_e_loop

1735 .align 16
1736 .LCBC_DECRYPT:
1737     xchgq    %r14,%r15
1738     addq     $15,%rdx
1739     andq     $15,%rcx
1740     andq     $-16,%rdx
1741     movq     %r14,0(%rsp)
1742     leaq     (%r12,%rdx,1),%rdx
1743     movq     %rdx,8(%rsp)
1744     movq     %rcx,16(%rsp)

1746     movq     (%rbx),%rax
1747     movq     8(%rbx),%rbx
1748     jmp      .Lcbc_d_loop

1749 .align 16
1750 .Lcbc_d_loop:
1751     movl     0(%r12),%r8d
1752     movl     4(%r12),%r9d
1753     movl     8(%r12),%r10d
1754     bswapl   %r8d
1755     movl     12(%r12),%r11d
1756     bswapl   %r9d
1757     movq     %rax,0+24(%rsp)
1758     bswapl   %r10d
1759     movq     %rbx,8+24(%rsp)
1760     bswapl   %r11d

1762     call     _x86_64_Camellia_decrypt

1764     movq     0(%rsp),%r14
1765     movq     8(%rsp),%rdx
1766     movq     16(%rsp),%rcx

1768     bswapl   %r8d
1769     movq     (%r12),%rax
1770     bswapl   %r9d
1771     movq     8(%r12),%rbx
1772     bswapl   %r10d
1773     xorl     0+24(%rsp),%r8d
1774     bswapl   %r11d
1775     xorl     4+24(%rsp),%r9d
1776     xorl     8+24(%rsp),%r10d
1777     leaq     16(%r12),%r12

```

```

1778     xorl     12+24(%rsp),%r11d
1779     cmpq     %rdx,%r12
1780     je       .Lcbc_ddone

1782     movl     %r8d,0(%r13)
1783     movl     %r9d,4(%r13)
1784     movl     %r10d,8(%r13)
1785     movl     %r11d,12(%r13)

1787     leaq     16(%r13),%r13
1788     jmp      .Lcbc_d_loop

1790 .align 16
1791 .Lcbc_ddone:
1792     movq     40(%rsp),%rdx
1793     cmpq     $0,%rcx
1794     jne      .Lcbc_dec_tail

1796     movl     %r8d,0(%r13)
1797     movl     %r9d,4(%r13)
1798     movl     %r10d,8(%r13)
1799     movl     %r11d,12(%r13)

1801     movq     %rax,(%rdx)
1802     movq     %rbx,8(%rdx)
1803     jmp      .Lcbc_done

1804 .align 16
1805 .Lcbc_dec_tail:
1806     movl     %r8d,0+24(%rsp)
1807     movl     %r9d,4+24(%rsp)
1808     movl     %r10d,8+24(%rsp)
1809     movl     %r11d,12+24(%rsp)

1811 .Lcbc_dec_pushf:
1812     pushfq
1813     cld
1814     leaq     8+24(%rsp),%rsi
1815     leaq     (%r13),%rdi
1816 .long      0x9066A4F3
1817     popfq
1818 .Lcbc_dec_popf:

1820     movq     %rax,(%rdx)
1821     movq     %rbx,8(%rdx)
1822     jmp      .Lcbc_done

1824 .align 16
1825 .Lcbc_done:
1826     movq     48(%rsp),%rcx
1827     movq     0(%rcx),%r15
1828     movq     8(%rcx),%r14
1829     movq     16(%rcx),%r13
1830     movq     24(%rcx),%r12
1831     movq     32(%rcx),%rbp
1832     movq     40(%rcx),%rbx
1833     leaq     48(%rcx),%rsp

1834 .Lcbc_abort:
1835     .byte    0xf3,0xc3
1836 .size      sunw_Camellia_cbc_encrypt,.-sunw_Camellia_cbc_encrypt

1838 .byte      67,97,109,101,108,108,105,97,32,102,111,114,32,120,56,54,95,54,52,32,98,

```

new/usr/src/lib/openssl/libsunw_crypto/krb5/krb5_asn.c

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*****
6206 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/krb5/krb5_asn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* krb5_asn.c */
2 /* Written by Vern Staats <staatsvr@asc.hpc.mil> for the OpenSSL project,
3 ** using ocsp/{*.h,*asn*.c} as a starting point
4 */
5 /* =====
6 * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
7 *
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10 * are met:
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57 #include <openssl/asn1.h>
58 #include <openssl/asn1t.h>
59 #include <openssl/krb5_asn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/krb5/krb5_asn.c

2

```
63 ASN1_SEQUENCE(KRB5_ENCDATA) = {
64     ASN1_EXP(KRB5_ENCDATA, etype, ASN1_INTEGER, 0),
65     ASN1_EXP_OPT(KRB5_ENCDATA, kvno, ASN1_INTEGER, 1),
66     ASN1_EXP(KRB5_ENCDATA, cipher, ASN1_OCTET_STRING, 2)
67 } ASN1_SEQUENCE_END(KRB5_ENCDATA)

69 IMPLEMENT_ASN1_FUNCTIONS(KRB5_ENCDATA)

72 ASN1_SEQUENCE(KRB5_PRINCNAME) = {
73     ASN1_EXP(KRB5_PRINCNAME, nametype, ASN1_INTEGER, 0),
74     ASN1_EXP_SEQUENCE_OF(KRB5_PRINCNAME, namestring, ASN1_GENERALSTRING, 1)
75 } ASN1_SEQUENCE_END(KRB5_PRINCNAME)

77 IMPLEMENT_ASN1_FUNCTIONS(KRB5_PRINCNAME)

80 /* [APPLICATION 1] = 0x61 */
81 ASN1_SEQUENCE(KRB5_TKTBODY) = {
82     ASN1_EXP(KRB5_TKTBODY, tktvno, ASN1_INTEGER, 0),
83     ASN1_EXP(KRB5_TKTBODY, realm, ASN1_GENERALSTRING, 1),
84     ASN1_EXP(KRB5_TKTBODY, sname, KRB5_PRINCNAME, 2),
85     ASN1_EXP(KRB5_TKTBODY, encdata, KRB5_ENCDATA, 3)
86 } ASN1_SEQUENCE_END(KRB5_TKTBODY)

88 IMPLEMENT_ASN1_FUNCTIONS(KRB5_TKTBODY)

91 ASN1_ITEM_TEMPLATE(KRB5_TICKET) =
92     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_EXPTAG|ASN1_TFLG_APPLICATION, 1,
93     KRB5_TICKET, KRB5_TKTBODY)
94 ASN1_ITEM_TEMPLATE_END(KRB5_TICKET)

96 IMPLEMENT_ASN1_FUNCTIONS(KRB5_TICKET)

99 /* [APPLICATION 14] = 0x6e */
100 ASN1_SEQUENCE(KRB5_APREQBODY) = {
101     ASN1_EXP(KRB5_APREQBODY, pvno, ASN1_INTEGER, 0),
102     ASN1_EXP(KRB5_APREQBODY, msgtype, ASN1_INTEGER, 1),
103     ASN1_EXP(KRB5_APREQBODY, apoptions, ASN1_BIT_STRING, 2),
104     ASN1_EXP(KRB5_APREQBODY, ticket, KRB5_TICKET, 3),
105     ASN1_EXP(KRB5_APREQBODY, authenticator, KRB5_ENCDATA, 4),
106 } ASN1_SEQUENCE_END(KRB5_APREQBODY)

108 IMPLEMENT_ASN1_FUNCTIONS(KRB5_APREQBODY)

110 ASN1_ITEM_TEMPLATE(KRB5_APREQ) =
111     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_EXPTAG|ASN1_TFLG_APPLICATION, 14,
112     KRB5_APREQ, KRB5_APREQBODY)
113 ASN1_ITEM_TEMPLATE_END(KRB5_APREQ)

115 IMPLEMENT_ASN1_FUNCTIONS(KRB5_APREQ)

118 /* Authenticator stuff */

120 ASN1_SEQUENCE(KRB5_CHECKSUM) = {
121     ASN1_EXP(KRB5_CHECKSUM, ctype, ASN1_INTEGER, 0),
122     ASN1_EXP(KRB5_CHECKSUM, checksum, ASN1_OCTET_STRING, 1)
123 } ASN1_SEQUENCE_END(KRB5_CHECKSUM)

125 IMPLEMENT_ASN1_FUNCTIONS(KRB5_CHECKSUM)
```



```
128 ASN1_SEQUENCE(KRB5_ENCKEY) = {
129     ASN1_EXP(KRB5_ENCKEY, ktype, ASN1_INTEGER, 0),
130     ASN1_EXP(KRB5_ENCKEY, keyvalue, ASN1_OCTET_STRING, 1)
131 } ASN1_SEQUENCE_END(KRB5_ENCKEY)

133 IMPLEMENT_ASN1_FUNCTIONS(KRB5_ENCKEY)

136 /* SEQ OF SEQ; see ASN1_EXP_SEQUENCE_OF_OPT() below */
137 ASN1_SEQUENCE(KRB5_AUTHDATA) = {
138     ASN1_EXP(KRB5_AUTHDATA, adtype, ASN1_INTEGER, 0),
139     ASN1_EXP(KRB5_AUTHDATA, addata, ASN1_OCTET_STRING, 1)
140 } ASN1_SEQUENCE_END(KRB5_AUTHDATA)

142 IMPLEMENT_ASN1_FUNCTIONS(KRB5_AUTHDATA)

145 /* [APPLICATION 2] = 0x62 */
146 ASN1_SEQUENCE(KRB5_AUTHENTBODY) = {
147     ASN1_EXP(KRB5_AUTHENTBODY, avno, ASN1_INTEGER, 0),
148     ASN1_EXP(KRB5_AUTHENTBODY, crealm, ASN1_GENERALSTRING, 1),
149     ASN1_EXP(KRB5_AUTHENTBODY, cname, KRB5_PRINCNAME, 2),
150     ASN1_EXP_OPT(KRB5_AUTHENTBODY, cksum, KRB5_CHECKSUM, 3),
151     ASN1_EXP(KRB5_AUTHENTBODY, cusec, ASN1_INTEGER, 4),
152     ASN1_EXP(KRB5_AUTHENTBODY, ctime, ASN1_GENERALIZEDTIME, 5),
153     ASN1_EXP_OPT(KRB5_AUTHENTBODY, subkey, KRB5_ENCKEY, 6),
154     ASN1_EXP_OPT(KRB5_AUTHENTBODY, seqnum, ASN1_INTEGER, 7),
155     ASN1_EXP_SEQUENCE_OF_OPT
156     (KRB5_AUTHENTBODY, authorization, KRB5_AUTHDATA, 8),
157 } ASN1_SEQUENCE_END(KRB5_AUTHENTBODY)

159 IMPLEMENT_ASN1_FUNCTIONS(KRB5_AUTHENTBODY)

161 ASN1_ITEM_TEMPLATE(KRB5_AUTHENT) =
162     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_EXPTAG|ASN1_TFLG_APPLICATION, 2,
163     KRB5_AUTHENT, KRB5_AUTHENTBODY)
164 ASN1_ITEM_TEMPLATE_END(KRB5_AUTHENT)

166 IMPLEMENT_ASN1_FUNCTIONS(KRB5_AUTHENT)
```

new/usr/src/lib/openssl/libsunw_crypto/lhash/lh_stats.c

1

```
*****
8601 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/lhash/lh_stats.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/lhash/lh_stats.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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11 * apply to all code found in this distribution, be it the RC4, RSA,
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13 * included with this distribution is covered by the same copyright terms
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <string.h>
61 #include <stdlib.h>
```

new/usr/src/lib/openssl/libsunw_crypto/lhash/lh_stats.c

2

```
62 /* If you wish to build this outside of SSLeay, remove the following lines
63  * and things should work as expected */
64 #include "cryptlib.h"

66 #ifndef OPENSSL_NO_BIO
67 #include <openssl/bio.h>
68 #endif
69 #include <openssl/lhash.h>

71 #ifdef OPENSSL_NO_BIO

73 void lh_stats(LHASH *lh, FILE *out)
74 {
75     fprintf(out, "num_items          = %lu\n", lh->num_items);
76     fprintf(out, "num_nodes          = %u\n", lh->num_nodes);
77     fprintf(out, "num_alloc_nodes     = %u\n", lh->num_alloc_nodes);
78     fprintf(out, "num_expands         = %lu\n", lh->num_expands);
79     fprintf(out, "num_expand_reallocs = %lu\n", lh->num_expand_reallocs);
80     fprintf(out, "num_contracts       = %lu\n", lh->num_contracts);
81     fprintf(out, "num_contract_reallocs = %lu\n", lh->num_contract_reallocs);
82     fprintf(out, "num_hash_calls      = %lu\n", lh->num_hash_calls);
83     fprintf(out, "num_comp_calls      = %lu\n", lh->num_comp_calls);
84     fprintf(out, "num_insert          = %lu\n", lh->num_insert);
85     fprintf(out, "num_replace         = %lu\n", lh->num_replace);
86     fprintf(out, "num_delete          = %lu\n", lh->num_delete);
87     fprintf(out, "num_no_delete       = %lu\n", lh->num_no_delete);
88     fprintf(out, "num_retrieve        = %lu\n", lh->num_retrieve);
89     fprintf(out, "num_retrieve_miss   = %lu\n", lh->num_retrieve_miss);
90     fprintf(out, "num_hash_comps      = %lu\n", lh->num_hash_comps);
91 #if 0
92     fprintf(out, "p                = %u\n", lh->p);
93     fprintf(out, "pmax             = %u\n", lh->pmax);
94     fprintf(out, "up_load          = %lu\n", lh->up_load);
95     fprintf(out, "down_load        = %lu\n", lh->down_load);
96 #endif
97 }

99 void lh_node_stats(LHASH *lh, FILE *out)
100 {
101     LHASH_NODE *n;
102     unsigned int i,num;

104     for (i=0; i<lh->num_nodes; i++)
105     {
106         for (n=lh->b[i],num=0; n != NULL; n=n->next)
107             num++;
108         fprintf(out,"node %6u -> %3u\n",i,num);
109     }
110 }

112 void lh_node_usage_stats(LHASH *lh, FILE *out)
113 {
114     LHASH_NODE *n;
115     unsigned long num;
116     unsigned int i;
117     unsigned long total=0,n_used=0;

119     for (i=0; i<lh->num_nodes; i++)
120     {
121         for (n=lh->b[i],num=0; n != NULL; n=n->next)
122             num++;
123         if (num != 0)
124         {
125             n_used++;
126             total+=num;
127         }
128     }
129 }
```

```

128     }
129     fprintf(out,"%lu nodes used out of %u\n",n_used,lh->num_nodes);
130     fprintf(out,"%lu items\n",total);
131     if (n_used == 0) return;
132     fprintf(out,"load %d.%02d  actual load %d.%02d\n",
133             (int)((total/lh->num_nodes),
134             (int)((total%lh->num_nodes)*100/lh->num_nodes),
135             (int)(total/n_used),
136             (int)((total%n_used)*100/n_used));
137 }
138
139 #else
140
141 #ifndef OPENSSL_NO_FP_API
142 void lh_stats(const_LHASH *lh, FILE *fp)
143 {
144     BIO *bp;
145
146     bp=BIO_new(BIO_s_file());
147     if (bp == NULL) goto end;
148     BIO_set_fp(bp,fp,BIO_NOCLOSE);
149     lh_stats_bio(lh,bp);
150     BIO_free(bp);
151 end;;
152 }
153
154 void lh_node_stats(const_LHASH *lh, FILE *fp)
155 {
156     BIO *bp;
157
158     bp=BIO_new(BIO_s_file());
159     if (bp == NULL) goto end;
160     BIO_set_fp(bp,fp,BIO_NOCLOSE);
161     lh_node_stats_bio(lh,bp);
162     BIO_free(bp);
163 end;;
164 }
165
166 void lh_node_usage_stats(const_LHASH *lh, FILE *fp)
167 {
168     BIO *bp;
169
170     bp=BIO_new(BIO_s_file());
171     if (bp == NULL) goto end;
172     BIO_set_fp(bp,fp,BIO_NOCLOSE);
173     lh_node_usage_stats_bio(lh,bp);
174     BIO_free(bp);
175 end;;
176 }
177
178 #endif
179
180 void lh_stats_bio(const_LHASH *lh, BIO *out)
181 {
182     BIO_printf(out,"num_items      = %lu\n",lh->num_items);
183     BIO_printf(out,"num_nodes      = %u\n",lh->num_nodes);
184     BIO_printf(out,"num_alloc_nodes = %u\n",lh->num_alloc_nodes);
185     BIO_printf(out,"num_expands    = %lu\n",lh->num_expands);
186     BIO_printf(out,"num_expand_reallocs = %lu\n",
187             lh->num_expand_reallocs);
188     BIO_printf(out,"num_contracts  = %lu\n",lh->num_contracts);
189     BIO_printf(out,"num_contract_reallocs = %lu\n",
190             lh->num_contract_reallocs);
191     BIO_printf(out,"num_hash_calls = %lu\n",lh->num_hash_calls);
192     BIO_printf(out,"num_comp_calls = %lu\n",lh->num_comp_calls);
193     BIO_printf(out,"num_insert     = %lu\n",lh->num_insert);

```

```

194     BIO_printf(out,"num_replace      = %lu\n",lh->num_replace);
195     BIO_printf(out,"num_delete      = %lu\n",lh->num_delete);
196     BIO_printf(out,"num_no_delete   = %lu\n",lh->num_no_delete);
197     BIO_printf(out,"num_retrieve    = %lu\n",lh->num_retrieve);
198     BIO_printf(out,"num_retrieve_miss = %lu\n",lh->num_retrieve_miss);
199     BIO_printf(out,"num_hash_comps  = %lu\n",lh->num_hash_comps);
200 #if 0
201     BIO_printf(out,"p              = %u\n",lh->p);
202     BIO_printf(out,"pmax          = %u\n",lh->pmax);
203     BIO_printf(out,"up_load       = %lu\n",lh->up_load);
204     BIO_printf(out,"down_load     = %lu\n",lh->down_load);
205 #endif
206 }
207
208 void lh_node_stats_bio(const_LHASH *lh, BIO *out)
209 {
210     LHASH_NODE *n;
211     unsigned int i,num;
212
213     for (i=0; i<lh->num_nodes; i++)
214     {
215         for (n=lh->b[i],num=0; n != NULL; n=n->next)
216             num++;
217         BIO_printf(out,"node %6u -> %3u\n",i,num);
218     }
219 }
220
221 void lh_node_usage_stats_bio(const_LHASH *lh, BIO *out)
222 {
223     LHASH_NODE *n;
224     unsigned long num;
225     unsigned int i;
226     unsigned long total=0,n_used=0;
227
228     for (i=0; i<lh->num_nodes; i++)
229     {
230         for (n=lh->b[i],num=0; n != NULL; n=n->next)
231             num++;
232         if (num != 0)
233         {
234             n_used++;
235             total+=num;
236         }
237     }
238     BIO_printf(out,"%lu nodes used out of %u\n",n_used,lh->num_nodes);
239     BIO_printf(out,"%lu items\n",total);
240     if (n_used == 0) return;
241     BIO_printf(out,"load %d.%02d  actual load %d.%02d\n",
242             (int)((total/lh->num_nodes),
243             (int)((total%lh->num_nodes)*100/lh->num_nodes),
244             (int)(total/n_used),
245             (int)((total%n_used)*100/n_used));
246 }
247
248 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/lhash/lhash.c

1

11529 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/lhash/lhash.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/lhash/lhash.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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31 * 3. All advertising materials mentioning features or use of this software
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35 * The word 'cryptographic' can be left out if the rouines from the library
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 /* Code for dynamic hash table routines
60 * Author - Eric Young v 2.0
61 */
```

new/usr/src/lib/openssl/libsunw_crypto/lhash/lhash.c

2

```
62 * 2.2 eay - added #include "crypto.h" so the memory leak checking code is
63 * present. eay 18-Jun-98
64 *
65 * 2.1 eay - Added an 'error in last operation' flag. eay 6-May-98
66 *
67 * 2.0 eay - Fixed a bug that occurred when using lh_delete
68 * from inside lh_doall(). As entries were deleted,
69 * the 'table' was 'contract()'ed, making some entries
70 * jump from the end of the table to the start, there by
71 * skipping the lh_doall() processing. eay - 4/12/95
72 *
73 * 1.9 eay - Fixed a memory leak in lh_free, the LHASH_NODES
74 * were not being free()ed. 21/11/95
75 *
76 * 1.8 eay - Put the stats routines into a separate file, lh_stats.c
77 * 19/09/95
78 *
79 * 1.7 eay - Removed the fputs() for realloc failures - the code
80 * should silently tolerate them. I have also fixed things
81 * lint complained about 04/05/95
82 *
83 * 1.6 eay - Fixed an invalid pointers in contract/expand 27/07/92
84 *
85 * 1.5 eay - Fixed a misuse of realloc in expand 02/03/1992
86 *
87 * 1.4 eay - Fixed lh_doall so the function can call lh_delete 28/05/91
88 *
89 * 1.3 eay - Fixed a few lint problems 19/3/1991
90 *
91 * 1.2 eay - Fixed lh_doall problem 13/3/1991
92 *
93 * 1.1 eay - Added lh_doall
94 *
95 * 1.0 eay - First version
96 */
97 #include <stdio.h>
98 #include <string.h>
99 #include <stdlib.h>
100 #include <openssl/crypto.h>
101 #include <openssl/lhash.h>
102
103 const char lh_version[]="lhash" OPENSSL_VERSION_PTEXT;
104
105 #undef MIN_NODES
106 #define MIN_NODES 16
107 #define UP_LOAD (2*LH_LOAD_MULT) /* load times 256 (default 2) */
108 #define DOWN_LOAD (LH_LOAD_MULT) /* load times 256 (default 1) */
109
110 static void expand(_LHASH *lh);
111 static void contract(_LHASH *lh);
112 static LHASH_NODE **getrn(_LHASH *lh, const void *data, unsigned long *rhash);
113
114 _LHASH *lh_new(LHASH_HASH_FN_TYPE h, LHASH_COMP_FN_TYPE c)
115 {
116     _LHASH *ret;
117     int i;
118
119     if ((ret=OPENSSL_malloc(sizeof(_LHASH))) == NULL)
120         goto err0;
121     if ((ret->b=OPENSSL_malloc(sizeof(LHASH_NODE *)*MIN_NODES)) == NULL)
122         goto err1;
123     for (i=0; i<MIN_NODES; i++)
124         ret->b[i]=NULL;
125     ret->comp=((c == NULL)?(LHASH_COMP_FN_TYPE)strcmp:c);
126     ret->hash=((h == NULL)?(LHASH_HASH_FN_TYPE)lh_strhash:h);
127     ret->num_nodes=MIN_NODES/2;
128 }
```

```

128     ret->num_alloc_nodes=MIN_NODES;
129     ret->p=0;
130     ret->pmax=MIN_NODES/2;
131     ret->up_load=UP_LOAD;
132     ret->down_load=DOWN_LOAD;
133     ret->num_items=0;

135     ret->num_expands=0;
136     ret->num_expand_reallocs=0;
137     ret->num_contracts=0;
138     ret->num_contract_reallocs=0;
139     ret->num_hash_calls=0;
140     ret->num_comp_calls=0;
141     ret->num_insert=0;
142     ret->num_replace=0;
143     ret->num_delete=0;
144     ret->num_no_delete=0;
145     ret->num_retrieve=0;
146     ret->num_retrieve_miss=0;
147     ret->num_hash_comps=0;

149     ret->error=0;
150     return(ret);
151 err1:
152     OPENSSL_free(ret);
153 err0:
154     return(NULL);
155 }

157 void lh_free(_LHASH *lh)
158 {
159     unsigned int i;
160     LHASH_NODE *n,*nn;

162     if (lh == NULL)
163         return;

165     for (i=0; i<lh->num_nodes; i++)
166     {
167         n=lh->b[i];
168         while (n != NULL)
169         {
170             nn=n->next;
171             OPENSSL_free(n);
172             n=nn;
173         }
174     }
175     OPENSSL_free(lh->b);
176     OPENSSL_free(lh);
177 }

179 void *lh_insert(_LHASH *lh, void *data)
180 {
181     unsigned long hash;
182     LHASH_NODE *nn,**rn;
183     void *ret;

185     lh->error=0;
186     if (lh->up_load <= (lh->num_items*LH_LOAD_MULT/lh->num_nodes))
187         expand(lh);

189     rn=getrn(lh,data,&hash);

191     if (*rn == NULL)
192     {
193         if ((nn=(LHASH_NODE *)OPENSSL_malloc(sizeof(LHASH_NODE))) == NUL

```

```

194         {
195             lh->error++;
196             return(NULL);
197         }
198         nn->data=data;
199         nn->next=NULL;
200 #ifndef OPENSSL_NO_HASH_COMP
201         nn->hash=hash;
202 #endif
203         *rn=nn;
204         ret=NULL;
205         lh->num_insert++;
206         lh->num_items++;
207     }
208     else /* replace same key */
209     {
210         ret = (*rn)->data;
211         (*rn)->data=data;
212         lh->num_replace++;
213     }
214     return(ret);
215 }

217 void *lh_delete(_LHASH *lh, const void *data)
218 {
219     unsigned long hash;
220     LHASH_NODE *nn,**rn;
221     void *ret;

223     lh->error=0;
224     rn=getrn(lh,data,&hash);

226     if (*rn == NULL)
227     {
228         lh->num_no_delete++;
229         return(NULL);
230     }
231     else
232     {
233         nn= *rn;
234         *rn=nn->next;
235         ret=nn->data;
236         OPENSSL_free(nn);
237         lh->num_delete++;
238     }

240     lh->num_items--;
241     if ((lh->num_nodes > MIN_NODES) &&
242         (lh->down_load >= (lh->num_items*LH_LOAD_MULT/lh->num_nodes)))
243         contract(lh);

245     return(ret);
246 }

248 void *lh_retrieve(_LHASH *lh, const void *data)
249 {
250     unsigned long hash;
251     LHASH_NODE **rn;
252     void *ret;

254     lh->error=0;
255     rn=getrn(lh,data,&hash);

257     if (*rn == NULL)
258     {
259         lh->num_retrieve_miss++;

```

```

260         return(NULL);
261     }
262     else
263     {
264         ret= (*rn)->data;
265         lh->num_retrieve++;
266     }
267     return(ret);
268 }

270 static void doall_util_fn(_LHASH *lh, int use_arg, LHASH_DOALL_FN_TYPE func,
271                          LHASH_DOALL_ARG_FN_TYPE func_arg, void *arg)
272 {
273     int i;
274     LHASH_NODE *a,*n;

276     if (lh == NULL)
277         return;

279     /* reverse the order so we search from 'top to bottom'
280      * We were having memory leaks otherwise */
281     for (i=lh->num_nodes-1; i>=0; i--)
282     {
283         a=lh->b[i];
284         while (a != NULL)
285         {
286             /* 28/05/91 - eay - n added so items can be deleted
287              * via lh_doall */
288             /* 22/05/08 - ben - eh? since a is not passed,
289              * this should not be needed */
290             n=a->next;
291             if(use_arg)
292                 func_arg(a->data,arg);
293             else
294                 func(a->data);
295             a=n;
296         }
297     }
298 }

300 void lh_doall(_LHASH *lh, LHASH_DOALL_FN_TYPE func)
301 {
302     doall_util_fn(lh, 0, func, (LHASH_DOALL_ARG_FN_TYPE)0, NULL);
303 }

305 void lh_doall_arg(_LHASH *lh, LHASH_DOALL_ARG_FN_TYPE func, void *arg)
306 {
307     doall_util_fn(lh, 1, (LHASH_DOALL_FN_TYPE)0, func, arg);
308 }

310 static void expand(_LHASH *lh)
311 {
312     LHASH_NODE **n,**n1,**n2,*np;
313     unsigned int p,i,j;
314     unsigned long hash,nni;

316     lh->num_nodes++;
317     lh->num_expands++;
318     p=(int)lh->p++;
319     n1= &(lh->b[p]);
320     n2= &(lh->b[p+(int)lh->pmax]);
321     *n2=NULL; /* 27/07/92 - eay - undefined pointer bug */
322     nni=lh->num_alloc_nodes;
323
324     for (np= *n1; np != NULL; )
325     {

```

```

326 #ifndef OPENSSL_NO_HASH_COMP
327     hash=np->hash;
328 #else
329     hash=lh->hash(np->data);
330     lh->num_hash_calls++;
331 #endif
332     if ((hash%nni) != p)
333     { /* move it */
334         *n1= (*n1)->next;
335         np->next= *n2;
336         *n2=np;
337     }
338     else
339         n1= &((*n1)->next);
340     np= *n1;
341 }

343 if ((lh->p) >= lh->pmax)
344 {
345     j=(int)lh->num_alloc_nodes*2;
346     n=(LHASH_NODE **)OPENSSL_realloc(lh->b,
347                                     (int)(sizeof(LHASH_NODE *)*j));
348     if (n == NULL)
349     {
350         /* fputs("realloc error in lhash",stderr); */
351         lh->error++;
352         lh->p=0;
353         return;
354     }
355     /* else */
356     for (i=(int)lh->num_alloc_nodes; i<j; i++)/* 26/02/92 eay */
357         n[i]=NULL; /* 02/03/92 eay */
358     lh->pmax=lh->num_alloc_nodes;
359     lh->num_alloc_nodes=j;
360     lh->num_expand_reallocs++;
361     lh->p=0;
362     lh->b=n;
363 }
364 }

366 static void contract(_LHASH *lh)
367 {
368     LHASH_NODE **n,*n1,*np;

370     np=lh->b[lh->p+lh->pmax-1];
371     lh->b[lh->p+lh->pmax-1]=NULL; /* 24/07-92 - eay - weird but :( */
372     if (lh->p == 0)
373     {
374         n=(LHASH_NODE **)OPENSSL_realloc(lh->b,
375                                           (unsigned int)(sizeof(LHASH_NODE *)*lh->pmax));
376         if (n == NULL)
377         {
378             /* fputs("realloc error in lhash",stderr); */
379             lh->error++;
380             return;
381         }
382         lh->num_contract_reallocs++;
383         lh->num_alloc_nodes/=2;
384         lh->pmax/=2;
385         lh->p=lh->pmax-1;
386         lh->b=n;
387     }
388     else
389         lh->p--;

391     lh->num_nodes--;

```

```

392     lh->num_contracts++;
394     n1=lh->b[(int)lh->p];
395     if (n1 == NULL)
396         lh->b[(int)lh->p]=np;
397     else
398     {
399         while (n1->next != NULL)
400             n1=n1->next;
401         n1->next=np;
402     }
403 }

405 static LHASH_NODE **getrn(_LHASH *lh, const void *data, unsigned long *rhash)
406 {
407     LHASH_NODE **ret,*n1;
408     unsigned long hash,nn;
409     LHASH_COMP_FN_TYPE cf;

411     hash=*(lh->hash)(data);
412     lh->num_hash_calls++;
413     *rhash=hash;

415     nn=hash%lh->pmax;
416     if (nn < lh->p)
417         nn=hash%lh->num_alloc_nodes;

419     cf=lh->comp;
420     ret= &(lh->b[(int)nn]);
421     for (n1= *ret; n1 != NULL; n1=n1->next)
422     {
423 #ifndef OPENSSSL_NO_HASH_COMP
424         lh->num_hash_comps++;
425         if (n1->hash != hash)
426         {
427             ret= &(n1->next);
428             continue;
429         }
430 #endif
431         lh->num_comp_calls++;
432         if(cf(n1->data,data) == 0)
433             break;
434         ret= &(n1->next);
435     }
436     return(ret);
437 }

439 /* The following hash seems to work very well on normal text strings
440  * no collisions on /usr/dict/words and it distributes on %2^n quite
441  * well, not as good as MD5, but still good.
442  */
443 unsigned long lh_strhash(const char *c)
444 {
445     unsigned long ret=0;
446     long n;
447     unsigned long v;
448     int r;

450     if ((c == NULL) || (*c == '\0'))
451         return(ret);
452 /*
453     unsigned char b[16];
454     MD5(c,strlen(c),b);
455     return(b[0]|(b[1]<<8)|(b[2]<<16)|(b[3]<<24));
456 */

```

```

458     n=0x100;
459     while (*c)
460     {
461         v=n|(*c);
462         n+=0x100;
463         r= (int)((v>>2)^v)&0x0f;
464         ret=(ret<<r)|(ret>>(32-r));
465         ret&=0xFFFFFFFFFL;
466         ret^=v*v;
467         c++;
468     }
469     return((ret>>16)^ret);
470 }

472 unsigned long lh_num_items(const _LHASH *lh)
473 {
474     return lh ? lh->num_items : 0;
475 }

```

7349 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/md2/md2_dgst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/md2/md2_dgst.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <string.h>
```

```
62 #include <openssl/md2.h>
63 #include <openssl/opensslv.h>
64 #include <openssl/crypto.h>
65
66 const char MD2_version[]="MD2" OPENSSL_VERSION_PTEXT;
67
68 /* Implemented from RFC1319 The MD2 Message-Digest Algorithm
69  */
70
71 #define UCHAR    unsigned char
72
73 static void md2_block(MD2_CTX *c, const unsigned char *d);
74 /* The magic S table - I have converted it to hex since it is
75  * basically just a random byte string. */
76 static const MD2_INT S[256]={
77     0x29, 0x2E, 0x43, 0xC9, 0xA2, 0xD8, 0x7C, 0x01,
78     0x3D, 0x36, 0x54, 0xA1, 0xEC, 0xF0, 0x06, 0x13,
79     0x62, 0xA7, 0x05, 0xF3, 0xC0, 0xC7, 0x73, 0x8C,
80     0x98, 0x93, 0x2B, 0xD9, 0xBC, 0x4C, 0x82, 0xCA,
81     0x1E, 0x9B, 0x57, 0x3C, 0xFD, 0xD4, 0xE0, 0x16,
82     0x67, 0x42, 0x6F, 0x18, 0x8A, 0x17, 0xE5, 0x12,
83     0xBE, 0x4E, 0xC4, 0xD6, 0xDA, 0x9E, 0xDE, 0x49,
84     0xA0, 0xFB, 0xF5, 0x8E, 0xBB, 0x2F, 0xEE, 0x7A,
85     0xA9, 0x68, 0x79, 0x91, 0x15, 0xB2, 0x07, 0x3F,
86     0x94, 0xC2, 0x10, 0x89, 0x0B, 0x22, 0x5F, 0x21,
87     0x80, 0x7F, 0x5D, 0x9A, 0x5A, 0x90, 0x32, 0x27,
88     0x35, 0x3E, 0xCC, 0xE7, 0xBF, 0xF7, 0x97, 0x03,
89     0xFF, 0x19, 0x30, 0xB3, 0x48, 0xA5, 0xB5, 0xD1,
90     0xD7, 0x5E, 0x92, 0x2A, 0xAC, 0x56, 0xAA, 0xC6,
91     0x4F, 0xB8, 0x38, 0xD2, 0x96, 0xA4, 0x7D, 0xB6,
92     0x76, 0xFC, 0x6B, 0xE2, 0x9C, 0x74, 0x04, 0xF1,
93     0x45, 0x9D, 0x70, 0x59, 0x64, 0x71, 0x87, 0x20,
94     0x86, 0x5B, 0xCF, 0x65, 0xE6, 0x2D, 0xA8, 0x02,
95     0x1B, 0x60, 0x25, 0xAD, 0xAE, 0xB0, 0xB9, 0xF6,
96     0x1C, 0x46, 0x61, 0x69, 0x34, 0x40, 0x7E, 0x0F,
97     0x55, 0x47, 0xA3, 0x23, 0xDD, 0x51, 0xAF, 0x3A,
98     0xC3, 0x5C, 0xF9, 0xCE, 0xBA, 0xC5, 0xEA, 0x26,
99     0x2C, 0x53, 0x0D, 0x6E, 0x85, 0x28, 0x84, 0x09,
100    0xD3, 0xDF, 0xCD, 0xF4, 0x41, 0x81, 0x4D, 0x52,
101    0x6A, 0xDC, 0x37, 0xC8, 0x6C, 0xC1, 0xAB, 0xFA,
102    0x24, 0xE1, 0x7B, 0x08, 0x0C, 0xBD, 0xB1, 0x4A,
103    0x78, 0x88, 0x95, 0x8B, 0xE3, 0x63, 0xE8, 0x6D,
104    0xE9, 0xCB, 0xD5, 0xFE, 0x3B, 0x00, 0x1D, 0x39,
105    0xF2, 0xEF, 0xB7, 0x0E, 0x66, 0x58, 0xD0, 0xEA,
106    0xA6, 0x77, 0x72, 0xF8, 0xEB, 0x75, 0x4B, 0x0A,
107    0x31, 0x44, 0x50, 0xB4, 0x8F, 0xED, 0x1F, 0x1A,
108    0xDB, 0x99, 0x8D, 0x33, 0x9F, 0x11, 0x83, 0x14,
109    };
110
111 const char *MD2_options(void)
112 {
113     if (sizeof(MD2_INT) == 1)
114         return("md2(char)");
115     else
116         return("md2(int)");
117 }
118
119 fips_md_init(MD2)
120 {
121     c->num=0;
122     memset(c->state,0,sizeof c->state);
123     memset(c->cksm,0,sizeof c->cksm);
124     memset(c->data,0,sizeof c->data);
125     return 1;
126 }
```



```

128 int MD2_Update(MD2_CTX *c, const unsigned char *data, size_t len)
129 {
130     register UCHAR *p;
131
132     if (len == 0) return 1;
133
134     p=c->data;
135     if (c->num != 0)
136     {
137         if ((c->num+len) >= MD2_BLOCK)
138         {
139             memcpy(&(p[c->num]), data, MD2_BLOCK-c->num);
140             md2_block(c, c->data);
141             data+=(MD2_BLOCK - c->num);
142             len-=(MD2_BLOCK - c->num);
143             c->num=0;
144             /* drop through and do the rest */
145         }
146         else
147         {
148             memcpy(&(p[c->num]), data, len);
149             /* data+=len; */
150             c->num+=(int)len;
151             return 1;
152         }
153     }
154     /* we now can process the input data in blocks of MD2_BLOCK
155     * chars and save the leftovers to c->data. */
156     while (len >= MD2_BLOCK)
157     {
158         md2_block(c, data);
159         data+=MD2_BLOCK;
160         len-=MD2_BLOCK;
161     }
162     memcpy(p, data, len);
163     c->num=(int)len;
164     return 1;
165 }
166
167 static void md2_block(MD2_CTX *c, const unsigned char *d)
168 {
169     register MD2_INT t, *sp1, *sp2;
170     register int i, j;
171     MD2_INT state[48];
172
173     sp1=c->state;
174     sp2=c->cksm;
175     j=sp2[MD2_BLOCK-1];
176     for (i=0; i<16; i++)
177     {
178         state[i]=sp1[i];
179         state[i+16]=t=d[i];
180         state[i+32]=(t^sp1[i]);
181         j=sp2[i]^S[t^j];
182     }
183     t=0;
184     for (i=0; i<18; i++)
185     {
186         for (j=0; j<48; j+=8)
187         {
188             t= state[j+ 0]^S[t];
189             t= state[j+ 1]^S[t];
190             t= state[j+ 2]^S[t];
191             t= state[j+ 3]^S[t];
192             t= state[j+ 4]^S[t];
193             t= state[j+ 5]^S[t];

```

```

194             t= state[j+ 6]^S[t];
195             t= state[j+ 7]^S[t];
196         }
197         t=(t+i)&0xff;
198     }
199     memcpy(sp1, state, 16*sizeof(MD2_INT));
200     OPENSSL_cleanse(state, 48*sizeof(MD2_INT));
201 }
202
203 int MD2_Final(unsigned char *md, MD2_CTX *c)
204 {
205     int i, v;
206     register UCHAR *cp;
207     register MD2_INT *p1, *p2;
208
209     cp=c->data;
210     p1=c->state;
211     p2=c->cksm;
212     v=MD2_BLOCK-c->num;
213     for (i=c->num; i<MD2_BLOCK; i++)
214         cp[i]=(UCHAR)v;
215
216     md2_block(c, cp);
217
218     for (i=0; i<MD2_BLOCK; i++)
219         cp[i]=(UCHAR)p2[i];
220     md2_block(c, cp);
221
222     for (i=0; i<16; i++)
223         md[i]=(UCHAR)(p1[i]&0xff);
224     memset((char *)&c, 0, sizeof(c));
225     return 1;
226 }

```

new/usr/src/lib/openssl/libsunw_crypto/md2/md2_one.c

1

```
*****
3931 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/md2/md2_one.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/md2/md2_one.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/md2.h>
```

new/usr/src/lib/openssl/libsunw_crypto/md2/md2_one.c

2

```
63 /* This is a separate file so that #defines in cryptlib.h can
64  * map my MD functions to different names */
66 unsigned char *MD2(const unsigned char *d, size_t n, unsigned char *md)
67 {
68     MD2_CTX c;
69     static unsigned char m[MD2_DIGEST_LENGTH];
71     if (md == NULL) md=m;
72     if (!MD2_Init(&c))
73         return NULL;
74 #ifndef CHARSET_EBCDIC
75     MD2_Update(&c,d,n);
76 #else
77     {
78         char temp[1024];
79         unsigned long chunk;
81         while (n > 0)
82         {
83             chunk = (n > sizeof(temp)) ? sizeof(temp) : n;
84             ebcdic2ascii(temp, d, chunk);
85             MD2_Update(&c,temp,chunk);
86             n -= chunk;
87             d += chunk;
88         }
89     }
90 #endif
91     MD2_Final(md,&c);
92     OPENSSL_cleanse(&c,sizeof(c)); /* Security consideration */
93     return(md);
94 }
```

new/usr/src/lib/openssl/libsunw_crypto/md4/md4_dgst.c

1

6440 Fri May 30 18:31:55 2014
new/usr/src/lib/openssl/libsunw_crypto/md4/md4_dgst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/md4/md4_dgst.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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30 * documentation and/or other materials provided with the distribution.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/opensslv.h>
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/md4/md4_dgst.c

2

```
62 #include "md4_locl.h"
```

```
64 const char MD4_version[]="MD4" OPENSSL_VERSION_PTEXT;
```

```
66 /* Implemented from RFC1186 The MD4 Message-Digest Algorithm
67  */
```

```
69 #define INIT_DATA_A (unsigned long)0x67452301L
70 #define INIT_DATA_B (unsigned long)0xefcdab89L
71 #define INIT_DATA_C (unsigned long)0x98badcfeL
72 #define INIT_DATA_D (unsigned long)0x10325476L
```

```
74 fips_md_init(MD4)
75 {
76     memset (c,0,sizeof(*c));
77     c->A=INIT_DATA_A;
78     c->B=INIT_DATA_B;
79     c->C=INIT_DATA_C;
80     c->D=INIT_DATA_D;
81     return 1;
82 }
```

```
84 #ifndef md4_block_data_order
```

```
85 #ifdef X
```

```
86 #undef X
```

```
87 #endif
```

```
88 void md4_block_data_order (MD4_CTX *c, const void *data_, size_t num)
```

```
89 {
90     const unsigned char *data=data_;
91     register unsigned MD32_REG_T A,B,C,D,l;
92     #ifndef MD32_XARRAY
93     /* See comment in crypto/sha/sha_locl.h for details. */
94     unsigned MD32_REG_T      XX0, XX1, XX2, XX3, XX4, XX5, XX6, XX7,
95                             XX8, XX9,XX10,XX11,XX12,XX13,XX14,XX15;
```

```
96 # define X(i)    XX##i
```

```
97 #else
```

```
98     MD4_LONG XX[MD4_LBLOCK];
```

```
99 # define X(i)    XX[i]
```

```
100 #endif
```

```
102     A=c->A;
```

```
103     B=c->B;
```

```
104     C=c->C;
```

```
105     D=c->D;
```

```
107     for (;num--;)
108     {
```

```
109         (void)HOST_c2l(data,l); X( 0)=l;
```

```
110         (void)HOST_c2l(data,l); X( 1)=l;
```

```
111         /* Round 0 */
```

```
112         R0(A,B,C,D,X( 0), 3,0); (void)HOST_c2l(data,l); X( 2)=l;
```

```
113         R0(D,A,B,C,X( 1), 7,0); (void)HOST_c2l(data,l); X( 3)=l;
```

```
114         R0(C,D,A,B,X( 2),11,0); (void)HOST_c2l(data,l); X( 4)=l;
```

```
115         R0(B,C,D,A,X( 3),19,0); (void)HOST_c2l(data,l); X( 5)=l;
```

```
116         R0(A,B,C,D,X( 4), 3,0); (void)HOST_c2l(data,l); X( 6)=l;
```

```
117         R0(D,A,B,C,X( 5), 7,0); (void)HOST_c2l(data,l); X( 7)=l;
```

```
118         R0(C,D,A,B,X( 6),11,0); (void)HOST_c2l(data,l); X( 8)=l;
```

```
119         R0(B,C,D,A,X( 7),19,0); (void)HOST_c2l(data,l); X( 9)=l;
```

```
120         R0(A,B,C,D,X( 8), 3,0); (void)HOST_c2l(data,l); X(10)=l;
```

```
121         R0(D,A,B,C,X( 9), 7,0); (void)HOST_c2l(data,l); X(11)=l;
```

```
122         R0(C,D,A,B,X(10),11,0); (void)HOST_c2l(data,l); X(12)=l;
```

```
123         R0(B,C,D,A,X(11),19,0); (void)HOST_c2l(data,l); X(13)=l;
```

```
124         R0(A,B,C,D,X(12), 3,0); (void)HOST_c2l(data,l); X(14)=l;
```

```
125         R0(D,A,B,C,X(13), 7,0); (void)HOST_c2l(data,l); X(15)=l;
```

```
126         R0(C,D,A,B,X(14),11,0);
```

```
127         R0(B,C,D,A,X(15),19,0);
```

```
128     /* Round 1 */
129     R1(A,B,C,D,X( 0), 3,0x5A827999L);
130     R1(D,A,B,C,X( 4), 5,0x5A827999L);
131     R1(C,D,A,B,X( 8), 9,0x5A827999L);
132     R1(B,C,D,A,X(12),13,0x5A827999L);
133     R1(A,B,C,D,X( 1), 3,0x5A827999L);
134     R1(D,A,B,C,X( 5), 5,0x5A827999L);
135     R1(C,D,A,B,X( 9), 9,0x5A827999L);
136     R1(B,C,D,A,X(13),13,0x5A827999L);
137     R1(A,B,C,D,X( 2), 3,0x5A827999L);
138     R1(D,A,B,C,X( 6), 5,0x5A827999L);
139     R1(C,D,A,B,X(10), 9,0x5A827999L);
140     R1(B,C,D,A,X(14),13,0x5A827999L);
141     R1(A,B,C,D,X( 3), 3,0x5A827999L);
142     R1(D,A,B,C,X( 7), 5,0x5A827999L);
143     R1(C,D,A,B,X(11), 9,0x5A827999L);
144     R1(B,C,D,A,X(15),13,0x5A827999L);
145     /* Round 2 */
146     R2(A,B,C,D,X( 0), 3,0x6ED9EBA1L);
147     R2(D,A,B,C,X( 8), 9,0x6ED9EBA1L);
148     R2(C,D,A,B,X( 4),11,0x6ED9EBA1L);
149     R2(B,C,D,A,X(12),15,0x6ED9EBA1L);
150     R2(A,B,C,D,X( 2), 3,0x6ED9EBA1L);
151     R2(D,A,B,C,X(10), 9,0x6ED9EBA1L);
152     R2(C,D,A,B,X( 6),11,0x6ED9EBA1L);
153     R2(B,C,D,A,X(14),15,0x6ED9EBA1L);
154     R2(A,B,C,D,X( 1), 3,0x6ED9EBA1L);
155     R2(D,A,B,C,X( 9), 9,0x6ED9EBA1L);
156     R2(C,D,A,B,X( 5),11,0x6ED9EBA1L);
157     R2(B,C,D,A,X(13),15,0x6ED9EBA1L);
158     R2(A,B,C,D,X( 3), 3,0x6ED9EBA1L);
159     R2(D,A,B,C,X(11), 9,0x6ED9EBA1L);
160     R2(C,D,A,B,X( 7),11,0x6ED9EBA1L);
161     R2(B,C,D,A,X(15),15,0x6ED9EBA1L);
163     A = c->A += A;
164     B = c->B += B;
165     C = c->C += C;
166     D = c->D += D;
167     }
168 }
169 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/md4/md4_one.c

1

```
*****
3908 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/md4/md4_one.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/md4/md4_one.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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57 */
59 #include <stdio.h>
60 #include <string.h>
61 #include <openssl/md4.h>
```

new/usr/src/lib/openssl/libsunw_crypto/md4/md4_one.c

2

```
62 #include <openssl/crypto.h>
64 #ifdef CHARSET_EBCDIC
65 #include <openssl/ebcdic.h>
66 #endif
68 unsigned char *MD4(const unsigned char *d, size_t n, unsigned char *md)
69 {
70     MD4_CTX c;
71     static unsigned char m[MD4_DIGEST_LENGTH];
73     if (md == NULL) md=m;
74     if (!MD4_Init(&c))
75         return NULL;
76 #ifndef CHARSET_EBCDIC
77     MD4_Update(&c,d,n);
78 #else
79     {
80         char temp[1024];
81         unsigned long chunk;
83         while (n > 0)
84         {
85             chunk = (n > sizeof(temp)) ? sizeof(temp) : n;
86             ebc2asc(temp, d, chunk);
87             MD4_Update(&c,temp,chunk);
88             n -= chunk;
89             d += chunk;
90         }
91     }
92 #endif
93     MD4_Final(md,&c);
94     OPENSSL_cleanse(&c,sizeof(c)); /* security consideration */
95     return(md);
96 }
```

new/usr/src/lib/openssl/libsunw_crypto/md5/md5_dgst.c

1

7079 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/md5/md5_dgst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/md5/md5_dgst.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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8  *
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11 * apply to all code found in this distribution, be it the RC4, RSA,
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "md5_loc1.h"
61 #include <openssl/openssl.h>
```

new/usr/src/lib/openssl/libsunw_crypto/md5/md5_dgst.c

2

```
62 #include <openssl/crypto.h>
64 const char MD5_version[]="MD5" OPENSSL_VERSION_PTEXT;
66 /* Implemented from RFC1321 The MD5 Message-Digest Algorithm
67 */
69 #define INIT_DATA_A (unsigned long)0x67452301L
70 #define INIT_DATA_B (unsigned long)0xefcdab89L
71 #define INIT_DATA_C (unsigned long)0x98badcfeL
72 #define INIT_DATA_D (unsigned long)0x10325476L
74 fips_md_init(MD5)
75 {
76     memset (c,0,sizeof(*c));
77     c->A=INIT_DATA_A;
78     c->B=INIT_DATA_B;
79     c->C=INIT_DATA_C;
80     c->D=INIT_DATA_D;
81     return 1;
82 }
84 #ifndef md5_block_data_order
85 #ifdef X
86 #undef X
87 #endif
88 void md5_block_data_order (MD5_CTX *c, const void *data_, size_t num)
89 {
90     const unsigned char *data=data_;
91     register unsigned MD32_REG_T A,B,C,D,L;
92     #ifndef MD32_XARRAY
93     /* See comment in crypto/sha/sha_loc1.h for details. */
94     unsigned MD32_REG_T      XX0, XX1, XX2, XX3, XX4, XX5, XX6, XX7,
95                             XX8, XX9,XX10,XX11,XX12,XX13,XX14,XX15;
96     # define X(i)  XX##i
97     #else
98     MD5_LONG XX[MD5_LBLOCK];
99     # define X(i)  XX[i]
100 #endif
102     A=c->A;
103     B=c->B;
104     C=c->C;
105     D=c->D;
107     for (;num--;)
108     {
109         HOST_c2l(data,l); X( 0)=l;
110         /* Round 0 */
111         R0(A,B,C,D,X( 0), 7,0xd76aa478L); HOST_c2l(data,l); X( 2)=l;
112         R0(D,A,B,C,X( 1),12,0xe8c7b756L); HOST_c2l(data,l); X( 3)=l;
113         R0(C,D,A,B,X( 2),17,0x242070dbL); HOST_c2l(data,l); X( 4)=l;
114         R0(B,C,D,A,X( 3),22,0xc1bdceeeL); HOST_c2l(data,l); X( 5)=l;
115         R0(A,B,C,D,X( 4), 7,0xf57c0fafL); HOST_c2l(data,l); X( 6)=l;
116         R0(D,A,B,C,X( 5),12,0x4787c62aL); HOST_c2l(data,l); X( 7)=l;
117         R0(C,D,A,B,X( 6),17,0xa8304613L); HOST_c2l(data,l); X( 8)=l;
118         R0(B,C,D,A,X( 7),22,0xfd469501L); HOST_c2l(data,l); X( 9)=l;
119         R0(A,B,C,D,X( 8), 7,0x698098d8L); HOST_c2l(data,l); X(10)=l;
120         R0(D,A,B,C,X( 9),12,0x8b44f7afL); HOST_c2l(data,l); X(11)=l;
121         R0(C,D,A,B,X(10),17,0xffff5bb1L); HOST_c2l(data,l); X(12)=l;
122         R0(B,C,D,A,X(11),22,0x895cd7beL); HOST_c2l(data,l); X(13)=l;
123         R0(A,B,C,D,X(12), 7,0x6b901122L); HOST_c2l(data,l); X(14)=l;
124         R0(D,A,B,C,X(13),12,0xfd987193L); HOST_c2l(data,l); X(15)=l;
125         R0(C,D,A,B,X(14),17,0xa679438eL);
126         R0(B,C,D,A,X(15),22,0x49b40821L);
127         /* Round 1 */
```

```

128     R1(A,B,C,D,X( 1), 5,0xf61e2562L);
129     R1(D,A,B,C,X( 6), 9,0xc040b340L);
130     R1(C,D,A,B,X(11),14,0x265e5a51L);
131     R1(B,C,D,A,X( 0),20,0xe9b6c7aaL);
132     R1(A,B,C,D,X( 5), 5,0xd62f105dL);
133     R1(D,A,B,C,X(10), 9,0x02441453L);
134     R1(C,D,A,B,X(15),14,0xd8a1e681L);
135     R1(B,C,D,A,X( 4),20,0xe7d3fbc8L);
136     R1(A,B,C,D,X( 9), 5,0x21e1cde6L);
137     R1(D,A,B,C,X(14), 9,0xc33707d6L);
138     R1(C,D,A,B,X( 3),14,0xf4d50d87L);
139     R1(B,C,D,A,X( 8),20,0x455a14edL);
140     R1(A,B,C,D,X(13), 5,0xa9e3e905L);
141     R1(D,A,B,C,X( 2), 9,0xfcefa3f8L);
142     R1(C,D,A,B,X( 7),14,0x676f02d9L);
143     R1(B,C,D,A,X(12),20,0x8d2a4c8aL);
144     /* Round 2 */
145     R2(A,B,C,D,X( 5), 4,0xfffa3942L);
146     R2(D,A,B,C,X( 8),11,0x8771f681L);
147     R2(C,D,A,B,X(11),16,0x6d9d6122L);
148     R2(B,C,D,A,X(14),23,0xfde5380cL);
149     R2(A,B,C,D,X( 1), 4,0xa4beea44L);
150     R2(D,A,B,C,X( 4),11,0x4bdecfa9L);
151     R2(C,D,A,B,X( 7),16,0xf6bb4b60L);
152     R2(B,C,D,A,X(10),23,0xbebfb70L);
153     R2(A,B,C,D,X(13), 4,0x289b7ec6L);
154     R2(D,A,B,C,X( 0),11,0xeeaa127faL);
155     R2(C,D,A,B,X( 3),16,0xd4ef3085L);
156     R2(B,C,D,A,X( 6),23,0x04881d05L);
157     R2(A,B,C,D,X( 9), 4,0xd9d4d039L);
158     R2(D,A,B,C,X(12),11,0xe6db99e5L);
159     R2(C,D,A,B,X(15),16,0x1fa27cf8L);
160     R2(B,C,D,A,X( 2),23,0xc4ac5665L);
161     /* Round 3 */
162     R3(A,B,C,D,X( 0), 6,0xf4292244L);
163     R3(D,A,B,C,X( 7),10,0x432aff97L);
164     R3(C,D,A,B,X(14),15,0xab9423a7L);
165     R3(B,C,D,A,X( 5),21,0xfc93a039L);
166     R3(A,B,C,D,X(12), 6,0x655b59c3L);
167     R3(D,A,B,C,X( 3),10,0x8f0ccc92L);
168     R3(C,D,A,B,X(10),15,0xffefff47dL);
169     R3(B,C,D,A,X( 1),21,0x85845dd1L);
170     R3(A,B,C,D,X( 8), 6,0x6fa87e4fL);
171     R3(D,A,B,C,X(15),10,0xfe2ce6e0L);
172     R3(C,D,A,B,X( 6),15,0xa3014314L);
173     R3(B,C,D,A,X(13),21,0x4e0811a1L);
174     R3(A,B,C,D,X( 4), 6,0xf7537e82L);
175     R3(D,A,B,C,X(11),10,0xbd3af235L);
176     R3(C,D,A,B,X( 2),15,0x2ad7d2bbL);
177     R3(B,C,D,A,X( 9),21,0xeb86d391L);

179     A = c->A += A;
180     B = c->B += B;
181     C = c->C += C;
182     D = c->D += D;
183     }
184 }
185 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/md5/md5_one.c

1

```
*****
3908 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/md5/md5_one.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/md5/md5_one.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <string.h>
61 #include <openssl/md5.h>
```

new/usr/src/lib/openssl/libsunw_crypto/md5/md5_one.c

2

```
62 #include <openssl/crypto.h>
64 #ifdef CHARSET_EBCDIC
65 #include <openssl/ebcdic.h>
66 #endif
68 unsigned char *MD5(const unsigned char *d, size_t n, unsigned char *md)
69 {
70     MD5_CTX c;
71     static unsigned char m[MD5_DIGEST_LENGTH];
73     if (md == NULL) md=m;
74     if (!MD5_Init(&c))
75         return NULL;
76 #ifndef CHARSET_EBCDIC
77     MD5_Update(&c,d,n);
78 #else
79     {
80         char temp[1024];
81         unsigned long chunk;
83         while (n > 0)
84         {
85             chunk = (n > sizeof(temp)) ? sizeof(temp) : n;
86             ebc2asc(temp, d, chunk);
87             MD5_Update(&c,temp,chunk);
88             n -= chunk;
89             d += chunk;
90         }
91     }
92 #endif
93     MD5_Final(md,&c);
94     OPENSSL_cleanse(&c,sizeof(c)); /* security consideration */
95     return(md);
96 }
```

13471 Fri May 30 18:31:56 2014
 new/usr/src/lib/openssl/libsunw_crypto/mem.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/mem.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <openssl/crypto.h>

```

62 #include "cryptlib.h"

```

65 static int allow_customize = 1; /* we provide flexible functions for */
66 static int allow_customize_debug = 1; /* exchanging memory-related functions at
67  * run-time, but this must be done
68  * before any blocks are actually
69  * allocated; or we'll run into huge
70  * problems when malloc/free pairs
71  * don't match etc. */

75 /* the following pointers may be changed as long as 'allow_customize' is set */

77 static void *(*malloc_func)(size_t) = malloc;
78 static void *default_malloc_ex(size_t num, const char *file, int line)
79 { return malloc_func(num); }
80 static void *(*malloc_ex_func)(size_t, const char *file, int line)
81 = default_malloc_ex;

83 static void *(*realloc_func)(void *, size_t) = realloc;
84 static void *default_realloc_ex(void *str, size_t num,
85 const char *file, int line)
86 { return realloc_func(str, num); }
87 static void *(*realloc_ex_func)(void *, size_t, const char *file, int line)
88 = default_realloc_ex;

90 static void (*free_func)(void *) = free;

92 static void *(*malloc_locked_func)(size_t) = malloc;
93 static void *default_malloc_locked_ex(size_t num, const char *file, int line)
94 { return malloc_locked_func(num); }
95 static void *(*malloc_locked_ex_func)(size_t, const char *file, int line)
96 = default_malloc_locked_ex;

98 static void (*free_locked_func)(void *) = free;

102 /* may be changed as long as 'allow_customize_debug' is set */
103 /* XXX use correct function pointer types */
104 #ifdef CRYPTO_MDEBUG
105 /* use default functions from mem_dbg.c */
106 static void (*malloc_debug_func)(void *, int, const char *, int, int)
107 = CRYPTO_dbg_malloc;
108 static void (*realloc_debug_func)(void *, void *, int, const char *, int, int)
109 = CRYPTO_dbg_realloc;
110 static void (*free_debug_func)(void *, int) = CRYPTO_dbg_free;
111 static void (*set_debug_options_func)(long) = CRYPTO_dbg_set_options;
112 static long (*get_debug_options_func)(void) = CRYPTO_dbg_get_options;
113 #else
114 /* applications can use CRYPTO_malloc_debug_init() to select above case
115  * at run-time */
116 static void (*malloc_debug_func)(void *, int, const char *, int, int) = NULL;
117 static void (*realloc_debug_func)(void *, void *, int, const char *, int, int)
118 = NULL;
119 static void (*free_debug_func)(void *, int) = NULL;
120 static void (*set_debug_options_func)(long) = NULL;
121 static long (*get_debug_options_func)(void) = NULL;
122 #endif

124 int CRYPTO_set_mem_functions(void *(*m)(size_t), void *(*r)(void *, size_t),
125 void *(*f)(void *))
126 {
127 /* Dummy call just to ensure OPENSSL_init() gets linked in */

```

```

128     OPENSSL_init();
129     if (!allow_customize)
130         return 0;
131     if ((m == 0) || (r == 0) || (f == 0))
132         return 0;
133     malloc_func=m; malloc_ex_func=default_malloc_ex;
134     realloc_func=r; realloc_ex_func=default_realloc_ex;
135     free_func=f;
136     malloc_locked_func=m; malloc_locked_ex_func=default_malloc_locked_ex;
137     free_locked_func=f;
138     return 1;
139 }

141 int CRYPTO_set_mem_ex_functions(
142     void *(*m)(size_t,const char *,int),
143     void *(*r)(void *, size_t,const char *,int),
144     void (*f)(void *))
145 {
146     if (!allow_customize)
147         return 0;
148     if ((m == 0) || (r == 0) || (f == 0))
149         return 0;
150     malloc_func=0; malloc_ex_func=m;
151     realloc_func=0; realloc_ex_func=r;
152     free_func=f;
153     malloc_locked_func=0; malloc_locked_ex_func=m;
154     free_locked_func=f;
155     return 1;
156 }

158 int CRYPTO_set_locked_mem_functions(void *(*m)(size_t), void (*f)(void *))
159 {
160     if (!allow_customize)
161         return 0;
162     if ((m == NULL) || (f == NULL))
163         return 0;
164     malloc_locked_func=m; malloc_locked_ex_func=default_malloc_locked_ex;
165     free_locked_func=f;
166     return 1;
167 }

169 int CRYPTO_set_locked_mem_ex_functions(
170     void *(*m)(size_t,const char *,int),
171     void (*f)(void *))
172 {
173     if (!allow_customize)
174         return 0;
175     if ((m == NULL) || (f == NULL))
176         return 0;
177     malloc_locked_func=0; malloc_locked_ex_func=m;
178     free_func=f;
179     return 1;
180 }

182 int CRYPTO_set_mem_debug_functions(void (*m)(void *,int,const char *,int,int),
183     void (*r)(void *,void *,int,const char *,int),
184     void (*f)(void *,int),
185     void (*so)(long),
186     long (*go)(void))
187 {
188     if (!allow_customize_debug)
189         return 0;
190     OPENSSL_init();
191     malloc_debug_func=m;
192     realloc_debug_func=r;
193     free_debug_func=f;

```

```

194     set_debug_options_func=so;
195     get_debug_options_func=go;
196     return 1;
197 }

200 void CRYPTO_get_mem_functions(void (**m)(size_t), void (**r)(void *, size_t),
201     void (**f)(void *))
202 {
203     if (m != NULL) *m = (malloc_ex_func == default_malloc_ex) ?
204         malloc_func : 0;
205     if (r != NULL) *r = (realloc_ex_func == default_realloc_ex) ?
206         realloc_func : 0;
207     if (f != NULL) *f=free_func;
208 }

210 void CRYPTO_get_mem_ex_functions(
211     void (**m)(size_t,const char *,int),
212     void (**r)(void *, size_t,const char *,int),
213     void (**f)(void *))
214 {
215     if (m != NULL) *m = (malloc_ex_func != default_malloc_ex) ?
216         malloc_ex_func : 0;
217     if (r != NULL) *r = (realloc_ex_func != default_realloc_ex) ?
218         realloc_ex_func : 0;
219     if (f != NULL) *f=free_func;
220 }

222 void CRYPTO_get_locked_mem_functions(void (**m)(size_t), void (**f)(void *))
223 {
224     if (m != NULL) *m = (malloc_locked_ex_func == default_malloc_locked_ex)
225         malloc_locked_func : 0;
226     if (f != NULL) *f=free_locked_func;
227 }

229 void CRYPTO_get_locked_mem_ex_functions(
230     void (**m)(size_t,const char *,int),
231     void (**f)(void *))
232 {
233     if (m != NULL) *m = (malloc_locked_ex_func != default_malloc_locked_ex)
234         malloc_locked_ex_func : 0;
235     if (f != NULL) *f=free_locked_func;
236 }

238 void CRYPTO_get_mem_debug_functions(void (**m)(void *,int,const char *,int,int),
239     void (**r)(void *,void *,int,const char *,int),
240     void (**f)(void *,int),
241     void (**so)(long),
242     long (**go)(void))
243 {
244     if (m != NULL) *m=malloc_debug_func;
245     if (r != NULL) *r=realloc_debug_func;
246     if (f != NULL) *f=free_debug_func;
247     if (so != NULL) *so=set_debug_options_func;
248     if (go != NULL) *go=get_debug_options_func;
249 }

252 void *CRYPTO_malloc_locked(int num, const char *file, int line)
253 {
254     void *ret = NULL;

256     if (num <= 0) return NULL;

258     allow_customize = 0;
259     if (malloc_debug_func != NULL)

```

```

260     {
261         allow_customize_debug = 0;
262         malloc_debug_func(NULL, num, file, line, 0);
263     }
264     ret = malloc_locked_ex_func(num, file, line);
265 #ifdef LEVITTE_DEBUG_MEM
266     fprintf(stderr, "LEVITTE_DEBUG_MEM:          > 0x%p (%d)\n", ret, num);
267 #endif
268     if (malloc_debug_func != NULL)
269         malloc_debug_func(ret, num, file, line, 1);
271 #ifndef OPENSSL_CPUID_OBJ
272     /* Create a dependency on the value of 'cleanse_ctr' so our memory
273      * sanitisation function can't be optimised out. NB: We only do
274      * this for >2Kb so the overhead doesn't bother us. */
275     if(ret && (num > 2048))
276     {
277         extern unsigned char cleanse_ctr;
278         ((unsigned char *)ret)[0] = cleanse_ctr;
279     }
281     return ret;
282 }
284 void CRYPTO_free_locked(void *str)
285 {
286     if (free_debug_func != NULL)
287         free_debug_func(str, 0);
288 #ifdef LEVITTE_DEBUG_MEM
289     fprintf(stderr, "LEVITTE_DEBUG_MEM:          < 0x%p\n", str);
290 #endif
291     free_locked_func(str);
292     if (free_debug_func != NULL)
293         free_debug_func(NULL, 1);
294 }
296 void *CRYPTO_malloc(int num, const char *file, int line)
297 {
298     void *ret = NULL;
300     if (num <= 0) return NULL;
302     allow_customize = 0;
303     if (malloc_debug_func != NULL)
304     {
305         allow_customize_debug = 0;
306         malloc_debug_func(NULL, num, file, line, 0);
307     }
308     ret = malloc_ex_func(num, file, line);
309 #ifdef LEVITTE_DEBUG_MEM
310     fprintf(stderr, "LEVITTE_DEBUG_MEM:          > 0x%p (%d)\n", ret, num);
311 #endif
312     if (malloc_debug_func != NULL)
313         malloc_debug_func(ret, num, file, line, 1);
315 #ifndef OPENSSL_CPUID_OBJ
316     /* Create a dependency on the value of 'cleanse_ctr' so our memory
317      * sanitisation function can't be optimised out. NB: We only do
318      * this for >2Kb so the overhead doesn't bother us. */
319     if(ret && (num > 2048))
320     {
321         extern unsigned char cleanse_ctr;
322         ((unsigned char *)ret)[0] = cleanse_ctr;
323     }
325     return ret;

```

```

326     }
327 char *CRYPTO_strdup(const char *str, const char *file, int line)
328 {
329     char *ret = CRYPTO_malloc(strlen(str)+1, file, line);
331     strcpy(ret, str);
332     return ret;
333 }
335 void *CRYPTO_realloc(void *str, int num, const char *file, int line)
336 {
337     void *ret = NULL;
339     if (str == NULL)
340         return CRYPTO_malloc(num, file, line);
342     if (num <= 0) return NULL;
344     if (realloc_debug_func != NULL)
345         realloc_debug_func(str, NULL, num, file, line, 0);
346     ret = realloc_ex_func(str, num, file, line);
347 #ifdef LEVITTE_DEBUG_MEM
348     fprintf(stderr, "LEVITTE_DEBUG_MEM:          | 0x%p -> 0x%p (%d)\n", str,
349 #endif
350         if (realloc_debug_func != NULL)
351             realloc_debug_func(str, ret, num, file, line, 1);
353     return ret;
354 }
356 void *CRYPTO_realloc_clean(void *str, int old_len, int num, const char *file,
357                             int line)
358 {
359     void *ret = NULL;
361     if (str == NULL)
362         return CRYPTO_malloc(num, file, line);
364     if (num <= 0) return NULL;
366     /* We don't support shrinking the buffer. Note the memcpy that copies
367      * |old_len| bytes to the new buffer, below. */
368     if (num < old_len) return NULL;
370     if (realloc_debug_func != NULL)
371         realloc_debug_func(str, NULL, num, file, line, 0);
372     ret = malloc_ex_func(num, file, line);
373     if(ret)
374     {
375         memcpy(ret, str, old_len);
376         OPENSSL_cleanse(str, old_len);
377         free_func(str);
378     }
379 #ifdef LEVITTE_DEBUG_MEM
380     fprintf(stderr,
381         "LEVITTE_DEBUG_MEM:          | 0x%p -> 0x%p (%d)\n",
382         str, ret, num);
383 #endif
384     if (realloc_debug_func != NULL)
385         realloc_debug_func(str, ret, num, file, line, 1);
387     return ret;
388 }
390 void CRYPTO_free(void *str)
391 {

```

```
392     if (free_debug_func != NULL)
393         free_debug_func(str, 0);
394 #ifdef LEVITTE_DEBUG_MEM
395     fprintf(stderr, "LEVITTE_DEBUG_MEM:      < 0x%p\n", str);
396 #endif
397     free_func(str);
398     if (free_debug_func != NULL)
399         free_debug_func(NULL, 1);
400 }

402 void *CRYPTO_remalloc(void *a, int num, const char *file, int line)
403 {
404     if (a != NULL) OPENSSL_free(a);
405     a=(char *)OPENSSL_malloc(num);
406     return(a);
407 }

409 void CRYPTO_set_mem_debug_options(long bits)
410 {
411     if (set_debug_options_func != NULL)
412         set_debug_options_func(bits);
413 }

415 long CRYPTO_get_mem_debug_options(void)
416 {
417     if (get_debug_options_func != NULL)
418         return get_debug_options_func();
419     return 0;
420 }
```

new/usr/src/lib/openssl/libsunw_crypto/mem_dbg.c

1

```
*****
23523 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/mem_dbg.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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```

new/usr/src/lib/openssl/libsunw_crypto/mem_dbg.c

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105 *
106 * This product includes cryptographic software written by Eric Young
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108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include <stdlib.h>
114 #include <time.h>
115 #include <cryptlib.h>
116 #include <openssl/crypto.h>
117 #include <openssl/buffer.h>
118 #include <openssl/bio.h>
119 #include <openssl/lhash.h>
120
121 static int mh_mode=CRYPTO_MEM_CHECK_OFF;
122 /* The state changes to CRYPTO_MEM_CHECK_ON | CRYPTO_MEM_CHECK_ENABLE
123  * when the application asks for it (usually after library initialisation
124  * for which no book-keeping is desired).
125  *
126  * State CRYPTO_MEM_CHECK_ON exists only temporarily when the library
127  * thinks that certain allocations should not be checked (e.g. the data
```

```

128 * structures used for memory checking). It is not suitable as an initial
129 * state: the library will unexpectedly enable memory checking when it
130 * executes one of those sections that want to disable checking
131 * temporarily.
132 *
133 * State CRYPTO_MEM_CHECK_ENABLE without ..._ON makes no sense whatsoever.
134 */

136 static unsigned long order = 0; /* number of memory requests */

138 DECLARE_LHASH_OF(MEM);
139 static LHASH_OF(MEM) *mh=NULL; /* hash-table of memory requests
140 * (address as key); access requires
141 * MALLOC2 lock */

144 typedef struct app_mem_info_st
145 /* For application-defined information (static C-string 'info')
146 * to be displayed in memory leak list.
147 * Each thread has its own stack. For applications, there is
148 * CRYPTO_push_info(...) to push an entry,
149 * CRYPTO_pop_info() to pop an entry,
150 * CRYPTO_remove_all_info() to pop all entries.
151 */
152 {
153     CRYPTO_THREADID threadid;
154     const char *file;
155     int line;
156     const char *info;
157     struct app_mem_info_st *next; /* tail of thread's stack */
158     int references;
159 } APP_INFO;

161 static void app_info_free(APP_INFO *);

163 DECLARE_LHASH_OF(APP_INFO);
164 static LHASH_OF(APP_INFO) *amih=NULL; /* hash-table with those
165 * app_mem_info_st's that are at
166 * the top of their thread's
167 * stack (with 'thread' as key);
168 * access requires MALLOC2
169 * lock */

171 typedef struct mem_st
172 /* memory-block description */
173 {
174     void *addr;
175     int num;
176     const char *file;
177     int line;
178     CRYPTO_THREADID threadid;
179     unsigned long order;
180     time_t time;
181     APP_INFO *app_info;
182 } MEM;

184 static long options = /* extra information to be recorded */
185 #if defined(CRYPTO_MDEBUG_TIME) || defined(CRYPTO_MDEBUG_ALL)
186     V_CRYPTO_MDEBUG_TIME |
187 #endif
188 #if defined(CRYPTO_MDEBUG_THREAD) || defined(CRYPTO_MDEBUG_ALL)
189     V_CRYPTO_MDEBUG_THREAD |
190 #endif
191     0;

```

```

194 static unsigned int num_disable = 0; /* num_disable > 0
195 * iff
196 * mh_mode == CRYPTO_MEM_CHECK_ON (w/o ...
197 */

199 /* Valid iff num_disable > 0. CRYPTO_LOCK_MALLOC2 is locked exactly in this
200 * case (by the thread named in disabling_thread).
201 */
202 static CRYPTO_THREADID disabling_threadid;

204 static void app_info_free(APP_INFO *inf)
205 {
206     if (--(inf->references) <= 0)
207     {
208         if (inf->next != NULL)
209         {
210             app_info_free(inf->next);
211         }
212         OPENSSL_free(inf);
213     }
214 }

216 int CRYPTO_mem_ctrl(int mode)
217 {
218     int ret=mh_mode;

220     CRYPTO_w_lock(CRYPTO_LOCK_MALLOC);
221     switch (mode)
222     {
223         /* for applications (not to be called while multiple threads
224         * use the library): */
225         case CRYPTO_MEM_CHECK_ON: /* aka MemCheck_start() */
226             mh_mode = CRYPTO_MEM_CHECK_ON|CRYPTO_MEM_CHECK_ENABLE;
227             num_disable = 0;
228             break;
229         case CRYPTO_MEM_CHECK_OFF: /* aka MemCheck_stop() */
230             mh_mode = 0;
231             num_disable = 0; /* should be true *before* MemCheck_stop is use
232                             * or there'll be a lot of confusion */
233             break;

235         /* switch off temporarily (for library-internal use): */
236         case CRYPTO_MEM_CHECK_DISABLE: /* aka MemCheck_off() */
237             if (mh_mode & CRYPTO_MEM_CHECK_ON)
238             {
239                 CRYPTO_THREADID cur;
240                 CRYPTO_THREADID_current(&cur);
241                 if (!num_disable || CRYPTO_THREADID_cmp(&disabling_threa
242                 {
243                     /* Long-time lock CRYPTO_LOCK_MALLOC2 must not b
244                     * we're holding CRYPTO_LOCK_MALLOC, or we'll de
245                     * somebody else holds CRYPTO_LOCK_MALLOC2 (and
246                     * it because we block entry to this function).
247                     * Give them a chance, first, and then claim the
248                     * appropriate order (long-time lock first).
249                     */
250                     CRYPTO_w_unlock(CRYPTO_LOCK_MALLOC);
251                     /* Note that after we have waited for CRYPTO_LOC
252                     * and CRYPTO_LOCK_MALLOC, we'll still be in the
253                     * "case" and "if" branch because MemCheck_start
254                     * MemCheck_stop may never be used while there a
255                     * OpenSSL threads. */
256                     CRYPTO_w_lock(CRYPTO_LOCK_MALLOC2);
257                     CRYPTO_w_lock(CRYPTO_LOCK_MALLOC);
258                     mh_mode &= ~CRYPTO_MEM_CHECK_ENABLE;
259                     CRYPTO_THREADID_cpy(&disabling_threadid, &cur);

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326 }
327 static IMPLEMENT_LHASH_COMP_FN(mem, MEM)
328 {
329     unsigned long mem_hash(const MEM *a)
330     {
331         unsigned long ret;
332
333         ret=(unsigned long)a->addr;
334
335         ret=ret*17851+(ret>>14)*7+(ret>>4)*251;
336         return(ret);
337     }
338 static IMPLEMENT_LHASH_HASH_FN(mem, MEM)
339 {
340     /* static int app_info_cmp(APP_INFO *a, APP_INFO *b) */
341     static int app_info_cmp(const void *a_void, const void *b_void)
342     {
343         return CRYPTO_THREADID_cmp(&((const APP_INFO *)a_void)->threadid,
344                                     &((const APP_INFO *)b_void)->threadid);
345     }
346 static IMPLEMENT_LHASH_COMP_FN(app_info, APP_INFO)
347 {
348     unsigned long app_info_hash(const APP_INFO *a)
349     {
350         unsigned long ret;
351
352         ret = CRYPTO_THREADID_hash(&a->threadid);
353         /* This is left in as a "who am I to question legacy?" measure */
354         ret=ret*17851+(ret>>14)*7+(ret>>4)*251;
355         return(ret);
356     }
357 static IMPLEMENT_LHASH_HASH_FN(app_info, APP_INFO)
358 {
359     static APP_INFO *pop_info(void)
360     {
361         APP_INFO tmp;
362         APP_INFO *ret = NULL;
363
364         if (amih != NULL)
365         {
366             CRYPTO_THREADID_current(&tmp.threadid);
367             if ((ret=lh_APP_INFO_delete(amih,&tmp)) != NULL)
368             {
369                 APP_INFO *next=ret->next;
370
371                 if (next != NULL)
372                 {
373                     next->references++;
374                     (void)lh_APP_INFO_insert(amih,next);
375                 }
376 #ifdef LEVITTE_DEBUG_MEM
377                 if (CRYPTO_THREADID_cmp(&ret->threadid, &tmp.threadid))
378                 {
379                     fprintf(stderr, "pop_info(): deleted info has ot\n",
380                             CRYPTO_THREADID_hash(&ret->threadid),
381                             CRYPTO_THREADID_hash(&tmp.threadid));
382                     abort();
383                 }
384 #endif
385                 if (--(ret->references) <= 0)
386                 {
387                     ret->next = NULL;
388                     if (next != NULL)
389                         next->references--;
390                     OPENSSL_free(ret);
391                 }
392             }
393         }
394     }
395 }

```

```

392     }
393     }
394     return(ret);
395 }

397 int CRYPTO_push_info(const char *info, const char *file, int line)
398 {
399     APP_INFO *ami, *amim;
400     int ret=0;

402     if (is_MemCheck_on())
403     {
404         MemCheck_off(); /* obtain MALLOC2 lock */

406         if ((ami = (APP_INFO *)OPENSSL_malloc(sizeof(APP_INFO))) == NULL)
407         {
408             ret=0;
409             goto err;
410         }
411         if (amih == NULL)
412         {
413             if ((amih=lh_APP_INFO_new()) == NULL)
414             {
415                 OPENSSL_free(ami);
416                 ret=0;
417                 goto err;
418             }
419         }

421         CRYPTO_THREADID_current(&ami->threadid);
422         ami->file=file;
423         ami->line=line;
424         ami->info=info;
425         ami->references=1;
426         ami->next=NULL;

428         if ((amim=lh_APP_INFO_insert(amih,ami)) != NULL)
429         {
430             #ifdef LEVITTE_DEBUG_MEM
431             if (CRYPTO_THREADID_cmp(&ami->threadid, &amim->threadid)
432             {
433                 fprintf(stderr, "CRYPTO_push_info(): previous in
434                     CRYPTO_THREADID_hash(&amim->threadid),
435                     CRYPTO_THREADID_hash(&ami->threadid));
436                 abort();
437             }
438             #endif
439             ami->next=amim;
440         }
441     err:
442         MemCheck_on(); /* release MALLOC2 lock */
443     }

445     return(ret);
446 }

448 int CRYPTO_pop_info(void)
449 {
450     int ret=0;

452     if (is_MemCheck_on()) /* _must_ be true, or something went severely wron
453     {
454         MemCheck_off(); /* obtain MALLOC2 lock */

456         ret=(pop_info() != NULL);

```

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458         MemCheck_on(); /* release MALLOC2 lock */
459     }
460     return(ret);
461 }

463 int CRYPTO_remove_all_info(void)
464 {
465     int ret=0;

467     if (is_MemCheck_on()) /* _must_ be true */
468     {
469         MemCheck_off(); /* obtain MALLOC2 lock */

471         while(pop_info() != NULL)
472             ret++;

474         MemCheck_on(); /* release MALLOC2 lock */
475     }
476     return(ret);
477 }

480 static unsigned long break_order_num=0;
481 void CRYPTO_dbg_malloc(void *addr, int num, const char *file, int line,
482     int before_p)
483 {
484     MEM *m,*mm;
485     APP_INFO tmp,*amim;

487     switch(before_p & 127)
488     {
489     case 0:
490         break;
491     case 1:
492         if (addr == NULL)
493             break;

495         if (is_MemCheck_on())
496         {
497             MemCheck_off(); /* make sure we hold MALLOC2 lock */
498             if ((m=(MEM *)OPENSSL_malloc(sizeof(MEM))) == NULL)
499             {
500                 OPENSSL_free(addr);
501                 MemCheck_on(); /* release MALLOC2 lock
502                     * if num_disabled drops to 0 */
503                 return;
504             }
505             if (mh == NULL)
506             {
507                 if ((mh=lh_MEM_new()) == NULL)
508                 {
509                     OPENSSL_free(addr);
510                     OPENSSL_free(m);
511                     addr=NULL;
512                     goto err;
513                 }
514             }

516             m->addr=addr;
517             m->file=file;
518             m->line=line;
519             m->num=num;
520             if (options & V_CRYPTO_MDEBUG_THREAD)
521                 CRYPTO_THREADID_current(&m->threadid);
522             else
523                 memset(&m->threadid, 0, sizeof(m->threadid));

```



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525         if (order == break_order_num)
526             {
527                 /* BREAK HERE */
528                 m->order=order;
529             }
530         m->order=order++;
531 #ifdef LEVITTE_DEBUG_MEM
532         fprintf(stderr, "LEVITTE_DEBUG_MEM: [%5ld] %c 0x%p (%d)\n",
533             m->order,
534             (before_p & 128) ? '*' : '+',
535             m->addr, m->num);
536 #endif
537         if (options & V_CRYPTODMDEBUG_TIME)
538             m->time=time(NULL);
539         else
540             m->time=0;
541
542         CRYPTO_THREADID_current(&tmp.threadid);
543         m->app_info=NULL;
544         if (amih != NULL
545             && (amim=lh_APP_INFO_retrieve(amih,&tmp)) != NULL)
546             {
547                 m->app_info = amim;
548                 amim->references++;
549             }
550
551         if ((mm=lh_MEM_insert(mh, m)) != NULL)
552             {
553                 /* Not good, but don't sweat it */
554                 if (mm->app_info != NULL)
555                     {
556                         mm->app_info->references--;
557                     }
558                 OPENSSL_free(mm);
559             }
560         err:
561             MemCheck_on(); /* release MALLOC2 lock
562                            * if num_disabled drops to 0 */
563         }
564         break;
565     }
566     return;
567 }
568
569 void CRYPTO_dbg_free(void *addr, int before_p)
570 {
571     MEM m,*mp;
572
573     switch(before_p)
574     {
575     case 0:
576         if (addr == NULL)
577             break;
578
579         if (is_MemCheck_on() && (mh != NULL))
580             {
581                 MemCheck_off(); /* make sure we hold MALLOC2 lock */
582
583                 m.addr=addr;
584                 mp=lh_MEM_delete(mh,&m);
585                 if (mp != NULL)
586                     {
587 #ifdef LEVITTE_DEBUG_MEM
588                         fprintf(stderr, "LEVITTE_DEBUG_MEM: [%5ld] - 0x%p (%d)\n",
589                             mp->order, mp->addr, mp->num);

```

```

590 #endif
591             if (mp->app_info != NULL)
592                 app_info_free(mp->app_info);
593             OPENSSL_free(mp);
594         }
595
596         MemCheck_on(); /* release MALLOC2 lock
597                        * if num_disabled drops to 0 */
598     }
599     break;
600 case 1:
601     break;
602 }
603
604 void CRYPTO_dbg_realloc(void *addr1, void *addr2, int num,
605     const char *file, int line, int before_p)
606 {
607     MEM m,*mp;
608
609 #ifdef LEVITTE_DEBUG_MEM
610     fprintf(stderr, "LEVITTE_DEBUG_MEM: --> CRYPTO_dbg_malloc(addr1 = %p, ad
611         addr1, addr2, num, file, line, before_p);
612 #endif
613
614     switch(before_p)
615     {
616     case 0:
617         break;
618     case 1:
619         if (addr2 == NULL)
620             break;
621
622         if (addr1 == NULL)
623             {
624                 CRYPTO_dbg_malloc(addr2, num, file, line, 128 | before_p
625                 break;
626             }
627
628         if (is_MemCheck_on())
629             {
630                 MemCheck_off(); /* make sure we hold MALLOC2 lock */
631
632                 m.addr=addr1;
633                 mp=lh_MEM_delete(mh,&m);
634                 if (mp != NULL)
635                     {
636 #ifdef LEVITTE_DEBUG_MEM
637                         fprintf(stderr, "LEVITTE_DEBUG_MEM: [%5ld] * 0x%
638                             mp->order,
639                             mp->addr, mp->num,
640                             addr2, num);
641 #endif
642                 mp->addr=addr2;
643                 mp->num=num;
644                 (void)lh_MEM_insert(mh,mp);
645             }
646
647         MemCheck_on(); /* release MALLOC2 lock
648                        * if num_disabled drops to 0 */
649     }
650     break;
651 }
652 return;
653 }

```

```

657 typedef struct mem_leak_st
658 {
659     BIO *bio;
660     int chunks;
661     long bytes;
662 } MEM_LEAK;

664 static void print_leak_doall_arg(const MEM *m, MEM_LEAK *l)
665 {
666     char buf[1024];
667     char *bufp = buf;
668     APP_INFO *amip;
669     int ami_cnt;
670     struct tm *lcl = NULL;
671     CRYPTO_THREADID ti;

673 #define BUF_REMAIN (sizeof buf - (size_t)(bufp - buf))

675     if(m->addr == (char *)l->bio)
676         return;

678     if (options & V_CRYPTO_MDEBUG_TIME)
679     {
680         lcl = localtime(&m->time);
681         BIO_snprintf(bufp, BUF_REMAIN, "[%02d:%02d:%02d] ",
682             lcl->tm_hour, lcl->tm_min, lcl->tm_sec);
683         bufp += strlen(bufp);
684     }

687     BIO_snprintf(bufp, BUF_REMAIN, "%5lu file=%s, line=%d, ",
688         m->order, m->file, m->line);
689     bufp += strlen(bufp);

691     if (options & V_CRYPTO_MDEBUG_THREAD)
692     {
693         BIO_snprintf(bufp, BUF_REMAIN, "thread=%lu, ",
694             CRYPTO_THREADID_hash(&m->threadid));
695         bufp += strlen(bufp);
696     }

698     BIO_snprintf(bufp, BUF_REMAIN, "number=%d, address=%08lx\n",
699         m->num, (unsigned long)m->addr);
700     bufp += strlen(bufp);

702     BIO_puts(l->bio, buf);
703     l->chunks++;
704     l->bytes+=m->num;

707     amip=m->app_info;
708     ami_cnt=0;
709     if (!amip)
710         return;
711     CRYPTO_THREADID_cpy(&ti, &amip->threadid);

713     do
714     {
715         int buf_len;
716         int info_len;

718         ami_cnt++;
719         memset(buf, '>', ami_cnt);
720         BIO_snprintf(buf + ami_cnt, sizeof buf - ami_cnt,
721             " thread=%lu, file=%s, line=%d, info=\"",

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```

722         CRYPTO_THREADID_hash(&amip->threadid), amip->file,
723         amip->line);
724         buf_len=strlen(buf);
725         info_len=strlen(amip->info);
726         if (128 - buf_len - 3 < info_len)
727         {
728             memcpy(buf + buf_len, amip->info, 128 - buf_len - 3);
729             buf_len = 128 - 3;
730         }
731         else
732         {
733             BUF_strncpy(buf + buf_len, amip->info,
734                 sizeof buf - buf_len);
735             buf_len = strlen(buf);
736         }
737         BIO_snprintf(buf + buf_len, sizeof buf - buf_len, "\\n");
738         BIO_puts(l->bio, buf);
739
741         amip = amip->next;
742     }
743     while(amip && !CRYPTO_THREADID_cmp(&amip->threadid, &ti));

745 #ifdef LEVITTE_DEBUG_MEM
746     if (amip)
747     {
748         fprintf(stderr, "Thread switch detected in backtrace!!!!\\n");
749         abort();
750     }
751 #endif
752 }

754 static IMPLEMENT_LHASH_DOALL_ARG_FN(print_leak, const MEM, MEM_LEAK)

756 void CRYPTO_mem_leaks(BIO *b)
757 {
758     MEM_LEAK ml;

760     if (mh == NULL && amih == NULL)
761         return;

763     MemCheck_off(); /* obtain MALLOC2 lock */

765     ml.bio=b;
766     ml.bytes=0;
767     ml.chunks=0;
768     if (mh != NULL)
769         lh_MEM_doall_arg(mh, LHASH_DOALL_ARG_FN(print_leak), MEM_LEAK,
770             &ml);
771     if (ml.chunks != 0)
772     {
773         BIO_printf(b, "%ld bytes leaked in %d chunks\\n",
774             ml.bytes, ml.chunks);
775 #ifdef CRYPTO_MDEBUG_ABORT
776         abort();
777 #endif
778     }
779     else
780     {
781         /* Make sure that, if we found no leaks, memory-leak debugging i
782         * does not introduce memory leaks (which might irritate
783         * external debugging tools).
784         * (When someone enables leak checking, but does not call
785         * this function, we declare it to be their fault.)
786         *
787         * XXX This should be in CRYPTO_mem_leaks_cb,

```

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788     * and CRYPTO_mem_leaks should be implemented by
789     * using CRYPTO_mem_leaks_cb.
790     * (Also there should be a variant of lh_doall_arg
791     * that takes a function pointer instead of a void *;
792     * this would obviate the ugly and illegal
793     * void_fn_to_char kludge in CRYPTO_mem_leaks_cb.
794     * Otherwise the code police will come and get us.)
795     */
796     int old_mh_mode;

798     CRYPTO_w_lock(CRYPTO_LOCK_MALLOC);

800     /* avoid deadlock when lh_free() uses CRYPTO_dbg_free(),
801     * which uses CRYPTO_is_mem_check_on */
802     old_mh_mode = mh_mode;
803     mh_mode = CRYPTO_MEM_CHECK_OFF;

805     if (mh != NULL)
806     {
807         lh_MEM_free(mh);
808         mh = NULL;
809     }
810     if (amih != NULL)
811     {
812         if (lh_APP_INFO_num_items(amih) == 0)
813         {
814             lh_APP_INFO_free(amih);
815             amih = NULL;
816         }
817     }

819     mh_mode = old_mh_mode;
820     CRYPTO_w_unlock(CRYPTO_LOCK_MALLOC);
821 }
822 MemCheck_on(); /* release MALLOC2 lock */
823 }

825 #ifndef OPENSSL_NO_FP_API
826 void CRYPTO_mem_leaks_fp(FILE *fp)
827 {
828     BIO *b;

830     if (mh == NULL) return;
831     /* Need to turn off memory checking when allocated BIOs ... especially
832     * as we're creating them at a time when we're trying to check we've not
833     * left anything un-free()'d!! */
834     MemCheck_off();
835     b = BIO_new(BIO_s_file());
836     MemCheck_on();
837     if(!b) return;
838     BIO_set_fp(b,fp,BIO_NOCLOSE);
839     CRYPTO_mem_leaks(b);
840     BIO_free(b);
841 }
842 #endif

846 /* FIXME: We really don't allow much to the callback. For example, it has
847 no chance of reaching the info stack for the item it processes. Should
848 it really be this way? -- Richard Levitte */
849 /* NB: The prototypes have been typedef'd to CRYPTO_MEM_LEAK_CB inside crypto.h
850 * If this code is restructured, remove the callback type if it is no longer
851 * needed. -- Geoff Thorpe */

853 /* Can't pass CRYPTO_MEM_LEAK_CB directly to lh_MEM_doall_arg because it

```

```

854     * is a function pointer and conversion to void * is prohibited. Instead
855     * pass its address
856     */

858     typedef CRYPTO_MEM_LEAK_CB *PCRYPTO_MEM_LEAK_CB;

860     static void cb_leak_doall_arg(const MEM *m, PCRYPTO_MEM_LEAK_CB *cb)
861     {
862         (*cb)(m->order,m->file,m->line,m->num,m->addr);
863     }

865     static IMPLEMENT_LHASH_DOALL_ARG_FN(cb_leak, const MEM, PCRYPTO_MEM_LEAK_CB)

867     void CRYPTO_mem_leaks_cb(CRYPTO_MEM_LEAK_CB *cb)
868     {
869         if (mh == NULL) return;
870         CRYPTO_w_lock(CRYPTO_LOCK_MALLOC2);
871         lh_MEM_doall_arg(mh, LHASH_DOALL_ARG_FN(cb_leak), PCRYPTO_MEM_LEAK_CB,
872                         &cb);
873         CRYPTO_w_unlock(CRYPTO_LOCK_MALLOC2);
874     }

```

new/usr/src/lib/openssl/libsunw_crypto/modes/cbc128.c

1

```
*****
5591 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/cbc128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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5  * modification, are permitted provided that the following conditions
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44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 */
51 #include <openssl/crypto.h>
52 #include "modes_lcl.h"
53 #include <string.h>
54
55 #ifndef MODES_DEBUG
56 # if !defined NDEBUG
57 # define NDEBUG
58 # endif
59 #endif
60 #include <assert.h>
```

new/usr/src/lib/openssl/libsunw_crypto/modes/cbc128.c

2

```
62 #ifndef STRICT_ALIGNMENT
63 # define STRICT_ALIGNMENT 0
64 #endif
65
66 void CRYPTO_cbc128_encrypt(const unsigned char *in, unsigned char *out,
67                             size_t len, const void *key,
68                             unsigned char ivec[16], block128_f block)
69 {
70     size_t n;
71     const unsigned char *iv = ivec;
72
73     assert(in && out && key && ivec);
74
75 #if !defined(OPENSSL_SMALL_FOOTPRINT)
76     if (STRICT_ALIGNMENT &&
77         ((size_t)in|(size_t)out|(size_t)ivec)%sizeof(size_t) != 0) {
78         while (len>=16) {
79             for(n=0; n<16; ++n)
80                 out[n] = in[n] ^ iv[n];
81             (*block)(out, out, key);
82             iv = out;
83             len -= 16;
84             in += 16;
85             out += 16;
86         }
87     } else {
88         while (len>=16) {
89             for(n=0; n<16; n+=sizeof(size_t))
90                 *(size_t*)(out+n) =
91                 *(size_t*)(in+n) ^ *(size_t*)(iv+n);
92             (*block)(out, out, key);
93             iv = out;
94             len -= 16;
95             in += 16;
96             out += 16;
97         }
98     }
99 #endif
100     while (len) {
101         for(n=0; n<16 && n<len; ++n)
102             out[n] = in[n] ^ iv[n];
103         for(; n<16; ++n)
104             out[n] = iv[n];
105         (*block)(out, out, key);
106         iv = out;
107         if (len<=16) break;
108         len -= 16;
109         in += 16;
110         out += 16;
111     }
112     memcpy(ivec, iv, 16);
113 }
114
115 void CRYPTO_cbc128_decrypt(const unsigned char *in, unsigned char *out,
116                             size_t len, const void *key,
117                             unsigned char ivec[16], block128_f block)
118 {
119     size_t n;
120     union { size_t t[16/sizeof(size_t)]; unsigned char c[16]; } tmp;
121
122     assert(in && out && key && ivec);
123
124 #if !defined(OPENSSL_SMALL_FOOTPRINT)
125     if (in != out) {
126         const unsigned char *iv = ivec;
```

```

128         if (STRICT_ALIGNMENT &&
129             ((size_t)in|(size_t)out|(size_t)ivec)%sizeof(size_t) != 0) {
130             while (len>=16) {
131                 (*block)(in, out, key);
132                 for(n=0; n<16; ++n)
133                     out[n] ^= iv[n];
134                 iv = in;
135                 len -= 16;
136                 in += 16;
137                 out += 16;
138             }
139         }
140         else if (16*sizeof(size_t) == 0) { /* always true */
141             while (len>=16) {
142                 size_t *out_t=(size_t *)out, *iv_t=(size_t *)iv;
143
144                 (*block)(in, out, key);
145                 for(n=0; n<16/sizeof(size_t); n++)
146                     out_t[n] ^= iv_t[n];
147                 iv = in;
148                 len -= 16;
149                 in += 16;
150                 out += 16;
151             }
152         }
153         memcpy(ivec,iv,16);
154     } else {
155         if (STRICT_ALIGNMENT &&
156             ((size_t)in|(size_t)out|(size_t)ivec)%sizeof(size_t) != 0) {
157             unsigned char c;
158             while (len>=16) {
159                 (*block)(in, tmp.c, key);
160                 for(n=0; n<16; ++n) {
161                     c = in[n];
162                     out[n] = tmp.c[n] ^ ivec[n];
163                     ivec[n] = c;
164                 }
165                 len -= 16;
166                 in += 16;
167                 out += 16;
168             }
169         }
170         else if (16*sizeof(size_t) == 0) { /* always true */
171             while (len>=16) {
172                 size_t c, *out_t=(size_t *)out, *ivec_t=(size_t *)ivec;
173                 const size_t *in_t=(const size_t *)in;
174
175                 (*block)(in, tmp.c, key);
176                 for(n=0; n<16/sizeof(size_t); n++) {
177                     c = in_t[n];
178                     out_t[n] = tmp.c[n] ^ ivec_t[n];
179                     ivec_t[n] = c;
180                 }
181                 len -= 16;
182                 in += 16;
183                 out += 16;
184             }
185         }
186     }
187 #endif
188     while (len) {
189         unsigned char c;
190         (*block)(in, tmp.c, key);
191         for(n=0; n<16 && n<len; ++n) {
192             c = in[n];
193             out[n] = tmp.c[n] ^ ivec[n];

```

```

194             ivec[n] = c;
195         }
196         if (len<=16) {
197             for (; n<16; ++n)
198                 ivec[n] = in[n];
199             break;
200         }
201         len -= 16;
202         in += 16;
203         out += 16;
204     }
205 }

```

new/usr/src/lib/openssl/libsunw_crypto/modes/ccm128.c

1

```
*****
11636 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/ccm128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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47 * =====
48 */
50 #include <openssl/crypto.h>
51 #include "modes_lcl.h"
52 #include <string.h>
53
54 #ifndef MODES_DEBUG
55 #ifndef NDEBUG
56 #define NDEBUG
57 #endif
58 #endif
59 #include <assert.h>
61 /* First you setup M and L parameters and pass the key schedule.
```

new/usr/src/lib/openssl/libsunw_crypto/modes/ccm128.c

2

```
62 * This is called once per session setup... */
63 void CRYPTO_ccm128_init(CCM128_CONTEXT *ctx,
64 unsigned int M,unsigned int L,void *key,block128_f block)
65 {
66     memset(ctx->nonce.c,0,sizeof(ctx->nonce.c));
67     ctx->nonce.c[0] = ((u8)(L-1)&7) | (u8)(((M-2)/2)&7)<<3;
68     ctx->blocks = 0;
69     ctx->block = block;
70     ctx->key = key;
71 }
72
73 /* !!! Following interfaces are to be called *once* per packet !!! */
74
75 /* Then you setup per-message nonce and pass the length of the message */
76 int CRYPTO_ccm128_setiv(CCM128_CONTEXT *ctx,
77 const unsigned char *nonce,size_t nlen,size_t mlen)
78 {
79     unsigned int L = ctx->nonce.c[0]&7; /* the L parameter */
80
81     if (nlen<(14-L)) return -1; /* nonce is too short */
82
83     if (sizeof(mlen)==8 && L>=3) {
84         ctx->nonce.c[8] = (u8)(mlen>>(56%(sizeof(mlen)*8)));
85         ctx->nonce.c[9] = (u8)(mlen>>(48%(sizeof(mlen)*8)));
86         ctx->nonce.c[10] = (u8)(mlen>>(40%(sizeof(mlen)*8)));
87         ctx->nonce.c[11] = (u8)(mlen>>(32%(sizeof(mlen)*8)));
88     }
89     else
90         ctx->nonce.u[1] = 0;
91
92     ctx->nonce.c[12] = (u8)(mlen>>24);
93     ctx->nonce.c[13] = (u8)(mlen>>16);
94     ctx->nonce.c[14] = (u8)(mlen>>8);
95     ctx->nonce.c[15] = (u8)mlen;
96
97     ctx->nonce.c[0] &= ~0x40; /* clear Adata flag */
98     memcpy(&ctx->nonce.c[1],nonce,14-L);
99
100     return 0;
101 }
102
103 /* Then you pass additional authentication data, this is optional */
104 void CRYPTO_ccm128_aad(CCM128_CONTEXT *ctx,
105 const unsigned char *aad,size_t alen)
106 {
107     unsigned int i;
108     block128_f block = ctx->block;
109
110     if (alen==0) return;
111
112     ctx->nonce.c[0] |= 0x40; /* set Adata flag */
113     (*block)(ctx->nonce.c,ctx->cmac.c,ctx->key),
114     ctx->blocks++;
115
116     if (alen<(0x10000-0x100)) {
117         ctx->cmac.c[0] ^= (u8)(alen>>8);
118         ctx->cmac.c[1] ^= (u8)alen;
119         i=2;
120     }
121     else if (sizeof(alen)==8 && alen>=(size_t)1<<(32%(sizeof(alen)*8))) {
122         ctx->cmac.c[0] ^= 0xFF;
123         ctx->cmac.c[1] ^= 0xFF;
124         ctx->cmac.c[2] ^= (u8)(alen>>(56%(sizeof(alen)*8)));
125         ctx->cmac.c[3] ^= (u8)(alen>>(48%(sizeof(alen)*8)));
126         ctx->cmac.c[4] ^= (u8)(alen>>(40%(sizeof(alen)*8)));
127         ctx->cmac.c[5] ^= (u8)(alen>>(32%(sizeof(alen)*8)));
128         ctx->cmac.c[6] ^= (u8)(alen>>24);
129     }
```

```

128         ctx->cmac.c[7] ^= (u8)(alen>>16);
129         ctx->cmac.c[8] ^= (u8)(alen>>8);
130         ctx->cmac.c[9] ^= (u8)alen;
131         i=10;
132     }
133     else {
134         ctx->cmac.c[0] ^= 0xFF;
135         ctx->cmac.c[1] ^= 0xFE;
136         ctx->cmac.c[2] ^= (u8)(alen>>24);
137         ctx->cmac.c[3] ^= (u8)(alen>>16);
138         ctx->cmac.c[4] ^= (u8)(alen>>8);
139         ctx->cmac.c[5] ^= (u8)alen;
140         i=6;
141     }
142
143     do {
144         for(;i<16 && alen;++i,++aad,--alen)
145             ctx->cmac.c[i] ^= *aad;
146         (*block)(ctx->cmac.c,ctx->cmac.c,ctx->key),
147         ctx->blocks++;
148         i=0;
149     } while (alen);
150 }
151
152 /* Finally you encrypt or decrypt the message */
153
154 /* counter part of nonce may not be larger than L*8 bits,
155  * L is not larger than 8, therefore 64-bit counter... */
156 static void ctr64_inc(unsigned char *counter) {
157     unsigned int n=8;
158     u8 c;
159
160     counter += 8;
161     do {
162         --n;
163         c = counter[n];
164         ++c;
165         counter[n] = c;
166         if (c) return;
167     } while (n);
168 }
169
170 int CRYPTO_ccm128_encrypt(CCM128_CONTEXT *ctx,
171     const unsigned char *inp, unsigned char *out,
172     size_t len)
173 {
174     size_t n;
175     unsigned int i,L;
176     unsigned char flags0 = ctx->nonce.c[0];
177     block128_f block = ctx->block;
178     void *key = ctx->key;
179     union { u64 u[2]; u8 c[16]; } scratch;
180
181     if (!(flags0&0x40))
182         (*block)(ctx->nonce.c,ctx->cmac.c,key),
183         ctx->blocks++;
184
185     ctx->nonce.c[0] = L = flags0&7;
186     for (n=0,i=15-L;i<15;++i) {
187         n |= ctx->nonce.c[i];
188         ctx->nonce.c[i]=0;
189         n <<= 8;
190     }
191     n |= ctx->nonce.c[15]; /* reconstructed length */
192     ctx->nonce.c[15]=1;

```

```

194     if (n!=len) return -1; /* length mismatch */
195
196     ctx->blocks += ((len+15)>>3)|1;
197     if (ctx->blocks > (U64(1)<<61)) return -2; /* too much data */
198
199     while (len>=16) {
200 #if defined(STRICT_ALIGNMENT)
201         union { u64 u[2]; u8 c[16]; } temp;
202
203         memcpy(temp.c,inp,16);
204         ctx->cmac.u[0] ^= temp.u[0];
205         ctx->cmac.u[1] ^= temp.u[1];
206 #else
207         ctx->cmac.u[0] ^= ((u64*)inp)[0];
208         ctx->cmac.u[1] ^= ((u64*)inp)[1];
209 #endif
210         (*block)(ctx->cmac.c,ctx->cmac.c,key);
211         (*block)(ctx->nonce.c,scratch.c,key);
212         ctr64_inc(ctx->nonce.c);
213 #if defined(STRICT_ALIGNMENT)
214         temp.u[0] ^= scratch.u[0];
215         temp.u[1] ^= scratch.u[1];
216         memcpy(out,temp.c,16);
217 #else
218         ((u64*)out)[0] = scratch.u[0]^((u64*)inp)[0];
219         ((u64*)out)[1] = scratch.u[1]^((u64*)inp)[1];
220 #endif
221         inp += 16;
222         out += 16;
223         len -= 16;
224     }
225
226     if (len) {
227         for (i=0; i<len; ++i) ctx->cmac.c[i] ^= inp[i];
228         (*block)(ctx->cmac.c,ctx->cmac.c,key);
229         (*block)(ctx->nonce.c,scratch.c,key);
230         for (i=0; i<len; ++i) out[i] = scratch.c[i]^inp[i];
231     }
232
233     for (i=15-L;i<16;++i)
234         ctx->nonce.c[i]=0;
235
236     (*block)(ctx->nonce.c,scratch.c,key);
237     ctx->cmac.u[0] ^= scratch.u[0];
238     ctx->cmac.u[1] ^= scratch.u[1];
239
240     ctx->nonce.c[0] = flags0;
241
242     return 0;
243 }
244
245 int CRYPTO_ccm128_decrypt(CCM128_CONTEXT *ctx,
246     const unsigned char *inp, unsigned char *out,
247     size_t len)
248 {
249     size_t n;
250     unsigned int i,L;
251     unsigned char flags0 = ctx->nonce.c[0];
252     block128_f block = ctx->block;
253     void *key = ctx->key;
254     union { u64 u[2]; u8 c[16]; } scratch;
255
256     if (!(flags0&0x40))
257         (*block)(ctx->nonce.c,ctx->cmac.c,key);
258
259     ctx->nonce.c[0] = L = flags0&7;

```

```

260     for (n=0,i=15-L;i<15;++i) {
261         n |= ctx->nonce.c[i];
262         ctx->nonce.c[i]=0;
263         n <= 8;
264     }
265     n |= ctx->nonce.c[15]; /* reconstructed length */
266     ctx->nonce.c[15]=1;

268     if (n!=len) return -1;

270     while (len>=16) {
271 #if defined(STRICT_ALIGNMENT)
272         union { u64 u[2]; u8 c[16]; } temp;
273 #endif
274         (*block)(ctx->nonce.c, scratch.c, key);
275         ctr64_inc(ctx->nonce.c);
276 #if defined(STRICT_ALIGNMENT)
277         memcpy (temp.c, inp, 16);
278         ctx->cmac.u[0] ^= (scratch.u[0] ^ temp.u[0]);
279         ctx->cmac.u[1] ^= (scratch.u[1] ^ temp.u[1]);
280         memcpy (out, scratch.c, 16);
281 #else
282         ctx->cmac.u[0] ^= (((u64*)out)[0] = scratch.u[0]^((u64*)inp)[0])
283         ctx->cmac.u[1] ^= (((u64*)out)[1] = scratch.u[1]^((u64*)inp)[1])
284 #endif
285         (*block)(ctx->cmac.c, ctx->cmac.c, key);

287         inp += 16;
288         out += 16;
289         len -= 16;
290     }

292     if (len) {
293         (*block)(ctx->nonce.c, scratch.c, key);
294         for (i=0; i<len; ++i)
295             ctx->cmac.c[i] ^= (out[i] = scratch.c[i]^inp[i]);
296         (*block)(ctx->cmac.c, ctx->cmac.c, key);
297     }

299     for (i=15-L;i<16;++i)
300         ctx->nonce.c[i]=0;

302     (*block)(ctx->nonce.c, scratch.c, key);
303     ctx->cmac.u[0] ^= scratch.u[0];
304     ctx->cmac.u[1] ^= scratch.u[1];

306     ctx->nonce.c[0] = flags0;

308     return 0;
309 }

311 static void ctr64_add (unsigned char *counter, size_t inc)
312 {
313     size_t n=8, val=0;

314     counter += 8;
315     do {
316         --n;
317         val += counter[n] + (inc&0xff);
318         counter[n] = (unsigned char)val;
319         val >>= 8; /* carry bit */
320         inc >>= 8;
321     } while(n && (inc || val));
322 }

324 int CRYPTO_ccm128_encrypt_ccm64(CCM128_CONTEXT *ctx,
325     const unsigned char *inp, unsigned char *out,

```

```

326     size_t len, ccm128_f stream)
327 {
328     size_t      n;
329     unsigned int i,L;
330     unsigned char flags0 = ctx->nonce.c[0];
331     block128_f   block = ctx->block;
332     void *       key    = ctx->key;
333     union { u64 u[2]; u8 c[16]; } scratch;

335     if (!(flags0&0x40))
336         (*block)(ctx->nonce.c, ctx->cmac.c, key),
337         ctx->blocks++;

339     ctx->nonce.c[0] = L = flags0&7;
340     for (n=0,i=15-L;i<15;++i) {
341         n |= ctx->nonce.c[i];
342         ctx->nonce.c[i]=0;
343         n <= 8;
344     }
345     n |= ctx->nonce.c[15]; /* reconstructed length */
346     ctx->nonce.c[15]=1;

348     if (n!=len) return -1; /* length mismatch */

350     ctx->blocks += ((len+15)>>3)|1;
351     if (ctx->blocks > (U64(1)<<61)) return -2; /* too much data */

353     if ((n=len/16)) {
354         (*stream)(inp, out, n, key, ctx->nonce.c, ctx->cmac.c);
355         n *= 16;
356         inp += n;
357         out += n;
358         len -= n;
359         if (len) ctr64_add(ctx->nonce.c, n/16);
360     }

362     if (len) {
363         for (i=0; i<len; ++i) ctx->cmac.c[i] ^= inp[i];
364         (*block)(ctx->cmac.c, ctx->cmac.c, key);
365         (*block)(ctx->nonce.c, scratch.c, key);
366         for (i=0; i<len; ++i) out[i] = scratch.c[i]^inp[i];
367     }

369     for (i=15-L;i<16;++i)
370         ctx->nonce.c[i]=0;

372     (*block)(ctx->nonce.c, scratch.c, key);
373     ctx->cmac.u[0] ^= scratch.u[0];
374     ctx->cmac.u[1] ^= scratch.u[1];

376     ctx->nonce.c[0] = flags0;

378     return 0;
379 }

381 int CRYPTO_ccm128_decrypt_ccm64(CCM128_CONTEXT *ctx,
382     const unsigned char *inp, unsigned char *out,
383     size_t len, ccm128_f stream)
384 {
385     size_t      n;
386     unsigned int i,L;
387     unsigned char flags0 = ctx->nonce.c[0];
388     block128_f   block = ctx->block;
389     void *       key    = ctx->key;
390     union { u64 u[2]; u8 c[16]; } scratch;

```



```
392     if (!(flags0&0x40))
393         (*block)(ctx->nonce.c, ctx->cmac.c, key);
394
395     ctx->nonce.c[0] = L = flags0&7;
396     for (n=0, i=15-L; i<15; ++i) {
397         n |= ctx->nonce.c[i];
398         ctx->nonce.c[i]=0;
399         n <= 8;
400     }
401     n |= ctx->nonce.c[15]; /* reconstructed length */
402     ctx->nonce.c[15]=1;
403
404     if (n!=len) return -1;
405
406     if ((n=len/16)) {
407         (*stream)(inp, out, n, key, ctx->nonce.c, ctx->cmac.c);
408         n *= 16;
409         inp += n;
410         out += n;
411         len -= n;
412         if (len) ctr64_add(ctx->nonce.c, n/16);
413     }
414
415     if (len) {
416         (*block)(ctx->nonce.c, scratch.c, key);
417         for (i=0; i<len; ++i)
418             ctx->cmac.c[i] ^= (out[i] = scratch.c[i]^inp[i]);
419         (*block)(ctx->cmac.c, ctx->cmac.c, key);
420     }
421
422     for (i=15-L; i<16; ++i)
423         ctx->nonce.c[i]=0;
424
425     (*block)(ctx->nonce.c, scratch.c, key);
426     ctx->cmac.u[0] ^= scratch.u[0];
427     ctx->cmac.u[1] ^= scratch.u[1];
428
429     ctx->nonce.c[0] = flags0;
430
431     return 0;
432 }
433
434 size_t CRYPTO_ccm128_tag(CCM128_CONTEXT *ctx, unsigned char *tag, size_t len)
435 {
436     unsigned int M = (ctx->nonce.c[0]>>3)&7; /* the M parameter */
437
438     M *= 2; M += 2;
439     if (len<M) return 0;
440     memcpy(tag, ctx->cmac.c, M);
441     return M;
442 }
```

new/usr/src/lib/openssl/libsunw_crypto/modes/cfb128.c

1

```
*****
7039 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/cfb128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
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3  *
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5  * modification, are permitted provided that the following conditions
6  * are met:
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9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
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20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
22 * endorse or promote products derived from this software without
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26 * 5. Products derived from this software may not be called "OpenSSL"
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28 * permission of the OpenSSL Project.
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30 * 6. Redistributions of any form whatsoever must retain the following
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36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
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43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 */
51 #include <openssl/crypto.h>
52 #include "modes_lcl.h"
53 #include <string.h>
54
55 #ifndef MODES_DEBUG
56 # ifnndef NDEBUG
57 # define NDEBUG
58 # endif
59 #endif
60 #include <assert.h>
```

new/usr/src/lib/openssl/libsunw_crypto/modes/cfb128.c

2

```
62 /* The input and output encrypted as though 128bit cfb mode is being
63 * used. The extra state information to record how much of the
64 * 128bit block we have used is contained in *num;
65 */
66 void CRYPTO_cfb128_encrypt(const unsigned char *in, unsigned char *out,
67                             size_t len, const void *key,
68                             unsigned char ivec[16], int *num,
69                             int enc, block128_f block)
70 {
71     unsigned int n;
72     size_t l = 0;
73
74     assert(in && out && key && ivec && num);
75
76     n = *num;
77
78     if (enc) {
79 #if !defined(OPENSSSL_SMALL_FOOTPRINT)
80         if (16*sizeof(size_t) == 0) do { /* always true actually */
81             while (n && len) {
82                 *(out++) = ivec[n] ^ *(in++);
83                 --len;
84                 n = (n+1) % 16;
85             }
86 #if defined(STRICT_ALIGNMENT)
87             if (((size_t)in|(size_t)out|(size_t)ivec)%sizeof(size_t) != 0)
88                 break;
89 #endif
90             while (len>=16) {
91                 (*block)(ivec, ivec, key);
92                 for (; n<16; n+=sizeof(size_t)) {
93                     *(size_t*)(out+n) =
94                         *(size_t*)(ivec+n) ^ *(size_t*)(in+n);
95                 }
96                 len -= 16;
97                 out += 16;
98                 in += 16;
99                 n = 0;
100             }
101             if (len) {
102                 (*block)(ivec, ivec, key);
103                 while (len--) {
104                     out[n] = ivec[n] ^ in[n];
105                     ++n;
106                 }
107             }
108             *num = n;
109             return;
110         } while (0);
111         /* the rest would be commonly eliminated by x86* compiler */
112 #endif
113         while (l<len) {
114             if (n == 0) {
115                 (*block)(ivec, ivec, key);
116             }
117             out[l] = ivec[n] ^ in[l];
118             ++l;
119             n = (n+1) % 16;
120         }
121         *num = n;
122     } else {
123 #if !defined(OPENSSSL_SMALL_FOOTPRINT)
124         if (16*sizeof(size_t) == 0) do { /* always true actually */
125             while (n && len) {
126                 unsigned char c;
127                 *(out++) = ivec[n] ^ (c = *(in++)); ivec[n] = c;
```

```

128         --len;
129         n = (n+1) % 16;
130     }
131 #if defined(STRICT_ALIGNMENT)
132     if (((size_t)in|(size_t)out|(size_t)ivec)%sizeof(size_t) != 0)
133         break;
134 #endif
135     while (len>=16) {
136         (*block)(ivec, ivec, key);
137         for (; n<16; n+=sizeof(size_t)) {
138             size_t t = *(size_t*)(in+n);
139             *(size_t*)(out+n) = *(size_t*)(ivec+n) ^ t;
140             *(size_t*)(ivec+n) = t;
141         }
142         len -= 16;
143         out += 16;
144         in += 16;
145         n = 0;
146     }
147     if (len) {
148         (*block)(ivec, ivec, key);
149         while (len--) {
150             unsigned char c;
151             out[n] = ivec[n] ^ (c = in[n]); ivec[n] = c;
152             ++n;
153         }
154     }
155     *num = n;
156     return;
157 } while (0);
158 /* the rest would be commonly eliminated by x86* compiler */
159 #endif
160 while (l<len) {
161     unsigned char c;
162     if (n == 0) {
163         (*block)(ivec, ivec, key);
164     }
165     out[l] = ivec[n] ^ (c = in[l]); ivec[n] = c;
166     ++l;
167     n = (n+1) % 16;
168 }
169 *num=n;
170 }
171 }

```

```

173 /* This expects a single block of size nbits for both in and out. Note that
174    it corrupts any extra bits in the last byte of out */
175 static void cfb1_encrypt_block(const unsigned char *in,unsigned char *out,
176                               int nbits,const void *key,
177                               unsigned char ivec[16],int enc,
178                               block128_f block)
179 {
180     int n,rem,num;
181     unsigned char ovec[16*2 + 1]; /* +1 because we dererence (but don't use)
182
183     if (nbits<=0 || nbits>128) return;
184
185     /* fill in the first half of the new IV with the current IV */
186     memcpy(ovec,ivec,16);
187     /* construct the new IV */
188     (*block)(ivec,ivec,key);
189     num = (nbits+7)/8;
190     if (enc) /* encrypt the input */
191         for(n=0 ; n < num ; ++n)
192             out[n] = (ovec[16+n] = in[n] ^ ivec[n]);
193     else /* decrypt the input */

```

```

194         for(n=0 ; n < num ; ++n)
195             out[n] = (ovec[16+n] = in[n]) ^ ivec[n];
196         /* shift ovec left... */
197         rem = nbits%8;
198         num = nbits/8;
199         if(rem==0)
200             memcpy(ivec,ovec+num,16);
201         else
202             for(n=0 ; n < 16 ; ++n)
203                 ivec[n] = ovec[n+num]<<rem | ovec[n+num+1]>>(8-rem);
204
205     /* it is not necessary to cleanse ovec, since the IV is not secret */
206 }
207
208 /* N.B. This expects the input to be packed, MS bit first */
209 void CRYPTO_cfb128_1_encrypt(const unsigned char *in, unsigned char *out,
210                              size_t bits, const void *key,
211                              unsigned char ivec[16], int *num,
212                              int enc, block128_f block)
213 {
214     size_t n;
215     unsigned char c[1],d[1];
216
217     assert(in && out && key && ivec && num);
218     assert(*num == 0);
219
220     for(n=0 ; n<bits ; ++n)
221     {
222         c[0]=(in[n/8]&(1 << (7-n%8))) ? 0x80 : 0;
223         cfb1_encrypt_block(c,d,1,key,ivec,enc,block);
224         out[n/8]=(out[n/8]&~(1 << (unsigned int)(7-n%8))) |
225             ((d[0]&0x80) >> (unsigned int)(n%8));
226     }
227 }
228
229 void CRYPTO_cfb128_8_encrypt(const unsigned char *in, unsigned char *out,
230                              size_t length, const void *key,
231                              unsigned char ivec[16], int *num,
232                              int enc, block128_f block)
233 {
234     size_t n;
235
236     assert(in && out && key && ivec && num);
237     assert(*num == 0);
238
239     for(n=0 ; n<length ; ++n)
240         cfb1_encrypt_block(&in[n],&out[n],8,key,ivec,enc,block);
241 }

```

new/usr/src/lib/openssl/libsunw_crypto/modes/ctr128.c

1

```
*****
6988 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/ctr128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
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5  * modification, are permitted provided that the following conditions
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16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
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43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 *
49 */
51 #include <openssl/crypto.h>
52 #include "modes_lcl.h"
53 #include <string.h>
54
55 #ifndef MODES_DEBUG
56 # ifndef NDEBUG
57 #  define NDEBUG
58 # endif
59 #endif
60 #include <assert.h>
```

new/usr/src/lib/openssl/libsunw_crypto/modes/ctr128.c

2

```
62 /* NOTE: the IV/counter CTR mode is big-endian. The code itself
63  * is endian-neutral. */
64
65 /* increment counter (128-bit int) by 1 */
66 static void ctr128_inc(unsigned char *counter) {
67     u32 n=16;
68     u8 c;
69
70     do {
71         --n;
72         c = counter[n];
73         ++c;
74         counter[n] = c;
75         if (c) return;
76     } while (n);
77 }
78
79 #if !defined(OPENSSL_SMALL_FOOTPRINT)
80 static void ctr128_inc_aligned(unsigned char *counter) {
81     size_t *data, c, n;
82     const union { long one; char little; } is_endian = {1};
83
84     if (is_endian.little) {
85         ctr128_inc(counter);
86         return;
87     }
88
89     data = (size_t *)counter;
90     n = 16/sizeof(size_t);
91     do {
92         --n;
93         c = data[n];
94         ++c;
95         data[n] = c;
96         if (c) return;
97     } while (n);
98 }
99 #endif
101 /* The input encrypted as though 128bit counter mode is being
102  * used. The extra state information to record how much of the
103  * 128bit block we have used is contained in *num, and the
104  * encrypted counter is kept in ecount_buf. Both *num and
105  * ecount_buf must be initialised with zeros before the first
106  * call to CRYPTO_ctr128_encrypt().
107  *
108  * This algorithm assumes that the counter is in the x lower bits
109  * of the IV (ivec), and that the application has full control over
110  * overflow and the rest of the IV. This implementation takes NO
111  * responsibility for checking that the counter doesn't overflow
112  * into the rest of the IV when incremented.
113  */
114 void CRYPTO_ctr128_encrypt(const unsigned char *in, unsigned char *out,
115                             size_t len, const void *key,
116                             unsigned char ivec[16], unsigned char ecount_buf[16],
117                             unsigned int *num, block128_f block)
118 {
119     unsigned int n;
120     size_t l=0;
121
122     assert(in && out && key && ecount_buf && num);
123     assert(*num < 16);
124
125     n = *num;
126
127 #if !defined(OPENSSL_SMALL_FOOTPRINT)
```

```

128     if (16*sizeof(size_t) == 0) do { /* always true actually */
129         while (n && len) {
130             *(out++) = *(in++) ^ ecounbuf[n];
131             --len;
132             n = (n+1) % 16;
133         }
134
135 #if defined(STRICT_ALIGNMENT)
136     if (((size_t)in|(size_t)out|(size_t)ivec)%sizeof(size_t) != 0)
137         break;
138 #endif
139     while (len>=16) {
140         (*block)(ivec, ecounbuf, key);
141         ctr128_inc_aligned(ivec);
142         for (; n<16; n+=sizeof(size_t))
143             *(size_t *) (out+n) =
144             *(size_t *) (in+n) ^ *(size_t *) (ecounbuf+n);
145         len -= 16;
146         out += 16;
147         in += 16;
148         n = 0;
149     }
150     if (len) {
151         (*block)(ivec, ecounbuf, key);
152         ctr128_inc_aligned(ivec);
153         while (len--) {
154             out[n] = in[n] ^ ecounbuf[n];
155             ++n;
156         }
157     }
158     *num = n;
159     return;
160 } while(0);
161 /* the rest would be commonly eliminated by x86* compiler */
162 #endif
163 while (l<len) {
164     if (n==0) {
165         (*block)(ivec, ecounbuf, key);
166         ctr128_inc(ivec);
167     }
168     out[l] = in[l] ^ ecounbuf[n];
169     ++l;
170     n = (n+1) % 16;
171 }
172
173 *num=n;
174 }
175
176 /* increment upper 96 bits of 128-bit counter by 1 */
177 static void ctr96_inc(unsigned char *counter) {
178     u32 n=12;
179     u8 c;
180
181     do {
182         --n;
183         c = counter[n];
184         ++c;
185         counter[n] = c;
186         if (c) return;
187     } while (n);
188 }
189
190 void CRYPTO_ctr128_encrypt_ctr32(const unsigned char *in, unsigned char *out,
191     size_t len, const void *key,
192     unsigned char ivec[16], unsigned char ecounbuf[16],
193     unsigned int *num, ctr128_f func)

```

```

194 {
195     unsigned int n,ctr32;
196
197     assert(in && out && key && ecounbuf && num);
198     assert(*num < 16);
199
200     n = *num;
201
202     while (n && len) {
203         *(out++) = *(in++) ^ ecounbuf[n];
204         --len;
205         n = (n+1) % 16;
206     }
207
208     ctr32 = GETU32(ivec+12);
209     while (len>=16) {
210         size_t blocks = len/16;
211         /*
212          * 1<<28 is just a not-so-small yet not-so-large number...
213          * Below condition is practically never met, but it has to
214          * be checked for code correctness.
215          */
216         if (sizeof(size_t)>sizeof(unsigned int) && blocks>(1U<<28))
217             blocks = (1U<<28);
218         /*
219          * As (*func) operates on 32-bit counter, caller
220          * has to handle overflow. 'if' below detects the
221          * overflow, which is then handled by limiting the
222          * amount of blocks to the exact overflow point...
223          */
224         ctr32 += (u32)blocks;
225         if (ctr32 < blocks) {
226             blocks -= ctr32;
227             ctr32 = 0;
228         }
229         (*func)(in,out,blocks,key,ivec);
230         /* (*ctr) does not update ivec, caller does: */
231         PUTU32(ivec+12,ctr32);
232         /* ... overflow was detected, propagate carry. */
233         if (ctr32 == 0) ctr96_inc(ivec);
234         blocks *= 16;
235         len -= blocks;
236         out += blocks;
237         in += blocks;
238     }
239     if (len) {
240         memset(ecounbuf,0,16);
241         (*func)(ecounbuf,ecounbuf,1,key,ivec);
242         ++ctr32;
243         PUTU32(ivec+12,ctr32);
244         if (ctr32 == 0) ctr96_inc(ivec);
245         while (len--) {
246             out[n] = in[n] ^ ecounbuf[n];
247             ++n;
248         }
249     }
250
251     *num=n;
252 }

```

new/usr/src/lib/openssl/libsunw_crypto/modes/cts128.c

1

```
*****
12796 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/cts128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
3  *
4  * Rights for redistribution and usage in source and binary
5  * forms are granted according to the OpenSSL license.
6  */
7
8 #include <openssl/crypto.h>
9 #include "modes_lcl.h"
10 #include <string.h>
11
12 #ifndef MODES_DEBUG
13 #ifndef NDEBUG
14 #define NDEBUG
15 #endif
16 #endif
17 #include <assert.h>
18
19 /*
20  * Trouble with Ciphertext Stealing, CTS, mode is that there is no
21  * common official specification, but couple of cipher/application
22  * specific ones: RFC2040 and RFC3962. Then there is 'Proposal to
23  * Extend CBC Mode By "Ciphertext Stealing"' at NIST site, which
24  * deviates from mentioned RFCs. Most notably it allows input to be
25  * of block length and it doesn't flip the order of the last two
26  * blocks. CTS is being discussed even in ECB context, but it's not
27  * adopted for any known application. This implementation provides
28  * two interfaces: one compliant with above mentioned RFCs and one
29  * compliant with the NIST proposal, both extending CBC mode.
30  */
31
32 size_t CRYPTO_cts128_encrypt_block(const unsigned char *in, unsigned char *out,
33                                   size_t len, const void *key,
34                                   unsigned char ivec[16], block128_f block)
35 {
36     size_t residue, n;
37
38     assert (in && out && key && ivec);
39
40     if (len <= 16) return 0;
41
42     if ((residue=len%16) == 0) residue = 16;
43
44     len -= residue;
45
46     CRYPTO_cbc128_encrypt(in,out, len, key, ivec, block);
47
48     in += len;
49     out += len;
50
51     for (n=0; n<residue; ++n)
52         ivec[n] ^= in[n];
53     (*block)(ivec,ivec,key);
54     memcpy(out,out-16,residue);
55     memcpy(out-16,ivec,16);
56
57     return len+residue;
58 }
59
60 size_t CRYPTO_nistcts128_encrypt_block(const unsigned char *in, unsigned char *o
61                                       size_t len, const void *key,
62                                       unsigned char ivec[16], block128_f block)
```

new/usr/src/lib/openssl/libsunw_crypto/modes/cts128.c

2

```
63 {
64     size_t residue, n;
65
66     assert (in && out && key && ivec);
67
68     if (len < 16) return 0;
69
70     residue=len%16;
71
72     len -= residue;
73
74     CRYPTO_cbc128_encrypt(in,out, len, key, ivec, block);
75
76     if (residue==0) return len;
77
78     in += len;
79     out += len;
80
81     for (n=0; n<residue; ++n)
82         ivec[n] ^= in[n];
83     (*block)(ivec,ivec,key);
84     memcpy(out-16+residue,ivec,16);
85
86     return len+residue;
87 }
88
89 size_t CRYPTO_cts128_encrypt(const unsigned char *in, unsigned char *out,
90                             size_t len, const void *key,
91                             unsigned char ivec[16], cbc128_f cbc)
92 {
93     size_t residue;
94     union { size_t align; unsigned char c[16]; } tmp;
95
96     assert (in && out && key && ivec);
97
98     if (len <= 16) return 0;
99
100     if ((residue=len%16) == 0) residue = 16;
101
102     len -= residue;
103
104     (*cbc)(in,out, len, key, ivec, 1);
105
106     in += len;
107     out += len;
108
109     #if defined(CBC_HANDLES_TRUNCATED_IO)
110     memcpy(tmp.c,out-16,16);
111     (*cbc)(in,out-16,residue,key,ivec,1);
112     memcpy(out,tmp.c,residue);
113 #else
114     memset(tmp.c,0,sizeof(tmp));
115     memcpy(tmp.c,in,residue);
116     memcpy(out,out-16,residue);
117     (*cbc)(tmp.c,out-16,16,key,ivec,1);
118 #endif
119
120     return len+residue;
121 }
122
123 size_t CRYPTO_nistcts128_encrypt(const unsigned char *in, unsigned char *out,
124                                 size_t len, const void *key,
125                                 unsigned char ivec[16], cbc128_f cbc)
126 {
127     size_t residue;
128     union { size_t align; unsigned char c[16]; } tmp;
129
130     assert (in && out && key && ivec);
131
132     if (len < 16) return 0;
```

```

129     residue=len%16;
131     len -= residue;
133     (*cbc)(in,out, len,key,ivec,1);
135     if (residue==0) return len;
137     in += len;
138     out += len;
140 #if defined(CBC_HANDLES_TRUNCATED_IO)
141     (*cbc)(in,out-16+residue,residue,key,ivec,1);
142 #else
143     memset(tmp.c,0,sizeof(tmp));
144     memcpy(tmp.c,in,residue);
145     (*cbc)(tmp.c,out-16+residue,16,key,ivec,1);
146 #endif
147     return len+residue;
148 }
150 size_t CRYPTO_cts128_decrypt_block(const unsigned char *in, unsigned char *out,
151                                     size_t len, const void *key,
152                                     unsigned char ivec[16], block128_f block)
153 {
154     size_t residue, n;
155     union { size_t align; unsigned char c[32]; } tmp;
156     assert (in && out && key && ivec);
158     if (len<=16) return 0;
160     if ((residue=len%16) == 0) residue = 16;
162     len -= 16+residue;
164     if (len) {
165         CRYPTO_cbc128_decrypt(in,out, len,key,ivec,block);
166         in += len;
167         out += len;
168     }
170     (*block)(in,tmp.c+16,key);
172     memcpy(tmp.c,tmp.c+16,16);
173     memcpy(tmp.c,in+16,residue);
174     (*block)(tmp.c,tmp.c,key);
176     for(n=0; n<16; ++n) {
177         unsigned char c = in[n];
178         out[n] = tmp.c[n] ^ ivec[n];
179         ivec[n] = c;
180     }
181     for(residue+=16; n<residue; ++n)
182         out[n] = tmp.c[n] ^ in[n];
184     return 16+len+residue;
185 }
187 size_t CRYPTO_nistcts128_decrypt_block(const unsigned char *in, unsigned char *o
188                                     size_t len, const void *key,
189                                     unsigned char ivec[16], block128_f block)
190 {
191     size_t residue, n;
192     union { size_t align; unsigned char c[32]; } tmp;
193     assert (in && out && key && ivec);

```

```

195     if (len<16) return 0;
197     residue=len%16;
199     if (residue==0) {
200         CRYPTO_cbc128_decrypt(in,out, len,key,ivec,block);
201         return len;
202     }
204     len -= 16+residue;
206     if (len) {
207         CRYPTO_cbc128_decrypt(in,out, len,key,ivec,block);
208         in += len;
209         out += len;
210     }
212     (*block)(in+residue,tmp.c+16,key);
214     memcpy(tmp.c,tmp.c+16,16);
215     memcpy(tmp.c,in,residue);
216     (*block)(tmp.c,tmp.c,key);
218     for(n=0; n<16; ++n) {
219         unsigned char c = in[n];
220         out[n] = tmp.c[n] ^ ivec[n];
221         ivec[n] = in[n+residue];
222         tmp.c[n] = c;
223     }
224     for(residue+=16; n<residue; ++n)
225         out[n] = tmp.c[n] ^ tmp.c[n-16];
227     return 16+len+residue;
228 }
230 size_t CRYPTO_cts128_decrypt(const unsigned char *in, unsigned char *out,
231                             size_t len, const void *key,
232                             unsigned char ivec[16], cbc128_f cbc)
233 {
234     size_t residue;
235     union { size_t align; unsigned char c[32]; } tmp;
236     assert (in && out && key && ivec);
238     if (len<=16) return 0;
240     if ((residue=len%16) == 0) residue = 16;
242     len -= 16+residue;
244     if (len) {
245         (*cbc)(in,out, len,key,ivec,0);
246         in += len;
247         out += len;
248     }
250     memset(tmp.c,0,sizeof(tmp));
251     /* this places in[16] at &tmp.c[16] and decrypted block at &tmp.c[0] */
252     (*cbc)(in,tmp.c,16,key,tmp.c+16,0);
254     memcpy(tmp.c,in+16,residue);
255 #if defined(CBC_HANDLES_TRUNCATED_IO)
256     (*cbc)(tmp.c,out,16+residue,key,ivec,0);
257 #else
258     (*cbc)(tmp.c,tmp.c,32,key,ivec,0);
259     memcpy(out,tmp.c,16+residue);

```

```

260 #endif
261     return 16+len+residue;
262 }

264 size_t CRYPTO_nistcts128_decrypt(const unsigned char *in, unsigned char *out,
265                                 size_t len, const void *key,
266                                 unsigned char ivec[16], cbc128_f cbc)
267 {
268     size_t residue;
269     union { size_t align; unsigned char c[32]; } tmp;

270     assert (in && out && key && ivec);

272     if (len<16) return 0;

274     residue=len%16;

276     if (residue==0) {
277         (*cbc)(in,out, len, key, ivec, 0);
278         return len;
279     }

281     len -= 16+residue;

283     if (len) {
284         (*cbc)(in,out, len, key, ivec, 0);
285         in += len;
286         out += len;
287     }

289     memset(tmp.c, 0, sizeof(tmp));
290     /* this places in[16] at &tmp.c[16] and decrypted block at &tmp.c[0] */
291     (*cbc)(in+residue, tmp.c, 16, key, tmp.c+16, 0);

293     memcpy(tmp.c, in, residue);
294     #if defined(CBC_HANDLES_TRUNCATED_IO)
295     (*cbc)(tmp.c, out, 16+residue, key, ivec, 0);
296     #else
297     (*cbc)(tmp.c, tmp.c, 32, key, ivec, 0);
298     memcpy(out, tmp.c, 16+residue);
299     #endif
300     return 16+len+residue;
301 }

303 #if defined(SELFTTEST)
304 #include <stdio.h>
305 #include <openssl/aes.h>

307 /* test vectors from RFC 3962 */
308 static const unsigned char test_key[16] = "chicken teriyaki";
309 static const unsigned char test_input[64] =
310     "I would like the " " General Gau's C"
311     "hicken, please, " "and wonton soup.";
312 static const unsigned char test_iv[16] = {0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0};

314 static const unsigned char vector_17[17] =
315 {0xc6,0x35,0x35,0x68,0xf2,0xbf,0x8c,0xb4, 0xd8,0xa5,0x80,0x36,0x2d,0xa7,0xff,0x7
316 0x97};
317 static const unsigned char vector_31[31] =
318 {0xfc,0x00,0x78,0x3e,0x0e,0xfd,0xb2,0xc1, 0xd4,0x45,0xd4,0xc8,0xef,0xf7,0xed,0x2
319 0x97,0x68,0x72,0x68,0xd6,0xec,0xcc,0xc0, 0xc0,0x7b,0x25,0xe2,0x5e,0xcf,0xe5};
320 static const unsigned char vector_32[32] =
321 {0x39,0x31,0x25,0x23,0xa7,0x86,0x62,0xd5, 0xbe,0x7f,0xcb,0xcc,0x98,0xeb,0xf5,0xa
322 0x97,0x68,0x72,0x68,0xd6,0xec,0xcc,0xc0, 0xc0,0x7b,0x25,0xe2,0x5e,0xcf,0xe5,0x8
323 0x39,0x31,0x25,0x23,0xa7,0x86,0x62,0xd5, 0xbe,0x7f,0xcb,0xcc,0x98,0xeb,0xf5,0xa
324 0x97,0x68,0x72,0x68,0xd6,0xec,0xcc,0xc0, 0xc0,0x7b,0x25,0xe2,0x5e,0xcf,0xe5,0x8
325 0xb3,0xff,0xfd,0x94,0x0c,0x16,0xa1,0x8c, 0x1b,0x55,0x49,0xd2,0xf8,0x38,0x02,0x9

```

```

326 0x39,0x31,0x25,0x23,0xa7,0x86,0x62,0xd5, 0xbe,0x7f,0xcb,0xcc,0x98,0xeb,0xf5};
327 static const unsigned char vector_48[48] =
328 {0x97,0x68,0x72,0x68,0xd6,0xec,0xcc,0xc0, 0xc0,0x7b,0x25,0xe2,0x5e,0xcf,0xe5,0x8
329 0x9d,0xad,0x8b,0xbb,0x96,0xc4,0xcd,0xc0, 0x3b,0xc1,0x03,0xe1,0xa1,0x94,0xbb,0xd
330 0x39,0x31,0x25,0x23,0xa7,0x86,0x62,0xd5, 0xbe,0x7f,0xcb,0xcc,0x98,0xeb,0xf5,0xa
331 static const unsigned char vector_64[64] =
332 {0x97,0x68,0x72,0x68,0xd6,0xec,0xcc,0xc0, 0xc0,0x7b,0x25,0xe2,0x5e,0xcf,0xe5,0x8
333 0x39,0x31,0x25,0x23,0xa7,0x86,0x62,0xd5, 0xbe,0x7f,0xcb,0xcc,0x98,0xeb,0xf5,0xa
334 0x48,0x07,0xef,0xe8,0x36,0xee,0x89,0xa5, 0x26,0x73,0x0d,0xbc,0x2f,0x7b,0xc8,0x4
335 0x9d,0xad,0x8b,0xbb,0x96,0xc4,0xcd,0xc0, 0x3b,0xc1,0x03,0xe1,0xa1,0x94,0xbb,0xd

337 static AES_KEY encks, decks;

339 void test_vector(const unsigned char *vector, size_t len)
340 {
341     unsigned char iv[sizeof(test_iv)];
342     unsigned char cleartext[64], ciphertext[64];
343     size_t tail;

344     printf("vector_%d\n", len); fflush(stdout);

346     if ((tail=len%16) == 0) tail = 16;
347     tail += 16;

349     /* test block-based encryption */
350     memcpy(iv, test_iv, sizeof(test_iv));
351     CRYPTO_cts128_encrypt_block(test_input, ciphertext, len, &encks, iv, (block12
352     if (memcmp(ciphertext, vector, len))
353         fprintf(stderr, "output_%d mismatch\n", len), exit(1);
354     if (memcmp(iv, vector+len-tail, sizeof(iv)))
355         fprintf(stderr, "iv_%d mismatch\n", len), exit(1);

357     /* test block-based decryption */
358     memcpy(iv, test_iv, sizeof(test_iv));
359     CRYPTO_cts128_decrypt_block(ciphertext, cleartext, len, &decks, iv, (block128
360     if (memcmp(cleartext, test_input, len))
361         fprintf(stderr, "input_%d mismatch\n", len), exit(2);
362     if (memcmp(iv, vector+len-tail, sizeof(iv)))
363         fprintf(stderr, "iv_%d mismatch\n", len), exit(2);

365     /* test streamed encryption */
366     memcpy(iv, test_iv, sizeof(test_iv));
367     CRYPTO_cts128_encrypt(test_input, ciphertext, len, &encks, iv, (cbc128_f)AES_
368     if (memcmp(ciphertext, vector, len))
369         fprintf(stderr, "output_%d mismatch\n", len), exit(3);
370     if (memcmp(iv, vector+len-tail, sizeof(iv)))
371         fprintf(stderr, "iv_%d mismatch\n", len), exit(3);

373     /* test streamed decryption */
374     memcpy(iv, test_iv, sizeof(test_iv));
375     CRYPTO_cts128_decrypt(ciphertext, cleartext, len, &decks, iv, (cbc128_f)AES_c
376     if (memcmp(cleartext, test_input, len))
377         fprintf(stderr, "input_%d mismatch\n", len), exit(4);
378     if (memcmp(iv, vector+len-tail, sizeof(iv)))
379         fprintf(stderr, "iv_%d mismatch\n", len), exit(4);
380 }

382 void test_nistvector(const unsigned char *vector, size_t len)
383 {
384     unsigned char iv[sizeof(test_iv)];
385     unsigned char cleartext[64], ciphertext[64], nistvector[64];
386     size_t tail;

387     printf("nistvector_%d\n", len); fflush(stdout);

389     if ((tail=len%16) == 0) tail = 16;

391     len -= 16 + tail;

```



```

392     memcpy(nistvector,vector,len);
393     /* flip two last blocks */
394     memcpy(nistvector+len,vector+len+16,tail);
395     memcpy(nistvector+len+tail,vector+len,16);
396     len += 16 + tail;
397     tail = 16;

399     /* test block-based encryption */
400     memcpy(iv,test_iv,sizeof(test_iv));
401     CRYPTO_nistcts128_encrypt_block(test_input,ciphertext,len,&encks,iv,(blo
402     if (memcmp(ciphertext,nistvector,len))
403         fprintf(stderr,"output_%d mismatch\n",len), exit(1);
404     if (memcmp(iv,nistvector+len-tail,sizeof(iv)))
405         fprintf(stderr,"iv_%d mismatch\n",len), exit(1);

407     /* test block-based decryption */
408     memcpy(iv,test_iv,sizeof(test_iv));
409     CRYPTO_nistcts128_decrypt_block(ciphertext,cleartext,len,&decks,iv,(bloc
410     if (memcmp(cleartext,test_input,len))
411         fprintf(stderr,"input_%d mismatch\n",len), exit(2);
412     if (memcmp(iv,nistvector+len-tail,sizeof(iv)))
413         fprintf(stderr,"iv_%d mismatch\n",len), exit(2);

415     /* test streamed encryption */
416     memcpy(iv,test_iv,sizeof(test_iv));
417     CRYPTO_nistcts128_encrypt(test_input,ciphertext,len,&encks,iv,(cbc128_f)
418     if (memcmp(ciphertext,nistvector,len))
419         fprintf(stderr,"output_%d mismatch\n",len), exit(3);
420     if (memcmp(iv,nistvector+len-tail,sizeof(iv)))
421         fprintf(stderr,"iv_%d mismatch\n",len), exit(3);

423     /* test streamed decryption */
424     memcpy(iv,test_iv,sizeof(test_iv));
425     CRYPTO_nistcts128_decrypt(ciphertext,cleartext,len,&decks,iv,(cbc128_f)A
426     if (memcmp(cleartext,test_input,len))
427         fprintf(stderr,"input_%d mismatch\n",len), exit(4);
428     if (memcmp(iv,nistvector+len-tail,sizeof(iv)))
429         fprintf(stderr,"iv_%d mismatch\n",len), exit(4);
430 }

432 int main()
433 {
434     AES_set_encrypt_key(test_key,128,&encks);
435     AES_set_decrypt_key(test_key,128,&decks);

437     test_vector(vector_17,sizeof(vector_17));
438     test_vector(vector_31,sizeof(vector_31));
439     test_vector(vector_32,sizeof(vector_32));
440     test_vector(vector_47,sizeof(vector_47));
441     test_vector(vector_48,sizeof(vector_48));
442     test_vector(vector_64,sizeof(vector_64));

444     test_nistvector(vector_17,sizeof(vector_17));
445     test_nistvector(vector_31,sizeof(vector_31));
446     test_nistvector(vector_32,sizeof(vector_32));
447     test_nistvector(vector_47,sizeof(vector_47));
448     test_nistvector(vector_48,sizeof(vector_48));
449     test_nistvector(vector_64,sizeof(vector_64));

451     return 0;
452 }
453 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/modes/gcm128.c

1

```
*****
55995 Fri May 30 18:31:56 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/gcm128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 2010 The OpenSSL Project. All rights reserved.
3  *
4  * Redistribution and use in source and binary forms, with or without
5  * modification, are permitted provided that the following conditions
6  * are met:
7  *
8  * 1. Redistributions of source code must retain the above copyright
9  * notice, this list of conditions and the following disclaimer.
10 *
11 * 2. Redistributions in binary form must reproduce the above copyright
12 * notice, this list of conditions and the following disclaimer in
13 * the documentation and/or other materials provided with the
14 * distribution.
15 *
16 * 3. All advertising materials mentioning features or use of this
17 * software must display the following acknowledgment:
18 * "This product includes software developed by the OpenSSL Project
19 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
20 *
21 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
22 * endorse or promote products derived from this software without
23 * prior written permission. For written permission, please contact
24 * openssl-core@openssl.org.
25 *
26 * 5. Products derived from this software may not be called "OpenSSL"
27 * nor may "OpenSSL" appear in their names without prior written
28 * permission of the OpenSSL Project.
29 *
30 * 6. Redistributions of any form whatsoever must retain the following
31 * acknowledgment:
32 * "This product includes software developed by the OpenSSL Project
33 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
34 *
35 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
36 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
37 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
38 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
39 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
40 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
41 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
42 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
43 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
44 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 */
50 #define OPENSSL_FIPSAPI
52 #include <openssl/crypto.h>
53 #include "modes_lcl.h"
54 #include <string.h>
56 #ifndef MODES_DEBUG
57 #ifndef NDEBUG
58 #define NDEBUG
59 #endif
60 #endif
61 #include <assert.h>
```

new/usr/src/lib/openssl/libsunw_crypto/modes/gcm128.c

2

```
63 #if defined(BSWAP4) && defined(STRICT_ALIGNMENT)
64 /* redefine, because alignment is ensured */
65 #undef GETU32
66 #define GETU32(p)      BSWAP4(*(const u32 *) (p))
67 #undef PUTU32
68 #define PUTU32(p,v)    *(u32 *) (p) = BSWAP4(v)
69 #endif
71 #define PACK(s)        ((size_t)(s)<<(sizeof(size_t)*8-16))
72 #define REDUCE1BIT(V)  do { \
73     if (sizeof(size_t)==8) { \
74         u64 T = U64(0xe100000000000000) & (0-(V.lo&1)); \
75         V.lo = (V.hi<<63)|(V.lo>>1); \
76         V.hi = (V.hi>>1)^T; \
77     } \
78     else { \
79         u32 T = 0xe1000000U & (0-(u32)(V.lo&1)); \
80         V.lo = (V.hi<<63)|(V.lo>>1); \
81         V.hi = (V.hi>>1)^(u64)T<<32; \
82     } \
83 } while(0)
85 /*
86 * Even though permitted values for TABLE_BITS are 8, 4 and 1, it should
87 * never be set to 8. 8 is effectively reserved for testing purposes.
88 * TABLE_BITS>1 are lookup-table-driven implementations referred to as
89 * "Shoup's" in GCM specification. In other words OpenSSL does not cover
90 * whole spectrum of possible table driven implementations. Why? In
91 * non-"Shoup's" case memory access pattern is segmented in such manner,
92 * that it's trivial to see that cache timing information can reveal
93 * fair portion of intermediate hash value. Given that ciphertext is
94 * always available to attacker, it's possible for him to attempt to
95 * deduce secret parameter H and if successful, tamper with messages
96 * [which is nothing but trivial in CTR mode]. In "Shoup's" case it's
97 * not as trivial, but there is no reason to believe that it's resistant
98 * to cache-timing attack. And the thing about "8-bit" implementation is
99 * that it consumes 16 (sixteen) times more memory, 4KB per individual
100 * key + 1KB shared. Well, on pros side it should be twice as fast as
101 * "4-bit" version. And for gcc-generated x86[_64] code, "8-bit" version
102 * was observed to run ~75% faster, closer to 100% for commercial
103 * compilers... Yet "4-bit" procedure is preferred, because it's
104 * believed to provide better security-performance balance and adequate
105 * all-round performance. "All-round" refers to things like:
106 *
107 * - shorter setup time effectively improves overall timing for
108 *   handling short messages;
109 * - larger table allocation can become unbearable because of VM
110 *   subsystem penalties (for example on Windows large enough free
111 *   results in VM working set trimming, meaning that consequent
112 *   malloc would immediately incur working set expansion);
113 * - larger table has larger cache footprint, which can affect
114 *   performance of other code paths (not necessarily even from same
115 *   thread in Hyper-Threading world);
116 *
117 * Value of 1 is not appropriate for performance reasons.
118 */
119 #if TABLE_BITS==8
121 static void gcm_init_8bit(u128 Htable[256], u64 H[2])
122 {
123     int i, j;
124     u128 V;
126     Htable[0].hi = 0;
127     Htable[0].lo = 0;
```

```

128     v.hi = H[0];
129     v.lo = H[1];

131     for (Htable[128]=v, i=64; i>0; i>>=1) {
132         REDUCE1BIT(v);
133         Htable[i] = v;
134     }

136     for (i=2; i<256; i<=1) {
137         u128 *Hi = Htable+i, H0 = *Hi;
138         for (j=1; j<i; ++j) {
139             Hi[j].hi = H0.hi^Htable[j].hi;
140             Hi[j].lo = H0.lo^Htable[j].lo;
141         }
142     }
143 }

145 static void gcm_gmult_8bit(u64 Xi[2], const u128 Htable[256])
146 {
147     u128 Z = { 0, 0 };
148     const u8 *xi = (const u8 *)Xi+15;
149     size_t rem, n = *xi;
150     const union { long one; char little; } is_endian = {1};
151     static const size_t rem_8bit[256] = {
152         PACK(0x0000), PACK(0x01C2), PACK(0x0384), PACK(0x0246),
153         PACK(0x0708), PACK(0x06CA), PACK(0x048C), PACK(0x054E),
154         PACK(0x0E10), PACK(0x0FD2), PACK(0x0D94), PACK(0x0C56),
155         PACK(0x0918), PACK(0x08DA), PACK(0x0A9C), PACK(0x0B5E),
156         PACK(0x1C20), PACK(0x1DE2), PACK(0x1FA4), PACK(0x1E66),
157         PACK(0x1B28), PACK(0x1AEA), PACK(0x18AC), PACK(0x196E),
158         PACK(0x1230), PACK(0x13F2), PACK(0x11B4), PACK(0x1076),
159         PACK(0x1538), PACK(0x14FA), PACK(0x16BC), PACK(0x177E),
160         PACK(0x3840), PACK(0x3982), PACK(0x3BC4), PACK(0x3A06),
161         PACK(0x3F48), PACK(0x3E8A), PACK(0x3CCC), PACK(0x3D0E),
162         PACK(0x3650), PACK(0x3792), PACK(0x35D4), PACK(0x3416),
163         PACK(0x3158), PACK(0x309A), PACK(0x32DC), PACK(0x331E),
164         PACK(0x2460), PACK(0x25A2), PACK(0x27E4), PACK(0x2626),
165         PACK(0x2368), PACK(0x22AA), PACK(0x20EC), PACK(0x212E),
166         PACK(0x2A70), PACK(0x2BB2), PACK(0x29F4), PACK(0x2836),
167         PACK(0x2D78), PACK(0x2CBA), PACK(0x2EFC), PACK(0x2F3E),
168         PACK(0x7080), PACK(0x7142), PACK(0x7304), PACK(0x72C6),
169         PACK(0x7788), PACK(0x764A), PACK(0x740C), PACK(0x75CE),
170         PACK(0x7E90), PACK(0x7F52), PACK(0x7D14), PACK(0x7CD6),
171         PACK(0x7998), PACK(0x785A), PACK(0x7A1C), PACK(0x7BDE),
172         PACK(0x6CA0), PACK(0x6D62), PACK(0x6F24), PACK(0x6EE6),
173         PACK(0x6BA8), PACK(0x6A6A), PACK(0x682C), PACK(0x69EE),
174         PACK(0x62B0), PACK(0x6372), PACK(0x6134), PACK(0x60F6),
175         PACK(0x65B8), PACK(0x647A), PACK(0x663C), PACK(0x67FE),
176         PACK(0x48C0), PACK(0x4902), PACK(0x4B44), PACK(0x4A86),
177         PACK(0x4FC8), PACK(0x4E0A), PACK(0x4C4C), PACK(0x4D8E),
178         PACK(0x46D0), PACK(0x4712), PACK(0x4554), PACK(0x4496),
179         PACK(0x41D8), PACK(0x401A), PACK(0x425C), PACK(0x439E),
180         PACK(0x54E0), PACK(0x5522), PACK(0x5764), PACK(0x56A6),
181         PACK(0x53E8), PACK(0x522A), PACK(0x506C), PACK(0x51AE),
182         PACK(0x5AF0), PACK(0x5B32), PACK(0x5974), PACK(0x58B6),
183         PACK(0x5DF8), PACK(0x5C3A), PACK(0x5E7C), PACK(0x5FBE),
184         PACK(0xE100), PACK(0xE0C2), PACK(0xE284), PACK(0xE346),
185         PACK(0xE608), PACK(0xE7CA), PACK(0xE58C), PACK(0xE44E),
186         PACK(0xEF10), PACK(0xEED2), PACK(0xEC94), PACK(0xED56),
187         PACK(0xE818), PACK(0xE9DA), PACK(0xEB9C), PACK(0xEA5E),
188         PACK(0xFD20), PACK(0xFCF2), PACK(0xFEA4), PACK(0xFF66),
189         PACK(0xFA28), PACK(0xFBFA), PACK(0xF9AC), PACK(0xF86E),
190         PACK(0xF330), PACK(0xF2F2), PACK(0xF0B4), PACK(0xF176),
191         PACK(0xF438), PACK(0xF5FA), PACK(0xF7BC), PACK(0xF67E),
192         PACK(0xD940), PACK(0xD882), PACK(0xDAC4), PACK(0xDB06),
193         PACK(0xDE48), PACK(0xDF8A), PACK(0xDDCC), PACK(0xDC0E),

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194     PACK(0xD750), PACK(0xD692), PACK(0xD4D4), PACK(0xD516),
195     PACK(0xD058), PACK(0xD19A), PACK(0xD3DC), PACK(0xD21E),
196     PACK(0xC560), PACK(0xC4A2), PACK(0xC6E4), PACK(0xC726),
197     PACK(0xC268), PACK(0xC3AA), PACK(0xC1EC), PACK(0xC02E),
198     PACK(0xCB70), PACK(0xCAB2), PACK(0xC8F4), PACK(0xC936),
199     PACK(0xCC78), PACK(0xCDBA), PACK(0xCFFC), PACK(0xCE3E),
200     PACK(0x9180), PACK(0x9042), PACK(0x9204), PACK(0x93C6),
201     PACK(0x9688), PACK(0x974A), PACK(0x950C), PACK(0x94CE),
202     PACK(0x9F90), PACK(0x9E52), PACK(0x9C14), PACK(0x9DD6),
203     PACK(0x9898), PACK(0x995A), PACK(0x9B1C), PACK(0x9ADE),
204     PACK(0x8DA0), PACK(0x8C62), PACK(0x8E24), PACK(0x8FE6),
205     PACK(0x8AA8), PACK(0x8B6A), PACK(0x892C), PACK(0x88EE),
206     PACK(0x83B0), PACK(0x8272), PACK(0x8034), PACK(0x81F6),
207     PACK(0x84B8), PACK(0x857A), PACK(0x873C), PACK(0x86FE),
208     PACK(0xA9C0), PACK(0xA802), PACK(0xAA44), PACK(0xAB86),
209     PACK(0xAEC8), PACK(0xAF0A), PACK(0xAD4C), PACK(0xAC8E),
210     PACK(0xA7D0), PACK(0xA612), PACK(0xA454), PACK(0xA596),
211     PACK(0xA0D8), PACK(0xA11A), PACK(0xA35C), PACK(0xA29E),
212     PACK(0xB5E0), PACK(0xB422), PACK(0xB664), PACK(0xB7A6),
213     PACK(0xB2E8), PACK(0xB32A), PACK(0xB16C), PACK(0xB0AE),
214     PACK(0xBBF0), PACK(0xBA32), PACK(0xB874), PACK(0xB9B6),
215     PACK(0xBCF8), PACK(0xBD3A), PACK(0xBF7C), PACK(0xBEBE) };

217     while (1) {
218         Z.hi ^= Htable[n].hi;
219         Z.lo ^= Htable[n].lo;

221         if ((u8 *)Xi==xi) break;

223         n = *(--xi);

225         rem = (size_t)Z.lo&0xff;
226         Z.lo = (Z.hi<<56)|(Z.lo>>8);
227         Z.hi = (Z.hi>>8);
228         if (sizeof(size_t)==8)
229             Z.hi ^= rem_8bit[rem];
230         else
231             Z.hi ^= (u64)rem_8bit[rem]<<32;
232     }

234     if (is_endian.little) {
235 #ifdef BSWAP8
236         Xi[0] = BSWAP8(Z.hi);
237         Xi[1] = BSWAP8(Z.lo);
238 #else
239         u8 *p = (u8 *)Xi;
240         u32 v;
241         v = (u32)(Z.hi>>32); PUTU32(p,v);
242         v = (u32)(Z.hi); PUTU32(p+4,v);
243         v = (u32)(Z.lo>>32); PUTU32(p+8,v);
244         v = (u32)(Z.lo); PUTU32(p+12,v);
245 #endif
246     } else {
247         Xi[0] = Z.hi;
248         Xi[1] = Z.lo;
249     }
250 }
251 #define GCM_MUL(ctx,Xi) gcm_gmult_8bit(ctx->Xi,ctx->Htable)

254 #elif TABLE_BITS==4

256 static void gcm_init_4bit(u128 Htable[16], u64 H[2])
257 {
258     u128 v;
259 #if defined(OPENSSSL_SMALL_FOOTPRINT)

```

```

260     int i;
261 #endif

263     Htable[0].hi = 0;
264     Htable[0].lo = 0;
265     V.hi = H[0];
266     V.lo = H[1];

268 #if defined(OPENSSSL_SMALL_FOOTPRINT)
269     for (Htable[8]=V, i=4; i>0; i-->=1) {
270         REDUCE1BIT(V);
271         Htable[i] = V;
272     }

274     for (i=2; i<16; i-->=1) {
275         u128 *Hi = Htable+i;
276         int j;
277         for (V=*Hi, j=1; j<i; ++j) {
278             Hi[j].hi = V.hi^Htable[j].hi;
279             Hi[j].lo = V.lo^Htable[j].lo;
280         }
281     }
282 #else
283     Htable[8] = V;
284     REDUCE1BIT(V);
285     Htable[4] = V;
286     REDUCE1BIT(V);
287     Htable[2] = V;
288     REDUCE1BIT(V);
289     Htable[1] = V;
290     Htable[3].hi = V.hi^Htable[2].hi, Htable[3].lo = V.lo^Htable[2].lo;
291     V=Htable[4];
292     Htable[5].hi = V.hi^Htable[1].hi, Htable[5].lo = V.lo^Htable[1].lo;
293     Htable[6].hi = V.hi^Htable[2].hi, Htable[6].lo = V.lo^Htable[2].lo;
294     Htable[7].hi = V.hi^Htable[3].hi, Htable[7].lo = V.lo^Htable[3].lo;
295     V=Htable[8];
296     Htable[9].hi = V.hi^Htable[1].hi, Htable[9].lo = V.lo^Htable[1].lo;
297     Htable[10].hi = V.hi^Htable[2].hi, Htable[10].lo = V.lo^Htable[2].lo;
298     Htable[11].hi = V.hi^Htable[3].hi, Htable[11].lo = V.lo^Htable[3].lo;
299     Htable[12].hi = V.hi^Htable[4].hi, Htable[12].lo = V.lo^Htable[4].lo;
300     Htable[13].hi = V.hi^Htable[5].hi, Htable[13].lo = V.lo^Htable[5].lo;
301     Htable[14].hi = V.hi^Htable[6].hi, Htable[14].lo = V.lo^Htable[6].lo;
302     Htable[15].hi = V.hi^Htable[7].hi, Htable[15].lo = V.lo^Htable[7].lo;
303 #endif
304 #if defined(GHASH_ASM) && (defined(__arm__) || defined(__arm))
305     /*
306      * ARM assembler expects specific dword order in Htable.
307      */
308     {
309         int j;
310         const union { long one; char little; } is_endian = {1};

312         if (is_endian.little)
313             for (j=0; j<16; ++j) {
314                 V = Htable[j];
315                 Htable[j].hi = V.lo;
316                 Htable[j].lo = V.hi;
317             }
318         else
319             for (j=0; j<16; ++j) {
320                 V = Htable[j];
321                 Htable[j].hi = V.lo<<32|V.lo>>32;
322                 Htable[j].lo = V.hi<<32|V.hi>>32;
323             }
324     }
325 #endif

```

```

326 }

328 #ifndef GHASH_ASM
329 static const size_t rem_4bit[16] = {
330     PACK(0x0000), PACK(0x1C20), PACK(0x3840), PACK(0x2460),
331     PACK(0x7080), PACK(0x6CA0), PACK(0x48C0), PACK(0x54E0),
332     PACK(0xE100), PACK(0xFD20), PACK(0xD940), PACK(0xC560),
333     PACK(0x9180), PACK(0x8DA0), PACK(0xA9C0), PACK(0xB5E0) };
334 #endif

335 static void gcm_gmult_4bit(u64 Xi[2], const u128 Htable[16])
336 {
337     u128 Z;
338     int cnt = 15;
339     size_t rem, nlo, nhi;
340     const union { long one; char little; } is_endian = {1};

342     nlo = ((const u8 *)Xi)[15];
343     nhi = nlo>>4;
344     nlo &= 0xf;

346     Z.hi = Htable[nlo].hi;
347     Z.lo = Htable[nlo].lo;

349     while (1) {
350         rem = (size_t)Z.lo&0xf;
351         Z.lo = (Z.hi<<60)|(Z.lo>>4);
352         Z.hi = (Z.hi>>4);
353         if (sizeof(size_t)==8)
354             Z.hi ^= rem_4bit[rem];
355         else
356             Z.hi ^= (u64)rem_4bit[rem]<<32;

358         Z.hi ^= Htable[nhi].hi;
359         Z.lo ^= Htable[nhi].lo;

361         if (--cnt<0) break;

363         nlo = ((const u8 *)Xi)[cnt];
364         nhi = nlo>>4;
365         nlo &= 0xf;

367         rem = (size_t)Z.lo&0xf;
368         Z.lo = (Z.hi<<60)|(Z.lo>>4);
369         Z.hi = (Z.hi>>4);
370         if (sizeof(size_t)==8)
371             Z.hi ^= rem_4bit[rem];
372         else
373             Z.hi ^= (u64)rem_4bit[rem]<<32;

375         Z.hi ^= Htable[nlo].hi;
376         Z.lo ^= Htable[nlo].lo;
377     }

379     if (is_endian.little) {
380 #ifdef BSWAP8
381         Xi[0] = BSWAP8(Z.hi);
382         Xi[1] = BSWAP8(Z.lo);
383 #else
384         u8 *p = (u8 *)Xi;
385         u32 v;
386         v = (u32)(Z.hi>>32); PUTU32(p,v);
387         v = (u32)(Z.hi); PUTU32(p+4,v);
388         v = (u32)(Z.lo>>32); PUTU32(p+8,v);
389         v = (u32)(Z.lo); PUTU32(p+12,v);
390 #endif
391     }

```

```

392     else {
393         Xi[0] = Z.hi;
394         Xi[1] = Z.lo;
395     }
396 }

398 #if !defined(OPENSSSL_SMALL_FOOTPRINT)
399 /*
400  * Streamed gcm_mult_4bit, see CRYPTO_gcm128_[en|de]crypt for
401  * details... Compiler-generated code doesn't seem to give any
402  * performance improvement, at least not on x86[_64]. It's here
403  * mostly as reference and a placeholder for possible future
404  * non-trivial optimization[s]...
405  */
406 static void gcm_ghash_4bit(u64 Xi[2], const u128 Htable[16],
407                          const u8 *inp, size_t len)
408 {
409     u128 Z;
410     int cnt;
411     size_t rem, nlo, nhi;
412     const union { long one; char little; } is_endian = {1};

414 #if 1
415     do {
416         cnt = 15;
417         nlo = ((const u8 *)Xi)[15];
418         nlo ^= inp[15];
419         nhi = nlo>>4;
420         nlo &= 0xf;

422         Z.hi = Htable[nlo].hi;
423         Z.lo = Htable[nlo].lo;

425         while (1) {
426             rem = (size_t)Z.lo&0xf;
427             Z.lo = (Z.hi<<60)|(Z.lo>>4);
428             Z.hi = (Z.hi>>4);
429             if (sizeof(size_t)==8)
430                 Z.hi ^= rem_4bit[rem];
431             else
432                 Z.hi ^= (u64)rem_4bit[rem]<<32;

434             Z.hi ^= Htable[nhi].hi;
435             Z.lo ^= Htable[nhi].lo;

437             if (--cnt<0)                break;

439             nlo = ((const u8 *)Xi)[cnt];
440             nlo ^= inp[cnt];
441             nhi = nlo>>4;
442             nlo &= 0xf;

444             rem = (size_t)Z.lo&0xf;
445             Z.lo = (Z.hi<<60)|(Z.lo>>4);
446             Z.hi = (Z.hi>>4);
447             if (sizeof(size_t)==8)
448                 Z.hi ^= rem_4bit[rem];
449             else
450                 Z.hi ^= (u64)rem_4bit[rem]<<32;

452             Z.hi ^= Htable[nlo].hi;
453             Z.lo ^= Htable[nlo].lo;
454         }
455     #else
456     /*
457     * Extra 256+16 bytes per-key plus 512 bytes shared tables

```

```

458     * [should] give ~50% improvement... One could have PACK()-ed
459     * the rem_8bit even here, but the priority is to minimize
460     * cache footprint...
461     */
462     u128 Hshr4[16]; /* Htable shifted right by 4 bits */
463     u8 Hshl4[16]; /* Htable shifted left by 4 bits */
464     static const unsigned short rem_8bit[256] = {
465         0x0000, 0x01C2, 0x0384, 0x0246, 0x0708, 0x06CA, 0x048C, 0x054E,
466         0x0E10, 0x0FD2, 0x0D94, 0x0C56, 0x0918, 0x08DA, 0x0A9C, 0x0B5E,
467         0x1C20, 0x1DE2, 0x1FA4, 0x1E66, 0x1B28, 0x1AEA, 0x18AC, 0x196E,
468         0x1230, 0x13F2, 0x11B4, 0x1076, 0x1538, 0x14FA, 0x16BC, 0x177E,
469         0x3840, 0x3982, 0x3BC4, 0x3A06, 0x3F48, 0x3E8A, 0x3CCC, 0x3D0E,
470         0x3650, 0x3792, 0x35D4, 0x3416, 0x3158, 0x309A, 0x32DC, 0x331E,
471         0x2460, 0x25A2, 0x27E4, 0x2626, 0x2368, 0x22AA, 0x20EC, 0x212E,
472         0x2A70, 0x2BB2, 0x29F4, 0x2836, 0x2D78, 0x2CBA, 0x2EFC, 0x2F3E,
473         0x7080, 0x7142, 0x7304, 0x72C6, 0x7788, 0x764A, 0x740C, 0x75CE,
474         0x7E90, 0x7F52, 0x7D14, 0x7CD6, 0x7998, 0x785A, 0x7A1C, 0x7BDE,
475         0x6CA0, 0x6D62, 0x6F24, 0x6EE6, 0x6BA8, 0x6A6A, 0x682C, 0x69EE,
476         0x62B0, 0x6372, 0x6134, 0x60F6, 0x65B8, 0x647A, 0x663C, 0x67FE,
477         0x48C0, 0x4902, 0x4B44, 0x4A86, 0x4FC8, 0x4E0A, 0x4C4C, 0x4D8E,
478         0x46D0, 0x4712, 0x4554, 0x4496, 0x41D8, 0x401A, 0x425C, 0x439E,
479         0x54E0, 0x5522, 0x5764, 0x56A6, 0x53E8, 0x522A, 0x506C, 0x51AE,
480         0x5AF0, 0x5B32, 0x5974, 0x58B6, 0x5DF8, 0x5C3A, 0x5E7C, 0x5FBE,
481         0xE100, 0xE0C2, 0xE284, 0xE346, 0xE608, 0xE7CA, 0xE58C, 0xE44E,
482         0xEF10, 0xEED2, 0xEC94, 0xED56, 0xEA18, 0xE9DA, 0xEB9C, 0xEA5E,
483         0xFD20, 0xFCE2, 0xFEA4, 0xFF66, 0xFA8B, 0xFBEA, 0xF9AC, 0xF86E,
484         0xF330, 0xF2F2, 0xF0B4, 0xF176, 0xF438, 0xF5FA, 0xF7BC, 0xF67E,
485         0xD940, 0xD882, 0xDAC4, 0xDB06, 0xDE48, 0xDF8A, 0xDDCC, 0xDC0E,
486         0xD750, 0xD692, 0xD4D4, 0xD516, 0xD058, 0xD19A, 0xD3DC, 0xD21E,
487         0xC560, 0xC4A2, 0xC6E4, 0xC726, 0xC268, 0xC3AA, 0xC1EC, 0xC02E,
488         0xCB70, 0xCAB2, 0xC8F4, 0xC936, 0xCC78, 0xCDBA, 0xCFFC, 0xCE3E,
489         0x9180, 0x9042, 0x9204, 0x93C6, 0x9688, 0x974A, 0x950C, 0x94CE,
490         0x9F90, 0x9E52, 0x9C14, 0x9DD6, 0x9898, 0x995A, 0x9B1C, 0x9ADE,
491         0x8DA0, 0x8C62, 0x8E24, 0x8FE6, 0x8AA8, 0x8B6A, 0x892C, 0x88EE,
492         0x83B0, 0x8272, 0x8034, 0x8034, 0x81F6, 0x84B8, 0x857A, 0x873C, 0x86FE,
493         0xA9C0, 0xA802, 0xAA44, 0xAB86, 0xAEC8, 0xAF0A, 0xAD4C, 0xAC8E,
494         0xA7D0, 0xA612, 0xA454, 0xA596, 0xA0D8, 0xA11A, 0xA35C, 0xA29E,
495         0xB5E0, 0xB422, 0xB664, 0xB7A6, 0xB2E8, 0xB32A, 0xB16C, 0xB0AE,
496         0xBBF0, 0xBA32, 0xB874, 0xB9B6, 0xBCF8, 0xBD3A, 0xBF7C, 0xBEBE };
497
498     /*
499     * This pre-processing phase slows down procedure by approximately
500     * same time as it makes each loop spin faster. In other words
501     * single block performance is approximately same as straightforward
502     * "4-bit" implementation, and then it goes only faster...
503     */
504     for (cnt=0; cnt<16; ++cnt) {
505         Z.hi = Htable[cnt].hi;
506         Z.lo = Htable[cnt].lo;
507         Hshr4[cnt].lo = (Z.hi<<60)|(Z.lo>>4);
508         Hshr4[cnt].hi = (Z.hi>>4);
509         Hshl4[cnt] = (u8)(Z.lo<<4);
510     }

512     do {
513         for (Z.lo=0, Z.hi=0, cnt=15; cnt; --cnt) {
514             nlo = ((const u8 *)Xi)[cnt];
515             nlo ^= inp[cnt];
516             nhi = nlo>>4;
517             nlo &= 0xf;

519             Z.hi ^= Htable[nlo].hi;
520             Z.lo ^= Htable[nlo].lo;

522             rem = (size_t)Z.lo&0xf;

524             Z.lo = (Z.hi<<56)|(Z.lo>>8);

```

```

524         Z.hi = (Z.hi>>8);

526         Z.hi ^= Hshr4[nhi].hi;
527         Z.lo ^= Hshr4[nhi].lo;
528         Z.hi ^= (u64)rem_8bit[rem^Hshl4[nhi]]<<48;
529     }

531     nlo = ((const u8 *)Xi)[0];
532     nlo ^= inp[0];
533     nhi = nlo>>4;
534     nlo &= 0xf;

536     Z.hi ^= Htable[nlo].hi;
537     Z.lo ^= Htable[nlo].lo;

539     rem = (size_t)Z.lo&0xf;

541     Z.lo = (Z.hi<<60)|(Z.lo>>4);
542     Z.hi = (Z.hi>>4);

544     Z.hi ^= Htable[nhi].hi;
545     Z.lo ^= Htable[nhi].lo;
546     Z.hi ^= ((u64)rem_8bit[rem<<4])<<48;
547 #endif

549     if (is_endian.little) {
550 #ifdef BSWAP8
551         Xi[0] = BSWAP8(Z.hi);
552         Xi[1] = BSWAP8(Z.lo);
553 #else
554         u8 *p = (u8 *)Xi;
555         u32 v;
556         v = (u32)(Z.hi>>32);    PUTU32(p,v);
557         v = (u32)(Z.hi);        PUTU32(p+4,v);
558         v = (u32)(Z.lo>>32);    PUTU32(p+8,v);
559         v = (u32)(Z.lo);        PUTU32(p+12,v);
560 #endif
561     }
562     else {
563         Xi[0] = Z.hi;
564         Xi[1] = Z.lo;
565     }
566     } while (inp+=16, len-=16);
567 }
568 #endif
569 #else
570 void gcm_gmult_4bit(u64 Xi[2],const u128 Htable[16]);
571 void gcm_ghash_4bit(u64 Xi[2],const u128 Htable[16],const u8 *inp,size_t len);
572 #endif

574 #define GCM_MUL(ctx,Xi)    gcm_gmult_4bit(ctx->Xi.u,ctx->Htable)
575 #if defined(GHASH_ASM) || !defined(OPENSSL_SMALL_FOOTPRINT)
576 #define GHASH(ctx,in,len) gcm_ghash_4bit((ctx->Xi.u,(ctx->Htable,in,len)
577 /* GHASH_CHUNK is "stride parameter" missioned to mitigate cache
578 * trashing effect. In other words idea is to hash data while it's
579 * still in L1 cache after encryption pass... */
580 #define GHASH_CHUNK      (3*1024)
581 #endif

583 #else /* TABLE_BITS */

585 static void gcm_gmult_1bit(u64 Xi[2],const u64 H[2])
586 {
587     u128 V,Z = { 0,0 };
588     long X;
589     int i,j;

```

```

590     const long *xi = (const long *)Xi;
591     const union { long one; char little; } is_endian = {1};

593     V.hi = H[0];    /* H is in host byte order, no byte swapping */
594     V.lo = H[1];

596     for (j=0; j<16/sizeof(long); ++j) {
597         if (is_endian.little) {
598             if (sizeof(long)==8) {
599 #ifdef BSWAP8
600                 X = (long)(BSWAP8(xi[j]));
601 #else
602                 const u8 *p = (const u8 *)xi[j];
603                 X = (long)((u64)GETU32(p)<<32|GETU32(p+4));
604 #endif
605             }
606             else {
607                 const u8 *p = (const u8 *)xi[j];
608                 X = (long)GETU32(p);
609             }
610         }
611         else
612             X = xi[j];

614         for (i=0; i<8*sizeof(long); ++i, X<=1) {
615             u64 M = (u64)(X>>(8*sizeof(long)-1));
616             Z.hi ^= V.hi&M;
617             Z.lo ^= V.lo&M;

619             REDUCE1BIT(V);
620         }
621     }

623     if (is_endian.little) {
624 #ifdef BSWAP8
625         Xi[0] = BSWAP8(Z.hi);
626         Xi[1] = BSWAP8(Z.lo);
627 #else
628         u8 *p = (u8 *)Xi;
629         u32 v;
630         v = (u32)(Z.hi>>32);    PUTU32(p,v);
631         v = (u32)(Z.hi);        PUTU32(p+4,v);
632         v = (u32)(Z.lo>>32);    PUTU32(p+8,v);
633         v = (u32)(Z.lo);        PUTU32(p+12,v);
634 #endif
635     }
636     else {
637         Xi[0] = Z.hi;
638         Xi[1] = Z.lo;
639     }
640 }
641 #define GCM_MUL(ctx,Xi)    gcm_gmult_1bit(ctx->Xi.u,ctx->H.u)

643 #endif

645 #if TABLE_BITS==4 && defined(GHASH_ASM)
646 # if !defined(I386_ONLY) && \
647     (defined(__i386) || defined(__i386__) || \
648      defined(__x86_64) || defined(__x86_64__) || \
649      defined(_M_IX86) || defined(_M_AMD64) || defined(_M_X64))
650 #  define GHASH_ASM_X86_OR_64
651 #  define GCM_FUNCREF_4BIT
652 extern unsigned int OPENSSL_ia32cap_P[2];

654 void gcm_init_clmul(u128 Htable[16],const u64 Xi[2]);
655 void gcm_gmult_clmul(u64 Xi[2],const u128 Htable[16]);

```

```

656 void gcm_ghash_clmul(u64 Xi[2], const u128 Htable[16], const u8 *inp, size_t len);

658 # if defined(__i386) || defined(__i386__) || defined(_M_IX86)
659 #   define GHASH_ASM_X86
660 void gcm_gmult_4bit_mmx(u64 Xi[2], const u128 Htable[16]);
661 void gcm_ghash_4bit_mmx(u64 Xi[2], const u128 Htable[16], const u8 *inp, size_t len)

663 void gcm_gmult_4bit_x86(u64 Xi[2], const u128 Htable[16]);
664 void gcm_ghash_4bit_x86(u64 Xi[2], const u128 Htable[16], const u8 *inp, size_t len)
665 # endif
666 # elif defined(__arm__) || defined(__arm)
667 #   include "arm_arch.h"
668 #   if __ARM_ARCH__ >= 7
669 #     define GHASH_ASM_ARM
670 #     define GCM_FUNCREF_4BIT
671 void gcm_gmult_neon(u64 Xi[2], const u128 Htable[16]);
672 void gcm_ghash_neon(u64 Xi[2], const u128 Htable[16], const u8 *inp, size_t len);
673 #   endif
674 # endif
675 #endif

677 #ifdef GCM_FUNCREF_4BIT
678 #   undef GCM_MUL
679 #   define GCM_MUL(ctx, Xi)      (*gcm_gmult_p)(ctx->Xi.u, ctx->Htable)
680 #   undef GHASH
681 #   undef GHASH
682 #   define GHASH(ctx, in, len)  (*gcm_ghash_p)(ctx->Xi.u, ctx->Htable, in, len)
683 #   endif
684 #endif

686 void CRYPTO_gcm128_init(GCM128_CONTEXT *ctx, void *key, block128_f block)
687 {
688     const union { long one; char little; } is_endian = {1};

690     memset(ctx, 0, sizeof(*ctx));
691     ctx->block = block;
692     ctx->key = key;

694     (*block)(ctx->H.c, ctx->H.c, key);

696     if (is_endian.little) {
697         /* H is stored in host byte order */
698 #ifdef BSWAP8
699         ctx->H.u[0] = BSWAP8(ctx->H.u[0]);
700         ctx->H.u[1] = BSWAP8(ctx->H.u[1]);
701 #else
702         u8 *p = ctx->H.c;
703         u64 hi, lo;
704         hi = (u64)GETU32(p) << 32 | GETU32(p+4);
705         lo = (u64)GETU32(p+8) << 32 | GETU32(p+12);
706         ctx->H.u[0] = hi;
707         ctx->H.u[1] = lo;
708 #endif
709     }

711 #if TABLE_BITS==8
712     gcm_init_8bit(ctx->Htable, ctx->H.u);
713 #elif TABLE_BITS==4
714 #   if defined(GHASH_ASM_X86_OR_64)
715 #     if !defined(GHASH_ASM_X86) || defined(OPENSSL_IA32_SSE2)
716         if (OPENSSL_ia32cap_P[0] & (1<<24)) && /* check FXSR bit */
717             OPENSSL_ia32cap_P[1] & (1<<1) ) { /* check PCLMULQDQ bit */
718             gcm_init_clmul(ctx->Htable, ctx->H.u);
719             ctx->gmult = gcm_gmult_clmul;
720             ctx->ghash = gcm_ghash_clmul;
721             return;

```

```

722     }
723 #   endif
724     gcm_init_4bit(ctx->Htable, ctx->H.u);
725 #   if defined(GHASH_ASM_X86) /* x86 only */
726 #     if defined(OPENSSL_IA32_SSE2)
727         if (OPENSSL_ia32cap_P[0] & (1<<25)) { /* check SSE bit */
728 #         else
729             if (OPENSSL_ia32cap_P[0] & (1<<23)) { /* check MMX bit */
730 #         endif
731             ctx->gmult = gcm_gmult_4bit_mmx;
732             ctx->ghash = gcm_ghash_4bit_mmx;
733         } else {
734             ctx->gmult = gcm_gmult_4bit_x86;
735             ctx->ghash = gcm_ghash_4bit_x86;
736         }
737 #     else
738         ctx->gmult = gcm_gmult_4bit;
739         ctx->ghash = gcm_ghash_4bit;
740 #     endif
741 #   elif defined(GHASH_ASM_ARM)
742     if (OPENSSL_armcap_P & ARMV7_NEON) {
743         ctx->gmult = gcm_gmult_neon;
744         ctx->ghash = gcm_ghash_neon;
745     } else {
746         gcm_init_4bit(ctx->Htable, ctx->H.u);
747         ctx->gmult = gcm_gmult_4bit;
748         ctx->ghash = gcm_ghash_4bit;
749     }
750 #   else
751     gcm_init_4bit(ctx->Htable, ctx->H.u);
752 #   endif
753 #endif
754 }

756 void CRYPTO_gcm128_setiv(GCM128_CONTEXT *ctx, const unsigned char *iv, size_t len)
757 {
758     const union { long one; char little; } is_endian = {1};
759     unsigned int ctr;
760 #ifdef GCM_FUNCREF_4BIT
761     void (*gcm_gmult_p)(u64 Xi[2], const u128 Htable[16]) = ctx->gmult;
762 #endif

764     ctx->Yi.u[0] = 0;
765     ctx->Yi.u[1] = 0;
766     ctx->Xi.u[0] = 0;
767     ctx->Xi.u[1] = 0;
768     ctx->len.u[0] = 0; /* AAD length */
769     ctx->len.u[1] = 0; /* message length */
770     ctx->ares = 0;
771     ctx->mres = 0;

773     if (len==12) {
774         memcpy(ctx->Yi.c, iv, 12);
775         ctx->Yi.c[15]=1;
776         ctr=1;
777     }
778     else {
779         size_t i;
780         u64 len0 = len;

782         while (len>=16) {
783             for (i=0; i<16; ++i) ctx->Yi.c[i] ^= iv[i];
784             GCM_MUL(ctx, Yi);
785             iv += 16;
786             len -= 16;
787         }

```

```

788     if (len) {
789         for (i=0; i<len; ++i) ctx->Yi.c[i] ^= iv[i];
790         GCM_MUL(ctx,Yi);
791     }
792     len0 <= 3;
793     if (is_endian.little) {
794 #ifdef BSWAP8
795         ctx->Yi.u[1] ^= BSWAP8(len0);
796 #else
797         ctx->Yi.c[8] ^= (u8)(len0>>56);
798         ctx->Yi.c[9] ^= (u8)(len0>>48);
799         ctx->Yi.c[10] ^= (u8)(len0>>40);
800         ctx->Yi.c[11] ^= (u8)(len0>>32);
801         ctx->Yi.c[12] ^= (u8)(len0>>24);
802         ctx->Yi.c[13] ^= (u8)(len0>>16);
803         ctx->Yi.c[14] ^= (u8)(len0>>8);
804         ctx->Yi.c[15] ^= (u8)(len0);
805 #endif
806     }
807     else
808         ctx->Yi.u[1] ^= len0;
809
810     GCM_MUL(ctx,Yi);
811
812     if (is_endian.little)
813 #ifdef BSWAP4
814         ctr = BSWAP4(ctx->Yi.d[3]);
815 #else
816         ctr = GETU32(ctx->Yi.c+12);
817 #endif
818     else
819         ctr = ctx->Yi.d[3];
820 }
821
822 (*ctx->block)(ctx->Yi.c,ctx->EK0.c,ctx->key);
823 ++ctr;
824 if (is_endian.little)
825 #ifdef BSWAP4
826     ctx->Yi.d[3] = BSWAP4(ctr);
827 #else
828     PUTU32(ctx->Yi.c+12,ctr);
829 #endif
830 else
831     ctx->Yi.d[3] = ctr;
832 }
833
834 int CRYPTO_gcm128_aad(GCM128_CONTEXT *ctx,const unsigned char *aad,size_t len)
835 {
836     size_t i;
837     unsigned int n;
838     u64 alen = ctx->len.u[0];
839 #ifdef GCM_FUNCREF_4BIT
840     void (*gcm_gmult_p)(u64 Xi[2],const u128 Htable[16]) = ctx->gmult;
841 # ifdef GHASH
842     void (*gcm_ghash_p)(u64 Xi[2],const u128 Htable[16],
843         const u8 *inp,size_t len) = ctx->ghash;
844 # endif
845 #endif
846
847     if (ctx->len.u[1]) return -2;
848
849     alen += len;
850     if (alen>(U64(1)<<61) || (sizeof(len)==8 && alen<len))
851         return -1;
852     ctx->len.u[0] = alen;

```

```

854     n = ctx->ares;
855     if (n) {
856         while (n && len) {
857             ctx->Xi.c[n] ^= *(aad++);
858             --len;
859             n = (n+1)%16;
860         }
861         if (n==0) GCM_MUL(ctx,Xi);
862         else {
863             ctx->ares = n;
864             return 0;
865         }
866     }
867
868 #ifdef GHASH
869     if ((i = (len&(size_t)-16))) {
870         GHASH(ctx,aad,i);
871         aad += i;
872         len -= i;
873     }
874 #else
875     while (len>=16) {
876         for (i=0; i<16; ++i) ctx->Xi.c[i] ^= aad[i];
877         GCM_MUL(ctx,Xi);
878         aad += 16;
879         len -= 16;
880     }
881 #endif
882     if (len) {
883         n = (unsigned int)len;
884         for (i=0; i<len; ++i) ctx->Xi.c[i] ^= aad[i];
885     }
886
887     ctx->ares = n;
888     return 0;
889 }
890
891 int CRYPTO_gcm128_encrypt(GCM128_CONTEXT *ctx,
892     const unsigned char *in, unsigned char *out,
893     size_t len)
894 {
895     const union { long one; char little; } is_endian = {1};
896     unsigned int n, ctr;
897     size_t i;
898     u64 mlen = ctx->len.u[1];
899     block128_f block = ctx->block;
900     void *key = ctx->key;
901 #ifdef GCM_FUNCREF_4BIT
902     void (*gcm_gmult_p)(u64 Xi[2],const u128 Htable[16]) = ctx->gmult;
903 # ifdef GHASH
904     void (*gcm_ghash_p)(u64 Xi[2],const u128 Htable[16],
905         const u8 *inp,size_t len) = ctx->ghash;
906 # endif
907 #endif
908
909     if 0
910     n = (unsigned int)mlen%16; /* alternative to ctx->mres */
911 #endif
912     mlen += len;
913     if (mlen>((U64(1)<<36)-32) || (sizeof(len)==8 && mlen<len))
914         return -1;
915     ctx->len.u[1] = mlen;
916
917     if (ctx->ares) {
918         /* First call to encrypt finalizes GHASH(AAD) */
919         GCM_MUL(ctx,Xi);

```



```

920         ctx->ares = 0;
921     }
922
923     if (is_endian.little)
924 #ifdef BSWAP4
925         ctr = BSWAP4(ctx->Yi.d[3]);
926 #else
927         ctr = GETU32(ctx->Yi.c+12);
928 #endif
929     else
930         ctr = ctx->Yi.d[3];
931
932     n = ctx->mres;
933 #if !defined(OPENSSL_SMALL_FOOTPRINT)
934     if (16*sizeof(size_t) == 0) do { /* always true actually */
935         if (n) {
936             while (n && len) {
937                 ctx->Xi.c[n] ^= *(out++) = *(in++)^ctx->EKi.c[n];
938                 --len;
939                 n = (n+1)%16;
940             }
941             if (n==0) GCM_MUL(ctx, Xi);
942             else {
943                 ctx->mres = n;
944                 return 0;
945             }
946         }
947 #if defined(STRICT_ALIGNMENT)
948         if (((size_t)in|(size_t)out)%sizeof(size_t) != 0)
949             break;
950 #endif
951 #if defined(GHASH) && defined(GHASH_CHUNK)
952         while (len>=GHASH_CHUNK) {
953             size_t j=GHASH_CHUNK;
954
955             while (j) {
956                 size_t *out_t=(size_t *)out;
957                 const size_t *in_t=(const size_t *)in;
958
959                 (*block)(ctx->Yi.c, ctx->EKi.c, key);
960                 ++ctr;
961                 if (is_endian.little)
962                     ctx->Yi.d[3] = BSWAP4(ctr);
963                 PUTU32(ctx->Yi.c+12, ctr);
964             }
965             else
966                 ctx->Yi.d[3] = ctr;
967             for (i=0; i<16/sizeof(size_t); ++i)
968                 out_t[i] = in_t[i] ^ ctx->EKi.t[i];
969             out += 16;
970             in += 16;
971             j -= 16;
972         }
973         GHASH(ctx, out-GHASH_CHUNK, GHASH_CHUNK);
974         len -= GHASH_CHUNK;
975     }
976     if ((i = (len&(size_t)-16))) {
977         size_t j=i;
978
979         while (len>=16) {
980             size_t *out_t=(size_t *)out;
981             const size_t *in_t=(const size_t *)in;
982
983             (*block)(ctx->Yi.c, ctx->EKi.c, key);

```

```

986         ++ctr;
987         if (is_endian.little)
988             ctx->Yi.d[3] = BSWAP4(ctr);
989         PUTU32(ctx->Yi.c+12, ctr);
990     }
991     else
992         ctx->Yi.d[3] = ctr;
993     for (i=0; i<16/sizeof(size_t); ++i)
994         out_t[i] = in_t[i] ^ ctx->EKi.t[i];
995     out += 16;
996     in += 16;
997     len -= 16;
998     }
999     GHASH(ctx, out-j, j);
1000 }
1001 #endif
1002 #else
1003 while (len>=16) {
1004     size_t *out_t=(size_t *)out;
1005     const size_t *in_t=(const size_t *)in;
1006
1007     (*block)(ctx->Yi.c, ctx->EKi.c, key);
1008     ++ctr;
1009     if (is_endian.little)
1010         ctx->Yi.d[3] = BSWAP4(ctr);
1011     PUTU32(ctx->Yi.c+12, ctr);
1012     else
1013         ctx->Yi.d[3] = ctr;
1014     for (i=0; i<16/sizeof(size_t); ++i)
1015         out_t[i] = in_t[i] ^ ctx->EKi.t[i];
1016     GCM_MUL(ctx, Xi);
1017     out += 16;
1018     in += 16;
1019     len -= 16;
1020 }
1021 #endif
1022 if (len) {
1023     (*block)(ctx->Yi.c, ctx->EKi.c, key);
1024     ++ctr;
1025     if (is_endian.little)
1026         ctx->Yi.d[3] = BSWAP4(ctr);
1027     PUTU32(ctx->Yi.c+12, ctr);
1028     else
1029         ctx->Yi.d[3] = ctr;
1030     while (len--) {
1031         ctx->Xi.c[n] ^= out[n] = in[n]^ctx->EKi.c[n];
1032         ++n;
1033     }
1034     ctx->mres = n;
1035     return 0;
1036 } while(0);
1037 #endif
1038 for (i=0; i<len; ++i) {
1039     if (n==0) {
1040         (*block)(ctx->Yi.c, ctx->EKi.c, key);
1041         ++ctr;

```

```

1052         if (is_endian.little)
1053             ctx->Yi.d[3] = BSWAP4(ctr);
1054         #ifdef BSWAP4
1055             else
1056                 PUTU32(ctx->Yi.c+12,ctr);
1057         #endif
1058         else
1059             ctx->Yi.d[3] = ctr;
1060     }
1061     ctx->Xi.c[n] ^= out[i] = in[i]^ctx->EKi.c[n];
1062     n = (n+1)%16;
1063     if (n==0)
1064         GCM_MUL(ctx,Xi);
1065 }
1067 ctx->mres = n;
1068 return 0;
1069 }

1071 int CRYPTO_gcm128_decrypt(GCM128_CONTEXT *ctx,
1072     const unsigned char *in, unsigned char *out,
1073     size_t len)
1074 {
1075     const union { long one; char little; } is_endian = {1};
1076     unsigned int n, ctr;
1077     size_t i;
1078     u64 mlen = ctx->len.u[1];
1079     block128_f block = ctx->block;
1080     void *key = ctx->key;
1081     #ifdef GCM_FUNCREF_4BIT
1082     void (*gcm_gmult_p)(u64 Xi[2],const u128 Htable[16]) = ctx->gmult;
1083     # ifdef GHASH
1084     void (*gcm_ghash_p)(u64 Xi[2],const u128 Htable[16],
1085         const u8 *inp,size_t len) = ctx->ghash;
1086     # endif
1087     #endif

1089     mlen += len;
1090     if (mlen>((U64(1)<<36)-32) || (sizeof(len)==8 && mlen<len))
1091         return -1;
1092     ctx->len.u[1] = mlen;

1094     if (ctx->ares) {
1095         /* First call to decrypt finalizes GHASH(AAD) */
1096         GCM_MUL(ctx,Xi);
1097         ctx->ares = 0;
1098     }

1100     if (is_endian.little)
1101     #ifdef BSWAP4
1102         ctr = BSWAP4(ctx->Yi.d[3]);
1103     #else
1104         ctr = GETU32(ctx->Yi.c+12);
1105     #endif
1106     else
1107         ctr = ctx->Yi.d[3];

1109     n = ctx->mres;
1110     #if !defined(OPENSSL_SMALL_FOOTPRINT)
1111     if (16*sizeof(size_t) == 0) do { /* always true actually */
1112         if (n) {
1113             while (n && len) {
1114                 u8 c = *(in++);
1115                 *(out++) = c^ctx->EKi.c[n];
1116                 ctx->Xi.c[n] ^= c;
1117                 --len;

```

```

1118         n = (n+1)%16;
1119     }
1120     if (n==0) GCM_MUL(ctx,Xi);
1121     else {
1122         ctx->mres = n;
1123         return 0;
1124     }
1125 }
1126 #if defined(STRICT_ALIGNMENT)
1127 if (((size_t)in|(size_t)out)%sizeof(size_t) != 0)
1128     break;
1129 #endif
1130 #if defined(GHASH) && defined(GHASH_CHUNK)
1131 while (len>=GHASH_CHUNK) {
1132     size_t j=GHASH_CHUNK;

1134     GHASH(ctx,in,GHASH_CHUNK);
1135     while (j) {
1136         size_t *out_t=(size_t *)out;
1137         const size_t *in_t=(const size_t *)in;

1139         (*block)(ctx->Yi.c,ctx->EKi.c,key);
1140         ++ctr;
1141         if (is_endian.little)
1142             #ifdef BSWAP4
1143                 ctx->Yi.d[3] = BSWAP4(ctr);
1144             #else
1145                 PUTU32(ctx->Yi.c+12,ctr);
1146             #endif
1147         else
1148             ctx->Yi.d[3] = ctr;
1149         for (i=0; i<16/sizeof(size_t); ++i)
1150             out_t[i] = in_t[i]^ctx->EKi.t[i];
1151         out += 16;
1152         in += 16;
1153         j -= 16;
1154     }
1155     len -= GHASH_CHUNK;
1156 }
1157 if ((i = (len&(size_t)-16))) {
1158     GHASH(ctx,in,i);
1159     while (len>=16) {
1160         size_t *out_t=(size_t *)out;
1161         const size_t *in_t=(const size_t *)in;

1163         (*block)(ctx->Yi.c,ctx->EKi.c,key);
1164         ++ctr;
1165         if (is_endian.little)
1166             #ifdef BSWAP4
1167                 ctx->Yi.d[3] = BSWAP4(ctr);
1168             #else
1169                 PUTU32(ctx->Yi.c+12,ctr);
1170             #endif
1171         else
1172             ctx->Yi.d[3] = ctr;
1173         for (i=0; i<16/sizeof(size_t); ++i)
1174             out_t[i] = in_t[i]^ctx->EKi.t[i];
1175         out += 16;
1176         in += 16;
1177         len -= 16;
1178     }
1179 }
1180 #else
1181 while (len>=16) {
1182     size_t *out_t=(size_t *)out;
1183     const size_t *in_t=(const size_t *)in;

```

```

1185         (*block)(ctx->Yi.c, ctx->EKi.c, key);
1186         ++ctr;
1187         if (is_endian.little)
1188             #ifdef BSWAP4
1189                 ctx->Yi.d[3] = BSWAP4(ctr);
1190             #else
1191                 PUTU32(ctx->Yi.c+12, ctr);
1192             #endif
1193         else
1194             ctx->Yi.d[3] = ctr;
1195         for (i=0; i<16/sizeof(size_t); ++i) {
1196             size_t c = in[i];
1197             out[i] = c^ctx->EKi.t[i];
1198             ctx->Xi.t[i] ^= c;
1199         }
1200         GCM_MUL(ctx, Xi);
1201         out += 16;
1202         in += 16;
1203         len -= 16;
1204     }
1205 #endif
1206     if (len) {
1207         (*block)(ctx->Yi.c, ctx->EKi.c, key);
1208         ++ctr;
1209         if (is_endian.little)
1210             #ifdef BSWAP4
1211                 ctx->Yi.d[3] = BSWAP4(ctr);
1212             #else
1213                 PUTU32(ctx->Yi.c+12, ctr);
1214             #endif
1215         else
1216             ctx->Yi.d[3] = ctr;
1217         while (len--) {
1218             u8 c = in[n];
1219             ctx->Xi.c[n] ^= c;
1220             out[n] = c^ctx->EKi.c[n];
1221             ++n;
1222         }
1223     }
1224
1225     ctx->mres = n;
1226     return 0;
1227 } while(0);
1228 #endif
1229 for (i=0; i<len; ++i) {
1230     u8 c;
1231     if (n==0) {
1232         (*block)(ctx->Yi.c, ctx->EKi.c, key);
1233         ++ctr;
1234         if (is_endian.little)
1235             #ifdef BSWAP4
1236                 ctx->Yi.d[3] = BSWAP4(ctr);
1237             #else
1238                 PUTU32(ctx->Yi.c+12, ctr);
1239             #endif
1240         else
1241             ctx->Yi.d[3] = ctr;
1242     }
1243     c = in[i];
1244     out[i] = c^ctx->EKi.c[n];
1245     ctx->Xi.c[n] ^= c;
1246     n = (n+1)%16;
1247     if (n==0)
1248         GCM_MUL(ctx, Xi);
1249 }

```

```

1251     ctx->mres = n;
1252     return 0;
1253 }
1254
1255 int CRYPTO_gcm128_encrypt_ctr32(GCM128_CONTEXT *ctx,
1256     const unsigned char *in, unsigned char *out,
1257     size_t len, ctr128_f stream)
1258 {
1259     const union { long one; char little; } is_endian = {1};
1260     unsigned int n, ctr;
1261     size_t i;
1262     u64 mlen = ctx->len.u[1];
1263     void *key = ctx->key;
1264     #ifdef GCM_FUNCREF_4BIT
1265     void (*gcm_gmult_p)(u64 Xi[2], const u128 Htable[16]) = ctx->gmult;
1266     #ifdef GHASH
1267     void (*gcm_ghash_p)(u64 Xi[2], const u128 Htable[16],
1268         const u8 *inp, size_t len) = ctx->ghash;
1269     #endif
1270 #endif
1271
1272     mlen += len;
1273     if (mlen > ((U64(1)<<36)-32) || (sizeof(len)==8 && mlen<len))
1274         return -1;
1275     ctx->len.u[1] = mlen;
1276
1277     if (ctx->ares) {
1278         /* First call to encrypt finalizes GHASH(AAD) */
1279         GCM_MUL(ctx, Xi);
1280         ctx->ares = 0;
1281     }
1282
1283     if (is_endian.little)
1284         #ifdef BSWAP4
1285             ctr = BSWAP4(ctx->Yi.d[3]);
1286         #else
1287             ctr = GETU32(ctx->Yi.c+12);
1288         #endif
1289     else
1290         ctr = ctx->Yi.d[3];
1291
1292     n = ctx->mres;
1293     if (n) {
1294         while (n && len) {
1295             ctx->Xi.c[n] ^= *(out++) = *(in++)^ctx->EKi.c[n];
1296             --len;
1297             n = (n+1)%16;
1298         }
1299         if (n==0) GCM_MUL(ctx, Xi);
1300         else {
1301             ctx->mres = n;
1302             return 0;
1303         }
1304     }
1305     #if defined(GHASH) && !defined(OPENSSL_SMALL_FOOTPRINT)
1306     while (len>=GHASH_CHUNK) {
1307         (*stream)(in, out, GHASH_CHUNK/16, key, ctx->Yi.c);
1308         ctr += GHASH_CHUNK/16;
1309         if (is_endian.little)
1310             #ifdef BSWAP4
1311                 ctx->Yi.d[3] = BSWAP4(ctr);
1312             #else
1313                 PUTU32(ctx->Yi.c+12, ctr);
1314             #endif
1315         else

```

```

1316         ctx->Yi.d[3] = ctr;
1317         GHASH(ctx,out,GHASH_CHUNK);
1318         out += GHASH_CHUNK;
1319         in += GHASH_CHUNK;
1320         len -= GHASH_CHUNK;
1321     }
1322 #endif
1323     if ((i = (len&(size_t)-16))) {
1324         size_t j=i/16;

1326         (*stream)(in,out,j,key,ctx->Yi.c);
1327         ctr += (unsigned int)j;
1328         if (is_endian.little)
1329 #ifdef BSWAP4
1330             ctx->Yi.d[3] = BSWAP4(ctr);
1331 #else
1332             PUTU32(ctx->Yi.c+12,ctr);
1333 #endif
1334         else
1335             ctx->Yi.d[3] = ctr;
1336         in += i;
1337         len -= i;
1338 #if defined(GHASH)
1339         GHASH(ctx,out,i);
1340         out += i;
1341 #else
1342         while (j--) {
1343             for (i=0;i<16;++i) ctx->Xi.c[i] ^= out[i];
1344             GCM_MUL(ctx,Xi);
1345             out += 16;
1346         }
1347 #endif
1348     }
1349     if (len) {
1350         (*ctx->block)(ctx->Yi.c,ctx->EKi.c,key);
1351         ++ctr;
1352         if (is_endian.little)
1353 #ifdef BSWAP4
1354             ctx->Yi.d[3] = BSWAP4(ctr);
1355 #else
1356             PUTU32(ctx->Yi.c+12,ctr);
1357 #endif
1358         else
1359             ctx->Yi.d[3] = ctr;
1360         while (len--) {
1361             ctx->Xi.c[n] ^= out[n] = in[n]^ctx->EKi.c[n];
1362             ++n;
1363         }
1364     }

1366     ctx->mres = n;
1367     return 0;
1368 }

```

```

1370 int CRYPTO_gcm128_decrypt_ctr32(GCM128_CONTEXT *ctx,
1371     const unsigned char *in, unsigned char *out,
1372     size_t len,ctr128_f stream)
1373 {
1374     const union { long one; char little; } is_endian = {1};
1375     unsigned int n, ctr;
1376     size_t i;
1377     u64 mlen = ctx->len.u[1];
1378     void *key = ctx->key;
1379 #ifdef GCM_FUNCREF_4BIT
1380     void (*gcm_gmult_p)(u64 Xi[2],const u128 Htable[16]) = ctx->gmult;
1381 # ifdef GHASH

```

```

1382     void (*gcm_ghash_p)(u64 Xi[2],const u128 Htable[16],
1383         const u8 *inp,size_t len) = ctx->ghash;
1384 # endif
1385 #endif

1387     mlen += len;
1388     if (mlen>((U64(1)<<36)-32) || (sizeof(len)==8 && mlen<len))
1389         return -1;
1390     ctx->len.u[1] = mlen;

1392     if (ctx->ares) {
1393         /* First call to decrypt finalizes GHASH(AAD) */
1394         GCM_MUL(ctx,Xi);
1395         ctx->ares = 0;
1396     }

1398     if (is_endian.little)
1399 #ifdef BSWAP4
1400         ctr = BSWAP4(ctx->Yi.d[3]);
1401 #else
1402         ctr = GETU32(ctx->Yi.c+12);
1403 #endif
1404     else
1405         ctr = ctx->Yi.d[3];

1407     n = ctx->mres;
1408     if (n) {
1409         while (n && len) {
1410             u8 c = *(in++);
1411             *(out++) = c^ctx->EKi.c[n];
1412             ctx->Xi.c[n] ^= c;
1413             --len;
1414             n = (n+1)%16;
1415         }
1416         if (n==0) GCM_MUL (ctx,Xi);
1417         else {
1418             ctx->mres = n;
1419             return 0;
1420         }
1421     }
1422 #if defined(GHASH) && !defined(OPENSSSL_SMALL_FOOTPRINT)
1423     while (len>=GHASH_CHUNK) {
1424         GHASH(ctx,in,GHASH_CHUNK);
1425         (*stream)(in,out,GHASH_CHUNK/16,key,ctx->Yi.c);
1426         ctr += GHASH_CHUNK/16;
1427         if (is_endian.little)
1428 #ifdef BSWAP4
1429             ctx->Yi.d[3] = BSWAP4(ctr);
1430 #else
1431             PUTU32(ctx->Yi.c+12,ctr);
1432 #endif
1433         else
1434             ctx->Yi.d[3] = ctr;
1435         out += GHASH_CHUNK;
1436         in += GHASH_CHUNK;
1437         len -= GHASH_CHUNK;
1438     }
1439 #endif
1440     if ((i = (len&(size_t)-16))) {
1441         size_t j=i/16;

1443 #if defined(GHASH)
1444         GHASH(ctx,in,i);
1445 #else
1446         while (j--) {
1447             size_t k;

```

```

1448         for (k=0;k<16;++k) ctx->Xi.c[k] ^= in[k];
1449         GCM_MUL(ctx,Xi);
1450         in += 16;
1451     }
1452     j = i/16;
1453     in -= i;
1454 #endif
1455     (*stream)(in,out,j,key,ctx->Yi.c);
1456     ctr += (unsigned int)j;
1457     if (is_endian.little)
1458 #ifdef BSWAP4
1459         ctx->Yi.d[3] = BSWAP4(ctr);
1460 #else
1461         PUTU32(ctx->Yi.c+12,ctr);
1462 #endif
1463     else
1464         ctx->Yi.d[3] = ctr;
1465     out += i;
1466     in += i;
1467     len -= i;
1468 }
1469 if (len) {
1470     (*ctx->block)(ctx->Yi.c,ctx->EKi.c,key);
1471     ++ctr;
1472     if (is_endian.little)
1473 #ifdef BSWAP4
1474         ctx->Yi.d[3] = BSWAP4(ctr);
1475 #else
1476         PUTU32(ctx->Yi.c+12,ctr);
1477 #endif
1478     else
1479         ctx->Yi.d[3] = ctr;
1480     while (len--) {
1481         u8 c = in[n];
1482         ctx->Xi.c[n] ^= c;
1483         out[n] = c^ctx->EKi.c[n];
1484         ++n;
1485     }
1486 }
1488 ctx->mres = n;
1489 return 0;
1490 }

1492 int CRYPTO_gcm128_finish(GCM128_CONTEXT *ctx,const unsigned char *tag,
1493                          size_t len)
1494 {
1495     const union { long one; char little; } is_endian = {1};
1496     u64 alen = ctx->len.u[0]<<3;
1497     u64 clen = ctx->len.u[1]<<3;
1498 #ifdef GCM_FUNCREF_4BIT
1499     void (*gcm_gmult_p)(u64 Xi[2],const u128 Htable[16]) = ctx->gmult;
1500 #endif
1502     if (ctx->mres || ctx->ares)
1503         GCM_MUL(ctx,Xi);

1505     if (is_endian.little) {
1506 #ifdef BSWAP8
1507         alen = BSWAP8(alen);
1508         clen = BSWAP8(clen);
1509 #else
1510         u8 *p = ctx->len.c;
1512         ctx->len.u[0] = alen;
1513         ctx->len.u[1] = clen;

```

```

1515         alen = (u64)GETU32(p) <<32|GETU32(p+4);
1516         clen = (u64)GETU32(p+8)<<32|GETU32(p+12);
1517 #endif
1518     }

1520     ctx->Xi.u[0] ^= alen;
1521     ctx->Xi.u[1] ^= clen;
1522     GCM_MUL(ctx,Xi);

1524     ctx->Xi.u[0] ^= ctx->EK0.u[0];
1525     ctx->Xi.u[1] ^= ctx->EK0.u[1];

1527     if (tag && len<=sizeof(ctx->Xi))
1528         return memcmp(ctx->Xi.c,tag,len);
1529     else
1530         return -1;
1531 }

1533 void CRYPTO_gcm128_tag(GCM128_CONTEXT *ctx, unsigned char *tag, size_t len)
1534 {
1535     CRYPTO_gcm128_finish(ctx, NULL, 0);
1536     memcpy(tag, ctx->Xi.c, len<=sizeof(ctx->Xi.c)?len:sizeof(ctx->Xi.c));
1537 }

1539 GCM128_CONTEXT *CRYPTO_gcm128_new(void *key, block128_f block)
1540 {
1541     GCM128_CONTEXT *ret;

1543     if ((ret = (GCM128_CONTEXT *)OPENSSL_malloc(sizeof(GCM128_CONTEXT))))
1544         CRYPTO_gcm128_init(ret,key,block);

1546     return ret;
1547 }

1549 void CRYPTO_gcm128_release(GCM128_CONTEXT *ctx)
1550 {
1551     if (ctx) {
1552         OPENSSL_cleanse(ctx,sizeof(*ctx));
1553         OPENSSL_free(ctx);
1554     }
1555 }

1557 #if defined(SELFTTEST)
1558 #include <stdio.h>
1559 #include <openssl/aes.h>

1561 /* Test Case 1 */
1562 static const u8 K1[16],
1563                *P1=NULL,
1564                *A1=NULL,
1565                IV1[12],
1566                *C1=NULL,
1567                T1[] = {0x58,0xe2,0xfc,0xce,0xfa,0x7e,0x30,0x61,0x36,0x7f,0x1d,0

1569 /* Test Case 2 */
1570 #define K2 K1
1571 #define A2 A1
1572 #define IV2 IV1
1573 static const u8 P2[16],
1574                C2[] = {0x03,0x88,0xda,0xce,0x60,0xb6,0xa3,0x92,0xf3,0x28,0xc2,0
1575                T2[] = {0xab,0x6e,0x47,0xd4,0x2c,0xec,0x13,0xbd,0xf5,0x3a,0x67,0

1577 /* Test Case 3 */
1578 #define A3 A2
1579 static const u8 K3[] = {0xfe,0xff,0xe9,0x92,0x86,0x65,0x73,0x1c,0x6d,0x6a,0x8f,0

```

```

1580     P3[] = {0xd9, 0x31, 0x32, 0x25, 0xf8, 0x84, 0x06, 0xe5, 0xa5, 0x59, 0x09, 0
1581             0x86, 0xa7, 0xa9, 0x53, 0x15, 0x34, 0xf7, 0xda, 0x2e, 0x4c, 0x30, 0
1582             0x1c, 0x3c, 0x0c, 0x95, 0x95, 0x68, 0x09, 0x53, 0x2f, 0xcf, 0x0e, 0
1583             0xb1, 0x6a, 0xed, 0xf5, 0xaa, 0x0d, 0xe6, 0x57, 0xba, 0x63, 0x7b, 0
1584     IV3[] = {0xca, 0xfe, 0xba, 0xbe, 0xfa, 0xce, 0xdb, 0xad, 0xde, 0xca, 0xf8, 0
1585     C3[] = {0x42, 0x83, 0x1e, 0xc2, 0x21, 0x77, 0x74, 0x24, 0x4b, 0x72, 0x21, 0
1586             0xe3, 0xaa, 0x21, 0x2f, 0x2c, 0x02, 0xa4, 0xe0, 0x35, 0xc1, 0x7e, 0
1587             0x21, 0xd5, 0x14, 0xb2, 0x54, 0x66, 0x93, 0x1c, 0x7d, 0x8f, 0x6a, 0
1588             0x1b, 0x6a, 0x0b, 0x39, 0x6a, 0x0a, 0xac, 0x97, 0x3d, 0x58, 0xe0, 0
1589     T3[] = {0x4d, 0x5c, 0x2a, 0xf3, 0x27, 0xcd, 0x64, 0xa6, 0x2c, 0xf3, 0x5a, 0

```

```

1591 /* Test Case 4 */
1592 #define K4 K3
1593 #define IV4 IV3
1594 static const u8 P4[] = {0xd9, 0x31, 0x32, 0x25, 0xf8, 0x84, 0x06, 0xe5, 0xa5, 0x59, 0x09, 0
1595             0x86, 0xa7, 0xa9, 0x53, 0x15, 0x34, 0xf7, 0xda, 0x2e, 0x4c, 0x30, 0
1596             0x1c, 0x3c, 0x0c, 0x95, 0x95, 0x68, 0x09, 0x53, 0x2f, 0xcf, 0x0e, 0
1597             0xb1, 0x6a, 0xed, 0xf5, 0xaa, 0x0d, 0xe6, 0x57, 0xba, 0x63, 0x7b, 0
1598     A4[] = {0xfe, 0xed, 0xfa, 0xce, 0xde, 0xad, 0xbe, 0xef, 0xfe, 0xed, 0xfa, 0
1599             0xab, 0xad, 0xda, 0xd2},
1600     C4[] = {0x42, 0x83, 0x1e, 0xc2, 0x21, 0x77, 0x74, 0x24, 0x4b, 0x72, 0x21, 0
1601             0xe3, 0xaa, 0x21, 0x2f, 0x2c, 0x02, 0xa4, 0xe0, 0x35, 0xc1, 0x7e, 0
1602             0x21, 0xd5, 0x14, 0xb2, 0x54, 0x66, 0x93, 0x1c, 0x7d, 0x8f, 0x6a, 0
1603             0x1b, 0xa3, 0x0b, 0x39, 0x6a, 0x0a, 0xac, 0x97, 0x3d, 0x58, 0xe0, 0
1604     T4[] = {0x5b, 0xc9, 0x4f, 0xbc, 0x32, 0x21, 0xa5, 0xdb, 0x94, 0xfa, 0xe9, 0

```

```

1606 /* Test Case 5 */
1607 #define K5 K4
1608 #define P5 P4
1609 #define A5 A4
1610 static const u8 IV5[] = {0xca, 0xfe, 0xba, 0xbe, 0xfa, 0xce, 0xdb, 0xad},
1611     C5[] = {0x61, 0x35, 0x3b, 0x4c, 0x28, 0x06, 0x93, 0x4a, 0x77, 0x7f, 0xf5, 0
1612             0x69, 0x9b, 0x2a, 0x71, 0x4f, 0xcd, 0xc6, 0xf8, 0x37, 0x66, 0xe5, 0
1613             0x73, 0x80, 0x69, 0x00, 0xe4, 0x9f, 0x24, 0xb2, 0x2b, 0x09, 0x75, 0
1614             0x49, 0x89, 0xb5, 0xe1, 0xeb, 0xac, 0x0f, 0xc2, 0x3f, 0x45, 0
1615     T5[] = {0x36, 0x12, 0xd2, 0xe7, 0x9e, 0x3b, 0x07, 0x85, 0x56, 0x1b, 0xe1, 0

```

```

1617 /* Test Case 6 */
1618 #define K6 K5
1619 #define P6 P5
1620 #define A6 A5
1621 static const u8 IV6[] = {0x93, 0x13, 0x22, 0x5d, 0xf8, 0x84, 0x06, 0xe5, 0x55, 0x90, 0x9c, 0
1622             0x6a, 0x7a, 0x95, 0x38, 0x53, 0x4f, 0x7d, 0xa1, 0xe4, 0xc3, 0x03, 0
1623             0xc3, 0xc0, 0xc9, 0x51, 0x56, 0x80, 0x95, 0x39, 0xfc, 0xf0, 0xe2, 0
1624             0x16, 0xae, 0xdb, 0xf5, 0xa0, 0xde, 0x6a, 0x57, 0xa6, 0x37, 0xb3, 0
1625     C6[] = {0x8c, 0xe2, 0x49, 0x98, 0x62, 0x56, 0x15, 0xb6, 0x03, 0xa0, 0x33, 0
1626             0xbe, 0x91, 0x12, 0xa5, 0xc3, 0xa2, 0x11, 0xa8, 0xba, 0x26, 0x2a, 0
1627             0x01, 0xe4, 0xa9, 0xa4, 0xfb, 0xa4, 0x3c, 0x90, 0xcc, 0xdc, 0xb2, 0
1628             0xd6, 0x28, 0x75, 0xd2, 0xac, 0xa4, 0x17, 0x03, 0x4c, 0x34, 0xae, 0
1629     T6[] = {0x61, 0x9c, 0xc5, 0xae, 0xff, 0xfe, 0x0b, 0xfa, 0x46, 0x2a, 0xf4, 0

```

```

1631 /* Test Case 7 */
1632 static const u8 K7[24],
1633     *P7=NULL,
1634     *A7=NULL,
1635     IV7[12],
1636     *C7=NULL,
1637     T7[] = {0xcd, 0x33, 0xb2, 0x8a, 0xc7, 0x73, 0xf7, 0x4b, 0xa0, 0x0e, 0xd1, 0

```

```

1639 /* Test Case 8 */
1640 #define K8 K7
1641 #define IV8 IV7
1642 #define A8 A7
1643 static const u8 P8[16],
1644     C8[] = {0x98, 0xe7, 0x24, 0x7c, 0x07, 0xf0, 0xfe, 0x41, 0x1c, 0x26, 0x7e, 0
1645     T8[] = {0x2f, 0xf5, 0x8d, 0x80, 0x03, 0x39, 0x27, 0xab, 0x8e, 0xf4, 0xd4, 0

```

```

1647 /* Test Case 9 */
1648 #define A9 A8
1649 static const u8 K9[] = {0xfe, 0xff, 0xe9, 0x92, 0x86, 0x65, 0x73, 0x1c, 0x6d, 0x6a, 0x8f, 0
1650             0xfe, 0xff, 0xe9, 0x92, 0x86, 0x65, 0x73, 0x1c},
1651     P9[] = {0xd9, 0x31, 0x32, 0x25, 0xf8, 0x84, 0x06, 0xe5, 0xa5, 0x59, 0x09, 0
1652             0x86, 0xa7, 0xa9, 0x53, 0x15, 0x34, 0xf7, 0xda, 0x2e, 0x4c, 0x30, 0
1653             0x1c, 0x3c, 0x0c, 0x95, 0x95, 0x68, 0x09, 0x53, 0x2f, 0xcf, 0x0e, 0
1654             0xb1, 0x6a, 0xed, 0xf5, 0xaa, 0x0d, 0xe6, 0x57, 0xba, 0x63, 0x7b, 0
1655     IV9[] = {0xca, 0xfe, 0xba, 0xbe, 0xfa, 0xce, 0xdb, 0xad, 0xde, 0xca, 0xf8, 0
1656     C9[] = {0x39, 0x80, 0xca, 0x0b, 0x3c, 0x00, 0xe8, 0x41, 0xeb, 0x06, 0xfa, 0
1657             0x85, 0x9e, 0x1c, 0xea, 0xa6, 0xef, 0xd9, 0x84, 0x62, 0x85, 0x93, 0
1658             0x7d, 0x77, 0x3d, 0x00, 0xc1, 0x44, 0xc5, 0x25, 0xac, 0x61, 0x9d, 0
1659             0x18, 0xe2, 0x44, 0x8b, 0x2f, 0xe3, 0x24, 0xd9, 0xcc, 0xda, 0x27, 0
1660     T9[] = {0x99, 0x24, 0xa7, 0xc8, 0x58, 0x73, 0x36, 0xbf, 0xb1, 0x18, 0x02, 0

```

```

1662 /* Test Case 10 */
1663 #define K10 K9
1664 #define IV10 IV9
1665 static const u8 P10[] = {0xd9, 0x31, 0x32, 0x25, 0xf8, 0x84, 0x06, 0xe5, 0xa5, 0x59, 0x09, 0
1666             0x86, 0xa7, 0xa9, 0x53, 0x15, 0x34, 0xf7, 0xda, 0x2e, 0x4c, 0x30, 0
1667             0x1c, 0x3c, 0x0c, 0x95, 0x95, 0x68, 0x09, 0x53, 0x2f, 0xcf, 0x0e, 0
1668             0xb1, 0x6a, 0xed, 0xf5, 0xaa, 0x0d, 0xe6, 0x57, 0xba, 0x63, 0x7b, 0
1669     A10[] = {0xfe, 0xed, 0xfa, 0xce, 0xde, 0xad, 0xbe, 0xef, 0xfe, 0xed, 0xfa, 0
1670             0xab, 0xad, 0xda, 0xd2},
1671     C10[] = {0x39, 0x80, 0xca, 0x0b, 0x3c, 0x00, 0xe8, 0x41, 0xeb, 0x06, 0xfa, 0
1672             0x85, 0x9e, 0x1c, 0xea, 0xa6, 0xef, 0xd9, 0x84, 0x62, 0x85, 0x93, 0
1673             0x7d, 0x77, 0x3d, 0x00, 0xc1, 0x44, 0xc5, 0x25, 0xac, 0x61, 0x9d, 0
1674             0x18, 0xe2, 0x44, 0x8b, 0x2f, 0xe3, 0x24, 0xd9, 0xcc, 0xda, 0x27, 0
1675     T10[] = {0x25, 0x19, 0x49, 0x8e, 0x80, 0xf1, 0x47, 0x8f, 0x37, 0xba, 0x55, 0

```

```

1677 /* Test Case 11 */
1678 #define K11 K10
1679 #define P11 P10
1680 #define A11 A10
1681 static const u8 IV11[] = {0xca, 0xfe, 0xba, 0xbe, 0xfa, 0xce, 0xdb, 0xad},
1682     C11[] = {0x0f, 0x10, 0xf5, 0x99, 0xae, 0x14, 0xa1, 0x54, 0xed, 0x24, 0xb3, 0
1683             0xc5, 0x66, 0x63, 0x2e, 0xf2, 0xbb, 0xb3, 0x4f, 0x83, 0x47, 0x28, 0
1684             0xfd, 0xdc, 0x29, 0xdf, 0x9a, 0x47, 0x1f, 0x75, 0xc6, 0x65, 0x41, 0
1685             0xe9, 0x3a, 0x19, 0xa5, 0x8e, 0x8b, 0x47, 0x3f, 0xa0, 0xf0, 0x62, 0
1686     T11[] = {0x65, 0xdc, 0xc5, 0x7f, 0xcf, 0x62, 0x3a, 0x24, 0x09, 0x4f, 0xcc, 0

```

```

1688 /* Test Case 12 */
1689 #define K12 K11
1690 #define P12 P11
1691 #define A12 A11
1692 static const u8 IV12[] = {0x93, 0x13, 0x22, 0x5d, 0xf8, 0x84, 0x06, 0xe5, 0x55, 0x90, 0x9c, 0
1693             0x6a, 0x7a, 0x95, 0x38, 0x53, 0x4f, 0x7d, 0xa1, 0xe4, 0xc3, 0x03, 0
1694             0xc3, 0xc0, 0xc9, 0x51, 0x56, 0x80, 0x95, 0x39, 0xfc, 0xf0, 0xe2, 0
1695             0x16, 0xae, 0xdb, 0xf5, 0xa0, 0xde, 0x6a, 0x57, 0xa6, 0x37, 0xb3, 0
1696     C12[] = {0xd2, 0x7e, 0x88, 0x68, 0x1c, 0xe3, 0x24, 0x3c, 0x48, 0x30, 0x16, 0
1697             0x1d, 0xe9, 0xa1, 0xd8, 0xe6, 0xb4, 0x47, 0xef, 0x6e, 0xf7, 0xb7, 0
1698             0x81, 0xe7, 0x90, 0x12, 0xaf, 0x34, 0xdd, 0xd9, 0xe2, 0xf0, 0x37, 0
1699             0xe6, 0x7c, 0x03, 0x67, 0x45, 0xfa, 0x22, 0xe7, 0xe9, 0xb7, 0x37, 0
1700     T12[] = {0xdc, 0xf5, 0x66, 0xff, 0x29, 0x1c, 0x25, 0xbb, 0xb8, 0x56, 0x8f, 0

```

```

1702 /* Test Case 13 */
1703 static const u8 K13[32],
1704     *P13=NULL,
1705     *A13=NULL,
1706     IV13[12],
1707     *C13=NULL,
1708     T13[] = {0x53, 0x0f, 0x8a, 0xfb, 0xc7, 0x45, 0x36, 0xb9, 0xa9, 0x63, 0xb4, 0x

```

```

1710 /* Test Case 14 */
1711 #define K14 K13

```

```

1712 #define A14 A13
1713 static const u8 P14[16],
1714                IV14[12],
1715                C14[] = {0xce, 0xa7, 0x40, 0x3d, 0x4d, 0x60, 0x6b, 0x6e, 0x07, 0x4e, 0xc5, 0
1716                T14[] = {0xd0, 0xd1, 0xc8, 0xa7, 0x99, 0x99, 0x6b, 0xf0, 0x26, 0x5b, 0x98, 0

1718 /* Test Case 15 */
1719 #define A15 A14
1720 static const u8 K15[] = {0xfe, 0xff, 0xe9, 0x92, 0x86, 0x65, 0x73, 0x1c, 0x6d, 0x6a, 0x8f, 0
1721                0xfe, 0xff, 0xe9, 0x92, 0x86, 0x65, 0x73, 0x1c, 0x6d, 0x6a, 0x8f, 0
1722                P15[] = {0xd9, 0x31, 0x32, 0x25, 0xf8, 0x84, 0x06, 0xe5, 0xa5, 0x59, 0x09, 0
1723                0x86, 0xa7, 0xa9, 0x53, 0x15, 0x34, 0xf7, 0xda, 0x2e, 0x4c, 0x30, 0
1724                0x1c, 0x3c, 0x0c, 0x95, 0x95, 0x68, 0x09, 0x53, 0x2f, 0xcf, 0xe0, 0
1725                0xb1, 0x6a, 0xed, 0xf5, 0xaa, 0x0d, 0xe6, 0x57, 0xba, 0x63, 0x7b, 0
1726                IV15[] = {0xca, 0xfe, 0xba, 0xbe, 0xfa, 0xce, 0xdb, 0xad, 0xde, 0xca, 0xf8, 0
1727                C15[] = {0x52, 0x2d, 0xc1, 0xf0, 0x99, 0x56, 0x7d, 0x07, 0xf4, 0x7f, 0x37, 0
1728                0x64, 0x3a, 0x8c, 0xdc, 0xbf, 0xe5, 0xc0, 0xc9, 0x75, 0x98, 0xa2, 0
1729                0x8c, 0xb0, 0x8e, 0x48, 0x59, 0x0d, 0xbb, 0x3d, 0xa7, 0xb0, 0x8b, 0
1730                0xc5, 0xf6, 0x1e, 0x63, 0x93, 0xba, 0x7a, 0x0a, 0xbc, 0xc9, 0xf6, 0
1731                T15[] = {0xb0, 0x94, 0xda, 0xc5, 0xd9, 0x34, 0x71, 0xbd, 0xec, 0x1a, 0x50, 0

1733 /* Test Case 16 */
1734 #define K16 K15
1735 #define IV16 IV15
1736 static const u8 P16[] = {0xd9, 0x31, 0x32, 0x25, 0xf8, 0x84, 0x06, 0xe5, 0xa5, 0x59, 0x09, 0
1737                0x86, 0xa7, 0xa9, 0x53, 0x15, 0x34, 0xf7, 0xda, 0x2e, 0x4c, 0x30, 0
1738                0x1c, 0x3c, 0x0c, 0x95, 0x95, 0x68, 0x09, 0x53, 0x2f, 0xcf, 0xe0, 0
1739                0xb1, 0x6a, 0xed, 0xf5, 0xaa, 0x0d, 0xe6, 0x57, 0xba, 0x63, 0x7b, 0
1740                A16[] = {0xfe, 0xed, 0xfa, 0xce, 0xde, 0xad, 0xbe, 0xef, 0xfe, 0xed, 0xfa, 0
1741                0xab, 0xad, 0xda, 0xd2},
1742                C16[] = {0x52, 0x2d, 0xc1, 0xf0, 0x99, 0x56, 0x7d, 0x07, 0xf4, 0x7f, 0x37, 0
1743                0x64, 0x3a, 0x8c, 0xdc, 0xbf, 0xe5, 0xc0, 0xc9, 0x75, 0x98, 0xa2, 0
1744                0x8c, 0xb0, 0x8e, 0x48, 0x59, 0x0d, 0xbb, 0x3d, 0xa7, 0xb0, 0x8b, 0
1745                0xc5, 0xf6, 0x1e, 0x63, 0x93, 0xba, 0x7a, 0x0a, 0xbc, 0xc9, 0xf6, 0
1746                T16[] = {0x76, 0xfc, 0x6e, 0xce, 0x0f, 0x4e, 0x17, 0x68, 0xcd, 0xdf, 0x88, 0

1748 /* Test Case 17 */
1749 #define K17 K16
1750 #define P17 P16
1751 #define A17 A16
1752 static const u8 IV17[] = {0xca, 0xfe, 0xba, 0xbe, 0xfa, 0xce, 0xdb, 0xad},
1753                C17[] = {0xc3, 0x76, 0x2d, 0xf1, 0xca, 0x78, 0x7d, 0x32, 0xae, 0x47, 0xc1, 0
1754                0xaf, 0x1a, 0xe1, 0x4d, 0x0b, 0x97, 0x6a, 0xfa, 0xc5, 0x2f, 0xf7, 0
1755                0xfe, 0xb5, 0x82, 0xd3, 0x39, 0x34, 0xa4, 0xf0, 0x95, 0x4c, 0xc2, 0
1756                0x62, 0xac, 0x43, 0x0e, 0x64, 0xab, 0xe4, 0x99, 0xf4, 0x7c, 0x9b, 0
1757                T17[] = {0x3a, 0x33, 0x7d, 0xbf, 0x46, 0xa7, 0x92, 0xc4, 0x5e, 0x45, 0x49, 0

1759 /* Test Case 18 */
1760 #define K18 K17
1761 #define P18 P17
1762 #define A18 A17
1763 static const u8 IV18[] = {0x93, 0x13, 0x22, 0x5d, 0xf8, 0x84, 0x06, 0xe5, 0x55, 0x90, 0x9c, 0
1764                0x6a, 0x7a, 0x95, 0x38, 0x53, 0x4f, 0x7d, 0xa1, 0xe4, 0xc3, 0x03, 0
1765                0xc3, 0xc0, 0xc9, 0x51, 0x56, 0x80, 0x95, 0x39, 0xfc, 0xf0, 0xe2, 0
1766                0x16, 0xae, 0xdb, 0xf5, 0xa0, 0xde, 0x6a, 0x57, 0xa6, 0x37, 0xb3, 0
1767                C18[] = {0x5a, 0x8d, 0xef, 0x2f, 0x0c, 0x9e, 0x53, 0xf1, 0xf7, 0x5d, 0x78, 0
1768                0xee, 0xb2, 0xb2, 0x2a, 0xaf, 0xde, 0x64, 0x19, 0xa0, 0x58, 0xab, 0
1769                0x0f, 0xc0, 0xc3, 0xb7, 0x80, 0xf2, 0x44, 0x45, 0x2d, 0xa3, 0xeb, 0
1770                0xa2, 0x41, 0x89, 0x97, 0x20, 0x0e, 0xf8, 0x2e, 0x44, 0xae, 0x7e, 0
1771                T18[] = {0xa4, 0x4a, 0x82, 0x66, 0xee, 0x1c, 0x8e, 0xb0, 0xc8, 0xb5, 0xd4, 0

1773 /* Test Case 19 */
1774 #define K19 K1
1775 #define P19 P1
1776 #define IV19 IV1
1777 #define C19 C1

```

```

1778 static const u8 A19[] = {0xd9, 0x31, 0x32, 0x25, 0xf8, 0x84, 0x06, 0xe5, 0xa5, 0x59, 0x09, 0
1779                0x86, 0xa7, 0xa9, 0x53, 0x15, 0x34, 0xf7, 0xda, 0x2e, 0x4c, 0x30, 0
1780                0x1c, 0x3c, 0x0c, 0x95, 0x95, 0x68, 0x09, 0x53, 0x2f, 0xcf, 0xe0, 0
1781                0xb1, 0x6a, 0xed, 0xf5, 0xaa, 0x0d, 0xe6, 0x57, 0xba, 0x63, 0x7b, 0
1782                0x52, 0x2d, 0xc1, 0xf0, 0x99, 0x56, 0x7d, 0x07, 0xf4, 0x7f, 0x37, 0
1783                0x64, 0x3a, 0x8c, 0xdc, 0xbf, 0xe5, 0xc0, 0xc9, 0x75, 0x98, 0xa2, 0
1784                0x8c, 0xb0, 0x8e, 0x48, 0x59, 0x0d, 0xbb, 0x3d, 0xa7, 0xb0, 0x8b, 0
1785                0xc5, 0xf6, 0x1e, 0x63, 0x93, 0xba, 0x7a, 0x0a, 0xbc, 0xc9, 0xf6, 0
1786                T19[] = {0x5f, 0xea, 0x79, 0x3a, 0x2d, 0x6f, 0x97, 0x4d, 0x37, 0xe6, 0x8e, 0

1788 /* Test Case 20 */
1789 #define K20 K1
1790 #define A20 A1
1791 static const u8 IV20[64] = {0xff, 0xff, 0xff, 0xff}, /* this results in 0xff in count
1792                P20[288],
1793                C20[] = {0x56, 0xb3, 0x37, 0x3c, 0xa9, 0xef, 0x6e, 0x4a, 0x2b, 0x64, 0xfe, 0
1794                0x25, 0xf1, 0x0d, 0x47, 0xa7, 0x5a, 0x5f, 0xce, 0x13, 0xef, 0xc6, 0
1795                0x41, 0x41, 0xbd, 0xd4, 0x8c, 0xf7, 0xc7, 0x70, 0x88, 0x7a, 0xfd, 0
1796                0xa9, 0xae, 0xff, 0xcd, 0x7c, 0x5c, 0xed, 0xdf, 0xc6, 0xa7, 0x83, 0
1797                0x9d, 0xa5, 0x58, 0x25, 0x72, 0x67, 0xca, 0xab, 0x2a, 0xd0, 0xb2, 0
1798                0xb1, 0x7f, 0xb4, 0x1c, 0x4b, 0x8b, 0x47, 0x5c, 0xb4, 0xf3, 0xf7, 0
1799                0xc9, 0xe8, 0xc4, 0xdc, 0x0a, 0x2a, 0x5f, 0xf1, 0x90, 0x3e, 0x50, 0
1800                0xa1, 0xcd, 0xb8, 0x36, 0x4c, 0x50, 0x61, 0xa2, 0x0c, 0xae, 0x74, 0
1801                0xb0, 0xab, 0xc9, 0xfd, 0x32, 0x17, 0xef, 0x9f, 0x8c, 0x90, 0xbe, 0
1802                0x97, 0xf4, 0xf8, 0x80, 0xdf, 0xf1, 0x5b, 0xfb, 0x7a, 0x6b, 0x28, 0
1803                0x3c, 0x2d, 0x59, 0xe3, 0xf9, 0xdf, 0xff, 0x65, 0x3c, 0x71, 0x26, 0
1804                0x11, 0xf4, 0x2b, 0xae, 0x12, 0xaf, 0x46, 0x2b, 0x10, 0x70, 0xbe, 0
1805                0x87, 0x2c, 0xa1, 0x0d, 0xee, 0x15, 0xb3, 0x24, 0x9b, 0x1a, 0x1b, 0
1806                0x4b, 0xcc, 0xb7, 0xd0, 0x32, 0x00, 0xbc, 0xe4, 0x20, 0xa2, 0xf8, 0
1807                0x4d, 0x14, 0x23, 0xc1, 0xb5, 0x69, 0x90, 0x03, 0xc1, 0x3e, 0xce, 0
1808                0x0e, 0xed, 0xc3, 0x40, 0x33, 0xba, 0xc1, 0x90, 0x27, 0x83, 0xdc, 0
1809                0x18, 0x8a, 0x43, 0x9c, 0x7e, 0xbc, 0xc0, 0x67, 0x2d, 0xbd, 0xa4, 0
1810                0x13, 0xb0, 0xbe, 0x41, 0x31, 0x5e, 0xf7, 0x78, 0x70, 0x8a, 0x70, 0
1811                T20[] = {0x8b, 0x30, 0x7f, 0x6b, 0x33, 0x28, 0x6d, 0x0a, 0xb0, 0x26, 0xa9, 0

1813 #define TEST_CASE(n) do {
1814                u8 out[sizeof(P##n)];
1815                AES_set_encrypt_key(K##n, sizeof(K##n)*8, &key);
1816                CRYPTO_gcm128_init(&ctx, &key, (block128_f)AES_encrypt);
1817                CRYPTO_gcm128_setiv(&ctx, IV##n, sizeof(IV##n));
1818                memset(out, 0, sizeof(out));
1819                if (A##n) CRYPTO_gcm128_aad(&ctx, A##n, sizeof(A##n));
1820                if (P##n) CRYPTO_gcm128_encrypt(&ctx, P##n, out, sizeof(out));
1821                if (C##n) CRYPTO_gcm128_finish(&ctx, T##n, 16) ||
1822                        (C##n && memcmp(out, C##n, sizeof(out)))
1823                ret++, printf("encrypt test%d failed.\n", n);
1824                CRYPTO_gcm128_setiv(&ctx, IV##n, sizeof(IV##n));
1825                memset(out, 0, sizeof(out));
1826                if (A##n) CRYPTO_gcm128_aad(&ctx, A##n, sizeof(A##n));
1827                if (C##n) CRYPTO_gcm128_decrypt(&ctx, C##n, out, sizeof(out));
1828                if (C##n) CRYPTO_gcm128_finish(&ctx, T##n, 16) ||
1829                        (P##n && memcmp(out, P##n, sizeof(out)))
1830                ret++, printf("decrypt test%d failed.\n", n);
1831                } while(0)

1833 int main()
1834 {
1835                GCM128_CONTEXT ctx;
1836                AES_KEY key;
1837                int ret=0;

1839                TEST_CASE(1);
1840                TEST_CASE(2);
1841                TEST_CASE(3);
1842                TEST_CASE(4);
1843                TEST_CASE(5);

```

```

1844     TEST_CASE(6);
1845     TEST_CASE(7);
1846     TEST_CASE(8);
1847     TEST_CASE(9);
1848     TEST_CASE(10);
1849     TEST_CASE(11);
1850     TEST_CASE(12);
1851     TEST_CASE(13);
1852     TEST_CASE(14);
1853     TEST_CASE(15);
1854     TEST_CASE(16);
1855     TEST_CASE(17);
1856     TEST_CASE(18);
1857     TEST_CASE(19);
1858     TEST_CASE(20);

1860 #ifdef OPENSSSL_CPUID_OBJ
1861 {
1862     size_t start, stop, gcm_t, ctr_t, OPENSSSL_rdtsc();
1863     union { u64 u; u8 c[1024]; } buf;
1864     int i;

1866     AES_set_encrypt_key(K1, sizeof(K1)*8, &key);
1867     CRYPTO_gcm128_init(&ctx, &key, (block128_f)AES_encrypt);
1868     CRYPTO_gcm128_setiv(&ctx, IV1, sizeof(IV1));

1870     CRYPTO_gcm128_encrypt(&ctx, buf.c, buf.c, sizeof(buf));
1871     start = OPENSSSL_rdtsc();
1872     CRYPTO_gcm128_encrypt(&ctx, buf.c, buf.c, sizeof(buf));
1873     gcm_t = OPENSSSL_rdtsc() - start;

1875     CRYPTO_ctr128_encrypt(buf.c, buf.c, sizeof(buf),
1876                          &key, ctx.Yi.c, ctx.EKi.c, &ctx.mres,
1877                          (block128_f)AES_encrypt);
1878     start = OPENSSSL_rdtsc();
1879     CRYPTO_ctr128_encrypt(buf.c, buf.c, sizeof(buf),
1880                          &key, ctx.Yi.c, ctx.EKi.c, &ctx.mres,
1881                          (block128_f)AES_encrypt);
1882     ctr_t = OPENSSSL_rdtsc() - start;

1884     printf("%.2f-%.2f=%.2f\n",
1885           gcm_t/(double)sizeof(buf),
1886           ctr_t/(double)sizeof(buf),
1887           (gcm_t-ctr_t)/(double)sizeof(buf));
1888 #ifdef GHASH
1889 {
1890     void (*gcm_ghash_p)(u64 Xi[2], const u128 Htable[16],
1891                        const u8 *inp, size_t len) = ctx.ghash;

1893     GHASH((&ctx), buf.c, sizeof(buf));
1894     start = OPENSSSL_rdtsc();
1895     for (i=0; i<100; ++i) GHASH((&ctx), buf.c, sizeof(buf));
1896     gcm_t = OPENSSSL_rdtsc() - start;
1897     printf("%.2f\n", gcm_t/(double)sizeof(buf)/(double)i);
1898 }
1899 #endif
1900 }
1901 #endif

1903     return ret;
1904 }
1905 #endif

```


new/usr/src/lib/openssl/libsunw_crypto/modes/ofb128.c

1

```
*****
3907 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/ofb128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* =====
2  * Copyright (c) 2008 The OpenSSL Project. All rights reserved.
3  *
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47 * =====
48 *
49 */
51 #include <openssl/crypto.h>
52 #include "modes_lcl.h"
53 #include <string.h>
54
55 #ifndef MODES_DEBUG
56 # ifndef NDEBUG
57 # define NDEBUG
58 # endif
59 #endif
60 #include <assert.h>
```

new/usr/src/lib/openssl/libsunw_crypto/modes/ofb128.c

2

```
62 /* The input and output encrypted as though 128bit ofb mode is being
63 * used. The extra state information to record how much of the
64 * 128bit block we have used is contained in *num;
65 */
66 void CRYPTO_ofb128_encrypt(const unsigned char *in, unsigned char *out,
67                             size_t len, const void *key,
68                             unsigned char ivec[16], int *num,
69                             block128_f block)
70 {
71     unsigned int n;
72     size_t l=0;
73
74     assert(in && out && key && ivec && num);
75
76     n = *num;
77
78     #if !defined(OPENSSL_SMALL_FOOTPRINT)
79     if (16*sizeof(size_t) == 0) do { /* always true actually */
80         while (n && len) {
81             *(out++) = *(in++) ^ ivec[n];
82             --len;
83             n = (n+1) % 16;
84         }
85     #if defined(STRICT_ALIGNMENT)
86     if (((size_t)in|(size_t)out|(size_t)ivec)%sizeof(size_t) != 0)
87         break;
88     #endif
89     while (len>=16) {
90         (*block)(ivec, ivec, key);
91         for (; n<16; n+=sizeof(size_t))
92             *(size_t*)(out+n) =
93             *(size_t*)(in+n) ^ *(size_t*)(ivec+n);
94         len -= 16;
95         out += 16;
96         in += 16;
97         n = 0;
98     }
99     if (len) {
100         (*block)(ivec, ivec, key);
101         while (len--) {
102             out[n] = in[n] ^ ivec[n];
103             ++n;
104         }
105     }
106     *num = n;
107     return;
108 } while(0);
109 /* the rest would be commonly eliminated by x86* compiler */
110 #endif
111 while (l<len) {
112     if (n==0) {
113         (*block)(ivec, ivec, key);
114     }
115     out[l] = in[l] ^ ivec[n];
116     ++l;
117     n = (n+1) % 16;
118 }
119
120 *num=n;
121 }
```

new/usr/src/lib/openssl/libsunw_crypto/modes/xts128.c

1

```
*****
5613 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/modes/xts128.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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45 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
46 * OF THE POSSIBILITY OF SUCH DAMAGE.
47 * =====
48 */
50 #include <openssl/crypto.h>
51 #include "modes_lcl.h"
52 #include <string.h>
53
54 #ifndef MODES_DEBUG
55 #ifndef NDEBUG
56 #define NDEBUG
57 #endif
58 #endif
59 #include <assert.h>
60
61 int CRYPTO_xts128_encrypt(const XTS128_CONTEXT *ctx, const unsigned char iv[16],
```

new/usr/src/lib/openssl/libsunw_crypto/modes/xts128.c

2

```
62     const unsigned char *inp, unsigned char *out,
63     size_t len, int enc)
64 {
65     const union { long one; char little; } is_endian = {1};
66     union { u64 u[2]; u32 d[4]; u8 c[16]; } tweak, scratch;
67     unsigned int i;
68
69     if (len<16) return -1;
70
71     memcpy(tweak.c, iv, 16);
72
73     (*ctx->block2)(tweak.c, tweak.c, ctx->key2);
74
75     if (!enc && (len%16)) len-=16;
76
77     while (len>=16) {
78 #if defined(STRICT_ALIGNMENT)
79         memcpy(scratch.c, inp, 16);
80         scratch.u[0] ^= tweak.u[0];
81         scratch.u[1] ^= tweak.u[1];
82 #else
83         scratch.u[0] = ((u64*)inp)[0]^tweak.u[0];
84         scratch.u[1] = ((u64*)inp)[1]^tweak.u[1];
85 #endif
86         (*ctx->block1)(scratch.c, scratch.c, ctx->key1);
87 #if defined(STRICT_ALIGNMENT)
88         scratch.u[0] ^= tweak.u[0];
89         scratch.u[1] ^= tweak.u[1];
90         memcpy(out, scratch.c, 16);
91 #else
92         ((u64*)out)[0] = scratch.u[0]^tweak.u[0];
93         ((u64*)out)[1] = scratch.u[1]^tweak.u[1];
94 #endif
95         inp += 16;
96         out += 16;
97         len -= 16;
98
99         if (len==0) return 0;
100
101         if (is_endian.little) {
102             unsigned int carry, res;
103
104             res = 0x87&(((int)tweak.d[3])>>31);
105             carry = (unsigned int)(tweak.u[0]>>63);
106             tweak.u[0] = (tweak.u[0]<<1)^res;
107             tweak.u[1] = (tweak.u[1]<<1)^carry;
108         }
109         else {
110             size_t c;
111
112             for (c=0; i=0; i<16; ++i) {
113                 /* substitutes for |, because c is 1 bit */
114                 c += ((size_t)tweak.c[i]<<1);
115                 tweak.c[i] = (u8)c;
116                 c = c>>8;
117             }
118             tweak.c[0] ^= (u8)(0x87&(0-c));
119         }
120     }
121     if (enc) {
122         for (i=0; i<len; ++i) {
123             u8 c = inp[i];
124             out[i] = scratch.c[i];
125             scratch.c[i] = c;
126         }
127         scratch.u[0] ^= tweak.u[0];
```

```

128         scratch.u[1] ^= tweak.u[1];
129         (*ctx->block1)(scratch.c, scratch.c, ctx->key1);
130         scratch.u[0] ^= tweak.u[0];
131         scratch.u[1] ^= tweak.u[1];
132         memcpy(out+16, scratch.c, 16);
133     }
134     else {
135         union { u64 u[2]; u8 c[16]; } tweak1;
136
137         if (is_endian.little) {
138             unsigned int carry, res;
139
140             res = 0x87 & (((int)tweak.d[3]) >> 31);
141             carry = (unsigned int)(tweak.u[0] >> 63);
142             tweak1.u[0] = (tweak.u[0] << 1) ^ res;
143             tweak1.u[1] = (tweak.u[1] << 1) | carry;
144         }
145         else {
146             size_t c;
147
148             for (c=0, i=0; i<16; ++i) {
149                 /* substitutes for |, because c is 1 bit */
150                 c += ((size_t)tweak.c[i] << 1;
151                 tweak1.c[i] = (u8)c;
152                 c = c >> 8;
153             }
154             tweak1.c[0] ^= (u8)(0x87 & (0-c));
155         }
156         #if defined(STRICT_ALIGNMENT)
157         memcpy(scratch.c, inp, 16);
158         scratch.u[0] ^= tweak1.u[0];
159         scratch.u[1] ^= tweak1.u[1];
160     #else
161         scratch.u[0] = ((u64*)inp)[0] ^ tweak1.u[0];
162         scratch.u[1] = ((u64*)inp)[1] ^ tweak1.u[1];
163     #endif
164         (*ctx->block1)(scratch.c, scratch.c, ctx->key1);
165         scratch.u[0] ^= tweak1.u[0];
166         scratch.u[1] ^= tweak1.u[1];
167
168         for (i=0; i<len; ++i) {
169             u8 c = inp[16+i];
170             out[16+i] = scratch.c[i];
171             scratch.c[i] = c;
172         }
173         scratch.u[0] ^= tweak.u[0];
174         scratch.u[1] ^= tweak.u[1];
175         (*ctx->block1)(scratch.c, scratch.c, ctx->key1);
176         #if defined(STRICT_ALIGNMENT)
177         scratch.u[0] ^= tweak.u[0];
178         scratch.u[1] ^= tweak.u[1];
179         memcpy(out, scratch.c, 16);
180     #else
181         ((u64*)out)[0] = scratch.u[0] ^ tweak.u[0];
182         ((u64*)out)[1] = scratch.u[1] ^ tweak.u[1];
183     #endif
184     }
185
186     return 0;
187 }

```

new/usr/src/lib/openssl/libsunw_crypto/o_dir.c

1

```
*****
3451 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/o_dir.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/o_dir.c -*. mode:C; c-file-style: "eay" -*. */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2004.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <errno.h>
60 #include <e_os.h>
```

new/usr/src/lib/openssl/libsunw_crypto/o_dir.c

2

```
62 /* The routines really come from the Levitte Programming, so to make
63  * life simple, let's just use the raw files and hack the symbols to
64  * fit our namespace. */
65 #define LP_DIR_CTX OPENSLL_DIR_CTX
66 #define LP_dir_context_st OPENSLL_dir_context_st
67 #define LP_find_file OPENSLL_DIR_read
68 #define LP_find_file_end OPENSLL_DIR_end

70 #include "o_dir.h"

72 #define LPDIR_H
73 #if defined OPENSLL_SYS_UNIX || defined DJGPP
74 #include "LPdir_unix.c"
75 #elif defined OPENSLL_SYS_VMS
76 #include "LPdir_vms.c"
77 #elif defined OPENSLL_SYS_WIN32
78 #include "LPdir_win32.c"
79 #elif defined OPENSLL_SYS_Wince
80 #include "LPdir_wince.c"
81 #else
82 #include "LPdir_nyi.c"
83 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/o_fips.c

1

```
*****
3419 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/o_fips.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Stephen Henson (steve@openssl.org) for the OpenSSL
2  * project 2011.
3  */
4 /* =====
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54  * Hudson (tjh@cryptsoft.com).
55  *
56  */
57
58 #include "cryptlib.h"
59 #ifdef OPENSSL_FIPS
60 #include <openssl/fips.h>
61 #include <openssl/fips_rand.h>
```

new/usr/src/lib/openssl/libsunw_crypto/o_fips.c

2

```
62 #include <openssl/rand.h>
63 #endif
64
65 int FIPS_mode(void)
66 {
67     OPENSSL_init();
68 #ifdef OPENSSL_FIPS
69     return FIPS_module_mode();
70 #else
71     return 0;
72 #endif
73 }
74
75 int FIPS_mode_set(int r)
76 {
77     OPENSSL_init();
78 #ifdef OPENSSL_FIPS
79 #ifndef FIPS_AUTH_USER_PASS
80 #define FIPS_AUTH_USER_PASS "Default FIPS Crypto User Password"
81 #endif
82     if (!FIPS_module_mode_set(r, FIPS_AUTH_USER_PASS))
83         return 0;
84     if (r)
85         RAND_set_rand_method(FIPS_rand_get_method());
86     else
87         RAND_set_rand_method(NULL);
88     return 1;
89 #else
90     if (r == 0)
91         return 1;
92     CRYPTOerr(CRYPTO_F_FIPS_MODE_SET, CRYPTO_R_FIPS_MODE_NOT_SUPPORTED);
93     return 0;
94 #endif
95 }
```

new/usr/src/lib/openssl/libsunw_crypto/o_init.c

1

```
*****
3147 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/o_init.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* o_init.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
53
54
55 #include <e_os.h>
56 #include <openssl/err.h>
57 #ifdef OPENSSL_FIPS
58 #include <openssl/fips.h>
59 #include <openssl/rand.h>
60 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/o_init.c

2

```
62 /* Perform any essential OpenSSL initialization operations.
63  * Currently only sets FIPS callbacks
64  */
65
66 void OPENSSL_init(void)
67 {
68     static int done = 0;
69     if (done)
70         return;
71     done = 1;
72 #ifdef OPENSSL_FIPS
73     FIPS_set_locking_callbacks(CRYPTO_lock, CRYPTO_add_lock);
74     FIPS_set_error_callbacks(ERR_put_error, ERR_add_error_vdata);
75     FIPS_set_malloc_callbacks(CRYPTO_malloc, CRYPTO_free);
76     RAND_init_fips();
77 #endif
78 #if 0
79     fprintf(stderr, "Called OPENSSL_init\n");
80 #endif
81 }
```

new/usr/src/lib/openssl/libsunw_crypto/o_str.c

1

```
*****
3915 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/o_str.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/o_str.c -*. mode:C; c-file-style: "eay" -*. */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3 * project 2003.
4 */
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <ctype.h>
60 #include <e_os.h>
61 #include <o_str.h>
```

new/usr/src/lib/openssl/libsunw_crypto/o_str.c

2

```
63 #if !defined(OPENSSL_IMPLEMENTS_strncasecmp) && \
64     !defined(OPENSSL_SYSNAME_WIN32) && \
65     !defined(NETWARE_CLIB)
66 # include <strings.h>
67 #endif

69 int OPENSSL_strncasecmp(const char *str1, const char *str2, size_t n)
70 {
71     #if defined(OPENSSL_IMPLEMENTS_strncasecmp)
72         while (*str1 && *str2 && n)
73         {
74             int res = toupper(*str1) - toupper(*str2);
75             if (res) return res < 0 ? -1 : 1;
76             str1++;
77             str2++;
78             n--;
79         }
80         if (n == 0)
81             return 0;
82         if (*str1)
83             return 1;
84         if (*str2)
85             return -1;
86         return 0;
87     #else
88         /* Recursion hazard warning! Whenever strncasecmp is #defined as
89          * OPENSSL_strncasecmp, OPENSSL_IMPLEMENTS_strncasecmp must be
90          * defined as well. */
91         return strncasecmp(str1, str2, n);
92     #endif
93 }

94 int OPENSSL_strcasecmp(const char *str1, const char *str2)
95 {
96     #if defined(OPENSSL_IMPLEMENTS_strncasecmp)
97         return OPENSSL_strncasecmp(str1, str2, (size_t)-1);
98     #else
99         return strcasecmp(str1, str2);
100 #endif
101 }

103 int OPENSSL_memcmp(const void *v1, const void *v2, size_t n)
104 {
105     const unsigned char *c1=v1, *c2=v2;
106     int ret=0;

108     while(n && (ret=*c1-*c2)==0) n--, c1++, c2++;

110     return ret;
111 }
```

new/usr/src/lib/openssl/libsunw_crypto/o_time.c

1

```
*****
11241 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/o_time.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/o_time.c - mode:C; c-file-style: "eay" -*/
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3 * project 2001.
4 */
5 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
6 * project 2008.
7 */
8 /* =====
9 * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
10 *
11 * Redistribution and use in source and binary forms, with or without
12 * modification, are permitted provided that the following conditions
13 * are met:
14 *
15 * 1. Redistributions of source code must retain the above copyright
16 * notice, this list of conditions and the following disclaimer.
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41 *
42 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
43 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
44 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
45 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
46 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
47 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
48 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
49 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
50 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
51 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
52 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
53 * OF THE POSSIBILITY OF SUCH DAMAGE.
54 * =====
55 *
56 * This product includes cryptographic software written by Eric Young
57 * (eay@cryptsoft.com). This product includes software written by Tim
58 * Hudson (tjh@cryptsoft.com).
59 *
60 */
```

new/usr/src/lib/openssl/libsunw_crypto/o_time.c

2

```
62 #include <openssl/e_os2.h>
63 #include <string.h>
64 #include <o_time.h>

66 #ifdef OPENSSL_SYS_VMS
67 # if __CRTL_VER >= 700000000 && \
68     (defined _POSIX_C_SOURCE || !defined _ANSI_C_SOURCE)
69 #   define VMS_GMTIME_OK
70 # endif
71 # ifndef VMS_GMTIME_OK
72 #   include <libdtddef.h>
73 #   include <lib$routines.h>
74 #   include <lnmdef.h>
75 #   include <starlet.h>
76 #   include <descrip.h>
77 #   include <stdlib.h>
78 # endif /* ndef VMS_GMTIME_OK */
79 #endif

81 struct tm *OPENSSL_gmtime(const time_t *timer, struct tm *result)
82 {
83     struct tm *ts = NULL;

85 #if defined(OPENSSL_THREADS) && !defined(OPENSSL_SYS_WIN32) && !defined(OPENSSL_
86     /* should return &data, but doesn't on some systems,
87     so we don't even look at the return value */
88     gmtime_r(timer, result);
89     ts = result;
90 #elif !defined(OPENSSL_SYS_VMS) || defined(VMS_GMTIME_OK)
91     ts = gmtime(timer);
92     if (ts == NULL)
93         return NULL;

95     memcpy(result, ts, sizeof(struct tm));
96     ts = result;
97 #endif
98 #if defined( OPENSSL_SYS_VMS) && !defined( VMS_GMTIME_OK)
99     if (ts == NULL)
100     {
101         static $DESCRIPTOR(tabnam, "LNMSDCL_LOGICAL");
102         static $DESCRIPTOR(lognam, "SYSSTIMEZONE_DIFFERENTIAL");
103         char logvalue[256];
104         unsigned int reslen = 0;
105         struct {
106             short buflen;
107             short code;
108             void *bufaddr;
109             unsigned int *reslen;
110         } itemlist[] = {
111             { 0, LNMS_STRING, 0, 0 },
112             { 0, 0, 0, 0 },
113         };
114         int status;
115         time_t t;

117         /* Get the value for SYSSTIMEZONE_DIFFERENTIAL */
118         itemlist[0].buflen = sizeof(logvalue);
119         itemlist[0].bufaddr = logvalue;
120         itemlist[0].reslen = &reslen;
121         status = sys$trnlm(0, &tabnam, &lognam, 0, itemlist);
122         if (!(status & 1))
123             return NULL;
124         logvalue[reslen] = '\0';

126         t = *timer;
```



```

128 /* The following is extracted from the DEC C header time.h */
129 /*
130 ** Beginning in OpenVMS Version 7.0 mktime, time, ctime, strftime
131 ** have two implementations. One implementation is provided
132 ** for compatibility and deals with time in terms of local time,
133 ** the other __utc__ deals with time in terms of UTC.
134 */
135 /* We use the same conditions as in said time.h to check if we should
136 assume that t contains local time (and should therefore be adjusted)
137 or UTC (and should therefore be left untouched). */
138 #if __CRTL_VER < 700000000 || defined _VMS_V6_SOURCE
139 /* Get the numerical value of the equivalence string */
140 status = atoi(logvalue);

142 /* and use it to move time to GMT */
143 t -= status;
144 #endif

146 /* then convert the result to the time structure */

148 /* Since there was no gmtime_r() to do this stuff for us,
149 we have to do it the hard way. */
150 {
151 /* The VMS epoch is the astronomical Smithsonian date,
152 if I remember correctly, which is November 17, 1858.
153 Furthermore, time is measure in tenths of microseconds
154 and stored in quadwords (64 bit integers). unix_epoch
155 below is January 1st 1970 expressed as a VMS time. The
156 following code was used to get this number:

158 #include <stdio.h>
159 #include <stdlib.h>
160 #include <lib$routines.h>
161 #include <starlet.h>

163 main()
164 {
165     unsigned long systime[2];
166     unsigned short epoch_values[7] =
167     { 1970, 1, 1, 0, 0, 0, 0 };

169     lib$scvt_vectim(epoch_values, systime);

171     printf("%u %u", systime[0], systime[1]);
172 }
173 */
174 unsigned long unix_epoch[2] = { 1273708544, 8164711 };
175 unsigned long deltatime[2];
176 unsigned long systime[2];
177 struct vms_vectime
178 {
179     short year, month, day, hour, minute, second,
180     centi_second;
181 } time_values;
182 long operation;

184 /* Turn the number of seconds since January 1st 1970 to
185 an internal delta time.
186 Note that lib$scvt_to_internal_time() will assume
187 that t is signed, and will therefore break on 32-bit
188 systems some time in 2038.
189 */
190 operation = LIB$K_DELTA_SECONDS;
191 status = lib$scvt_to_internal_time(&operation,
192 &t, deltatime);

```

```

194 /* Add the delta time with the Unix epoch and we have
195 the current UTC time in internal format */
196 status = lib$add_times(unix_epoch, deltatime, systime);

198 /* Turn the internal time into a time vector */
199 status = sys$numtim(&time_values, systime);

201 /* Fill in the struct tm with the result */
202 result->tm_sec = time_values.second;
203 result->tm_min = time_values.minute;
204 result->tm_hour = time_values.hour;
205 result->tm_mday = time_values.day;
206 result->tm_mon = time_values.month - 1;
207 result->tm_year = time_values.year - 1900;

209 operation = LIB$K_DAY_OF_WEEK;
210 status = lib$scvt_from_internal_time(&operation,
211 &result->tm_wday, systime);
212 result->tm_wday %= 7;

214 operation = LIB$K_DAY_OF_YEAR;
215 status = lib$scvt_from_internal_time(&operation,
216 &result->tm_yday, systime);
217 result->tm_yday--;

219 result->tm_isdst = 0; /* There's no way to know... */

221 ts = result;
222 }
223 #endif
224 return ts;
225 }
226

228 /* Take a tm structure and add an offset to it. This avoids any OS issues
229 * with restricted date types and overflows which cause the year 2038
230 * problem.
231 */

233 #define SECS_PER_DAY (24 * 60 * 60)

235 static long date_to_julian(int y, int m, int d);
236 static void julian_to_date(long jd, int *y, int *m, int *d);

238 int OPENSSL_gmtime_adj(struct tm *tm, int off_day, long offset_sec)
239 {
240     int offset_hms, offset_day;
241     long time_jd;
242     int time_year, time_month, time_day;
243     /* split offset into days and day seconds */
244     offset_day = offset_sec / SECS_PER_DAY;
245     /* Avoid sign issues with % operator */
246     offset_hms = offset_sec - (offset_day * SECS_PER_DAY);
247     offset_day += off_day;
248     /* Add current time seconds to offset */
249     offset_hms += tm->tm_hour * 3600 + tm->tm_min * 60 + tm->tm_sec;
250     /* Adjust day seconds if overflow */
251     if (offset_hms >= SECS_PER_DAY)
252     {
253         offset_day++;
254         offset_hms -= SECS_PER_DAY;
255     }
256     else if (offset_hms < 0)
257     {
258         offset_day--;
259         offset_hms += SECS_PER_DAY;

```

```

260     }
261
262     /* Convert date of time structure into a Julian day number.
263     */
264
265     time_year = tm->tm_year + 1900;
266     time_month = tm->tm_mon + 1;
267     time_day = tm->tm_mday;
268
269     time_jd = date_to_julian(time_year, time_month, time_day);
270
271     /* Work out Julian day of new date */
272     time_jd += offset_day;
273
274     if (time_jd < 0)
275         return 0;
276
277     /* Convert Julian day back to date */
278
279     julian_to_date(time_jd, &time_year, &time_month, &time_day);
280
281     if (time_year < 1900 || time_year > 9999)
282         return 0;
283
284     /* Update tm structure */
285
286     tm->tm_year = time_year - 1900;
287     tm->tm_mon = time_month - 1;
288     tm->tm_mday = time_day;
289
290     tm->tm_hour = offset_hms / 3600;
291     tm->tm_min = (offset_hms / 60) % 60;
292     tm->tm_sec = offset_hms % 60;
293
294     return 1;
295 }
296
297 /* Convert date to and from julian day
298  * Uses Fliegel & Van Flandern algorithm
299  */
300
301 static long date_to_julian(int y, int m, int d)
302 {
303     return (1461 * (y + 4800 + (m - 14) / 12)) / 4 +
304            (367 * (m - 2 - 12 * ((m - 14) / 12))) / 12 -
305            (3 * ((y + 4900 + (m - 14) / 12) / 100)) / 4 +
306            d - 32075;
307 }
308
309 static void julian_to_date(long jd, int *y, int *m, int *d)
310 {
311     long L = jd + 68569;
312     long n = (4 * L) / 146097;
313     long i, j;
314
315     L = L - (146097 * n + 3) / 4;
316     i = (4000 * (L + 1)) / 1461001;
317     L = L - (1461 * i) / 4 + 31;
318     j = (80 * L) / 2447;
319     *d = L - (2447 * j) / 80;
320     L = j / 11;
321     *m = j + 2 - (12 * L);
322     *y = 100 * (n - 49) + i + L;
323 }
324
325 #ifdef OPENSSSL_TIME_TEST

```

```

327 #include <stdio.h>
328
329 /* Time checking test code. Check times are identical for a wide range of
330  * offsets. This should be run on a machine with 64 bit time_t or it will
331  * trigger the very errors the routines fix.
332  */
333
334 int main(int argc, char **argv)
335 {
336     long offset;
337     for (offset = 0; offset < 1000000; offset++)
338     {
339         check_time(offset);
340         check_time(-offset);
341         check_time(offset * 1000);
342         check_time(-offset * 1000);
343     }
344 }
345
346 int check_time(long offset)
347 {
348     struct tm tm1, tm2;
349     time_t t1, t2;
350     time(&t1);
351     t2 = t1 + offset;
352     OPENSSSL_gmtime(&t2, &tm2);
353     OPENSSSL_gmtime(&t1, &tm1);
354     OPENSSSL_gmtime_adj(&tm1, 0, offset);
355     if ((tm1.tm_year == tm2.tm_year) &&
356         (tm1.tm_mon == tm2.tm_mon) &&
357         (tm1.tm_mday == tm2.tm_mday) &&
358         (tm1.tm_hour == tm2.tm_hour) &&
359         (tm1.tm_min == tm2.tm_min) &&
360         (tm1.tm_sec == tm2.tm_sec))
361         return 1;
362     fprintf(stderr, "TIME ERROR!!\n");
363     fprintf(stderr, "Time1: %d/%d/%d, %d:%02d:%02d\n",
364             tm2.tm_mday, tm2.tm_mon + 1, tm2.tm_year + 1900,
365             tm2.tm_hour, tm2.tm_min, tm2.tm_sec);
366     fprintf(stderr, "Time2: %d/%d/%d, %d:%02d:%02d\n",
367             tm1.tm_mday, tm1.tm_mon + 1, tm1.tm_year + 1900,
368             tm1.tm_hour, tm1.tm_min, tm1.tm_sec);
369     return 0;
370 }
371
372 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/objects/o_names.c

1

8304 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/objects/o_names.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>

5 #include <openssl/err.h>
6 #include <openssl/lhash.h>
7 #include <openssl/objects.h>
8 #include <openssl/safestack.h>
9 #include <openssl/e_os2.h>

11 /* Later versions of DEC C has started to add linkage information to certain
12 * functions, which makes it tricky to use them as values to regular function
13 * pointers. One way is to define a macro that takes care of casting them
14 * correctly.
15 */
16 #ifndef OPENSSSL_SYS_VMS_DECC
17 # define OPENSSSL_strcmp (int (*)(const char *,const char *))strcmp
18 #else
19 # define OPENSSSL_strcmp strcmp
20 #endif

22 /* I use the ex_data stuff to manage the identifiers for the obj_name_types
23 * that applications may define. I only really use the free function field.
24 */
25 DECLARE_LHASH_OF(OBJ_NAME);
26 static LHASH_OF(OBJ_NAME) *names_lh=NULL;
27 static int names_type_num=OBJ_NAME_TYPE_NUM;

29 typedef struct name_funcs_st
30 {
31     unsigned long (*hash_func)(const char *name);
32     int (*cmp_func)(const char *a,const char *b);
33     void (*free_func)(const char *, int, const char *);
34 } NAME_FUNCS;

36 DECLARE_STACK_OF(NAME_FUNCS)
37 IMPLEMENT_STACK_OF(NAME_FUNCS)

39 static STACK_OF(NAME_FUNCS) *name_funcs_stack;

41 /* The LHASH callbacks now use the raw "void *" prototypes and do per-variable
42 * casting in the functions. This prevents function pointer casting without the
43 * need for macro-generated wrapper functions. */

45 /* static unsigned long obj_name_hash(OBJ_NAME *a); */
46 static unsigned long obj_name_hash(const void *a_void);
47 /* static int obj_name_cmp(OBJ_NAME *a,OBJ_NAME *b); */
48 static int obj_name_cmp(const void *a_void,const void *b_void);

50 static IMPLEMENT_LHASH_HASH_FN(obj_name, OBJ_NAME)
51 static IMPLEMENT_LHASH_COMP_FN(obj_name, OBJ_NAME)

53 int OBJ_NAME_init(void)
54 {
55     if (names_lh != NULL) return(1);
56     MemCheck_off();
57     names_lh=lh_OBJ_NAME_new();
58     MemCheck_on();
59     return(names_lh != NULL);
60 }
```

new/usr/src/lib/openssl/libsunw_crypto/objects/o_names.c

2

```
62 int OBJ_NAME_new_index(unsigned long (*hash_func)(const char *),
63 int (*cmp_func)(const char *, const char *),
64 void (*free_func)(const char *, int, const char *))
65 {
66     int ret;
67     int i;
68     NAME_FUNCS *name_funcs;

70     if (name_funcs_stack == NULL)
71     {
72         MemCheck_off();
73         name_funcs_stack=sk_NAME_FUNCS_new_null();
74         MemCheck_on();
75     }
76     if (name_funcs_stack == NULL)
77     {
78         /* ERROR */
79         return(0);
80     }
81     ret=names_type_num;
82     names_type_num++;
83     for (i=sk_NAME_FUNCS_num(name_funcs_stack); i<names_type_num; i++)
84     {
85         MemCheck_off();
86         name_funcs = OPENSSSL_malloc(sizeof(NAME_FUNCS));
87         MemCheck_on();
88         if (!name_funcs)
89         {
90             OBJerr(OBJ_F_OBJ_NAME_NEW_INDEX,ERR_R_MALLOC_FAILURE);
91             return(0);
92         }
93         name_funcs->hash_func = lh_strhash;
94         name_funcs->cmp_func = OPENSSSL_strcmp;
95         name_funcs->free_func = 0; /* NULL is often declared to
96                                  * ((void *)0), which according
97                                  * to Compaq C is not really
98                                  * compatible with a function
99                                  * pointer. -- Richard Levit

100         MemCheck_off();
101         sk_NAME_FUNCS_push(name_funcs_stack,name_funcs);
102         MemCheck_on();
103     }
104     name_funcs = sk_NAME_FUNCS_value(name_funcs_stack, ret);
105     if (hash_func != NULL)
106         name_funcs->hash_func = hash_func;
107     if (cmp_func != NULL)
108         name_funcs->cmp_func = cmp_func;
109     if (free_func != NULL)
110         name_funcs->free_func = free_func;
111     return(ret);
112 }

114 /* static int obj_name_cmp(OBJ_NAME *a, OBJ_NAME *b) */
115 static int obj_name_cmp(const void *a_void, const void *b_void)
116 {
117     int ret;
118     const OBJ_NAME *a = (const OBJ_NAME *)a_void;
119     const OBJ_NAME *b = (const OBJ_NAME *)b_void;

121     ret=a->type-b->type;
122     if (ret == 0)
123     {
124         if ((name_funcs_stack != NULL)
125             && (sk_NAME_FUNCS_num(name_funcs_stack) > a->type))
126         {
127             ret=sk_NAME_FUNCS_value(name_funcs_stack,
```

```

128         a->type)->cmp_func(a->name,b->name);
129     }
130     else
131         ret=strcmp(a->name,b->name);
132     }
133     return(ret);
134 }

136 /* static unsigned long obj_name_hash(OBJ_NAME *a) */
137 static unsigned long obj_name_hash(const void *a_void)
138 {
139     unsigned long ret;
140     const OBJ_NAME *a = (const OBJ_NAME *)a_void;

142     if ((name_fncs_stack != NULL) && (sk_NAME_FUNCS_num(name_fncs_stack) >
143         {
144             ret=sk_NAME_FUNCS_value(name_fncs_stack,
145                 a->type)->hash_func(a->name);
146         }
147     else
148         {
149             ret=lh_strhash(a->name);
150         }
151     ret^=a->type;
152     return(ret);
153 }

155 const char *OBJ_NAME_get(const char *name, int type)
156 {
157     OBJ_NAME on,*ret;
158     int num=0,alias;

160     if (name == NULL) return(NULL);
161     if ((names_lh == NULL) && !OBJ_NAME_init()) return(NULL);

163     alias=type&OBJ_NAME_ALIAS;
164     type&= ~OBJ_NAME_ALIAS;

166     on.name=name;
167     on.type=type;

169     for (;;)
170     {
171         ret=lh_OBJ_NAME_retrieve(names_lh,&on);
172         if (ret == NULL) return(NULL);
173         if ((ret->alias) && !alias)
174             {
175                 if (++num > 10) return(NULL);
176                 on.name=ret->data;
177             }
178         else
179             {
180                 return(ret->data);
181             }
182     }
183 }

185 int OBJ_NAME_add(const char *name, int type, const char *data)
186 {
187     OBJ_NAME *onp,*ret;
188     int alias;

190     if ((names_lh == NULL) && !OBJ_NAME_init()) return(0);

192     alias=type&OBJ_NAME_ALIAS;
193     type&= ~OBJ_NAME_ALIAS;

```

```

195     onp=(OBJ_NAME *)OPENSSL_malloc(sizeof(OBJ_NAME));
196     if (onp == NULL)
197     {
198         /* ERROR */
199         return(0);
200     }

202     onp->name=name;
203     onp->alias=alias;
204     onp->type=type;
205     onp->data=data;

207     ret=lh_OBJ_NAME_insert(names_lh,onp);
208     if (ret != NULL)
209     {
210         /* free things */
211         if ((name_fncs_stack != NULL) && (sk_NAME_FUNCS_num(name_fncs_
212             {
213                 /* XXX: I'm not sure I understand why the free
214                  * function should get three arguments...
215                  * -- Richard Levitte
216                  */
217                 sk_NAME_FUNCS_value(name_fncs_stack,
218                     ret->type)->free_func(ret->name,ret->type,ret->d
219             }
220         OPENSSL_free(ret);
221     }
222     else
223     {
224         if (lh_OBJ_NAME_error(names_lh))
225         {
226             /* ERROR */
227             return(0);
228         }
229     }
230     return(1);
231 }

233 int OBJ_NAME_remove(const char *name, int type)
234 {
235     OBJ_NAME on,*ret;

237     if (names_lh == NULL) return(0);

239     type&= ~OBJ_NAME_ALIAS;
240     on.name=name;
241     on.type=type;
242     ret=lh_OBJ_NAME_delete(names_lh,&on);
243     if (ret != NULL)
244     {
245         /* free things */
246         if ((name_fncs_stack != NULL) && (sk_NAME_FUNCS_num(name_fncs_
247             {
248                 /* XXX: I'm not sure I understand why the free
249                  * function should get three arguments...
250                  * -- Richard Levitte
251                  */
252                 sk_NAME_FUNCS_value(name_fncs_stack,
253                     ret->type)->free_func(ret->name,ret->type,ret->d
254             }
255         OPENSSL_free(ret);
256         return(1);
257     }
258     else
259         return(0);

```

```

260     }

262 struct doall
263 {
264     int type;
265     void (*fn)(const OBJ_NAME *,void *arg);
266     void *arg;
267 };

269 static void do_all_fn_doall_arg(const OBJ_NAME *name,struct doall *d)
270 {
271     if(name->type == d->type)
272         d->fn(name,d->arg);
273 }

275 static IMPLEMENT_LHASH_DOALL_ARG_FN(do_all_fn, const OBJ_NAME, struct doall)

277 void OBJ_NAME_do_all(int type,void (*fn)(const OBJ_NAME *,void *arg),void *arg)
278 {
279     struct doall d;

281     d.type=type;
282     d.fn=fn;
283     d.arg=arg;

285     lh_OBJ_NAME_doall_arg(names_lh, LHASH_DOALL_ARG_FN(do_all_fn),
286                          struct doall, &d);
287 }

289 struct doall_sorted
290 {
291     int type;
292     int n;
293     const OBJ_NAME **names;
294 };

296 static void do_all_sorted_fn(const OBJ_NAME *name,void *d_)
297 {
298     struct doall_sorted *d=d_;

300     if(name->type != d->type)
301         return;

303     d->names[d->n++]=name;
304 }

306 static int do_all_sorted_cmp(const void *n1_,const void *n2_)
307 {
308     const OBJ_NAME * const *n1=n1_;
309     const OBJ_NAME * const *n2=n2_;

311     return strcmp((*n1)->name,(*n2)->name);
312 }

314 void OBJ_NAME_do_all_sorted(int type,void (*fn)(const OBJ_NAME *,void *arg),
315                             void *arg)
316 {
317     struct doall_sorted d;
318     int n;

320     d.type=type;
321     d.names=OPENSSL_malloc(lh_OBJ_NAME_num_items(names_lh)*sizeof *d.names);
322     d.n=0;
323     OBJ_NAME_do_all(type,do_all_sorted_fn,&d);

325     qsort((void *)d.names,d.n,sizeof *d.names,do_all_sorted_cmp);

```

```

327     for(n=0 ; n < d.n ; ++n)
328         fn(d.names[n],arg);

330     OPENSSL_free((void *)d.names);
331 }

333 static int free_type;

335 static void names_lh_free_doall(OBJ_NAME *onp)
336 {
337     if (onp == NULL)
338         return;

340     if (free_type < 0 || free_type == onp->type)
341         OBJ_NAME_remove(onp->name,onp->type);
342 }

344 static IMPLEMENT_LHASH_DOALL_FN(names_lh_free, OBJ_NAME)

346 static void name_funcs_free(NAME_FUNCS *ptr)
347 {
348     OPENSSL_free(ptr);
349 }

351 void OBJ_NAME_cleanup(int type)
352 {
353     unsigned long down_load;

355     if (names_lh == NULL) return;

357     free_type=type;
358     down_load=lh_OBJ_NAME_down_load(names_lh);
359     lh_OBJ_NAME_down_load(names_lh)=0;

361     lh_OBJ_NAME_doall(names_lh,LHASH_DOALL_FN(names_lh_free));
362     if (type < 0)
363     {
364         lh_OBJ_NAME_free(names_lh);
365         sk_NAME_FUNCS_pop_free(name_funcs_stack,name_funcs_free);
366         names_lh=NULL;
367         name_funcs_stack = NULL;
368     }
369     else
370         lh_OBJ_NAME_down_load(names_lh)=down_load;
371 }

```

new/usr/src/lib/openssl/libsunw_crypto/objects/obj_dat.c

1

17969 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/objects/obj_dat.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/objects/obj_dat.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <ctype.h>
61 #include <limits.h>
```

new/usr/src/lib/openssl/libsunw_crypto/objects/obj_dat.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/lhash.h>
64 #include <openssl/asn1.h>
65 #include <openssl/objects.h>
66 #include <openssl/bn.h>
67
68 /* obj_dat.h is generated from objects.h by obj_dat.pl */
69 #ifndef OPENSSL_NO_OBJECT
70 #include "obj_dat.h"
71 #else
72 /* You will have to load all the objects needed manually in the application */
73 #define NUM_NID 0
74 #define NUM_SN 0
75 #define NUM_LN 0
76 #define NUM_OBJ 0
77 static const unsigned char lvalues[1];
78 static const ASN1_OBJECT nid_objs[1];
79 static const unsigned int sn_objs[1];
80 static const unsigned int ln_objs[1];
81 static const unsigned int obj_objs[1];
82 #endif
83
84 DECLARE_OBJ_BSEARCH_CMP_FN(const ASN1_OBJECT *, unsigned int, sn);
85 DECLARE_OBJ_BSEARCH_CMP_FN(const ASN1_OBJECT *, unsigned int, ln);
86 DECLARE_OBJ_BSEARCH_CMP_FN(const ASN1_OBJECT *, unsigned int, obj);
87
88 #define ADDED_DATA 0
89 #define ADDED_SNAME 1
90 #define ADDED_LNAME 2
91 #define ADDED_NID 3
92
93 typedef struct added_obj_st
94 {
95     int type;
96     ASN1_OBJECT *obj;
97 } ADDED_OBJ;
98 DECLARE_LHASH_OF(ADDED_OBJ);
99
100 static int new_nid=NUM_NID;
101 static LHASH_OF(ADDED_OBJ) *added=NULL;
102
103 static int sn_cmp(const ASN1_OBJECT * const *a, const unsigned int *b)
104 { return(strcmp((*a)->sn,nid_objs[*b].sn)); }
105
106 IMPLEMENT_OBJ_BSEARCH_CMP_FN(const ASN1_OBJECT *, unsigned int, sn);
107
108 static int ln_cmp(const ASN1_OBJECT * const *a, const unsigned int *b)
109 { return(strcmp((*a)->ln,nid_objs[*b].ln)); }
110
111 IMPLEMENT_OBJ_BSEARCH_CMP_FN(const ASN1_OBJECT *, unsigned int, ln);
112
113 static unsigned long added_obj_hash(const ADDED_OBJ *ca)
114 {
115     const ASN1_OBJECT *a;
116     int i;
117     unsigned long ret=0;
118     unsigned char *p;
119
120     a=ca->obj;
121     switch (ca->type)
122     {
123     case ADDED_DATA:
124         ret=a->length<<20L;
125         p=(unsigned char *)a->data;
126         for (i=0; i<a->length; i++)
127             ret^=p[i]<<((i*3)%24);
```

```

128         break;
129     case ADDED_SNAME:
130         ret=lh_strhash(a->sn);
131         break;
132     case ADDED_LNAME:
133         ret=lh_strhash(a->ln);
134         break;
135     case ADDED_NID:
136         ret=a->nid;
137         break;
138     default:
139         /* abort(); */
140         return 0;
141     }
142     ret&=0x3fffffffL;
143     ret|=ca->type<<30L;
144     return(ret);
145 }
146 static IMPLEMENT_LHASH_HASH_FN(added_obj, ADDED_OBJ)

148 static int added_obj_cmp(const ADDED_OBJ *ca, const ADDED_OBJ *cb)
149 {
150     ASN1_OBJECT *a,*b;
151     int i;

153     i=ca->type-cb->type;
154     if (i) return(i);
155     a=ca->obj;
156     b=cb->obj;
157     switch (ca->type)
158     {
159     case ADDED_DATA:
160         i=(a->length - b->length);
161         if (i) return(i);
162         return(memcmp(a->data,b->data,(size_t)a->length));
163     case ADDED_SNAME:
164         if (a->sn == NULL) return(-1);
165         else if (b->sn == NULL) return(1);
166         else return(strcmp(a->sn,b->sn));
167     case ADDED_LNAME:
168         if (a->ln == NULL) return(-1);
169         else if (b->ln == NULL) return(1);
170         else return(strcmp(a->ln,b->ln));
171     case ADDED_NID:
172         return(a->nid-b->nid);
173     default:
174         /* abort(); */
175         return 0;
176     }
177 }
178 static IMPLEMENT_LHASH_COMP_FN(added_obj, ADDED_OBJ)

180 static int init_added(void)
181 {
182     if (added != NULL) return(1);
183     added=lh_ADDED_OBJ_new();
184     return(added != NULL);
185 }

187 static void cleanup1_doall(ADDED_OBJ *a)
188 {
189     a->obj->nid=0;
190     a->obj->flags|=ASN1_OBJECT_FLAG_DYNAMIC|
191                 ASN1_OBJECT_FLAG_DYNAMIC_STRINGS|
192                 ASN1_OBJECT_FLAG_DYNAMIC_DATA;
193 }

```

```

195 static void cleanup2_doall(ADDED_OBJ *a)
196 {
197     a->obj->nid++;
198 }

198 static void cleanup3_doall(ADDED_OBJ *a)
199 {
200     if (--a->obj->nid == 0)
201         ASN1_OBJECT_free(a->obj);
202     OPENSSL_free(a);
203 }

205 static IMPLEMENT_LHASH_DOALL_FN(cleanup1, ADDED_OBJ)
206 static IMPLEMENT_LHASH_DOALL_FN(cleanup2, ADDED_OBJ)
207 static IMPLEMENT_LHASH_DOALL_FN(cleanup3, ADDED_OBJ)

209 /* The purpose of obj_cleanup_defer is to avoid EVP_cleanup() attempting
210  * to use freed up OIDs. If neccessary the actual freeing up of OIDs is
211  * delayed.
212  */

214 int obj_cleanup_defer = 0;

216 void check_defer(int nid)
217 {
218     if (!obj_cleanup_defer && nid >= NUM_NID)
219         obj_cleanup_defer = 1;
220 }

222 void OBJ_cleanup(void)
223 {
224     if (obj_cleanup_defer)
225     {
226         obj_cleanup_defer = 2;
227         return ;
228     }
229     if (added == NULL) return;
230     lh_ADDED_OBJ_down_load(added) = 0;
231     lh_ADDED_OBJ_doall(added,LHASH_DOALL_FN(cleanup1)); /* zero counters */
232     lh_ADDED_OBJ_doall(added,LHASH_DOALL_FN(cleanup2)); /* set counters */
233     lh_ADDED_OBJ_doall(added,LHASH_DOALL_FN(cleanup3)); /* free objects */
234     lh_ADDED_OBJ_free(added);
235     added=NULL;
236 }

238 int OBJ_new_nid(int num)
239 {
240     int i;

242     i=new_nid;
243     new_nid+=num;
244     return(i);
245 }

247 int OBJ_add_object(const ASN1_OBJECT *obj)
248 {
249     ASN1_OBJECT *o;
250     ADDED_OBJ *ao[4]={NULL,NULL,NULL,NULL},*aop;
251     int i;

253     if (added == NULL)
254         if (!init_added()) return(0);
255     if ((o=OBJ_dup(obj)) == NULL) goto err;
256     if (!(ao[ADDED_NID]=(ADDED_OBJ *)OPENSSL_malloc(sizeof(ADDED_OBJ)))) got
257     if ((o->length != 0) && (obj->data != NULL))
258         if (!(ao[ADDED_DATA]=(ADDED_OBJ *)OPENSSL_malloc(sizeof(ADDED_OBJ)))
259     if (o->sn != NULL)

```

```

260     if (!(ao[ADDED_SNAME]=(ADDED_OBJ *)OPENSSL_malloc(sizeof(ADDED_O
261 if (o->ln != NULL)
262     if (!(ao[ADDED_LNAME]=(ADDED_OBJ *)OPENSSL_malloc(sizeof(ADDED_O

264     for (i=ADDED_DATA; i<=ADDED_NID; i++)
265     {
266         if (ao[i] != NULL)
267         {
268             ao[i]->type=i;
269             ao[i]->obj=o;
270             aop=lh_ADDED_OBJ_insert(added,ao[i]);
271             /* memory leak, buit should not normally matter */
272             if (aop != NULL)
273                 OPENSSL_free(aop);
274         }
275     }
276     o->flags&= ~(ASN1_OBJECT_FLAG_DYNAMIC|ASN1_OBJECT_FLAG_DYNAMIC_STRINGS|
277                 ASN1_OBJECT_FLAG_DYNAMIC_DATA);

279     return(o->nid);
280 err2:
281     OBJerr(OBJ_F_OBJ_ADD_OBJECT,ERR_R_MALLOC_FAILURE);
282 err:
283     for (i=ADDED_DATA; i<=ADDED_NID; i++)
284         if (ao[i] != NULL) OPENSSL_free(ao[i]);
285     if (o != NULL) OPENSSL_free(o);
286     return(NID_undef);
287 }

289 ASN1_OBJECT *OBJ_nid2obj(int n)
290 {
291     ADDED_OBJ ad,*adp;
292     ASN1_OBJECT ob;

294     if ((n >= 0) && (n < NUM_NID))
295     {
296         if ((n != NID_undef) && (nid_objs[n].nid == NID_undef))
297         {
298             OBJerr(OBJ_F_OBJ_NID2OBJ,OBJ_R_UNKNOWN_NID);
299             return(NULL);
300         }
301         return((ASN1_OBJECT *)&(nid_objs[n]));
302     }
303     else if (added == NULL)
304         return(NULL);
305     else
306     {
307         ad.type=ADDED_NID;
308         ad.obj= &ob;
309         ob.nid=n;
310         adp=lh_ADDED_OBJ_retrieve(added,&ad);
311         if (adp != NULL)
312             return(adp->obj);
313         else
314         {
315             OBJerr(OBJ_F_OBJ_NID2OBJ,OBJ_R_UNKNOWN_NID);
316             return(NULL);
317         }
318     }
319 }

321 const char *OBJ_nid2sn(int n)
322 {
323     ADDED_OBJ ad,*adp;
324     ASN1_OBJECT ob;

```

```

326     if ((n >= 0) && (n < NUM_NID))
327     {
328         if ((n != NID_undef) && (nid_objs[n].nid == NID_undef))
329         {
330             OBJerr(OBJ_F_OBJ_NID2SN,OBJ_R_UNKNOWN_NID);
331             return(NULL);
332         }
333         return(nid_objs[n].sn);
334     }
335     else if (added == NULL)
336         return(NULL);
337     else
338     {
339         ad.type=ADDED_NID;
340         ad.obj= &ob;
341         ob.nid=n;
342         adp=lh_ADDED_OBJ_retrieve(added,&ad);
343         if (adp != NULL)
344             return(adp->obj->sn);
345         else
346         {
347             OBJerr(OBJ_F_OBJ_NID2SN,OBJ_R_UNKNOWN_NID);
348             return(NULL);
349         }
350     }
351 }

353 const char *OBJ_nid2ln(int n)
354 {
355     ADDED_OBJ ad,*adp;
356     ASN1_OBJECT ob;

358     if ((n >= 0) && (n < NUM_NID))
359     {
360         if ((n != NID_undef) && (nid_objs[n].nid == NID_undef))
361         {
362             OBJerr(OBJ_F_OBJ_NID2LN,OBJ_R_UNKNOWN_NID);
363             return(NULL);
364         }
365         return(nid_objs[n].ln);
366     }
367     else if (added == NULL)
368         return(NULL);
369     else
370     {
371         ad.type=ADDED_NID;
372         ad.obj= &ob;
373         ob.nid=n;
374         adp=lh_ADDED_OBJ_retrieve(added,&ad);
375         if (adp != NULL)
376             return(adp->obj->ln);
377         else
378         {
379             OBJerr(OBJ_F_OBJ_NID2LN,OBJ_R_UNKNOWN_NID);
380             return(NULL);
381         }
382     }
383 }

385 static int obj_cmp(const ASN1_OBJECT * const *ap, const unsigned int *bp)
386 {
387     int j;
388     const ASN1_OBJECT *a= *ap;
389     const ASN1_OBJECT *b= &nid_objs[*bp];

391     j=(a->length - b->length);

```



```

524         goto err;
525         if (!BN_set_word(bl, l))
526             goto err;
527         use_bn = 1;
528     }
529     if (use_bn)
530     {
531         if (!BN_lshift(bl, bl, 7))
532             goto err;
533     }
534     else
535         l <= 7L;
536 }
537
538 if (first)
539 {
540     first = 0;
541     if (l >= 80)
542     {
543         i = 2;
544         if (use_bn)
545         {
546             if (!BN_sub_word(bl, 80))
547                 goto err;
548         }
549         else
550             l -= 80;
551     }
552     else
553     {
554         i = (int)(l/40);
555         l = (long)(i*40);
556     }
557     if (buf && (buf_len > 0))
558     {
559         *buf++ = i + '0';
560         buf_len--;
561     }
562     n++;
563 }
564
565 if (use_bn)
566 {
567     char *bndec;
568     bndec = BN_bn2dec(bl);
569     if (!bndec)
570         goto err;
571     i = strlen(bndec);
572     if (buf)
573     {
574         if (buf_len > 0)
575         {
576             *buf++ = '.';
577             buf_len--;
578         }
579         BUF_strncpy(buf, bndec, buf_len);
580         if (i > buf_len)
581         {
582             buf += buf_len;
583             buf_len = 0;
584         }
585     }
586     else
587     {
588         buf += i;
589         buf_len -= i;
590     }
591 }

```

```

590     }
591     n++;
592     n += i;
593     OPENSSL_free(bndec);
594 }
595     else
596     {
597         BIO_snprintf(tbuf, sizeof tbuf, "%lu", l);
598         i = strlen(tbuf);
599         if (buf && (buf_len > 0))
600         {
601             BUF_strncpy(buf, tbuf, buf_len);
602             if (i > buf_len)
603             {
604                 buf += buf_len;
605                 buf_len = 0;
606             }
607         }
608         else
609         {
610             buf += i;
611             buf_len -= i;
612         }
613     }
614     n += i;
615     l = 0;
616 }
617
618 if (bl)
619     BN_free(bl);
620 return n;
621
622 err:
623 if (bl)
624     BN_free(bl);
625 return -1;
626 }
627
628 int OBJ_txt2nid(const char *s)
629 {
630     ASN1_OBJECT *obj;
631     int nid;
632     obj = OBJ_txt2obj(s, 0);
633     nid = OBJ_obj2nid(obj);
634     ASN1_OBJECT_free(obj);
635     return nid;
636 }
637
638 int OBJ_ln2nid(const char *s)
639 {
640     ASN1_OBJECT o;
641     const ASN1_OBJECT *oo = &o;
642     ADDED_OBJ ad, *adp;
643     const unsigned int *op;
644
645     o.ln = s;
646     if (added != NULL)
647     {
648         ad.type = ADDED_LNAME;
649         ad.obj = &o;
650         adp = lh_ADDED_OBJ_retrieve(added, &ad);
651         if (adp != NULL) return (adp->obj->nid);
652     }
653     op = OBJ_bsearch_ln(&o, ln_objs, NUM_LN);
654     if (op == NULL) return(NID_undef);
655     return(nid_objs[*op].nid);

```

```

656     }
658 int OBJ_sn2nid(const char *s)
659 {
660     ASN1_OBJECT o;
661     const ASN1_OBJECT *oo= &o;
662     ADDED_OBJ ad,*adp;
663     const unsigned int *op;
665     o.sn=s;
666     if (added != NULL)
667     {
668         ad.type=ADDED_SNAME;
669         ad.obj= &o;
670         adp=lh_ADDED_OBJ_retrieve(added,&ad);
671         if (adp != NULL) return (adp->obj->nid);
672     }
673     op=OBJ_bsearch_sn(&o, sn_objs, NUM_SN);
674     if (op == NULL) return(NID_undef);
675     return(nid_objs[*op].nid);
676 }
678 const void *OBJ_bsearch_(const void *key, const void *base, int num, int size,
679                          int (*cmp)(const void *, const void *))
680 {
681     return OBJ_bsearch_ex_(key, base, num, size, cmp, 0);
682 }
684 const void *OBJ_bsearch_ex_(const void *key, const void *base_, int num,
685                             int size,
686                             int (*cmp)(const void *, const void *),
687                             int flags)
688 {
689     const char *base=base_;
690     int l,h,i=0,c=0;
691     const char *p = NULL;
693     if (num == 0) return(NULL);
694     l=0;
695     h=num;
696     while (l < h)
697     {
698         i=(l+h)/2;
699         p= &(base[i*size]);
700         c=(*cmp)(key,p);
701         if (c < 0)
702             h=i;
703         else if (c > 0)
704             l=i+1;
705         else
706             break;
707     }
708 #ifdef CHARSET_EBCDIC
709 /* THIS IS A KLUDGE - Because the *_obj is sorted in ASCII order, and
710  * I don't have perl (yet), we revert to a *LINEAR* search
711  * when the object wasn't found in the binary search.
712  */
713     if (c != 0)
714     {
715         for (i=0; i<num; ++i)
716         {
717             p= &(base[i*size]);
718             c= (*cmp)(key,p);
719             if (c == 0 || (c < 0 && (flags & OBJ_BSEARCH_VALUE_ON_NO
720                 return p;
721         }

```

```

722     }
723 #endif
724     if (c != 0 && !(flags & OBJ_BSEARCH_VALUE_ON_NOMATCH))
725         p = NULL;
726     else if (c == 0 && (flags & OBJ_BSEARCH_FIRST_VALUE_ON_MATCH))
727     {
728         while(i > 0 && (*cmp)(key,&(base[(i-1)*size])) == 0)
729             i--;
730         p = &(base[i*size]);
731     }
732     return(p);
733 }
735 int OBJ_create_objects(BIO *in)
736 {
737     MS_STATIC char buf[512];
738     int i,num=0;
739     char *o,*s,*l=NULL;
741     for (;;)
742     {
743         s=o=NULL;
744         i=BIO_gets(in,buf,512);
745         if (i <= 0) return(num);
746         buf[i-1]='\0';
747         if (!isalnum((unsigned char)buf[0])) return(num);
748         o=s=buf;
749         while (isdigit((unsigned char)*s) || (*s == '.'))
750             s++;
751         if (*s != '\0')
752         {
753             *(s++)='\0';
754             while (isspace((unsigned char)*s))
755                 s++;
756             if (*s == '\0')
757                 s=NULL;
758             else
759             {
760                 l=s;
761                 while ((*l != '\0') && !isspace((unsigned char)*l))
762                     l++;
763                 if (*l != '\0')
764                 {
765                     *(l++)='\0';
766                     while (isspace((unsigned char)*l))
767                         l++;
768                     if (*l == '\0') l=NULL;
769                 }
770                 else
771                     l=NULL;
772             }
773         }
774         else
775             s=NULL;
776         if ((o == NULL) || (*o == '\0')) return(num);
777         if (!OBJ_create(o,s,l)) return(num);
778         num++;
779     }
780     /* return(num); */
781 }
783 int OBJ_create(const char *oid, const char *sn, const char *ln)
784 {
785     int ok=0;
786     ASN1_OBJECT *op=NULL;
787     unsigned char *buf;

```

```
788     int i;
790     i=a2d_ASN1_OBJECT(NULL,0,oid,-1);
791     if (i <= 0) return(0);
793     if ((buf=(unsigned char *)OPENSSL_malloc(i)) == NULL)
794     {
795         OBJerr(OBJ_F_OBJ_CREATE,ERR_R_MALLOC_FAILURE);
796         return(0);
797     }
798     i=a2d_ASN1_OBJECT(buf,i,oid,-1);
799     if (i == 0)
800         goto err;
801     op=(ASN1_OBJECT *)ASN1_OBJECT_create(OBJ_new_nid(1),buf,i,sn,ln);
802     if (op == NULL)
803         goto err;
804     ok=OBJ_add_object(op);
805 err:
806     ASN1_OBJECT_free(op);
807     OPENSSL_free(buf);
808     return(ok);
809 }
```

new/usr/src/lib/openssl/libsunw_crypto/objects/obj_err.c

1

```
*****
3881 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/objects/obj_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/objects/obj_err.c */
2 /* =====
3 * Copyright (c) 1999-2006 The OpenSSL Project. All rights reserved.
4 *
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */
60
61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/objects/obj_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/objects.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_OBJ,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_OBJ,0,reason)
70
71 static ERR_STRING_DATA OBJ_str_functs[]=
72 {
73 {ERR_FUNC(OBJ_F_OBJ_ADD_OBJECT), "OBJ_add_object"},
74 {ERR_FUNC(OBJ_F_OBJ_CREATE), "OBJ_create"},
75 {ERR_FUNC(OBJ_F_OBJ_DUP), "OBJ_dup"},
76 {ERR_FUNC(OBJ_F_OBJ_NAME_NEW_INDEX), "OBJ_NAME_new_index"},
77 {ERR_FUNC(OBJ_F_OBJ_NID2LN), "OBJ_nid2ln"},
78 {ERR_FUNC(OBJ_F_OBJ_NID2OBJ), "OBJ_nid2obj"},
79 {ERR_FUNC(OBJ_F_OBJ_NID2SN), "OBJ_nid2sn"},
80 {0,NULL}
81 };
82
83 static ERR_STRING_DATA OBJ_str_reasons[]=
84 {
85 {ERR_REASON(OBJ_R_MALLOC_FAILURE), "malloc failure"},
86 {ERR_REASON(OBJ_R_UNKNOWN_NID), "unknown nid"},
87 {0,NULL}
88 };
89
90 #endif
91
92 void ERR_load_OBJ_strings(void)
93 {
94 #ifndef OPENSSL_NO_ERR
95
96 if (ERR_func_error_string(OBJ_str_functs[0].error) == NULL)
97 {
98 ERR_load_strings(0,OBJ_str_functs);
99 ERR_load_strings(0,OBJ_str_reasons);
100 }
101 #endif
102 }
```

```
*****
```

```
4749 Fri May 30 18:31:57 2014
new/usr/src/lib/openssl/libsunw_crypto/objects/obj_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/objects/obj_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/lhash.h>
```

```
62 #include <openssl/objects.h>
63 #include <openssl/buffer.h>
64
65 ASN1_OBJECT *OBJ_dup(const ASN1_OBJECT *o)
66 {
67     ASN1_OBJECT *r;
68     int i;
69     char *ln=NULL, *sn=NULL;
70     unsigned char *data=NULL;
71
72     if (o == NULL) return(NULL);
73     if (!(o->flags & ASN1_OBJECT_FLAG_DYNAMIC))
74         return((ASN1_OBJECT *)o); /* XXX: ugh! Why? What kind of
75                                     duplication is this??? */
76
77     r=ASN1_OBJECT_new();
78     if (r == NULL)
79     {
80         OBJerr(OBJ_F_OBJ_DUP,ERR_R_ASN1_LIB);
81         return(NULL);
82     }
83     data=OPENSSL_malloc(o->length);
84     if (data == NULL)
85         goto err;
86     if (o->data != NULL)
87         memcpy(data,o->data,o->length);
88     /* once data attached to object it remains const */
89     r->data = data;
90     r->length=o->length;
91     r->nid=o->nid;
92     r->ln=r->sn=NULL;
93     if (o->ln != NULL)
94     {
95         i=strlen(o->ln)+1;
96         ln=OPENSSL_malloc(i);
97         if (ln == NULL) goto err;
98         memcpy(ln,o->ln,i);
99         r->ln=ln;
100    }
101
102    if (o->sn != NULL)
103    {
104        i=strlen(o->sn)+1;
105        sn=OPENSSL_malloc(i);
106        if (sn == NULL) goto err;
107        memcpy(sn,o->sn,i);
108        r->sn=sn;
109    }
110    r->flags=o->flags|(ASN1_OBJECT_FLAG_DYNAMIC|
111                      ASN1_OBJECT_FLAG_DYNAMIC_STRINGS|ASN1_OBJECT_FLAG_DYNAMIC_DATA);
112    return(r);
113 err:
114    OBJerr(OBJ_F_OBJ_DUP,ERR_R_MALLOC_FAILURE);
115    if (ln != NULL) OPENSSL_free(ln);
116    if (sn != NULL) OPENSSL_free(sn);
117    if (data != NULL) OPENSSL_free(data);
118    if (r != NULL) OPENSSL_free(r);
119    return(NULL);
120 }
121
122 int OBJ_cmp(const ASN1_OBJECT *a, const ASN1_OBJECT *b)
123 {
124     int ret;
125
126     ret=(a->length-b->length);
127     if (ret) return(ret);
```

new/usr/src/lib/openssl/libsunw_crypto/objects/obj_lib.c

3

```
128     return(memcmp(a->data,b->data,a->length));  
129 }
```

new/usr/src/lib/openssl/libsunw_crypto/objects/obj_xref.c

1

```
*****
6184 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/objects/obj_xref.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/objects/obj_xref.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
59 #include <openssl/objects.h>
60 #include "obj_xref.h"
```

new/usr/src/lib/openssl/libsunw_crypto/objects/obj_xref.c

2

```
62 DECLARE_STACK_OF(nid_triple)
63 STACK_OF(nid_triple) *sig_app, *sigx_app;

65 static int sig_cmp(const nid_triple *a, const nid_triple *b)
66 {
67     return a->sign_id - b->sign_id;
68 }

70 DECLARE_OBJ_BSEARCH_CMP_FN(nid_triple, nid_triple, sig);
71 IMPLEMENT_OBJ_BSEARCH_CMP_FN(nid_triple, nid_triple, sig);

73 static int sig_sk_cmp(const nid_triple * const *a, const nid_triple * const *b)
74 {
75     return (*a)->sign_id - (*b)->sign_id;
76 }

78 DECLARE_OBJ_BSEARCH_CMP_FN(const nid_triple *, const nid_triple *, sigx);

80 static int sigx_cmp(const nid_triple * const *a, const nid_triple * const *b)
81 {
82     int ret;
83     ret = (*a)->hash_id - (*b)->hash_id;
84     if (ret)
85         return ret;
86     return (*a)->pkey_id - (*b)->pkey_id;
87 }

89 IMPLEMENT_OBJ_BSEARCH_CMP_FN(const nid_triple *, const nid_triple *, sigx);

91 int OBJ_find_sigid_algs(int signid, int *pdig_nid, int *ppkey_nid)
92 {
93     nid_triple tmp;
94     const nid_triple *rv = NULL;
95     tmp.sign_id = signid;

97     if (sig_app)
98     {
99         int idx = sk_nid_triple_find(sig_app, &tmp);
100         if (idx >= 0)
101             rv = sk_nid_triple_value(sig_app, idx);
102     }

104 #ifndef OBJ_XREF_TEST2
105     if (rv == NULL)
106     {
107         rv = OBJ_bsearch_sig(&tmp, sigoid_srt,
108                             sizeof(sigoid_srt) / sizeof(nid_triple));
109     }
110 #endif
111     if (rv == NULL)
112         return 0;
113     if (pdig_nid)
114         *pdig_nid = rv->hash_id;
115     if (ppkey_nid)
116         *ppkey_nid = rv->pkey_id;
117     return 1;
118 }

120 int OBJ_find_sigid_by_algs(int *psignid, int dig_nid, int pkey_nid)
121 {
122     nid_triple tmp;
123     const nid_triple *t=&tmp;
124     const nid_triple **rv = NULL;

126     tmp.hash_id = dig_nid;
127     tmp.pkey_id = pkey_nid;
```



```

129     if (sigx_app)
130     {
131         int idx = sk_nid_triple_find(sigx_app, &tmp);
132         if (idx >= 0)
133         {
134             t = sk_nid_triple_value(sigx_app, idx);
135             rv = &t;
136         }
137     }

139 #ifndef OBJ_XREF_TEST2
140     if (rv == NULL)
141     {
142         rv = OBJ_bsearch_sigx(&t, sigoid_srt_xref,
143                             sizeof(sigoid_srt_xref) / sizeof(nid_triple *)
144                             );
145     }
146 #endif
147     if (rv == NULL)
148         return 0;
149     if (psignid)
150         *psignid = (*rv)->sign_id;
151     return 1;
152 }

154 int OBJ_add_sigid(int signid, int dig_id, int pkey_id)
155 {
156     nid_triple *ntr;
157     if (!sig_app)
158         sig_app = sk_nid_triple_new(sig_sk_cmp);
159     if (!sig_app)
160         return 0;
161     if (!sigx_app)
162         sigx_app = sk_nid_triple_new(sigx_cmp);
163     if (!sigx_app)
164         return 0;
165     ntr = OPENSSL_malloc(sizeof(int) * 3);
166     if (!ntr)
167         return 0;
168     ntr->sign_id = signid;
169     ntr->hash_id = dig_id;
170     ntr->pkey_id = pkey_id;

172     if (!sk_nid_triple_push(sig_app, ntr))
173     {
174         OPENSSL_free(ntr);
175         return 0;
176     }

178     if (!sk_nid_triple_push(sigx_app, ntr))
179         return 0;

181     sk_nid_triple_sort(sig_app);
182     sk_nid_triple_sort(sigx_app);

184     return 1;
185 }

187 static void sid_free(nid_triple *tt)
188 {
189     OPENSSL_free(tt);
190 }

192 void OBJ_sigid_free(void)
193 {

```

```

194     if (sig_app)
195     {
196         sk_nid_triple_pop_free(sig_app, sid_free);
197         sig_app = NULL;
198     }
199     if (sigx_app)
200     {
201         sk_nid_triple_free(sigx_app);
202         sigx_app = NULL;
203     }
204 }
205
206 #ifdef OBJ_XREF_TEST

208 main()
209 {
210     int n1, n2, n3;

212     int i, rv;
213 #ifndef OBJ_XREF_TEST2
214     for (i = 0; i < sizeof(sigoid_srt) / sizeof(nid_triple); i++)
215     {
216         OBJ_add_sigid(sigoid_srt[i][0], sigoid_srt[i][1],
217                     sigoid_srt[i][2]);
218     }
219 #endif

221     for (i = 0; i < sizeof(sigoid_srt) / sizeof(nid_triple); i++)
222     {
223         n1 = sigoid_srt[i][0];
224         rv = OBJ_find_sigid_algs(n1, &n2, &n3);
225         printf("Forward: %d, %s %s %s\n", rv,
226             OBJ_nid2ln(n1), OBJ_nid2ln(n2), OBJ_nid2ln(n3));
227         n1=0;
228         rv = OBJ_find_sigid_by_algs(&n1, n2, n3);
229         printf("Reverse: %d, %s %s %s\n", rv,
230             OBJ_nid2ln(n1), OBJ_nid2ln(n2), OBJ_nid2ln(n3));
231     }
232 }
233
234 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_asn.c

1

```
*****
7300 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_asn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ocsp_asn.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <openssl/asn1.h>
59 #include <openssl/asn1t.h>
60 #include <openssl/ocsp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_asn.c

2

```
62 ASN1_SEQUENCE(OCSP_SIGNATURE) = {
63     ASN1_SIMPLE(OCSP_SIGNATURE, signatureAlgorithm, X509_ALGOR),
64     ASN1_SIMPLE(OCSP_SIGNATURE, signature, ASN1_BIT_STRING),
65     ASN1_EXP_SEQUENCE_OF_OPT(OCSP_SIGNATURE, certs, X509, 0)
66 } ASN1_SEQUENCE_END(OCSP_SIGNATURE)
67
68 IMPLEMENT_ASN1_FUNCTIONS(OCSP_SIGNATURE)
69
70 ASN1_SEQUENCE(OCSP_CERTID) = {
71     ASN1_SIMPLE(OCSP_CERTID, hashAlgorithm, X509_ALGOR),
72     ASN1_SIMPLE(OCSP_CERTID, issuerNameHash, ASN1_OCTET_STRING),
73     ASN1_SIMPLE(OCSP_CERTID, issuerKeyHash, ASN1_OCTET_STRING),
74     ASN1_SIMPLE(OCSP_CERTID, serialNumber, ASN1_INTEGER)
75 } ASN1_SEQUENCE_END(OCSP_CERTID)
76
77 IMPLEMENT_ASN1_FUNCTIONS(OCSP_CERTID)
78
79 ASN1_SEQUENCE(OCSP_ONEREQ) = {
80     ASN1_SIMPLE(OCSP_ONEREQ, reqCert, OCSP_CERTID),
81     ASN1_EXP_SEQUENCE_OF_OPT(OCSP_ONEREQ, singleRequestExtensions, X509_EXTE
82 } ASN1_SEQUENCE_END(OCSP_ONEREQ)
83
84 IMPLEMENT_ASN1_FUNCTIONS(OCSP_ONEREQ)
85
86 ASN1_SEQUENCE(OCSP_REQINFO) = {
87     ASN1_EXP_OPT(OCSP_REQINFO, version, ASN1_INTEGER, 0),
88     ASN1_EXP_OPT(OCSP_REQINFO, requestorName, GENERAL_NAME, 1),
89     ASN1_SEQUENCE_OF(OCSP_REQINFO, requestList, OCSP_ONEREQ),
90     ASN1_EXP_SEQUENCE_OF_OPT(OCSP_REQINFO, requestExtensions, X509_EXTENSION
91 } ASN1_SEQUENCE_END(OCSP_REQINFO)
92
93 IMPLEMENT_ASN1_FUNCTIONS(OCSP_REQINFO)
94
95 ASN1_SEQUENCE(OCSP_REQUEST) = {
96     ASN1_SIMPLE(OCSP_REQUEST, tbsRequest, OCSP_REQINFO),
97     ASN1_EXP_OPT(OCSP_REQUEST, optionalSignature, OCSP_SIGNATURE, 0)
98 } ASN1_SEQUENCE_END(OCSP_REQUEST)
99
100 IMPLEMENT_ASN1_FUNCTIONS(OCSP_REQUEST)
101
102 /* OCSP_RESPONSE templates */
103
104 ASN1_SEQUENCE(OCSP_RESPBYTES) = {
105     ASN1_SIMPLE(OCSP_RESPBYTES, responseType, ASN1_OBJECT),
106     ASN1_SIMPLE(OCSP_RESPBYTES, response, ASN1_OCTET_STRING)
107 } ASN1_SEQUENCE_END(OCSP_RESPBYTES)
108
109 IMPLEMENT_ASN1_FUNCTIONS(OCSP_RESPBYTES)
110
111 ASN1_SEQUENCE(OCSP_RESPONSE) = {
112     ASN1_SIMPLE(OCSP_RESPONSE, responseStatus, ASN1_ENUMERATED),
113     ASN1_EXP_OPT(OCSP_RESPONSE, responseBytes, OCSP_RESPBYTES, 0)
114 } ASN1_SEQUENCE_END(OCSP_RESPONSE)
115
116 IMPLEMENT_ASN1_FUNCTIONS(OCSP_RESPONSE)
117
118 ASN1_CHOICE(OCSP_RESPID) = {
119     ASN1_EXP(OCSP_RESPID, value.byName, X509_NAME, 1),
120     ASN1_EXP(OCSP_RESPID, value.byKey, ASN1_OCTET_STRING, 2)
121 } ASN1_CHOICE_END(OCSP_RESPID)
122
123 IMPLEMENT_ASN1_FUNCTIONS(OCSP_RESPID)
124
125 ASN1_SEQUENCE(OCSP_REVOKEDINFO) = {
126     ASN1_SIMPLE(OCSP_REVOKEDINFO, revocationTime, ASN1_GENERALIZEDTIME),
127     ASN1_EXP_OPT(OCSP_REVOKEDINFO, revocationReason, ASN1_ENUMERATED, 0)
```

```
128 } ASN1_SEQUENCE_END(OCSP_REVOKEDINFO)

130 IMPLEMENT_ASN1_FUNCTIONS(OCSP_REVOKEDINFO)

132 ASN1_CHOICE(OCSP_CERTSTATUS) = {
133     ASN1_IMP(OCSP_CERTSTATUS, value.good, ASN1_NULL, 0),
134     ASN1_IMP(OCSP_CERTSTATUS, value.revoked, OCSP_REVOKEDINFO, 1),
135     ASN1_IMP(OCSP_CERTSTATUS, value.unknown, ASN1_NULL, 2)
136 } ASN1_CHOICE_END(OCSP_CERTSTATUS)

138 IMPLEMENT_ASN1_FUNCTIONS(OCSP_CERTSTATUS)

140 ASN1_SEQUENCE(OCSP_SINGLERESP) = {
141     ASN1_SIMPLE(OCSP_SINGLERESP, certId, OCSP_CERTID),
142     ASN1_SIMPLE(OCSP_SINGLERESP, certStatus, OCSP_CERTSTATUS),
143     ASN1_SIMPLE(OCSP_SINGLERESP, thisUpdate, ASN1_GENERALIZEDTIME),
144     ASN1_EXP_OPT(OCSP_SINGLERESP, nextUpdate, ASN1_GENERALIZEDTIME, 0),
145     ASN1_EXP_SEQUENCE_OF_OPT(OCSP_SINGLERESP, singleExtensions, X509_EXTE
146 } ASN1_SEQUENCE_END(OCSP_SINGLERESP)

148 IMPLEMENT_ASN1_FUNCTIONS(OCSP_SINGLERESP)

150 ASN1_SEQUENCE(OCSP_RESPDATA) = {
151     ASN1_EXP_OPT(OCSP_RESPDATA, version, ASN1_INTEGER, 0),
152     ASN1_SIMPLE(OCSP_RESPDATA, responderId, OCSP_RESPID),
153     ASN1_SIMPLE(OCSP_RESPDATA, producedAt, ASN1_GENERALIZEDTIME),
154     ASN1_SEQUENCE_OF(OCSP_RESPDATA, responses, OCSP_SINGLERESP),
155     ASN1_EXP_SEQUENCE_OF_OPT(OCSP_RESPDATA, responseExtensions, X509_EXTE
156 } ASN1_SEQUENCE_END(OCSP_RESPDATA)

158 IMPLEMENT_ASN1_FUNCTIONS(OCSP_RESPDATA)

160 ASN1_SEQUENCE(OCSP_BASICRESP) = {
161     ASN1_SIMPLE(OCSP_BASICRESP, tbsResponseData, OCSP_RESPDATA),
162     ASN1_SIMPLE(OCSP_BASICRESP, signatureAlgorithm, X509_ALGOR),
163     ASN1_SIMPLE(OCSP_BASICRESP, signature, ASN1_BIT_STRING),
164     ASN1_EXP_SEQUENCE_OF_OPT(OCSP_BASICRESP, certs, X509, 0)
165 } ASN1_SEQUENCE_END(OCSP_BASICRESP)

167 IMPLEMENT_ASN1_FUNCTIONS(OCSP_BASICRESP)

169 ASN1_SEQUENCE(OCSP_CRLID) = {
170     ASN1_EXP_OPT(OCSP_CRLID, crlUrl, ASN1_IA5STRING, 0),
171     ASN1_EXP_OPT(OCSP_CRLID, crlNum, ASN1_INTEGER, 1),
172     ASN1_EXP_OPT(OCSP_CRLID, crlTime, ASN1_GENERALIZEDTIME, 2)
173 } ASN1_SEQUENCE_END(OCSP_CRLID)

175 IMPLEMENT_ASN1_FUNCTIONS(OCSP_CRLID)

177 ASN1_SEQUENCE(OCSP_SERVICELOC) = {
178     ASN1_SIMPLE(OCSP_SERVICELOC, issuer, X509_NAME),
179     ASN1_SEQUENCE_OF_OPT(OCSP_SERVICELOC, locator, ACCESS_DESCRIPTION)
180 } ASN1_SEQUENCE_END(OCSP_SERVICELOC)

182 IMPLEMENT_ASN1_FUNCTIONS(OCSP_SERVICELOC)
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_cl.c

1

```
*****
10785 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_cl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ocsp_cl.c */
2 /* Written by Tom Titchener <Tom.Titchener@groove.net> for the OpenSSL
3  * project. */

5 /* History:
6  * This file was transfered to Richard Levitte from CertCo by Kathy
7  * Weinhold in mid-spring 2000 to be included in OpenSSL or released
8  * as a patch kit. */

10 /* =====
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12  *
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19  *
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24  *
25  * 3. All advertising materials mentioning features or use of this
26  * software must display the following acknowledgment:
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29  *
30  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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43  *
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55  * OF THE POSSIBILITY OF SUCH DAMAGE.
56  * =====
57  *
58  * This product includes cryptographic software written by Eric Young
59  * (eay@cryptsoft.com). This product includes software written by Tim
60  * Hudson (tjh@cryptsoft.com).
61  *
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_cl.c

2

```
62 */

64 #include <stdio.h>
65 #include <time.h>
66 #include <cryptlib.h>
67 #include <openssl/objects.h>
68 #include <openssl/rand.h>
69 #include <openssl/x509.h>
70 #include <openssl/pem.h>
71 #include <openssl/x509v3.h>
72 #include <openssl/ocsp.h>

74 /* Utility functions related to sending OCSP requests and extracting
75  * relevant information from the response.
76  */

78 /* Add an OCSP_CERTID to an OCSP request. Return new OCSP_ONEREQ
79  * pointer: useful if we want to add extensions.
80  */

82 OCSP_ONEREQ *OCSP_request_add0_id(OCSP_REQUEST *req, OCSP_CERTID *cid)
83 {
84     OCSP_ONEREQ *one = NULL;

86     if (!(one = OCSP_ONEREQ_new())) goto err;
87     if (one->reqCert) OCSP_CERTID_free(one->reqCert);
88     one->reqCert = cid;
89     if (req &&
90         !sk_OCSP_ONEREQ_push(req->tbsRequest->requestList, one))
91         goto err;
92     return one;
93 err:
94     OCSP_ONEREQ_free(one);
95     return NULL;
96 }

98 /* Set requestorName from an X509_NAME structure */

100 int OCSP_request_set1_name(OCSP_REQUEST *req, X509_NAME *nm)
101 {
102     GENERAL_NAME *gen;
103     gen = GENERAL_NAME_new();
104     if (gen == NULL)
105         return 0;
106     if (!X509_NAME_set(&gen->d.directoryName, nm))
107     {
108         GENERAL_NAME_free(gen);
109         return 0;
110     }
111     gen->type = GEN_DIRNAME;
112     if (req->tbsRequest->requestorName)
113         GENERAL_NAME_free(req->tbsRequest->requestorName);
114     req->tbsRequest->requestorName = gen;
115     return 1;
116 }
117

119 /* Add a certificate to an OCSP request */

121 int OCSP_request_add1_cert(OCSP_REQUEST *req, X509 *cert)
122 {
123     OCSP_SIGNATURE *sig;
124     if (!req->optionalSignature)
125         req->optionalSignature = OCSP_SIGNATURE_new();
126     sig = req->optionalSignature;
127     if (!sig) return 0;
```

```

128     if (!cert) return 1;
129     if (!sig->certs && !(sig->certs = sk_X509_new_null()))
130         return 0;
131
132     if(!sk_X509_push(sig->certs, cert)) return 0;
133     CRYPTO_add(&cert->references, 1, CRYPTO_LOCK_X509);
134     return 1;
135 }
136
137 /* Sign an OCSP request set the requestorName to the subject
138  * name of an optional signers certificate and include one
139  * or more optional certificates in the request. Behaves
140  * like PKCS7_sign().
141  */
142
143 int OCSP_request_sign(OCSP_REQUEST *req,
144                       X509 *signer,
145                       EVP_PKEY *key,
146                       const EVP_MD *dgst,
147                       STACK_OF(X509) *certs,
148                       unsigned long flags)
149 {
150     int i;
151     OCSP_SIGNATURE *sig;
152     X509 *x;
153
154     if (!OCSP_request_set1_name(req, X509_get_subject_name(signer)))
155         goto err;
156
157     if (!(req->optionalSignature = sig = OCSP_SIGNATURE_new())) goto err;
158     if (key)
159     {
160         if (!X509_check_private_key(signer, key))
161         {
162             OCSPerr(OCSP_F_OCSP_REQUEST_SIGN, OCSP_R_PRIVATE_KEY_DOES_NOT_MATCH_CERT, 0);
163             goto err;
164         }
165         if (!OCSP_REQUEST_sign(req, key, dgst)) goto err;
166     }
167
168     if (!(flags & OCSP_NOCERTS))
169     {
170         if(!OCSP_request_add1_cert(req, signer)) goto err;
171         for (i = 0; i < sk_X509_num(certificates); i++)
172         {
173             x = sk_X509_value(certificates, i);
174             if (!OCSP_request_add1_cert(req, x)) goto err;
175         }
176     }
177
178     return 1;
179 err:
180     OCSP_SIGNATURE_free(req->optionalSignature);
181     req->optionalSignature = NULL;
182     return 0;
183 }
184
185 /* Get response status */
186
187 int OCSP_response_status(OCSP_RESPONSE *resp)
188 {
189     return ASN1_ENUMERATED_get(resp->responseStatus);
190 }
191
192 /* Extract basic response from OCSP_RESPONSE or NULL if
193  * no basic response present.
194  */

```

[illegible]

```

260             ASN1_GENERALIZEDTIME **thisupd,
261             ASN1_GENERALIZEDTIME **nextupd)
262     {
263         int ret;
264         OCSP_CERTSTATUS *cst;
265         if(!single) return -1;
266         cst = single->certStatus;
267         ret = cst->type;
268         if (ret == V_OCSP_CERTSTATUS_REVOKED)
269         {
270             OCSP_REVOKEDINFO *rev = cst->value.revoked;
271             if (revtime) *revtime = rev->revocationTime;
272             if (reason)
273             {
274                 if(rev->revocationReason)
275                     *reason = ASN1_ENUMERATED_get(rev->revocationReason);
276                 else *reason = -1;
277             }
278         }
279         if(thisupd) *thisupd = single->thisUpdate;
280         if(nextupd) *nextupd = single->nextUpdate;
281         return ret;
282     }
283
284 /* This function combines the previous ones: look up a certificate ID and
285  * if found extract status information. Return 0 is successful.
286  */
287
288 int OCSP_resp_find_status(OCSP_BASICRESP *bs, OCSP_CERTID *id, int *status,
289                          int *reason,
290                          ASN1_GENERALIZEDTIME **revtime,
291                          ASN1_GENERALIZEDTIME **thisupd,
292                          ASN1_GENERALIZEDTIME **nextupd)
293 {
294     int i;
295     OCSP_SINGLERESP *single;
296     i = OCSP_resp_find(bs, id, -1);
297     /* Maybe check for multiple responses and give an error? */
298     if(i < 0) return 0;
299     single = OCSP_resp_get0(bs, i);
300     i = OCSP_single_get0_status(single, reason, revtime, thisupd, nextupd);
301     if(status) *status = i;
302     return 1;
303 }
304
305 /* Check validity of thisUpdate and nextUpdate fields. It is possible that the r
306  * take a few seconds to process and/or the time wont be totally accurate. There
307  * rejecting otherwise valid time we allow the times to be within 'nsec' of the
308  * Also to avoid accepting very old responses without a nextUpdate field an opti
309  * parameter specifies the maximum age the thisUpdate field can be.
310  */
311
312 int OCSP_check_validity(ASN1_GENERALIZEDTIME *thisupd, ASN1_GENERALIZEDTIME *nex
313 {
314     int ret = 1;
315     time_t t_now, t_tmp;
316     time(&t_now);
317     /* Check thisUpdate is valid and not more than nsec in the future */
318     if (!ASN1_GENERALIZEDTIME_check(thisupd))
319     {
320         OCSPerr(OCSP_F_OCSP_CHECK_VALIDITY, OCSP_R_ERROR_IN_THISUPDATE_F
321         ret = 0;
322     }
323     else
324     {
325         t_tmp = t_now + nsec;

```

```

326         if (X509_cmp_time(thisupd, &t_tmp) > 0)
327         {
328             OCSPerr(OCSP_F_OCSP_CHECK_VALIDITY, OCSP_R_STATUS_NOT_YE
329             ret = 0;
330         }
331
332     /* If maxsec specified check thisUpdate is not more than maxsec
333     if (maxsec >= 0)
334     {
335         t_tmp = t_now - maxsec;
336         if (X509_cmp_time(thisupd, &t_tmp) < 0)
337         {
338             OCSPerr(OCSP_F_OCSP_CHECK_VALIDITY, OCSP_R_STATU
339             ret = 0;
340         }
341     }
342 }
343
344 if (!nextupd) return ret;
345
346 /* Check nextUpdate is valid and not more than nsec in the past */
347 if (!ASN1_GENERALIZEDTIME_check(nextupd))
348 {
349     OCSPerr(OCSP_F_OCSP_CHECK_VALIDITY, OCSP_R_ERROR_IN_NEXTUPDATE_F
350     ret = 0;
351 }
352 else
353 {
354     t_tmp = t_now - nsec;
355     if (X509_cmp_time(nextupd, &t_tmp) < 0)
356     {
357         OCSPerr(OCSP_F_OCSP_CHECK_VALIDITY, OCSP_R_STATUS_EXPIRE
358         ret = 0;
359     }
360 }
361
362 /* Also don't allow nextUpdate to precede thisUpdate */
363 if (ASN1_STRING_cmp(nextupd, thisupd) < 0)
364 {
365     OCSPerr(OCSP_F_OCSP_CHECK_VALIDITY, OCSP_R_NEXTUPDATE_BEFORE_THI
366     ret = 0;
367 }
368
369 return ret;
370 }
371

```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_err.c

1

```
*****
6666 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ocsp/ocsp_err.c */
2 /* =====
3  * Copyright (c) 1999-2006 The OpenSSL Project. All rights reserved.
4  *
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6  * modification, are permitted provided that the following conditions
7  * are met:
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17  * 3. All advertising materials mentioning features or use of this
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44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/ocsp.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_OCSP,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_OCSP,0,reason)

71 static ERR_STRING_DATA OCSP_str_functs[]=
72 {
73 {ERR_FUNC(OCSP_F_ASN1_STRING_ENCODE), "ASN1_STRING_encode"},
74 {ERR_FUNC(OCSP_F_D2I_OCSP_NONCE), "D2I_OCSP_NONCE"},
75 {ERR_FUNC(OCSP_F_OCSP_BASIC_ADD1_STATUS), "OCSP_basic_add1_status"},
76 {ERR_FUNC(OCSP_F_OCSP_BASIC_SIGN), "OCSP_basic_sign"},
77 {ERR_FUNC(OCSP_F_OCSP_BASIC_VERIFY), "OCSP_basic_verify"},
78 {ERR_FUNC(OCSP_F_OCSP_CERT_ID_NEW), "OCSP_cert_id_new"},
79 {ERR_FUNC(OCSP_F_OCSP_CHECK_DELEGATED), "OCSP_CHECK_DELEGATED"},
80 {ERR_FUNC(OCSP_F_OCSP_CHECK_IDS), "OCSP_CHECK_IDS"},
81 {ERR_FUNC(OCSP_F_OCSP_CHECK_ISSUER), "OCSP_CHECK_ISSUER"},
82 {ERR_FUNC(OCSP_F_OCSP_CHECK_VALIDITY), "OCSP_check_validity"},
83 {ERR_FUNC(OCSP_F_OCSP_MATCH_ISSUERID), "OCSP_MATCH_ISSUERID"},
84 {ERR_FUNC(OCSP_F_OCSP_PARSE_URL), "OCSP_parse_url"},
85 {ERR_FUNC(OCSP_F_OCSP_REQUEST_SIGN), "OCSP_request_sign"},
86 {ERR_FUNC(OCSP_F_OCSP_REQUEST_VERIFY), "OCSP_request_verify"},
87 {ERR_FUNC(OCSP_F_OCSP_RESPONSE_GET1_BASIC), "OCSP_response_get1_basic"},
88 {ERR_FUNC(OCSP_F_OCSP_SENDREQ_BIO), "OCSP_sendreq_bio"},
89 {ERR_FUNC(OCSP_F_OCSP_SENDREQ_NBIO), "OCSP_sendreq_nbio"},
90 {ERR_FUNC(OCSP_F_PARSE_HTTP_LINE1), "PARSE_HTTP_LINE1"},
91 {ERR_FUNC(OCSP_F_REQUEST_VERIFY), "REQUEST_VERIFY"},
92 {0, NULL}
93 };

95 static ERR_STRING_DATA OCSP_str_reasons[]=
96 {
97 {ERR_REASON(OCSP_R_BAD_DATA), "bad data"},
98 {ERR_REASON(OCSP_R_CERTIFICATE_VERIFY_ERROR), "certificate verify error"},
99 {ERR_REASON(OCSP_R_DIGEST_ERR), "digest err"},
100 {ERR_REASON(OCSP_R_ERROR_IN_NEXTUPDATE_FIELD), "error in nextupdate field"},
101 {ERR_REASON(OCSP_R_ERROR_IN_THISUPDATE_FIELD), "error in thisupdate field"},
102 {ERR_REASON(OCSP_R_ERROR_PARSING_URL), "error parsing url"},
103 {ERR_REASON(OCSP_R_MISSING_OCSPSIGNING_USAGE), "missing ocspsigning usage"},
104 {ERR_REASON(OCSP_R_NEXTUPDATE_BEFORE_THISUPDATE), "nextupdate before thisupdate"},
105 {ERR_REASON(OCSP_R_NOT_BASIC_RESPONSE), "not basic response"},
106 {ERR_REASON(OCSP_R_NO_CERTIFICATES_IN_CHAIN), "no certificates in chain"},
107 {ERR_REASON(OCSP_R_NO_CONTENT), "no content"},
108 {ERR_REASON(OCSP_R_NO_PUBLIC_KEY), "no public key"},
109 {ERR_REASON(OCSP_R_NO_RESPONSE_DATA), "no response data"},
110 {ERR_REASON(OCSP_R_NO_REVOKED_TIME), "no revoked time"},
111 {ERR_REASON(OCSP_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE), "private key does not"},
112 {ERR_REASON(OCSP_R_REQUEST_NOT_SIGNED), "request not signed"},
113 {ERR_REASON(OCSP_R_RESPONSE_CONTAINS_NO_REVOCATION_DATA), "response contains no r"},
114 {ERR_REASON(OCSP_R_ROOT_CA_NOT_TRUSTED), "root ca not trusted"},
115 {ERR_REASON(OCSP_R_SERVER_READ_ERROR), "server read error"},
116 {ERR_REASON(OCSP_R_SERVER_RESPONSE_ERROR), "server response error"},
117 {ERR_REASON(OCSP_R_SERVER_RESPONSE_PARSE_ERROR), "server response parse error"},
118 {ERR_REASON(OCSP_R_SERVER_WRITE_ERROR), "server write error"},
119 {ERR_REASON(OCSP_R_SIGNATURE_FAILURE), "signature failure"},
120 {ERR_REASON(OCSP_R_SIGNER_CERTIFICATE_NOT_FOUND), "signer certificate not found"},
121 {ERR_REASON(OCSP_R_STATUS_EXPIRED), "status expired"},
122 {ERR_REASON(OCSP_R_STATUS_NOT_YET_VALID), "status not yet valid"},
123 {ERR_REASON(OCSP_R_STATUS_TOO_OLD), "status too old"},
124 {ERR_REASON(OCSP_R_UNKNOWN_MESSAGE_DIGEST), "unknown message digest"},
125 {ERR_REASON(OCSP_R_UNKNOWN_NID), "unknown nid"},
126 {ERR_REASON(OCSP_R_UNSUPPORTED_REQUESTORNAME_TYPE), "unsupported requestorname ty"},
127 {0, NULL}
}
```

```
128     };
130 #endif
132 void ERR_load_OCSP_strings(void)
133 {
134 #ifndef OPENSSL_NO_ERR
136     if (ERR_func_error_string(OCSP_str_functs[0].error) == NULL)
137     {
138         ERR_load_strings(0, OCSP_str_functs);
139         ERR_load_strings(0, OCSP_str_reasons);
140     }
141 #endif
142 }
```


new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_ext.c

1

```
*****
16220 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_ext.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ocsp_ext.c */
2 /* Written by Tom Titchener <Tom.Titchener@groove.net> for the OpenSSL
3  * project. */

5 /* History:
6  * This file was transfered to Richard Levitte from CertCo by Kathy
7  * Weinhold in mid-spring 2000 to be included in OpenSSL or released
8  * as a patch kit. */

10 /* =====
11  * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
12  *
13  * Redistribution and use in source and binary forms, with or without
14  * modification, are permitted provided that the following conditions
15  * are met:
16  *
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18  * notice, this list of conditions and the following disclaimer.
19  *
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24  *
25  * 3. All advertising materials mentioning features or use of this
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47  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
48  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
49  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
50  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
51  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
52  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
53  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
54  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
55  * OF THE POSSIBILITY OF SUCH DAMAGE.
56  * =====
57  *
58  * This product includes cryptographic software written by Eric Young
59  * (eay@cryptsoft.com). This product includes software written by Tim
60  * Hudson (tjh@cryptsoft.com).
61  *
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_ext.c

2

```
62 */

64 #include <stdio.h>
65 #include <cryptlib.h>
66 #include <openssl/objects.h>
67 #include <openssl/x509.h>
68 #include <openssl/ocsp.h>
69 #include <openssl/rand.h>
70 #include <openssl/x509v3.h>

72 /* Standard wrapper functions for extensions */

74 /* OCSP request extensions */

76 int OCSP_REQUEST_get_ext_count(OCSP_REQUEST *x)
77 {
78     return(X509v3_get_ext_count(x->tbsRequest->requestExtensions));
79 }

81 int OCSP_REQUEST_get_ext_by_NID(OCSP_REQUEST *x, int nid, int lastpos)
82 {
83     return(X509v3_get_ext_by_NID(x->tbsRequest->requestExtensions, nid, lastpos));
84 }

86 int OCSP_REQUEST_get_ext_by_OBJ(OCSP_REQUEST *x, ASN1_OBJECT *obj, int lastpos)
87 {
88     return(X509v3_get_ext_by_OBJ(x->tbsRequest->requestExtensions, obj, lastpos));
89 }

91 int OCSP_REQUEST_get_ext_by_critical(OCSP_REQUEST *x, int crit, int lastpos)
92 {
93     return(X509v3_get_ext_by_critical(x->tbsRequest->requestExtensions, crit, lastpos));
94 }

96 X509_EXTENSION *OCSP_REQUEST_get_ext(OCSP_REQUEST *x, int loc)
97 {
98     return(X509v3_get_ext(x->tbsRequest->requestExtensions, loc));
99 }

101 X509_EXTENSION *OCSP_REQUEST_delete_ext(OCSP_REQUEST *x, int loc)
102 {
103     return(X509v3_delete_ext(x->tbsRequest->requestExtensions, loc));
104 }

106 void *OCSP_REQUEST_get1_ext_d2i(OCSP_REQUEST *x, int nid, int *crit, int *idx)
107 {
108     return X509v3_get_d2i(x->tbsRequest->requestExtensions, nid, crit, idx);
109 }

111 int OCSP_REQUEST_add1_ext_i2d(OCSP_REQUEST *x, int nid, void *value, int crit,
112                               unsigned long flags)
113 {
114     return X509v3_add1_i2d(&x->tbsRequest->requestExtensions, nid, value, crit, flags);
115 }

117 int OCSP_REQUEST_add_ext(OCSP_REQUEST *x, X509_EXTENSION *ex, int loc)
118 {
119     return(X509v3_add_ext(&x->tbsRequest->requestExtensions, ex, loc) != NUL);
120 }

122 /* Single extensions */

124 int OCSP_ONEREQ_get_ext_count(OCSP_ONEREQ *x)
125 {
126     return(X509v3_get_ext_count(x->singleRequestExtensions));
127 }
```

```

129 int OCSP_ONEREQ_get_ext_by_NID(OCSP_ONEREQ *x, int nid, int lastpos)
130 {
131     return(X509v3_get_ext_by_NID(x->singleRequestExtensions,nid,lastpos));
132 }

134 int OCSP_ONEREQ_get_ext_by_OBJ(OCSP_ONEREQ *x, ASN1_OBJECT *obj, int lastpos)
135 {
136     return(X509v3_get_ext_by_OBJ(x->singleRequestExtensions,obj,lastpos));
137 }

139 int OCSP_ONEREQ_get_ext_by_critical(OCSP_ONEREQ *x, int crit, int lastpos)
140 {
141     return(X509v3_get_ext_by_critical(x->singleRequestExtensions,crit,lastpos));
142 }

144 X509_EXTENSION *OCSP_ONEREQ_get_ext(OCSP_ONEREQ *x, int loc)
145 {
146     return(X509v3_get_ext(x->singleRequestExtensions,loc));
147 }

149 X509_EXTENSION *OCSP_ONEREQ_delete_ext(OCSP_ONEREQ *x, int loc)
150 {
151     return(X509v3_delete_ext(x->singleRequestExtensions,loc));
152 }

154 void *OCSP_ONEREQ_get1_ext_d2i(OCSP_ONEREQ *x, int nid, int *crit, int *idx)
155 {
156     return X509v3_get_d2i(x->singleRequestExtensions, nid, crit, idx);
157 }

159 int OCSP_ONEREQ_add1_ext_i2d(OCSP_ONEREQ *x, int nid, void *value, int crit,
160                             unsigned long flags)
161 {
162     return X509v3_add1_i2d(&x->singleRequestExtensions, nid, value, crit, flags);
163 }

165 int OCSP_ONEREQ_add_ext(OCSP_ONEREQ *x, X509_EXTENSION *ex, int loc)
166 {
167     return(X509v3_add_ext(&x->singleRequestExtensions,ex,loc) != NULL);
168 }

170 /* OCSP Basic response */

172 int OCSP_BASICRESP_get_ext_count(OCSP_BASICRESP *x)
173 {
174     return(X509v3_get_ext_count(x->tbsResponseData->responseExtensions));
175 }

177 int OCSP_BASICRESP_get_ext_by_NID(OCSP_BASICRESP *x, int nid, int lastpos)
178 {
179     return(X509v3_get_ext_by_NID(x->tbsResponseData->responseExtensions,nid,
180 lastpos));
181 }

182 int OCSP_BASICRESP_get_ext_by_OBJ(OCSP_BASICRESP *x, ASN1_OBJECT *obj, int lastpos)
183 {
184     return(X509v3_get_ext_by_OBJ(x->tbsResponseData->responseExtensions,obj,
185 lastpos));
186 }

187 int OCSP_BASICRESP_get_ext_by_critical(OCSP_BASICRESP *x, int crit, int lastpos)
188 {
189     return(X509v3_get_ext_by_critical(x->tbsResponseData->responseExtensions,
190 crit,lastpos));
191 }

192 X509_EXTENSION *OCSP_BASICRESP_get_ext(OCSP_BASICRESP *x, int loc)
193 {

```

```

194     return(X509v3_get_ext(x->tbsResponseData->responseExtensions,loc));
195 }

197 X509_EXTENSION *OCSP_BASICRESP_delete_ext(OCSP_BASICRESP *x, int loc)
198 {
199     return(X509v3_delete_ext(x->tbsResponseData->responseExtensions,loc));
200 }

202 void *OCSP_BASICRESP_get1_ext_d2i(OCSP_BASICRESP *x, int nid, int *crit, int *id
203 {
204     return X509v3_get_d2i(x->tbsResponseData->responseExtensions, nid, crit,
205 *id);
206 }

207 int OCSP_BASICRESP_add1_ext_i2d(OCSP_BASICRESP *x, int nid, void *value, int cri
208                             unsigned long flags)
209 {
210     return X509v3_add1_i2d(&x->tbsResponseData->responseExtensions, nid, val
211 *value, crit, flags);
212 }

213 int OCSP_BASICRESP_add_ext(OCSP_BASICRESP *x, X509_EXTENSION *ex, int loc)
214 {
215     return(X509v3_add_ext(&x->tbsResponseData->responseExtensions,ex,loc)
216 != NULL);
217 }

218 /* OCSP single response extensions */

220 int OCSP_SINGLERESP_get_ext_count(OCSP_SINGLERESP *x)
221 {
222     return(X509v3_get_ext_count(x->singleExtensions));
223 }

225 int OCSP_SINGLERESP_get_ext_by_NID(OCSP_SINGLERESP *x, int nid, int lastpos)
226 {
227     return(X509v3_get_ext_by_NID(x->singleExtensions,nid,lastpos));
228 }

230 int OCSP_SINGLERESP_get_ext_by_OBJ(OCSP_SINGLERESP *x, ASN1_OBJECT *obj, int las
231 {
232     return(X509v3_get_ext_by_OBJ(x->singleExtensions,obj,lastpos));
233 }

235 int OCSP_SINGLERESP_get_ext_by_critical(OCSP_SINGLERESP *x, int crit, int lastpo
236 {
237     return(X509v3_get_ext_by_critical(x->singleExtensions,crit,lastpos));
238 }

240 X509_EXTENSION *OCSP_SINGLERESP_get_ext(OCSP_SINGLERESP *x, int loc)
241 {
242     return(X509v3_get_ext(x->singleExtensions,loc));
243 }

245 X509_EXTENSION *OCSP_SINGLERESP_delete_ext(OCSP_SINGLERESP *x, int loc)
246 {
247     return(X509v3_delete_ext(x->singleExtensions,loc));
248 }

250 void *OCSP_SINGLERESP_get1_ext_d2i(OCSP_SINGLERESP *x, int nid, int *crit, int *
251 {
252     return X509v3_get_d2i(x->singleExtensions, nid, crit, idx);
253 }

255 int OCSP_SINGLERESP_add1_ext_i2d(OCSP_SINGLERESP *x, int nid, void *value, int c
256                             unsigned long flags)
257 {
258     return X509v3_add1_i2d(&x->singleExtensions, nid, value, crit, flags);
259 }

```

```

261 int OCSP_SINGLERESP_add_ext(OCSP_SINGLERESP *x, X509_EXTENSION *ex, int loc)
262 {
263     return(X509v3_add_ext(&(x->singleExtensions),ex,loc) != NULL);
264 }

266 /* also CRL Entry Extensions */
267 #if 0
268 ASN1_STRING *ASN1_STRING_encode(ASN1_STRING *s, i2d_of_void *i2d,
269                                 void *data, STACK_OF(ASN1_OBJECT) *sk)
270 {
271     int i;
272     unsigned char *p, *b = NULL;

274     if (data)
275     {
276         if ((i=i2d(data,NULL)) <= 0) goto err;
277         if (!(b=p=OPENSSL_malloc((unsigned int)i)))
278             goto err;
279         if (i2d(data, &p) <= 0) goto err;
280     }
281     else if (sk)
282     {
283         if ((i=i2d_ASN1_SET_OF_ASN1_OBJECT(sk,NULL,
284                                             (I2D_OF(ASN1_OBJECT))i2d,
285                                             V_ASN1_SEQUENCE,
286                                             V_ASN1_UNIVERSAL,
287                                             IS_SEQUENCE)<=0) goto err;
288         if (!(b=p=OPENSSL_malloc((unsigned int)i)))
289             goto err;
290         if (i2d_ASN1_SET_OF_ASN1_OBJECT(sk,&p,(I2D_OF(ASN1_OBJECT))i2d,
291                                         V_ASN1_SEQUENCE,
292                                         V_ASN1_UNIVERSAL,
293                                         IS_SEQUENCE)<=0) goto err;
294     }
295     else
296     {
297         OCSPerr(OCSP_F_ASN1_STRING_ENCODE,OCSP_R_BAD_DATA);
298         goto err;
299     }
300     if (!s && !(s = ASN1_STRING_new())) goto err;
301     if (!(ASN1_STRING_set(s, b, i))) goto err;
302     OPENSSL_free(b);
303     return s;
304 err:
305     if (b) OPENSSL_free(b);
306     return NULL;
307 }
308 #endif

310 /* Nonce handling functions */

312 /* Add a nonce to an extension stack. A nonce can be specified or if NULL
313  * a random nonce will be generated.
314  * Note: OpenSSL 0.9.7d and later create an OCTET STRING containing the
315  * nonce, previous versions used the raw nonce.
316  */

318 static int ocs_add1_nonce(STACK_OF(X509_EXTENSION) **exts, unsigned char *val,
319                          {
320     unsigned char *tmpval;
321     ASN1_OCTET_STRING os;
322     int ret = 0;
323     if (len <= 0) len = OCSP_DEFAULT_NONCE_LENGTH;
324     /* Create the OCTET STRING manually by writing out the header and
325      * appending the content octets. This avoids an extra memory allocation

```

```

326     * operation in some cases. Applications should *NOT* do this because
327     * it relies on library internals.
328     */
329     os.length = ASN1_object_size(0, len, V_ASN1_OCTET_STRING);
330     os.data = OPENSSL_malloc(os.length);
331     if (os.data == NULL)
332         goto err;
333     tmpval = os.data;
334     ASN1_put_object(&tmpval, 0, len, V_ASN1_OCTET_STRING, V_ASN1_UNIVERSAL);
335     if (val)
336         memcpy(tmpval, val, len);
337     else
338         RAND_pseudo_bytes(tmpval, len);
339     if(!X509v3_add1_i2d(exts, NID_id_pkix_OCSP_Nonce,
340                        &os, 0, X509v3_ADD_REPLACE))
341         goto err;
342     ret = 1;
343     err:
344     if (os.data)
345         OPENSSL_free(os.data);
346     return ret;
347 }

350 /* Add nonce to an OCSP request */

352 int OCSP_request_add1_nonce(OCSP_REQUEST *req, unsigned char *val, int len)
353 {
354     return ocs_add1_nonce(&req->tbsRequest->requestExtensions, val, len);
355 }

357 /* Same as above but for a response */

359 int OCSP_basic_add1_nonce(OCSP_BASICRESP *resp, unsigned char *val, int len)
360 {
361     return ocs_add1_nonce(&resp->tbsResponseData->responseExtensions, val,
362                          len);
363 }

364 /* Check nonce validity in a request and response.
365  * Return value reflects result:
366  * 1: nonces present and equal.
367  * 2: nonces both absent.
368  * 3: nonce present in response only.
369  * 0: nonces both present and not equal.
370  * -1: nonce in request only.
371  *
372  * For most responders clients can check return > 0.
373  * If responder doesn't handle nonces return != 0 may be
374  * necessary. return == 0 is always an error.
375  */

377 int OCSP_check_nonce(OCSP_REQUEST *req, OCSP_BASICRESP *bs)
378 {
379     /*
380     * Since we are only interested in the presence or absence of
381     * the nonce and comparing its value there is no need to use
382     * the X509v3 routines: this way we can avoid them allocating an
383     * ASN1_OCTET_STRING structure for the value which would be
384     * freed immediately anyway.
385     */

387     int req_idx, resp_idx;
388     X509_EXTENSION *req_ext, *resp_ext;
389     req_idx = OCSP_REQUEST_get_ext_by_NID(req, NID_id_pkix_OCSP_Nonce, -1);
390     resp_idx = OCSP_BASICRESP_get_ext_by_NID(bs, NID_id_pkix_OCSP_Nonce, -1);
391     /* Check both absent */

```

```

392     if((req_idx < 0) && (resp_idx < 0))
393         return 2;
394     /* Check in request only */
395     if((req_idx >= 0) && (resp_idx < 0))
396         return -1;
397     /* Check in response but not request */
398     if((req_idx < 0) && (resp_idx >= 0))
399         return 3;
400     /* Otherwise nonce in request and response so retrieve the extensions */
401     req_ext = OCSF_REQUEST_get_ext(req, req_idx);
402     resp_ext = OCSF_BASICRESP_get_ext(bs, resp_idx);
403     if(ASN1_OCTET_STRING_cmp(req_ext->value, resp_ext->value))
404         return 0;
405     return 1;
406 }

408 /* Copy the nonce value (if any) from an OCSF request to
409  * a response.
410  */

412 int OCSF_copy_nonce(OCSF_BASICRESP *resp, OCSF_REQUEST *req)
413 {
414     X509_EXTENSION *req_ext;
415     int req_idx;
416     /* Check for nonce in request */
417     req_idx = OCSF_REQUEST_get_ext_by_NID(req, NID_id_pkix_OCSF_Nonce, -1);
418     /* If no nonce that's OK */
419     if (req_idx < 0) return 2;
420     req_ext = OCSF_REQUEST_get_ext(req, req_idx);
421     return OCSF_BASICRESP_add_ext(resp, req_ext, -1);
422 }

424 X509_EXTENSION *OCSF_crlID_new(char *url, long *n, char *tim)
425 {
426     X509_EXTENSION *x = NULL;
427     OCSF_CRLID *cid = NULL;
428
429     if (!(cid = OCSF_CRLID_new())) goto err;
430     if (url)
431     {
432         if (!(cid->crlUrl = ASN1_IA5STRING_new())) goto err;
433         if (!(ASN1_STRING_set(cid->crlUrl, url, -1))) goto err;
434     }
435     if (n)
436     {
437         if (!(cid->crlNum = ASN1_INTEGER_new())) goto err;
438         if (!(ASN1_INTEGER_set(cid->crlNum, *n))) goto err;
439     }
440     if (tim)
441     {
442         if (!(cid->crlTime = ASN1_GENERALIZEDTIME_new())) goto err;
443         if (!(ASN1_GENERALIZEDTIME_set_string(cid->crlTime, tim)))
444             goto err;
445     }
446     x = X509V3_EXT_i2d(NID_id_pkix_OCSF_CrlID, 0, cid);
447 err:
448     if (cid) OCSF_CRLID_free(cid);
449     return x;
450 }

452 /* AcceptableResponses ::= SEQUENCE OF OBJECT IDENTIFIER */
453 X509_EXTENSION *OCSF_accept_responses_new(char **oids)
454 {
455     int nid;
456     STACK_OF(ASN1_OBJECT) *sk = NULL;
457     ASN1_OBJECT *o = NULL;

```

```

458     X509_EXTENSION *x = NULL;
459
460     if (!(sk = sk_ASN1_OBJECT_new_null())) goto err;
461     while (oids && *oids)
462     {
463         if ((nid=OBJ_txt2nid(*oids))!=NID_undef&&(o=OBJ_nid2obj(nid)))
464             sk_ASN1_OBJECT_push(sk, o);
465         oids++;
466     }
467     x = X509V3_EXT_i2d(NID_id_pkix_OCSF_acceptableResponses, 0, sk);
468 err:
469     if (sk) sk_ASN1_OBJECT_pop_free(sk, ASN1_OBJECT_free);
470     return x;
471 }

473 /* ArchiveCutoff ::= GeneralizedTime */
474 X509_EXTENSION *OCSF_archive_cutoff_new(char* tim)
475 {
476     X509_EXTENSION *x=NULL;
477     ASN1_GENERALIZEDTIME *gt = NULL;
478
479     if (!(gt = ASN1_GENERALIZEDTIME_new())) goto err;
480     if (!(ASN1_GENERALIZEDTIME_set_string(gt, tim))) goto err;
481     x = X509V3_EXT_i2d(NID_id_pkix_OCSF_archiveCutoff, 0, gt);
482 err:
483     if (gt) ASN1_GENERALIZEDTIME_free(gt);
484     return x;
485 }

487 /* per ACCESS_DESCRIPTION parameter are oids, of which there are currently
488  * two--NID_ad_ocsp, NID_id_ad_caIssuers--and GeneralName value. This
489  * method forces NID_ad_ocsp and uniformResourceLocator [6] IA5String.
490  */
491 X509_EXTENSION *OCSF_url_svcloc_new(X509_NAME* issuer, char **urls)
492 {
493     X509_EXTENSION *x = NULL;
494     ASN1_IA5STRING *ia5 = NULL;
495     OCSF_SERVICELOC *sloc = NULL;
496     ACCESS_DESCRIPTION *ad = NULL;
497
498     if (!(sloc = OCSF_SERVICELOC_new())) goto err;
499     if (!(sloc->issuer = X509_NAME_dup(issuer))) goto err;
500     if (urls && *urls && !(sloc->locator = sk_ACCESS_DESCRIPTION_new_null()))
501         while (urls && *urls)
502         {
503             if (!(ad = ACCESS_DESCRIPTION_new())) goto err;
504             if (!(ad->method=OBJ_nid2obj(NID_ad_OCSP))) goto err;
505             if (!(ad->location = GENERAL_NAME_new())) goto err;
506             if (!(ia5 = ASN1_IA5STRING_new())) goto err;
507             if (!(ASN1_STRING_set((ASN1_STRING*)ia5, *urls, -1)) goto err;
508             ad->location->type = GEN_URI;
509             ad->location->d.ia5 = ia5;
510             if (!sk_ACCESS_DESCRIPTION_push(sloc->locator, ad)) goto err;
511             urls++;
512         }
513     x = X509V3_EXT_i2d(NID_id_pkix_OCSF_serviceLocator, 0, sloc);
514 err:
515     if (sloc) OCSF_SERVICELOC_free(sloc);
516     return x;
517 }

```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_ht.c

1

```
*****
11532 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_ht.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ocsp_ht.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <ctype.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_ht.c

2

```
62 #include <string.h>
63 #include "e_os.h"
64 #include <openssl/asn1.h>
65 #include <openssl/ocsp.h>
66 #include <openssl/err.h>
67 #include <openssl/buffer.h>
68 #ifdef OPENSSL_SYS_SUNOS
69 #define strtoul (unsigned long)strtol
70 #endif /* OPENSSL_SYS_SUNOS */

72 /* Stateful OCSP request code, supporting non-blocking I/O */

74 /* Opaque OCSP request status structure */

76 struct ocsp_req_ctx_st {
77     int state; /* Current I/O state */
78     unsigned char *iobuf; /* Line buffer */
79     int iobuflen; /* Line buffer length */
80     BIO *io; /* BIO to perform I/O with */
81     BIO *mem; /* Memory BIO response is built into */
82     unsigned long asn1_len; /* ASN1 length of response */
83 };

85 #define OCSP_MAX_REQUEST_LENGTH (100 * 1024)
86 #define OCSP_MAX_LINE_LEN 4096;

88 /* OCSP states */

90 /* If set no reading should be performed */
91 #define OHS_NOREAD 0x1000
92 /* Error condition */
93 #define OHS_ERROR (0 | OHS_NOREAD)
94 /* First line being read */
95 #define OHS_FIRSTLINE 1
96 /* MIME headers being read */
97 #define OHS_HEADERS 2
98 /* OCSP initial header (tag + length) being read */
99 #define OHS_ASN1_HEADER 3
100 /* OCSP content octets being read */
101 #define OHS_ASN1_CONTENT 4
102 /* Request being sent */
103 #define OHS_ASN1_WRITE (6 | OHS_NOREAD)
104 /* Request being flushed */
105 #define OHS_ASN1_FLUSH (7 | OHS_NOREAD)
106 /* Completed */
107 #define OHS_DONE (8 | OHS_NOREAD)

110 static int parse_http_line1(char *line);

112 void OCSP_REQ_CTX_free(OCSP_REQ_CTX *rctx)
113 {
114     if (rctx->mem)
115         BIO_free(rctx->mem);
116     if (rctx->iobuf)
117         OPENSSL_free(rctx->iobuf);
118     OPENSSL_free(rctx);
119 }

121 int OCSP_REQ_CTX_set1_req(OCSP_REQ_CTX *rctx, OCSP_REQUEST *req)
122 {
123     static const char req_hdr[] =
124     "Content-Type: application/ocsp-request\r\n"
125     "Content-Length: %d\r\n\r\n";
126     if (BIO_printf(rctx->mem, req_hdr, i2d_OCSP_REQUEST(req, NULL)) <= 0)
127         return 0;
```

```

128     if (i2d_OCSP_REQUEST_bio(rctx->mem, req) <= 0)
129         return 0;
130     rctx->state = OHS_ASN1_WRITE;
131     rctx->asn1_len = BIO_get_mem_data(rctx->mem, NULL);
132     return 1;
133 }

135 int OCSP_REQ_CTX_add1_header(OCSP_REQ_CTX *rctx,
136                             const char *name, const char *value)
137 {
138     if (!name)
139         return 0;
140     if (BIO_puts(rctx->mem, name) <= 0)
141         return 0;
142     if (value)
143     {
144         if (BIO_write(rctx->mem, ": ", 2) != 2)
145             return 0;
146         if (BIO_puts(rctx->mem, value) <= 0)
147             return 0;
148     }
149     if (BIO_write(rctx->mem, "\r\n", 2) != 2)
150         return 0;
151     return 1;
152 }

154 OCSP_REQ_CTX *OCSP_sendreq_new(BIO *io, char *path, OCSP_REQUEST *req,
155                                int maxline)
156 {
157     static const char post_hdr[] = "POST %s HTTP/1.0\r\n";

159     OCSP_REQ_CTX *rctx;
160     rctx = OPENSSL_malloc(sizeof(OCSP_REQ_CTX));
161     rctx->state = OHS_ERROR;
162     rctx->mem = BIO_new(BIO_s_mem());
163     rctx->io = io;
164     rctx->asn1_len = 0;
165     if (maxline > 0)
166         rctx->iobufen = maxline;
167     else
168         rctx->iobufen = OCSP_MAX_LINE_LEN;
169     rctx->iobuf = OPENSSL_malloc(rctx->iobufen);
170     if (!rctx->iobuf)
171         return 0;
172     if (!path)
173         path = "/";

175     if (BIO_printf(rctx->mem, post_hdr, path) <= 0)
176         return 0;

178     if (req && !OCSP_REQ_CTX_set1_req(rctx, req))
179         return 0;

181     return rctx;
182 }

184 /* Parse the HTTP response. This will look like this:
185  * "HTTP/1.0 200 OK". We need to obtain the numeric code and
186  * (optional) informational message.
187  */

189 static int parse_http_line1(char *line)
190 {
191     int retcode;
192     char *p, *q, *r;
193     /* Skip to first white space (passed protocol info) */

```

```

195     for(p = line; *p && !isspace((unsigned char)*p); p++)
196         continue;
197     if(!*p)
198     {
199         OCSPerr(OCSP_F_PARSE_HTTP_LINE1,
200                OCSP_R_SERVER_RESPONSE_PARSE_ERROR);
201         return 0;
202     }

204     /* Skip past white space to start of response code */
205     while(*p && isspace((unsigned char)*p))
206         p++;

208     if(!*p)
209     {
210         OCSPerr(OCSP_F_PARSE_HTTP_LINE1,
211                OCSP_R_SERVER_RESPONSE_PARSE_ERROR);
212         return 0;
213     }

215     /* Find end of response code: first whitespace after start of code */
216     for(q = p; *q && !isspace((unsigned char)*q); q++)
217         continue;

219     if(!*q)
220     {
221         OCSPerr(OCSP_F_PARSE_HTTP_LINE1,
222                OCSP_R_SERVER_RESPONSE_PARSE_ERROR);
223         return 0;
224     }

226     /* Set end of response code and start of message */
227     *q++ = 0;

229     /* Attempt to parse numeric code */
230     retcode = strtoul(p, &r, 10);

232     if(*r)
233         return 0;

235     /* Skip over any leading white space in message */
236     while(*q && isspace((unsigned char)*q))
237         q++;

239     if(*q)
240     {
241         /* Finally zap any trailing white space in message (include
242          * CRLF) */

244         /* We know q has a non white space character so this is OK */
245         for(r = q + strlen(q) - 1; isspace((unsigned char)*r); r--)
246             *r = 0;
247     }

248     if(retcode != 200)
249     {
250         OCSPerr(OCSP_F_PARSE_HTTP_LINE1, OCSP_R_SERVER_RESPONSE_ERROR);
251         if(!*q)
252             ERR_add_error_data(2, "Code=", p);
253         else
254             ERR_add_error_data(4, "Code=", p, ", Reason=", q);
255         return 0;
256     }

259     return 1;

```

```

261     }
263 int OCSF_sendreq_nbio(OCSP_RESPONSE **presp, OCSP_REQ_CTX *rctx)
264 {
265     int i, n;
266     const unsigned char *p;
267     next_io:
268     if (!(rctx->state & OHS_NOREAD))
269     {
270         n = BIO_read(rctx->io, rctx->iobuf, rctx->iobuflen);
271
272         if (n <= 0)
273         {
274             if (BIO_should_retry(rctx->io))
275                 return -1;
276             return 0;
277         }
279         /* Write data to memory BIO */
281         if (BIO_write(rctx->mem, rctx->iobuf, n) != n)
282             return 0;
283     }
285     switch(rctx->state)
286     {
288         case OHS_ASN1_WRITE:
289             n = BIO_get_mem_data(rctx->mem, &p);
291             i = BIO_write(rctx->io,
292                          p + (n - rctx->asn1_len), rctx->asn1_len);
294             if (i <= 0)
295             {
296                 if (BIO_should_retry(rctx->io))
297                     return -1;
298                 rctx->state = OHS_ERROR;
299                 return 0;
300             }
302             rctx->asn1_len -= i;
304             if (rctx->asn1_len > 0)
305                 goto next_io;
307             rctx->state = OHS_ASN1_FLUSH;
309             (void)BIO_reset(rctx->mem);
311             case OHS_ASN1_FLUSH:
313                 i = BIO_flush(rctx->io);
315                 if (i > 0)
316                 {
317                     rctx->state = OHS_FIRSTLINE;
318                     goto next_io;
319                 }
321                 if (BIO_should_retry(rctx->io))
322                     return -1;
324                 rctx->state = OHS_ERROR;
325                 return 0;

```

```

327         case OHS_ERROR:
328             return 0;
330         case OHS_FIRSTLINE:
331         case OHS_HEADERS:
333             /* Attempt to read a line in */
335             next_line:
336             /* Due to &%^$ memory BIO behaviour with BIO_gets we
337              * have to check there's a complete line in there before
338              * calling BIO_gets or we'll just get a partial read.
339              */
340             n = BIO_get_mem_data(rctx->mem, &p);
341             if ((n <= 0) || !memchr(p, '\n', n))
342             {
343                 if (n >= rctx->iobuflen)
344                 {
345                     rctx->state = OHS_ERROR;
346                     return 0;
347                 }
348                 goto next_io;
349             }
350             n = BIO_gets(rctx->mem, (char *)rctx->iobuf, rctx->iobuflen);
352             if (n <= 0)
353             {
354                 if (BIO_should_retry(rctx->mem))
355                     goto next_io;
356                 rctx->state = OHS_ERROR;
357                 return 0;
358             }
360             /* Don't allow excessive lines */
361             if (n == rctx->iobuflen)
362             {
363                 rctx->state = OHS_ERROR;
364                 return 0;
365             }
367             /* First line */
368             if (rctx->state == OHS_FIRSTLINE)
369             {
370                 if (parse_http_line1((char *)rctx->iobuf))
371                 {
372                     rctx->state = OHS_HEADERS;
373                     goto next_line;
374                 }
375                 else
376                 {
377                     rctx->state = OHS_ERROR;
378                     return 0;
379                 }
380             }
381             else
382             {
383                 /* Look for blank line: end of headers */
384                 for (p = rctx->iobuf; *p; p++)
385                 {
386                     if ((*p != '\r') && (*p != '\n'))
387                         break;
388                 }
389                 if (*p)
390                     goto next_line;

```

```

392         rctx->state = OHS_ASN1_HEADER;
393     }
394 }
395
396 /* Fall thru */
397
398 case OHS_ASN1_HEADER:
399     /* Now reading ASN1 header: can read at least 2 bytes which
400      * is enough for ASN1 SEQUENCE header and either length field
401      * or at least the length of the length field.
402      */
403     n = BIO_get_mem_data(rctx->mem, &p);
404     if (n < 2)
405         goto next_io;
406
407     /* Check it is an ASN1 SEQUENCE */
408     if (*p++ != (V_ASN1_SEQUENCE|V_ASN1_CONSTRUCTED))
409     {
410         rctx->state = OHS_ERROR;
411         return 0;
412     }
413
414     /* Check out length field */
415     if (*p & 0x80)
416     {
417         /* If MSB set on initial length octet we can now
418          * always read 6 octets: make sure we have them.
419          */
420         if (n < 6)
421             goto next_io;
422         n = *p & 0x7F;
423         /* Not NDEF or excessive length */
424         if (!n || (n > 4))
425         {
426             rctx->state = OHS_ERROR;
427             return 0;
428         }
429         p++;
430         rctx->asn1_len = 0;
431         for (i = 0; i < n; i++)
432         {
433             rctx->asn1_len <= 8;
434             rctx->asn1_len |= *p++;
435         }
436
437         if (rctx->asn1_len > OCSF_MAX_REQUEST_LENGTH)
438         {
439             rctx->state = OHS_ERROR;
440             return 0;
441         }
442
443         rctx->asn1_len += n + 2;
444     }
445     else
446         rctx->asn1_len = *p + 2;
447
448     rctx->state = OHS_ASN1_CONTENT;
449
450     /* Fall thru */
451
452 case OHS_ASN1_CONTENT:
453     n = BIO_get_mem_data(rctx->mem, &p);
454     if (n < (int)rctx->asn1_len)
455         goto next_io;

```

```

459         *presp = d2i_OCSP_RESPONSE(NULL, &p, rctx->asn1_len);
460         if (*presp)
461         {
462             rctx->state = OHS_DONE;
463             return 1;
464         }
465
466         rctx->state = OHS_ERROR;
467         return 0;
468
469         break;
470
471     case OHS_DONE:
472         return 1;
473
474     }
475
476     return 0;
477 }
478
479 /* Blocking OCSP request handler: now a special case of non-blocking I/O */
480
481 OCSP_RESPONSE *OCSP_sendreq_bio(BIO *b, char *path, OCSP_REQUEST *req)
482 {
483     OCSP_RESPONSE *resp = NULL;
484     OCSP_REQ_CTX *ctx;
485     int rv;
486
487     ctx = OCSP_sendreq_new(b, path, req, -1);
488
489     do
490     {
491         rv = OCSP_sendreq_nbio(&resp, ctx);
492     } while ((rv == -1) && BIO_should_retry(b));
493
494     OCSP_REQ_CTX_free(ctx);
495
496     if (rv)
497         return resp;
498
499     return NULL;
500 }

```


new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_lib.c

1

```
*****
7178 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ocsp_lib.c */
2 /* Written by Tom Titchener <Tom.Titchener@groove.net> for the OpenSSL
3  * project. */

5 /* History:
6  * This file was transfered to Richard Levitte from CertCo by Kathy
7  * Weinhold in mid-spring 2000 to be included in OpenSSL or released
8  * as a patch kit. */

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57  *
58  * This product includes cryptographic software written by Eric Young
59  * (eay@cryptsoft.com). This product includes software written by Tim
60  * Hudson (tjh@cryptsoft.com).
61  *
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_lib.c

2

```
62 */

64 #include <stdio.h>
65 #include <cryptlib.h>
66 #include <openssl/objects.h>
67 #include <openssl/rand.h>
68 #include <openssl/x509.h>
69 #include <openssl/pem.h>
70 #include <openssl/x509v3.h>
71 #include <openssl/ocsp.h>
72 #include <openssl/asn1t.h>

74 /* Convert a certificate and its issuer to an OCSP_CERTID */

76 OCSP_CERTID *OCSP_cert_to_id(const EVP_MD *dgst, X509 *subject, X509 *issuer)
77 {
78     X509_NAME *iname;
79     ASN1_INTEGER *serial;
80     ASN1_BIT_STRING *ikey;
81     #ifndef OPENSSL_NO_SHA1
82     if(!dgst) dgst = EVP_sha1();
83     #endif
84     if (subject)
85     {
86         iname = X509_get_issuer_name(subject);
87         serial = X509_get_serialNumber(subject);
88     }
89     else
90     {
91         iname = X509_get_subject_name(issuer);
92         serial = NULL;
93     }
94     ikey = X509_get0_pubkey_bitstr(issuer);
95     return OCSP_cert_id_new(dgst, iname, ikey, serial);
96 }

99 OCSP_CERTID *OCSP_cert_id_new(const EVP_MD *dgst,
100                                X509_NAME *issuerName,
101                                ASN1_BIT_STRING* issuerKey,
102                                ASN1_INTEGER *serialNumber)
103 {
104     int nid;
105     unsigned int i;
106     X509_ALGOR *alg;
107     OCSP_CERTID *cid = NULL;
108     unsigned char md[EVP_MAX_MD_SIZE];

110     if (!(cid = OCSP_CERTID_new())) goto err;

112     alg = cid->hashAlgorithm;
113     if (alg->algorithm != NULL) ASN1_OBJECT_free(alg->algorithm);
114     if ((nid = EVP_MD_type(dgst)) == NID_undef)
115     {
116         OCSPerr(OCSP_F_OCSP_CERT_ID_NEW, OCSP_R_UNKNOWN_NID);
117         goto err;
118     }
119     if (!(alg->algorithm=OBJ_nid2obj(nid))) goto err;
120     if ((alg->parameter=ASN1_TYPE_new()) == NULL) goto err;
121     alg->parameter->type=V_ASN1_NULL;

123     if (!X509_NAME_digest(issuerName, dgst, md, &i)) goto digerr;
124     if (!(ASN1_OCTET_STRING_set(cid->issuerNameHash, md, i))) goto err;

126     /* Calculate the issuerKey hash, excluding tag and length */
127     if (!EVP_Digest(issuerKey->data, issuerKey->length, md, &i, dgst, NULL))
```

```

128         goto err;
130         if (!(ASN1_OCTET_STRING_set(cid->issuerKeyHash, md, i))) goto err;
132         if (serialNumber)
133         {
134             ASN1_INTEGER_free(cid->serialNumber);
135             if (!(cid->serialNumber = ASN1_INTEGER_dup(serialNumber))) goto
136             err;
137             return cid;
138 digerr:
139     OCSPerr(OCSP_F_OCSP_CERT_ID_NEW, OCSP_R_DIGEST_ERR);
140 err:
141     if (cid) OCSP_CERTID_free(cid);
142     return NULL;
143 }
145 int OCSP_id_issuer_cmp(OCSP_CERTID *a, OCSP_CERTID *b)
146 {
147     int ret;
148     ret = OBJ_cmp(a->hashAlgorithm->algorithm, b->hashAlgorithm->algorithm);
149     if (ret) return ret;
150     ret = ASN1_OCTET_STRING_cmp(a->issuerNameHash, b->issuerNameHash);
151     if (ret) return ret;
152     return ASN1_OCTET_STRING_cmp(a->issuerKeyHash, b->issuerKeyHash);
153 }
155 int OCSP_id_cmp(OCSP_CERTID *a, OCSP_CERTID *b)
156 {
157     int ret;
158     ret = OCSP_id_issuer_cmp(a, b);
159     if (ret) return ret;
160     return ASN1_INTEGER_cmp(a->serialNumber, b->serialNumber);
161 }
164 /* Parse a URL and split it up into host, port and path components and whether
165  * it is SSL.
166  */
168 int OCSP_parse_url(char *url, char **phost, char **pport, char **ppath, int *pss
169 {
170     char *p, *buf;
172     char *host, *port;
174     *phost = NULL;
175     *pport = NULL;
176     *ppath = NULL;
178     /* dup the buffer since we are going to mess with it */
179     buf = BUF_strdup(url);
180     if (!buf) goto mem_err;
182     /* Check for initial colon */
183     p = strchr(buf, ':');
185     if (!p) goto parse_err;
187     *(p++) = '\0';
189     if (!strcmp(buf, "http"))
190     {
191         *pssl = 0;
192         port = "80";
193     }

```

```

194     else if (!strcmp(buf, "https"))
195     {
196         *pssl = 1;
197         port = "443";
198     }
199     else
200         goto parse_err;
202     /* Check for double slash */
203     if ((p[0] != '/') || (p[1] != '/'))
204         goto parse_err;
206     p += 2;
208     host = p;
210     /* Check for trailing part of path */
212     p = strchr(p, '/');
214     if (!p)
215         *ppath = BUF_strdup("/");
216     else
217     {
218         *ppath = BUF_strdup(p);
219         /* Set start of path to 0 so hostname is valid */
220         *p = '\0';
221     }
223     if (!*ppath) goto mem_err;
225     /* Look for optional ':' for port number */
226     if ((p = strchr(host, ':')))
227     {
228         *p = 0;
229         port = p + 1;
230     }
231     else
232     {
233         /* Not found: set default port */
234         if (*pssl) port = "443";
235         else port = "80";
236     }
238     *pport = BUF_strdup(port);
239     if (!*pport) goto mem_err;
241     *phost = BUF_strdup(host);
243     if (!*phost) goto mem_err;
245     OPENSSL_free(buf);
247     return 1;
249 mem_err:
250     OCSPerr(OCSP_F_OCSP_PARSE_URL, ERR_R_MALLOC_FAILURE);
251     goto err;
253 parse_err:
254     OCSPerr(OCSP_F_OCSP_PARSE_URL, OCSP_R_ERROR_PARSING_URL);
257 err:
258     if (buf) OPENSSL_free(buf);
259     if (*ppath) OPENSSL_free(*ppath);

```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_lib.c

5

```
260     if (*pport) OPENSSL_free(*pport);
261     if (*phost) OPENSSL_free(*phost);
262     return 0;

264     }

266 IMPLEMENT_ASN1_DUP_FUNCTION(OCSP_CERTID)
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_prn.c

1

```
*****
10202 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_prn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ocsp_prn.c */
2 /* Written by Tom Titchener <Tom.Titchener@groove.net> for the OpenSSL
3  * project. */

5 /* History:
6  * This file was originally part of ocsp.c and was transfered to Richard
7  * Levitte from CertCo by Kathy Weinhold in mid-spring 2000 to be included
8  * in OpenSSL or released as a patch kit. */

10 /* =====
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55  * OF THE POSSIBILITY OF SUCH DAMAGE.
56  * =====
57  *
58  * This product includes cryptographic software written by Eric Young
59  * (eay@cryptsoft.com). This product includes software written by Tim
60  * Hudson (tjh@cryptsoft.com).
61  *
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_prn.c

2

```
62 */

64 #include <openssl/bio.h>
65 #include <openssl/err.h>
66 #include <openssl/ocsp.h>
67 #include <openssl/pem.h>

69 static int ocsp_certid_print(BIO *bp, OCSP_CERTID* a, int indent)
70 {
71     BIO_printf(bp, "%sCertificate ID:\n", indent, "");
72     indent += 2;
73     BIO_printf(bp, "%sHash Algorithm: ", indent, "");
74     i2a_ASN1_OBJECT(bp, a->hashAlgorithm->algorithm);
75     BIO_printf(bp, "\n%sIssuer Name Hash: ", indent, "");
76     i2a_ASN1_STRING(bp, a->issuerNameHash, V_ASN1_OCTET_STRING);
77     BIO_printf(bp, "\n%sIssuer Key Hash: ", indent, "");
78     i2a_ASN1_STRING(bp, a->issuerKeyHash, V_ASN1_OCTET_STRING);
79     BIO_printf(bp, "\n%sSerial Number: ", indent, "");
80     i2a_ASN1_INTEGER(bp, a->serialNumber);
81     BIO_printf(bp, "\n");
82     return 1;
83 }

85 typedef struct
86 {
87     long t;
88     const char *m;
89 } OCSP_TBLSTR;

91 static const char *table2string(long s, const OCSP_TBLSTR *ts, int len)
92 {
93     const OCSP_TBLSTR *p;
94     for (p=ts; p < ts + len; p++)
95         if (p->t == s)
96             return p->m;
97     return "(UNKNOWN)";
98 }

100 const char *OCSP_response_status_str(long s)
101 {
102     static const OCSP_TBLSTR rstat_tbl[] = {
103         { OCSP_RESPONSE_STATUS_SUCCESSFUL, "successful" },
104         { OCSP_RESPONSE_STATUS_MALFORMEDREQUEST, "malformedrequest" },
105         { OCSP_RESPONSE_STATUS_INTERNALERROR, "internalerror" },
106         { OCSP_RESPONSE_STATUS_TRYLATER, "trylater" },
107         { OCSP_RESPONSE_STATUS_SIGREQUIRED, "sigrequired" },
108         { OCSP_RESPONSE_STATUS_UNAUTHORIZED, "unauthorized" } };
109     return table2string(s, rstat_tbl, 6);
110 }

112 const char *OCSP_cert_status_str(long s)
113 {
114     static const OCSP_TBLSTR cstat_tbl[] = {
115         { V_OCSP_CERTSTATUS_GOOD, "good" },
116         { V_OCSP_CERTSTATUS_REVOKED, "revoked" },
117         { V_OCSP_CERTSTATUS_UNKNOWN, "unknown" } };
118     return table2string(s, cstat_tbl, 3);
119 }

121 const char *OCSP_crl_reason_str(long s)
122 {
123     static const OCSP_TBLSTR reason_tbl[] = {
124         { OCSP_REVOKED_STATUS_UNSPECIFIED, "unspecified" },
125         { OCSP_REVOKED_STATUS_KEYCOMPROMISE, "keyCompromise" },
126         { OCSP_REVOKED_STATUS_CACOMPROMISE, "cACompromise" },
127         { OCSP_REVOKED_STATUS_AFFILIATIONCHANGED, "affiliationChanged" },
```

```

128     { OCSPP_REVOKED_STATUS_SUPERSEDED, "superseded" },
129     { OCSPP_REVOKED_STATUS_CESSATIONOFOPERATION, "cessationOfOperation" },
130     { OCSPP_REVOKED_STATUS_CERTIFICATEHOLD, "certificateHold" },
131     { OCSPP_REVOKED_STATUS_REMOVEFROMCRL, "removeFromCRL" } };
132     return table2string(s, reason_tbl, 8);
133 }

135 int OCSP_REQUEST_print(BIO *bp, OCSP_REQUEST* o, unsigned long flags)
136 {
137     int i;
138     long l;
139     OCSP_CERTID* cid = NULL;
140     OCSP_ONEREQ *one = NULL;
141     OCSP_REQINFO *inf = o->tbsRequest;
142     OCSP_SIGNATURE *sig = o->optionalSignature;

144     if (BIO_write(bp, "OCSP Request Data:\n", 19) <= 0) goto err;
145     l = ASN1_INTEGER_get(inf->version);
146     if (BIO_printf(bp, "    Version: %lu (0x%lx)", l+1, l) <= 0) goto err;
147     if (inf->requestorName != NULL)
148     {
149         if (BIO_write(bp, "\n    Requestor Name: ", 21) <= 0)
150             goto err;
151         GENERAL_NAME_print(bp, inf->requestorName);
152     }
153     if (BIO_write(bp, "\n    Requestor List:\n", 21) <= 0) goto err;
154     for (i = 0; i < sk_OCSP_ONEREQ_num(inf->requestList); i++)
155     {
156         one = sk_OCSP_ONEREQ_value(inf->requestList, i);
157         cid = one->reqCert;
158         ocsp_certid_print(bp, cid, 8);
159         if (!X509V3_extensions_print(bp,
160             "Request Single Extensions",
161             one->singleRequestExtensions, flags, 8))
162             goto err;
163     }
164     if (!X509V3_extensions_print(bp, "Request Extensions",
165         inf->requestExtensions, flags, 4))
166         goto err;
167     if (sig)
168     {
169         X509_signature_print(bp, sig->signatureAlgorithm, sig->signature
170             for (i=0; i<sk_X509_num(sig->certs); i++)
171             {
172                 X509_print(bp, sk_X509_value(sig->certs, i));
173                 PEM_write_bio_X509(bp, sk_X509_value(sig->certs, i));
174             }
175     }
176     return 1;
177 err:
178     return 0;
179 }

181 int OCSP_RESPONSE_print(BIO *bp, OCSP_RESPONSE* o, unsigned long flags)
182 {
183     int i, ret = 0;
184     long l;
185     OCSP_CERTID *cid = NULL;
186     OCSP_BASICRESP *br = NULL;
187     OCSP_RESPID *rid = NULL;
188     OCSP_RESPDATA *rd = NULL;
189     OCSP_CERTSTATUS *cst = NULL;
190     OCSP_REVOKEDINFO *rev = NULL;
191     OCSP_SINGLERESP *single = NULL;
192     OCSP_RESPBYTES *rb = o->responseBytes;

```

```

194     if (BIO_puts(bp, "OCSP Response Data:\n") <= 0) goto err;
195     l = ASN1_ENUMERATED_get(o->responseStatus);
196     if (BIO_printf(bp, "    OCSP Response Status: %s (0x%lx)\n",
197         OCSP_response_status_str(l, l) <= 0) goto err;
198     if (rb == NULL) return 1;
199     if (BIO_puts(bp, "    Response Type: ") <= 0)
200         goto err;
201     if (i2a_ASN1_OBJECT(bp, rb->responseType) <= 0)
202         goto err;
203     if (OBJ_obj2nid(rb->responseType) != NID_id_pkix_OCSP_basic)
204     {
205         BIO_puts(bp, " (unknown response type)\n");
206         return 1;
207     }

209     i = ASN1_STRING_length(rb->response);
210     if (! (br = OCSP_response_get1_basic(o))) goto err;
211     rd = br->tbsResponseData;
212     l = ASN1_INTEGER_get(rd->version);
213     if (BIO_printf(bp, "\n    Version: %lu (0x%lx)\n",
214         l+1, l) <= 0) goto err;
215     if (BIO_puts(bp, "    Responder Id: ") <= 0) goto err;

217     rid = rd->responderId;
218     switch (rid->type)
219     {
220         case V_OCSP_RESPID_NAME:
221             X509_NAME_print_ex(bp, rid->value.byName, 0, XN_FLAG_ONE
222                 break;
223         case V_OCSP_RESPID_KEY:
224             i2a_ASN1_STRING(bp, rid->value.byKey, V_ASN1_OCTET_STRIN
225                 break;
226     }

228     if (BIO_printf(bp, "\n    Produced At: ") <= 0) goto err;
229     if (!ASN1_GENERALIZEDTIME_print(bp, rd->producedAt)) goto err;
230     if (BIO_printf(bp, "\n    Responses:\n") <= 0) goto err;
231     for (i = 0; i < sk_OCSP_SINGLERESP_num(rd->responses); i++)
232     {
233         if (! sk_OCSP_SINGLERESP_value(rd->responses, i)) continue;
234         single = sk_OCSP_SINGLERESP_value(rd->responses, i);
235         cid = single->certId;
236         if (ocsp_certid_print(bp, cid, 4) <= 0) goto err;
237         cst = single->certStatus;
238         if (BIO_printf(bp, "    Cert Status: %s",
239             OCSP_cert_status_str(cst->type)) <= 0)
240             goto err;
241         if (cst->type == V_OCSP_CERTSTATUS_REVOKED)
242         {
243             rev = cst->value.revoked;
244             if (BIO_printf(bp, "\n    Revocation Time: ") <= 0)
245                 goto err;
246             if (!ASN1_GENERALIZEDTIME_print(bp,
247                 rev->revocationTime))
248                 goto err;
249             if (rev->revocationReason)
250             {
251                 l = ASN1_ENUMERATED_get(rev->revocationReason);
252                 if (BIO_printf(bp,
253                     "\n    Revocation Reason: %s (0x%lx)",
254                     OCSP_crl_reason_str(l, l) <= 0)
255                     goto err;
256             }
257         }
258         if (BIO_printf(bp, "\n    This Update: ") <= 0) goto err;
259         if (!ASN1_GENERALIZEDTIME_print(bp, single->thisUpdate))

```

```
260         goto err;
261     if (single->nextUpdate)
262     {
263         if (BIO_printf(bp, "\n    Next Update: ") <= 0) goto err;
264         if (!ASN1_GENERALIZEDTIME_print(bp, single->nextUpdate))
265             goto err;
266     }
267     if (BIO_write(bp, "\n", 1) <= 0) goto err;
268     if (!X509V3_extensions_print(bp,
269         "Response Single Extensions",
270         single->singleExtensions, flags, 8))
271         goto err;
272     if (BIO_write(bp, "\n", 1) <= 0) goto err;
273 }
274 if (!X509V3_extensions_print(bp, "Response Extensions",
275     rd->responseExtensions, flags, 4))
276     goto err;
277 if(X509_signature_print(bp, br->signatureAlgorithm, br->signature) <= 0)
278     goto err;
279
280 for (i=0; i<sk_X509_num(br->certs); i++)
281 {
282     X509_print(bp, sk_X509_value(br->certs, i));
283     PEM_write_bio_X509(bp, sk_X509_value(br->certs, i));
284 }
285
286 ret = 1;
287 err:
288     OCSP_BASICRESP_free(br);
289     return ret;
290 }
```



```

128         ASN1_TIME *thisupd, ASN1_TIME *nextupd)
129     {
130         OCSP_SINGLERESP *single = NULL;
131         OCSP_CERTSTATUS *cs;
132         OCSP_REVOKEDINFO *ri;
133
134         if(!rsp->tbsResponseData->responses &&
135             !(rsp->tbsResponseData->responses = sk_OCSP_SINGLERESP_new_null()))
136             goto err;
137
138         if (!(single = OCSP_SINGLERESP_new()))
139             goto err;
140
141         if (!ASN1_TIME_to_generalizedtime(thisupd, &single->thisUpdate))
142             goto err;
143         if (nextupd &&
144             !ASN1_TIME_to_generalizedtime(nextupd, &single->nextUpdate))
145             goto err;
146
147         OCSP_CERTID_free(single->certId);
148
149         if(!(single->certId = OCSP_CERTID_dup(cid)))
150             goto err;
151
152         cs = single->certStatus;
153         switch(cs->type = status)
154         {
155             case V_OCSP_CERTSTATUS_REVOKED:
156                 if (!revtime)
157                     OCSPerr(OCSP_F_OCSP_BASIC_ADD1_STATUS, OCSP_R_NO_REVOKED_
158                             goto err;
159                     }
160                 if (!(cs->value.revoked = ri = OCSP_REVOKEDINFO_new())) goto err
161                 if (!ASN1_TIME_to_generalizedtime(revtime, &ri->revocationTime))
162                     goto err;
163                 if (reason != OCSP_REVOKED_STATUS_NOSTATUS)
164                     if (!(ri->revocationReason = ASN1_ENUMERATED_new()))
165                         goto err;
166                     if (!(ASN1_ENUMERATED_set(ri->revocationReason,
167                                                 reason)))
168                         goto err;
169                 }
170             break;
171
172             case V_OCSP_CERTSTATUS_GOOD:
173                 cs->value.good = ASN1_NULL_new();
174                 break;
175
176             case V_OCSP_CERTSTATUS_UNKNOWN:
177                 cs->value.unknown = ASN1_NULL_new();
178                 break;
179
180             default:
181                 goto err;
182         }
183
184         if (!(sk_OCSP_SINGLERESP_push(rsp->tbsResponseData->responses, single)))
185             goto err;
186         return single;
187     err:
188         OCSP_SINGLERESP_free(single);
189         return NULL;

```

```

194     }
195
196     /* Add a certificate to an OCSP request */
197
198     int OCSP_basic_add1_cert(OCSP_BASICRESP *resp, X509 *cert)
199     {
200         if (!resp->certs && !(resp->certs = sk_X509_new_null()))
201             return 0;
202
203         if(!sk_X509_push(resp->certs, cert)) return 0;
204         CRYPTO_add(&cert->references, 1, CRYPTO_LOCK_X509);
205         return 1;
206     }
207
208     int OCSP_basic_sign(OCSP_BASICRESP *brsp,
209                        X509 *signer, EVP_PKEY *key, const EVP_MD *dgst,
210                        STACK_OF(X509) *certs, unsigned long flags)
211     {
212         int i;
213         OCSP_RESPID *rid;
214
215         if (!X509_check_private_key(signer, key))
216             OCSPerr(OCSP_F_OCSP_BASIC_SIGN, OCSP_R_PRIVATE_KEY_DOES_NOT_MATC
217                     goto err;
218             }
219
220         if(!(flags & OCSP_NOCERTS))
221             if(!OCSP_basic_add1_cert(brsp, signer))
222                 goto err;
223         for (i = 0; i < sk_X509_num(cert); i++)
224             {
225                 X509 *tmpcert = sk_X509_value(cert, i);
226                 if(!OCSP_basic_add1_cert(brsp, tmpcert))
227                     goto err;
228             }
229
230         rid = brsp->tbsResponseData->responderId;
231         if (flags & OCSP_RESPID_KEY)
232             {
233                 unsigned char md[SHA_DIGEST_LENGTH];
234                 X509_pubkey_digest(signer, EVP_sha1(), md, NULL);
235                 if (!(rid->value.byKey = ASN1_OCTET_STRING_new()))
236                     goto err;
237                 if (!(ASN1_OCTET_STRING_set(rid->value.byKey, md, SHA_DIGEST_LEN
238                                             goto err;
239                 rid->type = V_OCSP_RESPID_KEY;
240             }
241         else
242             {
243                 if (!X509_NAME_set(&rid->value.byName,
244                                   X509_get_subject_name(signer)))
245                     goto err;
246                 rid->type = V_OCSP_RESPID_NAME;
247             }
248
249         if (!(flags & OCSP_NOTIME) &&
250             !X509_gmtime_adj(brsp->tbsResponseData->producedAt, 0))
251             goto err;
252
253         /* Right now, I think that not doing double hashing is the right
254            thing.
255            -- Richard Levitte */
256
257         if (!OCSP_BASICRESP_sign(brsp, key, dgst, 0)) goto err;

```


new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_srv.c

5

```
261         return 1;
262 err:
263     return 0;
264 }
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_vfy.c

1

```
*****
12898 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_vfy.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* ocsp_vfy.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000-2004 The OpenSSL Project. All rights reserved.
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49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57

59 #include <openssl/ocsp.h>
60 #include <openssl/err.h>
61 #include <string.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ocsp/ocsp_vfy.c

2

```
63 static int ocsp_find_signer(X509 **psigner, OCSP_BASICRESP *bs, STACK_OF(X509) *
64                             X509_STORE *st, unsigned long flags);
65 static X509 *ocsp_find_signer_sk(STACK_OF(X509) *certs, OCSP_RESPID *id);
66 static int ocsp_check_issuer(OCSP_BASICRESP *bs, STACK_OF(X509) *chain, unsigned
67 static int ocsp_check_ids(STACK_OF(OCSP_SINGLERESP) *sresp, OCSP_CERTID **ret);
68 static int ocsp_match_issuerid(X509 *cert, OCSP_CERTID *cid, STACK_OF(OCSP_SINGL
69 static int ocsp_check_delegated(X509 *x, int flags);
70 static int ocsp_req_find_signer(X509 **psigner, OCSP_REQUEST *req, X509_NAME *nm
71                                X509_STORE *st, unsigned long flags);

73 /* Verify a basic response message */

75 int OCSP_basic_verify(OCSP_BASICRESP *bs, STACK_OF(X509) *certs,
76                      X509_STORE *st, unsigned long flags)
77 {
78     X509 *signer, *x;
79     STACK_OF(X509) *chain = NULL;
80     X509_STORE_CTX ctx;
81     int i, ret = 0;
82     ret = ocsp_find_signer(&signer, bs, certs, st, flags);
83     if (!ret)
84     {
85         OCSPerr(OCSP_F_OCSP_BASIC_VERIFY, OCSP_R_SIGNER_CERTIFICATE_NOT_
86         goto end;
87     }
88     if ((ret == 2) && (flags & OCSP_TRUSTOTHER))
89         flags |= OCSP_NOVERIFY;
90     if (!(flags & OCSP_NOSIGS))
91     {
92         EVP_PKEY *skey;
93         skey = X509_get_pubkey(signer);
94         if (skey)
95         {
96             ret = OCSP_BASICRESP_verify(bs, skey, 0);
97             EVP_PKEY_free(skey);
98         }
99         if (!skey || ret <= 0)
100         {
101             OCSPerr(OCSP_F_OCSP_BASIC_VERIFY, OCSP_R_SIGNATURE_FAILU
102             goto end;
103         }
104     }
105     if (!(flags & OCSP_NOVERIFY))
106     {
107         int init_res;
108         if (flags & OCSP_NOCHAIN)
109             init_res = X509_STORE_CTX_init(&ctx, st, signer, NULL);
110         else
111             init_res = X509_STORE_CTX_init(&ctx, st, signer, bs->cer
112         if (!init_res)
113         {
114             ret = -1;
115             OCSPerr(OCSP_F_OCSP_BASIC_VERIFY, ERR_R_X509_LIB);
116             goto end;
117         }
118     }

119     X509_STORE_CTX_set_purpose(&ctx, X509_PURPOSE_OCSP_HELPER);
120     ret = X509_verify_cert(&ctx);
121     chain = X509_STORE_CTX_get1_chain(&ctx);
122     X509_STORE_CTX_cleanup(&ctx);
123     if (ret <= 0)
124     {
125         i = X509_STORE_CTX_get_error(&ctx);
126         OCSPerr(OCSP_F_OCSP_BASIC_VERIFY, OCSP_R_CERTIFICATE_VERI
127         ERR_add_error_data(2, "Verify error:",
```

```

128             X509_verify_cert_error_string(i));
129         goto end;
130     }
131     if(flags & OCSF_NOCHECKS)
132     {
133         ret = 1;
134         goto end;
135     }
136     /* At this point we have a valid certificate chain
137     * need to verify it against the OCSF issuer criteria.
138     */
139     ret = ocsp_check_issuer(bs, chain, flags);

141     /* If fatal error or valid match then finish */
142     if (ret != 0) goto end;

144     /* Easy case: explicitly trusted. Get root CA and
145     * check for explicit trust
146     */
147     if(flags & OCSF_NOEXPLICIT) goto end;

149     x = sk_X509_value(chain, sk_X509_num(chain) - 1);
150     if(X509_check_trust(x, NID_OCSF_sign, 0) != X509_TRUST_TRUSTED)
151     {
152         OCSFPerr(OCSF_F_OCSF_BASIC_VERIFY, OCSF_R_ROOT_CA_NOT_TRUS
153         goto end;
154     }
155     ret = 1;
156 }

160 end:
161 if(chain) sk_X509_pop_free(chain, X509_free);
162 return ret;
163 }

166 static int ocsp_find_signer(X509 **psigner, OCSF_BASICRESP *bs, STACK_OF(X509) *
167                             X509_STORE *st, unsigned long flags)
168 {
169     X509 *signer;
170     OCSF_RESPID *rid = bs->tbsResponseData->responderId;
171     if ((signer = ocsp_find_signer_sk(certs, rid)))
172     {
173         *psigner = signer;
174         return 2;
175     }
176     if(!(flags & OCSF_NOINTERN) &&
177        (signer = ocsp_find_signer_sk(bs->certs, rid)))
178     {
179         *psigner = signer;
180         return 1;
181     }
182     /* Maybe lookup from store if by subject name */

184     *psigner = NULL;
185     return 0;
186 }

189 static X509 *ocsp_find_signer_sk(STACK_OF(X509) *certs, OCSF_RESPID *id)
190 {
191     int i;
192     unsigned char tmphash[SHA_DIGEST_LENGTH], *keyhash;
193     X509 *x;

```

```

195     /* Easy if lookup by name */
196     if (id->type == V_OCSF_RESPID_NAME)
197         return X509_find_by_subject(certs, id->value.byName);

199     /* Lookup by key hash */

201     /* If key hash isn't SHA1 length then forget it */
202     if (id->value.byKey->length != SHA_DIGEST_LENGTH) return NULL;
203     keyhash = id->value.byKey->data;
204     /* Calculate hash of each key and compare */
205     for (i = 0; i < sk_X509_num(certs); i++)
206     {
207         x = sk_X509_value(certs, i);
208         X509_pubkey_digest(x, EVP_sha1(), tmphash, NULL);
209         if(!memcmp(keyhash, tmphash, SHA_DIGEST_LENGTH))
210             return x;
211     }
212     return NULL;
213 }

216 static int ocsp_check_issuer(OCSF_BASICRESP *bs, STACK_OF(X509) *chain, unsigned
217 {
218     STACK_OF(OCSF_SINGLERESP) *sresp;
219     X509 *signer, *sca;
220     OCSF_CERTID *caid = NULL;
221     int i;
222     sresp = bs->tbsResponseData->responses;

224     if (sk_X509_num(chain) <= 0)
225     {
226         OCSFPerr(OCSF_F_OCSF_CHECK_ISSUER, OCSF_R_NO_CERTIFICATES_IN_CHAI
227         return -1;
228     }

230     /* See if the issuer IDs match. */
231     i = ocsp_check_ids(sresp, &caid);

233     /* If ID mismatch or other error then return */
234     if (i <= 0) return i;

236     signer = sk_X509_value(chain, 0);
237     /* Check to see if OCSF responder CA matches request CA */
238     if (sk_X509_num(chain) > 1)
239     {
240         sca = sk_X509_value(chain, 1);
241         i = ocsp_match_issuerid(sca, caid, sresp);
242         if (i < 0) return i;
243         if (i)
244         {
245             /* We have a match, if extensions OK then success */
246             if (ocsp_check_delegated(signer, flags)) return 1;
247             return 0;
248         }
249     }

251     /* Otherwise check if OCSF request signed directly by request CA */
252     return ocsp_match_issuerid(signer, caid, sresp);
253 }

256 /* Check the issuer certificate IDs for equality. If there is a mismatch with th
257 * algorithm then there's no point trying to match any certificates against the
258 * If the issuer IDs all match then we just need to check equality against one o
259 */

```

```

260
261 static int ocsp_check_ids(STACK_OF(OCSP_SINGLERESP) *sresp, OCSP_CERTID **ret)
262 {
263     OCSP_CERTID *tmpid, *cid;
264     int i, idcount;
265
266     idcount = sk_OCSP_SINGLERESP_num(sresp);
267     if (idcount <= 0)
268     {
269         OCSPerr(OCSP_F_OCSP_CHECK_IDS, OCSP_R_RESPONSE_CONTAINS_NO_REVOC
270         return -1;
271     }
272
273     cid = sk_OCSP_SINGLERESP_value(sresp, 0)->certId;
274
275     *ret = NULL;
276
277     for (i = 1; i < idcount; i++)
278     {
279         tmpid = sk_OCSP_SINGLERESP_value(sresp, i)->certId;
280         /* Check to see if IDs match */
281         if (OCSP_id_issuer_cmp(cid, tmpid))
282         {
283             /* If algorithm mismatch let caller deal with it */
284             if (OBJ_cmp(tmpid->hashAlgorithm->algorithm,
285             cid->hashAlgorithm->algorithm))
286                 return 2;
287             /* Else mismatch */
288             return 0;
289         }
290     }
291
292     /* All IDs match: only need to check one ID */
293     *ret = cid;
294     return 1;
295 }
296
297
298 static int ocsp_match_issuerid(X509 *cert, OCSP_CERTID *cid,
299 STACK_OF(OCSP_SINGLERESP) *sresp)
300 {
301     /* If only one ID to match then do it */
302     if (cid)
303     {
304         const EVP_MD *dgst;
305         X509_NAME *iname;
306         int mdlen;
307         unsigned char md[EVP_MAX_MD_SIZE];
308         if (!(dgst = EVP_get_digestbyobj(cid->hashAlgorithm->algorithm))
309         {
310             OCSPerr(OCSP_F_OCSP_MATCH_ISSUERID, OCSP_R_UNKNOWN_MESSA
311             return -1;
312         }
313
314         mdlen = EVP_MD_size(dgst);
315         if (mdlen < 0)
316             return -1;
317         if ((cid->issuerNameHash->length != mdlen) ||
318             (cid->issuerKeyHash->length != mdlen))
319             return 0;
320         iname = X509_get_subject_name(cert);
321         if (!X509_NAME_digest(iname, dgst, md, NULL))
322             return -1;
323         if (memcmp(md, cid->issuerNameHash->data, mdlen))
324             return 0;
325         X509_pubkey_digest(cert, dgst, md, NULL);

```

```

326         if (memcmp(md, cid->issuerKeyHash->data, mdlen))
327             return 0;
328
329         return 1;
330     }
331     else
332     {
333         /* We have to match the whole lot */
334         int i, ret;
335         OCSP_CERTID *tmpid;
336         for (i = 0; i < sk_OCSP_SINGLERESP_num(sresp); i++)
337         {
338             tmpid = sk_OCSP_SINGLERESP_value(sresp, i)->certId;
339             ret = ocsp_match_issuerid(cert, tmpid, NULL);
340             if (ret <= 0) return ret;
341         }
342         return 1;
343     }
344 }
345
346
347 static int ocsp_check_delegated(X509 *x, int flags)
348 {
349     X509_check_purpose(x, -1, 0);
350     if ((x->ex_flags & EXFLAG_XKUSAGE) &&
351         (x->ex_xkusage & XKU_OCSP_SIGN))
352         return 1;
353     OCSPerr(OCSP_F_OCSP_CHECK_DELEGATED, OCSP_R_MISSING_OCSPSIGNING_USAGE);
354     return 0;
355 }
356
357
358 /* Verify an OCSP request. This is fortunately much easier than OCSP
359 * response verify. Just find the signers certificate and verify it
360 * against a given trust value.
361 */
362
363 int OCSP_request_verify(OCSP_REQUEST *req, STACK_OF(X509) *certs, X509_STORE *st
364 {
365     X509 *signer;
366     X509_NAME *nm;
367     GENERAL_NAME *gen;
368     int ret;
369     X509_STORE_CTX ctx;
370     if (!req->optionalSignature)
371     {
372         OCSPerr(OCSP_F_OCSP_REQUEST_VERIFY, OCSP_R_REQUEST_NOT_SIGNED);
373         return 0;
374     }
375     gen = req->tbsRequest->requestorName;
376     if (!gen || gen->type != GEN_DIRNAME)
377     {
378         OCSPerr(OCSP_F_OCSP_REQUEST_VERIFY, OCSP_R_UNSUPPORTED_REQUESTOR
379         return 0;
380     }
381     nm = gen->d.directoryName;
382     ret = ocsp_req_find_signer(&signer, req, nm, certs, store, flags);
383     if (ret <= 0)
384     {
385         OCSPerr(OCSP_F_OCSP_REQUEST_VERIFY, OCSP_R_SIGNER_CERTIFICATE_NO
386         return 0;
387     }
388     if ((ret == 2) && (flags & OCSP_TRUSTOTHER))
389         flags |= OCSP_NOVERIFY;
390     if (!(flags & OCSP_NOSIGS))
391     {

```

```
392     EVP_PKEY *skey;
393     skey = X509_get_pubkey(signer);
394     ret = OCSP_REQUEST_verify(req, skey);
395     EVP_PKEY_free(skey);
396     if (ret <= 0)
397     {
398         OCSPerr(OCSP_F_OCSP_REQUEST_VERIFY, OCSP_R_SIGNATURE_FAI
399         return 0;
400     }
401 }
402 if (!(flags & OCSP_NOVERIFY))
403 {
404     int init_res;
405     if (flags & OCSP_NOCHAIN)
406         init_res = X509_STORE_CTX_init(&ctx, store, signer, NULL
407     else
408         init_res = X509_STORE_CTX_init(&ctx, store, signer,
409         req->optionalSignature->certs);
410     if (!init_res)
411     {
412         OCSPerr(OCSP_F_OCSP_REQUEST_VERIFY, ERR_R_X509_LIB);
413         return 0;
414     }
415
416     X509_STORE_CTX_set_purpose(&ctx, X509_PURPOSE_OCSP_HELPER);
417     X509_STORE_CTX_set_trust(&ctx, X509_TRUST_OCSP_REQUEST);
418     ret = X509_verify_cert(&ctx);
419     X509_STORE_CTX_cleanup(&ctx);
420     if (ret <= 0)
421     {
422         ret = X509_STORE_CTX_get_error(&ctx);
423         OCSPerr(OCSP_F_OCSP_REQUEST_VERIFY, OCSP_R_CERTIFICATE_VE
424         ERR_add_error_data(2, "Verify error:",
425         X509_verify_cert_error_string(ret));
426         return 0;
427     }
428 }
429 return 1;
430 }
431
432 static int ocsp_req_find_signer(X509 **psigner, OCSP_REQUEST *req, X509_NAME *nm
433     X509_STORE *st, unsigned long flags)
434 {
435     X509 *signer;
436     if (!(flags & OCSP_NOINTERN))
437     {
438         signer = X509_find_by_subject(req->optionalSignature->certs, nm)
439         *psigner = signer;
440         return 1;
441     }
442
443     signer = X509_find_by_subject(cert, nm);
444     if (signer)
445     {
446         *psigner = signer;
447         return 2;
448     }
449     return 0;
450 }
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_all.c

1

```
*****
13750 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_all.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/pem/pem_all.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
59 * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
60 *
61 * Redistribution and use in source and binary forms, with or without
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_all.c

2

```
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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include "cryptlib.h"
114 #include <openssl/bio.h>
115 #include <openssl/evp.h>
116 #include <openssl/x509.h>
117 #include <openssl/pkcs7.h>
118 #include <openssl/pem.h>
119 #ifndef OPENSSL_NO_RSA
120 #include <openssl/rsa.h>
121 #endif
122 #ifndef OPENSSL_NO_DSA
123 #include <openssl/dsa.h>
124 #endif
125 #ifndef OPENSSL_NO_DH
126 #include <openssl/dh.h>
127 #endif
```

```

129 #ifndef OPENSSL_NO_RSA
130 static RSA *pkey_get_rsa(EVP_PKEY *key, RSA **rsa);
131 #endif
132 #ifndef OPENSSL_NO_DSA
133 static DSA *pkey_get_dsa(EVP_PKEY *key, DSA **dsa);
134 #endif

136 #ifndef OPENSSL_NO_EC
137 static EC_KEY *pkey_get_eckey(EVP_PKEY *key, EC_KEY **eckey);
138 #endif

140 IMPLEMENT_PEM_rw(X509_REQ, X509_REQ, PEM_STRING_X509_REQ, X509_REQ)

142 IMPLEMENT_PEM_write(X509_REQ_NEW, X509_REQ, PEM_STRING_X509_REQ_OLD, X509_REQ)

144 IMPLEMENT_PEM_rw(X509_CRL, X509_CRL, PEM_STRING_X509_CRL, X509_CRL)

146 IMPLEMENT_PEM_rw(PKCS7, PKCS7, PEM_STRING_PKCS7, PKCS7)

148 IMPLEMENT_PEM_rw(NETSCAPE_CERT_SEQUENCE, NETSCAPE_CERT_SEQUENCE,
149 PEM_STRING_X509, NETSCAPE_CERT_SEQUENCE)

152 #ifndef OPENSSL_NO_RSA

154 /* We treat RSA or DSA private keys as a special case.
155  * For private keys we read in an EVP_PKEY structure with
156  * PEM_read_bio_PrivateKey() and extract the relevant private
157  * key: this means can handle "traditional" and PKCS#8 formats
158  * transparently.
159  */
160 */

162 static RSA *pkey_get_rsa(EVP_PKEY *key, RSA **rsa)
163 {
164     RSA *rtmp;
165     if(!key) return NULL;
166     rtmp = EVP_PKEY_get1_RSA(key);
167     EVP_PKEY_free(key);
168     if(!rtmp) return NULL;
169     if(rsa) {
170         RSA_free(*rsa);
171         *rsa = rtmp;
172     }
173     return rtmp;
174 }

176 RSA *PEM_read_bio_RSAPrivateKey(BIO *bp, RSA **rsa, pem_password_cb *cb,
177 void *u)
178 {
179     EVP_PKEY *pktmp;
180     pktmp = PEM_read_bio_PrivateKey(bp, NULL, cb, u);
181     return pkey_get_rsa(pktmp, rsa);
182 }

184 #ifndef OPENSSL_NO_FP_API

186 RSA *PEM_read_RSAPrivateKey(FILE *fp, RSA **rsa, pem_password_cb *cb,
187 void *u)
188 {
189     EVP_PKEY *pktmp;
190     pktmp = PEM_read_PrivateKey(fp, NULL, cb, u);
191     return pkey_get_rsa(pktmp, rsa);
192 }

```

```

194 #endif

196 #ifdef OPENSSL_FIPS

198 int PEM_write_bio_RSAPrivateKey(BIO *bp, RSA *x, const EVP_CIPHER *enc,
199 unsigned char *kstr, int klen,
200 pem_password_cb *cb, void *u)
201 {
202     if (FIPS_mode())
203     {
204         EVP_PKEY *k;
205         int ret;
206         k = EVP_PKEY_new();
207         if (!k)
208             return 0;
209         EVP_PKEY_set1_RSA(k, x);

211         ret = PEM_write_bio_PrivateKey(bp, k, enc, kstr, klen, cb, u);
212         EVP_PKEY_free(k);
213         return ret;
214     }
215     else
216         return PEM_ASN1_write_bio((i2d_of_void *)i2d_RSAPrivateKey,
217 PEM_STRING_RSA, bp, x, enc, kstr, klen, cb, u);
218 }

220 #ifndef OPENSSL_NO_FP_API
221 int PEM_write_RSAPrivateKey(FILE *fp, RSA *x, const EVP_CIPHER *enc,
222 unsigned char *kstr, int klen,
223 pem_password_cb *cb, void *u)
224 {
225     if (FIPS_mode())
226     {
227         EVP_PKEY *k;
228         int ret;
229         k = EVP_PKEY_new();
230         if (!k)
231             return 0;
232         EVP_PKEY_set1_RSA(k, x);

233         ret = PEM_write_PrivateKey(fp, k, enc, kstr, klen, cb, u);
234         EVP_PKEY_free(k);
235         return ret;
236     }
237     else
238         return PEM_ASN1_write((i2d_of_void *)i2d_RSAPrivateKey,
239 PEM_STRING_RSA, fp, x, enc, kstr, klen, cb, u);
240 }
241 #endif
242 #endif

244 #else

245 #endif

247 IMPLEMENT_PEM_write_cb_const(RSAPrivateKey, RSA, PEM_STRING_RSA, RSAPrivateKey)

249 #endif

251 IMPLEMENT_PEM_rw_const(RSAPublicKey, RSA, PEM_STRING_RSA_PUBLIC, RSAPublicKey)
252 IMPLEMENT_PEM_rw(RSA_PUBKEY, RSA, PEM_STRING_PUBLIC, RSA_PUBKEY)

254 #endif

256 #ifndef OPENSSL_NO_DSA

258 static DSA *pkey_get_dsa(EVP_PKEY *key, DSA **dsa)
259 {

```

```

260     DSA *dtmp;
261     if(!key) return NULL;
262     dtmp = EVP_PKEY_get1_DSA(key);
263     EVP_PKEY_free(key);
264     if(!dtmp) return NULL;
265     if(dsa) {
266         DSA_free(*dsa);
267         *dsa = dtmp;
268     }
269     return dtmp;
270 }

272 DSA *PEM_read_bio_DSAPrivateKey(BIO *bp, DSA **dsa, pem_password_cb *cb,
273                                void *u)
274 {
275     EVP_PKEY *pktmp;
276     pktmp = PEM_read_bio_PrivateKey(bp, NULL, cb, u);
277     return pkey_get_dsa(pktmp, dsa); /* will free pktmp */
278 }

280 #ifdef OPENSSL_FIPS

282 int PEM_write_bio_DSAPrivateKey(BIO *bp, DSA *x, const EVP_CIPHER *enc,
283                                unsigned char *kstr, int klen,
284                                pem_password_cb *cb, void *u)
285 {
286     if (FIPS_mode())
287     {
288         EVP_PKEY *k;
289         int ret;
290         k = EVP_PKEY_new();
291         if (!k)
292             return 0;
293         EVP_PKEY_set1_DSA(k, x);

295         ret = PEM_write_bio_PrivateKey(bp, k, enc, kstr, klen, cb, u);
296         EVP_PKEY_free(k);
297         return ret;
298     }
299     else
300         return PEM_ASN1_write_bio((i2d_of_void *)i2d_DSAPrivateKey,
301                                   PEM_STRING_DSA, bp, x, enc, kstr, klen, cb, u);
302 }

304 #ifndef OPENSSL_NO_FP_API
305 int PEM_write_DSAPrivateKey(FILE *fp, DSA *x, const EVP_CIPHER *enc,
306                             unsigned char *kstr, int klen,
307                             pem_password_cb *cb, void *u)
308 {
309     if (FIPS_mode())
310     {
311         EVP_PKEY *k;
312         int ret;
313         k = EVP_PKEY_new();
314         if (!k)
315             return 0;
316         EVP_PKEY_set1_DSA(k, x);
317         ret = PEM_write_PrivateKey(fp, k, enc, kstr, klen, cb, u);
318         EVP_PKEY_free(k);
319         return ret;
320     }
321     else
322         return PEM_ASN1_write((i2d_of_void *)i2d_DSAPrivateKey,
323                               PEM_STRING_DSA, fp, x, enc, kstr, klen, cb, u);
324 }
325 #endif

```

```

327 #else

329 IMPLEMENT_PEM_write_cb_const(DSAPrivateKey, DSA, PEM_STRING_DSA, DSAPrivateKey)

331 #endif

333 IMPLEMENT_PEM_rw(DSA_PUBKEY, DSA, PEM_STRING_PUBLIC, DSA_PUBKEY)

335 #ifndef OPENSSL_NO_FP_API

337 DSA *PEM_read_DSAPrivateKey(FILE *fp, DSA **dsa, pem_password_cb *cb,
338                             void *u)
339 {
340     EVP_PKEY *pktmp;
341     pktmp = PEM_read_PrivateKey(fp, NULL, cb, u);
342     return pkey_get_dsa(pktmp, dsa); /* will free pktmp */
343 }

345 #endif

347 IMPLEMENT_PEM_rw_const(DSAPrivateKey, DSA, PEM_STRING_DSAPRIVATEKEY, DSAPrivateKey)

349 #endif

352 #ifndef OPENSSL_NO_EC
353 static EC_KEY *pkey_get_eckey(EVP_PKEY *key, EC_KEY **eckey)
354 {
355     EC_KEY *dtmp;
356     if(!key) return NULL;
357     dtmp = EVP_PKEY_get1_EC_KEY(key);
358     EVP_PKEY_free(key);
359     if(!dtmp) return NULL;
360     if(eckey)
361     {
362         EC_KEY_free(*eckey);
363         *eckey = dtmp;
364     }
365     return dtmp;
366 }

368 EC_KEY *PEM_read_bio_ECPrivateKey(BIO *bp, EC_KEY **key, pem_password_cb *cb,
369                                   void *u)
370 {
371     EVP_PKEY *pktmp;
372     pktmp = PEM_read_bio_PrivateKey(bp, NULL, cb, u);
373     return pkey_get_eckey(pktmp, key); /* will free pktmp */
374 }

376 IMPLEMENT_PEM_rw_const(ECPrivateKey, EC_KEY, PEM_STRING_ECPRIVATEKEY, ECPrivateKey)

380 #ifdef OPENSSL_FIPS

382 int PEM_write_bio_ECPrivateKey(BIO *bp, EC_KEY *x, const EVP_CIPHER *enc,
383                                unsigned char *kstr, int klen,
384                                pem_password_cb *cb, void *u)
385 {
386     if (FIPS_mode())
387     {
388         EVP_PKEY *k;
389         int ret;
390         k = EVP_PKEY_new();
391         if (!k)

```



```

392         return 0;
393         EVP_PKEY_set1_EC_KEY(k, x);

395         ret = PEM_write_bio_PrivateKey(bp, k, enc, kstr, klen, cb, u);
396         EVP_PKEY_free(k);
397         return ret;
398     }
399     else
400         return PEM_ASN1_write_bio((i2d_of_void *)i2d_ECPrivateKey,
401                                   PEM_STRING_ECPRIVATEKEY,
402                                   bp,x,enc,kstr,klen,cb,u);
403 }

405 #ifndef OPENSSL_NO_FP_API
406 int PEM_write_ECPrivateKey(FILE *fp, EC_KEY *x, const EVP_CIPHER *enc,
407                            unsigned char *kstr, int klen,
408                            pem_password_cb *cb, void *u)
409 {
410     if (FIPS_mode())
411     {
412         EVP_PKEY *k;
413         int ret;
414         k = EVP_PKEY_new();
415         if (!k)
416             return 0;
417         EVP_PKEY_set1_EC_KEY(k, x);
418         ret = PEM_write_PrivateKey(fp, k, enc, kstr, klen, cb, u);
419         EVP_PKEY_free(k);
420         return ret;
421     }
422     else
423         return PEM_ASN1_write((i2d_of_void *)i2d_ECPrivateKey,
424                               PEM_STRING_ECPRIVATEKEY,
425                               fp,x,enc,kstr,klen,cb,u);
426 }
427 #endif

429 #else

431 IMPLEMENT_PEM_write_cb(ECPrivateKey, EC_KEY, PEM_STRING_ECPRIVATEKEY, ECPrivateK
433 #endif

435 IMPLEMENT_PEM_rw(EC_PUBKEY, EC_KEY, PEM_STRING_PUBLIC, EC_PUBKEY)

437 #ifndef OPENSSL_NO_FP_API
438
439 EC_KEY *PEM_read_ECPrivateKey(FILE *fp, EC_KEY **eckey, pem_password_cb *cb,
440                                void *u)
441 {
442     EVP_PKEY *pktmp;
443     pktmp = PEM_read_PrivateKey(fp, NULL, cb, u);
444     return pkey_get_eckey(pktmp, eckey); /* will free pktmp */
445 }

447 #endif

449 #endif

451 #ifndef OPENSSL_NO_DH

453 IMPLEMENT_PEM_rw_const(DHparams, DH, PEM_STRING_DHPARAMS, DHparams)

455 #endif

457 IMPLEMENT_PEM_rw(PUBKEY, EVP_PKEY, PEM_STRING_PUBLIC, PUBKEY)

```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_err.c

1

```
*****
7387 Fri May 30 18:31:58 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/pem/pem_err.c */
2 /* =====
3  * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
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10  * notice, this list of conditions and the following disclaimer.
11  *
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15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
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29  * permission of the OpenSSL Project.
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37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/pem.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_PEM,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_PEM,0,reason)

71 static ERR_STRING_DATA PEM_str_functs[]=
72 {
73 {ERR_FUNC(PEM_F_B2I_DSS), "B2I_DSS"},
74 {ERR_FUNC(PEM_F_B2I_PVK_BIO), "b2i_PVK_bio"},
75 {ERR_FUNC(PEM_F_B2I_RSA), "B2I_RSA"},
76 {ERR_FUNC(PEM_F_CHECK_BITLEN_DSA), "CHECK_BITLEN_DSA"},
77 {ERR_FUNC(PEM_F_CHECK_BITLEN_RSA), "CHECK_BITLEN_RSA"},
78 {ERR_FUNC(PEM_F_D2I_PKCS8PRIVATEKEY_BIO), "d2i_PKCS8PrivateKey_bio"},
79 {ERR_FUNC(PEM_F_D2I_PKCS8PRIVATEKEY_FP), "d2i_PKCS8PrivateKey_fp"},
80 {ERR_FUNC(PEM_F_DO_B2I), "DO_B2I"},
81 {ERR_FUNC(PEM_F_DO_B2I_BIO), "DO_B2I_BIO"},
82 {ERR_FUNC(PEM_F_DO_BLOB_HEADER), "DO_BLOB_HEADER"},
83 {ERR_FUNC(PEM_F_DO_PK8PKEY), "DO_PK8PKEY"},
84 {ERR_FUNC(PEM_F_DO_PK8PKEY_FP), "DO_PK8PKEY_FP"},
85 {ERR_FUNC(PEM_F_DO_PVK_BODY), "DO_PVK_BODY"},
86 {ERR_FUNC(PEM_F_DO_PVK_HEADER), "DO_PVK_HEADER"},
87 {ERR_FUNC(PEM_F_I2B_PVK), "I2B_PVK"},
88 {ERR_FUNC(PEM_F_I2B_PVK_BIO), "i2b_PVK_bio"},
89 {ERR_FUNC(PEM_F_LOAD_IV), "LOAD_IV"},
90 {ERR_FUNC(PEM_F_PEM_ASN1_READ), "PEM_ASN1_read"},
91 {ERR_FUNC(PEM_F_PEM_ASN1_READ_BIO), "PEM_ASN1_read_bio"},
92 {ERR_FUNC(PEM_F_PEM_ASN1_WRITE), "PEM_ASN1_write"},
93 {ERR_FUNC(PEM_F_PEM_ASN1_WRITE_BIO), "PEM_ASN1_write_bio"},
94 {ERR_FUNC(PEM_F_PEM_DEF_CALLBACK), "PEM_def_callback"},
95 {ERR_FUNC(PEM_F_PEM_DO_HEADER), "PEM_do_header"},
96 {ERR_FUNC(PEM_F_PEM_F_PEM_WRITE_PKCS8PRIVATEKEY), "PEM_F_PEM_WRITE_PKCS8PR"},
97 {ERR_FUNC(PEM_F_PEM_GET_EVP_CIPHER_INFO), "PEM_get_EVP_CIPHER_INFO"},
98 {ERR_FUNC(PEM_F_PEM_PK8PKEY), "PEM_PK8PKEY"},
99 {ERR_FUNC(PEM_F_PEM_READ), "PEM_read"},
100 {ERR_FUNC(PEM_F_PEM_READ_BIO), "PEM_read_bio"},
101 {ERR_FUNC(PEM_F_PEM_READ_BIO_PARAMETERS), "PEM_read_bio_Parameters"},
102 {ERR_FUNC(PEM_F_PEM_READ_BIO_PRIVATEKEY), "PEM_READ_BIO_PRIVATEKEY"},
103 {ERR_FUNC(PEM_F_PEM_READ_PRIVATEKEY), "PEM_READ_PRIVATEKEY"},
104 {ERR_FUNC(PEM_F_PEM_SEALFINAL), "PEM_SealFinal"},
105 {ERR_FUNC(PEM_F_PEM_SEALINIT), "PEM_SealInit"},
106 {ERR_FUNC(PEM_F_PEM_SIGNFINAL), "PEM_SignFinal"},
107 {ERR_FUNC(PEM_F_PEM_WRITE), "PEM_write"},
108 {ERR_FUNC(PEM_F_PEM_WRITE_BIO), "PEM_write_bio"},
109 {ERR_FUNC(PEM_F_PEM_WRITE_PRIVATEKEY), "PEM_WRITE_PRIVATEKEY"},
110 {ERR_FUNC(PEM_F_PEM_X509_INFO_READ), "PEM_X509_INFO_read"},
111 {ERR_FUNC(PEM_F_PEM_X509_INFO_READ_BIO), "PEM_X509_INFO_read_bio"},
112 {ERR_FUNC(PEM_F_PEM_X509_INFO_WRITE_BIO), "PEM_X509_INFO_write_bio"},
113 {0,NULL}
114 };

116 static ERR_STRING_DATA PEM_str_reasons[]=
117 {
118 {ERR_REASON(PEM_R_BAD_BASE64_DECODE), "bad base64 decode"},
119 {ERR_REASON(PEM_R_BAD_DECRYPT), "bad decrypt"},
120 {ERR_REASON(PEM_R_BAD_END_LINE), "bad end line"},
121 {ERR_REASON(PEM_R_BAD_IV_CHARS), "bad iv chars"},
122 {ERR_REASON(PEM_R_BAD_MAGIC_NUMBER), "bad magic number"},
123 {ERR_REASON(PEM_R_BAD_PASSWORD_READ), "bad password read"},
124 {ERR_REASON(PEM_R_BAD_VERSION_NUMBER), "bad version number"},
125 {ERR_REASON(PEM_R_BIO_WRITE_FAILURE), "bio write failure"},
126 {ERR_REASON(PEM_R_CIPHER_IS_NULL), "cipher is null"},
127 {ERR_REASON(PEM_R_ERROR_CONVERTING_PRIVATE_KEY), "error converting private key"},
```

```
128 {ERR_REASON(PEM_R_EXPECTING_PRIVATE_KEY_BLOB),"expecting private key blob"},
129 {ERR_REASON(PEM_R_EXPECTING_PUBLIC_KEY_BLOB),"expecting public key blob"},
130 {ERR_REASON(PEM_R_INCONSISTENT_HEADER),"inconsistent header"},
131 {ERR_REASON(PEM_R_KEYBLOB_HEADER_PARSE_ERROR),"keyblob header parse error"},
132 {ERR_REASON(PEM_R_KEYBLOB_TOO_SHORT),"keyblob too short"},
133 {ERR_REASON(PEM_R_NOT_DEK_INFO),"not dek info"},
134 {ERR_REASON(PEM_R_NOT_ENCRYPTED),"not encrypted"},
135 {ERR_REASON(PEM_R_NOT_PROC_TYPE),"not proc type"},
136 {ERR_REASON(PEM_R_NO_START_LINE),"no start line"},
137 {ERR_REASON(PEM_R_PROBLEMS_GETTING_PASSWORD),"problems getting password"},
138 {ERR_REASON(PEM_R_PUBLIC_KEY_NO_RSA),"public key no rsa"},
139 {ERR_REASON(PEM_R_PVK_DATA_TOO_SHORT),"pvk data too short"},
140 {ERR_REASON(PEM_R_PVK_TOO_SHORT),"pvk too short"},
141 {ERR_REASON(PEM_R_READ_KEY),"read key"},
142 {ERR_REASON(PEM_R_SHORT_HEADER),"short header"},
143 {ERR_REASON(PEM_R_UNSUPPORTED_CIPHER),"unsupported cipher"},
144 {ERR_REASON(PEM_R_UNSUPPORTED_ENCRYPTION),"unsupported encryption"},
145 {ERR_REASON(PEM_R_UNSUPPORTED_KEY_COMPONENTS),"unsupported key components"},
146 {0,NULL}
147 };

149 #endif

151 void ERR_load_PEM_strings(void)
152 {
153 #ifndef OPENSSL_NO_ERR
155     if (ERR_func_error_string(PEM_str_functs[0].error) == NULL)
156     {
157         ERR_load_strings(0,PEM_str_functs);
158         ERR_load_strings(0,PEM_str_reasons);
159     }
160 #endif
161 }
```

```

*****
11076 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_info.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/pem/pem_info.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>

```

```

62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/x509.h>
65 #include <openssl/pem.h>
66 #ifndef OPENSSL_NO_RSA
67 #include <openssl/rsa.h>
68 #endif
69 #ifndef OPENSSL_NO_DSA
70 #include <openssl/dsa.h>
71 #endif
72
73 #ifndef OPENSSL_NO_FP_API
74 STACK_OF(X509_INFO) *PEM_X509_INFO_read(FILE *fp, STACK_OF(X509_INFO) *sk, pem_p
75 {
76     BIO *b;
77     STACK_OF(X509_INFO) *ret;
78
79     if ((b=BIO_new(BIO_s_file())) == NULL)
80     {
81         PEMerr(PEM_F_PEM_X509_INFO_READ, ERR_R_BUF_LIB);
82         return(0);
83     }
84     BIO_set_fp(b, fp, BIO_NOCLOSE);
85     ret=PEM_X509_INFO_read_bio(b, sk, cb, u);
86     BIO_free(b);
87     return(ret);
88 }
89 #endif
90
91 STACK_OF(X509_INFO) *PEM_X509_INFO_read_bio(BIO *bp, STACK_OF(X509_INFO) *sk, pe
92 {
93     X509_INFO *xi=NULL;
94     char *name=NULL, *header=NULL;
95     void *pp;
96     unsigned char *data=NULL;
97     const unsigned char *p;
98     long len, error=0;
99     int ok=0;
100     STACK_OF(X509_INFO) *ret=NULL;
101     unsigned int i, raw, ptype;
102     d2i_of_void *d2i = 0;
103
104     if (sk == NULL)
105     {
106         if ((ret=sk_X509_INFO_new_null()) == NULL)
107         {
108             PEMerr(PEM_F_PEM_X509_INFO_READ_BIO, ERR_R_MALLOC_FAILURE);
109             goto err;
110         }
111     }
112     else
113         ret=sk;
114
115     if ((xi=X509_INFO_new()) == NULL) goto err;
116     for (;;)
117     {
118         raw=0;
119         ptype = 0;
120         i=PEM_read_bio(bp, &name, &header, &data, &len);
121         if (i == 0)
122         {
123             error=ERR_GET_REASON(ERR_peek_last_error());
124             if (error == PEM_R_NO_START_LINE)
125             {
126                 ERR_clear_error();
127                 break;

```

```

128         goto err;
129     }
130 }
131 start:
132     if ( (strcmp(name, PEM_STRING_X509) == 0) ||
133         (strcmp(name, PEM_STRING_X509_OLD) == 0))
134     {
135         d2i=(D2I_OF(void))d2i_X509;
136         if (xi->x509 != NULL)
137         {
138             if (!sk_X509_INFO_push(ret,xi)) goto err;
139             if ((xi=X509_INFO_new()) == NULL) goto err;
140             goto start;
141         }
142         pp=&(xi->x509);
143     }
144     else if ((strcmp(name, PEM_STRING_X509_TRUSTED) == 0))
145     {
146         d2i=(D2I_OF(void))d2i_X509_AUX;
147         if (xi->x509 != NULL)
148         {
149             if (!sk_X509_INFO_push(ret,xi)) goto err;
150             if ((xi=X509_INFO_new()) == NULL) goto err;
151             goto start;
152         }
153         pp=&(xi->x509);
154     }
155     else if (strcmp(name, PEM_STRING_X509_CRL) == 0)
156     {
157         d2i=(D2I_OF(void))d2i_X509_CRL;
158         if (xi->crl != NULL)
159         {
160             if (!sk_X509_INFO_push(ret,xi)) goto err;
161             if ((xi=X509_INFO_new()) == NULL) goto err;
162             goto start;
163         }
164         pp=&(xi->crl);
165     }
166     else
167     #ifndef OPENSSL_NO_RSA
168     {
169         if (strcmp(name, PEM_STRING_RSA) == 0)
170         {
171             d2i=(D2I_OF(void))d2i_RSAPrivateKey;
172             if (xi->x_pkey != NULL)
173             {
174                 if (!sk_X509_INFO_push(ret,xi)) goto err;
175                 if ((xi=X509_INFO_new()) == NULL) goto err;
176                 goto start;
177             }
178             xi->enc_data=NULL;
179             xi->enc_len=0;
180             xi->x_pkey=X509_PKEY_new();
181             ptype=EVP_PKEY_RSA;
182             pp=&xi->x_pkey->dec_pkey;
183             if ((int)strlen(header) > 10) /* assume encrypted */
184                 raw=1;
185         }
186     }
187     else
188     #endif
189     #ifndef OPENSSL_NO_DSA
190     {
191         if (strcmp(name, PEM_STRING_DSA) == 0)
192         {
193             d2i=(D2I_OF(void))d2i_DSAPrivateKey;
194             if (xi->x_pkey != NULL)

```

```

194         {
195             if (!sk_X509_INFO_push(ret,xi)) goto err;
196             if ((xi=X509_INFO_new()) == NULL) goto err;
197             goto start;
198         }
199     }
200     xi->enc_data=NULL;
201     xi->enc_len=0;
202
203     xi->x_pkey=X509_PKEY_new();
204     ptype = EVP_PKEY_DSA;
205     pp=&xi->x_pkey->dec_pkey;
206     if ((int)strlen(header) > 10) /* assume encrypted */
207         raw=1;
208 }
209     else
210     #endif
211     #ifndef OPENSSL_NO_EC
212     {
213         if (strcmp(name, PEM_STRING_ECPRIVATEKEY) == 0)
214         {
215             d2i=(D2I_OF(void))d2i_ECPrivateKey;
216             if (xi->x_pkey != NULL)
217             {
218                 if (!sk_X509_INFO_push(ret,xi)) goto err;
219                 if ((xi=X509_INFO_new()) == NULL) goto e
220                 goto start;
221             }
222             xi->enc_data=NULL;
223             xi->enc_len=0;
224             xi->x_pkey=X509_PKEY_new();
225             ptype = EVP_PKEY_EC;
226             pp=&xi->x_pkey->dec_pkey;
227             if ((int)strlen(header) > 10) /* assume encrypted */
228                 raw=1;
229         }
230     }
231     else
232     #endif
233     {
234         d2i=NULL;
235         pp=NULL;
236     }
237
238     if (d2i != NULL)
239     {
240         if (!raw)
241         {
242             EVP_CIPHER_INFO cipher;
243
244             if (!PEM_get_EVP_CIPHER_INFO(header,&cipher))
245                 goto err;
246             if (!PEM_do_header(&cipher,data,&len,cb,u))
247                 goto err;
248             p=data;
249             if (ptype)
250             {
251                 if (!d2i_PrivateKey(ptype, pp, &p, len))
252                 {
253                     PEMerr(PEM_F_PEM_X509_INFO_READ
254                         goto err;
255                 }
256             }
257             else if (d2i(pp,&p,len) == NULL)
258             {
259                 PEMerr(PEM_F_PEM_X509_INFO_READ_BIO,ERR_

```

```

260         goto err;
261     }
262 }
263 else
264 { /* encrypted RSA data */
265     if (!PEM_get_EVP_CIPHER_INFO(header,
266         &xi->enc_cipher)) goto err;
267     xi->enc_data=(char *)data;
268     xi->enc_len=(int)len;
269     data=NULL;
270 }
271 }
272 else
273     /* unknown */
274 }
275 if (name != NULL) OPENSSL_free(name);
276 if (header != NULL) OPENSSL_free(header);
277 if (data != NULL) OPENSSL_free(data);
278 name=NULL;
279 header=NULL;
280 data=NULL;
281 }
282
283 /* if the last one hasn't been pushed yet and there is anything
284  * in it then add it to the stack ...
285  */
286 if ((xi->x509 != NULL) || (xi->crl != NULL) ||
287     (xi->x_pkey != NULL) || (xi->enc_data != NULL))
288 {
289     if (!sk_X509_INFO_push(ret,xi)) goto err;
290     xi=NULL;
291 }
292 ok=1;
293 err:
294 if (xi != NULL) X509_INFO_free(xi);
295 if (!ok)
296 {
297     for (i=0; ((int)i)<sk_X509_INFO_num(ret); i++)
298     {
299         xi=sk_X509_INFO_value(ret,i);
300         X509_INFO_free(xi);
301     }
302     if (ret != sk) sk_X509_INFO_free(ret);
303     ret=NULL;
304 }
305
306 if (name != NULL) OPENSSL_free(name);
307 if (header != NULL) OPENSSL_free(header);
308 if (data != NULL) OPENSSL_free(data);
309 return(ret);
310 }
311
312 /* A TJH addition */
313 int PEM_X509_INFO_write_bio(BIO *bp, X509_INFO *xi, EVP_CIPHER *enc,
314     unsigned char *kstr, int klen, pem_password_cb *cb, void *u)
315 {
316     EVP_CIPHER_CTX ctx;
317     int i,ret=0;
318     unsigned char *data=NULL;
319     const char *objstr=NULL;
320     char buf[PEM_BUFSIZE];
321     unsigned char *iv=NULL;
322
323     if (enc != NULL)
324     {

```

```

326         objstr=OBJ_nid2sn(EVP_CIPHER_nid(enc));
327         if (objstr == NULL)
328         {
329             PEMerr(PEM_F_PEM_X509_INFO_WRITE_BIO, PEM_R_UNSUPPORTED_C
330                 goto err;
331         }
332     }
333
334     /* now for the fun part ... if we have a private key then
335     * we have to be able to handle a not-yet-decrypted key
336     * being written out correctly ... if it is decrypted or
337     * it is non-encrypted then we use the base code
338     */
339     if (xi->x_pkey!=NULL)
340     {
341         if ( (xi->enc_data!=NULL) && (xi->enc_len>0) )
342         {
343             if (enc == NULL)
344             {
345                 PEMerr(PEM_F_PEM_X509_INFO_WRITE_BIO, PEM_R_CIPHE
346                     goto err;
347             }
348
349             /* copy from weirdo names into more normal things */
350             iv=xi->enc_cipher.iv;
351             data=(unsigned char *)xi->enc_data;
352             i=xi->enc_len;
353
354             /* we take the encryption data from the
355             * internal stuff rather than what the
356             * user has passed us ... as we have to
357             * match exactly for some strange reason
358             */
359             objstr=OBJ_nid2sn(
360                 EVP_CIPHER_nid(xi->enc_cipher.cipher));
361             if (objstr == NULL)
362             {
363                 PEMerr(PEM_F_PEM_X509_INFO_WRITE_BIO, PEM_R_UNSUP
364                     goto err;
365             }
366
367             /* create the right magic header stuff */
368             OPENSSL_assert(strlen(objstr)+23+2*enc->iv_len+13 <= siz
369             buf[0]='\0';
370             PEM_proc_type(buf, PEM_TYPE_ENCRYPTED);
371             PEM_dek_info(buf, objstr, enc->iv_len, (char *)iv);
372
373             /* use the normal code to write things out */
374             i=PEM_write_bio(bp, PEM_STRING_RSA, buf, data, i);
375             if (i <= 0) goto err;
376         }
377         else
378         {
379             /* Add DSA/DH */
380             #ifndef OPENSSL_NO_RSA
381             /* normal optionally encrypted stuff */
382             if (PEM_write_bio_RSAPrivateKey(bp,
383                 xi->x_pkey->dec_pkey->pkey.rsa,
384                 enc, kstr, klen, cb, u)<=0)
385                 goto err;
386             #endif
387         }
388     }
389
390     /* if we have a certificate then write it out now */
391     if ((xi->x509 != NULL) && (PEM_write_bio_X509(bp,xi->x509) <= 0))

```

```
392         goto err;

394     /* we are ignoring anything else that is loaded into the X509_INFO
395     * structure for the moment ... as I don't need it so I'm not
396     * coding it here and Eric can do it when this makes it into the
397     * base library --tjh
398     */

400     ret=1;

402 err:
403     OPENSSL_cleanse((char *)&ctx,sizeof(ctx));
404     OPENSSL_cleanse(buf, PEM_BUFSIZE);
405     return(ret);
406 }
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_lib.c

1

```
*****
21098 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/pem/pem_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <ctype.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_lib.c

2

```
62 #include <openssl/buffer.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65 #include <openssl/rand.h>
66 #include <openssl/x509.h>
67 #include <openssl/pem.h>
68 #include <openssl/pkcs12.h>
69 #include "asn1_locl.h"
70 #ifndef OPENSSL_NO_DES
71 #include <openssl/des.h>
72 #endif
73 #ifndef OPENSSL_NO_ENGINE
74 #include <openssl/engine.h>
75 #endif
77 const char PEM_version[]="PEM" OPENSSL_VERSION_PTEXT;
79 #define MIN_LENGTH 4
81 static int load_iv(char **fromp,unsigned char *to, int num);
82 static int check_pem(const char *nm, const char *name);
83 int pem_check_suffix(const char *pem_str, const char *suffix);
85 int PEM_def_callback(char *buf, int num, int w, void *key)
86 {
87 #ifdef OPENSSL_NO_FP_API
88 /* We should not ever call the default callback routine from
89  * windows. */
90 PEMerr(PEM_F_PEM_DEF_CALLBACK,ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
91 return(-1);
92 #else
93 int i,j;
94 const char *prompt;
95 if(key) {
96 i=strlen(key);
97 i=(i > num)?num:i;
98 memcpy(buf,key,i);
99 return(i);
100 }
102 prompt=EVP_get_pw_prompt();
103 if (prompt == NULL)
104 prompt="Enter PEM pass phrase:";
106 for (;;)
107 {
108 i=EVP_read_pw_string_min(buf,MIN_LENGTH,num,prompt,w);
109 if (i != 0)
110 {
111 PEMerr(PEM_F_PEM_DEF_CALLBACK,PEM_R_PROBLEMS_GETTING_PAS
112 memset(buf,0,(unsigned int)num);
113 return(-1);
114 }
115 j=strlen(buf);
116 if (j < MIN_LENGTH)
117 {
118 fprintf(stderr,"phrase is too short, needs to be at leas
119 }
120 else
121 break;
122 }
123 return(j);
124 #endif
125 }
127 void PEM_proc_type(char *buf, int type)
```



```

128     {
129         const char *str;

131         if (type == PEM_TYPE_ENCRYPTED)
132             str="ENCRYPTED";
133         else if (type == PEM_TYPE_MIC_CLEAR)
134             str="MIC-CLEAR";
135         else if (type == PEM_TYPE_MIC_ONLY)
136             str="MIC-ONLY";
137         else
138             str="BAD-TYPE";
139
140         BUF_strlcat(buf, "Proc-Type: 4, ", PEM_BUFSIZE);
141         BUF_strlcat(buf, str, PEM_BUFSIZE);
142         BUF_strlcat(buf, "\n", PEM_BUFSIZE);
143     }

145 void PEM_dek_info(char *buf, const char *type, int len, char *str)
146 {
147     static const unsigned char map[17]="0123456789ABCDEF";
148     long i;
149     int j;

151     BUF_strlcat(buf, "DEK-Info: ", PEM_BUFSIZE);
152     BUF_strlcat(buf, type, PEM_BUFSIZE);
153     BUF_strlcat(buf, " ", PEM_BUFSIZE);
154     j=strlen(buf);
155     if (j + (len * 2) + 1 > PEM_BUFSIZE)
156         return;
157     for (i=0; i<len; i++)
158     {
159         buf[j+i*2] =map[(str[i]>>4)&0x0f];
160         buf[j+i*2+1]=map[(str[i]&0x0f)];
161     }
162     buf[j+i*2]='\n';
163     buf[j+i*2+1]='\0';
164 }

166 #ifndef OPENSSL_NO_FP_API
167 void *PEM_ASN1_read(d2i_of_void *d2i, const char *name, FILE *fp, void **x,
168                    pem_password_cb *cb, void *u)
169 {
170     BIO *b;
171     void *ret;

173     if ((b=BIO_new(BIO_s_file())) == NULL)
174     {
175         PEMerr(PEM_F_PEM_ASN1_READ,ERR_R_BUF_LIB);
176         return(0);
177     }
178     BIO_set_fp(b,fp,BIO_NOCLOSE);
179     ret=PEM_ASN1_read_bio(d2i,name,b,x,cb,u);
180     BIO_free(b);
181     return(ret);
182 }
183 #endif

185 static int check_pem(const char *nm, const char *name)
186 {
187     /* Normal matching nm and name */
188     if (!strcmp(nm,name)) return 1;

190     /* Make PEM_STRING_EVP_PKEY match any private key */

192     if(!strcmp(name,PEM_STRING_EVP_PKEY))
193     {

```

```

194         int slen;
195         const EVP_PKEY_ASN1_METHOD *ameth;
196         if(!strcmp(nm,PEM_STRING_PKCS8))
197             return 1;
198         if(!strcmp(nm,PEM_STRING_PKCS8INF))
199             return 1;
200         slen = pem_check_suffix(nm, "PRIVATE KEY");
201         if (slen > 0)
202         {
203             /* NB: ENGINE implementations wont contain
204              * a deprecated old private key decode function
205              * so don't look for them.
206              */
207             ameth = EVP_PKEY_asn1_find_str(NULL, nm, slen);
208             if (ameth && ameth->old_priv_decode)
209                 return 1;
210         }
211         return 0;
212     }

214     if(!strcmp(name,PEM_STRING_PARAMETERS))
215     {
216         int slen;
217         const EVP_PKEY_ASN1_METHOD *ameth;
218         slen = pem_check_suffix(nm, "PARAMETERS");
219         if (slen > 0)
220         {
221             ENGINE *e;
222             ameth = EVP_PKEY_asn1_find_str(&e, nm, slen);
223             if (ameth)
224             {
225                 int r;
226                 if (ameth->param_decode)
227                     r = 1;
228                 else
229                     r = 0;
230             }
231             #ifndef OPENSSL_NO_ENGINE
232             if (e)
233                 ENGINE_finish(e);
234             #endif
235             return r;
236         }
237         return 0;
238     }

240     /* Permit older strings */
242     if(!strcmp(nm,PEM_STRING_X509_OLD) &&
243        !strcmp(name,PEM_STRING_X509)) return 1;

245     if(!strcmp(nm,PEM_STRING_X509_REQ_OLD) &&
246        !strcmp(name,PEM_STRING_X509_REQ)) return 1;

248     /* Allow normal certs to be read as trusted certs */
249     if(!strcmp(nm,PEM_STRING_X509) &&
250        !strcmp(name,PEM_STRING_X509_TRUSTED)) return 1;

252     if(!strcmp(nm,PEM_STRING_X509_OLD) &&
253        !strcmp(name,PEM_STRING_X509_TRUSTED)) return 1;

255     /* Some CAs use PKCS#7 with CERTIFICATE headers */
256     if(!strcmp(nm, PEM_STRING_X509) &&
257        !strcmp(name, PEM_STRING_PKCS7)) return 1;

259     if(!strcmp(nm, PEM_STRING_PKCS7_SIGNED) &&

```

```

260         !strcmp(name, PEM_STRING_PKCS7)) return 1;

262 #ifndef OPENSSL_NO_CMS
263     if(!strcmp(nm, PEM_STRING_X509) &&
264         !strcmp(name, PEM_STRING_CMS)) return 1;
265     /* Allow CMS to be read from PKCS#7 headers */
266     if(!strcmp(nm, PEM_STRING_PKCS7) &&
267         !strcmp(name, PEM_STRING_CMS)) return 1;
268 #endif

270     return 0;
271 }

273 int PEM_bytes_read_bio(unsigned char **pdata, long *plen, char **pnm, const char
274     pem_password_cb *cb, void *u)
275 {
276     EVP_CIPHER_INFO cipher;
277     char *nm=NULL, *header=NULL;
278     unsigned char *data=NULL;
279     long len;
280     int ret = 0;

282     for (;;)
283     {
284         if (!PEM_read_bio(bp, &nm, &header, &data, &len)) {
285             if(ERR_GET_REASON(ERR_peek_error()) ==
286                 PEM_R_NO_START_LINE)
287                 ERR_add_error_data(2, "Expecting: ", name);
288             return 0;
289             if(check_pem(nm, name)) break;
290             OPENSSL_free(nm);
291             OPENSSL_free(header);
292             OPENSSL_free(data);
293         }
294         if (!PEM_get_EVP_CIPHER_INFO(header, &cipher)) goto err;
295         if (!PEM_do_header(&cipher, data, &len, cb, u)) goto err;

298         *pdata = data;
299         *plen = len;

301         if (pnm)
302             *pnm = nm;

304         ret = 1;

306 err:
307     if (!ret || !pnm) OPENSSL_free(nm);
308     OPENSSL_free(header);
309     if (!ret) OPENSSL_free(data);
310     return ret;
311 }

313 #ifndef OPENSSL_NO_FP_API
314 int PEM_ASN1_write(i2d_of_void *i2d, const char *name, FILE *fp,
315     void *x, const EVP_CIPHER *enc, unsigned char *kstr,
316     int klen, pem_password_cb *callback, void *u)
317 {
318     BIO *b;
319     int ret;

321     if ((b=BIO_new(BIO_s_file())) == NULL)
322     {
323         PEMerr(PEM_F_PEM_ASN1_WRITE, ERR_R_BUF_LIB);
324         return(0);
325     }

```

```

326     BIO_set_fp(b, fp, BIO_NOCLOSE);
327     ret=PEM_ASN1_write_bio(i2d, name, b, x, enc, kstr, klen, callback, u);
328     BIO_free(b);
329     return(ret);
330 }
331 #endif

333 int PEM_ASN1_write_bio(i2d_of_void *i2d, const char *name, BIO *bp,
334     void *x, const EVP_CIPHER *enc, unsigned char *kstr,
335     int klen, pem_password_cb *callback, void *u)
336 {
337     EVP_CIPHER_CTX ctx;
338     int dsize=0, i, j, ret=0;
339     unsigned char *p, *data=NULL;
340     const char *objstr=NULL;
341     char buf[PEM_BUFSIZE];
342     unsigned char key[EVP_MAX_KEY_LENGTH];
343     unsigned char iv[EVP_MAX_IV_LENGTH];
344
345     if (enc != NULL)
346     {
347         objstr=OBJ_nid2sn(EVP_CIPHER_nid(enc));
348         if (objstr == NULL)
349         {
350             PEMerr(PEM_F_PEM_ASN1_WRITE_BIO, PEM_R_UNSUPPORTED_CIPHER);
351             goto err;
352         }
353     }

355     if ((dsize=i2d(x, NULL)) < 0)
356     {
357         PEMerr(PEM_F_PEM_ASN1_WRITE_BIO, ERR_R_ASN1_LIB);
358         dsize=0;
359         goto err;
360     }
361     /* dsize + 8 bytes are needed */
362     /* actually it needs the cipher block size extra... */
363     data=(unsigned char *)OPENSSL_malloc((unsigned int)dsize+20);
364     if (data == NULL)
365     {
366         PEMerr(PEM_F_PEM_ASN1_WRITE_BIO, ERR_R_MALLOC_FAILURE);
367         goto err;
368     }
369     p=data;
370     i=i2d(x, &p);

372     if (enc != NULL)
373     {
374         if (kstr == NULL)
375         {
376             if (callback == NULL)
377                 klen=PEM_def_callback(buf, PEM_BUFSIZE, 1, u);
378             else
379                 klen=(*callback)(buf, PEM_BUFSIZE, 1, u);
380             if (klen <= 0)
381             {
382                 PEMerr(PEM_F_PEM_ASN1_WRITE_BIO, PEM_R_READ_KEY);
383                 goto err;
384             }
385 #ifdef CHARSET_EBCDIC
386             /* Convert the pass phrase from EBCDIC */
387             ebcdic2ascii(buf, buf, klen);
388 #endif
389             kstr=(unsigned char *)buf;
390         }
391         RAND_add(data, i, 0); /* put in the RSA key. */

```

```

392     OPENSSL_assert(enc->iv_len <= (int)sizeof(iv));
393     if (RAND_pseudo_bytes(iv, enc->iv_len) < 0) /* Generate a salt */
394         goto err;
395     /* The 'iv' is used as the iv and as a salt. It is
396     * NOT taken from the BytesToKey function */
397     if (!EVP_BytesToKey(enc, EVP_md5(), iv, kstr, klen, 1, key, NULL))
398         goto err;

400     if (kstr == (unsigned char *)buf) OPENSSL_cleanse(buf, PEM_BUFSIZE);

402     OPENSSL_assert(strlen(objstr)+23+2*enc->iv_len+13 <= sizeof buf)

404     buf[0]='\0';
405     PEM_proc_type(buf, PEM_TYPE_ENCRYPTED);
406     PEM_dek_info(buf, objstr, enc->iv_len, (char *)iv);
407     /* k=strlen(buf); */

409     EVP_CIPHER_CTX_init(&ctx);
410     ret = 1;
411     if (!EVP_EncryptInit_ex(&ctx, enc, NULL, key, iv)
412         || !EVP_EncryptUpdate(&ctx, data, &j, data, i)
413         || !EVP_EncryptFinal_ex(&ctx, &(data[j]), &i))
414         ret = 0;
415     EVP_CIPHER_CTX_cleanup(&ctx);
416     if (ret == 0)
417         goto err;
418     i+=j;
419 }
420 else
421 {
422     ret=1;
423     buf[0]='\0';
424 }
425 i=PEM_write_bio(bp, name, buf, data, i);
426 if (i <= 0) ret=0;

427 err:
428     OPENSSL_cleanse(key, sizeof(key));
429     OPENSSL_cleanse(iv, sizeof(iv));
430     OPENSSL_cleanse((char *)&ctx, sizeof(ctx));
431     OPENSSL_cleanse(buf, PEM_BUFSIZE);
432     if (data != NULL)
433     {
434         OPENSSL_cleanse(data, (unsigned int)dsz);
435         OPENSSL_free(data);
436     }
437     return(ret);
438 }

440 int PEM_do_header(EVP_CIPHER_INFO *cipher, unsigned char *data, long *plen,
441     pem_password_cb *callback, void *u)
442 {
443     int i, j, o, klen;
444     long len;
445     EVP_CIPHER_CTX ctx;
446     unsigned char key[EVP_MAX_KEY_LENGTH];
447     char buf[PEM_BUFSIZE];

449     len = *plen;

451     if (cipher->cipher == NULL) return(1);
452     if (callback == NULL)
453         klen=PEM_def_callback(buf, PEM_BUFSIZE, 0, u);
454     else
455         klen=callback(buf, PEM_BUFSIZE, 0, u);
456     if (klen <= 0)
457     {

```

```

458         PEMerr(PEM_F_PEM_DO_HEADER, PEM_R_BAD_PASSWORD_READ);
459         return(0);
460     }
461 #ifdef CHARSET_EBCDIC
462     /* Convert the pass phrase from EBCDIC */
463     ebcddic2ascii(buf, buf, klen);
464 #endif

466     if (!EVP_BytesToKey(cipher->cipher, EVP_md5(), &(cipher->iv[0]),
467         (unsigned char *)buf, klen, 1, key, NULL))
468         return 0;

470     j=(int)len;
471     EVP_CIPHER_CTX_init(&ctx);
472     o = EVP_DecryptInit_ex(&ctx, cipher->cipher, NULL, key, &(cipher->iv[0]));
473     if (o)
474     {
475         o = EVP_DecryptUpdate(&ctx, data, &i, data, j);
476         if (o)
477             o = EVP_DecryptFinal_ex(&ctx, &(data[i]), &j);
478     }
479     EVP_CIPHER_CTX_cleanup(&ctx);
480     OPENSSL_cleanse((char *)buf, sizeof(buf));
481     OPENSSL_cleanse((char *)key, sizeof(key));
482     j+=i;
483     if (!o)
484     {
485         PEMerr(PEM_F_PEM_DO_HEADER, PEM_R_BAD_DECRYPT);
486         return(0);
487     }
488     *plen=j;
489     return(1);
490 }

490 int PEM_get_EVP_CIPHER_INFO(char *header, EVP_CIPHER_INFO *cipher)
491 {
492     const EVP_CIPHER *enc=NULL;
493     char *p,c;
494     char **header_pp = &header;

496     cipher->cipher=NULL;
497     if ((header == NULL) || (*header == '\0') || (*header == '\n'))
498         return(1);
499     if (strcmp(header, "Proc-Type: ", 11) != 0)
500     {
501         PEMerr(PEM_F_PEM_GET_EVP_CIPHER_INFO, PEM_R_NOT_PROC_TYPE); ret
502         header+=11;
503     }
504     if (*header != '4') return(0); header++;
505     if (*header != ',') return(0); header++;
506     if (strcmp(header, "ENCRYPTED", 9) != 0)
507     {
508         PEMerr(PEM_F_PEM_GET_EVP_CIPHER_INFO, PEM_R_NOT_ENCRYPTED); ret
509         for (; (*header != '\n') && (*header != '\0'); header++)
510             ;
511     }
512     if (*header == '\0')
513     {
514         PEMerr(PEM_F_PEM_GET_EVP_CIPHER_INFO, PEM_R_SHORT_HEADER); retu
515         header++;
516     }
517     if (strcmp(header, "DEK-Info: ", 10) != 0)
518     {
519         PEMerr(PEM_F_PEM_GET_EVP_CIPHER_INFO, PEM_R_NOT_DEK_INFO); retu
520         header+=10;
521     }

523     p=header;
524     for (;;)
525     {
526         c = *header;
527         #ifdef CHARSET_EBCDIC
528         if (!( (c >= 'A') && (c <= 'Z') || (c == '-') ||
529             ((c >= '0') && (c <= '9'))))
530             break;
531         #else

```

```

524         if (!(isupper(c) || (c == '-') ||
525               isdigit(c)))
526             break;
527 #endif
528         header++;
529     }
530     *header='\0';
531     cipher->cipher=enc=EVP_get_cipherbyname(p);
532     *header=c;
533     header++;
534
535     if (enc == NULL)
536     {
537         PEMerr(PEM_F_PEM_GET_EVP_CIPHER_INFO, PEM_R_UNSUPPORTED_ENCRYPTIO
538               return(0);
539     }
540     if (!load_iv(header_pp, &(cipher->iv[0]), enc->iv_len))
541         return(0);
542
543     return(1);
544 }
545
546 static int load_iv(char **fromp, unsigned char *to, int num)
547 {
548     int v,i;
549     char *from;
550
551     from= *fromp;
552     for (i=0; i<num; i++) to[i]=0;
553     num*=2;
554     for (i=0; i<num; i++)
555     {
556         if ((*from >= '0') && (*from <= '9'))
557             v= *from-'0';
558         else if ((*from >= 'A') && (*from <= 'F'))
559             v= *from-'A'+10;
560         else if ((*from >= 'a') && (*from <= 'f'))
561             v= *from-'a'+10;
562         else
563         {
564             PEMerr(PEM_F_LOAD_IV, PEM_R_BAD_IV_CHARS);
565             return(0);
566         }
567         from++;
568         to[i/2]=v<<((long)((!(i&1))*4));
569     }
570
571     *fromp=from;
572     return(1);
573 }
574
575 #ifndef OPENSSL_NO_FP_API
576 int PEM_write(FILE *fp, char *name, char *header, unsigned char *data,
577              long len)
578 {
579     BIO *b;
580     int ret;
581
582     if ((b=BIO_new(BIO_s_file())) == NULL)
583     {
584         PEMerr(PEM_F_PEM_WRITE, ERR_R_BUF_LIB);
585         return(0);
586     }
587     BIO_set_fp(b, fp, BIO_NOCLOSE);
588     ret=PEM_write_bio(b, name, header, data, len);
589     BIO_free(b);

```

```

590     return(ret);
591 }
592 #endif
593
594 int PEM_write_bio(BIO *bp, const char *name, char *header, unsigned char *data,
595                  long len)
596 {
597     int nlen,n,i,j,outl;
598     unsigned char *buf = NULL;
599     EVP_ENCODE_CTX ctx;
600     int reason=ERR_R_BUF_LIB;
601
602     EVP_EncodeInit(&ctx);
603     nlen=strlen(name);
604
605     if ( (BIO_write(bp, "-----BEGIN ", 11) != 11) ||
606         (BIO_write(bp, name, nlen) != nlen) ||
607         (BIO_write(bp, "-----\n", 6) != 6))
608         goto err;
609
610     i=strlen(header);
611     if (i > 0)
612     {
613         if ( (BIO_write(bp, header, i) != i) ||
614             (BIO_write(bp, "\n", 1) != 1))
615             goto err;
616     }
617
618     buf = OPENSSL_malloc(PEM_BUFSIZE*8);
619     if (buf == NULL)
620     {
621         reason=ERR_R_MALLOC_FAILURE;
622         goto err;
623     }
624
625     i=j=0;
626     while (len > 0)
627     {
628         n=(int)((len>(PEM_BUFSIZE*5))?(PEM_BUFSIZE*5):len);
629         EVP_EncodeUpdate(&ctx, buf, &outl, &(data[j]), n);
630         if ((outl) && (BIO_write(bp, (char *)buf, outl) != outl))
631             goto err;
632         i+=outl;
633         len-=n;
634         j+=n;
635     }
636     EVP_EncodeFinal(&ctx, buf, &outl);
637     if ((outl > 0) && (BIO_write(bp, (char *)buf, outl) != outl)) goto err;
638     OPENSSL_cleanse(buf, PEM_BUFSIZE*8);
639     OPENSSL_free(buf);
640     buf = NULL;
641     if ( (BIO_write(bp, "-----END ", 9) != 9) ||
642         (BIO_write(bp, name, nlen) != nlen) ||
643         (BIO_write(bp, "-----\n", 6) != 6))
644         goto err;
645     return(i+outl);
646 err:
647     if (buf) {
648         OPENSSL_cleanse(buf, PEM_BUFSIZE*8);
649         OPENSSL_free(buf);
650     }
651     PEMerr(PEM_F_PEM_WRITE_BIO, reason);
652     return(0);
653 }
654
655 #ifndef OPENSSL_NO_FP_API

```

```

656 int PEM_read(FILE *fp, char **name, char **header, unsigned char **data,
657               long *len)
658 {
659     BIO *b;
660     int ret;

662     if ((b=BIO_new(BIO_s_file())) == NULL)
663     {
664         PEMerr(PEM_F_PEM_READ,ERR_R_BUF_LIB);
665         return(0);
666     }
667     BIO_set_fp(b,fp,BIO_NOCLOSE);
668     ret=PEM_read_bio(b, name, header, data,len);
669     BIO_free(b);
670     return(ret);
671 }
672 #endif

674 int PEM_read_bio(BIO *bp, char **name, char **header, unsigned char **data,
675                  long *len)
676 {
677     EVP_ENCODE_CTX ctx;
678     int end=0,i,k,bl=0,h1=0,nohead=0;
679     char buf[256];
680     BUF_MEM *nameB;
681     BUF_MEM *headerB;
682     BUF_MEM *dataB,*tmpB;
683
684     nameB=BUF_MEM_new();
685     headerB=BUF_MEM_new();
686     dataB=BUF_MEM_new();
687     if ((nameB == NULL) || (headerB == NULL) || (dataB == NULL))
688     {
689         BUF_MEM_free(nameB);
690         BUF_MEM_free(headerB);
691         BUF_MEM_free(dataB);
692         PEMerr(PEM_F_PEM_READ_BIO,ERR_R_MALLOC_FAILURE);
693         return(0);
694     }

696     buf[254]='\0';
697     for (;;)
698     {
699         i=BIO_gets(bp,buf,254);

701         if (i <= 0)
702         {
703             PEMerr(PEM_F_PEM_READ_BIO,PEM_R_NO_START_LINE);
704             goto err;
705         }

707         while ((i >= 0) && (buf[i] <= ' ')) i--;
708         buf[++i]='\n'; buf[++i]='\0';

710         if (strcmp(buf,"-----BEGIN ",11) == 0)
711         {
712             i=strlen(&(buf[11]));

714             if (strcmp(&(buf[11+i-6]),"-----\n",6) != 0)
715                 continue;
716             if (!BUF_MEM_grow(nameB,i+9))
717             {
718                 PEMerr(PEM_F_PEM_READ_BIO,ERR_R_MALLOC_FAILURE);
719                 goto err;
720             }
721             memcpy(nameB->data,&(buf[11]),i-6);

```

```

722         nameB->data[i-6]='\0';
723         break;
724     }
725 }
726 h1=0;
727 if (!BUF_MEM_grow(headerB,256))
728 { PEMerr(PEM_F_PEM_READ_BIO,ERR_R_MALLOC_FAILURE); goto err; }
729 headerB->data[0]='\0';
730 for (;;)
731 {
732     i=BIO_gets(bp,buf,254);
733     if (i <= 0) break;

735     while ((i >= 0) && (buf[i] <= ' ')) i--;
736     buf[++i]='\n'; buf[++i]='\0';

738     if (buf[0] == '\n') break;
739     if (!BUF_MEM_grow(headerB,h1+i+9))
740     { PEMerr(PEM_F_PEM_READ_BIO,ERR_R_MALLOC_FAILURE); goto err; }
741     if (strcmp(buf,"-----END ",9) == 0)
742     {
743         nohead=1;
744         break;
745     }
746     memcpy(&(headerB->data[h1]),buf,i);
747     headerB->data[h1+i]='\0';
748     h1+=i;
749 }

751 bl=0;
752 if (!BUF_MEM_grow(dataB,1024))
753 { PEMerr(PEM_F_PEM_READ_BIO,ERR_R_MALLOC_FAILURE); goto err; }
754 dataB->data[0]='\0';
755 if (!nohead)
756 {
757     for (;;)
758     {
759         i=BIO_gets(bp,buf,254);
760         if (i <= 0) break;

762         while ((i >= 0) && (buf[i] <= ' ')) i--;
763         buf[++i]='\n'; buf[++i]='\0';

765         if (i != 65) end=1;
766         if (strcmp(buf,"-----END ",9) == 0)
767             break;
768         if (i > 65) break;
769         if (!BUF_MEM_grow_clean(dataB,i+bl+9))
770         {
771             PEMerr(PEM_F_PEM_READ_BIO,ERR_R_MALLOC_FAILURE);
772             goto err;
773         }
774         memcpy(&(dataB->data[bl]),buf,i);
775         dataB->data[bl+i]='\0';
776         bl+=i;
777         if (end)
778         {
779             buf[0]='\0';
780             i=BIO_gets(bp,buf,254);
781             if (i <= 0) break;

783             while ((i >= 0) && (buf[i] <= ' ')) i--;
784             buf[++i]='\n'; buf[++i]='\0';

786             break;
787         }

```

```

788     }
789 }
790 else
791 {
792     tmpB=headerB;
793     headerB=dataB;
794     dataB=tmpB;
795     bl=hl;
796 }
797 i=strlen(nameB->data);
798 if ( (strncmp(buf,"-----END ",9) != 0) ||
799     (strncmp(nameB->data,&(buf[9]),i) != 0) ||
800     (strncmp(&(buf[9+i]),"-----\n",6) != 0))
801 {
802     PEMerr(PEM_F_PEM_READ_BIO, PEM_R_BAD_END_LINE);
803     goto err;
804 }
806 EVP_DecodeInit(&ctx);
807 i=EVP_DecodeUpdate(&ctx,
808     (unsigned char *)dataB->data,&bl,
809     (unsigned char *)dataB->data,bl);
810 if (i < 0)
811 {
812     PEMerr(PEM_F_PEM_READ_BIO, PEM_R_BAD_BASE64_DECODE);
813     goto err;
814 }
815 i=EVP_DecodeFinal(&ctx, (unsigned char *)&(dataB->data[bl]),&k);
816 if (i < 0)
817 {
818     PEMerr(PEM_F_PEM_READ_BIO, PEM_R_BAD_BASE64_DECODE);
819     goto err;
820 }
821 bl+=k;
823 if (bl == 0) goto err;
824 *name=nameB->data;
825 *header=headerB->data;
826 *data=(unsigned char *)dataB->data;
827 *len=bl;
828 OPENSSL_free(nameB);
829 OPENSSL_free(headerB);
830 OPENSSL_free(dataB);
831 return(1);
832 err:
833 BUF_MEM_free(nameB);
834 BUF_MEM_free(headerB);
835 BUF_MEM_free(dataB);
836 return(0);
837 }
839 /* Check pem string and return prefix length.
840 * If for example the pem_str == "RSA PRIVATE KEY" and suffix = "PRIVATE KEY"
841 * the return value is 3 for the string "RSA".
842 */
844 int pem_check_suffix(const char *pem_str, const char *suffix)
845 {
846     int pem_len = strlen(pem_str);
847     int suffix_len = strlen(suffix);
848     const char *p;
849     if (suffix_len + 1 >= pem_len)
850         return 0;
851     p = pem_str + pem_len - suffix_len;
852     if (strcmp(p, suffix))
853         return 0;

```

```

854     p--;
855     if (*p != ' ')
856         return 0;
857     return p - pem_str;
858 }

```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_oth.c

1

3858 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_oth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/pem/pem_oth.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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19 * as the author of the parts of the library used.
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_oth.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/rand.h>
65 #include <openssl/x509.h>
66 #include <openssl/pem.h>
67
68 /* Handle 'other' PEMs: not private keys */
69
70 void *PEM_ASN1_read_bio(d2i_of_void *d2i, const char *name, BIO *bp, void **x,
71                        pem_password_cb *cb, void *u)
72 {
73     const unsigned char *p=NULL;
74     unsigned char *data=NULL;
75     long len;
76     char *ret=NULL;
77
78     if (!PEM_bytes_read_bio(&data, &len, NULL, name, bp, cb, u))
79         return NULL;
80     p = data;
81     ret=d2i(x,&p,len);
82     if (ret == NULL)
83         PEMerr(PEM_F_PEM_ASN1_READ_BIO,ERR_R_ASN1_LIB);
84     OPENSSL_free(data);
85     return(ret);
86 }
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_pk8.c

1

8344 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_pk8.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/pem/pem_pkey.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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28 * 2. Redistributions in binary form must reproduce the above copyright
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31 * 3. All advertising materials mentioning features or use of this software
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34 * Eric Young (eay@cryptsoft.com)"
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40 *
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_pk8.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/rand.h>
65 #include <openssl/x509.h>
66 #include <openssl/pkcs12.h>
67 #include <openssl/pem.h>
68
69 static int do_pk8pkey(BIO *bp, EVP_PKEY *x, int isder,
70                      int nid, const EVP_CIPHER *enc,
71                      char *kstr, int klen,
72                      pem_password_cb *cb, void *u);
73 static int do_pk8pkey_fp(FILE *bp, EVP_PKEY *x, int isder,
74                          int nid, const EVP_CIPHER *enc,
75                          char *kstr, int klen,
76                          pem_password_cb *cb, void *u);
77
78 /* These functions write a private key in PKCS#8 format: it is a "drop in"
79  * replacement for PEM_write_bio_PrivateKey() and friends. As usual if 'enc'
80  * is NULL then it uses the unencrypted private key form. The 'nid' versions
81  * uses PKCS#5 v1.5 PBE algorithms whereas the others use PKCS#5 v2.0.
82  */
83
84 int PEM_write_bio_PKCS8PrivateKey_nid(BIO *bp, EVP_PKEY *x, int nid,
85                                         char *kstr, int klen,
86                                         pem_password_cb *cb, void *u)
87 {
88     return do_pk8pkey(bp, x, 0, nid, NULL, kstr, klen, cb, u);
89 }
90
91 int PEM_write_bio_PKCS8PrivateKey(BIO *bp, EVP_PKEY *x, const EVP_CIPHER *enc,
92                                     char *kstr, int klen,
93                                     pem_password_cb *cb, void *u)
94 {
95     return do_pk8pkey(bp, x, 0, -1, enc, kstr, klen, cb, u);
96 }
97
98 int i2d_PKCS8PrivateKey_bio(BIO *bp, EVP_PKEY *x, const EVP_CIPHER *enc,
99                             char *kstr, int klen,
100                             pem_password_cb *cb, void *u)
101 {
102     return do_pk8pkey(bp, x, 1, -1, enc, kstr, klen, cb, u);
103 }
104
105 int i2d_PKCS8PrivateKey_nid_bio(BIO *bp, EVP_PKEY *x, int nid,
106                                  char *kstr, int klen,
107                                  pem_password_cb *cb, void *u)
108 {
109     return do_pk8pkey(bp, x, 1, nid, NULL, kstr, klen, cb, u);
110 }
111
112 static int do_pk8pkey(BIO *bp, EVP_PKEY *x, int isder, int nid, const EVP_CIPHER
113                      char *kstr, int klen,
114                      pem_password_cb *cb, void *u)
115 {
116     X509_SIG *p8;
117     PKCS8_PRIV_KEY_INFO *p8inf;
118     char buf[PEM_BUFSIZE];
119     int ret;
120     if(!p8inf = EVP_PKEY2PKCS8(x)) {
121         PEMerr(PEM_F_DO_PK8PKEY,
122               PEM_R_ERROR_CONVERTING_PRIVATE_KEY);
123         return 0;
124     }
125     if(enc || (nid != -1)) {
126         if(!kstr) {
127             if(!cb) klen = PEM_def_callback(buf, PEM_BUFSIZE, 1, u);
```



```

128         else klen = cb(buf, PEM_BUFSIZE, 1, u);
129         if(klen <= 0) {
130             PEMerr(PEM_F_DO_PK8PKEY, PEM_R_READ_KEY);
131             PKCS8_PRIV_KEY_INFO_free(p8inf);
132             return 0;
133         }
134         kstr = buf;
135     }
136     p8 = PKCS8_encrypt(nid, enc, kstr, klen, NULL, 0, 0, p8inf);
137     if(kstr == buf) OPENSSL_cleanse(buf, klen);
138     PKCS8_PRIV_KEY_INFO_free(p8inf);
139     if(isder) ret = i2d_PKCS8_bio(bp, p8);
140     else ret = PEM_write_bio_PKCS8(bp, p8);
141     X509_SIG_free(p8);
142     return ret;
143 } else {
144     if(isder) ret = i2d_PKCS8_PRIV_KEY_INFO_bio(bp, p8inf);
145     else ret = PEM_write_bio_PKCS8_PRIV_KEY_INFO(bp, p8inf);
146     PKCS8_PRIV_KEY_INFO_free(p8inf);
147     return ret;
148 }
149 }
150 }

152 EVP_PKEY *d2i_PKCS8PrivateKey_bio(BIO *bp, EVP_PKEY **x, pem_password_cb *cb, vo
153 {
154     PKCS8_PRIV_KEY_INFO *p8inf = NULL;
155     X509_SIG *p8 = NULL;
156     int klen;
157     EVP_PKEY *ret;
158     char p8buf[PEM_BUFSIZE];
159     p8 = d2i_PKCS8_bio(bp, NULL);
160     if(!p8) return NULL;
161     if(cb) klen=cb(p8buf, PEM_BUFSIZE, 0, u);
162     else klen=PEM_def_callback(p8buf, PEM_BUFSIZE, 0, u);
163     if(klen <= 0) {
164         PEMerr(PEM_F_D2I_PKCS8PRIVATEKEY_BIO, PEM_R_BAD_PASSWORD_READ);
165         X509_SIG_free(p8);
166         return NULL;
167     }
168     p8inf = PKCS8_decrypt(p8, p8buf, klen);
169     X509_SIG_free(p8);
170     if(!p8inf) return NULL;
171     ret = EVP_PKCS82PKEY(p8inf);
172     PKCS8_PRIV_KEY_INFO_free(p8inf);
173     if(!ret) return NULL;
174     if(x) {
175         if(*x) EVP_PKEY_free(*x);
176         *x = ret;
177     }
178     return ret;
179 }

181 #ifndef OPENSSL_NO_FP_API

183 int i2d_PKCS8PrivateKey_fp(FILE *fp, EVP_PKEY *x, const EVP_CIPHER *enc,
184 char *kstr, int klen,
185 pem_password_cb *cb, void *u)
186 {
187     return do_pk8pkey_fp(fp, x, 1, -1, enc, kstr, klen, cb, u);
188 }

190 int i2d_PKCS8PrivateKey_nid_fp(FILE *fp, EVP_PKEY *x, int nid,
191 char *kstr, int klen,
192 pem_password_cb *cb, void *u)
193 {

```

```

194     return do_pk8pkey_fp(fp, x, 1, nid, NULL, kstr, klen, cb, u);
195 }

197 int PEM_write_PKCS8PrivateKey_nid(FILE *fp, EVP_PKEY *x, int nid,
198 char *kstr, int klen,
199 pem_password_cb *cb, void *u)
200 {
201     return do_pk8pkey_fp(fp, x, 0, nid, NULL, kstr, klen, cb, u);
202 }

204 int PEM_write_PKCS8PrivateKey(FILE *fp, EVP_PKEY *x, const EVP_CIPHER *enc,
205 char *kstr, int klen, pem_password_cb *cb, void *u)
206 {
207     return do_pk8pkey_fp(fp, x, 0, -1, enc, kstr, klen, cb, u);
208 }

210 static int do_pk8pkey_fp(FILE *fp, EVP_PKEY *x, int isder, int nid, const EVP_CI
211 char *kstr, int klen,
212 pem_password_cb *cb, void *u)
213 {
214     BIO *bp;
215     int ret;
216     if(!(bp = BIO_new_fp(fp, BIO_NOCLOSE))) {
217         PEMerr(PEM_F_DO_PK8PKEY_FP, ERR_R_BUF_LIB);
218         return(0);
219     }
220     ret = do_pk8pkey(bp, x, isder, nid, enc, kstr, klen, cb, u);
221     BIO_free(bp);
222     return ret;
223 }

225 EVP_PKEY *d2i_PKCS8PrivateKey_fp(FILE *fp, EVP_PKEY **x, pem_password_cb *cb, vo
226 {
227     BIO *bp;
228     EVP_PKEY *ret;
229     if(!(bp = BIO_new_fp(fp, BIO_NOCLOSE))) {
230         PEMerr(PEM_F_D2I_PKCS8PRIVATEKEY_FP, ERR_R_BUF_LIB);
231         return NULL;
232     }
233     ret = d2i_PKCS8PrivateKey_bio(bp, x, cb, u);
234     BIO_free(bp);
235     return ret;
236 }

238 #endif

240 IMPLEMENT_PEM_rw(PKCS8, X509_SIG, PEM_STRING_PKCS8, X509_SIG)
241 IMPLEMENT_PEM_rw(PKCS8_PRIV_KEY_INFO, PKCS8_PRIV_KEY_INFO, PEM_STRING_PKCS8INF,
242 PKCS8_PRIV_KEY_INFO)

```

7827 Fri May 30 18:31:59 2014
 new/usr/src/lib/openssl/libsunw_crypto/pem/pem_pkey.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1 /* crypto/pem/pem_pkey.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/buffer.h>

```

```

62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/rand.h>
65 #include <openssl/x509.h>
66 #include <openssl/pkcs12.h>
67 #include <openssl/pem.h>
68 #ifndef OPENSSL_NO_ENGINE
69 #include <openssl/engine.h>
70 #endif
71 #include "asn1_locl.h"

73 int pem_check_suffix(const char *pem_str, const char *suffix);

75 EVP_PKEY *PEM_read_bio_PrivateKey(BIO *bp, EVP_PKEY **x, pem_password_cb *cb, vo
76 {
77     char *nm=NULL;
78     const unsigned char *p=NULL;
79     unsigned char *data=NULL;
80     long len;
81     int slen;
82     EVP_PKEY *ret=NULL;

84     if (!PEM_bytes_read_bio(&data, &len, &nm, PEM_STRING_EVP_PKEY, bp, cb, u
85         return NULL;
86     p = data;

88     if (strcmp(nm, PEM_STRING_PKCS8INF) == 0) {
89         PKCS8_PRIV_KEY_INFO *p8inf;
90         p8inf=d2i_PKCS8_PRIV_KEY_INFO(NULL, &p, len);
91         if(!p8inf) goto p8err;
92         ret = EVP_PKCS82PKEY(p8inf);
93         if(x) {
94             if(*x) EVP_PKEY_free((EVP_PKEY *)*x);
95             *x = ret;
96         }
97         PKCS8_PRIV_KEY_INFO_free(p8inf);
98     } else if (strcmp(nm, PEM_STRING_PKCS8) == 0) {
99         PKCS8_PRIV_KEY_INFO *p8inf;
100         X509_SIG *p8;
101         int klen;
102         char p8buf[PEM_BUFSIZE];
103         p8 = d2i_X509_SIG(NULL, &p, len);
104         if(!p8) goto p8err;
105         if (cb) klen=cb(p8buf, PEM_BUFSIZE, 0, u);
106         else klen=PEM_def_callback(p8buf, PEM_BUFSIZE, 0, u);
107         if (klen <= 0) {
108             PEMerr(PEM_F_PEM_READ_BIO_PRIVATEKEY,
109                 PEM_R_BAD_PASSWORD_READ);
110             X509_SIG_free(p8);
111             goto err;
112         }
113         p8inf = PKCS8_decrypt(p8, p8buf, klen);
114         X509_SIG_free(p8);
115         if(!p8inf) goto p8err;
116         ret = EVP_PKCS82PKEY(p8inf);
117         if(x) {
118             if(*x) EVP_PKEY_free((EVP_PKEY *)*x);
119             *x = ret;
120         }
121         PKCS8_PRIV_KEY_INFO_free(p8inf);
122     } else if ((slen = pem_check_suffix(nm, "PRIVATE KEY")) > 0)
123     {
124         const EVP_PKEY_ASN1_METHOD *ameth;
125         ameth = EVP_PKEY_asn1_find_str(NULL, nm, slen);
126         if (!ameth || !ameth->old_priv_decode)
127             goto p8err;

```

```

128         ret=d2i_PrivateKey(ameth->pkey_id,x,&p, len);
129     }
130 p8err:
131     if (ret == NULL)
132         PEMerr(PEM_F_PEM_READ_BIO_PRIVATEKEY,ERR_R_ASN1_LIB);
133 err:
134     OPENSSL_free(nm);
135     OPENSSL_cleanse(data, len);
136     OPENSSL_free(data);
137     return(ret);
138 }
139
140 int PEM_write_bio_PrivateKey(BIO *bp, EVP_PKEY *x, const EVP_CIPHER *enc,
141                             unsigned char *kstr, int klen,
142                             pem_password_cb *cb, void *u)
143 {
144     char pem_str[80];
145     if (!x->ameth || x->ameth->priv_encode)
146         return PEM_write_bio_PKCS8PrivateKey(bp, x, enc,
147                                             (char *)kstr, klen,
148                                             cb, u);
149
150     BIO_snprintf(pem_str, 80, "%s PRIVATE KEY", x->ameth->pem_str);
151     return PEM_ASN1_write_bio((i2d_of_void *)i2d_PrivateKey,
152                             pem_str, bp, x, enc, kstr, klen, cb, u);
153 }
154
155 EVP_PKEY *PEM_read_bio_Parameters(BIO *bp, EVP_PKEY **x)
156 {
157     char *nm=NULL;
158     const unsigned char *p=NULL;
159     unsigned char *data=NULL;
160     long len;
161     int slen;
162     EVP_PKEY *ret=NULL;
163
164     if (!PEM_bytes_read_bio(&data, &len, &nm, PEM_STRING_PARAMETERS,
165                             bp, 0, NULL))
166         return NULL;
167     p = data;
168
169     if ((slen = pem_check_suffix(nm, "PARAMETERS")) > 0)
170     {
171         ret = EVP_PKEY_new();
172         if (!ret)
173             goto err;
174         if (!EVP_PKEY_set_type_str(ret, nm, slen)
175             || !ret->ameth->param_decode
176             || !ret->ameth->param_decode(ret, &p, len))
177         {
178             EVP_PKEY_free(ret);
179             ret = NULL;
180             goto err;
181         }
182         if(x)
183         {
184             if(*x) EVP_PKEY_free((EVP_PKEY *)*x);
185             *x = ret;
186         }
187     }
188 err:
189     if (ret == NULL)
190         PEMerr(PEM_F_PEM_READ_BIO_PARAMETERS,ERR_R_ASN1_LIB);
191     OPENSSL_free(nm);
192     OPENSSL_free(data);
193     return(ret);

```

```

194     }
195
196 int PEM_write_bio_Parameters(BIO *bp, EVP_PKEY *x)
197 {
198     char pem_str[80];
199     if (!x->ameth || !x->ameth->param_encode)
200         return 0;
201
202     BIO_snprintf(pem_str, 80, "%s PARAMETERS", x->ameth->pem_str);
203     return PEM_ASN1_write_bio(
204         (i2d_of_void *)x->ameth->param_encode,
205         pem_str, bp, x, NULL, NULL, 0, 0, NULL);
206 }
207
208 #ifndef OPENSSL_NO_FP_API
209 EVP_PKEY *PEM_read_PrivateKey(FILE *fp, EVP_PKEY **x, pem_password_cb *cb, void
210 {
211     BIO *b;
212     EVP_PKEY *ret;
213
214     if ((b=BIO_new(BIO_s_file())) == NULL)
215     {
216         PEMerr(PEM_F_PEM_READ_PRIVATEKEY,ERR_R_BUF_LIB);
217         return(0);
218     }
219     BIO_set_fp(b, fp, BIO_NOCLOSE);
220     ret=PEM_read_bio_PrivateKey(b, x, cb, u);
221     BIO_free(b);
222     return(ret);
223 }
224
225 int PEM_write_PrivateKey(FILE *fp, EVP_PKEY *x, const EVP_CIPHER *enc,
226                          unsigned char *kstr, int klen,
227                          pem_password_cb *cb, void *u)
228 {
229     BIO *b;
230     int ret;
231
232     if ((b=BIO_new_fp(fp, BIO_NOCLOSE)) == NULL)
233     {
234         PEMerr(PEM_F_PEM_WRITE_PRIVATEKEY,ERR_R_BUF_LIB);
235         return 0;
236     }
237     ret=PEM_write_bio_PrivateKey(b, x, enc, kstr, klen, cb, u);
238     BIO_free(b);
239     return ret;
240 }
241
242 #endif

```

```
*****
```

```
5966 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_seal.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/pem/pem_seal.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <openssl/opensslconf.h> /* for OPENSSL_NO_RSA */
60 #ifndef OPENSSL_NO_RSA
61 #include <stdio.h>
```

```
62 #include "cryptlib.h"
63 #include <openssl/evp.h>
64 #include <openssl/rand.h>
65 #include <openssl/objects.h>
66 #include <openssl/x509.h>
67 #include <openssl/pem.h>
68 #include <openssl/rsa.h>
69
70 int PEM_SealInit(PEM_ENCODE_SEAL_CTX *ctx, EVP_CIPHER *type, EVP_MD *md_type,
71                 unsigned char **ek, int *ekl, unsigned char *iv, EVP_PKEY **pubk,
72                 int npubk)
73 {
74     unsigned char key[EVP_MAX_KEY_LENGTH];
75     int ret= -1;
76     int i,j,max=0;
77     char *s=NULL;
78
79     for (i=0; i<npubk; i++)
80     {
81         if (pubk[i]->type != EVP_PKEY_RSA)
82         {
83             PEMerr(PEM_F_PEM_SEALINIT, PEM_R_PUBLIC_KEY_NO_RSA);
84             goto err;
85         }
86         j=RSA_size(pubk[i]->pkey.rsa);
87         if (j > max) max=j;
88     }
89     s=(char *)OPENSSL_malloc(max*2);
90     if (s == NULL)
91     {
92         PEMerr(PEM_F_PEM_SEALINIT, ERR_R_MALLOC_FAILURE);
93         goto err;
94     }
95
96     EVP_EncodeInit(&ctx->encode);
97
98     EVP_MD_CTX_init(&ctx->md);
99     if (!EVP_SignInit(&ctx->md,md_type))
100         goto err;
101
102     EVP_CIPHER_CTX_init(&ctx->cipher);
103     ret=EVP_SealInit(&ctx->cipher,type,ek,ekl,iv,pubk,npubk);
104     if (ret <= 0) goto err;
105
106     /* base64 encode the keys */
107     for (i=0; i<npubk; i++)
108     {
109         j=EVP_EncodeBlock((unsigned char *)s,ek[i],
110                          RSA_size(pubk[i]->pkey.rsa));
111         ekl[i]=j;
112         memcpy(ek[i],s,j+1);
113     }
114
115     ret=npubk;
116 err:
117     if (s != NULL) OPENSSL_free(s);
118     OPENSSL_cleanse(key,EVP_MAX_KEY_LENGTH);
119     return(ret);
120 }
121
122 void PEM_SealUpdate(PEM_ENCODE_SEAL_CTX *ctx, unsigned char *out, int *outl,
123                   unsigned char *in, int inl)
124 {
125     unsigned char buffer[1600];
126     int i,j;
```

```
128     *outl=0;
129     EVP_SignUpdate(&ctx->md,in,inl);
130     for (;;)
131     {
132         if (inl <= 0) break;
133         if (inl > 1200)
134             i=1200;
135         else
136             i=inl;
137         EVP_EncryptUpdate(&ctx->cipher,buffer,&j,in,i);
138         EVP_EncodeUpdate(&ctx->encode,out,&j,buffer,j);
139         *outl+=j;
140         out+=j;
141         in+=i;
142         inl-=i;
143     }
144 }

146 int PEM_SealFinal(PEM_ENCODE_SEAL_CTX *ctx, unsigned char *sig, int *sigl,
147                  unsigned char *out, int *outl, EVP_PKEY *priv)
148 {
149     unsigned char *s=NULL;
150     int ret=0,j;
151     unsigned int i;

153     if (priv->type != EVP_PKEY_RSA)
154     {
155         PEMerr(PEM_F_PEM_SEALFINAL,PEM_R_PUBLIC_KEY_NO_RSA);
156         goto err;
157     }
158     i=RSA_size(priv->pkey.rsa);
159     if (i < 100) i=100;
160     s=(unsigned char *)OPENSSL_malloc(i*2);
161     if (s == NULL)
162     {
163         PEMerr(PEM_F_PEM_SEALFINAL,ERR_R_MALLOC_FAILURE);
164         goto err;
165     }

167     if (!EVP_EncryptFinal_ex(&ctx->cipher,s,(int *)&i))
168         goto err;
169     EVP_EncodeUpdate(&ctx->encode,out,&j,s,i);
170     *outl=j;
171     out+=j;
172     EVP_EncodeFinal(&ctx->encode,out,&j);
173     *outl+=j;

175     if (!EVP_SignFinal(&ctx->md,s,&i,priv)) goto err;
176     *sigl=EVP_EncodeBlock(sig,s,i);

178     ret=1;
179 err:
180     EVP_MD_CTX_cleanup(&ctx->md);
181     EVP_CIPHER_CTX_cleanup(&ctx->cipher);
182     if (s != NULL) OPENSSL_free(s);
183     return(ret);
184 }
185 #else /* !OPENSSL_NO_RSA */

187 # if PEDANTIC
188 static void *dummy=&dummy;
189 # endif

191 #endif
```

```

*****
4111 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_sign.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/pem/pem_sign.c */
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4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/rand.h>

```

```

62 #include <openssl/evp.h>
63 #include <openssl/objects.h>
64 #include <openssl/x509.h>
65 #include <openssl/pem.h>
66
67 void PEM_SignInit(EVP_MD_CTX *ctx, EVP_MD *type)
68 {
69     EVP_DigestInit_ex(ctx, type, NULL);
70 }
71
72 void PEM_SignUpdate(EVP_MD_CTX *ctx, unsigned char *data,
73                    unsigned int count)
74 {
75     EVP_DigestUpdate(ctx, data, count);
76 }
77
78 int PEM_SignFinal(EVP_MD_CTX *ctx, unsigned char *sigret, unsigned int *siglen,
79                  EVP_PKEY *pkey)
80 {
81     unsigned char *m;
82     int i, ret=0;
83     unsigned int m_len;
84
85     m=(unsigned char *)OPENSSL_malloc(EVP_PKEY_size(pkey)+2);
86     if (m == NULL)
87     {
88         PEMerr(PEM_F_PEM_SIGNFINAL, ERR_R_MALLOC_FAILURE);
89         goto err;
90     }
91
92     if (EVP_SignFinal(ctx, m, &m_len, pkey) <= 0) goto err;
93
94     i=EVP_EncodeBlock(sigret, m, m_len);
95     *siglen=i;
96     ret=1;
97 err:
98     /* ctx has been zeroed by EVP_SignFinal() */
99     if (m != NULL) OPENSSL_free(m);
100     return(ret);
101 }

```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_x509.c

1

```
*****
2958 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_x509.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pem_x509.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
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53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_x509.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/x509.h>
64 #include <openssl/pkcs7.h>
65 #include <openssl/pem.h>

67 IMPLEMENT_PEM_rw(X509, X509, PEM_STRING_X509, X509)
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_xaux.c

1

```
*****
3060 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pem_xaux.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pem_xaux.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
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54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pem_xaux.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/x509.h>
64 #include <openssl/pkcs7.h>
65 #include <openssl/pem.h>
67 IMPLEMENT_PEM_rw(X509_AUX, PEM_STRING_X509_TRUSTED, X509_AUX)
68 IMPLEMENT_PEM_rw(X509_CERT_PAIR, X509_CERT_PAIR, PEM_STRING_X509_PAIR, X509_CERT)
```


new/usr/src/lib/openssl/libsunw_crypto/pem/pvkfmt.c

1

```
*****
21644 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pem/pvkfmt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
2  * project 2005.
3  */
4 /* =====
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51  *
52  * This product includes cryptographic software written by Eric Young
53  * (eay@cryptsoft.com). This product includes software written by Tim
54  * Hudson (tjh@cryptsoft.com).
55  *
56  */
58 /* Support for PVK format keys and related structures (such a PUBLICKEYBLOB
59  * and PRIVATEKEYBLOB).
60  */
```

new/usr/src/lib/openssl/libsunw_crypto/pem/pvkfmt.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/pem.h>
64 #include <openssl/rand.h>
65 #include <openssl/bn.h>
66 #if !defined(OPENSSL_NO_RSA) && !defined(OPENSSL_NO_DSA)
67 #include <openssl/dsa.h>
68 #include <openssl/rsa.h>
69
70 /* Utility function: read a DWORD (4 byte unsigned integer) in little endian
71  * format
72  */
73
74 static unsigned int read_ledword(const unsigned char **in)
75 {
76     const unsigned char *p = *in;
77     unsigned int ret;
78     ret = *p++;
79     ret |= (*p++ << 8);
80     ret |= (*p++ << 16);
81     ret |= (*p++ << 24);
82     *in = p;
83     return ret;
84 }
85
86 /* Read a BIGNUM in little endian format. The docs say that this should take up
87  * bitlen/8 bytes.
88  */
89
90 static int read_lebn(const unsigned char **in, unsigned int nbyte, BIGNUM **r)
91 {
92     const unsigned char *p;
93     unsigned char *tmpbuf, *q;
94     unsigned int i;
95     p = *in + nbyte - 1;
96     tmpbuf = OPENSSL_malloc(nbyte);
97     if (!tmpbuf)
98         return 0;
99     q = tmpbuf;
100     for (i = 0; i < nbyte; i++)
101         *q++ = *p--;
102     *r = BN_bin2bn(tmpbuf, nbyte, NULL);
103     OPENSSL_free(tmpbuf);
104     if (*r)
105     {
106         *in += nbyte;
107         return 1;
108     }
109     else
110         return 0;
111 }
112
113
114 /* Convert private key blob to EVP_PKEY: RSA and DSA keys supported */
115
116 #define MS_PUBLICKEYBLOB 0x6
117 #define MS_PRIVATEKEYBLOB 0x7
118 #define MS_RSA1MAGIC 0x31415352L
119 #define MS_RSA2MAGIC 0x32415352L
120 #define MS_DSS1MAGIC 0x31535344L
121 #define MS_DSS2MAGIC 0x32535344L
122
123 #define MS_KEYALG_RSA_KEYX 0xa400
124 #define MS_KEYALG_DSS_SIGN 0x2200
125
126 #define MS_KEYTYPE_KEYX 0x1
127 #define MS_KEYTYPE_SIGN 0x2
```

```

129 /* The PVK file magic number: seems to spell out "hobsfile", who is Bob? */
130 #define MS_PVKMAGIC 0xb0b5f11eL
131 /* Salt length for PVK files */
132 #define PVK_SALTLEN 0x10
133
134 static EVP_PKEY *b2i_rsa(const unsigned char **in, unsigned int length,
135                          unsigned int bitlen, int ispub);
136 static EVP_PKEY *b2i_dss(const unsigned char **in, unsigned int length,
137                          unsigned int bitlen, int ispub);
138
139 static int do_blob_header(const unsigned char **in, unsigned int length,
140                          unsigned int *pmagic, unsigned int *pbitlen,
141                          int *pisdss, int *pispub)
142 {
143     const unsigned char *p = *in;
144     if (length < 16)
145         return 0;
146     /* bType */
147     if (*p == MS_PUBLICKEYBLOB)
148     {
149         if (*pispub == 0)
150         {
151             PEMerr(PEM_F_DO_BLOB_HEADER,
152                   PEM_R_EXPECTING_PRIVATE_KEY_BLOB);
153             return 0;
154         }
155         *pispub = 1;
156     }
157     else if (*p == MS_PRIVATEKEYBLOB)
158     {
159         if (*pispub == 1)
160         {
161             PEMerr(PEM_F_DO_BLOB_HEADER,
162                   PEM_R_EXPECTING_PUBLIC_KEY_BLOB);
163             return 0;
164         }
165         *pispub = 0;
166     }
167     else
168         return 0;
169     p++;
170     /* Version */
171     if (*p++ != 0x2)
172     {
173         PEMerr(PEM_F_DO_BLOB_HEADER, PEM_R_BAD_VERSION_NUMBER);
174         return 0;
175     }
176     /* Ignore reserved, aiKeyAlg */
177     p+= 6;
178     *pmagic = read_ledword(&p);
179     *pbitlen = read_ledword(&p);
180     *pisdss = 0;
181     switch (*pmagic)
182     {
183
184         case MS_DSS1MAGIC:
185             *pisdss = 1;
186         case MS_RSA1MAGIC:
187             if (*pispub == 0)
188             {
189                 PEMerr(PEM_F_DO_BLOB_HEADER,
190                       PEM_R_EXPECTING_PRIVATE_KEY_BLOB);
191                 return 0;
192             }
193             break;

```

```

195         case MS_DSS2MAGIC:
196             *pisdss = 1;
197         case MS_RSA2MAGIC:
198             if (*pispub == 1)
199             {
200                 PEMerr(PEM_F_DO_BLOB_HEADER,
201                       PEM_R_EXPECTING_PUBLIC_KEY_BLOB);
202                 return 0;
203             }
204             break;
205
206         default:
207             PEMerr(PEM_F_DO_BLOB_HEADER, PEM_R_BAD_MAGIC_NUMBER);
208             return -1;
209     }
210     *in = p;
211     return 1;
212 }
213
214 static unsigned int blob_length(unsigned bitlen, int isdss, int ispub)
215 {
216     unsigned int nbyte, hnbyte;
217     nbyte = (bitlen + 7) >> 3;
218     hnbyte = (bitlen + 15) >> 4;
219     if (isdss)
220     {
221
222         /* Expected length: 20 for q + 3 components bitlen each + 24
223          * for seed structure.
224          */
225         if (ispub)
226             return 44 + 3 * nbyte;
227         /* Expected length: 20 for q, priv, 2 bitlen components + 24
228          * for seed structure.
229          */
230         else
231             return 64 + 2 * nbyte;
232     }
233     else
234     {
235         /* Expected length: 4 for 'e' + 'n' */
236         if (ispub)
237             return 4 + nbyte;
238         else
239             /* Expected length: 4 for 'e' and 7 other components.
240              * 2 components are bitlen size, 5 are bitlen/2
241              */
242             return 4 + 2*nbyte + 5*hnbyte;
243     }
244 }
245
246 static EVP_PKEY *do_b2i(const unsigned char **in, unsigned int length,
247                        int ispub)
248 {
249     const unsigned char *p = *in;
250     unsigned int bitlen, magic;
251     int isdss;
252     if (do_blob_header(&p, length, &magic, &bitlen, &isdss, &ispub) <= 0)
253     {
254         PEMerr(PEM_F_DO_B2I, PEM_R_KEYBLOB_HEADER_PARSE_ERROR);
255         return NULL;
256     }
257     length -= 16;
258     if (length < blob_length(bitlen, isdss, ispub))
259

```

```

260     {
261         PEMerr(PEM_F_DO_B2I, PEM_R_KEYBLOB_TOO_SHORT);
262         return NULL;
263     }
264     if (isdss)
265         return b2i_dss(&p, length, bitlen, ispub);
266     else
267         return b2i_rsa(&p, length, bitlen, ispub);
268 }

270 static EVP_PKEY *do_b2i_bio(BIO *in, int ispub)
271 {
272     const unsigned char *p;
273     unsigned char hdr_buf[16], *buf = NULL;
274     unsigned int bitlen, magic, length;
275     int isdss;
276     EVP_PKEY *ret = NULL;
277     if (BIO_read(in, hdr_buf, 16) != 16)
278     {
279         PEMerr(PEM_F_DO_B2I_BIO, PEM_R_KEYBLOB_TOO_SHORT);
280         return NULL;
281     }
282     p = hdr_buf;
283     if (do_blob_header(&p, 16, &magic, &bitlen, &isdss, &ispub) <= 0)
284         return NULL;

286     length = blob_length(bitlen, isdss, ispub);
287     buf = OPENSSL_malloc(length);
288     if (!buf)
289     {
290         PEMerr(PEM_F_DO_B2I_BIO, ERR_R_MALLOC_FAILURE);
291         goto err;
292     }
293     p = buf;
294     if (BIO_read(in, buf, length) != (int)length)
295     {
296         PEMerr(PEM_F_DO_B2I_BIO, PEM_R_KEYBLOB_TOO_SHORT);
297         goto err;
298     }

300     if (isdss)
301         ret = b2i_dss(&p, length, bitlen, ispub);
302     else
303         ret = b2i_rsa(&p, length, bitlen, ispub);

305     err:
306     if (buf)
307         OPENSSL_free(buf);
308     return ret;
309 }

311 static EVP_PKEY *b2i_dss(const unsigned char **in, unsigned int length,
312                          unsigned int bitlen, int ispub)
313 {
314     const unsigned char *p = *in;
315     EVP_PKEY *ret = NULL;
316     DSA *dsa = NULL;
317     BN_CTX *ctx = NULL;
318     unsigned int nbyte;
319     nbyte = (bitlen + 7) >> 3;

321     dsa = DSA_new();
322     ret = EVP_PKEY_new();
323     if (!dsa || !ret)
324         goto memerr;
325     if (!read_lebn(&p, nbyte, &dsa->p))

```

```

326         goto memerr;
327     if (!read_lebn(&p, 20, &dsa->q))
328         goto memerr;
329     if (!read_lebn(&p, nbyte, &dsa->g))
330         goto memerr;
331     if (ispub)
332     {
333         if (!read_lebn(&p, nbyte, &dsa->pub_key))
334             goto memerr;
335     }
336     else
337     {
338         if (!read_lebn(&p, 20, &dsa->priv_key))
339             goto memerr;
340         /* Calculate public key */
341         if (!(dsa->pub_key = BN_new()))
342             goto memerr;
343         if (!(ctx = BN_CTX_new()))
344             goto memerr;
345         if (!BN_mod_exp(dsa->pub_key, dsa->g,
346                        dsa->priv_key, dsa->p, ctx))
347             goto memerr;
348         BN_CTX_free(ctx);
349     }
350     BN_CTX_free(ctx);
351 }

353 EVP_PKEY_set1_DSA(ret, dsa);
354 DSA_free(dsa);
355 *in = p;
356 return ret;

358 memerr:
359 PEMerr(PEM_F_B2I_DSS, ERR_R_MALLOC_FAILURE);
360 if (dsa)
361     DSA_free(dsa);
362 if (ret)
363     EVP_PKEY_free(ret);
364 if (ctx)
365     BN_CTX_free(ctx);
366 return NULL;
367 }

369 static EVP_PKEY *b2i_rsa(const unsigned char **in, unsigned int length,
370                          unsigned int bitlen, int ispub)
371 {
372     {
373         const unsigned char *p = *in;
374         EVP_PKEY *ret = NULL;
375         RSA *rsa = NULL;
376         unsigned int nbyte, hnbyte;
377         nbyte = (bitlen + 7) >> 3;
378         hnbyte = (bitlen + 15) >> 4;
379         rsa = RSA_new();
380         ret = EVP_PKEY_new();
381         if (!rsa || !ret)
382             goto memerr;
383         rsa->e = BN_new();
384         if (!rsa->e)
385             goto memerr;
386         if (!BN_set_word(rsa->e, read_ledword(&p)))
387             goto memerr;
388         if (!read_lebn(&p, nbyte, &rsa->n))
389             goto memerr;
390         if (!ispub)
391             {

```

```

392     if (!read_lebn(&p, hnbyte, &rsa->p))
393         goto memerr;
394     if (!read_lebn(&p, hnbyte, &rsa->q))
395         goto memerr;
396     if (!read_lebn(&p, hnbyte, &rsa->dmp1))
397         goto memerr;
398     if (!read_lebn(&p, hnbyte, &rsa->dmq1))
399         goto memerr;
400     if (!read_lebn(&p, hnbyte, &rsa->iqmp))
401         goto memerr;
402     if (!read_lebn(&p, nbyte, &rsa->d))
403         goto memerr;
404     }
405
406     EVP_PKEY_set1_RSA(ret, rsa);
407     RSA_free(rsa);
408     *in = p;
409     return ret;
410 memerr:
411     PEMerr(PEM_F_B2I_RSA, ERR_R_MALLOC_FAILURE);
412     if (rsa)
413         RSA_free(rsa);
414     if (ret)
415         EVP_PKEY_free(ret);
416     return NULL;
417 }
418
419 EVP_PKEY *b2i_PrivateKey(const unsigned char **in, long length)
420 {
421     return do_b2i(in, length, 0);
422 }
423
424 EVP_PKEY *b2i_PublicKey(const unsigned char **in, long length)
425 {
426     return do_b2i(in, length, 1);
427 }
428
429 EVP_PKEY *b2i_PrivateKey_bio(BIO *in)
430 {
431     return do_b2i_bio(in, 0);
432 }
433
434 EVP_PKEY *b2i_PublicKey_bio(BIO *in)
435 {
436     return do_b2i_bio(in, 1);
437 }
438
439 static void write_ledword(unsigned char **out, unsigned int dw)
440 {
441     unsigned char *p = *out;
442     *p++ = dw & 0xff;
443     *p++ = (dw>>8) & 0xff;
444     *p++ = (dw>>16) & 0xff;
445     *p++ = (dw>>24) & 0xff;
446     *out = p;
447 }
448
449 static void write_lebn(unsigned char **out, const BIGNUM *bn, int len)
450 {
451     int nb, i;
452     unsigned char *p = *out, *q, c;
453     nb = BN_num_bytes(bn);
454     BN_bn2bin(bn, p);
455     q = p + nb - 1;
456     /* In place byte order reversal */

```

```

458     for (i = 0; i < nb/2; i++)
459     {
460         c = *p;
461         *p++ = *q;
462         *q-- = c;
463     }
464     *out += nb;
465     /* Pad with zeroes if we have to */
466     if (len > 0)
467     {
468         len -= nb;
469         if (len > 0)
470         {
471             memset(*out, 0, len);
472             *out += len;
473         }
474     }
475 }
476
477 static int check_bitlen_rsa(RSA *rsa, int ispub, unsigned int *magic);
478 static int check_bitlen_dsa(DSA *dsa, int ispub, unsigned int *magic);
479
480 static void write_rsa(unsigned char **out, RSA *rsa, int ispub);
481 static void write_dsa(unsigned char **out, DSA *dsa, int ispub);
482
483 static int do_i2b(unsigned char **out, EVP_PKEY *pk, int ispub)
484 {
485     unsigned char *p;
486     unsigned int bitlen, magic = 0, keyalg;
487     int outlen, noinc = 0;
488     if (pk->type == EVP_PKEY_DSA)
489     {
490         bitlen = check_bitlen_dsa(pk->pkey.dsa, ispub, &magic);
491         keyalg = MS_KEYALG_DSS_SIGN;
492     }
493     else if (pk->type == EVP_PKEY_RSA)
494     {
495         bitlen = check_bitlen_rsa(pk->pkey.rsa, ispub, &magic);
496         keyalg = MS_KEYALG_RSA_KEYX;
497     }
498     else
499         return -1;
500     if (bitlen == 0)
501         return -1;
502     outlen = 16 + blob_length(bitlen,
503                                keyalg == MS_KEYALG_DSS_SIGN ? 1 : 0, ispub);
504     if (out == NULL)
505         return outlen;
506     if (*out)
507         p = *out;
508     else
509     {
510         p = OPENSSL_malloc(outlen);
511         if (!p)
512             return -1;
513         *out = p;
514         noinc = 1;
515     }
516     if (ispub)
517         *p++ = MS_PUBLICKEYBLOB;
518     else
519         *p++ = MS_PRIVATEKEYBLOB;
520     *p++ = 0x2;
521     *p++ = 0;
522     *p++ = 0;

```

```

524     write_ledword(&p, keyalg);
525     write_ledword(&p, magic);
526     write_ledword(&p, bitlen);
527     if (keyalg == MS_KEYALG_DSS_SIGN)
528         write_dsa(&p, pk->pkey.dsa, ispub);
529     else
530         write_rsa(&p, pk->pkey.rsa, ispub);
531     if (!noinc)
532         *out += outlen;
533     return outlen;
534 }

536 static int do_i2b_bio(BIO *out, EVP_PKEY *pk, int ispub)
537 {
538     unsigned char *tmp = NULL;
539     int outlen, wrlen;
540     outlen = do_i2b(&tmp, pk, ispub);
541     if (outlen < 0)
542         return -1;
543     wrlen = BIO_write(out, tmp, outlen);
544     OPENSSL_free(tmp);
545     if (wrlen == outlen)
546         return outlen;
547     return -1;
548 }

550 static int check_bitlen_dsa(DSA *dsa, int ispub, unsigned int *pmagic)
551 {
552     int bitlen;
553     bitlen = BN_num_bits(dsa->p);
554     if ((bitlen & 7) || (BN_num_bits(dsa->q) != 160)
555         || (BN_num_bits(dsa->g) > bitlen))
556         goto badkey;
557     if (ispub)
558     {
559         if (BN_num_bits(dsa->pub_key) > bitlen)
560             goto badkey;
561         *pmagic = MS_DSS1MAGIC;
562     }
563     else
564     {
565         if (BN_num_bits(dsa->priv_key) > 160)
566             goto badkey;
567         *pmagic = MS_DSS2MAGIC;
568     }
569     return bitlen;
570 badkey:
571     PEMerr(PEM_F_CHECK_BITLEN_DSA, PEM_R_UNSUPPORTED_KEY_COMPONENTS);
572     return 0;
573 }

576 static int check_bitlen_rsa(RSA *rsa, int ispub, unsigned int *pmagic)
577 {
578     int nbyte, hnbyte, bitlen;
579     if (BN_num_bits(rsa->e) > 32)
580         goto badkey;
581     bitlen = BN_num_bits(rsa->n);
582     nbyte = BN_num_bytes(rsa->n);
583     hnbyte = (BN_num_bits(rsa->n) + 15) >> 4;
584     if (ispub)
585     {
586         *pmagic = MS_RSA1MAGIC;
587         return bitlen;
588     }
589     else

```

```

590     {
591         *pmagic = MS_RSA2MAGIC;
592         /* For private key each component must fit within nbyte or
593          * hnbyte.
594          */
595         if (BN_num_bytes(rsa->d) > nbyte)
596             goto badkey;
597         if ((BN_num_bytes(rsa->iqmp) > hnbyte)
598             || (BN_num_bytes(rsa->p) > hnbyte)
599             || (BN_num_bytes(rsa->q) > hnbyte)
600             || (BN_num_bytes(rsa->dmp1) > hnbyte)
601             || (BN_num_bytes(rsa->dmq1) > hnbyte))
602             goto badkey;
603     }
604     return bitlen;
605 badkey:
606     PEMerr(PEM_F_CHECK_BITLEN_RSA, PEM_R_UNSUPPORTED_KEY_COMPONENTS);
607     return 0;
608 }

611 static void write_rsa(unsigned char **out, RSA *rsa, int ispub)
612 {
613     int nbyte, hnbyte;
614     nbyte = BN_num_bytes(rsa->n);
615     hnbyte = (BN_num_bits(rsa->n) + 15) >> 4;
616     write_lebn(out, rsa->e, 4);
617     write_lebn(out, rsa->n, -1);
618     if (ispub)
619         return;
620     write_lebn(out, rsa->p, hnbyte);
621     write_lebn(out, rsa->q, hnbyte);
622     write_lebn(out, rsa->dmp1, hnbyte);
623     write_lebn(out, rsa->dmq1, hnbyte);
624     write_lebn(out, rsa->iqmp, hnbyte);
625     write_lebn(out, rsa->d, nbyte);
626 }

628 static void write_dsa(unsigned char **out, DSA *dsa, int ispub)
629 {
630     int nbyte;
631     nbyte = BN_num_bytes(dsa->p);
632     write_lebn(out, dsa->p, nbyte);
633     write_lebn(out, dsa->q, 20);
634     write_lebn(out, dsa->g, nbyte);
635     if (ispub)
636         write_lebn(out, dsa->pub_key, nbyte);
637     else
638         write_lebn(out, dsa->priv_key, 20);
639     /* Set "invalid" for seed structure values */
640     memset(*out, 0xff, 24);
641     *out += 24;
642     return;
643 }

644 }
645 }

647 int i2b_PrivateKey_bio(BIO *out, EVP_PKEY *pk)
648 {
649     return do_i2b_bio(out, pk, 0);
650 }

652 int i2b_PublicKey_bio(BIO *out, EVP_PKEY *pk)
653 {
654     return do_i2b_bio(out, pk, 1);
655 }

```

```

657 #ifndef OPENSSL_NO_RC4
659 static int do_PVK_header(const unsigned char **in, unsigned int length,
660                          int skip_magic,
661                          unsigned int *psaltlen, unsigned int *pkeylen)
662 {
663     const unsigned char *p = *in;
664     unsigned int pvk_magic, is_encrypted;
665     if (skip_magic)
666     {
667         if (length < 20)
668         {
669             PEMerr(PEM_F_DO_PVK_HEADER, PEM_R_PVK_TOO_SHORT);
670             return 0;
671         }
672         length -= 20;
673     }
674     else
675     {
676         if (length < 24)
677         {
678             PEMerr(PEM_F_DO_PVK_HEADER, PEM_R_PVK_TOO_SHORT);
679             return 0;
680         }
681         length -= 24;
682         pvk_magic = read_ledword(&p);
683         if (pvk_magic != MS_PVKMAGIC)
684         {
685             PEMerr(PEM_F_DO_PVK_HEADER, PEM_R_BAD_MAGIC_NUMBER);
686             return 0;
687         }
688     }
689     /* Skip reserved */
690     p += 4;
691     /*keytype = */read_ledword(&p);
692     is_encrypted = read_ledword(&p);
693     *psaltlen = read_ledword(&p);
694     *pkeylen = read_ledword(&p);
695
696     if (is_encrypted && !*psaltlen)
697     {
698         PEMerr(PEM_F_DO_PVK_HEADER, PEM_R_INCONSISTENT_HEADER);
699         return 0;
700     }
701
702     *in = p;
703     return 1;
704 }
705
707 static int derive_pvk_key(unsigned char *key,
708                          const unsigned char *salt, unsigned int saltlen,
709                          const unsigned char *pass, int passlen)
710 {
711     EVP_MD_CTX mctx;
712     int rv = 1;
713     EVP_MD_CTX_init(&mctx);
714     if (!EVP_DigestInit_ex(&mctx, EVP_sha1(), NULL))
715     {
716         || !EVP_DigestUpdate(&mctx, salt, saltlen)
717         || !EVP_DigestUpdate(&mctx, pass, passlen)
718         || !EVP_DigestFinal_ex(&mctx, key, NULL))
719         rv = 0;
720
721     EVP_MD_CTX_cleanup(&mctx);
722     return rv;

```

```

722     }
723
725 static EVP_PKEY *do_PVK_body(const unsigned char **in,
726                              unsigned int saltlen, unsigned int keylen,
727                              pem_password_cb *cb, void *u)
728 {
729     EVP_PKEY *ret = NULL;
730     const unsigned char *p = *in;
731     unsigned int magic;
732     unsigned char *enctmp = NULL, *q;
733     EVP_CIPHER_CTX cctx;
734     EVP_CIPHER_CTX_init(&cctx);
735     if (saltlen)
736     {
737         char psbuf[PEM_BUFSIZE];
738         unsigned char keybuf[20];
739         int enctmplen, inlen;
740         if (cb)
741             inlen=cb(psbuf, PEM_BUFSIZE, 0, u);
742         else
743             inlen=PEM_def_callback(psbuf, PEM_BUFSIZE, 0, u);
744         if (inlen <= 0)
745         {
746             PEMerr(PEM_F_DO_PVK_BODY, PEM_R_BAD_PASSWORD_READ);
747             return NULL;
748         }
749         enctmp = OPENSSL_malloc(keylen + 8);
750         if (!enctmp)
751         {
752             PEMerr(PEM_F_DO_PVK_BODY, ERR_R_MALLOC_FAILURE);
753             return NULL;
754         }
755         if (!derive_pvk_key(keybuf, p, saltlen,
756                             (unsigned char *)psbuf, inlen))
757             return NULL;
758         p += saltlen;
759         /* Copy BLOBHEADER across, decrypt rest */
760         memcpy(enctmp, p, 8);
761         p += 8;
762         inlen = keylen - 8;
763         q = enctmp + 8;
764         if (!EVP_DecryptInit_ex(&cctx, EVP_rc4(), NULL, keybuf, NULL))
765             goto err;
766         if (!EVP_DecryptUpdate(&cctx, q, &enctmplen, p, inlen))
767             goto err;
768         if (!EVP_DecryptFinal_ex(&cctx, q + enctmplen, &enctmplen))
769             goto err;
770         magic = read_ledword((const unsigned char **)&q);
771         if (magic != MS_RSA2MAGIC && magic != MS_DSS2MAGIC)
772         {
773             q = enctmp + 8;
774             memset(keybuf + 5, 0, 11);
775             if (!EVP_DecryptInit_ex(&cctx, EVP_rc4(), NULL, keybuf,
776                                     NULL))
777                 goto err;
778             OPENSSL_cleanse(keybuf, 20);
779             if (!EVP_DecryptUpdate(&cctx, q, &enctmplen, p, inlen))
780                 goto err;
781             if (!EVP_DecryptFinal_ex(&cctx, q + enctmplen,
782                                     &enctmplen))
783                 goto err;
784             magic = read_ledword((const unsigned char **)&q);
785             if (magic != MS_RSA2MAGIC && magic != MS_DSS2MAGIC)
786             {
787                 PEMerr(PEM_F_DO_PVK_BODY, PEM_R_BAD_DECRYPT);

```

```

788         goto err;
789     }
790 }
791 else
792     OPENSSL_cleanse(keybuf, 20);
793 p = enctmp;
794 }

796 ret = b2i_PrivateKey(&p, keylen);
797 err:
798 EVP_CIPHER_CTX_cleanup(&cctx);
799 if (enctmp && saltlen)
800     OPENSSL_free(enctmp);
801 return ret;
802 }

805 EVP_PKEY *b2i_PVK_bio(BIO *in, pem_password_cb *cb, void *u)
806 {
807     unsigned char pvk_hdr[24], *buf = NULL;
808     const unsigned char *p;
809     int buflen;
810     EVP_PKEY *ret = NULL;
811     unsigned int saltlen, keylen;
812     if (BIO_read(in, pvk_hdr, 24) != 24)
813     {
814         PEMerr(PEM_F_B2I_PVK_BIO, PEM_R_PVK_DATA_TOO_SHORT);
815         return NULL;
816     }
817     p = pvk_hdr;

819     if (!do_PVK_header(&p, 24, 0, &saltlen, &keylen))
820         return 0;
821     buflen = (int) keylen + saltlen;
822     buf = OPENSSL_malloc(buflen);
823     if (!buf)
824     {
825         PEMerr(PEM_F_B2I_PVK_BIO, ERR_R_MALLOC_FAILURE);
826         return 0;
827     }
828     p = buf;
829     if (BIO_read(in, buf, buflen) != buflen)
830     {
831         PEMerr(PEM_F_B2I_PVK_BIO, PEM_R_PVK_DATA_TOO_SHORT);
832         goto err;
833     }
834     ret = do_PVK_body(&p, saltlen, keylen, cb, u);

836     err:
837     if (buf)
838     {
839         OPENSSL_cleanse(buf, buflen);
840         OPENSSL_free(buf);
841     }
842     return ret;
843 }

845
846 static int i2b_PVK(unsigned char **out, EVP_PKEY*pk, int enclevel,
847     pem_password_cb *cb, void *u)
848 {
849     int outlen = 24, pklen;
850     unsigned char *p, *salt = NULL;
851     EVP_CIPHER_CTX cctx;
852     EVP_CIPHER_CTX_init(&cctx);
853 
```

```

854     if (enclevel)
855         outlen += PVK_SALTLEN;
856     pklen = do_i2b(NULL, pk, 0);
857     if (pklen < 0)
858         return -1;
859     outlen += pklen;
860     if (!out)
861         return outlen;
862     if (*out)
863         p = *out;
864     else
865     {
866         p = OPENSSL_malloc(outlen);
867         if (!p)
868         {
869             PEMerr(PEM_F_I2B_PVK, ERR_R_MALLOC_FAILURE);
870             return -1;
871         }
872         *out = p;
873     }

875     write_ledword(&p, MS_PVKMAGIC);
876     write_ledword(&p, 0);
877     if (pk->type == EVP_PKEY_DSA)
878         write_ledword(&p, MS_KEYTYPE_SIGN);
879     else
880         write_ledword(&p, MS_KEYTYPE_KEYX);
881     write_ledword(&p, enclevel ? 1 : 0);
882     write_ledword(&p, enclevel ? PVK_SALTLEN : 0);
883     write_ledword(&p, pklen);
884     if (enclevel)
885     {
886         if (RAND_bytes(p, PVK_SALTLEN) <= 0)
887             goto error;
888         salt = p;
889         p += PVK_SALTLEN;
890     }
891     do_i2b(&p, pk, 0);
892     if (enclevel == 0)
893         return outlen;
894     else
895     {
896         char psbuf[PEM_BUFSIZE];
897         unsigned char keybuf[20];
898         int enctmplen, inlen;
899         if (cb)
900             inlen=cb(psbuf, PEM_BUFSIZE, 1, u);
901         else
902             inlen=PEM_def_callback(psbuf, PEM_BUFSIZE, 1, u);
903         if (inlen <= 0)
904         {
905             PEMerr(PEM_F_I2B_PVK, PEM_R_BAD_PASSWORD_READ);
906             goto error;
907         }
908         if (!derive_pvk_key(keybuf, salt, PVK_SALTLEN,
909             (unsigned char *)psbuf, inlen))
910             goto error;
911         if (enclevel == 1)
912             memset(keybuf + 5, 0, 11);
913         p = salt + PVK_SALTLEN + 8;
914         if (!EVP_EncryptInit_ex(&cctx, EVP_rc4(), NULL, keybuf, NULL))
915             goto error;
916         OPENSSL_cleanse(keybuf, 20);
917         if (!EVP_EncryptUpdate(&cctx, p, &enctmplen, p, pklen - 8))
918             goto error;
919         if (!EVP_DecryptFinal_ex(&cctx, p + enctmplen, &enctmplen))

```

```
920         goto error;
921     }
922     EVP_CIPHER_CTX_cleanup(&cctx);
923     return outlen;
924
925     error:
926     EVP_CIPHER_CTX_cleanup(&cctx);
927     return -1;
928 }
929
930 int i2b_PVK_bio(BIO *out, EVP_PKEY *pk, int enclevel,
931                pem_password_cb *cb, void *u)
932 {
933     unsigned char *tmp = NULL;
934     int outlen, wrlen;
935     outlen = i2b_PVK(&tmp, pk, enclevel, cb, u);
936     if (outlen < 0)
937         return -1;
938     wrlen = BIO_write(out, tmp, outlen);
939     OPENSSL_free(tmp);
940     if (wrlen == outlen)
941     {
942         PEMerr(PEM_F_I2B_PVK_BIO, PEM_R_BIO_WRITE_FAILURE);
943         return outlen;
944     }
945     return -1;
946 }
947
948 #endif
949
950 #endif
```


new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_add.c

1

```
*****
7740 Fri May 30 18:31:59 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_add.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_add.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
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14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
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19  *
20  * 3. All advertising materials mentioning features or use of this
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38  *
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40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_add.c

2

```
63 /* Pack an object into an OCTET STRING and turn into a safebag */
65 PKCS12_SAFEBAG *PKCS12_item_pack_safebag(void *obj, const ASN1_ITEM *it, int nid
66 int nid2)
67 {
68     PKCS12_BAGS *bag;
69     PKCS12_SAFEBAG *safebag;
70     if (!(bag = PKCS12_BAGS_new())) {
71         PKCS12err(PKCS12_F_PKCS12_ITEM_PACK_SAFEBAG, ERR_R_MALLOC_FAILURE)
72         return NULL;
73     }
74     bag->type = OBJ_nid2obj(nid1);
75     if (!ASN1_item_pack(obj, it, &bag->value.octet)) {
76         PKCS12err(PKCS12_F_PKCS12_ITEM_PACK_SAFEBAG, ERR_R_MALLOC_FAILURE)
77         return NULL;
78     }
79     if (!(safebag = PKCS12_SAFEBAG_new())) {
80         PKCS12err(PKCS12_F_PKCS12_ITEM_PACK_SAFEBAG, ERR_R_MALLOC_FAILURE)
81         return NULL;
82     }
83     safebag->value.bag = bag;
84     safebag->type = OBJ_nid2obj(nid2);
85     return safebag;
86 }
88 /* Turn PKCS8 object into a keybag */
90 PKCS12_SAFEBAG *PKCS12_MAKE_KEYBAG(PKCS8_PRIV_KEY_INFO *p8)
91 {
92     PKCS12_SAFEBAG *bag;
93     if (!(bag = PKCS12_SAFEBAG_new())) {
94         PKCS12err(PKCS12_F_PKCS12_MAKE_KEYBAG, ERR_R_MALLOC_FAILURE);
95         return NULL;
96     }
97     bag->type = OBJ_nid2obj(NID_keyBag);
98     bag->value.keybag = p8;
99     return bag;
100 }
102 /* Turn PKCS8 object into a shrouded keybag */
104 PKCS12_SAFEBAG *PKCS12_MAKE_SHKEYBAG(int pbe_nid, const char *pass,
105 int passlen, unsigned char *salt, int saltlen, int iter,
106 PKCS8_PRIV_KEY_INFO *p8)
107 {
108     PKCS12_SAFEBAG *bag;
109     const EVP_CIPHER *pbe_ciph;
111     /* Set up the safe bag */
112     if (!(bag = PKCS12_SAFEBAG_new())) {
113         PKCS12err(PKCS12_F_PKCS12_MAKE_SHKEYBAG, ERR_R_MALLOC_FAILURE);
114         return NULL;
115     }
117     bag->type = OBJ_nid2obj(NID_pkcs8ShroudedKeyBag);
119     pbe_ciph = EVP_get_cipherbynid(pbe_nid);
121     if (pbe_ciph)
122         pbe_nid = -1;
124     if (!(bag->value.shkeybag =
125         PKCS8_encrypt(pbe_nid, pbe_ciph, pass, passlen, salt, saltlen, iter,
126 p8))) {
127         PKCS12err(PKCS12_F_PKCS12_MAKE_SHKEYBAG, ERR_R_MALLOC_FAILURE);
```

```

128         return NULL;
129     }
131     return bag;
132 }

134 /* Turn a stack of SAFE BAGS into a PKCS#7 data ContentInfo */
135 PKCS7 *PKCS12_pack_p7data(STACK_OF(PKCS12_SAFEBAG) *sk)
136 {
137     PKCS7 *p7;
138     if (!(p7 = PKCS7_new())) {
139         PKCS12err(PKCS12_F_PKCS12_PACK_P7DATA, ERR_R_MALLOC_FAILURE);
140         return NULL;
141     }
142     p7->type = OBJ_nid2obj(NID_pkcs7_data);
143     if (!(p7->d.data = M_ASN1_OCTET_STRING_new())) {
144         PKCS12err(PKCS12_F_PKCS12_PACK_P7DATA, ERR_R_MALLOC_FAILURE);
145         return NULL;
146     }
147     if (!ASN1_item_pack(sk, ASN1_ITEM_rptr(PKCS12_SAFEBAGS), &p7->d.data)) {
148         PKCS12err(PKCS12_F_PKCS12_PACK_P7DATA, PKCS12_R_CANT_PACK_STRUCT);
149         return NULL;
150     }
151     return p7;
152 }
153 }

155 /* Unpack SAFE BAGS from PKCS#7 data ContentInfo */
156 STACK_OF(PKCS12_SAFEBAG) *PKCS12_unpack_p7data(PKCS7 *p7)
157 {
158     if (!PKCS7_type_is_data(p7))
159     {
160         PKCS12err(PKCS12_F_PKCS12_UNPACK_P7DATA, PKCS12_R_CONTENT_TYPE_NO);
161         return NULL;
162     }
163     return ASN1_item_unpack(p7->d.data, ASN1_ITEM_rptr(PKCS12_SAFEBAGS));
164 }

166 /* Turn a stack of SAFE BAGS into a PKCS#7 encrypted data ContentInfo */
168 PKCS7 *PKCS12_pack_p7encdata(int pbe_nid, const char *pass, int passlen,
169                               unsigned char *salt, int saltlen, int iter,
170                               STACK_OF(PKCS12_SAFEBAG) *bags)
171 {
172     PKCS7 *p7;
173     X509_ALGOR *pbe;
174     const EVP_CIPHER *pbe_ciph;
175     if (!(p7 = PKCS7_new())) {
176         PKCS12err(PKCS12_F_PKCS12_PACK_P7ENCData, ERR_R_MALLOC_FAILURE);
177         return NULL;
178     }
179     if (!PKCS7_set_type(p7, NID_pkcs7_encrypted)) {
180         PKCS12err(PKCS12_F_PKCS12_PACK_P7ENCData,
181                   PKCS12_R_ERROR_SETTING_ENCRYPTED_DATA_TYPE);
182         return NULL;
183     }
185     pbe_ciph = EVP_get_cipherbynid(pbe_nid);

187     if (pbe_ciph)
188         pbe = PKCS5_pbe2_set(pbe_ciph, iter, salt, saltlen);
189     else
190         pbe = PKCS5_pbe_set(pbe_nid, iter, salt, saltlen);

192     if (!pbe) {
193         PKCS12err(PKCS12_F_PKCS12_PACK_P7ENCData, ERR_R_MALLOC_FAILURE);

```

```

194         return NULL;
195     }
196     X509_ALGOR_free(p7->d.encrypted->enc_data->algorithm);
197     p7->d.encrypted->enc_data->algorithm = pbe;
198     M_ASN1_OCTET_STRING_free(p7->d.encrypted->enc_data->enc_data);
199     if (!(p7->d.encrypted->enc_data->enc_data =
200         PKCS12_item_i2d_encrypt(pbe, ASN1_ITEM_rptr(PKCS12_SAFEBAGS), pass, pass
201                                bags, 1))) {
202         PKCS12err(PKCS12_F_PKCS12_PACK_P7ENCData, PKCS12_R_ENCRYPT_ERROR);
203         return NULL;
204     }
206     return p7;
207 }

209 STACK_OF(PKCS12_SAFEBAG) *PKCS12_unpack_p7encdata(PKCS7 *p7, const char *pass, i
210 {
211     if (!PKCS7_type_is_encrypted(p7)) return NULL;
212     return PKCS12_item_decrypt_d2i(p7->d.encrypted->enc_data->algorithm,
213                                     ASN1_ITEM_rptr(PKCS12_SAFEBAGS),
214                                     pass, passlen,
215                                     p7->d.encrypted->enc_data->enc_data, 1);
216 }

218 PKCS8_PRIV_KEY_INFO *PKCS12_decrypt_skey(PKCS12_SAFEBAG *bag, const char *pass,
219                                             int passlen)
220 {
221     return PKCS8_decrypt(bag->value.shkeybag, pass, passlen);
222 }

224 int PKCS12_pack_authsafes(PKCS12 *p12, STACK_OF(PKCS7) *safes)
225 {
226     if (ASN1_item_pack(safes, ASN1_ITEM_rptr(PKCS12_AUTHSAFES),
227                        &p12->authsafes->d.data))
228         return 1;
229     return 0;
230 }

232 STACK_OF(PKCS7) *PKCS12_unpack_authsafes(PKCS12 *p12)
233 {
234     if (!PKCS7_type_is_data(p12->authsafes))
235     {
236         PKCS12err(PKCS12_F_PKCS12_UNPACK_AUTHSAFES, PKCS12_R_CONTENT_TYPE);
237         return NULL;
238     }
239     return ASN1_item_unpack(p12->authsafes->d.data, ASN1_ITEM_rptr(PKCS12_AU
240 }

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_asn.c

1

```
*****
5299 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_asn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* p12_asn.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_asn.c

2

```
62 #include <openssl/pkcs12.h>

64 /* PKCS#12 ASN1 module */

66 ASN1_SEQUENCE(PKCS12) = {
67     ASN1_SIMPLE(PKCS12, version, ASN1_INTEGER),
68     ASN1_SIMPLE(PKCS12, authsafes, PKCS7),
69     ASN1_OPT(PKCS12, mac, PKCS12_MAC_DATA)
70 } ASN1_SEQUENCE_END(PKCS12)

72 IMPLEMENT_ASN1_FUNCTIONS(PKCS12)

74 ASN1_SEQUENCE(PKCS12_MAC_DATA) = {
75     ASN1_SIMPLE(PKCS12_MAC_DATA, dinfo, X509_SIG),
76     ASN1_SIMPLE(PKCS12_MAC_DATA, salt, ASN1_OCTET_STRING),
77     ASN1_OPT(PKCS12_MAC_DATA, iter, ASN1_INTEGER)
78 } ASN1_SEQUENCE_END(PKCS12_MAC_DATA)

80 IMPLEMENT_ASN1_FUNCTIONS(PKCS12_MAC_DATA)

82 ASN1_ADB_TEMPLATE(bag_default) = ASN1_EXP(PKCS12_BAGS, value.other, ASN1_ANY, 0)

84 ASN1_ADB(PKCS12_BAGS) = {
85     ADB_ENTRY(NID_x509Certificate, ASN1_EXP(PKCS12_BAGS, value.x509cert, ASN1_X509_CERTIFICATE, 0)),
86     ADB_ENTRY(NID_x509Crl, ASN1_EXP(PKCS12_BAGS, value.x509crl, ASN1_OCTET_STRING, 0)),
87     ADB_ENTRY(NID_sdsiCertificate, ASN1_EXP(PKCS12_BAGS, value.sdsicert, ASN1_X509_CERTIFICATE, 0))
88 } ASN1_ADB_END(PKCS12_BAGS, 0, type, 0, &bag_default_tt, NULL);

90 ASN1_SEQUENCE(PKCS12_BAGS) = {
91     ASN1_SIMPLE(PKCS12_BAGS, type, ASN1_OBJECT),
92     ASN1_ADB_OBJECT(PKCS12_BAGS),
93 } ASN1_SEQUENCE_END(PKCS12_BAGS)

95 IMPLEMENT_ASN1_FUNCTIONS(PKCS12_BAGS)

97 ASN1_ADB_TEMPLATE(safebag_default) = ASN1_EXP(PKCS12_SAFE_BAG, value.other, ASN1_ANY, 0)

99 ASN1_ADB(PKCS12_SAFE_BAG) = {
100     ADB_ENTRY(NID_keyBag, ASN1_EXP(PKCS12_SAFE_BAG, value.keybag, PKCS8_PRIV_KEY_INFO, 0)),
101     ADB_ENTRY(NID_pkcs8ShroudedKeyBag, ASN1_EXP(PKCS12_SAFE_BAG, value.shkeybag, PKCS8_PRIV_KEY_INFO, 0)),
102     ADB_ENTRY(NID_safeContentsBag, ASN1_EXP(PKCS12_SAFE_BAG, value.safecbags, PKCS12_BAGS, 0)),
103     ADB_ENTRY(NID_certBag, ASN1_EXP(PKCS12_SAFE_BAG, value.bag, PKCS12_BAGS, 0)),
104     ADB_ENTRY(NID_crlBag, ASN1_EXP(PKCS12_SAFE_BAG, value.bag, PKCS12_BAGS, 0)),
105     ADB_ENTRY(NID_secretBag, ASN1_EXP(PKCS12_SAFE_BAG, value.bag, PKCS12_BAGS, 0))
106 } ASN1_ADB_END(PKCS12_SAFE_BAG, 0, type, 0, &safebag_default_tt, NULL);

108 ASN1_SEQUENCE(PKCS12_SAFE_BAG) = {
109     ASN1_SIMPLE(PKCS12_SAFE_BAG, type, ASN1_OBJECT),
110     ASN1_ADB_OBJECT(PKCS12_SAFE_BAG),
111     ASN1_SET_OF_OPT(PKCS12_SAFE_BAG, attrib, X509_ATTRIBUTE)
112 } ASN1_SEQUENCE_END(PKCS12_SAFE_BAG)

114 IMPLEMENT_ASN1_FUNCTIONS(PKCS12_SAFE_BAG)

116 /* SEQUENCE OF SafeBag */
117 ASN1_ITEM_TEMPLATE(PKCS12_SAFE_BAGS) =
118     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, PKCS12_SAFE_BAGS, PKCS12_SAFE_BAG)
119 ASN1_ITEM_TEMPLATE_END(PKCS12_SAFE_BAGS)

121 /* Authsafes: SEQUENCE OF PKCS7 */
122 ASN1_ITEM_TEMPLATE(PKCS12_AUTHSAFES) =
123     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, PKCS12_AUTHSAFES, PKCS7)
124 ASN1_ITEM_TEMPLATE_END(PKCS12_AUTHSAFES)
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_attr.c

1

```
*****
4812 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_attr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_attr.c

2

```
63 /* Add a local keyid to a safebag */
65 int PKCS12_add_localkeyid(PKCS12_SAFEBAG *bag, unsigned char *name,
66                          int namelen)
67 {
68     if (X509at_add1_attr_by_NID(&bag->attrib, NID_localKeyID,
69                                V_ASN1_OCTET_STRING, name, namelen))
70         return 1;
71     else
72         return 0;
73 }

75 /* Add key usage to PKCS#8 structure */

77 int PKCS8_add_keyusage(PKCS8_PRIV_KEY_INFO *p8, int usage)
78 {
79     unsigned char us_val;
80     us_val = (unsigned char) usage;
81     if (X509at_add1_attr_by_NID(&p8->attributes, NID_key_usage,
82                                V_ASN1_BIT_STRING, &us_val, 1))
83         return 1;
84     else
85         return 0;
86 }

88 /* Add a friendlyname to a safebag */

90 int PKCS12_add_friendlyname_asc(PKCS12_SAFEBAG *bag, const char *name,
91                                int namelen)
92 {
93     if (X509at_add1_attr_by_NID(&bag->attrib, NID_friendlyName,
94                                MBSTRING_ASC, (unsigned char *)name, namelen))
95         return 1;
96     else
97         return 0;
98 }

101 int PKCS12_add_friendlyname_uni(PKCS12_SAFEBAG *bag,
102                                const unsigned char *name, int namelen)
103 {
104     if (X509at_add1_attr_by_NID(&bag->attrib, NID_friendlyName,
105                                MBSTRING_BMP, name, namelen))
106         return 1;
107     else
108         return 0;
109 }

111 int PKCS12_add_CSPName_asc(PKCS12_SAFEBAG *bag, const char *name,
112                            int namelen)
113 {
114     if (X509at_add1_attr_by_NID(&bag->attrib, NID_ms_csp_name,
115                                MBSTRING_ASC, (unsigned char *)name, namelen))
116         return 1;
117     else
118         return 0;
119 }

121 ASN1_TYPE *PKCS12_get_attr_gen(STACK_OF(X509_ATTRIBUTE) *attrs, int attr_nid)
122 {
123     X509_ATTRIBUTE *attrib;
124     int i;
125     if (!attrs) return NULL;
126     for (i = 0; i < sk_X509_ATTRIBUTE_num(attrs); i++) {
127         attrib = sk_X509_ATTRIBUTE_value(attrs, i);
```

```
128         if (OBJ_obj2nid (attrib->object) == attr_nid) {
129             if (sk_ASN1_TYPE_num (attrib->value.set))
130                 return sk_ASN1_TYPE_value(attrib->value.set, 0);
131             else return NULL;
132         }
133     }
134     return NULL;
135 }

137 char *PKCS12_get_friendlyname(PKCS12_SAFEBAG *bag)
138 {
139     ASN1_TYPE *atype;
140     if (!(atype = PKCS12_get_attr(bag, NID_friendlyName))) return NULL;
141     if (atype->type != V_ASN1_BMPSTRING) return NULL;
142     return OPENSSL_uni2asc(atype->value.bmpstring->data,
143                           atype->value.bmpstring->length);
144 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_crpt.c

1

```
*****
4355 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_crpt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_crpt.c */
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54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_crpt.c

2

```
63 /* PKCS#12 PBE algorithms now in static table */
65 void PKCS12_PBE_add(void)
66 {
67 }
69 int PKCS12_PBE_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
70                          ASN1_TYPE *param, const EVP_CIPHER *cipher, const EVP_MD *md, int
71                          {
72     PBEPARAM *pbe;
73     int saltlen, iter, ret;
74     unsigned char *salt;
75     const unsigned char *pbuf;
76     unsigned char key[EVP_MAX_KEY_LENGTH], iv[EVP_MAX_IV_LENGTH];
78     /* Extract useful info from parameter */
79     if (param == NULL || param->type != V_ASN1_SEQUENCE ||
80         param->value.sequence == NULL) {
81         PKCS12err(PKCS12_F_PKCS12_PBE_KEYIVGEN, PKCS12_R_DECODE_ERROR);
82         return 0;
83     }
85     pbuf = param->value.sequence->data;
86     if (!(pbe = d2i_PBEPARAM(NULL, &pbuf, param->value.sequence->length))) {
87         PKCS12err(PKCS12_F_PKCS12_PBE_KEYIVGEN, PKCS12_R_DECODE_ERROR);
88         return 0;
89     }
91     if (!pbe->iter) iter = 1;
92     else iter = ASN1_INTEGER_get (pbe->iter);
93     salt = pbe->salt->data;
94     saltlen = pbe->salt->length;
95     if (!PKCS12_key_gen (pass, passlen, salt, saltlen, PKCS12_KEY_ID,
96                          iter, EVP_CIPHER_key_length(cipher), key, md)) {
97         PKCS12err(PKCS12_F_PKCS12_PBE_KEYIVGEN, PKCS12_R_KEY_GEN_ERROR);
98         PBEPARAM_free(pbe);
99         return 0;
100     }
101     if (!PKCS12_key_gen (pass, passlen, salt, saltlen, PKCS12_IV_ID,
102                          iter, EVP_CIPHER_iv_length(cipher), iv, md)) {
103         PKCS12err(PKCS12_F_PKCS12_PBE_KEYIVGEN, PKCS12_R_IV_GEN_ERROR);
104         PBEPARAM_free(pbe);
105         return 0;
106     }
107     PBEPARAM_free(pbe);
108     ret = EVP_CipherInit_ex(ctx, cipher, NULL, key, iv, en_de);
109     OPENSSL_cleanse(key, EVP_MAX_KEY_LENGTH);
110     OPENSSL_cleanse(iv, EVP_MAX_IV_LENGTH);
111     return ret;
112 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_crt.c

1

```
*****
8346 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_crt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_crt.c

2

```
64 static int pkcs12_add_bag(STACK_OF(PKCS12_SAFEBA) **pbags, PKCS12_SAFEBA *bag)
65
66 static int copy_bag_attr(PKCS12_SAFEBA *bag, EVP_PKEY *pkey, int nid)
67 {
68     int idx;
69     X509_ATTRIBUTE *attr;
70     idx = EVP_PKEY_get_attr_by_NID(pkey, nid, -1);
71     if (idx < 0)
72         return 1;
73     attr = EVP_PKEY_get_attr(pkey, idx);
74     if (!X509at_add1_attr(&bag->attrib, attr))
75         return 0;
76     return 1;
77 }
78
79 PKCS12 *PKCS12_create(char *pass, char *name, EVP_PKEY *pkey, X509 *cert,
80                       STACK_OF(X509) *ca, int nid_key, int nid_cert, int iter, int mac_it
81                       int keytype)
82 {
83     PKCS12 *p12 = NULL;
84     STACK_OF(PKCS7) *safes = NULL;
85     STACK_OF(PKCS12_SAFEBA) *bags = NULL;
86     PKCS12_SAFEBA *bag = NULL;
87     int i;
88     unsigned char keyid[EVP_MAX_MD_SIZE];
89     unsigned int keyidlen = 0;
90
91     /* Set defaults */
92     if (!nid_cert)
93     {
94 #ifdef OPENSSL_FIPS
95         if (FIPS_mode())
96             nid_cert = NID_pbe_WithSHA1And3_Key_TripleDES_CBC;
97         else
98             nid_cert = NID_pbe_WithSHA1And40BitRC2_CBC;
99     }
100     if (!nid_key)
101         nid_key = NID_pbe_WithSHA1And3_Key_TripleDES_CBC;
102     if (!iter)
103         iter = PKCS12_DEFAULT_ITER;
104     if (!mac_iter)
105         mac_iter = 1;
106
107     if (!pkey && !cert && !ca)
108     {
109         PKCS12err(PKCS12_F_PKCS12_CREATE, PKCS12_R_INVALID_NULL_ARGUMENT)
110         return NULL;
111     }
112
113     if (pkey && cert)
114     {
115         if (!X509_check_private_key(cert, pkey))
116             return NULL;
117         X509_digest(cert, EVP_sha1(), keyid, &keyidlen);
118     }
119
120     if (cert)
121     {
122         bag = PKCS12_add_cert(&bags, cert);
123         if (name && !PKCS12_add_friendlyname(bag, name, -1))
124             goto err;
125         if (keyidlen && !PKCS12_add_localkeyid(bag, keyid, keyidlen))
126             goto err;
127     }
```

```

128     }
129
130     /* Add all other certificates */
131     for(i = 0; i < sk_X509_num(ca); i++)
132     {
133         if (!PKCS12_add_cert(&bags, sk_X509_value(ca, i)))
134             goto err;
135     }
136
137     if (bags && !PKCS12_add_safe(&safes, bags, nid_cert, iter, pass))
138         goto err;
139
140     sk_PKCS12_SAFEBAG_pop_free(bags, PKCS12_SAFEBAG_free);
141     bags = NULL;
142
143     if (pkey)
144     {
145         bag = PKCS12_add_key(&bags, pkey, keytype, iter, nid_key, pass);
146
147         if (!bag)
148             goto err;
149
150         if (!copy_bag_attr(bag, pkey, NID_ms_csp_name))
151             goto err;
152         if (!copy_bag_attr(bag, pkey, NID_LocalKeySet))
153             goto err;
154
155         if(name && !PKCS12_add_friendlyname(bag, name, -1))
156             goto err;
157         if(keyidlen && !PKCS12_add_localkeyid(bag, keyid, keyidlen))
158             goto err;
159     }
160
161     if (bags && !PKCS12_add_safe(&safes, bags, -1, 0, NULL))
162         goto err;
163
164     sk_PKCS12_SAFEBAG_pop_free(bags, PKCS12_SAFEBAG_free);
165     bags = NULL;
166
167     p12 = PKCS12_add_safes(safes, 0);
168
169     if (!p12)
170         goto err;
171
172     sk_PKCS7_pop_free(safes, PKCS7_free);
173
174     safes = NULL;
175
176     if ((mac_iter != -1) &&
177         !PKCS12_set_mac(p12, pass, -1, NULL, 0, mac_iter, NULL))
178         goto err;
179
180     return p12;
181
182 err:
183
184     if (p12)
185         PKCS12_free(p12);
186     if (safes)
187         sk_PKCS7_pop_free(safes, PKCS7_free);
188     if (bags)
189         sk_PKCS12_SAFEBAG_pop_free(bags, PKCS12_SAFEBAG_free);
190     return NULL;
191 }

```

```

194 PKCS12_SAFEBAG *PKCS12_add_cert(STACK_OF(PKCS12_SAFEBAG) **pbags, X509 *cert)
195 {
196     PKCS12_SAFEBAG *bag = NULL;
197     char *name;
198     int namelen = -1;
199     unsigned char *keyid;
200     int keyidlen = -1;
201
202     /* Add user certificate */
203     if(!(bag = PKCS12_x5092certbag(cert)))
204         goto err;
205
206     /* Use friendlyName and localKeyID in certificate.
207      * (if present)
208      */
209
210     name = (char *)X509_alias_get0(cert, &namelen);
211
212     if(name && !PKCS12_add_friendlyname(bag, name, namelen))
213         goto err;
214
215     keyid = X509_keyid_get0(cert, &keyidlen);
216
217     if(keyid && !PKCS12_add_localkeyid(bag, keyid, keyidlen))
218         goto err;
219
220     if (!pkcs12_add_bag(pbags, bag))
221         goto err;
222
223     return bag;
224
225 err:
226
227     if (bag)
228         PKCS12_SAFEBAG_free(bag);
229
230     return NULL;
231
232 }
233
234 PKCS12_SAFEBAG *PKCS12_add_key(STACK_OF(PKCS12_SAFEBAG) **pbags, EVP_PKEY *key,
235                                int key_usage, int iter,
236                                int nid_key, char *pass)
237 {
238
239     PKCS12_SAFEBAG *bag = NULL;
240     PKCS8_PRIV_KEY_INFO *p8 = NULL;
241
242     /* Make a PKCS#8 structure */
243     if(!(p8 = EVP_PKEY2PKCS8(key)))
244         goto err;
245     if(key_usage && !PKCS8_add_keyusage(p8, key_usage))
246         goto err;
247     if (nid_key != -1)
248     {
249         bag = PKCS12_MAKE_SHKEYBAG(nid_key, pass, -1, NULL, 0, iter, p8);
250         PKCS8_PRIV_KEY_INFO_free(p8);
251     }
252     else
253         bag = PKCS12_MAKE_KEYBAG(p8);
254
255     if(!bag)
256         goto err;
257
258     if (!pkcs12_add_bag(pbags, bag))
259         goto err;

```



```

261     return bag;
263     err:
265     if (bag)
266         PKCS12_SAFEABAG_free(bag);
268     return NULL;
270 }
272 int PKCS12_add_safe(STACK_OF(PKCS7) **psafes, STACK_OF(PKCS12_SAFEABAG) *bags,
273                   int nid_safe, int iter, char *pa
274 {
275     PKCS7 *p7 = NULL;
276     int free_safes = 0;
278     if (!*psafes)
279     {
280         *psafes = sk_PKCS7_new_null();
281         if (!*psafes)
282             return 0;
283         free_safes = 1;
284     }
285     else
286         free_safes = 0;
288     if (nid_safe == 0)
289         nid_safe = NID_pbe_WithSHA1And40BitRC2_CBC;
291     if (nid_safe == -1)
292         p7 = PKCS12_pack_p7data(bags);
293     else
294         p7 = PKCS12_pack_p7encdata(nid_safe, pass, -1, NULL, 0,
295                                   iter, bags);
296     if (!p7)
297         goto err;
299     if (!sk_PKCS7_push(*psafes, p7))
300         goto err;
302     return 1;
304     err:
305     if (free_safes)
306     {
307         sk_PKCS7_free(*psafes);
308         *psafes = NULL;
309     }
311     if (p7)
312         PKCS7_free(p7);
314     return 0;
316 }
318 static int pkcs12_add_bag(STACK_OF(PKCS12_SAFEABAG) **pbags, PKCS12_SAFEABAG *bag)
319 {
320     int free_bags;
321     if (!pbags)
322         return 1;
323     if (!*pbags)
324     {
325         *pbags = sk_PKCS12_SAFEABAG_new_null();

```

```

326         if (!*pbags)
327             return 0;
328         free_bags = 1;
329     }
330     else
331         free_bags = 0;
333     if (!sk_PKCS12_SAFEABAG_push(*pbags, bag))
334     {
335         if (free_bags)
336         {
337             sk_PKCS12_SAFEABAG_free(*pbags);
338             *pbags = NULL;
339         }
340         return 0;
341     }
343     return 1;
345 }
346
348 PKCS12 *PKCS12_add_safes(STACK_OF(PKCS7) *safes, int nid_p7)
349 {
350     PKCS12 *p12;
351     if (nid_p7 <= 0)
352         nid_p7 = NID_pkcs7_data;
353     p12 = PKCS12_init(nid_p7);
355     if (!p12)
356         return NULL;
358     if (!PKCS12_pack_authsafes(p12, safes))
359     {
360         PKCS12_free(p12);
361         return NULL;
362     }
364     return p12;
366 }

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_decr.c

1

```
*****
5903 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_decr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* p12_decr.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_decr.c

2

```
63 /* Define this to dump decrypted output to files called DERnnn */
64 /*#define DEBUG_DECRYPT*/

67 /* Encrypt/Decrypt a buffer based on password and algor, result in a
68  * OPENSSL_malloc'ed buffer
69  */

71 unsigned char * PKCS12_pbe_crypt(X509_ALGOR *algor, const char *pass,
72                                  int passlen, unsigned char *in, int inlen, unsigned char **data,
73                                  int *datalen, int en_de)
74 {
75     unsigned char *out;
76     int outlen, i;
77     EVP_CIPHER_CTX ctx;

79     EVP_CIPHER_CTX_init(&ctx);
80     /* Decrypt data */
81     if (!EVP_PBE_CipherInit(algor->algorithm, pass, passlen,
82                             algor->parameter, &ctx, en_de)) {
83         PKCS12err(PKCS12_F_PKCS12_PBE_CRYPT, PKCS12_R_PKCS12_ALGOR_CIPHER
84                  return NULL;
85     }

87     if(!(out = OPENSSL_malloc(inlen + EVP_CIPHER_CTX_block_size(&ctx)))) {
88         PKCS12err(PKCS12_F_PKCS12_PBE_CRYPT, ERR_R_MALLOC_FAILURE);
89         goto err;
90     }

92     if (!EVP_CipherUpdate(&ctx, out, &i, in, inlen))
93     {
94         OPENSSL_free(out);
95         out = NULL;
96         PKCS12err(PKCS12_F_PKCS12_PBE_CRYPT, ERR_R_EVP_LIB);
97         goto err;
98     }

100     outlen = i;
101     if(!EVP_CipherFinal_ex(&ctx, out + i, &i)) {
102         OPENSSL_free(out);
103         out = NULL;
104         PKCS12err(PKCS12_F_PKCS12_PBE_CRYPT, PKCS12_R_PKCS12_CIPHERFINAL
105                  goto err;
106     }
107     outlen += i;
108     if (datalen) *datalen = outlen;
109     if (data) *data = out;
110     err:
111     EVP_CIPHER_CTX_cleanup(&ctx);
112     return out;

114 }

116 /* Decrypt an OCTET STRING and decode ASN1 structure
117  * if zbuf set zero buffer after use.
118  */

120 void * PKCS12_item_decrypt_d2i(X509_ALGOR *algor, const ASN1_ITEM *it,
121                                const char *pass, int passlen, ASN1_OCTET_STRING *oct, int zbuf)
122 {
123     unsigned char *out;
124     const unsigned char *p;
125     void *ret;
126     int outlen;
```

```
128     if (!PKCS12_pbe_crypt(algor, pass, passlen, oct->data, oct->length,
129                           &out, &outlen, 0)) {
130         PKCS12err(PKCS12_F_PKCS12_ITEM_DECRYPT_D2I, PKCS12_R_PKCS12_PBE_C
131                  return NULL;
132     }
133     p = out;
134 #ifdef DEBUG_DECRYPT
135     {
136         FILE *op;
137
138         char fname[30];
139         static int fnm = 1;
140         sprintf(fname, "DER%d", fnm++);
141         op = fopen(fname, "wb");
142         fwrite(p, 1, outlen, op);
143         fclose(op);
144     }
145 #endif
146     ret = ASN1_item_d2i(NULL, &p, outlen, it);
147     if (zbuf) OPENSSL_cleanse(out, outlen);
148     if (!ret) PKCS12err(PKCS12_F_PKCS12_ITEM_DECRYPT_D2I, PKCS12_R_DECODE_ERROR);
149     OPENSSL_free(out);
150     return ret;
151 }
152
153 /* Encode ASN1 structure and encrypt, return OCTET STRING
154  * if zbuf set zero encoding.
155  */
156
157 ASN1_OCTET_STRING *PKCS12_item_i2d_encrypt(X509_ALGOR *algor, const ASN1_ITEM *i
158                                             const char *pass, int passlen,
159                                             void *obj, int zbuf)
160 {
161     ASN1_OCTET_STRING *oct;
162     unsigned char *in = NULL;
163     int inlen;
164     if (!(oct = M_ASN1_OCTET_STRING_new ())) {
165         PKCS12err(PKCS12_F_PKCS12_ITEM_I2D_ENCRYPT, ERR_R_MALLOC_FAILURE)
166         return NULL;
167     }
168     inlen = ASN1_item_i2d(obj, &in, it);
169     if (!in) {
170         PKCS12err(PKCS12_F_PKCS12_ITEM_I2D_ENCRYPT, PKCS12_R_ENCODE_ERROR)
171         return NULL;
172     }
173     if (!PKCS12_pbe_crypt(algor, pass, passlen, in, inlen, &oct->data,
174                           &oct->length, 1)) {
175         PKCS12err(PKCS12_F_PKCS12_ITEM_I2D_ENCRYPT, PKCS12_R_ENCRYPT_ERROR)
176         OPENSSL_free(in);
177         return NULL;
178     }
179     if (zbuf) OPENSSL_cleanse(in, inlen);
180     OPENSSL_free(in);
181     return oct;
182 }
183
184 IMPLEMENT_PKCS12_STACK_OF(PKCS7)
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_init.c

1

```
*****
3474 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_init.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_init.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
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53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_init.c

2

```
63 /* Initialise a PKCS12 structure to take data */
65 PKCS12 *PKCS12_init(int mode)
66 {
67     PKCS12 *pkcs12;
68     if (!(pkcs12 = PKCS12_new())) {
69         PKCS12err(PKCS12_F_PKCS12_INIT, ERR_R_MALLOC_FAILURE);
70         return NULL;
71     }
72     ASN1_INTEGER_set(pkcs12->version, 3);
73     pkcs12->authsafes->type = OBJ_nid2obj(mode);
74     switch (mode) {
75         case NID_pkcs7_data:
76             if (!(pkcs12->authsafes->d.data =
77                 M_ASN1_OCTET_STRING_new())) {
78                 PKCS12err(PKCS12_F_PKCS12_INIT, ERR_R_MALLOC_FAILURE);
79                 goto err;
80             }
81             break;
82         default:
83             PKCS12err(PKCS12_F_PKCS12_INIT,
84                 PKCS12_R_UNSUPPORTED_PKCS12_MODE);
85             goto err;
86     }
87     return pkcs12;
89 err:
90     if (pkcs12 != NULL) PKCS12_free(pkcs12);
91     return NULL;
92 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_key.c

1

```
*****
6897 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_key.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_key.c */
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_key.c

2

```
62 #include <openssl/bn.h>
63
64 /* Uncomment out this line to get debugging info about key generation */
65 //#define DEBUG_KEYGEN*/
66 #ifdef DEBUG_KEYGEN
67 #include <openssl/bio.h>
68 extern BIO *bio_err;
69 void h_dump(unsigned char *p, int len);
70 #endif
71
72 /* PKCS12 compatible key/IV generation */
73 #ifndef min
74 #define min(a,b) ((a) < (b) ? (a) : (b))
75 #endif
76
77 int PKCS12_key_gen_asc(const char *pass, int passlen, unsigned char *salt,
78 int saltlen, int id, int iter, int n, unsigned char *out,
79 const EVP_MD *md_type)
80 {
81 int ret;
82 unsigned char *unipass;
83 int uniplen;
84
85 if(!pass) {
86 unipass = NULL;
87 uniplen = 0;
88 } else if (!OPENSSL_asc2uni(pass, passlen, &unipass, &uniplen)) {
89 PKCS12err(PKCS12_F_PKCS12_KEY_GEN_ASC, ERR_R_MALLOC_FAILURE);
90 return 0;
91 }
92 ret = PKCS12_key_gen_uni(unipass, uniplen, salt, saltlen,
93 id, iter, n, out, md_type);
94 if (ret <= 0)
95 return 0;
96 if(unipass) {
97 OPENSSL_cleanse(unipass, uniplen); /* Clear password from m
98 OPENSSL_free(unipass);
99 }
100 return ret;
101 }
102
103 int PKCS12_key_gen_uni(unsigned char *pass, int passlen, unsigned char *salt,
104 int saltlen, int id, int iter, int n, unsigned char *out,
105 const EVP_MD *md_type)
106 {
107 unsigned char *B, *D, *I, *p, *Ai;
108 int Slen, Plen, Ilen, Ijlen;
109 int i, j, u, v;
110 int ret = 0;
111 BIGNUM *Ij, *Bpl1; /* These hold Ij and B + 1 */
112 EVP_MD_CTX ctx;
113 #ifdef DEBUG_KEYGEN
114 unsigned char *tmpout = out;
115 int tmpn = n;
116 #endif
117
118 if 0
119 if (!pass) {
120 PKCS12err(PKCS12_F_PKCS12_KEY_GEN_UNI, ERR_R_PASSED_NULL_PARAMETE
121 return 0;
122 }
123 #endif
124
125 EVP_MD_CTX_init(&ctx);
126 #ifdef DEBUG_KEYGEN
127 fprintf(stderr, "KEYGEN DEBUG\n");
```

```

128     fprintf(stderr, "ID %d, ITER %d\n", id, iter);
129     fprintf(stderr, "Password (length %d):\n", passlen);
130     h_dump(pass, passlen);
131     fprintf(stderr, "Salt (length %d):\n", saltlen);
132     h_dump(salt, saltlen);
133 #endif
134     v = EVP_MD_block_size (md_type);
135     u = EVP_MD_size (md_type);
136     if (u < 0)
137         return 0;
138     D = OPENSSL_malloc (v);
139     Ai = OPENSSL_malloc (u);
140     B = OPENSSL_malloc (v + 1);
141     Slen = v * ((saltlen+v-1)/v);
142     if(passlen) Plen = v * ((passlen+v-1)/v);
143     else Plen = 0;
144     Ilen = Slen + Plen;
145     I = OPENSSL_malloc (Ilen);
146     Ij = BN_new();
147     Bp11 = BN_new();
148     if (!D || !Ai || !B || !I || !Ij || !Bp11)
149         goto err;
150     for (i = 0; i < v; i++) D[i] = id;
151     p = I;
152     for (i = 0; i < Slen; i++) *p++ = salt[i % saltlen];
153     for (i = 0; i < Plen; i++) *p++ = pass[i % passlen];
154     for (;;) {
155         if (!EVP_DigestInit_ex(&ctx, md_type, NULL))
156             || !EVP_DigestUpdate(&ctx, D, v)
157             || !EVP_DigestUpdate(&ctx, I, Ilen)
158             || !EVP_DigestFinal_ex(&ctx, Ai, NULL))
159             goto err;
160         for (j = 1; j < iter; j++) {
161             if (!EVP_DigestInit_ex(&ctx, md_type, NULL))
162                 || !EVP_DigestUpdate(&ctx, Ai, u)
163                 || !EVP_DigestFinal_ex(&ctx, Ai, NULL))
164                 goto err;
165         }
166         memcpy (out, Ai, min (n, u));
167         if (u >= n) {
168 #ifdef DEBUG_KEYGEN
169             fprintf(stderr, "Output KEY (length %d)\n", tmpn);
170             h_dump(tmpout, tmpn);
171 #endif
172             ret = 1;
173             goto end;
174         }
175         n -= u;
176         out += u;
177         for (j = 0; j < v; j++) B[j] = Ai[j % u];
178         /* Work out B + 1 first then can use B as tmp space */
179         if (!BN_bin2bn (B, v, Bp11))
180             goto err;
181         if (!BN_add_word (Bp11, 1))
182             goto err;
183         for (j = 0; j < Ilen; j+=v) {
184             if (!BN_bin2bn(I + j, v, Ij))
185                 goto err;
186             if (!BN_add(Ij, Ij, Bp11))
187                 goto err;
188             if (!BN_bin2bn(Ij, B))
189                 goto err;
190             Ijlen = BN_num_bytes (Ij);
191             /* If more than 2^(v*8) - 1 cut off MSB */
192             if (Ijlen > v) {
193                 if (!BN_bin2bn (Ij, B))

```

```

194                                     goto err;
195                                     memcpy (I + j, B + 1, v);
196 #ifndef PKCS12_BROKEN_KEYGEN
197                                     /* If less than v bytes pad with zeroes */
198                                     } else if (Ijlen < v) {
199                                         memset(I + j, 0, v - Ijlen);
200                                         if (!BN_bin2bn(Ij, I + j + v - Ijlen))
201                                             goto err;
202 #endif
203                                     } else if (!BN_bin2bn (Ij, I + j))
204                                         goto err;
205                                     }
206                                     }
208 err:
209     PKCS12err(PKCS12_F_PKCS12_KEY_GEN_UNI,ERR_R_MALLOC_FAILURE);
211 end:
212     OPENSSL_free (Ai);
213     OPENSSL_free (B);
214     OPENSSL_free (D);
215     OPENSSL_free (I);
216     BN_free (Ij);
217     BN_free (Bp11);
218     EVP_MD_CTX_cleanup(&ctx);
219     return ret;
220 }
221 #ifdef DEBUG_KEYGEN
222 void h_dump (unsigned char *p, int len)
223 {
224     for (; len --; p++) fprintf(stderr, "%02X", *p);
225     fprintf(stderr, "\n");
226 }
227 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_kiss.c

1

```
*****
8201 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_kiss.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* p12_kiss.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_kiss.c

2

```
63 /* Simplified PKCS#12 routines */

65 static int parse_pk12( PKCS12 *p12, const char *pass, int passlen,
66                        EVP_PKEY **pkey, STACK_OF(X509) *ocerts);

68 static int parse_bags( STACK_OF(PKCS12_SAFE_BAG) *bags, const char *pass,
69                        int passlen, EVP_PKEY **pkey, STACK_OF(X509) *ocerts);

71 static int parse_bag( PKCS12_SAFE_BAG *bag, const char *pass, int passlen,
72                       EVP_PKEY **pkey, STACK_OF(X509) *ocerts);

74 /* Parse and decrypt a PKCS#12 structure returning user key, user cert
75  * and other (CA) certs. Note either ca should be NULL, *ca should be NULL,
76  * or it should point to a valid STACK structure. pkey and cert can be
77  * passed uninitialised.
78  */

80 int PKCS12_parse(PKCS12 *p12, const char *pass, EVP_PKEY **pkey, X509 **cert,
81                  STACK_OF(X509) **ca)
82 {
83     STACK_OF(X509) *ocerts = NULL;
84     X509 *x = NULL;
85     /* Check for NULL PKCS12 structure */

87     if(!p12)
88     {
89         PKCS12err(PKCS12_F_PKCS12_PARSE, PKCS12_R_INVALID_NULL_PKCS12_POI);
90         return 0;
91     }

93     if(pkey)
94         *pkey = NULL;
95     if(cert)
96         *cert = NULL;

98     /* Check the mac */

100     /* If password is zero length or NULL then try verifying both cases
101      * to determine which password is correct. The reason for this is that
102      * under PKCS#12 password based encryption no password and a zero length
103      * password are two different things...
104      */

106     if(!pass || !*pass) {
107         if(PKCS12_verify_mac(p12, NULL, 0)) pass = NULL;
108         else if(PKCS12_verify_mac(p12, "", 0)) pass = "";
109         else {
110             PKCS12err(PKCS12_F_PKCS12_PARSE, PKCS12_R_MAC_VERIFY_FAIL);
111             goto err;
112         }
113     } else if (!PKCS12_verify_mac(p12, pass, -1)) {
114         PKCS12err(PKCS12_F_PKCS12_PARSE, PKCS12_R_MAC_VERIFY_FAILURE);
115         goto err;
116     }

118     /* Allocate stack for other certificates */
119     ocerts = sk_X509_new_null();

121     if (!ocerts)
122     {
123         PKCS12err(PKCS12_F_PKCS12_PARSE, ERR_R_MALLOC_FAILURE);
124         return 0;
125     }

127     if (!parse_pk12 (p12, pass, -1, pkey, ocerts))
```

```

128     {
129         PKCS12err(PKCS12_F_PKCS12_PARSE, PKCS12_R_PARSE_ERROR);
130         goto err;
131     }

133     while ((x = sk_X509_pop(ocerts)))
134     {
135         if (pkey && *pkey && cert && !*cert)
136         {
137             if (X509_check_private_key(x, *pkey))
138             {
139                 *cert = x;
140                 x = NULL;
141             }
142         }

144         if (ca && x)
145         {
146             if (!*ca)
147                 *ca = sk_X509_new_null();
148             if (!*ca)
149                 goto err;
150             if (!sk_X509_push(*ca, x))
151                 goto err;
152             x = NULL;
153         }
154         if (x)
155             X509_free(x);
156     }

158     if (ocerts)
159         sk_X509_pop_free(ocerts, X509_free);

161     return 1;

163 err:

165     if (pkey && *pkey)
166         EVP_PKEY_free(*pkey);
167     if (cert && *cert)
168         X509_free(*cert);
169     if (x)
170         X509_free(x);
171     if (ocerts)
172         sk_X509_pop_free(ocerts, X509_free);
173     return 0;

175 }

177 /* Parse the outer PKCS#12 structure */

179 static int parse_pk12(PKCS12 *p12, const char *pass, int passlen,
180                      EVP_PKEY **pkey, STACK_OF(X509) *ocerts)
181 {
182     STACK_OF(PKCS7) *asafes;
183     STACK_OF(PKCS12_SAFEBAG) *bags;
184     int i, bagnid;
185     PKCS7 *p7;

187     if (!(asafes = PKCS12_unpack_authsafes(p12))) return 0;
188     for (i = 0; i < sk_PKCS7_num(asafes); i++) {
189         p7 = sk_PKCS7_value(asafes, i);
190         bagnid = OBJ_obj2nid(p7->type);
191         if (bagnid == NID_pkcs7_data) {
192             bags = PKCS12_unpack_p7data(p7);
193         } else if (bagnid == NID_pkcs7_encrypted) {

```

```

194         bags = PKCS12_unpack_p7encdata(p7, pass, passlen);
195     } else continue;
196     if (!bags) {
197         sk_PKCS7_pop_free(asafes, PKCS7_free);
198         return 0;
199     }
200     if (!parse_bags(bags, pass, passlen, pkey, ocerts)) {
201         sk_PKCS12_SAFEBAG_pop_free(bags, PKCS12_SAFEBAG_free);
202         sk_PKCS7_pop_free(asafes, PKCS7_free);
203         return 0;
204     }
205     sk_PKCS12_SAFEBAG_pop_free(bags, PKCS12_SAFEBAG_free);
206 }
207 sk_PKCS7_pop_free(asafes, PKCS7_free);
208 return 1;
209 }

212 static int parse_bags(STACK_OF(PKCS12_SAFEBAG) *bags, const char *pass,
213                      int passlen, EVP_PKEY **pkey, STACK_OF(X509) *ocerts)
214 {
215     int i;
216     for (i = 0; i < sk_PKCS12_SAFEBAG_num(bags); i++) {
217         if (!parse_bag(sk_PKCS12_SAFEBAG_value(bags, i),
218                      pass, passlen, pkey, ocerts))
219             return 0;
220     }
221     return 1;
222 }

224 static int parse_bag(PKCS12_SAFEBAG *bag, const char *pass, int passlen,
225                      EVP_PKEY **pkey, STACK_OF(X509) *ocerts)
226 {
227     PKCS8_PRIV_KEY_INFO *p8;
228     X509 *x509;
229     ASN1_TYPE *attrib;
230     ASN1_BMPSTRING *fname = NULL;
231     ASN1_OCTET_STRING *lkid = NULL;

233     if ((attrib = PKCS12_get_attr(bag, NID_friendlyName)))
234         fname = attrib->value.bmpstring;

236     if ((attrib = PKCS12_get_attr(bag, NID_localKeyID)))
237         lkid = attrib->value.octet_string;

239     switch (M_PKCS12_bag_type(bag))
240     {
241     case NID_keyBag:
242         if (!pkey || *pkey)
243             return 1;
244         if (!(*pkey = EVP_PKCS82PKEY(bag->value.keybag)))
245             return 0;
246         break;

248     case NID_pkcs8ShroudedKeyBag:
249         if (!pkey || *pkey)
250             return 1;
251         if (!(p8 = PKCS12_decrypt_skey(bag, pass, passlen)))
252             return 0;
253         *pkey = EVP_PKCS82PKEY(p8);
254         PKCS8_PRIV_KEY_INFO_free(p8);
255         if (!(*pkey)) return 0;
256         break;

258     case NID_certBag:
259         if (M_PKCS12_cert_bag_type(bag) != NID_x509Certificate)

```



```
260         return 1;
261     if (!(x509 = PKCS12_certhbag2x509(bag)))
262         return 0;
263     if(lkid && !X509_keyid_set1(x509, lkid->data, lkid->length))
264     {
265         X509_free(x509);
266         return 0;
267     }
268     if(fname) {
269         int len, r;
270         unsigned char *data;
271         len = ASN1_STRING_to_UTF8(&data, fname);
272         if(len > 0) {
273             r = X509_alias_set1(x509, data, len);
274             OPENSSL_free(data);
275             if (!r)
276             {
277                 X509_free(x509);
278                 return 0;
279             }
280         }
281     }
282     if(!sk_X509_push(ocerts, x509))
283     {
284         X509_free(x509);
285         return 0;
286     }
287
288     break;
289
290     case NID_safeContentsBag:
291         return parse_bags(bag->value.safes, pass, passlen,
292                          pkey, ocerts);
293     break;
294
295     default:
296         return 1;
297     break;
298 }
299 return 1;
300 }
301 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_mutl.c

1

```
*****
6529 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_mutl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_mutl.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
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19 *
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
59 #ifndef OPENSSL_NO_HMAC
60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_mutl.c

2

```
62 #include <openssl/hmac.h>
63 #include <openssl/rand.h>
64 #include <openssl/pkcs12.h>
65
66 /* Generate a MAC */
67 int PKCS12_gen_mac(PKCS12 *p12, const char *pass, int passlen,
68                   unsigned char *mac, unsigned int *maclen)
69 {
70     const EVP_MD *md_type;
71     HMAC_CTX hmac;
72     unsigned char key[EVP_MAX_MD_SIZE], *salt;
73     int saltlen, iter;
74     int md_size;
75
76     if (!PKCS7_type_is_data(p12->authsafes))
77     {
78         PKCS12err(PKCS12_F_PKCS12_GEN_MAC, PKCS12_R_CONTENT_TYPE_NOT_DATA);
79         return 0;
80     }
81
82     salt = p12->mac->salt->data;
83     saltlen = p12->mac->salt->length;
84     if (!p12->mac->iter) iter = 1;
85     else iter = ASN1_INTEGER_get (p12->mac->iter);
86     if (!md_type =
87         EVP_get_digestbyobj (p12->mac->dinfo->algor->algorithm)) {
88         PKCS12err(PKCS12_F_PKCS12_GEN_MAC, PKCS12_R_UNKNOWN_DIGEST_ALGORI);
89         return 0;
90     }
91     md_size = EVP_MD_size(md_type);
92     if (md_size < 0)
93         return 0;
94     if (!PKCS12_key_gen (pass, passlen, salt, saltlen, PKCS12_MAC_ID, iter,
95                         md_size, key, md_type)) {
96         PKCS12err(PKCS12_F_PKCS12_GEN_MAC, PKCS12_R_KEY_GEN_ERROR);
97         return 0;
98     }
99     HMAC_CTX_init(&hmac);
100    if (!HMAC_Init_ex(&hmac, key, md_size, md_type, NULL)
101        || !HMAC_Update(&hmac, p12->authsafes->d.data->data,
102                      p12->authsafes->d.data->length)
103        || !HMAC_Final(&hmac, mac, maclen))
104    {
105        HMAC_CTX_cleanup(&hmac);
106        return 0;
107    }
108    HMAC_CTX_cleanup(&hmac);
109    return 1;
110 }
111
112 /* Verify the mac */
113 int PKCS12_verify_mac(PKCS12 *p12, const char *pass, int passlen)
114 {
115     unsigned char mac[EVP_MAX_MD_SIZE];
116     unsigned int maclen;
117     if (p12->mac == NULL) {
118         PKCS12err(PKCS12_F_PKCS12_VERIFY_MAC, PKCS12_R_MAC_ABSENT);
119         return 0;
120     }
121     if (!PKCS12_gen_mac (p12, pass, passlen, mac, &maclen)) {
122         PKCS12err(PKCS12_F_PKCS12_VERIFY_MAC, PKCS12_R_MAC_GENERATION_ERR);
123         return 0;
124     }
125     if ((maclen != (unsigned int)p12->mac->dinfo->digest->length)
126         || memcmp (mac, p12->mac->dinfo->digest->data, maclen)) return 0;
127     return 1;
128 }
```

```
128 }
129
130 /* Set a mac */
131
132 int PKCS12_set_mac(PKCS12 *p12, const char *pass, int passlen,
133 unsigned char *salt, int saltlen, int iter, const EVP_MD *md_type)
134 {
135     unsigned char mac[EVP_MAX_MD_SIZE];
136     unsigned int maclen;
137
138     if (!md_type) md_type = EVP_sha1();
139     if (PKCS12_setup_mac (p12, iter, salt, saltlen, md_type) ==
140         PKCS12_ERROR) {
141         PKCS12err(PKCS12_F_PKCS12_SET_MAC, PKCS12_R_MAC_SETUP_ERROR);
142         return 0;
143     }
144     if (!PKCS12_gen_mac (p12, pass, passlen, mac, &maclen)) {
145         PKCS12err(PKCS12_F_PKCS12_SET_MAC, PKCS12_R_MAC_GENERATION_ERROR)
146         return 0;
147     }
148     if (!(M_ASN1_OCTET_STRING_set (p12->mac->dinfo->digest, mac, maclen))) {
149         PKCS12err(PKCS12_F_PKCS12_SET_MAC, PKCS12_R_MAC_STRING_SET_ERROR)
150         return 0;
151     }
152     return 1;
153 }
154
155 /* Set up a mac structure */
156 int PKCS12_setup_mac(PKCS12 *p12, int iter, unsigned char *salt, int saltlen,
157 const EVP_MD *md_type)
158 {
159     if (!(p12->mac = PKCS12_MAC_DATA_new())) return PKCS12_ERROR;
160     if (iter > 1) {
161         if (!(p12->mac->iter = M_ASN1_INTEGER_new())) {
162             PKCS12err(PKCS12_F_PKCS12_SETUP_MAC, ERR_R_MALLOC_FAILURE)
163             return 0;
164         }
165         if (!ASN1_INTEGER_set(p12->mac->iter, iter)) {
166             PKCS12err(PKCS12_F_PKCS12_SETUP_MAC, ERR_R_MALLOC_FAILURE)
167             return 0;
168         }
169     }
170     if (!saltlen) saltlen = PKCS12_SALT_LEN;
171     p12->mac->salt->length = saltlen;
172     if (!(p12->mac->salt->data = OPENSSL_malloc (saltlen))) {
173         PKCS12err(PKCS12_F_PKCS12_SETUP_MAC, ERR_R_MALLOC_FAILURE);
174         return 0;
175     }
176     if (!salt) {
177         if (RAND_pseudo_bytes (p12->mac->salt->data, saltlen) < 0)
178             return 0;
179     }
180     else memcpy (p12->mac->salt->data, salt, saltlen);
181     p12->mac->dinfo->algor->algorithm = OBJ_nid2obj(EVP_MD_type(md_type));
182     if (!(p12->mac->dinfo->algor->parameter = ASN1_TYPE_new())) {
183         PKCS12err(PKCS12_F_PKCS12_SETUP_MAC, ERR_R_MALLOC_FAILURE);
184         return 0;
185     }
186     p12->mac->dinfo->algor->parameter->type = V_ASN1_NULL;
187
188     return 1;
189 }
190 #endif
```



```

128         bags = NULL;
129     }
130     } else continue;
131     if (!bags) {
132         sk_PKCS7_pop_free(asafes, PKCS7_free);
133         return 0;
134     }
135     if (!newpass_bags(bags, oldpass, newpass)) {
136         sk_PKCS12_SAFEBAG_pop_free(bags, PKCS12_SAFEBAG_free);
137         sk_PKCS7_pop_free(asafes, PKCS7_free);
138         return 0;
139     }
140     /* Repack bag in same form with new password */
141     if (bagnid == NID_pkcs7_data) p7new = PKCS12_pack_p7data(bags);
142     else p7new = PKCS12_pack_p7encdata(pbe_nid, newpass, -1, NULL,
143                                       pbe_saltlen, pbe_iter, bags);
144     sk_PKCS12_SAFEBAG_pop_free(bags, PKCS12_SAFEBAG_free);
145     if (!p7new) {
146         sk_PKCS7_pop_free(asafes, PKCS7_free);
147         return 0;
148     }
149     sk_PKCS7_push(newsafes, p7new);
150 }
151 sk_PKCS7_pop_free(asafes, PKCS7_free);
152
153 /* Repack safe: save old safe in case of error */
154
155 p12_data_tmp = p12->authsafes->d.data;
156 if (!(p12->authsafes->d.data = ASN1_OCTET_STRING_new())) goto saferr;
157 if (!PKCS12_pack_authsafes(p12, newsafes)) goto saferr;
158
159 if (!PKCS12_gen_mac(p12, newpass, -1, mac, &maclen)) goto saferr;
160 if (!(macnew = ASN1_OCTET_STRING_new())) goto saferr;
161 if (!ASN1_OCTET_STRING_set(macnew, mac, maclen)) goto saferr;
162 ASN1_OCTET_STRING_free(p12->mac->dinfo->digest);
163 p12->mac->dinfo->digest = macnew;
164 ASN1_OCTET_STRING_free(p12_data_tmp);
165
166 return 1;
167
168 saferr:
169 /* Restore old safe */
170 ASN1_OCTET_STRING_free(p12->authsafes->d.data);
171 ASN1_OCTET_STRING_free(macnew);
172 p12->authsafes->d.data = p12_data_tmp;
173 return 0;
174
175 }
176
177 static int newpass_bags(STACK_OF(PKCS12_SAFEBAG) *bags, char *oldpass,
178                        char *newpass)
179 {
180     int i;
181     for (i = 0; i < sk_PKCS12_SAFEBAG_num(bags); i++) {
182         if (!newpass_bag(sk_PKCS12_SAFEBAG_value(bags, i),
183                         oldpass, newpass))
184             return 0;
185     }
186     return 1;
187 }
188
189 /* Change password of safebag: only needs handle shrouded keybags */
190
191 static int newpass_bag(PKCS12_SAFEBAG *bag, char *oldpass, char *newpass)
192 {

```

```

194     PKCS8_PRIV_KEY_INFO *p8;
195     X509_SIG *p8new;
196     int p8_nid, p8_saltlen, p8_iter;
197
198     if (M_PKCS12_bag_type(bag) != NID_pkcs8ShroudedKeyBag) return 1;
199
200     if (!(p8 = PKCS8_decrypt(bag->value.shkeybag, oldpass, -1))) return 0;
201     if (!alg_get(bag->value.shkeybag->algor, &p8_nid, &p8_iter,
202                &p8_saltlen))
203         return 0;
204     if (!(p8new = PKCS8_encrypt(p8_nid, NULL, newpass, -1, NULL, p8_saltlen,
205                               p8_iter, p8))) return 0;
206     X509_SIG_free(bag->value.shkeybag);
207     bag->value.shkeybag = p8new;
208     return 1;
209 }
210
211 static int alg_get(X509_ALGOR *alg, int *pnid, int *piter, int *psaltlen)
212 {
213     PBEPARAM *pbe;
214     const unsigned char *p;
215
216     p = alg->parameter->value.sequence->data;
217     pbe = d2i_PBEPARAM(NULL, &p, alg->parameter->value.sequence->length);
218     if (!pbe)
219         return 0;
220     *pnid = OBJ_obj2nid(alg->algorithm);
221     *piter = ASN1_INTEGER_get(pbe->iter);
222     *psaltlen = pbe->salt->length;
223     PBEPARAM_free(pbe);
224     return 1;
225 }

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_p8d.c

1

```
*****
3005 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_p8d.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_p8d.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_p8d.c

2

```
63 PKCS8_PRIV_KEY_INFO *PKCS8_decrypt(X509_SIG *p8, const char *pass, int passlen)
64 {
65     return PKCS12_item_decrypt_d2i(p8->algor, ASN1_ITEM_rptr(PKCS8_PRIV_KEY_
66     passlen, p8->digest, 1);
67 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_p8e.c

1

```
*****
3688 Fri May 30 18:32:00 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_p8e.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_p8e.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
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4  */
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54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_p8e.c

2

```
63 X509_SIG *PKCS8_encrypt(int pbe_nid, const EVP_CIPHER *cipher,
64                          const char *pass, int passlen,
65                          unsigned char *salt, int saltlen, int iter,
66                          PKCS8_PRIV_KEY_INFO *p8inf)
67 {
68     X509_SIG *p8 = NULL;
69     X509_ALGOR *pbe;
70
71     if (!(p8 = X509_SIG_new())) {
72         PKCS12err(PKCS12_F_PKCS8_ENCRYPT, ERR_R_MALLOC_FAILURE);
73         goto err;
74     }
75
76     if (pbe_nid == -1) pbe = PKCS5_pbe2_set(cipher, iter, salt, saltlen);
77     else pbe = PKCS5_pbe_set(pbe_nid, iter, salt, saltlen);
78     if (!pbe) {
79         PKCS12err(PKCS12_F_PKCS8_ENCRYPT, ERR_R_ASN1_LIB);
80         goto err;
81     }
82     X509_ALGOR_free(p8->algor);
83     p8->algor = pbe;
84     M_ASN1_OCTET_STRING_free(p8->digest);
85     p8->digest = PKCS12_item_i2d_encrypt(pbe, ASN1_ITEM_rptr(PKCS8_PRIV_KEY_
86                                     pass, passlen, p8inf, 1);
87     if (!p8->digest) {
88         PKCS12err(PKCS12_F_PKCS8_ENCRYPT, PKCS12_R_ENCRYPT_ERROR);
89         goto err;
90     }
91
92     return p8;
93
94 err:
95     X509_SIG_free(p8);
96     return NULL;
97 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_utl.c

1

```
*****
5016 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_utl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* p12_utl.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/pkcs12.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/p12_utl.c

2

```
63 /* Cheap and nasty Unicode stuff */
64
65 unsigned char *OPENSSL_asc2uni(const char *asc, int asclen, unsigned char **uni,
66 {
67     int ulen, i;
68     unsigned char *unitmp;
69     if (asclen == -1) asclen = strlen(asc);
70     ulen = asclen*2 + 2;
71     if (!(unitmp = OPENSSL_malloc(ulen))) return NULL;
72     for (i = 0; i < ulen - 2; i+=2) {
73         unitmp[i] = 0;
74         unitmp[i + 1] = asc[i>>1];
75     }
76     /* Make result double null terminated */
77     unitmp[ulen - 2] = 0;
78     unitmp[ulen - 1] = 0;
79     if (unilen) *unilen = ulen;
80     if (uni) *uni = unitmp;
81     return unitmp;
82 }
83
84 char *OPENSSL_uni2asc(unsigned char *uni, int unilen)
85 {
86     int asclen, i;
87     char *asctmp;
88     asclen = unilen / 2;
89     /* If no terminating zero allow for one */
90     if (!unilen || uni[unilen - 1]) asclen++;
91     uni++;
92     if (!(asctmp = OPENSSL_malloc(asclen))) return NULL;
93     for (i = 0; i < unilen; i+=2) asctmp[i>>1] = uni[i];
94     asctmp[asclen - 1] = 0;
95     return asctmp;
96 }
97
98 int i2d_PKCS12_bio(BIO *bp, PKCS12 *p12)
99 {
100     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(PKCS12), bp, p12);
101 }
102
103 #ifndef OPENSSL_NO_FP_API
104 int i2d_PKCS12_fp(FILE *fp, PKCS12 *p12)
105 {
106     return ASN1_item_i2d_fp(ASN1_ITEM_rptr(PKCS12), fp, p12);
107 }
108 #endif
109
110 PKCS12 *d2i_PKCS12_bio(BIO *bp, PKCS12 **p12)
111 {
112     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(PKCS12), bp, p12);
113 }
114 #ifndef OPENSSL_NO_FP_API
115 PKCS12 *d2i_PKCS12_fp(FILE *fp, PKCS12 **p12)
116 {
117     return ASN1_item_d2i_fp(ASN1_ITEM_rptr(PKCS12), fp, p12);
118 }
119 #endif
120
121 PKCS12_SAFEBAG *PKCS12_x5092certbag(X509 *x509)
122 {
123     return PKCS12_item_pack_safebag(x509, ASN1_ITEM_rptr(X509),
124                                     NID_x509Certificate, NID_certBag);
125 }
126
127 PKCS12_SAFEBAG *PKCS12_x509crl2certbag(X509_CRL *crl)
```



```

128 {
129     return PKCS12_item_pack_safepack(crl, ASN1_ITEM_rptr(X509_CRL),
130         NID_x509Crl, NID_crlBag);
131 }

133 X509 *PKCS12_certbag2x509(PKCS12_SAFEBAG *bag)
134 {
135     if(M_PKCS12_bag_type(bag) != NID_certBag) return NULL;
136     if(M_PKCS12_cert_bag_type(bag) != NID_x509Certificate) return NULL;
137     return ASN1_item_unpack(bag->value.bag->value.octet, ASN1_ITEM_rptr(X509)
138 );
139 }

140 X509_CRL *PKCS12_certbag2x509crl(PKCS12_SAFEBAG *bag)
141 {
142     if(M_PKCS12_bag_type(bag) != NID_crlBag) return NULL;
143     if(M_PKCS12_cert_bag_type(bag) != NID_x509Crl) return NULL;
144     return ASN1_item_unpack(bag->value.bag->value.octet,
145         ASN1_ITEM_rptr(X509_CRL)
146 );
147 }

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/pk12err.c

1

```
*****
6783 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs12/pk12err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/pk12err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/pkcs12.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_PKCS12,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_PKCS12,0,reason)

71 static ERR_STRING_DATA PKCS12_str_functs[]=
72 {
73 {ERR_FUNC(PKCS12_F_PARSE_BAG), "PARSE_BAG"},
74 {ERR_FUNC(PKCS12_F_PARSE_BAGS), "PARSE_BAGS"},
75 {ERR_FUNC(PKCS12_F_PKCS12_ADD_FRIENDLYNAME), "PKCS12_ADD_FRIENDLYNAME"},
76 {ERR_FUNC(PKCS12_F_PKCS12_ADD_FRIENDLYNAME_ASC), "PKCS12_add_friendlyname"},
77 {ERR_FUNC(PKCS12_F_PKCS12_ADD_FRIENDLYNAME_UNI), "PKCS12_add_friendlyname"},
78 {ERR_FUNC(PKCS12_F_PKCS12_ADD_LOCALKEYID), "PKCS12_add_localkeyid"},
79 {ERR_FUNC(PKCS12_F_PKCS12_CREATE), "PKCS12_create"},
80 {ERR_FUNC(PKCS12_F_PKCS12_GEN_MAC), "PKCS12_gen_mac"},
81 {ERR_FUNC(PKCS12_F_PKCS12_INIT), "PKCS12_init"},
82 {ERR_FUNC(PKCS12_F_PKCS12_ITEM_DECRYPT_D2I), "PKCS12_item_decrypt_d2i"},
83 {ERR_FUNC(PKCS12_F_PKCS12_ITEM_I2D_ENCRYPT), "PKCS12_item_i2d_encrypt"},
84 {ERR_FUNC(PKCS12_F_PKCS12_ITEM_PACK_SAFEBAG), "PKCS12_item_pack_safebag"},
85 {ERR_FUNC(PKCS12_F_PKCS12_KEY_GEN_ASC), "PKCS12_key_gen_asc"},
86 {ERR_FUNC(PKCS12_F_PKCS12_KEY_GEN_UNI), "PKCS12_key_gen_uni"},
87 {ERR_FUNC(PKCS12_F_PKCS12_MAKE_KEYBAG), "PKCS12_MAKE_KEYBAG"},
88 {ERR_FUNC(PKCS12_F_PKCS12_MAKE_SHKEYBAG), "PKCS12_MAKE_SHKEYBAG"},
89 {ERR_FUNC(PKCS12_F_PKCS12_NEWPASS), "PKCS12_newpass"},
90 {ERR_FUNC(PKCS12_F_PKCS12_PACK_P7DATA), "PKCS12_pack_p7data"},
91 {ERR_FUNC(PKCS12_F_PKCS12_PACK_P7ENCDATA), "PKCS12_pack_p7encdata"},
92 {ERR_FUNC(PKCS12_F_PKCS12_PARSE), "PKCS12_parse"},
93 {ERR_FUNC(PKCS12_F_PKCS12_PBE_CRYPT), "PKCS12_pbe_crypt"},
94 {ERR_FUNC(PKCS12_F_PKCS12_PBE_KEYIVGEN), "PKCS12_PBE_keyivgen"},
95 {ERR_FUNC(PKCS12_F_PKCS12_SETUP_MAC), "PKCS12_setup_mac"},
96 {ERR_FUNC(PKCS12_F_PKCS12_SET_MAC), "PKCS12_set_mac"},
97 {ERR_FUNC(PKCS12_F_PKCS12_UNPACK_AUTHSAFES), "PKCS12_unpack_authsafes"},
98 {ERR_FUNC(PKCS12_F_PKCS12_UNPACK_P7DATA), "PKCS12_unpack_p7data"},
99 {ERR_FUNC(PKCS12_F_PKCS12_VERIFY_MAC), "PKCS12_verify_mac"},
100 {ERR_FUNC(PKCS12_F_PKCS8_ADD_KEYUSAGE), "PKCS8_add_keyusage"},
101 {ERR_FUNC(PKCS12_F_PKCS8_ENCRYPT), "PKCS8_encrypt"},
102 {0,NULL}
103 };

105 static ERR_STRING_DATA PKCS12_str_reasons[]=
106 {
107 {ERR_REASON(PKCS12_R_CANT_PACK_STRUCTURE),"cant pack structure"},
108 {ERR_REASON(PKCS12_R_CONTENT_TYPE_NOT_DATA),"content type not data"},
109 {ERR_REASON(PKCS12_R_DECODE_ERROR),"decode error"},
110 {ERR_REASON(PKCS12_R_ENCODE_ERROR),"encode error"},
111 {ERR_REASON(PKCS12_R_ENCRYPT_ERROR),"encrypt error"},
112 {ERR_REASON(PKCS12_R_ERROR_SETTING_ENCRYPTED_DATA_TYPE),"error setting encrypted"},
113 {ERR_REASON(PKCS12_R_INVALID_NULL_ARGUMENT),"invalid null argument"},
114 {ERR_REASON(PKCS12_R_INVALID_NULL_PKCS12_POINTER),"invalid null pkcs12 pointer"},
115 {ERR_REASON(PKCS12_R_IV_GEN_ERROR),"iv gen error"},
116 {ERR_REASON(PKCS12_R_KEY_GEN_ERROR),"key gen error"},
117 {ERR_REASON(PKCS12_R_MAC_ABSENT),"mac absent"},
118 {ERR_REASON(PKCS12_R_MAC_GENERATION_ERROR),"mac generation error"},
119 {ERR_REASON(PKCS12_R_MAC_SETUP_ERROR),"mac setup error"},
120 {ERR_REASON(PKCS12_R_MAC_STRING_SET_ERROR),"mac string set error"},
121 {ERR_REASON(PKCS12_R_MAC_VERIFY_ERROR),"mac verify error"},
122 {ERR_REASON(PKCS12_R_MAC_VERIFY_FAILURE),"mac verify failure"},
123 {ERR_REASON(PKCS12_R_PARSE_ERROR),"parse error"},
124 {ERR_REASON(PKCS12_R_PKCS12_ALGOR_CIPHERINIT_ERROR),"pkcs12 algor cipherinit err"},
125 {ERR_REASON(PKCS12_R_PKCS12_CIPHERFINAL_ERROR),"pkcs12 cipherfinal error"},
126 {ERR_REASON(PKCS12_R_PKCS12_PBE_CRYPT_ERROR),"pkcs12 pbe crypt error"},
127 {ERR_REASON(PKCS12_R_UNKNOWN_DIGEST_ALGORITHM),"unknown digest algorithm"},
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs12/pk12err.c

3

```
128 {ERR_REASON(PKCS12_R_UNSUPPORTED_PKCS12_MODE),"unsupported pkcs12 mode"},
129 {0,NULL}
130 };
132 #endif
134 void ERR_load_PKCS12_strings(void)
135 {
136 #ifndef OPENSSL_NO_ERR
138     if (ERR_func_error_string(PKCS12_str_functs[0].error) == NULL)
139     {
140         ERR_load_strings(0,PKCS12_str_functs);
141         ERR_load_strings(0,PKCS12_str_reasons);
142     }
143 #endif
144 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/bio_pk7.c

1

```
*****
2913 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/bio_pk7.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* bio_pk7.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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7  *
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  */
53
55 #include <openssl/asn1.h>
56 #include <openssl/pkcs7.h>
57 #include <openssl/bio.h>
58
59 #if !defined(OPENSSL_SYSNAME_NETWARE) && !defined(OPENSSL_SYSNAME_VXWORKS)
60 #include <memory.h>
61 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/bio_pk7.c

2

```
62 #include <stdio.h>
63
64 /* Streaming encode support for PKCS#7 */
65
66 BIO *BIO_new_PKCS7(BIO *out, PKCS7 *p7)
67 {
68     return BIO_new_NDEF(out, (ASN1_VALUE *)p7, ASN1_ITEM_rptr(PKCS7));
69 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_asn1.c

1

```
*****
9354 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* pk7_asn1.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_asn1.c

2

```
62 #include <openssl/pkcs7.h>
63 #include <openssl/x509.h>

65 /* PKCS#7 ASN1 module */

67 /* This is the ANY DEFINED BY table for the top level PKCS#7 structure */

69 ASN1_ADB_TEMPLATE(p7default) = ASN1_EXP_OPT(PKCS7, d.other, ASN1_ANY, 0);

71 ASN1_ADB(PKCS7) = {
72     ADB_ENTRY(NID_pkcs7_data, ASN1_NDEF_EXP_OPT(PKCS7, d.data, ASN1_OCTET_ST
73     ADB_ENTRY(NID_pkcs7_signed, ASN1_NDEF_EXP_OPT(PKCS7, d.sign, PKCS7_SIGNE
74     ADB_ENTRY(NID_pkcs7_enveloped, ASN1_NDEF_EXP_OPT(PKCS7, d.enveloped, PKC
75     ADB_ENTRY(NID_pkcs7_signedAndEnveloped, ASN1_NDEF_EXP_OPT(PKCS7, d.sign
76     ADB_ENTRY(NID_pkcs7_digest, ASN1_NDEF_EXP_OPT(PKCS7, d.digest, PKCS7_DIG
77     ADB_ENTRY(NID_pkcs7_encrypted, ASN1_NDEF_EXP_OPT(PKCS7, d.encrypted, PKC
78 } ASN1_ADB_END(PKCS7, 0, type, 0, &p7default_tt, NULL);

80 /* PKCS#7 streaming support */
81 static int pk7_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
82                  void *exarg)
83 {
84     ASN1_STREAM_ARG *sarg = exarg;
85     PKCS7 **pp7 = (PKCS7 **)pval;

87     switch(operation)
88     {
89     case ASN1_OP_STREAM_PRE:
90         if (PKCS7_stream(&sarg->boundary, *pp7) <= 0)
91             return 0;
92     case ASN1_OP_DETACHED_PRE:
93         sarg->ndef_bio = PKCS7_dataInit(*pp7, sarg->out);
94         if (!sarg->ndef_bio)
95             return 0;
96     case ASN1_OP_STREAM_POST:
97         case ASN1_OP_DETACHED_POST:
98             if (PKCS7_dataFinal(*pp7, sarg->ndef_bio) <= 0)
99                 return 0;
100             break;
101     }
102     return 1;
103 }

105
106
107 }

109 ASN1_NDEF_SEQUENCE_cb(PKCS7, pk7_cb) = {
110     ASN1_SIMPLE(PKCS7, type, ASN1_OBJECT),
111     ASN1_ADB_OBJECT(PKCS7)
112 } ASN1_NDEF_SEQUENCE_END_cb(PKCS7, PKCS7)

114 IMPLEMENT_ASN1_FUNCTIONS(PKCS7)
115 IMPLEMENT_ASN1_NDEF_FUNCTION(PKCS7)
116 IMPLEMENT_ASN1_DUP_FUNCTION(PKCS7)

118 ASN1_NDEF_SEQUENCE(PKCS7_SIGNED) = {
119     ASN1_SIMPLE(PKCS7_SIGNED, version, ASN1_INTEGER),
120     ASN1_SET_OF(PKCS7_SIGNED, md_algs, X509_ALGOR),
121     ASN1_SIMPLE(PKCS7_SIGNED, contents, PKCS7),
122     ASN1_IMP_SEQUENCE_OF_OPT(PKCS7_SIGNED, cert, X509, 0),
123     ASN1_IMP_SET_OF_OPT(PKCS7_SIGNED, crl, X509_CRL, 1),
124     ASN1_SET_OF(PKCS7_SIGNED, signer_info, PKCS7_SIGNER_INFO)
125 } ASN1_NDEF_SEQUENCE_END(PKCS7_SIGNED)

127 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_SIGNED)
```

```

129 /* Minor tweak to operation: free up EVP_PKEY */
130 static int si_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
131                 void *exarg)
132 {
133     if(operation == ASN1_OP_FREE_POST) {
134         PKCS7_SIGNER_INFO *si = (PKCS7_SIGNER_INFO *)*pval;
135         EVP_PKEY_free(si->pkey);
136     }
137     return 1;
138 }
139
140 ASN1_SEQUENCE_cb(PKCS7_SIGNER_INFO, si_cb) = {
141     ASN1_SIMPLE(PKCS7_SIGNER_INFO, version, ASN1_INTEGER),
142     ASN1_SIMPLE(PKCS7_SIGNER_INFO, issuer_and_serial, PKCS7_ISSUER_AND_SERIAL),
143     ASN1_SIMPLE(PKCS7_SIGNER_INFO, digest_alg, X509_ALGOR),
144     /* NB this should be a SET OF but we use a SEQUENCE OF so the
145      * original order * is retained when the structure is reencoded.
146      * Since the attributes are implicitly tagged this will not affect
147      * the encoding.
148      */
149     ASN1_IMP_SEQUENCE_OF_OPT(PKCS7_SIGNER_INFO, auth_attr, X509_ATTRIBUTE, 0),
150     ASN1_SIMPLE(PKCS7_SIGNER_INFO, digest_enc_alg, X509_ALGOR),
151     ASN1_SIMPLE(PKCS7_SIGNER_INFO, enc_digest, ASN1_OCTET_STRING),
152     ASN1_IMP_SET_OF_OPT(PKCS7_SIGNER_INFO, unauth_attr, X509_ATTRIBUTE, 1)
153 } ASN1_SEQUENCE_END_cb(PKCS7_SIGNER_INFO, PKCS7_SIGNER_INFO)
154
155 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_SIGNER_INFO)
156
157 ASN1_SEQUENCE(PKCS7_ISSUER_AND_SERIAL) = {
158     ASN1_SIMPLE(PKCS7_ISSUER_AND_SERIAL, issuer, X509_NAME),
159     ASN1_SIMPLE(PKCS7_ISSUER_AND_SERIAL, serial, ASN1_INTEGER)
160 } ASN1_SEQUENCE_END(PKCS7_ISSUER_AND_SERIAL)
161
162 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_ISSUER_AND_SERIAL)
163
164 ASN1_NDEF_SEQUENCE(PKCS7_ENVELOPE) = {
165     ASN1_SIMPLE(PKCS7_ENVELOPE, version, ASN1_INTEGER),
166     ASN1_SET_OF(PKCS7_ENVELOPE, recipientinfo, PKCS7_RECIP_INFO),
167     ASN1_SIMPLE(PKCS7_ENVELOPE, enc_data, PKCS7_ENC_CONTENT)
168 } ASN1_NDEF_SEQUENCE_END(PKCS7_ENVELOPE)
169
170 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_ENVELOPE)
171
172 /* Minor tweak to operation: free up X509 */
173 static int ri_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
174                 void *exarg)
175 {
176     if(operation == ASN1_OP_FREE_POST) {
177         PKCS7_RECIP_INFO *ri = (PKCS7_RECIP_INFO *)*pval;
178         X509_free(ri->cert);
179     }
180     return 1;
181 }
182
183 ASN1_SEQUENCE_cb(PKCS7_RECIP_INFO, ri_cb) = {
184     ASN1_SIMPLE(PKCS7_RECIP_INFO, version, ASN1_INTEGER),
185     ASN1_SIMPLE(PKCS7_RECIP_INFO, issuer_and_serial, PKCS7_ISSUER_AND_SERIAL),
186     ASN1_SIMPLE(PKCS7_RECIP_INFO, key_enc_algor, X509_ALGOR),
187     ASN1_SIMPLE(PKCS7_RECIP_INFO, enc_key, ASN1_OCTET_STRING)
188 } ASN1_SEQUENCE_END_cb(PKCS7_RECIP_INFO, PKCS7_RECIP_INFO)
189
190 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_RECIP_INFO)
191
192 ASN1_NDEF_SEQUENCE(PKCS7_ENC_CONTENT) = {
193     ASN1_SIMPLE(PKCS7_ENC_CONTENT, content_type, ASN1_OBJECT),

```

```

194     ASN1_SIMPLE(PKCS7_ENC_CONTENT, algorithm, X509_ALGOR),
195     ASN1_IMP_OPT(PKCS7_ENC_CONTENT, enc_data, ASN1_OCTET_STRING_NDEF, 0)
196 } ASN1_NDEF_SEQUENCE_END(PKCS7_ENC_CONTENT)
197
198 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_ENC_CONTENT)
199
200 ASN1_NDEF_SEQUENCE(PKCS7_SIGN_ENVELOPE) = {
201     ASN1_SIMPLE(PKCS7_SIGN_ENVELOPE, version, ASN1_INTEGER),
202     ASN1_SET_OF(PKCS7_SIGN_ENVELOPE, recipientinfo, PKCS7_RECIP_INFO),
203     ASN1_SET_OF(PKCS7_SIGN_ENVELOPE, md_algs, X509_ALGOR),
204     ASN1_SIMPLE(PKCS7_SIGN_ENVELOPE, enc_data, PKCS7_ENC_CONTENT),
205     ASN1_IMP_SET_OF_OPT(PKCS7_SIGN_ENVELOPE, cert, X509, 0),
206     ASN1_IMP_SET_OF_OPT(PKCS7_SIGN_ENVELOPE, crl, X509_CRL, 1),
207     ASN1_SET_OF(PKCS7_SIGN_ENVELOPE, signer_info, PKCS7_SIGNER_INFO)
208 } ASN1_NDEF_SEQUENCE_END(PKCS7_SIGN_ENVELOPE)
209
210 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_SIGN_ENVELOPE)
211
212 ASN1_NDEF_SEQUENCE(PKCS7_ENCRYPT) = {
213     ASN1_SIMPLE(PKCS7_ENCRYPT, version, ASN1_INTEGER),
214     ASN1_SIMPLE(PKCS7_ENCRYPT, enc_data, PKCS7_ENC_CONTENT)
215 } ASN1_NDEF_SEQUENCE_END(PKCS7_ENCRYPT)
216
217 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_ENCRYPT)
218
219 ASN1_NDEF_SEQUENCE(PKCS7_DIGEST) = {
220     ASN1_SIMPLE(PKCS7_DIGEST, version, ASN1_INTEGER),
221     ASN1_SIMPLE(PKCS7_DIGEST, md, X509_ALGOR),
222     ASN1_SIMPLE(PKCS7_DIGEST, contents, PKCS7),
223     ASN1_SIMPLE(PKCS7_DIGEST, digest, ASN1_OCTET_STRING)
224 } ASN1_NDEF_SEQUENCE_END(PKCS7_DIGEST)
225
226 IMPLEMENT_ASN1_FUNCTIONS(PKCS7_DIGEST)
227
228 /* Specials for authenticated attributes */
229
230 /* When signing attributes we want to reorder them to match the sorted
231  * encoding.
232  */
233
234 ASN1_ITEM_TEMPLATE(PKCS7_ATTR_SIGN) =
235     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SET_ORDER, 0, PKCS7_ATTRIBUTES, X509_ATT
236     ASN1_ITEM_TEMPLATE_END(PKCS7_ATTR_SIGN)
237
238 /* When verifying attributes we need to use the received order. So
239  * we use SEQUENCE OF and tag it to SET OF
240  */
241
242 ASN1_ITEM_TEMPLATE(PKCS7_ATTR_VERIFY) =
243     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF | ASN1_TFLG_IMPTAG | ASN1_TF
244     V_ASN1_SET, PKCS7_ATTRIBUTES, X509_ATTRIBUTE)
245     ASN1_ITEM_TEMPLATE_END(PKCS7_ATTR_VERIFY)
246
247 IMPLEMENT_ASN1_PRINT_FUNCTION(PKCS7)

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_attr.c

1

```
*****
5597 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_attr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* pk7_attr.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001-2004 The OpenSSL Project. All rights reserved.
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <openssl/bio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_attr.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/pem.h>
65 #include <openssl/pkcs7.h>
66 #include <openssl/x509.h>
67 #include <openssl/err.h>

69 int PKCS7_add_attrib_smimecap(PKCS7_SIGNER_INFO *si, STACK_OF(X509_ALGOR) *cap)
70 {
71     ASN1_STRING *seq;
72     if(!(seq = ASN1_STRING_new())) {
73         PKCS7err(PKCS7_F_PKCS7_ADD_ATTRIB_SMIMECAP,ERR_R_MALLOC_FAILURE)
74         return 0;
75     }
76     seq->length = ASN1_item_i2d((ASN1_VALUE *)cap,&seq->data,
77                               ASN1_ITEM_rptr(X509_ALGORS));
78     return PKCS7_add_signed_attribute(si, NID_SMIMECapabilities,
79                                     V_ASN1_SEQUENCE, seq);
80 }

82 STACK_OF(X509_ALGOR) *PKCS7_get_smimecap(PKCS7_SIGNER_INFO *si)
83 {
84     ASN1_TYPE *cap;
85     const unsigned char *p;

87     cap = PKCS7_get_signed_attribute(si, NID_SMIMECapabilities);
88     if (!cap || (cap->type != V_ASN1_SEQUENCE))
89         return NULL;
90     p = cap->value.sequence->data;
91     return (STACK_OF(X509_ALGOR) *)
92         ASN1_item_d2i(NULL, &p, cap->value.sequence->length,
93                     ASN1_ITEM_rptr(X509_ALGORS));
94 }

96 /* Basic smime-capabilities OID and optional integer arg */
97 int PKCS7_simple_smimecap(STACK_OF(X509_ALGOR) *sk, int nid, int arg)
98 {
99     X509_ALGOR *alg;

101     if(!(alg = X509_ALGOR_new())) {
102         PKCS7err(PKCS7_F_PKCS7_SIMPLE_SMIMECAP,ERR_R_MALLOC_FAILURE);
103         return 0;
104     }
105     ASN1_OBJECT_free(alg->algorithm);
106     alg->algorithm = OBJ_nid2obj(nid);
107     if (arg > 0) {
108         ASN1_INTEGER *nbit;
109         if(!(alg->parameter = ASN1_TYPE_new())) {
110             PKCS7err(PKCS7_F_PKCS7_SIMPLE_SMIMECAP,ERR_R_MALLOC_FAIL)
111             return 0;
112         }
113         if(!(nbit = ASN1_INTEGER_new())) {
114             PKCS7err(PKCS7_F_PKCS7_SIMPLE_SMIMECAP,ERR_R_MALLOC_FAIL)
115             return 0;
116         }
117         if(!ASN1_INTEGER_set(nbit, arg)) {
118             PKCS7err(PKCS7_F_PKCS7_SIMPLE_SMIMECAP,ERR_R_MALLOC_FAIL)
119             return 0;
120         }
121         alg->parameter->value.integer = nbit;
122         alg->parameter->type = V_ASN1_INTEGER;
123     }
124     sk_X509_ALGOR_push(sk, alg);
125     return 1;
126 }
```

```
128 int PKCS7_add_attrib_content_type(PKCS7_SIGNER_INFO *si, ASN1_OBJECT *coid)
129 {
130     if (PKCS7_get_signed_attribute(si, NID_pkcs9_contentType))
131         return 0;
132     if (!coid)
133         coid = OBJ_nid2obj(NID_pkcs7_data);
134     return PKCS7_add_signed_attribute(si, NID_pkcs9_contentType,
135                                     V_ASN1_OBJECT, coid);
136 }

138 int PKCS7_add0_attrib_signing_time(PKCS7_SIGNER_INFO *si, ASN1_TIME *t)
139 {
140     if (!t && !(t=X509_gmtime_adj(NULL,0)))
141     {
142         PKCS7err(PKCS7_F_PKCS7_ADD0_ATTRIB_SIGNING_TIME,
143                 ERR_R_MALLOC_FAILURE);
144         return 0;
145     }
146     return PKCS7_add_signed_attribute(si, NID_pkcs9_signingTime,
147                                     V_ASN1_UTCTIME, t);
148 }

150 int PKCS7_add1_attrib_digest(PKCS7_SIGNER_INFO *si,
151                             const unsigned char *md, int mdlen)
152 {
153     ASN1_OCTET_STRING *os;
154     os = ASN1_OCTET_STRING_new();
155     if (!os)
156         return 0;
157     if (!ASN1_STRING_set(os, md, mdlen)
158         || !PKCS7_add_signed_attribute(si, NID_pkcs9_messageDigest,
159                                     V_ASN1_OCTET_STRING, os))
160     {
161         ASN1_OCTET_STRING_free(os);
162         return 0;
163     }
164     return 1;
165 }
```


new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_doit.c

1

30711 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_doit.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/pkcs7/pk7_doit.c */
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4  *
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6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/rand.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_doit.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64 #include <openssl/x509v3.h>
65 #include <openssl/err.h>
66
67 static int add_attribute(STACK_OF(X509_ATTRIBUTE) **sk, int nid, int attrtype,
68                          void *value);
69 static ASN1_TYPE *get_attribute(STACK_OF(X509_ATTRIBUTE) *sk, int nid);
70
71 static int PKCS7_type_is_other(PKCS7 * p7)
72 {
73     int isOther=1;
74
75     int nid=OBJ_obj2nid(p7->type);
76
77     switch( nid )
78     {
79         case NID_pkcs7_data:
80         case NID_pkcs7_signed:
81         case NID_pkcs7_enveloped:
82         case NID_pkcs7_signedAndEnveloped:
83         case NID_pkcs7_digest:
84         case NID_pkcs7_encrypted:
85             isOther=0;
86             break;
87         default:
88             isOther=1;
89     }
90
91     return isOther;
92 }
93
94 static ASN1_OCTET_STRING *PKCS7_get_octet_string(PKCS7 *p7)
95 {
96     if ( PKCS7_type_is_data(p7) )
97         return p7->d.data;
98     if ( PKCS7_type_is_other(p7) && p7->d.other
99         && (p7->d.other->type == V_ASN1_OCTET_STRING) )
100         return p7->d.other->value.octet_string;
101     return NULL;
102 }
103
104 static int PKCS7_bio_add_digest(BIO **pbio, X509_ALGOR *alg)
105 {
106     BIO *btmp;
107     const EVP_MD *md;
108     if ((btmp=BIO_new(BIO_f_md())) == NULL)
109     {
110         PKCS7err(PKCS7_F_PKCS7_BIO_ADD_DIGEST,ERR_R_BIO_LIB);
111         goto err;
112     }
113
114     md=EVP_get_digestbyobj(alg->algorithm);
115     if (md == NULL)
116     {
117         PKCS7err(PKCS7_F_PKCS7_BIO_ADD_DIGEST,PKCS7_R_UNKNOWN_DIGEST_TYP);
118         goto err;
119     }
120
121     BIO_set_md(btmp,md);
122     if (*pbio == NULL)
123         *pbio=btmp;
124     else if (!BIO_push(*pbio,btmp))
125     {
126         PKCS7err(PKCS7_F_PKCS7_BIO_ADD_DIGEST,ERR_R_BIO_LIB);
127     }
```

```

128         goto err;
129     }
130     btmp=NULL;

132     return 1;

134     err:
135     if (btmp)
136         BIO_free(btmp);
137     return 0;

139 }

141 static int pkcs7_encode_rinfo(PKCS7_RECIP_INFO *ri,
142                               unsigned char *key, int keylen)
143 {
144     EVP_PKEY_CTX *pctx = NULL;
145     EVP_PKEY *pkey = NULL;
146     unsigned char *ek = NULL;
147     int ret = 0;
148     size_t eklen;

150     pkey = X509_get_pubkey(ri->cert);
151     if (!pkey)
152         return 0;

153     pctx = EVP_PKEY_CTX_new(pkey, NULL);
154     if (!pctx)
155         return 0;

156     if (EVP_PKEY_encrypt_init(pctx) <= 0)
157         goto err;

158     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_ENCRYPT,
159                           EVP_PKEY_CTRL_PKCS7_ENCODE_RINFO, 0, ri) <= 0)
160     {
161         PKCS7err(PKCS7_F_PKCS7_ENCODE_RINFO, PKCS7_R_CTRL_ERROR);
162         goto err;
163     }

164     if (EVP_PKEY_encrypt(pctx, NULL, &eklen, key, keylen) <= 0)
165         goto err;

166     ek = OPENSSL_malloc(eklen);
167     if (ek == NULL)
168     {
169         PKCS7err(PKCS7_F_PKCS7_ENCODE_RINFO, ERR_R_MALLOC_FAILURE);
170         goto err;
171     }

172     if (EVP_PKEY_encrypt(pctx, ek, &eklen, key, keylen) <= 0)
173         goto err;

174     ASN1_STRING_set0(ri->enc_key, ek, eklen);
175     ek = NULL;

176     ret = 1;

177     err:
178     if (pkey)
179         EVP_PKEY_free(pkey);
180     if (pctx)
181         EVP_PKEY_CTX_free(pctx);
182     if (ek)

```

```

194         OPENSSL_free(ek);
195     return ret;

197 }

200 static int pkcs7_decrypt_rinfo(unsigned char **pek, int *peklen,
201                                PKCS7_RECIP_INFO *ri, EVP_PKEY *pkey)
202 {
203     EVP_PKEY_CTX *pctx = NULL;
204     unsigned char *ek = NULL;
205     size_t eklen;

207     int ret = -1;

209     pctx = EVP_PKEY_CTX_new(pkey, NULL);
210     if (!pctx)
211         return -1;

212     if (EVP_PKEY_decrypt_init(pctx) <= 0)
213         goto err;

214     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_DECRYPT,
215                           EVP_PKEY_CTRL_PKCS7_DECRYPT, 0, ri) <= 0)
216     {
217         PKCS7err(PKCS7_F_PKCS7_DECRYPT_RINFO, PKCS7_R_CTRL_ERROR);
218         goto err;
219     }

220     if (EVP_PKEY_decrypt(pctx, NULL, &eklen,
221                           ri->enc_key->data, ri->enc_key->length) <= 0)
222         goto err;

223     ek = OPENSSL_malloc(eklen);
224     if (ek == NULL)
225     {
226         PKCS7err(PKCS7_F_PKCS7_DECRYPT_RINFO, ERR_R_MALLOC_FAILURE);
227         goto err;
228     }

229     if (EVP_PKEY_decrypt(pctx, ek, &eklen,
230                           ri->enc_key->data, ri->enc_key->length) <= 0)
231     {
232         ret = 0;
233         PKCS7err(PKCS7_F_PKCS7_DECRYPT_RINFO, ERR_R_EVP_LIB);
234         goto err;
235     }

236     ret = 1;

237     if (*pek)
238     {
239         OPENSSL_cleanse(*pek, *peklen);
240         OPENSSL_free(*pek);
241     }

242     *pek = ek;
243     *peklen = eklen;

244     err:
245     if (pctx)
246         EVP_PKEY_CTX_free(pctx);
247     if (!ret && ek)
248         OPENSSL_free(ek);

```

```

260     return ret;
261 }

263 BIO *PKCS7_dataInit(PKCS7 *p7, BIO *bio)
264 {
265     int i;
266     BIO *out=NULL, *btmp=NULL;
267     X509_ALGOR *xa = NULL;
268     const EVP_CIPHER *evp_cipher=NULL;
269     STACK_OF(X509_ALGOR) *md_sk=NULL;
270     STACK_OF(PKCS7_RECIP_INFO) *rsk=NULL;
271     X509_ALGOR *xalg=NULL;
272     PKCS7_RECIP_INFO *ri=NULL;
273     ASN1_OCTET_STRING *os=NULL;

275     i=OBJ_obj2nid(p7->type);
276     p7->state=PKCS7_S_HEADER;

278     switch (i)
279     {
280     case NID_pkcs7_signed:
281         md_sk=p7->d.sign->md_algs;
282         os = PKCS7_get_octet_string(p7->d.sign->contents);
283         break;
284     case NID_pkcs7_signedAndEnveloped:
285         rsk=p7->d.signed_and_enveloped->recipientinfo;
286         md_sk=p7->d.signed_and_enveloped->md_algs;
287         xalg=p7->d.signed_and_enveloped->enc_data->algorithm;
288         evp_cipher=p7->d.signed_and_enveloped->enc_data->cipher;
289         if (evp_cipher == NULL)
290         {
291             PKCS7err(PKCS7_F_PKCS7_DATAINIT,
292                     PKCS7_R_CIPHER_NOT_INITIALIZED);
293             goto err;
294         }
295         break;
296     case NID_pkcs7_enveloped:
297         rsk=p7->d.enveloped->recipientinfo;
298         xalg=p7->d.enveloped->enc_data->algorithm;
299         evp_cipher=p7->d.enveloped->enc_data->cipher;
300         if (evp_cipher == NULL)
301         {
302             PKCS7err(PKCS7_F_PKCS7_DATAINIT,
303                     PKCS7_R_CIPHER_NOT_INITIALIZED);
304             goto err;
305         }
306         break;
307     case NID_pkcs7_digest:
308         xa = p7->d.digest->md;
309         os = PKCS7_get_octet_string(p7->d.digest->contents);
310         break;
311     case NID_pkcs7_data:
312         break;
313     default:
314         PKCS7err(PKCS7_F_PKCS7_DATAINIT, PKCS7_R_UNSUPPORTED_CONTENT_TYPE);
315         goto err;
316     }

318     for (i=0; i<sk_X509_ALGOR_num(md_sk); i++)
319         if (!PKCS7_bio_add_digest(&out, sk_X509_ALGOR_value(md_sk, i)))
320             goto err;

322     if (xa && !PKCS7_bio_add_digest(&out, xa))
323         goto err;

325     if (evp_cipher != NULL)

```

```

326     {
327         unsigned char key[EVP_MAX_KEY_LENGTH];
328         unsigned char iv[EVP_MAX_IV_LENGTH];
329         int keylen, ivlen;
330         EVP_CIPHER_CTX *ctx;

332         if ((btmp=BIO_new(BIO_f_cipher())) == NULL)
333         {
334             PKCS7err(PKCS7_F_PKCS7_DATAINIT, ERR_R_BIO_LIB);
335             goto err;
336         }
337         BIO_get_cipher_ctx(btmp, &ctx);
338         keylen=EVP_CIPHER_key_length(evp_cipher);
339         ivlen=EVP_CIPHER_iv_length(evp_cipher);
340         xalg->algorithm = OBJ_nid2obj(EVP_CIPHER_type(evp_cipher));
341         if (ivlen > 0)
342             if (RAND_pseudo_bytes(iv, ivlen) <= 0)
343                 goto err;
344         if (EVP_CipherInit_ex(ctx, evp_cipher, NULL, NULL, NULL, 1) <= 0)
345             goto err;
346         if (EVP_CIPHER_CTX_rand_key(ctx, key) <= 0)
347             goto err;
348         if (EVP_CipherInit_ex(ctx, NULL, NULL, key, iv, 1) <= 0)
349             goto err;

351         if (ivlen > 0) {
352             if (xalg->parameter == NULL) {
353                 xalg->parameter = ASN1_TYPE_new();
354                 if (xalg->parameter == NULL)
355                     goto err;
356             }
357             if (EVP_CIPHER_param_to_asn1(ctx, xalg->parameter) < 0)
358                 goto err;
359         }

361         /* Lets do the pub key stuff :- */
362         for (i=0; i<sk_PKCS7_RECIP_INFO_num(rsk); i++)
363         {
364             ri=sk_PKCS7_RECIP_INFO_value(rsk, i);
365             if (pkcs7_encode_rinfo(ri, key, keylen) <= 0)
366                 goto err;
367         }
368         OPENSSL_cleanse(key, keylen);

370         if (out == NULL)
371             out=btmp;
372         else
373             BIO_push(out, btmp);
374         btmp=NULL;
375     }

377     if (bio == NULL)
378     {
379         if (PKCS7_is_detached(p7))
380             bio=BIO_new(BIO_s_null());
381         else if (os && os->length > 0)
382             bio = BIO_new_mem_buf(os->data, os->length);
383         if (bio == NULL)
384         {
385             bio=BIO_new(BIO_s_mem());
386             if (bio == NULL)
387                 goto err;
388             BIO_set_mem_eof_return(bio, 0);
389         }
390     }
391     if (out)

```

```

392     BIO_push(out,bio);
393     else
394         out = bio;
395     bio=NULL;
396     if (0)
397     {
398 err:
399         if (out != NULL)
400             BIO_free_all(out);
401         if (btmp != NULL)
402             BIO_free_all(btmp);
403         out=NULL;
404     }
405     return(out);
406 }

408 static int pkcs7_cmp_ri(PKCS7_RECIP_INFO *ri, X509 *pcert)
409 {
410     int ret;
411     ret = X509_NAME_cmp(ri->issuer_and_serial->issuer,
412                        pcert->cert_info->issuer);
413     if (ret)
414         return ret;
415     return M_ASN1_INTEGER_cmp(pcert->cert_info->serialNumber,
416                              ri->issuer_and_serial->serial);
417 }

419 /* int */
420 BIO *PKCS7_dataDecode(PKCS7 *p7, EVP_PKEY *pkey, BIO *in_bio, X509 *pcert)
421 {
422     int i,j;
423     BIO *out=NULL,*btmp=NULL,*etmp=NULL,*bio=NULL;
424     X509_ALGOR *xa;
425     ASN1_OCTET_STRING *data_body=NULL;
426     const EVP_MD *evp_md;
427     const EVP_CIPHER *evp_cipher=NULL;
428     EVP_CIPHER_CTX *evp_ctx=NULL;
429     X509_ALGOR *enc_alg=NULL;
430     STACK_OF(X509_ALGOR) *md_sk=NULL;
431     STACK_OF(PKCS7_RECIP_INFO) *rsk=NULL;
432     PKCS7_RECIP_INFO *ri=NULL;
433     unsigned char *ek = NULL, *tkey = NULL;
434     int eklen = 0, tkeylen = 0;

436     i=OBJ_obj2nid(p7->type);
437     p7->state=PKCS7_S_HEADER;

439     switch (i)
440     {
441     case NID_pkcs7_signed:
442         data_body=PKCS7_get_octet_string(p7->d.sign->contents);
443         md_sk=p7->d.sign->md_algs;
444         break;
445     case NID_pkcs7_signedAndEnveloped:
446         rsk=p7->d.signed_and_enveloped->recipientinfo;
447         md_sk=p7->d.signed_and_enveloped->md_algs;
448         data_body=p7->d.signed_and_enveloped->enc_data->enc_data;
449         enc_alg=p7->d.signed_and_enveloped->enc_data->algorithm;
450         evp_cipher=EVP_get_cipherbyobj(enc_alg->algorithm);
451         if (evp_cipher == NULL)
452         {
453             PKCS7err(PKCS7_F_PKCS7_DATADECODE,PKCS7_R_UNSUPPORTED_CI
454                     goto err;
455         }
456         break;
457     case NID_pkcs7_enveloped:

```

```

458         rsk=p7->d.enveloped->recipientinfo;
459         enc_alg=p7->d.enveloped->enc_data->algorithm;
460         data_body=p7->d.enveloped->enc_data->enc_data;
461         evp_cipher=EVP_get_cipherbyobj(enc_alg->algorithm);
462         if (evp_cipher == NULL)
463         {
464             PKCS7err(PKCS7_F_PKCS7_DATADECODE,PKCS7_R_UNSUPPORTED_CI
465                     goto err;
466         }
467         break;
468     default:
469         PKCS7err(PKCS7_F_PKCS7_DATADECODE,PKCS7_R_UNSUPPORTED_CONTENT_TY
470                 goto err;
471     }

473     /* We will be checking the signature */
474     if (md_sk != NULL)
475     {
476         for (i=0; i<sk_X509_ALGOR_num(md_sk); i++)
477         {
478             xa=sk_X509_ALGOR_value(md_sk,i);
479             if ((btmp=BIO_new(BIO_f_md())) == NULL)
480             {
481                 PKCS7err(PKCS7_F_PKCS7_DATADECODE,ERR_R_BIO_LIB)
482                 goto err;
483             }

485             j=OBJ_obj2nid(xa->algorithm);
486             evp_md=EVP_get_digestbynid(j);
487             if (evp_md == NULL)
488             {
489                 PKCS7err(PKCS7_F_PKCS7_DATADECODE,PKCS7_R_UNKNOW
490                         goto err;
491             }

493             BIO_set_md(btmp,evp_md);
494             if (out == NULL)
495                 out=btmp;
496             else
497                 BIO_push(out,btmp);
498             btmp=NULL;
499         }
500     }

502     if (evp_cipher != NULL)
503     {
504     #if 0
505         unsigned char key[EVP_MAX_KEY_LENGTH];
506         unsigned char iv[EVP_MAX_IV_LENGTH];
507         unsigned char *p;
508         int keylen,ivlen;
509         int max;
510         X509_OBJECT ret;
511     #endif

513         if ((etmp=BIO_new(BIO_f_cipher())) == NULL)
514         {
515             PKCS7err(PKCS7_F_PKCS7_DATADECODE,ERR_R_BIO_LIB);
516             goto err;
517         }

519         /* It was encrypted, we need to decrypt the secret key
520          * with the private key */

522         /* Find the recipientInfo which matches the passed certificate
523          * (if any)

```

```

524      */
525
526      if (pcert)
527      {
528          for (i=0; i<sk_PKCS7_RECIP_INFO_num(rsk); i++)
529          {
530              ri=sk_PKCS7_RECIP_INFO_value(rsk,i);
531              if (!pkcs7_cmp_ri(ri, pcert))
532                  break;
533              ri=NULL;
534          }
535          if (ri == NULL)
536          {
537              PKCS7err(PKCS7_F_PKCS7_DATADECODE,
538                      PKCS7_R_NO_RECIPIENT_MATCHES_CERTIFICATE);
539              goto err;
540          }
541      }
542
543      /* If we haven't got a certificate try each ri in turn */
544      if (pcert == NULL)
545      {
546          /* Always attempt to decrypt all rinfor even
547           * after success as a defence against MMA timing
548           * attacks.
549           */
550          for (i=0; i<sk_PKCS7_RECIP_INFO_num(rsk); i++)
551          {
552              ri=sk_PKCS7_RECIP_INFO_value(rsk,i);
553
554              if (pkcs7_decrypt_rinfo(&ek, &eklen,
555                                     ri, pkey) < 0)
556                  goto err;
557              ERR_clear_error();
558          }
559      }
560      else
561      {
562          /* Only exit on fatal errors, not decrypt failure */
563          if (pkcs7_decrypt_rinfo(&ek, &eklen, ri, pkey) < 0)
564              goto err;
565          ERR_clear_error();
566      }
567
568      evp_ctx=NULL;
569      BIO_get_cipher_ctx(etmp,&evp_ctx);
570      if (EVP_CipherInit_ex(evp_ctx, evp_cipher, NULL, NULL, NULL, 0) <= 0)
571          goto err;
572      if (EVP_CIPHER_asn1_to_param(evp_ctx, enc_alg->parameter) < 0)
573          goto err;
574      /* Generate random key as MMA defence */
575      tkeylen = EVP_CIPHER_CTX_key_length(evp_ctx);
576      tkey = OPENSSL_malloc(tkeylen);
577      if (!tkey)
578          goto err;
579      if (EVP_CIPHER_CTX_rand_key(evp_ctx, tkey) <= 0)
580          goto err;
581      if (ek == NULL)
582      {
583          ek = tkey;
584          eklen = tkeylen;
585          tkey = NULL;
586      }
587
588      if (eklen != EVP_CIPHER_CTX_key_length(evp_ctx)) {
589          /* Some S/MIME clients don't use the same key

```

```

590          * and effective key length. The key length is
591          * determined by the size of the decrypted RSA key.
592          */
593          if (!EVP_CIPHER_CTX_set_key_length(evp_ctx, eklen))
594          {
595              /* Use random key as MMA defence */
596              OPENSSL_cleanse(ek, eklen);
597              OPENSSL_free(ek);
598              ek = tkey;
599              eklen = tkeylen;
600              tkey = NULL;
601          }
602      }
603      /* Clear errors so we don't leak information useful in MMA */
604      ERR_clear_error();
605      if (EVP_CipherInit_ex(evp_ctx, NULL, NULL, ek, NULL, 0) <= 0)
606          goto err;
607
608      if (ek)
609      {
610          OPENSSL_cleanse(ek, eklen);
611          OPENSSL_free(ek);
612          ek = NULL;
613      }
614      if (tkey)
615      {
616          OPENSSL_cleanse(tkey, tkeylen);
617          OPENSSL_free(tkey);
618          tkey = NULL;
619      }
620
621      if (out == NULL)
622          out=etmp;
623      else
624          BIO_push(out, etmp);
625      etmp=NULL;
626
627
628      #if 1
629      if (PKCS7_is_detached(p7) || (in_bio != NULL))
630      {
631          bio=in_bio;
632      }
633      else
634      {
635          #if 0
636          bio=BIO_new(BIO_s_mem());
637          /* We need to set this so that when we have read all
638           * the data, the encrypt BIO, if present, will read
639           * EOF and encode the last few bytes */
640          BIO_set_mem_eof_return(bio, 0);
641
642          if (data_body->length > 0)
643              BIO_write(bio, (char *)data_body->data, data_body->length)
644          #else
645          if (data_body->length > 0)
646              bio = BIO_new_mem_buf(data_body->data, data_body->length);
647          else {
648              bio=BIO_new(BIO_s_mem());
649              BIO_set_mem_eof_return(bio, 0);
650          }
651          if (bio == NULL)
652              goto err;
653      #endif
654      }
655      BIO_push(out, bio);

```

```

656     bio=NULL;
657 #endif
658     if (0)
659     {
660     err:
661         if (ek)
662         {
663             OPENSSL_cleanse(ek,eklen);
664             OPENSSL_free(ek);
665         }
666         if (tkey)
667         {
668             OPENSSL_cleanse(tkey,tkeylen);
669             OPENSSL_free(tkey);
670         }
671         if (out != NULL) BIO_free_all(out);
672         if (btmp != NULL) BIO_free_all(btmp);
673         if (etmp != NULL) BIO_free_all(etmp);
674         if (bio != NULL) BIO_free_all(bio);
675         out=NULL;
676     }
677     return(out);
678 }

680 static BIO *PKCS7_find_digest(EVP_MD_CTX **pmd, BIO *bio, int nid)
681 {
682     for (;;)
683     {
684         bio=BIO_find_type(bio,BIO_TYPE_MD);
685         if (bio == NULL)
686         {
687             PKCS7err(PKCS7_F_PKCS7_FIND_DIGEST,PKCS7_R_UNABLE_TO_FIND
688             return NULL;
689         }
690         BIO_get_md_ctx(bio,pmd);
691         if (*pmd == NULL)
692         {
693             PKCS7err(PKCS7_F_PKCS7_FIND_DIGEST,ERR_R_INTERNAL_ERROR)
694             return NULL;
695         }
696         if (EVP_MD_CTX_type(*pmd) == nid)
697             return bio;
698         bio=BIO_next(bio);
699     }
700     return NULL;
701 }

703 static int do_pkcs7_signed_attr(PKCS7_SIGNER_INFO *si, EVP_MD_CTX *mctx)
704 {
705     unsigned char md_data[EVP_MAX_MD_SIZE];
706     unsigned int md_len;

708     /* Add signing time if not already present */
709     if (!PKCS7_get_signed_attribute(si, NID_pkcs9_signingTime))
710     {
711         if (!PKCS7_add0_attr_signing_time(si, NULL))
712         {
713             PKCS7err(PKCS7_F_DO_PKCS7_SIGNED_ATTRIB,
714             ERR_R_MALLOC_FAILURE);
715             return 0;
716         }
717     }

719     /* Add digest */
720     if (!EVP_DigestFinal_ex(mctx, md_data,&md_len))
721     {

```

```

722         PKCS7err(PKCS7_F_DO_PKCS7_SIGNED_ATTRIB, ERR_R_EVP_LIB);
723         return 0;
724     }
725     if (!PKCS7_add1_attr_digest(si, md_data, md_len))
726     {
727         PKCS7err(PKCS7_F_DO_PKCS7_SIGNED_ATTRIB, ERR_R_MALLOC_FAILURE);
728         return 0;
729     }

731     /* Now sign the attributes */
732     if (!PKCS7_SIGNER_INFO_sign(si))
733         return 0;

735     return 1;
736 }

737
738 int PKCS7_dataFinal(PKCS7 *p7, BIO *bio)
739 {
740     int ret=0;
741     int i,j;
742     BIO *btmp;
743     PKCS7_SIGNER_INFO *si;
744     EVP_MD_CTX *mdc,ctx_tmp;
745     STACK_OF(X509_ATTRIBUTE) *sk;
746     STACK_OF(PKCS7_SIGNER_INFO) *si_sk=NULL;
747     ASN1_OCTET_STRING *os=NULL;

750     EVP_MD_CTX_init(&ctx_tmp);
751     i=OBJ_obj2nid(p7->type);
752     p7->state=PKCS7_S_HEADER;

754     switch (i)
755     {
756     case NID_pkcs7_data:
757         os = p7->d.data;
758         break;
759     case NID_pkcs7_signedAndEnveloped:
760         /* XXXXXXXXXXXXXXXX */
761         si_sk=p7->d.signed_and_enveloped->signer_info;
762         os = p7->d.signed_and_enveloped->enc_data->enc_data;
763         if (!os)
764         {
765             os=M_ASN1_OCTET_STRING_new();
766             if (!os)
767             {
768                 PKCS7err(PKCS7_F_PKCS7_DATAFINAL,ERR_R_MALLOC_FA
769                 goto err;
770             }
771             p7->d.signed_and_enveloped->enc_data->enc_data=os;
772         }
773         break;
774     case NID_pkcs7_enveloped:
775         /* XXXXXXXXXXXXXXXX */
776         os = p7->d.enveloped->enc_data->enc_data;
777         if (!os)
778         {
779             os=M_ASN1_OCTET_STRING_new();
780             if (!os)
781             {
782                 PKCS7err(PKCS7_F_PKCS7_DATAFINAL,ERR_R_MALLOC_FA
783                 goto err;
784             }
785             p7->d.enveloped->enc_data->enc_data=os;
786         }
787         break;

```

```

788     case NID_pkcs7_signed:
789         si_sk=p7->d.sign->signer_info;
790         os=PKCS7_get_octet_string(p7->d.sign->contents);
791         /* If detached data then the content is excluded */
792         if(PKCS7_type_is_data(p7->d.sign->contents) && p7->detached) {
793             M_ASN1_OCTET_STRING_free(os);
794             p7->d.sign->contents->d.data = NULL;
795         }
796         break;

798     case NID_pkcs7_digest:
799         os=PKCS7_get_octet_string(p7->d.digest->contents);
800         /* If detached data then the content is excluded */
801         if(PKCS7_type_is_data(p7->d.digest->contents) && p7->detached)
802         {
803             M_ASN1_OCTET_STRING_free(os);
804             p7->d.digest->contents->d.data = NULL;
805         }
806         break;

808     default:
809         PKCS7err(PKCS7_F_PKCS7_DATAFINAL,PKCS7_R_UNSUPPORTED_CONTENT_TYP
810         goto err;
811     }

813     if (si_sk != NULL)
814     {
815         for (i=0; i<sk_PKCS7_SIGNER_INFO_num(si_sk); i++)
816         {
817             si=sk_PKCS7_SIGNER_INFO_value(si_sk,i);
818             if (si->pkey == NULL)
819                 continue;

821             j = OBJ_obj2nid(si->digest_alg->algorithm);

823             btmp=bio;

825             btmp = PKCS7_find_digest(&mdc, btmp, j);

827             if (btmp == NULL)
828                 goto err;

830             /* We now have the EVP_MD_CTX, lets do the
831             * signing. */
832             if (!EVP_MD_CTX_copy_ex(&ctx_tmp,mdc))
833                 goto err;

835             sk=si->auth_attr;

837             /* If there are attributes, we add the digest
838             * attribute and only sign the attributes */
839             if (sk_X509_ATTRIBUTE_num(sk) > 0)
840             {
841                 if (!do_pkcs7_signed_attr(si, &ctx_tmp))
842                     goto err;
843             }
844             else
845             {
846                 unsigned char *abuf = NULL;
847                 unsigned int abuflen;
848                 abuflen = EVP_PKEY_size(si->pkey);
849                 abuf = OPENSSL_malloc(abuflen);
850                 if (!abuf)
851                     goto err;
853                 if (!EVP_SignFinal(&ctx_tmp, abuf, &abuflen,

```

```

854                                     si->pkey))
855                                     {
856                                         PKCS7err(PKCS7_F_PKCS7_DATAFINAL,
857                                         ERR_R_EVP_LIB);
858                                         goto err;
859                                     }
860                                     ASN1_STRING_set0(si->enc_digest, abuf, abuflen);
861                                 }
862                             }
863                         }
864                     else if (i == NID_pkcs7_digest)
865                     {
866                         unsigned char md_data[EVP_MAX_MD_SIZE];
867                         unsigned int md_len;
868                         if (!PKCS7_find_digest(&mdc, bio,
869                         OBJ_obj2nid(p7->d.digest->md->algorithm)))
870                             goto err;
871                         if (!EVP_DigestFinal_ex(mdc,md_data,&md_len))
872                             goto err;
873                         M_ASN1_OCTET_STRING_set(p7->d.digest->digest, md_data, md_len);
874                     }

876                     if (!PKCS7_is_detached(p7) && !(os->flags & ASN1_STRING_FLAG_NDEF))
877                     {
878                         char *cont;
879                         long contlen;
880                         btmp=BIO_find_type(bio,BIO_TYPE_MEM);
881                         if (btmp == NULL)
882                         {
883                             PKCS7err(PKCS7_F_PKCS7_DATAFINAL,PKCS7_R_UNABLE_TO_FIND
884                             goto err;
885                         }
886                         contlen = BIO_get_mem_data(btmp, &cont);
887                         /* Mark the BIO read only then we can use its copy of the data
888                         * instead of making an extra copy.
889                         */
890                         BIO_set_flags(btmp, BIO_FLAGS_MEM_RDONLY);
891                         BIO_set_mem_eof_return(btmp, 0);
892                         ASN1_STRING_set0(os, (unsigned char *)cont, contlen);
893                     }
894                     ret=1;
895     err:
896         EVP_MD_CTX_cleanup(&ctx_tmp);
897         return(ret);
898     }

900 int PKCS7_SIGNER_INFO_sign(PKCS7_SIGNER_INFO *si)
901 {
902     EVP_MD_CTX mctx;
903     EVP_PKEY_CTX *pctx;
904     unsigned char *abuf = NULL;
905     int alen;
906     size_t siglen;
907     const EVP_MD *md = NULL;

909     md = EVP_get_digestbyobj(si->digest_alg->algorithm);
910     if (md == NULL)
911         return 0;

913     EVP_MD_CTX_init(&mctx);
914     if (EVP_DigestSignInit(&mctx, &pctx, md,NULL, si->pkey) <= 0)
915         goto err;

917     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_SIGN,
918                         EVP_PKEY_CTRL_PKCS7_SIGN, 0, si) <= 0)
919         {

```

```

920         PKCS7err(PKCS7_F_PKCS7_SIGNER_INFO_SIGN, PKCS7_R_CTRL_ERROR);
921         goto err;
922     }

924     alen = ASN1_item_i2d((ASN1_VALUE *)si->auth_attr,&abuf,
925                          ASN1_ITEM_rptr(PKCS7_ATTR_SIGN));
926     if(!abuf)
927         goto err;
928     if (EVP_DigestSignUpdate(&mctx,abuf,alen) <= 0)
929         goto err;
930     OPENSSL_free(abuf);
931     if (EVP_DigestSignFinal(&mctx, NULL, &siglen) <= 0)
932         goto err;
933     abuf = OPENSSL_malloc(siglen);
934     if(!abuf)
935         goto err;
936     if (EVP_DigestSignFinal(&mctx, abuf, &siglen) <= 0)
937         goto err;

939     if (EVP_PKEY_CTX_ctrl(pctx, -1, EVP_PKEY_OP_SIGN,
940                          EVP_PKEY_CTRL_PKCS7_SIGN, 1, si) <= 0)
941     {
942         PKCS7err(PKCS7_F_PKCS7_SIGNER_INFO_SIGN, PKCS7_R_CTRL_ERROR);
943         goto err;
944     }

946     EVP_MD_CTX_cleanup(&mctx);

948     ASN1_STRING_set0(si->enc_digest, abuf, siglen);

950     return 1;

952     err:
953     if (abuf)
954         OPENSSL_free(abuf);
955     EVP_MD_CTX_cleanup(&mctx);
956     return 0;

958 }

960 int PKCS7_dataVerify(X509_STORE *cert_store, X509_STORE_CTX *ctx, BIO *bio,
961                     PKCS7 *p7, PKCS7_SIGNER_INFO *si)
962 {
963     PKCS7_ISSUER_AND_SERIAL *ias;
964     int ret=0,i;
965     STACK_OF(X509) *cert;
966     X509 *x509;

968     if (PKCS7_type_is_signed(p7))
969     {
970         cert=p7->d.sign->cert;
971     }
972     else if (PKCS7_type_is_signedAndEnveloped(p7))
973     {
974         cert=p7->d.signed_and_enveloped->cert;
975     }
976     else
977     {
978         PKCS7err(PKCS7_F_PKCS7_DATAVERIFY,PKCS7_R_WRONG_PKCS7_TYPE);
979         goto err;
980     }
981     /* XXXXXXXXXXXXXXXXXXXXXXXX */
982     ias=si->issuer_and_serial;

984     x509=X509_find_by_issuer_and_serial(cert,ias->issuer,ias->serial);

```

```

986     /* were we able to find the cert in passed to us */
987     if (x509 == NULL)
988     {
989         PKCS7err(PKCS7_F_PKCS7_DATAVERIFY,PKCS7_R_UNABLE_TO_FIND_CERTIFI
990         goto err;
991     }

993     /* Lets verify */
994     if(!X509_STORE_CTX_init(ctx,cert_store,x509,cert))
995     {
996         PKCS7err(PKCS7_F_PKCS7_DATAVERIFY,ERR_R_X509_LIB);
997         goto err;
998     }
999     X509_STORE_CTX_set_purpose(ctx, X509_PURPOSE_SMIME_SIGN);
1000     i=X509_verify_cert(ctx);
1001     if (i <= 0)
1002     {
1003         PKCS7err(PKCS7_F_PKCS7_DATAVERIFY,ERR_R_X509_LIB);
1004         X509_STORE_CTX_cleanup(ctx);
1005         goto err;
1006     }
1007     X509_STORE_CTX_cleanup(ctx);

1009     return PKCS7_signatureVerify(bio, p7, si, x509);
1010     err:
1011     return ret;
1012 }

1014 int PKCS7_signatureVerify(BIO *bio, PKCS7 *p7, PKCS7_SIGNER_INFO *si,
1015                          X509 *x509)
1016 {
1017     ASN1_OCTET_STRING *os;
1018     EVP_MD_CTX mdc_tmp,*mdc;
1019     int ret=0,i;
1020     int md_type;
1021     STACK_OF(X509_ATTRIBUTE) *sk;
1022     BIO *btmp;
1023     EVP_PKEY *pkey;

1025     EVP_MD_CTX_init(&mdc_tmp);

1027     if (!PKCS7_type_is_signed(p7) &&
1028         !PKCS7_type_is_signedAndEnveloped(p7)) {
1029         PKCS7err(PKCS7_F_PKCS7_SIGNATUREVERIFY,
1030                 PKCS7_R_WRONG_PKCS7_TYPE);
1031         goto err;
1032     }

1034     md_type=OBJ_obj2nid(si->digest_alg->algorithm);

1036     btmp=bio;
1037     for (;;)
1038     {
1039         if ((btmp == NULL) ||
1040             ((btmp=BIO_find_type(btmp,BIO_TYPE_MD)) == NULL))
1041         {
1042             PKCS7err(PKCS7_F_PKCS7_SIGNATUREVERIFY,
1043                     PKCS7_R_UNABLE_TO_FIND_MESSAGE_DIGEST);
1044             goto err;
1045         }
1046         BIO_get_md_ctx(btmp,&mdc);
1047         if (mdc == NULL)
1048         {
1049             PKCS7err(PKCS7_F_PKCS7_SIGNATUREVERIFY,
1050                     ERR_R_INTERNAL_ERROR);
1051             goto err;

```



```

1052     }
1053     if (EVP_MD_CTX_type(mdc) == md_type)
1054         break;
1055     /* Workaround for some broken clients that put the signature
1056     * OID instead of the digest OID in digest_alg->algorithm
1057     */
1058     if (EVP_MD_pkey_type(EVP_MD_CTX_md(mdc)) == md_type)
1059         break;
1060     btmp=BIO_next(btmp);
1061 }

1063 /* mdc is the digest ctx that we want, unless there are attributes,
1064 * in which case the digest is the signed attributes */
1065 if (!EVP_MD_CTX_copy_ex(&mdc_tmp,mdc))
1066     goto err;

1068 sk=si->auth_attr;
1069 if ((sk != NULL) && (sk_X509_ATTRIBUTE_num(sk) != 0))
1070 {
1071     unsigned char md_dat[EVP_MAX_MD_SIZE], *abuf = NULL;
1072     unsigned int md_len;
1073     int alen;
1074     ASN1_OCTET_STRING *message_digest;

1076     if (!EVP_DigestFinal_ex(&mdc_tmp,md_dat,&md_len))
1077         goto err;
1078     message_digest=PKCS7_digest_from_attributes(sk);
1079     if (!message_digest)
1080     {
1081         PKCS7err(PKCS7_F_PKCS7_SIGNATUREVERIFY,
1082                 PKCS7_R_UNABLE_TO_FIND_MESSAGE_DIGEST);
1083         goto err;
1084     }
1085     if ((message_digest->length != (int)md_len) ||
1086         (memcmp(message_digest->data,md_dat,md_len)))
1087     {
1088 #if 0
1089 {
1090     int ii;
1091     for (ii=0; ii<message_digest->length; ii++)
1092         printf("%02X",message_digest->data[ii]); printf(" sent\n");
1093     for (ii=0; ii<md_len; ii++) printf("%02X",md_dat[ii]); printf(" calc\n");
1094 }
1095 #endif

1096         PKCS7err(PKCS7_F_PKCS7_SIGNATUREVERIFY,
1097                 PKCS7_R_DIGEST_FAILURE);
1098         ret= -1;
1099         goto err;
1100     }

1102     if (!EVP_VerifyInit_ex(&mdc_tmp,EVP_get_digestbynid(md_type), NU
1103         goto err;

1105     alen = ASN1_item_i2d((ASN1_VALUE *)sk, &abuf,
1106                          ASN1_ITEM_rptr(PKCS7_ATTR_VERIFY
1107     if (alen <= 0)
1108     {
1109         PKCS7err(PKCS7_F_PKCS7_SIGNATUREVERIFY,ERR_R_ASN1_LIB);
1110         ret = -1;
1111         goto err;
1112     }
1113     if (!EVP_VerifyUpdate(&mdc_tmp, abuf, alen))
1114         goto err;

1116     OPENSSL_free(abuf);
1117 }

```

```

1119     os=si->enc_digest;
1120     pkey = X509_get_pubkey(x509);
1121     if (!pkey)
1122     {
1123         ret = -1;
1124         goto err;
1125     }

1127     i=EVP_VerifyFinal(&mdc_tmp,os->data,os->length, pkey);
1128     EVP_PKEY_free(pkey);
1129     if (i <= 0)
1130     {
1131         PKCS7err(PKCS7_F_PKCS7_SIGNATUREVERIFY,
1132                 PKCS7_R_SIGNATURE_FAILURE);
1133         ret= -1;
1134         goto err;
1135     }
1136     else
1137         ret=1;
1138 err:
1139     EVP_MD_CTX_cleanup(&mdc_tmp);
1140     return(ret);
1141 }

1143 PKCS7_ISSUER_AND_SERIAL *PKCS7_get_issuer_and_serial(PKCS7 *p7, int idx)
1144 {
1145     STACK_OF(PKCS7_RECIP_INFO) *rsk;
1146     PKCS7_RECIP_INFO *ri;
1147     int i;

1149     i=OBJ_obj2nid(p7->type);
1150     if (i != NID_pkcs7_signedAndEnveloped)
1151         return NULL;
1152     if (p7->d.signed_and_enveloped == NULL)
1153         return NULL;
1154     rsk=p7->d.signed_and_enveloped->recipientinfo;
1155     if (rsk == NULL)
1156         return NULL;
1157     ri=sk_PKCS7_RECIP_INFO_value(rsk,0);
1158     if (sk_PKCS7_RECIP_INFO_num(rsk) <= idx) return(NULL);
1159     ri=sk_PKCS7_RECIP_INFO_value(rsk,idx);
1160     return(ri->issuer_and_serial);
1161 }

1163 ASN1_TYPE *PKCS7_get_signed_attribute(PKCS7_SIGNER_INFO *si, int nid)
1164 {
1165     return(get_attribute(si->auth_attr,nid));
1166 }

1168 ASN1_TYPE *PKCS7_get_attribute(PKCS7_SIGNER_INFO *si, int nid)
1169 {
1170     return(get_attribute(si->unauth_attr,nid));
1171 }

1173 static ASN1_TYPE *get_attribute(STACK_OF(X509_ATTRIBUTE) *sk, int nid)
1174 {
1175     int i;
1176     X509_ATTRIBUTE *xa;
1177     ASN1_OBJECT *o;

1179     o=OBJ_nid2obj(nid);
1180     if (!o || !sk) return(NULL);
1181     for (i=0; i<sk_X509_ATTRIBUTE_num(sk); i++)
1182     {
1183         xa=sk_X509_ATTRIBUTE_value(sk,i);

```

```

1184         if (OBJ_cmp(xa->object,o) == 0)
1185             {
1186                 if (!xa->single && sk_ASN1_TYPE_num(xa->value.set))
1187                     return(sk_ASN1_TYPE_value(xa->value.set,0));
1188                 else
1189                     return(NULL);
1190             }
1191     }
1192     return(NULL);
1193 }

1195 ASN1_OCTET_STRING *PKCS7_digest_from_attributes(STACK_OF(X509_ATTRIBUTE) *sk)
1196 {
1197     ASN1_TYPE *astype;
1198     if(!(astype = get_attribute(sk, NID_pkcs9_messageDigest))) return NULL;
1199     return astype->value.octet_string;
1200 }

1202 int PKCS7_set_signed_attributes(PKCS7_SIGNER_INFO *p7si,
1203                                STACK_OF(X509_ATTRIBUTE) *sk)
1204 {
1205     int i;

1207     if (p7si->auth_attr != NULL)
1208         sk_X509_ATTRIBUTE_pop_free(p7si->auth_attr,X509_ATTRIBUTE_free);
1209     p7si->auth_attr=sk_X509_ATTRIBUTE_dup(sk);
1210     if (p7si->auth_attr == NULL)
1211         return 0;
1212     for (i=0; i<sk_X509_ATTRIBUTE_num(sk); i++)
1213     {
1214         if ((sk_X509_ATTRIBUTE_set(p7si->auth_attr,i,
1215                                   X509_ATTRIBUTE_dup(sk_X509_ATTRIBUTE_value(sk,i))))
1216             == NULL)
1217             return(0);
1218     }
1219     return(1);
1220 }

1222 int PKCS7_set_attributes(PKCS7_SIGNER_INFO *p7si, STACK_OF(X509_ATTRIBUTE) *sk)
1223 {
1224     int i;

1226     if (p7si->unauth_attr != NULL)
1227         sk_X509_ATTRIBUTE_pop_free(p7si->unauth_attr,
1228                                   X509_ATTRIBUTE_free);
1229     p7si->unauth_attr=sk_X509_ATTRIBUTE_dup(sk);
1230     if (p7si->unauth_attr == NULL)
1231         return 0;
1232     for (i=0; i<sk_X509_ATTRIBUTE_num(sk); i++)
1233     {
1234         if ((sk_X509_ATTRIBUTE_set(p7si->unauth_attr,i,
1235                                   X509_ATTRIBUTE_dup(sk_X509_ATTRIBUTE_value(sk,i))))
1236             == NULL)
1237             return(0);
1238     }
1239     return(1);
1240 }

1242 int PKCS7_add_signed_attribute(PKCS7_SIGNER_INFO *p7si, int nid, int atrtype,
1243                               void *value)
1244 {
1245     return(add_attribute(&(amp7si->auth_attr),nid,atrtype,value));
1246 }

1248 int PKCS7_add_attribute(PKCS7_SIGNER_INFO *p7si, int nid, int atrtype,
1249                        void *value)

```

```

1250     {
1251         return(add_attribute(&(amp7si->unauth_attr),nid,atrtype,value));
1252     }

1254 static int add_attribute(STACK_OF(X509_ATTRIBUTE) **sk, int nid, int atrtype,
1255                          void *value)
1256 {
1257     X509_ATTRIBUTE *attr=NULL;

1259     if (*sk == NULL)
1260     {
1261         *sk = sk_X509_ATTRIBUTE_new_null();
1262         if (*sk == NULL)
1263             return 0;
1264     new_attr:
1265         if (!(attr=X509_ATTRIBUTE_create(nid,atrtype,value)))
1266             return 0;
1267         if (!sk_X509_ATTRIBUTE_push(*sk,attr))
1268             {
1269                 X509_ATTRIBUTE_free(attr);
1270                 return 0;
1271             }
1272     }
1273     else
1274     {
1275         int i;

1277         for (i=0; i<sk_X509_ATTRIBUTE_num(*sk); i++)
1278         {
1279             attr=sk_X509_ATTRIBUTE_value(*sk,i);
1280             if (OBJ_obj2nid(attr->object) == nid)
1281             {
1282                 X509_ATTRIBUTE_free(attr);
1283                 attr=X509_ATTRIBUTE_create(nid,atrtype,value);
1284                 if (attr == NULL)
1285                     return 0;
1286                 if (!sk_X509_ATTRIBUTE_set(*sk,i,attr))
1287                     {
1288                         X509_ATTRIBUTE_free(attr);
1289                         return 0;
1290                     }
1291                 goto end;
1292             }
1293         }
1294         goto new_attr;
1295     }
1296 end:
1297     return(1);
1298 }

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_lib.c

1

```
*****
16066 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/pkcs7/pk7_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_lib.c

2

```
62 #include <openssl/x509.h>
63 #include "asn1_locl.h"
64
65 long PKCS7_ctrl(PKCS7 *p7, int cmd, long larg, char *parg)
66 {
67     int nid;
68     long ret;
69
70     nid=OBJ_obj2nid(p7->type);
71
72     switch (cmd)
73     {
74     case PKCS7_OP_SET_DETACHED_SIGNATURE:
75         if (nid == NID_pkcs7_signed)
76         {
77             ret=p7->detached=(int)larg;
78             if (ret && PKCS7_type_is_data(p7->d.sign->contents))
79             {
80                 ASN1_OCTET_STRING *os;
81                 os=p7->d.sign->contents->d.data;
82                 ASN1_OCTET_STRING_free(os);
83                 p7->d.sign->contents->d.data = NULL;
84             }
85         }
86         else
87         {
88             PKCS7err(PKCS7_F_PKCS7_CTRL,PKCS7_R_OPERATION_NOT_SUPPOR
89             ret=0;
90         }
91         break;
92     case PKCS7_OP_GET_DETACHED_SIGNATURE:
93         if (nid == NID_pkcs7_signed)
94         {
95             if(!p7->d.sign || !p7->d.sign->contents->d.ptr)
96                 ret = 1;
97             else ret = 0;
98
99             p7->detached = ret;
100         }
101         else
102         {
103             PKCS7err(PKCS7_F_PKCS7_CTRL,PKCS7_R_OPERATION_NOT_SUPPOR
104             ret=0;
105         }
106         break;
107     default:
108         PKCS7err(PKCS7_F_PKCS7_CTRL,PKCS7_R_UNKNOWN_OPERATION);
109         ret=0;
110     }
111     return(ret);
112 }
113
114 int PKCS7_content_new(PKCS7 *p7, int type)
115 {
116     PKCS7 *ret=NULL;
117
118     if ((ret=PKCS7_new()) == NULL) goto err;
119     if (!PKCS7_set_type(ret,type)) goto err;
120     if (!PKCS7_set_content(p7,ret)) goto err;
121
122     return(1);
123 err:
124     if (ret != NULL) PKCS7_free(ret);
125     return(0);
126 }
127
```

```

129 int PKCS7_set_content(PKCS7 *p7, PKCS7 *p7_data)
130 {
131     int i;

133     i=OBJ_obj2nid(p7->type);
134     switch (i)
135     {
136     case NID_pkcs7_signed:
137         if (p7->d.sign->contents != NULL)
138             PKCS7_free(p7->d.sign->contents);
139         p7->d.sign->contents=p7_data;
140         break;
141     case NID_pkcs7_digest:
142         if (p7->d.digest->contents != NULL)
143             PKCS7_free(p7->d.digest->contents);
144         p7->d.digest->contents=p7_data;
145         break;
146     case NID_pkcs7_data:
147     case NID_pkcs7_enveloped:
148     case NID_pkcs7_signedAndEnveloped:
149     case NID_pkcs7_encrypted:
150     default:
151         PKCS7err(PKCS7_F_PKCS7_SET_CONTENT, PKCS7_R_UNSUPPORTED_CONTENT_T
152             goto err;
153     }
154     return(1);
155 err:
156     return(0);
157 }

159 int PKCS7_set_type(PKCS7 *p7, int type)
160 {
161     ASN1_OBJECT *obj;

163     /*PKCS7_content_free(p7);*/
164     obj=OBJ_nid2obj(type); /* will not fail */

166     switch (type)
167     {
168     case NID_pkcs7_signed:
169         p7->type=obj;
170         if ((p7->d.sign=PKCS7_SIGNED_new()) == NULL)
171             goto err;
172         if (!ASN1_INTEGER_set(p7->d.sign->version,1))
173             {
174                 PKCS7_SIGNED_free(p7->d.sign);
175                 p7->d.sign=NULL;
176                 goto err;
177             }
178         break;
179     case NID_pkcs7_data:
180         p7->type=obj;
181         if ((p7->d.data=M_ASN1_OCTET_STRING_new()) == NULL)
182             goto err;
183         break;
184     case NID_pkcs7_signedAndEnveloped:
185         p7->type=obj;
186         if ((p7->d.signed_and_enveloped=PKCS7_SIGN_ENVELOPE_new())
187             == NULL) goto err;
188         ASN1_INTEGER_set(p7->d.signed_and_enveloped->version,1);
189         if (!ASN1_INTEGER_set(p7->d.signed_and_enveloped->version,1))
190             goto err;
191         p7->d.signed_and_enveloped->enc_data->content_type
192             = OBJ_nid2obj(NID_pkcs7_data);
193         break;

```

```

194     case NID_pkcs7_enveloped:
195         p7->type=obj;
196         if ((p7->d.enveloped=PKCS7_ENVELOPE_new())
197             == NULL) goto err;
198         if (!ASN1_INTEGER_set(p7->d.enveloped->version,0))
199             goto err;
200         p7->d.enveloped->enc_data->content_type
201             = OBJ_nid2obj(NID_pkcs7_data);
202         break;
203     case NID_pkcs7_encrypted:
204         p7->type=obj;
205         if ((p7->d.encrypted=PKCS7_ENCRYPT_new())
206             == NULL) goto err;
207         if (!ASN1_INTEGER_set(p7->d.encrypted->version,0))
208             goto err;
209         p7->d.encrypted->enc_data->content_type
210             = OBJ_nid2obj(NID_pkcs7_data);
211         break;

213     case NID_pkcs7_digest:
214         p7->type=obj;
215         if ((p7->d.digest=PKCS7_DIGEST_new())
216             == NULL) goto err;
217         if (!ASN1_INTEGER_set(p7->d.digest->version,0))
218             goto err;
219         break;
220     default:
221         PKCS7err(PKCS7_F_PKCS7_SET_TYPE, PKCS7_R_UNSUPPORTED_CONTENT_TYPE
222             goto err;
223     }
224     return(1);
225 err:
226     return(0);
227 }

229 int PKCS7_set0_type_other(PKCS7 *p7, int type, ASN1_TYPE *other)
230 {
231     p7->type = OBJ_nid2obj(type);
232     p7->d.other = other;
233     return 1;
234 }

236 int PKCS7_add_signer(PKCS7 *p7, PKCS7_SIGNER_INFO *psi)
237 {
238     int i,j,nid;
239     X509_ALGOR *alg;
240     STACK_OF(PKCS7_SIGNER_INFO) *signer_sk;
241     STACK_OF(X509_ALGOR) *md_sk;

243     i=OBJ_obj2nid(p7->type);
244     switch (i)
245     {
246     case NID_pkcs7_signed:
247         signer_sk= p7->d.sign->signer_info;
248         md_sk= p7->d.sign->md_algs;
249         break;
250     case NID_pkcs7_signedAndEnveloped:
251         signer_sk= p7->d.signed_and_enveloped->signer_info;
252         md_sk= p7->d.signed_and_enveloped->md_algs;
253         break;
254     default:
255         PKCS7err(PKCS7_F_PKCS7_ADD_SIGNER, PKCS7_R_WRONG_CONTENT_TYPE);
256         return(0);
257     }

259     nid=OBJ_obj2nid(psi->digest_alg->algorithm);

```

```

261  /* If the digest is not currently listed, add it */
262  j=0;
263  for (i=0; i<sk_X509_ALGOR_num(md_sk); i++)
264  {
265      alg=sk_X509_ALGOR_value(md_sk,i);
266      if (OBJ_obj2nid(alg->algorithm) == nid)
267      {
268          j=1;
269          break;
270      }
271  }
272  if (!j) /* we need to add another algorithm */
273  {
274      if (!(alg=X509_ALGOR_new())
275          || !(alg->parameter = ASN1_TYPE_new()))
276      {
277          X509_ALGOR_free(alg);
278          PKCS7err(PKCS7_F_PKCS7_ADD_SIGNER, ERR_R_MALLOC_FAILURE);
279          return(0);
280      }
281      alg->algorithm=OBJ_nid2obj(nid);
282      alg->parameter->type = V_ASN1_NULL;
283      if (!sk_X509_ALGOR_push(md_sk,alg))
284      {
285          X509_ALGOR_free(alg);
286          return 0;
287      }
288  }

290  if (!sk_PKCS7_SIGNER_INFO_push(signer_sk,psi))
291      return 0;
292  return(1);
293  }

295 int PKCS7_add_certificate(PKCS7 *p7, X509 *x509)
296 {
297     int i;
298     STACK_OF(X509) **sk;

300     i=OBJ_obj2nid(p7->type);
301     switch (i)
302     {
303     case NID_pkcs7_signed:
304         sk= &(p7->d.sign->cert);
305         break;
306     case NID_pkcs7_signedAndEnveloped:
307         sk= &(p7->d.signed_and_enveloped->cert);
308         break;
309     default:
310         PKCS7err(PKCS7_F_PKCS7_ADD_CERTIFICATE, PKCS7_R_WRONG_CONTENT_TYP
311         return(0);
312     }

314     if (*sk == NULL)
315         *sk=sk_X509_new_null();
316     if (*sk == NULL)
317     {
318         PKCS7err(PKCS7_F_PKCS7_ADD_CERTIFICATE, ERR_R_MALLOC_FAILURE);
319         return 0;
320     }
321     CRYPTO_add(&x509->references,1,CRYPTO_LOCK_X509);
322     if (!sk_X509_push(*sk,x509))
323     {
324         X509_free(x509);
325         return 0;

```

```

326     }
327     return(1);
328 }

330 int PKCS7_add_crl(PKCS7 *p7, X509_CRL *crl)
331 {
332     int i;
333     STACK_OF(X509_CRL) **sk;

335     i=OBJ_obj2nid(p7->type);
336     switch (i)
337     {
338     case NID_pkcs7_signed:
339         sk= &(p7->d.sign->crl);
340         break;
341     case NID_pkcs7_signedAndEnveloped:
342         sk= &(p7->d.signed_and_enveloped->crl);
343         break;
344     default:
345         PKCS7err(PKCS7_F_PKCS7_ADD_CRL, PKCS7_R_WRONG_CONTENT_TYPE);
346         return(0);
347     }

349     if (*sk == NULL)
350         *sk=sk_X509_CRL_new_null();
351     if (*sk == NULL)
352     {
353         PKCS7err(PKCS7_F_PKCS7_ADD_CRL, ERR_R_MALLOC_FAILURE);
354         return 0;
355     }

357     CRYPTO_add(&crl->references,1,CRYPTO_LOCK_X509_CRL);
358     if (!sk_X509_CRL_push(*sk,crl))
359     {
360         X509_CRL_free(crl);
361         return 0;
362     }
363     return(1);
364 }

366 int PKCS7_SIGNER_INFO_set(PKCS7_SIGNER_INFO *p7i, X509 *x509, EVP_PKEY *pkey,
367                          const EVP_MD *dgst)
368 {
369     int ret;

371     /* We now need to add another PKCS7_SIGNER_INFO entry */
372     if (!ASN1_INTEGER_set(p7i->version,1))
373         goto err;
374     if (!X509_NAME_set(&p7i->issuer_and_serial->issuer,
375                      X509_get_issuer_name(x509)))
376         goto err;

378     /* because ASN1_INTEGER_set is used to set a 'long' we will do
379      * things the ugly way. */
380     M_ASN1_INTEGER_free(p7i->issuer_and_serial->serial);
381     if (!(p7i->issuer_and_serial->serial=
382         M_ASN1_INTEGER_dup(X509_get_serialNumber(x509))))
383         goto err;

385     /* lets keep the pkey around for a while */
386     CRYPTO_add(&pkey->references,1,CRYPTO_LOCK_EVP_PKEY);
387     p7i->pkey=pkey;

389     /* Set the algorithms */
391     X509_ALGOR_set0(p7i->digest_alg, OBJ_nid2obj(EVP_MD_type(dgst)),

```

```

392         V_ASN1_NULL, NULL);
394     if (pkey->ameth && pkey->ameth->pkey_ctrl)
395     {
396         ret = pkey->ameth->pkey_ctrl(pkey, ASN1_PKEY_CTRL_PKCS7_SIGN,
397                                     0, p7i);
398         if (ret > 0)
399             return 1;
400         if (ret != -2)
401         {
402             PKCS7err(PKCS7_F_PKCS7_SIGNER_INFO_SET,
403                     PKCS7_R_SIGNING_CTRL_FAILURE);
404             return 0;
405         }
406     }
407     PKCS7err(PKCS7_F_PKCS7_SIGNER_INFO_SET,
408             PKCS7_R_SIGNING_NOT_SUPPORTED_FOR_THIS_KEY_TYPE);
409 err:
410     return 0;
411 }

413 PKCS7_SIGNER_INFO *PKCS7_add_signature(PKCS7 *p7, X509 *x509, EVP_PKEY *pkey,
414                                         const EVP_MD *dgst)
415 {
416     PKCS7_SIGNER_INFO *si = NULL;
417
418     if (dgst == NULL)
419     {
420         int def_nid;
421         if (EVP_PKEY_get_default_digest_nid(pkey, &def_nid) <= 0)
422             goto err;
423         dgst = EVP_get_digestbynid(def_nid);
424         if (dgst == NULL)
425         {
426             PKCS7err(PKCS7_F_PKCS7_ADD_SIGNATURE,
427                     PKCS7_R_NO_DEFAULT_DIGEST);
428             goto err;
429         }
430     }
431
432     if ((si=PKCS7_SIGNER_INFO_new()) == NULL) goto err;
433     if (!PKCS7_SIGNER_INFO_set(si,x509,pkey,dgst)) goto err;
434     if (!PKCS7_add_signer(p7,si)) goto err;
435     return(si);
436 err:
437     if (si)
438         PKCS7_SIGNER_INFO_free(si);
439     return(NULL);
440 }

442 int PKCS7_set_digest(PKCS7 *p7, const EVP_MD *md)
443 {
444     if (PKCS7_type_is_digest(p7))
445     {
446         if (!(p7->d.digest->md->parameter = ASN1_TYPE_new()))
447         {
448             PKCS7err(PKCS7_F_PKCS7_SET_DIGEST,ERR_R_MALLOC_FAILURE);
449             return 0;
450         }
451         p7->d.digest->md->parameter->type = V_ASN1_NULL;
452         p7->d.digest->md->algorithm = OBJ_nid2obj(EVP_MD_nid(md));
453         return 1;
454     }
455     PKCS7err(PKCS7_F_PKCS7_SET_DIGEST,PKCS7_R_WRONG_CONTENT_TYPE);
456     return 1;
457 }

```

```

458     }
459
460 STACK_OF(PKCS7_SIGNER_INFO) *PKCS7_get_signer_info(PKCS7 *p7)
461 {
462     if (PKCS7_type_is_signed(p7))
463     {
464         return(p7->d.sign->signer_info);
465     }
466     else if (PKCS7_type_is_signedAndEnveloped(p7))
467     {
468         return(p7->d.signed_and_enveloped->signer_info);
469     }
470     else
471         return(NULL);
472 }

474 void PKCS7_SIGNER_INFO_get0_algs(PKCS7_SIGNER_INFO *si, EVP_PKEY **pk,
475                                  X509_ALGOR **pdig, X509_ALGOR **psig)
476 {
477     if (pk)
478         *pk = si->pkey;
479     if (pdig)
480         *pdig = si->digest_alg;
481     if (psig)
482         *psig = si->digest_enc_alg;
483 }

485 void PKCS7_RECIP_INFO_get0_alg(PKCS7_RECIP_INFO *ri, X509_ALGOR **penc)
486 {
487     if (penc)
488         *penc = ri->key_enc_algor;
489 }

491 PKCS7_RECIP_INFO *PKCS7_add_recipient(PKCS7 *p7, X509 *x509)
492 {
493     PKCS7_RECIP_INFO *ri;
494
495     if ((ri=PKCS7_RECIP_INFO_new()) == NULL) goto err;
496     if (!PKCS7_RECIP_INFO_set(ri,x509)) goto err;
497     if (!PKCS7_add_recipient_info(p7,ri)) goto err;
498     return ri;
499 err:
500     if (ri)
501         PKCS7_RECIP_INFO_free(ri);
502     return NULL;
503 }

505 int PKCS7_add_recipient_info(PKCS7 *p7, PKCS7_RECIP_INFO *ri)
506 {
507     int i;
508     STACK_OF(PKCS7_RECIP_INFO) *sk;
509
510     i=OBJ_obj2nid(p7->type);
511     switch (i)
512     {
513     case NID_pkcs7_signedAndEnveloped:
514         sk= p7->d.signed_and_enveloped->recipientinfo;
515         break;
516     case NID_pkcs7_enveloped:
517         sk= p7->d.enveloped->recipientinfo;
518         break;
519     default:
520         PKCS7err(PKCS7_F_PKCS7_ADD_RECIPIENT_INFO,PKCS7_R_WRONG_CONTENT_TYPE);
521         return(0);
522     }

```

```

524     if (!sk_PKCS7_RECIP_INFO_push(sk, ri))
525         return 0;
526     return(1);
527 }

529 int PKCS7_RECIP_INFO_set(PKCS7_RECIP_INFO *p7i, X509 *x509)
530 {
531     int ret;
532     EVP_PKEY *pkey = NULL;
533     if (!ASN1_INTEGER_set(p7i->version, 0))
534         return 0;
535     if (!X509_NAME_set(&p7i->issuer_and_serial->issuer,
536                       X509_get_issuer_name(x509)))
537         return 0;

539     M_ASN1_INTEGER_free(p7i->issuer_and_serial->serial);
540     if (!(p7i->issuer_and_serial->serial=
541           M_ASN1_INTEGER_dup(X509_get_serialNumber(x509))))
542         return 0;

544     pkey = X509_get_pubkey(x509);

546     if (!pkey || !pkey->ameth || !pkey->ameth->pkey_ctrl)
547     {
548         PKCS7err(PKCS7_F_PKCS7_RECIP_INFO_SET,
549                 PKCS7_R_ENCRYPTION_NOT_SUPPORTED_FOR_THIS_KEY_TYPE);
550         goto err;
551     }

553     ret = pkey->ameth->pkey_ctrl(pkey, ASN1_PKEY_CTRL_PKCS7_ENCRYPT,
554                                0, p7i);
555     if (ret == -2)
556     {
557         PKCS7err(PKCS7_F_PKCS7_RECIP_INFO_SET,
558                 PKCS7_R_ENCRYPTION_NOT_SUPPORTED_FOR_THIS_KEY_TYPE);
559         goto err;
560     }
561     if (ret <= 0)
562     {
563         PKCS7err(PKCS7_F_PKCS7_RECIP_INFO_SET,
564                 PKCS7_R_ENCRYPTION_CTRL_FAILURE);
565         goto err;
566     }

568     EVP_PKEY_free(pkey);

570     CRYPTO_add(&x509->references, 1, CRYPTO_LOCK_X509);
571     p7i->cert=x509;

573     return 1;

575 err:
576     if (pkey)
577         EVP_PKEY_free(pkey);
578     return 0;
579 }

581 X509 *PKCS7_cert_from_signer_info(PKCS7 *p7, PKCS7_SIGNER_INFO *si)
582 {
583     if (PKCS7_type_is_signed(p7))
584         return(X509_find_by_issuer_and_serial(p7->d.sign->cert,
585                                                si->issuer_and_serial->issuer,
586                                                si->issuer_and_serial->serial));
587     else
588         return(NULL);
589 }

```

```

591 int PKCS7_set_cipher(PKCS7 *p7, const EVP_CIPHER *cipher)
592 {
593     int i;
594     PKCS7_ENC_CONTENT *ec;

596     i=OBJ_obj2nid(p7->type);
597     switch (i)
598     {
599         case NID_pkcs7_signedAndEnveloped:
600             ec=p7->d.signed_and_enveloped->enc_data;
601             break;
602         case NID_pkcs7_enveloped:
603             ec=p7->d.enveloped->enc_data;
604             break;
605         default:
606             PKCS7err(PKCS7_F_PKCS7_SET_CIPHER, PKCS7_R_WRONG_CONTENT_TYPE);
607             return(0);
608     }

610     /* Check cipher OID exists and has data in it*/
611     i = EVP_CIPHER_type(cipher);
612     if(i == NID_undef) {
613         PKCS7err(PKCS7_F_PKCS7_SET_CIPHER, PKCS7_R_CIPHER_HAS_NO_OBJECT_ID);
614         return(0);
615     }

617     ec->cipher = cipher;
618     return 1;
619 }

621 int PKCS7_stream(unsigned char ***boundary, PKCS7 *p7)
622 {
623     ASN1_OCTET_STRING *os = NULL;

625     switch (OBJ_obj2nid(p7->type))
626     {
627         case NID_pkcs7_data:
628             os = p7->d.data;
629             break;

631         case NID_pkcs7_signedAndEnveloped:
632             os = p7->d.signed_and_enveloped->enc_data->enc_data;
633             if (os == NULL)
634             {
635                 os=M_ASN1_OCTET_STRING_new();
636                 p7->d.signed_and_enveloped->enc_data->enc_data=os;
637             }
638             break;

640         case NID_pkcs7_enveloped:
641             os = p7->d.enveloped->enc_data->enc_data;
642             if (os == NULL)
643             {
644                 os=M_ASN1_OCTET_STRING_new();
645                 p7->d.enveloped->enc_data->enc_data=os;
646             }
647             break;

649         case NID_pkcs7_signed:
650             os=p7->d.sign->contents->d.data;
651             break;

653         default:
654             os = NULL;
655             break;

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_lib.c

11

```
656         }
657
658     if (os == NULL)
659         return 0;
661
662     os->flags |= ASN1_STRING_FLAG_NDEF;
663     *boundary = &os->data;
664
665     return 1;
666 }
```


new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_mime.c

1

```
*****
3632 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_mime.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pk7_mime.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 */

55 #include <stdio.h>
56 #include <ctype.h>
57 #include "cryptlib.h"
58 #include <openssl/rand.h>
59 #include <openssl/x509.h>
60 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_mime.c

2

```
62 /* PKCS#7 wrappers round generalised stream and MIME routines */

64 int i2d_PKCS7_bio_stream(BIO *out, PKCS7 *p7, BIO *in, int flags)
65 {
66     return i2d_ASN1_bio_stream(out, (ASN1_VALUE *)p7, in, flags,
67                               ASN1_ITEM_rptr(PKCS7));
68 }

70 int PEM_write_bio_PKCS7_stream(BIO *out, PKCS7 *p7, BIO *in, int flags)
71 {
72     return PEM_write_bio_ASN1_stream(out, (ASN1_VALUE *) p7, in, flags,
73                                     "PKCS7",
74                                     ASN1_ITEM_rptr(PKCS7));
75 }

77 int SMIME_write_PKCS7(BIO *bio, PKCS7 *p7, BIO *data, int flags)
78 {
79     STACK_OF(X509_ALGOR) *mdalgs;
80     int ctype_nid = OBJ_obj2nid(p7->type);
81     if (ctype_nid == NID_pkcs7_signed)
82         mdalgs = p7->d.sign->md_algs;
83     else
84         mdalgs = NULL;

86     flags ^= SMIME_OLDMIME;

89     return SMIME_write_ASN1(bio, (ASN1_VALUE *)p7, data, flags,
90                             ctype_nid, NID_undef, mdalgs,
91                             ASN1_ITEM_rptr(PKCS7));
92 }

94 PKCS7 *SMIME_read_PKCS7(BIO *bio, BIO **bcont)
95 {
96     return (PKCS7 *)SMIME_read_ASN1(bio, bcont, ASN1_ITEM_rptr(PKCS7));
97 }
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_smime.c

1

```
*****
15373 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_smime.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pk7_smime.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 /* Simple PKCS#7 processing functions */
59
60 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pk7_smime.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/x509.h>
64 #include <openssl/x509v3.h>
65
66 static int pkcs7_copy_existing_digest(PKCS7 *p7, PKCS7_SIGNER_INFO *si);
67
68 PKCS7 *PKCS7_sign(X509 *signcert, EVP_PKEY *pkey, STACK_OF(X509) *certs,
69                  BIO *data, int flags)
70 {
71     PKCS7 *p7;
72     int i;
73
74     if(!(p7 = PKCS7_new()))
75     {
76         PKCS7err(PKCS7_F_PKCS7_SIGN, ERR_R_MALLOC_FAILURE);
77         return NULL;
78     }
79
80     if (!PKCS7_set_type(p7, NID_pkcs7_signed))
81         goto err;
82
83     if (!PKCS7_content_new(p7, NID_pkcs7_data))
84         goto err;
85
86     if (pkey && !PKCS7_sign_add_signer(p7, signcert, pkey, NULL, flags))
87     {
88         PKCS7err(PKCS7_F_PKCS7_SIGN, PKCS7_R_PKCS7_ADD_SIGNER_ERROR);
89         goto err;
90     }
91
92     if(!(flags & PKCS7_NOCERTS))
93     {
94         for(i = 0; i < sk_X509_num(certs); i++)
95         {
96             if (!PKCS7_add_certificate(p7, sk_X509_value(certs, i)))
97                 goto err;
98         }
99     }
100
101     if(flags & PKCS7_DETACHED)
102         PKCS7_set_detached(p7, 1);
103
104     if (flags & (PKCS7_STREAM|PKCS7_PARTIAL))
105         return p7;
106
107     if (PKCS7_final(p7, data, flags))
108         return p7;
109
110     err:
111     PKCS7_free(p7);
112     return NULL;
113 }
114
115 int PKCS7_final(PKCS7 *p7, BIO *data, int flags)
116 {
117     BIO *p7bio;
118     int ret = 0;
119     if (!(p7bio = PKCS7_dataInit(p7, NULL)))
120     {
121         PKCS7err(PKCS7_F_PKCS7_FINAL, ERR_R_MALLOC_FAILURE);
122         return 0;
123     }
124
125     SMIME_crlf_copy(data, p7bio, flags);
126
127     (void)BIO_flush(p7bio);
```

```

130     if (!PKCS7_dataFinal(p7,p7bio))
131     {
132         PKCS7err(PKCS7_F_PKCS7_FINAL,PKCS7_R_PKCS7_DATASIGN);
133         goto err;
134     }

136     ret = 1;

138     err:
139     BIO_free_all(p7bio);

141     return ret;

143 }

145 /* Check to see if a cipher exists and if so add S/MIME capabilities */

147 static int add_cipher_smcap(STACK_OF(X509_ALGOR) *sk, int nid, int arg)
148 {
149     if (EVP_get_cipherbynid(nid))
150         return PKCS7_simple_smimecap(sk, nid, arg);
151     return 1;
152 }

154 static int add_digest_smcap(STACK_OF(X509_ALGOR) *sk, int nid, int arg)
155 {
156     if (EVP_get_digestbynid(nid))
157         return PKCS7_simple_smimecap(sk, nid, arg);
158     return 1;
159 }

161 PKCS7_SIGNER_INFO *PKCS7_sign_add_signer(PKCS7 *p7, X509 *signcert,
162                                           EVP_PKEY *pkey, const EVP_MD *md,
163                                           int flags)
164 {
165     PKCS7_SIGNER_INFO *si = NULL;
166     STACK_OF(X509_ALGOR) *smcap = NULL;
167     if(!X509_check_private_key(signcert, pkey))
168     {
169         PKCS7err(PKCS7_F_PKCS7_SIGN_ADD_SIGNER,
170                 PKCS7_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE);
171         return NULL;
172     }

174     if (!(si = PKCS7_add_signature(p7,signcert,pkey, md)))
175     {
176         PKCS7err(PKCS7_F_PKCS7_SIGN_ADD_SIGNER,
177                 PKCS7_R_PKCS7_ADD_SIGNATURE_ERROR);
178         return NULL;
179     }

181     if(!(flags & PKCS7_NOCERTS))
182     {
183         if (!PKCS7_add_certificate(p7, signcert))
184             goto err;
185     }

187     if(!(flags & PKCS7_NOATTR))
188     {
189         if (!PKCS7_add_attrib_content_type(si, NULL))
190             goto err;
191         /* Add SMIMECapabilities */
192         if(!(flags & PKCS7_NOSMIMECAP))
193             {

```

```

194         if(!(smcap = sk_X509_ALGOR_new_null()))
195         {
196             PKCS7err(PKCS7_F_PKCS7_SIGN_ADD_SIGNER,
197                     ERR_R_MALLOC_FAILURE);
198             goto err;
199         }

200         if (!add_cipher_smcap(smcap, NID_aes_256_cbc, -1)
201             || !add_digest_smcap(smcap, NID_id_GostR3411_94, -1)
202             || !add_cipher_smcap(smcap, NID_id_Gost28147_89, -1)
203             || !add_cipher_smcap(smcap, NID_aes_192_cbc, -1)
204             || !add_cipher_smcap(smcap, NID_aes_128_cbc, -1)
205             || !add_cipher_smcap(smcap, NID_des_ede3_cbc, -1)
206             || !add_cipher_smcap(smcap, NID_rc2_cbc, 128)
207             || !add_cipher_smcap(smcap, NID_rc2_cbc, 64)
208             || !add_cipher_smcap(smcap, NID_des_cbc, -1)
209             || !add_cipher_smcap(smcap, NID_rc2_cbc, 40)
210             || !PKCS7_add_attrib_smimecap(si, smcap))
211             goto err;
212         sk_X509_ALGOR_pop_free(smcap, X509_ALGOR_free);
213         smcap = NULL;
214     }

215     if (flags & PKCS7_REUSE_DIGEST)
216     {
217         if (!pkcs7_copy_existing_digest(p7, si))
218             goto err;
219         if (!(flags & PKCS7_PARTIAL) &&
220             !PKCS7_SIGNER_INFO_sign(si))
221             goto err;
222     }

223     }
224     return si;
225     err:
226     if (smcap)
227         sk_X509_ALGOR_pop_free(smcap, X509_ALGOR_free);
228     return NULL;
229 }

231 /* Search for a digest matching SignerInfo digest type and if found
232  * copy across.
233  */

235 static int pkcs7_copy_existing_digest(PKCS7 *p7, PKCS7_SIGNER_INFO *si)
236 {
237     int i;
238     STACK_OF(PKCS7_SIGNER_INFO) *sinfos;
239     PKCS7_SIGNER_INFO *sitmp;
240     ASN1_OCTET_STRING *osdig = NULL;
241     sinfos = PKCS7_get_signer_info(p7);
242     for (i = 0; i < sk_PKCS7_SIGNER_INFO_num(sinfos); i++)
243     {
244         sitmp = sk_PKCS7_SIGNER_INFO_value(sinfos, i);
245         if (si == sitmp)
246             break;
247         if (sk_X509_ATTRIBUTE_num(sitmp->auth_attr) <= 0)
248             continue;
249         if (!OBJ_cmp(si->digest_alg->algorithm,
250                     sitmp->digest_alg->algorithm))
251         {
252             osdig = PKCS7_digest_from_attributes(sitmp->auth_attr);
253             break;
254         }
255     }

256     }

258     if (osdig)
259         return PKCS7_add1_attrib_digest(si, osdig->data, osdig->length);

```

```

261     PKCS7err(PKCS7_F_PKCS7_COPY_EXISTING_DIGEST,
262              PKCS7_R_NO_MATCHING_DIGEST_TYPE_FOUND);
263     return 0;
264 }

266 int PKCS7_verify(PKCS7 *p7, STACK_OF(X509) *certs, X509_STORE *store,
267                 BIO *indata, BIO *out, int flags)
268 {
269     STACK_OF(X509) *signers;
270     X509 *signer;
271     STACK_OF(PKCS7_SIGNER_INFO) *sinfos;
272     PKCS7_SIGNER_INFO *si;
273     X509_STORE_CTX cert_ctx;
274     char buf[4096];
275     int i, j=0, k, ret = 0;
276     BIO *p7bio;
277     BIO *tmpin, *tmpout;

279     if(!p7) {
280         PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_INVALID_NULL_POINTER);
281         return 0;
282     }

284     if(!PKCS7_type_is_signed(p7)) {
285         PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_WRONG_CONTENT_TYPE);
286         return 0;
287     }

289     /* Check for no data and no content: no data to verify signature */
290     if(PKCS7_get_detached(p7) && !indata) {
291         PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_NO_CONTENT);
292         return 0;
293     }
294 #if 0
295     /* NB: this test commented out because some versions of Netscape
296      * illegally include zero length content when signing data.
297      */

299     /* Check for data and content: two sets of data */
300     if(!PKCS7_get_detached(p7) && indata) {
301         PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_CONTENT_AN
302                 return 0;
303     }
304 #endif

306     sinfos = PKCS7_get_signer_info(p7);

308     if(!sinfos || !sk_PKCS7_SIGNER_INFO_num(sinfos)) {
309         PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_NO_SIGNATURES_ON_DATA);
310         return 0;
311     }

314     signers = PKCS7_get0_signers(p7, certs, flags);

316     if(!signers) return 0;

318     /* Now verify the certificates */

320     if (!(flags & PKCS7_NOVERIFY)) for (k = 0; k < sk_X509_num(signers); k++)
321         signer = sk_X509_value(signers, k);
322     if (!(flags & PKCS7_NOCHAIN)) {
323         if(!X509_STORE_CTX_init(&cert_ctx, store, signer,
324                                p7->d.sign->cert))
325             {

```

```

326         PKCS7err(PKCS7_F_PKCS7_VERIFY, ERR_R_X509_LIB);
327         sk_X509_free(signers);
328         return 0;
329     }
330     X509_STORE_CTX_set_default(&cert_ctx, "smime_sign");
331 } else if(!X509_STORE_CTX_init(&cert_ctx, store, signer, NULL))
332     PKCS7err(PKCS7_F_PKCS7_VERIFY, ERR_R_X509_LIB);
333     sk_X509_free(signers);
334     return 0;
335 }
336 if (!(flags & PKCS7_NOCRL))
337     X509_STORE_CTX_set0_crls(&cert_ctx, p7->d.sign->crl);
338 i = X509_verify_cert(&cert_ctx);
339 if (i <= 0) j = X509_STORE_CTX_get_error(&cert_ctx);
340 X509_STORE_CTX_cleanup(&cert_ctx);
341 if (i <= 0) {
342     PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_CERTIFICATE_VERIFY
343             ERR_add_error_data(2, "Verify error:",
344                               X509_verify_cert_error_string(j));
345     sk_X509_free(signers);
346     return 0;
347 }
348 /* Check for revocation status here */
349 }

351 /* Performance optimization: if the content is a memory BIO then
352  * store its contents in a temporary read only memory BIO. This
353  * avoids potentially large numbers of slow copies of data which will
354  * occur when reading from a read write memory BIO when signatures
355  * are calculated.
356  */

358 if (indata && (BIO_method_type(indata) == BIO_TYPE_MEM))
359 {
360     char *ptr;
361     long len;
362     len = BIO_get_mem_data(indata, &ptr);
363     tmpin = BIO_new_mem_buf(ptr, len);
364     if (tmpin == NULL)
365     {
366         PKCS7err(PKCS7_F_PKCS7_VERIFY, ERR_R_MALLOC_FAILURE);
367         return 0;
368     }
369 }
370 else
371     tmpin = indata;
372

374 if (!(p7bio=PKCS7_dataInit(p7, tmpin)))
375     goto err;

377 if(flags & PKCS7_TEXT) {
378     if(!(tmpout = BIO_new(BIO_s_mem()))){
379         PKCS7err(PKCS7_F_PKCS7_VERIFY, ERR_R_MALLOC_FAILURE);
380         goto err;
381     }
382     BIO_set_mem_eof_return(tmpout, 0);
383 } else tmpout = out;

385 /* We now have to 'read' from p7bio to calculate digests etc. */
386 for (;;)
387 {
388     i=BIO_read(p7bio, buf, sizeof(buf));
389     if (i <= 0) break;
390     if (tmpout) BIO_write(tmpout, buf, i);
391 }

```

```

393     if(flags & PKCS7_TEXT) {
394         if(!SMIME_text(tmpout, out)) {
395             PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_SMIME_TEXT_ERROR);
396             BIO_free(tmpout);
397             goto err;
398         }
399         BIO_free(tmpout);
400     }

402     /* Now Verify All Signatures */
403     if (!(flags & PKCS7_NOSIGS))
404         for (i=0; i<sk_PKCS7_SIGNER_INFO_num(sinfos); i++)
405         {
406             si=sk_PKCS7_SIGNER_INFO_value(sinfos,i);
407             signer = sk_X509_value (signers, i);
408             j=PKCS7_signatureVerify(p7bio,p7,si, signer);
409             if (j <= 0) {
410                 PKCS7err(PKCS7_F_PKCS7_VERIFY, PKCS7_R_SIGNATURE_FAILURE);
411                 goto err;
412             }
413         }

415     ret = 1;

417     err:
418     if (tmpin == indata)
419     {
420         if (indata) BIO_pop(p7bio);
421     }
422     BIO_free_all(p7bio);

425     sk_X509_free(signers);

427     return ret;
428 }

430 STACK_OF(X509) *PKCS7_get0_signers(PKCS7 *p7, STACK_OF(X509) *certs, int flags)
431 {
432     STACK_OF(X509) *signers;
433     STACK_OF(PKCS7_SIGNER_INFO) *sinfos;
434     PKCS7_SIGNER_INFO *si;
435     PKCS7_ISSUER_AND_SERIAL *ias;
436     X509 *signer;
437     int i;

439     if(!p7) {
440         PKCS7err(PKCS7_F_PKCS7_GET0_SIGNERS, PKCS7_R_INVALID_NULL_POINTER);
441         return NULL;
442     }

444     if(!PKCS7_type_is_signed(p7)) {
445         PKCS7err(PKCS7_F_PKCS7_GET0_SIGNERS, PKCS7_R_WRONG_CONTENT_TYPE);
446         return NULL;
447     }

449     /* Collect all the signers together */

451     sinfos = PKCS7_get_signer_info(p7);

453     if(sk_PKCS7_SIGNER_INFO_num(sinfos) <= 0) {
454         PKCS7err(PKCS7_F_PKCS7_GET0_SIGNERS, PKCS7_R_NO_SIGNERS);
455         return 0;
456     }

```

```

458     if(!(signers = sk_X509_new_null())) {
459         PKCS7err(PKCS7_F_PKCS7_GET0_SIGNERS, ERR_R_MALLOC_FAILURE);
460         return NULL;
461     }

463     for (i = 0; i < sk_PKCS7_SIGNER_INFO_num(sinfos); i++)
464     {
465         si = sk_PKCS7_SIGNER_INFO_value(sinfos, i);
466         ias = si->issuer_and_serial;
467         signer = NULL;
468         /* If any certificates passed they take priority */
469         if (certs) signer = X509_find_by_issuer_and_serial (certs,
470             ias->issuer, ias->serial);
471         if (!signer && !(flags & PKCS7_NOINTERN)
472             && p7->d.sign->cert) signer =
473             X509_find_by_issuer_and_serial (p7->d.sign->cert,
474             ias->issuer, ias->serial);
475         if (!signer) {
476             PKCS7err(PKCS7_F_PKCS7_GET0_SIGNERS, PKCS7_R_SIGNER_CERTI);
477             sk_X509_free(signers);
478             return 0;
479         }

481         if (!sk_X509_push(signers, signer)) {
482             sk_X509_free(signers);
483             return NULL;
484         }
485     }
486     return signers;
487 }

490 /* Build a complete PKCS#7 enveloped data */

492 PKCS7 *PKCS7_encrypt(STACK_OF(X509) *certs, BIO *in, const EVP_CIPHER *cipher,
493     int flags)
494 {
495     PKCS7 *p7;
496     BIO *p7bio = NULL;
497     int i;
498     X509 *x509;
499     if(!(p7 = PKCS7_new())) {
500         PKCS7err(PKCS7_F_PKCS7_ENCRYPT, ERR_R_MALLOC_FAILURE);
501         return NULL;
502     }

504     if (!PKCS7_set_type(p7, NID_pkcs7_enveloped))
505         goto err;
506     if (!PKCS7_set_cipher(p7, cipher)) {
507         PKCS7err(PKCS7_F_PKCS7_ENCRYPT, PKCS7_R_ERROR_SETTING_CIPHER);
508         goto err;
509     }

511     for(i = 0; i < sk_X509_num(certificates); i++) {
512         x509 = sk_X509_value(certificates, i);
513         if(!PKCS7_add_recipient(p7, x509)) {
514             PKCS7err(PKCS7_F_PKCS7_ENCRYPT,
515                 PKCS7_R_ERROR_ADDING_RECIPIENT);
516             goto err;
517         }
518     }

520     if (flags & PKCS7_STREAM)
521         return p7;

523     if (PKCS7_final(p7, in, flags))

```

```

524         return p7;
526     err:
528     BIO_free_all(p7bio);
529     PKCS7_free(p7);
530     return NULL;
532 }

534 int PKCS7_decrypt(PKCS7 *p7, EVP_PKEY *pkey, X509 *cert, BIO *data, int flags)
535 {
536     BIO *tmpmem;
537     int ret, i;
538     char buf[4096];

540     if(!p7) {
541         PKCS7err(PKCS7_F_PKCS7_DECRYPT, PKCS7_R_INVALID_NULL_POINTER);
542         return 0;
543     }

545     if(!PKCS7_type_is_enveloped(p7)) {
546         PKCS7err(PKCS7_F_PKCS7_DECRYPT, PKCS7_R_WRONG_CONTENT_TYPE);
547         return 0;
548     }

550     if(cert && !X509_check_private_key(cert, pkey)) {
551         PKCS7err(PKCS7_F_PKCS7_DECRYPT,
552                 PKCS7_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE);
553         return 0;
554     }

556     if(!(tmpmem = PKCS7_dataDecode(p7, pkey, NULL, cert))) {
557         PKCS7err(PKCS7_F_PKCS7_DECRYPT, PKCS7_R_DECRYPT_ERROR);
558         return 0;
559     }

561     if (flags & PKCS7_TEXT) {
562         BIO *tmpbuf, *bread;
563         /* Encrypt BIOs can't do BIO_gets() so add a buffer BIO */
564         if(!(tmpbuf = BIO_new(BIO_f_buffer()))) {
565             PKCS7err(PKCS7_F_PKCS7_DECRYPT, ERR_R_MALLOC_FAILURE);
566             BIO_free_all(tmpmem);
567             return 0;
568         }
569         if(!(bread = BIO_push(tmpbuf, tmpmem))) {
570             PKCS7err(PKCS7_F_PKCS7_DECRYPT, ERR_R_MALLOC_FAILURE);
571             BIO_free_all(tmpbuf);
572             BIO_free_all(tmpmem);
573             return 0;
574         }
575         ret = SMIME_text(bread, data);
576         if (ret > 0 && BIO_method_type(tmpmem) == BIO_TYPE_CIPHER)
577             {
578                 if (!BIO_get_cipher_status(tmpmem))
579                     ret = 0;
580             }
581         BIO_free_all(bread);
582         return ret;
583     } else {
584         for(;;) {
585             i = BIO_read(tmpmem, buf, sizeof(buf));
586             if(i <= 0)
587                 {
588                     ret = 1;
589                     if (BIO_method_type(tmpmem) == BIO_TYPE_CIPHER)

```

```

590             {
591                 if (!BIO_get_cipher_status(tmpmem))
592                     ret = 0;
593             }
594         break;
595     }
596     if (BIO_write(data, buf, i) != i)
597     {
598         ret = 0;
599         break;
600     }
601 }
602 BIO_free_all(tmpmem);
603 return ret;
604 }
605 }
606 }

```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pkcs7err.c

1

```
*****
9769 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pkcs7err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/pkcs7/pkcs7err.c */
2 /* =====
3  * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
13  * notice, this list of conditions and the following disclaimer in
14  * the documentation and/or other materials provided with the
15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
21  *
22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
24  * prior written permission. For written permission, please contact
25  * openssl-core@OpenSSL.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
32  * acknowledgment:
33  * "This product includes software developed by the OpenSSL Project
34  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pkcs7/pkcs7err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/pkcs7.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_PKCS7,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_PKCS7,0,reason)

71 static ERR_STRING_DATA PKCS7_str_functs[]=
72 {
73 {ERR_FUNC(PKCS7_F_B64_READ_PKCS7), "B64_READ_PKCS7"},
74 {ERR_FUNC(PKCS7_F_B64_WRITE_PKCS7), "B64_WRITE_PKCS7"},
75 {ERR_FUNC(PKCS7_F_D0_PKCS7_SIGNED_ATTRIB), "D0_PKCS7_SIGNED_ATTRIB"},
76 {ERR_FUNC(PKCS7_F_I2D_PKCS7_BIO_STREAM), "i2d_pkcs7_bio_stream"},
77 {ERR_FUNC(PKCS7_F_PKCS7_ADD0_ATTRIB_SIGNING_TIME), "PKCS7_add0_attrib_signi"},
78 {ERR_FUNC(PKCS7_F_PKCS7_ADD_ATTRIB_SMIMECAP), "PKCS7_add_attrib_smimecap"},
79 {ERR_FUNC(PKCS7_F_PKCS7_ADD_CERTIFICATE), "PKCS7_add_certificate"},
80 {ERR_FUNC(PKCS7_F_PKCS7_ADD_CRL), "PKCS7_add_crl"},
81 {ERR_FUNC(PKCS7_F_PKCS7_ADD_RECIPIENT_INFO), "PKCS7_add_recipient_info"},
82 {ERR_FUNC(PKCS7_F_PKCS7_ADD_SIGNATURE), "PKCS7_add_signature"},
83 {ERR_FUNC(PKCS7_F_PKCS7_ADD_SIGNER), "PKCS7_add_signer"},
84 {ERR_FUNC(PKCS7_F_PKCS7_BIO_ADD_DIGEST), "PKCS7_BIO_ADD_DIGEST"},
85 {ERR_FUNC(PKCS7_F_PKCS7_COPY_EXISTING_DIGEST), "PKCS7_COPY_EXISTING_DIGEST"},
86 {ERR_FUNC(PKCS7_F_PKCS7_CTRL), "PKCS7_ctrl"},
87 {ERR_FUNC(PKCS7_F_PKCS7_DATADECODE), "PKCS7_dataDecode"},
88 {ERR_FUNC(PKCS7_F_PKCS7_DATAFINAL), "PKCS7_dataFinal"},
89 {ERR_FUNC(PKCS7_F_PKCS7_DATAINIT), "PKCS7_dataInit"},
90 {ERR_FUNC(PKCS7_F_PKCS7_DATASIGN), "PKCS7_DATASIGN"},
91 {ERR_FUNC(PKCS7_F_PKCS7_DATAVERIFY), "PKCS7_dataVerify"},
92 {ERR_FUNC(PKCS7_F_PKCS7_DECRYPT), "PKCS7_decrypt"},
93 {ERR_FUNC(PKCS7_F_PKCS7_DECRYPT_RINFO), "PKCS7_DECRYPT_RINFO"},
94 {ERR_FUNC(PKCS7_F_PKCS7_ENCODE_RINFO), "PKCS7_ENCODE_RINFO"},
95 {ERR_FUNC(PKCS7_F_PKCS7_ENCRYPT), "PKCS7_encrypt"},
96 {ERR_FUNC(PKCS7_F_PKCS7_FINAL), "PKCS7_final"},
97 {ERR_FUNC(PKCS7_F_PKCS7_FIND_DIGEST), "PKCS7_FIND_DIGEST"},
98 {ERR_FUNC(PKCS7_F_PKCS7_GET0_SIGNERS), "PKCS7_get0_signers"},
99 {ERR_FUNC(PKCS7_F_PKCS7_RECIP_INFO_SET), "PKCS7_RECIP_INFO_set"},
100 {ERR_FUNC(PKCS7_F_PKCS7_SET_CIPHER), "PKCS7_set_cipher"},
101 {ERR_FUNC(PKCS7_F_PKCS7_SET_CONTENT), "PKCS7_set_content"},
102 {ERR_FUNC(PKCS7_F_PKCS7_SET_DIGEST), "PKCS7_set_digest"},
103 {ERR_FUNC(PKCS7_F_PKCS7_SET_TYPE), "PKCS7_set_type"},
104 {ERR_FUNC(PKCS7_F_PKCS7_SIGN), "PKCS7_sign"},
105 {ERR_FUNC(PKCS7_F_PKCS7_SIGNATUREVERIFY), "PKCS7_signatureVerify"},
106 {ERR_FUNC(PKCS7_F_PKCS7_SIGNER_INFO_SET), "PKCS7_SIGNER_INFO_set"},
107 {ERR_FUNC(PKCS7_F_PKCS7_SIGNER_INFO_SIGN), "PKCS7_SIGNER_INFO_sign"},
108 {ERR_FUNC(PKCS7_F_PKCS7_SIGN_ADD_SIGNER), "PKCS7_sign_add_signer"},
109 {ERR_FUNC(PKCS7_F_PKCS7_SIMPLE_SMIMECAP), "PKCS7_simple_smimecap"},
110 {ERR_FUNC(PKCS7_F_PKCS7_VERIFY), "PKCS7_verify"},
111 {ERR_FUNC(PKCS7_F_SMIME_READ_PKCS7), "SMIME_read_PKCS7"},
112 {ERR_FUNC(PKCS7_F_SMIME_TEXT), "SMIME_text"},
113 {0,NULL}
114 };

116 static ERR_STRING_DATA PKCS7_str_reasons[]=
117 {
118 {ERR_REASON(PKCS7_R_CERTIFICATE_VERIFY_ERROR),"certificate verify error"},
119 {ERR_REASON(PKCS7_R_CIPHER_HAS_NO_OBJECT_IDENTIFIER),"cipher has no object ident"},
120 {ERR_REASON(PKCS7_R_CIPHER_NOT_INITIALIZED),"cipher not initialized"},
121 {ERR_REASON(PKCS7_R_CONTENT_AND_DATA_PRESENT),"content and data present"},
122 {ERR_REASON(PKCS7_R_CTRL_ERROR),"ctrl error"},
123 {ERR_REASON(PKCS7_R_DECODE_ERROR),"decode error"},
124 {ERR_REASON(PKCS7_R_DECRYPTED_KEY_IS_WRONG_LENGTH),"decrypted key is wrong lengt"},
125 {ERR_REASON(PKCS7_R_DECRYPT_ERROR),"decrypt error"},
126 {ERR_REASON(PKCS7_R_DIGEST_FAILURE),"digest failure"},
127 {ERR_REASON(PKCS7_R_ENCRYPTION_CTRL_FAILURE),"encryption ctrl failure"},
```

```

128 {ERR_REASON(PKCS7_R_ENCRYPTION_NOT_SUPPORTED_FOR_THIS_KEY_TYPE),"encryption not
129 {ERR_REASON(PKCS7_R_ERROR_ADDING_RECIPIENT),"error adding recipient"},
130 {ERR_REASON(PKCS7_R_ERROR_SETTING_CIPHER),"error setting cipher"},
131 {ERR_REASON(PKCS7_R_INVALID_MIME_TYPE),"invalid mime type"},
132 {ERR_REASON(PKCS7_R_INVALID_NULL_POINTER),"invalid null pointer"},
133 {ERR_REASON(PKCS7_R_MIME_NO_CONTENT_TYPE),"mime no content type"},
134 {ERR_REASON(PKCS7_R_MIME_PARSE_ERROR),"mime parse error"},
135 {ERR_REASON(PKCS7_R_MIME_SIG_PARSE_ERROR),"mime sig parse error"},
136 {ERR_REASON(PKCS7_R_MISSING_CERIPEND_INFO),"missing ceripend info"},
137 {ERR_REASON(PKCS7_R_NO_CONTENT),"no content"},
138 {ERR_REASON(PKCS7_R_NO_CONTENT_TYPE),"no content type"},
139 {ERR_REASON(PKCS7_R_NO_DEFAULT_DIGEST),"no default digest"},
140 {ERR_REASON(PKCS7_R_NO_MATCHING_DIGEST_TYPE_FOUND),"no matching digest type foun
141 {ERR_REASON(PKCS7_R_NO_MULTIPART_BODY_FAILURE),"no multipart body failure"},
142 {ERR_REASON(PKCS7_R_NO_MULTIPART_BOUNDARY),"no multipart boundary"},
143 {ERR_REASON(PKCS7_R_NO_RECIPIENT_MATCHES_CERTIFICATE),"no recipient matches cert
144 {ERR_REASON(PKCS7_R_NO_RECIPIENT_MATCHES_KEY),"no recipient matches key"},
145 {ERR_REASON(PKCS7_R_NO_SIGNATURES_ON_DATA),"no signatures on data"},
146 {ERR_REASON(PKCS7_R_NO_SIGNERS),"no signers"},
147 {ERR_REASON(PKCS7_R_NO_SIG_CONTENT_TYPE),"no sig content type"},
148 {ERR_REASON(PKCS7_R_OPERATION_NOT_SUPPORTED_ON_THIS_TYPE),"operation not support
149 {ERR_REASON(PKCS7_R_PKCS7_ADD_SIGNATURE_ERROR),"pkcs7 add signature error"},
150 {ERR_REASON(PKCS7_R_PKCS7_ADD_SIGNER_ERROR),"pkcs7 add signer error"},
151 {ERR_REASON(PKCS7_R_PKCS7_DATAFINAL),"pkcs7 datafinal"},
152 {ERR_REASON(PKCS7_R_PKCS7_DATAFINAL_ERROR),"pkcs7 datafinal error"},
153 {ERR_REASON(PKCS7_R_PKCS7_DATASIGN),"pkcs7 datasign"},
154 {ERR_REASON(PKCS7_R_PKCS7_PARSE_ERROR),"pkcs7 parse error"},
155 {ERR_REASON(PKCS7_R_PKCS7_SIG_PARSE_ERROR),"pkcs7 sig parse error"},
156 {ERR_REASON(PKCS7_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE),"private key does no
157 {ERR_REASON(PKCS7_R_SIGNATURE_FAILURE),"signature failure"},
158 {ERR_REASON(PKCS7_R_SIGNER_CERTIFICATE_NOT_FOUND),"signer certificate not found"
159 {ERR_REASON(PKCS7_R_SIGNING_CTRL_FAILURE),"signing ctrl failure"},
160 {ERR_REASON(PKCS7_R_SIGNING_NOT_SUPPORTED_FOR_THIS_KEY_TYPE),"signing not suppor
161 {ERR_REASON(PKCS7_R_SIG_INVALID_MIME_TYPE),"sig invalid mime type"},
162 {ERR_REASON(PKCS7_R_SMIME_TEXT_ERROR),"smime text error"},
163 {ERR_REASON(PKCS7_R_UNABLE_TO_FIND_CERTIFICATE),"unable to find certificate"},
164 {ERR_REASON(PKCS7_R_UNABLE_TO_FIND_MEM_BIO),"unable to find mem bio"},
165 {ERR_REASON(PKCS7_R_UNABLE_TO_FIND_MESSAGE_DIGEST),"unable to find message diges
166 {ERR_REASON(PKCS7_R_UNKNOWN_DIGEST_TYPE),"unknown digest type"},
167 {ERR_REASON(PKCS7_R_UNKNOWN_OPERATION),"unknown operation"},
168 {ERR_REASON(PKCS7_R_UNSUPPORTED_CIPHER_TYPE),"unsupported cipher type"},
169 {ERR_REASON(PKCS7_R_UNSUPPORTED_CONTENT_TYPE),"unsupported content type"},
170 {ERR_REASON(PKCS7_R_WRONG_CONTENT_TYPE),"wrong content type"},
171 {ERR_REASON(PKCS7_R_WRONG_PKCS7_TYPE),"wrong pkcs7 type"},
172 {0,NULL}};
173 };

175 #endif

177 void ERR_load_PKCS7_strings(void)
178 {
179 #ifndef OPENSSL_NO_ERR
181     if (ERR_func_error_string(PKCS7_str_functs[0].error) == NULL)
182     {
183         ERR_load_strings(0,PKCS7_str_functs);
184         ERR_load_strings(0,PKCS7_str_reasons);
185     }
186 #endif
187 }

```


new/usr/src/lib/openssl/libsunw_crypto/pl/aes-586.pl

1

```
*****
103486 Fri May 30 18:32:01 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/aes-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # Version 4.3.
11 #
12 # You might fail to appreciate this module performance from the first
13 # try. If compared to "vanilla" linux-ia32-icc target, i.e. considered
14 # to be *the* best Intel C compiler without -KPIC, performance appears
15 # to be virtually identical... But try to re-configure with shared
16 # library support... Aha! Intel compiler "suddenly" lags behind by 30%
17 # [on P4, more on others:-) And if compared to position-independent
18 # code generated by GNU C, this code performs *more* than *twice* as
19 # fast! Yes, all this buzz about PIC means that unlike other hand-
20 # coded implementations, this one was explicitly designed to be safe
21 # to use even in shared library context... This also means that this
22 # code isn't necessarily absolutely fastest "ever," because in order
23 # to achieve position independence an extra register has to be
24 # off-loaded to stack, which affects the benchmark result.
25 #
26 # Special note about instruction choice. Do you recall RC4_INT code
27 # performing poorly on P4? It might be the time to figure out why.
28 # RC4_INT code implies effective address calculations in base+offset*4
29 # form. Trouble is that it seems that offset scaling turned to be
30 # critical path... At least eliminating scaling resulted in 2.8x RC4
31 # performance improvement [as you might recall]. As AES code is hungry
32 # for scaling too, I [try to] avoid the latter by favoring off-by-2
33 # shifts and masking the result with 0xFF<<2 instead of "boring" 0xFF.
34 #
35 # As was shown by Dean Gaudet <dean@arctic.org>, the above note turned
36 # void. Performance improvement with off-by-2 shifts was observed on
37 # intermediate implementation, which was spilling yet another register
38 # to stack... Final offset*4 code below runs just a tad faster on P4,
39 # but exhibits up to 10% improvement on other cores.
40 #
41 # Second version is "monolithic" replacement for aes_core.c, which in
42 # addition to AES_[de]ncrypt implements private_AES_set_[de]ncryption_key.
43 # This made it possible to implement little-endian variant of the
44 # algorithm without modifying the base C code. Motivating factor for
45 # the undertaken effort was that it appeared that in tight IA-32
46 # register window little-endian flavor could achieve slightly higher
47 # Instruction Level Parallelism, and it indeed resulted in up to 15%
48 # better performance on most recent µ-archs...
49 #
50 # Third version adds AES_cbc_encrypt implementation, which resulted in
51 # up to 40% performance improvement of CBC benchmark results. 40% was
52 # observed on P4 core, where "overall" improvement coefficient, i.e. if
53 # compared to PIC generated by GCC and in CBC mode, was observed to be
54 # as large as 4x:-) CBC performance is virtually identical to ECB now
55 # and on some platforms even better, e.g. 17.6 "small" cycles/byte on
56 # Opteron, because certain function prologues and epilogues are
57 # effectively taken out of the loop...
58 #
59 # Version 3.2 implements compressed tables and prefetch of these tables
60 # in CBC[!] mode. Former means that 3/4 of table references are now
61 # misaligned, which unfortunately has negative impact on elder IA-32
```

new/usr/src/lib/openssl/libsunw_crypto/pl/aes-586.pl

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62 # implementations, Pentium suffered 30% penalty, PIII - 10%.
63 #
64 # Version 3.3 avoids L1 cache aliasing between stack frame and
65 # S-boxes, and 3.4 - L1 cache aliasing even between key schedule. The
66 # latter is achieved by copying the key schedule to controlled place in
67 # stack. This unfortunately has rather strong impact on small block CBC
68 # performance, ~2x deterioration on 16-byte block if compared to 3.3.
69 #
70 # Version 3.5 checks if there is L1 cache aliasing between user-supplied
71 # key schedule and S-boxes and abstains from copying the former if
72 # there is no. This allows end-user to consciously retain small block
73 # performance by aligning key schedule in specific manner.
74 #
75 # Version 3.6 compresses Td4 to 256 bytes and prefetches it in ECB.
76 #
77 # Current ECB performance numbers for 128-bit key in CPU cycles per
78 # processed byte [measure commonly used by AES benchmarks] are:
79 #
80 #             small footprint      fully unrolled
81 # P4           24                  22
82 # AMD K8       20                  19
83 # PIII        25                  23
84 # Pentium     81                  78
85 #
86 # Version 3.7 reimplements outer rounds as "compact." Meaning that
87 # first and last rounds reference compact 256 bytes S-box. This means
88 # that first round consumes a lot more CPU cycles and that encrypt
89 # and decrypt performance becomes asymmetric. Encrypt performance
90 # drops by 10-12%, while decrypt - by 20-25%:-( 256 bytes S-box is
91 # aggressively pre-fetched.
92 #
93 # Version 4.0 effectively rolls back to 3.6 and instead implements
94 # additional set of functions, _[x86|sse]_AES_[en|de]crypt_compact,
95 # which use exclusively 256 byte S-box. These functions are to be
96 # called in modes not concealing plain text, such as ECB, or when
97 # we're asked to process smaller amount of data [or unconditionally
98 # on hyper-threading CPU]. Currently it's called unconditionally from
99 # AES_[en|de]crypt, which affects all modes, but CBC. CBC routine
100 # still needs to be modified to switch between slower and faster
101 # mode when appropriate... But in either case benchmark landscape
102 # changes dramatically and below numbers are CPU cycles per processed
103 # byte for 128-bit key.
104 #
105 #             ECB encrypt      ECB decrypt      CBC large chunk
106 # P4           56[60]          84[100]          23
107 # AMD K8       48[44]          70[79]           18
108 # PIII        41[50]          61[91]           24
109 # Core 2       32[38]          45[70]          18.5
110 # Pentium     120             160             77
111 #
112 # Version 4.1 switches to compact S-box even in key schedule setup.
113 #
114 # Version 4.2 prefetches compact S-box in every SSE round or in other
115 # words every cache-line is *guaranteed* to be accessed within ~50
116 # cycles window. Why just SSE? Because it's needed on hyper-threading
117 # CPU! Which is also why it's prefetched with 64 byte stride. Best
118 # part is that it has no negative effect on performance:-)
119 #
120 # Version 4.3 implements switch between compact and non-compact block
121 # functions in AES_cbc_encrypt depending on how much data was asked
122 # to be processed in one stroke.
123 #
124 # =====
125 # Timing attacks are classified in two classes: synchronous when
126 # attacker consciously initiates cryptographic operation and collects
127 # timing data of various character afterwards, and asynchronous when
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128 # malicious code is executed on same CPU simultaneously with AES,
129 # instruments itself and performs statistical analysis of this data.
130 #
131 # As far as synchronous attacks go the root to the AES timing
132 # vulnerability is twofold. Firstly, of 256 S-box elements at most 160
133 # are referred to in single 128-bit block operation. Well, in C
134 # implementation with 4 distinct tables it's actually as little as 40
135 # references per 256 elements table, but anyway... Secondly, even
136 # though S-box elements are clustered into smaller amount of cache-
137 # lines, smaller than 160 and even 40, it turned out that for certain
138 # plain-text pattern[s] or simply put chosen plain-text and given key
139 # few cache-lines remain unaccessed during block operation. Now, if
140 # attacker can figure out this access pattern, he can deduct the key
141 # [or at least part of it]. The natural way to mitigate this kind of
142 # attacks is to minimize the amount of cache-lines in S-box and/or
143 # prefetch them to ensure that every one is accessed for more uniform
144 # timing. But note that *if* plain-text was concealed in such way that
145 # input to block function is distributed *uniformly*, then attack
146 # wouldn't apply. Now note that some encryption modes, most notably
147 # CBC, do mask the plain-text in this exact way [secure cipher output
148 # is distributed uniformly]. Yes, one still might find input that
149 # would reveal the information about given key, but if amount of
150 # candidate inputs to be tried is larger than amount of possible key
151 # combinations then attack becomes infeasible. This is why revised
152 # AES_cbc_encrypt "dares" to switch to larger S-box when larger chunk
153 # of data is to be processed in one stroke. The current size limit of
154 # 512 bytes is chosen to provide same [diminishingly low] probability
155 # for cache-line to remain untouched in large chunk operation with
156 # large S-box as for single block operation with compact S-box and
157 # surely needs more careful consideration...
158 #
159 # As for asynchronous attacks. There are two flavours: attacker code
160 # being interleaved with AES on hyper-threading CPU at *instruction*
161 # level, and two processes time sharing single core. As for latter.
162 # Two vectors. 1. Given that attacker process has higher priority,
163 # yield execution to process performing AES just before timer fires
164 # off the scheduler, immediately regain control of CPU and analyze the
165 # cache state. For this attack to be efficient attacker would have to
166 # effectively slow down the operation by several *orders* of magnitude,
167 # by ratio of time slice to duration of handful of AES rounds, which
168 # unlikely to remain unnoticed. Not to mention that this also means
169 # that he would spend correspondingly more time to collect enough
170 # statistical data to mount the attack. It's probably appropriate to
171 # say that if adversary reckons that this attack is beneficial and
172 # risks to be noticed, you probably have larger problems having him
173 # mere opportunity. In other words suggested code design expects you
174 # to preclude/mitigate this attack by overall system security design.
175 # 2. Attacker manages to make his code interrupt driven. In order for
176 # this kind of attack to be feasible, interrupt rate has to be high
177 # enough, again comparable to duration of handful of AES rounds. But
178 # is there interrupt source of such rate? Hardly, not even 16bps NIC
179 # generates interrupts at such raging rate...
180 #
181 # And now back to the former, hyper-threading CPU or more specifically
182 # Intel P4. Recall that asynchronous attack implies that malicious
183 # code instruments itself. And naturally instrumentation granularity
184 # has to be noticeably lower than duration of codepath accessing S-box.
185 # Given that all cache-lines are accessed during that time that is.
186 # Current implementation accesses *all* cache-lines within ~50 cycles
187 # window, which is actually *less* than RDTSC latency on Intel P4!

189 $0 =~ m/([^\[\]\\])[\^\\\/]+$/; $dir=$1;
190 push(@INC, "${dir}", "${dir}../../perlasm");
191 require "x86asm.pl";

193 &asm_init($ARGV[0], "aes-586.pl", $x86only = $ARGV[$#ARGV] eq "386");

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194 &static_label("AES-Te");
195 &static_label("AES-Td");

197 $s0="eax";
198 $s1="ebx";
199 $s2="ecx";
200 $s3="edx";
201 $key="edi";
202 $acc="esi";
203 $tbl="ebp";

205 # stack frame layout in _[x86|sse]_AES_* routines, frame is allocated
206 # by caller
207 $_ra=&DWP(0,"esp"); # return address
208 $_s0=&DWP(4,"esp"); # s0 backing store
209 $_s1=&DWP(8,"esp"); # s1 backing store
210 $_s2=&DWP(12,"esp"); # s2 backing store
211 $_s3=&DWP(16,"esp"); # s3 backing store
212 $_key=&DWP(20,"esp"); # pointer to key schedule
213 $_end=&DWP(24,"esp"); # pointer to end of key schedule
214 $_tbl=&DWP(28,"esp"); # %ebp backing store

216 # stack frame layout in AES_[en|crypt] routines, which differs from
217 # above by 4 and overlaps by %ebp backing store
218 $_tbl=&DWP(24,"esp");
219 $_esp=&DWP(28,"esp");

221 sub _data_word() { my $i; while(defined($i=shift)) { &data_word($i,$i); } }

223 $speed_limit=512; # chunks smaller than $speed_limit are
224 # processed with compact routine in CBC mode
225 $small_footprint=1; # $small_footprint=1 code is ~5% slower [on
226 # recent µ-archs], but ~5 times smaller!
227 # I favor compact code to minimize cache
228 # contention and in hope to "collect" 5% back
229 # in real-life applications...

231 $vertical_spin=0; # shift "vertically" defaults to 0, because of
232 # its proof-of-concept status...
233 # Note that there is no decvert(), as well as last encryption round is
234 # performed with "horizontal" shifts. This is because this "vertical"
235 # implementation [one which groups shifts on a given $s[i] to form a
236 # "column," unlike "horizontal" one, which groups shifts on different
237 # $s[i] to form a "row"] is work in progress. It was observed to run
238 # few percents faster on Intel cores, but not AMD. On AMD K8 core it's
239 # whole 12% slower!-( So we face a trade-off... Shall it be resolved
240 # some day? Till then the code is considered experimental and by
241 # default remains dormant...

243 sub encvert()
244 { my ($te,$s) = @_;
245   my $v0 = $acc, $v1 = $key;

247   &mov ($v0,$s[3]); # copy s3
248   &mov (&DWP(4,"esp"),$s[2]); # save s2
249   &mov ($v1,$s[0]); # copy s0
250   &mov (&DWP(8,"esp"),$s[1]); # save s1

252   &movz ($s[2],&HB($s[0]));
253   &and ($s[0],0xFF);
254   &mov ($s[0],&DWP(0,$te,$s[0],8)); # s0>>0
255   &shr ($v1,16);
256   &mov ($s[3],&DWP(3,$te,$s[2],8)); # s0>>8
257   &movz ($s[1],&HB($v1));
258   &and ($v1,0xFF);
259   &mov ($s[2],&DWP(2,$te,$v1,8)); # s0>>16

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260      &mov    ($v1,$v0);
261      &mov    ($s[1],&DWP(1,Ste,$s[1],8));          # s0>>24

263      &and    ($v0,0xFF);
264      &xor    ($s[3],&DWP(0,Ste,$v0,8));              # s3>>0
265      &movz   ($v0,&HB($v1));
266      &shr    ($v1,16);
267      &xor    ($s[2],&DWP(3,Ste,$v0,8));              # s3>>8
268      &movz   ($v0,&HB($v1));
269      &and    ($v1,0xFF);
270      &xor    ($s[1],&DWP(2,Ste,$v1,8));              # s3>>16
271      &mov    ($v1,&DWP(4,"esp"));                    # restore s2
272      &xor    ($s[0],&DWP(1,Ste,$v0,8));              # s3>>24

274      &mov    ($v0,$v1);
275      &and    ($v1,0xFF);
276      &xor    ($s[2],&DWP(0,Ste,$v1,8));              # s2>>0
277      &movz   ($v1,&HB($v0));
278      &shr    ($v0,16);
279      &xor    ($s[1],&DWP(3,Ste,$v1,8));              # s2>>8
280      &movz   ($v1,&HB($v0));
281      &and    ($v0,0xFF);
282      &xor    ($s[0],&DWP(2,Ste,$v0,8));              # s2>>16
283      &mov    ($v0,&DWP(8,"esp"));                    # restore s1
284      &xor    ($s[3],&DWP(1,Ste,$v1,8));              # s2>>24

286      &mov    ($v1,$v0);
287      &and    ($v0,0xFF);
288      &xor    ($s[1],&DWP(0,Ste,$v0,8));              # s1>>0
289      &movz   ($v0,&HB($v1));
290      &shr    ($v1,16);
291      &xor    ($s[0],&DWP(3,Ste,$v0,8));              # s1>>8
292      &movz   ($v0,&HB($v1));
293      &and    ($v1,0xFF);
294      &xor    ($s[3],&DWP(2,Ste,$v1,8));              # s1>>16
295      &mov    ($key,$_key);                          # reincarnate v1 as key
296      &xor    ($s[2],&DWP(1,Ste,$v0,8));              # s1>>24
297 }

299 # Another experimental routine, which features "horizontal spin," but
300 # eliminates one reference to stack. Strangely enough runs slower...
301 sub enchoriz()
302 { my $v0 = $key, $v1 = $acc;

304      &movz   ($v0,&LB($s0));                          # 3, 2, 1, 0*
305      &rotr   ($s2,8);                                # 8,11,10, 9
306      &mov    ($v1,&DWP(0,Ste,$v0,8));                  # 0
307      &movz   ($v0,&HB($s1));                          # 7, 6, 5*, 4
308      &rotr   ($s3,16);                                # 13,12,15,14
309      &xor    ($v1,&DWP(3,Ste,$v0,8));                  # 5
310      &movz   ($v0,&HB($s2));                          # 8,11,10*, 9
311      &rotr   ($s0,16);                                # 1, 0, 3, 2
312      &xor    ($v1,&DWP(2,Ste,$v0,8));                  # 10
313      &movz   ($v0,&HB($s3));                          # 13,12,15*,14
314      &xor    ($v1,&DWP(1,Ste,$v0,8));                  # 15, t[0] collected
315      &mov    ($_s0,$v1);                             # t[0] saved

317      &movz   ($v0,&LB($s1));                          # 7, 6, 5, 4*
318      &shr    ($s1,16);                                # -, -, 7, 6
319      &mov    ($v1,&DWP(0,Ste,$v0,8));                  # 4
320      &movz   ($v0,&LB($s3));                          # 13,12,15,14*
321      &xor    ($v1,&DWP(2,Ste,$v0,8));                  # 14
322      &movz   ($v0,&HB($s0));                          # 1, 0, 3*, 2
323      &and    ($s3,0xffff0000);                       # 13,12, -, -
324      &xor    ($v1,&DWP(1,Ste,$v0,8));                  # 3
325      &movz   ($v0,&LB($s2));                          # 8,11,10, 9*

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326      &or     ($s3,$s1);                              # 13,12, 7, 6
327      &xor    ($v1,&DWP(3,Ste,$v0,8));                  # 9, t[1] collected
328      &mov    ($s1,$v1);                              # s[1]=t[1]

330      &movz   ($v0,&LB($s0));                          # 1, 0, 3, 2*
331      &shr    ($s2,16);                                # -, -, 8,11
332      &mov    ($v1,&DWP(2,Ste,$v0,8));                  # 2
333      &movz   ($v0,&HB($s3));                          # 13,12, 7*, 6
334      &xor    ($v1,&DWP(1,Ste,$v0,8));                  # 7
335      &movz   ($v0,&HB($s2));                          # -, -, 8*,11
336      &xor    ($v1,&DWP(0,Ste,$v0,8));                  # 8
337      &mov    ($v0,$s3);
338      &shr    ($v0,24);
339      &xor    ($v1,&DWP(3,Ste,$v0,8));                  # 13
                                                    # 13, t[2] collected

341      &movz   ($v0,&LB($s2));                          # -, -, 8,11*
342      &shr    ($s0,24);                                # 1*
343      &mov    ($s2,&DWP(1,Ste,$v0,8));                  # 11
344      &xor    ($s2,&DWP(3,Ste,$s0,8));                  # 1
345      &mov    ($s0,$_s0);                              # s[0]=t[0]
346      &movz   ($v0,&LB($s3));                          # 13,12, 7, 6*
347      &shr    ($s3,16);                                # -, 13,12
348      &xor    ($s2,&DWP(2,Ste,$v0,8));                  # 6
349      &mov    ($key,$_key);                          # reincarnate v0 as key
350      &and    ($s3,0xff);                              # -, 13,12*
351      &mov    ($s3,&DWP(0,Ste,$s3,8));                  # 12
352      &xor    ($s3,$s2);                              # s[2]=t[3] collected
353      &mov    ($s2,$v1);                              # s[2]=t[2]
354 }

356 # More experimental code... SSE one... Even though this one eliminates
357 # *all* references to stack, it's not faster...
358 sub sse_encbody()
359 {
360      &movz   ($acc,&LB("eax"));                        # 0
361      &mov    ("ecx",&DWP(0,$tbl,$acc,8));               # 0
362      &pshufw  ("mm2","mm0",0x0d);                      # 7, 6, 3, 2
363      &movz   ("edx",&HB("eax"));                      # 1
364      &mov    ("edx",&DWP(3,$tbl,"edx",8));              # 1
365      &shr    ("eax",16);                              # 5, 4

367      &movz   ($acc,&LB("ebx"));                        # 10
368      &xor    ("ecx",&DWP(2,$tbl,$acc,8));               # 10
369      &pshufw  ("mm6","mm4",0x08);                      # 13,12, 9, 8
370      &movz   ($acc,&HB("ebx"));                        # 11
371      &xor    ("edx",&DWP(1,$tbl,$acc,8));              # 11
372      &shr    ("ebx",16);                              # 15,14

374      &movz   ($acc,&HB("eax"));                        # 5
375      &xor    ("ecx",&DWP(3,$tbl,$acc,8));               # 5
376      &movq    ("mm3",QWP(16,$key));                   # 5
377      &movz   ($acc,&HB("ebx"));                        # 15
378      &xor    ("ecx",&DWP(1,$tbl,$acc,8));              # 15
379      &movd    ("mm0","ecx");                          # t[0] collected

381      &movz   ($acc,&LB("eax"));                        # 4
382      &mov    ("ecx",&DWP(0,$tbl,$acc,8));               # 4
383      &movd    ("eax","mm2");                          # 7, 6, 3, 2
384      &movz   ($acc,&LB("ebx"));                        # 14
385      &xor    ("ecx",&DWP(2,$tbl,$acc,8));              # 14
386      &movd    ("ebx","mm6");                          # 13,12, 9, 8

388      &movz   ($acc,&HB("eax"));                        # 3
389      &xor    ("ecx",&DWP(1,$tbl,$acc,8));               # 3
390      &movz   ($acc,&HB("ebx"));                        # 9
391      &xor    ("ecx",&DWP(3,$tbl,$acc,8));              # 9

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392      &movd    ("mm1", "ecx");          # t[1] collected
394      &movz    ($acc, &HB("eax"));      # 2
395      &mov     ("ecx", &DWP(2, $tbl, $acc, 8)); # 2
396      &shr     ("eax", 16);              # 7, 6
397      &punpckldq ("mm0", "mm1");        # t[0,1] collected
398      &movz    ($acc, &LB("ebx"));      # 8
399      &xor     ("ecx", &DWP(0, $tbl, $acc, 8)); # 8
400      &shr     ("ebx", 16);              # 13, 12

402      &movz    ($acc, &HB("eax"));      # 7
403      &xor     ("ecx", &DWP(1, $tbl, $acc, 8)); # 7
404      &pxor    ("mm0", "mm3");          # 6
405      &movz    ("eax", &LB("eax"));      # 6
406      &xor     ("edx", &DWP(2, $tbl, "eax", 8)); # 6
407      &pshufw  ("mm1", "mm0", 0x08);    # 5, 4, 1, 0
408      &movz    ($acc, &HB("ebx"));      # 13
409      &xor     ("ecx", &DWP(3, $tbl, $acc, 8)); # 13
410      &xor     ("ecx", &DWP(24, $key));   # t[2]
411      &movd    ("mm4", "ecx");          # t[2] collected
412      &movz    ("ebx", &LB("ebx"));      # 12
413      &xor     ("edx", &DWP(0, $tbl, "ebx", 8)); # 12
414      &shr     ("ecx", 16);              # 5, 4, 1, 0
415      &movd    ("eax", "mm1");          # t[3]
416      &mov     ("ebx", &DWP(28, $key));   # t[3]
417      &xor     ("ebx", "edx");          # t[3] collected
418      &movd    ("mm5", "ebx");          # t[3] collected
419      &and     ("ebx", 0xffff0000);
420      &or      ("ebx", "ecx");

422      &punpckldq ("mm4", "mm5");        # t[2,3] collected
423  }

425 #####
426 # "Compact" block function
427 #####

429 sub enccompact()
430 { my $Fn = mov;
431   while ($#>5) { pop(@_); $Fn=sub{}; }
432   my ($i, $te, @s)=@_;
433   my $tmp = $key;
434   my $out = $i==3?$s[0]:$acc;

436   # $Fn is used in first compact round and its purpose is to
437   # void restoration of some values from stack, so that after
438   # 4xenccompact with extra argument $key value is left there...
439   if ($i==3) { &$Fn ($key, $key); }###edx
440   else { &mov ($out, $s[0]); }
441         &and ($out, 0xFF);
442   if ($i==1) { &shr ($s[0], 16); }###ebx[1]
443   if ($i==2) { &shr ($s[0], 24); }###ecx[2]
444         &movz ($out, &BP(-128, $te, $out, 1));

446   if ($i==3) { $tmp=$s[1]; }###eax
447         &movz ($tmp, &HB($s[1]));
448         &movz ($tmp, &BP(-128, $te, $tmp, 1));
449         &shl ($tmp, 8);
450         &xor ($out, $tmp);

452   if ($i==3) { $tmp=$s[2]; &mov ($s[1], $s[0]); }###ebx
453   else { &mov ($tmp, $s[2]); }
454         &shr ($tmp, 16);
455   if ($i==2) { &and ($s[1], 0xFF); }###edx[2]
456         &and ($tmp, 0xFF);
457         &movz ($tmp, &BP(-128, $te, $tmp, 1));

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458         &shl ($tmp, 16);
459         &xor ($out, $tmp);

461   if ($i==3) { $tmp=$s[3]; &mov ($s[2], $s[1]); }###ecx
462   elsif($i==2){ &movz ($tmp, &HB($s[3])); }###ebx[2]
463   else { &mov ($tmp, $s[3]); }
464         &shr ($tmp, 24);
465         &movz ($tmp, &BP(-128, $te, $tmp, 1));
466         &shl ($tmp, 24);
467         &xor ($out, $tmp);
468   if ($i<2) { &mov (&DWP(4+4*$i, "esp"), $out); }
469   if ($i==3) { &mov ($s[3], $acc); }
470   &comment();
471 }

473 sub enctransform()
474 { my @s = ($s0, $s1, $s2, $s3);
475   my $i = shift;
476   my $tmp = $tbl;
477   my $r2 = $key ;

479   &mov ($acc, $s[$i]);
480   &and ($acc, 0x80808080);
481   &mov ($tmp, $acc);
482   &shr ($tmp, 7);
483   &lea ($r2, &DWP(0, $s[$i], $s[$i]));
484   &sub ($acc, $tmp);
485   &and ($r2, 0xfefefefe);
486   &and ($acc, 0x1b1b1b1b);
487   &mov ($tmp, $s[$i]);
488   &xor ($acc, $r2); # r2

490   &xor ($s[$i], $acc); # r0 ^ r2
491   &rotr ($s[$i], 24);
492   &xor ($s[$i], $acc) # ROTATE(r2^r0, 24) ^ r2
493   &rotr ($tmp, 16);
494   &xor ($s[$i], $tmp);
495   &rotr ($tmp, 8);
496   &xor ($s[$i], $tmp);
497 }

499 &function_begin_B("x86_AES_encrypt_compact");
500 # note that caller is expected to allocate stack frame for me!
501 &mov ($key, $key); # save key

503 &xor ($s0, &DWP(0, $key)); # xor with key
504 &xor ($s1, &DWP(4, $key));
505 &xor ($s2, &DWP(8, $key));
506 &xor ($s3, &DWP(12, $key));

508 &mov ($acc, &DWP(240, $key)); # load key->rounds
509 &lea ($acc, &DWP(-2, $acc, $acc));
510 &lea ($acc, &DWP(0, $key, $acc, 8));
511 &mov ($end, $acc); # end of key schedule

513 # prefetch Te4
514 &mov ($key, &DWP(0-128, $tbl));
515 &mov ($acc, &DWP(32-128, $tbl));
516 &mov ($key, &DWP(64-128, $tbl));
517 &mov ($acc, &DWP(96-128, $tbl));
518 &mov ($key, &DWP(128-128, $tbl));
519 &mov ($acc, &DWP(160-128, $tbl));
520 &mov ($key, &DWP(192-128, $tbl));
521 &mov ($acc, &DWP(224-128, $tbl));

523 &set_label("loop", 16);

```

```

525      &enccompact(0,$tbl,$s0,$s1,$s2,$s3,1);
526      &enccompact(1,$tbl,$s1,$s2,$s3,$s0,1);
527      &enccompact(2,$tbl,$s2,$s3,$s0,$s1,1);
528      &enccompact(3,$tbl,$s3,$s0,$s1,$s2,1);
529      &enctransform(2);
530      &enctransform(3);
531      &enctransform(0);
532      &enctransform(1);
533      &mov ($key,$_key);
534      &mov ($tbl,$_tbl);
535      &add ($key,16);          # advance rd_key
536      &xor ($s0,&DWP(0,$key));
537      &xor ($s1,&DWP(4,$key));
538      &xor ($s2,&DWP(8,$key));
539      &xor ($s3,&DWP(12,$key));

541      &cmp ($key,$_end);
542      &mov ($_key,$key);
543      &jb (&label("loop"));

545      &enccompact(0,$tbl,$s0,$s1,$s2,$s3);
546      &enccompact(1,$tbl,$s1,$s2,$s3,$s0);
547      &enccompact(2,$tbl,$s2,$s3,$s0,$s1);
548      &enccompact(3,$tbl,$s3,$s0,$s1,$s2);

550      &xor ($s0,&DWP(16,$key));
551      &xor ($s1,&DWP(20,$key));
552      &xor ($s2,&DWP(24,$key));
553      &xor ($s3,&DWP(28,$key));

555      &ret ();
556 &function_end_B("_x86_AES_encrypt_compact");

558 #####
559 # "Compact" SSE block function.
560 #####
561 #
562 # Performance is not actually extraordinary in comparison to pure
563 # x86 code. In particular encrypt performance is virtually the same.
564 # Decrypt performance on the other hand is 15-20% better on newer
565 # u-archs [but we're thankful for *any* improvement here], and ~50%
566 # better on PIII:-) And additionally on the pros side this code
567 # eliminates redundant references to stack and thus relieves/
568 # minimizes the pressure on the memory bus.
569 #
570 # MMX register layout                                lsb
571 # +---+---+---+---+---+---+---+---+---+---+---+---+
572 # |          mm4          |          mm0          |
573 # +---+---+---+---+---+---+---+---+---+---+---+---+
574 # |          s3          |          s2          |          s1          |          s0          |
575 # +---+---+---+---+---+---+---+---+---+---+---+---+
576 # |15|14|13|12|11|10| 9| 8| 7| 6| 5| 4| 3| 2| 1| 0|
577 # +---+---+---+---+---+---+---+---+---+---+---+---+
578 #
579 # Indexes translate as s[N/4]>>(8*(N%4)), e.g. 5 means s1>>8.
580 # In this terms encryption and decryption "compact" permutation
581 # matrices can be depicted as following:
582 #
583 # encryption                                lsb      # decryption                                lsb
584 # +---+---+---+---+---+---+---+---+---+---+---+---+
585 # | t0 || 15 | 10 | 5 | 0 |          # | t0 || 7 | 10 | 13 | 0 |
586 # +---+---+---+---+---+---+---+---+---+---+---+---+
587 # | t1 || 3 | 14 | 9 | 4 |          # | t1 || 11 | 14 | 1 | 4 |
588 # +---+---+---+---+---+---+---+---+---+---+---+---+
589 # | t2 || 7 | 2 | 13 | 8 |          # | t2 || 15 | 2 | 5 | 8 |

```

```

590 # +---+---+---+---+---+---+---+---+---+---+---+---+
591 # | t3 || 11 | 6 | 1 | 12 |          # | t3 || 3 | 6 | 9 | 12 |
592 # +---+---+---+---+---+---+---+---+---+---+---+---+
593 #
594 #####
595 # Why not xmm registers? Short answer. It was actually tested and
596 # was not any faster, but "contrary", most notably on Intel CPUs.
597 # Longer answer. Main advantage of using mm registers is that movd
598 # latency is lower, especially on Intel P4. While arithmetic
599 # instructions are twice as many, they can be scheduled every cycle
600 # and not every second one when they are operating on xmm register,
601 # so that "arithmetic throughput" remains virtually the same. And
602 # finally the code can be executed even on elder SSE-only CPUs:-)

604 sub sse_enccompact()
605 {
606     &pshufw ("mm1","mm0",0x08);          # 5, 4, 1, 0
607     &pshufw ("mm5","mm4",0x0d);          # 15,14,11,10
608     &movd ("eax","mm1");                 # 5, 4, 1, 0
609     &movd ("ebx","mm5");                 # 15,14,11,10

611     &movz ($acc,&LB("eax"));              # 0
612     &movz ("ecx",&BP(-128,$tbl,$acc,1));  # 0
613     &pshufw ("mm2","mm0",0x0d);          # 7, 6, 3, 2
614     &movz ("edx",&HB("eax"));             # 1
615     &movz ("edx",&BP(-128,$tbl,"edx",1)); # 1
616     &shl ("edx",8);                     # 1
617     &shr ("eax",16);                    # 5, 4

619     &movz ($acc,&LB("ebx"));              # 10
620     &movz ($acc,&BP(-128,$tbl,$acc,1));  # 10
621     &shl ($acc,16);                     # 10
622     &or ("ecx",$acc);                   # 10
623     &pshufw ("mm6","mm4",0x08);          # 13,12, 9, 8
624     &movz ($acc,&HB("ebx"));             # 11
625     &movz ($acc,&BP(-128,$tbl,$acc,1));  # 11
626     &shl ($acc,24);                     # 11
627     &or ("edx",$acc);                   # 11
628     &shr ("ebx",16);                    # 15,14

630     &movz ($acc,&HB("eax"));              # 5
631     &movz ($acc,&BP(-128,$tbl,$acc,1));  # 5
632     &shl ($acc,8);                      # 5
633     &or ("ecx",$acc);                   # 5
634     &movz ($acc,&HB("ebx"));             # 15
635     &movz ($acc,&BP(-128,$tbl,$acc,1));  # 15
636     &shl ($acc,24);                     # 15
637     &or ("ecx",$acc);                   # 15
638     &movd ("mm0","ecx");                # t[0] collected

640     &movz ($acc,&LB("eax"));              # 4
641     &movz ("ecx",&BP(-128,$tbl,$acc,1)); # 4
642     &movd ("eax","mm2");                 # 7, 6, 3, 2
643     &movz ($acc,&LB("ebx"));             # 14
644     &movz ($acc,&BP(-128,$tbl,$acc,1)); # 14
645     &shl ($acc,16);                     # 14
646     &or ("ecx",$acc);                   # 14

648     &movd ("ebx","mm6");                 # 13,12, 9, 8
649     &movz ($acc,&HB("eax"));              # 3
650     &movz ($acc,&BP(-128,$tbl,$acc,1));  # 3
651     &shl ($acc,24);                     # 3
652     &or ("ecx",$acc);                   # 3
653     &movz ($acc,&HB("ebx"));             # 9
654     &movz ($acc,&BP(-128,$tbl,$acc,1)); # 9
655     &shl ($acc,8);                      # 9

```

```

656      &or      ("ecx", $acc);          # 9
657      &movd    ("mm1", "ecx");         # t[1] collected

659      &movz    ($acc, &LB("ebx"));     # 8
660      &movz    ("ecx", &BP(-128, $tbl, $acc, 1)); # 8
661      &shr     ("ebx", 16);             # 13, 12
662      &movz    ($acc, &LB("eax"));     # 2
663      &movz    ($acc, &BP(-128, $tbl, $acc, 1)); # 2
664      &shl     ($acc, 16);             # 2
665      &or      ("ecx", $acc);          # 2
666      &shr     ("eax", 16);            # 7, 6

668      &punpckldq ("mm0", "mm1");       # t[0,1] collected

670      &movz    ($acc, &HB("eax"));     # 7
671      &movz    ($acc, &BP(-128, $tbl, $acc, 1)); # 7
672      &shl     ($acc, 24);              # 7
673      &or      ("ecx", $acc);          # 7
674      &and     ("eax", 0xff);           # 6
675      &movz    ("eax", &BP(-128, $tbl, "eax", 1)); # 6
676      &shl     ("eax", 16);            # 6
677      &or      ("edx", "eax");         # 6
678      &movz    ($acc, &HB("ebx"));     # 13
679      &movz    ($acc, &BP(-128, $tbl, $acc, 1)); # 13
680      &shl     ($acc, 8);              # 13
681      &or      ("ecx", $acc);          # 13
682      &movd    ("mm4", "ecx");         # t[2] collected
683      &and     ("ebx", 0xff);           # 12
684      &movz    ("ebx", &BP(-128, $tbl, "ebx", 1)); # 12
685      &or      ("edx", "ebx");         # 12
686      &movd    ("mm5", "edx");         # t[3] collected

688      &punpckldq ("mm4", "mm5");       # t[2,3] collected
689 }

691      if (!$x86only) {
692 &function_begin_B("_sse_AES_encrypt_compact");
693      &pxor    ("mm0", &QWP(0, $key)); # 7, 6, 5, 4, 3, 2, 1, 0
694      &pxor    ("mm4", &QWP(8, $key)); # 15, 14, 13, 12, 11, 10, 9, 8

696      # note that caller is expected to allocate stack frame for me!
697      &mov     ($acc, &DWP(240, $key)); # load key->rounds
698      &lea     ($acc, &DWP(-2, $acc, $acc));
699      &lea     ($acc, &DWP(0, $key, $acc, 8));
700      &mov     ($__end, $acc);          # end of key schedule

702      &mov     ($s0, 0x1b1b1b1b);      # magic constant
703      &mov     (&DWP(8, "esp"), $s0);
704      &mov     (&DWP(12, "esp"), $s0);

706      # prefetch Te4
707      &mov     ($s0, &DWP(0-128, $tbl));
708      &mov     ($s1, &DWP(32-128, $tbl));
709      &mov     ($s2, &DWP(64-128, $tbl));
710      &mov     ($s3, &DWP(96-128, $tbl));
711      &mov     ($s0, &DWP(128-128, $tbl));
712      &mov     ($s1, &DWP(160-128, $tbl));
713      &mov     ($s2, &DWP(192-128, $tbl));
714      &mov     ($s3, &DWP(224-128, $tbl));

716      &set_label("loop", 16);
717      &sse_enccompact();
718      &add     ($key, 16);
719      &cmp     ($key, $__end);
720      &ja      (&label("out"));

```

```

722      &movq    ("mm2", &QWP(8, "esp"));
723      &pxor     ("mm3", "mm3");
724      &movq     ("mm1", "mm0");
725      &pcmpgtb  ("mm3", "mm0");
726      &pand     ("mm3", "mm2");
727      &pshufw   ("mm2", "mm0", 0xb1);
728      &paddb   ("mm0", "mm0");
729      &pxor     ("mm0", "mm3");
730      &pshufw   ("mm3", "mm2", 0xb1);
731      &pxor     ("mm1", "mm0");
732      &pxor     ("mm0", "mm2");

734      &movq    ("mm2", "mm3");
735      &pslld    ("mm3", 8);
736      &psrld    ("mm2", 24);
737      &pxor     ("mm0", "mm3");
738      &pxor     ("mm0", "mm2");

740      &movq    ("mm3", "mm1");
741      &movq     ("mm2", &QWP(0, $key));
742      &psrld    ("mm1", 8);
743      &mov     ($s0, &DWP(0-128, $tbl));
744      &pslld    ("mm3", 24);
745      &mov     ($s1, &DWP(64-128, $tbl));
746      &pxor     ("mm0", "mm1");
747      &mov     ($s2, &DWP(128-128, $tbl));
748      &pxor     ("mm0", "mm3");
749      &mov     ($s3, &DWP(192-128, $tbl));

751      &pxor     ("mm0", "mm2");
752      &jmp      (&label("loop"));

754      &set_label("out", 16);
755      &pxor     ("mm0", &QWP(0, $key));
756      &pxor     ("mm4", &QWP(8, $key));

758      &ret     ();
759 &function_end_B("_sse_AES_encrypt_compact");
760 }

762 #####
763 # Vanilla block function.
764 #####

766 sub encstep()
767 { my ($i, $te, @s) = @_;
768   my $tmp = $key;
769   my $out = $i==3?$s[0]:$acc;

771   # lines marked with #e?x[i] denote "reordered" instructions...
772   if ($i==3) { &mov ($key, $__key); }##edx
773   else { &mov ($out, $s[0]); }
774         &and ($out, 0xFF); }
775   if ($i==1) { &shr ($s[0], 16); }##ebx[1]
776   if ($i==2) { &shr ($s[0], 24); }##ecx[2]
777         &mov ($out, &DWP(0, $te, $out, 8));

779   if ($i==3) { $tmp=$s[1]; }##eax
780         &movz ($tmp, &HB($s[1]));
781         &xor ($out, &DWP(3, $te, $tmp, 8));

783   if ($i==3) { $tmp=$s[2]; &mov ($s[1], $__s0); }##ebx
784   else { &mov ($tmp, $s[2]); }
785         &shr ($tmp, 16); }
786   if ($i==2) { &and ($s[1], 0xFF); }##edx[2]
787         &and ($tmp, 0xFF); }

```

```

788      &xor      ($out,&DWP(2,$te,$tmp,8));

790      if ($i==3) { $tmp=$s[3]; &mov ($s[2],$s1); }##%ecx
791      elsif($i==2){ &movz ($tmp,&HB($s[3])); }##%ebx[2]
792      else { &mov ($tmp,$s[3]); }
793      &shr ($tmp,24); }
794      &xor ($out,&DWP(1,$te,$tmp,8));
795      if ($i<2) { &mov (&DWP(4+4*$i,"esp"),$out); }
796      if ($i==3) { &mov ($s[3],$acc); }
797      &comment();
798 }

800 sub enclast()
801 { my ($i,$te,$s)=@_;
802   my $tmp = $key;
803   my $out = $i==3?$s[0]:$acc;

805   if ($i==3) { &mov ($key,$_key); }##%edx
806   else { &mov ($out,$s[0]); }
807   &and ($out,0xFF);
808   if ($i==1) { &shr ($s[0],16); }##%ebx[1]
809   if ($i==2) { &shr ($s[0],24); }##%ecx[2]
810   &mov ($out,&DWP(2,$te,$out,8));
811   &and ($out,0x000000ff);

813   if ($i==3) { $tmp=$s[1]; }##%eax
814   &movz ($tmp,&HB($s[1]));
815   &mov ($tmp,&DWP(0,$te,$tmp,8));
816   &and ($tmp,0x0000ff00);
817   &xor ($out,$tmp);

819   if ($i==3) { $tmp=$s[2]; &mov ($s[1],$s0); }##%ebx
820   else { &mov ($tmp,$s[2]); }
821   &shr ($tmp,16); }
822   if ($i==2) { &and ($s[1],0xFF); }##%edx[2]
823   &and ($tmp,0xFF);
824   &mov ($tmp,&DWP(0,$te,$tmp,8));
825   &and ($tmp,0x00ff0000);
826   &xor ($out,$tmp);

828   if ($i==3) { $tmp=$s[3]; &mov ($s[2],$s1); }##%ecx
829   elsif($i==2){ &movz ($tmp,&HB($s[3])); }##%ebx[2]
830   else { &mov ($tmp,$s[3]); }
831   &shr ($tmp,24); }
832   &mov ($tmp,&DWP(2,$te,$tmp,8));
833   &and ($tmp,0xff000000);
834   &xor ($out,$tmp);
835   if ($i<2) { &mov (&DWP(4+4*$i,"esp"),$out); }
836   if ($i==3) { &mov ($s[3],$acc); }
837 }

839 &function_begin_B("_x86_AES_encrypt");
840 if ($vertical_spin) {
841   # I need high parts of volatile registers to be accessible...
842   &exch ($s1="edi",$key="ebx");
843   &mov ($s2="esi",$acc="ecx");
844 }

846 # note that caller is expected to allocate stack frame for me!
847 &mov ($_key,$key); # save key

849 &xor ($s0,&DWP(0,$key)); # xor with key
850 &xor ($s1,&DWP(4,$key));
851 &xor ($s2,&DWP(8,$key));
852 &xor ($s3,&DWP(12,$key));

```

```

854      &mov ($acc,&DWP(240,$key)); # load key->rounds

856      if ($small_footprint) {
857        &lea ($acc,&DWP(-2,$acc,$acc));
858        &lea ($acc,&DWP(0,$key,$acc,8));
859        &mov ($_end,$acc); # end of key schedule

861        &set_label("loop",16);
862        if ($vertical_spin) {
863          &encvert($tbl,$s0,$s1,$s2,$s3);
864        } else {
865          &encstep(0,$tbl,$s0,$s1,$s2,$s3);
866          &encstep(1,$tbl,$s1,$s2,$s3,$s0);
867          &encstep(2,$tbl,$s2,$s3,$s0,$s1);
868          &encstep(3,$tbl,$s3,$s0,$s1,$s2);
869        }
870        &add ($key,16); # advance rd_key
871        &xor ($s0,&DWP(0,$key));
872        &xor ($s1,&DWP(4,$key));
873        &xor ($s2,&DWP(8,$key));
874        &xor ($s3,&DWP(12,$key));
875        &cmp ($key,$_end);
876        &mov ($_key,$key);
877        &jb (&label("loop"));
878      }
879      else {
880        &cmp ($acc,10);
881        &jle (&label("10rounds"));
882        &cmp ($acc,12);
883        &jle (&label("12rounds"));

885      &set_label("14rounds",4);
886      for ($i=1;$i<3;$i++) {
887        if ($vertical_spin) {
888          &encvert($tbl,$s0,$s1,$s2,$s3);
889        } else {
890          &encstep(0,$tbl,$s0,$s1,$s2,$s3);
891          &encstep(1,$tbl,$s1,$s2,$s3,$s0);
892          &encstep(2,$tbl,$s2,$s3,$s0,$s1);
893          &encstep(3,$tbl,$s3,$s0,$s1,$s2);
894        }
895        &xor ($s0,&DWP(16*$i+0,$key));
896        &xor ($s1,&DWP(16*$i+4,$key));
897        &xor ($s2,&DWP(16*$i+8,$key));
898        &xor ($s3,&DWP(16*$i+12,$key));
899      }
900      &add ($key,32);
901      &mov ($_key,$key); # advance rd_key
902      &set_label("12rounds",4);
903      for ($i=1;$i<3;$i++) {
904        if ($vertical_spin) {
905          &encvert($tbl,$s0,$s1,$s2,$s3);
906        } else {
907          &encstep(0,$tbl,$s0,$s1,$s2,$s3);
908          &encstep(1,$tbl,$s1,$s2,$s3,$s0);
909          &encstep(2,$tbl,$s2,$s3,$s0,$s1);
910          &encstep(3,$tbl,$s3,$s0,$s1,$s2);
911        }
912        &xor ($s0,&DWP(16*$i+0,$key));
913        &xor ($s1,&DWP(16*$i+4,$key));
914        &xor ($s2,&DWP(16*$i+8,$key));
915        &xor ($s3,&DWP(16*$i+12,$key));
916      }
917      &add ($key,32);
918      &mov ($_key,$key); # advance rd_key
919      &set_label("10rounds",4);

```

```

920     for (Si=1;Si<10;Si++) {
921         if ($vertical_spin) {
922             &ncvert($tbl,$s0,$s1,$s2,$s3);
923         } else {
924             &ncstep(0,$tbl,$s0,$s1,$s2,$s3);
925             &ncstep(1,$tbl,$s1,$s2,$s3,$s0);
926             &ncstep(2,$tbl,$s2,$s3,$s0,$s1);
927             &ncstep(3,$tbl,$s3,$s0,$s1,$s2);
928         }
929         &xor ($s0,&DWP(16*$i+0,$key));
930         &xor ($s1,&DWP(16*$i+4,$key));
931         &xor ($s2,&DWP(16*$i+8,$key));
932         &xor ($s3,&DWP(16*$i+12,$key));
933     }
934 }

936 if ($vertical_spin) {
937     # "reincarnate" some registers for "horizontal" spin...
938     &mov ($s1="ebx",$key="edi");
939     &mov ($s2="ecx",$acc="esi");
940 }
941 &enclast(0,$tbl,$s0,$s1,$s2,$s3);
942 &enclast(1,$tbl,$s1,$s2,$s3,$s0);
943 &enclast(2,$tbl,$s2,$s3,$s0,$s1);
944 &enclast(3,$tbl,$s3,$s0,$s1,$s2);

946 &add ($key,$small_footprint?16:160);
947 &xor ($s0,&DWP(0,$key));
948 &xor ($s1,&DWP(4,$key));
949 &xor ($s2,&DWP(8,$key));
950 &xor ($s3,&DWP(12,$key));

952 &ret ();

954 &set_label("AES_Te",64); # Yes! I keep it in the code segment!
955 &_data_word(0xa56363c6, 0x847c7cf8, 0x997777ee, 0x8d7b7bf6);
956 &_data_word(0x0df2f2ff, 0xbd6b6bd6, 0xb16f6fde, 0x54c5c591);
957 &_data_word(0x50303060, 0x03010102, 0xa96767ce, 0x7d2b2b56);
958 &_data_word(0x19fefeef, 0x62d7d7b5, 0xe6abab4d, 0x9a7676ec);
959 &_data_word(0x45caca8f, 0x9d82821f, 0x40c9c989, 0x877d7dfa);
960 &_data_word(0x15fafaef, 0xeb5959b2, 0xc947478e, 0x0bf0f0fb);
961 &_data_word(0xecadad41, 0x67d4d4b3, 0xfda2a25f, 0xeaafaf45);
962 &_data_word(0xb9f9c9c23, 0xf7a4a453, 0x967272e4, 0x5bc0c09b);
963 &_data_word(0xc2b7b775, 0x1cfdfdfe1, 0xae93933d, 0x6a26264c);
964 &_data_word(0x5a36366c, 0x413f3f7e, 0x02f7f7f5, 0x4fcccc83);
965 &_data_word(0x5c343468, 0xf4a5a551, 0x34e5e5d1, 0x08f1f1f9);
966 &_data_word(0x937171e2, 0x73d8d8ab, 0x53313162, 0x3f15152a);
967 &_data_word(0x0c040408, 0x52c7c795, 0x65232346, 0x5ec3c39d);
968 &_data_word(0x28181830, 0xa1969637, 0x0f05050a, 0xb59a9a2f);
969 &_data_word(0x0907070e, 0x36121224, 0x9b80801b, 0x3de2e2df);
970 &_data_word(0x26ebecbd, 0x6927274e, 0xcdb2b27f, 0x9f7575ea);
971 &_data_word(0x10909012, 0x9e83831d, 0x742c2c58, 0x2e1a1a34);
972 &_data_word(0x2d1b1b36, 0xb26e6edc, 0xee5a5ab4, 0xfba0a05b);
973 &_data_word(0xf65252a4, 0x4d3b3b76, 0x61d6d6b7, 0xcbe3b37d);
974 &_data_word(0x7b292952, 0x3ee3e3dd, 0x712f2f5e, 0x97848413);
975 &_data_word(0xf55353a6, 0x68d1d1b9, 0x00000000, 0x2cededc1);
976 &_data_word(0x60202040, 0x1ffcfc3e, 0xc8b1b179, 0xed5b5b4b);
977 &_data_word(0xb6e6ad4, 0x46cbcb8d, 0xd9bebe67, 0x4b393972);
978 &_data_word(0xde4a4a94, 0xd44c4c98, 0xe85858b0, 0x4acf3f85);
979 &_data_word(0x6bd0d0bb, 0x2aefefc5, 0xe5aaaa4f, 0x16fbfbcd);
980 &_data_word(0xc5434386, 0xd74d4d9a, 0x55333366, 0x94858511);
981 &_data_word(0xc4f4548a, 0x10f9f9e9, 0x06020204, 0x817f7f7f);
982 &_data_word(0xf05050a0, 0x443c3c78, 0xba9f9f25, 0xe3a8a84b);
983 &_data_word(0xf35151a2, 0xfea3a35d, 0xc0404080, 0x8a8f8f05);
984 &_data_word(0xad92923f, 0xbc9d9d21, 0x48383870, 0x04f5f5f1);
985 &_data_word(0xdfbcbcb63, 0xc1b6b677, 0x75dadaaf, 0x63212142);

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986 &_data_word(0x30101020, 0x1affffe5, 0x0ef3f3fd, 0x6dd2d2bf);
987 &_data_word(0x4ccdc8d1, 0x140c0c18, 0x35131326, 0x2fececc3);
988 &_data_word(0xe15f5f5e, 0xa2979735, 0xcc444488, 0x3917172e);
989 &_data_word(0x57c4c493, 0xf2a7a755, 0x827e7efc, 0x73d3d37a);
990 &_data_word(0xac6464c8, 0xe75d5dba, 0x2b191932, 0x957373e6);
991 &_data_word(0xa06060c0, 0x98818119, 0xd14f4f9e, 0x7fddcdca3);
992 &_data_word(0x66222244, 0x7e2a2a54, 0xab90903b, 0x8388880b);
993 &_data_word(0xca46468c, 0x29eeec7, 0xd3b8b86b, 0x3c141428);
994 &_data_word(0x79dedea7, 0xe25e5ebc, 0x1d0b0b16, 0x76dbdbad);
995 &_data_word(0x3be0e0db, 0x56323264, 0x4e3a3a74, 0x1e0a0a14);
996 &_data_word(0xdb494992, 0xa06060c, 0x6c242448, 0xe45c5cb8);
997 &_data_word(0x5dc2c29f, 0xed3d3dbd, 0xefacac43, 0xa66262c4);
998 &_data_word(0xa8919139, 0xa4959531, 0x37e4e4d3, 0x8b7979f2);
999 &_data_word(0x32e7e7d5, 0x43c8c88b, 0x9373736e, 0xb76d6dda);
1000 &_data_word(0x8c8d8d01, 0x64d5d5b1, 0xd24e4e9c, 0xe0a9a949);
1001 &_data_word(0xb46c6cd8, 0xfa5656ac, 0x07f4f4f3, 0x25eaeacf);
1002 &_data_word(0xaf6565ca, 0x8e7a7af4, 0xe9aeae47, 0x18080810);
1003 &_data_word(0xd5baba6f, 0x887878f0, 0x6f25254a, 0x722e2e5c);
1004 &_data_word(0x241c1c38, 0xf1a6a657, 0xc7b4b473, 0x51c6c697);
1005 &_data_word(0x23e8e8cb, 0x7cddddd1, 0x9c7474e8, 0x211f1f3e);
1006 &_data_word(0xdd4b4b96, 0xdcdbdbd6, 0x868b8b0d, 0x858a8a0f);
1007 &_data_word(0x907070e0, 0x423e3e7c, 0xc45b5b71, 0xaa6666cc);
1008 &_data_word(0xd8484890, 0x05030306, 0x01f6f6f7, 0x120e0e1c);
1009 &_data_word(0xa36161c2, 0x5f35356a, 0xf95757ae, 0xd0b9b969);
1010 &_data_word(0x91868617, 0x58c1c199, 0x271d1d3a, 0xb99e9e27);
1011 &_data_word(0x38e1e1d9, 0x13f8f8eb, 0xb398982b, 0x33111122);
1012 &_data_word(0xb6969d2, 0x70d9d9a9, 0x898e8e07, 0xa7949433);
1013 &_data_word(0xb69b9b2d, 0x221e1e3c, 0x92878715, 0x20e9e9c9);
1014 &_data_word(0x49cece87, 0xff5555aa, 0x78282850, 0x7adfdfa5);
1015 &_data_word(0x8f8c8c03, 0xf8a1a159, 0x80898909, 0x170d0d1a);
1016 &_data_word(0xdabfbfb5, 0x31e6e6d7, 0xc6424284, 0xb86868d0);
1017 &_data_word(0xc3414182, 0xb0999929, 0x772d2d5a, 0x110f0f1e);
1018 &_data_word(0xcbb0b07b, 0xfc5454a8, 0xd6bbbb6d, 0x3a16162c);

1020 #Te4 # four copies of Te4 to choose from to avoid L1 aliasing
1021 &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
1022 &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
1023 &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
1024 &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xc0);
1025 &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
1026 &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0x71, 0xd8, 0x31, 0x15);
1027 &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
1028 &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
1029 &data_byte(0x09, 0x83, 0x2c, 0x1a, 0x1b, 0x6e, 0x5a, 0xa0);
1030 &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
1031 &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
1032 &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
1033 &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
1034 &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
1035 &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
1036 &data_byte(0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
1037 &data_byte(0xcd, 0xc0, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
1038 &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
1039 &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
1040 &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
1041 &data_byte(0xe0, 0x32, 0x3a, 0x0a, 0x49, 0x06, 0x24, 0x5c);
1042 &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
1043 &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0x8d, 0xd5, 0x4e, 0xa9);
1044 &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
1045 &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
1046 &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0xa8);
1047 &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
1048 &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0xc1, 0x1d, 0x9e);
1049 &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0xd9, 0x8e, 0x94);
1050 &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xce, 0x55, 0x28, 0xdf);
1051 &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);

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1052      &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);
1054      &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
1055      &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
1056      &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
1057      &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xc0);
1058      &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
1059      &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0x71, 0xd8, 0x31, 0x15);
1060      &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
1061      &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
1062      &data_byte(0x09, 0x83, 0x2c, 0x1a, 0x1b, 0x6e, 0x5a, 0xa0);
1063      &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
1064      &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
1065      &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
1066      &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
1067      &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
1068      &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
1069      &data_byte(0xb6, 0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
1070      &data_byte(0xcd, 0x0c, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
1071      &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
1072      &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
1073      &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
1074      &data_byte(0xe0, 0x32, 0x3a, 0x0a, 0x49, 0x06, 0x24, 0x5c);
1075      &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
1076      &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0x8d, 0xd5, 0x4e, 0xa9);
1077      &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
1078      &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
1079      &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0x8a);
1080      &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
1081      &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0xc1, 0x1d, 0x9e);
1082      &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0x8e, 0x9a);
1083      &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xcce, 0x55, 0x28, 0xdf);
1084      &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);
1085      &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);

1087      &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
1088      &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
1089      &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
1090      &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xc0);
1091      &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
1092      &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0x71, 0xd8, 0x31, 0x15);
1093      &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
1094      &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
1095      &data_byte(0x09, 0x83, 0x2c, 0x1a, 0x1b, 0x6e, 0x5a, 0xa0);
1096      &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
1097      &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
1098      &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
1099      &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
1100      &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
1101      &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
1102      &data_byte(0xb6, 0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
1103      &data_byte(0xcd, 0x0c, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
1104      &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
1105      &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
1106      &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
1107      &data_byte(0xe0, 0x32, 0x3a, 0x0a, 0x49, 0x06, 0x24, 0x5c);
1108      &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
1109      &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0x8d, 0xd5, 0x4e, 0xa9);
1110      &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
1111      &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
1112      &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0x8a);
1113      &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
1114      &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0xc1, 0x1d, 0x9e);
1115      &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0x8e, 0x9a);
1116      &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xcce, 0x55, 0x28, 0xdf);
1117      &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);

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1118      &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);
1120      &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
1121      &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
1122      &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
1123      &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xc0);
1124      &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
1125      &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0x71, 0xd8, 0x31, 0x15);
1126      &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
1127      &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
1128      &data_byte(0x09, 0x83, 0x2c, 0x1a, 0x1b, 0x6e, 0x5a, 0xa0);
1129      &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
1130      &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
1131      &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
1132      &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
1133      &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
1134      &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
1135      &data_byte(0xb6, 0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
1136      &data_byte(0xcd, 0x0c, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
1137      &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
1138      &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
1139      &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
1140      &data_byte(0xe0, 0x32, 0x3a, 0x0a, 0x49, 0x06, 0x24, 0x5c);
1141      &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
1142      &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0x8d, 0xd5, 0x4e, 0xa9);
1143      &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
1144      &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
1145      &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0x8a);
1146      &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
1147      &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0xc1, 0x1d, 0x9e);
1148      &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0x8e, 0x9a);
1149      &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xcce, 0x55, 0x28, 0xdf);
1150      &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);
1151      &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);
1152      #rcon:
1153      &data_word(0x00000001, 0x00000002, 0x00000004, 0x00000008);
1154      &data_word(0x00000010, 0x00000020, 0x00000040, 0x00000080);
1155      &data_word(0x0000001b, 0x00000036, 0x00000060, 0x000000c0);
1156      &data_word(0x00000000, 0x00000000, 0x00000000, 0x00000000);
1157      &function_end_B("x86_AES_encrypt");

1159 # void AES_encrypt(const void *inp,void *out,const AES_KEY *key);
1160 &function_begin("AES_encrypt");
1161      &mov      ($acc,&wparam(0));          # load inp
1162      &mov      ($key,&wparam(2));          # load key

1164      &mov      ($s0,"esp");
1165      &sub      ("esp",36);
1166      &and      ("esp",-64);                  # align to cache-line

1168      # place stack frame just "above" the key schedule
1169      &lea      ($s1,&DWP(-64-63,$key));
1170      &sub      ($s1,"esp");
1171      &neg      ($s1);
1172      &and      ($s1,0x3c0);                  # modulo 1024, but aligned to cache-line
1173      &sub      ("esp",$s1);
1174      &add      ("esp",4);                    # 4 is reserved for caller's return address
1175      &mov      ($_esp,$s0);                  # save stack pointer

1177      &call     (&label("pic_point"));        # make it PIC!
1178      &set_label("pic_point");
1179      &blindpop($tbl);
1180      &picmeup($s0,"OPENSSL_ia32cap_P",$tbl,&label("pic_point")) if (!x86only)
1181      &lea      ($tbl,&DWP(&label("AES_Te")."-."&label("pic_point"),$tbl));

1183      # pick Te4 copy which can't "overlap" with stack frame or key schedule

```

```

1184      &lea      ($s1,&DWP(768-4,"esp"));
1185      &sub      ($s1,$tbl);
1186      &and      ($s1,0x300);
1187      &lea      ($tbl,&DWP(2048+128,$tbl,$s1));

1189      if (!$x86only) {
1190      &bt      (&DWP(0,$s0),25);      # check for SSE bit
1191      &jnc      (&label("x86"));

1193      &movq      ("mm0",&QWP(0,$acc));
1194      &movq      ("mm4",&QWP(8,$acc));
1195      &call      ("_sse_AES_encrypt_compact");
1196      &mov      ("esp",$_esp);      # restore stack pointer
1197      &mov      ($acc,&wparam(1));      # load out
1198      &movq      (&QWP(0,$acc),"mm0");      # write output data
1199      &movq      (&QWP(8,$acc),"mm4");
1200      &emms      ();
1201      &function_end_A();
1202      }

1203      &set_label("x86",16);
1204      &mov      ($tbl,$tbl);
1205      &mov      ($s0,&DWP(0,$acc));      # load input data
1206      &mov      ($s1,&DWP(4,$acc));
1207      &mov      ($s2,&DWP(8,$acc));
1208      &mov      ($s3,&DWP(12,$acc));
1209      &call      ("_x86_AES_encrypt_compact");
1210      &mov      ("esp",$_esp);      # restore stack pointer
1211      &mov      ($acc,&wparam(1));      # load out
1212      &mov      (&DWP(0,$acc),$s0);      # write output data
1213      &mov      (&DWP(4,$acc),$s1);
1214      &mov      (&DWP(8,$acc),$s2);
1215      &mov      (&DWP(12,$acc),$s3);
1216      &function_end("AES_encrypt");

1218      #-----#

1220      #####
1221      # "Compact" block function
1222      #####

1224      sub decompact()
1225      { my $Fn = mov;
1226        while ($#>5) { pop(@_); $Fn=sub{}; }
1227        my ($i,$td,@s)=@_;
1228        my $tmp = $key;
1229        my $out = $i==3?$s[0]:$acc;

1231        # $Fn is used in first compact round and its purpose is to
1232        # void restoration of some values from stack, so that after
1233        # 4xdecompact with extra argument $key, $s0 and $s1 values
1234        # are left there...
1235        if($i==3) { &$Fn      ($key,$_key);      }
1236        else      { &mov      ($out,$s[0]);      }
1237        &and      ($out,0xFF);
1238        &movz     ($out,&BP(-128,$td,$out,1));

1240        if ($i==3) { $tmp=$s[1];      }
1241        &movz     ($tmp,&HB($s[1]));
1242        &movz     ($tmp,&BP(-128,$td,$tmp,1));
1243        &shl      ($tmp,8);
1244        &xor      ($out,$tmp);

1246        if ($i==3) { $tmp=$s[2]; &mov ($s[1],$acc);      }
1247        else      { &mov      ($tmp,$s[2]);      }
1248        &shr      ($tmp,16);
1249        &and      ($tmp,0xFF);

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```

1250      &movz     ($tmp,&BP(-128,$td,$tmp,1));
1251      &shl      ($tmp,16);
1252      &xor      ($out,$tmp);

1254      if ($i==3) { $tmp=$s[3]; &$Fn ($s[2],$_s1);      }
1255      else      { &mov      ($tmp,$s[3]);      }
1256      &shr      ($tmp,24);
1257      &movz     ($tmp,&BP(-128,$td,$tmp,1));
1258      &shl      ($tmp,24);
1259      &xor      ($out,$tmp);
1260      if ($i<2) { &mov      (&DWP(4+4*$i,"esp"),$out);      }
1261      if ($i==3) { &$Fn      ($s[3],$_s0);      }
1262      }

1264      # must be called with 2,3,0,1 as argument sequence!!!
1265      sub dectransform()
1266      { my @s = ($s0,$s1,$s2,$s3);
1267        my $i = shift;
1268        my $tmp = $key;
1269        my $tp2 = @s[($i+2)%4]; $tp2 = @s[2] if ($i==1);
1270        my $tp4 = @s[($i+3)%4]; $tp4 = @s[3] if ($i==1);
1271        my $tp8 = $tbl;

1273        &mov      ($acc,$s[$i]);
1274        &and      ($acc,0x80808080);
1275        &mov      ($tmp,$acc);
1276        &shr      ($tmp,7);
1277        &lea      ($tp2,&DWP(0,$s[$i],$s[$i]));
1278        &sub      ($acc,$tmp);
1279        &and      ($tp2,0xfefefefe);
1280        &and      ($acc,0x1b1b1b1b);
1281        &xor      ($acc,$tp2);
1282        &mov      ($tp2,$acc);

1284        &and      ($acc,0x80808080);
1285        &mov      ($tmp,$acc);
1286        &shr      ($tmp,7);
1287        &lea      ($tp4,&DWP(0,$tp2,$tp2));
1288        &sub      ($acc,$tmp);
1289        &and      ($tp4,0xfefefefe);
1290        &and      ($acc,0x1b1b1b1b);
1291        &xor      ($tp2,$s[$i]); # tp2^tp1
1292        &xor      ($acc,$tp4);
1293        &mov      ($tp4,$acc);

1295        &and      ($acc,0x80808080);
1296        &mov      ($tmp,$acc);
1297        &shr      ($tmp,7);
1298        &lea      ($tp8,&DWP(0,$tp4,$tp4));
1299        &sub      ($acc,$tmp);
1300        &and      ($tp8,0xfefefefe);
1301        &and      ($acc,0x1b1b1b1b);
1302        &xor      ($tp4,$s[$i]); # tp4^tp1
1303        &rotl     ($s[$i],8); # = ROTATE(tp1,8)
1304        &xor      ($tp8,$acc);

1306        &xor      ($s[$i],$tp2);
1307        &xor      ($tp2,$tp8);
1308        &rotl     ($tp2,24);
1309        &xor      ($s[$i],$tp4);
1310        &xor      ($tp4,$tp8);
1311        &rotl     ($tp4,16);
1312        &xor      ($s[$i],$tp8); # ^= tp8^(tp4^tp1)^(tp2^tp1)
1313        &rotl     ($tp8,8);
1314        &xor      ($s[$i],$tp2); # ^= ROTATE(tp8^tp2^tp1,24)
1315        &xor      ($s[$i],$tp4); # ^= ROTATE(tp8^tp4^tp1,16)

```

```

1316      &mov    ($s0,$_s0)                if($i==2); #prefetch $s0
1317      &mov    ($s1,$_s1)                if($i==3); #prefetch $s1
1318      &mov    ($s2,$_s2)                if($i==1);
1319      &xor    ($s[$i],$tp8); # ^= ROTATE(tp8,8)

1321      &mov    ($s3,$_s3)                if($i==1);
1322      &mov    (&DWP(4+4*$i,"esp"),$s[$i]) if($i>=2);
1323  }

1325 &function_begin_B("x86_AES_decrypt_compact");
1326 # note that caller is expected to allocate stack frame for me!
1327 &mov    ($_key,$key); # save key

1329      &xor    ($s0,&DWP(0,$key)); # xor with key
1330      &xor    ($s1,&DWP(4,$key));
1331      &xor    ($s2,&DWP(8,$key));
1332      &xor    ($s3,&DWP(12,$key));

1334      &mov    ($sacc,&DWP(240,$key)); # load key->rounds

1336      &lea    ($sacc,&DWP(-2,$sacc,$sacc));
1337      &lea    ($sacc,&DWP(0,$key,$sacc,8));
1338      &mov    ($_end,$sacc); # end of key schedule

1340      # prefetch Td4
1341      &mov    ($key,&DWP(0-128,$tbl));
1342      &mov    ($sacc,&DWP(32-128,$tbl));
1343      &mov    ($key,&DWP(64-128,$tbl));
1344      &mov    ($sacc,&DWP(96-128,$tbl));
1345      &mov    ($key,&DWP(128-128,$tbl));
1346      &mov    ($sacc,&DWP(160-128,$tbl));
1347      &mov    ($key,&DWP(192-128,$tbl));
1348      &mov    ($sacc,&DWP(224-128,$tbl));

1350      &set_label("loop",16);

1352      &decompact(0,$tbl,$s0,$s3,$s2,$s1,1);
1353      &decompact(1,$tbl,$s1,$s0,$s3,$s2,1);
1354      &decompact(2,$tbl,$s2,$s1,$s0,$s3,1);
1355      &decompact(3,$tbl,$s3,$s2,$s1,$s0,1);
1356      &decompact(2);
1357      &decompact(3);
1358      &decompact(0);
1359      &decompact(1);
1360      &mov    ($key,$_key);
1361      &mov    ($tbl,$_tbl);
1362      &add    ($key,16); # advance rd_key
1363      &xor    ($s0,&DWP(0,$key));
1364      &xor    ($s1,&DWP(4,$key));
1365      &xor    ($s2,&DWP(8,$key));
1366      &xor    ($s3,&DWP(12,$key));

1368      &cmp    ($key,$_end);
1369      &mov    ($_key,$key);
1370      &jb     (&label("loop"));

1372      &decompact(0,$tbl,$s0,$s3,$s2,$s1);
1373      &decompact(1,$tbl,$s1,$s0,$s3,$s2);
1374      &decompact(2,$tbl,$s2,$s1,$s0,$s3);
1375      &decompact(3,$tbl,$s3,$s2,$s1,$s0);

1377      &xor    ($s0,&DWP(16,$key));
1378      &xor    ($s1,&DWP(20,$key));
1379      &xor    ($s2,&DWP(24,$key));
1380      &xor    ($s3,&DWP(28,$key));

```

```

1382      &ret    ();
1383 &function_end_B("x86_AES_decrypt_compact");

1385 #####
1386 # "Compact" SSE block function.
1387 #####

1389 sub sse_decompact()
1390 {
1391      &pshufw ("mm1","mm0",0x0c); # 7, 6, 1, 0
1392      &movd   ("eax","mm1"); # 7, 6, 1, 0

1394      &pshufw ("mm5","mm4",0x09); # 13,12,11,10
1395      &movz   ($sacc,&LB("eax")); # 0
1396      &movz   ("ecx",&BP(-128,$tbl,$sacc,1)); # 0
1397      &movd   ("ebx","mm5"); # 13,12,11,10
1398      &movz   ("edx",&HB("eax")); # 1
1399      &movz   ("edx",&BP(-128,$tbl,"edx",1)); # 1
1400      &shl    ("edx",8); # 1

1402      &pshufw ("mm2","mm0",0x06); # 3, 2, 5, 4
1403      &movz   ($sacc,&LB("ebx")); # 10
1404      &movz   ($sacc,&BP(-128,$tbl,$sacc,1)); # 10
1405      &shl    ($sacc,16); # 10
1406      &or     ("ecx",$sacc); # 10
1407      &shr    ("eax",16); # 7, 6
1408      &movz   ($sacc,&HB("ebx")); # 11
1409      &movz   ($sacc,&BP(-128,$tbl,$sacc,1)); # 11
1410      &shl    ($sacc,24); # 11
1411      &or     ("edx",$sacc); # 11
1412      &shr    ("ebx",16); # 13,12

1414      &pshufw ("mm6","mm4",0x03); # 9, 8,15,14
1415      &movz   ($sacc,&HB("eax")); # 7
1416      &movz   ($sacc,&BP(-128,$tbl,$sacc,1)); # 7
1417      &shl    ($sacc,24); # 7
1418      &or     ("ecx",$sacc); # 7
1419      &movz   ($sacc,&HB("ebx")); # 13
1420      &movz   ($sacc,&BP(-128,$tbl,$sacc,1)); # 13
1421      &shl    ($sacc,8); # 13
1422      &or     ("ecx",$sacc); # 13
1423      &movd   ("mm0","ecx"); # t[0] collected

1425      &movz   ($sacc,&LB("eax")); # 6
1426      &movd   ("eax","mm2"); # 3, 2, 5, 4
1427      &movz   ("ecx",&BP(-128,$tbl,$sacc,1)); # 6
1428      &shl    ("ecx",16); # 6
1429      &movz   ($sacc,&LB("ebx")); # 12
1430      &movd   ("ebx","mm6"); # 9, 8,15,14
1431      &movz   ($sacc,&BP(-128,$tbl,$sacc,1)); # 12
1432      &or     ("ecx",$sacc); # 12

1434      &movz   ($sacc,&LB("eax")); # 4
1435      &movz   ($sacc,&BP(-128,$tbl,$sacc,1)); # 4
1436      &or     ("edx",$sacc); # 4
1437      &movz   ($sacc,&LB("ebx")); # 14
1438      &movz   ($sacc,&BP(-128,$tbl,$sacc,1)); # 14
1439      &shl    ($sacc,16); # 14
1440      &or     ("edx",$sacc); # 14
1441      &movd   ("mm1","edx"); # t[1] collected

1443      &movz   ($sacc,&HB("eax")); # 5
1444      &movz   ("edx",&BP(-128,$tbl,$sacc,1)); # 5
1445      &shl    ("edx",8); # 5
1446      &movz   ($sacc,&HB("ebx")); # 15
1447      &shr    ("eax",16); # 3, 2

```

```

1448    &movz    ($acc,&BP(-128,$tbl,$acc,1));    # 15
1449    &shl     ($acc,24);                        # 15
1450    &or      ("edx",$acc);                     # 15
1451    &shr     ("ebx",16);                       # 9, 8

1453    &punpckldq    ("mm0","mm1");                # t[0,1] collected

1455    &movz    ($acc,&HB("ebx"));                  # 9
1456    &movz    ($acc,&BP(-128,$tbl,$acc,1));        # 9
1457    &shl     ($acc,8);                          # 9
1458    &or      ("ecx",$acc);                      # 9
1459    &and     ("ebx",0xff);                      # 8
1460    &movz    ("ebx",&BP(-128,$tbl,"ebx",1));      # 8
1461    &or      ("edx","ebx");                     # 8
1462    &movz    ($acc,&LB("eax"));                  # 2
1463    &movz    ($acc,&BP(-128,$tbl,$acc,1));        # 2
1464    &shl     ($acc,16);                         # 2
1465    &or      ("edx",$acc);                      # 2
1466    &movd    ("mm4","edx");                     # t[2] collected
1467    &movz    ("eax",&HB("eax"));                  # 3
1468    &movz    ("eax",&BP(-128,$tbl,"eax",1));      # 3
1469    &shl     ("eax",24);                        # 3
1470    &or      ("ecx","eax");                     # 3
1471    &movd    ("mm5","ecx");                     # t[3] collected

1473    &punpckldq    ("mm4","mm5");                # t[2,3] collected
1474 }

1476                                     if (!$x86only) {
1477 &function_begin_B("_sse_AES_decrypt_compact");
1478    &pxor    ("mm0",&QWP(0,$key));              # 7, 6, 5, 4, 3, 2, 1, 0
1479    &pxor    ("mm4",&QWP(8,$key));              # 15,14,13,12,11,10, 9, 8

1481    # note that caller is expected to allocate stack frame for me!
1482    &mov     ($acc,&DWP(240,$key));              # load key->rounds
1483    &lea     ($acc,&DWP(-2,$acc,$acc));
1484    &lea     ($acc,&DWP(0,$key,$acc,8));
1485    &mov     ($_end,$acc);                      # end of key schedule

1487    &mov     ($s0,0x1b1b1b1b);                  # magic constant
1488    &mov     (&DWP(8,"esp"),$s0);
1489    &mov     (&DWP(12,"esp"),$s0);

1491    # prefetch Td4
1492    &mov     ($s0,&DWP(0-128,$tbl));
1493    &mov     ($s1,&DWP(32-128,$tbl));
1494    &mov     ($s2,&DWP(64-128,$tbl));
1495    &mov     ($s3,&DWP(96-128,$tbl));
1496    &mov     ($s0,&DWP(128-128,$tbl));
1497    &mov     ($s1,&DWP(160-128,$tbl));
1498    &mov     ($s2,&DWP(192-128,$tbl));
1499    &mov     ($s3,&DWP(224-128,$tbl));

1501    &set_label("loop",16);
1502    &sse_decompact();
1503    &add     ($key,16);
1504    &cmp     ($key,$_end);
1505    &ja      (&label("out"));

1507    # ROTATE(x^y,N) == ROTATE(x,N)^ROTATE(y,N)
1508    &movq    ("mm3","mm0");                    &movq    ("mm7","mm4");
1509    &movq    ("mm2","mm0",1);                  &movq    ("mm6","mm4",1);
1510    &movq    ("mm1","mm0");                    &movq    ("mm5","mm4");
1511    &pshufw  ("mm0","mm0",0xb1);                &pshufw  ("mm4","mm4",0xb1);# = R
1512    &pslld   ("mm2",8);                        &pslld   ("mm6",8);
1513    &psrld   ("mm3",8);                        &psrld   ("mm7",8);

```

```

1514    &pxor    ("mm0","mm2");                    &pxor    ("mm4","mm6"); # ^= tp0
1515    &pxor    ("mm0","mm3");                    &pxor    ("mm4","mm7"); # ^= tp0
1516    &pslld   ("mm2",16);                      &pslld   ("mm6",16);
1517    &psrld   ("mm3",16);                      &psrld   ("mm7",16);
1518    &pxor    ("mm0","mm2");                    &pxor    ("mm4","mm6"); # ^= tp0
1519    &pxor    ("mm0","mm3");                    &pxor    ("mm4","mm7"); # ^= tp0

1521    &movq    ("mm3",&QWP(8,"esp"));
1522    &pxor    ("mm2","mm2");                    &pxor    ("mm6","mm6");
1523    &pcmpgtb ("mm2","mm1");                    &pcmpgtb ("mm6","mm5");
1524    &pand    ("mm2","mm3");                    &pand    ("mm6","mm3");
1525    &paddb   ("mm1","mm1");                    &paddb   ("mm5","mm5");
1526    &pxor    ("mm1","mm2");                    &pxor    ("mm5","mm6"); # tp2
1527    &movq    ("mm3","mm1");                    &movq    ("mm7","mm5");
1528    &movq    ("mm2","mm1");                    &movq    ("mm6","mm5");
1529    &pxor    ("mm0","mm1");                    &pxor    ("mm4","mm5"); # ^= tp2
1530    &pslld   ("mm3",24);                      &pslld   ("mm7",24);
1531    &psrld   ("mm2",8);                      &psrld   ("mm6",8);
1532    &pxor    ("mm0","mm3");                    &pxor    ("mm4","mm7"); # ^= tp2
1533    &pxor    ("mm0","mm2");                    &pxor    ("mm4","mm6"); # ^= tp2

1535    &movq    ("mm2",&QWP(8,"esp"));
1536    &pxor    ("mm3","mm3");                    &pxor    ("mm7","mm7");
1537    &pcmpgtb ("mm3","mm1");                    &pcmpgtb ("mm7","mm5");
1538    &pand    ("mm3","mm2");                    &pand    ("mm7","mm2");
1539    &paddb   ("mm1","mm1");                    &paddb   ("mm5","mm5");
1540    &pxor    ("mm1","mm3");                    &pxor    ("mm5","mm7"); # tp4
1541    &pshufw  ("mm3","mm1",0xb1);                &pshufw  ("mm7","mm5",0xb1);
1542    &pxor    ("mm0","mm1");                    &pxor    ("mm4","mm5"); # ^= tp4
1543    &pxor    ("mm0","mm3");                    &pxor    ("mm4","mm7"); # ^= ROT

1545    &pxor    ("mm3","mm3");                    &pxor    ("mm7","mm7");
1546    &pcmpgtb ("mm3","mm1");                    &pcmpgtb ("mm7","mm5");
1547    &pand    ("mm3","mm2");                    &pand    ("mm7","mm2");
1548    &paddb   ("mm1","mm1");                    &paddb   ("mm5","mm5");
1549    &pxor    ("mm1","mm3");                    &pxor    ("mm5","mm7"); # tp8
1550    &pxor    ("mm0","mm1");                    &pxor    ("mm4","mm5"); # ^= tp8
1551    &movq    ("mm3","mm1");                    &movq    ("mm7","mm5");
1552    &pshufw  ("mm2","mm1",0xb1);                &pshufw  ("mm6","mm5",0xb1);
1553    &pxor    ("mm0","mm2");                    &pxor    ("mm4","mm6"); # ^= ROT
1554    &pslld   ("mm1",8);                      &pslld   ("mm5",8);
1555    &psrld   ("mm3",8);                      &psrld   ("mm7",8);
1556    &movq    ("mm2",&QWP(0,$key));                &movq    ("mm6",&QWP(8,$key));
1557    &pxor    ("mm0","mm1");                    &pxor    ("mm4","mm5"); # ^= tp8
1558    &pxor    ("mm0","mm3");                    &pxor    ("mm4","mm7"); # ^= tp8
1559    &mov     ($s0,&DWP(0-128,$tbl));
1560    &pslld   ("mm1",16);                      &pslld   ("mm5",16);
1561    &mov     ($s1,&DWP(64-128,$tbl));
1562    &psrld   ("mm3",16);                      &psrld   ("mm7",16);
1563    &mov     ($s2,&DWP(128-128,$tbl));
1564    &pxor    ("mm0","mm1");                    &pxor    ("mm4","mm5"); # ^= tp8
1565    &mov     ($s3,&DWP(192-128,$tbl));
1566    &pxor    ("mm0","mm3");                    &pxor    ("mm4","mm7"); # ^= tp8

1568    &pxor    ("mm0","mm2");                    &pxor    ("mm4","mm6");
1569    &jmp     (&label("loop"));

1571    &set_label("out",16);
1572    &pxor    ("mm0",&QWP(0,$key));
1573    &pxor    ("mm4",&QWP(8,$key));

1575    &ret     ();
1576 &function_end_B("_sse_AES_decrypt_compact");
1577 }

1579 #####

```

```

1580 # Vanilla block function.
1581 #####

1583 sub decstep()
1584 { my ($i,$td,@s) = @_ ;
1585   my $tmp = $key;
1586   my $out = $i==3?$s[0]:$acc;

1588   # no instructions are reordered, as performance appears
1589   # optimal... or rather that all attempts to reorder didn't
1590   # result in better performance [which by the way is not a
1591   # bit lower than encryption].
1592   if($i==3) { &mov ($key,$_key); }
1593   else { &mov ($out,$s[0]); }
1594         &and ($out,0xFF);
1595         &mov ($out,&DWP(0,$td,$out,8));

1597   if ($i==3) { $tmp=$s[1]; }
1598               &movz ($tmp,&HB($s[1]));
1599               &xor ($out,&DWP(3,$td,$tmp,8));

1601   if ($i==3) { $tmp=$s[2]; &mov ($s[1],$acc); }
1602   else { &mov ($tmp,$s[2]); }
1603         &shr ($tmp,16);
1604         &and ($tmp,0xFF);
1605         &xor ($out,&DWP(2,$td,$tmp,8));

1607   if ($i==3) { $tmp=$s[3]; &mov ($s[2],$s1); }
1608   else { &mov ($tmp,$s[3]); }
1609         &shr ($tmp,24);
1610         &xor ($out,&DWP(1,$td,$tmp,8));
1611   if ($i<2) { &mov (&DWP(4+4*$i,"esp"),$out); }
1612   if ($i==3) { &mov ($s[3],$s0); }
1613               &comment();
1614 }

1616 sub declast()
1617 { my ($i,$td,@s)=@_ ;
1618   my $tmp = $key;
1619   my $out = $i==3?$s[0]:$acc;

1621   if($i==0) { &lea ($td,&DWP(2048+128,$td));
1622               &mov ($tmp,&DWP(0-128,$td));
1623               &mov ($acc,&DWP(32-128,$td));
1624               &mov ($tmp,&DWP(64-128,$td));
1625               &mov ($acc,&DWP(96-128,$td));
1626               &mov ($tmp,&DWP(128-128,$td));
1627               &mov ($acc,&DWP(160-128,$td));
1628               &mov ($tmp,&DWP(192-128,$td));
1629               &mov ($acc,&DWP(224-128,$td));
1630               &lea ($td,&DWP(-128,$td)); }
1631   if($i==3) { &mov ($key,$_key); }
1632   else { &mov ($out,$s[0]); }
1633         &and ($out,0xFF);
1634         &movz ($out,&BP(0,$td,$out,1));

1636   if ($i==3) { $tmp=$s[1]; }
1637               &movz ($tmp,&HB($s[1]));
1638               &movz ($tmp,&BP(0,$td,$tmp,1));
1639               &shl ($tmp,8);
1640               &xor ($out,$tmp);

1642   if ($i==3) { $tmp=$s[2]; &mov ($s[1],$acc); }
1643   else { &mov ($tmp,$s[2]); }
1644         &shr ($tmp,16);
1645         &and ($tmp,0xFF);

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1646         &movz ($tmp,&BP(0,$td,$tmp,1));
1647         &shl ($tmp,16);
1648         &xor ($out,$tmp);

1650   if ($i==3) { $tmp=$s[3]; &mov ($s[2],$s1); }
1651   else { &mov ($tmp,$s[3]); }
1652         &shr ($tmp,24);
1653         &movz ($tmp,&BP(0,$td,$tmp,1));
1654         &shl ($tmp,24);
1655         &xor ($out,$tmp);
1656   if ($i<2) { &mov (&DWP(4+4*$i,"esp"),$out); }
1657   if ($i==3) { &mov ($s[3],$s0); }
1658               &lea ($td,&DWP(-2048,$td)); }
1659 }

1661 &function_begin_B(" x86_AES_decrypt");
1662 # note that caller is expected to allocate stack frame for me!
1663 &mov ($_key,$key); # save key

1665 &xor ($s0,&DWP(0,$key)); # xor with key
1666 &xor ($s1,&DWP(4,$key));
1667 &xor ($s2,&DWP(8,$key));
1668 &xor ($s3,&DWP(12,$key));

1670 &mov ($acc,&DWP(240,$key)); # load key->rounds

1672 if ($small_footprint) {
1673   &lea ($acc,&DWP(-2,$acc,$acc));
1674   &lea ($acc,&DWP(0,$key,$acc,8));
1675   &mov ($_end,$acc); # end of key schedule
1676   &set_label("loop",16);
1677   &decstep(0,$tbl,$s0,$s3,$s2,$s1);
1678   &decstep(1,$tbl,$s1,$s0,$s3,$s2);
1679   &decstep(2,$tbl,$s2,$s1,$s0,$s3);
1680   &decstep(3,$tbl,$s3,$s2,$s1,$s0);
1681   &add ($key,16); # advance rd_key
1682   &xor ($s0,&DWP(0,$key));
1683   &xor ($s1,&DWP(4,$key));
1684   &xor ($s2,&DWP(8,$key));
1685   &xor ($s3,&DWP(12,$key));
1686   &cmp ($key,$_end);
1687   &mov ($_key,$key);
1688   &jb (&label("loop"));
1689 }
1690 else {
1691   &cmp ($acc,10);
1692   &jle (&label("10rounds"));
1693   &cmp ($acc,12);
1694   &jle (&label("12rounds"));

1696   &set_label("14rounds",4);
1697   for ($i=1;$i<3;$i++) {
1698     &decstep(0,$tbl,$s0,$s3,$s2,$s1);
1699     &decstep(1,$tbl,$s1,$s0,$s3,$s2);
1700     &decstep(2,$tbl,$s2,$s1,$s0,$s3);
1701     &decstep(3,$tbl,$s3,$s2,$s1,$s0);
1702     &xor ($s0,&DWP(16*$i+0,$key));
1703     &xor ($s1,&DWP(16*$i+4,$key));
1704     &xor ($s2,&DWP(16*$i+8,$key));
1705     &xor ($s3,&DWP(16*$i+12,$key));
1706   }
1707   &add ($key,32);
1708   &mov ($_key,$key); # advance rd_key
1709   &set_label("12rounds",4);
1710   for ($i=1;$i<3;$i++) {
1711     &decstep(0,$tbl,$s0,$s3,$s2,$s1);

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1712     &decstep(1,$tbl,$s1,$s0,$s3,$s2);
1713     &decstep(2,$tbl,$s2,$s1,$s0,$s3);
1714     &decstep(3,$tbl,$s3,$s2,$s1,$s0);
1715     &xor ($s0,&DWP(16*$i+0,$key));
1716     &xor ($s1,&DWP(16*$i+4,$key));
1717     &xor ($s2,&DWP(16*$i+8,$key));
1718     &xor ($s3,&DWP(16*$i+12,$key));
1719 }
1720 &add ($key,32);
1721 &mov ($key,$key); # advance rd_key
1722 &set_label("10rounds",4);
1723 for ($i=1;$i<10;$i++) {
1724     &decstep(0,$tbl,$s0,$s3,$s2,$s1);
1725     &decstep(1,$tbl,$s1,$s0,$s3,$s2);
1726     &decstep(2,$tbl,$s2,$s1,$s0,$s3);
1727     &decstep(3,$tbl,$s3,$s2,$s1,$s0);
1728     &xor ($s0,&DWP(16*$i+0,$key));
1729     &xor ($s1,&DWP(16*$i+4,$key));
1730     &xor ($s2,&DWP(16*$i+8,$key));
1731     &xor ($s3,&DWP(16*$i+12,$key));
1732 }
1733 }

1735 &declast(0,$tbl,$s0,$s3,$s2,$s1);
1736 &declast(1,$tbl,$s1,$s0,$s3,$s2);
1737 &declast(2,$tbl,$s2,$s1,$s0,$s3);
1738 &declast(3,$tbl,$s3,$s2,$s1,$s0);

1740 &add ($key,$small_footprint?16:160);
1741 &xor ($s0,&DWP(0,$key));
1742 &xor ($s1,&DWP(4,$key));
1743 &xor ($s2,&DWP(8,$key));
1744 &xor ($s3,&DWP(12,$key));

1746 &ret ();

1748 &set_label("AES_Td",64); # Yes! I keep it in the code segment!
1749 &_data_word(0x50a7f451, 0x5365417e, 0xc3a4171a, 0x965e273a);
1750 &_data_word(0xcb6bab3b, 0xf1459d1f, 0xab58faac, 0x9303e34b);
1751 &_data_word(0x55fa3020, 0xf66d76ad, 0x9176cc88, 0x254c02f5);
1752 &_data_word(0xfcd7e54f, 0xd7cb2ac5, 0x80443526, 0x8fa362b5);
1753 &_data_word(0x495ab1de, 0x671bba25, 0x980eea45, 0xe1c0fe5d);
1754 &_data_word(0x02752fc3, 0x12f04c81, 0xa397468d, 0xc6f9d36b);
1755 &_data_word(0xe75f8f03, 0x959c9215, 0xeb7a6dbf, 0xda595295);
1756 &_data_word(0x2d83bed4, 0xd3217458, 0x2969e049, 0x44c8c98e);
1757 &_data_word(0x6a89c275, 0x78798ef4, 0x6b3e5899, 0xdd71b9e7);
1758 &_data_word(0xb64fe1be, 0x17ad88f0, 0x66ac20c9, 0xb43ace2d);
1759 &_data_word(0x184adf63, 0x82311ae5, 0x60335197, 0x457f5362);
1760 &_data_word(0xe07764b1, 0x84ae6bbb, 0x1ca081fe, 0x942b08f9);
1761 &_data_word(0x58684870, 0x19fd458f, 0x876cde94, 0xb7f87b52);
1762 &_data_word(0x23d373ab, 0xe2024b72, 0x578f1fe3, 0x2aab5566);
1763 &_data_word(0x02728ebb2, 0x03c2b52f, 0x9a7bc586, 0xa50837d3);
1764 &_data_word(0xf2872830, 0xb2a5bf23, 0xba6a0302, 0x5c8216ed);
1765 &_data_word(0x2b1ccc8a, 0x92b479a7, 0xf0f207f3, 0xa1e2694e);
1766 &_data_word(0xcdcf4da65, 0xd5be0506, 0x1f6234d1, 0x8afa6ac4);
1767 &_data_word(0x9d532e34, 0xa055f3a2, 0x32e18a05, 0x75ebf6a4);
1768 &_data_word(0x39ec830b, 0xaaef6040, 0x069f715e, 0x51106ebd);
1769 &_data_word(0xf98a213e, 0x3d06dd96, 0xae053edd, 0x46bde64d);
1770 &_data_word(0xb58d5491, 0x055dc471, 0x6fd40604, 0xff155060);
1771 &_data_word(0x24fb9819, 0x97e9bdd6, 0xcc434089, 0x779ed967);
1772 &_data_word(0xbd42e8b0, 0x888b8907, 0x385b19e7, 0xdbbec879);
1773 &_data_word(0x470a7ca1, 0xe90f427c, 0xc91e84f8, 0x00000000);
1774 &_data_word(0x83868009, 0x48ed2b32, 0xac70111e, 0x4e725a6c);
1775 &_data_word(0xfbf0fe0f, 0x5638850f, 0x1ed5ae3d, 0x27392d36);
1776 &_data_word(0x64d90f0a, 0x21a65c68, 0xd1545b9b, 0x3a2e3624);
1777 &_data_word(0xb1670a0c, 0x0fe75793, 0xd296eeb4, 0x9e919b1b);

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1778 &_data_word(0x4fc5c080, 0xa220dc61, 0x694b775a, 0x161a121c);
1779 &_data_word(0x0aba93e2, 0xe52aa0c0, 0x43e0223c, 0x1d171b12);
1780 &_data_word(0x00d090e, 0xadc78bf2, 0xb9a8b62d, 0xc8a91e14);
1781 &_data_word(0x8519f157, 0x4c0775af, 0xbdd99ee, 0xfd607fa3);
1782 &_data_word(0x9f2601f7, 0xbcf5725c, 0xc53b6644, 0x347efb5b);
1783 &_data_word(0x7629438b, 0xdcc623cb, 0x68fcedb6, 0x63f1e4b8);
1784 &_data_word(0xcadc31d7, 0x10856342, 0x40229713, 0x2011c684);
1785 &_data_word(0x7d244a85, 0xf83dbbd2, 0x1132f9ae, 0x6da129c7);
1786 &_data_word(0x4b2f9e1d, 0xf330b2dc, 0xec52860d, 0xd0e3c177);
1787 &_data_word(0x6c16b32b, 0x99b970a9, 0xfa489411, 0x2264e947);
1788 &_data_word(0xc48cfca8, 0x1a3ff0a0, 0xd82c7d56, 0xf903322);
1789 &_data_word(0xc74e4987, 0xc1d138d9, 0xfea2ca8c, 0x360bd498);
1790 &_data_word(0xc8f1f5a6, 0x28de7aa5, 0x268eb7da, 0xa4bfad3f);
1791 &_data_word(0xe49d3a2c, 0xd927850, 0x9bcc5f6a, 0x62467e54);
1792 &_data_word(0xc2138df6, 0xe8b8d899, 0x5ef7392e, 0xf5afc382);
1793 &_data_word(0xbe805d9f, 0x7c93d069, 0xa92dd56f, 0xb31225cf);
1794 &_data_word(0x3b99acc8, 0xa77d1810, 0x6e639ce8, 0x7bbb3bdb);
1795 &_data_word(0x097826cd, 0xf418596e, 0x01b79aec, 0xa89a4f83);
1796 &_data_word(0x656e95e6, 0x7ee6ffa, 0x08cfbc21, 0xe6e815ef);
1797 &_data_word(0xd99be7ba, 0xce366f4a, 0xd4099fea, 0xd67cb029);
1798 &_data_word(0xafb2a431, 0x31233f2a, 0x3094a5c6, 0xc066a235);
1799 &_data_word(0x37bc4e74, 0xa6ca82fc, 0xb0d090e0, 0x15d8a733);
1800 &_data_word(0x4a9804f1, 0xf7daec41, 0xe50cd7f, 0x2ff69117);
1801 &_data_word(0x8dd64d76, 0x4db0ef43, 0x544daacc, 0xdf0496e4);
1802 &_data_word(0xe3b5d19e, 0x1b886a4c, 0xb81f2cc1, 0x7f516546);
1803 &_data_word(0x04ea5e9d, 0x5d358c0f, 0x737487fa, 0x2e410bfb);
1804 &_data_word(0x5a1d67b3, 0x52d2db92, 0x335610e9, 0x1347d66d);
1805 &_data_word(0x8c61d79a, 0x7a0ca137, 0xe14f859, 0x893c13eb);
1806 &_data_word(0xee27a9ce, 0x35c961b7, 0xede51ce1, 0x3ch1477a);
1807 &_data_word(0x59dfd29c, 0x3f73f255, 0x79ce1418, 0xbf37c773);
1808 &_data_word(0xeacd7f53, 0x5baafd5f, 0x146f3ddf, 0x86db4478);
1809 &_data_word(0x81f3afca, 0x3ec468b9, 0x2c342438, 0x5f40a3c2);
1810 &_data_word(0x72c31d16, 0xc25e2bc, 0x8b493c28, 0x41950dff);
1811 &_data_word(0x7101a839, 0xdeb30c08, 0x9ce4b4d8, 0x90c15664);
1812 &_data_word(0x6184cb7b, 0x70b632d5, 0x745c6c48, 0x4257b8d0);

1814 #Td4: # four copies of Td4 to choose from to avoid L1 aliasing
1815 &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
1816 &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
1817 &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
1818 &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);
1819 &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
1820 &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
1821 &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
1822 &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
1823 &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
1824 &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);
1825 &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
1826 &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
1827 &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0x93, 0xa0);
1828 &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
1829 &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0x02);
1830 &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0x6b);
1831 &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
1832 &data_byte(0x97, 0xfc, 0xc, 0xc, 0xf0, 0xb4, 0xe6, 0x73);
1833 &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
1834 &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0xc, 0x75, 0xdf, 0xe);
1835 &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
1836 &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xb6, 0x1b);
1837 &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
1838 &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
1839 &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
1840 &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
1841 &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
1842 &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
1843 &data_byte(0xa0, 0xe0, 0x3b, 0x40, 0xae, 0x2a, 0xf5, 0xb0);

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1844      &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
1845      &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
1846      &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);

1848      &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
1849      &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
1850      &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
1851      &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);
1852      &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
1853      &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
1854      &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
1855      &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
1856      &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
1857      &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);
1858      &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
1859      &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
1860      &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0xd3, 0xa0);
1861      &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
1862      &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0x02);
1863      &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0x6b);
1864      &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
1865      &data_byte(0x97, 0xf2, 0xcf, 0xce, 0xf0, 0xb4, 0xe6, 0x73);
1866      &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
1867      &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0x1c, 0x75, 0xdf, 0x6e);
1868      &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
1869      &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xbe, 0x1b);
1870      &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
1871      &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
1872      &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
1873      &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
1874      &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
1875      &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
1876      &data_byte(0xa0, 0xe0, 0x3b, 0x4d, 0xae, 0x2a, 0xf5, 0xb0);
1877      &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
1878      &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
1879      &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);

1881      &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
1882      &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
1883      &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
1884      &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);
1885      &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
1886      &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
1887      &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
1888      &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
1889      &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
1890      &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);
1891      &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
1892      &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
1893      &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0xd3, 0xa0);
1894      &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
1895      &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0x02);
1896      &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0x6b);
1897      &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
1898      &data_byte(0x97, 0xf2, 0xcf, 0xce, 0xf0, 0xb4, 0xe6, 0x73);
1899      &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
1900      &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0x1c, 0x75, 0xdf, 0x6e);
1901      &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
1902      &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xbe, 0x1b);
1903      &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
1904      &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
1905      &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
1906      &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
1907      &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
1908      &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
1909      &data_byte(0xa0, 0xe0, 0x3b, 0x4d, 0xae, 0x2a, 0xf5, 0xb0);

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1910      &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
1911      &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
1912      &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);

1914      &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
1915      &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
1916      &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
1917      &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);
1918      &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
1919      &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
1920      &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
1921      &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
1922      &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
1923      &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);
1924      &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
1925      &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
1926      &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0xd3, 0xa0);
1927      &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
1928      &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0x02);
1929      &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0x6b);
1930      &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
1931      &data_byte(0x97, 0xf2, 0xcf, 0xce, 0xf0, 0xb4, 0xe6, 0x73);
1932      &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
1933      &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0x1c, 0x75, 0xdf, 0x6e);
1934      &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
1935      &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xbe, 0x1b);
1936      &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
1937      &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
1938      &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
1939      &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
1940      &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
1941      &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
1942      &data_byte(0xa0, 0xe0, 0x3b, 0x4d, 0xae, 0x2a, 0xf5, 0xb0);
1943      &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
1944      &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
1945      &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);
1946      &function_end_B("x86_AES_decrypt");

1948      # void AES_decrypt (const void *inp, void *out, const AES_KEY *key);
1949      &function_begin("AES_decrypt");
1950      &mov      ($acc, &wparam(0));          # load inp
1951      &mov      ($key, &wparam(2));          # load key

1953      &mov      ($s0, "esp");
1954      &sub      ("esp", 36);
1955      &and      ("esp", -64);                  # align to cache-line

1957      # place stack frame just "above" the key schedule
1958      &lea      ($s1, &DWP(-64-63, $key));
1959      &sub      ($s1, "esp");
1960      &neg      ($s1);
1961      &and      ($s1, 0x3c0);                  # modulo 1024, but aligned to cache-line
1962      &sub      ("esp", $s1);
1963      &add      ("esp", 4);                    # 4 is reserved for caller's return address
1964      &mov      ($_esp, $s0);                  # save stack pointer

1966      &call     (&label("pic_point"));        # make it PIC!
1967      &set_label("pic_point");
1968      &blndpop($tbl);
1969      &picmeup($s0, "OPENSSL_ia32cap_P", $tbl, &label("pic_point")) if(!$x86only)
1970      &lea      ($tbl, &DWP(&label("AES_Td")."-".&label("pic_point"), $tbl));

1972      # pick Td4 copy which can't "overlap" with stack frame or key schedule
1973      &lea      ($s1, &DWP(768-4, "esp"));
1974      &sub      ($s1, $tbl);
1975      &and      ($s1, 0x300);

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1976      &lea      ($tbl,&DWP(2048+128,$tbl,$s1));
1978
1979      &bt        (&DWP(0,$s0),25);          if (!$x86only) {
1980      &jnc        (&label("x86"));            # check for SSE bit
1981
1982      &movq       ("mm0",&QWP(0,$acc));
1983      &movq       ("mm4",&QWP(8,$acc));
1984      &call       ("_sse_AES_decrypt_compact");
1985      &mov        ("esp",$esp);                # restore stack pointer
1986      &mov        ($acc,&wparam(1));           # load out
1987      &movq       (&QWP(0,$acc),"mm0");       # write output data
1988      &movq       (&QWP(8,$acc),"mm4");
1989      &emms       ();
1990      &function_end_A();
1991
1992      &set_label("x86",16);
1993      &mov        ($tbl,$tbl);
1994      &mov        ($s0,&DWP(0,$acc));          # load input data
1995      &mov        ($s1,&DWP(4,$acc));
1996      &mov        ($s2,&DWP(8,$acc));
1997      &mov        ($s3,&DWP(12,$acc));
1998      &call       ("_x86_AES_decrypt_compact");
1999      &mov        ("esp",$esp);                # restore stack pointer
2000      &mov        ($acc,&wparam(1));           # load out
2001      &mov        (&DWP(0,$acc),$s0);        # write output data
2002      &mov        (&DWP(4,$acc),$s1);
2003      &mov        (&DWP(8,$acc),$s2);
2004      &mov        (&DWP(12,$acc),$s3);
2005      &function_end("AES_decrypt");
2006
2007 # void AES_cbc_encrypt (const void char *inp, unsigned char *out,
2008 #                       size_t length, const AES_KEY *key,
2009 #                       unsigned char *ivp, const int enc);
2010 {
2011 # stack frame layout
2012 #   -4(%esp)      # return address      0(%esp)
2013 #   0(%esp)       # s0 backing store   4(%esp)
2014 #   4(%esp)       # s1 backing store   8(%esp)
2015 #   8(%esp)       # s2 backing store  12(%esp)
2016 #  12(%esp)       # s3 backing store  16(%esp)
2017 #  16(%esp)       # key backup         20(%esp)
2018 #  20(%esp)       # end of key schedule 24(%esp)
2019 #  24(%esp)       # %ebp backup        28(%esp)
2020 #  28(%esp)       # %esp backup
2021 my $inp=&DWP(32,"esp"); # copy of wparam(0)
2022 my $out=&DWP(36,"esp"); # copy of wparam(1)
2023 my $len=&DWP(40,"esp"); # copy of wparam(2)
2024 my $key=&DWP(44,"esp"); # copy of wparam(3)
2025 my $ivp=&DWP(48,"esp"); # copy of wparam(4)
2026 my $tmp=&DWP(52,"esp"); # volatile variable
2027 #
2028 my $ivec=&DWP(60,"esp"); # ivec[16]
2029 my $aes_key=&DWP(76,"esp"); # copy of aes_key
2030 my $mark=&DWP(76+240,"esp"); # copy of aes_key->rounds
2031
2032 &function_begin("AES_cbc_encrypt");
2033      &mov       ($s2 eq "ecx"? $s2 : "",&wparam(2)); # load len
2034      &cmp       ($s2,0);
2035      &jc        (&label("drop_out"));
2036
2037      &call      (&label("pic_point")); # make it PIC!
2038      &set_label("pic_point");
2039      &blndpop($tbl);
2040      &picmeup($s0,"OPENSSL_ia32cap_P",$tbl,&label("pic_point")) if (!$x86only)

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2042      &cmp       (&wparam(5),0);
2043      &lea       ($tbl,&DWP(&label("AES_Te")."-".&label("pic_point"),$tbl));
2044      &jne       (&label("picked_te"));
2045      &lea       ($tbl,&DWP(&label("AES_Td")."-".&label("AES_Te"),$tbl));
2046      &set_label("picked_te");
2047
2048      # one can argue if this is required
2049      &pushf     ();
2050      &cld       ();
2051
2052      &cmp       ($s2,$speed_limit);
2053      &jb        (&label("slow_way"));
2054      &test      ($s2,15);
2055      &jnz       (&label("slow_way"));
2056
2057      &bt        (&DWP(0,$s0),28);          if (!$x86only) {
2058      &jc        (&label("slow_way"));       # check for hyper-threading bit
2059      }
2060      # pre-allocate aligned stack frame...
2061      &lea       ($acc,&DWP(-80-244,"esp"));
2062      &and       ($acc,-64);
2063
2064      # ... and make sure it doesn't alias with $tbl modulo 4096
2065      &mov       ($s0,$tbl);
2066      &lea       ($s1,&DWP(2048+256,$tbl));
2067      &mov       ($s3,$acc);
2068      &and       ($s0,0xffff);               # s = %ebp&0xffff
2069      &and       ($s1,0xffff);               # e = (%ebp+2048+256)&0xffff
2070      &and       ($s3,0xffff);               # p = %esp&0xffff
2071
2072      &cmp       ($s3,$s1);                  # if (p>=e) %esp -= (p-e);
2073      &jb        (&label("tbl_break_out"));
2074      &sub       ($s3,$s1);
2075      &sub       ($acc,$s3);
2076      &jmp       (&label("tbl_ok"));
2077      &set_label("tbl_break_out",4); # else %esp -= (p-s)&0xffff + framesz;
2078      &sub       ($s3,$s0);
2079      &and       ($s3,0xffff);
2080      &add       ($s3,384);
2081      &sub       ($acc,$s3);
2082      &set_label("tbl_ok",4);
2083
2084      &lea       ($s3,&wparam(0));            # obtain pointer to parameter block
2085      &exch      ("esp",$acc);                # allocate stack frame
2086      &add       ("esp",4);                   # reserve for return address!
2087      &mov       ($tbl,$tbl);                 # save %ebp
2088      &mov       ($_esp,$acc);                # save %esp
2089
2090      &mov       ($s0,&DWP(0,$s3));           # load inp
2091      &mov       ($s1,&DWP(4,$s3));           # load out
2092      &mov       ($s2,&DWP(8,$s3));           # load len
2093      &mov       ($key,&DWP(12,$s3));         # load key
2094      &mov       ($acc,&DWP(16,$s3));         # load ivp
2095      &mov       ($s3,&DWP(20,$s3));         # load enc flag
2096
2097      &mov       ($_inp,$s0);                 # save copy of inp
2098      &mov       ($_out,$s1);                 # save copy of out
2099      &mov       ($_len,$s2);                 # save copy of len
2100      &mov       ($_key,$key);                # save copy of key
2101      &mov       ($_ivp,$acc);                # save copy of ivp
2102
2103      &mov       ($mark,0);                   # copy of aes_key->rounds = 0;
2104      # do we copy key schedule to stack?
2105      &mov       ($s1 eq "ebx"? $s1 : "",$key);
2106      &mov       ($s2 eq "ecx"? $s2 : "",244/4);
2107      &sub       ($s1,$tbl);

```



```

2108      &mov      ("esi", $key);
2109      &and      ($s1, 0xffff);
2110      &lea      ("edi", $aes_key);
2111      &cmp      ($s1, 2048+256);
2112      &jb       (&label("do_copy"));
2113      &cmp      ($s1, 4096-244);
2114      &jb       (&label("skip_copy"));
2115      &set_label("do_copy", 4);
2116      &mov      ($key, "edi");
2117      &data_word(0xA5F3F689); # rep movsd
2118      &set_label("skip_copy");

2120      &mov      ($key, 16);
2121      &set_label("prefetch_tbl", 4);
2122      &mov      ($s0, &DWP(0, $tbl));
2123      &mov      ($s1, &DWP(32, $tbl));
2124      &mov      ($s2, &DWP(64, $tbl));
2125      &mov      ($s3, &DWP(96, $tbl));
2126      &lea      ($tbl, &DWP(128, $tbl));
2127      &sub      ($key, 1);
2128      &jnz      (&label("prefetch_tbl"));
2129      &sub      ($tbl, 2048);

2131      &mov      ($sacc, $inp);
2132      &mov      ($key, $ivp);

2134      &cmp      ($s3, 0);
2135      &jje      (&label("fast_decrypt"));

2137 #----- ENCRYPT -----#
2138      &mov      ($s0, &DWP(0, $key)); # load iv
2139      &mov      ($s1, &DWP(4, $key));

2141      &set_label("fast_enc_loop", 16);
2142      &mov      ($s2, &DWP(8, $key));
2143      &mov      ($s3, &DWP(12, $key));

2145      &xor      ($s0, &DWP(0, $sacc)); # xor input data
2146      &xor      ($s1, &DWP(4, $sacc));
2147      &xor      ($s2, &DWP(8, $sacc));
2148      &xor      ($s3, &DWP(12, $sacc));

2150      &mov      ($key, $key); # load key
2151      &call      ("_x86_AES_encrypt");

2153      &mov      ($sacc, $inp); # load inp
2154      &mov      ($key, $out); # load out

2156      &mov      (&DWP(0, $key), $s0); # save output data
2157      &mov      (&DWP(4, $key), $s1);
2158      &mov      (&DWP(8, $key), $s2);
2159      &mov      (&DWP(12, $key), $s3);

2161      &lea      ($sacc, &DWP(16, $sacc)); # advance inp
2162      &mov      ($s2, $len); # load len
2163      &mov      ($inp, $sacc); # save inp
2164      &lea      ($s3, &DWP(16, $key)); # advance out
2165      &mov      ($out, $s3); # save out
2166      &sub      ($s2, 16); # decrease len
2167      &mov      ($len, $s2); # save len

2168      &jnz      (&label("fast_enc_loop"));
2169      &mov      ($sacc, $ivp); # load ivp
2170      &mov      ($s2, &DWP(8, $key)); # restore last 2 dwords
2171      &mov      ($s3, &DWP(12, $key));
2172      &mov      (&DWP(0, $sacc), $s0); # save ivec
2173      &mov      (&DWP(4, $sacc), $s1);

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```

2174      &mov      (&DWP(8, $sacc), $s2);
2175      &mov      (&DWP(12, $sacc), $s3);

2177      &cmp      ($mark, 0); # was the key schedule copied?
2178      &mov      ("edi", $key);
2179      &jje      (&label("skip_ezero"));
2180      # zero copy of key schedule
2181      &mov      ("ecx", 240/4);
2182      &xor      ("eax", "eax");
2183      &align      (4);
2184      &data_word(0xABF3F689); # rep stosd
2185      &set_label("skip_ezero");
2186      &mov      ("esp", $esp);
2187      &popf      ();
2188      &set_label("drop_out");
2189      &function_end_A();
2190      &pushf      (); # kludge, never executed

2192 #----- DECRYPT -----#
2193 &set_label("fast_decrypt", 16);

2195      &cmp      ($sacc, $out);
2196      &jje      (&label("fast_dec_in_place")); # in-place processing...

2198      &mov      ($tmp, $key);

2200      &align      (4);
2201      &set_label("fast_dec_loop", 16);
2202      &mov      ($s0, &DWP(0, $sacc)); # read input
2203      &mov      ($s1, &DWP(4, $sacc));
2204      &mov      ($s2, &DWP(8, $sacc));
2205      &mov      ($s3, &DWP(12, $sacc));

2207      &mov      ($key, $key); # load key
2208      &call      ("_x86_AES_decrypt");

2210      &mov      ($key, $tmp); # load ivp
2211      &mov      ($sacc, $len); # load len
2212      &xor      ($s0, &DWP(0, $key)); # xor iv
2213      &xor      ($s1, &DWP(4, $key));
2214      &xor      ($s2, &DWP(8, $key));
2215      &xor      ($s3, &DWP(12, $key));

2217      &mov      ($key, $out); # load out
2218      &mov      ($sacc, $inp); # load inp

2220      &mov      (&DWP(0, $key), $s0); # write output
2221      &mov      (&DWP(4, $key), $s1);
2222      &mov      (&DWP(8, $key), $s2);
2223      &mov      (&DWP(12, $key), $s3);

2225      &mov      ($s2, $len); # load len
2226      &mov      ($tmp, $sacc); # save ivp
2227      &lea      ($sacc, &DWP(16, $sacc)); # advance inp
2228      &mov      ($inp, $sacc); # save inp
2229      &lea      ($key, &DWP(16, $key)); # advance out
2230      &mov      ($out, $key); # save out
2231      &sub      ($s2, 16); # decrease len
2232      &mov      ($len, $s2); # save len

2233      &jnz      (&label("fast_dec_loop"));
2234      &mov      ($key, $tmp); # load temp ivp
2235      &mov      ($sacc, $ivp); # load user ivp
2236      &mov      ($s0, &DWP(0, $key)); # load iv
2237      &mov      ($s1, &DWP(4, $key));
2238      &mov      ($s2, &DWP(8, $key));
2239      &mov      ($s3, &DWP(12, $key));

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```

2240      &mov      (&DWP(0,$acc),$s0);      # copy back to user
2241      &mov      (&DWP(4,$acc),$s1);
2242      &mov      (&DWP(8,$acc),$s2);
2243      &mov      (&DWP(12,$acc),$s3);
2244      &jmp      (&label("fast_dec_out"));

2246      &set_label("fast_dec_in_place",16);
2247      &set_label("fast_dec_in_place_loop");
2248      &mov      ($s0,&DWP(0,$acc));      # read input
2249      &mov      ($s1,&DWP(4,$acc));
2250      &mov      ($s2,&DWP(8,$acc));
2251      &mov      ($s3,&DWP(12,$acc));

2253      &lea      ($key,$ivec);
2254      &mov      (&DWP(0,$key),$s0);      # copy to temp
2255      &mov      (&DWP(4,$key),$s1);
2256      &mov      (&DWP(8,$key),$s2);
2257      &mov      (&DWP(12,$key),$s3);

2259      &mov      ($key,$_key);      # load key
2260      &call     ("_x86_AES_decrypt");

2262      &mov      ($key,$_ivp);      # load ivp
2263      &mov      ($acc,$_out);      # load out
2264      &xor      ($s0,&DWP(0,$key));      # xor iv
2265      &xor      ($s1,&DWP(4,$key));
2266      &xor      ($s2,&DWP(8,$key));
2267      &xor      ($s3,&DWP(12,$key));

2269      &mov      (&DWP(0,$acc),$s0);      # write output
2270      &mov      (&DWP(4,$acc),$s1);
2271      &mov      (&DWP(8,$acc),$s2);
2272      &mov      (&DWP(12,$acc),$s3);

2274      &lea      ($acc,&DWP(16,$acc));      # advance out
2275      &mov      ($_out,$acc);      # save out

2277      &lea      ($acc,$ivec);
2278      &mov      ($s0,&DWP(0,$acc));      # read temp
2279      &mov      ($s1,&DWP(4,$acc));
2280      &mov      ($s2,&DWP(8,$acc));
2281      &mov      ($s3,&DWP(12,$acc));

2283      &mov      (&DWP(0,$key),$s0);      # copy iv
2284      &mov      (&DWP(4,$key),$s1);
2285      &mov      (&DWP(8,$key),$s2);
2286      &mov      (&DWP(12,$key),$s3);

2288      &mov      ($acc,$_inp);      # load inp
2289      &mov      ($s2,$_len);      # load len
2290      &lea      ($acc,&DWP(16,$acc));      # advance inp
2291      &mov      ($_inp,$acc);      # save inp
2292      &sub      ($s2,16);      # decrease len
2293      &mov      ($_len,$s2);      # save len
2294      &jnz      (&label("fast_dec_in_place_loop"));

2296      &set_label("fast_dec_out",4);
2297      &cmp      ($mark,0);      # was the key schedule copied?
2298      &mov      ("edi,$_key);
2299      &je      (&label("skip_dzero"));
2300      # zero copy of key schedule
2301      &mov      ("ecx",240/4);
2302      &xor      ("eax","eax");
2303      &align    (4);
2304      &data_word(0xABF3F689); # rep stosd
2305      &set_label("skip_dzero")

```

```

2306      &mov      ("esp,$_esp);
2307      &popf      ();
2308      &function_end_A();
2309      &pushf      ();      # kludge, never executed

2311      #----- SLOW ROUTINE -----#
2312      &set_label("slow_way",16);

2314      &mov      ($s0,&DWP(0,$s0)) if (!$x86only); # load OPENSSL_ia32cap
2315      &mov      ($key,&wparam(3));      # load key

2317      # pre-allocate aligned stack frame...
2318      &lea      ($acc,&DWP(-80,"esp"));
2319      &and      ($acc,-64);

2321      # ... and make sure it doesn't alias with $key modulo 1024
2322      &lea      ($s1,&DWP(-80-63,$key));
2323      &sub      ($s1,$acc);
2324      &neg      ($s1);
2325      &and      ($s1,0x3C0);      # modulo 1024, but aligned to cache-line
2326      &sub      ($acc,$s1);

2328      # pick S-box copy which can't overlap with stack frame or $key
2329      &lea      ($s1,&DWP(768,$acc));
2330      &sub      ($s1,$tbl);
2331      &and      ($s1,0x300);
2332      &lea      ($tbl,&DWP(2048+128,$tbl,$s1));

2334      &lea      ($s3,&wparam(0));      # pointer to parameter block

2336      &exch      ("esp",$acc);
2337      &add      ("esp",4);      # reserve for return address!
2338      &mov      ($_tbl,$tbl);      # save %ebp
2339      &mov      ($_esp,$acc);      # save %esp
2340      &mov      ($_tmp,$s0);      # save OPENSSL_ia32cap

2342      &mov      ($s0,&DWP(0,$s3));      # load inp
2343      &mov      ($s1,&DWP(4,$s3));      # load out
2344      &mov      ($s2,&DWP(8,$s3));      # load len
2345      &mov      ($key,&DWP(12,$s3));      # load key
2346      &mov      ($acc,&DWP(16,$s3));      # load ivp
2347      &mov      ($s3,&DWP(20,$s3));      # load enc flag

2349      &mov      ($_inp,$s0);      # save copy of inp
2350      &mov      ($_out,$s1);      # save copy of out
2351      &mov      ($_len,$s2);      # save copy of len
2352      &mov      ($_key,$key);      # save copy of key
2353      &mov      ($_ivp,$acc);      # save copy of ivp

2355      &mov      ($key,$acc);
2356      &mov      ($acc,$s0);

2358      &cmp      ($s3,0);
2359      &je      (&label("slow_decrypt"));

2361      #----- SLOW ENCRYPT -----#
2362      &cmp      ($s2,16);
2363      &mov      ($s3,$s1);
2364      &jb      (&label("slow_enc_tail"));

2366      if (!$x86only) {
2367      &bt      ($_tmp,25);      # check for SSE bit
2368      &jnc      (&label("slow_enc_x86"));

2370      &movq      ("mm0",&QWP(0,$key));      # load iv
2371      &movq      ("mm4",&QWP(8,$key));

```

```

2373      &set_label("slow_enc_loop_sse",16);
2374      &pxor    ("mm0",&QWP(0,$acc)); # xor input data
2375      &pxor    ("mm4",&QWP(8,$acc));

2377      &mov     ($key,$_key);
2378      &call    ("_sse_AES_encrypt_compact");

2380      &mov     ($acc,$_inp); # load inp
2381      &mov     ($key,$_out); # load out
2382      &mov     ($s2,$_len); # load len

2384      &movq    (&QWP(0,$key),"mm0"); # save output data
2385      &movq    (&QWP(8,$key),"mm4");

2387      &lea     ($acc,&DWP(16,$acc)); # advance inp
2388      &mov     ($_inp,$acc); # save inp
2389      &lea     ($s3,&DWP(16,$key)); # advance out
2390      &mov     ($_out,$s3); # save out
2391      &sub     ($s2,16); # decrease len
2392      &cmp     ($s2,16);
2393      &mov     ($_len,$s2); # save len
2394      &jae     (&label("slow_enc_loop_sse"));
2395      &test    ($s2,15);
2396      &jnz     (&label("slow_enc_tail"));
2397      &mov     ($acc,$_ivp); # load ivp
2398      &movq    (&QWP(0,$acc),"mm0"); # save ivec
2399      &movq    (&QWP(8,$acc),"mm4");
2400      &emms   ();
2401      &mov     ("esp",$_esp);
2402      &popf   ();
2403      &function_end_A();
2404      &pushf  (); # kludge, never executed
2405      }
2406      &set_label("slow_enc_x86",16);
2407      &mov     ($s0,&DWP(0,$key)); # load iv
2408      &mov     ($s1,&DWP(4,$key));

2410      &set_label("slow_enc_loop_x86",4);
2411      &mov     ($s2,&DWP(8,$key));
2412      &mov     ($s3,&DWP(12,$key));

2414      &xor     ($s0,&DWP(0,$acc)); # xor input data
2415      &xor     ($s1,&DWP(4,$acc));
2416      &xor     ($s2,&DWP(8,$acc));
2417      &xor     ($s3,&DWP(12,$acc));

2419      &mov     ($key,$_key); # load key
2420      &call    ("_x86_AES_encrypt_compact");

2422      &mov     ($acc,$_inp); # load inp
2423      &mov     ($key,$_out); # load out

2425      &mov     (&DWP(0,$key),$s0); # save output data
2426      &mov     (&DWP(4,$key),$s1);
2427      &mov     (&DWP(8,$key),$s2);
2428      &mov     (&DWP(12,$key),$s3);

2430      &mov     ($s2,$_len); # load len
2431      &lea     ($acc,&DWP(16,$acc)); # advance inp
2432      &mov     ($_inp,$acc); # save inp
2433      &lea     ($s3,&DWP(16,$key)); # advance out
2434      &mov     ($_out,$s3); # save out
2435      &sub     ($s2,16); # decrease len
2436      &cmp     ($s2,16);
2437      &mov     ($_len,$s2); # save len

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2438      &jae     (&label("slow_enc_loop_x86"));
2439      &test    ($s2,15);
2440      &jnz     (&label("slow_enc_tail"));
2441      &mov     ($acc,$_ivp); # load ivp
2442      &mov     ($s2,&DWP(8,$key)); # restore last dwords
2443      &mov     ($s3,&DWP(12,$key));
2444      &mov     (&DWP(0,$acc),$s0); # save ivec
2445      &mov     (&DWP(4,$acc),$s1);
2446      &mov     (&DWP(8,$acc),$s2);
2447      &mov     (&DWP(12,$acc),$s3);

2449      &mov     ("esp",$_esp);
2450      &popf   ();
2451      &function_end_A();
2452      &pushf  (); # kludge, never executed

2454      &set_label("slow_enc_tail",16);
2455      &emms   (); # if (!SSE)
2456      &mov     ($key eq "edi"? $key:"",$s3); # load out to edi
2457      &mov     ($s1,16);
2458      &sub     ($s1,$s2);
2459      &cmp     ($key,$acc eq "esi"? $acc:""); # compare with inp
2460      &jbe     (&label("enc_in_place"));
2461      &align   (4);
2462      &data_word(0xA4F3F689); # rep movsb # copy input
2463      &jmp     (&label("enc_skip_in_place"));
2464      &set_label("enc_in_place");
2465      &lea     ($key,&DWP(0,$key,$s2));
2466      &set_label("enc_skip_in_place");
2467      &mov     ($s2,$s1);
2468      &xor     ($s0,$s0);
2469      &align   (4);
2470      &data_word(0xAAF3F689); # rep stosb # zero tail

2472      &mov     ($key,$_ivp); # restore ivp
2473      &mov     ($acc,$s3); # output as input
2474      &mov     ($s0,&DWP(0,$key));
2475      &mov     ($s1,&DWP(4,$key));
2476      &mov     ($_len,16); # len=16
2477      &jmp     (&label("slow_enc_loop_x86")); # one more spin...

2479      #----- SLOW DECRYPT -----#
2480      &set_label("slow_decrypt",16);
2481      if (!SSE) {
2482          &bt     ($_tmp,25); # check for SSE bit
2483          &jnc    (&label("slow_dec_loop_x86"));

2485      &set_label("slow_dec_loop_sse",4);
2486      &movq    ("mm0",&QWP(0,$acc)); # read input
2487      &movq    ("mm4",&QWP(8,$acc));

2489      &mov     ($key,$_key);
2490      &call    ("_sse_AES_decrypt_compact");

2492      &mov     ($acc,$_inp); # load inp
2493      &lea     ($s0,$_ivec);
2494      &mov     ($s1,$_out); # load out
2495      &mov     ($s2,$_len); # load len
2496      &mov     ($key,$_ivp); # load ivp

2498      &movq    ("mm1",&QWP(0,$acc)); # re-read input
2499      &movq    ("mm5",&QWP(8,$acc));

2501      &pxor    ("mm0",&QWP(0,$key)); # xor iv
2502      &pxor    ("mm4",&QWP(8,$key));

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2504      &movq    (&QWP(0,$key),"mm1");    # copy input to iv
2505      &movq    (&QWP(8,$key),"mm5");

2507      &sub     ($s2,16);                    # decrease len
2508      &jc      (&label("slow_dec_partial_sse"));

2510      &movq    (&QWP(0,$s1),"mm0");      # write output
2511      &movq    (&QWP(8,$s1),"mm4");

2513      &lea     ($s1,&DWP(16,$s1));         # advance out
2514      &mov     ($_out,$s1);                # save out
2515      &lea     ($sacc,&DWP(16,$sacc));      # advance inp
2516      &mov     ($_inp,$sacc);              # save inp
2517      &mov     ($_len,$s2);                # save len
2518      &jnz     (&label("slow_dec_loop_sse"));
2519      &emms   ();
2520      &mov     ("esp",$_esp);
2521      &popf    ();
2522      &function_end_A();
2523      &pushf   ();                        # kludge, never executed

2525      &set_label("slow_dec_partial_sse",16);
2526      &movq    (&QWP(0,$s0),"mm0");      # save output to temp
2527      &movq    (&QWP(8,$s0),"mm4");
2528      &emms    ();

2530      &add     ($s2,eq "ecx" ? "ecx":"",16);
2531      &mov     ("edi",$s1);                # out
2532      &mov     ("esi",$s0);                # temp
2533      &align   (4);
2534      &data_word(0xA4F3F689);             # rep movsb # copy partial output

2536      &mov     ("esp",$_esp);
2537      &popf    ();
2538      &function_end_A();
2539      &pushf   ();                        # kludge, never executed
2540      }
2541      &set_label("slow_dec_loop_x86",16);
2542      &mov     ($s0,&DWP(0,$sacc));        # read input
2543      &mov     ($s1,&DWP(4,$sacc));
2544      &mov     ($s2,&DWP(8,$sacc));
2545      &mov     ($s3,&DWP(12,$sacc));

2547      &lea     ($key,$ivec);
2548      &mov     (&DWP(0,$key),$s0);        # copy to temp
2549      &mov     (&DWP(4,$key),$s1);
2550      &mov     (&DWP(8,$key),$s2);
2551      &mov     (&DWP(12,$key),$s3);

2553      &mov     ($key,$_key);              # load key
2554      &call    ("_x86_AES_decrypt_compact");

2556      &mov     ($key,$_ivp);               # load ivp
2557      &mov     ($sacc,$_len);              # load len
2558      &xor     ($s0,&DWP(0,$key));          # xor iv
2559      &xor     ($s1,&DWP(4,$key));
2560      &xor     ($s2,&DWP(8,$key));
2561      &xor     ($s3,&DWP(12,$key));

2563      &sub     ($sacc,16);
2564      &jc      (&label("slow_dec_partial_x86"));

2566      &mov     ($_len,$sacc);              # save len
2567      &mov     ($sacc,$_out);              # load out

2569      &mov     (&DWP(0,$sacc),$s0);      # write output

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2570      &mov     (&DWP(4,$sacc),$s1);
2571      &mov     (&DWP(8,$sacc),$s2);
2572      &mov     (&DWP(12,$sacc),$s3);

2574      &lea     ($sacc,&DWP(16,$sacc));      # advance out
2575      &mov     ($_out,$sacc);              # save out

2577      &lea     ($sacc,$ivec);
2578      &mov     ($s0,&DWP(0,$sacc));        # read temp
2579      &mov     ($s1,&DWP(4,$sacc));
2580      &mov     ($s2,&DWP(8,$sacc));
2581      &mov     ($s3,&DWP(12,$sacc));

2583      &mov     (&DWP(0,$key),$s0);        # copy it to iv
2584      &mov     (&DWP(4,$key),$s1);
2585      &mov     (&DWP(8,$key),$s2);
2586      &mov     (&DWP(12,$key),$s3);

2588      &mov     ($sacc,$_inp);              # load inp
2589      &lea     ($sacc,&DWP(16,$sacc));      # advance inp
2590      &mov     ($_inp,$sacc);              # save inp
2591      &jnz     (&label("slow_dec_loop_x86"));
2592      &mov     ("esp",$_esp);
2593      &popf    ();
2594      &function_end_A();
2595      &pushf   ();                        # kludge, never executed

2597      &set_label("slow_dec_partial_x86",16);
2598      &lea     ($sacc,$ivec);
2599      &mov     (&DWP(0,$sacc),$s0);        # save output to temp
2600      &mov     (&DWP(4,$sacc),$s1);
2601      &mov     (&DWP(8,$sacc),$s2);
2602      &mov     (&DWP(12,$sacc),$s3);

2604      &mov     ($sacc,$_inp);
2605      &mov     ($s0,&DWP(0,$sacc));        # re-read input
2606      &mov     ($s1,&DWP(4,$sacc));
2607      &mov     ($s2,&DWP(8,$sacc));
2608      &mov     ($s3,&DWP(12,$sacc));

2610      &mov     (&DWP(0,$key),$s0);        # copy it to iv
2611      &mov     (&DWP(4,$key),$s1);
2612      &mov     (&DWP(8,$key),$s2);
2613      &mov     (&DWP(12,$key),$s3);

2615      &mov     ("ecx",$_len);
2616      &mov     ("edi",$_out);
2617      &lea     ("esi",$ivec);
2618      &align   (4);
2619      &data_word(0xA4F3F689);             # rep movsb # copy partial output

2621      &mov     ("esp",$_esp);
2622      &popf    ();
2623      &function_end("AES_cbc_encrypt");
2624  }

2626  #-----#

2628  sub enckey()
2629  {
2630      &movz     ("esi",&LB("edx"));
2631      &movz     ("ebx",&BP(-128,$tbl,"esi",1)); # rk[i]>>0
2632      &movz     ("esi",&HB("edx"));
2633      &shl      ("ebx",24);
2634      &xor      ("eax","ebx");

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2636      &movz    ("ebx",&BP(-128,$tbl,"esi",1));
2637      &shr     ("edx",16);
2638      &movz    ("esi",&LB("edx"));          # rk[i]>>16
2639      &xor     ("eax","ebx");

2641      &movz    ("ebx",&BP(-128,$tbl,"esi",1));
2642      &movz    ("esi",&HB("edx"));          # rk[i]>>24
2643      &shl     ("ebx",8);
2644      &xor     ("eax","ebx");

2646      &movz    ("ebx",&BP(-128,$tbl,"esi",1));
2647      &shl     ("ebx",16);
2648      &xor     ("eax","ebx");

2650      &xor     ("eax",&DWP(1024-128,$tbl,"ecx",4));  # rcon
2651 }

2653 &function_begin(" x86_AES_set_encrypt_key");
2654      &mov     ("esi",&wparam(1));          # user supplied key
2655      &mov     ("edi",&wparam(3));          # private key schedule

2657      &test    ("esi",-1);
2658      &jz      (&label("badpointer"));
2659      &test    ("edi",-1);
2660      &jz      (&label("badpointer"));

2662      &call    (&label("pic_point"));
2663      &set_label("pic_point");
2664      &bldpop($tbl);
2665      &lea     ($tbl,&DWP(&label("AES_Te")."-".&label("pic_point"),$tbl));
2666      &lea     ($tbl,&DWP(2048+128,$tbl));

2668      # prefetch Te4
2669      &mov     ("eax",&DWP(0-128,$tbl));
2670      &mov     ("ebx",&DWP(32-128,$tbl));
2671      &mov     ("ecx",&DWP(64-128,$tbl));
2672      &mov     ("edx",&DWP(96-128,$tbl));
2673      &mov     ("eax",&DWP(128-128,$tbl));
2674      &mov     ("ebx",&DWP(160-128,$tbl));
2675      &mov     ("ecx",&DWP(192-128,$tbl));
2676      &mov     ("edx",&DWP(224-128,$tbl));

2678      &mov     ("ecx",&wparam(2));          # number of bits in key
2679      &cmp     ("ecx",128);
2680      &jc      (&label("10rounds"));
2681      &cmp     ("ecx",192);
2682      &jc      (&label("12rounds"));
2683      &cmp     ("ecx",256);
2684      &jc      (&label("14rounds"));
2685      &mov     ("eax",-2);                  # invalid number of bits
2686      &jmp     (&label("exit"));

2688      &set_label("10rounds");
2689      &mov     ("eax",&DWP(0,"esi"));          # copy first 4 dwords
2690      &mov     ("ebx",&DWP(4,"esi"));
2691      &mov     ("ecx",&DWP(8,"esi"));
2692      &mov     ("edx",&DWP(12,"esi"));
2693      &mov     (&DWP(0,"edi"),"eax");
2694      &mov     (&DWP(4,"edi"),"ebx");
2695      &mov     (&DWP(8,"edi"),"ecx");
2696      &mov     (&DWP(12,"edi"),"edx");

2698      &xor     ("ecx","ecx");
2699      &jmp     (&label("10shortcut"));

2701      &align   (4);

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2702      &set_label("10loop");
2703      &mov     ("eax",&DWP(0,"edi"));          # rk[0]
2704      &mov     ("edx",&DWP(12,"edi"));          # rk[3]
2705      &set_label("10shortcut");
2706      &enckey ();

2708      &mov     (&DWP(16,"edi"),"eax");          # rk[4]
2709      &xor     ("eax",&DWP(4,"edi"));
2710      &mov     (&DWP(20,"edi"),"eax");          # rk[5]
2711      &xor     ("eax",&DWP(8,"edi"));
2712      &mov     (&DWP(24,"edi"),"eax");          # rk[6]
2713      &xor     ("eax",&DWP(12,"edi"));
2714      &mov     (&DWP(28,"edi"),"eax");          # rk[7]
2715      &inc     ("ecx");
2716      &add     ("edi",16);
2717      &cmp     ("ecx",10);
2718      &jl      (&label("10loop"));

2720      &mov     (&DWP(80,"edi"),10);          # setup number of rounds
2721      &xor     ("eax","eax");
2722      &jmp     (&label("exit"));

2723      &set_label("12rounds");
2724      &mov     ("eax",&DWP(0,"esi"));          # copy first 6 dwords
2725      &mov     ("ebx",&DWP(4,"esi"));
2726      &mov     ("ecx",&DWP(8,"esi"));
2727      &mov     ("edx",&DWP(12,"esi"));
2728      &mov     (&DWP(0,"edi"),"eax");
2729      &mov     (&DWP(4,"edi"),"ebx");
2730      &mov     (&DWP(8,"edi"),"ecx");
2731      &mov     (&DWP(12,"edi"),"edx");
2732      &mov     ("ecx",&DWP(16,"esi"));
2733      &mov     ("edx",&DWP(20,"esi"));
2734      &mov     (&DWP(16,"edi"),"ecx");
2735      &mov     (&DWP(20,"edi"),"edx");

2738      &xor     ("ecx","ecx");
2739      &jmp     (&label("12shortcut"));

2741      &align   (4);
2742      &set_label("12loop");
2743      &mov     ("eax",&DWP(0,"edi"));          # rk[0]
2744      &mov     ("edx",&DWP(20,"edi"));          # rk[5]
2745      &set_label("12shortcut");
2746      &enckey ();

2748      &mov     (&DWP(24,"edi"),"eax");          # rk[6]
2749      &xor     ("eax",&DWP(4,"edi"));
2750      &mov     (&DWP(28,"edi"),"eax");          # rk[7]
2751      &xor     ("eax",&DWP(8,"edi"));
2752      &mov     (&DWP(32,"edi"),"eax");          # rk[8]
2753      &xor     ("eax",&DWP(12,"edi"));
2754      &mov     (&DWP(36,"edi"),"eax");          # rk[9]

2756      &cmp     ("ecx",7);
2757      &jc      (&label("12break"));
2758      &inc     ("ecx");

2760      &xor     ("eax",&DWP(16,"edi"));
2761      &mov     (&DWP(40,"edi"),"eax");          # rk[10]
2762      &xor     ("eax",&DWP(20,"edi"));
2763      &mov     (&DWP(44,"edi"),"eax");          # rk[11]

2765      &add     ("edi",24);
2766      &jmp     (&label("12loop"));

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2768     &set_label("12break");
2769     &mov     (&DWP(72,"edi"),12);          # setup number of rounds
2770     &xor     ("eax","eax");
2771     &jmp     (&label("exit"));

2773     &set_label("14rounds");
2774     &mov     ("eax",&DWP(0,"esi"));          # copy first 8 dwords
2775     &mov     ("ebx",&DWP(4,"esi"));
2776     &mov     ("ecx",&DWP(8,"esi"));
2777     &mov     ("edx",&DWP(12,"esi"));
2778     &mov     (&DWP(0,"edi"),"eax");
2779     &mov     (&DWP(4,"edi"),"ebx");
2780     &mov     (&DWP(8,"edi"),"ecx");
2781     &mov     (&DWP(12,"edi"),"edx");
2782     &mov     ("eax",&DWP(16,"esi"));
2783     &mov     ("ebx",&DWP(20,"esi"));
2784     &mov     ("ecx",&DWP(24,"esi"));
2785     &mov     ("edx",&DWP(28,"esi"));
2786     &mov     (&DWP(16,"edi"),"eax");
2787     &mov     (&DWP(20,"edi"),"ebx");
2788     &mov     (&DWP(24,"edi"),"ecx");
2789     &mov     (&DWP(28,"edi"),"edx");

2791     &xor     ("ecx","ecx");
2792     &jmp     (&label("14shortcut"));

2794     &align  (4);
2795     &set_label("14loop");
2796     &mov     ("edx",&DWP(28,"edi"));        # rk[7]
2797     &set_label("14shortcut");
2798     &mov     ("eax",&DWP(0,"edi"));        # rk[0]

2800     &enckey ();

2802     &mov     (&DWP(32,"edi"),"eax");      # rk[8]
2803     &xor     ("eax",&DWP(4,"edi"));
2804     &mov     (&DWP(36,"edi"),"eax");      # rk[9]
2805     &xor     ("eax",&DWP(8,"edi"));
2806     &mov     (&DWP(40,"edi"),"eax");      # rk[10]
2807     &xor     ("eax",&DWP(12,"edi"));
2808     &mov     (&DWP(44,"edi"),"eax");      # rk[11]

2810     &cmp     ("ecx",6);
2811     &je      (&label("14break"));
2812     &inc     ("ecx");

2814     &mov     ("edx","eax");
2815     &mov     ("eax",&DWP(16,"edi"));        # rk[4]
2816     &movz    ("esi",&LB("edx"));           # rk[11]>>0
2817     &movz    ("ebx",&BP(-128,$tbl,"esi",1));
2818     &movz    ("esi",&HB("edx"));           # rk[11]>>8
2819     &xor     ("eax","ebx");

2821     &movz    ("ebx",&BP(-128,$tbl,"esi",1));
2822     &shr     ("edx",16);
2823     &shl     ("ebx",8);
2824     &movz    ("esi",&LB("edx"));           # rk[11]>>16
2825     &xor     ("eax","ebx");

2827     &movz    ("ebx",&BP(-128,$tbl,"esi",1));
2828     &movz    ("esi",&HB("edx"));           # rk[11]>>24
2829     &shl     ("ebx",16);
2830     &xor     ("eax","ebx");

2832     &movz    ("ebx",&BP(-128,$tbl,"esi",1));
2833     &shl     ("ebx",24);

```

```

2834     &xor     ("eax","ebx");

2836     &mov     (&DWP(48,"edi"),"eax");      # rk[12]
2837     &xor     ("eax",&DWP(20,"edi"));
2838     &mov     (&DWP(52,"edi"),"eax");      # rk[13]
2839     &xor     ("eax",&DWP(24,"edi"));
2840     &mov     (&DWP(56,"edi"),"eax");      # rk[14]
2841     &xor     ("eax",&DWP(28,"edi"));
2842     &mov     (&DWP(60,"edi"),"eax");      # rk[15]

2844     &add     ("edi",32);
2845     &jmp     (&label("14loop"));

2847     &set_label("14break");
2848     &mov     (&DWP(48,"edi"),14);        # setup number of rounds
2849     &xor     ("eax","eax");
2850     &jmp     (&label("exit"));

2852     &set_label("badpointer");
2853     &mov     ("eax",-1);
2854     &set_label("exit");
2855     &function_end("x86_AES_set_encrypt_key");

2857     # int private_AES_set_encrypt_key(const unsigned char *userKey, const int bits,
2858     #                                   AES_KEY *key)
2859     &function_begin_B("private_AES_set_encrypt_key");
2860     &call    ("x86_AES_set_encrypt_key");
2861     &ret     ();
2862     &function_end_B("private_AES_set_encrypt_key");

2864     sub deckey()
2865     { my ($i,$key,$tp1,$tp2,$tp4,$tp8) = @_ ;
2866       my $tmp = $tbl;

2868       &mov     ($sacc,$tp1);
2869       &and     ($sacc,0x80808080);
2870       &mov     ($tmp,$sacc);
2871       &shr     ($tmp,7);
2872       &lea     ($tp2,&DWP(0,$tp1,$tp1));
2873       &sub     ($sacc,$tmp);
2874       &and     ($tp2,0xfefefefe);
2875       &and     ($sacc,0x1b1b1b1b);
2876       &xor     ($sacc,$tp2);
2877       &mov     ($tp2,$sacc);

2879       &and     ($sacc,0x80808080);
2880       &mov     ($tmp,$sacc);
2881       &shr     ($tmp,7);
2882       &lea     ($tp4,&DWP(0,$tp2,$tp2));
2883       &sub     ($sacc,$tmp);
2884       &and     ($tp4,0xfefefefe);
2885       &and     ($sacc,0x1b1b1b1b);
2886       &xor     ($tp2,$tp1);          # tp2^tp1
2887       &xor     ($sacc,$tp4);
2888       &mov     ($tp4,$sacc);

2890       &and     ($sacc,0x80808080);
2891       &mov     ($tmp,$sacc);
2892       &shr     ($tmp,7);
2893       &lea     ($tp8,&DWP(0,$tp4,$tp4));
2894       &xor     ($tp4,$tp1);          # tp4^tp1
2895       &sub     ($sacc,$tmp);
2896       &and     ($tp8,0xfefefefe);
2897       &and     ($sacc,0x1b1b1b1b);
2898       &rotl    ($tp1,8);              # = ROTATE(tp1,8)
2899       &xor     ($tp8,$sacc);

```

```

2901      &mov      ($tmp,&DWP(4*(Si+1),$key));      # modulo-scheduled load
2903      &xor      ($stp1,$stp2);
2904      &xor      ($stp2,$stp8);
2905      &xor      ($stp1,$stp4);
2906      &rotr     ($stp2,24);
2907      &xor      ($stp4,$stp8);
2908      &xor      ($stp1,$stp8);      # ^= tp8^(tp4^tp1)^(tp2^tp1)
2909      &rotr     ($stp4,16);
2910      &xor      ($stp1,$stp2);      # ^= ROTATE(tp8^tp2^tp1,24)
2911      &rotr     ($stp8,8);
2912      &xor      ($stp1,$stp4);      # ^= ROTATE(tp8^tp4^tp1,16)
2913      &mov      ($stp2,$tmp);
2914      &xor      ($stp1,$stp8);      # ^= ROTATE(tp8,8)

2916      &mov      (&DWP(4*$i,$key),$stp1);
2917 }

2919 # int private_AES_set_decrypt_key(const unsigned char *userKey, const int bits,
2920 #                                AES_KEY *key)
2921 &function_begin_B("private_AES_set_decrypt_key");
2922 &call      ("_x86_AES_set_encrypt_key");
2923 &cmp      ("eax",0);
2924 &jne      (&label("proceed"));
2925 &ret      ();

2927 &set_label("proceed");
2928 &push     ("ebp");
2929 &push     ("ebx");
2930 &push     ("esi");
2931 &push     ("edi");

2933 &mov      ("esi",&wparam(2));
2934 &mov      ("ecx",&DWP(240,"esi"));      # pull number of rounds
2935 &lea      ("ecx",&DWP(0,"", "ecx",4));
2936 &lea      ("edi",&DWP(0,"esi", "ecx",4));      # pointer to last chunk

2938 &set_label("invert",4);      # invert order of chunks
2939 &mov      ("eax",&DWP(0,"esi"));
2940 &mov      ("ebx",&DWP(4,"esi"));
2941 &mov      ("ecx",&DWP(8,"edi"));
2942 &mov      ("edx",&DWP(4,"edi"));
2943 &mov      (&DWP(0,"edi"), "eax");
2944 &mov      (&DWP(4,"edi"), "ebx");
2945 &mov      (&DWP(0,"esi"), "ecx");
2946 &mov      (&DWP(4,"esi"), "edx");
2947 &mov      ("eax",&DWP(8,"esi"));
2948 &mov      ("ebx",&DWP(12,"esi"));
2949 &mov      ("ecx",&DWP(8,"edi"));
2950 &mov      ("edx",&DWP(12,"edi"));
2951 &mov      (&DWP(8,"edi"), "eax");
2952 &mov      (&DWP(12,"edi"), "ebx");
2953 &mov      (&DWP(8,"esi"), "ecx");
2954 &mov      (&DWP(12,"esi"), "edx");
2955 &add      ("esi",16);
2956 &sub      ("edi",16);
2957 &cmp      ("esi","edi");
2958 &jne      (&label("invert"));

2960 &mov      ($key,&wparam(2));
2961 &mov      ($acc,&DWP(240,$key));      # pull number of rounds
2962 &lea      ($acc,&DWP(-2,$acc,$acc));
2963 &lea      ($acc,&DWP(0,$key,$acc,8));
2964 &mov      (&wparam(2),$acc);

```

```

2966      &mov      ($s0,&DWP(16,$key));      # modulo-scheduled load
2967      &set_label("permute",4);      # permute the key schedule
2968      &add      ($key,16);
2969      &deckey   (0,$key,$s0,$s1,$s2,$s3);
2970      &deckey   (1,$key,$s1,$s2,$s3,$s0);
2971      &deckey   (2,$key,$s2,$s3,$s0,$s1);
2972      &deckey   (3,$key,$s3,$s0,$s1,$s2);
2973      &cmp      ($key,&wparam(2));
2974      &jb       (&label("permute"));

2976      &xor      ("eax","eax");      # return success
2977 &function_end("private_AES_set_decrypt_key");
2978 &asciz("AES for x86, CRYPTOGAMS by <appro@openssl.org>");

2980 &asm_finish();

```

```

*****
75022 Fri May 30 18:32:02 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/aes-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # Version 2.1.
11 #
12 # aes-*-cbc benchmarks are improved by >70% [compared to gcc 3.3.2 on
13 # Opteron 240 CPU] plus all the bells-n-whistles from 32-bit version
14 # [you'll notice a lot of resemblance], such as compressed S-boxes
15 # in little-endian byte order, prefetch of these tables in CBC mode,
16 # as well as avoiding L1 cache aliasing between stack frame and key
17 # schedule and already mentioned tables, compressed Td4...
18 #
19 # Performance in number of cycles per processed byte for 128-bit key:
20 #
21 #           ECB encrypt      ECB decrypt      CBC large chunk
22 # AMD64      33              41              13.0
23 # EM64T      38              59              18.6(*)
24 # Core 2     30              43              14.5(*)
25 #
26 # (*) with hyper-threading off

28 $flavour = shift;
29 $output = shift;
30 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

32 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

34 $0 =~ m/(.*[\\\/\[\]^\\\/\+$/; $dir=$1;
35 ( $xlate="$dir\x86_64-xlate.pl" and -f $xlate ) or
36 ( $xlate="$dir"../perlasm/x86_64-xlate.pl" and -f $xlate ) or
37 die "can't locate x86_64-xlate.pl";

39 open OUT,"| \"$^X\" $xlate $flavour $output";
40 *STDOUT=*OUT;

42 $verticalspin=1;      # unlike 32-bit version $verticalspin performs
43                       # ~15% better on both AMD and Intel cores
44 $speed_limit=512;     # see aes-586.pl for details

46 $code=".text\n";

48 $s0="%eax";
49 $s1="%ebx";
50 $s2="%ecx";
51 $s3="%edx";
52 $acc0="%esi"; $mask80="%rsi";
53 $acc1="%edi"; $maskfe="%rdi";
54 $acc2="%ebp"; $mask1b="%rbp";
55 $inp="%r8";
56 $out="%r9";
57 $t0="%r10d";
58 $t1="%r11d";
59 $t2="%r12d";
60 $rnds="%r13d";
61 $sbox="%r14";

```

```

62 $key="%r15";

64 sub hi() { my $r=shift; $r =~ s/%[er]([a-d])x/%\1h/;   $r; }
65 sub lo() { my $r=shift; $r =~ s/%[er]([a-d])x/%\1l/;   $r; }
66
67 $r =~ s/%[er]([sd])/%\1/;
68 sub LO() { my $r=shift; $r =~ s/%(r[0-9]+)[d]?/%\1b/;   $r; }
69 $r =~ s/%r([a-z]+)%/%e\1/;
70 $r =~ s/%r([0-9]+)%/%r\1d/;   $r; }

70 sub _data_word()
71 { my $i;
72   while(defined($i=shift)) { $code.=sprintf".long\t0x%08x,0x%08x\n",$i,$i; }
73 }
74 sub data_word()
75 { my $i;
76   my $last=pop(@_);
77   $code.=" .long\t";
78   while(defined($i=shift)) { $code.=sprintf"0x%08x,", $i; }
79   $code.=sprintf"0x%08x\n",$last;
80 }

82 sub data_byte()
83 { my $i;
84   my $last=pop(@_);
85   $code.=" .byte\t";
86   while(defined($i=shift)) { $code.=sprintf"0x%02x,", $i&0xff; }
87   $code.=sprintf"0x%02x\n",$last&0xff;
88 }

90 sub encvert()
91 { my $t3="%r8d";      # zaps $inp!

93 $code.=<<<__
94   # favor 3-way issue Opteron pipeline...
95   movzb  '%lo("$s0")', $acc0
96   movzb  '%lo("$s1")', $acc1
97   movzb  '%lo("$s2")', $acc2
98   mov     0($sbox, $acc0, 8), $t0
99   mov     0($sbox, $acc1, 8), $t1
100  mov     0($sbox, $acc2, 8), $t2

102  movzb  '%hi("$s1")', $acc0
103  movzb  '%hi("$s2")', $acc1
104  movzb  '%lo("$s3")', $acc2
105  xor     3($sbox, $acc0, 8), $t0
106  xor     3($sbox, $acc1, 8), $t1
107  mov     0($sbox, $acc2, 8), $t3

109  movzb  '%hi("$s3")', $acc0
110  shr     \16, $s2
111  movzb  '%hi("$s0")', $acc2
112  xor     3($sbox, $acc0, 8), $t2
113  shr     \16, $s3
114  xor     3($sbox, $acc2, 8), $t3

116  shr     \16, $s1
117  lea     16($key), $key
118  shr     \16, $s0

120  movzb  '%lo("$s2")', $acc0
121  movzb  '%lo("$s3")', $acc1
122  movzb  '%lo("$s0")', $acc2
123  xor     2($sbox, $acc0, 8), $t0
124  xor     2($sbox, $acc1, 8), $t1
125  xor     2($sbox, $acc2, 8), $t2

127  movzb  '%hi("$s3")', $acc0

```



```

128     movzb    ' &hi("$s0")', $acc1
129     movzb    ' &lo("$s1")', $acc2
130     xor      1($sbox, $acc0, 8), $t0
131     xor      1($sbox, $acc1, 8), $t1
132     xor      2($sbox, $acc2, 8), $t3

134     mov      12($key), $s3
135     movzb    ' &hi("$s1")', $acc1
136     movzb    ' &hi("$s2")', $acc2
137     mov      0($key), $s0
138     xor      1($sbox, $acc1, 8), $t2
139     xor      1($sbox, $acc2, 8), $t3

141     mov      4($key), $s1
142     mov      8($key), $s2
143     xor      $t0, $s0
144     xor      $t1, $s1
145     xor      $t2, $s2
146     xor      $t3, $s3
147     }
148 }

150 sub enclastvert()
151 { my $t3="%r8d";          # zaps $inp!

153 $code.=<<<;
154     movzb    ' &lo("$s0")', $acc0
155     movzb    ' &lo("$s1")', $acc1
156     movzb    ' &lo("$s2")', $acc2
157     movzb    2($sbox, $acc0, 8), $t0
158     movzb    2($sbox, $acc1, 8), $t1
159     movzb    2($sbox, $acc2, 8), $t2

161     movzb    ' &lo("$s3")', $acc0
162     movzb    ' &hi("$s1")', $acc1
163     movzb    ' &hi("$s2")', $acc2
164     movzb    2($sbox, $acc0, 8), $t3
165     mov      0($sbox, $acc1, 8), $acc1  # $t0
166     mov      0($sbox, $acc2, 8), $acc2  # $t1

168     and      \0x0000ff00, $acc1
169     and      \0x0000ff00, $acc2

171     xor      $acc1, $t0
172     xor      $acc2, $t1
173     shr      \16, $s2

175     movzb    ' &hi("$s3")', $acc0
176     movzb    ' &hi("$s0")', $acc1
177     shr      \16, $s3
178     mov      0($sbox, $acc0, 8), $acc0  # $t2
179     mov      0($sbox, $acc1, 8), $acc1  # $t3

181     and      \0x0000ff00, $acc0
182     and      \0x0000ff00, $acc1
183     shr      \16, $s1
184     xor      $acc0, $t2
185     xor      $acc1, $t3
186     shr      \16, $s0

188     movzb    ' &lo("$s2")', $acc0
189     movzb    ' &lo("$s3")', $acc1
190     movzb    ' &lo("$s0")', $acc2
191     mov      0($sbox, $acc0, 8), $acc0  # $t0
192     mov      0($sbox, $acc1, 8), $acc1  # $t1
193     mov      0($sbox, $acc2, 8), $acc2  # $t2

```

```

195     and      \0x00ff0000, $acc0
196     and      \0x00ff0000, $acc1
197     and      \0x00ff0000, $acc2

199     xor      $acc0, $t0
200     xor      $acc1, $t1
201     xor      $acc2, $t2

203     movzb    ' &lo("$s1")', $acc0
204     movzb    ' &hi("$s3")', $acc1
205     movzb    ' &hi("$s0")', $acc2
206     mov      0($sbox, $acc0, 8), $acc0  # $t3
207     mov      2($sbox, $acc1, 8), $acc1  # $t0
208     mov      2($sbox, $acc2, 8), $acc2  # $t1

210     and      \0x00ff0000, $acc0
211     and      \0x00ff0000, $acc1
212     and      \0x00ff0000, $acc2

214     xor      $acc0, $t3
215     xor      $acc1, $t0
216     xor      $acc2, $t1

218     movzb    ' &hi("$s1")', $acc0
219     movzb    ' &hi("$s2")', $acc1
220     mov      16+12($key), $s3
221     mov      2($sbox, $acc0, 8), $acc0  # $t2
222     mov      2($sbox, $acc1, 8), $acc1  # $t3
223     mov      16+0($key), $s0

225     and      \0xff000000, $acc0
226     and      \0xff000000, $acc1

228     xor      $acc0, $t2
229     xor      $acc1, $t3

231     mov      16+4($key), $s1
232     mov      16+8($key), $s2
233     xor      $t0, $s0
234     xor      $t1, $s1
235     xor      $t2, $s2
236     xor      $t3, $s3
237     }
238 }

240 sub encstep()
241 { my ($i, @s) = @_;
242   my $tmp0=$acc0;
243   my $tmp1=$acc1;
244   my $tmp2=$acc2;
245   my $out=($t0, $t1, $t2, $s[0])[$i];

247     if ($i==3) {
248         $tmp0=$s[1];
249         $tmp1=$s[2];
250         $tmp2=$s[3];
251     }
252     $code.="    movzb    ".&lo($s[0]).", $out\n";
253     $code.="    mov      $s[2], $tmp1\n"      if ($i!=3);
254     $code.="    lea      16($key), $key\n"    if ($i==0);

256     $code.="    movzb    ".&hi($s[1]).", $tmp0\n";
257     $code.="    mov      0($sbox, $out, 8), $out\n";

259     $code.="    shr      \16, $tmp1\n";

```

```

260 $code.="      mov    $s[3],$tmp2\n"      if ($i!=3);
261 $code.="      xor     3($sbox,$tmp0,8),$out\n";

263 $code.="      movzb   ".&lo($tmp1).",$tmp1\n";
264 $code.="      shr     \24,$tmp2\n";
265 $code.="      xor     4*$i($key),$out\n";

267 $code.="      xor     2($sbox,$tmp1,8),$out\n";
268 $code.="      xor     1($sbox,$tmp2,8),$out\n";

270 $code.="      mov     $t0,$s[1]\n"      if ($i==3);
271 $code.="      mov     $t1,$s[2]\n"      if ($i==3);
272 $code.="      mov     $t2,$s[3]\n"      if ($i==3);
273 $code.="      $code.="\\n";
274 }

276 sub enclast()
277 { my ($i,@s)=@_;
278   my $tmp0=$acc0;
279   my $tmp1=$acc1;
280   my $tmp2=$acc2;
281   my $out=($t0,$t1,$t2,$s[0])[$i];

283   if ($i==3) {
284     $tmp0=$s[1];
285     $tmp1=$s[2];
286     $tmp2=$s[3];
287   }
288   $code.="      movzb   ".&lo($s[0]).",$out\n";
289   $code.="      mov     $s[2],$tmp1\n"      if ($i!=3);

291   $code.="      mov     2($sbox,$out,8),$out\n";
292   $code.="      shr     \16,$tmp1\n";
293   $code.="      mov     $s[3],$tmp2\n"      if ($i!=3);

295   $code.="      and     \0x000000ff,$out\n";
296   $code.="      movzb   ".&hi($s[1]).",$tmp0\n";
297   $code.="      movzb   ".&lo($tmp1).",$tmp1\n";
298   $code.="      shr     \24,$tmp2\n";

300   $code.="      mov     0($sbox,$tmp0,8),$tmp0\n";
301   $code.="      mov     0($sbox,$tmp1,8),$tmp1\n";
302   $code.="      mov     2($sbox,$tmp2,8),$tmp2\n";

304   $code.="      and     \0x0000ff00,$tmp0\n";
305   $code.="      and     \0x00ff0000,$tmp1\n";
306   $code.="      and     \0xff000000,$tmp2\n";

308   $code.="      xor     $tmp0,$out\n";
309   $code.="      mov     $t0,$s[1]\n"      if ($i==3);
310   $code.="      xor     $tmp1,$out\n";
311   $code.="      mov     $t1,$s[2]\n"      if ($i==3);
312   $code.="      xor     $tmp2,$out\n";
313   $code.="      mov     $t2,$s[3]\n"      if ($i==3);
314   $code.="      $code.="\\n";
315 }

317 $code.=<<<";
318 .type    _x86_64_AES_encrypt,@abi-omnipotent
319 .align   16
320 _x86_64_AES_encrypt:
321     xor     0($key),$s0      # xor with key
322     xor     4($key),$s1
323     xor     8($key),$s2
324     xor     12($key),$s3

```

```

326     mov     240($key),$rnds      # load key->rounds
327     sub     \1,$rnds
328     jmp     .Lenc_loop
329 .align    16
330 .Lenc_loop:
331     ---
332     if ($verticalspin) { &encvert(); }
333     else { &encstep(0,$s0,$s1,$s2,$s3);
334           &encstep(1,$s1,$s2,$s3,$s0);
335           &encstep(2,$s2,$s3,$s0,$s1);
336           &encstep(3,$s3,$s0,$s1,$s2);
337     }
338     $code.=<<<";
339     sub     \1,$rnds
340     jnz     .Lenc_loop
341     ---
342     if ($verticalspin) { &enclastvert(); }
343     else { &enclast(0,$s0,$s1,$s2,$s3);
344           &enclast(1,$s1,$s2,$s3,$s0);
345           &enclast(2,$s2,$s3,$s0,$s1);
346           &enclast(3,$s3,$s0,$s1,$s2);
347     }
348     xor     16+0($key),$s0      # xor with key
349     xor     16+4($key),$s1
350     xor     16+8($key),$s2
351     xor     16+12($key),$s3
352     ---
353     }
354     $code.=<<<";
355     .byte   0xf3,0xc3      # rep ret
356     .size   _x86_64_AES_encrypt,.-_x86_64_AES_encrypt
357     ---

359 # it's possible to implement this by shifting tN by 8, filling least
360 # significant byte with byte load and finally bswap-ing at the end,
361 # but such partial register load kills Core 2...
362 sub enccompactvert()
363 { my ($t3,$t4,$t5)=("%r8d","%r9d","%r13d");

365     $code.=<<<";
366     movzb   '&lo("$s0")',$t0
367     movzb   '&lo("$s1")',$t1
368     movzb   '&lo("$s2")',$t2
369     movzb   ($sbox,$t0,1),$t0
370     movzb   ($sbox,$t1,1),$t1
371     movzb   ($sbox,$t2,1),$t2

373     movzb   '&lo("$s3")',$t3
374     movzb   '&hi("$s1")',$sacc0
375     movzb   '&hi("$s2")',$sacc1
376     movzb   ($sbox,$t3,1),$t3
377     movzb   ($sbox,$sacc0,1),$t4      #t0
378     movzb   ($sbox,$sacc1,1),$t5      #t1

380     movzb   '&hi("$s3")',$sacc2
381     movzb   '&hi("$s0")',$sacc0
382     shr     \16,$s2
383     movzb   ($sbox,$sacc2,1),$sacc2      #t2
384     movzb   ($sbox,$sacc0,1),$sacc0      #t3
385     shr     \16,$s3

387     movzb   '&lo("$s2")',$sacc1
388     shl     \8,$t4
389     shl     \8,$t5
390     movzb   ($sbox,$sacc1,1),$sacc1      #t0
391     xor     $t4,$t0

```

```

392     xor     $t5,$t1

394     movzb   '&lo("$s3")', $t4
395     shr     \$16,$s0
396     shr     \$16,$s1
397     movzb   '&lo("$s0")', $t5
398     shl     \$8,$acc2
399     shl     \$8,$acc0
400     movzb   ($sbox,$t4,1), $t4      #t1
401     movzb   ($sbox,$t5,1), $t5      #t2
402     xor     $acc2,$t2
403     xor     $acc0,$t3

405     movzb   '&lo("$s1")', $acc2
406     movzb   '&hi("$s3")', $acc0
407     shl     \$16,$acc1
408     movzb   ($sbox,$acc2,1), $acc2  #t3
409     movzb   ($sbox,$acc0,1), $acc0  #t0
410     xor     $acc1,$t0

412     movzb   '&hi("$s0")', $acc1
413     shr     \$8,$s2
414     shr     \$8,$s1
415     movzb   ($sbox,$acc1,1), $acc1  #t1
416     movzb   ($sbox,$s2,1), $s3      #t3
417     movzb   ($sbox,$s1,1), $s2      #t2
418     shl     \$16,$t4
419     shl     \$16,$t5
420     shl     \$16,$acc2
421     xor     $t4,$t1
422     xor     $t5,$t2
423     xor     $acc2,$t3

425     shl     \$24,$acc0
426     shl     \$24,$acc1
427     shl     \$24,$s3
428     xor     $acc0,$t0
429     shl     \$24,$s2
430     xor     $acc1,$t1
431     mov     $t0,$s0
432     mov     $t1,$s1
433     xor     $t2,$s2
434     xor     $t3,$s3
435     _____
436 }

438 sub enctransform_ref()
439 { my $sn = shift;
440   my ($acc,$r2,$tmp)=( "%r8d", "%r9d", "%r13d");

442   $code.=<<<____;
443       mov     $sn,$acc
444       and     \$0x80808080,$acc
445       mov     $acc,$tmp
446       shr     \$7,$tmp
447       lea     ($sn,$sn), $r2
448       sub     $tmp,$acc
449       and     \$0xfefefefe,$r2
450       and     \$0x1b1b1b1b,$acc
451       mov     $sn,$tmp
452       xor     $acc,$r2

454       xor     $r2,$sn
455       rol     \$24,$sn
456       xor     $r2,$sn
457       ror     \$16,$tmp

```

```

458     xor     $tmp,$sn
459     ror     \$8,$tmp
460     xor     $tmp,$sn
461     _____
462 }

464 # unlike decrypt case it does not pay off to parallelize enctransform
465 sub enctransform()
466 { my ($t3,$r20,$r21)=( $acc2, "%r8d", "%r9d");

468   $code.=<<<____;
469       mov     $s0,$acc0
470       mov     $s1,$acc1
471       and     \$0x80808080,$acc0
472       and     \$0x80808080,$acc1
473       mov     $acc0,$t0
474       mov     $acc1,$t1
475       shr     \$7,$t0
476       lea     ($s0,$s0), $r20
477       shr     \$7,$t1
478       lea     ($s1,$s1), $r21
479       sub     $t0,$acc0
480       sub     $t1,$acc1
481       and     \$0xfefefefe,$r20
482       and     \$0xfefefefe,$r21
483       and     \$0x1b1b1b1b,$acc0
484       and     \$0x1b1b1b1b,$acc1
485       mov     $s0,$t0
486       mov     $s1,$t1
487       xor     $acc0,$r20
488       xor     $acc1,$r21

490       xor     $r20,$s0
491       xor     $r21,$s1
492       mov     $s2,$acc0
493       mov     $s3,$acc1
494       rol     \$24,$s0
495       rol     \$24,$s1
496       and     \$0x80808080,$acc0
497       and     \$0x80808080,$acc1
498       xor     $r20,$s0
499       xor     $r21,$s1
500       mov     $acc0,$t2
501       mov     $acc1,$t3
502       ror     \$16,$t0
503       ror     \$16,$t1
504       shr     \$7,$t2
505       lea     ($s2,$s2), $r20
506       xor     $t0,$s0
507       xor     $t1,$s1
508       shr     \$7,$t3
509       lea     ($s3,$s3), $r21
510       ror     \$8,$t0
511       ror     \$8,$t1
512       sub     $t2,$acc0
513       sub     $t3,$acc1
514       xor     $t0,$s0
515       xor     $t1,$s1

517       and     \$0xfefefefe,$r20
518       and     \$0xfefefefe,$r21
519       and     \$0x1b1b1b1b,$acc0
520       and     \$0x1b1b1b1b,$acc1
521       mov     $s2,$t2
522       mov     $s3,$t3
523       xor     $acc0,$r20

```

```

524     xor     $acc1,$r21

526     xor     $r20,$s2
527     xor     $r21,$s3
528     rol     \24,$s2
529     rol     \24,$s3
530     xor     $r20,$s2
531     xor     $r21,$s3
532     mov     0($sbox), $acc0           # prefetch Te4
533     ror     \16,$t2
534     ror     \16,$t3
535     mov     64($sbox), $acc1
536     xor     $t2,$s2
537     xor     $t3,$s3
538     mov     128($sbox), $r20
539     ror     \8,$t2
540     ror     \8,$t3
541     mov     192($sbox), $r21
542     xor     $t2,$s2
543     xor     $t3,$s3
544
545 }

547 $code.=<<__ ;
548 .type _x86_64_AES_encrypt_compact, @abi-omnipotent
549 .align 16
550 _x86_64_AES_encrypt_compact:
551     lea     128($sbox), $inp           # size optimization
552     mov     0-128($inp), $acc1         # prefetch Te4
553     mov     32-128($inp), $acc2
554     mov     64-128($inp), $t0
555     mov     96-128($inp), $t1
556     mov     128-128($inp), $acc1
557     mov     160-128($inp), $acc2
558     mov     192-128($inp), $t0
559     mov     224-128($inp), $t1
560     jmp     .Lenc_loop_compact
561 .align 16
562 .Lenc_loop_compact:
563     xor     0($key), $s0               # xor with key
564     xor     4($key), $s1
565     xor     8($key), $s2
566     xor     12($key), $s3
567     lea     16($key), $key
568
569     &enccompactvert();
570 $code.=<<__ ;
571     cmp     16(%rsp), $key
572     je      .Lenc_compact_done
573
574     &enctransform();
575 $code.=<<__ ;
576     jmp     .Lenc_loop_compact
577 .align 16
578 .Lenc_compact_done:
579     xor     0($key), $s0
580     xor     4($key), $s1
581     xor     8($key), $s2
582     xor     12($key), $s3
583     .byte   0xf3, 0xc3                # rep ret
584 .size _x86_64_AES_encrypt_compact, .-_x86_64_AES_encrypt_compact
585
587 # void AES_encrypt (const void *inp, void *out, const AES_KEY *key);
588 $code.=<<__ ;
589 .globl AES_encrypt

```

```

590 .type AES_encrypt, @function, 3
591 .align 16
592 .globl asm_AES_encrypt
593 .hidden asm_AES_encrypt
594 asm_AES_encrypt:
595 AES_encrypt:
596     push    %rbx
597     push    %rbp
598     push    %r12
599     push    %r13
600     push    %r14
601     push    %r15

603     # allocate frame "above" key schedule
604     mov     %rsp, %r10
605     lea     -63(%rdx), %rcx           # %rdx is key argument
606     and     \5-64, %rsp
607     sub     %rsp, %rcx
608     neg     %rcx
609     and     \0x3c0, %rcx
610     sub     %rcx, %rsp
611     sub     \32, %rsp

613     mov     %rsi, 16(%rsp)           # save out
614     mov     %r10, 24(%rsp)          # save real stack pointer
615 .Lenc_prologue:

617     mov     %rdx, $key
618     mov     240($key), $rnds         # load rounds

620     mov     0(%rdi), $s0             # load input vector
621     mov     4(%rdi), $s1
622     mov     8(%rdi), $s2
623     mov     12(%rdi), $s3

625     shl     \4, $rnds
626     lea     ($key, $rnds), %rbp
627     mov     $key, (%rsp)             # key schedule
628     mov     %rbp, 8(%rsp)           # end of key schedule

630     # pick Te4 copy which can't "overlap" with stack frame or key schedule
631     lea     .LAES_Te+2048(%rip), $sbox
632     lea     768(%rsp), %rbp
633     sub     $sbox, %rbp
634     and     \0x300, %rbp
635     lea     ($sbox, %rbp), $sbox

637     call    _x86_64_AES_encrypt_compact

639     mov     16(%rsp), $out           # restore out
640     mov     24(%rsp), %rsi          # restore saved stack pointer
641     mov     $s0, 0($out)            # write output vector
642     mov     $s1, 4($out)
643     mov     $s2, 8($out)
644     mov     $s3, 12($out)

646     mov     (%rsi), %r15
647     mov     8(%rsi), %r14
648     mov     16(%rsi), %r13
649     mov     24(%rsi), %r12
650     mov     32(%rsi), %rbp
651     mov     40(%rsi), %rbx
652     lea     48(%rsi), %rsp

653 .Lenc_epilogue:
654     ret
655 .size AES_encrypt, .-AES_encrypt

```

```

656 ____
658 #-----#

660 sub decvert()
661 { my $t3="%r8d";      # zaps $inp!

663 $code.=<<<____;
664     # favor 3-way issue Opteron pipeline...
665     movzb  ' &lo("$s0")', $acc0
666     movzb  ' &lo("$s1")', $acc1
667     movzb  ' &lo("$s2")', $acc2
668     mov     0($sbox, $acc0, 8), $t0
669     mov     0($sbox, $acc1, 8), $t1
670     mov     0($sbox, $acc2, 8), $t2

672     movzb  ' &hi("$s3")', $acc0
673     movzb  ' &hi("$s0")', $acc1
674     movzb  ' &lo("$s3")', $acc2
675     xor     3($sbox, $acc0, 8), $t0
676     xor     3($sbox, $acc1, 8), $t1
677     mov     0($sbox, $acc2, 8), $t3

679     movzb  ' &hi("$s1")', $acc0
680     shr     \16, $s0
681     movzb  ' &hi("$s2")', $acc2
682     xor     3($sbox, $acc0, 8), $t2
683     shr     \16, $s3
684     xor     3($sbox, $acc2, 8), $t3

686     shr     \16, $s1
687     lea     16($key), $key
688     shr     \16, $s2

690     movzb  ' &lo("$s2")', $acc0
691     movzb  ' &lo("$s3")', $acc1
692     movzb  ' &lo("$s0")', $acc2
693     xor     2($sbox, $acc0, 8), $t0
694     xor     2($sbox, $acc1, 8), $t1
695     xor     2($sbox, $acc2, 8), $t2

697     movzb  ' &hi("$s1")', $acc0
698     movzb  ' &hi("$s2")', $acc1
699     movzb  ' &lo("$s1")', $acc2
700     xor     1($sbox, $acc0, 8), $t0
701     xor     1($sbox, $acc1, 8), $t1
702     xor     2($sbox, $acc2, 8), $t3

704     movzb  ' &hi("$s3")', $acc0
705     mov     12($key), $s3
706     movzb  ' &hi("$s0")', $acc2
707     xor     1($sbox, $acc0, 8), $t2
708     mov     0($key), $s0
709     xor     1($sbox, $acc2, 8), $t3

711     xor     $t0, $s0
712     mov     4($key), $s1
713     mov     8($key), $s2
714     xor     $t2, $s2
715     xor     $t1, $s1
716     xor     $t3, $s3
717 ____
718 }

720 sub declastvert()
721 { my $t3="%r8d";      # zaps $inp!

```

```

723 $code.=<<<____;
724     lea     2048($sbox), $sbox      # size optimization
725     movzb  ' &lo("$s0")', $acc0
726     movzb  ' &lo("$s1")', $acc1
727     movzb  ' &lo("$s2")', $acc2
728     movzb  ($sbox, $acc0, 1), $t0
729     movzb  ($sbox, $acc1, 1), $t1
730     movzb  ($sbox, $acc2, 1), $t2

732     movzb  ' &lo("$s3")', $acc0
733     movzb  ' &hi("$s3")', $acc1
734     movzb  ' &hi("$s0")', $acc2
735     movzb  ($sbox, $acc0, 1), $t3
736     movzb  ($sbox, $acc1, 1), $acc1  # $t0
737     movzb  ($sbox, $acc2, 1), $acc2  # $t1

739     shl     \8, $acc1
740     shl     \8, $acc2

742     xor     $acc1, $t0
743     xor     $acc2, $t1
744     shr     \16, $s3

746     movzb  ' &hi("$s1")', $acc0
747     movzb  ' &hi("$s2")', $acc1
748     shr     \16, $s0
749     movzb  ($sbox, $acc0, 1), $acc0  # $t2
750     movzb  ($sbox, $acc1, 1), $acc1  # $t3

752     shl     \8, $acc0
753     shl     \8, $acc1
754     shr     \16, $s1
755     xor     $acc0, $t2
756     xor     $acc1, $t3
757     shr     \16, $s2

759     movzb  ' &lo("$s2")', $acc0
760     movzb  ' &lo("$s3")', $acc1
761     movzb  ' &lo("$s0")', $acc2
762     movzb  ($sbox, $acc0, 1), $acc0  # $t0
763     movzb  ($sbox, $acc1, 1), $acc1  # $t1
764     movzb  ($sbox, $acc2, 1), $acc2  # $t2

766     shl     \16, $acc0
767     shl     \16, $acc1
768     shl     \16, $acc2

770     xor     $acc0, $t0
771     xor     $acc1, $t1
772     xor     $acc2, $t2

774     movzb  ' &lo("$s1")', $acc0
775     movzb  ' &hi("$s1")', $acc1
776     movzb  ' &hi("$s2")', $acc2
777     movzb  ($sbox, $acc0, 1), $acc0  # $t3
778     movzb  ($sbox, $acc1, 1), $acc1  # $t0
779     movzb  ($sbox, $acc2, 1), $acc2  # $t1

781     shl     \16, $acc0
782     shl     \24, $acc1
783     shl     \24, $acc2

785     xor     $acc0, $t3
786     xor     $acc1, $t0
787     xor     $acc2, $t1

```

```

789     movzb    '&hi("$s3")', $acc0
790     movzb    '&hi("$s0")', $acc1
791     mov      16+12($key), $s3
792     movzb    ($sbox, $acc0, 1), $acc0    # $t2
793     movzb    ($sbox, $acc1, 1), $acc1    # $t3
794     mov      16+0($key), $s0

796     shl      \ $24, $acc0
797     shl      \ $24, $acc1

799     xor      $acc0, $t2
800     xor      $acc1, $t3

802     mov      16+4($key), $s1
803     mov      16+8($key), $s2
804     lea      -2048($sbox), $sbox
805     xor      $t0, $s0
806     xor      $t1, $s1
807     xor      $t2, $s2
808     xor      $t3, $s3
809
810 }

812 sub decstep()
813 { my ($i, @s) = @_;
814   my $tmp0=$acc0;
815   my $tmp1=$acc1;
816   my $tmp2=$acc2;
817   my $out=($t0, $t1, $t2, $s[$i])[$i];

819     $code.="      mov      $s[0], $out\n"          if ($i!=3);
820     $code.="      $tmp1=$s[2]                    if ($i==3);
821     $code.="      mov      $s[2], $tmp1\n"        if ($i!=3);
822     $code.="      and      \ $0xFF, $out\n";

824     $code.="      mov      0($sbox, $out, 8), $out\n";
825     $code.="      shr      \ $16, $tmp1\n";
826     $tmp2=$s[3]                                if ($i==3);
827     $code.="      mov      $s[3], $tmp2\n"        if ($i!=3);

829     $tmp0=$s[1]                                if ($i==3);
830     $code.="      movzb    ".&hi($s[1]).", $tmp0\n";
831     $code.="      and      \ $0xFF, $tmp1\n";
832     $code.="      shr      \ $24, $tmp2\n";

834     $code.="      xor      3($sbox, $tmp0, 8), $out\n";
835     $code.="      xor      2($sbox, $tmp1, 8), $out\n";
836     $code.="      xor      1($sbox, $tmp2, 8), $out\n";

838     $code.="      mov      $t2, $s[1]\n"          if ($i==3);
839     $code.="      mov      $t1, $s[2]\n"          if ($i==3);
840     $code.="      mov      $t0, $s[3]\n"          if ($i==3);
841     $code.="      $code.="\\n";
842 }

844 sub declast()
845 { my ($i, @s)=@_;
846   my $tmp0=$acc0;
847   my $tmp1=$acc1;
848   my $tmp2=$acc2;
849   my $out=($t0, $t1, $t2, $s[$i])[$i];

851     $code.="      mov      $s[0], $out\n"          if ($i!=3);
852     $code.="      $tmp1=$s[2]                    if ($i==3);
853     $code.="      mov      $s[2], $tmp1\n"        if ($i!=3);

```

```

854     $code.="      and      \ $0xFF, $out\n";

856     $code.="      movzb    2048($sbox, $out, 1), $out\n";
857     $code.="      shr      \ $16, $tmp1\n";
858     $tmp2=$s[3]                                if ($i==3);
859     $code.="      mov      $s[3], $tmp2\n"        if ($i!=3);

861     $tmp0=$s[1]                                if ($i==3);
862     $code.="      movzb    ".&hi($s[1]).", $tmp0\n";
863     $code.="      and      \ $0xFF, $tmp1\n";
864     $code.="      shr      \ $24, $tmp2\n";

866     $code.="      movzb    2048($sbox, $tmp0, 1), $tmp0\n";
867     $code.="      movzb    2048($sbox, $tmp1, 1), $tmp1\n";
868     $code.="      movzb    2048($sbox, $tmp2, 1), $tmp2\n";

870     $code.="      shl      \ $8, $tmp0\n";
871     $code.="      shl      \ $16, $tmp1\n";
872     $code.="      shl      \ $24, $tmp2\n";

874     $code.="      xor      $tmp0, $out\n";
875     $code.="      mov      $t2, $s[1]\n"          if ($i==3);
876     $code.="      xor      $tmp1, $out\n";
877     $code.="      mov      $t1, $s[2]\n"          if ($i==3);
878     $code.="      xor      $tmp2, $out\n";
879     $code.="      mov      $t0, $s[3]\n"          if ($i==3);
880     $code.="      $code.="\\n";
881 }

883 $code.=<<";
884 .type      _x86_64_AES_decrypt, \@abi-omnipotent
885 .align     16
886 _x86_64_AES_decrypt:
887     xor      0($key), $s0                      # xor with key
888     xor      4($key), $s1
889     xor      8($key), $s2
890     xor      12($key), $s3

892     mov      240($key), $rnds                    # load key->rounds
893     sub      \ $1, $rnds
894     jmp      .Ldec_loop
895 .align     16
896 .Ldec_loop:
897
898     if ($verticalspin) { &decvert(); }
899     else { &decstep(0, $s0, $s3, $s2, $s1);
900           &decstep(1, $s1, $s0, $s3, $s2);
901           &decstep(2, $s2, $s1, $s0, $s3);
902           &decstep(3, $s3, $s2, $s1, $s0);
903           $code.=<<";
904           lea      16($key), $key
905           xor      0($key), $s0                      # xor with key
906           xor      4($key), $s1
907           xor      8($key), $s2
908           xor      12($key), $s3
909
910     }
911 $code.=<<";
912     sub      \ $1, $rnds
913     jnz      .Ldec_loop
914
915     if ($verticalspin) { &declastvert(); }
916     else { &declast(0, $s0, $s3, $s2, $s1);
917           &declast(1, $s1, $s0, $s3, $s2);
918           &declast(2, $s2, $s1, $s0, $s3);
919           &declast(3, $s3, $s2, $s1, $s0);

```

```

920     $code.=<<____;
921     xor     16+0($key), $s0          # xor with key
922     xor     16+4($key), $s1
923     xor     16+8($key), $s2
924     xor     16+12($key), $s3
925 ____
926     }
927     $code.=<<____;
928     .byte   0xf3, 0xc3              # rep ret
929     .size   _x86_64_AES_decrypt, .- _x86_64_AES_decrypt
930 ____
931
932 sub decompactvert()
933 { my ($t3,$t4,$t5)="%r8d", "%r9d", "%r13d");
934
935     $code.=<<____;
936     movzb   '$&lo("$s0")', $t0
937     movzb   '$&lo("$s1")', $t1
938     movzb   '$&lo("$s2")', $t2
939     movzb   ($sbox,$t0,1), $t0
940     movzb   ($sbox,$t1,1), $t1
941     movzb   ($sbox,$t2,1), $t2
942
943     movzb   '$&lo("$s3")', $t3
944     movzb   '$&hi("$s3")', $acc0
945     movzb   '$&hi("$s0")', $acc1
946     movzb   ($sbox,$t3,1), $t3
947     movzb   ($sbox,$acc0,1), $t4      #t0
948     movzb   ($sbox,$acc1,1), $t5      #t1
949
950     movzb   '$&hi("$s1")', $acc2
951     movzb   '$&hi("$s2")', $acc0
952     shr     \$16,$s2
953     movzb   ($sbox,$acc2,1), $acc2    #t2
954     movzb   ($sbox,$acc0,1), $acc0    #t3
955     shr     \$16,$s3
956
957     movzb   '$&lo("$s2")', $acc1
958     shl     \$8,$t4
959     shl     \$8,$t5
960     movzb   ($sbox,$acc1,1), $acc1    #t0
961     xor     $t4,$t0
962     xor     $t5,$t1
963
964     movzb   '$&lo("$s3")', $t4
965     shr     \$16,$s0
966     shr     \$16,$s1
967     movzb   '$&lo("$s0")', $t5
968     shl     \$8,$acc2
969     shl     \$8,$acc0
970     movzb   ($sbox,$t4,1), $t4      #t1
971     movzb   ($sbox,$t5,1), $t5      #t2
972     xor     $acc2,$t2
973     xor     $acc0,$t3
974
975     movzb   '$&lo("$s1")', $acc2
976     movzb   '$&hi("$s1")', $acc0
977     shl     \$16,$acc1
978     movzb   ($sbox,$acc2,1), $acc2    #t3
979     movzb   ($sbox,$acc0,1), $acc0    #t0
980     xor     $acc1,$t0
981
982     movzb   '$&hi("$s2")', $acc1
983     shl     \$16,$t4
984     shl     \$16,$t5
985     movzb   ($sbox,$acc1,1), $s1      #t1

```

```

986     xor     $t4,$t1
987     xor     $t5,$t2
988
989     movzb   '$&hi("$s3")', $acc1
990     shr     \$8,$s0
991     shl     \$16,$acc2
992     movzb   ($sbox,$acc1,1), $s2      #t2
993     movzb   ($sbox,$s0,1), $s3      #t3
994     xor     $acc2,$t3
995
996     shl     \$24,$acc0
997     shl     \$24,$s1
998     shl     \$24,$s2
999     xor     $acc0,$t0
1000    shl     \$24,$s3
1001    xor     $t1,$s1
1002    mov     $t0,$s0
1003    xor     $t2,$s2
1004    xor     $t3,$s3
1005 ____
1006 }
1007
1008 # parallelized version! input is pair of 64-bit values: %rax=s1.s0
1009 # and %rcx=s3.s2, output is four 32-bit values in %eax=s0, %ebx=s1,
1010 # %ecx=s2 and %edx=s3.
1011 sub dectransform()
1012 { my ($tp10,$tp20,$tp40,$tp80,$acc0)="%rax", "%r8", "%r9", "%r10", "%rbx");
1013   my ($tp18,$tp28,$tp48,$tp88,$acc8)="%rcx", "%r11", "%r12", "%r13", "%rdx");
1014   my $prefetch = shift;
1015
1016   $code.=<<____;
1017   mov     $tp10,$acc0
1018   mov     $tp18,$acc8
1019   and     $mask80,$acc0
1020   and     $mask80,$acc8
1021   mov     $acc0,$tp40
1022   mov     $acc8,$tp48
1023   shr     \$7,$tp40
1024   lea     ($tp10,$tp10), $tp20
1025   shr     \$7,$tp48
1026   lea     ($tp18,$tp18), $tp28
1027   sub     $tp40,$acc0
1028   sub     $tp48,$acc8
1029   and     $maskfe,$tp20
1030   and     $maskfe,$tp28
1031   and     $mask1b,$acc0
1032   and     $mask1b,$acc8
1033   xor     $tp20,$acc0
1034   xor     $tp28,$acc8
1035   mov     $acc0,$tp20
1036   mov     $acc8,$tp28
1037
1038   and     $mask80,$acc0
1039   and     $mask80,$acc8
1040   mov     $acc0,$tp80
1041   mov     $acc8,$tp88
1042   shr     \$7,$tp80
1043   lea     ($tp20,$tp20), $tp40
1044   shr     \$7,$tp88
1045   lea     ($tp28,$tp28), $tp48
1046   sub     $tp80,$acc0
1047   sub     $tp88,$acc8
1048   and     $maskfe,$tp40
1049   and     $maskfe,$tp48
1050   and     $mask1b,$acc0
1051   and     $mask1b,$acc8

```

```

1052     xor     $acc0, $stp40
1053     xor     $acc8, $stp48
1054     mov     $acc0, $stp40
1055     mov     $acc8, $stp48

1057     and     $mask80, $acc0
1058     and     $mask80, $acc8
1059     mov     $acc0, $stp80
1060     mov     $acc8, $stp88
1061     shr     $7, $stp80
1062     xor     $stp10, $stp20      # tp2^=tp1
1063     shr     $7, $stp88
1064     xor     $stp18, $stp28      # tp2^=tp1
1065     sub     $stp80, $acc0
1066     sub     $stp88, $acc8
1067     lea     ($stp40, $stp40), $stp80
1068     lea     ($stp48, $stp48), $stp88
1069     xor     $stp10, $stp40      # tp4^=tp1
1070     xor     $stp18, $stp48      # tp4^=tp1
1071     and     $maskfe, $stp80
1072     and     $maskfe, $stp88
1073     and     $mask1b, $acc0
1074     and     $mask1b, $acc8
1075     xor     $acc0, $stp80
1076     xor     $acc8, $stp88

1078     xor     $stp80, $stp10      # tp1^=tp8
1079     xor     $stp88, $stp18      # tp1^=tp8
1080     xor     $stp80, $stp20      # tp2^tp1^=tp8
1081     xor     $stp88, $stp28      # tp2^tp1^=tp8
1082     mov     $stp10, $acc0
1083     mov     $stp18, $acc8
1084     xor     $stp80, $stp40      # tp4^tp1^=tp8
1085     xor     $stp88, $stp48      # tp4^tp1^=tp8
1086     shr     $32, $acc0
1087     shr     $32, $acc8
1088     xor     $stp20, $stp80      # tp8^=tp8^tp2^tp1=tp2^tp1
1089     xor     $stp28, $stp88      # tp8^=tp8^tp2^tp1=tp2^tp1
1090     rol     $8, '&L0("$stp10")'  # ROTATE(tp1^tp8, 8)
1091     rol     $8, '&L0("$stp18")'  # ROTATE(tp1^tp8, 8)
1092     xor     $stp40, $stp80      # tp2^tp1^=tp8^tp4^tp1=tp8^tp4^tp2
1093     xor     $stp48, $stp88      # tp2^tp1^=tp8^tp4^tp1=tp8^tp4^tp2

1095     rol     $8, '&L0("$acc0")'    # ROTATE(tp1^tp8, 8)
1096     rol     $8, '&L0("$acc8")'    # ROTATE(tp1^tp8, 8)
1097     xor     '&L0("$stp80")', '&L0("$stp10")'
1098     xor     '&L0("$stp88")', '&L0("$stp18")'
1099     shr     $32, $stp80
1100     shr     $32, $stp88
1101     xor     '&L0("$stp80")', '&L0("$acc0")'
1102     xor     '&L0("$stp88")', '&L0("$acc8")'

1104     mov     $stp20, $stp80
1105     mov     $stp28, $stp88
1106     shr     $32, $stp80
1107     shr     $32, $stp88
1108     rol     $24, '&L0("$stp20")'  # ROTATE(tp2^tp1^tp8, 24)
1109     rol     $24, '&L0("$stp28")'  # ROTATE(tp2^tp1^tp8, 24)
1110     rol     $24, '&L0("$stp80")'  # ROTATE(tp2^tp1^tp8, 24)
1111     rol     $24, '&L0("$stp88")'  # ROTATE(tp2^tp1^tp8, 24)
1112     xor     '&L0("$stp20")', '&L0("$stp10")'
1113     xor     '&L0("$stp28")', '&L0("$stp18")'
1114     mov     $stp40, $stp20
1115     mov     $stp48, $stp28
1116     xor     '&L0("$stp80")', '&L0("$acc0")'
1117     xor     '&L0("$stp88")', '&L0("$acc8")'

```

```

1119     "mov     0($sbox), $mask80"    if ($sprefetch)'
1120     shr     $32, $stp20
1121     shr     $32, $stp28
1122     "mov     64($sbox), $maskfe"    if ($sprefetch)'
1123     rol     $16, '&L0("$stp40")'    # ROTATE(tp4^tp1^tp8, 16)
1124     rol     $16, '&L0("$stp48")'    # ROTATE(tp4^tp1^tp8, 16)
1125     "mov     128($sbox), $mask1b"   if ($sprefetch)'
1126     rol     $16, '&L0("$stp20")'    # ROTATE(tp4^tp1^tp8, 16)
1127     rol     $16, '&L0("$stp28")'    # ROTATE(tp4^tp1^tp8, 16)
1128     "mov     192($sbox), $stp80"    if ($sprefetch)'
1129     xor     '&L0("$stp40")', '&L0("$stp10")'
1130     xor     '&L0("$stp48")', '&L0("$stp18")'
1131     "mov     256($sbox), $stp88"    if ($sprefetch)'
1132     xor     '&L0("$stp20")', '&L0("$acc0")'
1133     xor     '&L0("$stp28")', '&L0("$acc8")'
1134 }
1135 }

1137 $code.=<<<__;;
1138 .type _x86_64_AES_decrypt_compact, \@abi-omnipotent
1139 .align 16
1140 _x86_64_AES_decrypt_compact:
1141     lea     128($sbox), $inp        # size optimization
1142     mov     0-128($inp), $acc1      # prefetch Td4
1143     mov     32-128($inp), $acc2
1144     mov     64-128($inp), $t0
1145     mov     96-128($inp), $t1
1146     mov     128-128($inp), $acc1
1147     mov     160-128($inp), $acc2
1148     mov     192-128($inp), $t0
1149     mov     224-128($inp), $t1
1150     jmp     .Ldec_loop_compact

1152 .align 16
1153 .Ldec_loop_compact:
1154     xor     0($key), $s0            # xor with key
1155     xor     4($key), $s1
1156     xor     8($key), $s2
1157     xor     12($key), $s3
1158     lea     16($key), $key
1159
1160     &decompactvert();
1161 $code.=<<<__;;
1162     cmp     16(%rsp), $key
1163     je      .Ldec_compact_done

1165     mov     256+0($sbox), $mask80
1166     shl     $32, %rbx
1167     shl     $32, %rdx
1168     mov     256+8($sbox), $maskfe
1169     or      %rbx, %rax
1170     or      %rdx, %rcx
1171     mov     256+16($sbox), $mask1b
1172
1173     &dctransform(1);
1174 $code.=<<<__;;
1175     jmp     .Ldec_loop_compact
1176 .align 16
1177 .Ldec_compact_done:
1178     xor     0($key), $s0
1179     xor     4($key), $s1
1180     xor     8($key), $s2
1181     xor     12($key), $s3
1182     .byte   0xf3, 0xc3              # rep ret
1183 .size      _x86_64_AES_decrypt_compact, .-_x86_64_AES_decrypt_compact

```



```

1184 ____
1186 # void AES_decrypt (const void *inp,void *out,const AES_KEY *key);
1187 $code.=<<____;
1188 .globl AES_decrypt
1189 .type AES_decrypt,\@function,3
1190 .align 16
1191 .globl asm_AES_decrypt
1192 .hidden asm_AES_decrypt
1193 asm_AES_decrypt:
1194 AES_decrypt:
1195     push    %rbx
1196     push    %rbp
1197     push    %r12
1198     push    %r13
1199     push    %r14
1200     push    %r15

1202     # allocate frame "above" key schedule
1203     mov     %rsp,%r10
1204     lea     -63(%rdx),%rcx # %rdx is key argument
1205     and     \%$-64,%rsp
1206     sub     %rsp,%rcx
1207     neg     %rcx
1208     and     \%0x3c0,%rcx
1209     sub     %rcx,%rsp
1210     sub     \%32,%rsp

1212     mov     %rsi,16(%rsp) # save out
1213     mov     %r10,24(%rsp) # save real stack pointer
1214 .Ldec_prologue:

1216     mov     %rdx,$key
1217     mov     240($key),$rnds # load rounds

1219     mov     0(%rdi),$s0 # load input vector
1220     mov     4(%rdi),$s1
1221     mov     8(%rdi),$s2
1222     mov     12(%rdi),$s3

1224     shl     \%4,$rnds
1225     lea     ($key,$rnds),%rbp
1226     mov     $key,(%rsp) # key schedule
1227     mov     %rbp,8(%rsp) # end of key schedule

1229     # pick Td4 copy which can't "overlap" with stack frame or key schedule
1230     lea     .LAES_Td+2048(%rip),$sbox
1231     lea     768(%rsp),%rbp
1232     sub     $sbox,%rbp
1233     and     \%0x300,%rbp
1234     lea     ($sbox,%rbp),$sbox
1235     shr     \%3,%rbp # recall "magic" constants!
1236     add     %rbp,$sbox

1238     call    _x86_64_AES_decrypt_compact

1240     mov     16(%rsp),$out # restore out
1241     mov     24(%rsp),%rsi # restore saved stack pointer
1242     mov     $s0,0($out) # write output vector
1243     mov     $s1,4($out)
1244     mov     $s2,8($out)
1245     mov     $s3,12($out)

1247     mov     (%rsi),%r15
1248     mov     8(%rsi),%r14
1249     mov     16(%rsi),%r13

```

```

1250     mov     24(%rsi),%r12
1251     mov     32(%rsi),%rbp
1252     mov     40(%rsi),%rbx
1253     lea     48(%rsi),%rsp
1254 .Ldec_epilogue:
1255     ret
1256 .size AES_decrypt,.-AES_decrypt
1257 ____
1258 #-----#

1260 sub enckey()
1261 {
1262 $code.=<<____;
1263     movz    %dl,%esi          # rk[i]>>0
1264     movzb   -128(%rbp,%rsi),%ebx
1265     movz    %dh,%esi          # rk[i]>>8
1266     shl     \%24,%ebx
1267     xor     %ebx,%eax

1269     movzb   -128(%rbp,%rsi),%ebx
1270     shr     \%16,%edx
1271     movz    %dl,%esi          # rk[i]>>16
1272     xor     %ebx,%eax

1274     movzb   -128(%rbp,%rsi),%ebx
1275     movz    %dh,%esi          # rk[i]>>24
1276     shl     \%8,%ebx
1277     xor     %ebx,%eax

1279     movzb   -128(%rbp,%rsi),%ebx
1280     shl     \%16,%ebx
1281     xor     %ebx,%eax

1283     xor     1024-128(%rbp,%rcx,4),%eax # rcon
1284 ____
1285 }

1287 # int private_AES_set_encrypt_key(const unsigned char *userKey, const int bits,
1288 #                                   AES_KEY *key)
1289 $code.=<<____;
1290 .globl private_AES_set_encrypt_key
1291 .type private_AES_set_encrypt_key,\@function,3
1292 .align 16
1293 private_AES_set_encrypt_key:
1294     push    %rbx
1295     push    %rbp
1296     push    %r12
1297     push    %r13
1298     push    %r14
1299     push    %r15
1300     sub     \%8,%rsp
1301 .Lenc_key_prologue:

1303     call    _x86_64_AES_set_encrypt_key

1305     mov     8(%rsp),%r15
1306     mov     16(%rsp),%r14
1307     mov     24(%rsp),%r13
1308     mov     32(%rsp),%r12
1309     mov     40(%rsp),%rbp
1310     mov     48(%rsp),%rbx
1311     add     \%56,%rsp
1312 .Lenc_key_epilogue:
1313     ret
1314 .size private_AES_set_encrypt_key,.-private_AES_set_encrypt_key

```

```

1316 .type      _x86_64_AES_set_encrypt_key, \@abi-omnipotent
1317 .align     16
1318 _x86_64_AES_set_encrypt_key:
1319     mov     %esi,%ecx          # %ecx=bits
1320     mov     %rdi,%rsi         # %rsi=userKey
1321     mov     %rdx,%rdi         # %rdi=key

1323     test    \$_1,%rsi
1324     jz      .Lbadpointer
1325     test    \$_1,%rdi
1326     jz      .Lbadpointer

1328     lea     .LAES_Te(%rip),%rbp
1329     lea     2048+128(%rbp),%rbp

1331     # prefetch Te4
1332     mov     0-128(%rbp),%eax
1333     mov     32-128(%rbp),%ebx
1334     mov     64-128(%rbp),%r8d
1335     mov     96-128(%rbp),%edx
1336     mov     128-128(%rbp),%eax
1337     mov     160-128(%rbp),%ebx
1338     mov     192-128(%rbp),%r8d
1339     mov     224-128(%rbp),%edx

1341     cmp     \$_128,%ecx
1342     je      .L10rounds
1343     cmp     \$_192,%ecx
1344     je      .L12rounds
1345     cmp     \$_256,%ecx
1346     je      .L14rounds
1347     mov     \$_2,%rax          # invalid number of bits
1348     jmp     .Lexit

1350 .L10rounds:
1351     mov     0(%rsi),%rax        # copy first 4 dwords
1352     mov     8(%rsi),%rdx
1353     mov     %rax,0(%rdi)
1354     mov     %rdx,8(%rdi)

1356     shr     \$_32,%rdx
1357     xor     %ecx,%ecx
1358     jmp     .L10shortcut

1359 .align     4
1360 .L10loop:
1361     mov     0(%rdi),%eax        # rk[0]
1362     mov     12(%rdi),%edx       # rk[3]

1363 .L10shortcut:
1364     ---
1365     &enckey ();
1366 $code.=<<____;
1367     mov     %eax,16(%rdi)       # rk[4]
1368     xor     4(%rdi),%eax
1369     mov     %eax,20(%rdi)       # rk[5]
1370     xor     8(%rdi),%eax
1371     mov     %eax,24(%rdi)       # rk[6]
1372     xor     12(%rdi),%eax
1373     mov     %eax,28(%rdi)       # rk[7]
1374     add     \$_1,%ecx
1375     lea     16(%rdi),%rdi
1376     cmp     \$_10,%ecx
1377     jl      .L10loop

1379     movl    \$_10,80(%rdi)      # setup number of rounds
1380     xor     %rax,%rax
1381     jmp     .Lexit

```

```

1383 .L12rounds:
1384     mov     0(%rsi),%rax        # copy first 6 dwords
1385     mov     8(%rsi),%rbx
1386     mov     16(%rsi),%rdx
1387     mov     %rax,0(%rdi)
1388     mov     %rbx,8(%rdi)
1389     mov     %rdx,16(%rdi)

1391     shr     \$_32,%rdx
1392     xor     %ecx,%ecx
1393     jmp     .L12shortcut

1394 .align     4
1395 .L12loop:
1396     mov     0(%rdi),%eax        # rk[0]
1397     mov     20(%rdi),%edx       # rk[5]

1398 .L12shortcut:
1399     ---
1400     &enckey ();
1401 $code.=<<____;
1402     mov     %eax,24(%rdi)       # rk[6]
1403     xor     4(%rdi),%eax
1404     mov     %eax,28(%rdi)       # rk[7]
1405     xor     8(%rdi),%eax
1406     mov     %eax,32(%rdi)       # rk[8]
1407     xor     12(%rdi),%eax
1408     mov     %eax,36(%rdi)       # rk[9]

1410     cmp     \$_7,%ecx
1411     je      .L12break
1412     add     \$_1,%ecx

1414     xor     16(%rdi),%eax
1415     mov     %eax,40(%rdi)       # rk[10]
1416     xor     20(%rdi),%eax
1417     mov     %eax,44(%rdi)       # rk[11]

1419     lea     24(%rdi),%rdi
1420     jmp     .L12loop

1421 .L12break:
1422     movl    \$_12,72(%rdi)      # setup number of rounds
1423     xor     %rax,%rax
1424     jmp     .Lexit

1426 .L14rounds:
1427     mov     0(%rsi),%rax        # copy first 8 dwords
1428     mov     8(%rsi),%rbx
1429     mov     16(%rsi),%rcx
1430     mov     24(%rsi),%rdx
1431     mov     %rax,0(%rdi)
1432     mov     %rbx,8(%rdi)
1433     mov     %rcx,16(%rdi)
1434     mov     %rdx,24(%rdi)

1436     shr     \$_32,%rdx
1437     xor     %ecx,%ecx
1438     jmp     .L14shortcut

1439 .align     4
1440 .L14loop:
1441     mov     0(%rdi),%eax        # rk[0]
1442     mov     28(%rdi),%edx       # rk[4]

1443 .L14shortcut:
1444     ---
1445     &enckey ();
1446 $code.=<<____;
1447     mov     %eax,32(%rdi)       # rk[8]

```

```

1448     xor     4(%rdi),%eax
1449     mov     %eax,36(%rdi)           # rk[9]
1450     xor     8(%rdi),%eax
1451     mov     %eax,40(%rdi)         # rk[10]
1452     xor     12(%rdi),%eax
1453     mov     %eax,44(%rdi)         # rk[11]

1455     cmp     \ $6,%ecx
1456     je      .L14break
1457     add     \ $1,%ecx

1459     mov     %eax,%edx
1460     mov     16(%rdi),%eax         # rk[4]
1461     movz    %dl,%esi              # rk[11]>>0
1462     movzb   -128(%rbp,%rsi),%ebx
1463     movz    %dh,%esi              # rk[11]>>8
1464     xor     %ebx,%eax

1466     movzb   -128(%rbp,%rsi),%ebx
1467     shr     \ $16,%edx
1468     shl     \ $8,%ebx
1469     movz    %dl,%esi              # rk[11]>>16
1470     xor     %ebx,%eax

1472     movzb   -128(%rbp,%rsi),%ebx
1473     movz    %dh,%esi              # rk[11]>>24
1474     shl     \ $16,%ebx
1475     xor     %ebx,%eax

1477     movzb   -128(%rbp,%rsi),%ebx
1478     shl     \ $24,%ebx
1479     xor     %ebx,%eax

1481     mov     %eax,48(%rdi)         # rk[12]
1482     xor     20(%rdi),%eax
1483     mov     %eax,52(%rdi)         # rk[13]
1484     xor     24(%rdi),%eax
1485     mov     %eax,56(%rdi)         # rk[14]
1486     xor     28(%rdi),%eax
1487     mov     %eax,60(%rdi)         # rk[15]

1489     lea     32(%rdi),%rdi
1490     jmp     .L14loop
1491 .L14break:
1492     movl    \ $14,48(%rdi)         # setup number of rounds
1493     xor     %rax,%rax
1494     jmp     .Lexit

1496 .Lbadpointer:
1497     mov     \ $-1,%rax
1498 .Lexit:
1499     .byte   0xf3,0xc3              # rep ret
1500 .size      _x86_64_AES_set_encrypt_key,.-_x86_64_AES_set_encrypt_key
1501 ____

1503 sub dekey_ref()
1504 { my ($i,$ptr,$te,$td) = @_;
1505   my ($stp1,$stp2,$stp4,$stp8,$sacc)=("%eax", "%ebx", "%edi", "%edx", "%r8d");
1506   $code.=<<____;
1507     mov     $i($ptr), $stp1
1508     mov     $stp1, $sacc
1509     and     \ $0x80808080, $sacc
1510     mov     $sacc, $stp4
1511     shr     \ $7, $stp4
1512     lea     0($stp1, $stp1), $stp2
1513     sub     $stp4, $sacc

```

```

1514     and     \ $0xfefefefe, $stp2
1515     and     \ $0x1b1b1b1b, $sacc
1516     xor     $stp2, $sacc
1517     mov     $sacc, $stp2

1519     and     \ $0x80808080, $sacc
1520     mov     $sacc, $stp8
1521     shr     \ $7, $stp8
1522     lea     0($stp2, $stp2), $stp4
1523     sub     $stp8, $sacc
1524     and     \ $0xfefefefe, $stp4
1525     and     \ $0x1b1b1b1b, $sacc
1526     xor     $stp1, $stp2         # tp2^tp1
1527     xor     $stp4, $sacc
1528     mov     $sacc, $stp4

1530     and     \ $0x80808080, $sacc
1531     mov     $sacc, $stp8
1532     shr     \ $7, $stp8
1533     sub     $stp8, $sacc
1534     lea     0($stp4, $stp4), $stp8
1535     xor     $stp1, $stp4         # tp4^tp1
1536     and     \ $0xfefefefe, $stp8
1537     and     \ $0x1b1b1b1b, $sacc
1538     xor     $sacc, $stp8

1540     xor     $stp8, $stp1         # tp1^tp8
1541     rol     \ $8, $stp1         # ROTATE(tp1^tp8, 8)
1542     xor     $stp8, $stp2         # tp2^tp1^tp8
1543     xor     $stp8, $stp4         # tp4^tp1^tp8
1544     xor     $stp2, $stp8
1545     xor     $stp4, $stp8         # tp8^(tp8^tp4^tp1)^(tp8^tp2^tp1)=tp8^tp

1547     xor     $stp8, $stp1
1548     rol     \ $24, $stp2         # ROTATE(tp2^tp1^tp8, 24)
1549     xor     $stp2, $stp1
1550     rol     \ $16, $stp4         # ROTATE(tp4^tp1^tp8, 16)
1551     xor     $stp4, $stp1

1553     mov     $stp1, $i($ptr)
1554 ____
1555 }

1557 # int private_AES_set_decrypt_key(const unsigned char *userKey, const int bits,
1558 #                                  AES_KEY *key)
1559 $code.=<<____;
1560 .globl private_AES_set_decrypt_key
1561 .type private_AES_set_decrypt_key, @function, 3
1562 .align 16
1563 private_AES_set_decrypt_key:
1564     push    %rbx
1565     push    %rbp
1566     push    %r12
1567     push    %r13
1568     push    %r14
1569     push    %r15
1570     push    %rdx                 # save key schedule
1571 .Ldec_key_prologue:

1573     call    _x86_64_AES_set_encrypt_key
1574     mov     (%rsp), %r8         # restore key schedule
1575     cmp     \ $0, %eax
1576     jne     .Labort

1578     mov     240(%r8), %r14d     # pull number of rounds
1579     xor     %rdi, %rdi

```

```

1580     lea     (%rdi,%r14d,4),%rcx
1581     mov     %r8,%rsi
1582     lea     (%r8,%rcx,4),%rdi      # pointer to last chunk
1583 .align    4
1584 .Linvert:
1585         mov     0(%rsi),%rax
1586         mov     8(%rsi),%rbx
1587         mov     0(%rdi),%rcx
1588         mov     8(%rdi),%rdx
1589         mov     %rax,0(%rdi)
1590         mov     %rbx,8(%rdi)
1591         mov     %rcx,0(%rsi)
1592         mov     %rdx,8(%rsi)
1593         lea     16(%rsi),%rsi
1594         lea     -16(%rdi),%rdi
1595         cmp     %rsi,%rdi
1596     jne     .Linvert

1598     lea     .LAES_Te+2048+1024(%rip),%rax  # rcon

1600     mov     40(%rax),%mask80
1601     mov     48(%rax),%maskfe
1602     mov     56(%rax),%mask1b

1604     mov     %r8,$key
1605     sub     $1,%r14d
1606 .align    4
1607 .Lpermute:
1608         lea     16($key),%key
1609         mov     0($key),%rax
1610         mov     8($key),%rcx
1611     ____
1612         &dectransform ();
1613 $code.<<<____;
1614         mov     %eax,0($key)
1615         mov     %ebx,4($key)
1616         mov     %ecx,8($key)
1617         mov     %edx,12($key)
1618         sub     $1,%r14d
1619     jnz     .Lpermute

1621     xor     %rax,%rax
1622 .Labort:
1623     mov     8(%rsp),%r15
1624     mov     16(%rsp),%r14
1625     mov     24(%rsp),%r13
1626     mov     32(%rsp),%r12
1627     mov     40(%rsp),%rbp
1628     mov     48(%rsp),%rbx
1629     add     $56,%rsp
1630 .Ldec_key_epilogue:
1631     ret
1632 .size     private_AES_set_decrypt_key,.-private_AES_set_decrypt_key
1633 ____

1635 # void AES_cbc_encrypt (const void char *inp, unsigned char *out,
1636 #                        size_t length, const AES_KEY *key,
1637 #                        unsigned char *ivp,const int enc);
1638 {
1639 # stack frame layout
1640 # -8(%rsp)      return address
1641 my $keyp="0(%rsp)";      # one to pass as $key
1642 my $keyend="8(%rsp)";    # &(keyp->rd_key[4*keyp->rounds])
1643 my $rsp="16(%rsp)";      # saved %rsp
1644 my $inp="24(%rsp)";      # copy of 1st parameter, inp
1645 my $out="32(%rsp)";      # copy of 2nd parameter, out

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```

1646 my $_len="40(%rsp)";      # copy of 3rd parameter, length
1647 my $_key="48(%rsp)";      # copy of 4th parameter, key
1648 my $_ivp="56(%rsp)";      # copy of 5th parameter, ivp
1649 my $ivec="64(%rsp)";      # ivec[16]
1650 my $aes_key="80(%rsp)";    # copy of aes_key
1651 my $mark="80+240(%rsp)";    # copy of aes_key->rounds

1653 $code.<<<____;
1654 .globl    AES_cbc_encrypt
1655 .type     AES_cbc_encrypt,@function,6
1656 .align    16
1657 .extern    OPENSSL_ia32cap_P
1658 .globl    asm_AES_cbc_encrypt
1659 .hidden    asm_AES_cbc_encrypt
1660 asm_AES_cbc_encrypt:
1661 AES_cbc_encrypt:
1662     cmp     $0,%rdx      # check length
1663     je      .Lcbc_epilogue
1664     pushfq
1665     push    %rbx
1666     push    %rbp
1667     push    %r12
1668     push    %r13
1669     push    %r14
1670     push    %r15
1671 .Lcbc_prologue:

1673     cld
1674     mov     %r9d,%r9d    # clear upper half of enc

1676     lea     .LAES_Te(%rip),%sbox
1677     cmp     $0,%r9
1678     jne     .Lcbc_picked_te
1679     lea     .LAES_Td(%rip),%sbox
1680 .Lcbc_picked_te:

1682     mov     OPENSSL_ia32cap_P(%rip),%r10d
1683     cmp     $$speed_limit,%rdx
1684     jb      .Lcbc_slow_prologue
1685     test    $15,%rdx
1686     jnz     .Lcbc_slow_prologue
1687     bt      $28,%r10d
1688     jc      .Lcbc_slow_prologue

1690 # allocate aligned stack frame...
1691     lea     -88-248(%rsp),%key
1692     and     $-64,%key

1694 # ... and make sure it doesn't alias with AES_T[ed] modulo 4096
1695     mov     $sbox,%r10
1696     lea     2304($sbox),%r11
1697     mov     $key,%r12
1698     and     $0xFFF,%r10    # s = $sbox&0xfff
1699     and     $0xFFF,%r11    # e = ($sbox+2048)&0xfff
1700     and     $0xFFF,%r12    # p = %rsp&0xfff

1702     cmp     %r11,%r12      # if (p>=e) %rsp -= (p-e);
1703     jb      .Lcbc_te_break_out
1704     sub     %r11,%r12
1705     sub     %r12,$key
1706     jmp     .Lcbc_te_ok
1707 .Lcbc_te_break_out:      # else %rsp -= (p-s)&0xfff + framesz
1708     sub     %r10,%r12
1709     and     $0xFFF,%r12
1710     add     $320,%r12
1711     sub     %r12,$key

```

```

1712 .align 4
1713 .Lcbc_te_ok:

1715     xchg    %rsp,$key
1716     #add    \$_,$rsp      # reserve for return address!
1717     mov     $key,$_rsp    # save %rsp
1718 .Lcbc_fast_body:
1719     mov     %rdi,$inp     # save copy of inp
1720     mov     %rsi,$out     # save copy of out
1721     mov     %rdx,$len     # save copy of len
1722     mov     %rcx,$key     # save copy of key
1723     mov     %r8,$ivp     # save copy of ivp
1724     movl    \$_,$mark     # copy of aes_key->rounds = 0;
1725     mov     %r8,%rbp     # rearrange input arguments
1726     mov     %r9,%rbx
1727     mov     %rsi,$out
1728     mov     %rdi,$inp
1729     mov     %rcx,$key

1731     mov     240($key),%eax # key->rounds
1732     # do we copy key schedule to stack?
1733     mov     $key,%r10
1734     sub     $sbox,%r10
1735     and     \$_0xfff,%r10
1736     cmp     \$_2304,%r10
1737     jb      .Lcbc_do_ecopy
1738     cmp     \$_4096-248,%r10
1739     jb      .Lcbc_skip_ecopy
1740 .align 4
1741 .Lcbc_do_ecopy:
1742     mov     $key,%rsi
1743     lea     $aes_key,%rdi
1744     lea     $aes_key,$key
1745     mov     \$_240/8,%ecx
1746     .long   0x90A548F3    # rep movsq
1747     mov     %eax,(%rdi)   # copy aes_key->rounds
1748 .Lcbc_skip_ecopy:
1749     mov     $key,$keyp    # save key pointer

1751     mov     \$_18,%ecx
1752 .align 4
1753 .Lcbc_prefetch_te:
1754     mov     0($sbox),%r10
1755     mov     32($sbox),%r11
1756     mov     64($sbox),%r12
1757     mov     96($sbox),%r13
1758     lea     128($sbox),%sbox
1759     sub     \$_1,%ecx
1760     jnz     .Lcbc_prefetch_te
1761     lea     -2304($sbox),%sbox

1763     cmp     \$_0,%rbx
1764     je      .LFAST_DECRYPT

1766 #----- ENCRYPT -----#
1767     mov     0(%rbp),%s0   # load iv
1768     mov     4(%rbp),%s1
1769     mov     8(%rbp),%s2
1770     mov     12(%rbp),%s3

1772 .align 4
1773 .Lcbc_fast_enc_loop:
1774     xor     0($inp),%s0
1775     xor     4($inp),%s1
1776     xor     8($inp),%s2
1777     xor     12($inp),%s3

```

```

1778     mov     $keyp,$key   # restore key
1779     mov     $inp,$_inp    # if ($verticalspin) save inp

1781     call    _x86_64_AES_encrypt

1783     mov     $_inp,$inp    # if ($verticalspin) restore inp
1784     mov     $_len,%r10
1785     mov     $s0,0($out)
1786     mov     $s1,4($out)
1787     mov     $s2,8($out)
1788     mov     $s3,12($out)

1790     lea     16($inp),%s0
1791     lea     16($out),%s1
1792     sub     \$_16,%r10
1793     test    \$_-16,%r10
1794     mov     %r10,$_len
1795     jnz     .Lcbc_fast_enc_loop
1796     mov     $_ivp,%rbp   # restore ivp
1797     mov     $s0,0(%rbp)  # save ivec
1798     mov     $s1,4(%rbp)
1799     mov     $s2,8(%rbp)
1800     mov     $s3,12(%rbp)

1802     jmp     .Lcbc_fast_cleanup

1804 #----- DECRYPT -----#
1805 .align 16
1806 .LFAST_DECRYPT:
1807     cmp     $inp,$out
1808     je      .Lcbc_fast_dec_in_place

1810     mov     %rbp,$ivec
1811 .align 4
1812 .Lcbc_fast_dec_loop:
1813     mov     0($inp),%s0   # read input
1814     mov     4($inp),%s1
1815     mov     8($inp),%s2
1816     mov     12($inp),%s3
1817     mov     $keyp,$key   # restore key
1818     mov     $inp,$_inp    # if ($verticalspin) save inp

1820     call    _x86_64_AES_decrypt

1822     mov     $ivec,%rbp   # load ivp
1823     mov     $_inp,$inp    # if ($verticalspin) restore inp
1824     mov     $_len,%r10
1825     xor     0(%rbp),%s0   # xor iv
1826     xor     4(%rbp),%s1
1827     xor     8(%rbp),%s2
1828     xor     12(%rbp),%s3
1829     mov     $inp,%rbp    # current input, next iv

1831     sub     \$_16,%r10
1832     mov     %r10,$_len   # update len
1833     mov     %rbp,$ivec   # update ivp

1835     mov     $s0,0($out)  # write output
1836     mov     $s1,4($out)
1837     mov     $s2,8($out)
1838     mov     $s3,12($out)

1840     lea     16($inp),%s0
1841     lea     16($out),%s1
1842     jnz     .Lcbc_fast_dec_loop
1843     mov     $_ivp,%r12   # load user ivp

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```

1844     mov     0(%rbp),%r10      # load iv
1845     mov     8(%rbp),%r11
1846     mov     %r10,0(%r12)      # copy back to user
1847     mov     %r11,8(%r12)
1848     jmp     .Lcbc_fast_cleanup

1850 .align 16
1851 .Lcbc_fast_dec_in_place:
1852     mov     0(%rbp),%r10      # copy iv to stack
1853     mov     8(%rbp),%r11
1854     mov     %r10,0+$ivec
1855     mov     %r11,8+$ivec
1856 .align 4
1857 .Lcbc_fast_dec_in_place_loop:
1858     mov     0($inp),%s0      # load input
1859     mov     4($inp),%s1
1860     mov     8($inp),%s2
1861     mov     12($inp),%s3
1862     mov     %keyp,%key      # restore key
1863     mov     $inp,$_inp      # if ($verticalspin) save inp

1865     call    _x86_64_AES_decrypt

1867     mov     $_inp,$inp      # if ($verticalspin) restore inp
1868     mov     %_len,%r10
1869     xor     0+$ivec,%s0
1870     xor     4+$ivec,%s1
1871     xor     8+$ivec,%s2
1872     xor     12+$ivec,%s3

1874     mov     0($inp),%r11     # load input
1875     mov     8($inp),%r12
1876     sub     $16,%r10
1877     jz      .Lcbc_fast_dec_in_place_done

1879     mov     %r11,0+$ivec     # copy input to iv
1880     mov     %r12,8+$ivec

1882     mov     %s0,0($out)      # save output [zaps input]
1883     mov     %s1,4($out)
1884     mov     %s2,8($out)
1885     mov     %s3,12($out)

1887     lea     16($inp),$_inp
1888     lea     16($out),$_out
1889     mov     %r10,$_len
1890     jmp     .Lcbc_fast_dec_in_place_loop
1891 .Lcbc_fast_dec_in_place_done:
1892     mov     $_ivp,%rdi
1893     mov     %r11,0(%rdi)     # copy iv back to user
1894     mov     %r12,8(%rdi)

1896     mov     %s0,0($out)      # save output [zaps input]
1897     mov     %s1,4($out)
1898     mov     %s2,8($out)
1899     mov     %s3,12($out)

1901 .align 4
1902 .Lcbc_fast_cleanup:
1903     cmpl    \$_0,%mark      # was the key schedule copied?
1904     lea     %aes_key,%rdi
1905     je      .Lcbc_exit
1906     mov     \$_240/8,%ecx
1907     xor     %rax,%rax
1908     .long   0x90AB48F3      # rep stosq

```

```

1910     jmp     .Lcbc_exit

1912 #----- SLOW ROUTINE -----#
1913 .align 16
1914 .Lcbc_slow_prologue:
1915     # allocate aligned stack frame...
1916     lea     -88(%rsp),%rbp
1917     and     \$_-64,%rbp
1918     # ... just "above" key schedule
1919     lea     -88-63(%rcx),%r10
1920     sub     %rbp,%r10
1921     neg     %r10
1922     and     \$_0x3c0,%r10
1923     sub     %r10,%rbp

1925     xchg    %rsp,%rbp
1926     #add    \$_8,%rsp      # reserve for return address!
1927     mov     %rbp,$_rsp     # save %rsp
1928 .Lcbc_slow_body:
1929     #mov     %rdi,$_inp     # save copy of inp
1930     #mov     %rsi,$_out     # save copy of out
1931     #mov     %rdx,$_len     # save copy of len
1932     #mov     %rcx,$_key     # save copy of key
1933     mov     %r8,$_ivp      # save copy of ivp
1934     mov     %r8,%rbp      # rearrange input arguments
1935     mov     %r9,%rbx
1936     mov     %rsi,$_out
1937     mov     %rdi,$_inp
1938     mov     %rcx,%key
1939     mov     %rdx,%r10

1941     mov     240(%key),%eax
1942     mov     %key,%keyp     # save key pointer
1943     shl     \$_4,%eax
1944     lea     (%key,%rax),%rax
1945     mov     %rax,%keyend

1947     # pick Te4 copy which can't "overlap" with stack frame or key schedule
1948     lea     2048($sbox),%sbox
1949     lea     768-8(%rsp),%rax
1950     sub     %sbox,%rax
1951     and     \$_0x300,%rax
1952     lea     (%sbox,%rax),%sbox

1954     cmp     \$_0,%rbx
1955     je      .LSLOW_DECRYPT

1957 #----- SLOW ENCRYPT -----#
1958     test    \$_-16,%r10     # check upon length
1959     mov     0(%rbp),%s0     # load iv
1960     mov     4(%rbp),%s1
1961     mov     8(%rbp),%s2
1962     mov     12(%rbp),%s3
1963     jz      .Lcbc_slow_enc_tail # short input...

1965 .align 4
1966 .Lcbc_slow_enc_loop:
1967     xor     0($inp),%s0
1968     xor     4($inp),%s1
1969     xor     8($inp),%s2
1970     xor     12($inp),%s3
1971     mov     %keyp,%key     # restore key
1972     mov     $inp,$_inp     # save inp
1973     mov     %out,$_out     # save out
1974     mov     %r10,$_len     # save len

```

```

1976      call    _x86_64_AES_encrypt_compact

1978      mov     $_inp,$inp      # restore inp
1979      mov     $_out,$out      # restore out
1980      mov     $_len,%r10      # restore len
1981      mov     $s0,0($out)
1982      mov     $s1,4($out)
1983      mov     $s2,8($out)
1984      mov     $s3,12($out)

1986      lea     16($inp),$inp
1987      lea     16($out),$out
1988      sub     \$_16,%r10
1989      test    \$_16,%r10
1990      jnz     .Lcbc_slow_enc_loop
1991      test    \$_15,%r10
1992      jnz     .Lcbc_slow_enc_tail
1993      mov     $_ivp,%rbp      # restore ivp
1994      mov     $s0,0(%rbp)      # save ivec
1995      mov     $s1,4(%rbp)
1996      mov     $s2,8(%rbp)
1997      mov     $s3,12(%rbp)

1999      jmp     .Lcbc_exit

2001 .align 4
2002 .Lcbc_slow_enc_tail:
2003      mov     %rax,%r11
2004      mov     %rcx,%r12
2005      mov     %r10,%rcx
2006      mov     $inp,%rsi
2007      mov     $out,%rdi
2008      .long   0x9066A4F3      # rep movsb
2009      mov     \$_16,%rcx      # zero tail
2010      sub     %r10,%rcx
2011      xor     %rax,%rax
2012      .long   0x9066AAF3      # rep stosb
2013      mov     $out,$inp      # this is not a mistake!
2014      mov     \$_16,%r10      # len=16
2015      mov     %r11,%rax
2016      mov     %r12,%rcx
2017      jmp     .Lcbc_slow_enc_loop # one more spin...
2018 #----- SLOW DECRYPT -----#
2019 .align 16
2020 .LSLOW_DECRYPT:
2021      shr     \$_3,%rax
2022      add     %rax,$sbox      # recall "magic" constants!

2024      mov     0(%rbp),%r11    # copy iv to stack
2025      mov     8(%rbp),%r12
2026      mov     %r11,0+$ivec
2027      mov     %r12,8+$ivec

2029 .align 4
2030 .Lcbc_slow_dec_loop:
2031      mov     0($inp),$s0      # load input
2032      mov     4($inp),$s1
2033      mov     8($inp),$s2
2034      mov     12($inp),$s3
2035      mov     $keyp,$key      # restore key
2036      mov     $inp,$_inp      # save inp
2037      mov     $out,$_out      # save out
2038      mov     %r10,$_len      # save len

2040      call    _x86_64_AES_decrypt_compact

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```

2042      mov     $_inp,$inp      # restore inp
2043      mov     $_out,$out      # restore out
2044      mov     $_len,%r10
2045      xor     0+$ivec,$s0
2046      xor     4+$ivec,$s1
2047      xor     8+$ivec,$s2
2048      xor     12+$ivec,$s3

2050      mov     0($inp),%r11     # load input
2051      mov     8($inp),%r12
2052      sub     \$_16,%r10
2053      jc      .Lcbc_slow_dec_partial
2054      jz      .Lcbc_slow_dec_done

2056      mov     %r11,0+$ivec     # copy input to iv
2057      mov     %r12,8+$ivec

2059      mov     $s0,0($out)      # save output [can zap input]
2060      mov     $s1,4($out)
2061      mov     $s2,8($out)
2062      mov     $s3,12($out)

2064      lea     16($inp),$inp
2065      lea     16($out),$out
2066      jmp     .Lcbc_slow_dec_loop

2067 .Lcbc_slow_dec_done:
2068      mov     $_ivp,%rdi
2069      mov     %r11,0(%rdi)      # copy iv back to user
2070      mov     %r12,8(%rdi)

2072      mov     $s0,0($out)      # save output [can zap input]
2073      mov     $s1,4($out)
2074      mov     $s2,8($out)
2075      mov     $s3,12($out)

2077      jmp     .Lcbc_exit

2079 .align 4
2080 .Lcbc_slow_dec_partial:
2081      mov     $_ivp,%rdi
2082      mov     %r11,0(%rdi)      # copy iv back to user
2083      mov     %r12,8(%rdi)

2085      mov     $s0,0+$ivec      # save output to stack
2086      mov     $s1,4+$ivec
2087      mov     $s2,8+$ivec
2088      mov     $s3,12+$ivec

2090      mov     $out,%rdi
2091      lea     $ivec,%rsi
2092      lea     16(%r10),%rcx
2093      .long   0x9066A4F3      # rep movsb
2094      jmp     .Lcbc_exit

2096 .align 16
2097 .Lcbc_exit:
2098      mov     $_rsp,%rsi
2099      mov     (%rsi),%r15
2100      mov     8(%rsi),%r14
2101      mov     16(%rsi),%r13
2102      mov     24(%rsi),%r12
2103      mov     32(%rsi),%rbp
2104      mov     40(%rsi),%rbx
2105      lea     48(%rsi),%rsp
2106 .Lcbc_popfq:
2107      popfq

```

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2108 .Lcbc_epilogue:
2109     ret
2110 .size  AES_cbc_encrypt,.-AES_cbc_encrypt
2111 ____
2112 }

2114 $code.=<<<;
2115 .align 64
2116 .LAES_Te:
2117 ____
2118     &_data_word(0xa56363c6, 0x847c7cf8, 0x997777ee, 0x8d7b7bf6);
2119     &_data_word(0x0df2f2ff, 0xbd6b6bd6, 0xb16f6fde, 0x54c5c591);
2120     &_data_word(0x50303060, 0x03010102, 0xa96767ce, 0x7d2b2b56);
2121     &_data_word(0x19fefee7, 0x62d7d7b5, 0xe6abab4d, 0x9a7676ec);
2122     &_data_word(0x45caca8f, 0x9d82821f, 0x40c9c989, 0x877d7dfa);
2123     &_data_word(0x15fafaef, 0xeb5959b2, 0xc947478e, 0x0bf0f0fb);
2124     &_data_word(0xecadad41, 0x67d4d4b3, 0xfda2a25f, 0xeaafaf45);
2125     &_data_word(0xbf9c9c23, 0xf7a4a453, 0x967272e4, 0x5bc0c09b);
2126     &_data_word(0xc2b7b775, 0x1cfdfe1, 0xae93933d, 0x6a26264c);
2127     &_data_word(0x5a36366c, 0x413f3f7e, 0x02f7f7f5, 0x4fcfcc83);
2128     &_data_word(0x5c343468, 0xf4a5a551, 0x34e5e5d1, 0x08f1f1f9);
2129     &_data_word(0x937171e2, 0x73d8d8ab, 0x53313162, 0x3f15152a);
2130     &_data_word(0x0c040408, 0x52c7c795, 0x65232346, 0x5ec3c39d);
2131     &_data_word(0x28181830, 0xa1969637, 0x0f05050a, 0xb59a9a2f);
2132     &_data_word(0x0907070e, 0x36121224, 0x9b80801b, 0x3de2e2df);
2133     &_data_word(0x26e6e6cd, 0x6927274e, 0xcd2b2b7f, 0x9f7575ea);
2134     &_data_word(0x1b090912, 0x9e83831d, 0x742c2c58, 0x2e1a1a34);
2135     &_data_word(0x2d1b1b36, 0xb26e6edc, 0xee5a5ab4, 0xfba0a05b);
2136     &_data_word(0xf65252a4, 0x4d3b3b76, 0x61d6d6b7, 0xceb3b37d);
2137     &_data_word(0x7b292952, 0x3ee3e3dd, 0x712f2f5e, 0x97848413);
2138     &_data_word(0xf55353a6, 0x68d1d1b9, 0x00000000, 0x2cededc1);
2139     &_data_word(0x60202040, 0x1ffcfc3, 0xc8b1b179, 0xed5b5bb6);
2140     &_data_word(0xb6a6ad4, 0x46cbcb8d, 0xd9bebe67, 0x4b393972);
2141     &_data_word(0xde4a4a94, 0xd44c4c98, 0xe85858b0, 0x4acfcf85);
2142     &_data_word(0x6bd0d0bb, 0x2aefefc5, 0xe5aaaa4f, 0x16fbfbfd);
2143     &_data_word(0xc5434386, 0xd74d4d9a, 0x55333366, 0x94858511);
2144     &_data_word(0xfc45458a, 0x10f9f9e9, 0x06020204, 0x817f7ffe);
2145     &_data_word(0xf05050a0, 0x443c3c78, 0xba9f9f25, 0xe3a8a84b);
2146     &_data_word(0xf35151a2, 0xfea3a35d, 0xc0404080, 0x8a8f8f05);
2147     &_data_word(0xad92923f, 0xbcd9d921, 0x48383870, 0x04f5f5f1);
2148     &_data_word(0xdfbcbcb63, 0xc1b6b677, 0x75dadaaf, 0x63212142);
2149     &_data_word(0x30101020, 0x1afffff5, 0x0ef3f3fd, 0x6dd2d2bf);
2150     &_data_word(0x4ccdc8d1, 0x140c0c18, 0x35131326, 0x2fececc3);
2151     &_data_word(0xe15f5f5e, 0xa2979735, 0xcc444488, 0x3917172e);
2152     &_data_word(0x57c4c493, 0xf2a7a755, 0x827e7efc, 0x473d3d7a);
2153     &_data_word(0xac6464c8, 0xe75d5dba, 0x2b191932, 0x957373e6);
2154     &_data_word(0xa06060c0, 0x98818119, 0xd14f4f9e, 0x7fddcd3a);
2155     &_data_word(0x66222244, 0x7e2a2a54, 0xab90903b, 0x8388880b);
2156     &_data_word(0xca46468c, 0x29eeec7, 0xd3b8b86b, 0x3c141428);
2157     &_data_word(0x79dedea7, 0xe25e5ebc, 0xd1d0b0b16, 0x76dbdbad);
2158     &_data_word(0x3be0e0db, 0x56323264, 0x4e3a3a74, 0x1e0a0a14);
2159     &_data_word(0xdb494992, 0xa06060c0, 0xc6242448, 0xe45c5cb8);
2160     &_data_word(0x5dc2c29f, 0x6ed3d3bd, 0xefacac43, 0xa66262c4);
2161     &_data_word(0xa8919139, 0xa4959531, 0x37e4e4d3, 0x8b7979f2);
2162     &_data_word(0x32e7e7d5, 0x43c8c88b, 0x5937376e, 0xb76d6dda);
2163     &_data_word(0x8c8d8d01, 0x64d5d5b1, 0xd24e4e9c, 0xe0a9a949);
2164     &_data_word(0xb46c6cd8, 0xfa5656ac, 0x07f4f4f3, 0x25eaeacf);
2165     &_data_word(0xaf6565ca, 0x8e7a7af4, 0xe9aeae47, 0x18080810);
2166     &_data_word(0xd5baba6f, 0x887878f0, 0x6f25254a, 0x722e2e5c);
2167     &_data_word(0x241c1c38, 0xf1a6a657, 0xc7b4b473, 0x51c6c697);
2168     &_data_word(0x23e8e8cb, 0x7cddddd1, 0x9c7474e8, 0x211f1f3e);
2169     &_data_word(0xdd4b4b96, 0xdcbdbdbd61, 0x868b8b0d, 0x858a8a0f);
2170     &_data_word(0x907070e0, 0x423e3e7c, 0xc4b5b571, 0xaa6666cc);
2171     &_data_word(0xd8484890, 0x05030306, 0x01f6f6f7, 0x120e0e1c);
2172     &_data_word(0xa36161c2, 0x5f35356a, 0xf95757ae, 0xd0b9b969);
2173     &_data_word(0x91868617, 0x58c1c199, 0x271d1d3a, 0xb99e9e27);

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2174     &_data_word(0x38e1e1d9, 0x13f8f8eb, 0xb398982b, 0x33111122);
2175     &_data_word(0xbb6969d2, 0x70d9d9a9, 0x898e8e07, 0xa7949433);
2176     &_data_word(0xb69b9b2d, 0x221e1e3c, 0x92878715, 0x20e9e9c9);
2177     &_data_word(0x49cece87, 0xff5555aa, 0x78282850, 0x7adfdfa5);
2178     &_data_word(0x8f8c8c03, 0xf8a1a159, 0x80898909, 0x170d0d1a);
2179     &_data_word(0xdabfbf65, 0x31e6e6d7, 0xc6424284, 0xb86868d0);
2180     &_data_word(0xc3414182, 0xb0999929, 0x772d2d5a, 0x110f0f1e);
2181     &_data_word(0xcbb0b07b, 0xfc5454a8, 0xd6bbbb6d, 0x3a16162c);

2183 #Te4 # four copies of Te4 to choose from to avoid L1 aliasing
2184     &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
2185     &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
2186     &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
2187     &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xcc);
2188     &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
2189     &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0x71, 0xd8, 0x31, 0x15);
2190     &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
2191     &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
2192     &data_byte(0x09, 0x83, 0x2c, 0xa2, 0x1b, 0x6e, 0x5a, 0xa0);
2193     &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
2194     &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
2195     &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
2196     &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
2197     &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
2198     &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
2199     &data_byte(0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
2200     &data_byte(0xcd, 0x0c, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
2201     &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
2202     &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
2203     &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
2204     &data_byte(0xe0, 0x32, 0x3a, 0xa0, 0x49, 0x06, 0x24, 0x5c);
2205     &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
2206     &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0xc8, 0x8d, 0x4e, 0xa9);
2207     &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
2208     &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
2209     &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0x8a);
2210     &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
2211     &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0x01, 0x1d, 0x9e);
2212     &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0xd9, 0x8e, 0x94);
2213     &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xce, 0x55, 0x28, 0xdf);
2214     &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);
2215     &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);

2217     &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
2218     &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
2219     &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
2220     &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xcc);
2221     &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
2222     &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0x71, 0xd8, 0x31, 0x15);
2223     &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
2224     &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
2225     &data_byte(0x09, 0x83, 0x2c, 0xa2, 0x1b, 0x6e, 0x5a, 0xa0);
2226     &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
2227     &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
2228     &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
2229     &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
2230     &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
2231     &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
2232     &data_byte(0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
2233     &data_byte(0xcd, 0x0c, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
2234     &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
2235     &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
2236     &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
2237     &data_byte(0xe0, 0x32, 0x3a, 0xa0, 0x49, 0x06, 0x24, 0x5c);
2238     &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
2239     &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0xc8, 0x8d, 0x4e, 0xa9);

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2240 &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
2241 &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
2242 &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0x8a);
2243 &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
2244 &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0xc1, 0x1d, 0x9e);
2245 &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0xd9, 0x8e, 0x94);
2246 &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xce, 0x55, 0x28, 0xdf);
2247 &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);
2248 &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);

2250 &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
2251 &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
2252 &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
2253 &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xc0);
2254 &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
2255 &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0xd8, 0x31, 0x15);
2256 &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
2257 &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
2258 &data_byte(0x09, 0x83, 0x2c, 0x1a, 0xb1, 0x6e, 0x5a, 0xa0);
2259 &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
2260 &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
2261 &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
2262 &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
2263 &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
2264 &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
2265 &data_byte(0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
2266 &data_byte(0xcd, 0x0c, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
2267 &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
2268 &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
2269 &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
2270 &data_byte(0xe0, 0x32, 0x3a, 0x0a, 0x49, 0x06, 0x24, 0x5c);
2271 &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
2272 &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0x8d, 0xd5, 0x4e, 0xa9);
2273 &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
2274 &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
2275 &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0x8a);
2276 &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
2277 &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0xc1, 0x1d, 0x9e);
2278 &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0xd9, 0x8e, 0x94);
2279 &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xce, 0x55, 0x28, 0xdf);
2280 &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);
2281 &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);

2283 &data_byte(0x63, 0x7c, 0x77, 0x7b, 0xf2, 0x6b, 0x6f, 0xc5);
2284 &data_byte(0x30, 0x01, 0x67, 0x2b, 0xfe, 0xd7, 0xab, 0x76);
2285 &data_byte(0xca, 0x82, 0xc9, 0x7d, 0xfa, 0x59, 0x47, 0xf0);
2286 &data_byte(0xad, 0xd4, 0xa2, 0xaf, 0x9c, 0xa4, 0x72, 0xc0);
2287 &data_byte(0xb7, 0xfd, 0x93, 0x26, 0x36, 0x3f, 0xf7, 0xcc);
2288 &data_byte(0x34, 0xa5, 0xe5, 0xf1, 0xd8, 0x31, 0x15);
2289 &data_byte(0x04, 0xc7, 0x23, 0xc3, 0x18, 0x96, 0x05, 0x9a);
2290 &data_byte(0x07, 0x12, 0x80, 0xe2, 0xeb, 0x27, 0xb2, 0x75);
2291 &data_byte(0x09, 0x83, 0x2c, 0x1a, 0xb1, 0x6e, 0x5a, 0xa0);
2292 &data_byte(0x52, 0x3b, 0xd6, 0xb3, 0x29, 0xe3, 0x2f, 0x84);
2293 &data_byte(0x53, 0xd1, 0x00, 0xed, 0x20, 0xfc, 0xb1, 0x5b);
2294 &data_byte(0x6a, 0xcb, 0xbe, 0x39, 0x4a, 0x4c, 0x58, 0xcf);
2295 &data_byte(0xd0, 0xef, 0xaa, 0xfb, 0x43, 0x4d, 0x33, 0x85);
2296 &data_byte(0x45, 0xf9, 0x02, 0x7f, 0x50, 0x3c, 0x9f, 0xa8);
2297 &data_byte(0x51, 0xa3, 0x40, 0x8f, 0x92, 0x9d, 0x38, 0xf5);
2298 &data_byte(0xb6, 0xda, 0x21, 0x10, 0xff, 0xf3, 0xd2);
2299 &data_byte(0xcd, 0x0c, 0x13, 0xec, 0x5f, 0x97, 0x44, 0x17);
2300 &data_byte(0xc4, 0xa7, 0x7e, 0x3d, 0x64, 0x5d, 0x19, 0x73);
2301 &data_byte(0x60, 0x81, 0x4f, 0xdc, 0x22, 0x2a, 0x90, 0x88);
2302 &data_byte(0x46, 0xee, 0xb8, 0x14, 0xde, 0x5e, 0x0b, 0xdb);
2303 &data_byte(0xe0, 0x32, 0x3a, 0x0a, 0x49, 0x06, 0x24, 0x5c);
2304 &data_byte(0xc2, 0xd3, 0xac, 0x62, 0x91, 0x95, 0xe4, 0x79);
2305 &data_byte(0xe7, 0xc8, 0x37, 0x6d, 0x8d, 0xd5, 0x4e, 0xa9);

```

```

2306 &data_byte(0x6c, 0x56, 0xf4, 0xea, 0x65, 0x7a, 0xae, 0x08);
2307 &data_byte(0xba, 0x78, 0x25, 0x2e, 0x1c, 0xa6, 0xb4, 0xc6);
2308 &data_byte(0xe8, 0xdd, 0x74, 0x1f, 0x4b, 0xbd, 0x8b, 0x8a);
2309 &data_byte(0x70, 0x3e, 0xb5, 0x66, 0x48, 0x03, 0xf6, 0xe0);
2310 &data_byte(0x61, 0x35, 0x57, 0xb9, 0x86, 0xc1, 0x1d, 0x9e);
2311 &data_byte(0xe1, 0xf8, 0x98, 0x11, 0x69, 0xd9, 0x8e, 0x94);
2312 &data_byte(0x9b, 0x1e, 0x87, 0xe9, 0xce, 0x55, 0x28, 0xdf);
2313 &data_byte(0x8c, 0xa1, 0x89, 0x0d, 0xbf, 0xe6, 0x42, 0x68);
2314 &data_byte(0x41, 0x99, 0x2d, 0x0f, 0xb0, 0x54, 0xbb, 0x16);
2315 #rcon:
2316 $code.=<<";
2317 .long 0x00000001, 0x00000002, 0x00000004, 0x00000008
2318 .long 0x00000010, 0x00000020, 0x00000040, 0x00000080
2319 .long 0x0000001b, 0x00000036, 0x00000080, 0x00000080
2320 .long 0xfefefefe, 0xfefefefe, 0x1b1b1b1b, 0x1b1b1b1b
2321
2322 $code.=<<";
2323 .align 64
2324 .LAES_Td;
2325
2326 &_data_word(0x50a7f451, 0x5365417e, 0xc3a4171a, 0x965e273a);
2327 &_data_word(0xc6bab3b, 0xf1459d1f, 0xab58faac, 0x9303e34b);
2328 &_data_word(0x55fa3020, 0xf66d76ad, 0x9176cc88, 0x1254c02f5);
2329 &_data_word(0xfcd7e54f, 0xd7cb2ac5, 0x80443526, 0x8fa362b5);
2330 &_data_word(0x495ab1de, 0x671bba25, 0x980eeaa5, 0xe1c0fe5d);
2331 &_data_word(0x02752fc3, 0x12f04c81, 0xa397468d, 0xc6f9d36b);
2332 &_data_word(0xe75f8f03, 0x959c9215, 0xeb7a6dbf, 0xda595295);
2333 &_data_word(0x2d83bed4, 0xd3217458, 0x2969e049, 0x44c8c98e);
2334 &_data_word(0x6a89c275, 0x78798ef4, 0x6b3e5899, 0xdd71b927);
2335 &_data_word(0xb64fe1be, 0x17ad88f0, 0x66ac20c9, 0xb43ace7d);
2336 &_data_word(0x184adf63, 0x82311ae5, 0x60335197, 0x457f5362);
2337 &_data_word(0xe07764b1, 0x84ae6bbb, 0x1ca081fe, 0x942b08f9);
2338 &_data_word(0x58684870, 0x19fd458f, 0x876cde94, 0xb7f87b52);
2339 &_data_word(0x23d373ab, 0xe2024b72, 0x578f1fe3, 0x2aab5566);
2340 &_data_word(0x0728ebb2, 0x03c2b52f, 0x9a7bc586, 0xa50837d3);
2341 &_data_word(0xf2872830, 0xb2a5bf23, 0xba6a0302, 0x5c8216ed);
2342 &_data_word(0x2b1ccf8a, 0x92b479a7, 0xf0f207f3, 0xa1e2694e);
2343 &_data_word(0xcdcf4da65, 0xd5be0506, 0xf16234d1, 0x8afea6c4);
2344 &_data_word(0x9d532e34, 0xa055f3a2, 0x32e18a05, 0x75ebf6a4);
2345 &_data_word(0x39ec830b, 0xaaef6040, 0x069f715e, 0x51106ebd);
2346 &_data_word(0xf98a213e, 0x3d06dd96, 0xae053edd, 0x46bde64d);
2347 &_data_word(0xb58d5491, 0x055dc471, 0x6fd40604, 0xff155060);
2348 &_data_word(0x24fb9819, 0x97e9bdd6, 0xcc434089, 0x779ed967);
2349 &_data_word(0xbd42e8b0, 0x888b8907, 0x385b19e7, 0xdbeec879);
2350 &_data_word(0x470a7ca1, 0xe90f427c, 0xc91e84f8, 0x00000000);
2351 &_data_word(0x83688009, 0x48ed2b32, 0xac70111e, 0x4e725a6c);
2352 &_data_word(0xfbf0efd, 0x5638850f, 0x1ed5ae3d, 0x27392d36);
2353 &_data_word(0x64d90f0a, 0x21a65c68, 0xd1545b9b, 0x3a2e3624);
2354 &_data_word(0xb1670a0c, 0x0fe75793, 0xd296eeb4, 0x9e919b1b);
2355 &_data_word(0x4fc5c080, 0xa220dc61, 0x694b775a, 0x161a121c);
2356 &_data_word(0x0aba93e2, 0xe52aa0c0, 0x43e0223c, 0x1d171b12);
2357 &_data_word(0x0b0d090e, 0xadc78bf7, 0xb9a8b62d, 0xc8a91e14);
2358 &_data_word(0x8519f157, 0x4c0775af, 0xbbdd99ee, 0xf607fa3);
2359 &_data_word(0x9f2601f7, 0xbcf5725c, 0xc53b6644, 0x347efb5b);
2360 &_data_word(0x7629438b, 0xdcc623cb, 0x68fcedb6, 0x63f1e4b8);
2361 &_data_word(0xcadc31d7, 0x10856342, 0x40229713, 0x2011c684);
2362 &_data_word(0x7d244a85, 0xf83dbbd2, 0x1132f9ae, 0x6da129c7);
2363 &_data_word(0x4b2f9e1d, 0xf330b2dc, 0xec52860d, 0xd0e3c177);
2364 &_data_word(0x6c16b32b, 0x99b970a9, 0xfa489411, 0x2264e947);
2365 &_data_word(0xc48cfca8, 0x1a3ff0a0, 0xd82c7d5e, 0xf903322);
2366 &_data_word(0xc74e4987, 0xc1d138d9, 0xfea2ca8c, 0x360bd498);
2367 &_data_word(0xcf81f5a6, 0x28de7aa5, 0x268eb7da, 0xa4bfad3f);
2368 &_data_word(0xe49d3a2c, 0x0d927850, 0x9bcc5f6a, 0x6246fe54);
2369 &_data_word(0xc2138df6, 0xe8b8d890, 0x5ef7392e, 0xf5afc382);
2370 &_data_word(0xbe805d9f, 0x7c93d069, 0xa92dd56f, 0xb31225cf);
2371 &_data_word(0x3b99acc8, 0xa77d1810, 0xe6639ce8, 0x7bbb3bdb);

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2372 &_data_word(0x097826cd, 0xf418596e, 0x01b79aec, 0xa89a4f83);
2373 &_data_word(0x656e95e6, 0x7ee6ffaa, 0x08cfbc21, 0xe6e815ef);
2374 &_data_word(0xd99be7ba, 0xce366f4a, 0xd4099fea, 0xd67cb029);
2375 &_data_word(0xafb2a431, 0x31233f2a, 0x3094a5c6, 0xc066a235);
2376 &_data_word(0x37bc4e74, 0xa6ca82fc, 0xb0d090e0, 0x15d8a733);
2377 &_data_word(0x4a9804f1, 0xf7daec41, 0xe050cd7f, 0x2ff69117);
2378 &_data_word(0x8dd64d76, 0x4db0ef43, 0x544daacc, 0xdf0496e4);
2379 &_data_word(0xe3b5d19e, 0x1b886a4c, 0xb81f2ccc, 0x7f516546);
2380 &_data_word(0x04ea5e9d, 0x5d358c01, 0x737487fa, 0x2e410bfbb);
2381 &_data_word(0x5a1d67b3, 0x52d2db92, 0x335610e9, 0x1347d66d);
2382 &_data_word(0x8c61d79a, 0x7a0ca137, 0x8e14f859, 0x893c13eb);
2383 &_data_word(0xee27a9ce, 0x35c961b7, 0xede51ce1, 0x3cb1477a);
2384 &_data_word(0x59dfd29c, 0x3f73f255, 0x79ce1418, 0xbf37c773);
2385 &_data_word(0xeacd7f53, 0x5baafd5f, 0x146f3ddf, 0x86db4478);
2386 &_data_word(0x81f3afca, 0x3ec468b9, 0x2c342438, 0x5f40a3c2);
2387 &_data_word(0x72c31d16, 0x0c25e2bc, 0x8b493c28, 0x41950dff);
2388 &_data_word(0x7101a839, 0xdeb30c08, 0x9ce4b4d8, 0x90c15664);
2389 &_data_word(0x6184cb7b, 0x70b632d5, 0x745c6c48, 0x4257b8d0);

```

```

2391 #Td4: # four copies of Td4 to choose from to avoid L1 aliasing
2392 &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
2393 &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
2394 &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
2395 &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);
2396 &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
2397 &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
2398 &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
2399 &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
2400 &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
2401 &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);
2402 &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
2403 &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
2404 &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0xd3, 0xa0);
2405 &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
2406 &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0xe2);
2407 &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0xb6);
2408 &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
2409 &data_byte(0x97, 0xf2, 0xcf, 0xce, 0xf0, 0xb4, 0xe6, 0x73);
2410 &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
2411 &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0x1c, 0x75, 0xdf, 0x6e);
2412 &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
2413 &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xbe, 0x1b);
2414 &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
2415 &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
2416 &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
2417 &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
2418 &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
2419 &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
2420 &data_byte(0xa0, 0xe0, 0x3b, 0x4d, 0xae, 0x2a, 0xf5, 0xb0);
2421 &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
2422 &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
2423 &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);
2424 $code.=<<";
2425 .long 0x80808080, 0x80808080, 0xfefefefe, 0xfefefefe
2426 .long 0x1b1b1b1b, 0x1b1b1b1b, 0, 0

```

```

2427 ---
2428 &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
2429 &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
2430 &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
2431 &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);
2432 &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
2433 &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
2434 &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
2435 &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
2436 &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
2437 &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);

```

```

2438 &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
2439 &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
2440 &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0xd3, 0xa0);
2441 &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
2442 &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0xe2);
2443 &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0xb6);
2444 &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
2445 &data_byte(0x97, 0xf2, 0xcf, 0xce, 0xf0, 0xb4, 0xe6, 0x73);
2446 &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
2447 &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0x1c, 0x75, 0xdf, 0x6e);
2448 &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
2449 &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xbe, 0x1b);
2450 &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
2451 &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
2452 &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
2453 &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
2454 &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
2455 &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
2456 &data_byte(0xa0, 0xe0, 0x3b, 0x4d, 0xae, 0x2a, 0xf5, 0xb0);
2457 &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
2458 &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
2459 &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);

```

```

2460 $code.=<<";
2461 .long 0x80808080, 0x80808080, 0xfefefefe, 0xfefefefe
2462 .long 0x1b1b1b1b, 0x1b1b1b1b, 0, 0

```

```

2463 ---
2464 &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
2465 &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
2466 &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
2467 &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);
2468 &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
2469 &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
2470 &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
2471 &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
2472 &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
2473 &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);
2474 &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
2475 &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
2476 &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0xd3, 0xa0);
2477 &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
2478 &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0xe2);
2479 &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0xb6);
2480 &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
2481 &data_byte(0x97, 0xf2, 0xcf, 0xce, 0xf0, 0xb4, 0xe6, 0x73);
2482 &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
2483 &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0x1c, 0x75, 0xdf, 0x6e);
2484 &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
2485 &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xbe, 0x1b);
2486 &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
2487 &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
2488 &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
2489 &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
2490 &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
2491 &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
2492 &data_byte(0xa0, 0xe0, 0x3b, 0x4d, 0xae, 0x2a, 0xf5, 0xb0);
2493 &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
2494 &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
2495 &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);

```

```

2496 $code.=<<";
2497 .long 0x80808080, 0x80808080, 0xfefefefe, 0xfefefefe
2498 .long 0x1b1b1b1b, 0x1b1b1b1b, 0, 0

```

```

2500 &data_byte(0x52, 0x09, 0x6a, 0xd5, 0x30, 0x36, 0xa5, 0x38);
2501 &data_byte(0xbf, 0x40, 0xa3, 0x9e, 0x81, 0xf3, 0xd7, 0xfb);
2502 &data_byte(0x7c, 0xe3, 0x39, 0x82, 0x9b, 0x2f, 0xff, 0x87);
2503 &data_byte(0x34, 0x8e, 0x43, 0x44, 0xc4, 0xde, 0xe9, 0xcb);

```

```

2504      &data_byte(0x54, 0x7b, 0x94, 0x32, 0xa6, 0xc2, 0x23, 0x3d);
2505      &data_byte(0xee, 0x4c, 0x95, 0x0b, 0x42, 0xfa, 0xc3, 0x4e);
2506      &data_byte(0x08, 0x2e, 0xa1, 0x66, 0x28, 0xd9, 0x24, 0xb2);
2507      &data_byte(0x76, 0x5b, 0xa2, 0x49, 0x6d, 0x8b, 0xd1, 0x25);
2508      &data_byte(0x72, 0xf8, 0xf6, 0x64, 0x86, 0x68, 0x98, 0x16);
2509      &data_byte(0xd4, 0xa4, 0x5c, 0xcc, 0x5d, 0x65, 0xb6, 0x92);
2510      &data_byte(0x6c, 0x70, 0x48, 0x50, 0xfd, 0xed, 0xb9, 0xda);
2511      &data_byte(0x5e, 0x15, 0x46, 0x57, 0xa7, 0x8d, 0x9d, 0x84);
2512      &data_byte(0x90, 0xd8, 0xab, 0x00, 0x8c, 0xbc, 0xd3, 0x0a);
2513      &data_byte(0xf7, 0xe4, 0x58, 0x05, 0xb8, 0xb3, 0x45, 0x06);
2514      &data_byte(0xd0, 0x2c, 0x1e, 0x8f, 0xca, 0x3f, 0x0f, 0x02);
2515      &data_byte(0xc1, 0xaf, 0xbd, 0x03, 0x01, 0x13, 0x8a, 0x6b);
2516      &data_byte(0x3a, 0x91, 0x11, 0x41, 0x4f, 0x67, 0xdc, 0xea);
2517      &data_byte(0x97, 0xf2, 0xcf, 0xce, 0xf0, 0xb4, 0xe6, 0x73);
2518      &data_byte(0x96, 0xac, 0x74, 0x22, 0xe7, 0xad, 0x35, 0x85);
2519      &data_byte(0xe2, 0xf9, 0x37, 0xe8, 0x1c, 0x75, 0xdf, 0x6e);
2520      &data_byte(0x47, 0xf1, 0x1a, 0x71, 0x1d, 0x29, 0xc5, 0x89);
2521      &data_byte(0x6f, 0xb7, 0x62, 0x0e, 0xaa, 0x18, 0xbe, 0x1b);
2522      &data_byte(0xfc, 0x56, 0x3e, 0x4b, 0xc6, 0xd2, 0x79, 0x20);
2523      &data_byte(0x9a, 0xdb, 0xc0, 0xfe, 0x78, 0xcd, 0x5a, 0xf4);
2524      &data_byte(0x1f, 0xdd, 0xa8, 0x33, 0x88, 0x07, 0xc7, 0x31);
2525      &data_byte(0xb1, 0x12, 0x10, 0x59, 0x27, 0x80, 0xec, 0x5f);
2526      &data_byte(0x60, 0x51, 0x7f, 0xa9, 0x19, 0xb5, 0x4a, 0xd0);
2527      &data_byte(0x2d, 0xe5, 0x7a, 0x9f, 0x93, 0xc9, 0x9c, 0xef);
2528      &data_byte(0xa0, 0xe0, 0x3b, 0x4d, 0xae, 0x2a, 0xf5, 0xb0);
2529      &data_byte(0xc8, 0xeb, 0xbb, 0x3c, 0x83, 0x53, 0x99, 0x61);
2530      &data_byte(0x17, 0x2b, 0x04, 0x7e, 0xba, 0x77, 0xd6, 0x26);
2531      &data_byte(0xe1, 0x69, 0x14, 0x63, 0x55, 0x21, 0x0c, 0x7d);
2532 $code.=<<__;;
2533      .long 0x80808080, 0x80808080, 0xfefefefe, 0xfefefefe
2534      .long 0x1b1b1b1b, 0x1b1b1b1b, 0, 0
2535 .asciz "AES for x86_64, CRYPTOGAMS by <appro@openssl.org>"
2536 .align 64
2537 ____

2539 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
2540 #                                CONTEXT *context,DISPATCHER_CONTEXT *disp)
2541 if ($win64) {
2542 $rec="%rcx";
2543 $frame="%rdx";
2544 $context="%r8";
2545 $disp="%r9";

2547 $code.=<<__;;
2548 .extern __imp_RtlVirtualUnwind
2549 .type block_se_handler,@abi-omnipotent
2550 .align 16
2551 block_se_handler:
2552     push    %rsi
2553     push    %rdi
2554     push    %rbx
2555     push    %rbp
2556     push    %r12
2557     push    %r13
2558     push    %r14
2559     push    %r15
2560     pushfq
2561     sub     $64,%rsp

2563     mov     120($context),%rax    # pull context->Rax
2564     mov     248($context),%rbx    # pull context->Rip

2566     mov     8($disp),%rsi        # disp->ImageBase
2567     mov     56($disp),%r11       # disp->HandlerData

2569     mov     0(%r11),%r10d        # HandlerData[0]

```

```

2570     lea     (%rsi,%r10),%r10     # prologue label
2571     cmp     %r10,%rbx           # context->Rip<prologue label
2572     jb     .Lin_block_prologue

2574     mov     152($context),%rax    # pull context->Rsp

2576     mov     4(%r11),%r10d        # HandlerData[1]
2577     lea     (%rsi,%r10),%r10     # epilogue label
2578     cmp     %r10,%rbx           # context->Rip>=epilogue label
2579     jae     .Lin_block_prologue

2581     mov     24(%rax),%rax        # pull saved real stack pointer
2582     lea     48(%rax),%rax        # adjust...

2584     mov     -8(%rax),%rbx
2585     mov     -16(%rax),%rbp
2586     mov     -24(%rax),%r12
2587     mov     -32(%rax),%r13
2588     mov     -40(%rax),%r14
2589     mov     -48(%rax),%r15
2590     mov     %rbx,144($context)   # restore context->Rbx
2591     mov     %rbp,160($context)   # restore context->Rbp
2592     mov     %r12,216($context)   # restore context->R12
2593     mov     %r13,224($context)   # restore context->R13
2594     mov     %r14,232($context)   # restore context->R14
2595     mov     %r15,240($context)   # restore context->R15

2597 .Lin_block_prologue:
2598     mov     8(%rax),%rdi
2599     mov     16(%rax),%rsi
2600     mov     %rax,152($context)   # restore context->Rsp
2601     mov     %rsi,168($context)   # restore context->Rsi
2602     mov     %rdi,176($context)   # restore context->Rdi

2604     jmp     .Lcommon_seh_exit
2605 .size     block_se_handler,.-block_se_handler

2607 .type     key_se_handler,@abi-omnipotent
2608 .align    16
2609 key_se_handler:
2610     push    %rsi
2611     push    %rdi
2612     push    %rbx
2613     push    %rbp
2614     push    %r12
2615     push    %r13
2616     push    %r14
2617     push    %r15
2618     pushfq
2619     sub     $64,%rsp

2621     mov     120($context),%rax    # pull context->Rax
2622     mov     248($context),%rbx    # pull context->Rip

2624     mov     8($disp),%rsi        # disp->ImageBase
2625     mov     56($disp),%r11       # disp->HandlerData

2627     mov     0(%r11),%r10d        # HandlerData[0]
2628     lea     (%rsi,%r10),%r10     # prologue label
2629     cmp     %r10,%rbx           # context->Rip<prologue label
2630     jb     .Lin_key_prologue

2632     mov     152($context),%rax    # pull context->Rsp

2634     mov     4(%r11),%r10d        # HandlerData[1]
2635     lea     (%rsi,%r10),%r10     # epilogue label

```

```

2636      cmp     %r10,%rbx      # context->Rip>=epilogue label
2637      jae     .Lin_key_prologue

2639      lea     56(%rax),%rax

2641      mov     -8(%rax),%rbx
2642      mov     -16(%rax),%rbp
2643      mov     -24(%rax),%r12
2644      mov     -32(%rax),%r13
2645      mov     -40(%rax),%r14
2646      mov     -48(%rax),%r15
2647      mov     %rbx,144($context) # restore context->Rbx
2648      mov     %rbp,160($context) # restore context->Rbp
2649      mov     %r12,216($context) # restore context->R12
2650      mov     %r13,224($context) # restore context->R13
2651      mov     %r14,232($context) # restore context->R14
2652      mov     %r15,240($context) # restore context->R15

2654 .Lin_key_prologue:
2655      mov     8(%rax),%rdi
2656      mov     16(%rax),%rsi
2657      mov     %rax,152($context) # restore context->Rsp
2658      mov     %rsi,168($context) # restore context->Rsi
2659      mov     %rdi,176($context) # restore context->Rdi

2661      jmp     .Lcommon_seh_exit
2662 .size      key_se_handler,.-key_se_handler

2664 .type      cbc_se_handler,@abi-omnipotent
2665 .align     16
2666 cbc_se_handler:
2667      push    %rsi
2668      push    %rdi
2669      push    %rbx
2670      push    %rbp
2671      push    %r12
2672      push    %r13
2673      push    %r14
2674      push    %r15
2675      pushfq
2676      sub     $64,%rsp

2678      mov     120($context),%rax # pull context->Rax
2679      mov     248($context),%rbx # pull context->Rip

2681      lea     .Lcbc_prologue(%rip),%r10
2682      cmp     %r10,%rbx      # context->Rip<.Lcbc_prologue
2683      jb     .Lin_cbc_prologue

2685      lea     .Lcbc_fast_body(%rip),%r10
2686      cmp     %r10,%rbx      # context->Rip<.Lcbc_fast_body
2687      jb     .Lin_cbc_frame_setup

2689      lea     .Lcbc_slow_prologue(%rip),%r10
2690      cmp     %r10,%rbx      # context->Rip<.Lcbc_slow_prologue
2691      jb     .Lin_cbc_body

2693      lea     .Lcbc_slow_body(%rip),%r10
2694      cmp     %r10,%rbx      # context->Rip<.Lcbc_slow_body
2695      jb     .Lin_cbc_frame_setup

2697 .Lin_cbc_body:
2698      mov     152($context),%rax # pull context->Rsp

2700      lea     .Lcbc_epilogue(%rip),%r10
2701      cmp     %r10,%rbx      # context->Rip>=.Lcbc_epilogue

```

```

2702      jae     .Lin_cbc_prologue

2704      lea     8(%rax),%rax

2706      lea     .Lcbc_popfq(%rip),%r10
2707      cmp     %r10,%rbx      # context->Rip>=.Lcbc_popfq
2708      jae     .Lin_cbc_prologue

2710      mov     '16-8'(%rax),%rax # biased $rsp
2711      lea     56(%rax),%rax

2713 .Lin_cbc_frame_setup:
2714      mov     -16(%rax),%rbx
2715      mov     -24(%rax),%rbp
2716      mov     -32(%rax),%r12
2717      mov     -40(%rax),%r13
2718      mov     -48(%rax),%r14
2719      mov     -56(%rax),%r15
2720      mov     %rbx,144($context) # restore context->Rbx
2721      mov     %rbp,160($context) # restore context->Rbp
2722      mov     %r12,216($context) # restore context->R12
2723      mov     %r13,224($context) # restore context->R13
2724      mov     %r14,232($context) # restore context->R14
2725      mov     %r15,240($context) # restore context->R15

2727 .Lin_cbc_prologue:
2728      mov     8(%rax),%rdi
2729      mov     16(%rax),%rsi
2730      mov     %rax,152($context) # restore context->Rsp
2731      mov     %rsi,168($context) # restore context->Rsi
2732      mov     %rdi,176($context) # restore context->Rdi

2734 .Lcommon_seh_exit:

2736      mov     40($disp),%rdi # disp->ContextRecord
2737      mov     $context,%rsi # context
2738      mov     $'1232/8',%ecx # sizeof(CONTEXT)
2739      .long    0xa548f3fc # cld; rep movsq

2741      mov     $disp,%rsi
2742      xor     %rcx,%rcx      # arg1, UNW_FLAG_NHANDLER
2743      mov     8(%rsi),%rdx # arg2, disp->ImageBase
2744      mov     0(%rsi),%r8 # arg3, disp->ControlPc
2745      mov     16(%rsi),%r9 # arg4, disp->FunctionEntry
2746      mov     40(%rsi),%r10 # disp->ContextRecord
2747      lea     56(%rsi),%r11 # &disp->HandlerData
2748      lea     24(%rsi),%r12 # &disp->EstablisherFrame
2749      mov     %r10,32(%rsp) # arg5
2750      mov     %r11,40(%rsp) # arg6
2751      mov     %r12,48(%rsp) # arg7
2752      mov     %rcx,56(%rsp) # arg8, (NULL)
2753      call    *__imp_RtlVirtualUnwind(%rip)

2755      mov     $!,%eax # ExceptionContinueSearch
2756      add     $64,%rsp
2757      popfq
2758      pop     %r15
2759      pop     %r14
2760      pop     %r13
2761      pop     %r12
2762      pop     %rbp
2763      pop     %rbx
2764      pop     %rdi
2765      pop     %rsi
2766      ret
2767 .size      cbc_se_handler,.-cbc_se_handler

```

```
2769 .section      .pdata
2770 .align 4
2771     .rva        .LSEH_begin_AES_encrypt
2772     .rva        .LSEH_end_AES_encrypt
2773     .rva        .LSEH_info_AES_encrypt

2775     .rva        .LSEH_begin_AES_decrypt
2776     .rva        .LSEH_end_AES_decrypt
2777     .rva        .LSEH_info_AES_decrypt

2779     .rva        .LSEH_begin_private_AES_set_encrypt_key
2780     .rva        .LSEH_end_private_AES_set_encrypt_key
2781     .rva        .LSEH_info_private_AES_set_encrypt_key

2783     .rva        .LSEH_begin_private_AES_set_decrypt_key
2784     .rva        .LSEH_end_private_AES_set_decrypt_key
2785     .rva        .LSEH_info_private_AES_set_decrypt_key

2787     .rva        .LSEH_begin_AES_cbc_encrypt
2788     .rva        .LSEH_end_AES_cbc_encrypt
2789     .rva        .LSEH_info_AES_cbc_encrypt

2791 .section      .xdata
2792 .align 8
2793 .LSEH_info_AES_encrypt:
2794     .byte 9,0,0,0
2795     .rva    block_se_handler
2796     .rva    .Lenc_prologue,.Lenc_epilogue    # HandlerData[]
2797 .LSEH_info_AES_decrypt:
2798     .byte 9,0,0,0
2799     .rva    block_se_handler
2800     .rva    .Ldec_prologue,.Ldec_epilogue    # HandlerData[]
2801 .LSEH_info_private_AES_set_encrypt_key:
2802     .byte 9,0,0,0
2803     .rva    key_se_handler
2804     .rva    .Lenc_key_prologue,.Lenc_key_epilogue    # HandlerData[]
2805 .LSEH_info_private_AES_set_decrypt_key:
2806     .byte 9,0,0,0
2807     .rva    key_se_handler
2808     .rva    .Ldec_key_prologue,.Ldec_key_epilogue    # HandlerData[]
2809 .LSEH_info_AES_cbc_encrypt:
2810     .byte 9,0,0,0
2811     .rva    cbc_se_handler
2812
2813 }

2815 $code =~ s/\'([^\']*)\'/eval($1)/gem;

2817 print $code;

2819 close STDOUT;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/aesni-sha1-x86_64.pl

1

```
*****
31703 Fri May 30 18:32:02 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/aesni-sha1-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@openssl.org> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # June 2011
11 #
12 # This is AESNI-CBC+SHA1 "stitch" implementation. The idea, as spelled
13 # in http://download.intel.com/design/intarch/papers/323686.pdf, is
14 # that since AESNI-CBC encrypt exhibit "very" low instruction-level
15 # parallelism, interleaving it with another algorithm would allow to
16 # utilize processor resources better and achieve better performance.
17 # SHA1 instruction sequences(*) are taken from sha1-x86_64.pl and
18 # AESNI code is weaved into it. Below are performance numbers in
19 # cycles per processed byte, less is better, for standalone AESNI-CBC
20 # encrypt, sum of the latter and standalone SHA1, and "stitched"
21 # subroutine:
22 #
23 #          AES-128-CBC    +SHA1          stitch    gain
24 # Westmere      3.77[+5.6]    9.37        6.65      +41%
25 # Sandy Bridge  5.05[+5.2(6.3)] 10.25(11.35) 6.16(7.08) +67%(+60%)
26 #
27 #          AES-192-CBC
28 # Westmere      4.51          10.11        6.97      +45%
29 # Sandy Bridge  6.05          11.25(12.35) 6.34(7.27) +77%(+70%)
30 #
31 #          AES-256-CBC
32 # Westmere      5.25          10.85        7.25      +50%
33 # Sandy Bridge  7.05          12.25(13.35) 7.06(7.70) +74%(+73%)
34 #
35 # (*) There are two code paths: SSE3 and AVX. See sha1-568.pl for
36 # background information. Above numbers in parentheses are SSE3
37 # results collected on AVX-capable CPU, i.e. apply on OSes that
38 # don't support AVX.
39 #
40 # Needless to mention that it makes no sense to implement "stitched"
41 # *decrypt* subroutine. Because *both* AESNI-CBC decrypt and SHA1
42 # fully utilize parallelism, so stitching would not give any gain
43 # anyway. Well, there might be some, e.g. because of better cache
44 # locality... For reference, here are performance results for
45 # standalone AESNI-CBC decrypt:
46 #
47 #          AES-128-CBC    AES-192-CBC    AES-256-CBC
48 # Westmere      1.31      1.55          1.80
49 # Sandy Bridge  0.93      1.06          1.22
50 #
51 $flavour = shift;
52 $output = shift;
53 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }
54
55 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);
56
57 $0 =~ m/(.*[/\\\])[^/\\]+$/; $dir=$1;
58 ( $xlate="$dir/x86_64-xlate.pl" and -f $xlate ) or
59 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
60 die "can't locate x86_64-xlate.pl";
```

new/usr/src/lib/openssl/libsunw_crypto/pl/aesni-sha1-x86_64.pl

2

```
62 $avx=1 if ('$ENV{CC}' -Wa,-v -c -o /dev/null -x assembler /dev/null 2>&1'
63           =~ /GNU assembler version ([2-9]\.[0-9]+)/ &&
64           $1>=2.19);
65 $avx=1 if (!$avx && $win64 && ($flavour =~ /nasm/ || $ENV{ASM} =~ /nasm/) &&
66           'nasm -v 2>&1' =~ /NASM version ([2-9]\.[0-9]+)/ &&
67           $1>=2.09);
68 $avx=1 if (!$avx && $win64 && ($flavour =~ /masm/ || $ENV{ASM} =~ /ml64/) &&
69           'ml64 2>&1' =~ /Version ([0-9]+)/ &&
70           $1>=10);
71
72 open OUT,"| \"$^X\" $xlate $flavour $output";
73 *STDOUT=*OUT;
74
75 # void aesni_cbc_sha1_enc(const void *inp,
76 #                         void *out,
77 #                         size_t length,
78 #                         const AES_KEY *key,
79 #                         unsigned char *iv,
80 #                         SHA_CTX *ctx,
81 #                         const void *in0);
82
83 $code.=<<__;;
84 .text
85 .extern OPENSSL_ia32cap_P
86
87 .globl aesni_cbc_sha1_enc
88 .type aesni_cbc_sha1_enc,@abi-omnipotent
89 .align 16
90 aesni_cbc_sha1_enc:
91     # caller should check for SSE3 and AES-NI bits
92     mov     OPENSSL_ia32cap_P+0(%rip),%r10d
93     mov     OPENSSL_ia32cap_P+4(%rip),%r11d
94
95 $code.=<<__ if ($avx);
96     and     \'$1<28',%r11d          # mask AVX bit
97     and     \'$1<30',%r10d          # mask "Intel CPU" bit
98     or      %r11d,%r10d
99     cmp     \'$1<28|1<30',%r10d
100    je      aesni_cbc_sha1_enc_avx
101
102 $code.=<<__;;
103    jmp     aesni_cbc_sha1_enc_ssse3
104    ret
105 .size aesni_cbc_sha1_enc,.-aesni_cbc_sha1_enc
106
107 my ($in0,$out,$len,$key,$ivp,$ctx,$inp) = ("%rdi", "%rsi", "%rdx", "%rcx", "%r8", "%r9"
108
109 my $Xi=4;
110 my @X=map("%xmm$ ", (4..7,0..3));
111 my @Tx=map("%xmm$ ", (8..10));
112 my @V=($A,$B,$C,$D,$E) = ("%eax", "%ebx", "%ecx", "%edx", "%ebp"); # size optimizat
113 my @T=("%esi", "%edi");
114 my $j=0; my $jj=0; my $r=0; my $sn=0;
115 my $K_XX_XX="$r11";
116 my ($iv,$in,$rndkey0)=map("%xmm$ ", (11..13));
117 my @rndkey=("%xmm14", "%xmm15");
118
119 sub AUTOLOAD() # thunk [simplified] 32-bit style perlasm
120 { my $opcode = $AUTOLOAD; $opcode =~ s/\.*/::/;
121   my $arg = pop;
122   $arg = "$$arg" if ($arg*1 eq $arg);
123   $code .= "\t$opcode\t".join(' ', $arg, reverse @_)."\n";
124 }
125
126 my $_rol=sub { &rol($_) };
```

```

128 my $ror=sub { &ror(@_) };
130 $code.=<<<;
131 .type aesni_cbc_sha1_enc_ssse3,\@function,6
132 .align 16
133 aesni_cbc_sha1_enc_ssse3:
134     mov     '($win64?56:8)'(%rsp),%sinp    # load 7th argument
135     #shr    \%$6,$len                      # debugging artefact
136     #jz     .Lepilogue_ssse3              # debugging artefact
137     push    %rbx
138     push    %rbp
139     push    %r12
140     push    %r13
141     push    %r14
142     push    %r15
143     lea     '-104-($win64?10*16:0)'(%rsp),%rsp
144     #mov     %sin0,%sinp                  # debugging artefact
145     #lea     64(%rsp),%ctx                # debugging artefact
146
147 $code.=<<< if ($win64);
148     movaps  %xmm6,96+0(%rsp)
149     movaps  %xmm7,96+16(%rsp)
150     movaps  %xmm8,96+32(%rsp)
151     movaps  %xmm9,96+48(%rsp)
152     movaps  %xmm10,96+64(%rsp)
153     movaps  %xmm11,96+80(%rsp)
154     movaps  %xmm12,96+96(%rsp)
155     movaps  %xmm13,96+112(%rsp)
156     movaps  %xmm14,96+128(%rsp)
157     movaps  %xmm15,96+144(%rsp)
158 .Lprologue_ssse3:
159
160 $code.=<<<;
161     mov     %sin0,%r12                    # reassign arguments
162     mov     %sout,%r13
163     mov     %slen,%r14
164     mov     %skey,%r15
165     movdqu (%siv),%siv                   # load IV
166     mov     %siv,88(%rsp)                 # save $sivp
167
168 my ($sin0,%sout,%slen,%skey)=map("%r$_",(12..15)); # reassign arguments
169 my $rounds="$sivp%d";
170 $code.=<<<;
171     shl     \%$6,$len
172     sub     %sin0,%sout
173     mov     240(%skey),%rounds
174     add     %sinp,%slen                   # end of input
175
176     lea     K_XX_XX(%rip),%K_XX_XX
177     mov     0(%ctx),%A
178     mov     4(%ctx),%B
179     mov     8(%ctx),%C
180     mov     12(%ctx),%D
181     mov     %B,%T[0]
182     mov     16(%ctx),%E
183
184     movdqa  64(%K_XX_XX),@X[2]            # pbswap mask
185     movdqa  0(%K_XX_XX),@Tx[1]           # K_00_19
186     movdqu  0(%sinp),@X[-4&7]           # load input to %xmm[0-3]
187     movdqu  16(%sinp),@X[-3&7]
188     movdqu  32(%sinp),@X[-2&7]
189     movdqu  48(%sinp),@X[-1&7]
190     pshufb @X[2],@X[-4&7]                # byte swap
191     add     \%$6,%sinp
192     pshufb @X[2],@X[-3&7]
193     pshufb @X[2],@X[-2&7]

```

```

194     pshufb @X[2],@X[-1&7]
195     paddb  @Tx[1],@X[-4&7]               # add K_00_19
196     paddb  @Tx[1],@X[-3&7]
197     paddb  @Tx[1],@X[-2&7]
198     movdqa @X[-4&7],0(%rsp)              # X[]+K xfer to IALU
199     psubb  @Tx[1],@X[-4&7]              # restore X[]
200     movdqa @X[-3&7],16(%rsp)
201     psubb  @Tx[1],@X[-3&7]
202     movdqa @X[-2&7],32(%rsp)
203     psubb  @Tx[1],@X[-2&7]
204     movups (%skey),%rndkey0             # $key[0]
205     movups 16(%skey),%rndkey[0]         # forward reference
206     jmp     .Loop_ssse3
207
209 my $aesenc=sub {
210     use integer;
211     my ($n,$k)=(($r/10,$r%10));
212     if ($k==0) {
213         $code.=<<<;
214         movups '16*$n'(%sin0),%sin      # load input
215         xorps  %rndkey0,%sin
216
217         $code.=<<< if ($n);
218         movups %siv,'16*($n-1)'(%sout,%sin0) # write output
219
220         $code.=<<<;
221         xorps  %sin,%siv
222         aesenc %rndkey[0],%siv
223         movups '32+16*$k'(%skey),%rndkey[1]
224
225     } elsif ($k==9) {
226         $sn++;
227         $code.=<<<;
228         cmp     \%$11,%rounds
229         jnb     .Laesenclast$sn
230         movups  '32+16*($k+0)'(%skey),%rndkey[1]
231         aesenc  %rndkey[0],%siv
232         movups  '32+16*($k+1)'(%skey),%rndkey[0]
233         aesenc  %rndkey[1],%siv
234         je      .Laesenclast$sn
235         movups  '32+16*($k+2)'(%skey),%rndkey[1]
236         aesenc  %rndkey[0],%siv
237         movups  '32+16*($k+3)'(%skey),%rndkey[0]
238         aesenc  %rndkey[1],%siv
239     .Laesenclast$sn:
240         aesenclast %rndkey[0],%siv
241         movups  16(%skey),%rndkey[1]      # forward reference
242
243     } else {
244         $code.=<<<;
245         aesenc  %rndkey[0],%siv
246         movups  '32+16*$k'(%skey),%rndkey[1]
247
248     }
249     $r++;
250     unshift(@rndkey,pop(@rndkey));
251 };
252
253 sub Xupdate_ssse3_16_31()                # recall that $Xi starts with 4
254 { use integer;
255     my $body = shift;
256     my @insns = (&$body,&$body,&$body,&$body); # 40 instructions
257     my ($a,$b,$c,$d,$e);
258
259     &movdqa (@X[0],@X[-3&7]);
260     eval(shift(@insns));

```

```

260     eval(shift(@insns));
261     &movdqa (@Tx[0],@X[-1&7]);
262     &alignr (@X[0],@X[-4&7],8);      # compose "X[-14]" in "X[0]"
263     eval(shift(@insns));
264     eval(shift(@insns));

266     &padd    (@Tx[1],@X[-1&7]);
267     eval(shift(@insns));
268     eval(shift(@insns));
269     &psrldq (@Tx[0],4);              # "X[-3]", 3 dwords
270     eval(shift(@insns));
271     eval(shift(@insns));
272     &pxor   (@X[0],@X[-4&7]);        # "X[0]"^="X[-16]"
273     eval(shift(@insns));
274     eval(shift(@insns));

276     &pxor   (@Tx[0],@X[-2&7]);        # "X[-3]"^"X[-8]"
277     eval(shift(@insns));
278     eval(shift(@insns));
279     eval(shift(@insns));
280     eval(shift(@insns));

282     &pxor   (@X[0],@Tx[0]);          # "X[0]"^="X[-3]"^"X[-8]"
283     eval(shift(@insns));
284     eval(shift(@insns));
285     &movdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
286     eval(shift(@insns));
287     eval(shift(@insns));

289     &movdqa (@Tx[2],@X[0]);
290     &movdqa (@Tx[0],@X[0]);
291     eval(shift(@insns));
292     eval(shift(@insns));
293     eval(shift(@insns));
294     eval(shift(@insns));

296     &pslldq (@Tx[2],12);              # "X[0]"<<96, extract one dword
297     &padd    (@X[0],@X[0]);
298     eval(shift(@insns));
299     eval(shift(@insns));
300     eval(shift(@insns));
301     eval(shift(@insns));

303     &psrld  (@Tx[0],31);
304     eval(shift(@insns));
305     eval(shift(@insns));
306     &movdqa (@Tx[1],@Tx[2]);
307     eval(shift(@insns));
308     eval(shift(@insns));

310     &psrld  (@Tx[2],30);
311     &por    (@X[0],@Tx[0]);           # "X[0]"<<=1
312     eval(shift(@insns));
313     eval(shift(@insns));
314     eval(shift(@insns));
315     eval(shift(@insns));

317     &pslld  (@Tx[1],2);
318     &pxor   (@X[0],@Tx[2]);
319     eval(shift(@insns));
320     eval(shift(@insns));
321     &movdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX"); # K_XX_X
322     eval(shift(@insns));
323     eval(shift(@insns));

325     &pxor   (@X[0],@Tx[1]);          # "X[0]"^="X[0]">>96)<<2

```

```

327     foreach (@insns) { eval; }      # remaining instructions [if any]

329     $Xi++;                          # "rotate" X[]
330     push(@Tx,shift(@Tx));
331 }

333 sub Xupdate_sse3_32_79()
334 { use integer;
335   my $body = shift;
336   my @insns = (&$body,&$body,&$body,&$body); # 32 to 48 instructions
337   my ($a,$b,$c,$d,$e);

339     &movdqa (@Tx[0],@X[-1&7])        if ($Xi==8);
340     eval(shift(@insns));              # body_20_39
341     &pxor   (@X[0],@X[-4&7]);        # "X[0]"="X[-32]"^"X[-16]"
342     &alignr (@Tx[0],@X[-2&7],8);      # compose "X[-6]"
343     eval(shift(@insns));
344     eval(shift(@insns));
345     eval(shift(@insns));              # rol

347     &pxor   (@X[0],@X[-7&7]);        # "X[0]"^="X[-28]"
348     eval(shift(@insns));
349     eval(shift(@insns)) if (@insns[0] != /&ro[r]l/);
350     if ($Xi%5) {
351       &movdqa (@Tx[2],@Tx[1]); # "perpetuate" K_XX_XX...
352     } else {                          # ... or load next one
353       &movdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX");
354     }
355     &padd    (@Tx[1],@X[-1&7]);
356     eval(shift(@insns));              # ror
357     eval(shift(@insns));

359     &pxor   (@X[0],@Tx[0]);          # "X[0]"^="X[-6]"
360     eval(shift(@insns));              # body_20_39
361     eval(shift(@insns));
362     eval(shift(@insns));
363     eval(shift(@insns));              # rol

365     &movdqa (@Tx[0],@X[0]);
366     &movdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
367     eval(shift(@insns));
368     eval(shift(@insns));
369     eval(shift(@insns));              # ror
370     eval(shift(@insns));

372     &pslld  (@X[0],2);
373     eval(shift(@insns));              # body_20_39
374     eval(shift(@insns));
375     &psrld  (@Tx[0],30);
376     eval(shift(@insns));
377     eval(shift(@insns));              # rol
378     eval(shift(@insns));
379     eval(shift(@insns));
380     eval(shift(@insns));              # ror
381     eval(shift(@insns));

383     &por    (@X[0],@Tx[0]);          # "X[0]"<<=2
384     eval(shift(@insns));              # body_20_39
385     eval(shift(@insns));
386     &movdqa (@Tx[1],@X[0]) if ($Xi<19);
387     eval(shift(@insns));
388     eval(shift(@insns));              # rol
389     eval(shift(@insns));
390     eval(shift(@insns));
391     eval(shift(@insns));              # rol

```



```

392     eval(shift(@insns));
394     foreach (@insns) { eval; }      # remaining instructions
396     $Xi++;      push(@X,shift(@X));  # "rotate" X[]
397     push(@Tx,shift(@Tx));
398 }

400 sub Xuplast_ssse3_80()
401 { use integer;
402   my $body = shift;
403   my @insns = (&$body,&$body,&$body,&$body);  # 32 instructions
404   my ($a,$b,$c,$d,$e);

406   eval(shift(@insns));
407   & padd ($Tx[1],@X[-1&7]);
408   eval(shift(@insns));
409   eval(shift(@insns));
410   eval(shift(@insns));
411   eval(shift(@insns));

413   & movdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer IAL

415   foreach (@insns) { eval; }      # remaining instructions

417   & cmp ($inp,$len);
418   & je (".ldone_ssse3");

420   unshift(@Tx,pop(@Tx));

422   & movdqa (@X[2],"64($K_XX_XX)"); # pbswap mask
423   & movdqa (@Tx[1],"0($K_XX_XX)"); # K_00_19
424   & movdqu (@X[-4&7],"0($inp)");  # load input
425   & movdqu (@X[-3&7],"16($inp)");
426   & movdqu (@X[-2&7],"32($inp)");
427   & movdqu (@X[-1&7],"48($inp)");
428   & pshufb (@X[-4&7],@X[2]);      # byte swap
429   & add ($inp,64);

431   $Xi=0;
432 }

434 sub Xloop_ssse3()
435 { use integer;
436   my $body = shift;
437   my @insns = (&$body,&$body,&$body,&$body);  # 32 instructions
438   my ($a,$b,$c,$d,$e);

440   eval(shift(@insns));
441   eval(shift(@insns));
442   & pshufb (@X[($Xi-3)&7],@X[2]);
443   eval(shift(@insns));
444   eval(shift(@insns));
445   & padd ($X[($Xi-4)&7],@Tx[1]);
446   eval(shift(@insns));
447   eval(shift(@insns));
448   eval(shift(@insns));
449   eval(shift(@insns));
450   & movdqa (eval(16*$Xi)."%rsp",@X[($Xi-4)&7]); # X[]+K xfer to IALU
451   eval(shift(@insns));
452   eval(shift(@insns));
453   & psubb (@X[($Xi-4)&7],@Tx[1]);

455   foreach (@insns) { eval; }
456   $Xi++;
457 }

```

```

459 sub Xtail_ssse3()
460 { use integer;
461   my $body = shift;
462   my @insns = (&$body,&$body,&$body,&$body);  # 32 instructions
463   my ($a,$b,$c,$d,$e);

465   foreach (@insns) { eval; }
466 }

468 sub body_00_19 () {
469   use integer;
470   my ($k,$n);
471   my @r=(
472     ($a,$b,$c,$d,$e)=@V;'.
473     & add ($e,eval(4*($j&15))."%rsp");',      # X[]+K xfer
474     & xor ($c,$d);',
475     & mov (@T[1],$a);',      # $b in next round
476     & $_rol ($a,5);',
477     & and (@T[0],$c);',      # ($b&($c^$d))
478     & xor ($c,$d);',      # restore $c
479     & xor (@T[0],$d);',
480     & add ($e,$a);',
481     & $_ror ($b,$j??7:2);',      # $b>>>2
482     & add ($e,@T[0]);',      # $j++; unshift(@V,pop(@V)); unshift(@T,pop(@T))
483   );
484   $n = scalar(@r);
485   $k = (($j+1)*12/20)*20*$n/12; # 12 aesencs per these 20 rounds
486   @r[$k:$n].='&$aesenc(';      if ($j==$k/$n);
487   $j++;
488   return @r;
489 }

491 sub body_20_39 () {
492   use integer;
493   my ($k,$n);
494   my @r=(
495     ($a,$b,$c,$d,$e)=@V;'.
496     & add ($e,eval(4*($j++&15))."%rsp");',      # X[]+K xfer
497     & xor (@T[0],$d);',      # ($b^$d)
498     & mov (@T[1],$a);',      # $b in next round
499     & $_rol ($a,5);',
500     & xor (@T[0],$c);',      # ($b^$d^$c)
501     & add ($e,$a);',
502     & $_ror ($b,7);',      # $b>>>2
503     & add ($e,@T[0]);',      # unshift(@V,pop(@V)); unshift(@T,pop(@T));'
504   );
505   $n = scalar(@r);
506   $k = (($j+1)*8/20)*20*$n/8; # 8 aesencs per these 20 rounds
507   @r[$k:$n].='&$aesenc(';      if ($j==$k/$n);
508   $j++;
509   return @r;
510 }

512 sub body_40_59 () {
513   use integer;
514   my ($k,$n);
515   my @r=(
516     ($a,$b,$c,$d,$e)=@V;'.
517     & mov (@T[1],$c);',
518     & xor ($c,$d);',
519     & add ($e,eval(4*($j++&15))."%rsp");',      # X[]+K xfer
520     & and (@T[1],$d);',
521     & and (@T[0],$c);',      # ($b&($c^$d))
522     & $_ror ($b,7);',      # $b>>>2
523     & add ($e,@T[1]);',

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```

524     'mov     (@T[1], $a);', # $b in next round
525     '$_rol   ($a, 5);',
526     '&add     ($e, @T[0]);',
527     '&xor     ($c, $d);', # restore $c
528     '&add     ($e, $a);', # unshift(@V, pop(@V)); unshift(@T, pop(@T));'
529     );
530     $n = scalar(@r);
531     $k = (($j+1)*12/20)*20*$n/12; # 12 aesencs per these 20 rounds
532     @r[$k:$n] = '&aesenc();' if ($j==$k/$n);
533     $j++;
534     return @r;
535 }
536 $code.=<<__ ;
537 .align 16
538 .Loop_ssse3:
539 ____
540     &Xupdate_ssse3_16_31(\&body_00_19);
541     &Xupdate_ssse3_16_31(\&body_00_19);
542     &Xupdate_ssse3_16_31(\&body_00_19);
543     &Xupdate_ssse3_16_31(\&body_00_19);
544     &Xupdate_ssse3_32_79(\&body_00_19);
545     &Xupdate_ssse3_32_79(\&body_20_39);
546     &Xupdate_ssse3_32_79(\&body_20_39);
547     &Xupdate_ssse3_32_79(\&body_20_39);
548     &Xupdate_ssse3_32_79(\&body_20_39);
549     &Xupdate_ssse3_32_79(\&body_20_39);
550     &Xupdate_ssse3_32_79(\&body_40_59);
551     &Xupdate_ssse3_32_79(\&body_40_59);
552     &Xupdate_ssse3_32_79(\&body_40_59);
553     &Xupdate_ssse3_32_79(\&body_40_59);
554     &Xupdate_ssse3_32_79(\&body_40_59);
555     &Xupdate_ssse3_32_79(\&body_20_39);
556     &Xuplast_ssse3_80(\&body_20_39); # can jump to "done"

558     $saved_j=$j; @saved_V=@V;
559     $saved_r=$r; @saved_rndkey=@rndkey;

561     &Xloop_ssse3(\&body_20_39);
562     &Xloop_ssse3(\&body_20_39);
563     &Xloop_ssse3(\&body_20_39);

565 $code.=<<__ ;
566     movups   $iv, 48($out, $in0) # write output
567     lea      64($in0), $in0

569     add      0($ctx), $A # update context
570     add      4($ctx), @T[0]
571     add      8($ctx), $C
572     add      12($ctx), $D
573     mov      $A, 0($ctx)
574     add      16($ctx), $E
575     mov      @T[0], 4($ctx)
576     mov      @T[0], $B # magic seed
577     mov      $C, 8($ctx)
578     mov      $D, 12($ctx)
579     mov      $E, 16($ctx)
580     jmp      .Loop_ssse3

582 .align 16
583 .ldone_ssse3:
584 ____
585     $j=$j=$saved_j; @V=@saved_V;
586     $r=$saved_r; @rndkey=@saved_rndkey;

588     &Xtail_ssse3(\&body_20_39);
589     &Xtail_ssse3(\&body_20_39);

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```

590     &Xtail_ssse3(\&body_20_39);

592 $code.=<<__ ;
593     movups   $iv, 48($out, $in0) # write output
594     mov      88($rsp), $ivp # restore $ivp

596     add      0($ctx), $A # update context
597     add      4($ctx), @T[0]
598     add      8($ctx), $C
599     mov      $A, 0($ctx)
600     add      12($ctx), $D
601     mov      @T[0], 4($ctx)
602     add      16($ctx), $E
603     mov      $C, 8($ctx)
604     mov      $D, 12($ctx)
605     mov      $E, 16($ctx)
606     movups   $iv, ($ivp) # write IV
607 ____
608 $code.=<<__ if ($win64);
609     movaps   96+0($rsp), %xmm6
610     movaps   96+16($rsp), %xmm7
611     movaps   96+32($rsp), %xmm8
612     movaps   96+48($rsp), %xmm9
613     movaps   96+64($rsp), %xmm10
614     movaps   96+80($rsp), %xmm11
615     movaps   96+96($rsp), %xmm12
616     movaps   96+112($rsp), %xmm13
617     movaps   96+128($rsp), %xmm14
618     movaps   96+144($rsp), %xmm15
619 ____
620 $code.=<<__ ;
621     lea      '104+($win64?10*16:0)'($rsp), %rsi
622     mov      0($rsi), %r15
623     mov      8($rsi), %r14
624     mov      16($rsi), %r13
625     mov      24($rsi), %r12
626     mov      32($rsi), %rbp
627     mov      40($rsi), %rbx
628     lea      48($rsi), %rsp
629 .Lepilogue_ssse3:
630     ret
631 .size aesni_cbc_sha1_enc_ssse3, .-aesni_cbc_sha1_enc_ssse3
632 ____

634 $j=$j=$r=$sn=0;

636 if ($avx) {
637     my ($in0, $out, $len, $key, $ivp, $ctx, $inp) = ("%rdi", "%rsi", "%rdx", "%rcx", "%r8", "%r9"

639     my $xi=4;
640     my @X=map("%xmm$", (4..7, 0..3));
641     my @Tx=map("%xmm$", (8..10));
642     my @V=($A, $B, $C, $D, $E) = ("%eax", "%ebx", "%ecx", "%edx", "%ebp"); # size optimizat
643     my @T=("%esi", "%edi");

645     my $_rol=sub { &shld(@_[0], @_) };
646     my $_ror=sub { &shrd(@_[0], @_) };

648 $code.=<<__ ;
649 .type aesni_cbc_sha1_enc_avx, \@function, 6
650 .align 16
651 aesni_cbc_sha1_enc_avx:
652     mov      '($win64?56:8)'($rsp), $inp # load 7th argument
653     #shr     \$_6, $len # debugging artefact
654     #jz      .Lepilogue_avx # debugging artefact
655     push     %rbx

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656      push    %rbp
657      push    %r12
658      push    %r13
659      push    %r14
660      push    %r15
661      lea     '-104-(Swin64?10*16:0)'(%rsp),%rsp
662      #mov     $in0,$inp          # debugging artefact
663      #lea     64(%rsp),Sctx      # debugging artefact
664
665      $code.=<<__ if ($Swin64);
666      movaps  %xmm6,96+0(%rsp)
667      movaps  %xmm7,96+16(%rsp)
668      movaps  %xmm8,96+32(%rsp)
669      movaps  %xmm9,96+48(%rsp)
670      movaps  %xmm10,96+64(%rsp)
671      movaps  %xmm11,96+80(%rsp)
672      movaps  %xmm12,96+96(%rsp)
673      movaps  %xmm13,96+112(%rsp)
674      movaps  %xmm14,96+128(%rsp)
675      movaps  %xmm15,96+144(%rsp)
676      .Lprologue_avx:
677
678      $code.=<<__ ;
679      vzeroall
680      mov     $in0,%r12          # reassign arguments
681      mov     $out,%r13
682      mov     $len,%r14
683      mov     $key,%r15
684      vmovdqu ($ivp),Siv        # load IV
685      mov     Sivp,88(%rsp)      # save Sivp
686
687      my ($in0,$out,$len,$key)=map("%r$_",(12..15)); # reassign arguments
688      my $rounds="{ivp}d";
689      $code.=<<__ ;
690      shl     \$_,$len
691      sub     $in0,$out
692      mov     240($key),$rounds
693      add     \$_112,$key        # size optimization
694      add     $inp,$len          # end of input
695
696      lea     K_XX_XX(%rip),SK_XX_XX
697      mov     0($ctx),$A        # load context
698      mov     4($ctx),$B
699      mov     8($ctx),$C
700      mov     12($ctx),$D
701      mov     $B,@T[0]          # magic seed
702      mov     16($ctx),$E
703
704      vmovdqa 64($K_XX_XX),@X[2] # pbswap mask
705      vmovdqa 0($K_XX_XX),@Tx[1] # K_00_19
706      vmovdqu 0($inp),@X[-4&7]  # load input to %xmm[0-3]
707      vmovdqu 16($inp),@X[-3&7]
708      vmovdqu 32($inp),@X[-2&7]
709      vmovdqu 48($inp),@X[-1&7]
710      vpshufb @X[2],@X[-4&7],@X[-4&7] # byte swap
711      add     \$_64,$inp
712      vpshufb @X[2],@X[-3&7],@X[-3&7]
713      vpshufb @X[2],@X[-2&7],@X[-2&7]
714      vpshufb @X[2],@X[-1&7],@X[-1&7]
715      vpaddb  @Tx[1],@X[-4&7],@X[0]  # add K_00_19
716      vpaddb  @Tx[1],@X[-3&7],@X[1]
717      vpaddb  @Tx[1],@X[-2&7],@X[2]
718      vmovdqa @X[0],0(%rsp)          # X[]+K xfer to IALU
719      vmovdqa @X[1],16(%rsp)
720      vmovdqa @X[2],32(%rsp)
721      vmovups -112($key),$rndkey0    # $key[0]

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```

722      vmovups 16-112($key),$rndkey[0] # forward reference
723      jmp     .Loop_avx
724
725
726      my $aesenc=sub {
727      use integer;
728      my ($n,$k)=$(Sr/10,$r%10);
729      if ($k==0) {
730          $code.=<<__ ;
731          vmovups      '16*$n'($in0),$sin          # load input
732          vxorps        $rndkey0,$sin,$sin
733
734          $code.=<<__ if ($n);
735          vmovups      $iv, '16*($n-1)'($out,$in0)  # write output
736
737          $code.=<<__ ;
738          vxorps        $sin,$iv,$iv
739          vaesenc        $rndkey[0],$iv,$iv
740          vmovups        '32+16*$k-112'($key),$rndkey[1]
741
742      } elsif ($k==9) {
743          $sn++;
744          $code.=<<__ ;
745          cmp           \$_11,$rounds
746          jb             .Lvaesenclast$sn
747          vaesenc        $rndkey[0],$iv,$iv
748          vmovups        '32+16*($k+0)-112'($key),$rndkey[1]
749          vaesenc        $rndkey[1],$iv,$iv
750          vmovups        '32+16*($k+1)-112'($key),$rndkey[0]
751          je             .Lvaesenclast$sn
752          vaesenc        $rndkey[0],$iv,$iv
753          vmovups        '32+16*($k+2)-112'($key),$rndkey[1]
754          vaesenc        $rndkey[1],$iv,$iv
755          vmovups        '32+16*($k+3)-112'($key),$rndkey[0]
756      .Lvaesenclast$sn:
757          vaesenclast    $rndkey[0],$iv,$iv
758          vmovups        16-112($key),$rndkey[1]    # forward reference
759
760      } else {
761          $code.=<<__ ;
762          vaesenc        $rndkey[0],$iv,$iv
763          vmovups        '32+16*$k-112'($key),$rndkey[1]
764
765      }
766      $r++;          unshift(@rndkey,pop(@rndkey));
767      };
768
769      sub Xupdate_avx_16_31()          # recall that $Xi starts with 4
770      { use integer;
771      my $body = shift;
772      my @insns = ($body,$body,$body,$body); # 40 instructions
773      my ($a,$b,$c,$d,$e);
774
775      eval(shift(@insns));
776      eval(shift(@insns));
777      &vpalignr(@X[0],@X[-3&7],@X[-4&7],8); # compose "X[-14]" in "X[0]"
778      eval(shift(@insns));
779      eval(shift(@insns));
780
781      &vpaddb (@Tx[1],@Tx[1],@X[-1&7]);
782      eval(shift(@insns));
783      eval(shift(@insns));
784      &vpsrlq(@Tx[0],@X[-1&7],4); # "X[-3]", 3 dwords
785      eval(shift(@insns));
786      eval(shift(@insns));
787      &vpxor (@X[0],@X[0],@X[-4&7]); # "X[0]"^="X[-16]"

```

```

788     eval(shift(@insns));
789     eval(shift(@insns));

791     &vpxor (@Tx[0],@Tx[0],@X[-2&7]);      # "X[-3]^X[-8]"
792     eval(shift(@insns));
793     eval(shift(@insns));
794     eval(shift(@insns));
795     eval(shift(@insns));

797     &vpxor (@X[0],@X[0],@Tx[0]);          # "X[0]^=X[-3]^X[-8]"
798     eval(shift(@insns));
799     eval(shift(@insns));
800     &vmovdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
801     eval(shift(@insns));
802     eval(shift(@insns));

804     &vpsrld (@Tx[0],@X[0],31);
805     eval(shift(@insns));
806     eval(shift(@insns));
807     eval(shift(@insns));
808     eval(shift(@insns));

810     &vpslldq(@Tx[2],@X[0],12);            # "X[0]<<96, extract one dword"
811     &vpadd (@X[0],@X[0],@X[0]);
812     eval(shift(@insns));
813     eval(shift(@insns));
814     eval(shift(@insns));
815     eval(shift(@insns));

817     &vpsrld (@Tx[1],@Tx[2],30);
818     &vpor (@X[0],@X[0],@Tx[0]);          # "X[0]<<=1"
819     eval(shift(@insns));
820     eval(shift(@insns));
821     eval(shift(@insns));
822     eval(shift(@insns));

824     &vpslld (@Tx[2],@Tx[2],2);
825     &vpxor (@X[0],@X[0],@Tx[1]);
826     eval(shift(@insns));
827     eval(shift(@insns));
828     eval(shift(@insns));
829     eval(shift(@insns));

831     &vpxor (@X[0],@X[0],@Tx[2]);          # "X[0]^=(X[0]>>96)<<2"
832     eval(shift(@insns));
833     eval(shift(@insns));
834     &vmovdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX"); # K_XX_X
835     eval(shift(@insns));
836     eval(shift(@insns));

839     foreach (@insns) { eval; }          # remaining instructions [if any]

841     $Xi++;      push(@X,shift(@X));      # "rotate" X[]
842     push(@Tx,shift(@Tx));
843 }

845 sub Xupdate_avx_32_79()
846 { use integer;
847   my $body = shift;
848   my @insns = (&$body,&$body,&$body,&$body); # 32 to 48 instructions
849   my ($a,$b,$c,$d,$e);

851     &vpalignr(@Tx[0],@X[-1&7],@X[-2&7],8); # compose "X[-6]"
852     &vpxor (@X[0],@X[0],@X[-4&7]);          # "X[0]^=X[-32]^X[-16]"
853     eval(shift(@insns));                    # body_20_39

```

```

854     eval(shift(@insns));
855     eval(shift(@insns));
856     eval(shift(@insns));          # rol

858     &vpxor (@X[0],@X[0],@X[-7&7]);          # "X[0]^=X[-28]"
859     eval(shift(@insns));
860     eval(shift(@insns));          if (@insns[0] != /&ro[r]/);
861     if ($Xi%5) {
862       &vmovdqa (@Tx[2],@Tx[1]);# "perpetuate" K_XX_XX...
863     } else {                          # ... or load next one
864       &vmovdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX");
865     }
866     &vpadd (@Tx[1],@Tx[1],@X[-1&7]);
867     eval(shift(@insns));          # ror
868     eval(shift(@insns));

870     &vpxor (@X[0],@X[0],@Tx[0]);          # "X[0]^=X[-6]"
871     eval(shift(@insns));          # body_20_39
872     eval(shift(@insns));
873     eval(shift(@insns));
874     eval(shift(@insns));          # rol

876     &vpsrld (@Tx[0],@X[0],30);
877     &vmovdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
878     eval(shift(@insns));
879     eval(shift(@insns));
880     eval(shift(@insns));          # ror
881     eval(shift(@insns));

883     &vpslld (@X[0],@X[0],2);
884     eval(shift(@insns));          # body_20_39
885     eval(shift(@insns));
886     eval(shift(@insns));
887     eval(shift(@insns));          # rol
888     eval(shift(@insns));
889     eval(shift(@insns));
890     eval(shift(@insns));          # ror
891     eval(shift(@insns));

893     &vpor (@X[0],@X[0],@Tx[0]);          # "X[0]<<=2"
894     eval(shift(@insns));          # body_20_39
895     eval(shift(@insns));
896     &vmovdqa (@Tx[1],@X[0]) if ($Xi<19);
897     eval(shift(@insns));
898     eval(shift(@insns));          # rol
899     eval(shift(@insns));
900     eval(shift(@insns));
901     eval(shift(@insns));          # rol
902     eval(shift(@insns));

904     foreach (@insns) { eval; }          # remaining instructions

906     $Xi++;      push(@X,shift(@X));      # "rotate" X[]
907     push(@Tx,shift(@Tx));
908 }

910 sub Xuplast_avx_80()
911 { use integer;
912   my $body = shift;
913   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
914   my ($a,$b,$c,$d,$e);

916     eval(shift(@insns));
917     &vpadd (@Tx[1],@Tx[1],@X[-1&7]);
918     eval(shift(@insns));
919     eval(shift(@insns));

```

```

920     eval(shift(@insns));
921     eval(shift(@insns));

923     &movdqa      (eval(16*((&Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer IAL

925     foreach (@insns) { eval; }                # remaining instructions

927     &cmp      ($inp,$len);
928     &jc       ("Ldone_avx");

930     unshift(@Tx,pop(@Tx));

932     &movdqa(@X[2],"64($K_XX_XX)");           # pbswap mask
933     &movdqa(@Tx[1],"0($K_XX_XX)");           # K_00_19
934     &movdqu(@X[-4&7],"0($inp)");             # load input
935     &movdqu(@X[-3&7],"16($inp)");
936     &movdqu(@X[-2&7],"32($inp)");
937     &movdqu(@X[-1&7],"48($inp)");
938     &vpshufb(@X[-4&7],@X[-4&7],@X[2]);       # byte swap
939     &add      ($inp,64);

941     $Xi=0;
942 }

944 sub Xloop_avx()
945 { use integer;
946   my $body = shift;
947   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
948   my ($a,$b,$c,$d,$e);

950     eval(shift(@insns));
951     eval(shift(@insns));
952     &vpshufb(@X[($Xi-3)&7],@X[($Xi-3)&7],@X[2]);
953     eval(shift(@insns));
954     eval(shift(@insns));
955     &vpaddq (@X[$Xi&7],@X[($Xi-4)&7],@Tx[1]);
956     eval(shift(@insns));
957     eval(shift(@insns));
958     eval(shift(@insns));
959     eval(shift(@insns));
960     &movdqa(eval(16*$Xi)."%rsp",@X[$Xi&7]); # X[]+K xfer to IALU
961     eval(shift(@insns));
962     eval(shift(@insns));

964     foreach (@insns) { eval; }
965     $Xi++;
966 }

968 sub Xtail_avx()
969 { use integer;
970   my $body = shift;
971   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
972   my ($a,$b,$c,$d,$e);

974     foreach (@insns) { eval; }
975 }

977 $code.=<<__ ;
978 .align 16
979 .Loop_avx:
980 ____
981     &Xupdate_avx_16_31(\&body_00_19);
982     &Xupdate_avx_16_31(\&body_00_19);
983     &Xupdate_avx_16_31(\&body_00_19);
984     &Xupdate_avx_16_31(\&body_00_19);
985     &Xupdate_avx_32_79(\&body_00_19);

```

```

986     &Xupdate_avx_32_79(\&body_20_39);
987     &Xupdate_avx_32_79(\&body_20_39);
988     &Xupdate_avx_32_79(\&body_20_39);
989     &Xupdate_avx_32_79(\&body_20_39);
990     &Xupdate_avx_32_79(\&body_20_39);
991     &Xupdate_avx_32_79(\&body_40_59);
992     &Xupdate_avx_32_79(\&body_40_59);
993     &Xupdate_avx_32_79(\&body_40_59);
994     &Xupdate_avx_32_79(\&body_40_59);
995     &Xupdate_avx_32_79(\&body_40_59);
996     &Xupdate_avx_32_79(\&body_20_39);
997     &Xuplast_avx_80(\&body_20_39); # can jump to "done"

999     $saved_j=$j; @saved_V=@V;
1000    $saved_r=$r; @saved_rndkey=@rndkey;

1002    &Xloop_avx(\&body_20_39);
1003    &Xloop_avx(\&body_20_39);
1004    &Xloop_avx(\&body_20_39);

1006 $code.=<<__ ;
1007 vmovups $iv,48($out,$inp)           # write output
1008 lea     64($inp),$inp

1010     add     0($ctx),$A               # update context
1011     add     4($ctx),@T[0]
1012     add     8($ctx),$C
1013     add     12($ctx),$D
1014     mov     $A,0($ctx)
1015     add     16($ctx),$E
1016     mov     @T[0],4($ctx)
1017     mov     @T[0],$B                 # magic seed
1018     mov     $C,8($ctx)
1019     mov     $D,12($ctx)
1020     mov     $E,16($ctx)
1021     jmp     .Loop_avx

1023 .align 16
1024 .Ldone_avx:
1025 ____
1026     $jj=$j=$saved_j; @V=@saved_V;
1027     $r=$saved_r; @rndkey=@saved_rndkey;

1029     &Xtail_avx(\&body_20_39);
1030     &Xtail_avx(\&body_20_39);
1031     &Xtail_avx(\&body_20_39);

1033 $code.=<<__ ;
1034 vmovups $iv,48($out,$inp)           # write output
1035 mov     88(%rsp),$iv                # restore $iv

1037     add     0($ctx),$A               # update context
1038     add     4($ctx),@T[0]
1039     add     8($ctx),$C
1040     mov     $A,0($ctx)
1041     add     12($ctx),$D
1042     mov     @T[0],4($ctx)
1043     add     16($ctx),$E
1044     mov     $C,8($ctx)
1045     mov     $D,12($ctx)
1046     mov     $E,16($ctx)
1047     vmovups $iv,($iv)               # write IV
1048     vzeroall
1049 ____
1050 $code.=<<__ if ($win64);
1051 movaps  96+0(%rsp),%xmm6

```

```

1052 movaps 96+16(%rsp),%xmm7
1053 movaps 96+32(%rsp),%xmm8
1054 movaps 96+48(%rsp),%xmm9
1055 movaps 96+64(%rsp),%xmm10
1056 movaps 96+80(%rsp),%xmm11
1057 movaps 96+96(%rsp),%xmm12
1058 movaps 96+112(%rsp),%xmm13
1059 movaps 96+128(%rsp),%xmm14
1060 movaps 96+144(%rsp),%xmm15
1061 ____
1062 $code.=<<____;
1063 lea '104+(%win64?10*16:0)'(%rsp),%rsi
1064 mov 0(%rsi),%r15
1065 mov 8(%rsi),%r14
1066 mov 16(%rsi),%r13
1067 mov 24(%rsi),%r12
1068 mov 32(%rsi),%rbp
1069 mov 40(%rsi),%rbx
1070 lea 48(%rsi),%rsp
1071 .Lepilogue_avx:
1072 ret
1073 .size aesni_cbc_sha1_enc_avx,.-aesni_cbc_sha1_enc_avx
1074 ____
1075 }
1076 $code.=<<____;
1077 .align 64
1078 K_XX_XX:
1079 .long 0x5a827999,0x5a827999,0x5a827999,0x5a827999 # K_00_19
1080 .long 0x6ed9eba1,0x6ed9eba1,0x6ed9eba1,0x6ed9eba1 # K_20_39
1081 .long 0x8f1bbcdc,0x8f1bbcdc,0x8f1bbcdc,0x8f1bbcdc # K_40_59
1082 .long 0xca62c1d6,0xca62c1d6,0xca62c1d6,0xca62c1d6 # K_60_79
1083 .long 0x00010203,0x04050607,0x08090a0b,0x0c0d0e0f # pbswap mask

1085 .asciz "AESNI-CBC+SHA1 stitch for x86_64, CRYPTOGRAMS by <appro@openssl.org>"
1086 .align 64
1087 ____

1089 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
1090 # CONTEXT *context,DISPATCHER_CONTEXT *disp)
1091 if ($win64) {
1092 $rec="%rcx";
1093 $frame="%rdx";
1094 $context="%r8";
1095 $disp="%r9";

1097 $code.=<<____;
1098 .extern __imp_RtlVirtualUnwind
1099 .type ssse3_handler,@abi-omnipotent
1100 .align 16
1101 ssse3_handler:
1102 push %rsi
1103 push %rdi
1104 push %rbx
1105 push %rbp
1106 push %r12
1107 push %r13
1108 push %r14
1109 push %r15
1110 pushfq
1111 sub \ $64,%rsp

1113 mov 120($context),%rax # pull context->Rax
1114 mov 248($context),%rbx # pull context->Rip

1116 mov 8($disp),%rsi # disp->ImageBase
1117 mov 56($disp),%r11 # disp->HandlerData

```

```

1119 mov 0(%r11),%r10d # HandlerData[0]
1120 lea (%rsi,%r10),%r10 # prologue label
1121 cmp %r10,%rbx # context->Rip<prologue label
1122 jb .Lcommon_seh_tail

1124 mov 152($context),%rax # pull context->Rsp

1126 mov 4(%r11),%r10d # HandlerData[1]
1127 lea (%rsi,%r10),%r10 # epilogue label
1128 cmp %r10,%rbx # context->Rip>=epilogue label
1129 jae .Lcommon_seh_tail

1131 lea 96(%rax),%rsi
1132 lea 512($context),%rdi # &context.Xmm6
1133 mov \ $20,%ecx
1134 .long 0xa548f3fc # cld; rep movsq
1135 lea '104+10*16'(%rax),%rax # adjust stack pointer

1137 mov 0(%rax),%r15
1138 mov 8(%rax),%r14
1139 mov 16(%rax),%r13
1140 mov 24(%rax),%r12
1141 mov 32(%rax),%rbp
1142 mov 40(%rax),%rbx
1143 lea 48(%rax),%rax
1144 mov %rbx,144($context) # restore context->Rbx
1145 mov %rbp,160($context) # restore context->Rbp
1146 mov %r12,216($context) # restore context->R12
1147 mov %r13,224($context) # restore context->R13
1148 mov %r14,232($context) # restore context->R14
1149 mov %r15,240($context) # restore context->R15

1151 .Lcommon_seh_tail:
1152 mov 8(%rax),%rdi
1153 mov 16(%rax),%rsi
1154 mov %rax,152($context) # restore context->Rsp
1155 mov %rsi,168($context) # restore context->Rsi
1156 mov %rdi,176($context) # restore context->Rdi

1158 mov 40($disp),%rdi # disp->ContextRecord
1159 mov $context,%rsi # context
1160 mov \ $154,%ecx # sizeof(CONTEXT)
1161 .long 0xa548f3fc # cld; rep movsq

1163 mov $disp,%rsi
1164 xor %rcx,%rcx # arg1, UNW_FLAG_NHANDLER
1165 mov 8(%rsi),%rdx # arg2, disp->ImageBase
1166 mov 0(%rsi),%r8 # arg3, disp->ControlPc
1167 mov 16(%rsi),%r9 # arg4, disp->FunctionEntry
1168 mov 40(%rsi),%r10 # disp->ContextRecord
1169 lea 56(%rsi),%r11 # &disp->HandlerData
1170 lea 24(%rsi),%r12 # &disp->EstablisherFrame
1171 mov %r10,32(%rsp) # arg5
1172 mov %r11,40(%rsp) # arg6
1173 mov %r12,48(%rsp) # arg7
1174 mov %rcx,56(%rsp) # arg8, (NULL)
1175 call *__imp_RtlVirtualUnwind(%rip)

1177 mov \ $1,%eax # ExceptionContinueSearch
1178 add \ $64,%rsp
1179 popfq
1180 pop %r15
1181 pop %r14
1182 pop %r13
1183 pop %r12

```

```

1184     pop    %rbp
1185     pop    %rbx
1186     pop    %rdi
1187     pop    %rsi
1188     ret
1189 .size    ssse3_handler, .-ssse3_handler

1191 .section    .pdata
1192 .align    4
1193     .rva    .LSEH_begin_aesni_cbc_sha1_enc_ssse3
1194     .rva    .LSEH_end_aesni_cbc_sha1_enc_ssse3
1195     .rva    .LSEH_info_aesni_cbc_sha1_enc_ssse3
1196
1197 $code.=<< if ($avx);
1198     .rva    .LSEH_begin_aesni_cbc_sha1_enc_avx
1199     .rva    .LSEH_end_aesni_cbc_sha1_enc_avx
1200     .rva    .LSEH_info_aesni_cbc_sha1_enc_avx
1201
1202 $code.=<<___;
1203 .section    .xdata
1204 .align    8
1205 .LSEH_info_aesni_cbc_sha1_enc_ssse3:
1206     .byte    9,0,0,0
1207     .rva    ssse3_handler
1208     .rva    .Lprologue_ssse3, .Lepilogue_ssse3    # HandlerData[]
1209
1210 $code.=<<___ if ($avx);
1211 .LSEH_info_aesni_cbc_sha1_enc_avx:
1212     .byte    9,0,0,0
1213     .rva    ssse3_handler
1214     .rva    .Lprologue_avx, .Lepilogue_avx    # HandlerData[]
1215
1216 }

1218 #####
1219 sub rex {
1220     local *opcode=shift;
1221     my ($dst,$src)=@_;
1222     my $rex=0;

1224     $rex|=0x04                if($dst>=8);
1225     $rex|=0x01                if($src>=8);
1226     push @opcode,$rex|0x40    if($rex);
1227 }

1229 sub aesni {
1230     my $line=shift;
1231     my @opcode=(0x66);

1233     if ($line=~/(aes[a-z]+\s+%xmm([0-9]+),\s+%xmm([0-9]+))/) {
1234         my %opcodelet = (
1235             "aesenc" => 0xdc,        "aesenc1ast" => 0xdd
1236         );
1237         return undef if (!defined($opcodelet{$1}));
1238         rex(\@opcode,$3,$2);
1239         push @opcode,0x0f,0x38,$opcodelet{$1};
1240         push @opcode,0xc0|($2&7)|(($3&7)<3);    # ModR/M
1241         return ".byte\t".join(' ',@opcode);
1242     }
1243     return $line;
1244 }

1246 $code =~ s/\s+'([^\']*')\s'/eval($1)/gem;
1247 $code =~ s/\s+b(aes.*%xmm[0-9]+).*/$aesni($1)/gem;

1249 print $code;

```

```

1250 close STDOUT;

```



```

93 # Inline version of internal aesni_[en|de]crypt1
94 { my $sn;
95 sub aesni_inline_generate1
96 { my ($p,$inout,$ivec)=@_; $inout=$inout0 if (!defined($inout));
97   $sn++;

99   &$movekey      ($rndkey0,&QWP(0,$key));
100  &$movekey      ($rndkey1,&QWP(16,$key));
101  &xorps          ($ivec,$rndkey0)      if (defined($ivec));
102  &lea            ($key,&DWP(32,$key));
103  &xorps          ($inout,$ivec)        if (defined($ivec));
104  &xorps          ($inout,$rndkey0)     if (!defined($ivec));
105  &set_label("$p1_loop_$sn");
106  eval"&aes${p}" ($inout,$rndkey1);
107  &dec            ($rounds);
108  &$movekey      ($rndkey1,&QWP(0,$key));
109  &lea            ($key,&DWP(16,$key));
110  &jnz            (&label("$p1_loop_$sn"));
111  eval"&aes${p}last" ($inout,$rndkey1);
112 }}

```

```

114 sub aesni_generate1      # fully unrolled loop
115 { my ($p,$inout)=@_; $inout=$inout0 if (!defined($inout));

```

```

117   &function_begin_B("_aesni_${p}rpt1");
118   &movups        ($rndkey0,&QWP(0,$key));
119   &$movekey      ($rndkey1,&QWP(0x10,$key));
120   &xorps          ($inout,$rndkey0);
121   &$movekey      ($rndkey0,&QWP(0x20,$key));
122   &lea            ($key,&DWP(0x30,$key));
123   &cmp            ($rounds,11);
124   &jb             (&label("$p128"));
125   &lea            ($key,&DWP(0x20,$key));
126   &jc             (&label("$p192"));
127   &lea            ($key,&DWP(0x20,$key));
128   eval"&aes${p}" ($inout,$rndkey1);
129   &$movekey      ($rndkey1,&QWP(-0x40,$key));
130   eval"&aes${p}" ($inout,$rndkey0);
131   &$movekey      ($rndkey0,&QWP(-0x30,$key));
132   &set_label("$p192");
133   eval"&aes${p}" ($inout,$rndkey1);
134   &$movekey      ($rndkey1,&QWP(-0x20,$key));
135   eval"&aes${p}" ($inout,$rndkey0);
136   &$movekey      ($rndkey0,&QWP(-0x10,$key));
137   &set_label("$p128");
138   eval"&aes${p}" ($inout,$rndkey1);
139   &$movekey      ($rndkey1,&QWP(0,$key));
140   eval"&aes${p}" ($inout,$rndkey0);
141   &$movekey      ($rndkey0,&QWP(0x10,$key));
142   eval"&aes${p}" ($inout,$rndkey1);
143   &$movekey      ($rndkey1,&QWP(0x20,$key));
144   eval"&aes${p}" ($inout,$rndkey0);
145   &$movekey      ($rndkey0,&QWP(0x30,$key));
146   eval"&aes${p}" ($inout,$rndkey1);
147   &$movekey      ($rndkey1,&QWP(0x40,$key));
148   eval"&aes${p}" ($inout,$rndkey0);
149   &$movekey      ($rndkey0,&QWP(0x50,$key));
150   eval"&aes${p}" ($inout,$rndkey1);
151   &$movekey      ($rndkey1,&QWP(0x60,$key));
152   eval"&aes${p}" ($inout,$rndkey0);
153   &$movekey      ($rndkey0,&QWP(0x70,$key));
154   eval"&aes${p}" ($inout,$rndkey1);
155   eval"&aes${p}last" ($inout,$rndkey0);
156   &ret();
157   &function_end_B("_aesni_${p}rpt1");
158 }

```

```

159 # void $PREFIX_encrypt (const void *inp,void *out,const AES_KEY *key);
160 &aesni_generate1("enc") if (!$inline);
161 &function_begin_B("${PREFIX}_encrypt");
162     &mov     ("eax",&wparam(0));
163     &mov     ($key,&wparam(2));
164     &movups  ($inout0,&QWP(0,"eax"));
165     &mov     ($rounds,&DWP(240,$key));
166     &mov     ("eax",&wparam(1));
167     if ($inline)
168     { &aesni_inline_generate1("enc"); }
169     else
170     { &call    ("_aesni_encrypt1"); }
171     &movups  ($inout0,&QWP(0,"eax"),$inout0);
172     &ret     ();
173 &function_end_B("${PREFIX}_encrypt");

175 # void $PREFIX_decrypt (const void *inp,void *out,const AES_KEY *key);
176 &aesni_generate1("dec") if (!$inline);
177 &function_begin_B("${PREFIX}_decrypt");
178     &mov     ("eax",&wparam(0));
179     &mov     ($key,&wparam(2));
180     &movups  ($inout0,&QWP(0,"eax"));
181     &mov     ($rounds,&DWP(240,$key));
182     &mov     ("eax",&wparam(1));
183     if ($inline)
184     { &aesni_inline_generate1("dec"); }
185     else
186     { &call    ("_aesni_decrypt1"); }
187     &movups  ($inout0,&QWP(0,"eax"),$inout0);
188     &ret     ();
189 &function_end_B("${PREFIX}_decrypt");

191 # _aesni_[en|de]cryptN are private interfaces, N denotes interleave
192 # factor. Why 3x subroutine were originally used in loops? Even though
193 # aes[enc|dec] latency was originally 6, it could be scheduled only
194 # every *2nd* cycle. Thus 3x interleave was the one providing optimal
195 # utilization, i.e. when subroutine's throughput is virtually same as
196 # of non-interleaved subroutine [for number of input blocks up to 3].
197 # This is why it makes no sense to implement 2x subroutine.
198 # aes[enc|dec] latency in next processor generation is 8, but the
199 # instructions can be scheduled every cycle. Optimal interleave for
200 # new processor is therefore 8x, but it's unfeasible to accommodate it
201 # in XMM registers addressable in 32-bit mode and therefore 6x is
202 # used instead...

204 sub aesni_generate3
205 { my $p=shift;

207     &function_begin_B("_aesni_${p}rypt3");
208     &$movekey ($rndkey0,&QWP(0,$key));
209     &shr      ($rounds,1);
210     &$movekey ($rndkey1,&QWP(16,$key));
211     &lea      ($key,&DWP(32,$key));
212     &xorps    ($inout0,$rndkey0);
213     &pxor     ($inout1,$rndkey0);
214     &pxor     ($inout2,$rndkey0);
215     &$movekey ($rndkey0,&QWP(0,$key));

217     &set_label("${p}3_loop");
218     eval"&aes${p}" ($inout0,$rndkey1);
219     eval"&aes${p}" ($inout1,$rndkey1);
220     &dec      ($rounds);
221     eval"&aes${p}" ($inout2,$rndkey1);
222     &$movekey ($rndkey1,&QWP(16,$key));
223     eval"&aes${p}" ($inout0,$rndkey0);
224     eval"&aes${p}" ($inout1,$rndkey0);

```

```

225     &lea      ($key,&DWP(32,$key));
226     eval"&aes${p}" ($inout2,$rndkey0);
227     &$movekey ($rndkey0,&QWP(0,$key));
228     &jnz      (&label("${p}3_loop"));
229     eval"&aes${p}" ($inout0,$rndkey1);
230     eval"&aes${p}" ($inout1,$rndkey1);
231     eval"&aes${p}" ($inout2,$rndkey1);
232     eval"&aes${p}last" ($inout0,$rndkey0);
233     eval"&aes${p}last" ($inout1,$rndkey0);
234     eval"&aes${p}last" ($inout2,$rndkey0);
235     &ret     ();
236     &function_end_B("_aesni_${p}rypt3");
237 }

239 # 4x interleave is implemented to improve small block performance,
240 # most notably [and naturally] 4 block by ~30%. One can argue that one
241 # should have implemented 5x as well, but improvement would be <20%,
242 # so it's not worth it...
243 sub aesni_generate4
244 { my $p=shift;

246     &function_begin_B("_aesni_${p}rypt4");
247     &$movekey ($rndkey0,&QWP(0,$key));
248     &$movekey ($rndkey1,&QWP(16,$key));
249     &shr      ($rounds,1);
250     &lea      ($key,&DWP(32,$key));
251     &xorps    ($inout0,$rndkey0);
252     &pxor     ($inout1,$rndkey0);
253     &pxor     ($inout2,$rndkey0);
254     &pxor     ($inout3,$rndkey0);
255     &$movekey ($rndkey0,&QWP(0,$key));

257     &set_label("${p}4_loop");
258     eval"&aes${p}" ($inout0,$rndkey1);
259     eval"&aes${p}" ($inout1,$rndkey1);
260     &dec      ($rounds);
261     eval"&aes${p}" ($inout2,$rndkey1);
262     eval"&aes${p}" ($inout3,$rndkey1);
263     &$movekey ($rndkey1,&QWP(16,$key));
264     eval"&aes${p}" ($inout0,$rndkey0);
265     eval"&aes${p}" ($inout1,$rndkey0);
266     &lea      ($key,&DWP(32,$key));
267     eval"&aes${p}" ($inout2,$rndkey0);
268     eval"&aes${p}" ($inout3,$rndkey0);
269     &$movekey ($rndkey0,&QWP(0,$key));
270     &jnz      (&label("${p}4_loop"));

272     eval"&aes${p}" ($inout0,$rndkey1);
273     eval"&aes${p}" ($inout1,$rndkey1);
274     eval"&aes${p}" ($inout2,$rndkey1);
275     eval"&aes${p}" ($inout3,$rndkey1);
276     eval"&aes${p}last" ($inout0,$rndkey0);
277     eval"&aes${p}last" ($inout1,$rndkey0);
278     eval"&aes${p}last" ($inout2,$rndkey0);
279     eval"&aes${p}last" ($inout3,$rndkey0);
280     &ret     ();
281     &function_end_B("_aesni_${p}rypt4");
282 }

284 sub aesni_generate6
285 { my $p=shift;

287     &function_begin_B("_aesni_${p}rypt6");
288     &static_label("_aesni_${p}rypt6_enter");
289     &$movekey ($rndkey0,&QWP(0,$key));
290     &shr      ($rounds,1);

```

```

291     &$movekey      ($rndkey1,&QWP(16,$key));
292     &lea            ($key,&DWP(32,$key));
293     &xorps           ($inout0,$rndkey0);
294     &pxor           ($inout1,$rndkey0);      # pxor does better here
295     eval"&aes${p}   ($inout0,$rndkey1)";
296     &pxor           ($inout2,$rndkey0);
297     eval"&aes${p}   ($inout1,$rndkey1)";
298     &pxor           ($inout3,$rndkey0);
299     &dec            ($rounds);
300     eval"&aes${p}   ($inout2,$rndkey1)";
301     &pxor           ($inout4,$rndkey0);
302     eval"&aes${p}   ($inout3,$rndkey1)";
303     &pxor           ($inout5,$rndkey0);
304     eval"&aes${p}   ($inout4,$rndkey1)";
305     &$movekey      ($rndkey0,&QWP(0,$key));
306     eval"&aes${p}   ($inout5,$rndkey1)";
307     &jmp            (&label("_aesni_${p}rypt6_enter"));

309     &set_label("$p6_loop",16);
310     eval"&aes${p}   ($inout0,$rndkey1)";
311     eval"&aes${p}   ($inout1,$rndkey1)";
312     &dec            ($rounds);
313     eval"&aes${p}   ($inout2,$rndkey1)";
314     eval"&aes${p}   ($inout3,$rndkey1)";
315     eval"&aes${p}   ($inout4,$rndkey1)";
316     eval"&aes${p}   ($inout5,$rndkey1)";
317     &set_label("_aesni_${p}rypt6_enter",16);
318     &$movekey      ($rndkey1,&QWP(16,$key));
319     eval"&aes${p}   ($inout0,$rndkey0)";
320     eval"&aes${p}   ($inout1,$rndkey0)";
321     &lea            ($key,&DWP(32,$key));
322     eval"&aes${p}   ($inout2,$rndkey0)";
323     eval"&aes${p}   ($inout3,$rndkey0)";
324     eval"&aes${p}   ($inout4,$rndkey0)";
325     eval"&aes${p}   ($inout5,$rndkey0)";
326     &$movekey      ($rndkey0,&QWP(0,$key));
327     &jnz            (&label("$p6_loop"));

329     eval"&aes${p}   ($inout0,$rndkey1)";
330     eval"&aes${p}   ($inout1,$rndkey1)";
331     eval"&aes${p}   ($inout2,$rndkey1)";
332     eval"&aes${p}   ($inout3,$rndkey1)";
333     eval"&aes${p}   ($inout4,$rndkey1)";
334     eval"&aes${p}   ($inout5,$rndkey1)";
335     eval"&aes${p}last ($inout0,$rndkey0)";
336     eval"&aes${p}last ($inout1,$rndkey0)";
337     eval"&aes${p}last ($inout2,$rndkey0)";
338     eval"&aes${p}last ($inout3,$rndkey0)";
339     eval"&aes${p}last ($inout4,$rndkey0)";
340     eval"&aes${p}last ($inout5,$rndkey0)";
341     &ret();
342     &function_end_B("_aesni_${p}rypt6");
343 }
344 &aesni_generate3("enc") if ($PREFIX eq "aesni");
345 &aesni_generate3("dec");
346 &aesni_generate4("enc") if ($PREFIX eq "aesni");
347 &aesni_generate4("dec");
348 &aesni_generate6("enc") if ($PREFIX eq "aesni");
349 &aesni_generate6("dec");

```

```

350 if ($PREFIX eq "aesni") {
351 #####
352 # void aesni_ecb_encrypt (const void *in, void *out,
353 #                          size_t length, const AES_KEY *key,
354 #                          int enc);
355 &function_begin("aesni_ecb_encrypt");
356     &mov            ($inp,&wparam(0));
357     &mov            ($out,&wparam(1));
358     &mov            ($len,&wparam(2));
359     &mov            ($key,&wparam(3));
360     &mov            ($rounds,&wparam(4));
361     &and            ($len,-16);
362     &jz             (&label("ecb_ret"));
363     &mov            ($rounds,&DWP(240,$key));
364     &test           ($rounds,$rounds);
365     &jz             (&label("ecb_decrypt"));

367     &mov            ($key_,$key);      # backup $key
368     &mov            ($rounds_,$rounds); # backup $rounds
369     &cmp            ($len,0x60);
370     &jb             (&label("ecb_enc_tail"));

372     &movdqu         ($inout0,&QWP(0,$inp));
373     &movdqu         ($inout1,&QWP(0x10,$inp));
374     &movdqu         ($inout2,&QWP(0x20,$inp));
375     &movdqu         ($inout3,&QWP(0x30,$inp));
376     &movdqu         ($inout4,&QWP(0x40,$inp));
377     &movdqu         ($inout5,&QWP(0x50,$inp));
378     &lea            ($inp,&DWP(0x60,$inp));
379     &sub            ($len,0x60);
380     &jmp            (&label("ecb_enc_loop6_enter"));

382 &set_label("ecb_enc_loop6",16);
383     &movups         (&QWP(0,$out),$inout0);
384     &movdqu         ($inout0,&QWP(0,$inp));
385     &movups         (&QWP(0x10,$out),$inout1);
386     &movdqu         ($inout1,&QWP(0x10,$inp));
387     &movups         (&QWP(0x20,$out),$inout2);
388     &movdqu         ($inout2,&QWP(0x20,$inp));
389     &movups         (&QWP(0x30,$out),$inout3);
390     &movdqu         ($inout3,&QWP(0x30,$inp));
391     &movups         (&QWP(0x40,$out),$inout4);
392     &movdqu         ($inout4,&QWP(0x40,$inp));
393     &movups         (&QWP(0x50,$out),$inout5);
394     &lea            ($out,&DWP(0x60,$out));
395     &movdqu         ($inout5,&QWP(0x50,$inp));
396     &lea            ($inp,&DWP(0x60,$inp));
397 &set_label("ecb_enc_loop6_enter");

399     &call           ("_aesni_encrypt6");

401     &mov            ($key,$key_);      # restore $key
402     &mov            ($rounds,$rounds_); # restore $rounds
403     &sub            ($len,0x60);
404     &jnc            (&label("ecb_enc_loop6"));

406     &movups         (&QWP(0,$out),$inout0);
407     &movups         (&QWP(0x10,$out),$inout1);
408     &movups         (&QWP(0x20,$out),$inout2);
409     &movups         (&QWP(0x30,$out),$inout3);
410     &movups         (&QWP(0x40,$out),$inout4);
411     &movups         (&QWP(0x50,$out),$inout5);
412     &lea            ($out,&DWP(0x60,$out));
413     &add            ($len,0x60);
414     &jz             (&label("ecb_ret"));

```

```

416 &set_label("ecb_enc_tail");
417     &movups ($inout0, &QWP(0, $inp));
418     &cmp ($len, 0x20);
419     &jb (&label("ecb_enc_one"));
420     &movups ($inout1, &QWP(0x10, $inp));
421     &je (&label("ecb_enc_two"));
422     &movups ($inout2, &QWP(0x20, $inp));
423     &cmp ($len, 0x40);
424     &jb (&label("ecb_enc_three"));
425     &movups ($inout3, &QWP(0x30, $inp));
426     &je (&label("ecb_enc_four"));
427     &movups ($inout4, &QWP(0x40, $inp));
428     &xorps ($inout5, $inout5);
429     &call ("_aesni_encrypt6");
430     &movups (&QWP(0, $out), $inout0);
431     &movups (&QWP(0x10, $out), $inout1);
432     &movups (&QWP(0x20, $out), $inout2);
433     &movups (&QWP(0x30, $out), $inout3);
434     &movups (&QWP(0x40, $out), $inout4);
435     jmp (&label("ecb_ret"));

437 &set_label("ecb_enc_one", 16);
438     if ($inline)
439     { &aesni_inline_generate1("enc"); }
440     else
441     { &call ("_aesni_encrypt1"); }
442     &movups (&QWP(0, $out), $inout0);
443     &jmp (&label("ecb_ret"));

445 &set_label("ecb_enc_two", 16);
446     &xorps ($inout2, $inout2);
447     &call ("_aesni_encrypt3");
448     &movups (&QWP(0, $out), $inout0);
449     &movups (&QWP(0x10, $out), $inout1);
450     &jmp (&label("ecb_ret"));

452 &set_label("ecb_enc_three", 16);
453     &call ("_aesni_encrypt3");
454     &movups (&QWP(0, $out), $inout0);
455     &movups (&QWP(0x10, $out), $inout1);
456     &movups (&QWP(0x20, $out), $inout2);
457     &jmp (&label("ecb_ret"));

459 &set_label("ecb_enc_four", 16);
460     &call ("_aesni_encrypt4");
461     &movups (&QWP(0, $out), $inout0);
462     &movups (&QWP(0x10, $out), $inout1);
463     &movups (&QWP(0x20, $out), $inout2);
464     &movups (&QWP(0x30, $out), $inout3);
465     &jmp (&label("ecb_ret"));
466 #####
467 &set_label("ecb_decrypt", 16);
468     &mov ($key_, $key); # backup $key
469     &mov ($rounds_, $rounds); # backup $rounds
470     &cmp ($len, 0x60);
471     &jb (&label("ecb_dec_tail"));

473     &movdqu ($inout0, &QWP(0, $inp));
474     &movdqu ($inout1, &QWP(0x10, $inp));
475     &movdqu ($inout2, &QWP(0x20, $inp));
476     &movdqu ($inout3, &QWP(0x30, $inp));
477     &movdqu ($inout4, &QWP(0x40, $inp));
478     &movdqu ($inout5, &QWP(0x50, $inp));
479     &lea ($inp, &DWP(0x60, $inp));
480     &sub ($len, 0x60);
481     &jmp (&label("ecb_dec_loop6_enter"));

```

```

483 &set_label("ecb_dec_loop6", 16);
484     &movups (&QWP(0, $out), $inout0);
485     &movdqu ($inout0, &QWP(0, $inp));
486     &movups (&QWP(0x10, $out), $inout1);
487     &movdqu ($inout1, &QWP(0x10, $inp));
488     &movups (&QWP(0x20, $out), $inout2);
489     &movdqu ($inout2, &QWP(0x20, $inp));
490     &movups (&QWP(0x30, $out), $inout3);
491     &movdqu ($inout3, &QWP(0x30, $inp));
492     &movups (&QWP(0x40, $out), $inout4);
493     &movdqu ($inout4, &QWP(0x40, $inp));
494     &movups (&QWP(0x50, $out), $inout5);
495     &lea ($out, &DWP(0x60, $out));
496     &movdqu ($inout5, &QWP(0x50, $inp));
497     &lea ($inp, &DWP(0x60, $inp));
498 &set_label("ecb_dec_loop6_enter");

500     &call ("_aesni_decrypt6");

502     &mov ($key, $key_); # restore $key
503     &mov ($rounds, $rounds_); # restore $rounds
504     &sub ($len, 0x60);
505     &jnc (&label("ecb_dec_loop6"));

507     &movups (&QWP(0, $out), $inout0);
508     &movups (&QWP(0x10, $out), $inout1);
509     &movups (&QWP(0x20, $out), $inout2);
510     &movups (&QWP(0x30, $out), $inout3);
511     &movups (&QWP(0x40, $out), $inout4);
512     &movups (&QWP(0x50, $out), $inout5);
513     &lea ($out, &DWP(0x60, $out));
514     &add ($len, 0x60);
515     &jz (&label("ecb_ret"));

517 &set_label("ecb_dec_tail");
518     &movups ($inout0, &QWP(0, $inp));
519     &cmp ($len, 0x20);
520     &jb (&label("ecb_dec_one"));
521     &movups ($inout1, &QWP(0x10, $inp));
522     &je (&label("ecb_dec_two"));
523     &movups ($inout2, &QWP(0x20, $inp));
524     &cmp ($len, 0x40);
525     &jb (&label("ecb_dec_three"));
526     &movups ($inout3, &QWP(0x30, $inp));
527     &je (&label("ecb_dec_four"));
528     &movups ($inout4, &QWP(0x40, $inp));
529     &xorps ($inout5, $inout5);
530     &call ("_aesni_decrypt6");
531     &movups (&QWP(0, $out), $inout0);
532     &movups (&QWP(0x10, $out), $inout1);
533     &movups (&QWP(0x20, $out), $inout2);
534     &movups (&QWP(0x30, $out), $inout3);
535     &movups (&QWP(0x40, $out), $inout4);
536     &jmp (&label("ecb_ret"));

538 &set_label("ecb_dec_one", 16);
539     if ($inline)
540     { &aesni_inline_generate1("dec"); }
541     else
542     { &call ("_aesni_decrypt1"); }
543     &movups (&QWP(0, $out), $inout0);
544     &jmp (&label("ecb_ret"));

546 &set_label("ecb_dec_two", 16);
547     &xorps ($inout2, $inout2);

```

```

548      &call      ("_aesni_decrypt3");
549      &movups    (&QWP(0,$out),$inout0);
550      &movups    (&QWP(0x10,$out),$inout1);
551      &jmp       (&label("ecb_ret"));

553 &set_label("ecb_dec_three",16);
554      &call      ("_aesni_decrypt3");
555      &movups    (&QWP(0,$out),$inout0);
556      &movups    (&QWP(0x10,$out),$inout1);
557      &movups    (&QWP(0x20,$out),$inout2);
558      &jmp       (&label("ecb_ret"));

560 &set_label("ecb_dec_four",16);
561      &call      ("_aesni_decrypt4");
562      &movups    (&QWP(0,$out),$inout0);
563      &movups    (&QWP(0x10,$out),$inout1);
564      &movups    (&QWP(0x20,$out),$inout2);
565      &movups    (&QWP(0x30,$out),$inout3);

567 &set_label("ecb_ret");
568 &function_end("aesni_ecb_encrypt");

```

```

569 #####
570 # void aesni_ccm64_[en|de]crypt_blocks (const void *in, void *out,
571 #                                       size_t blocks, const AES_KEY *key,
572 #                                       const char *ivec, char *cmac);
573 #
574 # Handles only complete blocks, operates on 64-bit counter and
575 # does not update *ivec! Nor does it finalize CMAC value
576 # (see engine/eng_aesni.c for details)
577 #
578 { my $cmac=$inout1;
579   &function_begin("aesni_ccm64_encrypt_blocks");
580     &mov      ($inp,&wparam(0));
581     &mov      ($out,&wparam(1));
582     &mov      ($len,&wparam(2));
583     &mov      ($key,&wparam(3));
584     &mov      ($rounds,&wparam(4));
585     &mov      ($rounds,&wparam(5));
586     &mov      ($key_,"esp");
587     &sub      ("esp",60);
588     &and      ("esp",-16);
589     &mov      (&DWP(48,"esp"),$key_);          # align stack

591     &movdqu   ($ivec,&QWP(0,$rounds_));        # load ivec
592     &movdqu   ($cmac,&QWP(0,$rounds_));        # load cmac
593     &mov      ($rounds,&DWP(240,$key_));

595     # compose byte-swap control mask for pshufb on stack
596     &mov      (&DWP(0,"esp"),0x0c0d0e0f);
597     &mov      (&DWP(4,"esp"),0x08090a0b);
598     &mov      (&DWP(8,"esp"),0x04050607);
599     &mov      (&DWP(12,"esp"),0x00010203);

601     # compose counter increment vector on stack
602     &mov      ($rounds_,1);
603     &xor      ($key_,$key_);
604     &mov      (&DWP(16,"esp"),$rounds_);
605     &mov      (&DWP(20,"esp"),$key_);
606     &mov      (&DWP(24,"esp"),$key_);
607     &mov      (&DWP(28,"esp"),$key_);

609     &shr      ($rounds,1);
610     &lea      ($key_,&DWP(0,$key));
611     &movdqa   ($inout3,&QWP(0,"esp"));
612     &movdqa   ($inout0,$ivec);
613     &mov      ($rounds_,$rounds);
614     &pshufb   ($ivec,$inout3);

616 &set_label("ccm64_enc_outer");
617     &$movekey ($rndkey0,&QWP(0,$key_));
618     &mov      ($rounds,$rounds_);
619     &movups   ($in0,&QWP(0,$inp));

621     &xorps    ($inout0,$rndkey0);
622     &$movekey ($rndkey1,&QWP(16,$key_));
623     &xorps    ($rndkey0,$in0);
624     &lea      ($key,&DWP(32,$key_));
625     &xorps    ($cmac,$rndkey0);
626     &$movekey ($rndkey0,&QWP(0,$key));          # cmac^=inp

628 &set_label("ccm64_enc2_loop");
629     &aesenc   ($inout0,$rndkey1);
630     &dec      ($rounds);
631     &aesenc   ($cmac,$rndkey1);
632     &$movekey ($rndkey1,&QWP(16,$key));
633     &aesenc   ($inout0,$rndkey0);
634     &lea      ($key,&DWP(32,$key));

```

```

635     &aesenc      ($cmac, $rndkey0);
636     &$movekey    ($rndkey0, &QWP(0, $key));
637     &jnz         (&label("ccm64_enc2_loop"));
638     &aesenc      ($inout0, $rndkey1);
639     &aesenc      ($cmac, $rndkey1);
640     &paddq       ($ivec, &QWP(16, "esp"));
641     &aesenclast  ($inout0, $rndkey0);
642     &aesenclast  ($cmac, $rndkey0);

644     &dec        ($len);
645     &lea        ($inp, &DWP(16, $inp));
646     &xorps      ($in0, $inout0);          # inp^=E(ivec)
647     &movdqa     ($inout0, $ivec);
648     &movups     (&QWP(0, $out), $in0);   # save output
649     &lea        ($out, &DWP(16, $out));
650     &pshufb     ($inout0, $inout3);
651     &jnz        (&label("ccm64_enc_outer"));

653     &mov        ("esp", &DWP(48, "esp"));
654     &mov        ($out, &wparam(5));
655     &movups     (&QWP(0, $out), $cmac);
656 &function_end("aesni_ccm64_encrypt_blocks");

658 &function_begin("aesni_ccm64_decrypt_blocks");
659     &mov        ($inp, &wparam(0));
660     &mov        ($out, &wparam(1));
661     &mov        ($len, &wparam(2));
662     &mov        ($key, &wparam(3));
663     &mov        ($rounds_, &wparam(4));
664     &mov        ($rounds, &wparam(5));
665     &mov        ($key_, "esp");
666     &sub        ("esp", 60);
667     &and        ("esp", -16);          # align stack
668     &mov        (&DWP(48, "esp"), $key_);

670     &movdqu     ($ivec, &QWP(0, $rounds_)); # load ivec
671     &movdqu     ($cmac, &QWP(0, $rounds));   # load cmac
672     &mov        ($rounds, &DWP(240, $key));

674     # compose byte-swap control mask for pshufb on stack
675     &mov        (&DWP(0, "esp"), 0x0c0d0e0f);
676     &mov        (&DWP(4, "esp"), 0x08090a0b);
677     &mov        (&DWP(8, "esp"), 0x04050607);
678     &mov        (&DWP(12, "esp"), 0x00010203);

680     # compose counter increment vector on stack
681     &mov        ($rounds_, 1);
682     &xor        ($key_, $key_);
683     &mov        (&DWP(16, "esp"), $rounds_);
684     &mov        (&DWP(20, "esp"), $key_);
685     &mov        (&DWP(24, "esp"), $key_);
686     &mov        (&DWP(28, "esp"), $key_);

688     &movdqa     ($inout3, &QWP(0, "esp")); # bswap mask
689     &movdqa     ($inout0, $ivec);

691     &mov        ($key_, $key);
692     &mov        ($rounds_, $rounds);

694     &pshufb     ($ivec, $inout3);
695     if ($inline)
696     { &aesni_inline_generate1("enc"); }
697     else
698     { &call     ("_aesni_encrypt1"); }
699     &movups     ($in0, &QWP(0, $inp));    # load inp
700     &paddq      ($ivec, &QWP(16, "esp"));

```

```

701     &lea        ($inp, &QWP(16, $inp));
702     &jmp        (&label("ccm64_dec_outer"));

704 &set_label("ccm64_dec_outer", 16);
705     &xorps      ($in0, $inout0);          # inp ^= E(ivec)
706     &movdqa     ($inout0, $ivec);
707     &mov        ($rounds, $rounds_);
708     &movups     (&QWP(0, $out), $in0);   # save output
709     &lea        ($out, &DWP(16, $out));
710     &pshufb     ($inout0, $inout3);

712     &sub        ($len, 1);
713     &jz         (&label("ccm64_dec_break"));

715     &$movekey    ($rndkey0, &QWP(0, $key_));
716     &shr        ($rounds, 1);
717     &$movekey    ($rndkey1, &QWP(16, $key_));
718     &xorps      ($in0, $rndkey0);
719     &lea        ($key, &DWP(32, $key_));
720     &xorps      ($inout0, $rndkey0);
721     &xorps      ($cmac, $in0);          # cmac^=out
722     &$movekey    ($rndkey0, &QWP(0, $key));

724 &set_label("ccm64_dec2_loop");
725     &aesenc     ($inout0, $rndkey1);
726     &dec        ($rounds);
727     &aesenc     ($cmac, $rndkey1);
728     &$movekey    ($rndkey1, &QWP(16, $key));
729     &aesenc     ($inout0, $rndkey0);
730     &lea        ($key, &DWP(32, $key));
731     &aesenc     ($cmac, $rndkey0);
732     &$movekey    ($rndkey0, &QWP(0, $key));
733     &jnz        (&label("ccm64_dec2_loop"));
734     &movups     ($in0, &QWP(0, $inp));    # load inp
735     &paddq      ($ivec, &QWP(16, "esp"));
736     &aesenc     ($inout0, $rndkey1);
737     &aesenc     ($cmac, $rndkey1);
738     &lea        ($inp, &QWP(16, $inp));
739     &aesenclast ($inout0, $rndkey0);
740     &aesenclast ($cmac, $rndkey0);
741     &jmp        (&label("ccm64_dec_outer"));

743 &set_label("ccm64_dec_break", 16);
744     &mov        ($key, $key_);
745     if ($inline)
746     { &aesni_inline_generate1("enc", $cmac, $in0); }
747     else
748     { &call     ("_aesni_encrypt1", $cmac); }

750     &mov        ("esp", &DWP(48, "esp"));
751     &mov        ($out, &wparam(5));
752     &movups     (&QWP(0, $out), $cmac);
753 &function_end("aesni_ccm64_decrypt_blocks");
754 }

```

```

755 #####
756 # void aesni_ctr32_encrypt_blocks (const void *in, void *out,
757 #                                   size_t blocks, const AES_KEY *key,
758 #                                   const char *ivec);
759 #
760 # Handles only complete blocks, operates on 32-bit counter and
761 # does not update *ivec! (see engine/eng_aesni.c for details)
762 #
763 # stack layout:
764 #   0      pshufb mask
765 #   16     vector addend: 0,6,6,6
766 #   32     counter-less ivec
767 #   48     1st triplet of counter vector
768 #   64     2nd triplet of counter vector
769 #   80     saved %esp

771 &function_begin("aesni_ctr32_encrypt_blocks");
772     &mov     ($inp,&wparam(0));
773     &mov     ($out,&wparam(1));
774     &mov     ($len,&wparam(2));
775     &mov     ($key,&wparam(3));
776     &mov     ($rounds,&wparam(4));
777     &mov     ($key_,"esp");
778     &sub     ("esp",88);
779     &and     ("esp",-16);          # align stack
780     &mov     (&DWP(80,"esp"),$key_);

782     &cmp     ($len,1);
783     &je      (&label("ctr32_one_shortcut"));

785     &movdqu  ($inout5,&QWP(0,$rounds));    # load ivec

787     # compose byte-swap control mask for pshufb on stack
788     &mov     (&DWP(0,"esp"),0x0c0d0e0f);
789     &mov     (&DWP(4,"esp"),0x08090a0b);
790     &mov     (&DWP(8,"esp"),0x04050607);
791     &mov     (&DWP(12,"esp"),0x00010203);

793     # compose counter increment vector on stack
794     &mov     ($rounds,6);
795     &xor     ($key_,$key_);
796     &mov     (&DWP(16,"esp"),$rounds);
797     &mov     (&DWP(20,"esp"),$rounds);
798     &mov     (&DWP(24,"esp"),$rounds);
799     &mov     (&DWP(28,"esp"),$key_);

801     &pextrd  ($rounds_,$inout5,3);          # pull 32-bit counter
802     &pinsrd  ($inout5,$key_,3);             # wipe 32-bit counter

804     &mov     ($rounds,&DWP(240,$key));      # key->rounds

806     # compose 2 vectors of 3x32-bit counters
807     &bswap   ($rounds_);
808     &pxor    ($rndkey1,$rndkey1);
809     &pxor    ($rndkey0,$rndkey0);
810     &movdqa  ($inout0,&QWP(0,"esp"));      # load byte-swap mask
811     &pinsrd  ($rndkey1,$rounds_,0);
812     &lea     ($key_,&DWP(3,$rounds_));
813     &pinsrd  ($rndkey0,$key_,0);
814     &inc     ($rounds_);
815     &pinsrd  ($rndkey1,$rounds_,1);
816     &inc     ($key_);
817     &pinsrd  ($rndkey0,$key_,1);
818     &inc     ($rounds_);
819     &pinsrd  ($rndkey1,$rounds_,2);
820     &inc     ($key_);

```

```

821     &pinsrd  ($rndkey0,$key_,2);
822     &movdqa  (&QWP(48,"esp"),$rndkey1);   # save 1st triplet
823     &pshufb  ($rndkey1,$inout0);           # byte swap
824     &movdqa  (&QWP(64,"esp"),$rndkey0);   # save 2nd triplet
825     &pshufb  ($rndkey0,$inout0);           # byte swap

827     &pshufd  ($inout0,$rndkey1,3<<6);     # place counter to upper dword
828     &pshufd  ($inout1,$rndkey1,2<<6);
829     &cmp     ($len,6);
830     &jb      (&label("ctr32_tail"));
831     &movdqa  (&QWP(32,"esp"),$inout5);     # save counter-less ivec
832     &shr     ($rounds,1);
833     &mov     ($key_,$key_);                # backup $key
834     &mov     ($rounds_,$rounds);           # backup $rounds
835     &sub     ($len,6);
836     &jmp     (&label("ctr32_loop6"));

838 &set_label("ctr32_loop6",16);
839     &pshufd  ($inout2,$rndkey1,1<<6);
840     &movdqa  ($rndkey1,&QWP(32,"esp"));     # pull counter-less ivec
841     &pshufd  ($inout3,$rndkey0,3<<6);
842     &por     ($inout0,$rndkey1);           # merge counter-less ivec
843     &pshufd  ($inout4,$rndkey0,2<<6);
844     &por     ($inout1,$rndkey1);
845     &pshufd  ($inout5,$rndkey0,1<<6);
846     &por     ($inout2,$rndkey1);
847     &por     ($inout3,$rndkey1);
848     &por     ($inout4,$rndkey1);
849     &por     ($inout5,$rndkey1);

851     # inlining _aesni_encrypt6's prologue gives ~4% improvement...
852     &$movekey ($rndkey0,&QWP(0,$key_));
853     &$movekey ($rndkey1,&QWP(16,$key_));
854     &lea     ($key,&DWP(32,$key_));
855     &dec     ($rounds);
856     &pxor    ($inout0,$rndkey0);
857     &pxor    ($inout1,$rndkey0);
858     &aesenc  ($inout0,$rndkey1);
859     &pxor    ($inout2,$rndkey0);
860     &aesenc  ($inout1,$rndkey1);
861     &pxor    ($inout3,$rndkey0);
862     &aesenc  ($inout2,$rndkey1);
863     &pxor    ($inout4,$rndkey0);
864     &aesenc  ($inout3,$rndkey1);
865     &pxor    ($inout5,$rndkey0);
866     &aesenc  ($inout4,$rndkey1);
867     &$movekey ($rndkey0,&QWP(0,$key));
868     &aesenc  ($inout5,$rndkey1);

870     &call    (&label("_aesni_encrypt6_enter"));

872     &movups   ($rndkey1,&QWP(0,$inp));
873     &movups   ($rndkey0,&QWP(0x10,$inp));
874     &xorps    ($inout0,$rndkey1);
875     &movups   ($rndkey1,&QWP(0x20,$inp));
876     &xorps    ($inout1,$rndkey0);
877     &movups   (&QWP(0,$out),$inout0);
878     &movdqa  ($rndkey0,&QWP(16,"esp"));     # load increment
879     &xorps    ($inout2,$rndkey1);
880     &movdqa  ($rndkey1,&QWP(48,"esp"));     # load 1st triplet
881     &movups   (&QWP(0x10,$out),$inout1);
882     &movups   (&QWP(0x20,$out),$inout2);

884     &paddd   ($rndkey1,$rndkey0);          # 1st triplet increment
885     &paddd   ($rndkey0,&QWP(64,"esp"));     # 2nd triplet increment
886     &movdqa  ($inout0,&QWP(0,"esp"));      # load byte swap mask

```

```

888     &movups ($inout1,&QWP(0x30,$inp));
889     &movups ($inout2,&QWP(0x40,$inp));
890     &xorps ($inout3,$inout1);
891     &movups ($inout1,&QWP(0x50,$inp));
892     &lea ($inp,&DWP(0x60,$inp));
893     &movdqa (&QWP(48,"esp"),$rndkey1); # save 1st triplet
894     &pshufb ($rndkey1,$inout0); # byte swap
895     &xorps ($inout4,$inout2);
896     &movups (&QWP(0x30,$out),$inout3);
897     &xorps ($inout5,$inout1);
898     &movdqa (&QWP(64,"esp"),$rndkey0); # save 2nd triplet
899     &pshufb ($rndkey0,$inout0); # byte swap
900     &movups (&QWP(0x40,$out),$inout4);
901     &pshufd ($inout0,$rndkey1,3<<6);
902     &movups (&QWP(0x50,$out),$inout5);
903     &lea ($out,&DWP(0x60,$out));

905     &mov ($rounds,$rounds_);
906     &pshufd ($inout1,$rndkey1,2<<6);
907     &sub ($len,6);
908     &jnc (&label("ctr32_loop6"));

910     &add ($len,6);
911     &jz (&label("ctr32_ret"));
912     &mov ($key,$key_);
913     &lea ($rounds,&DWP(1,"",$rounds,2)); # restore $rounds
914     &movdqa ($inout5,&QWP(32,"esp")); # pull count-less ivec

916 &set_label("ctr32_tail");
917     &por ($inout0,$inout5);
918     &cmp ($len,2);
919     &jb (&label("ctr32_one"));

921     &pshufd ($inout2,$rndkey1,1<<6);
922     &por ($inout1,$inout5);
923     &je (&label("ctr32_two"));

925     &pshufd ($inout3,$rndkey0,3<<6);
926     &por ($inout2,$inout5);
927     &cmp ($len,4);
928     &jb (&label("ctr32_three"));

930     &pshufd ($inout4,$rndkey0,2<<6);
931     &por ($inout3,$inout5);
932     &je (&label("ctr32_four"));

934     &por ($inout4,$inout5);
935     &call ("_aesni_encrypt6");
936     &movups ($rndkey1,&QWP(0,$inp));
937     &movups ($rndkey0,&QWP(0x10,$inp));
938     &xorps ($inout0,$rndkey1);
939     &movups ($rndkey1,&QWP(0x20,$inp));
940     &xorps ($inout1,$rndkey0);
941     &movups ($rndkey0,&QWP(0x30,$inp));
942     &xorps ($inout2,$rndkey1);
943     &movups ($rndkey1,&QWP(0x40,$inp));
944     &xorps ($inout3,$rndkey0);
945     &movups (&QWP(0,$out),$inout0);
946     &xorps ($inout4,$rndkey1);
947     &movups (&QWP(0x10,$out),$inout1);
948     &movups (&QWP(0x20,$out),$inout2);
949     &movups (&QWP(0x30,$out),$inout3);
950     &movups (&QWP(0x40,$out),$inout4);
951     &jmp (&label("ctr32_ret"));

```

```

953 &set_label("ctr32_one_shortcut",16);
954     &movups ($inout0,&QWP(0,$rounds_)); # load ivec
955     &mov ($rounds,&DWP(240,$key));
956
957 &set_label("ctr32_one");
958     if ($inline)
959     { &aesni_inline_generate1("enc"); }
960     else
961     { &call ("_aesni_encrypt1"); }
962     &movups ($in0,&QWP(0,$inp));
963     &xorps ($in0,$inout0);
964     &movups (&QWP(0,$out),$in0);
965     &jmp (&label("ctr32_ret"));

967 &set_label("ctr32_two",16);
968     &call ("_aesni_encrypt3");
969     &movups ($inout3,&QWP(0,$inp));
970     &movups ($inout4,&QWP(0x10,$inp));
971     &xorps ($inout0,$inout3);
972     &xorps ($inout1,$inout4);
973     &movups (&QWP(0,$out),$inout0);
974     &movups (&QWP(0x10,$out),$inout1);
975     &jmp (&label("ctr32_ret"));

977 &set_label("ctr32_three",16);
978     &call ("_aesni_encrypt3");
979     &movups ($inout3,&QWP(0,$inp));
980     &movups ($inout4,&QWP(0x10,$inp));
981     &xorps ($inout0,$inout3);
982     &movups ($inout5,&QWP(0x20,$inp));
983     &xorps ($inout1,$inout4);
984     &movups (&QWP(0,$out),$inout0);
985     &xorps ($inout2,$inout5);
986     &movups (&QWP(0x10,$out),$inout1);
987     &movups (&QWP(0x20,$out),$inout2);
988     &jmp (&label("ctr32_ret"));

990 &set_label("ctr32_four",16);
991     &call ("_aesni_encrypt4");
992     &movups ($inout4,&QWP(0,$inp));
993     &movups ($inout5,&QWP(0x10,$inp));
994     &movups ($rndkey1,&QWP(0x20,$inp));
995     &xorps ($inout0,$inout4);
996     &movups ($rndkey0,&QWP(0x30,$inp));
997     &xorps ($inout1,$inout5);
998     &movups (&QWP(0,$out),$inout0);
999     &xorps ($inout2,$rndkey1);
1000     &movups (&QWP(0x10,$out),$inout1);
1001     &xorps ($inout3,$rndkey0);
1002     &movups (&QWP(0x20,$out),$inout2);
1003     &movups (&QWP(0x30,$out),$inout3);

1005 &set_label("ctr32_ret");
1006     &mov ("esp",&DWP(80,"esp"));
1007 &function_end("aesni_ctr32_encrypt_blocks");

```



```

1008 #####
1009 # void aesni_xts_[en]crypt(const char *inp, char *out, size_t len,
1010 #   const AES_KEY *key1, const AES_KEY *key2
1011 #   const unsigned char iv[16]);
1012 #
1013 { my ($tweak, $sttmp, $stres, $stmask) = ($rndkey1, $rndkey0, $sinout0, $sinout1);

1015 &function_begin("aesni_xts_encrypt");
1016     &mov ($key, &wparam(4));          # key2
1017     &mov ($inp, &wparam(5));          # clear-text tweak

1019     &mov ($rounds, &DWP(240, $key));   # key2->rounds
1020     &movups ($sinout0, &QWP(0, $inp));
1021     if ($inline)
1022     { &aesni_inline_generate1("enc"); }
1023     else
1024     { &call ("_aesni_encrypt1"); }

1026     &mov ($inp, &wparam(0));
1027     &mov ($out, &wparam(1));
1028     &mov ($len, &wparam(2));
1029     &mov ($key, &wparam(3));          # key1

1031     &mov ($key_, "esp");
1032     &sub ("esp", 16*7+8);
1033     &mov ($rounds, &DWP(240, $key));   # key1->rounds
1034     &and ("esp", -16);                # align stack

1036     &mov (&DWP(16*6+0, "esp"), 0x87); # compose the magic constant
1037     &mov (&DWP(16*6+4, "esp"), 0);
1038     &mov (&DWP(16*6+8, "esp"), 1);
1039     &mov (&DWP(16*6+12, "esp"), 0);
1040     &mov (&DWP(16*7+0, "esp"), $len);  # save original $len
1041     &mov (&DWP(16*7+4, "esp"), $key_); # save original %esp

1043     &movdqa ($tweak, $sinout0);
1044     &pxor ($sttmp, $sttmp);
1045     &movdqa ($stmask, &QWP(6*16, "esp")); # 0x0...010...87
1046     &pcmpgtd ($sttmp, $tweak);          # broadcast upper bits

1048     &and ($len, -16);
1049     &mov ($key_, $key);
1050     &mov ($rounds_, $rounds);
1051     &sub ($len, 16*6);
1052     &jc (&label("xts_enc_short"));

1054     &shr ($rounds, 1);
1055     &mov ($rounds_, $rounds);
1056     &jmp (&label("xts_enc_loop6"));

1058 &set_label("xts_enc_loop6", 16);
1059     for ($i=0; $i<4; $i++) {
1060         &pshufd ($stres, $sttmp, 0x13);
1061         &pxor ($sttmp, $sttmp);
1062         &movdqa (&QWP(16*$i, "esp"), $tweak);
1063         &paddq ($tweak, $tweak);      # &psllq($tweak, 1);
1064         &pand ($stres, $stmask);      # isolate carry and residue
1065         &pcmpgtd ($sttmp, $tweak);    # broadcast upper bits
1066         &pxor ($tweak, $stres);
1067     }
1068     &pshufd ($sinout5, $sttmp, 0x13);
1069     &movdqa (&QWP(16*$i++, "esp"), $tweak);
1070     &paddq ($tweak, $tweak);          # &psllq($tweak, 1);
1071     &$movekey ($rndkey0, &QWP(0, $key_));
1072     &pand ($sinout5, $stmask);        # isolate carry and residue
1073     &movups ($sinout0, &QWP(0, $inp)); # load input

```

```

1074     &pxor ($sinout5, $tweak);

1076     # inline_aesni_encrypt6 prologue and flip xor with tweak and key[0]
1077     &movdqu ($sinout1, &QWP(16*1, $inp));
1078     &xorps ($sinout0, $rndkey0);      # input^=rndkey[0]
1079     &movdqu ($sinout2, &QWP(16*2, $inp));
1080     &pxor ($sinout1, $rndkey0);
1081     &movdqu ($sinout3, &QWP(16*3, $inp));
1082     &pxor ($sinout2, $rndkey0);
1083     &movdqu ($sinout4, &QWP(16*4, $inp));
1084     &pxor ($sinout3, $rndkey0);
1085     &movdqu ($rndkey1, &QWP(16*5, $inp));
1086     &pxor ($sinout4, $rndkey0);
1087     &lea ($inp, &DWP(16*6, $inp));
1088     &pxor ($sinout0, &QWP(16*0, "esp")); # input^=tweak
1089     &movdqa (&QWP(16*$i, "esp"), $sinout5); # save last tweak
1090     &pxor ($sinout5, $rndkey1);

1092     &$movekey ($rndkey1, &QWP(16, $key_));
1093     &lea ($key, &DWP(32, $key_));
1094     &pxor ($sinout1, &QWP(16*1, "esp"));
1095     &aesenc ($sinout0, $rndkey1);
1096     &pxor ($sinout2, &QWP(16*2, "esp"));
1097     &aesenc ($sinout1, $rndkey1);
1098     &pxor ($sinout3, &QWP(16*3, "esp"));
1099     &dec ($rounds);
1100     &aesenc ($sinout2, $rndkey1);
1101     &pxor ($sinout4, &QWP(16*4, "esp"));
1102     &aesenc ($sinout3, $rndkey1);
1103     &pxor ($sinout5, $rndkey0);
1104     &aesenc ($sinout4, $rndkey1);
1105     &$movekey ($rndkey0, &QWP(0, $key));
1106     &aesenc ($sinout5, $rndkey1);
1107     &call (&label("_aesni_encrypt6_enter"));

1109     &movdqa ($tweak, &QWP(16*5, "esp")); # last tweak
1110     &pxor ($sttmp, $sttmp);
1111     &xorps ($sinout0, &QWP(16*0, "esp")); # output^=tweak
1112     &pcmpgtd ($sttmp, $tweak);          # broadcast upper bits
1113     &xorps ($sinout1, &QWP(16*1, "esp"));
1114     &movups (&QWP(16*0, $out), $sinout0); # write output
1115     &xorps ($sinout2, &QWP(16*2, "esp"));
1116     &movups (&QWP(16*1, $out), $sinout1);
1117     &xorps ($sinout3, &QWP(16*3, "esp"));
1118     &movups (&QWP(16*2, $out), $sinout2);
1119     &xorps ($sinout4, &QWP(16*4, "esp"));
1120     &movups (&QWP(16*3, $out), $sinout3);
1121     &xorps ($sinout5, $tweak);
1122     &movups (&QWP(16*4, $out), $sinout4);
1123     &pshufd ($stres, $sttmp, 0x13);
1124     &movups (&QWP(16*5, $out), $sinout5);
1125     &lea ($out, &DWP(16*6, $out));
1126     &movdqa ($stmask, &QWP(16*6, "esp")); # 0x0...010...87

1128     &pxor ($sttmp, $sttmp);
1129     &paddq ($tweak, $tweak);          # &psllq($tweak, 1);
1130     &pand ($stres, $stmask);          # isolate carry and residue
1131     &pcmpgtd ($sttmp, $tweak);        # broadcast upper bits
1132     &mov ($rounds, $rounds_);         # restore $rounds
1133     &pxor ($tweak, $stres);

1135     &sub ($len, 16*6);
1136     &jnc (&label("xts_enc_loop6"));

1138     &lea ($rounds, &DWP(1, "", $rounds, 2)); # restore $rounds
1139     &mov ($key, $key_);               # restore $key

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1140      &mov      ($rounds_, $rounds);

1142  &set_label("xts_enc_short");
1143      &add      ($len, 16*6);
1144      &jz        (&label("xts_enc_done6x"));

1146      &movdqa   ($inout3, $tweak);          # put aside previous tweak
1147      &cmp      ($len, 0x20);
1148      &jb        (&label("xts_enc_one"));

1150      &pshufd    ($twres, $wttmp, 0x13);
1151      &pxor      ($wttmp, $wttmp);
1152      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1153      &pand      ($twres, $twmask);        # isolate carry and residue
1154      &pcmpgtd   ($wttmp, $tweak);        # broadcast upper bits
1155      &pxor      ($tweak, $twres);
1156      &jc        (&label("xts_enc_two"));

1158      &pshufd    ($twres, $wttmp, 0x13);
1159      &pxor      ($wttmp, $wttmp);
1160      &movdqa     ($inout4, $tweak);        # put aside previous tweak
1161      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1162      &pand      ($twres, $twmask);        # isolate carry and residue
1163      &pcmpgtd   ($wttmp, $tweak);        # broadcast upper bits
1164      &pxor      ($tweak, $twres);
1165      &cmp      ($len, 0x40);
1166      &jb        (&label("xts_enc_three"));

1168      &pshufd    ($twres, $wttmp, 0x13);
1169      &pxor      ($wttmp, $wttmp);
1170      &movdqa     ($inout5, $tweak);        # put aside previous tweak
1171      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1172      &pand      ($twres, $twmask);        # isolate carry and residue
1173      &pcmpgtd   ($wttmp, $tweak);        # broadcast upper bits
1174      &pxor      ($tweak, $twres);
1175      &movdqa     (&QWP(16*0, "esp"), $inout3);
1176      &movdqa     (&QWP(16*1, "esp"), $inout4);
1177      &jc        (&label("xts_enc_four"));

1179      &movdqa     (&QWP(16*2, "esp"), $inout5);
1180      &pshufd     ($inout5, $wttmp, 0x13);
1181      &movdqa     (&QWP(16*3, "esp"), $tweak);
1182      &paddq     ($tweak, $tweak);          # &psllq($inout0, 1);
1183      &pand      ($inout5, $twmask);        # isolate carry and residue
1184      &pxor      ($inout5, $tweak);

1186      &movdqu     ($inout0, &QWP(16*0, $inp)); # load input
1187      &movdqu     ($inout1, &QWP(16*1, $inp)); # load input
1188      &movdqu     ($inout2, &QWP(16*2, $inp)); # load input
1189      &pxor      ($inout0, &QWP(16*0, "esp")); # input^=tweak
1190      &movdqu     ($inout3, &QWP(16*3, $inp));
1191      &pxor      ($inout1, &QWP(16*1, "esp")); # input^=tweak
1192      &movdqu     ($inout4, &QWP(16*4, $inp));
1193      &pxor      ($inout2, &QWP(16*2, "esp")); # input^=tweak
1194      &lea        ($inp, &DWP(16*5, $inp));
1195      &pxor      ($inout3, &QWP(16*3, "esp")); # input^=tweak
1196      &movdqa     (&QWP(16*4, "esp"), $inout5); # save last tweak
1197      &pxor      ($inout4, $inout5);

1199      &call      ("_aesni_encrypt6");

1201      &movaps     ($tweak, &QWP(16*4, "esp")); # last tweak
1202      &xorps      ($inout0, &QWP(16*0, "esp")); # output^=tweak
1203      &xorps      ($inout1, &QWP(16*1, "esp"));
1204      &xorps      ($inout2, &QWP(16*2, "esp"));
1205      &movups     (&QWP(16*0, $out), $inout0); # write output

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1206      &xorps     ($inout3, &QWP(16*3, "esp"));
1207      &movups     (&QWP(16*1, $out), $inout1);
1208      &xorps     ($inout4, $tweak);
1209      &movups     (&QWP(16*2, $out), $inout2);
1210      &movups     (&QWP(16*3, $out), $inout3);
1211      &movups     (&QWP(16*4, $out), $inout4);
1212      &lea       ($out, &DWP(16*5, $out));
1213      &jmp       (&label("xts_enc_done"));

1215  &set_label("xts_enc_one", 16);
1216      &movups     ($inout0, &QWP(16*0, $inp)); # load input
1217      &lea        ($inp, &DWP(16*1, $inp));
1218      &xorps      ($inout0, $inout3);          # input^=tweak
1219      if ($inline)
1220      { &aesni_inline_generate1("enc"); }
1221      else
1222      { &call      ("_aesni_encrypt1"); }
1223      &xorps      ($inout0, $inout3);          # output^=tweak
1224      &movups     (&QWP(16*0, $out), $inout0); # write output
1225      &lea        ($out, &DWP(16*1, $out));

1227      &movdqa     ($tweak, $inout3);          # last tweak
1228      &jmp       (&label("xts_enc_done"));

1230  &set_label("xts_enc_two", 16);
1231      &movaps     ($inout4, $tweak);          # put aside last tweak

1233      &movups     ($inout0, &QWP(16*0, $inp)); # load input
1234      &movups     ($inout1, &QWP(16*1, $inp)); # load input
1235      &lea        ($inp, &DWP(16*2, $inp));
1236      &xorps      ($inout0, $inout3);          # input^=tweak
1237      &xorps      ($inout1, $inout4);
1238      &xorps      ($inout2, $inout2);

1240      &call      ("_aesni_encrypt3");

1242      &xorps      ($inout0, $inout3);          # output^=tweak
1243      &xorps      ($inout1, $inout4);
1244      &movups     (&QWP(16*0, $out), $inout0); # write output
1245      &movups     (&QWP(16*1, $out), $inout1);
1246      &lea        ($out, &DWP(16*2, $out));

1248      &movdqa     ($tweak, $inout4);          # last tweak
1249      &jmp       (&label("xts_enc_done"));

1251  &set_label("xts_enc_three", 16);
1252      &movaps     ($inout5, $tweak);          # put aside last tweak
1253      &movups     ($inout0, &QWP(16*0, $inp)); # load input
1254      &movups     ($inout1, &QWP(16*1, $inp)); # load input
1255      &movups     ($inout2, &QWP(16*2, $inp)); # load input
1256      &lea        ($inp, &DWP(16*3, $inp));
1257      &xorps      ($inout0, $inout3);          # input^=tweak
1258      &xorps      ($inout1, $inout4);
1259      &xorps      ($inout2, $inout5);

1261      &call      ("_aesni_encrypt3");

1263      &xorps      ($inout0, $inout3);          # output^=tweak
1264      &xorps      ($inout1, $inout4);
1265      &xorps      ($inout2, $inout5);
1266      &movups     (&QWP(16*0, $out), $inout0); # write output
1267      &movups     (&QWP(16*1, $out), $inout1);
1268      &movups     (&QWP(16*2, $out), $inout2);
1269      &lea        ($out, &DWP(16*3, $out));

1271      &movdqa     ($tweak, $inout5);          # last tweak

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1272      &jmp      (&label("xts_enc_done"));

1274 &set_label("xts_enc_four",16);
1275      &movaps   ($inout4,$tweak);          # put aside last tweak

1277      &movups   ($inout0,&QWP(16*0,$inp));  # load input
1278      &movups   ($inout1,&QWP(16*1,$inp));
1279      &movups   ($inout2,&QWP(16*2,$inp));
1280      &xorps    ($inout0,&QWP(16*0,"esp"));  # input^=tweak
1281      &movups   ($inout3,&QWP(16*3,$inp));
1282      &lea      ($inp,&DWP(16*4,$inp));
1283      &xorps    ($inout1,&QWP(16*1,"esp"));
1284      &xorps    ($inout2,$inout5);
1285      &xorps    ($inout3,$inout4);

1287      &call     ("_aesni_encrypt4");

1289      &xorps    ($inout0,&QWP(16*0,"esp"));  # output^=tweak
1290      &xorps    ($inout1,&QWP(16*1,"esp"));
1291      &xorps    ($inout2,$inout5);
1292      &movups   (&QWP(16*0,$out),$inout0);  # write output
1293      &xorps    ($inout3,$inout4);
1294      &movups   (&QWP(16*1,$out),$inout1);
1295      &movups   (&QWP(16*2,$out),$inout2);
1296      &movups   (&QWP(16*3,$out),$inout3);
1297      &lea      ($out,&DWP(16*4,$out));

1299      &movdqa   ($tweak,$inout4);          # last tweak
1300      &jmp      (&label("xts_enc_done"));

1302 &set_label("xts_enc_done6x",16);
1303      &mov      ($len,&DWP(16*7+0,"esp"));  # restore original $len
1304      &and      ($len,15);
1305      &jz       (&label("xts_enc_ret"));
1306      &movdqa   ($inout3,$tweak);
1307      &mov      (&DWP(16*7+0,"esp"),$len);  # save $len%16
1308      &jmp      (&label("xts_enc_steal"));

1310 &set_label("xts_enc_done",16);
1311      &mov      ($len,&DWP(16*7+0,"esp"));  # restore original $len
1312      &pxor     ($wttmp,$wttmp);
1313      &and      ($len,15);
1314      &jz       (&label("xts_enc_ret"));

1316      &pcmpgtd ($wttmp,$tweak);            # broadcast upper bits
1317      &mov      (&DWP(16*7+0,"esp"),$len); # save $len%16
1318      &pshufd   ($inout3,$wttmp,0x13);
1319      &paddq    ($tweak,$tweak);            # &psllq($tweak,1);
1320      &pand     ($inout3,&QWP(16*6,"esp"));  # isolate carry and residue
1321      &pxor     ($inout3,$tweak);

1323 &set_label("xts_enc_steal");
1324      &movz     ($rounds,&BP(0,$inp));
1325      &movz     ($key,&BP(-16,$out));
1326      &lea      ($inp,&DWP(1,$inp));
1327      &mov      (&BP(-16,$out),&LB($rounds));
1328      &mov      (&BP(0,$out),&LB($key));
1329      &lea      ($out,&DWP(1,$out));
1330      &sub      ($len,1);
1331      &jnz      (&label("xts_enc_steal"));

1333      &sub      ($out,&DWP(16*7+0,"esp"));  # rewind $out
1334      &mov      ($key,$key_);              # restore $key
1335      &mov      ($rounds,$rounds_);        # restore $rounds

1337      &movups   ($inout0,&QWP(-16,$out));  # load input

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1338      &xorps    ($inout0,$inout3);          # input^=tweak
1339      if ($inline)
1340      { &aesni_inline_generate1("enc"); }
1341      else
1342      { &call     ("_aesni_encrypt1"); }
1343      &xorps    ($inout0,$inout3);          # output^=tweak
1344      &movups   (&QWP(-16,$out),$inout0);  # write output

1346 &set_label("xts_enc_ret");
1347      &mov      ("esp",&DWP(16*7+4,"esp")); # restore %esp
1348 &function_end("aesni_xts_encrypt");

1350 &function_begin("aesni_xts_decrypt");
1351      &mov      ($key,&wparam(4));          # key2
1352      &mov      ($inp,&wparam(5));          # clear-text tweak

1354      &mov      ($rounds,&DWP(240,$key));   # key2->rounds
1355      &movups   ($inout0,&QWP(0,$inp));
1356      if ($inline)
1357      { &aesni_inline_generate1("enc"); }
1358      else
1359      { &call     ("_aesni_encrypt1"); }

1361      &mov      ($inp,&wparam(0));
1362      &mov      ($out,&wparam(1));
1363      &mov      ($len,&wparam(2));
1364      &mov      ($key,&wparam(3));          # key1

1366      &mov      ($key_,"esp");
1367      &sub      ("esp",16*7+8);
1368      &and      ("esp",-16);              # align stack

1370      &xor      ($rounds_,$rounds_);        # if(len%16) len-=16;
1371      &test     ($len,15);
1372      &setnz    (&LB($rounds_));
1373      &shl      ($rounds_,4);
1374      &sub      ($len,$rounds_);

1376      &mov      (&DWP(16*6+0,"esp"),0x87); # compose the magic constant
1377      &mov      (&DWP(16*6+4,"esp"),0);
1378      &mov      (&DWP(16*6+8,"esp"),1);
1379      &mov      (&DWP(16*6+12,"esp"),0);
1380      &mov      (&DWP(16*7+0,"esp"),$len); # save original $len
1381      &mov      (&DWP(16*7+4,"esp"),$key_); # save original %esp

1383      &mov      ($rounds,&DWP(240,$key));   # key1->rounds
1384      &mov      ($key_,$key);
1385      &mov      ($rounds_,$rounds);        # backup $key
                                          # backup $rounds

1387      &movdqa   ($tweak,$inout0);
1388      &pxor     ($wttmp,$wttmp);
1389      &movdqa   ($tmask,&QWP(6*16,"esp"));  # 0x0...010...87
1390      &pcmpgtd ($wttmp,$tweak);            # broadcast upper bits

1392      &and      ($len,-16);
1393      &sub      ($len,16*6);
1394      &jc       (&label("xts_dec_short"));

1396      &shr      ($rounds,1);
1397      &mov      ($rounds_,$rounds);
1398      &jmp      (&label("xts_dec_loop6"));

1400 &set_label("xts_dec_loop6",16);
1401      for ($i=0;$i<4;$i++) {
1402          &pshufd ($twres,$wttmp,0x13);
1403          &pxor  ($wttmp,$wttmp);

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1404      &movdqa    (&QWP(16*$i, "esp"), $tweak);
1405      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1406      &pand     ($twres, $twmask);          # isolate carry and residue
1407      &pcmpgtd  ($wtmpt, $tweak);          # broadcast upper bits
1408      &pxor     ($tweak, $twres);
1409    }
1410    &pshufd    ($inout5, $wtmpt, 0x13);
1411    &movdqa    (&QWP(16*$i++, "esp"), $tweak);
1412    &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1413    &$movekey   ($rndkey0, &QWP(0, $key_));
1414    &pand     ($inout5, $twmask);          # isolate carry and residue
1415    &movups    ($inout0, &QWP(0, $inp));   # load input
1416    &pxor     ($inout5, $tweak);

1418    # inline_aesni_encrypt6 prologue and flip xor with tweak and key[0]
1419    &movdqu    ($inout1, &QWP(16*1, $inp));
1420    &xorps     ($inout0, $rndkey0);        # input^=rndkey[0]
1421    &movdqu    ($inout2, &QWP(16*2, $inp));
1422    &pxor     ($inout1, $rndkey0);
1423    &movdqu    ($inout3, &QWP(16*3, $inp));
1424    &pxor     ($inout2, $rndkey0);
1425    &movdqu    ($inout4, &QWP(16*4, $inp));
1426    &pxor     ($inout3, $rndkey0);
1427    &movdqu    ($rndkey1, &QWP(16*5, $inp));
1428    &pxor     ($inout4, $rndkey0);
1429    &lea       ($inp, &DWP(16*6, $inp));
1430    &pxor     ($inout0, &QWP(16*0, "esp")); # input^=tweak
1431    &movdqa    (&QWP(16*$i, "esp"), $inout5); # save last tweak
1432    &pxor     ($inout5, $rndkey1);

1434    &$movekey   ($rndkey1, &QWP(16, $key_));
1435    &lea       ($key, &DWP(32, $key_));
1436    &pxor     ($inout1, &QWP(16*1, "esp"));
1437    &aesdec     ($inout0, $rndkey1);
1438    &pxor     ($inout2, &QWP(16*2, "esp"));
1439    &aesdec     ($inout1, $rndkey1);
1440    &pxor     ($inout3, &QWP(16*3, "esp"));
1441    &dec       ($rounds);
1442    &aesdec     ($inout2, $rndkey1);
1443    &pxor     ($inout4, &QWP(16*4, "esp"));
1444    &aesdec     ($inout3, $rndkey1);
1445    &pxor     ($inout5, $rndkey0);
1446    &aesdec     ($inout4, $rndkey1);
1447    &$movekey   ($rndkey0, &QWP(0, $key));
1448    &aesdec     ($inout5, $rndkey1);
1449    &call      (&label("_aesni_decrypt6_enter"));

1451    &movdqa    ($tweak, &QWP(16*5, "esp")); # last tweak
1452    &pxor     ($wtmpt, $wtmpt);
1453    &xorps     ($inout0, &QWP(16*0, "esp")); # output^=tweak
1454    &pcmpgtd   ($wtmpt, $tweak);          # broadcast upper bits
1455    &xorps     ($inout1, &QWP(16*1, "esp"));
1456    &movups    (&QWP(16*0, $out), $inout0); # write output
1457    &xorps     ($inout2, &QWP(16*2, "esp"));
1458    &movups    (&QWP(16*1, $out), $inout1);
1459    &xorps     ($inout3, &QWP(16*3, "esp"));
1460    &movups    (&QWP(16*2, $out), $inout2);
1461    &xorps     ($inout4, &QWP(16*4, "esp"));
1462    &movups    (&QWP(16*3, $out), $inout3);
1463    &xorps     ($inout5, $tweak);
1464    &movups    (&QWP(16*4, $out), $inout4);
1465    &pshufd    ($twres, $wtmpt, 0x13);
1466    &movups    (&QWP(16*5, $out), $inout5);
1467    &lea       ($out, &DWP(16*6, $out));
1468    &movdqa    ($twmask, &QWP(16*6, "esp")); # 0x0...010...87

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1470      &pxor     ($wtmpt, $wtmpt);
1471      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1472      &pand     ($twres, $twmask);          # isolate carry and residue
1473      &pcmpgtd  ($wtmpt, $tweak);          # broadcast upper bits
1474      &mov      ($rounds, $rounds_);        # restore $rounds
1475      &pxor     ($tweak, $twres);

1477      &sub      ($len, 16*6);
1478      &jnc      (&label("xts_dec_loop6"));

1480      &lea      ($rounds, &DWP(1, "", $rounds, 2)); # restore $rounds
1481      &mov      ($key, $key_);              # restore $key
1482      &mov      ($rounds_, $rounds);

1484      &set_label("xts_dec_short");
1485      &add      ($len, 16*6);
1486      &jz       (&label("xts_dec_done6x"));

1488      &movdqa    ($inout3, $tweak);          # put aside previous tweak
1489      &cmp      ($len, 0x20);
1490      &jb       (&label("xts_dec_one"));

1492      &pshufd    ($twres, $wtmpt, 0x13);
1493      &pxor     ($wtmpt, $wtmpt);
1494      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1495      &pand     ($twres, $twmask);          # isolate carry and residue
1496      &pcmpgtd  ($wtmpt, $tweak);          # broadcast upper bits
1497      &pxor     ($tweak, $twres);
1498      &jc       (&label("xts_dec_two"));

1500      &pshufd    ($twres, $wtmpt, 0x13);
1501      &pxor     ($wtmpt, $wtmpt);
1502      &movdqa    ($inout4, $tweak);          # put aside previous tweak
1503      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1504      &pand     ($twres, $twmask);          # isolate carry and residue
1505      &pcmpgtd  ($wtmpt, $tweak);          # broadcast upper bits
1506      &pxor     ($tweak, $twres);
1507      &cmp      ($len, 0x40);
1508      &jb       (&label("xts_dec_three"));

1510      &pshufd    ($twres, $wtmpt, 0x13);
1511      &pxor     ($wtmpt, $wtmpt);
1512      &movdqa    ($inout5, $tweak);          # put aside previous tweak
1513      &paddq     ($tweak, $tweak);          # &psllq($tweak, 1);
1514      &pand     ($twres, $twmask);          # isolate carry and residue
1515      &pcmpgtd  ($wtmpt, $tweak);          # broadcast upper bits
1516      &pxor     ($tweak, $twres);
1517      &movdqa    (&QWP(16*0, "esp"), $inout3);
1518      &movdqa    (&QWP(16*1, "esp"), $inout4);
1519      &jc       (&label("xts_dec_four"));

1521      &movdqa    (&QWP(16*2, "esp"), $inout5);
1522      &pshufd    ($inout5, $wtmpt, 0x13);
1523      &movdqa    (&QWP(16*3, "esp"), $tweak);
1524      &paddq     ($tweak, $tweak);          # &psllq($inout0, 1);
1525      &pand     ($inout5, $twmask);          # isolate carry and residue
1526      &pxor     ($inout5, $tweak);

1528      &movdqu    ($inout0, &QWP(16*0, $inp)); # load input
1529      &movdqu    ($inout1, &QWP(16*1, $inp));
1530      &movdqu    ($inout2, &QWP(16*2, $inp));
1531      &pxor     ($inout0, &QWP(16*0, "esp")); # input^=tweak
1532      &movdqu    ($inout3, &QWP(16*3, $inp));
1533      &pxor     ($inout1, &QWP(16*1, "esp"));
1534      &movdqu    ($inout4, &QWP(16*4, $inp));
1535      &pxor     ($inout2, &QWP(16*2, "esp"));

```

```

1536     &lea    ($inp,&DWP(16*5,$inp));
1537     &pxor   ($inout3,&QWP(16*3,"esp"));
1538     &movdqa (&QWP(16*4,"esp"),$inout5);    # save last tweak
1539     &pxor   ($inout4,$inout5);

1541     &call   ("_aesni_decrypt6");

1543     &movaps ($tweak,&QWP(16*4,"esp"));    # last tweak
1544     &xorps  ($inout0,&QWP(16*0,"esp"));    # output^=tweak
1545     &xorps  ($inout1,&QWP(16*1,"esp"));
1546     &xorps  ($inout2,&QWP(16*2,"esp"));
1547     &movups ($inout0,&QWP(16*0,$out),$inout0);    # write output
1548     &xorps  ($inout3,&QWP(16*3,"esp"));
1549     &movups ($inout3,&QWP(16*1,$out),$inout1);
1550     &xorps  ($inout4,$tweak);
1551     &movups ($inout3,&QWP(16*2,$out),$inout2);
1552     &movups ($inout3,&QWP(16*3,$out),$inout3);
1553     &movups ($inout3,&QWP(16*4,$out),$inout4);
1554     &lea    ($out,&DWP(16*5,$out));
1555     &jmp    (&label("xts_dec_done"));

1557 &set_label("xts_dec_one",16);
1558     &movups ($inout0,&QWP(16*0,$inp));    # load input
1559     &lea    ($inp,&DWP(16*1,$inp));
1560     &xorps  ($inout0,$inout3);    # input^=tweak
1561     if ($inline)
1562     { &aesni_inline_generate1("dec"); }
1563     else
1564     { &call   ("_aesni_decrypt1"); }
1565     &xorps  ($inout0,$inout3);    # output^=tweak
1566     &movups ($inout0,&QWP(16*0,$out),$inout0);    # write output
1567     &lea    ($out,&DWP(16*1,$out));

1569     &movdqa ($tweak,$inout3);    # last tweak
1570     &jmp    (&label("xts_dec_done"));

1572 &set_label("xts_dec_two",16);
1573     &movaps ($inout4,$tweak);    # put aside last tweak

1575     &movups ($inout0,&QWP(16*0,$inp));    # load input
1576     &movups ($inout1,&QWP(16*1,$inp));
1577     &lea    ($inp,&DWP(16*2,$inp));
1578     &xorps  ($inout0,$inout3);    # input^=tweak
1579     &xorps  ($inout1,$inout4);

1581     &call   ("_aesni_decrypt3");

1583     &xorps  ($inout0,$inout3);    # output^=tweak
1584     &xorps  ($inout1,$inout4);
1585     &movups ($inout0,&QWP(16*0,$out),$inout0);    # write output
1586     &movups ($inout0,&QWP(16*1,$out),$inout1);
1587     &lea    ($out,&DWP(16*2,$out));

1589     &movdqa ($tweak,$inout4);    # last tweak
1590     &jmp    (&label("xts_dec_done"));

1592 &set_label("xts_dec_three",16);
1593     &movaps ($inout5,$tweak);    # put aside last tweak
1594     &movups ($inout0,&QWP(16*0,$inp));    # load input
1595     &movups ($inout1,&QWP(16*1,$inp));
1596     &movups ($inout2,&QWP(16*2,$inp));
1597     &lea    ($inp,&DWP(16*3,$inp));
1598     &xorps  ($inout0,$inout3);    # input^=tweak
1599     &xorps  ($inout1,$inout4);
1600     &xorps  ($inout2,$inout5);

```

```

1602     &call   ("_aesni_decrypt3");

1604     &xorps  ($inout0,$inout3);    # output^=tweak
1605     &xorps  ($inout1,$inout4);
1606     &xorps  ($inout2,$inout5);
1607     &movups ($inout0,&QWP(16*0,$out),$inout0);    # write output
1608     &movups ($inout0,&QWP(16*1,$out),$inout1);
1609     &movups ($inout0,&QWP(16*2,$out),$inout2);
1610     &lea    ($out,&DWP(16*3,$out));

1612     &movdqa ($tweak,$inout5);    # last tweak
1613     &jmp    (&label("xts_dec_done"));

1615 &set_label("xts_dec_four",16);
1616     &movaps ($inout4,$tweak);    # put aside last tweak

1618     &movups ($inout0,&QWP(16*0,$inp));    # load input
1619     &movups ($inout1,&QWP(16*1,$inp));
1620     &movups ($inout2,&QWP(16*2,$inp));
1621     &xorps  ($inout0,&QWP(16*0,"esp"));    # input^=tweak
1622     &movups ($inout3,&QWP(16*3,$inp));
1623     &lea    ($inp,&DWP(16*4,$inp));
1624     &xorps  ($inout1,&QWP(16*1,"esp"));
1625     &xorps  ($inout2,$inout5);
1626     &xorps  ($inout3,$inout4);

1628     &call   ("_aesni_decrypt4");

1630     &xorps  ($inout0,&QWP(16*0,"esp"));    # output^=tweak
1631     &xorps  ($inout1,&QWP(16*1,"esp"));
1632     &xorps  ($inout2,$inout5);
1633     &movups ($inout0,&QWP(16*0,$out),$inout0);    # write output
1634     &xorps  ($inout3,$inout4);
1635     &movups ($inout0,&QWP(16*1,$out),$inout1);
1636     &movups ($inout0,&QWP(16*2,$out),$inout2);
1637     &movups ($inout0,&QWP(16*3,$out),$inout3);
1638     &lea    ($out,&DWP(16*4,$out));

1640     &movdqa ($tweak,$inout4);    # last tweak
1641     &jmp    (&label("xts_dec_done"));

1643 &set_label("xts_dec_done6x",16);    # $tweak is pre-calculated
1644     &mov    ($len,&DWP(16*7+0,"esp"));    # restore original $len
1645     &and    ($len,15);
1646     &jz     (&label("xts_dec_ret"));
1647     &mov    (&DWP(16*7+0,"esp"),$len);    # save $len%16
1648     &jmp    (&label("xts_dec_only_one_more"));

1650 &set_label("xts_dec_done",16);
1651     &mov    ($len,&DWP(16*7+0,"esp"));    # restore original $len
1652     &pxor   ($wtmp,$wtmp);
1653     &and    ($len,15);
1654     &jz     (&label("xts_dec_ret"));

1656     &pcmpgtb($wtmp,$tweak);    # broadcast upper bits
1657     &mov    (&DWP(16*7+0,"esp"),$len);    # save $len%16
1658     &pshufd ($wtres,$wtmp,0x13);
1659     &pxor   ($wtmp,$wtmp);
1660     &movdqa ($tmask,&QWP(16*6,"esp"));
1661     &paddq   ($tweak,$tweak);    # &psllq($tweak,1);
1662     &pand    ($wtres,$tmask);    # isolate carry and residue
1663     &pcmpgtb($wtmp,$tweak);    # broadcast upper bits
1664     &pxor   ($tweak,$wtres);

1666 &set_label("xts_dec_only_one_more");
1667     &pshufd ($inout3,$wtmp,0x13);

```

```

1668      &movdqa ($inout4,$tweak);      # put aside previous tweak
1669      &paddq ($tweak,$tweak);          # &psllq($tweak,1);
1670      &pand ($inout3,$tweak);          # isolate carry and residue
1671      &pxor ($inout3,$tweak);

1673      &mov ($key,$key_);               # restore $key
1674      &mov ($rounds,$rounds_);         # restore $rounds

1676      &movups ($inout0,&QWP(0,$inp));   # load input
1677      &xorps ($inout0,$inout3);         # input^=tweak
1678      if ($inline)
1679      { &aesni_inline_generate1("dec"); }
1680      else
1681      { &call ("_aesni_decrypt1"); }
1682      &xorps ($inout0,$inout3);         # output^=tweak
1683      &movups (&QWP(0,$out),$inout0); # write output

1685 &set_label("xts_dec_steal");
1686      &movz ($rounds,&BP(16,$inp));
1687      &movz ($key,&BP(0,$out));
1688      &lea ($inp,&DWP(1,$inp));
1689      &mov (&BP(0,$out),&LB($rounds));
1690      &mov (&BP(16,$out),&LB($key));
1691      &lea ($out,&DWP(1,$out));
1692      &sub ($len,1);
1693      &jnz (&label("xts_dec_steal"));

1695      &sub ($out,&DWP(16*7+0,"esp"));   # rewind $out
1696      &mov ($key,$key_);               # restore $key
1697      &mov ($rounds,$rounds_);         # restore $rounds

1699      &movups ($inout0,&QWP(0,$out));   # load input
1700      &xorps ($inout0,$inout4);         # input^=tweak
1701      if ($inline)
1702      { &aesni_inline_generate1("dec"); }
1703      else
1704      { &call ("_aesni_decrypt1"); }
1705      &xorps ($inout0,$inout4);         # output^=tweak
1706      &movups (&QWP(0,$out),$inout0); # write output

1708 &set_label("xts_dec_ret");
1709      &mov ("esp",&DWP(16*7+4,"esp")); # restore %esp
1710 &function_end("aesni_xts_decrypt");
1711 }
1712 }

```

```

1713 #####
1714 # void $PREFIX_cbc_encrypt (const void *inp, void *out,
1715 #                             size_t length, const AES_KEY *key,
1716 #                             unsigned char *ivp, const int enc);
1717 &function_begin("${PREFIX}_cbc_encrypt");
1718      &mov ($inp,&wparam(0));
1719      &mov ($rounds_,"esp");
1720      &mov ($out,&wparam(1));
1721      &sub ($rounds_,24);
1722      &mov ($len,&wparam(2));
1723      &and ($rounds_,-16);
1724      &mov ($key,&wparam(3));
1725      &mov ($key_,&wparam(4));
1726      &test ($len,$len);
1727      &jz (&label("cbc_abort"));

1729      &cmp ($wparam(5),0);
1730      &xchg ($rounds_,"esp");
1731      &movups ($ivec,&QWP(0,$key_));      # alloca
1732      &mov ($rounds,&DWP(240,$key));      # load IV
1733      &mov ($key_,$key);
1734      &mov (&DWP(16,"esp"),$rounds_);    # backup $key
1735      &mov ($rounds,$rounds);            # save original %esp
1736      &jc (&label("cbc_decrypt"));

1738      &movaps ($inout0,$ivec);
1739      &cmp ($len,16);
1740      &jb (&label("cbc_enc_tail"));
1741      &sub ($len,16);
1742      &jmp (&label("cbc_enc_loop"));

1744 &set_label("cbc_enc_loop",16);
1745      &movups ($ivec,&QWP(0,$inp));      # input actually
1746      &lea ($inp,&DWP(16,$inp));
1747      if ($inline)
1748      { &aesni_inline_generate1("enc",$inout0,$ivec); }
1749      else
1750      { &xorps($inout0,$ivec); &call("_aesni_encrypt1"); }
1751      &mov ($rounds,$rounds_);          # restore $rounds
1752      &mov ($key,$key_);                # restore $key
1753      &movups (&QWP(0,$out),$inout0);   # store output
1754      &lea ($out,&DWP(16,$out));
1755      &sub ($len,16);
1756      &jnc (&label("cbc_enc_loop"));
1757      &add ($len,16);
1758      &jnz (&label("cbc_enc_tail"));
1759      &movaps ($ivec,$inout0);
1760      &jmp (&label("cbc_ret"));

1762 &set_label("cbc_enc_tail");
1763      &mov ("ecx",$len);                # zaps $rounds
1764      &data_word(0xA4F3F689);          # rep movsb
1765      &mov ("ecx",16);                 # zero tail
1766      &sub ("ecx",$len);
1767      &xor ("eax","eax");
1768      &data_word(0xAAF3F689);          # zaps $len
1769      &lea ($out,&DWP(-16,$out));        # rep stosb
1770      &mov ($rounds,$rounds_);          # rewind $out by 1 block
1771      &mov ($inp,$out);                 # restore $rounds
1772      &mov ($key,$key_);                # $inp and $out are the same
1773      &jmp (&label("cbc_enc_loop"));
1774 #####
1775 &set_label("cbc_decrypt",16);
1776      &cmp ($len,0x50);
1777      &jbe (&label("cbc_dec_tail"));
1778      &movaps (&QWP(0,"esp"),$ivec);  # save IV

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1779      &sub      ($len,0x50);
1780      &jmp      (&label("cbc_dec_loop6_enter"));

1782 &set_label("cbc_dec_loop6",16);
1783      &movaps   (&QWP(0,"esp"),$rndkey0);      # save IV
1784      &movups   (&QWP(0,$out),$inout5);
1785      &lea      ($out,&DWP(0x10,$out));
1786 &set_label("cbc_dec_loop6_enter");
1787      &movdqu   ($inout0,&QWP(0,$inp));
1788      &movdqu   ($inout1,&QWP(0x10,$inp));
1789      &movdqu   ($inout2,&QWP(0x20,$inp));
1790      &movdqu   ($inout3,&QWP(0x30,$inp));
1791      &movdqu   ($inout4,&QWP(0x40,$inp));
1792      &movdqu   ($inout5,&QWP(0x50,$inp));

1794      &call     ("_aesni_decrypt6");

1796      &movups   ($rndkey1,&QWP(0,$inp));
1797      &movups   ($rndkey0,&QWP(0x10,$inp));
1798      &xorps    ($inout0,&QWP(0,"esp"));          # ^=IV
1799      &xorps    ($inout1,$rndkey1);
1800      &movups   ($rndkey1,&QWP(0x20,$inp));
1801      &xorps    ($inout2,$rndkey0);
1802      &movups   ($rndkey0,&QWP(0x30,$inp));
1803      &xorps    ($inout3,$rndkey1);
1804      &movups   ($rndkey1,&QWP(0x40,$inp));
1805      &xorps    ($inout4,$rndkey0);
1806      &movups   ($rndkey0,&QWP(0x50,$inp));      # IV
1807      &xorps    ($inout5,$rndkey1);
1808      &movups   (&QWP(0,$out),$inout0);
1809      &movups   (&QWP(0x10,$out),$inout1);
1810      &lea      ($inp,&DWP(0x60,$inp));
1811      &movups   (&QWP(0x20,$out),$inout2);
1812      &mov      ($rounds,$rounds_)              # restore $rounds
1813      &movups   (&QWP(0x30,$out),$inout3);
1814      &mov      ($key,$key_)                     # restore $key
1815      &movups   (&QWP(0x40,$out),$inout4);
1816      &lea      ($out,&DWP(0x50,$out));
1817      &sub      ($len,0x60);
1818      &jja      (&label("cbc_dec_loop6"));

1820      &movaps   ($inout0,$inout5);
1821      &movaps   ($ivec,$rndkey0);
1822      &add      ($len,0x50);
1823      &jle      (&label("cbc_dec_tail_collected"));
1824      &movups   (&QWP(0,$out),$inout0);
1825      &lea      ($out,&DWP(0x10,$out));
1826 &set_label("cbc_dec_tail");
1827      &movups   ($inout0,&QWP(0,$inp));
1828      &movaps   ($in0,$inout0);
1829      &cmp      ($len,0x10);
1830      &jbe      (&label("cbc_dec_one"));

1832      &movups   ($inout1,&QWP(0x10,$inp));
1833      &movaps   ($in1,$inout1);
1834      &cmp      ($len,0x20);
1835      &jbe      (&label("cbc_dec_two"));

1837      &movups   ($inout2,&QWP(0x20,$inp));
1838      &cmp      ($len,0x30);
1839      &jbe      (&label("cbc_dec_three"));

1841      &movups   ($inout3,&QWP(0x30,$inp));
1842      &cmp      ($len,0x40);
1843      &jbe      (&label("cbc_dec_four"));

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1845      &movups   ($inout4,&QWP(0x40,$inp));
1846      &movaps   (&QWP(0,"esp"),$ivec);          # save IV
1847      &movups   ($inout0,&QWP(0,$inp));
1848      &xorps    ($inout5,$inout5);
1849      &call     ("_aesni_decrypt6");
1850      &movups   ($rndkey1,&QWP(0,$inp));
1851      &movups   ($rndkey0,&QWP(0x10,$inp));
1852      &xorps    ($inout0,&QWP(0,"esp"));          # ^= IV
1853      &xorps    ($inout1,$rndkey1);
1854      &movups   ($rndkey1,&QWP(0x20,$inp));
1855      &xorps    ($inout2,$rndkey0);
1856      &movups   ($rndkey0,&QWP(0x30,$inp));
1857      &xorps    ($inout3,$rndkey1);
1858      &movups   ($ivec,&QWP(0x40,$inp));          # IV
1859      &xorps    ($inout4,$rndkey0);
1860      &movups   (&QWP(0,$out),$inout0);
1861      &movups   (&QWP(0x10,$out),$inout1);
1862      &movups   (&QWP(0x20,$out),$inout2);
1863      &movups   (&QWP(0x30,$out),$inout3);
1864      &lea      ($out,&DWP(0x40,$out));
1865      &movaps   ($inout0,$inout4);
1866      &sub      ($len,0x50);
1867      &jmp      (&label("cbc_dec_tail_collected"));

1869 &set_label("cbc_dec_one",16);
1870      if ($inline)
1871      { &aesni_inline_generate1("dec"); }
1872      else
1873      { &call     ("_aesni_decrypt1"); }
1874      &xorps    ($inout0,$ivec);
1875      &movaps   ($ivec,$in0);
1876      &sub      ($len,0x10);
1877      &jmp      (&label("cbc_dec_tail_collected"));

1879 &set_label("cbc_dec_two",16);
1880      &xorps    ($inout2,$inout2);
1881      &call     ("_aesni_decrypt3");
1882      &xorps    ($inout0,$ivec);
1883      &xorps    ($inout1,$in0);
1884      &movups   (&QWP(0,$out),$inout0);
1885      &movaps   ($inout0,$inout1);
1886      &lea      ($out,&DWP(0x10,$out));
1887      &movaps   ($ivec,$in1);
1888      &sub      ($len,0x20);
1889      &jmp      (&label("cbc_dec_tail_collected"));

1891 &set_label("cbc_dec_three",16);
1892      &call     ("_aesni_decrypt3");
1893      &xorps    ($inout0,$ivec);
1894      &xorps    ($inout1,$in0);
1895      &xorps    ($inout2,$in1);
1896      &movups   (&QWP(0,$out),$inout0);
1897      &movaps   ($inout0,$inout2);
1898      &movups   (&QWP(0x10,$out),$inout1);
1899      &lea      ($out,&DWP(0x20,$out));
1900      &movups   ($ivec,&QWP(0x20,$inp));
1901      &sub      ($len,0x30);
1902      &jmp      (&label("cbc_dec_tail_collected"));

1904 &set_label("cbc_dec_four",16);
1905      &call     ("_aesni_decrypt4");
1906      &movups   ($rndkey1,&QWP(0x10,$inp));
1907      &movups   ($rndkey0,&QWP(0x20,$inp));
1908      &xorps    ($inout0,$ivec);
1909      &movups   ($ivec,&QWP(0x30,$inp));
1910      &xorps    ($inout1,$in0);

```

```

1911      &movups (&QWP(0,$out),$inout0);
1912      &xorps ($inout2,$rndkey1);
1913      &movups (&QWP(0x10,$out),$inout1);
1914      &xorps ($inout3,$rndkey0);
1915      &movups (&QWP(0x20,$out),$inout2);
1916      &lea ($out,&DWP(0x30,$out));
1917      &movaps ($inout0,$inout3);
1918      &sub ($len,0x40);

1920 &set_label("cbc_dec_tail_collected");
1921      &and ($len,15);
1922      &jnz (&label("cbc_dec_tail_partial"));
1923      &movups (&QWP(0,$out),$inout0);
1924      &jmp (&label("cbc_ret"));

1926 &set_label("cbc_dec_tail_partial",16);
1927      &movaps (&QWP(0,$esp),$inout0);
1928      &mov ("ecx",16);
1929      &mov ($inp,$esp);
1930      &sub ("ecx",$len);
1931      &data_word(0xA4F3F689); # rep movsb

1933 &set_label("cbc_ret");
1934      &mov ("esp",&DWP(16,$esp)); # pull original %esp
1935      &mov ($key_,$wparam(4));
1936      &movups (&QWP(0,$key_),$ivec); # output IV
1937 &set_label("cbc_abort");
1938 &function_end("${PREFIX}_cbc_encrypt");

```

```

1939 #####
1940 # Mechanical port from aesni-x86_64.pl.
1941 #
1942 # _aesni_set_encrypt_key is private interface,
1943 # input:
1944 #   "eax"    const unsigned char *userKey
1945 #   $rounds  int bits
1946 #   $key     AES_KEY *key
1947 # output:
1948 #   "eax"    return code
1949 #   $round   rounds

1951 &function_begin_B("aesni_set_encrypt_key");
1952      &test ("eax","eax");
1953      &jz (&label("bad_pointer"));
1954      &test ($key,$key);
1955      &jz (&label("bad_pointer"));

1957      &movups ("xmm0",&QWP(0,$eax)); # pull first 128 bits of *userKey
1958      &xorps ("xmm4","xmm4"); # low dword of xmm4 is assumed 0
1959      &lea ($key,&DWP(16,$key));
1960      &cmp ($rounds,256);
1961      &jc (&label("14rounds"));
1962      &cmp ($rounds,192);
1963      &jc (&label("12rounds"));
1964      &cmp ($rounds,128);
1965      &jne (&label("bad_keybits"));

1967 &set_label("10rounds",16);
1968      &mov ($rounds,9);
1969      &$movekey (&QWP(-16,$key),"xmm0"); # round 0
1970      &aeskeygenassist("xmm1","xmm0",0x01); # round 1
1971      &call (&label("key_128_cold"));
1972      &aeskeygenassist("xmm1","xmm0",0x2); # round 2
1973      &call (&label("key_128"));
1974      &aeskeygenassist("xmm1","xmm0",0x04); # round 3
1975      &call (&label("key_128"));
1976      &aeskeygenassist("xmm1","xmm0",0x08); # round 4
1977      &call (&label("key_128"));
1978      &aeskeygenassist("xmm1","xmm0",0x10); # round 5
1979      &call (&label("key_128"));
1980      &aeskeygenassist("xmm1","xmm0",0x20); # round 6
1981      &call (&label("key_128"));
1982      &aeskeygenassist("xmm1","xmm0",0x40); # round 7
1983      &call (&label("key_128"));
1984      &aeskeygenassist("xmm1","xmm0",0x80); # round 8
1985      &call (&label("key_128"));
1986      &aeskeygenassist("xmm1","xmm0",0x1b); # round 9
1987      &call (&label("key_128"));
1988      &aeskeygenassist("xmm1","xmm0",0x36); # round 10
1989      &call (&label("key_128"));
1990      &$movekey (&QWP(0,$key),"xmm0");
1991      &mov (&DWP(80,$key),$rounds);
1992      &xor ("eax","eax");
1993      &ret();

1995 &set_label("key_128",16);
1996      &$movekey (&QWP(0,$key),"xmm0");
1997      &lea ($key,&DWP(16,$key));
1998 &set_label("key_128_cold");
1999      &shufps ("xmm4","xmm0",0b00010000);
2000      &xorps ("xmm0","xmm4");
2001      &shufps ("xmm4","xmm0",0b10001100);
2002      &xorps ("xmm0","xmm4");
2003      &shufps ("xmm1","xmm1",0b11111111); # critical path
2004      &xorps ("xmm0","xmm1");

```



```

2005      &ret();

2007 &set_label("12rounds",16);
2008      &movq      ("xmm2",&QWP(16,"eax"));          # remaining 1/3 of *user
2009      &mov      ($rounds,11);
2010      &$movekey   (&QWP(-16,$key),"xmm0")          # round 0
2011      &aeskeygenassist("xmm1","xmm2",0x01);        # round 1,2
2012      &call      (&label("key_192a_cold"));
2013      &aeskeygenassist("xmm1","xmm2",0x02);        # round 2,3
2014      &call      (&label("key_192b"));
2015      &aeskeygenassist("xmm1","xmm2",0x04);        # round 4,5
2016      &call      (&label("key_192a"));
2017      &aeskeygenassist("xmm1","xmm2",0x08);        # round 5,6
2018      &call      (&label("key_192b"));
2019      &aeskeygenassist("xmm1","xmm2",0x10);        # round 7,8
2020      &call      (&label("key_192a"));
2021      &aeskeygenassist("xmm1","xmm2",0x20);        # round 8,9
2022      &call      (&label("key_192b"));
2023      &aeskeygenassist("xmm1","xmm2",0x40);        # round 10,11
2024      &call      (&label("key_192a"));
2025      &aeskeygenassist("xmm1","xmm2",0x80);        # round 11,12
2026      &call      (&label("key_192b"));
2027      &$movekey   (&QWP(0,$key),"xmm0");
2028      &mov      (&DWP(48,$key),$rounds);
2029      &xor      ("eax","eax");
2030      &ret();

2032 &set_label("key_192a",16);
2033      &$movekey   (&QWP(0,$key),"xmm0");
2034      &lea      ($key,&DWP(16,$key));
2035 &set_label("key_192a_cold",16);
2036      &movaps     ("xmm5","xmm2");
2037 &set_label("key_192b_warm");
2038      &$shufps    ("xmm4","xmm0",0b00010000);
2039      &$movdqa     ("xmm3","xmm2");
2040      &$xorps      ("xmm0","xmm4");
2041      &$shufps      ("xmm4","xmm0",0b10001100);
2042      &$pslldq     ("xmm3",4);
2043      &$xorps      ("xmm0","xmm4");
2044      &$pshufd     ("xmm1","xmm1",0b01010101);    # critical path
2045      &$pxor      ("xmm2","xmm3");
2046      &$pxor      ("xmm0","xmm1");
2047      &$pshufd     ("xmm3","xmm0",0b11111111);
2048      &$pxor      ("xmm2","xmm3");
2049      &ret();

2051 &set_label("key_192b",16);
2052      &$movaps     ("xmm3","xmm0");
2053      &$shufps      ("xmm5","xmm0",0b01000100);
2054      &$movekey     (&QWP(0,$key),"xmm5");
2055      &$shufps      ("xmm3","xmm2",0b01001110);
2056      &$movekey     (&QWP(16,$key),"xmm3");
2057      &lea      ($key,&DWP(32,$key));
2058      &jmp      (&label("key_192b_warm"));

2060 &set_label("14rounds",16);
2061      &$movups     ("xmm2",&QWP(16,"eax"));          # remaining half of *use
2062      &$mov      ($rounds,13);
2063      &lea      ($key,&DWP(16,$key));
2064      &$movekey     (&QWP(-32,$key),"xmm0");        # round 0
2065      &$movekey     (&QWP(-16,$key),"xmm2");        # round 1
2066      &aeskeygenassist("xmm1","xmm2",0x01);        # round 2
2067      &call      (&label("key_256a_cold"));
2068      &aeskeygenassist("xmm1","xmm0",0x01);        # round 3
2069      &call      (&label("key_256b"));
2070      &aeskeygenassist("xmm1","xmm2",0x02);        # round 4

```

```

2071      &call      (&label("key_256a"));
2072      &aeskeygenassist("xmm1","xmm0",0x02);        # round 5
2073      &call      (&label("key_256b"));
2074      &aeskeygenassist("xmm1","xmm2",0x04);        # round 6
2075      &call      (&label("key_256a"));
2076      &aeskeygenassist("xmm1","xmm0",0x04);        # round 7
2077      &call      (&label("key_256b"));
2078      &aeskeygenassist("xmm1","xmm2",0x08);        # round 8
2079      &call      (&label("key_256a"));
2080      &aeskeygenassist("xmm1","xmm0",0x08);        # round 9
2081      &call      (&label("key_256b"));
2082      &aeskeygenassist("xmm1","xmm2",0x10);        # round 10
2083      &call      (&label("key_256a"));
2084      &aeskeygenassist("xmm1","xmm0",0x10);        # round 11
2085      &call      (&label("key_256b"));
2086      &aeskeygenassist("xmm1","xmm2",0x20);        # round 12
2087      &call      (&label("key_256a"));
2088      &aeskeygenassist("xmm1","xmm0",0x20);        # round 13
2089      &call      (&label("key_256b"));
2090      &aeskeygenassist("xmm1","xmm2",0x40);        # round 14
2091      &call      (&label("key_256a"));
2092      &$movekey     (&QWP(0,$key),"xmm0");
2093      &$mov      (&DWP(16,$key),$rounds);
2094      &$xor      ("eax","eax");
2095      &ret();

2097 &set_label("key_256a",16);
2098      &$movekey     (&QWP(0,$key),"xmm2");
2099      &lea      ($key,&DWP(16,$key));
2100 &set_label("key_256a_cold");
2101      &$shufps      ("xmm4","xmm0",0b00010000);
2102      &$xorps      ("xmm0","xmm4");
2103      &$shufps      ("xmm4","xmm0",0b10001100);
2104      &$xorps      ("xmm0","xmm4");
2105      &$shufps      ("xmm1","xmm1",0b11111111);    # critical path
2106      &$xorps      ("xmm0","xmm1");
2107      &ret();

2109 &set_label("key_256b",16);
2110      &$movekey     (&QWP(0,$key),"xmm0");
2111      &lea      ($key,&DWP(16,$key));

2113      &$shufps      ("xmm4","xmm2",0b00010000);
2114      &$xorps      ("xmm2","xmm4");
2115      &$shufps      ("xmm4","xmm2",0b10001100);
2116      &$xorps      ("xmm2","xmm4");
2117      &$shufps      ("xmm1","xmm1",0b10101010);    # critical path
2118      &$xorps      ("xmm2","xmm1");
2119      &ret();

2121 &set_label("bad_pointer",4);
2122      &$mov      ("eax",-1);
2123      &ret      ();
2124 &set_label("bad_keybits",4);
2125      &$mov      ("eax",-2);
2126      &ret      ();
2127 &function_end_B("_aesni_set_encrypt_key");

2129 # int $PREFIX_set_encrypt_key (const unsigned char *userKey, int bits,
2130 #                               AES_KEY *key)
2131 &function_begin_B("${PREFIX}_set_encrypt_key");
2132      &$mov      ("eax",&wparam(0));
2133      &$mov      ($rounds,&wparam(1));
2134      &$mov      ($key,&wparam(2));
2135      &call      ("_aesni_set_encrypt_key");
2136      &ret      ();

```

```

2137 &function_end_B("${PREFIX}_set_encrypt_key");

2139 # int $PREFIX_set_decrypt_key (const unsigned char *userKey, int bits,
2140 #                               AES_KEY *key)
2141 &function_begin_B("${PREFIX}_set_decrypt_key");
2142     &mov     ("eax",&wparam(0));
2143     &mov     ($rounds,&wparam(1));
2144     &mov     ($key,&wparam(2));
2145     &call    ("_aesni_set_encrypt_key");
2146     &mov     ($key,&wparam(2));
2147     &shl     ($rounds,4)    # rounds-1 after _aesni_set_encrypt_key
2148     &test    ("eax","eax");
2149     &jnz     (&label("dec_key_ret"));
2150     &lea     ("eax",&DWP(16,$key,$rounds)); # end of key schedule

2152     &$movekey    ("xmm0",&QWP(0,$key)); # just swap
2153     &$movekey    ("xmm1",&QWP(0,"eax"));
2154     &$movekey    (&QWP(0,"eax"),"xmm0");
2155     &$movekey    (&QWP(0,$key),"xmm1");
2156     &lea         ($key,&DWP(16,$key));
2157     &lea         ("eax",&DWP(-16,"eax"));

2159 &set_label("dec_key_inverse");
2160     &$movekey    ("xmm0",&QWP(0,$key)); # swap and inverse
2161     &$movekey    ("xmm1",&QWP(0,"eax"));
2162     &aesimc      ("xmm0","xmm0");
2163     &aesimc      ("xmm1","xmm1");
2164     &lea         ($key,&DWP(16,$key));
2165     &lea         ("eax",&DWP(-16,"eax"));
2166     &$movekey    (&QWP(16,"eax"),"xmm0");
2167     &$movekey    (&QWP(-16,$key),"xmm1");
2168     &cmp         ("eax",$key);
2169     &ja         (&label("dec_key_inverse"));

2171     &$movekey    ("xmm0",&QWP(0,$key)); # inverse middle
2172     &aesimc      ("xmm0","xmm0");
2173     &$movekey    (&QWP(0,$key),"xmm0");

2175     &xor         ("eax","eax"); # return success
2176 &set_label("dec_key_ret");
2177     &ret         ();
2178 &function_end_B("${PREFIX}_set_decrypt_key");
2179 &asciz("AES for Intel AES-NI, CRYPTOGAMS by <appro@openssl.org>");

2181 &asm_finish();

```

new/usr/src/lib/openssl/libsunw_crypto/pl/aesni-x86_64.pl

1

```
*****
77731 Fri May 30 18:32:02 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/aesni-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # This module implements support for Intel AES-NI extension. In
11 # OpenSSL context it's used with Intel engine, but can also be used as
12 # drop-in replacement for crypto/aes/asm/aes-x86_64.pl [see below for
13 # details].
14 #
15 # Performance.
16 #
17 # Given aes(enc|dec) instructions' latency asymptotic performance for
18 # non-parallelizable modes such as CBC encrypt is 3.75 cycles per byte
19 # processed with 128-bit key. And given their throughput asymptotic
20 # performance for parallelizable modes is 1.25 cycles per byte. Being
21 # asymptotic limit it's not something you commonly achieve in reality,
22 # but how close does one get? Below are results collected for
23 # different modes and block sized. Pairs of numbers are for en-/
24 # decryption.
25 #
26 #      16-byte      64-byte      256-byte      1-KB      8-KB
27 # ECB  4.25/4.25    1.38/1.38    1.28/1.28    1.26/1.26    1.26/1.26
28 # CTR  5.42/5.42    1.92/1.92    1.44/1.44    1.28/1.28    1.26/1.26
29 # CBC  4.38/4.43    4.15/1.43    4.07/1.32    4.07/1.29    4.06/1.28
30 # CCM  5.66/9.42    4.42/5.41    4.16/4.40    4.09/4.15    4.06/4.07
31 # OFB  5.42/5.42    4.64/4.64    4.44/4.44    4.39/4.39    4.38/4.38
32 # CFB  5.73/5.85    5.56/5.62    5.48/5.56    5.47/5.55    5.47/5.55
33 #
34 # ECB, CTR, CBC and CCM results are free from EVP overhead. This means
35 # that otherwise used 'openssl speed -evp aes-128-??? -engine aesni
36 # [-decrypt]' will exhibit 10-15% worse results for smaller blocks.
37 # The results were collected with specially crafted speed.c benchmark
38 # in order to compare them with results reported in "Intel Advanced
39 # Encryption Standard (AES) New Instruction Set" White Paper Revision
40 # 3.0 dated May 2010. All above results are consistently better. This
41 # module also provides better performance for block sizes smaller than
42 # 128 bytes in points *not* represented in the above table.
43 #
44 # Looking at the results for 8-KB buffer.
45 #
46 # CFB and OFB results are far from the limit, because implementation
47 # uses "generic" CRYPTO_[c|o]fb128_encrypt interfaces relying on
48 # single-block aesni_encrypt, which is not the most optimal way to go.
49 # CBC encrypt result is unexpectedly high and there is no documented
50 # explanation for it. Seemingly there is a small penalty for feeding
51 # the result back to AES unit the way it's done in CBC mode. There is
52 # nothing one can do and the result appears optimal. CCM result is
53 # identical to CBC, because CBC-MAC is essentially CBC encrypt without
54 # saving output. CCM CTR "stays invisible," because it's neatly
55 # interleaved with CBC-MAC. This provides ~30% improvement over
56 # "straightforward" CCM implementation with CTR and CBC-MAC performed
57 # disjointly. Parallelizable modes practically achieve the theoretical
58 # limit.
59 #
60 # Looking at how results vary with buffer size.
61 #
```

new/usr/src/lib/openssl/libsunw_crypto/pl/aesni-x86_64.pl

2

```
62 # Curves are practically saturated at 1-KB buffer size. In most cases
63 # "256-byte" performance is >95%, and "64-byte" is ~90% of "8-KB" one.
64 # CTR curve doesn't follow this pattern and is "slowest" changing one
65 # with "256-byte" result being 87% of "8-KB." This is because overhead
66 # in CTR mode is most computationally intensive. Small-block CCM
67 # decrypt is slower than encrypt, because first CTR and last CBC-MAC
68 # iterations can't be interleaved.
69 #
70 # Results for 192- and 256-bit keys.
71 #
72 # EVP-free results were observed to scale perfectly with number of
73 # rounds for larger block sizes, i.e. 192-bit result being 10/12 times
74 # lower and 256-bit one - 10/14. Well, in CBC encrypt case differences
75 # are a tad smaller, because the above mentioned penalty biases all
76 # results by same constant value. In similar way function call
77 # overhead affects small-block performance, as well as OFB and CFB
78 # results. Differences are not large, most common coefficients are
79 # 10/11.7 and 10/13.4 (as opposite to 10/12.0 and 10/14.0), but one
80 # observe even 10/11.2 and 10/12.4 (CTR, OFB, CFB)...

82 # January 2011
83 #
84 # While Westmere processor features 6 cycles latency for aes[enc|dec]
85 # instructions, which can be scheduled every second cycle, Sandy
86 # Bridge spends 8 cycles per instruction, but it can schedule them
87 # every cycle. This means that code targeting Westmere would perform
88 # suboptimally on Sandy Bridge. Therefore this update.
89 #
90 # In addition, non-parallelizable CBC encrypt (as well as CCM) is
91 # optimized. Relative improvement might appear modest, 8% on Westmere,
92 # but in absolute terms it's 3.77 cycles per byte encrypted with
93 # 128-bit key on Westmere, and 5.07 - on Sandy Bridge. These numbers
94 # should be compared to asymptotic limits of 3.75 for Westmere and
95 # 5.00 for Sandy Bridge. Actually, the fact that they get this close
96 # to asymptotic limits is quite amazing. Indeed, the limit is
97 # calculated as latency times number of rounds, 10 for 128-bit key,
98 # and divided by 16, the number of bytes in block, or in other words
99 # it accounts *solely* for aesenc instructions. But there are extra
100 # instructions, and numbers so close to the asymptotic limits mean
101 # that it's as if it takes as little as *one* additional cycle to
102 # execute all of them. How is it possible? It is possible thanks to
103 # out-of-order execution logic, which manages to overlap post-
104 # processing of previous block, things like saving the output, with
105 # actual encryption of current block, as well as pre-processing of
106 # current block, things like fetching input and xor-ing it with
107 # 0-round element of the key schedule, with actual encryption of
108 # previous block. Keep this in mind...
109 #
110 # For parallelizable modes, such as ECB, CBC decrypt, CTR, higher
111 # performance is achieved by interleaving instructions working on
112 # independent blocks. In which case asymptotic limit for such modes
113 # can be obtained by dividing above mentioned numbers by AES
114 # instructions' interleave factor. Westmere can execute at most 3
115 # instructions at a time, meaning that optimal interleave factor is 3,
116 # and that's where the "magic" number of 1.25 come from. "Optimal
117 # interleave factor" means that increase of interleave factor does
118 # not improve performance. The formula has proven to reflect reality
119 # pretty well on Westmere... Sandy Bridge on the other hand can
120 # execute up to 8 AES instructions at a time, so how does varying
121 # interleave factor affect the performance? Here is table for ECB
122 # (numbers are cycles per byte processed with 128-bit key):
123 #
124 # instruction interleave factor      3x      6x      8x
125 # theoretical asymptotic limit      1.67    0.83    0.625
126 # measured performance for 8KB block  1.05    0.86    0.84
127 #
```

```

128 # "as if" interleave factor      4.7x   5.8x   6.0x
129 #
130 # Further data for other parallelizable modes:
131 #
132 # CBC decrypt      1.16   0.93   0.93
133 # CTR              1.14   0.91   n/a
134 #
135 # Well, given 3x column it's probably inappropriate to call the limit
136 # asymptotic, if it can be surpassed, isn't it? What happens there?
137 # Rewind to CBC paragraph for the answer. Yes, out-of-order execution
138 # magic is responsible for this. Processor overlaps not only the
139 # additional instructions with AES ones, but even AES instructions
140 # processing adjacent triplets of independent blocks. In the 6x case
141 # additional instructions still claim disproportionately small amount
142 # of additional cycles, but in 8x case number of instructions must be
143 # a tad too high for out-of-order logic to cope with, and AES unit
144 # remains underutilized... As you can see 8x interleave is hardly
145 # justifiable, so there no need to feel bad that 32-bit aesni-x86.pl
146 # utilizes 6x interleave because of limited register bank capacity.
147 #
148 # Higher interleave factors do have negative impact on Westmere
149 # performance. While for ECB mode it's negligible ~1.5%, other
150 # parallelizables perform ~5% worse, which is outweighed by ~25%
151 # improvement on Sandy Bridge. To balance regression on Westmere
152 # CTR mode was implemented with 6x aesenc interleave factor.

154 # April 2011
155 #
156 # Add aesni_xts_[en|de]crypt. Westmere spends 1.33 cycles processing
157 # one byte out of 8KB with 128-bit key, Sandy Bridge - 0.97. Just like
158 # in CTR mode AES instruction interleave factor was chosen to be 6x.

160 $PREFIX="aesni";      # if $PREFIX is set to "AES", the script
161                       # generates drop-in replacement for
162                       # crypto/aes/asm/aes-x86_64.pl:-)

164 $flavour = shift;
165 $output  = shift;
166 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

168 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

170 $0 =~ m/(.*[\\\/\s])(^\\\/\s)+$/; $dir=$1;
171 ( $xlate="$dir"x86_64-xlate.pl" and -f $xlate ) or
172 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl" and -f $xlate) or
173 die "can't locate x86_64-xlate.pl";

175 open OUT,"| \"$^X\" $xlate $flavour $output";
176 *STDOUT=*OUT;

178 $movkey = $PREFIX eq "aesni" ? "movups" : "movups";
179 @_args=$win64? ("%rcx","%rdx","%r8","%r9") : # Win64 order
180               ("%rdi","%rsi","%rdx","%rcx"); # Unix order

182 $code=".text\n";

184 $rounds="%eax"; # input to and changed by aesni_[en|de]cryptN !!!
185 # this is natural Unix argument order for public $PREFIX_[ecb|cbc]_encrypt ...
186 $inp="%rdi";
187 $out="%rsi";
188 $len="%rdx";
189 $key="%rcx";      # input to and changed by aesni_[en|de]cryptN !!!
190 $ivp="%r8";      # cbc, ctr, ...

192 $rnds_="%r10d"; # backup copy for $rounds
193 $key_="%r11";  # backup copy for $key

```

```

195 # %xmm register layout
196 $rndkey0="%xmm0";      $rndkey1="%xmm1";
197 $inout0="%xmm2";      $inout1="%xmm3";
198 $inout2="%xmm4";      $inout3="%xmm5";
199 $inout4="%xmm6";      $inout5="%xmm7";
200 $inout6="%xmm8";      $inout7="%xmm9";

202 $in2="%xmm6";          $in1="%xmm7";      # used in CBC decrypt, CTR, ...
203 $in0="%xmm8";          $iv="%xmm9";

```

```

204 # Inline version of internal aesni_[en|de]crypt1.
205 #
206 # Why folded loop? Because aes[enc|dec] is slow enough to accommodate
207 # cycles which take care of loop variables...
208 { my $sn;
209 sub aesni_generate1 {
210 my ($p,$key,$rounds,$inout,$ivec)=@_;   $inout=$inout0 if (!defined($inout));
211 ++$sn;
212 $code.=<<<__ ;
213     $movkey ($key),$rndkey0
214     $movkey 16($key),$rndkey1
215 __
216 $code.=<<<__ if (defined($ivec));
217     xorps    $rndkey0,$ivec
218     lea      32($key),$key
219     xorps    $ivec,$inout
220 __
221 $code.=<<<__ if (!defined($ivec));
222     lea      32($key),$key
223     xorps    $rndkey0,$inout
224 __
225 $code.=<<<__ ;
226 .Loop_${p}1 $sn:
227     aes${p} $rndkey1,$inout
228     dec     $rounds
229     $movkey ($key),$rndkey1
230     lea     16($key),$key
231     jnz     .Loop_${p}1 $sn # loop body is 16 bytes
232     aes${p}last $rndkey1,$inout
233 __
234 }
235 # void $PREFIX_[en|de]crypt (const void *inp,void *out,const AES_KEY *key);
236 #
237 { my ($inp,$out,$key) = @_args;

239 $code.=<<<__ ;
240 .globl ${PREFIX}_encrypt
241 .type  ${PREFIX}_encrypt,@abi-omnipotent
242 .align 16
243 ${PREFIX}_encrypt:
244     movups ($inp),$inout0      # load input
245     mov     240($key),$rounds   # key->rounds
246 __
247     &aesni_generate1("enc",$key,$rounds);
248 $code.=<<<__ ;
249     movups $inout0,$out        # output
250     ret
251 .size  ${PREFIX}_encrypt,.-${PREFIX}_encrypt

253 .globl ${PREFIX}_decrypt
254 .type  ${PREFIX}_decrypt,@abi-omnipotent
255 .align 16
256 ${PREFIX}_decrypt:
257     movups ($inp),$inout0      # load input
258     mov     240($key),$rounds   # key->rounds
259 __
260     &aesni_generate1("dec",$key,$rounds);
261 $code.=<<<__ ;
262     movups $inout0,$out        # output
263     ret
264 .size  ${PREFIX}_decrypt,.-${PREFIX}_decrypt
265
266 }
```

```

267 # _aesni_[en|de]cryptN are private interfaces, N denotes interleave
268 # factor. Why 3x subroutine were originally used in loops? Even though
269 # aes[enc|dec] latency was originally 6, it could be scheduled only
270 # every *2nd* cycle. Thus 3x interleave was the one providing optimal
271 # utilization, i.e. when subroutine's throughput is virtually same as
272 # of non-interleaved subroutine [for number of input blocks up to 3].
273 # This is why it makes no sense to implement 2x subroutine.
274 # aes[enc|dec] latency in next processor generation is 8, but the
275 # instructions can be scheduled every cycle. Optimal interleave for
276 # new processor is therefore 8x...
277 sub aesni_generate3 {
278 my $dir=shift;
279 # As already mentioned it takes in $key and $rounds, which are *not*
280 # preserved. $inout[0-2] is cipher/clear text...
281 $code.=<<<__ ;
282 .type  _aesni_${dir}rpt3,@abi-omnipotent
283 .align 16
284 _aesni_${dir}rpt3:
285     $movkey ($key),$rndkey0
286     shr     \ $1,$rounds
287     $movkey 16($key),$rndkey1
288     lea     32($key),$key
289     xorps   $rndkey0,$inout0
290     xorps   $rndkey0,$inout1
291     xorps   $rndkey0,$inout2
292     $movkey ($key),$rndkey0

294 .L${dir}_loop3:
295     aes${dir} $rndkey1,$inout0
296     aes${dir} $rndkey1,$inout1
297     dec     $rounds
298     aes${dir} $rndkey1,$inout2
299     $movkey 16($key),$rndkey1
300     aes${dir} $rndkey0,$inout0
301     aes${dir} $rndkey0,$inout1
302     lea     32($key),$key
303     aes${dir} $rndkey0,$inout2
304     $movkey ($key),$rndkey0
305     jnz     .L${dir}_loop3

307     aes${dir} $rndkey1,$inout0
308     aes${dir} $rndkey1,$inout1
309     aes${dir} $rndkey1,$inout2
310     aes${dir}last $rndkey0,$inout0
311     aes${dir}last $rndkey0,$inout1
312     aes${dir}last $rndkey0,$inout2
313     ret
314 .size  _aesni_${dir}rpt3,.-_aesni_${dir}rpt3
315 }
316
317 # 4x interleave is implemented to improve small block performance,
318 # most notably [and naturally] 4 block by ~30%. One can argue that one
319 # should have implemented 5x as well, but improvement would be <20%,
320 # so it's not worth it...
321 sub aesni_generate4 {
322 my $dir=shift;
323 # As already mentioned it takes in $key and $rounds, which are *not*
324 # preserved. $inout[0-3] is cipher/clear text...
325 $code.=<<<__ ;
326 .type  _aesni_${dir}rpt4,@abi-omnipotent
327 .align 16
328 _aesni_${dir}rpt4:
329     $movkey ($key),$rndkey0
330     shr     \ $1,$rounds
331     $movkey 16($key),$rndkey1
332     lea     32($key),$key

```

```

333     xorps    $rndkey0,$inout0
334     xorps    $rndkey0,$inout1
335     xorps    $rndkey0,$inout2
336     xorps    $rndkey0,$inout3
337     $movkey  ($key),$rndkey0

339 .L${dir}_loop4:
340     aes${dir}    $rndkey1,$inout0
341     aes${dir}    $rndkey1,$inout1
342     dec          $rounds
343     aes${dir}    $rndkey1,$inout2
344     aes${dir}    $rndkey1,$inout3
345     $movkey      16($key),$rndkey1
346     aes${dir}    $rndkey0,$inout0
347     aes${dir}    $rndkey0,$inout1
348     lea          32($key),$key
349     aes${dir}    $rndkey0,$inout2
350     aes${dir}    $rndkey0,$inout3
351     $movkey      ($key),$rndkey0
352     jnz          .L${dir}_loop4

354     aes${dir}    $rndkey1,$inout0
355     aes${dir}    $rndkey1,$inout1
356     aes${dir}    $rndkey1,$inout2
357     aes${dir}    $rndkey1,$inout3
358     aes${dir}last $rndkey0,$inout0
359     aes${dir}last $rndkey0,$inout1
360     aes${dir}last $rndkey0,$inout2
361     aes${dir}last $rndkey0,$inout3
362     ret
363 .size    _aesni_${dir}rpt4,.-_aesni_${dir}rpt4
364
365 }
366 sub aesni_generate6 {
367     my $dir=shift;
368     # As already mentioned it takes in $key and $rounds, which are *not*
369     # preserved. $inout[0-5] is cipher/clear text...
370     $code.=<<__ ;
371     .type    _aesni_${dir}rpt6,\@abi-omnipotent
372     .align   16
373     _aesni_${dir}rpt6:
374         $movkey    ($key),$rndkey0
375         shr        \ $1,$rounds
376         $movkey    16($key),$rndkey1
377         lea        32($key),$key
378         xorps      $rndkey0,$inout0
379         pxor       $rndkey0,$inout1
380         aes${dir}  $rndkey1,$inout0
381         pxor       $rndkey0,$inout2
382         aes${dir}  $rndkey1,$inout1
383         pxor       $rndkey0,$inout3
384         aes${dir}  $rndkey1,$inout2
385         pxor       $rndkey0,$inout4
386         aes${dir}  $rndkey1,$inout3
387         pxor       $rndkey0,$inout5
388         dec        $rounds
389         aes${dir}  $rndkey1,$inout4
390         $movkey    ($key),$rndkey0
391         aes${dir}  $rndkey1,$inout5
392         jmp        .L${dir}_loop6_enter
393     .align   16
394     .L${dir}_loop6:
395         aes${dir}  $rndkey1,$inout0
396         aes${dir}  $rndkey1,$inout1
397         dec        $rounds
398         aes${dir}  $rndkey1,$inout2

```

```

399     aes${dir}    $rndkey1,$inout3
400     aes${dir}    $rndkey1,$inout4
401     aes${dir}    $rndkey1,$inout5
402     .L${dir}_loop6_enter:                                # happens to be 16-byte aligned
403         $movkey    16($key),$rndkey1
404         aes${dir}  $rndkey0,$inout0
405         aes${dir}  $rndkey0,$inout1
406         lea        32($key),$key
407         aes${dir}  $rndkey0,$inout2
408         aes${dir}  $rndkey0,$inout3
409         aes${dir}  $rndkey0,$inout4
410         aes${dir}  $rndkey0,$inout5
411         $movkey    ($key),$rndkey0
412         jnz        .L${dir}_loop6

414     aes${dir}    $rndkey1,$inout0
415     aes${dir}    $rndkey1,$inout1
416     aes${dir}    $rndkey1,$inout2
417     aes${dir}    $rndkey1,$inout3
418     aes${dir}    $rndkey1,$inout4
419     aes${dir}    $rndkey1,$inout5
420     aes${dir}last $rndkey0,$inout0
421     aes${dir}last $rndkey0,$inout1
422     aes${dir}last $rndkey0,$inout2
423     aes${dir}last $rndkey0,$inout3
424     aes${dir}last $rndkey0,$inout4
425     aes${dir}last $rndkey0,$inout5
426     ret
427 .size    _aesni_${dir}rpt6,.-_aesni_${dir}rpt6
428
429 }
430 sub aesni_generate8 {
431     my $dir=shift;
432     # As already mentioned it takes in $key and $rounds, which are *not*
433     # preserved. $inout[0-7] is cipher/clear text...
434     $code.=<<__ ;
435     .type    _aesni_${dir}rpt8,\@abi-omnipotent
436     .align   16
437     _aesni_${dir}rpt8:
438         $movkey    ($key),$rndkey0
439         shr        \ $1,$rounds
440         $movkey    16($key),$rndkey1
441         lea        32($key),$key
442         xorps      $rndkey0,$inout0
443         xorps      $rndkey0,$inout1
444         aes${dir}  $rndkey1,$inout0
445         pxor       $rndkey0,$inout2
446         aes${dir}  $rndkey1,$inout1
447         pxor       $rndkey0,$inout3
448         aes${dir}  $rndkey1,$inout2
449         pxor       $rndkey0,$inout4
450         aes${dir}  $rndkey1,$inout3
451         pxor       $rndkey0,$inout5
452         dec        $rounds
453         aes${dir}  $rndkey1,$inout4
454         pxor       $rndkey0,$inout6
455         aes${dir}  $rndkey1,$inout5
456         pxor       $rndkey0,$inout7
457         $movkey    ($key),$rndkey0
458         aes${dir}  $rndkey1,$inout6
459         aes${dir}  $rndkey1,$inout7
460         $movkey    16($key),$rndkey1
461         jmp        .L${dir}_loop8_enter
462     .align   16
463     .L${dir}_loop8:
464         aes${dir}  $rndkey1,$inout0

```

```

465     aes${dir}      $rndkey1,$inout1
466     dec            $rounds
467     aes${dir}      $rndkey1,$inout2
468     aes${dir}      $rndkey1,$inout3
469     aes${dir}      $rndkey1,$inout4
470     aes${dir}      $rndkey1,$inout5
471     aes${dir}      $rndkey1,$inout6
472     aes${dir}      $rndkey1,$inout7
473     $movkey        16($key),$rndkey1
474 .LS{dir}_loop8_enter:      # happens to be 16-byte aligned
475     aes${dir}      $rndkey0,$inout0
476     aes${dir}      $rndkey0,$inout1
477     lea            32($key),$key
478     aes${dir}      $rndkey0,$inout2
479     aes${dir}      $rndkey0,$inout3
480     aes${dir}      $rndkey0,$inout4
481     aes${dir}      $rndkey0,$inout5
482     aes${dir}      $rndkey0,$inout6
483     aes${dir}      $rndkey0,$inout7
484     $movkey        ($key),$rndkey0
485     jnz            .LS{dir}_loop8

487     aes${dir}      $rndkey1,$inout0
488     aes${dir}      $rndkey1,$inout1
489     aes${dir}      $rndkey1,$inout2
490     aes${dir}      $rndkey1,$inout3
491     aes${dir}      $rndkey1,$inout4
492     aes${dir}      $rndkey1,$inout5
493     aes${dir}      $rndkey1,$inout6
494     aes${dir}      $rndkey1,$inout7
495     aes${dir}last  $rndkey0,$inout0
496     aes${dir}last  $rndkey0,$inout1
497     aes${dir}last  $rndkey0,$inout2
498     aes${dir}last  $rndkey0,$inout3
499     aes${dir}last  $rndkey0,$inout4
500     aes${dir}last  $rndkey0,$inout5
501     aes${dir}last  $rndkey0,$inout6
502     aes${dir}last  $rndkey0,$inout7
503     ret
504 .size    _aesni_${dir}rpt8,.-_aesni_${dir}rpt8
505 }
506
507 &aesni_generate3("enc") if ($PREFIX eq "aesni");
508 &aesni_generate3("dec");
509 &aesni_generate4("enc") if ($PREFIX eq "aesni");
510 &aesni_generate4("dec");
511 &aesni_generate6("enc") if ($PREFIX eq "aesni");
512 &aesni_generate6("dec");
513 &aesni_generate8("enc") if ($PREFIX eq "aesni");
514 &aesni_generate8("dec");

```

```

515 if ($PREFIX eq "aesni") {
516 #####
517 # void aesni_ecb_encrypt (const void *in, void *out,
518 #                          size_t length, const AES_KEY *key,
519 #                          int enc);
520 $code.=<<";
521 .globl aesni_ecb_encrypt
522 .type aesni_ecb_encrypt,@function,5
523 .align 16
524 aesni_ecb_encrypt:
525     and    \$.16,$len
526     jz     .Lecb_ret

528     mov    240($key),$rounds    # key->rounds
529     $movkey ($key),$rndkey0
530     mov    $key,$key_          # backup $key
531     mov    $rounds,$rnds_      # backup $rounds
532     test   %r8d,%r8d           # 5th argument
533     jz     .Lecb_decrypt
534 #----- ECB ENCRYPT -----#
535     cmp    \$.0x80,$len
536     jb     .Lecb_enc_tail

538     movdqu ($inp),$inout0
539     movdqu 0x10($inp),$inout1
540     movdqu 0x20($inp),$inout2
541     movdqu 0x30($inp),$inout3
542     movdqu 0x40($inp),$inout4
543     movdqu 0x50($inp),$inout5
544     movdqu 0x60($inp),$inout6
545     movdqu 0x70($inp),$inout7
546     lea    0x80($inp),$inp
547     sub    \$.0x80,$len
548     jmp    .Lecb_enc_loop8_enter
549 .align 16
550 .Lecb_enc_loop8:
551     movups $inout0,($out)
552     mov    $key_,$key          # restore $key
553     movdqu ($inp),$inout0
554     mov    $rnds_,$rounds      # restore $rounds
555     movups $inout1,0x10($out)
556     movdqu 0x10($inp),$inout1
557     movups $inout2,0x20($out)
558     movdqu 0x20($inp),$inout2
559     movups $inout3,0x30($out)
560     movdqu 0x30($inp),$inout3
561     movups $inout4,0x40($out)
562     movdqu 0x40($inp),$inout4
563     movups $inout5,0x50($out)
564     movdqu 0x50($inp),$inout5
565     movups $inout6,0x60($out)
566     movdqu 0x60($inp),$inout6
567     movups $inout7,0x70($out)
568     lea    0x80($out),$out
569     movdqu 0x70($inp),$inout7
570     lea    0x80($inp),$inp
571 .Lecb_enc_loop8_enter:

573     call    _aesni_encrypt8

575     sub    \$.0x80,$len
576     jnc    .Lecb_enc_loop8

578     movups $inout0,($out)
579     mov    $key_,$key          # restore $key
580     movups $inout1,0x10($out)

```

```

581     mov     $rnds_, $rounds      # restore $rounds
582     movups  $inout2, 0x20($out)
583     movups  $inout3, 0x30($out)
584     movups  $inout4, 0x40($out)
585     movups  $inout5, 0x50($out)
586     movups  $inout6, 0x60($out)
587     movups  $inout7, 0x70($out)
588     lea     0x80($out), $out
589     add     \ $0x80, $len
590     jz      .Lech_ret

```

```

592 .Lech_enc_tail:
593     movups  ($inp), $inout0
594     cmp     \ $0x20, $len
595     jb      .Lech_enc_one
596     movups  0x10($inp), $inout1
597     je      .Lech_enc_two
598     movups  0x20($inp), $inout2
599     cmp     \ $0x40, $len
600     jb      .Lech_enc_three
601     movups  0x30($inp), $inout3
602     je      .Lech_enc_four
603     movups  0x40($inp), $inout4
604     cmp     \ $0x60, $len
605     jb      .Lech_enc_five
606     movups  0x50($inp), $inout5
607     je      .Lech_enc_six
608     movdqu  0x60($inp), $inout6
609     call    _aesni_encrypt8
610     movups  $inout0, ($out)
611     movups  $inout1, 0x10($out)
612     movups  $inout2, 0x20($out)
613     movups  $inout3, 0x30($out)
614     movups  $inout4, 0x40($out)
615     movups  $inout5, 0x50($out)
616     movups  $inout6, 0x60($out)
617     jmp     .Lech_ret
618 .align 16
619 .Lech_enc_one:
620     ---
621     &aesni_generate1("enc", $key, $rounds);
622     $code. = << ---;
623     movups  $inout0, ($out)
624     jmp     .Lech_ret
625 .align 16
626 .Lech_enc_two:
627     xorps   $inout2, $inout2
628     call    _aesni_encrypt3
629     movups  $inout0, ($out)
630     movups  $inout1, 0x10($out)
631     jmp     .Lech_ret
632 .align 16
633 .Lech_enc_three:
634     call    _aesni_encrypt3
635     movups  $inout0, ($out)
636     movups  $inout1, 0x10($out)
637     movups  $inout2, 0x20($out)
638     jmp     .Lech_ret
639 .align 16
640 .Lech_enc_four:
641     call    _aesni_encrypt4
642     movups  $inout0, ($out)
643     movups  $inout1, 0x10($out)
644     movups  $inout2, 0x20($out)
645     movups  $inout3, 0x30($out)
646     jmp     .Lech_ret

```

```

647 .align 16
648 .Lech_enc_five:
649     xorps   $inout5, $inout5
650     call    _aesni_encrypt6
651     movups  $inout0, ($out)
652     movups  $inout1, 0x10($out)
653     movups  $inout2, 0x20($out)
654     movups  $inout3, 0x30($out)
655     movups  $inout4, 0x40($out)
656     jmp     .Lech_ret
657 .align 16
658 .Lech_enc_six:
659     call    _aesni_encrypt6
660     movups  $inout0, ($out)
661     movups  $inout1, 0x10($out)
662     movups  $inout2, 0x20($out)
663     movups  $inout3, 0x30($out)
664     movups  $inout4, 0x40($out)
665     movups  $inout5, 0x50($out)
666     jmp     .Lech_ret

```



```

667 #----- ECB DECRYPT -----#
668 .align 16
669 .Lecb_decrypt:
670     cmp     \ $0x80,$len
671     jb      .Lecb_dec_tail

673     movdqu  ($inp), $inout0
674     movdqu  0x10($inp), $inout1
675     movdqu  0x20($inp), $inout2
676     movdqu  0x30($inp), $inout3
677     movdqu  0x40($inp), $inout4
678     movdqu  0x50($inp), $inout5
679     movdqu  0x60($inp), $inout6
680     movdqu  0x70($inp), $inout7
681     lea     0x80($inp), $inp
682     sub     \ $0x80,$len
683     jmp     .Lecb_dec_loop8_enter
684 .align 16
685 .Lecb_dec_loop8:
686     movups  $inout0, ($out)
687     mov     $key_, $key          # restore $key
688     movdqu  ($inp), $inout0
689     mov     $rnds_, $rounds      # restore $rounds
690     movups  $inout1, 0x10($out)
691     movdqu  0x10($inp), $inout1
692     movups  $inout2, 0x20($out)
693     movdqu  0x20($inp), $inout2
694     movups  $inout3, 0x30($out)
695     movdqu  0x30($inp), $inout3
696     movups  $inout4, 0x40($out)
697     movdqu  0x40($inp), $inout4
698     movups  $inout5, 0x50($out)
699     movdqu  0x50($inp), $inout5
700     movups  $inout6, 0x60($out)
701     movdqu  0x60($inp), $inout6
702     movups  $inout7, 0x70($out)
703     lea     0x80($out), $out
704     movdqu  0x70($inp), $inout7
705     lea     0x80($inp), $inp
706 .Lecb_dec_loop8_enter:

708     call    _aesni_decrypt8

710     $movkey ($key_), $rndkey0
711     sub     \ $0x80,$len
712     jnc     .Lecb_dec_loop8

714     movups  $inout0, ($out)
715     mov     $key_, $key          # restore $key
716     movups  $inout1, 0x10($out)
717     mov     $rnds_, $rounds      # restore $rounds
718     movups  $inout2, 0x20($out)
719     movups  $inout3, 0x30($out)
720     movups  $inout4, 0x40($out)
721     movups  $inout5, 0x50($out)
722     movups  $inout6, 0x60($out)
723     movups  $inout7, 0x70($out)
724     lea     0x80($out), $out
725     add     \ $0x80,$len
726     jz      .Lecb_ret

728 .Lecb_dec_tail:
729     movups  ($inp), $inout0
730     cmp     \ $0x20,$len
731     jb      .Lecb_dec_one
732     movups  0x10($inp), $inout1

```

```

733     je      .Lecb_dec_two
734     movups  0x20($inp), $inout2
735     cmp     \ $0x40,$len
736     jb      .Lecb_dec_three
737     movups  0x30($inp), $inout3
738     je      .Lecb_dec_four
739     movups  0x40($inp), $inout4
740     cmp     \ $0x60,$len
741     jb      .Lecb_dec_five
742     movups  0x50($inp), $inout5
743     je      .Lecb_dec_six
744     movups  0x60($inp), $inout6
745     $movkey ($key_), $rndkey0
746     call    _aesni_decrypt8
747     movups  $inout0, ($out)
748     movups  $inout1, 0x10($out)
749     movups  $inout2, 0x20($out)
750     movups  $inout3, 0x30($out)
751     movups  $inout4, 0x40($out)
752     movups  $inout5, 0x50($out)
753     movups  $inout6, 0x60($out)
754     jmp     .Lecb_ret
755 .align 16
756 .Lecb_dec_one:
757     ---
758     &aesni_generate1("dec", $key, $rounds);
759     $code.=<<";
760     movups  $inout0, ($out)
761     jmp     .Lecb_ret
762 .align 16
763 .Lecb_dec_two:
764     xorps   $inout2, $inout2
765     call    _aesni_decrypt3
766     movups  $inout0, ($out)
767     movups  $inout1, 0x10($out)
768     jmp     .Lecb_ret
769 .align 16
770 .Lecb_dec_three:
771     call    _aesni_decrypt3
772     movups  $inout0, ($out)
773     movups  $inout1, 0x10($out)
774     movups  $inout2, 0x20($out)
775     jmp     .Lecb_ret
776 .align 16
777 .Lecb_dec_four:
778     call    _aesni_decrypt4
779     movups  $inout0, ($out)
780     movups  $inout1, 0x10($out)
781     movups  $inout2, 0x20($out)
782     movups  $inout3, 0x30($out)
783     jmp     .Lecb_ret
784 .align 16
785 .Lecb_dec_five:
786     xorps   $inout5, $inout5
787     call    _aesni_decrypt6
788     movups  $inout0, ($out)
789     movups  $inout1, 0x10($out)
790     movups  $inout2, 0x20($out)
791     movups  $inout3, 0x30($out)
792     movups  $inout4, 0x40($out)
793     jmp     .Lecb_ret
794 .align 16
795 .Lecb_dec_six:
796     call    _aesni_decrypt6
797     movups  $inout0, ($out)
798     movups  $inout1, 0x10($out)

```

```

799      movups   $inout2,0x20($out)
800      movups   $inout3,0x30($out)
801      movups   $inout4,0x40($out)
802      movups   $inout5,0x50($out)

804 .Lecb_ret:
805      ret
806 .size   aesni_ecb_encrypt,.-aesni_ecb_encrypt
807 ____

```

```

808 {
809 #####
810 # void aesni_ccm64_[en|de]crypt_blocks (const void *in, void *out,
811 #                                       size_t blocks, const AES_KEY *key,
812 #                                       const char *ivec, char *cmac);
813 #
814 # Handles only complete blocks, operates on 64-bit counter and
815 # does not update *ivec! Nor does it finalize CMAC value
816 # (see engine/eng_aesni.c for details)
817 #
818 {
819 my $cmac="%r9"; # 6th argument

821 my $increment="%xmm6";
822 my $bswap_mask="%xmm7";

824 $code.=<<____;
825 .globl aesni_ccm64_encrypt_blocks
826 .type aesni_ccm64_encrypt_blocks, \@function,6
827 .align 16
828 aesni_ccm64_encrypt_blocks:
829 ____
830 $code.=<<____ if ($win64);
831      lea      -0x58(%rsp),%rsp
832      movaps   %xmm6, (%rsp)
833      movaps   %xmm7, 0x10(%rsp)
834      movaps   %xmm8, 0x20(%rsp)
835      movaps   %xmm9, 0x30(%rsp)
836 .Lccm64_enc_body:
837 ____
838 $code.=<<____;
839      mov      240($key), $rounds          # key->rounds
840      movdqu   ($ivp), $iv
841      movdqa   .Lincrement64(%rip), $increment
842      movdqa   .Lbswap_mask(%rip), $bswap_mask

844      shr      \ $1, $rounds
845      lea      0($key), $key_
846      movdqu   ($cmac), $inout1
847      movdqa   $iv, $inout0
848      mov      $rounds, $rnds_
849      pshufb   $bswap_mask, $iv
850      jmp      .Lccm64_enc_outer
851 .align 16
852 .Lccm64_enc_outer:
853      $movkey ($key_), $rndkey0
854      mov      $rnds_, $rounds
855      movups   ($inp), $in0                # load inp

857      xorps    $rndkey0, $inout0           # counter
858      $movkey 16($key_), $rndkey1
859      xorps    $in0, $rndkey0
860      lea      32($key_), $key
861      xorps    $rndkey0, $inout1          # cmac^=inp
862      $movkey ($key), $rndkey0

864 .Lccm64_enc2_loop:
865      aesenc   $rndkey1, $inout0
866      dec      $rounds
867      aesenc   $rndkey1, $inout1
868      $movkey 16($key), $rndkey1
869      aesenc   $rndkey0, $inout0
870      lea      32($key), $key
871      aesenc   $rndkey0, $inout1
872      $movkey 0($key), $rndkey0
873      jnz      .Lccm64_enc2_loop

```

```

874 aesenc $rndkey1,$inout0
875 aesenc $rndkey1,$inout1
876 paddq $incement,$iv
877 aesenclast $rndkey0,$inout0
878 aesenclast $rndkey0,$inout1

880 dec $len
881 lea 16($inp),$inp
882 xorps $inout0,$in0 # inp ^= E(iv)
883 movdqa $iv,$inout0
884 movups $in0,($out) # save output
885 lea 16($out),$out
886 pshufb $bswap_mask,$inout0
887 jnz .Lccm64_enc_outer

889 movups $inout1,($cmac)
890
891 $code.=<<__ if ($win64);
892 movaps (%rsp),%xmm6
893 movaps 0x10(%rsp),%xmm7
894 movaps 0x20(%rsp),%xmm8
895 movaps 0x30(%rsp),%xmm9
896 lea 0x58(%rsp),%rsp
897 .Lccm64_enc_ret:
898
899 $code.=<<__ ;
900 ret
901 .size aesni_ccm64_encrypt_blocks,.-aesni_ccm64_encrypt_blocks
902
903 #####
904 $code.=<<__ ;
905 .globl aesni_ccm64_decrypt_blocks
906 .type aesni_ccm64_decrypt_blocks, @function,6
907 .align 16
908 aesni_ccm64_decrypt_blocks:
909
910 $code.=<<__ if ($win64);
911 lea -0x58(%rsp),%rsp
912 movaps %xmm6, (%rsp)
913 movaps %xmm7, 0x10(%rsp)
914 movaps %xmm8, 0x20(%rsp)
915 movaps %xmm9, 0x30(%rsp)
916 .Lccm64_dec_body:
917
918 $code.=<<__ ;
919 mov 240($key),$rounds # key->rounds
920 movups ($iv),$iv
921 movdqu ($cmac),$inout1
922 movdqa .Lincrement64(%rip),$incement
923 movdqa .Lbswap_mask(%rip),$bswap_mask

925 movaps $iv,$inout0
926 mov $rounds,$rnds_
927 mov $key,$key_
928 pshufb $bswap_mask,$iv
929
930 &aesni_generate1("enc",$key,$rounds);
931 $code.=<<__ ;
932 movups ($inp),$in0 # load inp
933 paddq $incement,$iv
934 lea 16($inp),$inp
935 jmp .Lccm64_dec_outer
936 .align 16
937 .Lccm64_dec_outer:
938 xorps $inout0,$in0 # inp ^= E(iv)
939 movdqa $iv,$inout0

```

```

940 mov $rnds_,$rounds
941 movups $in0,($out) # save output
942 lea 16($out),$out
943 pshufb $bswap_mask,$inout0

945 sub \ $1,$len
946 jz .Lccm64_dec_break

948 $movkey ($key_),$rndkey0
949 shr \ $1,$rounds
950 $movkey 16($key_),$rndkey1
951 xorps $rndkey0,$in0
952 lea 32($key_),$key
953 xorps $rndkey0,$inout0
954 xorps $in0,$inout1 # cmac^=out
955 $movkey ($key),$rndkey0

957 .Lccm64_dec2_loop:
958 aesenc $rndkey1,$inout0
959 dec $rounds
960 aesenc $rndkey1,$inout1
961 $movkey 16($key),$rndkey1
962 aesenc $rndkey0,$inout0
963 lea 32($key),$key
964 aesenc $rndkey0,$inout1
965 $movkey 0($key),$rndkey0
966 jnz .Lccm64_dec2_loop
967 movups ($inp),$in0 # load inp
968 paddq $incement,$iv
969 aesenc $rndkey1,$inout0
970 aesenc $rndkey1,$inout1
971 lea 16($inp),$inp
972 aesenclast $rndkey0,$inout0
973 aesenclast $rndkey0,$inout1
974 jmp .Lccm64_dec_outer

976 .align 16
977 .Lccm64_dec_break:
978 #xorps $in0,$inout1 # cmac^=out
979
980 &aesni_generate1("enc",$key,$rounds,$inout1,$in0);
981 $code.=<<__ ;
982 movups $inout1,($cmac)
983
984 $code.=<<__ if ($win64);
985 movaps (%rsp),%xmm6
986 movaps 0x10(%rsp),%xmm7
987 movaps 0x20(%rsp),%xmm8
988 movaps 0x30(%rsp),%xmm9
989 lea 0x58(%rsp),%rsp
990 .Lccm64_dec_ret:
991
992 $code.=<<__ ;
993 ret
994 .size aesni_ccm64_decrypt_blocks,.-aesni_ccm64_decrypt_blocks
995
996 }

```

```

997 #####
998 # void aesni_ctr32_encrypt_blocks (const void *in, void *out,
999 #                                size_t blocks, const AES_KEY *key,
1000 #                                const char *ivec);
1001 #
1002 # Handles only complete blocks, operates on 32-bit counter and
1003 # does not update *ivec! (see engine/eng_aesni.c for details)
1004 #
1005 {
1006 my $reserved = $win64?0:-0x28;
1007 my ($in0,$in1,$in2,$in3)=map("%xmm$_",(8..11));
1008 my ($iv0,$iv1,$ivec)=( "%xmm12", "%xmm13", "%xmm14");
1009 my $bswap_mask="%xmm15";

1011 $code.=<<<_ ;
1012 .globl aesni_ctr32_encrypt_blocks
1013 .type aesni_ctr32_encrypt_blocks, @function,5
1014 .align 16
1015 aesni_ctr32_encrypt_blocks:
1016
1017 $code.=<<<_ if ($win64);
1018     lea     -0xc8(%rsp),%rsp
1019     movaps  %xmm6,0x20(%rsp)
1020     movaps  %xmm7,0x30(%rsp)
1021     movaps  %xmm8,0x40(%rsp)
1022     movaps  %xmm9,0x50(%rsp)
1023     movaps  %xmm10,0x60(%rsp)
1024     movaps  %xmm11,0x70(%rsp)
1025     movaps  %xmm12,0x80(%rsp)
1026     movaps  %xmm13,0x90(%rsp)
1027     movaps  %xmm14,0xa0(%rsp)
1028     movaps  %xmm15,0xb0(%rsp)
1029 .Lctr32_body:
1030
1031 $code.=<<<_ ;
1032     cmp     \ $1,$len
1033     je      .Lctr32_one_shortcut

1035     movdqu  ($ivp), $ivec
1036     movdqa  .Lbswap_mask(%rip), $bswap_mask
1037     xor     $rounds,$rounds
1038     pextrd  \ $3,$ivec,$rnds_      # pull 32-bit counter
1039     pinsrd  \ $3,$rounds,$ivec     # wipe 32-bit counter

1041     mov     240($key),$rounds      # key->rounds
1042     bswap   $rnds_
1043     pxor    $iv0,$iv0              # vector of 3 32-bit counters
1044     pxor    $iv1,$iv1              # vector of 3 32-bit counters
1045     pinsrd  \ $0,$rnds_,$iv0
1046     lea     3($rnds_), $key_
1047     pinsrd  \ $0,$key_,$iv1
1048     inc     $rnds_
1049     pinsrd  \ $1,$rnds_,$iv0
1050     inc     $key_
1051     pinsrd  \ $1,$key_,$iv1
1052     inc     $rnds_
1053     pinsrd  \ $2,$rnds_,$iv0
1054     inc     $key_
1055     pinsrd  \ $2,$key_,$iv1
1056     movdqa  $iv0,$reserved(%rsp)
1057     pshufb  $bswap_mask,$iv0
1058     movdqa  $iv1,'$reserved+0x10'(%rsp)
1059     pshufb  $bswap_mask,$iv1

1061     pshufd  \ $'3<<6',$iv0,$inout0    # place counter to upper dword
1062     pshufd  \ $'2<<6',$iv0,$inout1

```

```

1063     pshufd  \ $'1<<6',$iv0,$inout2
1064     cmp     \ $6,$len
1065     jb      .Lctr32_tail
1066     shr     \ $1,$rounds
1067     mov     $key,$key_            # backup $key
1068     mov     $rounds,$rnds_       # backup $rounds
1069     sub     \ $6,$len
1070     jmp     .Lctr32_loop6

1072 .align 16
1073 .Lctr32_loop6:
1074     pshufd  \ $'3<<6',$iv1,$inout3
1075     por     $ivec,$inout0        # merge counter-less ivec
1076     $movkey ($key_), $rndkey0
1077     pshufd  \ $'2<<6',$iv1,$inout4
1078     por     $ivec,$inout1
1079     $movkey 16($key_), $rndkey1
1080     pshufd  \ $'1<<6',$iv1,$inout5
1081     por     $ivec,$inout2
1082     por     $ivec,$inout3
1083     xorps   $rndkey0,$inout0
1084     por     $ivec,$inout4
1085     por     $ivec,$inout5

1087     # inline _aesni_encrypt6 and interleave last rounds
1088     # with own code...

1090     pxor    $rndkey0,$inout1
1091     aesenc   $rndkey1,$inout0
1092     lea     32($key_), $key
1093     pxor    $rndkey0,$inout2
1094     aesenc   $rndkey1,$inout1
1095     movdqa  .Lincrement32(%rip), $iv1
1096     pxor    $rndkey0,$inout3
1097     aesenc   $rndkey1,$inout2
1098     movdqa  $reserved(%rsp), $iv0
1099     pxor    $rndkey0,$inout4
1100     aesenc   $rndkey1,$inout3
1101     pxor    $rndkey0,$inout5
1102     $movkey ($key_), $rndkey0
1103     dec     $rounds
1104     aesenc   $rndkey1,$inout4
1105     aesenc   $rndkey1,$inout5
1106     jmp     .Lctr32_enc_loop6_enter

1107 .align 16
1108 .Lctr32_enc_loop6:
1109     aesenc   $rndkey1,$inout0
1110     aesenc   $rndkey1,$inout1
1111     dec     $rounds
1112     aesenc   $rndkey1,$inout2
1113     aesenc   $rndkey1,$inout3
1114     aesenc   $rndkey1,$inout4
1115     aesenc   $rndkey1,$inout5
1116 .Lctr32_enc_loop6_enter:
1117     $movkey 16($key_), $rndkey1
1118     aesenc   $rndkey0,$inout0
1119     aesenc   $rndkey0,$inout1
1120     lea     32($key_), $key
1121     aesenc   $rndkey0,$inout2
1122     aesenc   $rndkey0,$inout3
1123     aesenc   $rndkey0,$inout4
1124     aesenc   $rndkey0,$inout5
1125     $movkey ($key_), $rndkey0
1126     jnz     .Lctr32_enc_loop6

1128     aesenc   $rndkey1,$inout0

```

```

1129      paddb      $iv1,$iv0          # increment counter vector
1130      aesenc      $rndkey1,$inout1
1131      paddb      $iv1,$iv0          # $reserved+0x10'(%rsp), $iv1
1132      aesenc      $rndkey1,$inout2
1133      movdqa      $iv0,$reserved(%rsp) # save counter vector
1134      aesenc      $rndkey1,$inout3
1135      movdqa      $iv1,$reserved+0x10'(%rsp)
1136      aesenc      $rndkey1,$inout4
1137      pshufb      $bswap_mask,$iv0    # byte swap
1138      aesenc      $rndkey1,$inout5
1139      pshufb      $bswap_mask,$iv1

1141      aesenclast  $rndkey0,$inout0
1142      movups      ($inp),$in0          # load input
1143      aesenclast  $rndkey0,$inout1
1144      movups      0x10($inp),$in1
1145      aesenclast  $rndkey0,$inout2
1146      movups      0x20($inp),$in2
1147      aesenclast  $rndkey0,$inout3
1148      movups      0x30($inp),$in3
1149      aesenclast  $rndkey0,$inout4
1150      movups      0x40($inp),$rndkey1
1151      aesenclast  $rndkey0,$inout5
1152      movups      0x50($inp),$rndkey0
1153      lea         0x60($inp),$inp

1155      xorps       $inout0,$in0          # xor
1156      pshufd      \$_3<<6', $iv0,$inout0
1157      xorps       $inout1,$in1
1158      pshufd      \$_2<<6', $iv0,$inout1
1159      movups      $in0,($out)          # store output
1160      xorps       $inout2,$in2
1161      pshufd      \$_1<<6', $iv0,$inout2
1162      movups      $in1,0x10($out)
1163      xorps       $inout3,$in3
1164      movups      $in2,0x20($out)
1165      xorps       $inout4,$rndkey1
1166      movups      $in3,0x30($out)
1167      xorps       $inout5,$rndkey0
1168      movups      $rndkey1,0x40($out)
1169      movups      $rndkey0,0x50($out)
1170      lea         0x60($out),$out
1171      mov         $rnds_,$rounds
1172      sub         \$_6,$len
1173      jnc         .Lctr32_loop6

1175      add         \$_6,$len
1176      jz          .Lctr32_done
1177      mov         $key_,$key          # restore $key
1178      lea         1($rounds,$rounds), $rounds # restore original value

.Lctr32_tail:
1181      por         $ivec,$inout0
1182      movups      ($inp),$in0
1183      cmp         \$_2,$len
1184      jb          .Lctr32_one

1186      por         $ivec,$inout1
1187      movups      0x10($inp),$in1
1188      je          .Lctr32_two

1190      pshufd      \$_3<<6', $iv1,$inout3
1191      por         $ivec,$inout2
1192      movups      0x20($inp),$in2
1193      cmp         \$_4,$len
1194      jb          .Lctr32_three

```

```

1196      pshufd      \$_2<<6', $iv1,$inout4
1197      por         $ivec,$inout3
1198      movups      0x30($inp),$in3
1199      je          .Lctr32_four

1201      por         $ivec,$inout4
1202      xorps       $inout5,$inout5

1204      call        _aesni_encrypt6

1206      movups      0x40($inp),$rndkey1
1207      xorps       $inout0,$in0
1208      xorps       $inout1,$in1
1209      movups      $in0,($out)
1210      xorps       $inout2,$in2
1211      movups      $in1,0x10($out)
1212      xorps       $inout3,$in3
1213      movups      $in2,0x20($out)
1214      xorps       $inout4,$rndkey1
1215      movups      $in3,0x30($out)
1216      movups      $rndkey1,0x40($out)
1217      jmp         .Lctr32_done

1219      .align      16
1220      .Lctr32_one_shortcut:
1221      movups      ($ivp),$inout0
1222      movups      ($inp),$in0
1223      mov         240($key),$rounds          # key->rounds
1224      .Lctr32_one:
1225      ____
1226      &aesni_generate1("enc", $key,$rounds);
1227      $code.=<<____;
1228      xorps       $inout0,$in0
1229      movups      $in0,($out)
1230      jmp         .Lctr32_done

1232      .align      16
1233      .Lctr32_two:
1234      xorps       $inout2,$inout2
1235      call        _aesni_encrypt3
1236      xorps       $inout0,$in0
1237      xorps       $inout1,$in1
1238      movups      $in0,($out)
1239      movups      $in1,0x10($out)
1240      jmp         .Lctr32_done

1242      .align      16
1243      .Lctr32_three:
1244      call        _aesni_encrypt3
1245      xorps       $inout0,$in0
1246      xorps       $inout1,$in1
1247      movups      $in0,($out)
1248      xorps       $inout2,$in2
1249      movups      $in1,0x10($out)
1250      movups      $in2,0x20($out)
1251      jmp         .Lctr32_done

1253      .align      16
1254      .Lctr32_four:
1255      call        _aesni_encrypt4
1256      xorps       $inout0,$in0
1257      xorps       $inout1,$in1
1258      movups      $in0,($out)
1259      xorps       $inout2,$in2
1260      movups      $in1,0x10($out)

```

```

1261      xorps    $inout3,$in3
1262      movups   $in2,0x20($out)
1263      movups   $in3,0x30($out)

1265 .Lctr32_done:
1266 ____
1267 $code.=<<__ if ($win64);
1268      movaps   0x20(%rsp),%xmm6
1269      movaps   0x30(%rsp),%xmm7
1270      movaps   0x40(%rsp),%xmm8
1271      movaps   0x50(%rsp),%xmm9
1272      movaps   0x60(%rsp),%xmm10
1273      movaps   0x70(%rsp),%xmm11
1274      movaps   0x80(%rsp),%xmm12
1275      movaps   0x90(%rsp),%xmm13
1276      movaps   0xa0(%rsp),%xmm14
1277      movaps   0xb0(%rsp),%xmm15
1278      lea      0xc8(%rsp),%rsp
1279 .Lctr32_ret:
1280 ____
1281 $code.=<<__ ;
1282      ret
1283 .size    aesni_ctr32_encrypt_blocks,.-aesni_ctr32_encrypt_blocks
1284 ____
1285 }

```

```

1286 #####
1287 # void aesni_xts_[en]crypt(const char *inp,char *out,size_t len,
1288 #      const AES_KEY *key1, const AES_KEY *key2
1289 #      const unsigned char iv[16]);
1290 #
1291 {
1292   my @tweak=map("%xmm$",(10..15));
1293   my ($twmask,$twres,$twtmp)=( "%xmm8", "%xmm9", @tweak[4]);
1294   my ($key2,$ivp,$len)=( "%r8", "%r9", "%r9");
1295   my $frame_size = 0x68 + ($win64?160:0);

1297 $code.=<<__ ;
1298 .globl aesni_xts_encrypt
1299 .type aesni_xts_encrypt, \@function,6
1300 .align 16
1301 aesni_xts_encrypt:
1302     lea      -$frame_size(%rsp),%rsp
1303 ____
1304 $code.=<<__ if ($win64);
1305     movaps   %xmm6,0x60(%rsp)
1306     movaps   %xmm7,0x70(%rsp)
1307     movaps   %xmm8,0x80(%rsp)
1308     movaps   %xmm9,0x90(%rsp)
1309     movaps   %xmm10,0xa0(%rsp)
1310     movaps   %xmm11,0xb0(%rsp)
1311     movaps   %xmm12,0xc0(%rsp)
1312     movaps   %xmm13,0xd0(%rsp)
1313     movaps   %xmm14,0xe0(%rsp)
1314     movaps   %xmm15,0xf0(%rsp)
1315 .Lxts_enc_body:
1316 ____
1317 $code.=<<__ ;
1318     movups   ($ivp),@tweak[5]          # load clear-text tweak
1319     mov      240(%r8),$rounds         # key2->rounds
1320     mov      240($key),$rnds_         # key1->rounds
1321 ____
1322     # generate the tweak
1323     &aesni_generate1("enc",$key2,$rounds,@tweak[5]);
1324 $code.=<<__ ;
1325     mov      $key,$key_              # backup $key
1326     mov      $rnds_,$rounds          # backup $rounds
1327     mov      $len,$len_              # backup $len
1328     and      \$$-16,$len

1330     movdqa   .Lxts_magic(%rip),$twmask
1331     pxor     $twtmp,$twtmp
1332     pcmptgd  @tweak[5],$twtmp          # broadcast upper bits
1333 ____
1334     for ($i=0;$i<4;$i++) {
1335       $code.=<<__ ;
1336       pshufd  \0x13,$twtmp,$twres
1337       pxor     $twtmp,$twtmp
1338       movdqa  @tweak[5],@tweak[$i]
1339       paddq   @tweak[5],@tweak[5]      # psllq 1,$tweak
1340       pand     $twmask,$twres          # isolate carry and residue
1341       pcmptgd @tweak[5],$twtmp          # broadcast upper bits
1342       pxor     $twres,@tweak[5]
1343     }
1344 ____
1345 $code.=<<__ ;
1346     sub      \$$16*6,$len
1347     jc       .Lxts_enc_short

1349     shr      \$$1,$rounds
1350     sub      \$$1,$rounds
1351     mov      $rounds,$rnds_

```

```

1352      jmp      .Lxts_enc_grandloop

1354 .align 16
1355 .Lxts_enc_grandloop:
1356     pshufd    \${0x13},$stwtmp,$stwres
1357     movdqa    @tweak[5],@tweak[4]
1358     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1359     movdqu    '16*0'($inp),$sinout0        # load input
1360     pand      $twmask,$stwres              # isolate carry and residue
1361     movdqu    '16*1'($inp),$sinout1
1362     pxor      $stwres,@tweak[5]

1364     movdqu    '16*2'($inp),$sinout2
1365     pxor      @tweak[0],$sinout0          # input^=tweak
1366     movdqu    '16*3'($inp),$sinout3
1367     pxor      @tweak[1],$sinout1
1368     movdqu    '16*4'($inp),$sinout4
1369     pxor      @tweak[2],$sinout2
1370     movdqu    '16*5'($inp),$sinout5
1371     lea       '16*6'($inp),$inp
1372     pxor      @tweak[3],$sinout3
1373     $movkey   ($key_),$rndkey0
1374     pxor      @tweak[4],$sinout4
1375     pxor      @tweak[5],$sinout5

1377 # inline _aesni_encrypt6 and interleave first and last rounds
1378 # with own code...
1379     $movkey   16($key_),$rndkey1
1380     pxor      $rndkey0,$sinout0
1381     pxor      $rndkey0,$sinout1
1382     movdqa    @tweak[0],'16*0'(%rsp)      # put aside tweaks
1383     aesenc    $rndkey1,$sinout0
1384     lea       32($key_),$key
1385     pxor      $rndkey0,$sinout2
1386     movdqa    @tweak[1],'16*1'(%rsp)
1387     aesenc    $rndkey1,$sinout1
1388     pxor      $rndkey0,$sinout3
1389     movdqa    @tweak[2],'16*2'(%rsp)
1390     aesenc    $rndkey1,$sinout2
1391     pxor      $rndkey0,$sinout4
1392     movdqa    @tweak[3],'16*3'(%rsp)
1393     aesenc    $rndkey1,$sinout3
1394     pxor      $rndkey0,$sinout5
1395     $movkey   ($key),$rndkey0
1396     dec       $rounds
1397     movdqa    @tweak[4],'16*4'(%rsp)
1398     aesenc    $rndkey1,$sinout4
1399     movdqa    @tweak[5],'16*5'(%rsp)
1400     aesenc    $rndkey1,$sinout5
1401     pxor      $stwtmp,$stwtmp
1402     pcmpgtd   @tweak[5],$stwtmp
1403     jmp      .Lxts_enc_loop6_enter

1405 .align 16
1406 .Lxts_enc_loop6:
1407     aesenc    $rndkey1,$sinout0
1408     aesenc    $rndkey1,$sinout1
1409     dec       $rounds
1410     aesenc    $rndkey1,$sinout2
1411     aesenc    $rndkey1,$sinout3
1412     aesenc    $rndkey1,$sinout4
1413     aesenc    $rndkey1,$sinout5
1414 .Lxts_enc_loop6_enter:
1415     $movkey   16($key),$rndkey1
1416     aesenc    $rndkey0,$sinout0
1417     aesenc    $rndkey0,$sinout1

```

```

1418     lea       32($key),$key
1419     aesenc    $rndkey0,$sinout2
1420     aesenc    $rndkey0,$sinout3
1421     aesenc    $rndkey0,$sinout4
1422     aesenc    $rndkey0,$sinout5
1423     $movkey   ($key),$rndkey0
1424     jnz      .Lxts_enc_loop6

1426     pshufd    \${0x13},$stwtmp,$stwres
1427     pxor      $stwtmp,$stwtmp
1428     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1429     aesenc    $rndkey1,$sinout0
1430     pand      $twmask,$stwres              # isolate carry and residue
1431     aesenc    $rndkey1,$sinout1
1432     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1433     aesenc    $rndkey1,$sinout2
1434     pxor      $stwres,@tweak[5]
1435     aesenc    $rndkey1,$sinout3
1436     aesenc    $rndkey1,$sinout4
1437     aesenc    $rndkey1,$sinout5
1438     $movkey   16($key),$rndkey1

1440     pshufd    \${0x13},$stwtmp,$stwres
1441     pxor      $stwtmp,$stwtmp
1442     movdqa    @tweak[5],@tweak[0]
1443     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1444     aesenc    $rndkey0,$sinout0
1445     pand      $twmask,$stwres              # isolate carry and residue
1446     aesenc    $rndkey0,$sinout1
1447     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1448     aesenc    $rndkey0,$sinout2
1449     pxor      $stwres,@tweak[5]
1450     aesenc    $rndkey0,$sinout3
1451     aesenc    $rndkey0,$sinout4
1452     aesenc    $rndkey0,$sinout5
1453     $movkey   32($key),$rndkey0

1455     pshufd    \${0x13},$stwtmp,$stwres
1456     pxor      $stwtmp,$stwtmp
1457     movdqa    @tweak[5],@tweak[1]
1458     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1459     aesenc    $rndkey1,$sinout0
1460     pand      $twmask,$stwres              # isolate carry and residue
1461     aesenc    $rndkey1,$sinout1
1462     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1463     aesenc    $rndkey1,$sinout2
1464     pxor      $stwres,@tweak[5]
1465     aesenc    $rndkey1,$sinout3
1466     aesenc    $rndkey1,$sinout4
1467     aesenc    $rndkey1,$sinout5

1469     pshufd    \${0x13},$stwtmp,$stwres
1470     pxor      $stwtmp,$stwtmp
1471     movdqa    @tweak[5],@tweak[2]
1472     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1473     aesenc    $rndkey0,$sinout0
1474     pand      $twmask,$stwres              # isolate carry and residue
1475     aesenc    $rndkey0,$sinout1
1476     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1477     aesenc    $rndkey0,$sinout2
1478     pxor      $stwres,@tweak[5]
1479     aesenc    $rndkey0,$sinout3
1480     aesenc    $rndkey0,$sinout4
1481     aesenc    $rndkey0,$sinout5

1483     pshufd    \${0x13},$stwtmp,$stwres

```

```

1484     pxor     $Stwtmp,$Stwtmp
1485     movdqa   @tweak[5],@tweak[3]
1486     paddq    @tweak[5],@tweak[5]          # psllq 1,$tweak
1487     xorps    '16*0'(%rsp), $inout0        # output^=tweak
1488     pand     $Stwmask,$Stwres             # isolate carry and residue
1489     xorps    '16*1'(%rsp), $inout1
1490     pcmpgtd  @tweak[5],$Stwtmp            # broadcast upper bits
1491     pxor     $Stwres,@tweak[5]

1493     xorps    '16*2'(%rsp), $inout2
1494     movups   $inout0,'16*0'($out)         # write output
1495     xorps    '16*3'(%rsp), $inout3
1496     movups   $inout1,'16*1'($out)
1497     xorps    '16*4'(%rsp), $inout4
1498     movups   $inout2,'16*2'($out)
1499     xorps    '16*5'(%rsp), $inout5
1500     movups   $inout3,'16*3'($out)
1501     mov      $rnds_,$rounds               # restore $rounds
1502     movups   $inout4,'16*4'($out)
1503     movups   $inout5,'16*5'($out)
1504     lea      '16*6'($out), $out
1505     sub      \16*6,$len
1506     jnc      .Lxts_enc_grandloop

1508     lea      3($rounds,$rounds), $rounds  # restore original value
1509     mov      $key_,$key                   # restore $key
1510     mov      $rounds,$rnds_               # backup $rounds

1512 .Lxts_enc_short:
1513     add      \16*6,$len
1514     jz       .Lxts_enc_done

1516     cmp      \0x20,$len
1517     jb       .Lxts_enc_one
1518     je       .Lxts_enc_two

1520     cmp      \0x40,$len
1521     jb       .Lxts_enc_three
1522     je       .Lxts_enc_four

1524     pshufd   \0x13,$Stwtmp,$Stwres
1525     movdqa   @tweak[5],@tweak[4]
1526     paddq    @tweak[5],@tweak[5]          # psllq 1,$tweak
1527     movdqu   ($inp), $inout0
1528     pand     $Stwmask,$Stwres             # isolate carry and residue
1529     movdqu   16*1($inp), $inout1
1530     pxor     $Stwres,@tweak[5]

1532     movdqu   16*2($inp), $inout2
1533     pxor     @tweak[0], $inout0
1534     movdqu   16*3($inp), $inout3
1535     pxor     @tweak[1], $inout1
1536     movdqu   16*4($inp), $inout4
1537     lea      16*5($inp), $inp
1538     pxor     @tweak[2], $inout2
1539     pxor     @tweak[3], $inout3
1540     pxor     @tweak[4], $inout4

1542     call     _aesni_encrypt6

1544     xorps    @tweak[0], $inout0
1545     movdqa   @tweak[5],@tweak[0]
1546     xorps    @tweak[1], $inout1
1547     xorps    @tweak[2], $inout2
1548     movdqu   $inout0,($out)
1549     xorps    @tweak[3], $inout3

```

```

1550     movdqu   $inout1,16*1($out)
1551     xorps    @tweak[4], $inout4
1552     movdqu   $inout2,16*2($out)
1553     movdqu   $inout3,16*3($out)
1554     movdqu   $inout4,16*4($out)
1555     lea      16*5($out), $out
1556     jmp      .Lxts_enc_done

1558 .align 16
1559 .Lxts_enc_one:
1560     movups   ($inp), $inout0
1561     lea      16*1($inp), $inp
1562     xorps    @tweak[0], $inout0
1563     —————
1564     &aesni_generate1("enc", $key,$rounds);
1565     $code.=<<";
1566     xorps    @tweak[0], $inout0
1567     movdqa   @tweak[1],@tweak[0]
1568     movups   $inout0,($out)
1569     lea      16*1($out), $out
1570     jmp      .Lxts_enc_done

1572 .align 16
1573 .Lxts_enc_two:
1574     movups   ($inp), $inout0
1575     movups   16($inp), $inout1
1576     lea      32($inp), $inp
1577     xorps    @tweak[0], $inout0
1578     xorps    @tweak[1], $inout1

1580     call     _aesni_encrypt3

1582     xorps    @tweak[0], $inout0
1583     movdqa   @tweak[2],@tweak[0]
1584     xorps    @tweak[1], $inout1
1585     movups   $inout0,($out)
1586     movups   $inout1,16*1($out)
1587     lea      16*2($out), $out
1588     jmp      .Lxts_enc_done

1590 .align 16
1591 .Lxts_enc_three:
1592     movups   ($inp), $inout0
1593     movups   16*1($inp), $inout1
1594     movups   16*2($inp), $inout2
1595     lea      16*3($inp), $inp
1596     xorps    @tweak[0], $inout0
1597     xorps    @tweak[1], $inout1
1598     xorps    @tweak[2], $inout2

1600     call     _aesni_encrypt3

1602     xorps    @tweak[0], $inout0
1603     movdqa   @tweak[3],@tweak[0]
1604     xorps    @tweak[1], $inout1
1605     xorps    @tweak[2], $inout2
1606     movups   $inout0,($out)
1607     movups   $inout1,16*1($out)
1608     movups   $inout2,16*2($out)
1609     lea      16*3($out), $out
1610     jmp      .Lxts_enc_done

1612 .align 16
1613 .Lxts_enc_four:
1614     movups   ($inp), $inout0
1615     movups   16*1($inp), $inout1

```



```

1616      movups    16*2($inp), $inout2
1617      xorps     @tweak[0], $inout0
1618      movups    16*3($inp), $inout3
1619      lea       16*4($inp), $inp
1620      xorps     @tweak[1], $inout1
1621      xorps     @tweak[2], $inout2
1622      xorps     @tweak[3], $inout3

1624      call     _aesni_encrypt4

1626      xorps     @tweak[0], $inout0
1627      movdqa    @tweak[5], @tweak[0]
1628      xorps     @tweak[1], $inout1
1629      xorps     @tweak[2], $inout2
1630      movups    $inout0, ($out)
1631      xorps     @tweak[3], $inout3
1632      movups    $inout1, 16*1($out)
1633      movups    $inout2, 16*2($out)
1634      movups    $inout3, 16*3($out)
1635      lea       16*4($out), $out
1636      jmp       .Lxts_enc_done

1638      .align    16
1639      .Lxts_enc_done:
1640      and       \ $15, $len_
1641      jz        .Lxts_enc_ret
1642      mov       $len_, $len

1644      .Lxts_enc_steal:
1645      movzb     ($inp), %eax           # borrow $rounds ...
1646      movzb     -16($out), %ecx        # ... and $key
1647      lea       1($inp), $inp
1648      mov       %al, -16($out)
1649      mov       %cl, 0($out)
1650      lea       1($out), $out
1651      sub       \ $1, $len
1652      jnz       .Lxts_enc_steal

1654      sub       $len_, $out           # rewind $out
1655      mov       $key_, $key          # restore $key
1656      mov       $rnds_, $rounds      # restore $rounds

1658      movups    -16($out), $inout0
1659      xorps     @tweak[0], $inout0

1660      &aesni_generate1("enc", $key, $rounds);
1661      $code.=<<__ ;
1662      xorps     @tweak[0], $inout0
1663      movups    $inout0, -16($out)

1666      .Lxts_enc_ret:
1667      $code.=<<__ if ($win64);
1668      movaps    0x60(%rsp), %xmm6
1669      movaps    0x70(%rsp), %xmm7
1670      movaps    0x80(%rsp), %xmm8
1671      movaps    0x90(%rsp), %xmm9
1672      movaps    0xa0(%rsp), %xmm10
1673      movaps    0xb0(%rsp), %xmm11
1674      movaps    0xc0(%rsp), %xmm12
1675      movaps    0xd0(%rsp), %xmm13
1676      movaps    0xe0(%rsp), %xmm14
1677      movaps    0xf0(%rsp), %xmm15
1678
1679      $code.=<<__ ;
1680      lea       $frame_size(%rsp), %rsp

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1682      .Lxts_enc_epilogue:
1683      ret
1684      .size     aesni_xts_encrypt, .-aesni_xts_encrypt
1685      ____

1687      $code.=<<__ ;
1688      .globl    aesni_xts_decrypt
1689      .type     aesni_xts_decrypt, \@function, 6
1690      .align    16
1691      aesni_xts_decrypt:
1692      lea       - $frame_size(%rsp), %rsp
1693      ____
1694      $code.=<<__ if ($win64);
1695      movaps    %xmm6, 0x60(%rsp)
1696      movaps    %xmm7, 0x70(%rsp)
1697      movaps    %xmm8, 0x80(%rsp)
1698      movaps    %xmm9, 0x90(%rsp)
1699      movaps    %xmm10, 0xa0(%rsp)
1700      movaps    %xmm11, 0xb0(%rsp)
1701      movaps    %xmm12, 0xc0(%rsp)
1702      movaps    %xmm13, 0xd0(%rsp)
1703      movaps    %xmm14, 0xe0(%rsp)
1704      movaps    %xmm15, 0xf0(%rsp)
1705      .Lxts_dec_body:
1706      ____
1707      $code.=<<__ ;
1708      movups    ($ivp), @tweak[5]      # load clear-text tweak
1709      mov       240($key2), $rounds    # key2->rounds
1710      mov       240($key), $rnds_      # key1->rounds
1711      ____
1712      # generate the tweak
1713      &aesni_generate1("enc", $key2, $rounds, @tweak[5]);
1714      $code.=<<__ ;
1715      xor       %eax, %eax             # if ($len%16) len-=16;
1716      test     \ $15, $len
1717      setnz    %al
1718      shl      \ $4, %rax
1719      sub      %rax, $len

1721      mov       $key, $key_            # backup $key
1722      mov       $rnds, $rounds         # backup $rounds
1723      mov       $len, $len_           # backup $len
1724      and       \ $-16, $len

1726      movdqa    .Lxts_magic(%rip), $twmask
1727      pxor      $twtmp, $twtmp
1728      pcmpgtd   @tweak[5], $twtmp      # broadcast upper bits
1729      ____
1730      for ($i=0; $i<4; $i++) {
1731      $code.=<<__ ;
1732      pshufd    \ $0x13, $twtmp, $twres
1733      pxor      $twtmp, $twtmp
1734      movdqa    @tweak[5], @tweak[$i]
1735      paddq     @tweak[5], @tweak[$i]  # psllq 1, $tweak
1736      pand      $twmask, $twres        # isolate carry and residue
1737      pcmpgtd   @tweak[5], $twtmp      # broadcast upper bits
1738      pxor      $twres, @tweak[$i]
1739      ____
1740      }
1741      $code.=<<__ ;
1742      sub       \ $16*6, $len
1743      jc        .Lxts_dec_short

1745      shr       \ $1, $rounds
1746      sub       \ $1, $rounds
1747      mov       $rounds, $rnds_

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```

1748      jmp      .Lxts_dec_grandloop

1750 .align 16
1751 .Lxts_dec_grandloop:
1752     pshufd    \ $0x13,$stwtmp,$stwres
1753     movdqa    @tweak[5],@tweak[4]
1754     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1755     movdqu    '16*0'($inp),$sinout0       # load input
1756     pand      $twmask,$stwres             # isolate carry and residue
1757     movdqu    '16*1'($inp),$sinout1
1758     pxor      $stwres,@tweak[5]

1760     movdqu    '16*2'($inp),$sinout2
1761     pxor      @tweak[0],$sinout0          # input^=tweak
1762     movdqu    '16*3'($inp),$sinout3
1763     pxor      @tweak[1],$sinout1
1764     movdqu    '16*4'($inp),$sinout4
1765     pxor      @tweak[2],$sinout2
1766     movdqu    '16*5'($inp),$sinout5
1767     lea       '16*6'($inp),$inp
1768     pxor      @tweak[3],$sinout3
1769     $movkey    ($key_),$rndkey0
1770     pxor      @tweak[4],$sinout4
1771     pxor      @tweak[5],$sinout5

1773     # inline _aesni_decrypt6 and interleave first and last rounds
1774     # with own code...
1775     $movkey    16($key_),$rndkey1
1776     pxor      $rndkey0,$sinout0
1777     pxor      $rndkey0,$sinout1
1778     movdqa    @tweak[0],'16*0'(%rsp)      # put aside tweaks
1779     aesdec    $rndkey1,$sinout0
1780     lea       32($key_),$key
1781     pxor      $rndkey0,$sinout2
1782     movdqa    @tweak[1],'16*1'(%rsp)
1783     aesdec    $rndkey1,$sinout1
1784     pxor      $rndkey0,$sinout3
1785     movdqa    @tweak[2],'16*2'(%rsp)
1786     aesdec    $rndkey1,$sinout2
1787     pxor      $rndkey0,$sinout4
1788     movdqa    @tweak[3],'16*3'(%rsp)
1789     aesdec    $rndkey1,$sinout3
1790     pxor      $rndkey0,$sinout5
1791     $movkey    ($key),$rndkey0
1792     dec       $rounds
1793     movdqa    @tweak[4],'16*4'(%rsp)
1794     aesdec    $rndkey1,$sinout4
1795     movdqa    @tweak[5],'16*5'(%rsp)
1796     aesdec    $rndkey1,$sinout5
1797     pxor      $stwtmp,$stwtmp
1798     pcmpgtd   @tweak[5],$stwtmp
1799     jmp       .Lxts_dec_loop6_enter

1801 .align 16
1802 .Lxts_dec_loop6:
1803     aesdec    $rndkey1,$sinout0
1804     aesdec    $rndkey1,$sinout1
1805     dec       $rounds
1806     aesdec    $rndkey1,$sinout2
1807     aesdec    $rndkey1,$sinout3
1808     aesdec    $rndkey1,$sinout4
1809     aesdec    $rndkey1,$sinout5
1810 .Lxts_dec_loop6_enter:
1811     $movkey    16($key),$rndkey1
1812     aesdec    $rndkey0,$sinout0
1813     aesdec    $rndkey0,$sinout1

```

```

1814     lea       32($key),$key
1815     aesdec    $rndkey0,$sinout2
1816     aesdec    $rndkey0,$sinout3
1817     aesdec    $rndkey0,$sinout4
1818     aesdec    $rndkey0,$sinout5
1819     $movkey    ($key),$rndkey0
1820     jnz       .Lxts_dec_loop6

1822     pshufd    \ $0x13,$stwtmp,$stwres
1823     pxor      $stwtmp,$stwtmp
1824     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1825     aesdec    $rndkey1,$sinout0
1826     pand      $twmask,$stwres             # isolate carry and residue
1827     aesdec    $rndkey1,$sinout1
1828     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1829     aesdec    $rndkey1,$sinout2
1830     pxor      $stwres,@tweak[5]
1831     aesdec    $rndkey1,$sinout3
1832     aesdec    $rndkey1,$sinout4
1833     aesdec    $rndkey1,$sinout5
1834     $movkey    16($key),$rndkey1

1836     pshufd    \ $0x13,$stwtmp,$stwres
1837     pxor      $stwtmp,$stwtmp
1838     movdqa    @tweak[5],@tweak[0]
1839     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1840     aesdec    $rndkey0,$sinout0
1841     pand      $twmask,$stwres             # isolate carry and residue
1842     aesdec    $rndkey0,$sinout1
1843     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1844     aesdec    $rndkey0,$sinout2
1845     pxor      $stwres,@tweak[5]
1846     aesdec    $rndkey0,$sinout3
1847     aesdec    $rndkey0,$sinout4
1848     aesdec    $rndkey0,$sinout5
1849     $movkey    32($key),$rndkey0

1851     pshufd    \ $0x13,$stwtmp,$stwres
1852     pxor      $stwtmp,$stwtmp
1853     movdqa    @tweak[5],@tweak[1]
1854     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1855     aesdec    $rndkey1,$sinout0
1856     pand      $twmask,$stwres             # isolate carry and residue
1857     aesdec    $rndkey1,$sinout1
1858     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1859     aesdec    $rndkey1,$sinout2
1860     pxor      $stwres,@tweak[5]
1861     aesdec    $rndkey1,$sinout3
1862     aesdec    $rndkey1,$sinout4
1863     aesdec    $rndkey1,$sinout5

1865     pshufd    \ $0x13,$stwtmp,$stwres
1866     pxor      $stwtmp,$stwtmp
1867     movdqa    @tweak[5],@tweak[2]
1868     paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
1869     aesdeclast $rndkey0,$sinout0
1870     pand      $twmask,$stwres             # isolate carry and residue
1871     aesdeclast $rndkey0,$sinout1
1872     pcmpgtd   @tweak[5],$stwtmp          # broadcast upper bits
1873     aesdeclast $rndkey0,$sinout2
1874     pxor      $stwres,@tweak[5]
1875     aesdeclast $rndkey0,$sinout3
1876     aesdeclast $rndkey0,$sinout4
1877     aesdeclast $rndkey0,$sinout5

1879     pshufd    \ $0x13,$stwtmp,$stwres

```

```

1880     pxor     $Stwtmp,$Stwtmp
1881     movdqa   @tweak[5],@tweak[3]
1882     paddq    @tweak[5],@tweak[5]
1883     xorps    '16*0'(%rsp),%inout0
1884     pand     $Stwmask,$Stwres
1885     xorps    '16*1'(%rsp),%inout1
1886     pcmpgtd  @tweak[5],$Stwtmp
1887     pxor     $Stwres,@tweak[5]

1889     xorps    '16*2'(%rsp),%inout2
1890     movups   %inout0,'16*0'(%out)
1891     xorps    '16*3'(%rsp),%inout3
1892     movups   %inout1,'16*1'(%out)
1893     xorps    '16*4'(%rsp),%inout4
1894     movups   %inout2,'16*2'(%out)
1895     xorps    '16*5'(%rsp),%inout5
1896     movups   %inout3,'16*3'(%out)
1897     mov      $rnds,$rounds
1898     movups   %inout4,'16*4'(%out)
1899     movups   %inout5,'16*5'(%out)
1900     lea      '16*6'(%out),%out
1901     sub      '16*6',%len
1902     jnc      .Lxtd_dec_grandloop

1904     lea      3($rounds,$rounds),$rounds
1905     mov      %key,$key
1906     mov      $rounds,$rnds_

1908 .Lxtd_dec_short:
1909     add      '16*6',%len
1910     jz       .Lxtd_dec_done

1912     cmp      '16*20',%len
1913     jb       .Lxtd_dec_one
1914     je       .Lxtd_dec_two

1916     cmp      '16*40',%len
1917     jb       .Lxtd_dec_three
1918     je       .Lxtd_dec_four

1920     pshufd   '16*13',$Stwtmp,$Stwres
1921     movdqa   @tweak[5],@tweak[4]
1922     paddq    @tweak[5],@tweak[5]
1923     movdqu   (%inp),%inout0
1924     pand     $Stwmask,$Stwres
1925     movdqu   16*1(%inp),%inout1
1926     pxor     $Stwres,@tweak[5]

1928     movdqu   16*2(%inp),%inout2
1929     pxor     @tweak[0],%inout0
1930     movdqu   16*3(%inp),%inout3
1931     pxor     @tweak[1],%inout1
1932     movdqu   16*4(%inp),%inout4
1933     lea      16*5(%inp),%inp
1934     pxor     @tweak[2],%inout2
1935     pxor     @tweak[3],%inout3
1936     pxor     @tweak[4],%inout4

1938     call     _aesni_decrypt6

1940     xorps    @tweak[0],%inout0
1941     xorps    @tweak[1],%inout1
1942     xorps    @tweak[2],%inout2
1943     movdqu   %inout0,($out)
1944     xorps    @tweak[3],%inout3
1945     movdqu   %inout1,16*1($out)

```

```

1946     xorps    @tweak[4],%inout4
1947     movdqu   %inout2,16*2($out)
1948     pxor     $Stwtmp,$Stwtmp
1949     movdqu   %inout3,16*3($out)
1950     pcmpgtd  @tweak[5],$Stwtmp
1951     movdqu   %inout4,16*4($out)
1952     lea      16*5($out),%out
1953     pshufd   '16*13',$Stwtmp,@tweak[1] # $Stwres
1954     and      '16*15',%len_
1955     jz       .Lxtd_dec_ret

1957     movdqa   @tweak[5],@tweak[0]
1958     paddq    @tweak[5],@tweak[5]
1959     pand     $Stwmask,@tweak[1]
1960     pxor     @tweak[5],@tweak[1]
1961     jmp      .Lxtd_dec_done2

1963 .align 16
1964 .Lxtd_dec_one:
1965     movups   (%inp),%inout0
1966     lea      16*1(%inp),%inp
1967     xorps    @tweak[0],%inout0
1968     ---
1969     &aesni_generate1("dec",$key,$rounds);
1970     $code.=<<";
1971     xorps    @tweak[0],%inout0
1972     movdqa   @tweak[1],@tweak[0]
1973     movups   %inout0,($out)
1974     movdqa   @tweak[2],@tweak[1]
1975     lea      16*1($out),%out
1976     jmp      .Lxtd_dec_done

1978 .align 16
1979 .Lxtd_dec_two:
1980     movups   (%inp),%inout0
1981     movups   16($inp),%inout1
1982     lea      32(%inp),%inp
1983     xorps    @tweak[0],%inout0
1984     xorps    @tweak[1],%inout1

1986     call     _aesni_decrypt3

1988     xorps    @tweak[0],%inout0
1989     movdqa   @tweak[2],@tweak[0]
1990     xorps    @tweak[1],%inout1
1991     movdqa   @tweak[3],@tweak[1]
1992     movups   %inout0,($out)
1993     movups   %inout1,16*1($out)
1994     lea      16*2($out),%out
1995     jmp      .Lxtd_dec_done

1997 .align 16
1998 .Lxtd_dec_three:
1999     movups   (%inp),%inout0
2000     movups   16*1(%inp),%inout1
2001     movups   16*2(%inp),%inout2
2002     lea      16*3(%inp),%inp
2003     xorps    @tweak[0],%inout0
2004     xorps    @tweak[1],%inout1
2005     xorps    @tweak[2],%inout2

2007     call     _aesni_decrypt3

2009     xorps    @tweak[0],%inout0
2010     movdqa   @tweak[3],@tweak[0]
2011     xorps    @tweak[1],%inout1

```

```

2012      movdqa    @tweak[5],@tweak[1]
2013      xorps     @tweak[2],$inout2
2014      movups    $inout0,$sout
2015      movups    $inout1,16*1($sout)
2016      movups    $inout2,16*2($sout)
2017      lea       16*3($sout),$sout
2018      jmp      .Lxts_dec_done

2020 .align 16
2021 .Lxts_dec_four:
2022      pshufd    \0x13,$sttmp,$stwres
2023      movdqa    @tweak[5],@tweak[4]
2024      paddq     @tweak[5],@tweak[5]          # psllq 1,$tweak
2025      movups    ($inp),$inout0
2026      pand      $twmask,$stwres             # isolate carry and residue
2027      movups    16*1($inp),$inout1
2028      pxor      $stwres,@tweak[5]

2030      movups    16*2($inp),$inout2
2031      xorps     @tweak[0],$inout0
2032      movups    16*3($inp),$inout3
2033      lea       16*4($inp),$inp
2034      xorps     @tweak[1],$inout1
2035      xorps     @tweak[2],$inout2
2036      xorps     @tweak[3],$inout3

2038      call     _aesni_decrypt4

2040      xorps     @tweak[0],$inout0
2041      movdqa    @tweak[4],@tweak[0]
2042      xorps     @tweak[1],$inout1
2043      movdqa    @tweak[5],@tweak[1]
2044      xorps     @tweak[2],$inout2
2045      movups    $inout0,$sout
2046      xorps     @tweak[3],$inout3
2047      movups    $inout1,16*1($sout)
2048      movups    $inout2,16*2($sout)
2049      movups    $inout3,16*3($sout)
2050      lea       16*4($sout),$sout
2051      jmp      .Lxts_dec_done

2053 .align 16
2054 .Lxts_dec_done:
2055      and       \15,$len_
2056      jz        .Lxts_dec_ret
2057 .Lxts_dec_done2:
2058      mov       $len_,$len
2059      mov       $key_,$key          # restore $key
2060      mov       $rnds_,$rounds     # restore $rounds

2062      movups    ($inp),$inout0
2063      xorps     @tweak[1],$inout0
2064      ____
2065      &aesni_generate1("dec",$key,$rounds);
2066 $code.=<<____;
2067      xorps     @tweak[1],$inout0
2068      movups    $inout0,($sout)

2070 .Lxts_dec_steal:
2071      movzb     16($inp),%eax        # borrow $rounds ...
2072      movzb     ($sout),%ecx        # ... and $key
2073      lea       1($inp),$inp
2074      mov       %al,($sout)
2075      mov       %cl,16($sout)
2076      lea       1($sout),$sout
2077      sub       \1,$len

```

```

2078      jnz      .Lxts_dec_steal

2080      sub       $len_,$sout          # rewind $sout
2081      mov       $key_,$key          # restore $key
2082      mov       $rnds_,$rounds     # restore $rounds

2084      movups    ($sout),$inout0
2085      xorps     @tweak[0],$inout0
2086      ____
2087      &aesni_generate1("dec",$key,$rounds);
2088 $code.=<<____;
2089      xorps     @tweak[0],$inout0
2090      movups    $inout0,($sout)

2092 .Lxts_dec_ret:
2093      ____
2094 $code.=<<____ if ($win64);
2095      movaps    0x60(%rsp),%xmm6
2096      movaps    0x70(%rsp),%xmm7
2097      movaps    0x80(%rsp),%xmm8
2098      movaps    0x90(%rsp),%xmm9
2099      movaps    0xa0(%rsp),%xmm10
2100      movaps    0xb0(%rsp),%xmm11
2101      movaps    0xc0(%rsp),%xmm12
2102      movaps    0xd0(%rsp),%xmm13
2103      movaps    0xe0(%rsp),%xmm14
2104      movaps    0xf0(%rsp),%xmm15
2105      ____
2106 $code.=<<____;
2107      lea       $frame_size(%rsp),%rsp
2108 .Lxts_dec_epilogue:
2109      ret
2110 .size aesni_xts_decrypt,.-aesni_xts_decrypt
2111 ____
2112 } }

```

```

2113 #####
2114 # void $PREFIX_cbc_encrypt (const void *inp, void *out,
2115 #                             size_t length, const AES_KEY *key,
2116 #                             unsigned char *ivp, const int enc);
2117 {
2118     my $reserved = $win64?0x40:-0x18;    # used in decrypt
2119     $code.=<<<__ ;
2120     .globl ${PREFIX}_cbc_encrypt
2121     .type ${PREFIX}_cbc_encrypt, @function, 6
2122     .align 16
2123     ${PREFIX}_cbc_encrypt:
2124     test    $len,$len                # check length
2125     jz      .Lcbc_ret
2126
2127     mov     240($key),$rnds_          # key->rounds
2128     mov     $key,$key_                # backup $key
2129     test    %r9d,%r9d                # 6th argument
2130     jz      .Lcbc_decrypt
2131     #----- CBC ENCRYPT -----#
2132     movups  ($ivp),$inout0            # load iv as initial state
2133     mov     $rnds_,$rounds
2134     cmp     \ $16,$len
2135     jb      .Lcbc_enc_tail
2136     sub     \ $16,$len
2137     jmp     .Lcbc_enc_loop
2138     .align 16
2139     .Lcbc_enc_loop:
2140     movups  ($inp),$inout1            # load input
2141     lea     16($inp),$inp
2142     #xorps  $inout1,$inout0
2143     ____
2144     &aesni_generate1("enc",$key,$rounds,$inout0,$inout1);
2145     $code.=<<<__ ;
2146     mov     $rnds_,$rounds            # restore $rounds
2147     mov     $key_,$key                # restore $key
2148     movups  $inout0,0($out)            # store output
2149     lea     16($out),$out
2150     sub     \ $16,$len
2151     jnc     .Lcbc_enc_loop
2152     add     \ $16,$len
2153     jnz     .Lcbc_enc_tail
2154     movups  $inout0,($ivp)
2155     jmp     .Lcbc_ret
2156
2157     .Lcbc_enc_tail:
2158     mov     $len,%rcx                # zaps $key
2159     xchg    $inp,$out                # $inp is %rsi and $out is %rdi now
2160     .long   0x9066A4F3                # rep movsb
2161     mov     \ $16,%ecx                # zero tail
2162     sub     $len,%rcx
2163     xor     %eax,%eax
2164     .long   0x9066AAF3                # rep stosb
2165     lea     -16(%rdi),%rdi            # rewind $out by 1 block
2166     mov     $rnds_,$rounds            # restore $rounds
2167     mov     %rdi,%rsi                # $inp and $out are the same
2168     mov     $key_,$key                # restore $key
2169     xor     $len,$len                # len=16
2170     jmp     .Lcbc_enc_loop            # one more spin

```

```

2171 #----- CBC DECRYPT -----#
2172 .align 16
2173 .Lcbc_decrypt:
2174 ____
2175 $code.=<<<__ if ($win64);
2176     lea     -0x58(%rsp),%rsp
2177     movaps  %xmm6, (%rsp)
2178     movaps  %xmm7, 0x10(%rsp)
2179     movaps  %xmm8, 0x20(%rsp)
2180     movaps  %xmm9, 0x30(%rsp)
2181     .Lcbc_decrypt_body:
2182     ____
2183     $code.=<<<__ ;
2184     movups  ($ivp),$iv
2185     mov     $rnds_,$rounds
2186     cmp     \ $0x70,$len
2187     jbe     .Lcbc_dec_tail
2188     shr     \ $1,$rnds_
2189     sub     \ $0x70,$len
2190     mov     $rnds_,$rounds
2191     movaps  $iv,$reserved(%rsp)
2192     jmp     .Lcbc_dec_loop8_enter
2193     .align 16
2194     .Lcbc_dec_loop8:
2195     movaps  $rndkey0,$reserved(%rsp)    # save IV
2196     movups  $inout7,($out)
2197     lea     0x10($out),$out
2198     .Lcbc_dec_loop8_enter:
2199     $movkey ($key),$rndkey0
2200     movups  ($inp),$inout0            # load input
2201     movups  0x10($inp),$inout1
2202     $movkey 16($key),$rndkey1
2203
2204     lea     32($key),$key
2205     movdqu  0x20($inp),$inout2
2206     xorps   $rndkey0,$inout0
2207     movdqu  0x30($inp),$inout3
2208     xorps   $rndkey0,$inout1
2209     movdqu  0x40($inp),$inout4
2210     aesdec  $rndkey1,$inout0
2211     pxor    $rndkey0,$inout2
2212     movdqu  0x50($inp),$inout5
2213     aesdec  $rndkey1,$inout1
2214     pxor    $rndkey0,$inout3
2215     movdqu  0x60($inp),$inout6
2216     aesdec  $rndkey1,$inout2
2217     pxor    $rndkey0,$inout4
2218     movdqu  0x70($inp),$inout7
2219     aesdec  $rndkey1,$inout3
2220     pxor    $rndkey0,$inout5
2221     dec     $rounds
2222     aesdec  $rndkey1,$inout4
2223     pxor    $rndkey0,$inout6
2224     aesdec  $rndkey1,$inout5
2225     pxor    $rndkey0,$inout7
2226     $movkey ($key),$rndkey0
2227     aesdec  $rndkey1,$inout6
2228     aesdec  $rndkey1,$inout7
2229     $movkey 16($key),$rndkey1
2230
2231     call    .Ldec_loop8_enter
2232
2233     movups  ($inp),$rndkey1            # re-load input
2234     movups  0x10($inp),$rndkey0
2235     xorps   $reserved(%rsp),$inout0  # ^= IV
2236     xorps   $rndkey1,$inout1

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```

2237     movups    0x20($inp), $rndkey1
2238     xorps     $rndkey0, $inout2
2239     movups    0x30($inp), $rndkey0
2240     xorps     $rndkey1, $inout3
2241     movups    0x40($inp), $rndkey1
2242     xorps     $rndkey0, $inout4
2243     movups    0x50($inp), $rndkey0
2244     xorps     $rndkey1, $inout5
2245     movups    0x60($inp), $rndkey1
2246     xorps     $rndkey0, $inout6
2247     movups    0x70($inp), $rndkey0    # IV
2248     xorps     $rndkey1, $inout7
2249     movups    $inout0, ($out)
2250     movups    $inout1, 0x10($out)
2251     movups    $inout2, 0x20($out)
2252     movups    $inout3, 0x30($out)
2253     mov     $rnds_, $rounds    # restore $rounds
2254     movups    $inout4, 0x40($out)
2255     mov     $key_, $key    # restore $key
2256     movups    $inout5, 0x50($out)
2257     lea     0x80($inp), $inp
2258     movups    $inout6, 0x60($out)
2259     lea     0x70($out), $out
2260     sub     \0x80, $len
2261     ja      .Lcbc_dec_loop8

2263     movaps    $inout7, $inout0
2264     movaps    $rndkey0, $iv
2265     add     \0x70, $len
2266     jle      .Lcbc_dec_tail_collected
2267     movups    $inout0, ($out)
2268     lea     1($rnds_, $rnds_), $rounds
2269     lea     0x10($out), $out
2270 .Lcbc_dec_tail:
2271     movups    ($inp), $inout0
2272     movaps    $inout0, $in0
2273     cmp     \0x10, $len
2274     jbe      .Lcbc_dec_one

2276     movups    0x10($inp), $inout1
2277     movaps    $inout1, $in1
2278     cmp     \0x20, $len
2279     jbe      .Lcbc_dec_two

2281     movups    0x20($inp), $inout2
2282     movaps    $inout2, $in2
2283     cmp     \0x30, $len
2284     jbe      .Lcbc_dec_three

2286     movups    0x30($inp), $inout3
2287     cmp     \0x40, $len
2288     jbe      .Lcbc_dec_four

2290     movups    0x40($inp), $inout4
2291     cmp     \0x50, $len
2292     jbe      .Lcbc_dec_five

2294     movups    0x50($inp), $inout5
2295     cmp     \0x60, $len
2296     jbe      .Lcbc_dec_six

2298     movups    0x60($inp), $inout6
2299     movaps    $iv, $reserved(%rsp)    # save IV
2300     call     _aesni_decrypt8
2301     movups    ($inp), $rndkey1
2302     movups    0x10($inp), $rndkey0

```

```

2303     xorps     $reserved(%rsp), $inout0 # ^= IV
2304     xorps     $rndkey1, $inout1
2305     movups    0x20($inp), $rndkey1
2306     xorps     $rndkey0, $inout2
2307     movups    0x30($inp), $rndkey0
2308     xorps     $rndkey1, $inout3
2309     movups    0x40($inp), $rndkey1
2310     xorps     $rndkey0, $inout4
2311     movups    0x50($inp), $rndkey0
2312     xorps     $rndkey1, $inout5
2313     movups    0x60($inp), $iv    # IV
2314     xorps     $rndkey0, $inout6
2315     movups    $inout0, ($out)
2316     movups    $inout1, 0x10($out)
2317     movups    $inout2, 0x20($out)
2318     movups    $inout3, 0x30($out)
2319     movups    $inout4, 0x40($out)
2320     movups    $inout5, 0x50($out)
2321     lea     0x60($out), $out
2322     movaps    $inout6, $inout0
2323     sub     \0x70, $len
2324     jmp      .Lcbc_dec_tail_collected
2325 .align     16
2326 .Lcbc_dec_one:
2327     ---
2328     &aesni_generate1("dec", $key, $rounds);
2329 $code.=<<";
2330     xorps     $iv, $inout0
2331     movaps    $in0, $iv
2332     sub     \0x10, $len
2333     jmp      .Lcbc_dec_tail_collected
2334 .align     16
2335 .Lcbc_dec_two:
2336     xorps     $inout2, $inout2
2337     call     _aesni_decrypt3
2338     xorps     $iv, $inout0
2339     xorps     $in0, $inout1
2340     movups    $inout0, ($out)
2341     movaps    $in1, $iv
2342     movaps    $inout1, $inout0
2343     lea     0x10($out), $out
2344     sub     \0x20, $len
2345     jmp      .Lcbc_dec_tail_collected
2346 .align     16
2347 .Lcbc_dec_three:
2348     call     _aesni_decrypt3
2349     xorps     $iv, $inout0
2350     xorps     $in0, $inout1
2351     movups    $inout0, ($out)
2352     xorps     $in1, $inout2
2353     movups    $inout1, 0x10($out)
2354     movaps    $in2, $iv
2355     movaps    $inout2, $inout0
2356     lea     0x20($out), $out
2357     sub     \0x30, $len
2358     jmp      .Lcbc_dec_tail_collected
2359 .align     16
2360 .Lcbc_dec_four:
2361     call     _aesni_decrypt4
2362     xorps     $iv, $inout0
2363     movups    0x30($inp), $iv
2364     xorps     $in0, $inout1
2365     movups    $inout0, ($out)
2366     xorps     $in1, $inout2
2367     movups    $inout1, 0x10($out)
2368     xorps     $in2, $inout3

```

```

2369      movups   $inout2,0x20($out)
2370      movaps   $inout3,$inout0
2371      lea      0x30($out),$out
2372      sub      \($0x40,$len
2373      jmp      .Lcbc_dec_tail_collected
2374 .align 16
2375 .Lcbc_dec_five:
2376      xorps    $inout5,$inout5
2377      call     _aesni_decrypt6
2378      movups   0x10($inp),$rndkey1
2379      movups   0x20($inp),$rndkey0
2380      xorps    $iv,$inout0
2381      xorps    $in0,$inout1
2382      xorps    $rndkey1,$inout2
2383      movups   0x30($inp),$rndkey1
2384      xorps    $rndkey0,$inout3
2385      movups   0x40($inp),$iv
2386      xorps    $rndkey1,$inout4
2387      movups   $inout0,($out)
2388      movups   $inout1,0x10($out)
2389      movups   $inout2,0x20($out)
2390      movups   $inout3,0x30($out)
2391      lea      0x40($out),$out
2392      movaps   $inout4,$inout0
2393      sub      \($0x50,$len
2394      jmp      .Lcbc_dec_tail_collected
2395 .align 16
2396 .Lcbc_dec_six:
2397      call     _aesni_decrypt6
2398      movups   0x10($inp),$rndkey1
2399      movups   0x20($inp),$rndkey0
2400      xorps    $iv,$inout0
2401      xorps    $in0,$inout1
2402      xorps    $rndkey1,$inout2
2403      movups   0x30($inp),$rndkey1
2404      xorps    $rndkey0,$inout3
2405      movups   0x40($inp),$rndkey0
2406      xorps    $rndkey1,$inout4
2407      movups   0x50($inp),$iv
2408      xorps    $rndkey0,$inout5
2409      movups   $inout0,($out)
2410      movups   $inout1,0x10($out)
2411      movups   $inout2,0x20($out)
2412      movups   $inout3,0x30($out)
2413      movups   $inout4,0x40($out)
2414      lea      0x50($out),$out
2415      movaps   $inout5,$inout0
2416      sub      \($0x60,$len
2417      jmp      .Lcbc_dec_tail_collected
2418 .align 16
2419 .Lcbc_dec_tail_collected:
2420      and      \($15,$len
2421      movups   $iv,($ivp)
2422      jnz      .Lcbc_dec_tail_partial
2423      movups   $inout0,($out)
2424      jmp      .Lcbc_dec_ret
2425 .align 16
2426 .Lcbc_dec_tail_partial:
2427      movaps   $inout0,$reserved(%rsp)
2428      mov      \($16,%rcx
2429      mov      $out,%rdi
2430      sub      $len,%rcx
2431      lea      $reserved(%rsp),%rsi
2432      .long    0x9066A4F3      # rep movsb
2434 .Lcbc_dec_ret:

```

```

2435      _____
2436      $code.=<<_____ if ($win64);
2437      movaps   (%rsp),%xmm6
2438      movaps   0x10(%rsp),%xmm7
2439      movaps   0x20(%rsp),%xmm8
2440      movaps   0x30(%rsp),%xmm9
2441      lea      0x58(%rsp),%rsp
2442      _____
2443      $code.=<<_____;
2444      .Lcbc_ret:
2445      ret
2446 .size    ${PREFIX}_cbc_encrypt,.-${PREFIX}_cbc_encrypt
2447      _____
2448      }

```

```

2449 # int $PREFIX_set_[en]crypt_key (const unsigned char *userKey,
2450 #                                int bits, AES_KEY *key)
2451 { my ($inp,$bits,$key) = @_args;
2452   $bits =~ s/%r/%e/;

2454 $code.=<<__;;
2455 .globl ${PREFIX}_set_decrypt_key
2456 .type ${PREFIX}_set_decrypt_key,@abi-omnipotent
2457 .align 16
2458 ${PREFIX}_set_decrypt_key:
2459   .byte 0x48,0x83,0xEC,0x08      # sub rsp,8
2460   call _aesni_set_encrypt_key
2461   shl  $4,$bits                  # rounds-1 after _aesni_set_encrypt_key
2462   test %eax,%eax
2463   jnz  .Ldec_key_ret
2464   lea  16($key,$bits),$inp      # points at the end of key schedule

2466   $movkey ($key),%xmm0          # just swap
2467   $movkey ($inp),%xmm1
2468   $movkey %xmm0,($inp)
2469   $movkey %xmm1,($key)
2470   lea  16($key),$key
2471   lea  -16($inp),$inp

2473 .Ldec_key_inverse:
2474   $movkey ($key),%xmm0          # swap and inverse
2475   $movkey ($inp),%xmm1
2476   aesimc %xmm0,%xmm0
2477   aesimc %xmm1,%xmm1
2478   lea  16($key),$key
2479   lea  -16($inp),$inp
2480   $movkey %xmm0,16($inp)
2481   $movkey %xmm1,-16($key)
2482   cmp  $key,$inp
2483   ja   .Ldec_key_inverse

2485   $movkey ($key),%xmm0          # inverse middle
2486   aesimc %xmm0,%xmm0
2487   $movkey %xmm0,($inp)

2488 .Ldec_key_ret:
2489   add  $8,%rsp
2490   ret

2491 .LSEH_end_set_decrypt_key:
2492 .size  ${PREFIX}_set_decrypt_key,.-${PREFIX}_set_decrypt_key
2493 ____

```

```

2494 # This is based on submission by
2495 #
2496 #   Huang Ying <ying.huang@intel.com>
2497 #   Vinodh Gopal <vinodh.gopal@intel.com>
2498 #   Kahraman Akdemir
2499 #
2500 # Agressively optimized in respect to aeskeygenassist's critical path
2501 # and is contained in %xmm0-5 to meet Win64 ABI requirement.
2502 #
2503 $code.=<<__;;
2504 .globl ${PREFIX}_set_encrypt_key
2505 .type ${PREFIX}_set_encrypt_key,@abi-omnipotent
2506 .align 16
2507 ${PREFIX}_set_encrypt_key:
2508 _aesni_set_encrypt_key:
2509   .byte 0x48,0x83,0xEC,0x08      # sub rsp,8
2510   mov  \%-1,%rax
2511   test $inp,$inp
2512   jz   .Lenc_key_ret
2513   test $key,$key
2514   jz   .Lenc_key_ret

2516   movups ($inp),%xmm0           # pull first 128 bits of *userKey
2517   xorps  %xmm4,%xmm4           # low dword of xmm4 is assumed 0
2518   lea  16($key),%rax
2519   cmp  \256,$bits
2520   je   .L14rounds
2521   cmp  \192,$bits
2522   je   .L12rounds
2523   cmp  \128,$bits
2524   jne  .Lbad_keybits

2526 .L10rounds:
2527   mov  \9,$bits                # 10 rounds for 128-bit key
2528   $movkey %xmm0,($key)          # round 0
2529   aeskeygenassist \0x1,%xmm0,%xmm1 # round 1
2530   call .Lkey_expansion_128_cold
2531   aeskeygenassist \0x2,%xmm0,%xmm1 # round 2
2532   call .Lkey_expansion_128
2533   aeskeygenassist \0x4,%xmm0,%xmm1 # round 3
2534   call .Lkey_expansion_128
2535   aeskeygenassist \0x8,%xmm0,%xmm1 # round 4
2536   call .Lkey_expansion_128
2537   aeskeygenassist \0x10,%xmm0,%xmm1 # round 5
2538   call .Lkey_expansion_128
2539   aeskeygenassist \0x20,%xmm0,%xmm1 # round 6
2540   call .Lkey_expansion_128
2541   aeskeygenassist \0x40,%xmm0,%xmm1 # round 7
2542   call .Lkey_expansion_128
2543   aeskeygenassist \0x80,%xmm0,%xmm1 # round 8
2544   call .Lkey_expansion_128
2545   aeskeygenassist \0x1b,%xmm0,%xmm1 # round 9
2546   call .Lkey_expansion_128
2547   aeskeygenassist \0x36,%xmm0,%xmm1 # round 10
2548   call .Lkey_expansion_128
2549   $movkey %xmm0,(%rax)
2550   mov  $bits,80(%rax) # 240(%rdx)
2551   xor  %eax,%eax
2552   jmp  .Lenc_key_ret

2554 .align 16
2555 .L12rounds:
2556   movq  16($inp),%xmm2         # remaining 1/3 of *userKey
2557   mov  \11,$bits              # 12 rounds for 192
2558   $movkey %xmm0,($key)         # round 0
2559   aeskeygenassist \0x1,%xmm2,%xmm1 # round 1,2

```



```

2560      call      .Lkey_expansion_192a_cold
2561      aeskeygenassist \0x2,%xmm2,%xmm1      # round 2,3
2562      call      .Lkey_expansion_192b
2563      aeskeygenassist \0x4,%xmm2,%xmm1      # round 4,5
2564      call      .Lkey_expansion_192a
2565      aeskeygenassist \0x8,%xmm2,%xmm1      # round 5,6
2566      call      .Lkey_expansion_192b
2567      aeskeygenassist \0x10,%xmm2,%xmm1     # round 7,8
2568      call      .Lkey_expansion_192a
2569      aeskeygenassist \0x20,%xmm2,%xmm1     # round 8,9
2570      call      .Lkey_expansion_192b
2571      aeskeygenassist \0x40,%xmm2,%xmm1     # round 10,11
2572      call      .Lkey_expansion_192a
2573      aeskeygenassist \0x80,%xmm2,%xmm1     # round 11,12
2574      call      .Lkey_expansion_192b
2575      $movkey %xmm0, (%rax)
2576      mov      $bits,48(%rax) # 240(%rdx)
2577      xor      %rax, %rax
2578      jmp      .Lenc_key_ret

2580 .align 16
2581 .L14rounds:
2582      movups   16($inp),%xmm2              # remaning half of *userKey
2583      mov      \13,$bits                    # 14 rounds for 256
2584      lea      16(%rax),%rax
2585      $movkey %xmm0, ($key)                  # round 0
2586      $movkey %xmm2, 16($key)                # round 1
2587      aeskeygenassist \0x1,%xmm2,%xmm1      # round 2
2588      call      .Lkey_expansion_256a_cold
2589      aeskeygenassist \0x1,%xmm0,%xmm1      # round 3
2590      call      .Lkey_expansion_256b
2591      aeskeygenassist \0x2,%xmm2,%xmm1      # round 4
2592      call      .Lkey_expansion_256a
2593      aeskeygenassist \0x2,%xmm0,%xmm1      # round 5
2594      call      .Lkey_expansion_256b
2595      aeskeygenassist \0x4,%xmm2,%xmm1      # round 6
2596      call      .Lkey_expansion_256a
2597      aeskeygenassist \0x4,%xmm0,%xmm1      # round 7
2598      call      .Lkey_expansion_256b
2599      aeskeygenassist \0x8,%xmm2,%xmm1      # round 8
2600      call      .Lkey_expansion_256a
2601      aeskeygenassist \0x8,%xmm0,%xmm1      # round 9
2602      call      .Lkey_expansion_256b
2603      aeskeygenassist \0x10,%xmm2,%xmm1     # round 10
2604      call      .Lkey_expansion_256a
2605      aeskeygenassist \0x10,%xmm0,%xmm1     # round 11
2606      call      .Lkey_expansion_256b
2607      aeskeygenassist \0x20,%xmm2,%xmm1     # round 12
2608      call      .Lkey_expansion_256a
2609      aeskeygenassist \0x20,%xmm0,%xmm1     # round 13
2610      call      .Lkey_expansion_256b
2611      aeskeygenassist \0x40,%xmm2,%xmm1     # round 14
2612      call      .Lkey_expansion_256a
2613      $movkey %xmm0, (%rax)
2614      mov      $bits,16(%rax) # 240(%rdx)
2615      xor      %rax, %rax
2616      jmp      .Lenc_key_ret

2618 .align 16
2619 .Lbad_keybits:
2620      mov      \2,%rax
2621 .Lenc_key_ret:
2622      add      \8,%rsp
2623      ret
2624 .LSEH_end_set_encrypt_key:

```

```

2625 .align 16
2626 .Lkey_expansion_128:
2627      $movkey %xmm0, (%rax)
2628      lea      16(%rax),%rax
2629 .Lkey_expansion_128_cold:
2630      shufps   \0b00010000,%xmm0,%xmm4
2631      xorps    %xmm4, %xmm0
2632      shufps   \0b10001100,%xmm0,%xmm4
2633      xorps    %xmm4, %xmm0
2634      shufps   \0b11111111,%xmm1,%xmm1     # critical path
2635      xorps    %xmm1,%xmm0
2636      ret

2638 .align 16
2639 .Lkey_expansion_192a:
2640      $movkey %xmm0, (%rax)
2641      lea      16(%rax),%rax
2642 .Lkey_expansion_192a_cold:
2643      movaps   %xmm2, %xmm5
2644 .Lkey_expansion_192b_warm:
2645      shufps   \0b00010000,%xmm0,%xmm4
2646      movdqa   %xmm2,%xmm3
2647      xorps    %xmm4,%xmm0
2648      shufps   \0b10001100,%xmm0,%xmm4
2649      psllq    \4,%xmm3
2650      xorps    %xmm4,%xmm0
2651      pshufd   \0b01010101,%xmm1,%xmm1     # critical path
2652      pxor     %xmm3,%xmm2
2653      pxor     %xmm1,%xmm0
2654      pshufd   \0b11111111,%xmm0,%xmm3
2655      pxor     %xmm3,%xmm2
2656      ret

2658 .align 16
2659 .Lkey_expansion_192b:
2660      movaps   %xmm0,%xmm3
2661      shufps   \0b01000100,%xmm0,%xmm5
2662      $movkey %xmm5, (%rax)
2663      shufps   \0b01001110,%xmm2,%xmm3
2664      $movkey %xmm3, 16(%rax)
2665      lea      32(%rax),%rax
2666      jmp      .Lkey_expansion_192b_warm

2668 .align 16
2669 .Lkey_expansion_256a:
2670      $movkey %xmm2, (%rax)
2671      lea      16(%rax),%rax
2672 .Lkey_expansion_256a_cold:
2673      shufps   \0b00010000,%xmm0,%xmm4
2674      xorps    %xmm4,%xmm0
2675      shufps   \0b10001100,%xmm0,%xmm4
2676      xorps    %xmm4,%xmm0
2677      shufps   \0b11111111,%xmm1,%xmm1     # critical path
2678      xorps    %xmm1,%xmm0
2679      ret

2681 .align 16
2682 .Lkey_expansion_256b:
2683      $movkey %xmm0, (%rax)
2684      lea      16(%rax),%rax

2686      shufps   \0b00010000,%xmm2,%xmm4
2687      xorps    %xmm4,%xmm2
2688      shufps   \0b10001100,%xmm2,%xmm4
2689      xorps    %xmm4,%xmm2
2690      shufps   \0b10101010,%xmm1,%xmm1     # critical path

```

```

2691     xorps    %xmm1,%xmm2
2692     ret
2693 .size    ${PREFIX}_set_encrypt_key,.-${PREFIX}_set_encrypt_key
2694 .size    __aesni_set_encrypt_key,.-__aesni_set_encrypt_key
2695 ____
2696 }

```

```

2697 $code.=<<____;
2698 .align    64
2699 .lswap_mask:
2700     .byte    15,14,13,12,11,10,9,8,7,6,5,4,3,2,1,0
2701 .Lincrement32:
2702     .long    6,6,6,0
2703 .Lincrement64:
2704     .long    1,0,0,0
2705 .Lxts_magic:
2706     .long    0x87,0,1,0

2708 .asciz    "AES for Intel AES-NI, CRYPTOGAMS by <appro@openssl.org>"
2709 .align    64
2710 ____

2712 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
2713 #                                CONTEXT *context,DISPATCHER_CONTEXT *disp)
2714 if ($win64) {
2715     $rec="%rcx";
2716     $frame="%rdx";
2717     $context="%r8";
2718     $disp="%r9";

2720 $code.=<<____;
2721 .extern    __imp_RtlVirtualUnwind
2722 ____
2723 $code.=<<____ if ($PREFIX eq "aesni");
2724 .type      ecb_se_handler,\@abi-omnipotent
2725 .align    16
2726 ecb_se_handler:
2727     push     %rsi
2728     push     %rdi
2729     push     %rbx
2730     push     %rbp
2731     push     %r12
2732     push     %r13
2733     push     %r14
2734     push     %r15
2735     pushfq   \ $64,%rsp
2736     sub      \ $64,%rsp

2738     mov      152($context),%rax    # pull context->Rsp

2740     jmp      .Lcommon_seh_tail
2741 .size      ecb_se_handler,.-ecb_se_handler

2743 .type      ccm64_se_handler,\@abi-omnipotent
2744 .align    16
2745 ccm64_se_handler:
2746     push     %rsi
2747     push     %rdi
2748     push     %rbx
2749     push     %rbp
2750     push     %r12
2751     push     %r13
2752     push     %r14
2753     push     %r15
2754     pushfq   \ $64,%rsp
2755     sub      \ $64,%rsp

2757     mov      120($context),%rax    # pull context->Rax
2758     mov      248($context),%rbx    # pull context->Rip

2760     mov      8($disp),%rsi        # disp->ImageBase
2761     mov      56($disp),%r11       # disp->HandlerData

```

```

2763      mov     0(%r11),%r10d      # HandlerData[0]
2764      lea     (%rsi,%r10),%r10    # prologue label
2765      cmp     %r10,%rbx          # context->Rip<prologue label
2766      jb
.Lcommon_seh_tail

2768      mov     152($context),%rax  # pull context->Rsp

2770      mov     4(%r11),%r10d      # HandlerData[1]
2771      lea     (%rsi,%r10),%r10    # epilogue label
2772      cmp     %r10,%rbx          # context->Rip>=epilogue label
2773      jae     .Lcommon_seh_tail

2775      lea     0(%rax),%rsi        # %xmm save area
2776      lea     512($context),%rdi   # &context.Xmm6
2777      mov     $8,%ecx             # 4*sizeof(%xmm0)/sizeof(%rax)
2778      .long   0xa548f3fc         # cld; rep movsq
2779      lea     0x58(%rax),%rax     # adjust stack pointer

2781      jmp     .Lcommon_seh_tail
2782 .size      ccm64_se_handler,.-ccm64_se_handler

2784 .type      ctr32_se_handler,\@abi-omnipotent
2785 .align     16
2786 ctr32_se_handler:
2787     push     %rsi
2788     push     %rdi
2789     push     %rbx
2790     push     %rbp
2791     push     %r12
2792     push     %r13
2793     push     %r14
2794     push     %r15
2795     pushfq   \ $64,%rsp
2796

2798     mov     120($context),%rax   # pull context->Rax
2799     mov     248($context),%rbx   # pull context->Rip

2801     lea     .Lctr32_body(%rip),%r10
2802     cmp     %r10,%rbx           # context->Rip<"prologue" label
2803     jb     .Lcommon_seh_tail

2805     mov     152($context),%rax   # pull context->Rsp

2807     lea     .Lctr32_ret(%rip),%r10
2808     cmp     %r10,%rbx
2809     jae     .Lcommon_seh_tail

2811     lea     0x20(%rax),%rsi      # %xmm save area
2812     lea     512($context),%rdi   # &context.Xmm6
2813     mov     $20,%ecx            # 10*sizeof(%xmm0)/sizeof(%rax)
2814     .long   0xa548f3fc         # cld; rep movsq
2815     lea     0xc8(%rax),%rax     # adjust stack pointer

2817     jmp     .Lcommon_seh_tail
2818 .size      ctr32_se_handler,.-ctr32_se_handler

2820 .type      xts_se_handler,\@abi-omnipotent
2821 .align     16
2822 xts_se_handler:
2823     push     %rsi
2824     push     %rdi
2825     push     %rbx
2826     push     %rbp
2827     push     %r12
2828     push     %r13

```

```

2829     push     %r14
2830     push     %r15
2831     pushfq   sub
2832     \ $64,%rsp

2834     mov     120($context),%rax   # pull context->Rax
2835     mov     248($context),%rbx   # pull context->Rip

2837     mov     8($disp),%rsi       # disp->ImageBase
2838     mov     56($disp),%r11      # disp->HandlerData

2840     mov     0(%r11),%r10d      # HandlerData[0]
2841     lea     (%rsi,%r10),%r10    # prologue label
2842     cmp     %r10,%rbx          # context->Rip<prologue label
2843     jb     .Lcommon_seh_tail

2845     mov     152($context),%rax   # pull context->Rsp

2847     mov     4(%r11),%r10d      # HandlerData[1]
2848     lea     (%rsi,%r10),%r10    # epilogue label
2849     cmp     %r10,%rbx          # context->Rip>=epilogue label
2850     jae     .Lcommon_seh_tail

2852     lea     0x60(%rax),%rsi      # %xmm save area
2853     lea     512($context),%rdi   # & context.Xmm6
2854     mov     $20,%ecx            # 10*sizeof(%xmm0)/sizeof(%rax)
2855     .long   0xa548f3fc         # cld; rep movsq
2856     lea     0x68+160(%rax),%rax # adjust stack pointer

2858     jmp     .Lcommon_seh_tail
2859 .size      xts_se_handler,.-xts_se_handler
2860
2861 $code.=<<__ ;
2862 .type      cbc_se_handler,\@abi-omnipotent
2863 .align     16
2864 cbc_se_handler:
2865     push     %rsi
2866     push     %rdi
2867     push     %rbx
2868     push     %rbp
2869     push     %r12
2870     push     %r13
2871     push     %r14
2872     push     %r15
2873     pushfq   sub
2874     \ $64,%rsp

2876     mov     152($context),%rax   # pull context->Rsp
2877     mov     248($context),%rbx   # pull context->Rip

2879     lea     .Lcbc_decrypt(%rip),%r10
2880     cmp     %r10,%rbx           # context->Rip<"prologue" label
2881     jb     .Lcommon_seh_tail

2883     lea     .Lcbc_decrypt_body(%rip),%r10
2884     cmp     %r10,%rbx           # context->Rip<cbc_decrypt_body
2885     jb     .Lrestore_cbc_rax

2887     lea     .Lcbc_ret(%rip),%r10
2888     cmp     %r10,%rbx           # context->Rip>="epilogue" label
2889     jae     .Lcommon_seh_tail

2891     lea     0(%rax),%rsi        # top of stack
2892     lea     512($context),%rdi   # &context.Xmm6
2893     mov     $8,%ecx             # 4*sizeof(%xmm0)/sizeof(%rax)
2894     .long   0xa548f3fc         # cld; rep movsq

```

```

2895      lea    0x58(%rax),%rax      # adjust stack pointer
2896      jmp    .lcommon_seh_tail

2898 .lrestore_cbc_rax:
2899      mov    120($context),%rax

2901 .lcommon_seh_tail:
2902      mov    8(%rax),%rdi
2903      mov    16(%rax),%rsi
2904      mov    %rax,152($context)    # restore context->Rsp
2905      mov    %rsi,168($context)    # restore context->Rsi
2906      mov    %rdi,176($context)    # restore context->Rdi

2908      mov    40($disp),%rdi        # disp->ContextRecord
2909      mov    $context,%rsi         # context
2910      mov    \ $154,%ecx           # sizeof(CONTEXT)
2911      .long   0xa548f3fc           # cld; rep movsq

2913      mov    $disp,%rsi
2914      xor    %rcx,%rcx             # arg1, UNW_FLAG_NHANDLER
2915      mov    8(%rsi),%rdx          # arg2, disp->ImageBase
2916      mov    0(%rsi),%r8           # arg3, disp->ControlPc
2917      mov    16(%rsi),%r9          # arg4, disp->FunctionEntry
2918      mov    40(%rsi),%r10         # disp->ContextRecord
2919      lea    56(%rsi),%r11         # &disp->HandlerData
2920      lea    24(%rsi),%r12         # &disp->EstablisherFrame
2921      mov    %r10,32(%rsp)         # arg5
2922      mov    %r11,40(%rsp)         # arg6
2923      mov    %r12,48(%rsp)         # arg7
2924      mov    %rcx,56(%rsp)         # arg8, (NULL)
2925      call   *__imp_RtlVirtualUnwind(%rip)

2927      mov    \ $1,%eax             # ExceptionContinueSearch
2928      add    \ $64,%rsp
2929      popfq  %r15
2930      pop    %r14
2931      pop    %r13
2932      pop    %r12
2933      pop    %rbp
2934      pop    %rbx
2935      pop    %rdi
2936      pop    %rsi
2937      ret
2938
2939 .size     cbc_se_handler,.-cbc_se_handler

2941 .section    .pdata
2942 .align     4
2943
2944 $code.=<<__ if ($PREFIX eq "aesni");
2945      .rva    .LSEH_begin_aesni_ecb_encrypt
2946      .rva    .LSEH_end_aesni_ecb_encrypt
2947      .rva    .LSEH_info_ecb

2949      .rva    .LSEH_begin_aesni_ccm64_encrypt_blocks
2950      .rva    .LSEH_end_aesni_ccm64_encrypt_blocks
2951      .rva    .LSEH_info_ccm64_enc

2953      .rva    .LSEH_begin_aesni_ccm64_decrypt_blocks
2954      .rva    .LSEH_end_aesni_ccm64_decrypt_blocks
2955      .rva    .LSEH_info_ccm64_dec

2957      .rva    .LSEH_begin_aesni_ctr32_encrypt_blocks
2958      .rva    .LSEH_end_aesni_ctr32_encrypt_blocks
2959      .rva    .LSEH_info_ctr32

```

```

2961      .rva    .LSEH_begin_aesni_xts_encrypt
2962      .rva    .LSEH_end_aesni_xts_encrypt
2963      .rva    .LSEH_info_xts_enc

2965      .rva    .LSEH_begin_aesni_xts_decrypt
2966      .rva    .LSEH_end_aesni_xts_decrypt
2967      .rva    .LSEH_info_xts_dec

2968      .rva    .LSEH_info_xts_dec
2969      $code.=<<__ ;
2970      .rva    .LSEH_begin_${PREFIX}_cbc_encrypt
2971      .rva    .LSEH_end_${PREFIX}_cbc_encrypt
2972      .rva    .LSEH_info_cbc

2974      .rva    ${PREFIX}_set_decrypt_key
2975      .rva    .LSEH_end_set_decrypt_key
2976      .rva    .LSEH_info_key

2978      .rva    ${PREFIX}_set_encrypt_key
2979      .rva    .LSEH_end_set_encrypt_key
2980      .rva    .LSEH_info_key
2981      .section .xdata
2982      .align 8
2983
2984 $code.=<<__ if ($PREFIX eq "aesni");
2985 .LSEH_info_ecb:
2986      .byte   9,0,0,0
2987      .rva    ecb_se_handler
2988 .LSEH_info_ccm64_enc:
2989      .byte   9,0,0,0
2990      .rva    ccm64_se_handler
2991      .rva    .Lccm64_enc_body,.Lccm64_enc_ret    # HandlerData[]
2992 .LSEH_info_ccm64_dec:
2993      .byte   9,0,0,0
2994      .rva    ccm64_se_handler
2995      .rva    .Lccm64_dec_body,.Lccm64_dec_ret    # HandlerData[]
2996 .LSEH_info_ctr32:
2997      .byte   9,0,0,0
2998      .rva    ctr32_se_handler
2999 .LSEH_info_xts_enc:
3000      .byte   9,0,0,0
3001      .rva    xts_se_handler
3002      .rva    .Lxts_enc_body,.Lxts_enc_epilogue    # HandlerData[]
3003 .LSEH_info_xts_dec:
3004      .byte   9,0,0,0
3005      .rva    xts_se_handler
3006      .rva    .Lxts_dec_body,.Lxts_dec_epilogue    # HandlerData[]
3007
3008 $code.=<<__ ;
3009 .LSEH_info_cbc:
3010      .byte   9,0,0,0
3011      .rva    cbc_se_handler
3012 .LSEH_info_key:
3013      .byte   0x01,0x04,0x01,0x00
3014      .byte   0x04,0x02,0x00,0x00    # sub rsp,8
3015
3016 }

3018 sub rex {
3019     local *opcode=shift;
3020     my ($dst,$src)=@_;
3021     my $rex=0;

3023     $rex|=0x04    if($dst>=8);
3024     $rex|=0x01    if($src>=8);
3025     push @opcode,$rex|0x40    if($rex);
3026 }

```

```
3028 sub aesni {
3029     my $line=shift;
3030     my @opcode=(0x66);

3032     if ($line=~/(aeskeygenassist)\s+\$([x0-9a-f]+),\s*%xmm([0-9]+),\s*%xmm([0-9]
3033         rex(\@opcode,$4,$3);
3034         push @opcode,0x0f,0x3a,0xdf;
3035         push @opcode,0xc0|($3&7)|(($4&7)<<3);    # ModR/M
3036         my $c=$2;
3037         push @opcode,$c=~/^0/?oct($c):$c;
3038         return ".byte\t".join(' ',@opcode);
3039     }
3040     elsif ($line=~/(aes[a-z]+\s+%xmm([0-9]+),\s*%xmm([0-9]+)/) {
3041         my %opcodelet = (
3042             "aesimc" => 0xdb,
3043             "aesenc" => 0xdc,    "aesenclast" => 0xdd,
3044             "aesdec" => 0xde,    "aesdeclast" => 0xdf
3045         );
3046         return undef if (!defined($opcodelet{$1}));
3047         rex(\@opcode,$3,$2);
3048         push @opcode,0x0f,0x38,$opcodelet{$1};
3049         push @opcode,0xc0|($2&7)|(($3&7)<<3);    # ModR/M
3050         return ".byte\t".join(' ',@opcode);
3051     }
3052     return $line;
3053 }

3055 $code =~ s/\`{[\^\'']*}\`/eval($1)/gem;
3056 $code =~ s/\b(aes.%xmm[0-9]+).*$ /aesni($1)/gem;

3058 print $code;

3060 close STDOUT;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/bf-586.pl

1

```
*****
2665 Fri May 30 18:32:02 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/bf-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/local/bin/perl

3 $0 =~ m/(.*[\\\/\s])(^\\\/\s)+$/; $dir=$1;
4 push(@INC,"${dir}","${dir}../../perlasm");
5 require "x86asm.pl";
6 require "cbc.pl";

8 &asm_init($ARGV[0],"bf-586.pl",$ARGV[$#ARGV] eq "386");

10 $BF_ROUNDS=16;
11 $BF_OFF=($BF_ROUNDS+2)*4;
12 $L="edi";
13 $R="esi";
14 $P="ebp";
15 $tmp1="eax";
16 $tmp2="ebx";
17 $tmp3="ecx";
18 $tmp4="edx";

20 &BF_encrypt("BF_encrypt",1);
21 &BF_decrypt("BF_decrypt",0);
22 &cbc("BF_cbc_encrypt","BF_encrypt","BF_decrypt",1,4,5,3,-1,-1);
23 &asm_finish();

25 sub BF_encrypt
26 {
27     local($name,$enc)=@_;

29     &function_begin_B($name,"");

31     &comment("");

33     &push("ebp");
34     &push("ebx");
35     &mov($tmp2,&wparam(0));
36     &mov($P,&wparam(1));
37     &push("esi");
38     &push("edi");

40     &comment("Load the 2 words");
41     &mov($L,&DWP(0,$tmp2,"",0));
42     &mov($R,&DWP(4,$tmp2,"",0));

44     &xor($tmp1,$tmp1);

46     # encrypting part

48     if ($enc)
49     {
50         &mov($tmp2,&DWP(0,$P,"",0));
51         &xor($tmp3,$tmp3);

53         &xor($L,$tmp2);
54         for ($i=0; $i<$BF_ROUNDS; $i+=2)
55         {
56             &comment("");
57             &comment("Round $i");
58             &BF_ENCRYPT($i+1,$R,$L,$P,$tmp1,$tmp2,$tmp3,$tmp4,1);

60             &comment("");
61             &comment("Round ".sprintf("%d",$i+1));
```

new/usr/src/lib/openssl/libsunw_crypto/pl/bf-586.pl

2

```
62         &BF_ENCRYPT($i+2,$L,$R,$P,$tmp1,$tmp2,$tmp3,$tmp4,1);
63     }
64     # &mov($tmp1,&wparam(0)); In last loop
65     &mov($tmp4,&DWP(($BF_ROUNDS+1)*4,$P,"",0));
66 }
67 else
68 {
69     &mov($tmp2,&DWP(($BF_ROUNDS+1)*4,$P,"",0));
70     &xor($tmp3,$tmp3);

72     &xor($L,$tmp2);
73     for ($i=$BF_ROUNDS; $i>0; $i-=2)
74     {
75         &comment("");
76         &comment("Round $i");
77         &BF_ENCRYPT($i,$R,$L,$P,$tmp1,$tmp2,$tmp3,$tmp4,0);
78         &comment("");
79         &comment("Round ".sprintf("%d",$i-1));
80         &BF_ENCRYPT($i-1,$L,$R,$P,$tmp1,$tmp2,$tmp3,$tmp4,0);
81     }
82     # &mov($tmp1,&wparam(0)); In last loop
83     &mov($tmp4,&DWP(0,$P,"",0));
84 }

86     &xor($R,$tmp4);
87     &mov(&DWP(4,$tmp1,"",0),$L);

89     &mov(&DWP(0,$tmp1,"",0),$R);
90     &function_end($name);
91 }

93 sub BF_ENCRYPT
94 {
95     local($i,$L,$R,$P,$tmp1,$tmp2,$tmp3,$tmp4,$enc)=@_;

97     &mov($tmp4,&DWP(&n2a($i*4),$P,"",0)); # for next round

99     &mov($tmp2,$R);
100    &xor($L,$tmp4);

102    &shr($tmp2,16);
103    &mov($tmp4,$R);

105    &movb(&LB($tmp1),&HB($tmp2)); # A
106    &and($tmp2,0xff); # B

108    &movb(&LB($tmp3),&HB($tmp4)); # C
109    &and($tmp4,0xff); # D

111    &mov($tmp1,&DWP(&n2a($BF_OFF+0x0000),$P,$tmp1,4));
112    &mov($tmp2,&DWP(&n2a($BF_OFF+0x0400),$P,$tmp2,4));

114    &add($tmp2,$tmp1);
115    &mov($tmp1,&DWP(&n2a($BF_OFF+0x0800),$P,$tmp3,4));

117    &xor($tmp2,$tmp1);
118    &mov($tmp4,&DWP(&n2a($BF_OFF+0x0C00),$P,$tmp4,4));

120    &add($tmp2,$tmp4);
121    if (($enc && ($i != 16)) || (!$enc) && ($i != 1))
122    { &xor($tmp1,$tmp1); }
123    else
124    {
125        &comment("Load parameter 0 ($i) enc=$enc");
126        &mov($tmp1,&wparam(0));
127        # In last loop
```

```
129      &xor(    $L,          $tmp2);
130      # delay
131      }

133 sub n2a
134 {
135     sprintf("%d", $_[0]);
136 }
```

```
*****
16420 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/bn-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #!/usr/local/bin/perl

3 $0 =~ m/(.*[\\\/])[^\\\/]+$/; $dir=$1;
4 push(@INC, "${dir}", "${dir}../../perlasm");
5 require "x86asm.pl";

7 &asm_init($ARGV[0], $0);

9 $sse2=0;
10 for (@ARGV) { $sse2=1 if (/^-DOPENSSL_IA32_SSE2/); }

12 &external_label("OPENSSL_ia32cap_P") if ($sse2);

14 &bn_mul_add_words("bn_mul_add_words");
15 &bn_mul_words("bn_mul_words");
16 &bn_sqr_words("bn_sqr_words");
17 &bn_div_words("bn_div_words");
18 &bn_add_words("bn_add_words");
19 &bn_sub_words("bn_sub_words");
20 &bn_sub_part_words("bn_sub_part_words");

22 &asm_finish();

24 sub bn_mul_add_words
25 {
26     local($name)=@_;

28     &function_begin_B($name, $sse2?"EXTRN\t_OPENSSL_ia32cap_P:DWORD":""");

30     $r="eax";
31     $a="edx";
32     $c="ecx";

34     if ($sse2) {
35         &picmeup("eax", "OPENSSL_ia32cap_P");
36         &bt(&DWP(0, "eax"), 26);
37         &jnc(&label("maw_non_sse2"));

39         &mov($r, &wparam(0));
40         &mov($a, &wparam(1));
41         &mov($c, &wparam(2));
42         &movd("mm0", &wparam(3)); # mm0 = w
43         &pxor("mm1", "mm1"); # mm1 = carry_in
44         &jmp(&label("maw_sse2_entry"));
45
46         &set_label("maw_sse2_unrolled", 16);
47         &movd("mm3", &DWP(0, $r, "", 0)); # mm3 = r[0]
48         &paddq("mm1", "mm3"); # mm1 = carry_in + r[0]
49         &movd("mm2", &DWP(0, $a, "", 0)); # mm2 = a[0]
50         &pmuludq("mm2", "mm0"); # mm2 = w*a[0]
51         &movd("mm4", &DWP(4, $a, "", 0)); # mm4 = a[1]
52         &pmuludq("mm4", "mm0"); # mm4 = w*a[1]
53         &movd("mm6", &DWP(8, $a, "", 0)); # mm6 = a[2]
54         &pmuludq("mm6", "mm0"); # mm6 = w*a[2]
55         &movd("mm7", &DWP(12, $a, "", 0)); # mm7 = a[3]
56         &pmuludq("mm7", "mm0"); # mm7 = w*a[3]
57         &paddq("mm1", "mm2"); # mm1 = carry_in + r[0] + w*a[0]
58         &movd("mm3", &DWP(4, $r, "", 0)); # mm3 = r[1]
59         &paddq("mm3", "mm4"); # mm3 = r[1] + w*a[1]
60         &movd("mm5", &DWP(8, $r, "", 0)); # mm5 = r[2]
61         &paddq("mm5", "mm6"); # mm5 = r[2] + w*a[2]
```

```
62     &movd("mm4", &DWP(12, $r, "", 0)); # mm4 = r[3]
63     &paddq("mm7", "mm4"); # mm7 = r[3] + w*a[3]
64     &movd(&DWP(0, $r, "", 0), "mm1");
65     &movd("mm2", &DWP(16, $a, "", 0)); # mm2 = a[4]
66     &pmuludq("mm2", "mm0"); # mm2 = w*a[4]
67     &psrlq("mm1", 32); # mm1 = carry0
68     &movd("mm4", &DWP(20, $a, "", 0)); # mm4 = a[5]
69     &pmuludq("mm4", "mm0"); # mm4 = w*a[5]
70     &paddq("mm1", "mm3"); # mm1 = carry0 + r[1] + w*a[1]
71     &movd("mm6", &DWP(24, $a, "", 0)); # mm6 = a[6]
72     &pmuludq("mm6", "mm0"); # mm6 = w*a[6]
73     &movd(&DWP(4, $r, "", 0), "mm1");
74     &psrlq("mm1", 32); # mm1 = carry1
75     &movd("mm3", &DWP(28, $a, "", 0)); # mm3 = a[7]
76     &add($a, 32);
77     &pmuludq("mm3", "mm0"); # mm3 = w*a[7]
78     &paddq("mm1", "mm5"); # mm1 = carry1 + r[2] + w*a[2]
79     &movd("mm5", &DWP(16, $r, "", 0)); # mm5 = r[4]
80     &paddq("mm2", "mm5"); # mm2 = r[4] + w*a[4]
81     &movd(&DWP(8, $r, "", 0), "mm1");
82     &psrlq("mm1", 32); # mm1 = carry2
83     &paddq("mm1", "mm7"); # mm1 = carry2 + r[3] + w*a[3]
84     &movd("mm5", &DWP(20, $r, "", 0)); # mm5 = r[5]
85     &paddq("mm4", "mm5"); # mm4 = r[5] + w*a[5]
86     &movd(&DWP(12, $r, "", 0), "mm1");
87     &psrlq("mm1", 32); # mm1 = carry3
88     &paddq("mm1", "mm2"); # mm1 = carry3 + r[4] + w*a[4]
89     &movd("mm5", &DWP(24, $r, "", 0)); # mm5 = r[6]
90     &paddq("mm6", "mm5"); # mm6 = r[6] + w*a[6]
91     &movd(&DWP(16, $r, "", 0), "mm1");
92     &psrlq("mm1", 32); # mm1 = carry4
93     &paddq("mm1", "mm4"); # mm1 = carry4 + r[5] + w*a[5]
94     &movd("mm5", &DWP(28, $r, "", 0)); # mm5 = r[7]
95     &paddq("mm3", "mm5"); # mm3 = r[7] + w*a[7]
96     &movd(&DWP(20, $r, "", 0), "mm1");
97     &psrlq("mm1", 32); # mm1 = carry5
98     &paddq("mm1", "mm6"); # mm1 = carry5 + r[6] + w*a[6]
99     &movd(&DWP(24, $r, "", 0), "mm1");
100    &psrlq("mm1", 32); # mm1 = carry6
101    &paddq("mm1", "mm3"); # mm1 = carry6 + r[7] + w*a[7]
102    &movd(&DWP(28, $r, "", 0), "mm1");
103    &lea($r, &DWP(32, $r));
104    &psrlq("mm1", 32); # mm1 = carry_out

106    &sub($c, 8);
107    &jz(&label("maw_sse2_exit"));
108    &set_label("maw_sse2_entry");
109    &test($c, 0xffffffff8);
110    &jnz(&label("maw_sse2_unrolled"));

112    &set_label("maw_sse2_loop", 4);
113    &movd("mm2", &DWP(0, $a)); # mm2 = a[i]
114    &movd("mm3", &DWP(0, $r)); # mm3 = r[i]
115    &pmuludq("mm2", "mm0"); # a[i] *= w
116    &lea($a, &DWP(4, $a));
117    &paddq("mm1", "mm3"); # carry += r[i]
118    &paddq("mm1", "mm2"); # carry += a[i]*w
119    &movd(&DWP(0, $r), "mm1"); # r[i] = carry_low
120    &sub($c, 1);
121    &psrlq("mm1", 32); # carry = carry_high
122    &lea($r, &DWP(4, $r));
123    &jnz(&label("maw_sse2_loop"));
124    &set_label("maw_sse2_exit");
125    &movd("eax", "mm1"); # c = carry_out
126    &emms();
127    &ret();
```



```

129     &set_label("maw_non_sse2",16);
130 }

132 # function_begin prologue
133 &push("ebp");
134 &push("ebx");
135 &push("esi");
136 &push("edi");

138 &comment("");
139 $Low="eax";
140 $High="edx";
141 $a="ebx";
142 $w="ebp";
143 $r="edi";
144 $c="esi";

146 &xor($c,$c);      # clear carry
147 &mov($r,&wparam(0)); #

149 &mov("ecx",&wparam(2)); #
150 &mov($a,&wparam(1)); #

152 &and("ecx",0xffffffff); # num / 8
153 &mov($w,&wparam(3)); #

155 &push("ecx");      # Up the stack for a tmp variable

157 &jz(&label("maw_finish"));

159 &set_label("maw_loop",16);

161 for ($i=0; $i<32; $i+=4)
162 {
163     &comment("Round $i");

165     &mov("eax",&DWP($i,$a));      # *a
166     &mul($w);                      # *a * w
167     &add("eax",$c);                # L(t)+= c
168     &adc("edx",0);                 # H(t)+=carry
169     &add("eax",&DWP($i,$r));        # L(t)+= *r
170     &adc("edx",0);                 # H(t)+=carry
171     &mov(&DWP($i,$r),"eax");        # *r= L(t);
172     &mov($c,"edx");                # c= H(t);
173 }

175 &comment("");
176 &sub("ecx",8);
177 &lea($a,&DWP(32,$a));
178 &lea($r,&DWP(32,$r));
179 &jnz(&label("maw_loop"));

181 &set_label("maw_finish",0);
182 &mov("ecx",&wparam(2)); # get num
183 &and("ecx",7);
184 &jnz(&label("maw_finish2")); # helps branch prediction
185 &jmp(&label("maw_end"));

187 &set_label("maw_finish2",1);
188 for ($i=0; $i<7; $i++)
189 {
190     &comment("Tail Round $i");
191     &mov("eax",&DWP($i*4,$a));      # *a
192     &mul($w);                      # *a * w
193     &add("eax",$c);                # L(t)+=c

```

```

194     &adc("edx",0);                # H(t)+=carry
195     &add("eax",&DWP($i*4,$r));      # L(t)+= *r
196     &adc("edx",0);                # H(t)+=carry
197     &dec("ecx") if ($i != 7-1);
198     &mov(&DWP($i*4,$r),"eax");      # *r= L(t);
199     &mov($c,"edx");                # c= H(t);
200     &jz(&label("maw_end")) if ($i != 7-1);
201 }
202 &set_label("maw_end",0);
203 &mov("eax",$c);

205 &pop("ecx");      # clear variable from

207 &function_end($name);
208 }

210 sub bn_mul_words
211 {
212     local($name)=@_;

214     &function_begin_B($name,$sse2?"EXTRN\tOPENSSL_ia32cap_P:DWORD:");

216     $r="eax";
217     $a="edx";
218     $c="ecx";

220     if ($sse2) {
221         &picmeup("eax","OPENSSL_ia32cap_P");
222         &bt(&DWP(0,"eax"),26);
223         &jnc(&label("mw_non_sse2"));

225         &mov($r,&wparam(0));
226         &mov($a,&wparam(1));
227         &mov($c,&wparam(2));
228         &movd("mm0",&wparam(3));      # mm0 = w
229         &pxor("mm1","mm1");           # mm1 = carry = 0

231         &set_label("mw_sse2_loop",16);
232         &movd("mm2",&DWP(0,$a));      # mm2 = a[i]
233         &pmuldq("mm2","mm0");          # a[i] *= w
234         &lea($a,&DWP(4,$a));
235         &paddq("mm1","mm2");           # carry += a[i]*w
236         &movd(&DWP(0,$r),"mm1");      # r[i] = carry_low
237         &sub($c,1);
238         &psrlq("mm1",32);             # carry = carry_high
239         &lea($r,&DWP(4,$r));
240         &jnz(&label("mw_sse2_loop"));

242         &movd("eax","mm1");           # return carry
243         &emms();
244         &ret();

245         &set_label("mw_non_sse2",16);
246     }

248     # function_begin prologue
249     &push("ebp");
250     &push("ebx");
251     &push("esi");
252     &push("edi");

254     &comment("");
255     $Low="eax";
256     $High="edx";
257     $a="ebx";
258     $w="ecx";
259     $r="edi";

```

```

260     $c="esi";
261     $num="ebp";

263     &xor($c,$c);          # clear carry
264     &mov($r,&wparam(0));  #
265     &mov($a,&wparam(1));  #
266     &mov($num,&wparam(2)); #
267     &mov($w,&wparam(3));  #

269     &and($num,0xffffffff); # num / 8
270     &jz(&label("mw_finish"));

272     &set_label("mw_loop",0);
273     for ($i=0; $i<32; $i+=4)
274     {
275         &comment("Round $i");

277         &mov("eax",&DWP($i,$a,"",0)); # *a
278         &mul($w);                      # *a * w
279         &add("eax",$c);                # L(t)+=c
280         # XXX

282         &adc("edx",0);                 # H(t)+=carry
283         &mov(&DWP($i,$r,"",0),"eax"); # *r= L(t);

285         &mov($c,"edx");                # c= H(t);
286     }

288     &comment("");
289     &add($a,32);
290     &add($r,32);
291     &sub($num,8);
292     &jz(&label("mw_finish"));
293     &jmp(&label("mw_loop"));

295     &set_label("mw_finish",0);
296     &mov($num,&wparam(2)); # get num
297     &and($num,7);
298     &jnz(&label("mw_finish2"));
299     &jmp(&label("mw_end"));

301     &set_label("mw_finish2",1);
302     for ($i=0; $i<7; $i++)
303     {
304         &comment("Tail Round $i");
305         &mov("eax",&DWP($i*4,$a,"",0)); # *a
306         &mul($w);                      # *a * w
307         &add("eax",$c);                # L(t)+=c
308         # XXX
309         &adc("edx",0);                 # H(t)+=carry
310         &mov(&DWP($i*4,$r,"",0),"eax"); # *r= L(t);
311         &mov($c,"edx");                # c= H(t);
312         &dec($num) if ($i != 7-1);
313         &jz(&label("mw_end")) if ($i != 7-1);
314     }
315     &set_label("mw_end",0);
316     &mov("eax",$c);

318     &function_end($name);
319 }

321 sub bn_sqr_words
322 {
323     local($name)=@_;

325     &function_begin_B($name,$sse2?"EXTRN\tOPENSSL_ia32cap_P:DWORD":"");

```

```

327     $r="eax";
328     $a="edx";
329     $c="ecx";

331     if ($sse2) {
332         &picmeup("eax","OPENSSL_ia32cap_P");
333         &bt(&DWP(0,"eax"),26);
334         &jnc(&label("sqr_non_sse2"));

336         &mov($r,&wparam(0));
337         &mov($a,&wparam(1));
338         &mov($c,&wparam(2));

340         &set_label("sqr_sse2_loop",16);
341         &movd("mm0",&DWP(0,$a));      # mm0 = a[i]
342         &pmuldq("mm0","mm0");          # a[i] *= a[i]
343         &lea($a,&DWP(4,$a));           # a++
344         &movq(&QWP(0,$r),"mm0");      # r[i] = a[i]*a[i]
345         &sub($c,1);
346         &lea($r,&DWP(8,$r));           # r += 2
347         &jnz(&label("sqr_sse2_loop"));

349         &emms();
350         &ret();
351     }
352     &set_label("sqr_non_sse2",16);
353 }

354 # function_begin prologue
355 &push("ebp");
356 &push("ebx");
357 &push("esi");
358 &push("edi");

360 &comment("");
361 $r="esi";
362 $a="edi";
363 $num="ebx";

365 &mov($r,&wparam(0)); #
366 &mov($a,&wparam(1)); #
367 &mov($num,&wparam(2)); #

369 &and($num,0xffffffff); # num / 8
370 &jz(&label("sw_finish"));

372 &set_label("sw_loop",0);
373 for ($i=0; $i<32; $i+=4)
374 {
375     &comment("Round $i");
376     &mov("eax",&DWP($i,$a,"",0)); # *a
377     # XXX
378     &mul("eax");                  # *a * *a
379     &mov(&DWP($i*2,$r,"",0),"eax"); #
380     &mov(&DWP($i*2+4,$r,"",0),"edx"); #
381 }

383 &comment("");
384 &add($a,32);
385 &add($r,64);
386 &sub($num,8);
387 &jnz(&label("sw_loop"));

389 &set_label("sw_finish",0);
390 &mov($num,&wparam(2)); # get num
391 &and($num,7);

```

```

392     &jz(&label("sw_end"));
394     for ($i=0; $i<7; $i++)
395     {
396         &comment("Tail Round $i");
397         &mov("eax",&DWP($i*4,$a,"",0)); # *a
398         # XXX
399         &mul("eax"); # *a * *a
400         &mov(&DWP($i*8,$r,"",0),"eax"); #
401         &dec($num) if ($i != 7-1);
402         &mov(&DWP($i*8+4,$r,"",0),"edx");
403         &jz(&label("sw_end")) if ($i != 7-1);
404     }
405     &set_label("sw_end",0);
407     &function_end($name);
408 }
410 sub bn_div_words
411 {
412     local($name)=@_;
414     &function_begin_B($name,"");
415     &mov("edx",&wparam(0)); #
416     &mov("eax",&wparam(1)); #
417     &mov("ecx",&wparam(2)); #
418     &div("ecx");
419     &ret();
420     &function_end_B($name);
421 }
423 sub bn_add_words
424 {
425     local($name)=@_;
427     &function_begin($name,"");
429     &comment("");
430     $a="esi";
431     $b="edi";
432     $c="eax";
433     $r="ebx";
434     $tmp1="ecx";
435     $tmp2="edx";
436     $num="ebp";
438     &mov($r,&wparam(0)); # get r
439     &mov($a,&wparam(1)); # get a
440     &mov($b,&wparam(2)); # get b
441     &mov($num,&wparam(3)); # get num
442     &xor($c,$c); # clear carry
443     &and($num,0xffffffff8); # num / 8
445     &jz(&label("aw_finish"));
447     &set_label("aw_loop",0);
448     for ($i=0; $i<8; $i++)
449     {
450         &comment("Round $i");
452         &mov($tmp1,&DWP($i*4,$a,"",0)); # *a
453         &mov($tmp2,&DWP($i*4,$b,"",0)); # *b
454         &add($tmp1,$c);
455         &mov($c,0);
456         &adc($c,$c);
457         &add($tmp1,$tmp2);

```

```

458         &adc($c,0);
459         &mov(&DWP($i*4,$r,"",0),$tmp1); # *r
460     }
462     &comment("");
463     &add($a,32);
464     &add($b,32);
465     &add($r,32);
466     &sub($num,8);
467     &jnz(&label("aw_loop"));
469     &set_label("aw_finish",0);
470     &mov($num,&wparam(3)); # get num
471     &and($num,7);
472     &jz(&label("aw_end"));
474     for ($i=0; $i<7; $i++)
475     {
476         &comment("Tail Round $i");
477         &mov($tmp1,&DWP($i*4,$a,"",0)); # *a
478         &mov($tmp2,&DWP($i*4,$b,"",0)); # *b
479         &add($tmp1,$c);
480         &mov($c,0);
481         &adc($c,$c);
482         &add($tmp1,$tmp2);
483         &adc($c,0);
484         &dec($num) if ($i != 6);
485         &mov(&DWP($i*4,$r,"",0),$tmp1); # *r
486         &jz(&label("aw_end")) if ($i != 6);
487     }
488     &set_label("aw_end",0);
490 #     &mov("eax",$c); # $c is "eax"
492     &function_end($name);
493 }
495 sub bn_sub_words
496 {
497     local($name)=@_;
499     &function_begin($name,"");
501     &comment("");
502     $a="esi";
503     $b="edi";
504     $c="eax";
505     $r="ebx";
506     $tmp1="ecx";
507     $tmp2="edx";
508     $num="ebp";
510     &mov($r,&wparam(0)); # get r
511     &mov($a,&wparam(1)); # get a
512     &mov($b,&wparam(2)); # get b
513     &mov($num,&wparam(3)); # get num
514     &xor($c,$c); # clear carry
515     &and($num,0xffffffff8); # num / 8
517     &jz(&label("aw_finish"));
519     &set_label("aw_loop",0);
520     for ($i=0; $i<8; $i++)
521     {
522         &comment("Round $i");

```

```

524      &mov($tmp1,&DWP($i*4,$a,"",0));      # *a
525      &mov($tmp2,&DWP($i*4,$b,"",0));      # *b
526      &sub($tmp1,$c);
527      &mov($c,0);
528      &adc($c,$c);
529      &sub($tmp1,$tmp2);
530      &adc($c,0);
531      &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
532  }

534  &comment("");
535  &add($a,32);
536  &add($b,32);
537  &add($r,32);
538  &sub($num,8);
539  &jnz(&label("aw_loop"));

541  &set_label("aw_finish",0);
542  &mov($num,&wparam(3)); # get num
543  &and($num,7);
544  &jz(&label("aw_end"));

546  for ($i=0; $i<7; $i++)
  {
548      &comment("Tail Round $i");
549      &mov($tmp1,&DWP($i*4,$a,"",0)); # *a
550      &mov($tmp2,&DWP($i*4,$b,"",0)); # *b
551      &sub($tmp1,$c);
552      &mov($c,0);
553      &adc($c,$c);
554      &sub($tmp1,$tmp2);
555      &adc($c,0);
556      &dec($num) if ($i != 6);
557      &mov(&DWP($i*4,$r,"",0),$tmp1); # *r
558      &jz(&label("aw_end")) if ($i != 6);
559  }
560  &set_label("aw_end",0);

562 #      &mov("eax",$c);      # $c is "eax"

564  &function_end($name);
565  }

567 sub bn_sub_part_words
568 {
569     local($name)=@_;

571     &function_begin($name,"");

573     &comment("");
574     $a="esi";
575     $b="edi";
576     $c="eax";
577     $r="ebx";
578     $tmp1="ecx";
579     $tmp2="edx";
580     $num="ebp";

582     &mov($r,&wparam(0)); # get r
583     &mov($a,&wparam(1)); # get a
584     &mov($b,&wparam(2)); # get b
585     &mov($num,&wparam(3)); # get num
586     &xor($c,$c); # clear carry
587     &and($num,0xffffffff); # num / 8

589     &jz(&label("aw_finish"));

```

```

591     &set_label("aw_loop",0);
592     for ($i=0; $i<8; $i++)
593     {
594         &comment("Round $i");

596         &mov($tmp1,&DWP($i*4,$a,"",0));      # *a
597         &mov($tmp2,&DWP($i*4,$b,"",0));      # *b
598         &sub($tmp1,$c);
599         &mov($c,0);
600         &adc($c,$c);
601         &sub($tmp1,$tmp2);
602         &adc($c,0);
603         &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
604     }

606     &comment("");
607     &add($a,32);
608     &add($b,32);
609     &add($r,32);
610     &sub($num,8);
611     &jnz(&label("aw_loop"));

613     &set_label("aw_finish",0);
614     &mov($num,&wparam(3)); # get num
615     &and($num,7);
616     &jz(&label("aw_end"));

618     for ($i=0; $i<7; $i++)
619     {
620         &comment("Tail Round $i");
621         &mov($tmp1,&DWP(0,$a,"",0)); # *a
622         &mov($tmp2,&DWP(0,$b,"",0)); # *b
623         &sub($tmp1,$c);
624         &mov($c,0);
625         &adc($c,$c);
626         &sub($tmp1,$tmp2);
627         &adc($c,0);
628         &mov(&DWP(0,$r,"",0),$tmp1); # *r
629         &add($a, 4);
630         &add($b, 4);
631         &add($r, 4);
632         &dec($num) if ($i != 6);
633         &jz(&label("aw_end")) if ($i != 6);
634     }
635     &set_label("aw_end",0);

637     &cmp(&wparam(4),0);
638     &je(&label("pw_end"));

640     &mov($num,&wparam(4)); # get dl
641     &cmp($num,0);
642     &je(&label("pw_end"));
643     &jge(&label("pw_pos"));

645     &comment("pw_neg");
646     &mov($tmp2,0);
647     &sub($tmp2,$num);
648     &mov($num,$tmp2);
649     &and($num,0xffffffff); # num / 8
650     &jz(&label("pw_neg_finish"));

652     &set_label("pw_neg_loop",0);
653     for ($i=0; $i<8; $i++)
654     {
655         &comment("dl<0 Round $i");

```

```

657      &mov($tmp1,0);
658      &mov($tmp2,&DWP($i*4,$b,"",0));      # *b
659      &sub($tmp1,$c);
660      &mov($c,0);
661      &adc($c,$c);
662      &sub($tmp1,$tmp2);
663      &adc($c,0);
664      &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
665  }
666
667      &comment("");
668      &add($b,32);
669      &add($r,32);
670      &sub($num,8);
671      &jnz(&label("pw_neg_loop"));
672
673      &set_label("pw_neg_finish",0);
674      &mov($tmp2,&wparam(4)); # get dl
675      &mov($num,0);
676      &sub($num,$tmp2);
677      &and($num,7);
678      &jz(&label("pw_end"));
679
680      for ($i=0; $i<7; $i++)
681      {
682          &comment("dl<0 Tail Round $i");
683          &mov($tmp1,0);
684          &mov($tmp2,&DWP($i*4,$b,"",0));# *b
685          &sub($tmp1,$c);
686          &mov($c,0);
687          &adc($c,$c);
688          &sub($tmp1,$tmp2);
689          &adc($c,0);
690          &dec($num) if ($i != 6);
691          &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
692          &jz(&label("pw_end")) if ($i != 6);
693      }
694
695      &jmp(&label("pw_end"));
696
697      &set_label("pw_pos",0);
698
699      &and($num,0xffffffff); # num / 8
700      &jz(&label("pw_pos_finish"));
701
702      &set_label("pw_pos_loop",0);
703
704      for ($i=0; $i<8; $i++)
705      {
706          &comment("dl>0 Round $i");
707
708          &mov($tmp1,&DWP($i*4,$a,"",0));      # *a
709          &sub($tmp1,$c);
710          &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
711          &jnc(&label("pw_nc". $i));
712      }
713
714      &comment("");
715      &add($a,32);
716      &add($r,32);
717      &sub($num,8);
718      &jnz(&label("pw_pos_loop"));
719
720      &set_label("pw_pos_finish",0);
721      &mov($num,&wparam(4)); # get dl

```

```

722      &and($num,7);
723      &jz(&label("pw_end"));
724
725      for ($i=0; $i<7; $i++)
726      {
727          &comment("dl>0 Tail Round $i");
728          &mov($tmp1,&DWP($i*4,$a,"",0));      # *a
729          &sub($tmp1,$c);
730          &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
731          &jnc(&label("pw_tail_nc". $i));
732          &dec($num) if ($i != 6);
733          &jz(&label("pw_end")) if ($i != 6);
734      }
735      &mov($c,1);
736      &jmp(&label("pw_end"));
737
738      &set_label("pw_nc_loop",0);
739      for ($i=0; $i<8; $i++)
740      {
741          &mov($tmp1,&DWP($i*4,$a,"",0));      # *a
742          &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
743          &set_label("pw_nc". $i,0);
744      }
745
746      &comment("");
747      &add($a,32);
748      &add($r,32);
749      &sub($num,8);
750      &jnz(&label("pw_nc_loop"));
751
752      &mov($num,&wparam(4)); # get dl
753      &and($num,7);
754      &jz(&label("pw_nc_end"));
755
756      for ($i=0; $i<7; $i++)
757      {
758          &mov($tmp1,&DWP($i*4,$a,"",0));      # *a
759          &mov(&DWP($i*4,$r,"",0),$tmp1);      # *r
760          &set_label("pw_tail_nc". $i,0);
761          &dec($num) if ($i != 6);
762          &jz(&label("pw_nc_end")) if ($i != 6);
763      }
764
765      &set_label("pw_nc_end",0);
766      &mov($c,0);
767
768      &set_label("pw_end",0);
769
770      #      &mov("eax",$c);      # $c is "eax"
771
772      &function_end($name);
773      }

```

new/usr/src/lib/openssl/libsunw_crypto/pl/bsaes-x86_64.pl

1

```
*****
73459 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/bsaes-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 #####
4 ### AES-128 [originally in CTR mode] #####
5 ### bitsliced implementation for Intel Core 2 processors #####
6 ### requires support of SSE extensions up to SSSE3 #####
7 ### Author: Emilia K'sper and Peter Schwabe #####
8 ### Date: 2009-03-19 #####
9 ### Public domain #####
10 #####
11 ### See http://homes.esat.kuleuven.be/~ekasper/#software for #####
12 ### further information. #####
13 #####
14 #
15 # September 2011.
16 #
17 # Started as transliteration to "perlasm" the original code has
18 # undergone following changes:
19 #
20 # - code was made position-independent;
21 # - rounds were folded into a loop resulting in >5x size reduction
22 # from 12.5KB to 2.2KB;
23 # - above was possible thanks to mixcolumns() modification that
24 # allowed to feed its output back to aesenc[last], this was
25 # achieved at cost of two additional inter-registers moves;
26 # - some instruction reordering and interleaving;
27 # - this module doesn't implement key setup subroutine, instead it
28 # relies on conversion of "conventional" key schedule as returned
29 # by AES_set_encrypt_key (see discussion below);
30 # - first and last round keys are treated differently, which allowed
31 # to skip one shiftrows(), reduce bit-sliced key schedule and
32 # speed-up conversion by 22%;
33 # - support for 192- and 256-bit keys was added;
34 #
35 # Resulting performance in CPU cycles spent to encrypt one byte out
36 # of 4096-byte buffer with 128-bit key is:
37 #
38 #           Emilia's      this(*)      difference
39 #
40 # Core 2      9.30          8.69          +7%
41 # Nehalem(**) 7.63          6.98          +9%
42 # Atom       17.1          17.4          -2%(***)
43 #
44 # (*) Comparison is not completely fair, because "this" is ECB,
45 # i.e. no extra processing such as counter values calculation
46 # and xor-ing input as in Emilia's CTR implementation is
47 # performed. However, the CTR calculations stand for not more
48 # than 1% of total time, so comparison is *rather* fair.
49 #
50 # (**) Results were collected on Westmere, which is considered to
51 # be equivalent to Nehalem for this code.
52 #
53 # (***) Slowdown on Atom is rather strange per se, because original
54 # implementation has a number of 9+ bytes instructions, which
55 # are bad for Atom front-end, and which I eliminated completely.
56 # In attempt to address deterioration sbbox() was tested in FP
57 # SIMD "domain" (movaps instead of movdqa, xorps instead of
58 # pxor, etc.). While it resulted in nominal 4% improvement on
59 # Atom, it hurted Westmere by more than 2x factor.
60 #
61 # As for key schedule conversion subroutine. Interface to OpenSSL
```

new/usr/src/lib/openssl/libsunw_crypto/pl/bsaes-x86_64.pl

2

```
62 # relies on per-invocation on-the-fly conversion. This naturally
63 # has impact on performance, especially for short inputs. Conversion
64 # time in CPU cycles and its ratio to CPU cycles spent in 8x block
65 # function is:
66 #
67 #           conversion      conversion/8x block
68 # Core 2      240          0.22
69 # Nehalem     180          0.20
70 # Atom        430          0.19
71 #
72 # The ratio values mean that 128-byte blocks will be processed
73 # 16-18% slower, 256-byte blocks - 9-10%, 384-byte blocks - 6-7%,
74 # etc. Then keep in mind that input sizes not divisible by 128 are
75 # *effectively* slower, especially shortest ones, e.g. consecutive
76 # 144-byte blocks are processed 44% slower than one would expect,
77 # 272 - 29%, 400 - 22%, etc. Yet, despite all these "shortcomings"
78 # it's still faster than ["hyper-threading-safe" code path in]
79 # aes-x86_64.pl on all lengths above 64 bytes...
80 #
81 # October 2011.
82 #
83 # Add decryption procedure. Performance in CPU cycles spent to decrypt
84 # one byte out of 4096-byte buffer with 128-bit key is:
85 #
86 # Core 2      9.83
87 # Nehalem     7.74
88 # Atom       19.0
89 #
90 # November 2011.
91 #
92 # Add bsaes_xts_[en|de]crypt. Less-than-80-bytes-block performance is
93 # suboptimal, but XTS is meant to be used with larger blocks...
94 #
95 #                                     <appro@openssl.org>

97 $flavour = shift;
98 $output = shift;
99 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

101 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

103 $0 =~ m/(.*[\\\/\[\]\^\\\`]+$/; $dir=$1;
104 ( $xlate="{dir}x86_64-xlate.pl" and -f $xlate ) or
105 ( $xlate="{dir}../../perlasm/x86_64-xlate.pl" and -f $xlate) or
106 die "can't locate x86_64-xlate.pl";

108 open OUT,"| \"^X\" $xlate $flavour $output";
109 *STDOUT=*OUT;

111 my ($inp,$out,$len,$key,$ivp)=("%rdi","%rsi","%rdx","%rcx");
112 my @XMM=map("%xmm$_",(15,0..14)); # best on Atom, +10% over (0..15)
113 my $ecb=0; # suppress unreferenced ECB subroutines, spare some space...

115 {
116 my ($key,$rounds,$const)=("%rax","%r10d","%r11");

118 sub Sbox {
119 # input in lsb > [b0, b1, b2, b3, b4, b5, b6, b7] < msb
120 # output in lsb > [b0, b1, b4, b6, b3, b7, b2, b5] < msb
121 my @b=@_[0..7];
122 my @t=@_[8..11];
123 my @s=@_[12..15];
124     &InBasisChange (@b);
125     &Inv_GF256 (@b[6,5,0,3,7,1,4,2],@t,@s);
126     &OutBasisChange (@b[7,1,4,2,6,5,0,3]);
127 }
```

```

129 sub InBasisChange {
130 # input in lsb > [b0, b1, b2, b3, b4, b5, b6, b7] < msb
131 # output in lsb > [b6, b5, b0, b3, b7, b1, b4, b2] < msb
132 my @b=@_[0..7];
133 $code.=<<__
134     pxor    @b[6], @b[5]
135     pxor    @b[1], @b[2]
136     pxor    @b[0], @b[3]
137     pxor    @b[2], @b[6]
138     pxor    @b[0], @b[5]
139
140     pxor    @b[3], @b[6]
141     pxor    @b[7], @b[3]
142     pxor    @b[5], @b[7]
143     pxor    @b[4], @b[3]
144     pxor    @b[5], @b[4]
145     pxor    @b[1], @b[3]
146
147     pxor    @b[7], @b[2]
148     pxor    @b[5], @b[1]
149 }
150
152 sub OutBasisChange {
153 # input in lsb > [b0, b1, b2, b3, b4, b5, b6, b7] < msb
154 # output in lsb > [b6, b1, b2, b4, b7, b0, b3, b5] < msb
155 my @b=@_[0..7];
156 $code.=<<__
157     pxor    @b[6], @b[0]
158     pxor    @b[4], @b[1]
159     pxor    @b[0], @b[2]
160     pxor    @b[6], @b[4]
161     pxor    @b[1], @b[6]
162
163     pxor    @b[5], @b[1]
164     pxor    @b[3], @b[5]
165     pxor    @b[7], @b[3]
166     pxor    @b[5], @b[7]
167     pxor    @b[5], @b[2]
168
169     pxor    @b[7], @b[4]
170 }
171
173 sub InvSbox {
174 # input in lsb > [b0, b1, b2, b3, b4, b5, b6, b7] < msb
175 # output in lsb > [b0, b1, b6, b4, b2, b7, b3, b5] < msb
176 my @b=@_[0..7];
177 my @t=@_[8..11];
178 my @s=@_[12..15];
179     &InvInBasisChange    (@b);
180     &Inv_GF256           (@b[5,1,2,6,3,7,0,4],@t,@s);
181     &InvOutBasisChange   (@b[3,7,0,4,5,1,2,6]);
182 }
183
184 sub InvInBasisChange {          # OutBasisChange in reverse
185 my @b=@_[5,1,2,6,3,7,0,4];
186 $code.=<<__
187     pxor    @b[7], @b[4]
188
189     pxor    @b[5], @b[7]
190     pxor    @b[5], @b[2]
191     pxor    @b[7], @b[3]
192     pxor    @b[3], @b[5]
193     pxor    @b[5], @b[1]

```

```

195     pxor    @b[1], @b[6]
196     pxor    @b[0], @b[2]
197     pxor    @b[6], @b[4]
198     pxor    @b[6], @b[0]
199     pxor    @b[4], @b[1]
200 }
201
203 sub InvOutBasisChange {          # InBasisChange in reverse
204 my @b=@_[2,5,7,3,6,1,0,4];
205 $code.=<<__
206     pxor    @b[5], @b[1]
207     pxor    @b[7], @b[2]
208
209     pxor    @b[1], @b[3]
210     pxor    @b[5], @b[4]
211     pxor    @b[5], @b[7]
212     pxor    @b[4], @b[3]
213     pxor    @b[0], @b[5]
214     pxor    @b[7], @b[3]
215     pxor    @b[2], @b[6]
216     pxor    @b[1], @b[2]
217     pxor    @b[3], @b[6]
218
219     pxor    @b[0], @b[3]
220     pxor    @b[6], @b[5]
221 }
222
224 sub Mul_GF4 {
225 #;*****
226 #; * Mul_GF4: Input x0-x1,y0-y1 Output x0-x1 Temp t0 (8) *
227 #;*****
228 my ($x0,$x1,$y0,$y1,$t0)=@_;
229 $code.=<<__
230     movdqa   $y0, $t0
231     pxor     $y1, $t0
232     pand     $x0, $t0
233     pxor     $x1, $x0
234     pand     $y0, $x1
235     pand     $y1, $x0
236     pxor     $x1, $x0
237     pxor     $t0, $x1
238 }
239
241 sub Mul_GF4_N {                  # not used, see next subroutine
242 # multiply and scale by N
243 my ($x0,$x1,$y0,$y1,$t0)=@_;
244 $code.=<<__
245     movdqa   $y0, $t0
246     pxor     $y1, $t0
247     pand     $x0, $t0
248     pxor     $x1, $x0
249     pand     $y0, $x1
250     pand     $y1, $x0
251     pxor     $x0, $x1
252     pxor     $t0, $x0
253 }
254
256 sub Mul_GF4_N_GF4 {
257 # interleaved Mul_GF4_N and Mul_GF4
258 my ($x0,$x1,$y0,$y1,$t0,
259     $x2,$x3,$y2,$y3,$t1)=@_;

```

```

260 $code.=<<__ ;
261     movdqa    $y0, $t0
262     movdqa    $y2, $t1
263     pxor      $y1, $t0
264     pxor      $y3, $t1
265     pand      $x0, $t0
266     pand      $x2, $t1
267     pxor      $x1, $x0
268     pxor      $x3, $x2
269     pand      $y0, $x1
270     pand      $y2, $x3
271     pand      $y1, $x0
272     pand      $y3, $x2
273     pxor      $x0, $x1
274     pxor      $x3, $x2
275     pxor      $t0, $x0
276     pxor      $t1, $x3
277
278 }
279 sub Mul_GF16_2 {
280     my $x=@_[0..7];
281     my $y=@_[8..11];
282     my $t=@_[12..15];
283     $code.=<<__ ;
284     movdqa    @x[0], @t[0]
285     movdqa    @x[1], @t[1]
286
287     &Mul_GF4      (@x[0], @x[1], @y[0], @y[1], @t[2]);
288     $code.=<<__ ;
289     pxor      @x[2], @t[0]
290     pxor      @x[3], @t[1]
291     pxor      @y[2], @y[0]
292     pxor      @y[3], @y[1]
293
294     Mul_GF4_N_GF4      (@t[0], @t[1], @y[0], @y[1], @t[3],
295                         @x[2], @x[3], @y[2], @y[3], @t[2]);
296     $code.=<<__ ;
297     pxor      @t[0], @x[0]
298     pxor      @t[0], @x[2]
299     pxor      @t[1], @x[1]
300     pxor      @t[1], @x[3]
301
302     movdqa    @x[4], @t[0]
303     movdqa    @x[5], @t[1]
304     pxor      @x[6], @t[0]
305     pxor      @x[7], @t[1]
306
307     &Mul_GF4_N_GF4      (@t[0], @t[1], @y[0], @y[1], @t[3],
308                         @x[6], @x[7], @y[2], @y[3], @t[2]);
309     $code.=<<__ ;
310     pxor      @y[2], @y[0]
311     pxor      @y[3], @y[1]
312
313     &Mul_GF4      (@x[4], @x[5], @y[0], @y[1], @t[3]);
314     $code.=<<__ ;
315     pxor      @t[0], @x[4]
316     pxor      @t[0], @x[6]
317     pxor      @t[1], @x[5]
318     pxor      @t[1], @x[7]
319
320 }
321 sub Inv_GF256 {
322     #;*****
323     #;* Inv_GF256: Input x0-x7 Output x0-x7 Temp t0-t3,s0-s3 (144) *
324     #;*****
325     my $x=@_[0..7];

```

```

326     my $t=@_[8..11];
327     my $s=@_[12..15];
328     # direct optimizations from hardware
329     $code.=<<__ ;
330     movdqa    @x[4], @t[3]
331     movdqa    @x[5], @t[2]
332     movdqa    @x[1], @t[1]
333     movdqa    @x[7], @s[1]
334     movdqa    @x[0], @s[0]
335
336     pxor      @x[6], @t[3]
337     pxor      @x[7], @t[2]
338     pxor      @x[3], @t[1]
339     movdqa    @t[3], @s[2]
340     pxor      @x[6], @s[1]
341     movdqa    @t[2], @t[0]
342     pxor      @x[2], @s[0]
343     movdqa    @t[3], @s[3]
344
345     por      @t[1], @t[2]
346     por      @s[0], @t[3]
347     pxor      @t[0], @s[3]
348     pand      @s[0], @s[2]
349     pxor      @t[1], @s[0]
350     pand      @t[1], @t[0]
351     pand      @s[0], @s[3]
352     movdqa    @x[3], @s[0]
353     pxor      @x[2], @s[0]
354     pand      @s[0], @s[1]
355     pxor      @s[1], @t[3]
356     pxor      @s[1], @t[2]
357     movdqa    @x[4], @s[1]
358     movdqa    @x[1], @s[0]
359     pxor      @x[5], @s[1]
360     pxor      @x[0], @s[0]
361     movdqa    @s[1], @t[1]
362     pand      @s[0], @s[1]
363     por      @s[0], @t[1]
364     pxor      @s[1], @t[0]
365     pxor      @s[3], @t[3]
366     pxor      @s[2], @t[2]
367     pxor      @s[3], @t[1]
368     movdqa    @x[7], @s[0]
369     pxor      @s[2], @t[0]
370     movdqa    @x[6], @s[1]
371     pxor      @s[2], @t[1]
372     movdqa    @x[5], @s[2]
373     pand      @x[3], @s[0]
374     movdqa    @x[4], @s[3]
375     pand      @x[2], @s[1]
376     pand      @x[1], @s[2]
377     por      @x[0], @s[3]
378     pxor      @s[0], @t[3]
379     pxor      @s[1], @t[2]
380     pxor      @s[2], @t[1]
381     pxor      @s[3], @t[0]
382
383     #Inv_GF16 \t0, \t1, \t2, \t3, \s0, \s1, \s2, \s3
384
385     # new smaller inversion
386
387     movdqa    @t[3], @s[0]
388     pand      @t[1], @t[3]
389     pxor      @t[2], @s[0]
390
391     movdqa    @t[0], @s[2]

```



```

392      movdqa  @s[0], @s[3]
393      pxor    @t[3], @s[2]
394      pand    @s[2], @s[3]

396      movdqa  @t[1], @s[1]
397      pxor    @t[2], @s[3]
398      pxor    @t[0], @s[1]

400      pxor    @t[2], @t[3]

402      pand    @t[3], @s[1]

404      movdqa  @s[2], @t[2]
405      pxor    @t[0], @s[1]

407      pxor    @s[1], @t[2]
408      pxor    @s[1], @t[1]

410      pand    @t[0], @t[2]

412      pxor    @t[2], @s[2]
413      pxor    @t[2], @t[1]

415      pand    @s[3], @s[2]

417      pxor    @s[0], @s[2]
418      _____
419 # output in s3, s2, s1, t1

421 # Mul_GF16_2 \x0, \x1, \x2, \x3, \x4, \x5, \x6, \x7, \t2, \t3, \t0, \t1, \s0, \s
423 # Mul_GF16_2 \x0, \x1, \x2, \x3, \x4, \x5, \x6, \x7, \s3, \s2, \s1, \t1, \s0, \t
424 &Mul_GF16_2(@x,@s[3,2,1],@t[1],@s[0],@t[0,2,3]);

426 ### output msb > [x3,x2,x1,x0,x7,x6,x5,x4] < lsb
427 }

429 # AES linear components

431 sub ShiftRows {
432 my @x=@_[0..7];
433 my $mask=pop;
434 $code.=<<<____;
435     pxor    0x00($key),@x[0]
436     pxor    0x10($key),@x[1]
437     pshufb  $mask,@x[0]
438     pxor    0x20($key),@x[2]
439     pshufb  $mask,@x[1]
440     pxor    0x30($key),@x[3]
441     pshufb  $mask,@x[2]
442     pxor    0x40($key),@x[4]
443     pshufb  $mask,@x[3]
444     pxor    0x50($key),@x[5]
445     pshufb  $mask,@x[4]
446     pxor    0x60($key),@x[6]
447     pshufb  $mask,@x[5]
448     pxor    0x70($key),@x[7]
449     pshufb  $mask,@x[6]
450     lea     0x80($key),$key
451     pshufb  $mask,@x[7]
452 }
453 }

455 sub MixColumns {
456 # modified to emit output in order suitable for feeding back to aesenc[last]
457 my @x=@_[0..7];

```

```

458 my @t=@_[8..15];
459 my $inv=@_[16]; # optional
460 $code.=<<<____;
461     pshufd  \0x93, @x[0], @t[0]      # x0 <<< 32
462     pshufd  \0x93, @x[1], @t[1]
463     pxor    @t[0], @x[0]
464     pshufd  \0x93, @x[2], @t[2]      # x0 ^ (x0 <<< 32)
465     pxor    @t[1], @x[1]
466     pshufd  \0x93, @x[3], @t[3]
467     pxor    @t[2], @x[2]
468     pshufd  \0x93, @x[4], @t[4]
469     pxor    @t[3], @x[3]
470     pshufd  \0x93, @x[5], @t[5]
471     pxor    @t[4], @x[4]
472     pshufd  \0x93, @x[6], @t[6]
473     pxor    @t[5], @x[5]
474     pshufd  \0x93, @x[7], @t[7]
475     pxor    @t[6], @x[6]
476     pxor    @t[7], @x[7]

478     pxor    @x[0], @t[1]
479     pxor    @x[7], @t[0]
480     pxor    @x[7], @t[1]
481     pshufd  \0x4E, @x[0], @x[0]      # (x0 ^ (x0 <<< 32)) <<< 64
482     pxor    @x[1], @t[2]
483     pshufd  \0x4E, @x[1], @x[1]
484     pxor    @x[4], @t[5]
485     pxor    @t[0], @x[0]
486     pxor    @x[5], @t[6]
487     pxor    @t[1], @x[1]
488     pxor    @x[3], @t[4]
489     pshufd  \0x4E, @x[4], @t[0]
490     pxor    @x[6], @t[7]
491     pshufd  \0x4E, @x[5], @t[1]
492     pxor    @x[2], @t[3]
493     pshufd  \0x4E, @x[3], @x[4]
494     pxor    @x[7], @t[3]
495     pshufd  \0x4E, @x[7], @x[5]
496     pxor    @x[7], @t[4]
497     pshufd  \0x4E, @x[6], @x[3]
498     pxor    @t[4], @t[0]
499     pshufd  \0x4E, @x[2], @x[6]
500     pxor    @t[5], @t[1]
501
502 $code.=<<<____ if (!$inv);
503     pxor    @t[3], @x[4]
504     pxor    @t[7], @x[5]
505     pxor    @t[6], @x[3]
506     movdqa  @t[0], @x[2]
507     pxor    @t[2], @x[6]
508     movdqa  @t[1], @x[7]
509
510 $code.=<<<____ if ($inv);
511     pxor    @x[4], @t[3]
512     pxor    @t[7], @x[5]
513     pxor    @x[3], @t[6]
514     movdqa  @t[0], @x[3]
515     pxor    @t[2], @x[6]
516     movdqa  @t[6], @x[2]
517     movdqa  @t[1], @x[7]
518     movdqa  @x[6], @x[4]
519     movdqa  @t[3], @x[6]
520
521 }

523 sub InvMixColumns_orig {

```

```

524 my @x=@_[0..7];
525 my @t=@_[8..15];

527 $code.=<<<__ ;
528     # multiplication by 0xe
529     pshufd    \$_x93, @x[7], @t[7]
530     movdqa    @x[2], @t[2]
531     pxor      @x[5], @x[7]          # 7 5
532     pxor      @x[5], @x[2]          # 2 5
533     pshufd    \$_x93, @x[0], @t[0]
534     movdqa    @x[5], @t[5]
535     pxor      @x[0], @x[5]          # 5 0      [1]
536     pxor      @x[1], @x[0]          # 0 1
537     pshufd    \$_x93, @x[1], @t[1]
538     pxor      @x[2], @x[1]          # 1 25
539     pxor      @x[6], @x[0]          # 01 6      [2]
540     pxor      @x[3], @x[1]          # 125 3      [4]
541     pshufd    \$_x93, @x[3], @t[3]
542     pxor      @x[0], @x[2]          # 25 016     [3]
543     pxor      @x[7], @x[3]          # 3 75
544     pxor      @x[6], @x[7]          # 75 6      [0]
545     pshufd    \$_x93, @x[6], @t[6]
546     movdqa    @x[4], @t[4]
547     pxor      @x[4], @x[6]          # 6 4
548     pxor      @x[3], @x[4]          # 4 375     [6]
549     pxor      @x[7], @x[3]          # 375 756=36
550     pxor      @t[5], @x[6]          # 64 5      [7]
551     pxor      @t[2], @x[3]          # 36 2
552     pxor      @t[4], @x[3]          # 362 4      [5]
553     pshufd    \$_x93, @t[5], @t[5]
554
555     my @y = @x[7,5,0,2,1,3,4,6];
556 $code.=<<<__ ;
557     # multiplication by 0xb
558     pxor      @y[0], @y[1]
559     pxor      @t[0], @y[0]
560     pxor      @t[1], @y[1]
561     pshufd    \$_x93, @t[2], @t[2]
562     pxor      @t[5], @y[0]
563     pxor      @t[6], @y[1]
564     pxor      @t[7], @y[0]
565     pshufd    \$_x93, @t[4], @t[4]
566     pxor      @t[6], @t[7]          # clobber t[7]
567     pxor      @y[0], @y[1]

569     pxor      @t[0], @y[3]
570     pshufd    \$_x93, @t[0], @t[0]
571     pxor      @t[1], @y[2]
572     pxor      @t[1], @y[4]
573     pxor      @t[2], @y[2]
574     pshufd    \$_x93, @t[1], @t[1]
575     pxor      @t[2], @y[3]
576     pxor      @t[2], @y[5]
577     pxor      @t[7], @y[2]
578     pshufd    \$_x93, @t[2], @t[2]
579     pxor      @t[3], @y[3]
580     pxor      @t[3], @y[6]
581     pxor      @t[3], @y[4]
582     pshufd    \$_x93, @t[3], @t[3]
583     pxor      @t[4], @y[7]
584     pxor      @t[4], @y[5]
585     pxor      @t[7], @y[7]
586     pxor      @t[5], @y[3]
587     pxor      @t[4], @y[4]
588     pxor      @t[5], @t[7]          # clobber t[7] even more

```

```

590     pxor      @t[7], @y[5]
591     pshufd    \$_x93, @t[4], @t[4]
592     pxor      @t[7], @y[6]
593     pxor      @t[7], @y[4]

595     pxor      @t[5], @t[7]
596     pshufd    \$_x93, @t[5], @t[5]
597     pxor      @t[6], @t[7]          # restore t[7]

599     # multiplication by 0xd
600     pxor      @y[7], @y[4]
601     pxor      @t[4], @y[7]
602     pshufd    \$_x93, @t[6], @t[6]
603     pxor      @t[0], @y[2]
604     pxor      @t[5], @y[7]
605     pxor      @t[2], @y[2]
606     pshufd    \$_x93, @t[7], @t[7]

608     pxor      @y[1], @y[3]
609     pxor      @t[1], @y[1]
610     pxor      @t[0], @y[0]
611     pxor      @t[0], @y[3]
612     pxor      @t[5], @y[1]
613     pxor      @t[5], @y[0]
614     pxor      @t[7], @y[1]
615     pshufd    \$_x93, @t[0], @t[0]
616     pxor      @t[6], @y[0]
617     pxor      @y[1], @y[3]
618     pxor      @t[1], @y[4]
619     pshufd    \$_x93, @t[1], @t[1]

621     pxor      @t[7], @y[7]
622     pxor      @t[2], @y[4]
623     pxor      @t[2], @y[5]
624     pshufd    \$_x93, @t[2], @t[2]
625     pxor      @t[6], @y[2]
626     pxor      @t[3], @t[6]          # clobber t[6]
627     pxor      @y[7], @y[4]
628     pxor      @t[6], @y[3]

630     pxor      @t[6], @y[6]
631     pxor      @t[5], @y[5]
632     pxor      @t[4], @y[6]
633     pshufd    \$_x93, @t[4], @t[4]
634     pxor      @t[6], @y[5]
635     pxor      @t[7], @y[6]
636     pxor      @t[3], @t[6]          # restore t[6]

638     pshufd    \$_x93, @t[5], @t[5]
639     pshufd    \$_x93, @t[6], @t[6]
640     pshufd    \$_x93, @t[7], @t[7]
641     pshufd    \$_x93, @t[3], @t[3]

643     # multiplication by 0x9
644     pxor      @y[1], @y[4]
645     pxor      @y[1], @t[1]          # t[1]=y[1]
646     pxor      @t[5], @t[0]          # clobber t[0]
647     pxor      @t[5], @t[1]
648     pxor      @t[0], @y[3]
649     pxor      @y[0], @t[0]          # t[0]=y[0]
650     pxor      @t[6], @t[1]
651     pxor      @t[7], @t[6]          # clobber t[6]
652     pxor      @t[1], @y[4]
653     pxor      @t[4], @y[7]
654     pxor      @y[4], @t[4]          # t[4]=y[4]
655     pxor      @t[3], @y[6]

```

```

656     pxor    @y[3], @t[3]          # t[3]=y[3]
657     pxor    @t[2], @y[5]
658     pxor    @y[2], @t[2]          # t[2]=y[2]
659     pxor    @t[7], @t[3]
660     pxor    @y[5], @t[5]          # t[5]=y[5]
661     pxor    @t[6], @t[2]
662     pxor    @t[6], @t[5]
663     pxor    @y[6], @t[6]          # t[6]=y[6]
664     pxor    @y[7], @t[7]          # t[7]=y[7]

666     movdqa  @t[0],@XMM[0]
667     movdqa  @t[1],@XMM[1]
668     movdqa  @t[2],@XMM[2]
669     movdqa  @t[3],@XMM[3]
670     movdqa  @t[4],@XMM[4]
671     movdqa  @t[5],@XMM[5]
672     movdqa  @t[6],@XMM[6]
673     movdqa  @t[7],@XMM[7]
674 ____
675 }

677 sub InvMixColumns {
678 my @x=@_[0..7];
679 my @t=@_[8..15];

681 # Thanks to Jussi Kivilinna for providing pointer to
682 #
683 # | 0e 0b 0d 09 | = | 02 03 01 01 | x | 05 00 04 00 |
684 # | 09 0e 0b 0d | = | 01 02 03 01 | x | 00 05 00 04 |
685 # | 0d 09 0e 0b | = | 01 01 02 03 | x | 04 00 05 00 |
686 # | 0b 0d 09 0e | = | 03 01 01 02 | x | 00 04 00 05 |

688 $code.=<<____;
689 # multiplication by 0x05-0x00-0x04-0x00
690 pshufd    \ $0x4E, @x[0], @t[0]
691 pshufd    \ $0x4E, @x[6], @t[6]
692 pxor      @x[0], @t[0]
693 pshufd    \ $0x4E, @x[7], @t[7]
694 pxor      @x[6], @t[6]
695 pshufd    \ $0x4E, @x[1], @t[1]
696 pxor      @x[7], @t[7]
697 pshufd    \ $0x4E, @x[2], @t[2]
698 pxor      @x[1], @t[1]
699 pshufd    \ $0x4E, @x[3], @t[3]
700 pxor      @x[2], @t[2]
701 pxor      @t[6], @x[0]
702 pxor      @t[6], @x[1]
703 pshufd    \ $0x4E, @x[4], @t[4]
704 pxor      @x[3], @t[3]
705 pxor      @t[0], @x[2]
706 pxor      @t[1], @x[3]
707 pshufd    \ $0x4E, @x[5], @t[5]
708 pxor      @x[4], @t[4]
709 pxor      @t[7], @x[1]
710 pxor      @t[2], @x[4]
711 pxor      @x[5], @t[5]

713     pxor    @t[7], @x[2]
714     pxor    @t[6], @x[3]
715     pxor    @t[6], @x[4]
716     pxor    @t[3], @x[5]
717     pxor    @t[4], @x[6]
718     pxor    @t[7], @x[4]
719     pxor    @t[7], @x[5]
720     pxor    @t[5], @x[7]
721 ____

```

```

722     &MixColumns    (@x,@t,1);      # flipped 2<->3 and 4<->6
723 }

725 sub aesenc {                      # not used
726 my @b=@_[0..7];
727 my @t=@_[8..15];
728 $code.=<<____;
729     movdqa    0x30($const),@t[0]    # .LSR
730 ____
731     &ShiftRows    (@b,@t[0]);
732     &Sbox          (@b,@t);
733     &MixColumns    (@b[0,1,4,6,3,7,2,5],@t);
734 }

736 sub aesenclast {                  # not used
737 my @b=@_[0..7];
738 my @t=@_[8..15];
739 $code.=<<____;
740     movdqa    0x40($const),@t[0]    # .LSRM0
741 ____
742     &ShiftRows    (@b,@t[0]);
743     &Sbox          (@b,@t);
744 $code.=<<____;
745     pxor      0x00($key),@b[0]
746     pxor      0x10($key),@b[1]
747     pxor      0x20($key),@b[4]
748     pxor      0x30($key),@b[6]
749     pxor      0x40($key),@b[3]
750     pxor      0x50($key),@b[7]
751     pxor      0x60($key),@b[2]
752     pxor      0x70($key),@b[5]
753 ____
754 }

756 sub swapmove {
757 my ($a,$b,$n,$mask,$t)=@_;
758 $code.=<<____;
759     movdqa    $b,$t
760     psrlq     \ $$n,$b
761     pxor      $a,$b
762     pand      $mask,$b
763     pxor      $b,$a
764     psllq     \ $$n,$b
765     pxor      $t,$b
766 ____
767 }

768 sub swapmove2x {
769 my ($a0,$b0,$a1,$b1,$n,$mask,$t0,$t1)=@_;
770 $code.=<<____;
771     movdqa    $b0,$t0
772     psrlq     \ $$n,$b0
773     movdqa    $b1,$t1
774     psrlq     \ $$n,$b1
775     pxor      $a0,$b0
776     pxor      $a1,$b1
777     pand      $mask,$b0
778     pand      $mask,$b1
779     pxor      $b0,$a0
780     psllq     \ $$n,$b0
781     pxor      $b1,$a1
782     psllq     \ $$n,$b1
783     pxor      $t0,$b0
784     pxor      $t1,$b1
785 ____
786 }

```

```

788 sub bitslice {
789   my @x=reverse(@_[0..7]);
790   my ($t0,$t1,$t2,$t3)=@[8..11];
791   $code.=<<___.
792       movdqa    0x00($const),$t0      # .LBS0
793       movdqa    0x10($const),$t1      # .LBS1
794   ____
795       &swapmove2x(@x[0,1,2,3],1,$t0,$t2,$t3);
796       &swapmove2x(@x[4,5,6,7],1,$t0,$t2,$t3);
797   $code.=<<___.
798       movdqa    0x20($const),$t0      # .LBS2
799   ____
800       &swapmove2x(@x[0,2,1,3],2,$t1,$t2,$t3);
801       &swapmove2x(@x[4,6,5,7],2,$t1,$t2,$t3);
802
803       &swapmove2x(@x[0,4,1,5],4,$t0,$t2,$t3);
804       &swapmove2x(@x[2,6,3,7],4,$t0,$t2,$t3);
805 }

807 $code.=<<___.
808 .text

810 .extern asm_AES_encrypt
811 .extern asm_AES_decrypt

813 .type    _bsaes_encrypt8,\@abi-omnipotent
814 .align   64
815 _bsaes_encrypt8:
816     lea    .LBS0(%rip), $const    # constants table

818     movdqa ($key), @XMM[9]        # round 0 key
819     lea    0x10($key), $key
820     movdqa 0x50($const), @XMM[8]  # .LM0SR
821     pxor   @XMM[9], @XMM[0]        # xor with round0 key
822     pxor   @XMM[9], @XMM[1]
823     pshufb @XMM[8], @XMM[0]
824     pxor   @XMM[9], @XMM[2]
825     pshufb @XMM[8], @XMM[1]
826     pxor   @XMM[9], @XMM[3]
827     pshufb @XMM[8], @XMM[2]
828     pxor   @XMM[9], @XMM[4]
829     pshufb @XMM[8], @XMM[3]
830     pxor   @XMM[9], @XMM[5]
831     pshufb @XMM[8], @XMM[4]
832     pxor   @XMM[9], @XMM[6]
833     pshufb @XMM[8], @XMM[5]
834     pxor   @XMM[9], @XMM[7]
835     pshufb @XMM[8], @XMM[6]
836     pshufb @XMM[8], @XMM[7]
837 _bsaes_encrypt8_bitslice:
838 ____
839     &bitslice (@XMM[0..7, 8..11]);
840 $code.=<<___.
841     dec      $rounds
842     jmp      .Lenc_sbox
843 .align 16
844 .Lenc_loop:
845 ____
846     &ShiftRows (@XMM[0..7, 8]);
847 $code.=" .Lenc_sbox:\n";
848     &Sbox      (@XMM[0..7, 8..15]);
849 $code.=<<___.
850     dec      $rounds
851     jl       .Lenc_done
852 ____
853     &MixColumns (@XMM[0,1,4,6,3,7,2,5, 8..15]);

```

```

854 $code.=<<___.
855     movdqa    0x30($const), @XMM[8]  # .LSR
856     jnz       .Lenc_loop
857     movdqa    0x40($const), @XMM[8]  # .LSRM0
858     jmp       .Lenc_loop
859 .align 16
860 .Lenc_done:
861 ____
862     # output in lsb > [t0, t1, t4, t6, t3, t7, t2, t5] < msb
863     &bitslice (@XMM[0,1,4,6,3,7,2,5, 8..11]);
864 $code.=<<___.
865     movdqa    ($key), @XMM[8]        # last round key
866     pxor      @XMM[8], @XMM[4]
867     pxor      @XMM[8], @XMM[6]
868     pxor      @XMM[8], @XMM[3]
869     pxor      @XMM[8], @XMM[7]
870     pxor      @XMM[8], @XMM[2]
871     pxor      @XMM[8], @XMM[5]
872     pxor      @XMM[8], @XMM[0]
873     pxor      @XMM[8], @XMM[1]
874     ret
875 .size    _bsaes_encrypt8,.-_bsaes_encrypt8

877 .type    _bsaes_decrypt8,\@abi-omnipotent
878 .align   64
879 _bsaes_decrypt8:
880     lea    .LBS0(%rip), $const    # constants table

882     movdqa ($key), @XMM[9]        # round 0 key
883     lea    0x10($key), $key
884     movdqa -0x30($const), @XMM[8]  # .LM0ISR
885     pxor   @XMM[9], @XMM[0]
886     pxor   @XMM[9], @XMM[1]
887     pshufb @XMM[8], @XMM[0]
888     pxor   @XMM[9], @XMM[2]
889     pshufb @XMM[8], @XMM[1]
890     pxor   @XMM[9], @XMM[3]
891     pshufb @XMM[8], @XMM[2]
892     pxor   @XMM[9], @XMM[4]
893     pshufb @XMM[8], @XMM[3]
894     pxor   @XMM[9], @XMM[5]
895     pshufb @XMM[8], @XMM[4]
896     pxor   @XMM[9], @XMM[6]
897     pshufb @XMM[8], @XMM[5]
898     pxor   @XMM[9], @XMM[7]
899     pshufb @XMM[8], @XMM[6]
900     pshufb @XMM[8], @XMM[7]
901 ____
902     &bitslice (@XMM[0..7, 8..11]);
903 $code.=<<___.
904     dec      $rounds
905     jmp      .Ldec_sbox
906 .align 16
907 .Ldec_loop:
908 ____
909     &ShiftRows (@XMM[0..7, 8]);
910 $code.=" .Ldec_sbox:\n";
911     &InvSbox    (@XMM[0..7, 8..15]);
912 $code.=<<___.
913     dec      $rounds
914     jl       .Ldec_done
915 ____
916     &InvMixColumns (@XMM[0,1,6,4,2,7,3,5, 8..15]);
917 $code.=<<___.
918     movdqa    -0x10($const), @XMM[8] # .LISR
919     jnz       .Ldec_loop

```

```

920      movdqa    -0x20($const), @XMM[8] # .LISRM0
921      jmp      .Ldec_loop
922  .align 16
923  .Ldec_done:
924  ____
925      &bitslice      (@XMM[0,1,6,4,2,7,3,5, 8..11]);
926  $code.=<<____;
927      movdqa    ($key), @XMM[8]          # last round key
928      pxor      @XMM[8], @XMM[6]
929      pxor      @XMM[8], @XMM[4]
930      pxor      @XMM[8], @XMM[2]
931      pxor      @XMM[8], @XMM[7]
932      pxor      @XMM[8], @XMM[3]
933      pxor      @XMM[8], @XMM[5]
934      pxor      @XMM[8], @XMM[0]
935      pxor      @XMM[8], @XMM[1]
936      ret
937  .size      _bsaes_decrypt8,.-_bsaes_decrypt8
938  ____
939  }
940  {
941  my ($out,$inp,$rounds,$const)=("%rax","%rcx","%r10d","%r11");

943  sub bitslice_key {
944  my @x=reverse(@_[0..7]);
945  my ($bs0,$bs1,$bs2,$t2,$t3)=@_[8..12];

947      &swapmove      (@x[0,1],1,$bs0,$t2,$t3);
948  $code.=<<____;
949      &swapmove(@x[2,3],1,$t0,$t2,$t3);
950      movdqa    @x[0], @x[2]
951      movdqa    @x[1], @x[3]
952  ____
953      &swapmove2x(@x[4,5,6,7],1,$t0,$t2,$t3);

955      &swapmove2x      (@x[0,2,1,3],2,$bs1,$t2,$t3);
956  $code.=<<____;
957      &swapmove2x(@x[4,6,5,7],2,$t1,$t2,$t3);
958      movdqa    @x[0], @x[4]
959      movdqa    @x[2], @x[6]
960      movdqa    @x[1], @x[5]
961      movdqa    @x[3], @x[7]
962  ____
963      &swapmove2x      (@x[0,4,1,5],4,$bs2,$t2,$t3);
964      &swapmove2x      (@x[2,6,3,7],4,$bs2,$t2,$t3);
965  }

967  $code.=<<____;
968  .type      _bsaes_key_convert,\@abi-omnipotent
969  .align 16
970  _bsaes_key_convert:
971      lea      .Lmasks(%rip), $const
972      movdqu   ($inp), %xmm7          # load round 0 key
973      lea      0x10($inp), $inp
974      movdqa   0x00($const), %xmm0    # 0x01...
975      movdqa   0x10($const), %xmm1    # 0x02...
976      movdqa   0x20($const), %xmm2    # 0x04...
977      movdqa   0x30($const), %xmm3    # 0x08...
978      movdqa   0x40($const), %xmm4    # .LM0
979      pcmpeqd  %xmm5, %xmm5          # .LNOT

981      movdqu   ($inp), %xmm6          # load round 1 key
982      movdqa   %xmm7, ($out)          # save round 0 key
983      lea      0x10($out), $out
984      dec      $rounds
985      jmp      .Lkey_loop

```

```

986  .align 16
987  .Lkey_loop:
988      pshufb   %xmm4, %xmm6          # .LM0

990      movdqa   %xmm0, %xmm8
991      movdqa   %xmm1, %xmm9

993      pand     %xmm6, %xmm8
994      pand     %xmm6, %xmm9
995      movdqa   %xmm2, %xmm10
996      pcmpeqb  %xmm0, %xmm8
997      psllq    \ $4, %xmm0          # 0x10...
998      movdqa   %xmm3, %xmm11
999      pcmpeqb  %xmm1, %xmm9
1000     psllq    \ $4, %xmm1          # 0x20...

1002     pand     %xmm6, %xmm10
1003     pand     %xmm6, %xmm11
1004     movdqa   %xmm0, %xmm12
1005     pcmpeqb  %xmm2, %xmm10
1006     psllq    \ $4, %xmm2          # 0x40...
1007     movdqa   %xmm1, %xmm13
1008     pcmpeqb  %xmm3, %xmm11
1009     psllq    \ $4, %xmm3          # 0x80...

1011     movdqa   %xmm2, %xmm14
1012     movdqa   %xmm3, %xmm15
1013     pxor     %xmm5, %xmm8          # "pnot"
1014     pxor     %xmm5, %xmm9

1016     pand     %xmm6, %xmm12
1017     pand     %xmm6, %xmm13
1018     movdqa   %xmm8, 0x00($out)    # write bit-sliced round key
1019     pcmpeqb  %xmm0, %xmm12
1020     psrlq    \ $4, %xmm0          # 0x01...
1021     movdqa   %xmm9, 0x10($out)
1022     pcmpeqb  %xmm1, %xmm13
1023     psrlq    \ $4, %xmm1          # 0x02...
1024     lea      0x10($inp), $inp

1026     pand     %xmm6, %xmm14
1027     pand     %xmm6, %xmm15
1028     movdqa   %xmm10, 0x20($out)
1029     pcmpeqb  %xmm2, %xmm14
1030     psrlq    \ $4, %xmm2          # 0x04...
1031     movdqa   %xmm11, 0x30($out)
1032     pcmpeqb  %xmm3, %xmm15
1033     psrlq    \ $4, %xmm3          # 0x08...
1034     movdqu   ($inp), %xmm6        # load next round key

1036     pxor     %xmm5, %xmm13
1037     pxor     %xmm5, %xmm14
1038     movdqa   %xmm12, 0x40($out)
1039     movdqa   %xmm13, 0x50($out)
1040     movdqa   %xmm14, 0x60($out)
1041     movdqa   %xmm15, 0x70($out)
1042     lea      0x80($out), $out
1043     dec      $rounds
1044     jnz      .Lkey_loop

1046     movdqa   0x50($const), %xmm7   # .L63
1047     #movdqa   %xmm6, ($out)         # don't save last round key
1048     ret
1049  .size      _bsaes_key_convert,.-_bsaes_key_convert
1050  ____
1051  }

```

```

1053 if (0 && !$win64) {      # following four functions are unsupported interface
1054                             # used for benchmarking...
1055 $code.=<<<__ ;
1056 .globl bsaes_enc_key_convert
1057 .type bsaes_enc_key_convert, \@function, 2
1058 .align 16
1059 bsaes_enc_key_convert:
1060     mov     240($inp),%r10d    # pass rounds
1061     mov     $inp,%rcx         # pass key
1062     mov     $out,%rax         # pass key schedule
1063     call    _bsaes_key_convert
1064     pxor    %xmm6,%xmm7       # fix up last round key
1065     movdqa  %xmm7,%rax        # save last round key
1066     ret
1067 .size bsaes_enc_key_convert,.-bsaes_enc_key_convert

1069 .globl bsaes_encrypt_128
1070 .type bsaes_encrypt_128, \@function, 4
1071 .align 16
1072 bsaes_encrypt_128:
1073 .Lenc128_loop:
1074     movdqu 0x00($inp), @XMM[0]    # load input
1075     movdqu 0x10($inp), @XMM[1]
1076     movdqu 0x20($inp), @XMM[2]
1077     movdqu 0x30($inp), @XMM[3]
1078     movdqu 0x40($inp), @XMM[4]
1079     movdqu 0x50($inp), @XMM[5]
1080     movdqu 0x60($inp), @XMM[6]
1081     movdqu 0x70($inp), @XMM[7]
1082     mov     $key,%rax           # pass the $key
1083     lea     0x80($inp), $inp
1084     mov     \ $10,%r10d

1086     call    _bsaes_encrypt8

1088     movdqu @XMM[0], 0x00($out)    # write output
1089     movdqu @XMM[1], 0x10($out)
1090     movdqu @XMM[4], 0x20($out)
1091     movdqu @XMM[6], 0x30($out)
1092     movdqu @XMM[3], 0x40($out)
1093     movdqu @XMM[7], 0x50($out)
1094     movdqu @XMM[2], 0x60($out)
1095     movdqu @XMM[5], 0x70($out)
1096     lea     0x80($out), $out
1097     sub     \ $0x80,$len
1098     ja      .Lenc128_loop
1099     ret
1100 .size bsaes_encrypt_128,.-bsaes_encrypt_128

1102 .globl bsaes_dec_key_convert
1103 .type bsaes_dec_key_convert, \@function, 2
1104 .align 16
1105 bsaes_dec_key_convert:
1106     mov     240($inp),%r10d    # pass rounds
1107     mov     $inp,%rcx         # pass key
1108     mov     $out,%rax         # pass key schedule
1109     call    _bsaes_key_convert
1110     pxor    ($out),%xmm7       # fix up round 0 key
1111     movdqa  %xmm6,($rax)       # save last round key
1112     movdqa  %xmm7,($out)
1113     ret
1114 .size bsaes_dec_key_convert,.-bsaes_dec_key_convert

1116 .globl bsaes_decrypt_128
1117 .type bsaes_decrypt_128, \@function, 4

```

```

1118 .align 16
1119 bsaes_decrypt_128:
1120 .Ldec128_loop:
1121     movdqu 0x00($inp), @XMM[0]    # load input
1122     movdqu 0x10($inp), @XMM[1]
1123     movdqu 0x20($inp), @XMM[2]
1124     movdqu 0x30($inp), @XMM[3]
1125     movdqu 0x40($inp), @XMM[4]
1126     movdqu 0x50($inp), @XMM[5]
1127     movdqu 0x60($inp), @XMM[6]
1128     movdqu 0x70($inp), @XMM[7]
1129     mov     $key,%rax           # pass the $key
1130     lea     0x80($inp), $inp
1131     mov     \ $10,%r10d

1133     call    _bsaes_decrypt8

1135     movdqu @XMM[0], 0x00($out)    # write output
1136     movdqu @XMM[1], 0x10($out)
1137     movdqu @XMM[6], 0x20($out)
1138     movdqu @XMM[4], 0x30($out)
1139     movdqu @XMM[2], 0x40($out)
1140     movdqu @XMM[7], 0x50($out)
1141     movdqu @XMM[3], 0x60($out)
1142     movdqu @XMM[5], 0x70($out)
1143     lea     0x80($out), $out
1144     sub     \ $0x80,$len
1145     ja      .Ldec128_loop
1146     ret
1147 .size bsaes_decrypt_128,.-bsaes_decrypt_128
1148
1149 }
1150 {
1151 #####
1152 #
1153 # OpenSSL interface
1154 #
1155 my ($arg1,$arg2,$arg3,$arg4,$arg5,$arg6)=$win64 ? ("%rcx", "%rdx", "%r8", "%r9", "%r
1156 : ("%rdi", "%rsi", "%rdx", "%rcx", "
1157 my ($inp,$out,$len,$key) = ("%r12", "%r13", "%r14", "%r15");

1159 if ($ecb) {
1160 $code.=<<<__ ;
1161 .globl bsaes_ecb_encrypt_blocks
1162 .type bsaes_ecb_encrypt_blocks, \@abi-omnipotent
1163 .align 16
1164 bsaes_ecb_encrypt_blocks:
1165     mov     %rsp,%rax
1166 .Lecb_enc_prologue:
1167     push    %rbp
1168     push    %rbx
1169     push    %r12
1170     push    %r13
1171     push    %r14
1172     push    %r15
1173     lea     -0x48(%rsp),%rsp
1174
1175 $code.=<<<__ if ($win64);
1176     lea     -0xa0(%rsp), %rsp
1177     movaps  %xmm6, 0x40(%rsp)
1178     movaps  %xmm7, 0x50(%rsp)
1179     movaps  %xmm8, 0x60(%rsp)
1180     movaps  %xmm9, 0x70(%rsp)
1181     movaps  %xmm10, 0x80(%rsp)
1182     movaps  %xmm11, 0x90(%rsp)
1183     movaps  %xmm12, 0xa0(%rsp)

```

```

1184     movaps    %xmm13, 0xb0(%rsp)
1185     movaps    %xmm14, 0xc0(%rsp)
1186     movaps    %xmm15, 0xd0(%rsp)
1187 .Lecb_enc_body:
1188     ____
1189     $code.=<<____;
1190     mov     %rsp,%rbp          # backup %rsp
1191     mov     240($arg4),%eax    # rounds
1192     mov     $arg1,$inp        # backup arguments
1193     mov     $arg2,$out
1194     mov     $arg3,$len
1195     mov     $arg4,$key
1196     cmp     \ $8,$arg3
1197     jnb     .Lecb_enc_short

1199     mov     %eax,%ebx         # backup rounds
1200     shl     \ $7,%rax         # 128 bytes per inner round key
1201     sub     \ $'128-32',%rax  # size of bit-sliced key schedule
1202     sub     %rax,%rsp
1203     mov     %rsp,%rax         # pass key schedule
1204     mov     $key,%rcx         # pass key
1205     mov     %ebx,%r10d        # pass rounds
1206     call    _bsaes_key_convert
1207     pxor    %xmm6,%xmm7      # fix up last round key
1208     movdqa  %xmm7,(%rax)      # save last round key

1210     sub     \ $8,$len
1211 .Lecb_enc_loop:
1212     movdqu  0x00($inp), @XMM[0] # load input
1213     movdqu  0x10($inp), @XMM[1]
1214     movdqu  0x20($inp), @XMM[2]
1215     movdqu  0x30($inp), @XMM[3]
1216     movdqu  0x40($inp), @XMM[4]
1217     movdqu  0x50($inp), @XMM[5]
1218     mov     %rsp,%rax         # pass key schedule
1219     movdqu  0x60($inp), @XMM[6]
1220     mov     %ebx,%r10d        # pass rounds
1221     movdqu  0x70($inp), @XMM[7]
1222     lea     0x80($inp), $inp

1224     call    _bsaes_encrypt8

1226     movdqu  @XMM[0], 0x00($out) # write output
1227     movdqu  @XMM[1], 0x10($out)
1228     movdqu  @XMM[4], 0x20($out)
1229     movdqu  @XMM[6], 0x30($out)
1230     movdqu  @XMM[3], 0x40($out)
1231     movdqu  @XMM[7], 0x50($out)
1232     movdqu  @XMM[2], 0x60($out)
1233     movdqu  @XMM[5], 0x70($out)
1234     lea     0x80($out), $out
1235     sub     \ $8,$len
1236     jnc     .Lecb_enc_loop

1238     add     \ $8,$len
1239     jz      .Lecb_enc_done

1241     movdqu  0x00($inp), @XMM[0] # load input
1242     mov     %rsp,%rax         # pass key schedule
1243     mov     %ebx,%r10d        # pass rounds
1244     cmp     \ $2,$len
1245     jb      .Lecb_enc_one
1246     movdqu  0x10($inp), @XMM[1]
1247     je      .Lecb_enc_two
1248     movdqu  0x20($inp), @XMM[2]
1249     cmp     \ $4,$len

```

```

1250     jb      .Lecb_enc_three
1251     movdqu  0x30($inp), @XMM[3]
1252     je      .Lecb_enc_four
1253     movdqu  0x40($inp), @XMM[4]
1254     cmp     \ $6,$len
1255     jb      .Lecb_enc_five
1256     movdqu  0x50($inp), @XMM[5]
1257     je      .Lecb_enc_six
1258     movdqu  0x60($inp), @XMM[6]
1259     call    _bsaes_encrypt8
1260     movdqu  @XMM[0], 0x00($out) # write output
1261     movdqu  @XMM[1], 0x10($out)
1262     movdqu  @XMM[4], 0x20($out)
1263     movdqu  @XMM[6], 0x30($out)
1264     movdqu  @XMM[3], 0x40($out)
1265     movdqu  @XMM[7], 0x50($out)
1266     movdqu  @XMM[2], 0x60($out)
1267     jmp     .Lecb_enc_done
1268 .align 16
1269 .Lecb_enc_six:
1270     call    _bsaes_encrypt8
1271     movdqu  @XMM[0], 0x00($out) # write output
1272     movdqu  @XMM[1], 0x10($out)
1273     movdqu  @XMM[4], 0x20($out)
1274     movdqu  @XMM[6], 0x30($out)
1275     movdqu  @XMM[3], 0x40($out)
1276     movdqu  @XMM[7], 0x50($out)
1277     jmp     .Lecb_enc_done
1278 .align 16
1279 .Lecb_enc_five:
1280     call    _bsaes_encrypt8
1281     movdqu  @XMM[0], 0x00($out) # write output
1282     movdqu  @XMM[1], 0x10($out)
1283     movdqu  @XMM[4], 0x20($out)
1284     movdqu  @XMM[6], 0x30($out)
1285     movdqu  @XMM[3], 0x40($out)
1286     jmp     .Lecb_enc_done
1287 .align 16
1288 .Lecb_enc_four:
1289     call    _bsaes_encrypt8
1290     movdqu  @XMM[0], 0x00($out) # write output
1291     movdqu  @XMM[1], 0x10($out)
1292     movdqu  @XMM[4], 0x20($out)
1293     movdqu  @XMM[6], 0x30($out)
1294     jmp     .Lecb_enc_done
1295 .align 16
1296 .Lecb_enc_three:
1297     call    _bsaes_encrypt8
1298     movdqu  @XMM[0], 0x00($out) # write output
1299     movdqu  @XMM[1], 0x10($out)
1300     movdqu  @XMM[4], 0x20($out)
1301     jmp     .Lecb_enc_done
1302 .align 16
1303 .Lecb_enc_two:
1304     call    _bsaes_encrypt8
1305     movdqu  @XMM[0], 0x00($out) # write output
1306     movdqu  @XMM[1], 0x10($out)
1307     jmp     .Lecb_enc_done
1308 .align 16
1309 .Lecb_enc_one:
1310     call    _bsaes_encrypt8
1311     movdqu  @XMM[0], 0x00($out) # write output
1312     jmp     .Lecb_enc_done
1313 .align 16
1314 .Lecb_enc_short:
1315     lea     ($inp), $arg1

```

```

1316     lea     ($out), $arg2
1317     lea     ($key), $arg3
1318     call    asm_AES_encrypt
1319     lea     16($inp), $inp
1320     lea     16($out), $out
1321     dec     $len
1322     jnz     .Lecb_enc_short

1324 .Lecb_enc_done:
1325     lea     (%rsp),%rax
1326     pxor    %xmm0, %xmm0
1327 .Lecb_enc_bzero:                # wipe key schedule [if any]
1328     movdqa %xmm0, 0x00(%rax)
1329     movdqa %xmm0, 0x10(%rax)
1330     lea     0x20(%rax), %rax
1331     cmp     %rax, %rbp
1332     jb      .Lecb_enc_bzero

1334     lea     (%rbp),%rsp        # restore %rsp

1336 $code.=<<< if ($win64);
1337     movaps  0x40(%rbp), %xmm6
1338     movaps  0x50(%rbp), %xmm7
1339     movaps  0x60(%rbp), %xmm8
1340     movaps  0x70(%rbp), %xmm9
1341     movaps  0x80(%rbp), %xmm10
1342     movaps  0x90(%rbp), %xmm11
1343     movaps  0xa0(%rbp), %xmm12
1344     movaps  0xb0(%rbp), %xmm13
1345     movaps  0xc0(%rbp), %xmm14
1346     movaps  0xd0(%rbp), %xmm15
1347     lea     0xa0(%rbp), %rsp
1348
1349 $code.=<<< ;
1350     mov     0x48(%rsp), %r15
1351     mov     0x50(%rsp), %r14
1352     mov     0x58(%rsp), %r13
1353     mov     0x60(%rsp), %r12
1354     mov     0x68(%rsp), %rbx
1355     mov     0x70(%rsp), %rax
1356     lea     0x78(%rsp), %rsp
1357     mov     %rax, %rbp
1358 .Lecb_enc_epilogue:
1359     ret
1360 .size     baes_ecb_encrypt_blocks,.-baes_ecb_encrypt_blocks

1362 .globl    baes_ecb_decrypt_blocks
1363 .type     baes_ecb_decrypt_blocks,@abi-omnipotent
1364 .align    16
1365 baes_ecb_decrypt_blocks:
1366     mov     %rsp, %rax
1367 .Lecb_dec_prologue:
1368     push    %rbp
1369     push    %rbx
1370     push    %r12
1371     push    %r13
1372     push    %r14
1373     push    %r15
1374     lea     -0x48(%rsp),%rsp
1375
1376 $code.=<<< if ($win64);
1377     lea     -0xa0(%rsp), %rsp
1378     movaps  %xmm6, 0x40(%rsp)
1379     movaps  %xmm7, 0x50(%rsp)
1380     movaps  %xmm8, 0x60(%rsp)
1381     movaps  %xmm9, 0x70(%rsp)

```

```

1382     movaps  %xmm10, 0x80(%rsp)
1383     movaps  %xmm11, 0x90(%rsp)
1384     movaps  %xmm12, 0xa0(%rsp)
1385     movaps  %xmm13, 0xb0(%rsp)
1386     movaps  %xmm14, 0xc0(%rsp)
1387     movaps  %xmm15, 0xd0(%rsp)
1388 .Lecb_dec_body:
1389
1390 $code.=<<< ;
1391     mov     %rsp,%rbp        # backup %rsp
1392     mov     240($arg4),%eax  # rounds
1393     mov     $arg1,$inp       # backup arguments
1394     mov     $arg2,$out
1395     mov     $arg3,$len
1396     mov     $arg4,$key
1397     cmp     \ $8,$arg3
1398     jb      .Lecb_dec_short

1400     mov     %eax,%ebx        # backup rounds
1401     shl     \ $7,%rax        # 128 bytes per inner round key
1402     sub     \ $'128-32',%rax # size of bit-sliced key schedule
1403     sub     %rax,%rsp
1404     mov     %rsp,%rax        # pass key schedule
1405     mov     $key,%rcx        # pass key
1406     mov     %ebx,%r10d       # pass rounds
1407     call    _baes_key_convert
1408     pxor    (%rsp),%xmm7     # fix up 0 round key
1409     movdqa  %xmm6,(%rax)     # save last round key
1410     movdqa  %xmm7,(%rsp)

1412     sub     \ $8,$len
1413 .Lecb_dec_loop:
1414     movdqu  0x00($inp), @XMM[0] # load input
1415     movdqu  0x10($inp), @XMM[1]
1416     movdqu  0x20($inp), @XMM[2]
1417     movdqu  0x30($inp), @XMM[3]
1418     movdqu  0x40($inp), @XMM[4]
1419     movdqu  0x50($inp), @XMM[5]
1420     mov     %rsp,%rax        # pass key schedule
1421     movdqu  0x60($inp), @XMM[6]
1422     mov     %ebx,%r10d       # pass rounds
1423     movdqu  0x70($inp), @XMM[7]
1424     lea     0x80($inp), $inp

1426     call    _baes_decrypt8

1428     movdqu  @XMM[0], 0x00($out) # write output
1429     movdqu  @XMM[1], 0x10($out)
1430     movdqu  @XMM[6], 0x20($out)
1431     movdqu  @XMM[4], 0x30($out)
1432     movdqu  @XMM[2], 0x40($out)
1433     movdqu  @XMM[7], 0x50($out)
1434     movdqu  @XMM[3], 0x60($out)
1435     movdqu  @XMM[5], 0x70($out)
1436     lea     0x80($out), $out
1437     sub     \ $8,$len
1438     jnc     .Lecb_dec_loop

1440     add     \ $8,$len
1441     jz      .Lecb_dec_done

1443     movdqu  0x00($inp), @XMM[0] # load input
1444     mov     %rsp,%rax        # pass key schedule
1445     mov     %ebx,%r10d       # pass rounds
1446     cmp     \ $2,$len
1447     jb      .Lecb_dec_one

```



```

1448 movdqu 0x10($inp), @XMM[1]
1449 je .Lecb_dec_two
1450 movdqu 0x20($inp), @XMM[2]
1451 cmp \4,$len
1452 jb .Lecb_dec_three
1453 movdqu 0x30($inp), @XMM[3]
1454 je .Lecb_dec_four
1455 movdqu 0x40($inp), @XMM[4]
1456 cmp \6,$len
1457 jb .Lecb_dec_five
1458 movdqu 0x50($inp), @XMM[5]
1459 je .Lecb_dec_six
1460 movdqu 0x60($inp), @XMM[6]
1461 call _bsaes_decrypt8
1462 movdqu @XMM[0], 0x00($out) # write output
1463 movdqu @XMM[1], 0x10($out)
1464 movdqu @XMM[6], 0x20($out)
1465 movdqu @XMM[4], 0x30($out)
1466 movdqu @XMM[2], 0x40($out)
1467 movdqu @XMM[7], 0x50($out)
1468 movdqu @XMM[3], 0x60($out)
1469 jmp .Lecb_dec_done
1470 .align 16
1471 .Lecb_dec_six:
1472 call _bsaes_decrypt8
1473 movdqu @XMM[0], 0x00($out) # write output
1474 movdqu @XMM[1], 0x10($out)
1475 movdqu @XMM[6], 0x20($out)
1476 movdqu @XMM[4], 0x30($out)
1477 movdqu @XMM[2], 0x40($out)
1478 movdqu @XMM[7], 0x50($out)
1479 jmp .Lecb_dec_done
1480 .align 16
1481 .Lecb_dec_five:
1482 call _bsaes_decrypt8
1483 movdqu @XMM[0], 0x00($out) # write output
1484 movdqu @XMM[1], 0x10($out)
1485 movdqu @XMM[6], 0x20($out)
1486 movdqu @XMM[4], 0x30($out)
1487 movdqu @XMM[2], 0x40($out)
1488 jmp .Lecb_dec_done
1489 .align 16
1490 .Lecb_dec_four:
1491 call _bsaes_decrypt8
1492 movdqu @XMM[0], 0x00($out) # write output
1493 movdqu @XMM[1], 0x10($out)
1494 movdqu @XMM[6], 0x20($out)
1495 movdqu @XMM[4], 0x30($out)
1496 jmp .Lecb_dec_done
1497 .align 16
1498 .Lecb_dec_three:
1499 call _bsaes_decrypt8
1500 movdqu @XMM[0], 0x00($out) # write output
1501 movdqu @XMM[1], 0x10($out)
1502 movdqu @XMM[6], 0x20($out)
1503 jmp .Lecb_dec_done
1504 .align 16
1505 .Lecb_dec_two:
1506 call _bsaes_decrypt8
1507 movdqu @XMM[0], 0x00($out) # write output
1508 movdqu @XMM[1], 0x10($out)
1509 jmp .Lecb_dec_done
1510 .align 16
1511 .Lecb_dec_one:
1512 call _bsaes_decrypt8
1513 movdqu @XMM[0], 0x00($out) # write output

```

```

1514 jmp .Lecb_dec_done
1515 .align 16
1516 .Lecb_dec_short:
1517 lea ($inp), $arg1
1518 lea ($out), $arg2
1519 lea ($key), $arg3
1520 call asm_AES_decrypt
1521 lea 16($inp), $inp
1522 lea 16($out), $out
1523 dec $len
1524 jnz .Lecb_dec_short

1526 .Lecb_dec_done:
1527 lea (%rsp), %rax
1528 pxor %xmm0, %xmm0
1529 .Lecb_dec_bzero: # wipe key schedule [if any]
1530 movdqa %xmm0, 0x00(%rax)
1531 movdqa %xmm0, 0x10(%rax)
1532 lea 0x20(%rax), %rax
1533 cmp %rax, %rbp
1534 jb .Lecb_dec_bzero

1536 lea (%rbp), %rsp # restore %rsp
1537
1538 $code.<=<< if ($win64);
1539 movaps 0x40(%rbp), %xmm6
1540 movaps 0x50(%rbp), %xmm7
1541 movaps 0x60(%rbp), %xmm8
1542 movaps 0x70(%rbp), %xmm9
1543 movaps 0x80(%rbp), %xmm10
1544 movaps 0x90(%rbp), %xmm11
1545 movaps 0xa0(%rbp), %xmm12
1546 movaps 0xb0(%rbp), %xmm13
1547 movaps 0xc0(%rbp), %xmm14
1548 movaps 0xd0(%rbp), %xmm15
1549 lea 0xa0(%rbp), %rsp
1550
1551 $code.<=<< ;
1552 mov 0x48(%rsp), %r15
1553 mov 0x50(%rsp), %r14
1554 mov 0x58(%rsp), %r13
1555 mov 0x60(%rsp), %r12
1556 mov 0x68(%rsp), %rbx
1557 mov 0x70(%rsp), %rax
1558 lea 0x78(%rsp), %rsp
1559 mov %rax, %rbp
1560 .Lecb_dec_epilogue:
1561 ret
1562 .size _bsaes_ecb_decrypt_blocks, .-bsaes_ecb_decrypt_blocks
1563
1564 }
1565 $code.<=<< ;
1566 .extern asm_AES_cbc_encrypt
1567 .globl _bsaes_cbc_encrypt
1568 .type _bsaes_cbc_encrypt, @abi-omnipotent
1569 .align 16
1570 _bsaes_cbc_encrypt:
1571
1572 $code.<=<< if ($win64);
1573 mov 48(%rsp), $arg6 # pull direction flag
1574
1575 $code.<=<< ;
1576 cmp \0, $arg6
1577 jne asm_AES_cbc_encrypt
1578 cmp \128, $arg3
1579 jb asm_AES_cbc_encrypt

```

```

1581     mov     %rsp, %rax
1582 .Lcbc_dec_prologue:
1583     push    %rbp
1584     push    %rbx
1585     push    %r12
1586     push    %r13
1587     push    %r14
1588     push    %r15
1589     lea     -0x48(%rsp), %rsp
1590
1591     $code.<=<< if ($win64);
1592     mov     0xa0(%rsp), $arg5      # pull ivp
1593     lea     -0xa0(%rsp), %rsp
1594     movaps  %xmm6, 0x40(%rsp)
1595     movaps  %xmm7, 0x50(%rsp)
1596     movaps  %xmm8, 0x60(%rsp)
1597     movaps  %xmm9, 0x70(%rsp)
1598     movaps  %xmm10, 0x80(%rsp)
1599     movaps  %xmm11, 0x90(%rsp)
1600     movaps  %xmm12, 0xa0(%rsp)
1601     movaps  %xmm13, 0xb0(%rsp)
1602     movaps  %xmm14, 0xc0(%rsp)
1603     movaps  %xmm15, 0xd0(%rsp)
1604 .Lcbc_dec_body:
1605
1606     $code.<=<< ;
1607     mov     %rsp, %rbp            # backup %rsp
1608     mov     240($arg4), %eax      # rounds
1609     mov     $arg1, $inp           # backup arguments
1610     mov     $arg2, $out
1611     mov     $arg3, $len
1612     mov     $arg4, $key
1613     mov     $arg5, %rbx
1614     shr     \%4, $len             # bytes to blocks
1615
1616     mov     %eax, %edx            # rounds
1617     shl     \%7, %rax             # 128 bytes per inner round key
1618     sub     \%128-32, %rax        # size of bit-sliced key schedule
1619     sub     %rax, %rsp
1620
1621     mov     %rsp, %rax            # pass key schedule
1622     mov     $key, %rcx           # pass key
1623     mov     %edx, %r10d          # pass rounds
1624     call    _bsaes_key_convert
1625     pxor    (%rsp), %xmm7        # fix up 0 round key
1626     movdqa  %xmm6, (%rax)        # save last round key
1627     movdqa  %xmm7, (%rsp)
1628
1629     movdqu  (%rbx), @XMM[15]     # load IV
1630     sub     \%8, $len
1631 .Lcbc_dec_loop:
1632     movdqu  0x00($inp), @XMM[0]  # load input
1633     movdqu  0x10($inp), @XMM[1]
1634     movdqu  0x20($inp), @XMM[2]
1635     movdqu  0x30($inp), @XMM[3]
1636     movdqu  0x40($inp), @XMM[4]
1637     movdqu  0x50($inp), @XMM[5]
1638     mov     %rsp, %rax            # pass key schedule
1639     movdqu  0x60($inp), @XMM[6]
1640     mov     %edx, %r10d          # pass rounds
1641     movdqu  0x70($inp), @XMM[7]
1642     movdqa  @XMM[15], 0x20(%rbp) # put aside IV
1643
1644     call    _bsaes_decrypt8

```

```

1646     pxor    0x20(%rbp), @XMM[0]  # ^= IV
1647     movdqu  0x00($inp), @XMM[8]  # re-load input
1648     movdqu  0x10($inp), @XMM[9]
1649     pxor    @XMM[8], @XMM[1]
1650     movdqu  0x20($inp), @XMM[10]
1651     pxor    @XMM[9], @XMM[6]
1652     movdqu  0x30($inp), @XMM[11]
1653     pxor    @XMM[10], @XMM[4]
1654     movdqu  0x40($inp), @XMM[12]
1655     pxor    @XMM[11], @XMM[2]
1656     movdqu  0x50($inp), @XMM[13]
1657     pxor    @XMM[12], @XMM[7]
1658     movdqu  0x60($inp), @XMM[14]
1659     pxor    @XMM[13], @XMM[3]
1660     movdqu  0x70($inp), @XMM[15]  # IV
1661     pxor    @XMM[14], @XMM[5]
1662     movdqu  @XMM[0], 0x00($out)    # write output
1663     lea     0x80($inp), $inp
1664     movdqu  @XMM[1], 0x10($out)
1665     movdqu  @XMM[6], 0x20($out)
1666     movdqu  @XMM[4], 0x30($out)
1667     movdqu  @XMM[2], 0x40($out)
1668     movdqu  @XMM[7], 0x50($out)
1669     movdqu  @XMM[3], 0x60($out)
1670     movdqu  @XMM[5], 0x70($out)
1671     lea     0x80($out), $out
1672     sub     \%8, $len
1673     jnc     .Lcbc_dec_loop
1674
1675     add     \%8, $len
1676     jz      .Lcbc_dec_done
1677
1678     movdqu  0x00($inp), @XMM[0]  # load input
1679     mov     %rsp, %rax            # pass key schedule
1680     mov     %edx, %r10d          # pass rounds
1681     cmp     \%2, $len
1682     jb      .Lcbc_dec_one
1683     movdqu  0x10($inp), @XMM[1]
1684     je      .Lcbc_dec_two
1685     movdqu  0x20($inp), @XMM[2]
1686     cmp     \%4, $len
1687     jb      .Lcbc_dec_three
1688     movdqu  0x30($inp), @XMM[3]
1689     je      .Lcbc_dec_four
1690     movdqu  0x40($inp), @XMM[4]
1691     cmp     \%6, $len
1692     jb      .Lcbc_dec_five
1693     movdqu  0x50($inp), @XMM[5]
1694     je      .Lcbc_dec_six
1695     movdqu  0x60($inp), @XMM[6]
1696     movdqa  @XMM[15], 0x20(%rbp)  # put aside IV
1697     call    _bsaes_decrypt8
1698     pxor    0x20(%rbp), @XMM[0]  # ^= IV
1699     movdqu  0x00($inp), @XMM[8]  # re-load input
1700     movdqu  0x10($inp), @XMM[9]
1701     pxor    @XMM[8], @XMM[1]
1702     movdqu  0x20($inp), @XMM[10]
1703     pxor    @XMM[9], @XMM[6]
1704     movdqu  0x30($inp), @XMM[11]
1705     pxor    @XMM[10], @XMM[4]
1706     movdqu  0x40($inp), @XMM[12]
1707     pxor    @XMM[11], @XMM[2]
1708     movdqu  0x50($inp), @XMM[13]
1709     pxor    @XMM[12], @XMM[7]
1710     movdqu  0x60($inp), @XMM[15]  # IV
1711     pxor    @XMM[13], @XMM[3]

```

```

1712 movdqu @XMM[0], 0x00($out) # write output
1713 movdqu @XMM[1], 0x10($out)
1714 movdqu @XMM[6], 0x20($out)
1715 movdqu @XMM[4], 0x30($out)
1716 movdqu @XMM[2], 0x40($out)
1717 movdqu @XMM[7], 0x50($out)
1718 movdqu @XMM[3], 0x60($out)
1719 jmp .Lcbc_dec_done
1720 .align 16
1721 .Lcbc_dec_six:
1722 movdqa @XMM[15], 0x20(%rbp) # put aside IV
1723 call _bsaes_decrypt8
1724 pxor 0x20(%rbp), @XMM[0] # ^= IV
1725 movdqu 0x00($inp), @XMM[8] # re-load input
1726 movdqu 0x10($inp), @XMM[9]
1727 pxor @XMM[8], @XMM[1]
1728 movdqu 0x20($inp), @XMM[10]
1729 pxor @XMM[9], @XMM[6]
1730 movdqu 0x30($inp), @XMM[11]
1731 pxor @XMM[10], @XMM[4]
1732 movdqu 0x40($inp), @XMM[12]
1733 pxor @XMM[11], @XMM[2]
1734 movdqu 0x50($inp), @XMM[15] # IV
1735 pxor @XMM[12], @XMM[7]
1736 movdqu @XMM[0], 0x00($out) # write output
1737 movdqu @XMM[1], 0x10($out)
1738 movdqu @XMM[6], 0x20($out)
1739 movdqu @XMM[4], 0x30($out)
1740 movdqu @XMM[2], 0x40($out)
1741 movdqu @XMM[7], 0x50($out)
1742 jmp .Lcbc_dec_done
1743 .align 16
1744 .Lcbc_dec_five:
1745 movdqa @XMM[15], 0x20(%rbp) # put aside IV
1746 call _bsaes_decrypt8
1747 pxor 0x20(%rbp), @XMM[0] # ^= IV
1748 movdqu 0x00($inp), @XMM[8] # re-load input
1749 movdqu 0x10($inp), @XMM[9]
1750 pxor @XMM[8], @XMM[1]
1751 movdqu 0x20($inp), @XMM[10]
1752 pxor @XMM[9], @XMM[6]
1753 movdqu 0x30($inp), @XMM[11]
1754 pxor @XMM[10], @XMM[4]
1755 movdqu 0x40($inp), @XMM[15] # IV
1756 pxor @XMM[11], @XMM[2]
1757 movdqu @XMM[0], 0x00($out) # write output
1758 movdqu @XMM[1], 0x10($out)
1759 movdqu @XMM[6], 0x20($out)
1760 movdqu @XMM[4], 0x30($out)
1761 movdqu @XMM[2], 0x40($out)
1762 jmp .Lcbc_dec_done
1763 .align 16
1764 .Lcbc_dec_four:
1765 movdqa @XMM[15], 0x20(%rbp) # put aside IV
1766 call _bsaes_decrypt8
1767 pxor 0x20(%rbp), @XMM[0] # ^= IV
1768 movdqu 0x00($inp), @XMM[8] # re-load input
1769 movdqu 0x10($inp), @XMM[9]
1770 pxor @XMM[8], @XMM[1]
1771 movdqu 0x20($inp), @XMM[10]
1772 pxor @XMM[9], @XMM[6]
1773 movdqu 0x30($inp), @XMM[15] # IV
1774 pxor @XMM[10], @XMM[4]
1775 movdqu @XMM[0], 0x00($out) # write output
1776 movdqu @XMM[1], 0x10($out)
1777 movdqu @XMM[6], 0x20($out)

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1778 movdqu @XMM[4], 0x30($out)
1779 jmp .Lcbc_dec_done
1780 .align 16
1781 .Lcbc_dec_three:
1782 movdqa @XMM[15], 0x20(%rbp) # put aside IV
1783 call _bsaes_decrypt8
1784 pxor 0x20(%rbp), @XMM[0] # ^= IV
1785 movdqu 0x00($inp), @XMM[8] # re-load input
1786 movdqu 0x10($inp), @XMM[9]
1787 pxor @XMM[8], @XMM[1]
1788 movdqu 0x20($inp), @XMM[15] # IV
1789 pxor @XMM[9], @XMM[6]
1790 movdqu @XMM[0], 0x00($out) # write output
1791 movdqu @XMM[1], 0x10($out)
1792 movdqu @XMM[6], 0x20($out)
1793 jmp .Lcbc_dec_done
1794 .align 16
1795 .Lcbc_dec_two:
1796 movdqa @XMM[15], 0x20(%rbp) # put aside IV
1797 call _bsaes_decrypt8
1798 pxor 0x20(%rbp), @XMM[0] # ^= IV
1799 movdqu 0x00($inp), @XMM[8] # re-load input
1800 movdqu 0x10($inp), @XMM[15] # IV
1801 pxor @XMM[8], @XMM[1]
1802 movdqu @XMM[0], 0x00($out) # write output
1803 movdqu @XMM[1], 0x10($out)
1804 jmp .Lcbc_dec_done
1805 .align 16
1806 .Lcbc_dec_one:
1807 lea ($inp), $arg1
1808 lea 0x20(%rbp), $arg2 # buffer output
1809 lea ($key), $arg3
1810 call asm_AES_decrypt # doesn't touch %xmm
1811 pxor 0x20(%rbp), @XMM[15] # ^= IV
1812 movdqu @XMM[15], ($out) # write output
1813 movdqa @XMM[0], @XMM[15] # IV

1815 .Lcbc_dec_done:
1816 movdqu @XMM[15], (%rbx) # return IV
1817 lea (%rsp), %rax
1818 pxor %xmm0, %xmm0
1819 .Lcbc_dec_bzero: # wipe key schedule [if any]
1820 movdqa %xmm0, 0x00(%rax)
1821 movdqa %xmm0, 0x10(%rax)
1822 lea 0x20(%rax), %rax
1823 cmp %rax, %rbp
1824 ja .Lcbc_dec_bzero

1826 lea (%rbp), %rsp # restore %rsp
1827
1828 $code.=<<__ if ($win64);
1829 movaps 0x40(%rbp), %xmm6
1830 movaps 0x50(%rbp), %xmm7
1831 movaps 0x60(%rbp), %xmm8
1832 movaps 0x70(%rbp), %xmm9
1833 movaps 0x80(%rbp), %xmm10
1834 movaps 0x90(%rbp), %xmm11
1835 movaps 0xa0(%rbp), %xmm12
1836 movaps 0xb0(%rbp), %xmm13
1837 movaps 0xc0(%rbp), %xmm14
1838 movaps 0xd0(%rbp), %xmm15
1839 lea 0xa0(%rbp), %rsp
1840
1841 $code.=<<__;
1842 mov 0x48(%rsp), %r15
1843 mov 0x50(%rsp), %r14

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1844     mov     0x58(%rsp), %r13
1845     mov     0x60(%rsp), %r12
1846     mov     0x68(%rsp), %rbx
1847     mov     0x70(%rsp), %rax
1848     lea     0x78(%rsp), %rsp
1849     mov     %rax, %rbp
1850 .Lcbc_dec_epilogue:
1851     ret
1852 .size     bsaes_cbc_encrypt,.-bsaes_cbc_encrypt

1854 .globl   bsaes_ctr32_encrypt_blocks
1855 .type    bsaes_ctr32_encrypt_blocks, \@abi-omnipotent
1856 .align   16
1857 bsaes_ctr32_encrypt_blocks:
1858     mov     %rsp, %rax
1859 .Lctr_enc_prologue:
1860     push    %rbp
1861     push    %rbx
1862     push    %r12
1863     push    %r13
1864     push    %r14
1865     push    %r15
1866     lea     -0x48(%rsp), %rsp
1867
1868 $code.=<<< if ($win64);
1869     mov     0xa0(%rsp), $arg5          # pull ivp
1870     lea     -0xa0(%rsp), %rsp
1871     movaps  %xmm6, 0x40(%rsp)
1872     movaps  %xmm7, 0x50(%rsp)
1873     movaps  %xmm8, 0x60(%rsp)
1874     movaps  %xmm9, 0x70(%rsp)
1875     movaps  %xmm10, 0x80(%rsp)
1876     movaps  %xmm11, 0x90(%rsp)
1877     movaps  %xmm12, 0xa0(%rsp)
1878     movaps  %xmm13, 0xb0(%rsp)
1879     movaps  %xmm14, 0xc0(%rsp)
1880     movaps  %xmm15, 0xd0(%rsp)
1881 .Lctr_enc_body:
1882
1883 $code.=<<< ;
1884     mov     %rsp, %rbp                # backup %rsp
1885     movdqu  ($arg5), %xmm0            # load counter
1886     mov     240($arg4), %eax          # rounds
1887     mov     $arg1, $inp               # backup arguments
1888     mov     $arg2, $out
1889     mov     $arg3, $len
1890     mov     $arg4, $key
1891     movdqa  %xmm0, 0x20(%rbp)         # copy counter
1892     cmp     \$. $arg3
1893     jb      .Lctr_enc_short

1895     mov     %eax, %ebx                # rounds
1896     shl     \$. %rax                  # 128 bytes per inner round key
1897     sub     \$. 128, %rax             # size of bit-sliced key schedule
1898     sub     %rax, %rsp

1900     mov     %rsp, %rax                # pass key schedule
1901     mov     $key, %rcx                # pass key
1902     mov     %ebx, %r10d               # pass rounds
1903     call    _bsaes_key_convert
1904     pxor    %xmm6, %xmm7              # fix up last round key
1905     movdqa  %xmm7, (%rax)             # save last round key

1907     movdqa  (%rsp), @XMM[9]           # load round0 key
1908     lea     .LADD1(%rip), %r11
1909     movdqa  0x20(%rbp), @XMM[0]      # counter copy

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```

1910     movdqa  -0x20(%r11), @XMM[8]     # .LSWPUP
1911     pshufb  @XMM[8], @XMM[9]         # byte swap upper part
1912     pshufb  @XMM[8], @XMM[0]
1913     movdqa  @XMM[9], (%rsp)          # save adjusted round0 key
1914     jmp     .Lctr_enc_loop
1915 .align     16
1916 .Lctr_enc_loop:
1917     movdqa  @XMM[0], 0x20(%rbp)       # save counter
1918     movdqa  @XMM[0], @XMM[1]         # prepare 8 counter values
1919     movdqa  @XMM[0], @XMM[2]
1920     paddb   0x00(%r11), @XMM[1]     # .LADD1
1921     movdqa  @XMM[0], @XMM[3]
1922     paddb   0x10(%r11), @XMM[2]     # .LADD2
1923     movdqa  @XMM[0], @XMM[4]
1924     paddb   0x20(%r11), @XMM[3]     # .LADD3
1925     movdqa  @XMM[0], @XMM[5]
1926     paddb   0x30(%r11), @XMM[4]     # .LADD4
1927     movdqa  @XMM[0], @XMM[6]
1928     paddb   0x40(%r11), @XMM[5]     # .LADD5
1929     movdqa  @XMM[0], @XMM[7]
1930     paddb   0x50(%r11), @XMM[6]     # .LADD6
1931     paddb   0x60(%r11), @XMM[7]     # .LADD7

1933     # Borrow prologue from _bsaes_encrypt8 to use the opportunity
1934     # to flip byte order in 32-bit counter
1935     movdqa  (%rsp), @XMM[9]          # round 0 key
1936     lea     0x10(%rsp), %rax         # pass key schedule
1937     movdqa  -0x10(%r11), @XMM[8]    # .LSWPUPM0SR
1938     pxor    @XMM[9], @XMM[0]        # xor with round0 key
1939     pxor    @XMM[9], @XMM[1]
1940     pshufb  @XMM[8], @XMM[0]
1941     pxor    @XMM[9], @XMM[2]
1942     pshufb  @XMM[8], @XMM[1]
1943     pxor    @XMM[9], @XMM[3]
1944     pshufb  @XMM[8], @XMM[2]
1945     pxor    @XMM[9], @XMM[4]
1946     pshufb  @XMM[8], @XMM[3]
1947     pxor    @XMM[9], @XMM[5]
1948     pshufb  @XMM[8], @XMM[4]
1949     pxor    @XMM[9], @XMM[6]
1950     pshufb  @XMM[8], @XMM[5]
1951     pxor    @XMM[9], @XMM[7]
1952     pshufb  @XMM[8], @XMM[6]
1953     lea     .LBS0(%rip), %r11        # constants table
1954     pshufb  @XMM[8], @XMM[7]
1955     mov     %ebx, %r10d              # pass rounds

1957     call    _bsaes_encrypt8_bitslice

1959     sub     \$. $len
1960     jc      .Lctr_enc_loop_done

1962     movdqu  0x00($inp), @XMM[8]      # load input
1963     movdqu  0x10($inp), @XMM[9]
1964     movdqu  0x20($inp), @XMM[10]
1965     movdqu  0x30($inp), @XMM[11]
1966     movdqu  0x40($inp), @XMM[12]
1967     movdqu  0x50($inp), @XMM[13]
1968     movdqu  0x60($inp), @XMM[14]
1969     movdqu  0x70($inp), @XMM[15]
1970     lea     0x80($inp), $inp
1971     pxor    @XMM[0], @XMM[8]
1972     movdqa  0x20(%rbp), @XMM[0]     # load counter
1973     pxor    @XMM[9], @XMM[1]
1974     movdqu  @XMM[8], 0x00($out)     # write output
1975     pxor    @XMM[10], @XMM[4]

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```

1976      movdqu @XMM[1], 0x10($out)
1977      pxor    @XMM[11], @XMM[6]
1978      movdqu @XMM[4], 0x20($out)
1979      pxor    @XMM[12], @XMM[3]
1980      movdqu @XMM[6], 0x30($out)
1981      pxor    @XMM[13], @XMM[7]
1982      movdqu @XMM[3], 0x40($out)
1983      pxor    @XMM[14], @XMM[2]
1984      movdqu @XMM[7], 0x50($out)
1985      pxor    @XMM[15], @XMM[5]
1986      movdqu @XMM[2], 0x60($out)
1987      lea     .LADD1(%rip), %r11
1988      movdqu @XMM[5], 0x70($out)
1989      lea     0x80($out), %out
1990      pdddd  0x70(%r11), @XMM[0]      # .LADD8
1991      jnz     .Lctr_enc_loop

1993      jmp     .Lctr_enc_done
1994      .align 16
1995      .Lctr_enc_loop_done:
1996      add     \($, $len
1997      movdqu 0x00($inp), @XMM[8]      # load input
1998      pxor    @XMM[8], @XMM[0]
1999      movdqu @XMM[0], 0x00($out)      # write output
2000      cmp     \($, $len
2001      jb     .Lctr_enc_done
2002      movdqu 0x10($inp), @XMM[9]
2003      pxor    @XMM[9], @XMM[1]
2004      movdqu @XMM[1], 0x10($out)
2005      je     .Lctr_enc_done
2006      movdqu 0x20($inp), @XMM[10]
2007      pxor    @XMM[10], @XMM[4]
2008      movdqu @XMM[4], 0x20($out)
2009      cmp     \($, $len
2010      jb     .Lctr_enc_done
2011      movdqu 0x30($inp), @XMM[11]
2012      pxor    @XMM[11], @XMM[6]
2013      movdqu @XMM[6], 0x30($out)
2014      je     .Lctr_enc_done
2015      movdqu 0x40($inp), @XMM[12]
2016      pxor    @XMM[12], @XMM[3]
2017      movdqu @XMM[3], 0x40($out)
2018      cmp     \($, $len
2019      jb     .Lctr_enc_done
2020      movdqu 0x50($inp), @XMM[13]
2021      pxor    @XMM[13], @XMM[7]
2022      movdqu @XMM[7], 0x50($out)
2023      je     .Lctr_enc_done
2024      movdqu 0x60($inp), @XMM[14]
2025      pxor    @XMM[14], @XMM[2]
2026      movdqu @XMM[2], 0x60($out)
2027      jmp     .Lctr_enc_done

2029      .align 16
2030      .Lctr_enc_short:
2031      lea     0x20(%rbp), %arg1
2032      lea     0x30(%rbp), %arg2
2033      lea     ($key), %arg3
2034      call    asm_AES_encrypt
2035      movdqu ($inp), @XMM[1]
2036      lea     16($inp), %inp
2037      mov     0x2c(%rbp), %eax      # load 32-bit counter
2038      bswap   %eax
2039      pxor    0x30(%rbp), @XMM[1]
2040      inc     %eax                  # increment
2041      movdqu @XMM[1], ($out)

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2042      bswap   %eax
2043      lea     16($out), %out
2044      mov     %eax, 0x2c(%rsp)      # save 32-bit counter
2045      dec     $len
2046      jnz     .Lctr_enc_short

2048      .Lctr_enc_done:
2049      lea     (%rsp), %rax
2050      pxor    %xmm0, %xmm0
2051      .Lctr_enc_bzero:              # wipe key schedule [if any]
2052      movdqa  %xmm0, 0x00(%rax)
2053      movdqa  %xmm0, 0x10(%rax)
2054      lea     0x20(%rax), %rax
2055      cmp     %rax, %rbp
2056      ja      .Lctr_enc_bzero

2058      lea     (%rbp), %rsp          # restore %rsp
2059
2060      $code.=<<< if ($win64);
2061      movaps  0x40(%rbp), %xmm6
2062      movaps  0x50(%rbp), %xmm7
2063      movaps  0x60(%rbp), %xmm8
2064      movaps  0x70(%rbp), %xmm9
2065      movaps  0x80(%rbp), %xmm10
2066      movaps  0x90(%rbp), %xmm11
2067      movaps  0xa0(%rbp), %xmm12
2068      movaps  0xb0(%rbp), %xmm13
2069      movaps  0xc0(%rbp), %xmm14
2070      movaps  0xd0(%rbp), %xmm15
2071      lea     0xa0(%rbp), %rsp
2072
2073      $code.=<<< ;
2074      mov     0x48(%rsp), %r15
2075      mov     0x50(%rsp), %r14
2076      mov     0x58(%rsp), %r13
2077      mov     0x60(%rsp), %r12
2078      mov     0x68(%rsp), %rbx
2079      mov     0x70(%rsp), %rax
2080      lea     0x78(%rsp), %rsp
2081      mov     %rax, %rbp
2082      .Lctr_enc_epilogue:
2083      ret
2084      .size    baes_ctr32_encrypt_blocks, .-baes_ctr32_encrypt_blocks
2085
2086      #####
2087      # void baes_xts_encrypt(const char *inp, char *out, size_t len,
2088      #   const AES_KEY *key1, const AES_KEY *key2,
2089      #   const unsigned char iv[16]);
2090      #
2091      my ($twmask, $twres, $twtmp) = @XMM[13..15];
2092      $arg6 = -s/d$//;

2094      $code.=<<< ;
2095      .globl  baes_xts_encrypt
2096      .type   baes_xts_encrypt, @abi-omnipotent
2097      .align 16
2098      baes_xts_encrypt:
2099      mov     %rsp, %rax
2100      .Lxts_enc_prologue:
2101      push    %rbp
2102      push    %rbx
2103      push    %r12
2104      push    %r13
2105      push    %r14
2106      push    %r15
2107      lea     -0x48(%rsp), %rsp

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```

2108 _____
2109 $code.=<< if ($win64);
2110     mov     0xa0(%rsp), $arg5      # pull key2
2111     mov     0xa8(%rsp), $arg6      # pull ivp
2112     lea     -0xa0(%rsp), %rsp
2113     movaps  %xmm6, 0x40(%rsp)
2114     movaps  %xmm7, 0x50(%rsp)
2115     movaps  %xmm8, 0x60(%rsp)
2116     movaps  %xmm9, 0x70(%rsp)
2117     movaps  %xmm10, 0x80(%rsp)
2118     movaps  %xmm11, 0x90(%rsp)
2119     movaps  %xmm12, 0xa0(%rsp)
2120     movaps  %xmm13, 0xb0(%rsp)
2121     movaps  %xmm14, 0xc0(%rsp)
2122     movaps  %xmm15, 0xd0(%rsp)
2123 .Lxts_enc_body:
2124 _____
2125 $code.=<< _____;
2126     mov     %rsp, %rbp             # backup %rsp
2127     mov     $arg1, $inp            # backup arguments
2128     mov     $arg2, $out
2129     mov     $arg3, $len
2130     mov     $arg4, $key
2131
2132     lea     ($arg6), $arg1
2133     lea     0x20(%rbp), $arg2
2134     lea     ($arg5), $arg3
2135     call    asm_AES_encrypt        # generate initial tweak
2136
2137     mov     240($key), %eax        # rounds
2138     mov     $len, %rbx            # backup $len
2139
2140     mov     %eax, %edx            # rounds
2141     shl     \ $7, %rax            # 128 bytes per inner round key
2142     sub     \ $'128-32', %rax     # size of bit-sliced key schedule
2143     sub     %rax, %rsp
2144
2145     mov     %rsp, %rax            # pass key schedule
2146     mov     $key, %rcx            # pass key
2147     mov     %edx, %r10d           # pass rounds
2148     call    _baes_key_convert
2149     pxor    %xmm6, %xmm7         # fix up last round key
2150     movdqa  %xmm7, (%rax)         # save last round key
2151
2152     and     \ $-16, $len          # place for tweak[8]
2153     sub     \ $0x80, %rsp        # initial tweak
2154     movdqa  0x20(%rbp), @XMM[7]
2155
2156     pxor    $twtmp, $twtmp
2157     movdqa  .Lxts_magic(%rip), $twtmask
2158     pcmpgtd @XMM[7], $twtmp      # broadcast upper bits
2159
2160     sub     \ $0x80, $len
2161     jc      .Lxts_enc_short
2162     jmp     .Lxts_enc_loop
2163
2164 .align 16
2165 .Lxts_enc_loop:
2166 _____
2167     for ($i=0; $i<7; $i++) {
2168         $code.=<< _____;
2169         pshufd \ $0x13, $twtmp, $twtres
2170         pxor   $twtmp, $twtmp
2171         movdqa @XMM[7], @XMM[$i]
2172         movdqa @XMM[7], '0x10*$i'(%rsp) # save tweak[$i]
2173         paddq  @XMM[7], @XMM[7]         # psllq 1, $tweak

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2174     pand    $twtmask, $twtres     # isolate carry and residue
2175     pcmpgtd @XMM[7], $twtmp      # broadcast upper bits
2176     pxor    $twtres, @XMM[7]
2177 _____
2178     $code.=<< _____ if ($i>=1);
2179     movdqu  '0x10*$i-1'($inp), @XMM[8+$i-1]
2180 _____
2181     $code.=<< _____ if ($i>=2);
2182     pxor    @XMM[8+$i-2], @XMM[$i-2] # input[] ^ tweak[]
2183     }
2184 _____
2185 $code.=<< _____;
2186     movdqu  0x60($inp), @XMM[8+6]
2187     pxor    @XMM[8+5], @XMM[5]
2188     movdqu  0x70($inp), @XMM[8+7]
2189     lea     0x80($inp), $inp
2190     movdqa  @XMM[7], 0x70(%rsp)
2191     pxor    @XMM[8+6], @XMM[6]
2192     lea     0x80(%rsp), %rax      # pass key schedule
2193     pxor    @XMM[8+7], @XMM[7]
2194     mov     %edx, %r10d          # pass rounds
2195
2196     call    _baes_encrypt8
2197
2198     pxor    0x00(%rsp), @XMM[0]  # ^= tweak[]
2199     pxor    0x10(%rsp), @XMM[1]
2200     movdqu  @XMM[0], 0x00($out)   # write output
2201     pxor    0x20(%rsp), @XMM[4]
2202     movdqu  @XMM[1], 0x10($out)
2203     pxor    0x30(%rsp), @XMM[6]
2204     movdqu  @XMM[4], 0x20($out)
2205     pxor    0x40(%rsp), @XMM[3]
2206     movdqu  @XMM[6], 0x30($out)
2207     pxor    0x50(%rsp), @XMM[7]
2208     movdqu  @XMM[3], 0x40($out)
2209     pxor    0x60(%rsp), @XMM[2]
2210     movdqu  @XMM[7], 0x50($out)
2211     pxor    0x70(%rsp), @XMM[5]
2212     movdqu  @XMM[2], 0x60($out)
2213     movdqu  @XMM[5], 0x70($out)
2214     lea     0x80($out), $out
2215
2216     movdqa  0x70(%rsp), @XMM[7]  # prepare next iteration tweak
2217     pxor    $twtmp, $twtmp
2218     movdqa  .Lxts_magic(%rip), $twtmask
2219     pcmpgtd @XMM[7], $twtmp
2220     pshufd  \ $0x13, $twtmp, $twtres
2221     pxor    $twtmp, $twtmp
2222     paddq   @XMM[7], @XMM[7]     # psllq 1, $tweak
2223     pand    $twtmask, $twtres    # isolate carry and residue
2224     pcmpgtd @XMM[7], $twtmp      # broadcast upper bits
2225     pxor    $twtres, @XMM[7]
2226
2227     sub     \ $0x80, $len
2228     jnc     .Lxts_enc_loop
2229
2230 .Lxts_enc_short:
2231     add     \ $0x80, $len
2232     jz      .Lxts_enc_done
2233 _____
2234     for ($i=0; $i<7; $i++) {
2235         $code.=<< _____;
2236         pshufd \ $0x13, $twtmp, $twtres
2237         pxor   $twtmp, $twtmp
2238         movdqa @XMM[7], @XMM[$i]
2239         movdqa @XMM[7], '0x10*$i'(%rsp) # save tweak[$i]

```

```

2240      paddq    @XMM[7], @XMM[7]      # psllq 1,$tweak
2241      pand     $tmask, $twres         # isolate carry and residue
2242      pcmptgt  @XMM[7], $twtmp        # broadcast upper bits
2243      pxor     $twres, @XMM[7]
2244
2245      $code.=<<__ if ($i>=1);
2246      movdqu   '0x10*($i-1)'($inp), @XMM[8+$i-1]
2247      cmp      \'$0x10*$i', $len
2248      je       .Lxts_enc_$i
2249
2250      $code.=<<__ if ($i>=2);
2251      pxor     @XMM[8+$i-2], @XMM[$i-2]# input[] ^ tweak[]
2252
2253      }
2254      $code.=<<__ ;
2255      movdqu   0x60($inp), @XMM[8+6]
2256      pxor     @XMM[8+5], @XMM[5]
2257      movdqa   @XMM[7], 0x70(%rsp)
2258      lea      0x70($inp), $inp
2259      pxor     @XMM[8+6], @XMM[6]
2260      lea      0x80(%rsp), %rax
2261      mov      %edx, %r10d             # pass key schedule
2262                                     # pass rounds
2263
2264      call     _bsaes_encrypt8
2265
2266      pxor     0x00(%rsp), @XMM[0]    # ^= tweak[]
2267      pxor     0x10(%rsp), @XMM[1]
2268      movdqu   @XMM[0], 0x00($out)    # write output
2269      pxor     0x20(%rsp), @XMM[4]
2270      movdqu   @XMM[1], 0x10($out)
2271      pxor     0x30(%rsp), @XMM[6]
2272      movdqu   @XMM[4], 0x20($out)
2273      pxor     0x40(%rsp), @XMM[3]
2274      movdqu   @XMM[6], 0x30($out)
2275      pxor     0x50(%rsp), @XMM[7]
2276      movdqu   @XMM[3], 0x40($out)
2277      pxor     0x60(%rsp), @XMM[2]
2278      movdqu   @XMM[7], 0x50($out)
2279      movdqu   @XMM[2], 0x60($out)
2280      lea      0x70($out), $out
2281
2282      movdqa   0x70(%rsp), @XMM[7]    # next iteration tweak
2283      jmp      .Lxts_enc_done
2284
2285      .align   16
2286      .Lxts_enc_6:
2287      pxor     @XMM[8+4], @XMM[4]
2288      lea      0x60($inp), $inp
2289      pxor     @XMM[8+5], @XMM[5]
2290      lea      0x80(%rsp), %rax
2291      mov      %edx, %r10d             # pass key schedule
2292                                     # pass rounds
2293
2294      call     _bsaes_encrypt8
2295
2296      pxor     0x00(%rsp), @XMM[0]    # ^= tweak[]
2297      pxor     0x10(%rsp), @XMM[1]
2298      movdqu   @XMM[0], 0x00($out)    # write output
2299      pxor     0x20(%rsp), @XMM[4]
2300      movdqu   @XMM[1], 0x10($out)
2301      pxor     0x30(%rsp), @XMM[6]
2302      movdqu   @XMM[4], 0x20($out)
2303      pxor     0x40(%rsp), @XMM[3]
2304      movdqu   @XMM[6], 0x30($out)
2305      pxor     0x50(%rsp), @XMM[7]
2306      movdqu   @XMM[3], 0x40($out)
2307      pxor     0x60(%rsp), @XMM[2]
2308      movdqu   @XMM[7], 0x50($out)
2309      movdqu   @XMM[2], 0x60($out)
2310      lea      0x70($out), $out

```

```

2307      movdqa   0x60(%rsp), @XMM[7]    # next iteration tweak
2308      jmp      .Lxts_enc_done
2309
2310      .align   16
2311      .Lxts_enc_5:
2312      pxor     @XMM[8+3], @XMM[3]
2313      lea      0x50($inp), $inp
2314      pxor     @XMM[8+4], @XMM[4]
2315      lea      0x80(%rsp), %rax
2316      mov      %edx, %r10d             # pass key schedule
2317                                     # pass rounds
2318
2319      call     _bsaes_encrypt8
2320
2321      pxor     0x00(%rsp), @XMM[0]    # ^= tweak[]
2322      pxor     0x10(%rsp), @XMM[1]
2323      movdqu   @XMM[0], 0x00($out)    # write output
2324      pxor     0x20(%rsp), @XMM[4]
2325      movdqu   @XMM[1], 0x10($out)
2326      pxor     0x30(%rsp), @XMM[6]
2327      movdqu   @XMM[4], 0x20($out)
2328      pxor     0x40(%rsp), @XMM[3]
2329      movdqu   @XMM[6], 0x30($out)
2330      movdqu   @XMM[3], 0x40($out)
2331      lea      0x50($out), $out
2332
2333      movdqa   0x50(%rsp), @XMM[7]    # next iteration tweak
2334      jmp      .Lxts_enc_done
2335
2336      .align   16
2337      .Lxts_enc_4:
2338      pxor     @XMM[8+2], @XMM[2]
2339      lea      0x40($inp), $inp
2340      pxor     @XMM[8+3], @XMM[3]
2341      lea      0x80(%rsp), %rax
2342      mov      %edx, %r10d             # pass key schedule
2343                                     # pass rounds
2344
2345      call     _bsaes_encrypt8
2346
2347      pxor     0x00(%rsp), @XMM[0]    # ^= tweak[]
2348      pxor     0x10(%rsp), @XMM[1]
2349      movdqu   @XMM[0], 0x00($out)    # write output
2350      pxor     0x20(%rsp), @XMM[4]
2351      movdqu   @XMM[1], 0x10($out)
2352      pxor     0x30(%rsp), @XMM[6]
2353      movdqu   @XMM[4], 0x20($out)
2354      movdqu   @XMM[6], 0x30($out)
2355      lea      0x40($out), $out
2356
2357      movdqa   0x40(%rsp), @XMM[7]    # next iteration tweak
2358      jmp      .Lxts_enc_done
2359
2360      .align   16
2361      .Lxts_enc_3:
2362      pxor     @XMM[8+1], @XMM[1]
2363      lea      0x30($inp), $inp
2364      pxor     @XMM[8+2], @XMM[2]
2365      lea      0x80(%rsp), %rax
2366      mov      %edx, %r10d             # pass key schedule
2367                                     # pass rounds
2368
2369      call     _bsaes_encrypt8
2370
2371      pxor     0x00(%rsp), @XMM[0]    # ^= tweak[]
2372      pxor     0x10(%rsp), @XMM[1]
2373      movdqu   @XMM[0], 0x00($out)    # write output
2374      pxor     0x20(%rsp), @XMM[4]
2375      movdqu   @XMM[1], 0x10($out)
2376      pxor     0x30(%rsp), @XMM[6]
2377      movdqu   @XMM[4], 0x20($out)
2378      movdqu   @XMM[6], 0x30($out)
2379      lea      0x40($out), $out

```

```

2373      movdqa 0x30(%rsp), @XMM[7]      # next iteration tweak
2374      jmp     .Lxts_enc_done
2375  .align 16
2376  .Lxts_enc_2:
2377      pxor    @XMM[8+0], @XMM[0]
2378      lea     0x20($inp), $inp
2379      pxor    @XMM[8+1], @XMM[1]
2380      lea     0x80(%rsp), %rax
2381      mov     %edx, %r10d                # pass key schedule
                                         # pass rounds

2383      call    _bsaes_encrypt8

2385      pxor    0x00(%rsp), @XMM[0]      # ^= tweak[]
2386      pxor    0x10(%rsp), @XMM[1]
2387      movdqu  @XMM[0], 0x00($out)
2388      movdqu  @XMM[1], 0x10($out)
2389      lea     0x20($out), $out

2391      movdqa 0x20(%rsp), @XMM[7]      # next iteration tweak
2392      jmp     .Lxts_enc_done
2393  .align 16
2394  .Lxts_enc_1:
2395      pxor    @XMM[0], @XMM[8]
2396      lea     0x10($inp), $inp
2397      movdqa  @XMM[8], 0x20(%rbp)
2398      lea     0x20(%rbp), $arg1
2399      lea     0x20(%rbp), $arg2
2400      lea     ($key), $arg3
2401      call    asm_AES_encrypt          # doesn't touch %xmm
2402      pxor    0x20(%rbp), @XMM[0]      # ^= tweak[]
2403      #pxor    @XMM[8], @XMM[0]
2404      #lea     0x80(%rsp), %rax
2405      #mov     %edx, %r10d
2406      #call    _bsaes_encrypt8
2407      #pxor    0x00(%rsp), @XMM[0]
2408      movdqu  @XMM[0], 0x00($out)
2409      lea     0x10($out), $out

2411      movdqa 0x10(%rsp), @XMM[7]      # next iteration tweak

2413  .Lxts_enc_done:
2414      and     \%$15, %ebx
2415      jz      .Lxts_enc_ret
2416      mov     $out, %rdx

2418  .Lxts_enc_steal:
2419      movzb   ($inp), %eax
2420      movzb   -16(%rdx), %ecx
2421      lea     1($inp), $inp
2422      mov     %al, -16(%rdx)
2423      mov     %cl, 0(%rdx)
2424      lea     1(%rdx), %rdx
2425      sub     \%$1, %ebx
2426      jnz     .Lxts_enc_steal

2428      movdqu  -16($out), @XMM[0]
2429      lea     0x20(%rbp), $arg1
2430      pxor    @XMM[7], @XMM[0]
2431      lea     0x20(%rbp), $arg2
2432      movdqa  @XMM[0], 0x20(%rbp)
2433      lea     ($key), $arg3
2434      call    asm_AES_encrypt          # doesn't touch %xmm
2435      pxor    0x20(%rbp), @XMM[7]
2436      movdqu  @XMM[7], -16($out)

```

```

2438  .Lxts_enc_ret:
2439      lea     (%rsp), %rax
2440      pxor    %xmm0, %xmm0
2441  .Lxts_enc_bzero:
2442      movdqa  %xmm0, 0x00(%rax)
2443      movdqa  %xmm0, 0x10(%rax)
2444      lea     0x20(%rax), %rax
2445      cmp     %rax, %rbp
2446      ja      .Lxts_enc_bzero

2448      lea     (%rbp), %rsp              # restore %rsp

2450  $code.=<<< if ($win64);
2451      movaps  0x40(%rbp), %xmm6
2452      movaps  0x50(%rbp), %xmm7
2453      movaps  0x60(%rbp), %xmm8
2454      movaps  0x70(%rbp), %xmm9
2455      movaps  0x80(%rbp), %xmm10
2456      movaps  0x90(%rbp), %xmm11
2457      movaps  0xa0(%rbp), %xmm12
2458      movaps  0xb0(%rbp), %xmm13
2459      movaps  0xc0(%rbp), %xmm14
2460      movaps  0xd0(%rbp), %xmm15
2461      lea     0xa0(%rbp), %rsp
2462
2463  $code.=<<< ;
2464      mov     0x48(%rsp), %r15
2465      mov     0x50(%rsp), %r14
2466      mov     0x58(%rsp), %r13
2467      mov     0x60(%rsp), %r12
2468      mov     0x68(%rsp), %rbx
2469      mov     0x70(%rsp), %rax
2470      lea     0x78(%rsp), %rsp
2471      mov     %rax, %rbp
2472  .Lxts_enc_epilogue:
2473      ret
2474  .size      bsaes_xts_encrypt, .-bsaes_xts_encrypt

2476  .globl     bsaes_xts_decrypt
2477  .type      bsaes_xts_decrypt, \@abi-omnipotent
2478  .align 16
2479  bsaes_xts_decrypt:
2480      mov     %rsp, %rax
2481  .Lxts_dec_prologue:
2482      push    %rbp
2483      push    %rbx
2484      push    %r12
2485      push    %r13
2486      push    %r14
2487      push    %r15
2488      lea     -0x48(%rsp), %rsp
2489
2490  $code.=<<< if ($win64);
2491      mov     0xa0(%rsp), $arg5
2492      mov     0xa8(%rsp), $arg6
2493      lea     -0xa0(%rsp), %rsp
2494      movaps  %xmm6, 0x40(%rsp)
2495      movaps  %xmm7, 0x50(%rsp)
2496      movaps  %xmm8, 0x60(%rsp)
2497      movaps  %xmm9, 0x70(%rsp)
2498      movaps  %xmm10, 0x80(%rsp)
2499      movaps  %xmm11, 0x90(%rsp)
2500      movaps  %xmm12, 0xa0(%rsp)
2501      movaps  %xmm13, 0xb0(%rsp)
2502      movaps  %xmm14, 0xc0(%rsp)
2503      movaps  %xmm15, 0xd0(%rsp)

```



```

2504 .Lxts_dec_body:
2505     ____
2506     $code.=<<____;
2507     mov     %rsp, %rbp           # backup %rsp
2508     mov     $arg1, $inp         # backup arguments
2509     mov     $arg2, $out
2510     mov     $arg3, $len
2511     mov     $arg4, $key

2513     lea     ($arg6), $arg1
2514     lea     0x20(%rbp), $arg2
2515     lea     ($arg5), $arg3
2516     call    asm_AES_encrypt     # generate initial tweak

2518     mov     240($key), %eax
2519     mov     $len, %rbx         # rounds
                                # backup $len

2521     mov     %eax, %edx         # rounds
2522     shl     $7, %rax          # 128 bytes per inner round key
2523     sub     $'128-32', %rax    # size of bit-sliced key schedule
2524     sub     %rax, %rsp

2526     mov     %rsp, %rax        # pass key schedule
2527     mov     $key, %rcx        # pass key
2528     mov     %edx, %r10d       # pass rounds
2529     call    _baes_key_convert
2530     pxor    (%rsp), %xmm7     # fix up round 0 key
2531     movdqa  %xmm6, (%rax)     # save last round key
2532     movdqa  %xmm7, (%rsp)

2534     xor     %eax, %eax        # if ($len%16) len-=16;
2535     and     $-16, $len
2536     test    $15, %ebx
2537     setnz   %al
2538     shl     $4, %rax
2539     sub     %rax, $len

2541     sub     $0x80, %rsp       # place for tweak[8]
2542     movdqa  0x20(%rbp), @XMM[7] # initial tweak

2544     pxor    $twtmp, $twtmp
2545     movdqa  .Lxts_magic(%rip), $twmask
2546     pcmpgtd @XMM[7], $twtmp    # broadcast upper bits

2548     sub     $0x80, $len
2549     jc      .Lxts_dec_short
2550     jmp     .Lxts_dec_loop

2552 .align 16
2553 .Lxts_dec_loop:
2554     ____
2555     for ($i=0;$i<7;$i++) {
2556         $code.=<<____;
2557         pshufd $0x13, $twtmp, $twres
2558         pxor    $twtmp, $twtmp
2559         movdqa  @XMM[7], @XMM[$i]
2560         movdqa  @XMM[7], '0x10*$i'(%rsp) # save tweak[$i]
2561         paddq   @XMM[7], @XMM[7]         # psllq 1,$tweak
2562         pand     $twmask, $twres         # isolate carry and residue
2563         pcmpgtd @XMM[7], $twtmp         # broadcast upper bits
2564         pxor    $twres, @XMM[7]
2565     ____
2566     $code.=<<____ if ($i>=1);
2567     movdqu     '0x10*($i-1)'($inp), @XMM[8+$i-1]
2568     ____
2569     $code.=<<____ if ($i>=2);

```

```

2570     pxor    @XMM[8+$i-2], @XMM[$i-2] # input[] ^ tweak[]
2571     ____
2572     }
2573     $code.=<<____;
2574     movdqu    0x60($inp), @XMM[8+6]
2575     pxor      @XMM[8+5], @XMM[5]
2576     movdqu    0x70($inp), @XMM[8+7]
2577     lea       0x80($inp), $inp
2578     movdqa    @XMM[7], 0x70(%rsp)
2579     pxor      @XMM[8+6], @XMM[6]
2580     lea       0x80(%rsp), %rax
2581     pxor      @XMM[8+7], @XMM[7]     # pass key schedule
2582     mov       %edx, %r10d           # pass rounds

2584     call      _baes_decrypt8

2586     pxor      0x00(%rsp), @XMM[0]   # ^= tweak[]
2587     pxor      0x10(%rsp), @XMM[1]
2588     movdqu    @XMM[0], 0x00($out)   # write output
2589     pxor      0x20(%rsp), @XMM[6]
2590     movdqu    @XMM[1], 0x10($out)
2591     pxor      0x30(%rsp), @XMM[4]
2592     movdqu    @XMM[6], 0x20($out)
2593     pxor      0x40(%rsp), @XMM[2]
2594     movdqu    @XMM[4], 0x30($out)
2595     pxor      0x50(%rsp), @XMM[7]
2596     movdqu    @XMM[2], 0x40($out)
2597     pxor      0x60(%rsp), @XMM[3]
2598     movdqu    @XMM[7], 0x50($out)
2599     pxor      0x70(%rsp), @XMM[5]
2600     movdqu    @XMM[3], 0x60($out)
2601     movdqu    @XMM[5], 0x70($out)
2602     lea       0x80($out), $out

2604     movdqa    0x70(%rsp), @XMM[7]   # prepare next iteration tweak
2605     pxor      $twtmp, $twtmp
2606     movdqa    .Lxts_magic(%rip), $twmask
2607     pcmpgtd   @XMM[7], $twtmp
2608     pshufd    $0x13, $twtmp, $twres
2609     pxor      $twtmp, $twtmp
2610     paddq     @XMM[7], @XMM[7]       # psllq 1,$tweak
2611     pand      $twmask, $twres       # isolate carry and residue
2612     pcmpgtd   @XMM[7], $twtmp       # broadcast upper bits
2613     pxor      $twres, @XMM[7]

2615     sub       $0x80, $len
2616     jnc       .Lxts_dec_loop

2618 .Lxts_dec_short:
2619     add       $0x80, $len
2620     jz        .Lxts_dec_done
2621     ____
2622     for ($i=0;$i<7;$i++) {
2623         $code.=<<____;
2624         pshufd $0x13, $twtmp, $twres
2625         pxor    $twtmp, $twtmp
2626         movdqa  @XMM[7], @XMM[$i]
2627         movdqa  @XMM[7], '0x10*$i'(%rsp) # save tweak[$i]
2628         paddq   @XMM[7], @XMM[7]         # psllq 1,$tweak
2629         pand     $twmask, $twres         # isolate carry and residue
2630         pcmpgtd @XMM[7], $twtmp         # broadcast upper bits
2631         pxor    $twres, @XMM[7]
2632     ____
2633     $code.=<<____ if ($i>=1);
2634     movdqu     '0x10*($i-1)'($inp), @XMM[8+$i-1]
2635     cmp        $'0x10*$i', $len

```

```

2636     je      .Lxts_dec_$i
2637   ____
2638     $code.=<<__ if ($i>=2);
2639     pxor    @XMM[8+$i-2], @XMM[$i-2]# input[] ^ tweak[]
2640   ____
2641   }
2642   $code.=<<__ ;
2643     movdqu  0x60($inp), @XMM[8+6]
2644     pxor    @XMM[8+5], @XMM[5]
2645     movdqa  @XMM[7], 0x70($rsp)
2646     lea     0x70($inp), $inp
2647     pxor    @XMM[8+6], @XMM[6]
2648     lea     0x80($rsp), %rax      # pass key schedule
2649     mov     %edx, %r10d          # pass rounds

2651     call    _bsaes_decrypt8

2653     pxor    0x00($rsp), @XMM[0]  # ^= tweak[]
2654     pxor    0x10($rsp), @XMM[1]
2655     movdqu  @XMM[0], 0x00($out)  # write output
2656     pxor    0x20($rsp), @XMM[6]
2657     movdqu  @XMM[1], 0x10($out)
2658     pxor    0x30($rsp), @XMM[4]
2659     movdqu  @XMM[6], 0x20($out)
2660     pxor    0x40($rsp), @XMM[2]
2661     movdqu  @XMM[4], 0x30($out)
2662     pxor    0x50($rsp), @XMM[7]
2663     movdqu  @XMM[2], 0x40($out)
2664     pxor    0x60($rsp), @XMM[3]
2665     movdqu  @XMM[7], 0x50($out)
2666     movdqu  @XMM[3], 0x60($out)
2667     lea     0x70($out), $out

2669     movdqa  0x70($rsp), @XMM[7]  # next iteration tweak
2670     jmp     .Lxts_dec_done
2671   .align 16
2672   .Lxts_dec_6:
2673     pxor    @XMM[8+4], @XMM[4]
2674     lea     0x60($inp), $inp
2675     pxor    @XMM[8+5], @XMM[5]
2676     lea     0x80($rsp), %rax      # pass key schedule
2677     mov     %edx, %r10d          # pass rounds

2679     call    _bsaes_decrypt8

2681     pxor    0x00($rsp), @XMM[0]  # ^= tweak[]
2682     pxor    0x10($rsp), @XMM[1]
2683     movdqu  @XMM[0], 0x00($out)  # write output
2684     pxor    0x20($rsp), @XMM[6]
2685     movdqu  @XMM[1], 0x10($out)
2686     pxor    0x30($rsp), @XMM[4]
2687     movdqu  @XMM[6], 0x20($out)
2688     pxor    0x40($rsp), @XMM[2]
2689     movdqu  @XMM[4], 0x30($out)
2690     pxor    0x50($rsp), @XMM[7]
2691     movdqu  @XMM[2], 0x40($out)
2692     movdqu  @XMM[7], 0x50($out)
2693     lea     0x60($out), $out

2695     movdqa  0x60($rsp), @XMM[7]  # next iteration tweak
2696     jmp     .Lxts_dec_done
2697   .align 16
2698   .Lxts_dec_5:
2699     pxor    @XMM[8+3], @XMM[3]
2700     lea     0x50($inp), $inp
2701     pxor    @XMM[8+4], @XMM[4]

```

```

2702     lea     0x80($rsp), %rax      # pass key schedule
2703     mov     %edx, %r10d          # pass rounds

2705     call    _bsaes_decrypt8

2707     pxor    0x00($rsp), @XMM[0]  # ^= tweak[]
2708     pxor    0x10($rsp), @XMM[1]
2709     movdqu  @XMM[0], 0x00($out)  # write output
2710     pxor    0x20($rsp), @XMM[6]
2711     movdqu  @XMM[1], 0x10($out)
2712     pxor    0x30($rsp), @XMM[4]
2713     movdqu  @XMM[6], 0x20($out)
2714     pxor    0x40($rsp), @XMM[2]
2715     movdqu  @XMM[4], 0x30($out)
2716     movdqu  @XMM[2], 0x40($out)
2717     lea     0x50($out), $out

2719     movdqa  0x50($rsp), @XMM[7]  # next iteration tweak
2720     jmp     .Lxts_dec_done
2721   .align 16
2722   .Lxts_dec_4:
2723     pxor    @XMM[8+2], @XMM[2]
2724     lea     0x40($inp), $inp
2725     pxor    @XMM[8+3], @XMM[3]
2726     lea     0x80($rsp), %rax      # pass key schedule
2727     mov     %edx, %r10d          # pass rounds

2729     call    _bsaes_decrypt8

2731     pxor    0x00($rsp), @XMM[0]  # ^= tweak[]
2732     pxor    0x10($rsp), @XMM[1]
2733     movdqu  @XMM[0], 0x00($out)  # write output
2734     pxor    0x20($rsp), @XMM[6]
2735     movdqu  @XMM[1], 0x10($out)
2736     pxor    0x30($rsp), @XMM[4]
2737     movdqu  @XMM[6], 0x20($out)
2738     movdqu  @XMM[4], 0x30($out)
2739     lea     0x40($out), $out

2741     movdqa  0x40($rsp), @XMM[7]  # next iteration tweak
2742     jmp     .Lxts_dec_done
2743   .align 16
2744   .Lxts_dec_3:
2745     pxor    @XMM[8+1], @XMM[1]
2746     lea     0x30($inp), $inp
2747     pxor    @XMM[8+2], @XMM[2]
2748     lea     0x80($rsp), %rax      # pass key schedule
2749     mov     %edx, %r10d          # pass rounds

2751     call    _bsaes_decrypt8

2753     pxor    0x00($rsp), @XMM[0]  # ^= tweak[]
2754     pxor    0x10($rsp), @XMM[1]
2755     movdqu  @XMM[0], 0x00($out)  # write output
2756     pxor    0x20($rsp), @XMM[6]
2757     movdqu  @XMM[1], 0x10($out)
2758     movdqu  @XMM[6], 0x20($out)
2759     lea     0x30($out), $out

2761     movdqa  0x30($rsp), @XMM[7]  # next iteration tweak
2762     jmp     .Lxts_dec_done
2763   .align 16
2764   .Lxts_dec_2:
2765     pxor    @XMM[8+0], @XMM[0]
2766     lea     0x20($inp), $inp
2767     pxor    @XMM[8+1], @XMM[1]

```

```

2768     lea    0x80(%rsp), %rax    # pass key schedule
2769     mov     %edx, %r10d        # pass rounds

2771     call    _bsaes_decrypt8

2773     pxor    0x00(%rsp), @XMM[0]    # ^= tweak[]
2774     pxor    0x10(%rsp), @XMM[1]
2775     movdqu  @XMM[0], 0x00($out)    # write output
2776     movdqu  @XMM[1], 0x10($out)
2777     lea     0x20($out), $out

2779     movdqa  0x20(%rsp), @XMM[7]    # next iteration tweak
2780     jmp     .Lxts_dec_done
2781 .align    16
2782 .Lxts_dec_1:
2783     pxor    @XMM[0], @XMM[8]
2784     lea     0x10($inp), $inp
2785     movdqa  @XMM[8], 0x20(%rbp)
2786     lea     0x20(%rbp), $arg1
2787     lea     0x20(%rbp), $arg2
2788     lea     ($key), $arg3
2789     call    asm_AES_decrypt        # doesn't touch %xmm
2790     pxor    0x20(%rbp), @XMM[0]    # ^= tweak[]
2791     #pxor    @XMM[8], @XMM[0]
2792     #lea     0x80(%rsp), %rax        # pass key schedule
2793     #mov     %edx, %r10d            # pass rounds
2794     #call    _bsaes_decrypt8
2795     #pxor    0x00(%rsp), @XMM[0]    # ^= tweak[]
2796     movdqu  @XMM[0], 0x00($out)    # write output
2797     lea     0x10($out), $out

2799     movdqa  0x10(%rsp), @XMM[7]    # next iteration tweak

2801 .Lxts_dec_done:
2802     and     $15, %ebx
2803     jz      .Lxts_dec_ret

2805     pxor    $wtmpt, $wtmpt
2806     movdqa  .Lxts_magic(%rip), $wtmask
2807     pcmpgtd @XMM[7], $wtmpt
2808     pshufd  $0x13, $wtmpt, $wtres
2809     movdqa  @XMM[7], @XMM[6]
2810     paddq   @XMM[7], @XMM[7]        # psllq 1,$tweak
2811     pand    $wtmask, $wtres        # isolate carry and residue
2812     movdqu  ($inp), @XMM[0]
2813     pxor    $wtres, @XMM[7]

2815     lea     0x20(%rbp), $arg1
2816     pxor    @XMM[7], @XMM[0]
2817     lea     0x20(%rbp), $arg2
2818     movdqa  @XMM[0], 0x20(%rbp)
2819     lea     ($key), $arg3
2820     call    asm_AES_decrypt        # doesn't touch %xmm
2821     pxor    0x20(%rbp), @XMM[7]
2822     mov     $out, %rdx
2823     movdqu  @XMM[7], ($out)

2825 .Lxts_dec_steal:
2826     movzb   16($inp), %eax
2827     movzb   (%rdx), %ecx
2828     lea     1($inp), $inp
2829     mov     %al, (%rdx)
2830     mov     %cl, 16(%rdx)
2831     lea     1(%rdx), %rdx
2832     sub     $1, %ebx
2833     jnz     .Lxts_dec_steal

```

```

2835     movdqu  ($out), @XMM[0]
2836     lea     0x20(%rbp), $arg1
2837     pxor    @XMM[6], @XMM[0]
2838     lea     0x20(%rbp), $arg2
2839     movdqa  @XMM[0], 0x20(%rbp)
2840     lea     ($key), $arg3
2841     call    asm_AES_decrypt        # doesn't touch %xmm
2842     pxor    0x20(%rbp), @XMM[6]
2843     movdqu  @XMM[6], ($out)

2845 .Lxts_dec_ret:
2846     lea     (%rsp), %rax
2847     pxor    %xmm0, %xmm0
2848 .Lxts_dec_bzero:
2849     movdqa  %xmm0, 0x00(%rax)    # wipe key schedule [if any]
2850     movdqa  %xmm0, 0x10(%rax)
2851     lea     0x20(%rax), %rax
2852     cmp     %rax, %rbp
2853     ja      .Lxts_dec_bzero

2855     lea     (%rbp), %rsp        # restore %rsp
2856
2857 $code.=<<__ if ($win64);
2858     movaps  0x40(%rbp), %xmm6
2859     movaps  0x50(%rbp), %xmm7
2860     movaps  0x60(%rbp), %xmm8
2861     movaps  0x70(%rbp), %xmm9
2862     movaps  0x80(%rbp), %xmm10
2863     movaps  0x90(%rbp), %xmm11
2864     movaps  0xa0(%rbp), %xmm12
2865     movaps  0xb0(%rbp), %xmm13
2866     movaps  0xc0(%rbp), %xmm14
2867     movaps  0xd0(%rbp), %xmm15
2868     lea     0xa0(%rbp), %rsp
2869
2870 $code.=<<__ ;
2871     mov     0x48(%rsp), %r15
2872     mov     0x50(%rsp), %r14
2873     mov     0x58(%rsp), %r13
2874     mov     0x60(%rsp), %r12
2875     mov     0x68(%rsp), %rbx
2876     mov     0x70(%rsp), %rax
2877     lea     0x78(%rsp), %rsp
2878     mov     %rax, %rbp
2879 .Lxts_dec_epilogue:
2880     ret
2881 .size      baes_xts_decrypt, .-baes_xts_decrypt
2882
2883 }
2884 $code.=<<__ ;
2885 .type      _baes_const, @object
2886 .align     64
2887 _baes_const:
2888 .LMOISR:
2889     .quad   # InvShiftRows constants
2890             0x0a0e0206070b0f03, 0x0004080c0d010509
2891 .LISRM0:
2892     .quad   0x01040b0e0205080f, 0x0306090c00070a0d
2893 .LISR:
2894     .quad   0x0504070602010003, 0x0f0e0d0c080b0a09
2895 .LBS0:
2896     .quad   # bit-slice constants
2897             0x5555555555555555, 0x5555555555555555
2898 .LBS1:
2899     .quad   0x3333333333333333, 0x3333333333333333
2898 .LBS2:
2899     .quad   0x0f0f0f0f0f0f0f0f, 0x0f0f0f0f0f0f0f0f

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```

2900 .LSR:          # shiftrows constants
2901         .quad    0x05040706000030201, 0x0f0e0d0c0a09080b
2902 .LSRM0:         # shiftrows constants
2903         .quad    0x0304090e00050a0f, 0x01060b0c0207080d
2904 .LM0SR:         # shiftrows constants
2905         .quad    0x0a0e02060f03070b, 0x0004080c05090d01
2906 .LSWPUP:        # byte-swap upper dword
2907         .quad    0x0706050403020100, 0x0c0d0e0f0b0a0908
2908 .LSWPUPM0SR:    # shiftrows constants
2909         .quad    0x0a0d02060c03070b, 0x0004080f05090e01
2910 .LADD1:         # counter increment constants
2911         .quad    0x0000000000000000, 0x0000000010000000
2912 .LADD2:         # counter increment constants
2913         .quad    0x0000000000000000, 0x0000000020000000
2914 .LADD3:         # counter increment constants
2915         .quad    0x0000000000000000, 0x0000000030000000
2916 .LADD4:         # counter increment constants
2917         .quad    0x0000000000000000, 0x0000000040000000
2918 .LADD5:         # counter increment constants
2919         .quad    0x0000000000000000, 0x0000000050000000
2920 .LADD6:         # counter increment constants
2921         .quad    0x0000000000000000, 0x0000000060000000
2922 .LADD7:         # counter increment constants
2923         .quad    0x0000000000000000, 0x0000000070000000
2924 .LADD8:         # counter increment constants
2925         .quad    0x0000000000000000, 0x0000000080000000
2926 .Lxts_magic:    # counter increment constants
2927         .long     0x87, 0, 1, 0
2928 .Lmasks:        # counter increment constants
2929         .quad    0x0101010101010101, 0x0101010101010101
2930         .quad    0x0202020202020202, 0x0202020202020202
2931         .quad    0x0404040404040404, 0x0404040404040404
2932         .quad    0x0808080808080808, 0x0808080808080808
2933 .LM0:           # counter increment constants
2934         .quad    0x02060a0e03070b0f, 0x0004080c0105090d
2935 .L63:           # counter increment constants
2936         .quad    0x6363636363636363, 0x6363636363636363
2937 .asciz "Bit-sliced AES for x86_64/SSSE3, Emilia K"/sper, Peter Schwabe, Andy Po
2938 .align 64
2939 .size _bsaes_const, . - _bsaes_const
2940 ____

2942 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec, ULONG64 frame,
2943 # CONTEXT *context, DISPATCHER_CONTEXT *disp)
2944 if ($win64) {
2945 $rec="%rcx";
2946 $frame="%rdx";
2947 $context="%r8";
2948 $disp="%r9";

2950 $code.<=<<____;
2951 .extern __imp_RtlVirtualUnwind
2952 .type se_handler, \@abi-omnipotent
2953 .align 16
2954 se_handler:
2955     push    %rsi
2956     push    %rdi
2957     push    %rbx
2958     push    %rbp
2959     push    %r12
2960     push    %r13
2961     push    %r14
2962     push    %r15
2963     pushfq
2964     sub     \$64,%rsp

```

```

2966     mov     120($context),%rax    # pull context->Rax
2967     mov     248($context),%rbx    # pull context->Rip

2969     mov     8($disp),%rsi         # disp->ImageBase
2970     mov     56($disp),%r11        # disp->HandlerData

2972     mov     0(%r11),%r10d         # HandlerData[0]
2973     lea     (%rsi,%r10),%r10      # prologue label
2974     cmp     %r10,%rbx             # context->Rip<prologue label
2975     jb      .Lin_prologue

2977     mov     152($context),%rax    # pull context->Rsp

2979     mov     4(%r11),%r10d         # HandlerData[1]
2980     lea     (%rsi,%r10),%r10      # epilogue label
2981     cmp     %r10,%rbx             # context->Rip==epilogue label
2982     jae     .Lin_prologue

2984     mov     160($context),%rax    # pull context->Rbp

2986     lea     0x40(%rax),%rsi        # %xmm save area
2987     lea     512($context),%rdi     # &context.Xmm6
2988     mov     \%$20,%ecx            # 10*sizeof(%xmm0)/sizeof(%rax)
2989     .long   0xa548f3fc            # cld; rep movsq
2990     lea     0xa0(%rax),%rax        # adjust stack pointer

2992     mov     0x70(%rax),%rbp        # restore context->Rbp
2993     mov     0x68(%rax),%rbx        # restore context->Rbx
2994     mov     0x60(%rax),%r12        # restore context->R12
2995     mov     0x58(%rax),%r13        # restore context->R13
2996     mov     0x50(%rax),%r14        # restore context->R14
2997     mov     0x48(%rax),%r15        # restore context->R15
2998     lea     0x78(%rax),%rax        # adjust stack pointer
2999     mov     %rbx,144($context)     # restore context->Rbx
3000     mov     %rbp,160($context)     # restore context->Rbp
3001     mov     %r12,216($context)     # restore context->R12
3002     mov     %r13,224($context)     # restore context->R13
3003     mov     %r14,232($context)     # restore context->R14
3004     mov     %r15,240($context)     # restore context->R15

3006 .Lin_prologue:
3007     mov     %rax,152($context)     # restore context->Rsp

3009     mov     40($disp),%rdi         # disp->ContextRecord
3010     mov     $context,%rsi          # context
3011     mov     \$'1232/8',%ecx        # sizeof(CONTEXT)
3012     .long   0xa548f3fc            # cld; rep movsq

3014     mov     $disp,%rsi            # arg1, UNW_FLAG_NHANDLER
3015     xor     %rcx,%rcx              # arg2, disp->ImageBase
3016     mov     8(%rsi),%rdx           # arg3, disp->ControlPc
3017     mov     0(%rsi),%r8            # arg4, disp->FunctionEntry
3018     mov     16(%rsi),%r9           # disp->ContextRecord
3019     mov     40(%rsi),%r10          # &disp->HandlerData
3020     lea     56(%rsi),%r11          # &disp->EstablisherFrame
3021     lea     24(%rsi),%r12          # arg5
3022     mov     %r10,32(%rsp)          # arg6
3023     mov     %r11,40(%rsp)          # arg7
3024     mov     %r12,48(%rsp)          # arg8, (NULL)
3025     mov     %rcx,56(%rsp)
3026     call    *__imp_RtlVirtualUnwind(%rip)

3028     mov     \$1,%eax               # ExceptionContinueSearch
3029     add     \$64,%rsp
3030     popfq
3031     pop     %r15

```

```

3032     pop    %r14
3033     pop    %r13
3034     pop    %r12
3035     pop    %rbp
3036     pop    %rbx
3037     pop    %rdi
3038     pop    %rsi
3039     ret
3040 .size    se_handler,.-se_handler

3042 .section      .pdata
3043 .align 4
3044 ____
3045 $code.=<<__ if ($seb);
3046     .rva     .Lech_enc_prologue
3047     .rva     .Lech_enc_epilogue
3048     .rva     .Lech_enc_info

3050     .rva     .Lech_dec_prologue
3051     .rva     .Lech_dec_epilogue
3052     .rva     .Lech_dec_info
3053 ____
3054 $code.=<<__;
3055     .rva     .Lcbc_dec_prologue
3056     .rva     .Lcbc_dec_epilogue
3057     .rva     .Lcbc_dec_info

3059     .rva     .Lctr_enc_prologue
3060     .rva     .Lctr_enc_epilogue
3061     .rva     .Lctr_enc_info

3063     .rva     .Lxts_enc_prologue
3064     .rva     .Lxts_enc_epilogue
3065     .rva     .Lxts_enc_info

3067     .rva     .Lxts_dec_prologue
3068     .rva     .Lxts_dec_epilogue
3069     .rva     .Lxts_dec_info

3071 .section      .xdata
3072 .align 8
3073 ____
3074 $code.=<<__ if ($seb);
3075 .Lech_enc_info:
3076     .byte    9,0,0,0
3077     .rva     se_handler
3078     .rva     .Lech_enc_body, .Lech_enc_epilogue    # HandlerData[]
3079 .Lech_dec_info:
3080     .byte    9,0,0,0
3081     .rva     se_handler
3082     .rva     .Lech_dec_body, .Lech_dec_epilogue    # HandlerData[]
3083 ____
3084 $code.=<<__;
3085 .Lcbc_dec_info:
3086     .byte    9,0,0,0
3087     .rva     se_handler
3088     .rva     .Lcbc_dec_body, .Lcbc_dec_epilogue    # HandlerData[]
3089 .Lctr_enc_info:
3090     .byte    9,0,0,0
3091     .rva     se_handler
3092     .rva     .Lctr_enc_body, .Lctr_enc_epilogue    # HandlerData[]
3093 .Lxts_enc_info:
3094     .byte    9,0,0,0
3095     .rva     se_handler
3096     .rva     .Lxts_enc_body, .Lxts_enc_epilogue    # HandlerData[]
3097 .Lxts_dec_info:

```

```

3098     .byte    9,0,0,0
3099     .rva     se_handler
3100     .rva     .Lxts_dec_body, .Lxts_dec_epilogue    # HandlerData[]
3101 ____
3102 }

3104 $code =~ s/\`([^\`]*)\`/eval($1)/gem;

3106 print $code;

3108 close STDOUT;

```

```

*****
9080 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/cbc.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 #!/usr/local/bin/perl

3 # void des_ncbc_encrypt(input, output, length, schedule, ivec, enc)
4 # des_cblock (*input);
5 # des_cblock (*output);
6 # long length;
7 # des_key_schedule schedule;
8 # des_cblock (*ivec);
9 # int enc;
10 #
11 # calls
12 # des_encrypt((DES_LONG *)tin,schedule,DES_ENCRYPT);
13 #

15 #cbc("des_ncbc_encrypt","des_encrypt",0);
16 #cbc("BF_cbc_encrypt","BF_encrypt","BF_encrypt",
17 #    1,4,5,3,5,-1);
18 #cbc("des_ncbc_encrypt","des_encrypt","des_encrypt",
19 #    0,4,5,3,5,-1);
20 #cbc("des_ede3_cbc_encrypt","des_encrypt3","des_decrypt3",
21 #    0,6,7,3,4,5);
22 #
23 # When doing a cipher that needs bigendian order,
24 # for encrypt, the iv is kept in bigendian form,
25 # while for decrypt, it is kept in little endian.
26 sub cbc
27 {
28     local($name,$enc_func,$dec_func,$swap,$iv_off,$enc_off,$p1,$p2,$p3)=@_;
29     # name is the function name
30     # enc_func and dec_func and the functions to call for encrypt/decrypt
31     # swap is true if byte order needs to be reversed
32     # iv_off is parameter number for the iv
33     # enc_off is parameter number for the encrypt/decrypt flag
34     # p1,p2,p3 are the offsets for parameters to be passed to the
35     # underlying calls.

37     &function_begin_B($name,"");
38     &comment("");

40     $in="esi";
41     $out="edi";
42     $count="ebp";

44     &push("ebp");
45     &push("ebx");
46     &push("esi");
47     &push("edi");

49     $data_off=4;
50     $data_off+=4 if ($p1 > 0);
51     $data_off+=4 if ($p2 > 0);
52     $data_off+=4 if ($p3 > 0);

54     &mov($count, &wparam(2)); # length

56     &comment("getting iv ptr from parameter $iv_off");
57     &mov("ebx", &wparam($iv_off)); # Get iv ptr

59     &mov($in, &DWP(0,"ebx","",0));# iv[0]
60     &mov($out, &DWP(4,"ebx","",0));# iv[1]

```

```

62     &push($out);
63     &push($in);
64     &push($out); # used in decrypt for iv[1]
65     &push($in); # used in decrypt for iv[0]

67     &mov("ebx", "esp"); # This is the address of tin[2]

69     &mov($in, &wparam(0)); # in
70     &mov($out, &wparam(1)); # out

72     # We have loaded them all, how lets push things
73     &comment("getting encrypt flag from parameter $enc_off");
74     &mov("ecx", &wparam($enc_off)); # Get enc flag
75     if ($p3 > 0)
76     {
77         &comment("get and push parameter $p3");
78         if ($enc_off != $p3)
79             { &mov("eax", &wparam($p3)); &push("eax"); }
80         else
81             { &push("ecx"); }
82     }
83     if ($p2 > 0)
84     {
85         &comment("get and push parameter $p2");
86         if ($enc_off != $p2)
87             { &mov("eax", &wparam($p2)); &push("eax"); }
88         else
89             { &push("ecx"); }
90     }
91     if ($p1 > 0)
92     {
93         &comment("get and push parameter $p1");
94         if ($enc_off != $p1)
95             { &mov("eax", &wparam($p1)); &push("eax"); }
96         else
97             { &push("ecx"); }
98     }
99     &push("ebx"); # push data/iv

101     &cmp("ecx",0);
102     &jz(&label("decrypt"));
103     &mov("ebx", &DWP($data_off+4,"esp","",0)); # load iv[1]

105     &jz(&label("encrypt_finish"));

107     #####

109     &set_label("encrypt_loop");
110     # encrypt start
111     # "eax" and "ebx" hold iv (or the last cipher text)

113     &mov("ecx", &DWP(0,$in","",0)); # load first 4 bytes
114     &mov("edx", &DWP(4,$in","",0)); # second 4 bytes

116     &xor("eax", "ecx");
117     &xor("ebx", "edx");

119     &bswap("eax") if $swap;
120     &bswap("ebx") if $swap;

122     &mov(&DWP($data_off,"esp","",0), "eax"); # put in array for call
123     &mov(&DWP($data_off+4,"esp","",0), "ebx"); #

125     &call($enc_func);

127     &mov("eax", &DWP($data_off,"esp","",0));

```

```

128      &mov("ebx",      &DWP($data_off+4,"esp","",0));
130      &bswap("eax")    if $swap;
131      &bswap("ebx")    if $swap;

133      &mov(&DWP(0,$out,"",0),"eax");
134      &mov(&DWP(4,$out,"",0),"ebx");

136      # eax and ebx are the next iv.

138      &add($in,      8);
139      &add($out,     8);

141      &sub($count,   8);
142      &jnz(&label("encrypt_loop"));

144 #####3
145      &set_label("encrypt_finish");
146      &mov($count,   &wparam(2));      # length
147      &and($count,   7);
148      &jz(&label("finish"));
149      &call(&label("PIC_point"));
150 &set_label("PIC_point");
151      &blndpop("edx");
152      &lea("ecx",&DWP(&label("cbc_enc_jump_table")."-".&label("PIC_point"),"edx
153      &mov($count,&DWP(0,"ecx",$count,4));
154      &add($count,"edx");
155      &xor("ecx","ecx");
156      &xor("edx","edx");
157      &mov($count,&DWP(&label("cbc_enc_jump_table"),"",$count,4));
158      &jmp_ptr($count);

160 &set_label("ej7");
161      &movb(&HB("edx"),      &BP(6,$in,"",0));
162      &shl("edx",8);
163 &set_label("ej6");
164      &movb(&HB("edx"),      &BP(5,$in,"",0));
165 &set_label("ej5");
166      &movb(&LB("edx"),      &BP(4,$in,"",0));
167 &set_label("ej4");
168      &mov("ecx",           &DWP(0,$in,"",0));
169      &jmp(&label("ejend"));
170 &set_label("ej3");
171      &movb(&HB("ecx"),      &BP(2,$in,"",0));
172      &shl("ecx",8);
173 &set_label("ej2");
174      &movb(&HB("ecx"),      &BP(1,$in,"",0));
175 &set_label("ej1");
176      &movb(&LB("ecx"),      &BP(0,$in,"",0));
177 &set_label("ejend");

179      &xor("eax",           "ecx");
180      &xor("ebx",           "edx");

182      &bswap("eax")    if $swap;
183      &bswap("ebx")    if $swap;

185      &mov(&DWP($data_off,"esp","",0),      "eax"); # put in array for call
186      &mov(&DWP($data_off+4,"esp","",0),      "ebx"); #

188      &call(&Senc_func);

190      &mov("eax",      &DWP($data_off,"esp","",0));
191      &mov("ebx",      &DWP($data_off+4,"esp","",0));

193      &bswap("eax")    if $swap;

```

```

194      &bswap("ebx")    if $swap;

196      &mov(&DWP(0,$out,"",0),"eax");
197      &mov(&DWP(4,$out,"",0),"ebx");

199      &jmp(&label("finish"));

201 #####
202 #####
203 &set_label("decrypt",1);
204 # decrypt start
205 &and($count,0xffffffff);
206 # The next 2 instructions are only for if the jz is taken
207 &mov("eax",      &DWP($data_off+8,"esp","",0)); # get iv[0]
208 &mov("ebx",      &DWP($data_off+12,"esp","",0)); # get iv[1]
209 &jz(&label("decrypt_finish"));

211      &set_label("decrypt_loop");
212      &mov("eax",      &DWP(0,$in,"",0));      # load first 4 bytes
213      &mov("ebx",      &DWP(4,$in,"",0));      # second 4 bytes

215      &bswap("eax")    if $swap;
216      &bswap("ebx")    if $swap;

218      &mov(&DWP($data_off,"esp","",0),      "eax"); # put back
219      &mov(&DWP($data_off+4,"esp","",0),      "ebx"); #

221      &call(&Sdec_func);

223      &mov("eax",      &DWP($data_off,"esp","",0)); # get return
224      &mov("ebx",      &DWP($data_off+4,"esp","",0)); #

226      &bswap("eax")    if $swap;
227      &bswap("ebx")    if $swap;

229      &mov("ecx",      &DWP($data_off+8,"esp","",0)); # get iv[0]
230      &mov("edx",      &DWP($data_off+12,"esp","",0)); # get iv[1]

232      &xor("ecx",      "eax");
233      &xor("edx",      "ebx");

235      &mov("eax",      &DWP(0,$in,"",0));      # get old cipher text,
236      &mov("ebx",      &DWP(4,$in,"",0));      # next iv actually

238      &mov(&DWP(0,$out,"",0),"ecx");
239      &mov(&DWP(4,$out,"",0),"edx");

241      &mov(&DWP($data_off+8,"esp","",0),      "eax"); # save iv
242      &mov(&DWP($data_off+12,"esp","",0),      "ebx"); #

244      &add($in,      8);
245      &add($out,     8);

247      &sub($count,   8);
248      &jnz(&label("decrypt_loop"));
249 ##### ENDIT #####3
250      &set_label("decrypt_finish");
251      &mov($count,   &wparam(2));      # length
252      &and($count,   7);
253      &jz(&label("finish"));

255      &mov("eax",      &DWP(0,$in,"",0));      # load first 4 bytes
256      &mov("ebx",      &DWP(4,$in,"",0));      # second 4 bytes

258      &bswap("eax")    if $swap;
259      &bswap("ebx")    if $swap;

```

```

261     &mov(&DWP($data_off,"esp","",0),    "eax"); # put back
262     &mov(&DWP($data_off+4,"esp","",0),    "ebx"); #
264     &call($dec_func);

266     &mov("eax",    &DWP($data_off,"esp","",0)); # get return
267     &mov("ebx",    &DWP($data_off+4,"esp","",0)); #

269     &bswap("eax")   if $swap;
270     &bswap("ebx")   if $swap;

272     &mov("ecx",    &DWP($data_off+8,"esp","",0)); # get iv[0]
273     &mov("edx",    &DWP($data_off+12,"esp","",0)); # get iv[1]

275     &xor("ecx",    "eax");
276     &xor("edx",    "ebx");

278     # this is for when we exit
279     &mov("eax",    &DWP(0,$in","",0)); # get old cipher text,
280     &mov("ebx",    &DWP(4,$in","",0)); # next iv actually

282 &set_label("dj7");
283     &rotr("edx",    16);
284     &movb(&BP(6,$out","",0), &LB("edx"));
285     &shr("edx",16);
286 &set_label("dj6");
287     &movb(&BP(5,$out","",0), &HB("edx"));
288 &set_label("dj5");
289     &movb(&BP(4,$out","",0), &LB("edx"));
290 &set_label("dj4");
291     &mov(&DWP(0,$out","",0), "ecx");
292     &jmp(&label("djend"));
293 &set_label("dj3");
294     &rotr("ecx",    16);
295     &movb(&BP(2,$out","",0), &LB("ecx"));
296     &shl("ecx",16);
297 &set_label("dj2");
298     &movb(&BP(1,$in","",0), &HB("ecx"));
299 &set_label("dj1");
300     &movb(&BP(0,$in","",0), &LB("ecx"));
301 &set_label("djend");

303     # final iv is still in eax:ebx
304     &jmp(&label("finish"));

307 ##### FINISH #####3
308     &set_label("finish",1);
309     &mov("ecx",    &wparam($iv_off)); # Get iv ptr

311     #####
312     $total=16+4;
313     $total+=4 if ($p1 > 0);
314     $total+=4 if ($p2 > 0);
315     $total+=4 if ($p3 > 0);
316     &add("esp",$total);

318     &mov(&DWP(0,"ecx","",0),    "eax"); # save iv
319     &mov(&DWP(4,"ecx","",0),    "ebx"); # save iv

321     &function_end_A($name);

323     &align(64);
324     &set_label("cbc_enc_jmp_table");
325     &data_word("0");

```

```

326     &data_word(&label("ej1")."-".&label("PIC_point"));
327     &data_word(&label("ej2")."-".&label("PIC_point"));
328     &data_word(&label("ej3")."-".&label("PIC_point"));
329     &data_word(&label("ej4")."-".&label("PIC_point"));
330     &data_word(&label("ej5")."-".&label("PIC_point"));
331     &data_word(&label("ej6")."-".&label("PIC_point"));
332     &data_word(&label("ej7")."-".&label("PIC_point"));
333     # not used
334     &set_label("cbc_dec_jmp_table",1);
335     &data_word("0");
336     &data_word(&label("dj1")."-".&label("PIC_point"));
337     &data_word(&label("dj2")."-".&label("PIC_point"));
338     &data_word(&label("dj3")."-".&label("PIC_point"));
339     &data_word(&label("dj4")."-".&label("PIC_point"));
340     &data_word(&label("dj5")."-".&label("PIC_point"));
341     &data_word(&label("dj6")."-".&label("PIC_point"));
342     &data_word(&label("dj7")."-".&label("PIC_point"));
343     &align(64);

345     &function_end_B($name);
346
347     }

349 1;

```



```

*****
33060 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/cml1-x86.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 # =====
4 # Copyright (c) 2008 Andy Polyakov <appro@openssl.org>
5 #
6 # This module may be used under the terms of either the GNU General
7 # Public License version 2 or later, the GNU Lesser General Public
8 # License version 2.1 or later, the Mozilla Public License version
9 # 1.1 or the BSD License. The exact terms of either license are
10 # distributed along with this module. For further details see
11 # http://www.openssl.org/~appro/camellia/.
12 # =====

14 # Performance in cycles per processed byte (less is better) in
15 # 'openssl speed ...' benchmark:
16 #
17 #
18 # -evp camellia-128-ecb    AMD K8   Core2   PIII    P4
19 # + over gcc 3.4.6        +90/11% +70/10% +53/4%  +160/64%
20 # + over gcc 8.0          +48/19% +21/15% +21/17% +55/37%
21 #
22 # camellia-128-cbc        17.3     21.1     23.9     25.9
23 #
24 # 128-bit key setup        196       280       256       240    cycles/key
25 # + over gcc 3.4.6        +30/0%  +17/11% +11/0%  +63/40%
26 # + over gcc 8.0          +18/3%  +10/0%  +10/3%  +21/10%
27 #
28 # Pairs of numbers in "+" rows represent performance improvement over
29 # compiler generated position-independent code, PIC, and non-PIC
30 # respectively. PIC results are of greater relevance, as this module
31 # is position-independent, i.e. suitable for a shared library or PIE.
32 # Position independence "costs" one register, which is why compilers
33 # are so close with non-PIC results, they have an extra register to
34 # spare. CBC results are better than ECB ones thanks to "zero-copy"
35 # private _x86_* interface, and are ~30-40% better than with compiler
36 # generated cml1_cbc.o, and reach ~80-90% of x86_64 performance on
37 # same CPU (where applicable).

39 $0 =~ m/([^\[\]\^\\\/\+;]|\$dir)/; $dir=$1;
40 push(@INC, "${dir}" "${dir}../../perlasm");
41 require "x86asm.pl";

43 $OPENSSL=1;

45 &asm_init($ARGV[0], "cml1-586.pl", $ARGV[$#ARGV] eq "386");

47 @T=("eax", "ebx", "ecx", "edx");
48 $idx="esi";
49 $key="edi";
50 $Tbl="ebp";

52 # stack frame layout in _x86_Camellia_* routines, frame is allocated
53 # by caller
54 $__ra=&DWP(0, "esp"); # return address
55 $__s0=&DWP(4, "esp"); # s0 backing store
56 $__s1=&DWP(8, "esp"); # s1 backing store
57 $__s2=&DWP(12, "esp"); # s2 backing store
58 $__s3=&DWP(16, "esp"); # s3 backing store
59 $__end=&DWP(20, "esp"); # pointer to end/start of key schedule

61 # stack frame layout in Camellia_[en]crypt routines, which differs from

```

```

62 # above by 4 and overlaps by pointer to end/start of key schedule
63 $__end=&DWP(16, "esp");
64 $__esp=&DWP(20, "esp");

66 # const unsigned int Camellia_SBOX[4][256];
67 # Well, sort of... Camellia_SBOX[0][...] is interleaved with [1][...],
68 # and [2][...] - with [3][...]. This is done to optimize code size.
69 $SBOX1_1110=0; # Camellia_SBOX[0]
70 $SBOX4_4404=4; # Camellia_SBOX[1]
71 $SBOX2_0222=2048; # Camellia_SBOX[2]
72 $SBOX3_3033=2052; # Camellia_SBOX[3]
73 &static_label("Camellia_SIGMA");
74 &static_label("Camellia_SBOX");

76 sub Camellia_Feistel {
77 my $i=@_ [0];
78 my $seed=defined(@_ [1])?@_ [1]:0;
79 my $scale=$seed<0?-8:8;
80 my $frame=defined(@_ [2])?@_ [2]:0;
81 my $j=($i&1)*2;
82 my $t0=@T[($j)%4], $t1=@T[($j+1)%4], $t2=@T[($j+2)%4], $t3=@T[($j+3)%4];

84     &xor ($t0, $idx); # t0=key[0]
85     &xor ($t1, &DWP($seed+$i*$scale+4, $key)); # t1=key[1]
86     &movz ($idx, &HB($t0)); # (t0>>8)&0xff
87     &mov ($t3, &DWP($SBOX3_3033, $Tbl, $idx, 8)); # t3=SBOX3_3033[0]
88     &movz ($idx, &LB($t0)); # (t0>>0)&0xff
89     &xor ($t3, &DWP($SBOX4_4404, $Tbl, $idx, 8)); # t3^=SBOX4_4404[0]
90     &shr ($t0, 16);
91     &movz ($idx, &LB($t1)); # (t1>>0)&0xff
92     &mov ($t2, &DWP($SBOX1_1110, $Tbl, $idx, 8)); # t2=SBOX1_1110[1]
93     &movz ($idx, &HB($t1)); # (t1>>24)&0xff
94     &xor ($t3, &DWP($SBOX1_1110, $Tbl, $idx, 8)); # t3^=SBOX1_1110[0]
95     &movz ($idx, &HB($t1)); # (t1>>8)&0xff
96     &xor ($t2, &DWP($SBOX4_4404, $Tbl, $idx, 8)); # t2^=SBOX4_4404[1]
97     &shr ($t1, 16);
98     &movz ($t0, &LB($t0)); # (t0>>16)&0xff
99     &xor ($t3, &DWP($SBOX2_0222, $Tbl, $t0, 8)); # t3^=SBOX2_0222[0]
100    &movz ($idx, &HB($t1)); # (t1>>24)&0xff
101    &mov ($t0, &DWP($frame+4*(($j+3)%4), "esp")); # prefetch "s3"
102    &xor ($t2, $t3); # t2=t3
103    &rotr ($t3, 8); # t3=RightRotate(t3, 8)
104    &xor ($t2, &DWP($SBOX2_0222, $Tbl, $idx, 8)); # t2^=SBOX2_0222[1]
105    &movz ($idx, &LB($t1)); # (t1>>16)&0xff
106    &mov ($t1, &DWP($frame+4*(($j+2)%4), "esp")); # prefetch "s2"
107    &xor ($t3, $t0); # t3=s3
108    &xor ($t2, &DWP($SBOX3_3033, $Tbl, $idx, 8)); # t2^=SBOX3_3033[1]
109    &mov ($idx, &DWP($seed+($i+1)*$scale, $key)); # prefetch key[i+1]
110    &xor ($t3, $t2); # t3=t2
111    &mov ($t0, &DWP($frame+4*(($j+3)%4), "esp"), $t3); # s3=t3
112    &xor ($t2, $t1); # t2^=s2
113    &mov (&DWP($frame+4*(($j+2)%4), "esp"), $t2); # s2=t2
114 }

116 # void Camellia_EncryptBlock_Rounds(
117 #     int grandRounds,
118 #     const Byte plaintext[],
119 #     const KEY_TABLE_TYPE keyTable,
120 #     Byte ciphertext[])
121 &function_begin("Camellia_EncryptBlock_Rounds");
122     &mov ("eax", &wparam(0)); # load grandRounds
123     &mov ($idx, &wparam(1)); # load plaintext pointer
124     &mov ($key, &wparam(2)); # load key schedule pointer

126     &mov ("ebx", "esp");
127     &sub ("esp", 7*4); # place for s[0-3], keyEnd, esp and ra

```

```

128      &and      ("esp", -64);

130      # place stack frame just "above mod 1024" the key schedule
131      # this ensures that cache associativity of 2 suffices
132      &lea      ("ecx", &DWP(-64-63, $key));
133      &sub      ("ecx", "esp");
134      &neg      ("ecx");
135      &and      ("ecx", 0x3C0); # modulo 1024, but aligned to cache-line
136      &sub      ("esp", "ecx");
137      &add      ("esp", 4); # 4 is reserved for callee's return address

139      &shl      ("eax", 6);
140      &lea      ("eax", &DWP(0, $key, "eax"));
141      &mov      ($_esp, "ebx"); # save %esp
142      &mov      ($_end, "eax"); # save keyEnd

144      &call     (&label("pic_point"));
145      &set_label("pic_point");
146      &blndpop($Tb1);
147      &lea      ($Tb1, &DWP(&label("Camellia_SBOX")."-".&label("pic_point"), $Tb1))

149      &mov      (@T[0], &DWP(0, $idx)); # load plaintext
150      &mov      (@T[1], &DWP(4, $idx));
151      &mov      (@T[2], &DWP(8, $idx));
152      &bswap     (@T[0]);
153      &mov      (@T[3], &DWP(12, $idx));
154      &bswap     (@T[1]);
155      &bswap     (@T[2]);
156      &bswap     (@T[3]);

158      &call     ("_x86_Camellia_encrypt");

160      &mov      ("esp", $_esp);
161      &bswap     (@T[0]);
162      &mov      ($idx, &wparam(3)); # load ciphertext pointer
163      &bswap     (@T[1]);
164      &bswap     (@T[2]);
165      &bswap     (@T[3]);
166      &mov      (&DWP(0, $idx), @T[0]); # write ciphertext
167      &mov      (&DWP(4, $idx), @T[1]);
168      &mov      (&DWP(8, $idx), @T[2]);
169      &mov      (&DWP(12, $idx), @T[3]);
170 &function_end("Camellia_EncryptBlock_Rounds");
171 # V1.x API
172 &function_begin_B("Camellia_EncryptBlock");
173      &mov      ("eax", 128);
174      &sub      ("eax", &wparam(0)); # load keyBitLength
175      &mov      ("eax", 3);
176      &adc      ("eax", 0); # keyBitLength==128?3:4
177      &mov      (&wparam(0), "eax");
178      &jmp      (&label("Camellia_EncryptBlock_Rounds"));
179 &function_end_B("Camellia_EncryptBlock");

181 if ($OPENSSL) {
182 # void Camellia_encrypt(
183 #     const unsigned char *in,
184 #     unsigned char *out,
185 #     const CAMELLIA_KEY *key)
186 &function_begin("Camellia_encrypt");
187      &mov      ($idx, &wparam(0)); # load plaintext pointer
188      &mov      ($key, &wparam(2)); # load key schedule pointer

190      &mov      ("ebx", "esp");
191      &sub      ("esp", 7*4); # place for s[0-3], keyEnd, esp and ra
192      &and      ("esp", -64);
193      &mov      ("eax", &DWP(272, $key)); # load grandRounds counter

```

```

195      # place stack frame just "above mod 1024" the key schedule
196      # this ensures that cache associativity of 2 suffices
197      &lea      ("ecx", &DWP(-64-63, $key));
198      &sub      ("ecx", "esp");
199      &neg      ("ecx");
200      &and      ("ecx", 0x3C0); # modulo 1024, but aligned to cache-line
201      &sub      ("esp", "ecx");
202      &add      ("esp", 4); # 4 is reserved for callee's return address

204      &shl      ("eax", 6);
205      &lea      ("eax", &DWP(0, $key, "eax"));
206      &mov      ($_esp, "ebx"); # save %esp
207      &mov      ($_end, "eax"); # save keyEnd

209      &call     (&label("pic_point"));
210      &set_label("pic_point");
211      &blndpop($Tb1);
212      &lea      ($Tb1, &DWP(&label("Camellia_SBOX")."-".&label("pic_point"), $Tb1))

214      &mov      (@T[0], &DWP(0, $idx)); # load plaintext
215      &mov      (@T[1], &DWP(4, $idx));
216      &mov      (@T[2], &DWP(8, $idx));
217      &bswap     (@T[0]);
218      &mov      (@T[3], &DWP(12, $idx));
219      &bswap     (@T[1]);
220      &bswap     (@T[2]);
221      &bswap     (@T[3]);

223      &call     ("_x86_Camellia_encrypt");

225      &mov      ("esp", $_esp);
226      &bswap     (@T[0]);
227      &mov      ($idx, &wparam(1)); # load ciphertext pointer
228      &bswap     (@T[1]);
229      &bswap     (@T[2]);
230      &bswap     (@T[3]);
231      &mov      (&DWP(0, $idx), @T[0]); # write ciphertext
232      &mov      (&DWP(4, $idx), @T[1]);
233      &mov      (&DWP(8, $idx), @T[2]);
234      &mov      (&DWP(12, $idx), @T[3]);
235 &function_end("Camellia_encrypt");
236 }

238 &function_begin_B("_x86_Camellia_encrypt");
239      &xor      (@T[0], &DWP(0, $key)); # ^=key[0-3]
240      &xor      (@T[1], &DWP(4, $key));
241      &xor      (@T[2], &DWP(8, $key));
242      &xor      (@T[3], &DWP(12, $key));
243      &mov      ($idx, &DWP(16, $key)); # prefetch key[4]

245      &mov      ($_s0, @T[0]); # save s[0-3]
246      &mov      ($_s1, @T[1]);
247      &mov      ($_s2, @T[2]);
248      &mov      ($_s3, @T[3]);

250 &set_label("loop", 16);
251      for ($i=0; $i<6; $i++) { Camellia_Feistel($i, 16, 4); }

253      &add      ($key, 16*4);
254      &cmp      ($key, $_end);
255      &jc       (&label("done"));

257      # @T[0-1] are preloaded, $idx is preloaded with key[0]
258      &and      ($idx, @T[0]);
259      &mov      (@T[3], $_s3);

```

```

260      &rotl    ($idx,1);
261      &mov     (@T[2],@T[3]);
262      &xor     (@T[1],$idx);
263      &or      (@T[2],&DWP(12,$key));
264      &mov     ($_s1,@T[1]);      # s1^=LeftRotate(s0&key[0],1);
265      &xor     (@T[2,$_s2);

267      &mov     ($idx,&DWP(4,$key));
268      &mov     ($_s2,@T[2]);      # s2^=s3|key[3];
269      &or      ($idx,@T[1]);
270      &and     (@T[2],&DWP(8,$key));
271      &xor     (@T[0],$idx);
272      &rotl    (@T[2],1);
273      &mov     ($_s0,@T[0]);      # s0^=s1|key[1];
274      &xor     (@T[3],@T[2]);
275      &mov     ($idx,&DWP(16,$key));      # prefetch key[4]
276      &mov     ($_s3,@T[3]);      # s3^=LeftRotate(s2&key[2],1);
277      &jmp     (&label("loop"));

279 &set_label("done",8);
280      &mov     (@T[2],@T[0]);      # SwapHalf
281      &mov     (@T[3],@T[1]);
282      &mov     (@T[0],$_s2);
283      &mov     (@T[1],$_s3);
284      &xor     (@T[0],$idx);      # $idx is preloaded with key[0]
285      &xor     (@T[1],&DWP(4,$key));
286      &xor     (@T[2],&DWP(8,$key));
287      &xor     (@T[3],&DWP(12,$key));
288      &ret     ();
289 &function_end_B("_x86_Camellia_encrypt");

291 # void Camellia_DecryptBlock_Rounds(
292 #     int grandRounds,
293 #     const Byte ciphertext[],
294 #     const KEY_TABLE_TYPE keyTable,
295 #     Byte plaintext[])
296 &function_begin("Camellia_DecryptBlock_Rounds");
297      &mov     ("eax",&wparam(0));      # load grandRounds
298      &mov     ($idx,&wparam(1));      # load ciphertext pointer
299      &mov     ($key,&wparam(2));      # load key schedule pointer

301      &mov     ("ebx","esp");
302      &sub     ("esp",7*4);      # place for s[0-3],keyEnd,esp and ra
303      &and     ("esp",-64);

305      # place stack frame just "above mod 1024" the key schedule
306      # this ensures that cache associativity of 2 suffices
307      &lea     ("ecx",&DWP(-64-63,$key));
308      &sub     ("ecx","esp");
309      &neg     ("ecx");
310      &and     ("ecx",0x3C0);      # modulo 1024, but aligned to cache-line
311      &sub     ("esp","ecx");
312      &add     ("esp",4);      # 4 is reserved for callee's return address

314      &shl     ("eax",6);
315      &mov     (&DWP(4*4,"esp"),$key); # save keyStart
316      &lea     ($key,&DWP(0,$key,"eax"));
317      &mov     (&DWP(5*4,"esp"),"ebx");# save %esp

319      &call    (&label("pic_point"));
320      &set_label("pic_point");
321      &blndpop($tbl);
322      &lea     ($tbl,&DWP(&label("Camellia_SBOX")."-".&label("pic_point"),$tbl))

324      &mov     (@T[0],&DWP(0,$idx));      # load ciphertext
325      &mov     (@T[1],&DWP(4,$idx));

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```

326      &mov     (@T[2],&DWP(8,$idx));
327      &bswap   (@T[0]);
328      &mov     (@T[3],&DWP(12,$idx));
329      &bswap   (@T[1]);
330      &bswap   (@T[2]);
331      &bswap   (@T[3]);

333      &call    ("_x86_Camellia_decrypt");

335      &mov     ("esp",&DWP(5*4,"esp"));
336      &bswap   (@T[0]);
337      &mov     ($idx,&wparam(3));      # load plaintext pointer
338      &bswap   (@T[1]);
339      &bswap   (@T[2]);
340      &bswap   (@T[3]);
341      &mov     (&DWP(0,$idx),@T[0]);      # write plaintext
342      &mov     (&DWP(4,$idx),@T[1]);
343      &mov     (&DWP(8,$idx),@T[2]);
344      &mov     (&DWP(12,$idx),@T[3]);
345 &function_end("Camellia_DecryptBlock_Rounds");
346 # V1.x API
347 &function_begin_B("Camellia_DecryptBlock");
348      &mov     ("eax",128);
349      &sub     ("eax",&wparam(0));      # load keyBitLength
350      &mov     ("eax",3);
351      &adc     ("eax",0);      # keyBitLength==128?3:4
352      &mov     (&wparam(0),"eax");
353      &jmp     (&label("Camellia_DecryptBlock_Rounds"));
354 &function_end_B("Camellia_DecryptBlock");

356 if ($OPENSSL) {
357 # void Camellia_decrypt(
358 #     const unsigned char *in,
359 #     unsigned char *out,
360 #     const CAMELLIA_KEY *key)
361 &function_begin("Camellia_decrypt");
362      &mov     ($idx,&wparam(0));      # load ciphertext pointer
363      &mov     ($key,&wparam(2));      # load key schedule pointer

365      &mov     ("ebx","esp");
366      &sub     ("esp",7*4);      # place for s[0-3],keyEnd,esp and ra
367      &and     ("esp",-64);
368      &mov     ("eax",&DWP(272,$key)); # load grandRounds counter

370      # place stack frame just "above mod 1024" the key schedule
371      # this ensures that cache associativity of 2 suffices
372      &lea     ("ecx",&DWP(-64-63,$key));
373      &sub     ("ecx","esp");
374      &neg     ("ecx");
375      &and     ("ecx",0x3C0);      # modulo 1024, but aligned to cache-line
376      &sub     ("esp","ecx");
377      &add     ("esp",4);      # 4 is reserved for callee's return address

379      &shl     ("eax",6);
380      &mov     (&DWP(4*4,"esp"),$key); # save keyStart
381      &lea     ($key,&DWP(0,$key,"eax"));
382      &mov     (&DWP(5*4,"esp"),"ebx");# save %esp

384      &call    (&label("pic_point"));
385      &set_label("pic_point");
386      &blndpop($tbl);
387      &lea     ($tbl,&DWP(&label("Camellia_SBOX")."-".&label("pic_point"),$tbl))

389      &mov     (@T[0],&DWP(0,$idx));      # load ciphertext
390      &mov     (@T[1],&DWP(4,$idx));
391      &mov     (@T[2],&DWP(8,$idx));

```

```

392     &bswap    (@T[0]);
393     &mov      (@T[3], &DWP(12, $idx));
394     &bswap    (@T[1]);
395     &bswap    (@T[2]);
396     &bswap    (@T[3]);

398     &call     ("_x86_Camellia_decrypt");

400     &mov      ("esp", &DWP(5*4, "esp"));
401     &bswap    (@T[0]);
402     &mov      ($idx, &wparam(1));    # load plaintext pointer
403     &bswap    (@T[1]);
404     &bswap    (@T[2]);
405     &bswap    (@T[3]);
406     &mov      (&DWP(0, $idx), @T[0]); # write plaintext
407     &mov      (&DWP(4, $idx), @T[1]);
408     &mov      (&DWP(8, $idx), @T[2]);
409     &mov      (&DWP(12, $idx), @T[3]);
410 &function_end("Camellia_decrypt");
411 }

413 &function_begin_B("_x86_Camellia_decrypt");
414     &xor      (@T[0], &DWP(0, $key)); # ^=key[0-3]
415     &xor      (@T[1], &DWP(4, $key));
416     &xor      (@T[2], &DWP(8, $key));
417     &xor      (@T[3], &DWP(12, $key));
418     &mov      ($idx, &DWP(-8, $key)); # prefetch key[-2]

420     &mov      ($_s0, @T[0]);    # save s[0-3]
421     &mov      ($_s1, @T[1]);
422     &mov      ($_s2, @T[2]);
423     &mov      ($_s3, @T[3]);

425 &set_label("loop", 16);
426     for ($i=0; $i<6; $i++) { Camellia_Feistel($i, -8, 4); }

428     &sub      ($key, 16*4);
429     &cmp      ($key, $_end);
430     &jc       (&label("done"));

432     # @T[0-1] are preloaded, $idx is preloaded with key[2]
433     &and      ($idx, @T[0]);
434     &mov      (@T[3], $_s3);
435     &rotr     ($idx, 1);
436     &mov      (@T[2], @T[3]);
437     &xor      (@T[1], $idx);
438     &or       (@T[2], &DWP(4, $key));
439     &mov      ($_s1, @T[1]);    # s1^=LeftRotate(s0&key[0], 1);
440     &xor      (@T[2], $_s2);

442     &mov      ($idx, &DWP(12, $key));
443     &mov      ($_s2, @T[2]);    # s2^=s3|key[3];
444     &or       ($idx, @T[1]);
445     &and      (@T[2], &DWP(0, $key));
446     &xor      (@T[0], $idx);
447     &rotr     (@T[2], 1);
448     &mov      ($_s0, @T[0]);    # s0^=s1|key[1];
449     &xor      (@T[3], @T[2]);
450     &mov      ($idx, &DWP(-8, $key)); # prefetch key[4]
451     &mov      ($_s3, @T[3]);    # s3^=LeftRotate(s2&key[2], 1);
452     &jmp      (&label("loop"));

454 &set_label("done", 8);
455     &mov      (@T[2], @T[0]);    # SwapHalf
456     &mov      (@T[3], @T[1]);
457     &mov      (@T[0], $_s2);

```

```

458     &mov      (@T[1], $_s3);
459     &xor      (@T[2], $idx);    # $idx is preloaded with key[2]
460     &xor      (@T[3], &DWP(12, $key));
461     &xor      (@T[0], &DWP(0, $key));
462     &xor      (@T[1], &DWP(4, $key));
463     &ret      ();
464 &function_end_B("_x86_Camellia_decrypt");

466 # shld is very slow on Intel P4 family. Even on AMD it limits
467 # instruction decode rate [because it's VectorPath] and consequently
468 # performance. PIII, PM and Core[2] seem to be the only ones which
469 # execute this code ~7% faster...
470 sub _rotr128 {
471     my ($i0, $i1, $i2, $i3, $rot, $rnd, @T)=@_;

473     $rnd *= 2;
474     if ($rot) {
475         &mov      ($idx, $i0);
476         &shld     ($i0, $i1, $rot);
477         &shld     ($i1, $i2, $rot);
478         &shld     ($i2, $i3, $rot);
479         &shld     ($i3, $idx, $rot);
480     }
481     &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i0 eq @T[0]);
482     &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i1 eq @T[0]);
483     &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i2 eq @T[0]);
484     &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i3 eq @T[0]);
485 }

487 # ... Implementing 128-bit rotate without shld gives >3x performance
488 # improvement on P4, only ~7% degradation on other Intel CPUs and
489 # not worse performance on AMD. This is therefore preferred.
490 sub _rotr128 {
491     my ($i0, $i1, $i2, $i3, $rot, $rnd, @T)=@_;

493     $rnd *= 2;
494     if ($rot) {
495         &mov      ($Tb1, $i0);
496         &shl      ($i0, $rot);
497         &mov      ($idx, $i1);
498         &shr      ($idx, 32-$rot);
499         &shl      ($i1, $rot);
500         &or       ($i0, $idx);
501         &mov      ($idx, $i2);
502         &shl      ($i2, $rot);
503         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i0 eq @T[0]);
504         &shr      ($idx, 32-$rot);
505         &or       ($i1, $idx);
506         &shr      ($Tb1, 32-$rot);
507         &mov      ($idx, $i3);
508         &shr      ($idx, 32-$rot);
509         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i1 eq @T[0]);
510         &shl      ($i3, $rot);
511         &or       ($i2, $idx);
512         &or       ($i3, $Tb1);
513         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i2 eq @T[0]);
514         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i3 eq @T[0]);
515     } else {
516         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i0 eq @T[0]);
517         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i1 eq @T[0]);
518         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i2 eq @T[0]);
519         &mov      (&DWP(-128+4*$rnd++, $key), shift(@T)) if ($i3 eq @T[0]);
520     }
521 }

523 sub _saveround {

```

```

524 my ($rnd,$key,@T)=@_ ;
525 my $bias=int(@T[0])?shift(@T):0;

527      &mov      (&DWP($bias+$rnd*8+0,$key),@T[0]);
528      &mov      (&DWP($bias+$rnd*8+4,$key),@T[1])      if ($#T>=1);
529      &mov      (&DWP($bias+$rnd*8+8,$key),@T[2])      if ($#T>=2);
530      &mov      (&DWP($bias+$rnd*8+12,$key),@T[3])     if ($#T>=3);
531 }

533 sub _loadround {
534 my ($rnd,$key,@T)=@_ ;
535 my $bias=int(@T[0])?shift(@T):0;

537      &mov      (@T[0],&DWP($bias+$rnd*8+0,$key));
538      &mov      (@T[1],&DWP($bias+$rnd*8+4,$key))      if ($#T>=1);
539      &mov      (@T[2],&DWP($bias+$rnd*8+8,$key))      if ($#T>=2);
540      &mov      (@T[3],&DWP($bias+$rnd*8+12,$key))     if ($#T>=3);
541 }

543 # void Camellia_Ekeygen(
544 #     const int keyBitLength,
545 #     const Byte *rawKey,
546 #     KEY_TABLE_TYPE keyTable)
547 &function_begin("Camellia_Ekeygen");
548 { my $step=0;

550      &stack_push(4);                # place for s[0-3]

552      &mov      ($Tb1,&wparam(0));    # load arguments
553      &mov      ($idx,&wparam(1));
554      &mov      ($key,&wparam(2));

556      &mov      (@T[0],&DWP(0,$idx));  # load 0-127 bits
557      &mov      (@T[1],&DWP(4,$idx));
558      &mov      (@T[2],&DWP(8,$idx));
559      &mov      (@T[3],&DWP(12,$idx));

561      &bswap    (@T[0]);
562      &bswap    (@T[1]);
563      &bswap    (@T[2]);
564      &bswap    (@T[3]);

566      &_saveround    (0,$key,@T);    # KL<<<0

568      &cmp      ($Tb1,128);
569      &jne      (&label("1st128"));

571      &mov      (@T[0],&DWP(16,$idx)); # load 128-191 bits
572      &mov      (@T[1],&DWP(20,$idx));
573      &cmp      ($Tb1,192);
574      &jne      (&label("1st192"));
575      &mov      (@T[2],&DWP(24,$idx)); # load 192-255 bits
576      &mov      (@T[3],&DWP(28,$idx));
577      &jmp      (&label("1st256"));
578 &set_label("1st192",4);
579      &mov      (@T[2],@T[0]);
580      &mov      (@T[3],@T[1]);
581      &not      (@T[2]);
582      &not      (@T[3]);
583 &set_label("1st256",4);
584      &bswap    (@T[0]);
585      &bswap    (@T[1]);
586      &bswap    (@T[2]);
587      &bswap    (@T[3]);

589      &_saveround    (4,$key,@T);    # temporary storage for KR!

```

```

591      &xor      (@T[0],&DWP(0*8+0,$key));    # KR^KL
592      &xor      (@T[1],&DWP(0*8+4,$key));
593      &xor      (@T[2],&DWP(1*8+0,$key));
594      &xor      (@T[3],&DWP(1*8+4,$key));

596 &set_label("1st128",4);
597      &call    (&label("pic_point"));
598      &set_label("pic_point");
599      &blindpop($Tb1);
600      &lea      ($Tb1,&DWP(&label("Camellia_SBOX")."-."&label("pic_point"),$Tb1)
601      &lea      ($key,&DWP(&label("Camellia_SIGMA")."-."&label("Camellia_SBOX"),

603      &mov      ($idx,&DWP($step*8,$key));    # prefetch SIGMA[0]
604      &mov      (&swtmp(0),@T[0]);          # save s[0-3]
605      &mov      (&swtmp(1),@T[1]);
606      &mov      (&swtmp(2),@T[2]);
607      &mov      (&swtmp(3),@T[3]);
608      &Camellia_Feistel($step++);
609      &Camellia_Feistel($step++);
610      &mov      (@T[2],&swtmp(2));
611      &mov      (@T[3],&swtmp(3));

613      &mov      ($idx,&wparam(2));
614      &xor      (@T[0],&DWP(0*8+0,$idx));    # ^KL
615      &xor      (@T[1],&DWP(0*8+4,$idx));
616      &xor      (@T[2],&DWP(1*8+0,$idx));
617      &xor      (@T[3],&DWP(1*8+4,$idx));

619      &mov      ($idx,&DWP($step*8,$key));    # prefetch SIGMA[4]
620      &mov      (&swtmp(0),@T[0]);          # save s[0-3]
621      &mov      (&swtmp(1),@T[1]);
622      &mov      (&swtmp(2),@T[2]);
623      &mov      (&swtmp(3),@T[3]);
624      &Camellia_Feistel($step++);
625      &Camellia_Feistel($step++);
626      &mov      (@T[2],&swtmp(2));
627      &mov      (@T[3],&swtmp(3));

629      &mov      ($idx,&wparam(0));
630      &cmp      ($idx,128);
631      &jne      (&label("2nd256"));

633      &mov      ($key,&wparam(2));
634      &lea      ($key,&DWP(128,$key));        # size optimization

636 ##### process KA
637 &_saveround    (2,$key,-128,@T);          # KA<<<0
638      &_rotl128    (@T,15,6,@T);            # KA<<<15
639      &_rotl128    (@T,15,8,@T);            # KA<<<(15+15=30)
640      &_rotl128    (@T,15,12,@T[0],@T[1]); # KA<<<(30+15=45)
641      &_rotl128    (@T,15,14,@T);          # KA<<<(45+15=60)
642      push        (@T,shift(@T));          # rotl128(@T,32);
643      &_rotl128    (@T,2,20,@T);          # KA<<<(60+32=94)
644      &_rotl128    (@T,17,24,@T);         # KA<<<(94+17=111)

646 ##### process KL
647 &_loadround    (0,$key,-128,@T);          # load KL
648      &_rotl128    (@T,15,4,@T);            # KL<<<15
649      &_rotl128    (@T,30,10,@T);          # KL<<<(15+30=45)
650      &_rotl128    (@T,15,13,@T[2],@T[3]); # KL<<<(45+15=60)
651      &_rotl128    (@T,17,16,@T);          # KL<<<(60+17=77)
652      &_rotl128    (@T,17,18,@T);          # KL<<<(77+17=94)
653      &_rotl128    (@T,17,22,@T);          # KL<<<(94+17=111)

655      while (@T[0] ne "eax")              # restore order

```

```

656 { unshift (@T, pop(@T)); }

658 &mov ("eax", 3); # 3 grandRounds
659 &jmp (&label("done"));

661 &set_label("2nd256", 16);
662 &mov ($idx, &wparam(2));
663 &_saveround (6, $idx, @T); # temporary storage for KA!

665 &xor (@T[0], &DWP(4*8+0, $idx)); # KA^KR
666 &xor (@T[1], &DWP(4*8+4, $idx));
667 &xor (@T[2], &DWP(5*8+0, $idx));
668 &xor (@T[3], &DWP(5*8+4, $idx));

670 &mov ($idx, &DWP($step*8, $key)); # prefetch SIGMA[8]
671 &mov (&swtmp(0), @T[0]); # save s[0-3]
672 &mov (&swtmp(1), @T[1]);
673 &mov (&swtmp(2), @T[2]);
674 &mov (&swtmp(3), @T[3]);
675 &Camellia_Feistel($step++);
676 &Camellia_Feistel($step++);
677 &mov (@T[2], &swtmp(2));
678 &mov (@T[3], &swtmp(3));

680 &mov ($key, &wparam(2));
681 &lea ($key, &DWP(128, $key)); # size optimization

683 ##### process KB
684 &_saveround (2, $key, -128, @T); # KB<<<0
685 &_rotl128 (@T, 30, 10, @T); # KB<<<30
686 &_rotl128 (@T, 30, 20, @T); # KB<<<(30+30=60)
687 push (@T, shift(@T)); # rotl128(@T, 32);
688 &_rotl128 (@T, 19, 32, @T); # KB<<<(60+32+19=111)

690 ##### process KR
691 &_loadround (4, $key, -128, @T); # load KR
692 &_rotl128 (@T, 15, 4, @T); # KR<<<15
693 &_rotl128 (@T, 15, 8, @T); # KR<<<(15+15=30)
694 &_rotl128 (@T, 30, 18, @T); # KR<<<(30+30=60)
695 push (@T, shift(@T)); # rotl128(@T, 32);
696 &_rotl128 (@T, 2, 26, @T); # KR<<<(60+32+2=94)

698 ##### process KA
699 &_loadround (6, $key, -128, @T); # load KA
700 &_rotl128 (@T, 15, 6, @T); # KA<<<15
701 &_rotl128 (@T, 30, 14, @T); # KA<<<(15+30=45)
702 push (@T, shift(@T)); # rotl128(@T, 32);
703 &_rotl128 (@T, 0, 24, @T); # KA<<<(45+32+0=77)
704 &_rotl128 (@T, 17, 28, @T); # KA<<<(77+17=94)

706 ##### process KL
707 &_loadround (0, $key, -128, @T); # load KL
708 push (@T, shift(@T)); # rotl128(@T, 32);
709 &_rotl128 (@T, 13, 12, @T); # KL<<<(32+13=45)
710 &_rotl128 (@T, 15, 16, @T); # KL<<<(45+15=60)
711 &_rotl128 (@T, 17, 22, @T); # KL<<<(60+17=77)
712 push (@T, shift(@T)); # rotl128(@T, 32);
713 &_rotl128 (@T, 2, 30, @T); # KL<<<(77+32+2=111)

715 while (@T[0] ne "eax") # restore order
716 { unshift (@T, pop(@T)); }

718 &mov ("eax", 4); # 4 grandRounds
719 &set_label("done");
720 &lea ("edx", &DWP(272-128, $key)); # end of key schedule
721 &stack_pop(4);

```

```

722 }
723 &function_end("Camellia_Ekeygen");

725 if ($OPENSSL) {
726 # int private_Camellia_set_key (
727 # const unsigned char *userKey,
728 # int bits,
729 # CAMELLIA_KEY *key)
730 &function_begin_B("private_Camellia_set_key");
731 &push ("ebx");
732 &mov ("ecx", &wparam(0)); # pull arguments
733 &mov ("ebx", &wparam(1));
734 &mov ("edx", &wparam(2));

736 &mov ("eax", -1);
737 &test ("ecx", "ecx");
738 &jz (&label("done")); # userKey==NULL?
739 &test ("edx", "edx");
740 &jz (&label("done")); # key==NULL?

742 &mov ("eax", -2);
743 &cmp ("ebx", 256);
744 &jne (&label("arg_ok")); # bits==256?
745 &cmp ("ebx", 192);
746 &jne (&label("arg_ok")); # bits==192?
747 &cmp ("ebx", 128);
748 &jne (&label("done")); # bits!=128?
749 &set_label("arg_ok", 4);

751 &push ("edx"); # push arguments
752 &push ("ecx");
753 &push ("ebx");
754 &call ("Camellia_Ekeygen");
755 &stack_pop(3);

757 # eax holds grandRounds and edx points at where to put it
758 &mov (&DWP(0, "edx"), "eax");
759 &xor ("eax", "eax");
760 &set_label("done", 4);
761 &pop ("ebx");
762 &ret ();
763 &function_end_B("private_Camellia_set_key");
764 }

766 @SBOX=(
767 112, 130, 44, 236, 179, 39, 192, 229, 228, 133, 87, 53, 234, 12, 174, 65,
768 35, 239, 107, 147, 69, 25, 165, 33, 237, 14, 79, 78, 29, 101, 146, 189,
769 134, 184, 175, 143, 124, 235, 31, 206, 62, 48, 220, 95, 94, 197, 11, 26,
770 166, 225, 57, 202, 213, 71, 93, 61, 217, 1, 90, 214, 81, 86, 108, 77,
771 139, 13, 154, 102, 251, 204, 176, 45, 116, 18, 43, 32, 240, 177, 132, 153,
772 223, 76, 203, 194, 52, 126, 118, 5, 109, 183, 169, 49, 209, 23, 4, 215,
773 20, 88, 58, 97, 222, 27, 17, 28, 50, 15, 156, 22, 83, 24, 242, 34,
774 254, 68, 207, 178, 195, 181, 122, 145, 36, 8, 232, 168, 96, 252, 105, 80,
775 170, 208, 160, 125, 161, 137, 98, 151, 84, 91, 30, 149, 224, 255, 100, 210,
776 16, 196, 0, 72, 163, 247, 117, 219, 138, 3, 230, 218, 9, 63, 221, 148,
777 135, 92, 131, 2, 205, 74, 144, 51, 115, 103, 246, 243, 157, 127, 191, 226,
778 82, 155, 216, 38, 200, 55, 198, 59, 129, 150, 111, 75, 19, 190, 99, 46,
779 233, 121, 167, 140, 159, 110, 188, 142, 41, 245, 249, 182, 47, 253, 180, 89,
780 120, 152, 6, 106, 231, 70, 113, 186, 212, 37, 171, 66, 136, 162, 141, 250,
781 114, 7, 185, 85, 248, 238, 172, 10, 54, 73, 42, 104, 60, 56, 241, 164,
782 64, 40, 211, 123, 187, 201, 67, 193, 21, 227, 173, 244, 119, 199, 128, 158);

784 sub S1110 { my $i=shift; $i=@SBOX[$i]; return $i<<24|$i<<16|$i<<8; }
785 sub S4404 { my $i=shift; $i=($i<<1|$i>>7)&0xff; $i=@SBOX[$i]; return $i<<24|$i<<
786 sub S0222 { my $i=shift; $i=@SBOX[$i]; $i=($i<<1|$i>>7)&0xff; return $i<<16|$i<<
787 sub S3033 { my $i=shift; $i=@SBOX[$i]; $i=($i>>1|$i<<7)&0xff; return $i<<24|$i<<

```

```

789 &set_label("Camellia_SIGMA", 64);
790 &data_word(
791     0xa09e667f, 0x3bcc908b, 0xb67ae858, 0x4caa73b2,
792     0xc6ef372f, 0xe94f82be, 0x54ff53a5, 0xfd1d36f1c,
793     0x10e527fa, 0xde682d1d, 0xb05688c2, 0xb3e6c1fd,
794     0, 0, 0, 0);
795 &set_label("Camellia_SBOX", 64);
796 # tables are interleaved, remember?
797 for ($i=0;$i<256;$i++) { &data_word(&S1110($i), &S4404($i)); }
798 for ($i=0;$i<256;$i++) { &data_word(&S0222($i), &S3033($i)); }

800 # void Camellia_cbc_encrypt (const void char *inp, unsigned char *out,
801 #                             size_t length, const CAMELLIA_KEY *key,
802 #                             unsigned char *ivp, const int enc);
803 {
804 # stack frame layout
805 #     -4(%esp)          # return address      0(%esp)
806 #     0(%esp)          # s0                  4(%esp)
807 #     4(%esp)          # s1                  8(%esp)
808 #     8(%esp)          # s2                 12(%esp)
809 #    12(%esp)          # s3                 16(%esp)
810 #    16(%esp)          # end of key schedule 20(%esp)
811 #    20(%esp)          # %esp backup
812 my $inp=&DWP(24,"esp"); #copy of wparam(0)
813 my $out=&DWP(28,"esp"); #copy of wparam(1)
814 my $len=&DWP(32,"esp"); #copy of wparam(2)
815 my $key=&DWP(36,"esp"); #copy of wparam(3)
816 my $ivp=&DWP(40,"esp"); #copy of wparam(4)
817 my $ivec=&DWP(44,"esp"); #ivec[16]
818 my $tmp=&DWP(44,"esp"); #volatile variable [yes, aliases with ivec]
819 my ($s0,$s1,$s2,$s3) = @T;

821 &function_begin("Camellia_cbc_encrypt");
822 &mov ($s2 eq "ecx"? $s2 : "", &wparam(2)); # load len
823 &cmp ($s2, 0);
824 &je (&label("enc_out"));

826 &pushf ();
827 &cld ();

829 &mov ($s0, &wparam(0)); # load inp
830 &mov ($s1, &wparam(1)); # load out
831 &mov ($s2, &wparam(2)); # load len
832 &mov ($s3, &wparam(3)); # load key
833 &mov ($Tb1, &wparam(4)); # load ivp

835 # allocate aligned stack frame...
836 &lea ($idx, &DWP(-64,"esp"));
837 &and ($idx, -64);

839 # place stack frame just "above mod 1024" the key schedule
840 # this ensures that cache associativity of 2 suffices
841 &lea ($key, &DWP(-64-63,$s3));
842 &sub ($key, $idx);
843 &neg ($key);
844 &and ($key, 0x3C0); # modulo 1024, but aligned to cache-line
845 &sub ($idx, $key);

847 &mov ($key, &wparam(5)); # load enc

849 &exch ("esp", $idx);
850 &add ("esp", 4); # reserve for return address!
851 &mov ($_esp, $idx); # save %esp

853 &mov ($_inp, $s0); # save copy of inp

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```

854 &mov ($_out, $s1); # save copy of out
855 &mov ($_len, $s2); # save copy of len
856 &mov ($_key, $s3); # save copy of key
857 &mov ($_ivp, $Tb1); # save copy of ivp

859 &call (&label("pic_point")); # make it PIC!
860 &set_label("pic_point");
861 &blndpop($Tb1);
862 &lea ($Tb1, &DWP(&label("Camellia_SBOX")."-".&label("pic_point"), $Tb1));

864 &mov ($idx, 32);
865 &set_label("prefetch_sbox", 4);
866 &mov ($s0, &DWP(0, $Tb1));
867 &mov ($s1, &DWP(32, $Tb1));
868 &mov ($s2, &DWP(64, $Tb1));
869 &mov ($s3, &DWP(96, $Tb1));
870 &lea ($Tb1, &DWP(128, $Tb1));
871 &dec ($idx);
872 &jnz (&label("prefetch_sbox"));
873 &mov ($s0, $_key);
874 &sub ($Tb1, 4096);
875 &mov ($idx, $_inp);
876 &mov ($s3, &DWP(272, $s0)); # load grandRounds

878 &cmp ($key, 0);
879 &je (&label("DECRYPT"));

881 &mov ($s2, $_len);
882 &mov ($key, $_ivp);
883 &shl ($s3, 6);
884 &lea ($s3, &DWP(0, $s0, $s3));
885 &mov ($_end, $s3);

887 &test ($s2, 0xFFFFFFFF);
888 &jz (&label("enc_tail")); # short input...

890 &mov ($s0, &DWP(0, $key)); # load iv
891 &mov ($s1, &DWP(4, $key));

893 &set_label("enc_loop", 4);
894 &mov ($s2, &DWP(8, $key));
895 &mov ($s3, &DWP(12, $key));

897 &xor ($s0, &DWP(0, $idx)); # xor input data
898 &xor ($s1, &DWP(4, $idx));
899 &xor ($s2, &DWP(8, $idx));
900 &bswap ($s0);
901 &xor ($s3, &DWP(12, $idx));
902 &bswap ($s1);
903 &mov ($key, $_key); # load key
904 &bswap ($s2);
905 &bswap ($s3);

907 &call ("_x86_Camellia_encrypt");

909 &mov ($idx, $_inp); # load inp
910 &mov ($key, $_out); # load out

912 &bswap ($s0);
913 &bswap ($s1);
914 &bswap ($s2);
915 &mov (&DWP(0, $key), $s0); # save output data
916 &bswap ($s3);
917 &mov (&DWP(4, $key), $s1);
918 &mov (&DWP(8, $key), $s2);
919 &mov (&DWP(12, $key), $s3);

```

```

921      &mov      ($s2,$_len);          # load len
923      &lea      ($idx,&DWP(16,$idx));
924      &mov      ($_inp,$idx);          # save inp

926      &lea      ($s3,&DWP(16,$key));
927      &mov      ($_out,$s3);          # save out

929      &sub      ($s2,16);
930      &test     ($s2,0xFFFFFFFF0);
931      &mov      ($_len,$s2);          # save len
932      &jnz      (&label("enc_loop"));
933      &test     ($s2,15);
934      &jnz      (&label("enc_tail"));
935      &mov      ($idx,$_ivp);          # load ivp
936      &mov      ($s2,&DWP(8,$key));    # restore last dwords
937      &mov      ($s3,&DWP(12,$key));
938      &mov      (&DWP(0,$idx),$s0);    # save ivec
939      &mov      (&DWP(4,$idx),$s1);
940      &mov      (&DWP(8,$idx),$s2);
941      &mov      (&DWP(12,$idx),$s3);

943      &mov      ("esp",$_esp);
944      &popf     ();
945      &set_label("enc_out");
946      &function_end_A();
947      &pushf     ();                  # kludge, never executed

949      &set_label("enc_tail",4);
950      &mov      ($s0,$key eq "edi" ? $key : "");
951      &mov      ($key,$_out);          # load out
952      &push     ($s0);                # push ivp
953      &mov      ($s1,16);
954      &sub      ($s1,$s2);
955      &cmp      ($key,$idx);          # compare with inp
956      &je       (&label("enc_in_place"));
957      &align    (4);
958      &data_word(0xA4F3F689); # rep movsb # copy input
959      &jmp      (&label("enc_skip_in_place"));
960      &set_label("enc_in_place");
961      &lea      ($key,&DWP(0,$key,$s2));
962      &set_label("enc_skip_in_place");
963      &mov      ($s2,$s1);
964      &xor      ($s0,$s0);
965      &align    (4);
966      &data_word(0xAAF3F689); # rep stosb # zero tail
967      &pop      ($key);              # pop ivp

969      &mov      ($idx,$_out);          # output as input
970      &mov      ($s0,&DWP(0,$key));
971      &mov      ($s1,&DWP(4,$key));
972      &mov      ($_len,16);          # len=16
973      &jmp      (&label("enc_loop")); # one more spin...

975 #----- DECRYPT -----#
976 &set_label("DECRYPT",16);
977      &shl      ($s3,6);
978      &lea      ($s3,&DWP(0,$s0,$s3));
979      &mov      ($_end,$s0);
980      &mov      ($_key,$s3);

982      &cmp      ($idx,$_out);
983      &je       (&label("dec_in_place")); # in-place processing...

985      &mov      ($key,$_ivp);          # load ivp

```

```

986      &mov      ($_tmp,$key);

988      &set_label("dec_loop",4);
989      &mov      ($s0,&DWP(0,$idx));    # read input
990      &mov      ($s1,&DWP(4,$idx));
991      &mov      ($s2,&DWP(8,$idx));
992      &bswap     ($s0);
993      &mov      ($s3,&DWP(12,$idx));
994      &bswap     ($s1);
995      &mov      ($key,$_key);          # load key
996      &bswap     ($s2);
997      &bswap     ($s3);

999      &call     ("_x86_Camellia_decrypt");

1001     &mov      ($key,$_tmp);          # load ivp
1002     &mov      ($idx,$_len);          # load len

1004     &bswap     ($s0);
1005     &bswap     ($s1);
1006     &bswap     ($s2);
1007     &xor      ($s0,&DWP(0,$key));    # xor iv
1008     &bswap     ($s3);
1009     &xor      ($s1,&DWP(4,$key));
1010     &xor      ($s2,&DWP(8,$key));
1011     &xor      ($s3,&DWP(12,$key));

1013     &sub      ($idx,16);
1014     &jc       (&label("dec_partial"));
1015     &mov      ($_len,$idx);          # save len
1016     &mov      ($idx,$_inp);          # load inp
1017     &mov      ($key,$_out);          # load out

1019     &mov      (&DWP(0,$key),$s0);    # write output
1020     &mov      (&DWP(4,$key),$s1);
1021     &mov      (&DWP(8,$key),$s2);
1022     &mov      (&DWP(12,$key),$s3);

1024     &mov      ($_tmp,$idx);          # save ivp
1025     &lea      ($idx,&DWP(16,$idx));
1026     &mov      ($_inp,$idx);          # save inp

1028     &lea      ($key,&DWP(16,$key));
1029     &mov      ($_out,$key);          # save out

1031     &jnz      (&label("dec_loop"));
1032     &mov      ($key,$_tmp);          # load temp ivp
1033     &set_label("dec_end");
1034     &mov      ($idx,$_ivp);          # load user ivp
1035     &mov      ($s0,&DWP(0,$key));    # load iv
1036     &mov      ($s1,&DWP(4,$key));
1037     &mov      ($s2,&DWP(8,$key));
1038     &mov      ($s3,&DWP(12,$key));
1039     &mov      (&DWP(0,$idx),$s0);    # copy back to user
1040     &mov      (&DWP(4,$idx),$s1);
1041     &mov      (&DWP(8,$idx),$s2);
1042     &mov      (&DWP(12,$idx),$s3);
1043     &jmp      (&label("dec_out"));

1045     &set_label("dec_partial",4);
1046     &lea      ($key,$ivec);
1047     &mov      (&DWP(0,$key),$s0);    # dump output to stack
1048     &mov      (&DWP(4,$key),$s1);
1049     &mov      (&DWP(8,$key),$s2);
1050     &mov      (&DWP(12,$key),$s3);
1051     &lea      ($s2 eq "ecx" ? $s2 : "",&DWP(16,$idx));

```



```

1052      &mov      ($idx eq "esi" ? $idx : "", $key);
1053      &mov      ($key eq "edi" ? $key : "", $out);      # load out
1054      &data_word(0xA4F3F689); # rep movsb      # copy output
1055      &mov      ($key, $inp);      # use inp as temp ivp
1056      &jmp      (&label("dec_end"));

1058      &set_label("dec_in_place", 4);
1059      &set_label("dec_in_place_loop");
1060      &lea      ($key, $ivec);
1061      &mov      ($s0, &DWP(0, $idx));      # read input
1062      &mov      ($s1, &DWP(4, $idx));
1063      &mov      ($s2, &DWP(8, $idx));
1064      &mov      ($s3, &DWP(12, $idx));

1066      &mov      (&DWP(0, $key), $s0);      # copy to temp
1067      &mov      (&DWP(4, $key), $s1);
1068      &mov      (&DWP(8, $key), $s2);
1069      &bswap     ($s0);
1070      &mov      (&DWP(12, $key), $s3);
1071      &bswap     ($s1);
1072      &mov      ($key, $key);      # load key
1073      &bswap     ($s2);
1074      &bswap     ($s3);

1076      &call     ("_x86_Camellia_decrypt");

1078      &mov      ($key, $ivp);      # load ivp
1079      &mov      ($idx, $out);      # load out

1081      &bswap     ($s0);
1082      &bswap     ($s1);
1083      &bswap     ($s2);
1084      &xor      ($s0, &DWP(0, $key));      # xor iv
1085      &bswap     ($s3);
1086      &xor      ($s1, &DWP(4, $key));
1087      &xor      ($s2, &DWP(8, $key));
1088      &xor      ($s3, &DWP(12, $key));

1090      &mov      (&DWP(0, $idx), $s0);      # write output
1091      &mov      (&DWP(4, $idx), $s1);
1092      &mov      (&DWP(8, $idx), $s2);
1093      &mov      (&DWP(12, $idx), $s3);

1095      &lea      ($idx, &DWP(16, $idx));
1096      &mov      ($out, $idx);      # save out

1098      &lea      ($idx, $ivec);
1099      &mov      ($s0, &DWP(0, $idx));      # read temp
1100      &mov      ($s1, &DWP(4, $idx));
1101      &mov      ($s2, &DWP(8, $idx));
1102      &mov      ($s3, &DWP(12, $idx));

1104      &mov      (&DWP(0, $key), $s0);      # copy iv
1105      &mov      (&DWP(4, $key), $s1);
1106      &mov      (&DWP(8, $key), $s2);
1107      &mov      (&DWP(12, $key), $s3);

1109      &mov      ($idx, $inp);      # load inp

1111      &lea      ($idx, &DWP(16, $idx));
1112      &mov      ($inp, $idx);      # save inp

1114      &mov      ($s2, $len);      # load len
1115      &sub      ($s2, 16);
1116      &jc      (&label("dec_in_place_partial"));
1117      &mov      ($len, $s2);      # save len

```

```

1118      &jnz      (&label("dec_in_place_loop"));
1119      &jmp      (&label("dec_out"));

1121      &set_label("dec_in_place_partial", 4);
1122      # one can argue if this is actually required...
1123      &mov      ($key eq "edi" ? $key : "", $out);
1124      &lea      ($idx eq "esi" ? $idx : "", $ivec);
1125      &lea      ($key, &DWP(0, $key, $s2));
1126      &lea      ($idx, &DWP(16, $idx, $s2));
1127      &neg      ($s2 eq "ecx" ? $s2 : "");
1128      &data_word(0xA4F3F689); # rep movsb      # restore tail

1130      &set_label("dec_out", 4);
1131      &mov      ("esp", $esp);
1132      &popf      ();
1133      &function_end("Camellia_cbc_encrypt");
1134  }

1136  &asciz("Camellia for x86 by <appro@openssl.org>");

1138  &asm_finish();

```

new/usr/src/lib/openssl/libsunw_crypto/pl/cml1-x86_64.pl

1

```
*****
25677 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/cml1-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 # =====
4 # Copyright (c) 2008 Andy Polyakov <appro@openssl.org>
5 #
6 # This module may be used under the terms of either the GNU General
7 # Public License version 2 or later, the GNU Lesser General Public
8 # License version 2.1 or later, the Mozilla Public License version
9 # 1.1 or the BSD License. The exact terms of either license are
10 # distributed along with this module. For further details see
11 # http://www.openssl.org/~appro/camellia/.
12 # =====

14 # Performance in cycles per processed byte (less is better) in
15 # 'openssl speed ...' benchmark:
16 #
17 #                               AMD64   Core2   EM64T
18 # -evp camellia-128-ecb      16.7     21.0    22.7
19 # + over gcc 3.4.6          +25%     +5%     0%
20 #
21 # camellia-128-cbc          15.7     20.4    21.1
22 #
23 # 128-bit key setup         128       216     205    cycles/key
24 # + over gcc 3.4.6          +54%    +39%    +15%
25 #
26 # Numbers in "+" rows represent performance improvement over compiler
27 # generated code. Key setup timings are impressive on AMD and Core2
28 # thanks to 64-bit operations being covertly deployed. Improvement on
29 # EM64T, pre-Core2 Intel x86_64 CPU, is not as impressive, because it
30 # apparently emulates some of 64-bit operations in [32-bit] microcode.

32 $flavour = shift;
33 $output = shift;
34 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

36 $win64=0; $win64=1 if ($flavour =~ /nm|asm|mingw64/ || $output =~ /\.asm$/);

38 $0 =~ m/(.*[\\\/\s])[^\\\/\s]+$/; $dir=$1;
39 ( $xlate="$dir\x86_64-xlate.pl" and -f $xlate ) or
40 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
41 die "can't locate x86_64-xlate.pl";

43 open OUT,"| \"$^X\" $xlate $flavour $output";
44 *STDOUT=*OUT;

46 sub hi() { my $r=shift; $r =~ s/%[er]([a-d])x/%\1h/;   $r; }
47 sub lo() { my $r=shift; $r =~ s/%[er]([a-d])x/%\1l/;   $r; }
48           $r =~ s/%[er]([sd])i/%\1l/;
49           $r =~ s/%[r]([0-9]+)[d]?/%\1b/;   $r; }

51 $t0="%eax"; $t1="%ebx"; $t2="%ecx"; $t3="%edx";
52 @S=("%r8d", "%r9d", "%r10d", "%r11d");
53 $i0="%esi";
54 $i1="%edi";
55 $tbl="%rbp"; # size optimization
56 $inp="%r12";
57 $out="%r13";
58 $key="%r14";
59 $keyend="%r15";
60 $arg0d=$win64?"%ecx":"%edi";
```

new/usr/src/lib/openssl/libsunw_crypto/pl/cml1-x86_64.pl

2

```
62 # const unsigned int Camellia_SBOX[4][256];
63 # Well, sort of... Camellia_SBOX[0][] is interleaved with [1][],
64 # and [2][] - with [3][]. This is done to minimize code size.
65 $SBOX1_1110=0; # Camellia_SBOX[0]
66 $SBOX4_4404=4; # Camellia_SBOX[1]
67 $SBOX2_0222=2048; # Camellia_SBOX[2]
68 $SBOX3_3033=2052; # Camellia_SBOX[3]

70 sub Camellia_Feistel {
71 my $i=@_ [0];
72 my $seed=defined(@_ [1])?@_ [1]:0;
73 my $scale=$seed<0?-8:8;
74 my $j=($i&1)*2;
75 my $s0=@S[($j)%4], $s1=@S[($j+1)%4], $s2=@S[($j+2)%4], $s3=@S[($j+3)%4];

77 $code.=<<<";
78     xor     $s0,$t0 # t0^=key[0]
79     xor     $s1,$t1 # t1^=key[1]
80     movz    'hi("$t0")',$i0 # (t0>>8)&0xff
81     movz    'lo("$t1")',$i1 # (t1>>0)&0xff
82     mov     $SBOX3_3033($tbl,$i0,8),$t3 # t3=SBOX3_3033[0]
83     mov     $SBOX1_1110($tbl,$i1,8),$t2 # t2=SBOX1_1110[1]
84     movz    'lo("$t0")',$i0 # (t0>>0)&0xff
85     shr     \ $16,$t0
86     movz    'hi("$t1")',$i1 # (t1>>8)&0xff
87     xor     $SBOX4_4404($tbl,$i0,8),$t3 # t3^=SBOX4_4404[0]
88     shr     \ $16,$t1
89     xor     $SBOX4_4404($tbl,$i1,8),$t2 # t2^=SBOX4_4404[1]
90     movz    'hi("$t0")',$i0 # (t0>>24)&0xff
91     movz    'lo("$t1")',$i1 # (t1>>16)&0xff
92     xor     $SBOX1_1110($tbl,$i0,8),$t3 # t3^=SBOX1_1110[0]
93     xor     $SBOX3_3033($tbl,$i1,8),$t2 # t2^=SBOX3_3033[1]
94     movz    'lo("$t0")',$i0 # (t0>>16)&0xff
95     movz    'hi("$t1")',$i1 # (t1>>24)&0xff
96     xor     $SBOX2_0222($tbl,$i0,8),$t3 # t3^=SBOX2_0222[0]
97     xor     $SBOX2_0222($tbl,$i1,8),$t2 # t2^=SBOX2_0222[1]
98     mov     '$seed+($i+1)*$scale'($key),$t1 # prefetch key[i+1]
99     mov     '$seed+($i+1)*$scale+4'($key),$t0
100    xor     $t3,$t2 # t2^=t3
101    ror     \ $8,$t3 # t3=RightRotate(t3,8)
102    xor     $t2,$s2
103    xor     $t2,$s3
104    xor     $t3,$s3
105
106 }

108 # void Camellia_EncryptBlock_Rounds(
109 #     int grandRounds,
110 #     const Byte plaintext[],
111 #     const KEY_TABLE_TYPE keyTable,
112 #     Byte ciphertext[])
113 $code.=<<<";
114 .text

116 # V1.x API
117 .globl Camellia_EncryptBlock
118 .type Camellia_EncryptBlock,@abi-omnipotent
119 .align 16
120 Camellia_EncryptBlock:
121     movl    \ $128,%eax
122     subl    $arg0d,%eax
123     movl    \ $3,$arg0d
124     adcl    \ $0,$arg0d # keyBitLength==128?3:4
125     jmp     .lenc_rounds
126 .size Camellia_EncryptBlock,.-Camellia_EncryptBlock
127 # V2
```

```

128 .globl Camellia_EncryptBlock_Rounds
129 .type Camellia_EncryptBlock_Rounds, @function, 4
130 .align 16
131 .Lenc_rounds:
132 Camellia_EncryptBlock_Rounds:
133     push    %rbx
134     push    %rbp
135     push    %r13
136     push    %r14
137     push    %r15
138 .Lenc_prologue:
139
140     #mov     %rsi, $inp           # put away arguments
141     mov     %rcx, $out
142     mov     %rdx, $key
143
144     shl     \%$6, %edi           # process grandRounds
145     lea     .LCamellia_SBOX(%rip), %tbl
146     lea     ($key, %rdi), $keyend
147
148     mov     0(%rsi), @S[0]       # load plaintext
149     mov     4(%rsi), @S[1]
150     mov     8(%rsi), @S[2]
151     bswap   @S[0]
152     mov     12(%rsi), @S[3]
153     bswap   @S[1]
154     bswap   @S[2]
155     bswap   @S[3]
156
157     call    _x86_64_Camellia_encrypt
158
159     bswap   @S[0]
160     bswap   @S[1]
161     bswap   @S[2]
162     mov     @S[0], 0($out)
163     bswap   @S[3]
164     mov     @S[1], 4($out)
165     mov     @S[2], 8($out)
166     mov     @S[3], 12($out)
167
168     mov     0(%rsp), %r15
169     mov     8(%rsp), %r14
170     mov     16(%rsp), %r13
171     mov     24(%rsp), %rbp
172     mov     32(%rsp), %rbx
173     lea     40(%rsp), %rsp
174 .Lenc_epilogue:
175     ret
176 .size Camellia_EncryptBlock_Rounds, .-Camellia_EncryptBlock_Rounds
177
178 .type _x86_64_Camellia_encrypt, @abi-omnipotent
179 .align 16
180 _x86_64_Camellia_encrypt:
181     xor     0($key), @S[1]
182     xor     4($key), @S[0]       # ^=key[0-3]
183     xor     8($key), @S[3]
184     xor     12($key), @S[2]
185 .align 16
186 .Leloop:
187     mov     16($key), %t1        # prefetch key[4-5]
188     mov     20($key), %t0
189
190     for (Si=0; Si<6; Si++) { Camellia_Feistel(Si, 16); }
191 $code.=<<__
192     lea     16*4($key), $key

```

```

194     cmp     $keyend, $key
195     mov     8($key), %t3        # prefetch key[2-3]
196     mov     12($key), %t2
197     je      .Ledone
198
199     and     @S[0], %t0
200     or      @S[3], %t3
201     rol     \%$1, %t0
202     xor     %t3, @S[2]         # s2^=s3|key[3];
203     xor     %t0, @S[1]         # s1^=LeftRotate(s0&key[0], 1);
204     and     @S[2], %t2
205     or      @S[1], %t1
206     rol     \%$1, %t2
207     xor     %t1, @S[0]         # s0^=s1|key[1];
208     xor     %t2, @S[3]         # s3^=LeftRotate(s2&key[2], 1);
209     jmp     .Leloop
210
211 .align 16
212 .Ledone:
213     xor     @S[2], %t0        # SwapHalf
214     xor     @S[3], %t1
215     xor     @S[0], %t2
216     xor     @S[1], %t3
217
218     mov     %t0, @S[0]
219     mov     %t1, @S[1]
220     mov     %t2, @S[2]
221     mov     %t3, @S[3]
222
223     .byte   0xf3, 0xc3        # rep ret
224 .size _x86_64_Camellia_encrypt, .-_x86_64_Camellia_encrypt
225
226 # V1.x API
227 .globl Camellia_DecryptBlock
228 .type Camellia_DecryptBlock, @abi-omnipotent
229 .align 16
230 Camellia_DecryptBlock:
231     movl    \%$128, %eax
232     subl    $arg0d, %eax
233     movl    \%$3, %arg0d
234     adcl    \%$0, %arg0d      # keyBitLength==128?3:4
235     jmp     .Ldec_rounds
236 .size Camellia_DecryptBlock, .-Camellia_DecryptBlock
237 # V2
238 .globl Camellia_DecryptBlock_Rounds
239 .type Camellia_DecryptBlock_Rounds, @function, 4
240 .align 16
241 .Ldec_rounds:
242 Camellia_DecryptBlock_Rounds:
243     push    %rbx
244     push    %rbp
245     push    %r13
246     push    %r14
247     push    %r15
248 .Ldec_prologue:
249
250     #mov     %rsi, $inp           # put away arguments
251     mov     %rcx, $out
252     mov     %rdx, $keyend
253
254     shl     \%$6, %edi           # process grandRounds
255     lea     .LCamellia_SBOX(%rip), %tbl
256     lea     ($keyend, %rdi), $key
257
258     mov     0(%rsi), @S[0]       # load plaintext
259     mov     4(%rsi), @S[1]

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```

260      mov     8(%rsi),@S[2]
261      bswap   @S[0]
262      mov     12(%rsi),@S[3]
263      bswap   @S[1]
264      bswap   @S[2]
265      bswap   @S[3]

267      call    _x86_64_Camellia_decrypt

269      bswap   @S[0]
270      bswap   @S[1]
271      bswap   @S[2]
272      mov     @S[0],0($out)
273      bswap   @S[3]
274      mov     @S[1],4($out)
275      mov     @S[2],8($out)
276      mov     @S[3],12($out)

278      mov     0(%rsp),%r15
279      mov     8(%rsp),%r14
280      mov     16(%rsp),%r13
281      mov     24(%rsp),%rbp
282      mov     32(%rsp),%rbx
283      lea     40(%rsp),%rsp
284      .Ldec_epilogue:
285      ret
286      .size    Camellia_DecryptBlock_Rounds,.-Camellia_DecryptBlock_Rounds

288      .type    _x86_64_Camellia_decrypt,@abi-omnipotent
289      .align   16
290      _x86_64_Camellia_decrypt:
291      xor     0($key),@S[1]
292      xor     4($key),@S[0]          # ^=key[0-3]
293      xor     8($key),@S[3]
294      xor     12($key),@S[2]
295      .align   16
296      .Ldloop:
297      mov     -8($key),%t1          # prefetch key[4-5]
298      mov     -4($key),%t0

300      for ($i=0;$i<6;$i++) { Camellia_Feistel($i,-8); }
302      $code.=<<";
303      lea     -16*4($key),%key
304      cmp     $keyend,$key
305      mov     0($key),%t3          # prefetch key[2-3]
306      mov     4($key),%t2
307      je      .Lddone

309      and     @S[0],%t0
310      or      @S[3],%t3
311      rol     %t1,%t0
312      xor     %t3,@S[2]          # s2^=s3|key[3];
313      xor     %t0,@S[1]          # s1^=LeftRotate(s0&key[0],1);
314      and     @S[2],%t2
315      or      @S[1],%t1
316      rol     %t1,%t2          # s0^=s1|key[1];
317      xor     %t1,@S[0]          # s3^=LeftRotate(s2&key[2],1);
318      xor     %t2,@S[3]

320      jmp     .Ldloop

322      .align   16
323      .Lddone:
324      xor     @S[2],%t2
325      xor     @S[3],%t3

```

```

326      xor     @S[0],%t0
327      xor     @S[1],%t1

329      mov     %t2,@S[0]          # SwapHalf
330      mov     %t3,@S[1]
331      mov     %t0,@S[2]
332      mov     %t1,@S[3]

334      .byte    0xf3,0xc3          # rep ret
335      .size    _x86_64_Camellia_decrypt,.-_x86_64_Camellia_decrypt
336      ____

338      sub     _saveround {
339      my ($rnd,$key,@T)=@_;
340      my $bias=int(@T[0])?shift(@T):0;

342      if ($#T==3) {
343      $code.=<<";
344      mov     @T[1],'$bias+$rnd*8+0'($key)
345      mov     @T[0],'$bias+$rnd*8+4'($key)
346      mov     @T[3],'$bias+$rnd*8+8'($key)
347      mov     @T[2],'$bias+$rnd*8+12'($key)
348      ____
349      } else {
350      $code.="      mov     @T[0],'$bias+$rnd*8+0'($key)\n";
351      $code.="      mov     @T[1],'$bias+$rnd*8+8'($key)\n" if ($#T>=1);
352      }
353      }

355      sub     _loadround {
356      my ($rnd,$key,@T)=@_;
357      my $bias=int(@T[0])?shift(@T):0;

359      $code.="      mov     '$bias+$rnd*8+0'($key),@T[0]\n";
360      $code.="      mov     '$bias+$rnd*8+8'($key),@T[1]\n" if ($#T>=1);
361      }

363      # shld is very slow on Intel EM64T family. Even on AMD it limits
364      # instruction decode rate [because it's VectorPath] and consequently
365      # performance...
366      sub     _rotl128 {
367      my ($i0,$i1,$rot)=@_;

369      if ($rot) {
370      $code.=<<";
371      mov     %i0,%r11
372      shld     %$rot,%i1,%i0
373      shld     %$rot,%r11,%i1
374      ____
375      }
376      }

378      # ... Implementing 128-bit rotate without shld gives 80% better
379      # performance EM64T, +15% on AMD64 and only ~7% degradation on
380      # Core2. This is therefore preferred.
381      sub     _rotl128 {
382      my ($i0,$i1,$rot)=@_;

384      if ($rot) {
385      $code.=<<";
386      mov     %i0,%r11
387      shl     %$rot,%i0
388      mov     %i1,%r9
389      shr     %$rot,%r9
390      shr     %$rot,%r11
391      or      %r9,%i0

```

```

392     shl     \$$rot,$i1
393     or      %r11,$i1
394 }
395 }
396 }

398 { my $step=0;

400 $code.=<<";
401 .globl Camellia_Ekeygen
402 .type Camellia_Ekeygen,\@function,3
403 .align 16
404 Camellia_Ekeygen:
405     push    %rbx
406     push    %rbp
407     push    %r13
408     push    %r14
409     push    %r15
410 .Lkey_prologue:

412     mov     %rdi,$keyend      # put away arguments, keyBitLength
413     mov     %rdx,$out         # keyTable

415     mov     0(%rsi),@S[0]      # load 0-127 bits
416     mov     4(%rsi),@S[1]
417     mov     8(%rsi),@S[2]
418     mov     12(%rsi),@S[3]

420     bswap   @S[0]
421     bswap   @S[1]
422     bswap   @S[2]
423     bswap   @S[3]
424
425     &_saveround    (0,$out,@S); # KL<<<0
426 $code.=<<";
427     cmp     \$$128,$keyend      # check keyBitLength
428     je      .L1st128

430     mov     16(%rsi),@S[0]      # load 128-191 bits
431     mov     20(%rsi),@S[1]
432     cmp     \$$192,$keyend
433     je      .L1st192
434     mov     24(%rsi),@S[2]      # load 192-255 bits
435     mov     28(%rsi),@S[3]
436     jmp     .L1st256

437 .L1st192:
438     mov     @S[0],@S[2]
439     mov     @S[1],@S[3]
440     not     @S[2]
441     not     @S[3]
442
443 .L1st256:
444     bswap   @S[0]
445     bswap   @S[1]
446     bswap   @S[2]
447     bswap   @S[3]
448
449     &_saveround    (4,$out,@S); # temp storage for KR!
450 $code.=<<";
451     xor     0($out),@S[1]      # KR^KL
452     xor     4($out),@S[0]
453     xor     8($out),@S[3]
454     xor     12($out),@S[2]

455 .L1st128:
456     lea     .LCamellia_SIGMA(%rip),%key
457     lea     .LCamellia_SBOX(%rip),%tbl

```

```

459     mov     0($key),%t1
460     mov     4($key),%t0
461
462     &Camellia_Feistel($step++);
463     &Camellia_Feistel($step++);
464 $code.=<<";
465     xor     0($out),@S[1]      # ^KL
466     xor     4($out),@S[0]
467     xor     8($out),@S[3]
468     xor     12($out),@S[2]
469
470     &Camellia_Feistel($step++);
471     &Camellia_Feistel($step++);
472 $code.=<<";
473     cmp     \$$128,$keyend
474     jne     .L2nd256

476     lea     128($out),%out      # size optimization
477     shl     \$$32,%r8          # @S[0]||
478     shl     \$$32,%r10         # @S[2]||
479     or      %r9,%r8            # ||@S[1]
480     or      %r11,%r10         # ||@S[3]
481
482     &_loadround    (0,$out,-128,"%rax","%rbx"); # KL
483     &_saveround    (2,$out,-128,"%r8","%r10"); # KA<<<0
484     &_rotl128      ("%rax","%rbx",15);
485     &_saveround    (4,$out,-128,"%rax","%rbx"); # KL<<<15
486     &_rotl128      ("%r8","%r10",15);
487     &_saveround    (6,$out,-128,"%r8","%r10"); # KA<<<15
488     &_rotl128      ("%r8","%r10",15); # 15+15=30
489     &_saveround    (8,$out,-128,"%r8","%r10"); # KA<<<30
490     &_rotl128      ("%rax","%rbx",30); # 15+30=45
491     &_saveround    (10,$out,-128,"%rax","%rbx"); # KL<<<45
492     &_rotl128      ("%r8","%r10",15); # 30+15=45
493     &_saveround    (12,$out,-128,"%r8"); # KA<<<45
494     &_rotl128      ("%rax","%rbx",15); # 45+15=60
495     &_saveround    (13,$out,-128,"%rbx"); # KL<<<60
496     &_rotl128      ("%r8","%r10",15); # 45+15=60
497     &_saveround    (14,$out,-128,"%r8","%r10"); # KA<<<60
498     &_rotl128      ("%rax","%rbx",17); # 60+17=77
499     &_saveround    (16,$out,-128,"%rax","%rbx"); # KL<<<77
500     &_rotl128      ("%rax","%rbx",17); # 77+17=94
501     &_saveround    (18,$out,-128,"%rax","%rbx"); # KL<<<94
502     &_rotl128      ("%r8","%r10",34); # 60+34=94
503     &_saveround    (20,$out,-128,"%r8","%r10"); # KA<<<94
504     &_rotl128      ("%rax","%rbx",17); # 94+17=111
505     &_saveround    (22,$out,-128,"%rax","%rbx"); # KL<<<111
506     &_rotl128      ("%r8","%r10",17); # 94+17=111
507     &_saveround    (24,$out,-128,"%r8","%r10"); # KA<<<111
508 $code.=<<";
509     mov     \$$3,%eax
510     jmp     .Ldone
511 .align 16
512 .L2nd256:
513
514     &_saveround    (6,$out,@S); # temp storage for KA!
515 $code.=<<";
516     xor     '4*8+0'($out),@S[1] # KA^KR
517     xor     '4*8+4'($out),@S[0]
518     xor     '5*8+0'($out),@S[3]
519     xor     '5*8+4'($out),@S[2]
520
521     &Camellia_Feistel($step++);
522     &Camellia_Feistel($step++);

```

```

524      &_loadround      (0,$out,"%rax","%rbx"); # KL
525      &_loadround      (4,$out,"%rcx","%rdx"); # KR
526      &_loadround      (6,$out,"%r14","%r15"); # KA
527 $code.=<<<";
528      lea      128($out),$out      # size optimization
529      shl      $32,%r8              # @S[0]
530      shl      $32,%r10             # @S[2]
531      or       %r9,%r8              # @S[1]
532      or       %r11,%r10            # @S[3]
533
534      &_saveround      (2,$out,-128,"%r8","%r10"); # KB<<<0
535      &_rotl128        ("%rcx","%rdx",15); #
536      &_saveround      (4,$out,-128,"%rcx","%rdx"); # KR<<<15
537      &_rotl128        ("%r14","%r15",15); #
538      &_saveround      (6,$out,-128,"%r14","%r15"); # KA<<<15
539      &_rotl128        ("%rcx","%rdx",15); # 15+15=30
540      &_saveround      (8,$out,-128,"%rcx","%rdx"); # KR<<<30
541      &_rotl128        ("%r8","%r10",30); #
542      &_saveround      (10,$out,-128,"%r8","%r10"); # KB<<<30
543      &_rotl128        ("%rax","%rbx",45); #
544      &_saveround      (12,$out,-128,"%rax","%rbx"); # KL<<<45
545      &_rotl128        ("%r14","%r15",30); # 15+30=45
546      &_saveround      (14,$out,-128,"%r14","%r15"); # KA<<<45
547      &_rotl128        ("%rax","%rbx",15); # 45+15=60
548      &_saveround      (16,$out,-128,"%rax","%rbx"); # KL<<<60
549      &_rotl128        ("%rcx","%rdx",30); # 30+30=60
550      &_saveround      (18,$out,-128,"%rcx","%rdx"); # KR<<<60
551      &_rotl128        ("%r8","%r10",30); # 30+30=60
552      &_saveround      (20,$out,-128,"%r8","%r10"); # KB<<<60
553      &_rotl128        ("%rax","%rbx",17); # 60+17=77
554      &_saveround      (22,$out,-128,"%rax","%rbx"); # KL<<<77
555      &_rotl128        ("%r14","%r15",32); # 45+32=77
556      &_saveround      (24,$out,-128,"%r14","%r15"); # KA<<<77
557      &_rotl128        ("%rcx","%rdx",34); # 60+34=94
558      &_saveround      (26,$out,-128,"%rcx","%rdx"); # KR<<<94
559      &_rotl128        ("%r14","%r15",17); # 77+17=94
560      &_saveround      (28,$out,-128,"%r14","%r15"); # KA<<<77
561      &_rotl128        ("%rax","%rbx",34); # 77+34=111
562      &_saveround      (30,$out,-128,"%rax","%rbx"); # KL<<<111
563      &_rotl128        ("%r8","%r10",51); # 60+51=111
564      &_saveround      (32,$out,-128,"%r8","%r10"); # KB<<<111
565 $code.=<<<";
566      mov      $4,%eax
567 .Ldone:
568      mov      0(%rsp),%r15
569      mov      8(%rsp),%r14
570      mov      16(%rsp),%r13
571      mov      24(%rsp),%rbp
572      mov      32(%rsp),%rbx
573      lea      40(%rsp),%rsp
574 .Lkey_epilogue:
575      ret
576 .size Camellia_Ekeygen,-Camellia_Ekeygen
577
578 }
579
580 @SBOX=(
581 112,130, 44,236,179, 39,192,229,228,133, 87, 53,234, 12,174, 65,
582 35,239,107,147, 69,25,165, 33,237, 14, 79, 78,29,101,146,189,
583 134,184,175,143,124,235, 31,206, 62,48,220, 95, 94,197, 11, 26,
584 166,225, 57,202,213, 71, 93, 61,217, 1, 90,214, 81, 86,108, 77,
585 139, 13,154,102,251,204,176, 45,116, 18, 43,32,240,177,132,153,
586 223, 76,203,194, 52,126,118, 5,109,183,169,49,209, 23, 4,215,
587 20, 88, 58, 97,222, 27, 17, 28, 50,15,156, 22, 83,24,242, 34,
588 254, 68,207,178,195,181,122,145, 36, 8,232,168, 96,252,105, 80,
589 170,208,160,125,161,137, 98,151, 84, 91, 30,149,224,255,100,210,

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590 16,196, 0, 72,163,247,117,219,138, 3,230,218, 9, 63,221,148,
591 135, 92,131, 2,205, 74,144, 51,115,103,246,243,157,127,191,226,
592 82,155,216, 38,200, 55,198, 59,129,150,111, 75, 19,190, 99, 46,
593 233,121,167,140,159,110,188,142, 41,245,249,182, 47,253,180, 89,
594 120,152, 6,106,231, 70,113,186,212, 37,171, 66,136,162,141,250,
595 114, 7,185, 85,248,238,172, 10, 54, 73, 42,104, 60, 56,241,164,
596 64, 40,211,123,187,201, 67,193, 21,227,173,244,119,199,128,158);

598 sub S1110 { my $i=shift; $i=@SBOX[$i]; $i=$i<<24|$i<<16|$i<<8; sprintf("0x%08x",
599 sub S4404 { my $i=shift; $i=($i<<1|$i>>7)&0xff; $i=@SBOX[$i]; $i=$i<<24|$i<<16|$
600 sub S0222 { my $i=shift; $i=@SBOX[$i]; $i=($i<<1|$i>>7)&0xff; $i=$i<<16|$i<<8|$i
601 sub S3033 { my $i=shift; $i=@SBOX[$i]; $i=($i>>1|$i<<7)&0xff; $i=$i<<24|$i<<8|$i

603 $code.=<<<";
604 .align 64
605 .LCamellia_SIGMA:
606 .long 0x3bcc908b, 0xa09e667f, 0x4caa73b2, 0xb67ae858
607 .long 0xe94f82be, 0xc6ef372f, 0xf1d36f1c, 0x54ff53a5
608 .long 0xde682d1d, 0x10e527fa, 0xb3e6c1fd, 0xb05688c2
609 .long 0, 0, 0, 0
610 .LCamellia_SBOX:
611
612 # tables are interleaved, remember?
613 sub data_word { $code.="long\t".join(' ',@_)."\n"; }
614 for ($i=0;$i<256;$i++) { &data_word(&S1110($i),&S4404($i)); }
615 for ($i=0;$i<256;$i++) { &data_word(&S0222($i),&S3033($i)); }

617 # void Camellia_cbc_encrypt (const void char *inp, unsigned char *out,
618 #                             size_t length, const CAMELLIA_KEY *key,
619 #                             unsigned char *ivp,const int enc);
620 {
621     $key="0(%rsp)";
622     $end="8(%rsp)"; # inp+len&~15
623     $res="16(%rsp)"; # len&15
624     $ivec="24(%rsp)";
625     $ivp="40(%rsp)";
626     $rsp="48(%rsp)";

628 $code.=<<<";
629 .globl Camellia_cbc_encrypt
630 .type Camellia_cbc_encrypt,@function,6
631 .align 16
632 Camellia_cbc_encrypt:
633     cmp      \%0,%rdx
634     je       .Lcbc_abort
635     push     %rbx
636     push     %rbp
637     push     %r12
638     push     %r13
639     push     %r14
640     push     %r15
641 .Lcbc_prologue:

643     mov      %rsp,%rbp
644     sub      \%64,%rsp
645     and      \%64,%rsp

647     # place stack frame just "above mod 1024" the key schedule,
648     # this ensures that cache associativity suffices
649     lea      -64-63(%rcx),%r10
650     sub      %rsp,%r10
651     neg      %r10
652     and      \%0x3C0,%r10
653     sub      %r10,%rsp
654     #add      \%8,%rsp # 8 is reserved for callee's ra

```

```

656      mov    %rdi,$inp      # inp argument
657      mov    %rsi,$out      # out argument
658      mov    %r8,%rbx      # ivp argument
659      mov    %rcx,$key      # key argument
660      mov    272(%rcx),${keyend}d # grandRounds

662      mov    %r8,$_ivp
663      mov    %rbp,$_rsp

665 .Lcbc_body:
666      lea     .LCamellia_SBOX(%rip), $Tbl

668      mov    \$_32,%ecx
669 .align 4
670 .Lcbc_prefetch_sbox:
671      mov    0($Tbl),%rax
672      mov    32($Tbl),%rsi
673      mov    64($Tbl),%rdi
674      mov    96($Tbl),%r11
675      lea    128($Tbl), $Tbl
676      loop   .Lcbc_prefetch_sbox
677      sub    \$_4096,$Tbl
678      shl    \$_6,$keyend
679      mov    %rdx,%rcx      # len argument
680      lea    ($key,$keyend), $keyend

682      cmp    \$_0,%r9d      # enc argument
683      je     .LCBC_DECRYPT

685      and    \$_-16,%rdx
686      and    \$_15,%rcx      # length residue
687      lea    ($inp,%rdx),%rdx
688      mov    $key,$_key
689      mov    %rdx,$_end
690      mov    %rcx,$_res

692      cmp    $inp,%rdx
693      mov    0(%rbx),@S[0]    # load IV
694      mov    4(%rbx),@S[1]
695      mov    8(%rbx),@S[2]
696      mov    12(%rbx),@S[3]
697      je     .Lcbc_enc_tail
698      jmp    .Lcbc_eloop

700 .align 16
701 .Lcbc_eloop:
702      xor    0($inp),@S[0]
703      xor    4($inp),@S[1]
704      xor    8($inp),@S[2]
705      bswap  @S[0]
706      xor    12($inp),@S[3]
707      bswap  @S[1]
708      bswap  @S[2]
709      bswap  @S[3]

711      call   _x86_64_Camellia_encrypt

713      mov    $_key,$key      # "rewind" the key
714      bswap  @S[0]
715      mov    $_end,%rdx
716      bswap  @S[1]
717      mov    $_res,%rcx
718      bswap  @S[2]
719      mov    @S[0],0($out)
720      bswap  @S[3]
721      mov    @S[1],4($out)

```

```

722      mov    @S[2],8($out)
723      lea    16($inp), $inp
724      mov    @S[3],12($out)
725      cmp    %rdx,$inp
726      lea    16($out), $out
727      jne    .Lcbc_eloop

729      cmp    \$_0,%rcx
730      jne    .Lcbc_enc_tail

732      mov    $_ivp,$out
733      mov    @S[0],0($out)      # write out IV residue
734      mov    @S[1],4($out)
735      mov    @S[2],8($out)
736      mov    @S[3],12($out)
737      jmp    .Lcbc_done

739 .align 16
740 .Lcbc_enc_tail:
741      xor    %rax,%rax
742      mov    %rax,0+$ivec
743      mov    %rax,8+$ivec
744      mov    %rax,$_res

746 .Lcbc_enc_pushf:
747      pushfq
748      cld
749      mov    $inp,%rsi
750      lea    8+$ivec,%rdi
751      .long  0x9066A4F3      # rep movsb
752      popfq
753 .Lcbc_enc_popf:

755      lea    $ivec,$inp
756      lea    16+$ivec,%rax
757      mov    %rax,$_end
758      jmp    .Lcbc_eloop      # one more time

760 .align 16
761 .LCBC_DECRYPT:
762      xchg    $key,$keyend
763      add     \$_15,%rdx
764      and     \$_15,%rcx      # length residue
765      and     \$_-16,%rdx
766      mov     $key,$_key
767      lea     ($inp,%rdx),%rdx
768      mov     %rdx,$_end
769      mov     %rcx,$_res

771      mov     (%rbx),%rax      # load IV
772      mov     8(%rbx),%rbx
773      jmp     .Lcbc_dloop

774 .align 16
775 .Lcbc_dloop:
776      mov     0($inp),@S[0]
777      mov     4($inp),@S[1]
778      mov     8($inp),@S[2]
779      bswap   @S[0]
780      mov     12($inp),@S[3]
781      bswap   @S[1]
782      mov     %rax,0+$ivec      # save IV to temporary storage
783      bswap   @S[2]
784      mov     %rbx,8+$ivec
785      bswap   @S[3]

787      call    _x86_64_Camellia_decrypt

```

```

789     mov     $_key,$key          # "rewind" the key
790     mov     $_end,%rdx
791     mov     $_res,%rcx

793     bswap   @S[0]
794     mov     ($inp),%rax          # load IV for next iteration
795     bswap   @S[1]
796     mov     8($inp),%rbx
797     bswap   @S[2]
798     xor     0+$ivec,@S[0]
799     bswap   @S[3]
800     xor     4+$ivec,@S[1]
801     xor     8+$ivec,@S[2]
802     lea     16($inp), $inp
803     xor     12+$ivec,@S[3]
804     cmp     %rdx,$inp
805     je      .Lcbc_ddone

807     mov     @S[0],0($out)
808     mov     @S[1],4($out)
809     mov     @S[2],8($out)
810     mov     @S[3],12($out)

812     lea     16($out), $out
813     jmp     .Lcbc_dloop

815 .align 16
816 .Lcbc_ddone:
817     mov     $_ivp,%rdx
818     cmp     \$_0,%rcx
819     jne     .Lcbc_dec_tail

821     mov     @S[0],0($out)
822     mov     @S[1],4($out)
823     mov     @S[2],8($out)
824     mov     @S[3],12($out)

826     mov     %rax, (%rdx)         # write out IV residue
827     mov     %rbx, 8(%rdx)
828     jmp     .Lcbc_done
829 .align 16
830 .Lcbc_dec_tail:
831     mov     @S[0],0+$ivec
832     mov     @S[1],4+$ivec
833     mov     @S[2],8+$ivec
834     mov     @S[3],12+$ivec

836 .Lcbc_dec_pushf:
837     pushfq
838     cld
839     lea     8+$ivec,%rsi
840     lea     ($out),%rdi
841     .long   0x9066A4F3           # rep movsb
842     popfq
843 .Lcbc_dec_popf:

845     mov     %rax, (%rdx)         # write out IV residue
846     mov     %rbx, 8(%rdx)
847     jmp     .Lcbc_done

849 .align 16
850 .Lcbc_done:
851     mov     $_rsp,%rcx
852     mov     0(%rcx),%r15
853     mov     8(%rcx),%r14

```

```

854     mov     16(%rcx),%r13
855     mov     24(%rcx),%r12
856     mov     32(%rcx),%rbp
857     mov     40(%rcx),%rbx
858     lea     48(%rcx),%rsp
859 .Lcbc_abort:
860     ret
861 .size Camellia_cbc_encrypt,.-Camellia_cbc_encrypt

863 .asciz "Camellia for x86_64 by <appro\@openssl.org>"
864
865 }

867 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
868 #                               CONTEXT *context,DISPATCHER_CONTEXT *disp)
869 if ($win64) {
870     $rec="%rcx";
871     $frame="%rdx";
872     $context="%r8";
873     $disp="%r9";

875 $code.=<<<__
876 .extern __imp_RtlVirtualUnwind
877 .type common_se_handler,\@abi-omnipotent
878 .align 16
879 common_se_handler:
880     push     %rsi
881     push     %rdi
882     push     %rbx
883     push     %rbp
884     push     %r12
885     push     %r13
886     push     %r14
887     push     %r15
888     pushfq
889     lea     -64(%rsp),%rsp

891     mov     120($context),%rax    # pull context->Rax
892     mov     248($context),%rbx    # pull context->Rip

894     mov     8($disp),%rsi        # disp->ImageBase
895     mov     56($disp),%r11       # disp->HandlerData

897     mov     0(%r11),%r10d        # HandlerData[0]
898     lea     (%rsi,%r10),%r10     # prologue label
899     cmp     %r10,%rbx           # context->Rip<prologue label
900     jb      .Lin_prologue

902     mov     152($context),%rax    # pull context->Rsp

904     mov     4(%r11),%r10d        # HandlerData[1]
905     lea     (%rsi,%r10),%r10     # epilogue label
906     cmp     %r10,%rbx           # context->Rip>=epilogue label
907     jae     .Lin_prologue

909     lea     40(%rax),%rax
910     mov     -8(%rax),%rbx
911     mov     -16(%rax),%rbp
912     mov     -24(%rax),%r13
913     mov     -32(%rax),%r14
914     mov     -40(%rax),%r15
915     mov     %rbx,144($context)   # restore context->Rbx
916     mov     %rbp,160($context)   # restore context->Rbp
917     mov     %r13,224($context)   # restore context->R13
918     mov     %r14,232($context)   # restore context->R14
919     mov     %r15,240($context)   # restore context->R15

```



```

921 .Lin_prologue:
922     mov     8(%rax),%rdi
923     mov     16(%rax),%rsi
924     mov     %rax,152($context)    # restore context->Rsp
925     mov     %rsi,168($context)    # restore context->Rsi
926     mov     %rdi,176($context)    # restore context->Rdi

928     jmp     .Lcommon_seh_exit
929 .size     common_se_handler,.-common_se_handler

931 .type     cbc_se_handler, \@abi-omnipotent
932 .align    16
933 cbc_se_handler:
934     push    %rsi
935     push    %rdi
936     push    %rbx
937     push    %rbp
938     push    %r12
939     push    %r13
940     push    %r14
941     push    %r15
942     pushfq
943     lea     -64(%rsp),%rsp

945     mov     120($context),%rax    # pull context->Rax
946     mov     248($context),%rbx    # pull context->Rip

948     lea     .Lcbc_prologue(%rip),%r10
949     cmp     %r10,%rbx             # context->Rip<.Lcbc_prologue
950     jb      .Lin_cbc_prologue

952     lea     .Lcbc_body(%rip),%r10
953     cmp     %r10,%rbx             # context->Rip<.Lcbc_body
954     jb      .Lin_cbc_frame_setup

956     mov     152($context),%rax    # pull context->Rsp

958     lea     .Lcbc_abort(%rip),%r10
959     cmp     %r10,%rbx             # context->Rip>=.Lcbc_abort
960     jae     .Lin_cbc_prologue

962     # handle pushf/popf in Camellia_cbc_encrypt
963     lea     .Lcbc_enc_pushf(%rip),%r10
964     cmp     %r10,%rbx             # context->Rip<=.Lcbc_enc_pushf
965     jbe     .Lin_cbc_no_flag
966     lea     8(%rax),%rax
967     lea     .Lcbc_enc_popf(%rip),%r10
968     cmp     %r10,%rbx             # context->Rip<.Lcbc_enc_popf
969     jb      .Lin_cbc_no_flag
970     lea     -8(%rax),%rax
971     lea     .Lcbc_dec_pushf(%rip),%r10
972     cmp     %r10,%rbx             # context->Rip<=.Lcbc_dec_pushf
973     jbe     .Lin_cbc_no_flag
974     lea     8(%rax),%rax
975     lea     .Lcbc_dec_popf(%rip),%r10
976     cmp     %r10,%rbx             # context->Rip<.Lcbc_dec_popf
977     jb      .Lin_cbc_no_flag
978     lea     -8(%rax),%rax

980 .Lin_cbc_no_flag:
981     mov     48(%rax),%rax         # $rsp
982     lea     48(%rax),%rax

984 .Lin_cbc_frame_setup:
985     mov     -8(%rax),%rbx

```

```

986     mov     -16(%rax),%rbp
987     mov     -24(%rax),%r12
988     mov     -32(%rax),%r13
989     mov     -40(%rax),%r14
990     mov     -48(%rax),%r15
991     mov     %rbx,144($context)    # restore context->Rbx
992     mov     %rbp,160($context)    # restore context->Rbp
993     mov     %r12,216($context)    # restore context->R12
994     mov     %r13,224($context)    # restore context->R13
995     mov     %r14,232($context)    # restore context->R14
996     mov     %r15,240($context)    # restore context->R15

998 .Lin_cbc_prologue:
999     mov     8(%rax),%rdi
1000     mov     16(%rax),%rsi
1001     mov     %rax,152($context)    # restore context->Rsp
1002     mov     %rsi,168($context)    # restore context->Rsi
1003     mov     %rdi,176($context)    # restore context->Rdi

1005 .align    4
1006 .Lcommon_seh_exit:

1008     mov     40($disp),%rdi        # disp->ContextRecord
1009     mov     $context,%rsi         # context
1010     mov     \$_1232/8',%ecx       # sizeof(CONTEXT)
1011     .long    0xa548f3fc           # cld; rep movsq

1013     mov     $disp,%rsi
1014     xor     %rcx,%rcx             # arg1, UNW_FLAG_NHANDLER
1015     mov     8(%rsi),%rdx          # arg2, disp->ImageBase
1016     mov     0(%rsi),%r8           # arg3, disp->ControlPc
1017     mov     16(%rsi),%r9          # arg4, disp->FunctionEntry
1018     mov     40(%rsi),%r10         # disp->ContextRecord
1019     lea     56(%rsi),%r11         # &disp->HandlerData
1020     lea     24(%rsi),%r12         # &disp->EstablisherFrame
1021     mov     %r10,32(%rsp)         # arg5
1022     mov     %r11,40(%rsp)         # arg6
1023     mov     %r12,48(%rsp)         # arg7
1024     mov     %rcx,56(%rsp)         # arg8, (NULL)
1025     call    *__imp_RtlVirtualUnwind(%rip)

1027     mov     \$_1,%eax             # ExceptionContinueSearch
1028     lea     64(%rsp),%rsp
1029     popfq
1030     pop     %r15
1031     pop     %r14
1032     pop     %r13
1033     pop     %r12
1034     pop     %rbp
1035     pop     %rbx
1036     pop     %rdi
1037     pop     %rsi
1038     ret
1039 .size     cbc_se_handler,.-cbc_se_handler

1041 .section    .pdata
1042 .align     4
1043     .rva     .LSEH_begin_Camellia_EncryptBlock_Rounds
1044     .rva     .LSEH_end_Camellia_EncryptBlock_Rounds
1045     .rva     .LSEH_info_Camellia_EncryptBlock_Rounds

1047     .rva     .LSEH_begin_Camellia_DecryptBlock_Rounds
1048     .rva     .LSEH_end_Camellia_DecryptBlock_Rounds
1049     .rva     .LSEH_info_Camellia_DecryptBlock_Rounds

1051     .rva     .LSEH_begin_Camellia_Ekeygen

```

```
1052      .rva      .LSEH_end_Camellia_Ekeygen
1053      .rva      .LSEH_info_Camellia_Ekeygen

1055      .rva      .LSEH_begin_Camellia_cbc_encrypt
1056      .rva      .LSEH_end_Camellia_cbc_encrypt
1057      .rva      .LSEH_info_Camellia_cbc_encrypt

1059 .section      .xdata
1060 .align 8
1061 .LSEH_info_Camellia_EncryptBlock_Rounds:
1062     .byte      9,0,0,0
1063     .rva      common_se_handler
1064     .rva      .Lenc_prologue,.Lenc_epilogue    # HandlerData[]
1065 .LSEH_info_Camellia_DecryptBlock_Rounds:
1066     .byte      9,0,0,0
1067     .rva      common_se_handler
1068     .rva      .Ldec_prologue,.Ldec_epilogue    # HandlerData[]
1069 .LSEH_info_Camellia_Ekeygen:
1070     .byte      9,0,0,0
1071     .rva      common_se_handler
1072     .rva      .Lkey_prologue,.Lkey_epilogue    # HandlerData[]
1073 .LSEH_info_Camellia_cbc_encrypt:
1074     .byte      9,0,0,0
1075     .rva      cbc_se_handler
1076     _____
1077 }

1079 $code =~ s/\'([^\']*)\'/eval $1/gem;
1080 print $code;
1081 close STDOUT;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/co-586.pl

1

```
*****
5640 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/co-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #!/usr/local/bin/perl

3 $0 =~ m/(.*[\\\/])[^\\\/]+$/; $dir=$1;
4 push(@INC, "${dir}", "${dir}../../perlasm");
5 require "x86asm.pl";

7 &asm_init($ARGV[0], $0);

9 &bn_mul_comba("bn_mul_comba8", 8);
10 &bn_mul_comba("bn_mul_comba4", 4);
11 &bn_sqr_comba("bn_sqr_comba8", 8);
12 &bn_sqr_comba("bn_sqr_comba4", 4);

14 &asm_finish();

16 sub mul_add_c
17 {
18     local($a, $ai, $b, $bi, $c0, $c1, $c2, $pos, $i, $na, $nb) = @_ ;

20     # pos == -1 if eax and edx are pre-loaded, 0 to load from next
21     # words, and 1 if load return value

23     &comment("mul a[$ai]*b[$bi]");

25     # "eax" and "edx" will always be pre-loaded.
26     # &mov("eax", &DWP($ai*4, $a, "", 0)) ;
27     # &mov("edx", &DWP($bi*4, $b, "", 0)) ;

29     &mul("edx");
30     &add($c0, "eax");
31     &mov("eax", &DWP(($na)*4, $a, "", 0)) if $pos == 0;      # load next a
32     &mov("eax", &wparam(0)) if $pos > 0;                    # load r[]
33     ###
34     &adc($c1, "edx");
35     &mov("edx", &DWP(($nb)*4, $b, "", 0)) if $pos == 0;      # load next b
36     &mov("edx", &DWP(($nb)*4, $b, "", 0)) if $pos == 1;      # load next b
37     ###
38     &adc($c2, 0);
39     # is pos > 1, it means it is the last loop
40     &mov(&DWP($i*4, "eax", "", 0), $c0) if $pos > 0;        # save r[];
41     &mov("eax", &DWP(($na)*4, $a, "", 0)) if $pos == 1;      # load next a
42 }

44 sub sqr_add_c
45 {
46     local($r, $a, $ai, $bi, $c0, $c1, $c2, $pos, $i, $na, $nb) = @_ ;

48     # pos == -1 if eax and edx are pre-loaded, 0 to load from next
49     # words, and 1 if load return value

51     &comment("sqr a[$ai]*a[$bi]");

53     # "eax" and "edx" will always be pre-loaded.
54     # &mov("eax", &DWP($ai*4, $a, "", 0)) ;
55     # &mov("edx", &DWP($bi*4, $b, "", 0)) ;

57     if ($ai == $bi)
58     { &mul("eax"); }
59     else
60     { &mul("edx"); }
61     &add($c0, "eax");
```

new/usr/src/lib/openssl/libsunw_crypto/pl/co-586.pl

2

```
62     &mov("eax", &DWP(($na)*4, $a, "", 0)) if $pos == 0;      # load next a
63     ###
64     &adc($c1, "edx");
65     &mov("edx", &DWP(($nb)*4, $a, "", 0)) if ($pos == 1) && ($na != $nb);
66     ###
67     &adc($c2, 0);
68     # is pos > 1, it means it is the last loop
69     &mov(&DWP($i*4, $r, "", 0), $c0) if $pos > 0;            # save r[];
70     &mov("eax", &DWP(($na)*4, $a, "", 0)) if $pos == 1;      # load next b
71 }

73 sub sqr_add_c2
74 {
75     local($r, $a, $ai, $bi, $c0, $c1, $c2, $pos, $i, $na, $nb) = @_ ;

77     # pos == -1 if eax and edx are pre-loaded, 0 to load from next
78     # words, and 1 if load return value

80     &comment("sqr a[$ai]*a[$bi]");

82     # "eax" and "edx" will always be pre-loaded.
83     # &mov("eax", &DWP($ai*4, $a, "", 0)) ;
84     # &mov("edx", &DWP($bi*4, $a, "", 0)) ;

86     if ($ai == $bi)
87     { &mul("eax"); }
88     else
89     { &mul("edx"); }
90     &add("eax", "eax");
91     ###
92     &adc("edx", "edx");
93     ###
94     &adc($c2, 0);
95     &add($c0, "eax");
96     &adc($c1, "edx");
97     &mov("eax", &DWP(($na)*4, $a, "", 0)) if $pos == 0;      # load next a
98     &mov("eax", &DWP(($na)*4, $a, "", 0)) if $pos == 1;      # load next b
99     &adc($c2, 0);
100    &mov(&DWP($i*4, $r, "", 0), $c0) if $pos > 0;            # save r[];
101    &mov("edx", &DWP(($nb)*4, $a, "", 0)) if ($pos <= 1) && ($na != $nb);
102    ###
103 }

105 sub bn_mul_comba
106 {
107     local($name, $num) = @_ ;
108     local($a, $b, $c0, $c1, $c2);
109     local($i, $as, $ae, $bs, $be, $ai, $bi);
110     local($tot, $end);

112     &function_begin_B($name, "");

114     $c0="ebx";
115     $c1="ecx";
116     $c2="ebp";
117     $a="esi";
118     $b="edi";

119
120     $as=0;
121     $ae=0;
122     $bs=0;
123     $be=0;
124     $tot=$num+$num-1;

126     &push("esi");
127     &mov($a, &wparam(1));
```

```

128     &push("edi");
129     &mov($b,&wparam(2));
130     &push("ebp");
131     &push("ebx");

133     &xor($c0,$c0);
134     &mov("eax",&DWP(0,$a,"",0)); # load the first word
135     &xor($c1,$c1);
136     &mov("edx",&DWP(0,$b,"",0)); # load the first second

138     for ($i=0; $i<$tot; $i++)
139     {
140         $ai=$as;
141         $bi=$bs;
142         $end=$be+1;

144         &comment("##### Calculate word $i");

146         for ($j=$bs; $j<$end; $j++)
147         {
148             &xor($c2,$c2) if ($j == $bs);
149             if (($j+1) == $end)
150             {
151                 $v=1;
152                 $v=2 if (($i+1) == $tot);
153             }
154             else
155             { $v=0; }
156             if (($j+1) != $end)
157             {
158                 $na=($ai-1);
159                 $nb=($bi+1);
160             }
161             else
162             {
163                 $na=$as+($i < ($num-1));
164                 $nb=$bs+($i >= ($num-1));
165             }
166             #printf STDERR "[ $ai, $bi ] -> [ $na, $nb ]\n";
167             &mul_add_c($a,$ai,$b,$bi,$c0,$c1,$c2,$v,$i,$na,$nb);
168             if ($v)
169             {
170                 &comment("saved r[$i]");
171                 # &mov("eax",&wparam(0));
172                 # &mov(&DWP($i*4,"eax","",0),$c0);
173                 ($c0,$c1,$c2) = ($c1,$c2,$c0);
174             }
175             $ai--;
176             $bi++;
177         }
178         $as++ if ($i < ($num-1));
179         $ae++ if ($i >= ($num-1));

181         $bs++ if ($i >= ($num-1));
182         $be++ if ($i < ($num-1));
183     }
184     &comment("save r[$i]");
185     # &mov("eax",&wparam(0));
186     &mov(&DWP($i*4,"eax","",0),$c0);

188     &pop("ebx");
189     &pop("ebp");
190     &pop("edi");
191     &pop("esi");
192     &ret();
193     &function_end_B($name);

```

```

194     }

196     sub bn_sqr_comba
197     {
198         local($name,$num)=@_;
199         local($r,$a,$c0,$c1,$c2)=@_;
200         local($i,$as,$ae,$bs,$be,$ai,$bi);
201         local($b,$tot,$end,$half);

203         &function_begin_B($name,"");

205         $c0="ebx";
206         $c1="ecx";
207         $c2="ebp";
208         $a="esi";
209         $r="edi";

211         &push("esi");
212         &push("edi");
213         &push("ebp");
214         &push("ebx");
215         &mov($r,&wparam(0));
216         &mov($a,&wparam(1));
217         &xor($c0,$c0);
218         &xor($c1,$c1);
219         &mov("eax",&DWP(0,$a,"",0)); # load the first word

221         $as=0;
222         $ae=0;
223         $bs=0;
224         $be=0;
225         $tot=$num+$num-1;

227         for ($i=0; $i<$tot; $i++)
228         {
229             $ai=$as;
230             $bi=$bs;
231             $end=$be+1;

233             &comment("##### Calculate word $i");
234             for ($j=$bs; $j<$end; $j++)
235             {
236                 &xor($c2,$c2) if ($j == $bs);
237                 if (($ai-1) < ($bi+1))
238                 {
239                     $v=1;
240                     $v=2 if ($i+1) == $tot;
241                 }
242                 else
243                 { $v=0; }
244                 if (!$v)
245                 {
246                     $na=$ai-1;
247                     $nb=$bi+1;
248                 }
249                 else
250                 {
251                     $na=$as+($i < ($num-1));
252                     $nb=$bs+($i >= ($num-1));
253                 }
254                 if ($ai == $bi)
255                 {
256                     &sqr_add_c($r,$a,$ai,$bi,
257                               $c0,$c1,$c2,$v,$i,$na,$nb);
258                 }
259                 else

```

```
260     {
261         &sqr_add_c2($r,$a,$ai,$bi,
262                 $c0,$c1,$c2,$v,$i,$na,$nb);
263     }
264     if ($v)
265     {
266         &comment("saved r[$i]");
267         #&mov(&DWP($i*4,$r,"",0),$c0);
268         ($c0,$c1,$c2) = ($c1,$c2,$c0);
269         last;
270     }
271     $ai--;
272     $bi++;
273 }
274 $as++ if ($i < ($num-1));
275 $ae++ if ($i >= ($num-1));
276
277 $bs++ if ($i >= ($num-1));
278 $be++ if ($i < ($num-1));
279 }
280 &mov(&DWP($i*4,$r,"",0),$c0);
281 &pop("ebx");
282 &pop("ebp");
283 &pop("edi");
284 &pop("esi");
285 &ret();
286 &function_end_B($name);
287 }
```



```

128     &xor(    $l,          $tmp1);
129     &mov(    $tmp1,      &DWP("0x500", $trans, $t, 0));
130     &xor(    $l,          $tmp1);
131     &mov(    $trans,     &wparam(1));
132 }

134 sub n2a
135 {
136     sprintf("%d", $_[0]);
137 }

139 # now has a side affect of rotating $a by $shift
140 sub R_PERM_OP
141 {
142     local($a,$b,$tt,$shift,$mask,$last)=@_;

144     &rotl(   $a,          $shift      ) if ($shift != 0);
145     &mov(    $tt,         $a           );
146     &xor(    $a,          $b           );
147     &and(    $a,          $mask       );
148     if ($notlast eq $b)
149     {
150         &xor(   $b,          $a           );
151         &xor(   $tt,         $a           );
152     }
153     else
154     {
155         &xor(   $tt,         $a           );
156         &xor(   $b,          $a           );
157     }
158     &comment("");
159 }

161 sub IP_new
162 {
163     local($l,$r,$tt,$lr)=@_;

165     &R_PERM_OP($l,$r,$tt, 4,"0xf0f0f0f0",$l);
166     &R_PERM_OP($r,$tt,$l,20,"0xffff0000f",$l);
167     &R_PERM_OP($l,$tt,$r,14,"0x33333333",$r);
168     &R_PERM_OP($tt,$r,$l,22,"0x03fc03fc",$r);
169     &R_PERM_OP($l,$r,$tt, 9,"0xaaaaaaaa",$r);

170
171     if ($lr != 3)
172     {
173         if (($lr-3) < 0)
174             { &rotr($tt, 3-$lr); }
175         else { &rotl($tt, $lr-3); }
176     }
177     if ($lr != 2)
178     {
179         if (($lr-2) < 0)
180             { &rotr($r, 2-$lr); }
181         else { &rotl($r, $lr-2); }
182     }
183 }

185 sub FP_new
186 {
187     local($l,$r,$tt,$lr)=@_;

189     if ($lr != 2)
190     {
191         if (($lr-2) < 0)
192             { &rotl($r, 2-$lr); }
193         else { &rotr($r, $lr-2); }

```

```

194     }
195     if ($lr != 3)
196     {
197         if (($lr-3) < 0)
198             { &rotl($l, 3-$lr); }
199         else { &rotr($l, $lr-3); }
200     }

202     &R_PERM_OP($l,$r,$tt, 0,"0xaaaaaaaa",$r);
203     &R_PERM_OP($tt,$r,$l,23,"0x03fc03fc",$r);
204     &R_PERM_OP($l,$r,$tt,10,"0x33333333",$l);
205     &R_PERM_OP($r,$tt,$l,18,"0xffff0000f",$l);
206     &R_PERM_OP($l,$tt,$r,12,"0xf0f0f0f0",$r);
207     &rotr($tt, 4);
208 }

```

```

*****
14498 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/des-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/local/bin/perl
2 #
3 # The inner loop instruction sequence and the IP/FP modifications are from
4 # Svend Olaf Mikkelsen <svolaf@inet.uni-c.dk>
5 #

7 $0 =~ m/(.*[\\\/])[^\\\/]+$/; $dir=$1;
8 push(@INC,"${dir}","${dir}../../perlasm");
9 require "x86asm.pl";
10 require "cbc.pl";
11 require "desboth.pl";

13 # base code is in microsoft
14 # op dest, source
15 # format.
16 #

18 &asm_init($ARGV[0],"des-586.pl");

20 $L="edi";
21 $R="esi";
22 $trans="ebp";
23 $small_footprint=1 if (grep(/\.DOPENSSL_SMALL_FOOTPRINT/,@ARGV));
24 # one can discuss setting this variable to 1 unconditionally, as
25 # the folded loop is only 3% slower than unrolled, but >7 times smaller

27 &public_label("DES_SPtrans");

29 &DES_encrypt_internal();
30 &DES_decrypt_internal();
31 &DES_encrypt("DES_encrypt1",1);
32 &DES_encrypt("DES_encrypt2",0);
33 &DES_encrypt3("DES_encrypt3",1);
34 &DES_encrypt3("DES_decrypt3",0);
35 &cbc("DES_ncbc_encrypt","DES_encrypt1","DES_encrypt1",0,4,5,3,5,-1);
36 &cbc("DES_edc3_cbc_encrypt","DES_encrypt3","DES_decrypt3",0,6,7,3,4,5);
37 &DES_SPtrans();

39 &asm_finish();

41 sub DES_encrypt_internal()
42 {
43     &function_begin_B("_x86_DES_encrypt");

45     if ($small_footprint)
46     {
47         &lea("edx",&DWP(128,"ecx"));
48         &push("edx");
49         &push("ecx");
50         &set_label("eloop");
51         &D_ENCRYPT(0,$L,$R,0,$trans,"eax","ebx","ecx","edx",&swtmp(0));
52         &comment("");
53         &D_ENCRYPT(1,$R,$L,2,$trans,"eax","ebx","ecx","edx",&swtmp(0));
54         &comment("");
55         &add("ecx",16);
56         &cmp("ecx",&swtmp(1));
57         &mov(&swtmp(0),"ecx");
58         &jb(&label("eloop"));
59         &add("esp",8);
60     }
61     else

```

```

62     {
63         &push("ecx");
64         for ($i=0; $i<16; $i+=2)
65         {
66             &comment("Round $i");
67             &D_ENCRYPT($i,$L,$R,$i*2,$trans,"eax","ebx","ecx","edx",&swtmp(0));
68             &comment("Round ".sprintf("%d",$i+1));
69             &D_ENCRYPT($i+1,$R,$L,($i+1)*2,$trans,"eax","ebx","ecx","edx",&swtmp(0));
70         }
71         &add("esp",4);
72     }
73     &ret();

75     &function_end_B("_x86_DES_encrypt");
76 }

78 sub DES_decrypt_internal()
79 {
80     &function_begin_B("_x86_DES_decrypt");

82     if ($small_footprint)
83     {
84         &push("ecx");
85         &lea("ecx",&DWP(128,"ecx"));
86         &push("ecx");
87         &set_label("dloop");
88         &D_ENCRYPT(0,$L,$R,-2,$trans,"eax","ebx","ecx","edx",&swtmp(0));
89         &comment("");
90         &D_ENCRYPT(1,$R,$L,-4,$trans,"eax","ebx","ecx","edx",&swtmp(0));
91         &comment("");
92         &sub("ecx",16);
93         &cmp("ecx",&swtmp(1));
94         &mov(&swtmp(0),"ecx");
95         &jb(&label("dloop"));
96         &add("esp",8);
97     }
98     else
99     {
100         &push("ecx");
101         for ($i=15; $i>0; $i-=2)
102         {
103             &comment("Round $i");
104             &D_ENCRYPT(15-$i,$L,$R,$i*2,$trans,"eax","ebx","ecx","edx",&swtmp(0));
105             &comment("Round ".sprintf("%d",$i-1));
106             &D_ENCRYPT(15-$i+1,$R,$L,($i-1)*2,$trans,"eax","ebx","ecx","edx",&swtmp(0));
107         }
108         &add("esp",4);
109     }
110     &ret();

112     &function_end_B("_x86_DES_decrypt");
113 }

115 sub DES_encrypt
116 {
117     local($name,$do_ip)=@_;

119     &function_begin_B($name);

121     &push("esi");
122     &push("edi");

124     &comment("");
125     &comment("Load the 2 words");

127     if ($do_ip)

```



```

128      {
129          &mov($R,&wparam(0));
130          &xor( "ecx", "ecx" );

132      &push("ebx");
133      &push("ebp");

135      &mov("eax",&DWP(0,$R,"",0));
136      &mov("ebx",&wparam(2)); # get encrypt flag
137      &mov($L,&DWP(4,$R,"",0));
138      &comment("");
139      &comment("IP");
140      &IP_new("eax",$L,$R,3);
141      }
142  else
143      {
144      &mov("eax",&wparam(0));
145      &xor( "ecx", "ecx" );

147      &push("ebx");
148      &push("ebp");

150      &mov($R,&DWP(0,"eax","",0));
151      &mov("ebx",&wparam(2)); # get encrypt flag
152      &rotl($R,3);
153      &mov($L,&DWP(4,"eax","",0));
154      &rotl($L,3);
155      }

157  # PIC-ification:-)
158  &call (&label("pic_point"));
159  &set_label("pic_point");
160  &blindpop($trans);
161  &lea ($trans,&DWP(&label("DES_SPtrans")."-".&label("pic_point"),$trans));

163  &mov( "ecx", &wparam(1) );

165  &cmp("ebx","0");
166  &je(&label("decrypt"));
167  &call("_x86_DES_encrypt");
168  &jmp(&label("done"));
169  &set_label("decrypt");
170  &call("_x86_DES_decrypt");
171  &set_label("done");

173  if ($do_ip)
174      {
175      &comment("");
176      &comment("FP");
177      &mov("edx",&wparam(0));
178      &FP_new($L,$R,"eax",3);

180      &mov(&DWP(0,"edx","",0),"eax");
181      &mov(&DWP(4,"edx","",0),$R);
182      }
183  else
184      {
185      &comment("");
186      &comment("Fixup");
187      &rotr($L,3); # r
188      &mov("eax",&wparam(0));
189      &rotr($R,3); # l
190      &mov(&DWP(0,"eax","",0),$L);
191      &mov(&DWP(4,"eax","",0),$R);
192      }

```

```

194      &pop("ebp");
195      &pop("ebx");
196      &pop("edi");
197      &pop("esi");
198      &ret();

200      &function_end_B($name);
201      }

203  sub D_ENCRYPT
204      {
205      local($r,$l,$R,$S,$trans,$u,$tmp1,$tmp2,$t,$swp1)=@_;

207      &mov( $u, &DWP(&n2a($S*4),$tmp2,"",0));
208      &xor( $tmp1, $tmp1);
209      &mov( $t, &DWP(&n2a(($S+1)*4),$tmp2,"",0));
210      &xor( $u, $R);
211      &xor( $tmp2, $tmp2);
212      &xor( $t, $R);
213      &and( $u, "0xfcfcfcfc" );
214      &and( $t, "0xfcfcfcfc" );
215      &movb( &LB($tmp1), &LB($u) );
216      &movb( &LB($tmp2), &HB($u) );
217      &rotr( $t, 4 );
218      &xor( $L, &DWP(" ",$trans,$tmp1,0));
219      &movb( &LB($tmp1), &LB($t) );
220      &xor( $L, &DWP("0x200",$trans,$tmp2,0));
221      &movb( &LB($tmp2), &HB($t) );
222      &shr( $u, 16);
223      &xor( $L, &DWP("0x100",$trans,$tmp1,0));
224      &movb( &LB($tmp1), &HB($u) );
225      &shr( $t, 16);
226      &xor( $L, &DWP("0x300",$trans,$tmp2,0));
227      &movb( &LB($tmp2), &HB($t) );
228      &and( $u, "0xff" );
229      &and( $t, "0xff" );
230      &xor( $L, &DWP("0x600",$trans,$tmp1,0));
231      &xor( $L, &DWP("0x700",$trans,$tmp2,0));
232      &mov( $tmp2, $swp1 );
233      &xor( $L, &DWP("0x400",$trans,$u,0));
234      &xor( $L, &DWP("0x500",$trans,$t,0));
235      }

237  sub n2a
238      {
239      sprintf("%d",$_[0]);
240      }

242  # now has a side affect of rotating $a by $shift
243  sub R_PERM_OP
244      {
245      local($a,$b,$tt,$shift,$mask,$last)=@_;

247      &rotl( $a, $shift ) if ($shift != 0);
248      &mov( $tt, $a );
249      &xor( $a, $b );
250      &and( $a, $mask );

251      # This can never succeed, and besides it is difficult to see what the
252      # idea was - Ben 13 Feb 99
253      if (!$last eq $b)
254      {
255          &xor( $b, $a );
256          &xor( $tt, $a );
257      }
258      else
259      {

```

```

260      &xor( $tt, $a );
261      &xor( $b, $a );
262    }
263    &comment{""};
264  }

266 sub IP_new
267 {
268   local($l,$r,$tt,$lr)=@_;

270   &R_PERM_OP($l,$r,$tt, 4,"0xf0f0f0f0",$l);
271   &R_PERM_OP($r,$tt,$l,20,"0xffff000f",$l);
272   &R_PERM_OP($l,$tt,$r,14,"0x33333333",$r);
273   &R_PERM_OP($tt,$r,$l,22,"0x03fc03fc",$r);
274   &R_PERM_OP($l,$r,$tt, 9,"0xaaaaaaaa",$r);
275
276   if ($lr != 3)
277   {
278     if (($lr-3) < 0)
279     { &rotr($tt, 3-$lr); }
280     else { &rotl($tt, $lr-3); }
281   }
282   if ($lr != 2)
283   {
284     if (($lr-2) < 0)
285     { &rotr($r, 2-$lr); }
286     else { &rotl($r, $lr-2); }
287   }
288 }

290 sub FP_new
291 {
292   local($l,$r,$tt,$lr)=@_;

294   if ($lr != 2)
295   {
296     if (($lr-2) < 0)
297     { &rotl($r, 2-$lr); }
298     else { &rotr($r, $lr-2); }
299   }
300   if ($lr != 3)
301   {
302     if (($lr-3) < 0)
303     { &rotl($l, 3-$lr); }
304     else { &rotr($l, $lr-3); }
305   }

307   &R_PERM_OP($l,$r,$tt, 0,"0xaaaaaaaa",$r);
308   &R_PERM_OP($tt,$r,$l,23,"0x03fc03fc",$r);
309   &R_PERM_OP($l,$r,$tt,10,"0x33333333",$l);
310   &R_PERM_OP($r,$tt,$l,18,"0xffff000f",$l);
311   &R_PERM_OP($l,$tt,$r,12,"0xf0f0f0f0",$r);
312   &rotr($tt, 4);
313 }

315 sub DES_SPtrans
316 {
317   &set_label("DES_SPtrans",64);
318   &data_word(0x02080800, 0x00080000, 0x02000002, 0x02080802);
319   &data_word(0x02000000, 0x00080802, 0x00080002, 0x02000002);
320   &data_word(0x00080802, 0x02080800, 0x02080000, 0x00000802);
321   &data_word(0x02000802, 0x02000000, 0x00000000, 0x00080002);
322   &data_word(0x00080000, 0x00000002, 0x02000800, 0x00080800);
323   &data_word(0x02080802, 0x02080000, 0x00000802, 0x02000800);
324   &data_word(0x00000002, 0x00000800, 0x00080800, 0x02080002);
325   &data_word(0x00000800, 0x02000802, 0x02080002, 0x00000000);

```

```

326   &data_word(0x00000000, 0x02080802, 0x02000800, 0x00080002);
327   &data_word(0x02080800, 0x00080000, 0x00080802, 0x02000800);
328   &data_word(0x02080002, 0x00000800, 0x00080800, 0x02000002);
329   &data_word(0x00080802, 0x00000002, 0x02000002, 0x02080000);
330   &data_word(0x02080802, 0x00080800, 0x02080000, 0x02000802);
331   &data_word(0x02000000, 0x00000802, 0x00080002, 0x00000000);
332   &data_word(0x00080000, 0x02000000, 0x02000802, 0x02080800);
333   &data_word(0x00000002, 0x02080002, 0x00000800, 0x00080802);
334   # nibble 1
335   &data_word(0x40108010, 0x00000000, 0x00108000, 0x40100000);
336   &data_word(0x40000010, 0x00008010, 0x40008000, 0x00108000);
337   &data_word(0x00008000, 0x40100010, 0x00000010, 0x40008000);
338   &data_word(0x00100010, 0x40108000, 0x40100000, 0x00000010);
339   &data_word(0x00100000, 0x40008010, 0x40100010, 0x00008000);
340   &data_word(0x00108010, 0x40000000, 0x00000000, 0x00100010);
341   &data_word(0x40008010, 0x00108010, 0x40108000, 0x40000010);
342   &data_word(0x40000000, 0x00100000, 0x00008010, 0x40108010);
343   &data_word(0x00100010, 0x40108000, 0x40008000, 0x00108010);
344   &data_word(0x40108010, 0x00100010, 0x40000010, 0x00000000);
345   &data_word(0x40000000, 0x00008010, 0x00100000, 0x40100010);
346   &data_word(0x00008000, 0x40000000, 0x00108010, 0x40008010);
347   &data_word(0x40108000, 0x00008000, 0x00000000, 0x40000010);
348   &data_word(0x00000010, 0x40108010, 0x00108000, 0x40100000);
349   &data_word(0x40100010, 0x00100000, 0x00008010, 0x40008000);
350   &data_word(0x40008010, 0x00000010, 0x40100000, 0x00108000);
351   # nibble 2
352   &data_word(0x04000001, 0x04040100, 0x00000100, 0x04000101);
353   &data_word(0x00040001, 0x04000000, 0x04000101, 0x00040100);
354   &data_word(0x04000100, 0x00040000, 0x04040000, 0x00000001);
355   &data_word(0x04040101, 0x00000101, 0x00000001, 0x04040001);
356   &data_word(0x00000000, 0x00040001, 0x04040100, 0x00000100);
357   &data_word(0x00000101, 0x04040101, 0x00040000, 0x04000001);
358   &data_word(0x04040001, 0x04000100, 0x00040101, 0x04040000);
359   &data_word(0x00040100, 0x00000000, 0x04000000, 0x00040101);
360   &data_word(0x04040100, 0x00000100, 0x00000001, 0x00040000);
361   &data_word(0x00000101, 0x00040001, 0x04040000, 0x04000101);
362   &data_word(0x00000000, 0x04040100, 0x00040100, 0x04040001);
363   &data_word(0x00040001, 0x04000000, 0x04040101, 0x00000001);
364   &data_word(0x00040101, 0x04000001, 0x04000000, 0x04040101);
365   &data_word(0x00040000, 0x04000100, 0x04000101, 0x00040100);
366   &data_word(0x04000100, 0x00000000, 0x04040001, 0x00000101);
367   &data_word(0x04000001, 0x00040101, 0x00000100, 0x04040000);
368   # nibble 3
369   &data_word(0x00401008, 0x10001000, 0x00000008, 0x10401008);
370   &data_word(0x00000000, 0x10400000, 0x10001008, 0x00400008);
371   &data_word(0x10401000, 0x10000008, 0x10000000, 0x00001008);
372   &data_word(0x10000008, 0x00401008, 0x00400000, 0x10000000);
373   &data_word(0x10400008, 0x00401000, 0x00001000, 0x00000008);
374   &data_word(0x00401000, 0x10001008, 0x10400000, 0x00001000);
375   &data_word(0x00000000, 0x00000008, 0x00400008, 0x10401000);
376   &data_word(0x10001000, 0x10400008, 0x10401008, 0x00400000);
377   &data_word(0x10400008, 0x00001008, 0x00400000, 0x10000008);
378   &data_word(0x00401000, 0x10001000, 0x00000008, 0x10400000);
379   &data_word(0x10001008, 0x00000000, 0x00001000, 0x00400008);
380   &data_word(0x00000000, 0x10400008, 0x10401000, 0x00001000);
381   &data_word(0x10000000, 0x10401008, 0x00401008, 0x00400000);
382   &data_word(0x10401008, 0x00000008, 0x10001000, 0x00401008);
383   &data_word(0x00400008, 0x00401000, 0x10400000, 0x10001008);
384   &data_word(0x00001008, 0x10000000, 0x10000008, 0x10401000);
385   # nibble 4
386   &data_word(0x08000000, 0x00010000, 0x00000400, 0x08010420);
387   &data_word(0x08010020, 0x08000400, 0x00010420, 0x08010000);
388   &data_word(0x00010000, 0x00000020, 0x08000020, 0x00010400);
389   &data_word(0x08000420, 0x08010400, 0x08010400, 0x00000000);
390   &data_word(0x00010400, 0x08000000, 0x00010020, 0x00000420);
391   &data_word(0x08000400, 0x00010420, 0x00000000, 0x08000020);

```

```
392 &data_word(0x00000020, 0x08000420, 0x08010420, 0x00010020);
393 &data_word(0x08010000, 0x00000400, 0x00000420, 0x08010400);
394 &data_word(0x08010400, 0x08000420, 0x00010020, 0x08010000);
395 &data_word(0x00010000, 0x00000020, 0x08000020, 0x08000400);
396 &data_word(0x08000000, 0x00010400, 0x08010420, 0x00000000);
397 &data_word(0x00010420, 0x08000000, 0x00000400, 0x00010020);
398 &data_word(0x08000420, 0x00000400, 0x00000000, 0x08010420);
399 &data_word(0x08010020, 0x08010400, 0x00000420, 0x00010000);
400 &data_word(0x00010400, 0x08010020, 0x08000400, 0x00000420);
401 &data_word(0x00000020, 0x00010420, 0x08010000, 0x08000020);
402 # nibble 5
403 &data_word(0x80000040, 0x00200040, 0x00000000, 0x80202000);
404 &data_word(0x00200040, 0x00002000, 0x80002040, 0x00200000);
405 &data_word(0x00002040, 0x80202040, 0x00202000, 0x80000000);
406 &data_word(0x80002000, 0x80000040, 0x80200000, 0x00202040);
407 &data_word(0x00200000, 0x80002040, 0x80200040, 0x00000000);
408 &data_word(0x00002000, 0x00000040, 0x80202000, 0x80200040);
409 &data_word(0x80202040, 0x80200000, 0x80000000, 0x00002040);
410 &data_word(0x00000040, 0x00202000, 0x00202040, 0x80002000);
411 &data_word(0x00002040, 0x80000000, 0x80002000, 0x00202040);
412 &data_word(0x80202000, 0x00200040, 0x00000000, 0x80002000);
413 &data_word(0x80000000, 0x00002000, 0x80200040, 0x00200000);
414 &data_word(0x00200040, 0x80202040, 0x00202000, 0x00000040);
415 &data_word(0x80202040, 0x00202000, 0x00200000, 0x80002040);
416 &data_word(0x80000040, 0x80200000, 0x00202040, 0x00000000);
417 &data_word(0x00002000, 0x80000040, 0x80002040, 0x80202000);
418 &data_word(0x80200000, 0x00002040, 0x00000040, 0x80200040);
419 # nibble 6
420 &data_word(0x00004000, 0x00000200, 0x01000200, 0x01000004);
421 &data_word(0x01004204, 0x00004004, 0x00004200, 0x00000000);
422 &data_word(0x01000000, 0x01000204, 0x00000204, 0x01004000);
423 &data_word(0x00000004, 0x01004200, 0x01004000, 0x00000204);
424 &data_word(0x01000204, 0x00004000, 0x00004004, 0x01004204);
425 &data_word(0x00000000, 0x01000200, 0x01000004, 0x00004200);
426 &data_word(0x01004004, 0x00004204, 0x01004200, 0x00000004);
427 &data_word(0x00004204, 0x01004004, 0x00000200, 0x01000000);
428 &data_word(0x00004204, 0x01004000, 0x01004004, 0x00000204);
429 &data_word(0x00004000, 0x00000200, 0x01000000, 0x01004004);
430 &data_word(0x01000204, 0x00004204, 0x00004200, 0x00000000);
431 &data_word(0x00000200, 0x01000004, 0x00000004, 0x01000200);
432 &data_word(0x00000000, 0x01000204, 0x01000200, 0x00004200);
433 &data_word(0x00000204, 0x00004000, 0x01004204, 0x01000000);
434 &data_word(0x01004200, 0x00000004, 0x00004004, 0x01004204);
435 &data_word(0x01000004, 0x01004200, 0x01004000, 0x00004004);
436 # nibble 7
437 &data_word(0x20800080, 0x20820000, 0x00020080, 0x00000000);
438 &data_word(0x20020000, 0x00800080, 0x20800000, 0x20820080);
439 &data_word(0x00000080, 0x20000000, 0x00820000, 0x00020080);
440 &data_word(0x00820080, 0x20020080, 0x20000080, 0x20800000);
441 &data_word(0x00020000, 0x00820080, 0x00800080, 0x20020000);
442 &data_word(0x20820080, 0x20000080, 0x00000000, 0x00820000);
443 &data_word(0x20000000, 0x00800080, 0x20020080, 0x20800080);
444 &data_word(0x00800000, 0x00020000, 0x20820000, 0x00000080);
445 &data_word(0x00800000, 0x00020000, 0x20000080, 0x20820080);
446 &data_word(0x00020080, 0x20000000, 0x00000000, 0x00820000);
447 &data_word(0x20800080, 0x20020080, 0x20020000, 0x00800080);
448 &data_word(0x20820000, 0x00000080, 0x00800080, 0x20020000);
449 &data_word(0x20820080, 0x00800000, 0x20800000, 0x20000080);
450 &data_word(0x00820000, 0x00020080, 0x20020080, 0x20800000);
451 &data_word(0x00000080, 0x20820000, 0x00820080, 0x00000000);
452 &data_word(0x20000000, 0x20800080, 0x00020000, 0x00820080);
453 }
```

```
*****
1375 Fri May 30 18:32:03 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/desboth.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #!/usr/local/bin/perl
3 $L="edi";
4 $R="esi";

6 sub DES_encrypt3
7 {
8     local($name,$enc)=@_;

10     &function_begin_B($name,"");
11     &push("ebx");
12     &mov("ebx",&wparam(0));

14     &push("ebp");
15     &push("esi");

17     &push("edi");

19     &comment("");
20     &comment("Load the data words");
21     &mov($L,&DWP(0,"ebx","",0));
22     &mov($R,&DWP(4,"ebx","",0));
23     &stack_push(3);

25     &comment("");
26     &comment("IP");
27     &IP_new($L,$R,"edx",0);

29     # put them back
30
31     if ($enc)
32     {
33         &mov(&DWP(4,"ebx","",0),$R);
34         &mov("eax",&wparam(1));
35         &mov(&DWP(0,"ebx","",0),"edx");
36         &mov("edi",&wparam(2));
37         &mov("esi",&wparam(3));
38     }
39     else
40     {
41         &mov(&DWP(4,"ebx","",0),$R);
42         &mov("esi",&wparam(1));
43         &mov(&DWP(0,"ebx","",0),"edx");
44         &mov("edi",&wparam(2));
45         &mov("eax",&wparam(3));
46     }
47     &mov(&swtmp(2),(DWC(($enc)?"1":"0")));
48     &mov(&swtmp(1),"eax");
49     &mov(&swtmp(0),"ebx");
50     &call("DES_encrypt2");
51     &mov(&swtmp(2),(DWC(($enc)?"0":"1")));
52     &mov(&swtmp(1),"edi");
53     &mov(&swtmp(0),"ebx");
54     &call("DES_encrypt2");
55     &mov(&swtmp(2),(DWC(($enc)?"1":"0")));
56     &mov(&swtmp(1),"esi");
57     &mov(&swtmp(0),"ebx");
58     &call("DES_encrypt2");

60     &stack_pop(3);
61     &mov($L,&DWP(0,"ebx","",0));
```

```
62     &mov($R,&DWP(4,"ebx","",0));

64     &comment("");
65     &comment("FP");
66     &FP_new($L,$R,"eax",0);

68     &mov(&DWP(0,"ebx","",0),"eax");
69     &mov(&DWP(4,"ebx","",0),$R);

71     &pop("edi");
72     &pop("esi");
73     &pop("ebp");
74     &pop("ebx");
75     &ret();
76     &function_end_B($name);
77 }
```



```
128 $Htbl = "esi";
```

```
129 $unroll = 0;      # Affects x86 loop. Folded loop performs ~7% worse
130                  # than unrolled, which has to be weighted against
131                  # 2.5x x86-specific code size reduction.

133 sub x86_loop {
134     my $off = shift;
135     my $rem = "eax";

137     &mov    ($Zhh,&DWP(4,$Htbl,$Zll));
138     &mov    ($Zhl,&DWP(0,$Htbl,$Zll));
139     &mov    ($Zlh,&DWP(12,$Htbl,$Zll));
140     &mov    ($Zll,&DWP(8,$Htbl,$Zll));
141     &xor    ($rem,$rem);      # avoid partial register stalls on PIII

143     # shrd practically kills P4, 2.5x deterioration, but P4 has
144     # MMX code-path to execute. shrd runs tad faster [than twice
145     # the shifts, move's and or's] on pre-MMX Pentium (as well as
146     # PIII and Core2), *but* minimizes code size, spares register
147     # and thus allows to fold the loop...
148     if (!$unroll) {
149         my $cnt = $inp;
150         &mov    ($cnt,15);
151         &jmp    (&label("x86_loop"));
152         &set_label("x86_loop",16);
153         for($i=1;$i<=2;$i++) {
154             &mov    (&LB($rem),&LB($Zll));
155             &shrd    ($Zll,$Zlh,4);
156             &and    (&LB($rem),0xf);
157             &shrd    ($Zlh,$Zhl,4);
158             &shrd    ($Zhl,$Zhh,4);
159             &shr    ($Zhh,4);
160             &xor    ($Zhh,&DWP($off+16,"esp",$rem,4));

162             &mov    (&LB($rem),&BP($off,"esp",$cnt));
163             if ($i&1) {
164                 &and    (&LB($rem),0xf0);
165             } else {
166                 &shl    (&LB($rem),4);
167             }

169             &xor    ($Zll,&DWP(8,$Htbl,$rem));
170             &xor    ($Zlh,&DWP(12,$Htbl,$rem));
171             &xor    ($Zhl,&DWP(0,$Htbl,$rem));
172             &xor    ($Zhh,&DWP(4,$Htbl,$rem));

174             if ($i&1) {
175                 &dec    ($cnt);
176                 &js     (&label("x86_break"));
177             } else {
178                 &jmp    (&label("x86_loop"));
179             }
180         }
181         &set_label("x86_break",16);
182     } else {
183         for($i=1;$i<32;$i++) {
184             &comment($i);
185             &mov    (&LB($rem),&LB($Zll));
186             &shrd    ($Zll,$Zlh,4);
187             &and    (&LB($rem),0xf);
188             &shrd    ($Zlh,$Zhl,4);
189             &shrd    ($Zhl,$Zhh,4);
190             &shr    ($Zhh,4);
191             &xor    ($Zhh,&DWP($off+16,"esp",$rem,4));

193             if ($i&1) {
194                 &mov    (&LB($rem),&BP($off+15-($i>>1),"esp"));
```

```

195         &and    (&LB($rem),0xf0);
196     } else {
197         &mov     (&LB($rem),&BP($off+15-($i>>1),"esp"));
198         &shl     (&LB($rem),4);
199     }

201     &xor     ($Zll,&DWP(8,$Htbl,$rem));
202     &xor     ($Zlh,&DWP(12,$Htbl,$rem));
203     &xor     ($Zhl,&DWP(0,$Htbl,$rem));
204     &xor     ($Zhh,&DWP(4,$Htbl,$rem));
205 }
206 }
207 &bswap     ($Zll);
208 &bswap     ($Zlh);
209 &bswap     ($Zhl);
210 if (!$x86only) {
211     &bswap     ($Zhh);
212 } else {
213     &mov     ("eax",$Zhh);
214     &bswap     ("eax");
215     &mov     ($Zhh,"eax");
216 }
217 }

219 if ($unroll) {
220     &function_begin_B("_x86_gmult_4bit_inner");
221     &x86_loop(4);
222     &ret     ();
223     &function_end_B("_x86_gmult_4bit_inner");
224 }

226 sub deposit_rem_4bit {
227     my $bias = shift;

229     &mov     (&DWP($bias+0, "esp"), 0x0000<<16);
230     &mov     (&DWP($bias+4, "esp"), 0x1C20<<16);
231     &mov     (&DWP($bias+8, "esp"), 0x3840<<16);
232     &mov     (&DWP($bias+12, "esp"), 0x2460<<16);
233     &mov     (&DWP($bias+16, "esp"), 0x7080<<16);
234     &mov     (&DWP($bias+20, "esp"), 0x6CA0<<16);
235     &mov     (&DWP($bias+24, "esp"), 0x48C0<<16);
236     &mov     (&DWP($bias+28, "esp"), 0x54E0<<16);
237     &mov     (&DWP($bias+32, "esp"), 0xE100<<16);
238     &mov     (&DWP($bias+36, "esp"), 0xFD20<<16);
239     &mov     (&DWP($bias+40, "esp"), 0xD940<<16);
240     &mov     (&DWP($bias+44, "esp"), 0xC560<<16);
241     &mov     (&DWP($bias+48, "esp"), 0x9180<<16);
242     &mov     (&DWP($bias+52, "esp"), 0x8DA0<<16);
243     &mov     (&DWP($bias+56, "esp"), 0xA9C0<<16);
244     &mov     (&DWP($bias+60, "esp"), 0xB5E0<<16);
245 }

```

```

246 $suffix = $x86only ? "" : "_x86";

248 &function_begin("gcm_gmult_4bit".$suffix);
249     &stack_push(16+4+1);
250     &mov     ($inp,&wparam(0));           # +1 for stack alignment
251     &mov     ($Htbl,&wparam(1));         # load Xi
                                           # load Htable
253     &mov     ($Zhh,&DWP(0,$inp));
254     &mov     ($Zhl,&DWP(4,$inp));         # load Xi[16]
255     &mov     ($Zlh,&DWP(8,$inp));
256     &mov     ($Zll,&DWP(12,$inp));

258     &deposit_rem_4bit(16);

260     &mov     (&DWP(0,"esp"),$Zhh);      # copy Xi[16] on stack
261     &mov     (&DWP(4,"esp"),$Zhl);
262     &mov     (&DWP(8,"esp"),$Zlh);
263     &mov     (&DWP(12,"esp"),$Zll);
264     &shr     ($Zll,20);
265     &and     ($Zll,0xf0);

267     if ($unroll) {
268         &call     ("_x86_gmult_4bit_inner");
269     } else {
270         &x86_loop(0);
271         &mov     ($inp,&wparam(0));
272     }

274     &mov     (&DWP(12,$inp),$Zll);
275     &mov     (&DWP(8,$inp),$Zlh);
276     &mov     (&DWP(4,$inp),$Zhl);
277     &mov     (&DWP(0,$inp),$Zhh);
278     &stack_pop(16+4+1);
279 &function_end("gcm_gmult_4bit".$suffix);

281 &function_begin("gcm_ghash_4bit".$suffix);
282     &stack_push(16+4+1);
283     &mov     ($Zll,&wparam(0));           # +1 for 64-bit alignment
284     &mov     ($Htbl,&wparam(1));         # load Xi
285     &mov     ($inp,&wparam(2));         # load Htable
286     &mov     ("ecx",&wparam(3));         # load len
287     &add     ("ecx",$inp);
288     &mov     (&wparam(3),"ecx");

290     &mov     ($Zhh,&DWP(0,$Zll));
291     &mov     ($Zhl,&DWP(4,$Zll));
292     &mov     ($Zlh,&DWP(8,$Zll));
293     &mov     ($Zll,&DWP(12,$Zll));

295     &deposit_rem_4bit(16);

297     &set_label("x86_outer_loop",16);
298     &xor     ($Zll,&DWP(12,$inp));       # xor with input
299     &xor     ($Zlh,&DWP(8,$inp));
300     &xor     ($Zhl,&DWP(4,$inp));
301     &xor     ($Zhh,&DWP(0,$inp));
302     &mov     (&DWP(12,"esp"),$Zll);     # dump it on stack
303     &mov     (&DWP(8,"esp"),$Zlh);
304     &mov     (&DWP(4,"esp"),$Zhl);
305     &mov     (&DWP(0,"esp"),$Zhh);

307     &shr     ($Zll,20);
308     &and     ($Zll,0xf0);

310     if ($unroll) {
311         &call     ("_x86_gmult_4bit_inner");

```

```

312     } else {
313         &x86_loop(0);
314         &mov ($inp,&wparam(2));
315     }
316     &lea ($inp,&DWP(16,$inp));
317     &cmp ($inp,&wparam(3));
318     &mov (&wparam(2),$inp) if (!$unroll);
319     &jb (&label("x86_outer_loop"));

321     &mov ($inp,&wparam(0)); # load Xi
322     &mov (&DWP(12,$inp),$Zll);
323     &mov (&DWP(8,$inp),$Zlh);
324     &mov (&DWP(4,$inp),$Zhl);
325     &mov (&DWP(0,$inp),$Zhh);
326     &stack_pop(16+4+1);
327 &function_end("gcm_ghash_4bit".$suffix);

```

```

328 if (!$x86only) {{{
330 &static_label("rem_4bit");

332 if (!$sse2) { # pure-MMX "May" version...

334 $S=12; # shift factor for rem_4bit

336 &function_begin_B("mmx_gmult_4bit_inner");
337 # MMX version performs 3.5 times better on P4 (see comment in non-MMX
338 # routine for further details), 100% better on Opteron, ~70% better
339 # on Core2 and PIII... In other words effort is considered to be well
340 # spent... Since initial release the loop was unrolled in order to
341 # "liberate" register previously used as loop counter. Instead it's
342 # used to optimize critical path in 'Z.hi ^= rem_4bit[Z.lo&0xf]'.
343 # The path involves move of Z.lo from MMX to integer register,
344 # effective address calculation and finally merge of value to Z.hi.
345 # Reference to rem_4bit is scheduled so late that I had to >>4
346 # rem_4bit elements. This resulted in 20-45% percent improvement
347 # on contemporary µ-archs.
348 {
349     my $cnt;
350     my $rem_4bit = "eax";
351     my @rem = ($Zhh,$Zll);
352     my $nhi = $Zhl;
353     my $nlo = $Zlh;

355     my ($Zlo,$Zhi) = ("mm0","mm1");
356     my $tmp = "mm2";

358     &xor ($nlo,$nlo); # avoid partial register stalls on PIII
359     &mov ($nhi,$Zll);
360     &mov (&LB($nlo),&LB($nhi));
361     &shl (&LB($nlo),4);
362     &and ($nhi,0xf0);
363     &movq ($Zlo,&QWP(8,$Htbl,$nlo));
364     &movq ($Zhi,&QWP(0,$Htbl,$nlo));
365     &movd ($rem[0],$Zlo);

367     for ($cnt=28;$cnt>=-2;$cnt--) {
368         my $odd = $cnt&1;
369         my $nix = $odd ? $nlo : $nhi;

371         &shl (&LB($nlo),4) if ($odd);
372         &psrlq ($Zlo,4);
373         &movq ($tmp,$Zhi);
374         &psrlq ($Zhi,4);
375         &pxor ($Zlo,&QWP(8,$Htbl,$nix));
376         &mov (&LB($nlo),&BP($cnt/2,$inp)) if (!$odd && $cnt>=0);
377         &psllq ($tmp,60);
378         &and ($nhi,0xf0) if ($odd);
379         &pxor ($Zhi,&QWP(0,$rem_4bit,$rem[1],8)) if ($cnt<28);
380         &and ($rem[0],0xf);
381         &pxor ($Zhi,&QWP(0,$Htbl,$nix));
382         &mov ($nhi,$nlo) if (!$odd && $cnt>=0);
383         &movd ($rem[1],$Zlo);
384         &pxor ($Zlo,$tmp);

386         push (@rem,shift(@rem)); # "rotate" registers
387     }

389     &mov ($inp,&DWP(4,$rem_4bit,$rem[1],8)); # last rem_4bit[rem]

391     &psrlq ($Zlo,32); # lower part of Zlo is already there
392     &movd ($Zhl,$Zhi);
393     &psrlq ($Zhi,32);

```



```

394      &movd    ($Zlh,$Zlo);
395      &movd    ($Zhh,$Zhi);
396      &shl     ($inp,4);          # compensate for rem_4bit[i] being >>4

398      &bswap   ($Zll);
399      &bswap   ($Zhl);
400      &bswap   ($Zlh);
401      &xor     ($Zhh,$inp);
402      &bswap   ($Zhh);

404      &ret     ();
405 }
406 &function_end_B("_mmx_gmult_4bit_inner");

408 &function_begin("gcm_gmult_4bit_mmx");
409      &mov     ($inp,&wparam(0)); # load Xi
410      &mov     ($Htbl,&wparam(1)); # load Htable

412      &call    (&label("pic_point"));
413      &set_label("pic_point");
414      &blndpop("eax");
415      &lea     ("eax",&DWP(&label("rem_4bit")."-".&label("pic_point"),"eax"));

417      &movz    ($Zll,&BP(15,$inp));

419      &call    ("_mmx_gmult_4bit_inner");

421      &mov     ($inp,&wparam(0)); # load Xi
422      &emms    ();
423      &mov     (&DWP(12,$inp),$Zll);
424      &mov     (&DWP(4,$inp),$Zhl);
425      &mov     (&DWP(8,$inp),$Zlh);
426      &mov     (&DWP(0,$inp),$Zhh);
427 &function_end("gcm_gmult_4bit_mmx");

```

```

428 # Streamed version performs 20% better on P4, 7% on Opteron,
429 # 10% on Core2 and PIII...
430 &function_begin("gcm_ghash_4bit_mmx");
431      &mov     ($Zhh,&wparam(0)); # load Xi
432      &mov     ($Htbl,&wparam(1)); # load Htable
433      &mov     ($inp,&wparam(2)); # load in
434      &mov     ($Zlh,&wparam(3)); # load len

436      &call    (&label("pic_point"));
437      &set_label("pic_point");
438      &blndpop("eax");
439      &lea     ("eax",&DWP(&label("rem_4bit")."-".&label("pic_point"),"eax"));

441      &add     ($Zlh,$inp);
442      &mov     (&wparam(3),$Zlh); # len to point at the end of input
443      &stack_push(4+1);          # +1 for stack alignment

445      &mov     ($Zll,&DWP(12,$Zhh)); # load Xi[16]
446      &mov     ($Zhl,&DWP(4,$Zhh));
447      &mov     ($Zlh,&DWP(8,$Zhh));
448      &mov     ($Zhh,&DWP(0,$Zhh));
449      &jmp     (&label("mmx_outer_loop"));

451      &set_label("mmx_outer_loop",16);
452      &xor     ($Zll,&DWP(12,$inp));
453      &xor     ($Zhl,&DWP(4,$inp));
454      &xor     ($Zlh,&DWP(8,$inp));
455      &xor     ($Zhh,&DWP(0,$inp));
456      &mov     (&wparam(2),$inp);
457      &mov     (&DWP(12,"esp"),$Zll);
458      &mov     (&DWP(4,"esp"),$Zhl);
459      &mov     (&DWP(8,"esp"),$Zlh);
460      &mov     (&DWP(0,"esp"),$Zhh);

462      &mov     ($inp,"esp");
463      &shr     ($Zll,24);

465      &call    ("_mmx_gmult_4bit_inner");

467      &mov     ($inp,&wparam(2));
468      &lea     ($inp,&DWP(16,$inp));
469      &cmp     ($inp,&wparam(3));
470      &jb      (&label("mmx_outer_loop"));

472      &mov     ($inp,&wparam(0)); # load Xi
473      &emms    ();
474      &mov     (&DWP(12,$inp),$Zll);
475      &mov     (&DWP(4,$inp),$Zhl);
476      &mov     (&DWP(8,$inp),$Zlh);
477      &mov     (&DWP(0,$inp),$Zhh);

479      &stack_pop(4+1);
480 &function_end("gcm_ghash_4bit_mmx");

```

```

481 }} else {{      # "June" MMX version...
482                # ... has slower "April" gcm_gmult_4bit_mmx with folded
483                # loop. This is done to conserve code size...
484 $S=16;          # shift factor for rem_4bit

486 sub mmx_loop() {
487 # MMX version performs 2.8 times better on P4 (see comment in non-MMX
488 # routine for further details), 40% better on Opteron and Core2, 50%
489 # better on PIII... In other words effort is considered to be well
490 # spent...
491     my $inp = shift;
492     my $rem_4bit = shift;
493     my $cnt = $Zhh;
494     my $nhi = $Zhl;
495     my $nlo = $Zlh;
496     my $rem = $Zll;

498     my ($Zlo,$Zhi) = ("mm0","mm1");
499     my $tmp = "mm2";

501     &xor    ($nlo,$nlo);    # avoid partial register stalls on PIII
502     &mov    ($nhi,$Zll);
503     &mov    (&LB($nlo),&LB($nhi));
504     &mov    ($cnt,14);
505     &shl    (&LB($nlo),4);
506     &and    ($nhi,0xf0);
507     &movq   ($Zlo,&QWP(8,$Htbl,$nlo));
508     &movq   ($Zhi,&QWP(0,$Htbl,$nlo));
509     &movd   ($rem,$Zlo);
510     &jmp    (&label("mmx_loop"));

512     &set_label("mmx_loop",16);
513     &psrlq  ($Zlo,4);
514     &and    ($rem,0xf);
515     &movq   ($tmp,$Zhi);
516     &psrlq  ($Zhi,4);
517     &pxor   ($Zlo,&QWP(8,$Htbl,$nhi));
518     &mov    (&LB($nlo),&BP(0,$inp,$cnt));
519     &psllq  ($tmp,60);
520     &pxor   ($Zhi,&QWP(0,$rem_4bit,$rem,8));
521     &dec    ($cnt);
522     &movd   ($rem,$Zlo);
523     &pxor   ($Zhi,&QWP(0,$Htbl,$nhi));
524     &mov    ($nhi,$nlo);
525     &pxor   ($Zlo,$tmp);
526     &jns    (&label("mmx_break"));

528     &shl    (&LB($nlo),4);
529     &and    ($rem,0xf);
530     &psrlq  ($Zlo,4);
531     &and    ($nhi,0xf0);
532     &movq   ($tmp,$Zhi);
533     &psrlq  ($Zhi,4);
534     &pxor   ($Zlo,&QWP(8,$Htbl,$nlo));
535     &psllq  ($tmp,60);
536     &pxor   ($Zhi,&QWP(0,$rem_4bit,$rem,8));
537     &movd   ($rem,$Zlo);
538     &pxor   ($Zhi,&QWP(0,$Htbl,$nlo));
539     &pxor   ($Zlo,$tmp);
540     &jmp    (&label("mmx_loop"));

542     &set_label("mmx_break",16);
543     &shl    (&LB($nlo),4);
544     &and    ($rem,0xf);
545     &psrlq  ($Zlo,4);
546     &and    ($nhi,0xf0);

```

```

547     &movq   ($tmp,$Zhi);
548     &psrlq  ($Zhi,4);
549     &pxor   ($Zlo,&QWP(8,$Htbl,$nlo));
550     &psllq  ($tmp,60);
551     &pxor   ($Zhi,&QWP(0,$rem_4bit,$rem,8));
552     &movd   ($rem,$Zlo);
553     &pxor   ($Zhi,&QWP(0,$Htbl,$nlo));
554     &pxor   ($Zlo,$tmp);

556     &psrlq  ($Zlo,4);
557     &and    ($rem,0xf);
558     &movq   ($tmp,$Zhi);
559     &psrlq  ($Zhi,4);
560     &pxor   ($Zlo,&QWP(8,$Htbl,$nhi));
561     &psllq  ($tmp,60);
562     &pxor   ($Zhi,&QWP(0,$rem_4bit,$rem,8));
563     &movd   ($rem,$Zlo);
564     &pxor   ($Zhi,&QWP(0,$Htbl,$nhi));
565     &pxor   ($Zlo,$tmp);

567     &psrlq  ($Zlo,32);    # lower part of Zlo is already there
568     &movd   ($Zhl,$Zhi);
569     &psrlq  ($Zhi,32);
570     &movd   ($Zlh,$Zlo);
571     &movd   ($Zhh,$Zhi);

573     &bswap  ($Zll);
574     &bswap  ($Zhl);
575     &bswap  ($Zlh);
576     &bswap  ($Zhh);
577 }

579 &function_begin("gcm_gmult_4bit_mmx");
580     &mov    ($inp,&wparam(0));    # load Xi
581     &mov    ($Htbl,&wparam(1));    # load Htable

583     &call    (&label("pic_point"));
584     &set_label("pic_point");
585     &blindpop("eax");
586     &lea     ("eax",&DWP(&label("rem_4bit")."-".&label("pic_point"),"eax"));

588     &movz    ($Zll,&BP(15,$inp));

590     &mmx_loop($inp,"eax");

592     &emms    ();
593     &mov      (&DWP(12,$inp),$Zll);
594     &mov      (&DWP(4,$inp),$Zhl);
595     &mov      (&DWP(8,$inp),$Zlh);
596     &mov      (&DWP(0,$inp),$Zhh);
597 &function_end("gcm_gmult_4bit_mmx");

```

```

598 #####
599 # Below subroutine is "528B" variant of "4-bit" GCM GHASH function
600 # (see gcm128.c for details). It provides further 20-40% performance
601 # improvement over above mentioned "May" version.

603 &static_label("rem_8bit");

605 &function_begin("gcm_ghash_4bit_mmx");
606 { my ($Zlo,$Zhi) = ("mm7","mm6");
607   my $rem_8bit = "esi";
608   my $Htbl = "ebx";

610   # parameter block
611   &mov      ("eax",&wparam(0));          # Xi
612   &mov      ("ebx",&wparam(1));          # Htable
613   &mov      ("ecx",&wparam(2));          # inp
614   &mov      ("edx",&wparam(3));          # len
615   &mov      ("ebp","esp");               # original %esp
616   &call     (&label("pic_point"));
617   &set_label("pic_point");
618   &blndpop  ($rem_8bit);
619   &lea      ($rem_8bit,&DWP(&label("rem_8bit")."-".&label("pic_point"),$rem_

621   &sub      ("esp",512+16+16);           # allocate stack frame...
622   &and      ("esp",-64);                 # ...and align it
623   &sub      ("esp",16);                 # place for (u8)H[!<<4)

625   &add      ("edx","ecx");               # pointer to the end of input
626   &mov      (&DWP(528+16+0,"esp"),"eax"); # save Xi
627   &mov      (&DWP(528+16+8,"esp"),"edx"); # save inp+len
628   &mov      (&DWP(528+16+12,"esp"),"ebp"); # save original %esp

630   { my @lo = ("mm0","mm1","mm2");
631     my @hi = ("mm3","mm4","mm5");
632     my @tmp = ("mm6","mm7");
633     my ($off1,$off2,$i) = (0,0,);

635     &add      ($Htbl,128);               # optimize for size
636     &lea      ("edi",&DWP(16+128,"esp"));
637     &lea      ("ebp",&DWP(16+256+128,"esp"));

639     # decompose Htable (low and high parts are kept separately),
640     # generate Htable[!>>4, (u8)Htable[!<<4], save to stack...
641     for ($i=0;$i<18;$i++) {

643       &mov      ("edx",&DWP(16*$i+8-128,$Htbl)) if ($i<16);
644       &movq     ($lo[0],&QWP(16*$i+8-128,$Htbl)) if ($i<16);
645       &psllq    ($tmp[1],60) if ($i>1);
646       &movq     ($hi[0],&QWP(16*$i+0-128,$Htbl)) if ($i<16);
647       &por      ($lo[2],$tmp[1]) if ($i>1);
648       &movq     (&QWP($off1-128,"edi"),$lo[1]) if ($i>0 && $i<17);
649       &psrlq    ($lo[1],4) if ($i>0 && $i<17);
650       &movq     (&QWP($off1,"edi"),$hi[1]) if ($i>0 && $i<17);
651       &movq     ($tmp[0],$hi[1]) if ($i>0 && $i<17);
652       &movq     (&QWP($off2-128,"ebp"),$lo[2]) if ($i>1);
653       &psrlq    ($hi[1],4) if ($i>0 && $i<17);
654       &movq     (&QWP($off2,"ebp"),$hi[2]) if ($i>1);
655       &shl      ("edx",4) if ($i<16);
656       &mov      (&BP($i,"esp"),&LB("edx")) if ($i<16);

658       unshift (@lo,pop(@lo));           # "rotate" registers
659       unshift (@hi,pop(@hi));
660       unshift (@tmp,pop(@tmp));
661       $off1 += 8 if ($i>0);
662       $off2 += 8 if ($i>1);
663     }

```

```

664   }

666   &movq      ($Zhi,&QWP(0,"eax"));
667   &mov       ("ebx",&DWP(8,"eax"));
668   &mov       ("edx",&DWP(12,"eax"));      # load Xi

670   &set_label("outer",16);
671   { my $nlo = "eax";
672     my $dat = "edx";
673     my @nhi = ("edi","ebp");
674     my @rem = ("ebx","ecx");
675     my @red = ("mm0","mm1","mm2");
676     my $tmp = "mm3";

678     &xor      ($dat,&DWP(12,"ecx"));      # merge input data
679     &xor      ("ebx",&DWP(8,"ecx"));
680     &pxor     ($Zhi,&QWP(0,"ecx"));
681     &lea      ("ecx",&DWP(16,"ecx"));      # inp+=16
682     &mov      (&DWP(528+12,"esp"),$dat); # save inp^Xi
683     &mov      (&DWP(528+8,"esp"),"ebx");
684     &movq     (&QWP(528+0,"esp"),$Zhi);
685     &mov      (&DWP(528+16+4,"esp"),"ecx"); # save inp

687     &xor      ($nlo,$nlo);
688     &rol      ($dat,8);
689     &mov      (&LB($nlo),&LB($dat));
690     &mov      ($nhi[1],$nlo);
691     &and      (&LB($nlo),0x0f);
692     &shr      ($nhi[1],4);
693     &pxor     ($red[0],$red[0]);
694     &rol      ($dat,8);                  # next byte
695     &pxor     ($red[1],$red[1]);
696     &pxor     ($red[2],$red[2]);

698     # Just like in "May" version modulo-schedule for critical path in
699     # 'Z.hi ^= rem_8bit[Z.lo&0xff^((u8)H[nhi]<<4)]<<48'. Final 'pxor'
700     # is scheduled so late that rem_8bit[] has to be shifted *right*
701     # by 16, which is why last argument to pinsrw is 2, which
702     # corresponds to <<32=<<48>>16...
703     for ($j=11;$i=0;$i<15;$i++) {

705       if ($i>0) {
706         &pxor ($Zlo,&QWP(16,"esp",$nlo,8)); # Z^=H[nlo]
707         &rol  ($dat,8);                     # next byte
708         &pxor ($Zhi,&QWP(16+128,"esp",$nlo,8));

710         &pxor ($Zlo,$tmp);
711         &pxor ($Zhi,&QWP(16+256+128,"esp",$nhi[0],8));
712         &xor  (&LB($rem[1]),&BP(0,"esp",$nhi[0])); # rem^H[nhi]<<4)
713       } else {
714         &movq ($Zlo,&QWP(16,"esp",$nlo,8));
715         &movq ($Zhi,&QWP(16+128,"esp",$nlo,8));
716       }

718       &mov      (&LB($nlo),&LB($dat));
719       &mov      ($dat,&DWP(528+$j,"esp")) if (--$j%4==0);

721       &movd     ($rem[0],$Zlo);
722       &movz     ($rem[1],&LB($rem[1])) if ($i>0);
723       &psrlq    ($Zlo,8);                # Z>>=8

725       &movq     ($tmp,$Zhi);
726       &mov      ($nhi[0],$nlo);
727       &psrlq    ($Zhi,8);

729       &pxor     ($Zlo,&QWP(16+256+0,"esp",$nhi[1],8)); # Z^=H[nhi]>>4

```

```

730      &and      (&LB($nlo),0x0f);
731      &psllq    ($tmp,56);

733      &pxor     ($Zhi,$red[1])          if ($i>1);
734      &shr      ($nhi[0],4);
735      &pinsrw   ($red[0],&WP(0,$rem_8bit,$rem[1],2),2) if ($i>0);

737      unshift  (@red,pop(@red));        # "rotate" registers
738      unshift  (@rem,pop(@rem));
739      unshift  (@nhi,pop(@nhi));
740  }

742      &pxor     ($Zlo,&QWP(16,"esp",$nlo,8));      # Z^=H[nlo]
743      &pxor     ($Zhi,&QWP(16+128,"esp",$nlo,8));
744      &xor      (&LB($rem[1]),&BP(0,"esp",$nhi[0])); # rem^=H[nhi]<<4

746      &pxor     ($Zlo,$tmp);
747      &pxor     ($Zhi,&QWP(16+256+128,"esp",$nhi[0],8));
748      &movz     ($rem[1],&LB($rem[1]));

750      &pxor     ($red[2],$red[2]);              # clear 2nd word
751      &psllq    ($red[1],4);

753      &movd     ($rem[0],$Zlo);
754      &psrlq    ($Zlo,4);                      # Z>>=4

756      &movq     ($tmp,$Zhi);
757      &psrlq    ($Zhi,4);
758      &shl      ($rem[0],4);                  # rem<<4

760      &pxor     ($Zlo,&QWP(16,"esp",$nhi[1],8));  # Z^=H[nhi]
761      &psllq    ($tmp,60);
762      &movz     ($rem[0],&LB($rem[0]));

764      &pxor     ($Zlo,$tmp);
765      &pxor     ($Zhi,&QWP(16+128,"esp",$nhi[1],8));

767      &pinsrw   ($red[0],&WP(0,$rem_8bit,$rem[1],2),2);
768      &pxor     ($Zhi,$red[1]);

770      &movd     ($dat,$Zlo);
771      &pinsrw   ($red[2],&WP(0,$rem_8bit,$rem[0],2),3); # last is <<48

773      &psllq    ($red[0],12);                  # correct by <<16>>4
774      &pxor     ($Zhi,$red[0]);
775      &psrlq    ($Zlo,32);
776      &pxor     ($Zhi,$red[2]);

778      &mov      ("ecx",&DWP(528+16+4,"esp"));    # restore inp
779      &movd     ("ebx",$Zlo);
780      &movq     ($tmp,$Zhi);                    # 01234567
781      &psllw    ($Zhi,8);                       # 1.3.5.7.
782      &psrlw    ($tmp,8);                       # .0.2.4.6
783      &por      ($Zhi,$tmp);                    # 10325476
784      &bswap    ($dat);
785      &pshufw   ($Zhi,$Zhi,0b00011011);        # 76543210
786      &bswap    ("ebx");

788      &cmp      ("ecx",&DWP(528+16+8,"esp"));    # are we done?
789      &jne      (&label("outer"));
790  }

792      &mov      ("eax",&DWP(528+16+0,"esp"));    # restore Xi
793      &mov      (&DWP(12,"eax"),"edx");
794      &mov      (&DWP(8,"eax"),"ebx");
795      &movq     (&QWP(0,"eax"),$Zhi);

```

```

797      &mov      ("esp",&DWP(528+16+12,"esp"));  # restore original %esp
798      &emms     ();
799  }
800  &function_end("gcm_ghash_4bit_mmx");
801  }}

```

```

802 if ($sse2) {
803 #####
804 # PCLMULQDQ version.

806 $Xip="eax";
807 $Htbl="edx";
808 $const="ecx";
809 $inp="esi";
810 $len="ebx";

812 ($Xi,$Xhi)=("xmm0","xmm1");      $Hkey="xmm2";
813 ($T1,$T2,$T3)=("xmm3","xmm4","xmm5");
814 ($Xn,$Xhn)=("xmm6","xmm7");

816 &static_label("bswap");

818 sub cmlul64x64_T2 {      # minimal "register" pressure
819 my ($Xhi,$Xi,$Hkey)=@_;

821     &movdqa      ($Xhi,$Xi);      #
822     &pshufd      ($T1,$Xi,0b01001110);
823     &pshufd      ($T2,$Hkey,0b01001110);
824     &pxor       ($T1,$Xi);      #
825     &pxor       ($T2,$Hkey);

827     &pclmulqdq   ($Xi,$Hkey,0x00);      #####
828     &pclmulqdq   ($Xhi,$Hkey,0x11);      #####
829     &pclmulqdq   ($T1,$T2,0x00);      #####
830     &xorps      ($T1,$Xi);      #
831     &xorps      ($T1,$Xhi);      #

833     &movdqa      ($T2,$T1);      #
834     &psrldq      ($T1,8);      #
835     &pslldq      ($T2,8);      #
836     &pxor       ($Xhi,$T1);      #
837     &pxor       ($Xi,$T2);      #
838 }

840 sub cmlul64x64_T3 {
841 # Even though this subroutine offers visually better ILP, it
842 # was empirically found to be a tad slower than above version.
843 # At least in gcm_ghash_cmlul context. But it's just as well,
844 # because loop modulo-scheduling is possible only thanks to
845 # minimized "register" pressure...
846 my ($Xhi,$Xi,$Hkey)=@_;

848     &movdqa      ($T1,$Xi);      #
849     &movdqa      ($Xhi,$Xi);      #
850     &pclmulqdq   ($Xi,$Hkey,0x00);      #####
851     &pclmulqdq   ($Xhi,$Hkey,0x11);      #####
852     &pshufd      ($T2,$T1,0b01001110);      #
853     &pshufd      ($T3,$Hkey,0b01001110);      #
854     &pxor       ($T2,$T1);      #
855     &pxor       ($T3,$Hkey);      #
856     &pclmulqdq   ($T2,$T3,0x00);      #####
857     &pxor       ($T2,$Xi);      #
858     &pxor       ($T2,$Xhi);      #

860     &movdqa      ($T3,$T2);      #
861     &psrldq      ($T2,8);      #
862     &pslldq      ($T3,8);      #
863     &pxor       ($Xhi,$T2);      #
864     &pxor       ($Xi,$T3);      #
865 }

```

```

866 if (1) {      # Algorithm 9 with <<1 twist.
867     # Reduction is shorter and uses only two
868     # temporary registers, which makes it better
869     # candidate for interleaving with 64x64
870     # multiplication. Pre-modulo-scheduled loop
871     # was found to be ~20% faster than Algorithm 5
872     # below. Algorithm 9 was therefore chosen for
873     # further optimization...

875 sub reduction_alg9 {      # 17/13 times faster than Intel version
876 my ($Xhi,$Xi) = @_;

878     # 1st phase
879     &movdqa      ($T1,$Xi);      #
880     &psllq      ($Xi,1);      #
881     &pxor       ($Xi,$T1);      #
882     &psllq      ($Xi,5);      #
883     &pxor       ($Xi,$T1);      #
884     &psllq      ($Xi,57);      #
885     &movdqa      ($T2,$Xi);      #
886     &pslldq      ($Xi,8);      #
887     &psrldq      ($T2,8);      #
888     &pxor       ($Xi,$T1);      #
889     &pxor       ($Xhi,$T2);      #

891     # 2nd phase
892     &movdqa      ($T2,$Xi);      #
893     &psrlq      ($Xi,5);      #
894     &pxor       ($Xi,$T2);      #
895     &psrlq      ($Xi,1);      #
896     &pxor       ($Xi,$T2);      #
897     &pxor       ($T2,$Xhi);      #
898     &psrlq      ($Xi,1);      #
899     &pxor       ($Xi,$T2);      #
900 }

902 &function_begin_B("gcm_init_cmlul");
903     &mov      ($Htbl,&wparam(0));
904     &mov      ($Xip,&wparam(1));

906     &call      (&label("pic"));
907     &set_label("pic");
908     &blindpop      ($const);
909     &lea      ($const,&DWP(&label("bswap")."-".&label("pic"),$const));

911     &movdqu      ($Hkey,&QWP(0,$Xip));
912     &pshufd      ($Hkey,$Hkey,0b01001110);# dword swap

914     # <<1 twist
915     &pshufd      ($T2,$Hkey,0b11111111); # broadcast uppermost dword
916     &movdqa      ($T1,$Hkey);
917     &psllq      ($Hkey,1);
918     &pxor       ($T3,$T3);      #
919     &psrlq      ($T1,63);
920     &pcmpgtd      ($T3,$T2);      # broadcast carry bit
921     &pslldq      ($T1,8);
922     &por       ($Hkey,$T1);      # H<<=1

924     # magic reduction
925     &pand      ($T3,&QWP(16,$const));      # 0x1c2_polynomial
926     &pxor       ($Hkey,$T3);      # if(carry) H^=0x1c2_polynomial

928     # calculate H^2
929     &movdqa      ($Xi,$Hkey);
930     &cmlul64x64_T2 ($Xhi,$Xi,$Hkey);
931     &reduction_alg9 ($Xhi,$Xi);

```

```

933     &movdqu      (&QWP(0,$Htbl),$Hkey); # save H
934     &movdqu      (&QWP(16,$Htbl),$Xi);  # save H^2

936     &ret         ();
937 &function_end_B("gcm_init_clmul");

939 &function_begin_B("gcm_gmult_clmul");
940     &mov         ($Xip,&wparam(0));
941     &mov         ($Htbl,&wparam(1));

943     &call        (&label("pic"));
944 &set_label("pic");
945     &blindpop    ($const);
946     &lea         ($const,&DWP(&label("bswap")."-".&label("pic"),$const));

948     &movdqu      ($Xi,&QWP(0,$Xip));
949     &movdqa      ($T3,&QWP(0,$const));
950     &movups      ($Hkey,&QWP(0,$Htbl));
951     &pshufb      ($Xi,$T3);

953     &clmul64x64_T2 ($Xhi,$Xi,$Hkey);
954     &reduction_alg9 ($Xhi,$Xi);

956     &pshufb      ($Xi,$T3);
957     &movdqu      (&QWP(0,$Xip),$Xi);

959     &ret         ();
960 &function_end_B("gcm_gmult_clmul");

962 &function_begin("gcm_ghash_clmul");
963     &mov         ($Xip,&wparam(0));
964     &mov         ($Htbl,&wparam(1));
965     &mov         ($inp,&wparam(2));
966     &mov         ($len,&wparam(3));

968     &call        (&label("pic"));
969 &set_label("pic");
970     &blindpop    ($const);
971     &lea         ($const,&DWP(&label("bswap")."-".&label("pic"),$const));

973     &movdqu      ($Xi,&QWP(0,$Xip));
974     &movdqa      ($T3,&QWP(0,$const));
975     &movdqu      ($Hkey,&QWP(0,$Htbl));
976     &pshufb      ($Xi,$T3);

978     &sub         ($len,0x10);
979     &jz           (&label("odd_tail"));

981     #####
982     # Xi+2 = [H*(Ii+1 + Xi+1)] mod P =
983     #       [(H*Ii+1) + (H*Xi+1)] mod P =
984     #       [(H*Ii+1) + H^2*(Ii+Xi)] mod P
985     #
986     &movdqu      ($T1,&QWP(0,$inp)); # Ii
987     &movdqu      ($Xn,&QWP(16,$inp)); # Ii+1
988     &pshufb      ($T1,$T3);
989     &pshufb      ($Xn,$T3);
990     &pxor        ($Xi,$T1); # Ii+Xi

992     &clmul64x64_T2 ($Xhn,$Xn,$Hkey); # H*Ii+1
993     &movups      ($Hkey,&QWP(16,$Htbl)); # load H^2

995     &lea         ($inp,&DWP(32,$inp)); # i+=2
996     &sub         ($len,0x20);
997     &jbe         (&label("even_tail"));

```

```

999 &set_label("mod_loop");
1000     &clmul64x64_T2 ($Xhi,$Xi,$Hkey); # H^2*(Ii+Xi)
1001     &movdqu      ($T1,&QWP(0,$inp)); # Ii
1002     &movups      ($Hkey,&QWP(0,$Htbl)); # load H

1004     &pxor        ($Xi,$Xn); # (H*Ii+1) + H^2*(Ii+Xi)
1005     &pxor        ($Xhi,$Xhn);

1007     &movdqu      ($Xn,&QWP(16,$inp)); # Ii+1
1008     &pshufb      ($T1,$T3);
1009     &pshufb      ($Xn,$T3);

1011     &movdqa      ($T3,$Xn); #&clmul64x64_TX ($Xhn,$Xn,$Hkey)
1012     &movdqa      ($Xhn,$Xn);
1013     &pxor        ($Xhi,$T1); # "Ii+Xi", consume early

1015     &movdqa      ($T1,$Xi); #&reduction_alg9($Xhi,$Xi); 1st
1016     &psllq      ($Xi,1);
1017     &pxor        ($Xi,$T1); #
1018     &psllq      ($Xi,5); #
1019     &pxor        ($Xi,$T1); #
1020     &pclmulqdq   ($Xn,$Hkey,0x00); #####
1021     &psllq      ($Xi,57); #
1022     &movdqa      ($T2,$Xi); #
1023     &pslldq      ($Xi,8); #
1024     &psrldq      ($T2,8); #
1025     &pxor        ($Xi,$T1); #
1026     &pshufd      ($T1,$T3,0b01001110); #
1027     &pxor        ($Xhi,$T2); #
1028     &pxor        ($T1,$T3); #
1029     &pshufd      ($T3,$Hkey,0b01001110); #
1030     &pxor        ($T3,$Hkey); #

1032     &pclmulqdq   ($Xhn,$Hkey,0x11); #####
1033     &movdqa      ($T2,$Xi); # 2nd phase
1034     &psrlq      ($Xi,5);
1035     &pxor        ($Xi,$T2); #
1036     &psrlq      ($Xi,1); #
1037     &pxor        ($Xi,$T2); #
1038     &pxor        ($T2,$Xhi); #
1039     &psrlq      ($Xi,1); #
1040     &pxor        ($Xi,$T2); #

1042     &pclmulqdq   ($T1,$T3,0x00); #####
1043     &movups      ($Hkey,&QWP(16,$Htbl)); # load H^2
1044     &xorps      ($T1,$Xn); #
1045     &xorps      ($T1,$Xhn); #

1047     &movdqa      ($T3,$T1); #
1048     &psrldq      ($T1,8); #
1049     &pslldq      ($T3,8); #
1050     &pxor        ($Xhn,$T1); #
1051     &pxor        ($Xn,$T3); #
1052     &movdqa      ($T3,&QWP(0,$const)); #

1054     &lea         ($inp,&DWP(32,$inp));
1055     &sub         ($len,0x20);
1056     &ja          (&label("mod_loop"));

1058 &set_label("even_tail");
1059     &clmul64x64_T2 ($Xhi,$Xi,$Hkey); # H^2*(Ii+Xi)

1061     &pxor        ($Xi,$Xn); # (H*Ii+1) + H^2*(Ii+Xi)
1062     &pxor        ($Xhi,$Xhn);

```

```

1064      &reduction_alg9 ($Xhi,$Xi);

1066      &test          ($len,$len);
1067      &jnz            (&label("done"));

1069      &movups        ($Hkey,&QWP(0,$Htbl)); # load H
1070 &set_label("odd_tail");
1071      &movdqu        ($T1,&QWP(0,$inp));    # Ii
1072      &pshufb         ($T1,$T3);
1073      &pxor           ($Xi,$T1);            # Ii+Xi

1075      &clmul64x64_T2 ($Xhi,$Xi,$Hkey);      # H*(Ii+Xi)
1076      &reduction_alg9 ($Xhi,$Xi);

1078 &set_label("done");
1079      &pshufb         ($Xi,$T3);
1080      &movdqu         (&QWP(0,$Xip),$Xi);
1081 &function_end("gcm_ghash_clmul");

```

```

1082 } else {                                     # Algorithm 5. Kept for reference purposes.

1084 sub reduction_alg5 {                         # 19/16 times faster than Intel version
1085 my ($Xhi,$Xi)=@_;

1087      # <<1
1088      &movdqa         ($T1,$Xi);               #
1089      &movdqa         ($T2,$Xhi);              #
1090      &pslld          ($Xi,1);                 #
1091      &pslld          ($Xhi,1);                #
1092      &psrld          ($T1,31);                #
1093      &psrld          ($T2,31);                #
1094      &movdqa         ($T3,$T1);              #
1095      &pslldq         ($T1,4);                 #
1096      &psrldq         ($T3,12);                #
1097      &pslldq         ($T2,4);                 #
1098      &por            ($Xhi,$T3);              #
1099      &por            ($Xi,$T1);               #
1100      &por            ($Xhi,$T2);              #

1102      # 1st phase
1103      &movdqa         ($T1,$Xi);               #
1104      &movdqa         ($T2,$Xi);               #
1105      &movdqa         ($T3,$Xi);               #
1106      &pslld          ($T1,31);                #
1107      &pslld          ($T2,30);                #
1108      &pslld          ($Xi,25);                #
1109      &pxor           ($T1,$T2);               #
1110      &pxor           ($T1,$Xi);               #
1111      &movdqa         ($T2,$T1);               #
1112      &pslldq         ($T1,12);                #
1113      &psrldq         ($T2,4);                 #
1114      &pxor           ($T3,$T1);               #

1116      # 2nd phase
1117      &pxor           ($Xhi,$T3);              #
1118      &movdqa         ($Xi,$T3);               #
1119      &movdqa         ($T1,$T3);               #
1120      &psrld          ($Xi,1);                 #
1121      &psrld          ($T1,2);                 #
1122      &psrld          ($T3,7);                 #
1123      &pxor           ($Xi,$T1);               #
1124      &pxor           ($Xhi,$T2);              #
1125      &pxor           ($Xi,$T3);               #
1126      &pxor           ($Xi,$Xhi);              #
1127 }

1129 &function_begin_B("gcm_init_clmul");
1130      &mov            ($Htbl,&wparam(0));
1131      &mov            ($Xip,&wparam(1));

1133      &call           (&label("pic"));
1134 &set_label("pic");
1135      &bldnpop         ($const);
1136      &lea             ($const,&DWP(&label("bswap")."-".&label("pic"),$const));

1138      &movdqu         ($Hkey,&QWP(0,$Xip));
1139      &pshufd          ($Hkey,$Hkey,0b01001110);# dword swap

1141      # calculate H^2
1142      &movdqa         ($Xi,$Hkey);
1143      &clmul64x64_T3  ($Xhi,$Xi,$Hkey);
1144      &reduction_alg5 ($Xhi,$Xi);

1146      &movdqu         (&QWP(0,$Htbl),$Hkey); # save H
1147      &movdqu         (&QWP(16,$Htbl),$Xi);  # save H^2

```

```

1149     &ret          ();
1150 &function_end_B("gcm_init_clmul");

1152 &function_begin_B("gcm_gmult_clmul");
1153     &mov           ($Xip,&wparam(0));
1154     &mov           ($Htbl,&wparam(1));

1156     &call          (&label("pic"));
1157 &set_label("pic");
1158     &bldpop        ($const);
1159     &lea           ($const,&DWP(&label("bswap")."-".&label("pic"),$const));

1161     &movdqu        ($Xi,&QWP(0,$Xip));
1162     &movdqa        ($Xn,&QWP(0,$const));
1163     &movdqu        ($Hkey,&QWP(0,$Htbl));
1164     &pshufb        ($Xi,$Xn);

1166     &clmul64x64_T3 ($Xhi,$Xi,$Hkey);
1167     &reduction_alg5 ($Xhi,$Xi);

1169     &pshufb        ($Xi,$Xn);
1170     &movdqu        (&QWP(0,$Xip),$Xi);

1172     &ret          ();
1173 &function_end_B("gcm_gmult_clmul");

1175 &function_begin("gcm_ghash_clmul");
1176     &mov           ($Xip,&wparam(0));
1177     &mov           ($Htbl,&wparam(1));
1178     &mov           ($inp,&wparam(2));
1179     &mov           ($len,&wparam(3));

1181     &call          (&label("pic"));
1182 &set_label("pic");
1183     &bldpop        ($const);
1184     &lea           ($const,&DWP(&label("bswap")."-".&label("pic"),$const));

1186     &movdqu        ($Xi,&QWP(0,$Xip));
1187     &movdqa        ($T3,&QWP(0,$const));
1188     &movdqu        ($Hkey,&QWP(0,$Htbl));
1189     &pshufb        ($Xi,$T3);

1191     &sub           ($len,0x10);
1192     &jz            (&label("odd_tail"));

1194     #####
1195     # Xi+2 = [H*(Ii+1 + Xi+1)] mod P =
1196     #       [(H*Ii+1) + (H*Xi+1)] mod P =
1197     #       [(H*Ii+1) + H^2*(Ii+Xi)] mod P
1198     #
1199     &movdqu        ($T1,&QWP(0,$inp));    # Ii
1200     &movdqu        ($Xn,&QWP(16,$inp));   # Ii+1
1201     &pshufb        ($T1,$T3);
1202     &pshufb        ($Xn,$T3);
1203     &pxor          ($Xi,$T1);            # Ii+Xi

1205     &clmul64x64_T3 ($Xhn,$Xn,$Hkey);    # H*Ii+1
1206     &movdqu        ($Hkey,&QWP(16,$Htbl)); # load H^2

1208     &sub           ($len,0x20);
1209     &lea           ($inp,&DWP(32,$inp));  # i+=2
1210     &jbe           (&label("even_tail"));

1212 &set_label("mod_loop");
1213     &clmul64x64_T3 ($Xhi,$Xi,$Hkey);    # H^2*(Ii+Xi)

```

```

1214     &movdqu        ($Hkey,&QWP(0,$Htbl)); # load H

1216     &pxor          ($Xi,$Xn);
1217     &pxor          ($Xhi,$Xhn);          # (H*Ii+1) + H^2*(Ii+Xi)

1219     &reduction_alg5 ($Xhi,$Xi);

1221     #####
1222     &movdqa        ($T3,&QWP(0,$const));
1223     &movdqu        ($T1,&QWP(0,$inp));    # Ii
1224     &movdqu        ($Xn,&QWP(16,$inp));   # Ii+1
1225     &pshufb        ($T1,$T3);
1226     &pshufb        ($Xn,$T3);
1227     &pxor          ($Xi,$T1);            # Ii+Xi

1229     &clmul64x64_T3 ($Xhn,$Xn,$Hkey);    # H*Ii+1
1230     &movdqu        ($Hkey,&QWP(16,$Htbl)); # load H^2

1232     &sub           ($len,0x20);
1233     &lea           ($inp,&DWP(32,$inp));
1234     &jz            (&label("mod_loop"));

1236 &set_label("even_tail");
1237     &clmul64x64_T3 ($Xhi,$Xi,$Hkey);    # H^2*(Ii+Xi)

1239     &pxor          ($Xi,$Xn);
1240     &pxor          ($Xhi,$Xhn);          # (H*Ii+1) + H^2*(Ii+Xi)

1242     &reduction_alg5 ($Xhi,$Xi);

1244     &movdqa        ($T3,&QWP(0,$const));
1245     &test          ($len,$len);
1246     &jnz           (&label("done"));

1248     &movdqu        ($Hkey,&QWP(0,$Htbl)); # load H
1249 &set_label("odd_tail");
1250     &movdqu        ($T1,&QWP(0,$inp));    # Ii
1251     &pshufb        ($T1,$T3);
1252     &pxor          ($Xi,$T1);            # Ii+Xi

1254     &clmul64x64_T3 ($Xhi,$Xi,$Hkey);    # H*(Ii+Xi)
1255     &reduction_alg5 ($Xhi,$Xi);

1257     &movdqa        ($T3,&QWP(0,$const));
1258 &set_label("done");
1259     &pshufb        ($Xi,$T3);
1260     &movdqu        (&QWP(0,$Xip),$Xi);
1261 &function_end("gcm_ghash_clmul");

1263 }

```



```

1264 &set_label("bswap", 64);
1265     &data_byte(15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0);
1266     &data_byte(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0xc2); # 0x1c2_polynomial
1267 }}
# $sse2

1269 &set_label("rem_4bit", 64);
1270     &data_word(0, 0x0000<<$S, 0, 0x1C20<<$S, 0, 0x3840<<$S, 0, 0x2460<<$S);
1271     &data_word(0, 0x7080<<$S, 0, 0x6CA0<<$S, 0, 0x48C0<<$S, 0, 0x54E0<<$S);
1272     &data_word(0, 0xE100<<$S, 0, 0xFD20<<$S, 0, 0xD940<<$S, 0, 0xC560<<$S);
1273     &data_word(0, 0x9180<<$S, 0, 0x8DA0<<$S, 0, 0xA9C0<<$S, 0, 0xB5E0<<$S);
1274 &set_label("rem_8bit", 64);
1275     &data_short(0x0000, 0x01C2, 0x0384, 0x0246, 0x0708, 0x06CA, 0x048C, 0x054E);
1276     &data_short(0x0E10, 0x0FD2, 0x0D94, 0x0C56, 0x0918, 0x08DA, 0x0A9C, 0x0B5E);
1277     &data_short(0x1C20, 0x1DE2, 0x1FA4, 0x1E66, 0x1B28, 0x1AEA, 0x18AC, 0x196E);
1278     &data_short(0x1230, 0x13F2, 0x11B4, 0x1076, 0x1538, 0x14FA, 0x16BC, 0x177E);
1279     &data_short(0x3840, 0x3982, 0x3BC4, 0x3A06, 0x3F48, 0x3E8A, 0x3CCC, 0x3D0E);
1280     &data_short(0x3650, 0x3792, 0x35D4, 0x3416, 0x3158, 0x309A, 0x32DC, 0x331E);
1281     &data_short(0x2460, 0x25A2, 0x27E4, 0x2626, 0x2368, 0x22AA, 0x20EC, 0x212E);
1282     &data_short(0x2A70, 0x2BB2, 0x29F4, 0x2836, 0x2D78, 0x2CBA, 0x2EFC, 0x2F3E);
1283     &data_short(0x7080, 0x7142, 0x7304, 0x72C6, 0x7788, 0x764A, 0x740C, 0x75CE);
1284     &data_short(0x7E90, 0x7F52, 0x7D14, 0x7CD6, 0x7998, 0x785A, 0x7A1C, 0x7BDE);
1285     &data_short(0x6CA0, 0x6D62, 0x6F24, 0x6EE6, 0x6BA8, 0x6A6A, 0x682C, 0x69EE);
1286     &data_short(0x62B0, 0x6372, 0x6134, 0x60F6, 0x65B8, 0x647A, 0x663C, 0x67FE);
1287     &data_short(0x48C0, 0x4902, 0x4B44, 0x4A86, 0x4FC8, 0x4E0A, 0x4C4C, 0x4D8E);
1288     &data_short(0x46D0, 0x4712, 0x4554, 0x4496, 0x41D8, 0x401A, 0x425C, 0x439E);
1289     &data_short(0x54E0, 0x5522, 0x5764, 0x56A6, 0x53E8, 0x522A, 0x506C, 0x51AE);
1290     &data_short(0x5AF0, 0x5B32, 0x5974, 0x58B6, 0x5DF8, 0x5C3A, 0x5E7C, 0x5FBE);
1291     &data_short(0xE100, 0xE0C2, 0xE284, 0xE346, 0xE608, 0xE7CA, 0xE58C, 0xE44E);
1292     &data_short(0xEF10, 0xEED2, 0xEC94, 0xED56, 0xE818, 0xE9DA, 0xEB9C, 0xEA5E);
1293     &data_short(0xFD20, 0xFCE2, 0xFEA4, 0xFF66, 0xFA28, 0xFBEA, 0xF9AC, 0xF86E);
1294     &data_short(0xF330, 0xF2F2, 0xF0B4, 0xF176, 0xF438, 0xF5FA, 0xF7BC, 0xF67E);
1295     &data_short(0xD940, 0xD882, 0xDAC4, 0xDB06, 0xDE48, 0xDF8A, 0xDDCC, 0xDC0E);
1296     &data_short(0xD750, 0xD692, 0xD4D4, 0xD516, 0xD058, 0xD19A, 0xD3DC, 0xD21E);
1297     &data_short(0xC560, 0xC4A2, 0xC6E4, 0xC726, 0xC268, 0xC3AA, 0xC1EC, 0xC02E);
1298     &data_short(0xCB70, 0xCAB2, 0xC8F4, 0xC936, 0xCC78, 0xCDBA, 0xCFFC, 0xCE3E);
1299     &data_short(0x9180, 0x9042, 0x9204, 0x93C6, 0x9688, 0x974A, 0x950C, 0x94CE);
1300     &data_short(0x9F90, 0x9E52, 0x9C14, 0x9DD6, 0x9898, 0x995A, 0x9B1C, 0x9ADE);
1301     &data_short(0x8DA0, 0x8C62, 0x8E24, 0x8FE6, 0x8AA8, 0x8B6A, 0x892C, 0x88EE);
1302     &data_short(0x83B0, 0x8272, 0x8034, 0x81F6, 0x84B8, 0x857A, 0x873C, 0x86FE);
1303     &data_short(0xA9C0, 0xA802, 0xAA44, 0xAB86, 0xAEC8, 0xAF0A, 0xAD4C, 0xAC8E);
1304     &data_short(0xA7D0, 0xA612, 0xA454, 0xA596, 0xA0D8, 0xA11A, 0xA35C, 0xA29E);
1305     &data_short(0xB5E0, 0xB422, 0xB664, 0xB7A6, 0xB2E8, 0xB32A, 0xB16C, 0xB0AE);
1306     &data_short(0xBBF0, 0xBA32, 0xB874, 0xB9B6, 0xBCF8, 0xBD3A, 0xBF7C, 0xBEBE);
1307 }}}
# !$x86only

1309 &asciz("GHASH for x86, CRYPTOGRAMS by <appro@openssl.org>");
1310 &asm_finish();

```

```

1312 # A question was risen about choice of vanilla MMX. Or rather why wasn't
1313 # SSE2 chosen instead? In addition to the fact that MMX runs on legacy
1314 # CPUs such as PIII, "4-bit" MMX version was observed to provide better
1315 # performance than *corresponding* SSE2 one even on contemporary CPUs.
1316 # SSE2 results were provided by Peter-Michael Hager. He maintains SSE2
1317 # implementation featuring full range of lookup-table sizes, but with
1318 # per-invocation lookup table setup. Latter means that table size is
1319 # chosen depending on how much data is to be hashed in every given call,
1320 # more data - larger table. Best reported result for Core2 is ~4 cycles
1321 # per processed byte out of 64KB block. This number accounts even for
1322 # 64KB table setup overhead. As discussed in gcm128.c we choose to be
1323 # more conservative in respect to lookup table sizes, but how do the
1324 # results compare? Minimalistic "256B" MMX version delivers ~11 cycles
1325 # on same platform. As also discussed in gcm128.c, next in line "8-bit
1326 # Shoup's" or "4KB" method should deliver twice the performance of
1327 # "256B" one, in other words not worse than ~6 cycles per byte. It
1328 # should be also be noted that in SSE2 case improvement can be "super-
1329 # linear," i.e. more than twice, mostly because >>8 maps to single

```

```

1330 # instruction on SSE2 register. This is unlike "4-bit" case when >>4
1331 # maps to same amount of instructions in both MMX and SSE2 cases.
1332 # Bottom line is that switch to SSE2 is considered to be justifiable
1333 # only in case we choose to implement "8-bit" method...

```

new/usr/src/lib/openssl/libsunw_crypto/pl/ghash-x86_64.pl

1

19327 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/ghash-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@openssl.org> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # March, June 2010
11 #
12 # The module implements "4-bit" GCM GHASH function and underlying
13 # single multiplication operation in GF(2^128). "4-bit" means that
14 # it uses 256 bytes per-key table [+128 bytes shared table]. GHASH
15 # function features so called "528B" variant utilizing additional
16 # 256+16 bytes of per-key storage [+512 bytes shared table].
17 # Performance results are for this streamed GHASH subroutine and are
18 # expressed in cycles per processed byte, less is better:
19 #
20 #             gcc 3.4.x(*)   assembler
21 #
22 # P4           28.6         14.0         +100%
23 # Opteron      19.3         7.7          +150%
24 # Core2        17.8         8.1(**)      +120%
25 #
26 # (*)   comparison is not completely fair, because C results are
27 #        for vanilla "256B" implementation, while assembler results
28 #        are for "528B";-)
29 # (**)  it's mystery [to me] why Core2 result is not same as for
30 #        Opteron;
31 #
32 # May 2010
33 #
34 # Add PCLMULQDQ version performing at 2.02 cycles per processed byte.
35 # See ghash-x86.pl for background information and details about coding
36 # techniques.
37 #
38 # Special thanks to David Woodhouse <dwmw2@infradead.org> for
39 # providing access to a Westmere-based system on behalf of Intel
40 # Open Source Technology Centre.
41 #
42 $flavour = shift;
43 $output = shift;
44 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }
45
46 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);
47
48 $0 =~ m/(.*[\\\/])[^\\\/]+$/; $dir=$1;
49 ( $xlate="$dir"x86_64-xlate.pl and -f $xlate ) or
50 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl and -f $xlate ) or
51 die "can't locate x86_64-xlate.pl";
52
53 open OUT,"| \"$^X\" $xlate $flavour $output";
54 *STDOUT=*OUT;
55
56 # common register layout
57 $nlo="%rax";
58 $nhi="%rbx";
59 $zlo="%r8";
60 $zhi="%r9";
61 $tmp="%r10";
```

new/usr/src/lib/openssl/libsunw_crypto/pl/ghash-x86_64.pl

2

```
62 $rem_4bit = "%r11";
63
64 $xi="%rdi";
65 $htbl="%rsi";
66
67 # per-function register layout
68 $cnt="%rcx";
69 $rem="%rdx";
70
71 sub LB() { my $r=shift; $r =~ s/%[er]([a-d])x/%\1/      or
72                $r =~ s/%[er]([sd])i/%\1\1/             or
73                $r =~ s/%[er](bp)/%\1\1/                 or
74                $r =~ s/%(r[0-9]+)[d]?/%\1b/;             $r; }
75
76 sub AUTOLOAD() # thunk [simplified] 32-bit style perlasm
77 { my $opcode = $AUTOLOAD; $opcode =~ s/.*:://;
78   my $arg = pop;
79   $arg = "$$arg" if ($arg*1 eq $arg);
80   $code .= "\t$opcode\t".join(' ', $arg, reverse @_)."\n";
81 }
```

```

82 { my $N;
83   sub loop() {
84     my $inp = shift;

86     $N++;
87     $code.=<<__;;
88     xor     $nlo,$nlo
89     xor     $nhi,$nhi
90     mov     ' &LB("$Zlo") ',' &LB("$nlo") '
91     mov     ' &LB("$Zlo") ',' &LB("$nhi") '
92     shl     \ $4, ' &LB("$nlo") '
93     mov     \ $14,$cnt
94     mov     8($Htbl,$nlo),$Zlo
95     mov     ($Htbl,$nlo),$Zhi
96     and     \ $0xf0, ' &LB("$nhi") '
97     mov     $Zlo,$rem
98     jmp     .Loop$N

100 .align 16
101 .Loop$N:
102     shr     \ $4,$Zlo
103     and     \ $0xf,$rem
104     mov     $Zhi,$tmp
105     mov     ($inp,$cnt), ' &LB("$nlo") '
106     shr     \ $4,$Zhi
107     xor     8($Htbl,$nhi),$Zlo
108     shl     \ $60,$tmp
109     xor     ($Htbl,$nhi),$Zhi
110     mov     ' &LB("$nlo") ',' &LB("$nhi") '
111     xor     ($rem_4bit,$rem,8),$Zhi
112     mov     $Zlo,$rem
113     shl     \ $4, ' &LB("$nlo") '
114     xor     $tmp,$Zlo
115     dec     $cnt
116     js      .Lbreak$N

118     shr     \ $4,$Zlo
119     and     \ $0xf,$rem
120     mov     $Zhi,$tmp
121     shr     \ $4,$Zhi
122     xor     8($Htbl,$nlo),$Zlo
123     shl     \ $60,$tmp
124     xor     ($Htbl,$nlo),$Zhi
125     and     \ $0xf0, ' &LB("$nhi") '
126     xor     ($rem_4bit,$rem,8),$Zhi
127     mov     $Zlo,$rem
128     xor     $tmp,$Zlo
129     jmp     .Loop$N

131 .align 16
132 .Lbreak$N:
133     shr     \ $4,$Zlo
134     and     \ $0xf,$rem
135     mov     $Zhi,$tmp
136     shr     \ $4,$Zhi
137     xor     8($Htbl,$nlo),$Zlo
138     shl     \ $60,$tmp
139     xor     ($Htbl,$nlo),$Zhi
140     and     \ $0xf0, ' &LB("$nhi") '
141     xor     ($rem_4bit,$rem,8),$Zhi
142     mov     $Zlo,$rem
143     xor     $tmp,$Zlo

145     shr     \ $4,$Zlo
146     and     \ $0xf,$rem
147     mov     $Zhi,$tmp

```

```

148     shr     \ $4,$Zhi
149     xor     8($Htbl,$nhi),$Zlo
150     shl     \ $60,$tmp
151     xor     ($Htbl,$nhi),$Zhi
152     xor     $tmp,$Zlo
153     xor     ($rem_4bit,$rem,8),$Zhi

155     bswap   $Zlo
156     bswap   $Zhi
157     __
158 }}

160 $code=<<__;;
161 .text

163 .globl gcm_gmult_4bit
164 .type gcm_gmult_4bit,@function,2
165 .align 16
166 gcm_gmult_4bit:
167     push    %rbx
168     push    %rbp          # %rbp and %r12 are pushed exclusively in
169     push    %r12         # order to reuse Win64 exception handler...
170 .Lgmult_prologue:

172     movzb   15($Xi),$Zlo
173     lea     .Lrem_4bit(%rip),$rem_4bit
174     __
175     &loop   ($Xi);
176 $code=<<__;;
177     mov     $Zlo,8($Xi)
178     mov     $Zhi,($Xi)

180     mov     16(%rsp),%rbx
181     lea     24(%rsp),%rsp
182 .Lgmult_epilogue:
183     ret
184 .size gcm_gmult_4bit,.-gcm_gmult_4bit
185 __

```

```

186 # per-function register layout
187 $inp="%rdx";
188 $len="%rcx";
189 $rem_8bit=$rem_4bit;

191 $code.=<<__
192 .globl gcm_ghash_4bit
193 .type gcm_ghash_4bit,@function,4
194 .align 16
195 gcm_ghash_4bit:
196     push    %rbx
197     push    %rbp
198     push    %r12
199     push    %r13
200     push    %r14
201     push    %r15
202     sub     $280,%rsp
203 .Lghash_prologue:
204     mov     $inp,%r14                # reassign couple of args
205     mov     $len,%r15
206
207 { my $inp="%r14";
208   my $dat="%edx";
209   my $len="%r15";
210   my @nhi=("%ebx", "%ecx");
211   my @rem=("%r12", "%r13");
212   my $Hshr4="%rbp";

214     &sub    ($Htbl,-128);            # size optimization
215     &lea    ($Hshr4,"16+128(%rsp)");
216     { my @lo =($nlo,$nhi);
217       my @hi =($zlo,$zhi);

219     &xor    ($dat,$dat);
220     for ($i=0,$j=-2;$i<18;$i++,$j++) {
221       &mov    ("{$j(%rsp)",&LB($dat))          if ($i>1);
222       &or     ($lo[0],$tmp)                    if ($i>1);
223       &mov    (&LB($dat),&LB($lo[1]))          if ($i>0 && $i<17);
224       &shr    ($lo[1],4)                       if ($i>0 && $i<17);
225       &mov    ($tmp,$hi[1])                    if ($i>0 && $i<17);
226       &shr    ($hi[1],4)                       if ($i>0 && $i<17);
227       &mov    ("8*{$j($Hshr4)",$hi[0])         if ($i>1);
228       &mov    ($hi[0],"16*{$i+0-128($Htbl)")   if ($i<16);
229       &shl    (&LB($dat),4)                   if ($i>0 && $i<17);
230       &mov    ("8*{$j-128($Hshr4)",&lo[0])     if ($i>1);
231       &mov    ($lo[0],"16*{$i+8-128($Htbl)")   if ($i<16);
232       &shl    ($tmp,60)                       if ($i>0 && $i<17);

234     push    (@lo,shift(@lo));
235     push    (@hi,shift(@hi));
236   }
237 }
238 &add    ($Htbl,-128);
239 &mov    ($zlo,"8($Xi)");
240 &mov    ($zhi,"0($Xi)");
241 &add    ($len,$inp);                  # pointer to the end of data
242 &lea    ($rem_8bit,".Lrem_8bit(%rip)");
243 &jmp    (".Louter_loop");

245 $code.=" .align 16\n.Louter_loop:\n";
246 &xor    ($zhi,"($inp)");
247 &mov    ("%rdx", "8($inp)");
248 &lea    ($inp,"16($inp)");
249 &xor    ("%rdx", $zlo);
250 &mov    ("($Xi)", $zhi);
251 &mov    ("8($Xi)", "%rdx");

```

```

252     &shr    ("%rdx", 32);

254     &xor    ($nlo,$nlo);
255     &rol    ($dat,8);
256     &mov    (&LB($nlo),&LB($dat));
257     &movz    ($nhi[0],&LB($dat));
258     &shl    (&LB($nlo),4);
259     &shr    ($nhi[0],4);

261     for ($j=11,$i=0;$i<15;$i++) {
262       &rol    ($dat,8);
263       &xor    ($zlo,"8($Htbl,$nlo)")          if ($i>0);
264       &xor    ($zhi,"($Htbl,$nlo)")          if ($i>0);
265       &mov    ($zlo,"8($Htbl,$nlo)")          if ($i==0);
266       &mov    ($zhi,"($Htbl,$nlo)")          if ($i==0);

268     &mov    (&LB($nlo),&LB($dat));
269     &xor    ($zlo,$tmp)
270     &movzw    ($rem[1],"($rem_8bit,$rem[1],2)") if ($i>0);
                                                    if ($i>0);

272     &movz    ($nhi[1],&LB($dat));
273     &shl    (&LB($nlo),4);
274     &movzb    ($rem[0],"(%rsp,$nhi[0])");

276     &shr    ($nhi[1],4)                      if ($i<14);
277     &and    ($nhi[1],0xf0)                   if ($i==14);
278     &shl    ($rem[1],48)                     if ($i>0);
279     &xor    ($rem[0],$zlo);

281     &mov    ($tmp,$zhi);
282     &xor    ($zhi,$rem[1])                    if ($i>0);
283     &shr    ($zlo,8);

285     &movz    ($rem[0],&LB($rem[0]));
286     &mov    ($dat,"{$j($Xi)")                if (--$j%4==0);
287     &shr    ($zhi,8);

289     &xor    ($zlo,"-128($Hshr4,$nhi[0],8)");
290     &shl    ($tmp,56);
291     &xor    ($zhi,"($Hshr4,$nhi[0],8)");

293     unshift (@nhi,pop(@nhi));                # "rotate" registers
294     unshift (@rem,pop(@rem));
295   }
296   &movzw    ($rem[1],"($rem_8bit,$rem[1],2)");
297   &xor    ($zlo,"8($Htbl,$nlo)");
298   &xor    ($zhi,"($Htbl,$nlo)");

300   &shl    ($rem[1],48);
301   &xor    ($zlo,$tmp);

303   &xor    ($zhi,$rem[1]);
304   &movz    ($rem[0],&LB($zlo));
305   &shr    ($zlo,4);

307   &mov    ($tmp,$zhi);
308   &shl    (&LB($rem[0]),4);
309   &shr    ($zhi,4);

311   &xor    ($zlo,"8($Htbl,$nhi[0])");
312   &movzw    ($rem[0],"($rem_8bit,$rem[0],2)");
313   &shl    ($tmp,60);

315   &xor    ($zhi,"($Htbl,$nhi[0])");
316   &xor    ($zlo,$tmp);
317   &shl    ($rem[0],48);

```

```

319      &bswap    ($Zlo);
320      &xor      ($Zhi,$rem[0]);

322      &bswap    ($Zhi);
323      &cmp      ($inp,$len);
324      &jb       (".Louter_loop");
325  }
326  $code.=<<__ ;
327      mov      $Zlo,8($Xi)
328      mov      $Zhi,$Xi)

330      lea      280(%rsp),%rsi
331      mov      0(%rsi),%r15
332      mov      8(%rsi),%r14
333      mov      16(%rsi),%r13
334      mov      24(%rsi),%r12
335      mov      32(%rsi),%rbp
336      mov      40(%rsi),%rbx
337      lea      48(%rsi),%rsp
338  .Lghash_epilogue:
339      ret
340  .size    gcm_ghash_4bit,.-gcm_ghash_4bit
341  __

```

```

342  #####
343  # PCLMULQDQ version.

345  @_4args=$win64? ("%rcx","%rdx","%r8","%r9") : # Win64 order
346      ("%rdi","%rsi","%rdx","%rcx"); # Unix order

348  ($Xi,$Xhi)=( "%xmm0", "%xmm1");  $Hkey="%xmm2";
349  ($T1,$T2,$T3)=( "%xmm3", "%xmm4", "%xmm5");

351  sub c1mul64x64_T2 { # minimal register pressure
352  my ($Xhi,$Xi,$Hkey,$modulo)=@_;

354  $code.=<<__ if (!defined($modulo));
355      movdqa    $Xi,$Xhi #
356      pshufd    \0b01001110,$Xi,$T1 #
357      pshufd    \0b01001110,$Hkey,$T2 #
358      pxor      $Xi,$T1 #
359      pxor      $Hkey,$T2 #
360  __
361  $code.=<<__ ;
362      pclmulqdq \0x00,$Hkey,$Xi #####
363      pclmulqdq \0x11,$Hkey,$Xhi #####
364      pclmulqdq \0x00,$T2,$T1 #####
365      pxor      $Xi,$T1 #
366      pxor      $Xhi,$T1 #

368      movdqa    $T1,$T2 #
369      psrldq    \8,$T1 #
370      pslldq    \8,$T2 #
371      pxor      $T1,$Xhi #
372      pxor      $T2,$Xi #
373  __
374  }

376  sub reduction_alg9 { # 17/13 times faster than Intel version
377  my ($Xhi,$Xi) = @_;

379  $code.=<<__ ;
380      # 1st phase
381      movdqa    $Xi,$T1 #
382      psllq     \1,$Xi #
383      pxor      $T1,$Xi #
384      psllq     \5,$Xi #
385      pxor      $T1,$Xi #
386      psllq     \57,$Xi #
387      movdqa    $Xi,$T2 #
388      pslldq    \8,$Xi #
389      psrldq    \8,$T2 #
390      pxor      $T1,$Xi #
391      pxor      $T2,$Xhi #

393      # 2nd phase
394      movdqa    $Xi,$T2 #
395      psrlq     \5,$Xi #
396      pxor      $T2,$Xi #
397      psrlq     \1,$Xi #
398      pxor      $T2,$Xi #
399      pxor      $Xhi,$T2 #
400      psrlq     \1,$Xi #
401      pxor      $T2,$Xi #
402  __
403  }

```

```

404 { my ($Htbl,$Xip)=@_4args;

406 $code.=<<<__ ;
407 .globl gcm_init_clmul
408 .type gcm_init_clmul,@abi-omnipotent
409 .align 16
410 gcm_init_clmul:
411     movdqu    ($Xip),$Hkey
412     pshufd    \0b01001110,$Hkey,$Hkey    # dword swap

414     # <<1 twist
415     pshufd    \0b11111111,$Hkey,$T2    # broadcast uppermost dword
416     movdqa    $Hkey,$T1
417     psllq     \ $1,$Hkey
418     pxor      $T3,$T3                    #
419     psrlq     \ $63,$T1
420     pcmpgtd   $T2,$T3                    # broadcast carry bit
421     psllq     \ $8,$T1
422     por       $T1,$Hkey                  # H<=<=1

424     # magic reduction
425     pand      .L0x1c2_polynomial(%rip),$T3
426     pxor      $T3,$Hkey                  # if(carry) H^=0x1c2_polynomial

428     # calculate H^2
429     movdqa    $Hkey,$Xi
430
431     &cmlul64x64_T2 ($Xhi,$Xi,$Hkey);
432     &reduction_alg9 ($Xhi,$Xi);
433 $code.=<<<__ ;
434     movdqu    $Hkey,($Htbl)              # save H
435     movdqu    $Xi,16($Htbl)              # save H^2
436     ret
437 .size gcm_init_clmul,.-gcm_init_clmul
438
439 }

441 { my ($Xip,$Htbl)=@_4args;

443 $code.=<<<__ ;
444 .globl gcm_gmult_clmul
445 .type gcm_gmult_clmul,@abi-omnipotent
446 .align 16
447 gcm_gmult_clmul:
448     movdqu    ($Xip),$Xi
449     movdqa    .Lbswap_mask(%rip),$T3
450     movdqu    ($Htbl),$Hkey
451     pshufb    $T3,$Xi
452
453     &cmlul64x64_T2 ($Xhi,$Xi,$Hkey);
454     &reduction_alg9 ($Xhi,$Xi);
455 $code.=<<<__ ;
456     pshufb    $T3,$Xi
457     movdqu    $Xi,($Xip)
458     ret
459 .size gcm_gmult_clmul,.-gcm_gmult_clmul
460
461 }

```

```

462 { my ($Xip,$Htbl,$inp,$len)=@_4args;
463     my $Xn="%xmm6";
464     my $Xhn="%xmm7";
465     my $Hkey2="%xmm8";
466     my $T1n="%xmm9";
467     my $T2n="%xmm10";

469 $code.=<<<__ ;
470 .globl gcm_ghash_clmul
471 .type gcm_ghash_clmul,@abi-omnipotent
472 .align 16
473 gcm_ghash_clmul:
474
475 $code.=<<<__ if ($win64);
476 .LSEH_begin_gcm_ghash_clmul:
477     # I can't trust assembler to use specific encoding:-
478     .byte 0x48,0x83,0xec,0x58    #sub    \0x58,%rsp
479     .byte 0x0f,0x29,0x34,0x24    #movaps %xmm6,(%rsp)
480     .byte 0x0f,0x29,0x7c,0x10    #movdqa %xmm7,0x10(%rsp)
481     .byte 0x44,0x0f,0x29,0x44,0x24,0x20    #movaps %xmm8,0x20(%rsp)
482     .byte 0x44,0x0f,0x29,0x4c,0x24,0x30    #movaps %xmm9,0x30(%rsp)
483     .byte 0x44,0x0f,0x29,0x54,0x24,0x40    #movaps %xmm10,0x40(%rsp)
484
485 $code.=<<<__ ;
486     movdqa    .Lbswap_mask(%rip),$T3

488     movdqu    ($Xip),$Xi
489     movdqu    ($Htbl),$Hkey
490     pshufb    $T3,$Xi

492     sub       \0x10,$len
493     jz        .Lodd_tail

495     movdqu    16($Htbl),$Hkey2
496     #####
497     # Xi+2 = [H*(Ii+1 + Xi+1)] mod P =
498     #         [(H*Ii+1) + (H*Xi+1)] mod P =
499     #         [(H*Ii+1) + H^2*(Ii+Xi)] mod P
500     #
501     movdqu    ($inp),$T1              # Ii
502     movdqu    16($inp),$Xn            # Ii+1
503     pshufb    $T3,$T1
504     pshufb    $T3,$Xn
505     pxor      $T1,$Xi                  # Ii+Xi
506
507     &cmlul64x64_T2 ($Xhn,$Xn,$Hkey);    # H*Ii+1
508 $code.=<<<__ ;
509     movdqa    $Xi,$Xhi
510     pshufd    \0b01001110,$Xi,$T1
511     pshufd    \0b01001110,$Hkey2,$T2
512     pxor      $Xi,$T1                  #
513     pxor      $Hkey2,$T2

515     lea       32($inp),$inp            # i+=2
516     sub       \0x20,$len
517     jbe       .Leven_tail

519 .Lmod_loop:
520
521     &cmlul64x64_T2 ($Xhi,$Xi,$Hkey2,1);    # H^2*(Ii+Xi)
522 $code.=<<<__ ;
523     movdqu    ($inp),$T1              # Ii
524     pxor      $Xn,$Xi                  # (H*Ii+1) + H^2*(Ii+Xi)
525     pxor      $Xhn,$Xhi

527     movdqu    16($inp),$Xn            # Ii+1

```

```

528      pshufb      $T3,$T1
529      pshufb      $T3,$Xn

531      movdqa      $Xn,$Xhn      #
532      pshufd      \0b01001110,$Xn,$T1n
533      pshufd      \0b01001110,$Hkey,$T2n
534      pxor        $Xn,$T1n      #
535      pxor        $Hkey,$T2n
536      pxor        $T1,$Xhi      # "Ii+Xi", consume early

538      movdqa      $Xi,$T1      # 1st phase
539      psllq       \5,$Xi
540      pxor        $T1,$Xi      #
541      psllq       \5,$Xi      #
542      pxor        $T1,$Xi      #
543      pcmulqddq   \0x00,$Hkey,$Xn      #####
544      psllq       \57,$Xi      #
545      movdqa      $Xi,$T2      #
546      psllq       \8,$Xi      #
547      psrldq      \8,$T2      #
548      pxor        $T1,$Xi      #
549      pxor        $T2,$Xhi      #

551      pcmulqddq   \0x11,$Hkey,$Xhn      #####
552      movdqa      $Xi,$T2      # 2nd phase
553      psrlq       \5,$Xi
554      pxor        $T2,$Xi      #
555      psrlq       \1,$Xi      #
556      pxor        $T2,$Xi      #
557      pxor        $Xhi,$T2      #
558      psrlq       \1,$Xi      #
559      pxor        $T2,$Xi      #

561      pcmulqddq   \0x00,$T2n,$T1n      #####
562      movdqa      $Xi,$Xhi      #
563      pshufd      \0b01001110,$Xi,$T1
564      pshufd      \0b01001110,$Hkey2,$T2
565      pxor        $Xi,$T1      #
566      pxor        $Hkey2,$T2      #

568      pxor        $Xn,$T1n      #
569      pxor        $Xhn,$T1n      #
570      movdqa      $T1n,$T2n      #
571      psrldq      \8,$T1n      #
572      psllq       \8,$T2n      #
573      pxor        $T1n,$Xhn      #
574      pxor        $T2n,$Xn      #

576      lea         32($inp),$inp
577      sub         \0x20,$len
578      ja          .Lmod_loop

580 .Leven_tail:
581 ____
582      &clmul64x64_T2 ($Xhi,$Xi,$Hkey2,1);      # H^2*(Ii+Xi)
583 $code.<=<<____;
584      pxor        $Xn,$Xi      # (H*Ii+1) + H^2*(Ii+Xi)
585      pxor        $Xhn,$Xhi
586 ____
587      &reduction_alg9 ($Xhi,$Xi);
588 $code.<=<<____;
589      test        $len,$len
590      jnz         .Ldone

592 .Lodd_tail:
593      movdqu      ($inp),$T1      # Ii

```

```

594      pshufb      $T3,$T1
595      pxor        $T1,$Xi      # Ii+Xi
596 ____
597      &clmul64x64_T2 ($Xhi,$Xi,$Hkey);      # H*(Ii+Xi)
598      &reduction_alg9 ($Xhi,$Xi);
599 $code.<=<<____;
600 .Ldone:
601      pshufb      $T3,$Xi
602      movdqu      $Xi,($Xip)
603 ____
604 $code.<=<<____ if ($win64);
605      movaps      (%rsp),%xmm6
606      movaps      0x10(%rsp),%xmm7
607      movaps      0x20(%rsp),%xmm8
608      movaps      0x30(%rsp),%xmm9
609      movaps      0x40(%rsp),%xmm10
610      add         \0x58,%rsp
611 ____
612 $code.<=<<____;
613      ret
614 .LSEH_end_gcm_ghash_clmul:
615 .size    gcm_ghash_clmul,.-gcm_ghash_clmul
616 ____
617 }

619 $code.<=<<____;
620 .align    64
621 .Lbswap_mask:
622      .byte     15,14,13,12,11,10,9,8,7,6,5,4,3,2,1,0
623 .L0x1c2_polynomial:
624      .byte     1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0xc2
625 .align    64
626 .type     .Lrem_4bit,@object
627 .Lrem_4bit:
628      .long     0,'0x0000<<16',0,'0x1C20<<16',0,'0x3840<<16',0,'0x2460<<16'
629      .long     0,'0x7080<<16',0,'0x6CA0<<16',0,'0x48C0<<16',0,'0x54E0<<16'
630      .long     0,'0xE100<<16',0,'0xFD20<<16',0,'0xD940<<16',0,'0xC560<<16'
631      .long     0,'0x9180<<16',0,'0x8DA0<<16',0,'0xA9C0<<16',0,'0xB5E0<<16'
632 .type     .Lrem_8bit,@object
633 .Lrem_8bit:
634      .value     0x0000,0x01C2,0x0384,0x0246,0x0708,0x06CA,0x048C,0x054E
635      .value     0x0E10,0x0FD2,0x0D94,0x0C56,0x0918,0x08DA,0x0A9C,0x0B5E
636      .value     0x1C20,0x1DE2,0x1FA4,0x1E66,0x1B28,0x1AEA,0x18AC,0x196E
637      .value     0x1230,0x13F2,0x11B4,0x1076,0x1538,0x14FA,0x16BC,0x177E
638      .value     0x3840,0x3982,0x3BC4,0x3A06,0x3F48,0x3E8A,0x3CCC,0x3D0E
639      .value     0x3650,0x3792,0x35D4,0x3416,0x3158,0x309A,0x32DC,0x331E
640      .value     0x2460,0x25A2,0x27E4,0x2626,0x2368,0x22AA,0x20EC,0x212E
641      .value     0x2A70,0x2BB2,0x29F4,0x2836,0x2D78,0x2CBA,0x2EFC,0x2F3E
642      .value     0x7080,0x7142,0x7304,0x72C6,0x7788,0x764A,0x740C,0x75CE
643      .value     0x7E90,0x7F52,0x7D14,0x7CD6,0x7998,0x785A,0x7A1C,0x7BDE
644      .value     0x6CA0,0x6D62,0x6F24,0x6EE6,0x6BA8,0x6A6A,0x682C,0x69EE
645      .value     0x62B0,0x6372,0x6134,0x60F6,0x65B8,0x647A,0x663C,0x67FE
646      .value     0x48C0,0x4902,0x4B44,0x4A86,0x4FC8,0x4E0A,0x4C4C,0x4D8E
647      .value     0x46D0,0x4712,0x4554,0x4496,0x41D8,0x401A,0x425C,0x439E
648      .value     0x54E0,0x5522,0x5764,0x56A6,0x53E8,0x522A,0x506C,0x51AE
649      .value     0x5AF0,0x5B32,0x5974,0x58B6,0x5DF8,0x5C3A,0x5E7C,0x5FBE
650      .value     0xE100,0xE0C2,0xE284,0xE346,0xE608,0xE7CA,0xE58C,0xE44E
651      .value     0xEF10,0xEED2,0xEC94,0xED56,0xE818,0xE9DA,0xEB9C,0xEA5E
652      .value     0xFD20,0xFCE2,0xFEA4,0xFF66,0xFA28,0xFBFA,0xF9AC,0xF86E
653      .value     0xF330,0xF2F2,0xF0B4,0xF176,0xF438,0xF5FA,0xF7BC,0xF67E
654      .value     0xD940,0xD882,0xDAC4,0xDB06,0xDE48,0xDF8A,0xDDCC,0xDC0E
655      .value     0xD750,0xD692,0xD4D4,0xD516,0xD058,0xD19A,0xD3DC,0xD21E
656      .value     0xC560,0xC4A2,0xC6E4,0xC726,0xC268,0xC3AA,0xC1EC,0xC02E
657      .value     0xCB70,0xCAB2,0xC8F4,0xC936,0xCC78,0xCDBA,0xCFFC,0xCE3E
658      .value     0x9180,0x9042,0x9204,0x93C6,0x9688,0x974A,0x950C,0x94CE
659      .value     0x9F90,0x9E52,0x9C14,0x9DD6,0x9898,0x995A,0x9B1C,0x9ADE

```

```

660 .value 0x8DA0,0x8C62,0x8E24,0x8FE6,0x8AA8,0x8B6A,0x892C,0x88EE
661 .value 0x83B0,0x8272,0x8034,0x81F6,0x84B8,0x857A,0x873C,0x86FE
662 .value 0xA9C0,0xA802,0xAA44,0xAB86,0xAEC8,0xAF0A,0xAD4C,0xAC8E
663 .value 0xA7D0,0xA612,0xA454,0xA596,0xA0D8,0xA11A,0xA35C,0xA29E
664 .value 0xB5E0,0xB422,0xB664,0xB7A6,0xB2E8,0xB32A,0xB16C,0xB0AE
665 .value 0xBBF0,0xBA32,0xB874,0xB9B6,0xBCF8,0xBD3A,0xBF7C,0xBEBE

667 .asciz "GHASH for x86_64, CRYPTOGAMS by <appro@openssl.org>"
668 .align 64
669 ____

```

```

670 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
671 #                                CONTEXT *context,DISPATCHER_CONTEXT *disp)
672 if ($win64) {
673   $rec="%rcx";
674   $frame="%rdx";
675   $context="%r8";
676   $disp="%r9";

678 $code.=<<____;
679 .extern __imp_RtlVirtualUnwind
680 .type se_handler,\@abi-omnipotent
681 .align 16
682 se_handler:
683     push    %rsi
684     push    %rdi
685     push    %rbx
686     push    %rbp
687     push    %r12
688     push    %r13
689     push    %r14
690     push    %r15
691     pushfq  \%$64,%rsp
692     sub     \%$64,%rsp

694     mov     120($context),%rax    # pull context->Rax
695     mov     248($context),%rbx    # pull context->Rip

697     mov     8($disp),%rsi        # disp->ImageBase
698     mov     56($disp),%r11       # disp->HandlerData

700     mov     0(%r11),%r10d        # HandlerData[0]
701     lea     (%rsi,%r10),%r10     # prologue label
702     cmp     %r10,%rbx            # context->Rip<prologue label
703     jb     .Lin_prologue

705     mov     152($context),%rax    # pull context->Rsp

707     mov     4(%r11),%r10d        # HandlerData[1]
708     lea     (%rsi,%r10),%r10     # epilogue label
709     cmp     %r10,%rbx            # context->Rip==epilogue label
710     jae     .Lin_prologue

712     lea     24(%rax),%rax        # adjust "rsp"

714     mov     -8(%rax),%rbx        # restore context->Rbx
715     mov     -16(%rax),%rbp       # restore context->Rbp
716     mov     -24(%rax),%r12       # restore context->R12
717     mov     %rbx,144($context)   # restore context->Rbx
718     mov     %rbp,160($context)   # restore context->Rbp
719     mov     %r12,216($context)   # restore context->R12

721 .Lin_prologue:
722     mov     8(%rax),%rdi         # restore context->Rsp
723     mov     16(%rax),%rsi        # restore context->Rsi
724     mov     %rax,152($context)   # restore context->Rsp
725     mov     %rsi,168($context)   # restore context->Rsi
726     mov     %rdi,176($context)   # restore context->Rdi

728     mov     40($disp),%rdi       # disp->ContextRecord
729     mov     $context,%rsi        # context
730     mov     \%$1232/8',%ecx      # sizeof(CONTEXT)
731     .long   0xa548f3fc           # cld; rep movsq

733     mov     $disp,%rsi          # arg1, UNW_FLAG_NHANDLER
734     xor     %rcx,%rcx           # arg2, disp->ImageBase
735     mov     8(%rsi),%rdx

```



```

736     mov     0(%rsi),%r8      # arg3, disp->ControlPc
737     mov     16(%rsi),%r9      # arg4, disp->FunctionEntry
738     mov     40(%rsi),%r10     # disp->ContextRecord
739     lea     56(%rsi),%r11     # &disp->HandlerData
740     lea     24(%rsi),%r12     # &disp->EstablisherFrame
741     mov     %r10,32(%rsp)     # arg5
742     mov     %r11,40(%rsp)     # arg6
743     mov     %r12,48(%rsp)     # arg7
744     mov     %rcx,56(%rsp)     # arg8, (NULL)
745     call    *__imp_RtlVirtualUnwind(%rip)

747     mov     $1,%eax          # ExceptionContinueSearch
748     add     $64,%rsp
749     popfq
750     pop     %r15
751     pop     %r14
752     pop     %r13
753     pop     %r12
754     pop     %rbp
755     pop     %rbx
756     pop     %rdi
757     pop     %rsi
758     ret
759 .size     se_handler,.-se_handler

761 .section     .pdata
762 .align      4
763     .rva     .LSEH_begin_gcm_gmult_4bit
764     .rva     .LSEH_end_gcm_gmult_4bit
765     .rva     .LSEH_info_gcm_gmult_4bit

767     .rva     .LSEH_begin_gcm_ghash_4bit
768     .rva     .LSEH_end_gcm_ghash_4bit
769     .rva     .LSEH_info_gcm_ghash_4bit

771     .rva     .LSEH_begin_gcm_ghash_clmul
772     .rva     .LSEH_end_gcm_ghash_clmul
773     .rva     .LSEH_info_gcm_ghash_clmul

775 .section     .xdata
776 .align      8
777 .LSEH_info_gcm_gmult_4bit:
778     .byte    9,0,0,0
779     .rva     se_handler
780     .rva     .Lgmult_prologue,.Lgmult_epilogue      # HandlerData
781 .LSEH_info_gcm_ghash_4bit:
782     .byte    9,0,0,0
783     .rva     se_handler
784     .rva     .Lghash_prologue,.Lghash_epilogue      # HandlerData
785 .LSEH_info_gcm_ghash_clmul:
786     .byte    0x01,0x1f,0x0b,0x00
787     .byte    0x1f,0xa8,0x04,0x00      #movaps 0x40(rsp),xmm10
788     .byte    0x19,0x98,0x03,0x00      #movaps 0x30(rsp),xmm9
789     .byte    0x13,0x88,0x02,0x00      #movaps 0x20(rsp),xmm8
790     .byte    0x0d,0x78,0x01,0x00      #movaps 0x10(rsp),xmm7
791     .byte    0x08,0x68,0x00,0x00      #movaps (rsp),xmm6
792     .byte    0x04,0xa2,0x00,0x00      #sub     rsp,0x58
793
794 }
```

```

795 $code =~ s/\`([^\`]*)\`/eval($1)/gem;

797 print $code;

799 close STDOUT;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/keysets.pl

1

```
*****
6967 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/keysets.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #!/usr/bin/perl

3 $NUMBER=0x01;
4 $UPPER=0x02;
5 $LOWER=0x04;
6 $UNDER=0x100;
7 $PUNCTUATION=0x200;
8 $WS=0x10;
9 $ESC=0x20;
10 $QUOTE=0x40;
11 $DQUOTE=0x400;
12 $COMMENT=0x80;
13 $FCOMMENT=0x800;
14 $EOF=0x08;
15 $HIGHBIT=0x1000;

17 foreach (0 .. 255)
18 {
19     $v=0;
20     $c=sprintf("%c",$_);
21     $v|=$NUMBER if ($c =~ /[0-9]/);
22     $v|=$UPPER if ($c =~ /[A-Z]/);
23     $v|=$LOWER if ($c =~ /[a-z]/);
24     $v|=$UNDER if ($c =~ _/);
25     $v|=$PUNCTUATION if ($c =~ /[!\".%&*\+\,\;\?\@^\`-~]/);
26     $v|=$WS if ($c =~ /\t\r\n/);
27     $v|=$ESC if ($c =~ \\\);
28     $v|=$QUOTE if ($c =~ /['"]/); # for emacs: ''"/)
29     $v|=$COMMENT if ($c =~ ^#/);
30     $v|=$EOF if ($c =~ ^\0/);
31     $v|=$HIGHBIT if ($c =~ /\x80-\xff/);

33     push(@V_def,$v);
34 }

36 foreach (0 .. 255)
37 {
38     $v=0;
39     $c=sprintf("%c",$_);
40     $v|=$NUMBER if ($c =~ /[0-9]/);
41     $v|=$UPPER if ($c =~ /[A-Z]/);
42     $v|=$LOWER if ($c =~ /[a-z]/);
43     $v|=$UNDER if ($c =~ _/);
44     $v|=$PUNCTUATION if ($c =~ /[!\".%&*\+\,\;\?\@^\`-~]/);
45     $v|=$WS if ($c =~ /\t\r\n/);
46     $v|=$DQUOTE if ($c =~ /["]/); # for emacs: ")/)
47     $v|=$FCOMMENT if ($c =~ ^#/);
48     $v|=$EOF if ($c =~ ^\0/);
49     $v|=$HIGHBIT if ($c =~ /\x80-\xff/);

51     push(@V_w32,$v);
52 }

54 print <<"EOF";
55 /* crypto/conf/conf_def.h */
56 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
57 * All rights reserved.
58 *
59 * This package is an SSL implementation written
60 * by Eric Young (eay@cryptsoft.com).
61 * The implementation was written so as to conform with Netscapes SSL.
```

new/usr/src/lib/openssl/libsunw_crypto/pl/keysets.pl

2

```
62 *
63 * This library is free for commercial and non-commercial use as long as
64 * the following conditions are aheared to. The following conditions
65 * apply to all code found in this distribution, be it the RC4, RSA,
66 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
67 * included with this distribution is covered by the same copyright terms
68 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
69 *
70 * Copyright remains Eric Young's, and as such any Copyright notices in
71 * the code are not to be removed.
72 * If this package is used in a product, Eric Young should be given attribution
73 * as the author of the parts of the library used.
74 * This can be in the form of a textual message at program startup or
75 * in documentation (online or textual) provided with the package.
76 *
77 * Redistribution and use in source and binary forms, with or without
78 * modification, are permitted provided that the following conditions
79 * are met:
80 * 1. Redistributions of source code must retain the copyright
81 * notice, this list of conditions and the following disclaimer.
82 * 2. Redistributions in binary form must reproduce the above copyright
83 * notice, this list of conditions and the following disclaimer in the
84 * documentation and/or other materials provided with the distribution.
85 * 3. All advertising materials mentioning features or use of this software
86 * must display the following acknowledgement:
87 * "This product includes cryptographic software written by
88 * Eric Young (eay@cryptsoft.com)"
89 * The word 'cryptographic' can be left out if the rouines from the library
90 * being used are not cryptographic related :-).
91 * 4. If you include any Windows specific code (or a derivative thereof) from
92 * the apps directory (application code) you must include an acknowledgement:
93 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
94 *
95 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG 'AS IS' AND
96 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
97 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
98 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
99 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
100 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
101 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
102 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
103 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
104 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
105 * SUCH DAMAGE.
106 *
107 * The licence and distribution terms for any publically available version or
108 * derivative of this code cannot be changed. i.e. this code cannot simply be
109 * copied and put under another distribution licence
110 * [including the GNU Public Licence.]
111 */

113 /* THIS FILE WAS AUTOMAGICALLY GENERATED!
114 Please modify and use keysets.pl to regenerate it. */

116 #define CONF_NUMBER $NUMBER
117 #define CONF_UPPER $UPPER
118 #define CONF_LOWER $LOWER
119 #define CONF_UNDER $UNDER
120 #define CONF_PUNCTUATION $PUNCTUATION
121 #define CONF_WS $WS
122 #define CONF_ESC $ESC
123 #define CONF_QUOTE $QUOTE
124 #define CONF_DQUOTE $DQUOTE
125 #define CONF_COMMENT $COMMENT
126 #define CONF_FCOMMENT $FCOMMENT
127 #define CONF_EOF $EOF
```

```

128 #define CONF_HIGHBIT          $HIGHBIT
129 #define CONF_ALPHA            (CONF_UPPER|CONF_LOWER)
130 #define CONF_ALPHA_NUMERIC    (CONF_ALPHA|CONF_NUMBER|CONF_UNDER)
131 #define CONF_ALPHA_NUMERIC_PUNCT (CONF_ALPHA|CONF_NUMBER|CONF_UNDER| \
132                                CONF_PUNCTUATION)

134 #define KEYTYPES(c)            ((unsigned short *)((c)->meth_data))
135 #ifndef CHARSET_EBCDIC
136 #define IS_COMMENT(c,a)        (KEYTYPES(c)[(a)&0xff]&CONF_COMMENT)
137 #define IS_FCOMMENT(c,a)      (KEYTYPES(c)[(a)&0xff]&CONF_FCOMMENT)
138 #define IS_EOF(c,a)           (KEYTYPES(c)[(a)&0xff]&CONF_EOF)
139 #define IS_ESC(c,a)           (KEYTYPES(c)[(a)&0xff]&CONF_ESC)
140 #define IS_NUMBER(c,a)        (KEYTYPES(c)[(a)&0xff]&CONF_NUMBER)
141 #define IS_WS(c,a)            (KEYTYPES(c)[(a)&0xff]&CONF_WS)
142 #define IS_ALPHA_NUMERIC(c,a) (KEYTYPES(c)[(a)&0xff]&CONF_ALPHA_NUMERIC)
143 #define IS_ALPHA_NUMERIC_PUNCT(c,a) \
144     (KEYTYPES(c)[(a)&0xff]&CONF_ALPHA_NUMERIC_PUNCT)
145 #define IS_QUOTE(c,a)         (KEYTYPES(c)[(a)&0xff]&CONF_QUOTE)
146 #define IS_DQUOTE(c,a)       (KEYTYPES(c)[(a)&0xff]&CONF_DQUOTE)
147 #define IS_HIGHBIT(c,a)      (KEYTYPES(c)[(a)&0xff]&CONF_HIGHBIT)

149 #else /*CHARSET_EBCDIC*/

151 #define IS_COMMENT(c,a)        (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_COMMENT)
152 #define IS_FCOMMENT(c,a)      (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_FCOMMENT)
153 #define IS_EOF(c,a)           (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_EOF)
154 #define IS_ESC(c,a)           (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_ESC)
155 #define IS_NUMBER(c,a)        (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_NUMBER)
156 #define IS_WS(c,a)            (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_WS)
157 #define IS_ALPHA_NUMERIC(c,a) (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_ALPHA_NUME)
158 #define IS_ALPHA_NUMERIC_PUNCT(c,a) \
159     (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_ALPHA_NUME)
160 #define IS_QUOTE(c,a)         (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_QUOTE)
161 #define IS_DQUOTE(c,a)       (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_DQUOTE)
162 #define IS_HIGHBIT(c,a)      (KEYTYPES(c)[os_toascii[a]&0xff]&CONF_HIGHBIT)
163 #endif /*CHARSET_EBCDIC*/

165 EOF

167 print "static unsigned short CONF_type_default[256]={";

169 for ($i=0; $i<256; $i++)
170 {
171     print "\n\t" if ($i % 8) == 0;
172     printf "0x%04X,",$V_def[$i];
173 }

175 print "\n\t};\n\n";

177 print "static unsigned short CONF_type_win32[256]={";

179 for ($i=0; $i<256; $i++)
180 {
181     print "\n\t" if ($i % 8) == 0;
182     printf "0x%04X,",$V_w32[$i];
183 }

185 print "\n\t};\n\n";

```

new/usr/src/lib/openssl/libsunw_crypto/pl/md5-586.pl

1

7612 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/md5-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #!/usr/local/bin/perl

3 # Normal is the
4 # md5_block_x86(MD5_CTX *c, ULONG *X);
5 # version, non-normal is the
6 # md5_block_x86(MD5_CTX *c, ULONG *X,int blocks);

8 $normal=0;

10 $0 =~ m/([^\s/\\])[^\\\/]+$/; $dir=$1;
11 push(@INC,"${dir}","${dir}../perlasm");
12 require "x86asm.pl";

14 &asm_init($ARGV[0],$0);

16 $A="eax";
17 $B="ebx";
18 $C="ecx";
19 $D="edx";
20 $tmp1="edi";
21 $tmp2="ebp";
22 $X="esi";

24 # What we need to load into $tmp for the next round
25 %Ltmp1=("R0",&Np($C), "R1",&Np($C), "R2",&Np($C), "R3",&Np($D));
26 @xo=(
27 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, # R0
28 1, 6, 11, 0, 5, 10, 15, 4, 9, 14, 3, 8, 13, 2, 7, 12, # R1
29 5, 8, 11, 14, 1, 4, 7, 10, 13, 0, 3, 6, 9, 12, 15, 2, # R2
30 0, 7, 14, 5, 12, 3, 10, 1, 8, 15, 6, 13, 4, 11, 2, 9, # R3
31 );

33 &md5_block("md5_block_asm_data_order");
34 &asm_finish();

36 sub Np
37 {
38     local($p)=@_;
39     local(%n)=( $A,$D,$B,$A,$C,$B,$D,$C);
40     return($n{$p});
41 }

43 sub R0
44 {
45     local($pos,$a,$b,$c,$d,$k,$ski,$s,$t)=@_;

47     &mov($tmp1,$C) if $pos < 0;
48     &mov($tmp2,&DWP($xo[$ski]*4,$K,"",0)) if $pos < 0; # very first one

50     # body proper

52     &comment("R0 $ski");
53     &xor($tmp1,$d); # F function - part 2

55     &and($tmp1,$b); # F function - part 3
56     &lea($a,&DWP($t,$a,$tmp2,1));

58     &xor($tmp1,$d); # F function - part 4

60     &add($a,$tmp1);
61     &mov($tmp1,&Np($c)) if $pos < 1;          # next tmp1 for R0
```

new/usr/src/lib/openssl/libsunw_crypto/pl/md5-586.pl

2

```
62     &mov($tmp1,&Np($c)) if $pos == 1;          # next tmp1 for R1

64     &rotr($a,$s);

66     &mov($tmp2,&DWP($xo[$ski+1]*4,$K,"",0)) if ($pos != 2);

68     &add($a,$b);
69 }

71 sub R1
72 {
73     local($pos,$a,$b,$c,$d,$k,$ski,$s,$t)=@_;

75     &comment("R1 $ski");

77     &lea($a,&DWP($t,$a,$tmp2,1));

79     &xor($tmp1,$b); # G function - part 2
80     &and($tmp1,$d); # G function - part 3

82     &mov($tmp2,&DWP($xo[$ski+1]*4,$K,"",0)) if ($pos != 2);
83     &xor($tmp1,$c);          # G function - part 4

85     &add($a,$tmp1);
86     &mov($tmp1,&Np($c)) if $pos < 1;          # G function - part 1
87     &mov($tmp1,&Np($c)) if $pos == 1;          # G function - part 1

89     &rotr($a,$s);

91     &add($a,$b);
92 }

94 sub R2
95 {
96     local($n,$pos,$a,$b,$c,$d,$k,$ski,$s,$t)=@_;
97     # This one is different, only 3 logical operations

99     if (($n & 1) == 0)
100     {
101         &comment("R2 $ski");
102         # make sure to do 'D' first, not 'B', else we clash with
103         # the last add from the previous round.

105         &xor($tmp1,$d); # H function - part 2

107         &xor($tmp1,$b); # H function - part 3
108         &lea($a,&DWP($t,$a,$tmp2,1));

110         &add($a,$tmp1);

112         &rotr($a,$s);

114         &mov($tmp2,&DWP($xo[$ski+1]*4,$K,"",0));
115         &mov($tmp1,&Np($c));
116     }
117     else
118     {
119         &comment("R2 $ski");
120         # make sure to do 'D' first, not 'B', else we clash with
121         # the last add from the previous round.

123         &lea($a,&DWP($t,$a,$tmp2,1));

125         &add($b,$c);          # MOVED FORWARD
126         &xor($tmp1,$d); # H function - part 2
```

```

128     &xor($tmp1,$b); # H function - part 3
129     &mov($tmp2,&DWP($xo[$ski+1]*4,$K,"",0)) if ($pos != 2);

131     &add($a,$tmp1);
132     &mov($tmp1,&Np($c)) if $pos < 1;      # H function - part 1
133     &mov($tmp1,-1) if $pos == 1;          # I function - part 1

135     &rotl($a,$s);

137     &add($a,$b);
138     }
139     }

141 sub R3
142 {
143     local($pos,$a,$b,$c,$d,$K,$ski,$s,$t)=@_;

145     &comment("R3 $ski");

147     # &not($tmp1)
148     &xor($tmp1,$d) if $pos < 0;      # I function - part 2

150     &or($tmp1,$b);                  # I function - part 3
151     &lea($a,&DWP($t,$a,$tmp2,1));

153     &xor($tmp1,$c);                # I function - part 4
154     &mov($tmp2,&DWP($xo[$ski+1]*4,$K,"",0)) if $pos != 2; # load X/k value
155     &mov($tmp2,&wparam(0)) if $pos == 2;

157     &add($a,$tmp1);
158     &mov($tmp1,-1) if $pos < 1;      # H function - part 1
159     &add($K,64) if $pos >= 1 && !$normal;

161     &rotl($a,$s);

163     &xor($tmp1,&Np($d)) if $pos <= 0; # I function - part = first time
164     &mov($tmp1,&DWP(0,$tmp2,"",0)) if $pos > 0;
165     &add($a,$b);
166     }

169 sub md5_block
170 {
171     local($name)=@_;

173     &function_begin_B($name,"",3);

175     # parameter 1 is the MD5_CTX structure.
176     # A      0
177     # B      4
178     # C      8
179     # D     12

181     &push("esi");
182     &push("edi");
183     &mov($tmp1,&wparam(0)); # edi
184     &mov($X,&wparam(1)); # esi
185     &mov($C,&wparam(2));
186     &push("ebp");
187     &shl($C,6);
188     &push("ebx");
189     &add($C,$X); # offset we end at
190     &sub($C,64);
191     &mov($a,&DWP(0,$tmp1,"",0));
192     &push($C); # Put on the TOS
193     &mov($B,&DWP(4,$tmp1,"",0));

```

```

194     &mov($C,&DWP(8,$tmp1,"",0));
195     &mov($D,&DWP(12,$tmp1,"",0));

197     &set_label("start") unless $normal;
198     &comment("");
199     &comment("R0 section");

201     &R0(-2,$a,$b,$c,$d,$X,0,7,0xd76aa478);
202     &R0(0,$D,$a,$b,$c,$X,1,12,0xe8c7b756);
203     &R0(0,$C,$D,$a,$b,$X,2,17,0x242070db);
204     &R0(0,$B,$C,$D,$a,$X,3,22,0xc1bdceee);
205     &R0(0,$a,$b,$c,$d,$X,4,7,0xf57c0faf);
206     &R0(0,$D,$a,$b,$c,$X,5,12,0x4787c62a);
207     &R0(0,$C,$D,$a,$b,$X,6,17,0xa8304613);
208     &R0(0,$B,$C,$D,$a,$X,7,22,0xfd469501);
209     &R0(0,$a,$b,$c,$d,$X,8,7,0x698098d8);
210     &R0(0,$D,$a,$b,$c,$X,9,12,0x8b44f7af);
211     &R0(0,$C,$D,$a,$b,$X,10,17,0xffff5bb1);
212     &R0(0,$B,$C,$D,$a,$X,11,22,0x895cd7be);
213     &R0(0,$a,$b,$c,$d,$X,12,7,0x6b901122);
214     &R0(0,$D,$a,$b,$c,$X,13,12,0xfd987193);
215     &R0(0,$C,$D,$a,$b,$X,14,17,0xa679438e);
216     &R0(1,$B,$C,$D,$a,$X,15,22,0x49b40821);

218     &comment("");
219     &comment("R1 section");
220     &R1(-1,$a,$b,$c,$d,$X,16,5,0xf61e2562);
221     &R1(0,$D,$a,$b,$c,$X,17,9,0xc040b340);
222     &R1(0,$C,$D,$a,$b,$X,18,14,0x265e5a51);
223     &R1(0,$B,$C,$D,$a,$X,19,20,0xe9b6c7aa);
224     &R1(0,$a,$b,$c,$d,$X,20,5,0xd62f105d);
225     &R1(0,$D,$a,$b,$c,$X,21,9,0x02441453);
226     &R1(0,$C,$D,$a,$b,$X,22,14,0xd8a1e681);
227     &R1(0,$B,$C,$D,$a,$X,23,20,0xe7d3fbc8);
228     &R1(0,$a,$b,$c,$d,$X,24,5,0x21e1cde6);
229     &R1(0,$D,$a,$b,$c,$X,25,9,0xc33707d6);
230     &R1(0,$C,$D,$a,$b,$X,26,14,0xf4d50d87);
231     &R1(0,$B,$C,$D,$a,$X,27,20,0x455a14ed);
232     &R1(0,$a,$b,$c,$d,$X,28,5,0xa9e3e905);
233     &R1(0,$D,$a,$b,$c,$X,29,9,0xfcfe3f8);
234     &R1(0,$C,$D,$a,$b,$X,30,14,0x67f02d9);
235     &R1(1,$B,$C,$D,$a,$X,31,20,0x8d2a4c8a);

237     &comment("");
238     &comment("R2 section");
239     &R2(0,-1,$a,$b,$c,$d,$X,32,4,0xffffa3942);
240     &R2(1,0,$D,$a,$b,$c,$X,33,11,0x8771f681);
241     &R2(2,0,$C,$D,$a,$b,$X,34,16,0x6d9d6122);
242     &R2(3,0,$B,$C,$D,$a,$X,35,23,0xfde5380c);
243     &R2(4,0,$a,$b,$c,$d,$X,36,4,0xa4beea44);
244     &R2(5,0,$D,$a,$b,$c,$X,37,11,0x4bdecfa9);
245     &R2(6,0,$C,$D,$a,$b,$X,38,16,0xf6bb4b60);
246     &R2(7,0,$B,$C,$D,$a,$X,39,23,0xbebfb70);
247     &R2(8,0,$a,$b,$c,$d,$X,40,4,0x289b7ec6);
248     &R2(9,0,$D,$a,$b,$c,$X,41,11,0xea127fa);
249     &R2(10,0,$C,$D,$a,$b,$X,42,16,0xd4ef3085);
250     &R2(11,0,$B,$C,$D,$a,$X,43,23,0x04881d05);
251     &R2(12,0,$a,$b,$c,$d,$X,44,4,0xd9d4d039);
252     &R2(13,0,$D,$a,$b,$c,$X,45,11,0xe6db99e5);
253     &R2(14,0,$C,$D,$a,$b,$X,46,16,0x1fa27cf8);
254     &R2(15,1,$B,$C,$D,$a,$X,47,23,0xc4ac5665);

256     &comment("");
257     &comment("R3 section");
258     &R3(-1,$a,$b,$c,$d,$X,48,6,0xf4292244);
259     &R3(0,$D,$a,$b,$c,$X,49,10,0x432aff97);

```

```

260      &R3( 0,$C,$D,$A,$B,$X,50,15,0xab9423a7);
261      &R3( 0,$B,$C,$D,$A,$X,51,21,0xfc93a039);
262      &R3( 0,$A,$B,$C,$D,$X,52, 6,0x655b59c3);
263      &R3( 0,$D,$A,$B,$C,$X,53,10,0x8f0ccc92);
264      &R3( 0,$C,$D,$A,$B,$X,54,15,0xffeff47d);
265      &R3( 0,$B,$C,$D,$A,$X,55,21,0x85845dd1);
266      &R3( 0,$A,$B,$C,$D,$X,56, 6,0x6fa87e4f);
267      &R3( 0,$D,$A,$B,$C,$X,57,10,0xfe2ce6e0);
268      &R3( 0,$C,$D,$A,$B,$X,58,15,0xa3014314);
269      &R3( 0,$B,$C,$D,$A,$X,59,21,0x4e0811a1);
270      &R3( 0,$A,$B,$C,$D,$X,60, 6,0xf7537e82);
271      &R3( 0,$D,$A,$B,$C,$X,61,10,0xbd3af235);
272      &R3( 0,$C,$D,$A,$B,$X,62,15,0x2ad7d2bb);
273      &R3( 2,$B,$C,$D,$A,$X,63,21,0xeb86d391);

275      # &mov($tmp2,&wparam(0));          # done in the last R3
276      # &mov($tmp1,  &DWP( 0,$tmp2,"",0)); # done is the last R3

278      &add($A,$tmp1);
279      &mov($tmp1,  &DWP( 4,$tmp2,"",0));

281      &add($B,$tmp1);
282      &mov($tmp1,  &DWP( 8,$tmp2,"",0));

284      &add($C,$tmp1);
285      &mov($tmp1,  &DWP(12,$tmp2,"",0));

287      &add($D,$tmp1);
288      &mov(&DWP( 0,$tmp2,"",0),$A);

290      &mov(&DWP( 4,$tmp2,"",0),$B);
291      &mov($tmp1,&swtmp(0)) unless $normal;

293      &mov(&DWP( 8,$tmp2,"",0),$C);
294      &mov(&DWP(12,$tmp2,"",0),$D);

296      &cmp($tmp1,$X) unless $normal;          # check count
297      &jae(&label("start")) unless $normal;

299      &pop("eax"); # pop the temp variable off the stack
300      &pop("ebx");
301      &pop("ebp");
302      &pop("edi");
303      &pop("esi");
304      &ret();
305      &function_end_B($name);
306      }

```

12448 Fri May 30 18:32:04 2014
 new/usr/src/lib/openssl/libsunw_crypto/pl/md5-x86_64.pl
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1  #!/usr/bin/perl -w
2  #
3  # MD5 optimized for AMD64.
4  #
5  # Author: Marc Bevand <bevand_m (at) epita.fr>
6  # Licence: I hereby disclaim the copyright on this code and place it
7  # in the public domain.
8  #

10 use strict;

12 my $code;

14 # round1_step() does:
15 #   dst = x + ((dst + F(x,y,z) + X[k] + T_i) <<< s)
16 #   %r10d = X[k_next]
17 #   %r11d = z' (copy of z for the next step)
18 # Each round1_step() takes about 5.3 clocks (9 instructions, 1.7 IPC)
19 sub round1_step
20 {
21     my ($pos, $dst, $x, $y, $z, $k_next, $T_i, $s) = @_;
22     $code .= " mov     0*4(%rsi),    %r10d    /* (NEXT STEP) X[0] */\n";
23     $code .= " mov     %edx,        %r11d    /* (NEXT STEP) z' = %edx */\n";
24     $code .= "<<EOF;";
25     xor     $y,    %r11d    /* y ^ ... */
26     lea     $T_i($dst,%r10d),$dst    /* Const + dst + ... */
27     and     $x,    %r11d    /* x & ... */
28     xor     $z,    %r11d    /* z ^ ... */
29     mov     $k_next*4(%rsi),%r10d    /* (NEXT STEP) X[$k_next] */
30     add     %r11d,    $dst    /* dst += ... */
31     rol     \$$s,    $dst    /* dst <<< s */
32     mov     $y,    %r11d    /* (NEXT STEP) z' = $y */
33     add     $x,    $dst    /* dst += x */
34 EOF
35 }

37 # round2_step() does:
38 #   dst = x + ((dst + G(x,y,z) + X[k] + T_i) <<< s)
39 #   %r10d = X[k_next]
40 #   %r11d = z' (copy of z for the next step)
41 #   %r12d = z' (copy of z for the next step)
42 # Each round2_step() takes about 5.4 clocks (11 instructions, 2.0 IPC)
43 sub round2_step
44 {
45     my ($pos, $dst, $x, $y, $z, $k_next, $T_i, $s) = @_;
46     $code .= " mov     1*4(%rsi),    %r10d    /* (NEXT STEP) X[1] */\n";
47     $code .= " mov     %edx,        %r11d    /* (NEXT STEP) z' = %edx */\n";
48     $code .= " mov     %edx,        %r12d    /* (NEXT STEP) z' = %edx */\n";
49     $code .= "<<EOF;";
50     not     %r11d    /* not z */
51     lea     $T_i($dst,%r10d),$dst    /* Const + dst + ... */
52     and     $x,    %r12d    /* x & z */
53     and     $y,    %r11d    /* y & (not z) */
54     mov     $k_next*4(%rsi),%r10d    /* (NEXT STEP) X[$k_next] */
55     or      %r11d,    %r12d    /* (y & (not z)) | (x & z) */
56     mov     $y,    %r11d    /* (NEXT STEP) z' = $y */
57     add     %r12d,    $dst    /* dst += ... */
58     mov     $y,    %r12d    /* (NEXT STEP) z' = $y */
59     rol     \$$s,    $dst    /* dst <<< s */
60     add     $x,    $dst    /* dst += x */
61 EOF

```

```

62 }

64 # round3_step() does:
65 #   dst = x + ((dst + H(x,y,z) + X[k] + T_i) <<< s)
66 #   %r10d = X[k_next]
67 #   %r11d = y' (copy of y for the next step)
68 # Each round3_step() takes about 4.2 clocks (8 instructions, 1.9 IPC)
69 sub round3_step
70 {
71     my ($pos, $dst, $x, $y, $z, $k_next, $T_i, $s) = @_;
72     $code .= " mov     5*4(%rsi),    %r10d    /* (NEXT STEP) X[5] */\n";
73     $code .= " mov     %ecx,        %r11d    /* (NEXT STEP) y' = %ecx */\n";
74     $code .= "<<EOF;";
75     lea     $T_i($dst,%r10d),$dst    /* Const + dst + ... */
76     mov     $k_next*4(%rsi),%r10d    /* (NEXT STEP) X[$k_next] */
77     xor     $z,    %r11d    /* z ^ ... */
78     xor     $x,    %r11d    /* x ^ ... */
79     add     %r11d,    $dst    /* dst += ... */
80     rol     \$$s,    $dst    /* dst <<< s */
81     mov     $x,    %r11d    /* (NEXT STEP) y' = $x */
82     add     $x,    $dst    /* dst += x */
83 EOF
84 }

86 # round4_step() does:
87 #   dst = x + ((dst + I(x,y,z) + X[k] + T_i) <<< s)
88 #   %r10d = X[k_next]
89 #   %r11d = not z' (copy of not z for the next step)
90 # Each round4_step() takes about 5.2 clocks (9 instructions, 1.7 IPC)
91 sub round4_step
92 {
93     my ($pos, $dst, $x, $y, $z, $k_next, $T_i, $s) = @_;
94     $code .= " mov     0*4(%rsi),    %r10d    /* (NEXT STEP) X[0] */\n";
95     $code .= " mov     \0xffffffff, %r11d\n" if ($pos == -1);
96     $code .= " xor     %edx,        %r11d    /* (NEXT STEP) not z' = %edx */\n";
97     if ($pos == -1);
98     $code .= "<<EOF;";
99     lea     $T_i($dst,%r10d),$dst    /* Const + dst + ... */
100     or      $x,    %r11d    /* x | ... */
101     xor     $y,    %r11d    /* y ^ ... */
102     add     %r11d,    $dst    /* dst += ... */
103     mov     $k_next*4(%rsi),%r10d    /* (NEXT STEP) X[$k_next] */
104     mov     \0xffffffff, %r11d
105     rol     \$$s,    $dst    /* dst <<< s */
106     xor     $y,    %r11d    /* (NEXT STEP) not z' = not $y */
107     add     $x,    $dst    /* dst += x */
108 EOF
109 }

111 my $flavour = shift;
112 my $output = shift;
113 if ($flavour =~ /\.asm/) { $output = $flavour; undef $flavour; }

115 my $win64=0; $win64=1 if ($flavour =~ /\[nm\]asm|mingw64/ || $output =~ /\.asm$/);

117 $0 =~ m/.*[\\\/][^\\\/]+$/; my $dir=$1; my $xlate;
118 ( $xlate="{dir}x86_64-xlate.pl" and -f $xlate ) or
119 ( $xlate="{dir}../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
120 die "can't locate x86_64-xlate.pl";

122 no warnings qw(uninitialized);
123 open OUT, ">\"$xlate\" $xlate $flavour $output";
124 *STDOUT=*OUT;

126 $code .= "<<EOF;";
127 .text

```

```

128 .align 16
130 .globl md5_block_asm_data_order
131 .type md5_block_asm_data_order, @function, 3
132 md5_block_asm_data_order:
133     push    %rbp
134     push    %rbx
135     push    %r12
136     push    %r14
137     push    %r15
138 .Lprologue:
139
140     # rdi = arg #1 (ctx, MD5_CTX pointer)
141     # rsi = arg #2 (ptr, data pointer)
142     # rdx = arg #3 (nbr, number of 16-word blocks to process)
143     mov     %rdi, %rbp    # rbp = ctx
144     shl     $6, %rdx     # rdx = nbr in bytes
145     lea     (%rsi,%rdx), %rdi    # rdi = end
146     mov     0*4(%rbp), %eax    # eax = ctx->A
147     mov     1*4(%rbp), %ebx    # ebx = ctx->B
148     mov     2*4(%rbp), %ecx    # ecx = ctx->C
149     mov     3*4(%rbp), %edx    # edx = ctx->D
150     # end is 'rdi'
151     # ptr is 'rsi'
152     # A is 'eax'
153     # B is 'ebx'
154     # C is 'ecx'
155     # D is 'edx'
156
157     cmp     %rdi, %rsi    # cmp end with ptr
158     je      .Lend        # jmp if ptr == end
159
160     # BEGIN of loop over 16-word blocks
161 .Lloop: # save old values of A, B, C, D
162     mov     %eax, %r8d
163     mov     %ebx, %r9d
164     mov     %ecx, %r14d
165     mov     %edx, %r15d
166 EOF
167 round1_step(-1, %eax, %ebx, %ecx, %edx, '1', '0xd76aa478', '7');
168 round1_step(0, %edx, %eax, %ebx, %ecx, '2', '0xe8c7b756', '12');
169 round1_step(0, %ecx, %edx, %eax, %ebx, '3', '0x242070db', '17');
170 round1_step(0, %ebx, %ecx, %edx, %eax, '4', '0xc1bdceee', '22');
171 round1_step(0, %eax, %ebx, %ecx, %edx, '5', '0xf57c0faf', '7');
172 round1_step(0, %edx, %eax, %ebx, %ecx, '6', '0x4787c62a', '12');
173 round1_step(0, %ecx, %edx, %eax, %ebx, '7', '0xa8304613', '17');
174 round1_step(0, %ebx, %ecx, %edx, %eax, '8', '0xfd469501', '22');
175 round1_step(0, %eax, %ebx, %ecx, %edx, '9', '0x698098d8', '7');
176 round1_step(0, %edx, %eax, %ebx, %ecx, '10', '0x8b44f7af', '12');
177 round1_step(0, %ecx, %edx, %eax, %ebx, '11', '0xfffff5bb1', '17');
178 round1_step(0, %ebx, %ecx, %edx, %eax, '12', '0x895cd7be', '22');
179 round1_step(0, %eax, %ebx, %ecx, %edx, '13', '0x6b901122', '7');
180 round1_step(0, %edx, %eax, %ebx, %ecx, '14', '0xfd987193', '12');
181 round1_step(0, %ecx, %edx, %eax, %ebx, '15', '0xa679438e', '17');
182 round1_step(1, %ebx, %ecx, %edx, %eax, '0', '0x49b40821', '22');
183
184 round2_step(-1, %eax, %ebx, %ecx, %edx, '6', '0xf61e2562', '5');
185 round2_step(0, %edx, %eax, %ebx, %ecx, '11', '0xc040b340', '9');
186 round2_step(0, %ecx, %edx, %eax, %ebx, '0', '0x265e5a51', '14');
187 round2_step(0, %ebx, %ecx, %edx, %eax, '5', '0xe9b6cfaa', '20');
188 round2_step(0, %eax, %ebx, %ecx, %edx, '10', '0xd62f105d', '5');
189 round2_step(0, %edx, %eax, %ebx, %ecx, '15', '0x2441453', '9');
190 round2_step(0, %ecx, %edx, %eax, %ebx, '4', '0xd8a1e681', '14');
191 round2_step(0, %ebx, %ecx, %edx, %eax, '9', '0xe7d3fbc8', '20');
192 round2_step(0, %eax, %ebx, %ecx, %edx, '14', '0x21e1cde6', '5');
193 round2_step(0, %edx, %eax, %ebx, %ecx, '3', '0xc33707d6', '9');

```

```

194 round2_step(0, %ecx, %edx, %eax, %ebx, '8', '0xf4d50d87', '14');
195 round2_step(0, %ebx, %ecx, %edx, %eax, '13', '0x455a14ed', '20');
196 round2_step(0, %eax, %ebx, %ecx, %edx, '2', '0xa9e3e905', '5');
197 round2_step(0, %edx, %eax, %ebx, %ecx, '7', '0xfcfa3f8', '9');
198 round2_step(0, %ecx, %edx, %eax, %ebx, '12', '0x67f02d9', '14');
199 round2_step(1, %ebx, %ecx, %edx, %eax, '0', '0x8d2a4c8a', '20');
200
201 round3_step(-1, %eax, %ebx, %ecx, %edx, '8', '0xffffa3942', '4');
202 round3_step(0, %edx, %eax, %ebx, %ecx, '11', '0x8771f681', '11');
203 round3_step(0, %ecx, %edx, %eax, %ebx, '14', '0x6d9d6122', '16');
204 round3_step(0, %ebx, %ecx, %edx, %eax, '1', '0xfde5380c', '23');
205 round3_step(0, %eax, %ebx, %ecx, %edx, '4', '0xa4beea44', '4');
206 round3_step(0, %edx, %eax, %ebx, %ecx, '7', '0x4bdecfa9', '11');
207 round3_step(0, %ecx, %edx, %eax, %ebx, '10', '0xf6bb4b60', '16');
208 round3_step(0, %ebx, %ecx, %edx, %eax, '13', '0x9bebfbcb', '23');
209 round3_step(0, %eax, %ebx, %ecx, %edx, '0', '0x289b7ec6', '4');
210 round3_step(0, %edx, %eax, %ebx, %ecx, '3', '0xeeaa127fa', '11');
211 round3_step(0, %ecx, %edx, %eax, %ebx, '6', '0xd4ef3085', '16');
212 round3_step(0, %ebx, %ecx, %edx, %eax, '9', '0x4881d05', '23');
213 round3_step(0, %eax, %ebx, %ecx, %edx, '12', '0xd9d4d039', '4');
214 round3_step(0, %edx, %eax, %ebx, %ecx, '15', '0xe6db99e5', '11');
215 round3_step(0, %ecx, %edx, %eax, %ebx, '2', '0x1fa27cf8', '16');
216 round3_step(1, %ebx, %ecx, %edx, %eax, '0', '0xc4ac5665', '23');
217
218 round4_step(-1, %eax, %ebx, %ecx, %edx, '7', '0xf4292244', '6');
219 round4_step(0, %edx, %eax, %ebx, %ecx, '14', '0x432aff97', '10');
220 round4_step(0, %ecx, %edx, %eax, %ebx, '5', '0xab9423a7', '15');
221 round4_step(0, %ebx, %ecx, %edx, %eax, '12', '0xfc93a039', '21');
222 round4_step(0, %eax, %ebx, %ecx, %edx, '3', '0x6555b59c3', '6');
223 round4_step(0, %edx, %eax, %ebx, %ecx, '10', '0x8f0ccc92', '10');
224 round4_step(0, %ecx, %edx, %eax, %ebx, '1', '0xffeff47d', '15');
225 round4_step(0, %ebx, %ecx, %edx, %eax, '8', '0x85845dd1', '21');
226 round4_step(0, %eax, %ebx, %ecx, %edx, '15', '0x6fa87e4f', '6');
227 round4_step(0, %edx, %eax, %ebx, %ecx, '6', '0xfe2cece0', '10');
228 round4_step(0, %ecx, %edx, %eax, %ebx, '13', '0xa3014314', '15');
229 round4_step(0, %ebx, %ecx, %edx, %eax, '4', '0x4e0811a1', '21');
230 round4_step(0, %eax, %ebx, %ecx, %edx, '11', '0xf7537e82', '6');
231 round4_step(0, %edx, %eax, %ebx, %ecx, '2', '0xbd3af235', '10');
232 round4_step(0, %ecx, %edx, %eax, %ebx, '9', '0x2ad7d2bb', '15');
233 round4_step(1, %ebx, %ecx, %edx, %eax, '0', '0xeb86d391', '21');
234 $code .= <<EOF;
235     # add old values of A, B, C, D
236     add     %r8d, %eax
237     add     %r9d, %ebx
238     add     %r14d, %ecx
239     add     %r15d, %edx
240
241     # loop control
242     add     $64, %rsi    # ptr += 64
243     cmp     %rdi, %rsi    # cmp end with ptr
244     jb      .Lloop        # jmp if ptr < end
245     # END of loop over 16-word blocks
246
247 .Lend:
248     mov     %eax, 0*4(%rbp)    # ctx->A = A
249     mov     %ebx, 1*4(%rbp)    # ctx->B = B
250     mov     %ecx, 2*4(%rbp)    # ctx->C = C
251     mov     %edx, 3*4(%rbp)    # ctx->D = D
252
253     mov     (%rsp), %r15
254     mov     8(%rsp), %r14
255     mov     16(%rsp), %r12
256     mov     24(%rsp), %rbx
257     mov     32(%rsp), %rbp
258     add     $40, %rsp
259 .Lepilogue:

```



```

260     ret
261 .size md5_block_asm_data_order,.-md5_block_asm_data_order
262 EOF

264 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
265 #                               CONTEXT *context,DISPATCHER_CONTEXT *disp)
266 if ($win64) {
267   my $rec="%rcx";
268   my $frame="%rdx";
269   my $context="%r8";
270   my $disp="%r9";

272   $code.=<<__ ;
273   .extern __imp_RtlVirtualUnwind
274   .type   se_handler,@abi-omnipotent
275   .align 16
276   se_handler:
277     push    %rsi
278     push    %rdi
279     push    %rbx
280     push    %rbp
281     push    %r12
282     push    %r13
283     push    %r14
284     push    %r15
285     pushfq  %rsp
286     sub     \($64,%rsp

288     mov     120($context),%rax    # pull context->Rax
289     mov     248($context),%rbx    # pull context->Rip

291     lea     .Lprologue(%rip),%r10
292     cmp     %r10,%rbx            # context->Rip<.Lprologue
293     jb      .Lin_prologue

295     mov     152($context),%rax    # pull context->Rsp

297     lea     .Lepilogue(%rip),%r10
298     cmp     %r10,%rbx            # context->Rip>=.Lepilogue
299     jae     .Lin_prologue

301     lea     40(%rax),%rax

303     mov     -8(%rax),%rbp
304     mov     -16(%rax),%rbx
305     mov     -24(%rax),%r12
306     mov     -32(%rax),%r14
307     mov     -40(%rax),%r15
308     mov     %rbx,144($context)    # restore context->Rbx
309     mov     %rbp,160($context)    # restore context->Rbp
310     mov     %r12,216($context)    # restore context->R12
311     mov     %r14,232($context)    # restore context->R14
312     mov     %r15,240($context)    # restore context->R15

314 .Lin_prologue:
315     mov     8(%rax),%rdi
316     mov     16(%rax),%rsi
317     mov     %rax,152($context)    # restore context->Rsp
318     mov     %rsi,168($context)    # restore context->Rsi
319     mov     %rdi,176($context)    # restore context->Rdi

321     mov     40($disp),%rdi        # disp->ContextRecord
322     mov     $context,%rsi         # context
323     mov     \($154,%ecx           # sizeof(CONTEXT)
324     .long   0xa548f3fc           # cld; rep movsq

```

```

326     mov     $disp,%rsi
327     xor     %rcx,%rcx            # arg1, UNW_FLAG_NHANDLER
328     mov     8(%rsi),%rdx         # arg2, disp->ImageBase
329     mov     0(%rsi),%r8          # arg3, disp->ControlPc
330     mov     16(%rsi),%r9         # arg4, disp->FunctionEntry
331     mov     40(%rsi),%r10        # disp->ContextRecord
332     lea     56(%rsi),%r11        # &disp->HandlerData
333     lea     24(%rsi),%r12        # &disp->EstablisherFrame
334     mov     %r10,32(%rsp)        # arg5
335     mov     %r11,40(%rsp)        # arg6
336     mov     %r12,48(%rsp)        # arg7
337     mov     %rcx,56(%rsp)        # arg8, (NULL)
338     call    *__imp_RtlVirtualUnwind(%rip)

340     mov     \($1,%eax            # ExceptionContinueSearch
341     add     \($64,%rsp
342     popfq
343     pop     %r15
344     pop     %r14
345     pop     %r13
346     pop     %r12
347     pop     %rbp
348     pop     %rbx
349     pop     %rdi
350     pop     %rsi
351     ret

352 .size   se_handler,.-se_handler

354 .section .pdata
355 .align 4
356     .rva   .LSEH_begin_md5_block_asm_data_order
357     .rva   .LSEH_end_md5_block_asm_data_order
358     .rva   .LSEH_info_md5_block_asm_data_order

360 .section .xdata
361 .align 8
362 .LSEH_info_md5_block_asm_data_order:
363     .byte  9,0,0,0
364     .rva   se_handler
365     ____
366 }

368 print $code;

370 close STDOUT;

```

new/usr/src/lib/openssl/libsunw_crypto/pl/modexp512-x86_64.pl

1

```
*****
34519 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/modexp512-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 #!/usr/bin/env perl
2 #
3 # Copyright (c) 2010-2011 Intel Corp.
4 # Author: Vinodh.Gopal@intel.com
5 # Jim Guilford
6 # Erdinc.Ozturk@intel.com
7 # Maxim.Perminov@intel.com
8 #
9 # More information about algorithm used can be found at:
10 # http://www.cse.buffalo.edu/srds2009/escs2009_submission_Gopal.pdf
11 #
12 # =====
13 # Copyright (c) 2011 The OpenSSL Project. All rights reserved.
14 #
15 # Redistribution and use in source and binary forms, with or without
16 # modification, are permitted provided that the following conditions
17 # are met:
18 #
19 # 1. Redistributions of source code must retain the above copyright
20 # notice, this list of conditions and the following disclaimer.
21 #
22 # 2. Redistributions in binary form must reproduce the above copyright
23 # notice, this list of conditions and the following disclaimer in
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25 # distribution.
26 #
27 # 3. All advertising materials mentioning features or use of this
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40 #
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46 # THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
47 # EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
48 # IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
49 # PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
50 # ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
51 # SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
52 # NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
53 # LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
54 # HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
55 # STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
56 # ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
57 # OF THE POSSIBILITY OF SUCH DAMAGE.
58 # =====
60 $flavour = shift;
61 $output = shift;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/modexp512-x86_64.pl

2

```
62 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }
64 my $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);
66 $0 =~ m/(.*[\\\/])[^\\\/]+$/; $dir=$1;
67 ( $xlate="$dir\x86_64-xlate.pl" and -f $xlate ) or
68 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
69 die "can't locate x86_64-xlate.pl";
71 open OUT,"| \"$^X\" $xlate $flavour $output";
72 *STDOUT=*OUT;
74 use strict;
75 my $code=".text\n\n";
76 my $m=0;
78 #
79 # Define x512 macros
80 #
82 #MULSTEP_512_ADD MACRO x7, x6, x5, x4, x3, x2, x1, x0, dst, src1, src2,
83 #
84 # uses rax, rdx, and args
85 sub MULSTEP_512_ADD
86 {
87 my ($x, $dst, $src2, $src, $op, $tmp)=@_;
88 my @X=@$x; # make a copy
89 $code.=<<";
90 mov (+8*0)($src2), %rax
91 mul $op # rdx:rax = %OP * [0]
92 mov ($src), $X[0]
93 add %rax, $X[0]
94 adc \0, %rdx
95 mov $X[0], $dst
96
97 for(my $i=1;$i<8;$i++) {
98 $code.=<<";
99 mov %rdx, $tmp
101 mov (+8*$i)($src2), %rax
102 mul $op # rdx:rax = %OP * [$i]
103 mov (+8*$i)($src), $X[$i]
104 add %rax, $X[$i]
105 adc \0, %rdx
106 add $tmp, $X[$i]
107 adc \0, %rdx
108
109 }
110 $code.=<<";
111 mov %rdx, $X[0]
112
113 }
115 #MULSTEP_512 MACRO x7, x6, x5, x4, x3, x2, x1, x0, dst, src2, src1_val, tmp
116 #
117 # uses rax, rdx, and args
118 sub MULSTEP_512
119 {
120 my ($x, $dst, $src2, $op, $tmp)=@_;
121 my @X=@$x; # make a copy
122 $code.=<<";
123 mov (+8*0)($src2), %rax
124 mul $op # rdx:rax = %OP * [0]
125 add %rax, $X[0]
126 adc \0, %rdx
127 mov $X[0], $dst
```

```

128 _____
129 for(my $i=1;$i<8;$i++) {
130 $code.=<<____;
131     mov     %rdx, $TMP
132
133     mov     (+8*$i)($SRC2), %rax
134     mul     $OP, %rax          # rdx:rax = %OP * [$i]
135     add     %rax, $X[$i]
136     adc     \%0, %rdx
137     add     $TMP, $X[$i]
138     adc     \%0, %rdx
139 }
140
141 $code.=<<____;
142     mov     %rdx, $X[0]
143
144 }
145
146 #
147 # Swizzle Macros
148 #
149
150 # macro to copy data from flat space to swizzled table
151 #MACRO swizzle pDst, pSrc, tmp1, tmp2
152 # pDst and pSrc are modified
153 sub swizzle
154 {
155     my ($pDst, $pSrc, $cnt, $d0)=@_;
156     $code.=<<____;
157     loop_$m:
158         mov     ($pSrc), $d0
159         mov     $d0#w, ($pDst)
160         shr     \%16, $d0
161         mov     $d0#w, (+64*1)($pDst)
162         shr     \%16, $d0
163         mov     $d0#w, (+64*2)($pDst)
164         shr     \%16, $d0
165         mov     $d0#w, (+64*3)($pDst)
166         lea     8($pSrc), $pSrc
167         lea     64*4($pDst), $pDst
168         dec     $cnt
169         jnz     loop_$m
170
171 }
172
173 $m++;
174 }
175
176 # macro to copy data from swizzled table to flat space
177 #MACRO unswizzle pDst, pSrc, tmp*3
178 sub unswizzle
179 {
180     my ($pDst, $pSrc, $cnt, $d0, $d1)=@_;
181     $code.=<<____;
182     loop_$m:
183         movzxw  (+64*3+256*0)($pSrc), $d0
184         movzxw  (+64*3+256*1)($pSrc), $d1
185         shl     \%16, $d0
186         shl     \%16, $d1
187         mov     (+64*2+256*0)($pSrc), $d0#w
188         mov     (+64*2+256*1)($pSrc), $d1#w
189         shl     \%16, $d0
190         shl     \%16, $d1
191         mov     (+64*1+256*0)($pSrc), $d0#w
192         mov     (+64*1+256*1)($pSrc), $d1#w

```

```

194     shl     \%16, $d0
195     shl     \%16, $d1
196     mov     (+64*0+256*0)($pSrc), $d0#w
197     mov     (+64*0+256*1)($pSrc), $d1#w
198     mov     $d0, (+8*0)($pDst)
199     mov     $d1, (+8*1)($pDst)
200     lea     256*2($pSrc), $pSrc
201     lea     8*2($pDst), $pDst
202     sub     \%1, $cnt
203     jnz     loop_$m
204
205
206 $m++;
207 }
208
209 #
210 # Data Structures
211 #
212
213 # Reduce Data
214 #
215 #
216 # Offset    Value
217 # 0C0       Carries
218 # 0B8       X2[10]
219 # 0B0       X2[9]
220 # 0A8       X2[8]
221 # 0A0       X2[7]
222 # 098       X2[6]
223 # 090       X2[5]
224 # 088       X2[4]
225 # 080       X2[3]
226 # 078       X2[2]
227 # 070       X2[1]
228 # 068       X2[0]
229 # 060       X1[12] P[10]
230 # 058       X1[11] P[9]  Z[8]
231 # 050       X1[10] P[8]  Z[7]
232 # 048       X1[9]  P[7]  Z[6]
233 # 040       X1[8]  P[6]  Z[5]
234 # 038       X1[7]  P[5]  Z[4]
235 # 030       X1[6]  P[4]  Z[3]
236 # 028       X1[5]  P[3]  Z[2]
237 # 020       X1[4]  P[2]  Z[1]
238 # 018       X1[3]  P[1]  Z[0]
239 # 010       X1[2]  P[0]  Y[2]
240 # 008       X1[1]  Q[1]  Y[1]
241 # 000       X1[0]  Q[0]  Y[0]
242
243 my $X1_offset = 0;
244 my $X2_offset = $X1_offset + 13*8;
245 my $Carries_offset = $X2_offset + 11*8;
246 my $Q_offset = 0;
247 my $P_offset = $Q_offset + 2*8;
248 my $Y_offset = 0;
249 my $Z_offset = $Y_offset + 3*8;
250
251 my $Red_Data_Size = $Carries_offset + 1*8;
252
253 #
254 # Stack Frame
255 #
256 #
257 # offset    value
258 # ...      <old stack contents>
259 # ...

```

```

260 # 280      Garray
262 # 278      tmp16[15]
263 # ...
264 # 200      tmp16[0]

266 # 1F8      tmp[7]
267 # ...
268 # 1C0      tmp[0]

270 # 1B8      GT[7]
271 # ...
272 # 180      GT[0]

274 # 178      Reduce Data
275 # ...
276 # 0B8      Reduce Data
277 # 0B0      reserved
278 # 0A8      reserved
279 # 0A0      reserved
280 # 098      reserved
281 # 090      reserved
282 # 088      reduce result addr
283 # 080      exp[8]

285 # ...
286 # 048      exp[1]
287 # 040      exp[0]

289 # 038      reserved
290 # 030      loop_idx
291 # 028      pg
292 # 020      i
293 # 018      pData ; arg 4
294 # 010      pG ; arg 2
295 # 008      pResult ; arg 1
296 # 000      rsp ; stack pointer before subtract

298 my $rsp_offset = 0;
299 my $pResult_offset = 8*1 + $rsp_offset;
300 my $pG_offset = 8*1 + $pResult_offset;
301 my $pData_offset = 8*1 + $pG_offset;
302 my $i_offset = 8*1 + $pData_offset;
303 my $pg_offset = 8*1 + $i_offset;
304 my $loop_idx_offset = 8*1 + $pg_offset;
305 my $reserved1_offset = 8*1 + $loop_idx_offset;
306 my $exp_offset = 8*1 + $reserved1_offset;
307 my $red_result_addr_offset = 8*9 + $exp_offset;
308 my $reserved2_offset = 8*1 + $red_result_addr_offset;
309 my $Reduce_Data_offset = 8*5 + $reserved2_offset;
310 my $SGT_offset = $Red_Data_Size + $Reduce_Data_offset;
311 my $Stmp_offset = 8*8 + $SGT_offset;
312 my $Stmp16_offset = 8*8 + $Stmp_offset;
313 my $garray_offset = 8*16 + $Stmp16_offset;
314 my $mem_size = 8*8*32 + $garray_offset;

316 #
317 # Offsets within Reduce Data
318 #
319 #
320 # struct MODF_2FOLD_MONT_512_C1_DATA {
321 #   UINT64 t[8][8];
322 #   UINT64 m[8];
323 #   UINT64 m1[8]; /* 2^768 % m */
324 #   UINT64 m2[8]; /* 2^640 % m */
325 #   UINT64 k1[2]; /* (- 1/m) % 2^128 */

```

```

326 #      };

328 my $T = 0;
329 my $M = 512;
330 my $M1 = 576;
331 my $M2 = 640;
332 my $K1 = 704;

# = 8 * 8 * 8
# = 8 * 8 * 9 /* += 8 * 8 */
# = 8 * 8 * 10 /* += 8 * 8 */
# = 8 * 8 * 11 /* += 8 * 8 */

334 #
335 # FUNCTIONS
336 #

338 {{{
339 #
340 # MULADD_128x512 : Function to multiply 128-bits (2 qwords) by 512-bits (8 qword
341 #                  and add 512-bits (8 qwords)
342 #                  to get 640 bits (10 qwords)
343 # Input: 128-bit mul source: [rdi+8*1], rbp
344 #        512-bit mul source: [rsi+8*n]
345 #        512-bit add source: r15, r14, ..., r9, r8
346 # Output: r9, r8, r15, r14, r13, r12, r11, r10, [rcx+8*1], [rcx+8*0]
347 # Clobbers all regs except: rcx, rsi, rdi
348 $code.=<<__;;
349 .type MULADD_128x512,\@abi-omnipotent
350 .align 16
351 MULADD_128x512:
352 __
353     &MULTSTEP_512([map("%r$", (8..15))], "(+8*0)(%rcx)", "%rsi", "%rbp", "%rb
354 $code.=<<__;;
355     mov     (+8*1)(%rdi), %rbp
356 __
357     &MULTSTEP_512([map("%r$", (9..15,8))], "(+8*1)(%rcx)", "%rsi", "%rbp", "%
358 $code.=<<__;;
359     ret
360 .size     MULADD_128x512,.-MULADD_128x512
361 __
362 }}}

364 {{{
365 #MULADD_256x512 MACRO    pDst, pA, pB, OP, TMP, X7, X6, X5, X4, X3, X2, X1, X0
366 #
367 # Inputs: pDst: Destination (768 bits, 12 qwords)
368 #        pA: Multiplicand (1024 bits, 16 qwords)
369 #        pB: Multiplicand (512 bits, 8 qwords)
370 # Dst = Ah * B + Al
371 # where Ah is (in qwords) A[15:12] (256 bits) and Al is A[7:0] (512 bits)
372 # Results in X3 X2 X1 X0 X7 X6 X5 X4 Dst[3:0]
373 # Uses registers: arguments, RAX, RDX
374 sub MULADD_256x512
375 {
376     my ($pDst, $pA, $pB, $OP, $TMP, $X) = @_;
377     $code.=<<__;;
378     mov     (+8*12)(%pA), $OP
379 __
380     &MULTSTEP_512_ADD($X, "(+8*0)(%pDst)", $pB, $pA, $OP, $TMP);
381     push(@$X, shift(@$X));

383 $code.=<<__;;
384     mov     (+8*13)(%pA), $OP
385 __
386     &MULTSTEP_512($X, "(+8*1)(%pDst)", $pB, $OP, $TMP);
387     push(@$X, shift(@$X));

389 $code.=<<__;;
390     mov     (+8*14)(%pA), $OP
391 __

```

```

392      &MULTSTEP_512($X, "(+8*2)($pDst)", $pB, $oP, $TMP);
393      push(@$X, shift(@$X));

395 $code.=<<__ ;
396      mov     (+8*15)($pA), $oP
397  ____
398      &MULTSTEP_512($X, "(+8*3)($pDst)", $pB, $oP, $TMP);
399      push(@$X, shift(@$X));
400 }

402 #
403 # mont_reduce(UINT64 *x, /* 1024 bits, 16 qwords */
404 #             UINT64 *m, /* 512 bits, 8 qwords */
405 #             MODF_2FOLD_MONT_512_C1_DATA *data,
406 #             UINT64 *r) /* 512 bits, 8 qwords */
407 # Input:  x (number to be reduced): tmp16 (Implicit)
408 #         m (modulus):                [pM] (Implicit)
409 #         data (reduce data):         [pData] (Implicit)
410 # Output: r (result):                Address in [red_res_addr]
411 #         result also in: r9, r8, r15, r14, r13, r12, r11, r10

413 my @X=map("%r$_", (8..15));

415 $code.=<<__ ;
416 .type mont_reduce, \@abi-omnipotent
417 .align 16
418 mont_reduce:
419 ____

421 my $STACK_DEPTH      = 8;
422 #
423 # X1 = Xh * M1 + Xl
424 $code.=<<__ ;
425      lea     (+$Reduce_Data_offset+$X1_offset+$STACK_DEPTH)(%rsp), %rdi
426      mov     (+$pData_offset+$STACK_DEPTH)(%rsp), %rsi
427      add     \$$M1, %rsi
428      lea     (+$tmp16_offset+$STACK_DEPTH)(%rsp), %rcx

430 ____

432      &MULADD_256x512("%rdi", "%rcx", "%rsi", "%rbp", "%rbx", \@X); # rotate
433      # results in r11, r10, r9, r8, r15, r14, r13, r12, X1[3:0]

435 $code.=<<__ ;
436      xor     %rax, %rax
437      # X1 += xl
438      add     (+8*8)(%rcx), $X[4]
439      adc     (+8*9)(%rcx), $X[5]
440      adc     (+8*10)(%rcx), $X[6]
441      adc     (+8*11)(%rcx), $X[7]
442      adc     \0, %rax
443      # X1 is now rax, r11-r8, r15-r12, tmp16[3:0]

445 #
446 # check for carry ;; carry stored in rax
447      mov     $X[4], (+8*8)(%rdi)          # rdi points to X1
448      mov     $X[5], (+8*9)(%rdi)
449      mov     $X[6], %rbp
450      mov     $X[7], (+8*11)(%rdi)

452      mov     %rax, (+$Reduce_Data_offset+$Carries_offset+$STACK_DEPTH)(%rsp)

454      mov     (+8*0)(%rdi), $X[4]
455      mov     (+8*1)(%rdi), $X[5]
456      mov     (+8*2)(%rdi), $X[6]
457      mov     (+8*3)(%rdi), $X[7]

```

```

459      # X1 is now stored in: X1[11], rbp, X1[9:8], r15-r8
460      # rdi -> X1
461      # rsi -> M1

463 #
464 # X2 = Xh * M2 + Xl
465 # do first part (X2 = Xh * M2)
466      add     \$$M1, %rdi          # rdi -> pXh ; 128 bits, 2 qword
467      #                                     Xh is actually { [rdi+8*1], rbp }
468      add     \$$M2-$M1', %rsi     # rsi -> M2
469      lea     (+$Reduce_Data_offset+$X2_offset+$STACK_DEPTH)(%rsp), %rcx
470  ____
471      unshift(@X, pop(@X));      unshift(@X, pop(@X));
472 $code.=<<__ ;

474      call    MULADD_128x512      # args in rcx, rdi / rbp, rsi, r
475      # result in r9, r8, r15, r14, r13, r12, r11, r10, X2[1:0]
476      mov     (+$Reduce_Data_offset+$Carries_offset+$STACK_DEPTH)(%rsp), %rax

478 # X2 += Xl
479      add     (+8*8-8*10)(%rdi), $X[6]          # (-8*10) is to adjust r
480      adc     (+8*9-8*10)(%rdi), $X[7]
481      mov     $X[6], (+8*8)(%rcx)
482      mov     $X[7], (+8*9)(%rcx)

484      adc     %rax, %rax
485      mov     %rax, (+$Reduce_Data_offset+$Carries_offset+$STACK_DEPTH)(%rsp)

487      lea     (+$Reduce_Data_offset+$Q_offset+$STACK_DEPTH)(%rsp), %rdi
488      add     \$$K1-$M2', %rsi          # rsi -> pK1 ; 128 bits,

490 # MUL_128x128t128      rdi, rcx, rsi ; Q = X2 * K1 (bottom half)
491 # B1:B0 = rsi[1:0] = K1[1:0]
492 # A1:A0 = rcx[1:0] = X2[1:0]
493 # Result = rdi[1], rbp = Q[1], rbp
494      mov     (%rsi), %r8          # B0
495      mov     (+8*1)(%rsi), %rbx   # B1

497      mov     (%rcx), %rax          # A0
498      mul     %r8          # B0
499      mov     %rax, %rbp
500      mov     %rdx, %r9

502      mov     (+8*1)(%rcx), %rax    # B0
503      mul     %r8          # B0
504      add     %rax, %r9            # A1

506      mov     (%rcx), %rax          # B1
507      mul     %rbx          # B1
508      add     %rax, %r9            # A0

510      mov     %r9, (+8*1)(%rdi)
511      # end MUL_128x128t128

513      sub     \$$K1-$M', %rsi

515      mov     (%rcx), $X[6]
516      mov     (+8*1)(%rcx), $X[7]          # r9:r8 = X2[1:0]

518      call    MULADD_128x512      # args in rcx, rdi / rbp, rsi, r
519      # result in r9, r8, r15, r14, r13, r12, r11, r10, X2[1:0]

521 # load first half of m to rdx, rdi, rbx, rax
522 # moved this here for efficiency
523      mov     (+8*0)(%rsi), %rax

```

```

524     mov     (+8*1)(%rsi), %rbx
525     mov     (+8*2)(%rsi), %rdi
526     mov     (+8*3)(%rsi), %rdx

528     # continue with reduction
529     mov     (+$Reduce_Data_offset+$Carries_offset+$STACK_DEPTH)(%rsp), %rbp

531     add     (+8*8)(%rcx), $X[6]
532     adc     (+8*9)(%rcx), $X[7]

534     #accumulate the final carry to rbp
535     adc     %rbp, %rbp

537     # Add in overflow corrections: R = (X2>>128) += T[overflow]
538     # R = {r9, r8, r15, r14, ..., r10}
539     shl     $3, %rbp
540     mov     (+$pData_offset+$STACK_DEPTH)(%rsp), %rcx
541     add     %rcx, %rbp          # pT ; 512 bits, 8 qwords, spread

543     # rsi will be used to generate a mask after the addition
544     xor     %rsi, %rsi

546     add     (+8*8*0)(%rbp), $X[0]
547     adc     (+8*8*1)(%rbp), $X[1]
548     adc     (+8*8*2)(%rbp), $X[2]
549     adc     (+8*8*3)(%rbp), $X[3]
550     adc     (+8*8*4)(%rbp), $X[4]
551     adc     (+8*8*5)(%rbp), $X[5]
552     adc     (+8*8*6)(%rbp), $X[6]
553     adc     (+8*8*7)(%rbp), $X[7]

555     # if there is a carry: rsi = 0xFFFFFFFFFFFFFFFF
556     # if carry is clear:   rsi = 0x0000000000000000
557     sbb     $0, %rsi

559     # if carry is clear, subtract 0. Otherwise, subtract 256 bits of m
560     and     %rsi, %rax
561     and     %rsi, %rbx
562     and     %rsi, %rdi
563     and     %rsi, %rdx

565     mov     $1, %rbp
566     sub     %rax, $X[0]
567     sbb     %rbx, $X[1]
568     sbb     %rdi, $X[2]
569     sbb     %rdx, $X[3]

571     # if there is a borrow:      rbp = 0
572     # if there is no borrow:    rbp = 1
573     # this is used to save the borrows in between the first half and the 2nd
574     sbb     $0, %rbp

576     #load second half of m to rdx, rdi, rbx, rax

578     add     $X[4], %rcx
579     mov     (+8*4)(%rcx), %rax
580     mov     (+8*5)(%rcx), %rbx
581     mov     (+8*6)(%rcx), %rdi
582     mov     (+8*7)(%rcx), %rdx

584     # use the rsi mask as before
585     # if carry is clear, subtract 0. Otherwise, subtract 256 bits of m
586     and     %rsi, %rax
587     and     %rsi, %rbx
588     and     %rsi, %rdi
589     and     %rsi, %rdx

```

```

591     # if rbp = 0, there was a borrow before, it is moved to the carry flag
592     # if rbp = 1, there was not a borrow before, carry flag is cleared
593     sub     $1, %rbp

595     sbb     %rax, $X[4]
596     sbb     %rbx, $X[5]
597     sbb     %rdi, $X[6]
598     sbb     %rdx, $X[7]

600     # write R back to memory

602     mov     (+$Red_result_addr_offset+$STACK_DEPTH)(%rsp), %rsi
603     mov     $X[0], (+8*0)(%rsi)
604     mov     $X[1], (+8*1)(%rsi)
605     mov     $X[2], (+8*2)(%rsi)
606     mov     $X[3], (+8*3)(%rsi)
607     mov     $X[4], (+8*4)(%rsi)
608     mov     $X[5], (+8*5)(%rsi)
609     mov     $X[6], (+8*6)(%rsi)
610     mov     $X[7], (+8*7)(%rsi)

612     ret
613 .size     mont_reduce,.-mont_reduce
614
615 }}}

617 {{{
618 #MUL_512x512      MACRO    pDst, pA, pB, x7, x6, x5, x4, x3, x2, x1, x0, tmp*2
619 #
620 # Inputs: pDst: Destination (1024 bits, 16 qwords)
621 #           pA:  Multiplicand (512 bits, 8 qwords)
622 #           pB:  Multiplicand (512 bits, 8 qwords)
623 # Uses registers rax, rdx, args
624 #   B operand in [pB] and also in x7...x0
625 sub MUL_512x512
626 {
627     my ($pDst, $pA, $pB, $x, $OP, $TMP, $pDst_o)=@_;
628     my ($pDst, $pDst_o) = ($pDst =~ m/([^\+]*\+?(.*)?)/);
629     my @X=@$x;          # make a copy

631     $code.=<<<";
632     mov     (+8*0)(%pA), $OP

634     mov     $X[0], %rax
635     mul     $OP                      # rdx:rax = %OP * [0]
636     mov     %rax, (+$pDst_o+8*0)(%pDst)
637     mov     %rdx, $X[0]

638     for(my $i=1;$i<8;$i++) {
639     $code.=<<<";
641     mov     $X[$i], %rax
642     mul     $OP                      # rdx:rax = %OP * [$i]
643     add     %rax, $X[$i-1]
644     adc     $0, %rdx
645     mov     %rdx, $X[$i]

646     }

649     for(my $i=1;$i<8;$i++) {
650     $code.=<<<";
651     mov     (+8*$i)(%pA), $OP

654     &MULTSTEP_512(\@X, "(+$pDst_o+8*$i)(%pDst)", $pB, $OP, $TMP);
655     push(@X, shift(@X));

```

```

656 }

658 $code.=<<<__ ;
659     mov     $X[0], (+$pDst_o+8*8)($pDst)
660     mov     $X[1], (+$pDst_o+8*9)($pDst)
661     mov     $X[2], (+$pDst_o+8*10)($pDst)
662     mov     $X[3], (+$pDst_o+8*11)($pDst)
663     mov     $X[4], (+$pDst_o+8*12)($pDst)
664     mov     $X[5], (+$pDst_o+8*13)($pDst)
665     mov     $X[6], (+$pDst_o+8*14)($pDst)
666     mov     $X[7], (+$pDst_o+8*15)($pDst)
667 __
668 }

670 #
671 # mont_mul_a3b : subroutine to compute (Src1 * Src2) % M (all 512-bits)
672 # Input:  src1: Address of source 1: rdi
673 #         src2: Address of source 2: rsi
674 # Output: dst: Address of destination: [red_res_addr]
675 #         src2 and result also in: r9, r8, r15, r14, r13, r12, r11, r10
676 # Temp:   Clobbers [tmp16], all registers
677 $code.=<<<__ ;
678 .type     mont_mul_a3b,\@abi-omnipotent
679 .align    16
680 mont_mul_a3b:
681     #
682     # multiply tmp = src1 * src2
683     # For multiply: dst = rcx, src1 = rdi, src2 = rsi
684     # stack depth is extra 8 from call
685 __
686     &MUL_512x512("%rsp+$tmp16_offset+8", "%rdi", "%rsi", [map("%r$", (10..15)
687 $code.=<<<__ ;
688     #
689     # Dst = tmp % m
690     # Call reduce(tmp, m, data, dst)
691 __
692     # tail recursion optimization: jmp to mont_reduce and return from there
693     jmp     mont_reduce
694     # call mont_reduce
695     # ret
696 .size     mont_mul_a3b,.-mont_mul_a3b
697 __
698 }}}

700 {{{
701 #SQR_512 MACRO pDest, pA, x7, x6, x5, x4, x3, x2, x1, x0, tmp*4
702 #
703 # Input in memory [pA] and also in x7..x0
704 # Uses all argument registers plus rax and rdx
705 #
706 # This version computes all of the off-diagonal terms into memory,
707 # and then it adds in the diagonal terms

709 sub SQR_512
710 {
711     my ($pDst, $pA, $x, $A, $tmp, $x7, $x6, $pDst_o)=@_ ;
712     my ($pDst, $pDst_o) = ($pDst =~ m/([^\+]*\+?(.*)?)/);
713     my @X=@$x;      # make a copy
714     $code.=<<<__ ;
715     # -----
716     # first pass 01...07
717     # -----
718     mov     $X[0], $A

720     mov     $X[1],%rax
721     mul     $A

```

```

722     mov     %rax, (+$pDst_o+8*1)($pDst)
723
724     for(my $i=2;$i<8;$i++) {
725     $code.=<<<__ ;
726         mov     %rdx, $X[$i-2]
727         mov     $X[$i],%rax
728         mul     $A
729         add     %rax, $X[$i-2]
730         adc     \%0, %rdx
731     }
732
733     $code.=<<<__ ;
734     mov     %rdx, $x7

736     mov     $X[0], (+$pDst_o+8*2)($pDst)

738     # -----
739     # second pass 12...17
740     # -----

742     mov     (+8*1)($pA), $A

744     mov     (+8*2)($pA),%rax
745     mul     $A
746     add     %rax, $X[1]
747     adc     \%0, %rdx
748     mov     $X[1], (+$pDst_o+8*3)($pDst)

750     mov     %rdx, $X[0]
751     mov     (+8*3)($pA),%rax
752     mul     $A
753     add     %rax, $X[2]
754     adc     \%0, %rdx
755     add     $X[0], $X[2]
756     adc     \%0, %rdx
757     mov     $X[2], (+$pDst_o+8*4)($pDst)

759     mov     %rdx, $X[0]
760     mov     (+8*4)($pA),%rax
761     mul     $A
762     add     %rax, $X[3]
763     adc     \%0, %rdx
764     add     $X[0], $X[3]
765     adc     \%0, %rdx

767     mov     %rdx, $X[0]
768     mov     (+8*5)($pA),%rax
769     mul     $A
770     add     %rax, $X[4]
771     adc     \%0, %rdx
772     add     $X[0], $X[4]
773     adc     \%0, %rdx

775     mov     %rdx, $X[0]
776     mov     $X[6],%rax
777     mul     $A
778     add     %rax, $X[5]
779     adc     \%0, %rdx
780     add     $X[0], $X[5]
781     adc     \%0, %rdx

783     mov     %rdx, $X[0]
784     mov     $X[7],%rax
785     mul     $A
786     add     %rax, $x7
787     adc     \%0, %rdx

```

```

788      add    $X[0], %rax
789      adc    \%0, %rdx

791      mov    %rdx, $X[1]

793      # -----
794      # third pass 23...27
795      # -----
796      mov     (+8*2)($pA), %rax

798      mov     (+8*3)($pA), %rax
799      mul     $A
800      add     %rax, $X[3]
801      adc     \%0, %rdx
802      mov     $X[3], (+$pDst_o+8*5)($pDst)

804      mov     %rdx, $X[0]
805      mov     (+8*4)($pA), %rax
806      mul     $A
807      add     %rax, $X[4]
808      adc     \%0, %rdx
809      add     $X[0], $X[4]
810      adc     \%0, %rdx
811      mov     $X[4], (+$pDst_o+8*6)($pDst)

813      mov     %rdx, $X[0]
814      mov     (+8*5)($pA), %rax
815      mul     $A
816      add     %rax, $X[5]
817      adc     \%0, %rdx
818      add     $X[0], $X[5]
819      adc     \%0, %rdx

821      mov     %rdx, $X[0]
822      mov     $X[6], %rax
823      mul     $A
824      add     %rax, %rax
825      adc     \%0, %rdx
826      add     $X[0], %rax
827      adc     \%0, %rdx

829      mov     %rdx, $X[0]
830      mov     $X[7], %rax
831      mul     $A
832      add     %rax, $X[1]
833      adc     \%0, %rdx
834      add     $X[0], $X[1]
835      adc     \%0, %rdx

837      mov     %rdx, $X[2]

839      # -----
840      # fourth pass 34...37
841      # -----

843      mov     (+8*3)($pA), %rax

845      mov     (+8*4)($pA), %rax
846      mul     $A
847      add     %rax, $X[5]
848      adc     \%0, %rdx
849      mov     $X[5], (+$pDst_o+8*7)($pDst)

851      mov     %rdx, $X[0]
852      mov     (+8*5)($pA), %rax
853      mul     $A

```

```

854      add     %rax, %rax
855      adc     \%0, %rdx
856      add     $X[0], %rax
857      adc     \%0, %rdx
858      mov     %rax, (+$pDst_o+8*8)($pDst)

860      mov     %rdx, $X[0]
861      mov     $X[6], %rax
862      mul     $A
863      add     %rax, $X[1]
864      adc     \%0, %rdx
865      add     $X[0], $X[1]
866      adc     \%0, %rdx

868      mov     %rdx, $X[0]
869      mov     $X[7], %rax
870      mul     $A
871      add     %rax, $X[2]
872      adc     \%0, %rdx
873      add     $X[0], $X[2]
874      adc     \%0, %rdx

876      mov     %rdx, $X[5]

878      # -----
879      # fifth pass 45...47
880      # -----
881      mov     (+8*4)($pA), %rax

883      mov     (+8*5)($pA), %rax
884      mul     $A
885      add     %rax, $X[1]
886      adc     \%0, %rdx
887      mov     $X[1], (+$pDst_o+8*9)($pDst)

889      mov     %rdx, $X[0]
890      mov     $X[6], %rax
891      mul     $A
892      add     %rax, $X[2]
893      adc     \%0, %rdx
894      add     $X[0], $X[2]
895      adc     \%0, %rdx
896      mov     $X[2], (+$pDst_o+8*10)($pDst)

898      mov     %rdx, $X[0]
899      mov     $X[7], %rax
900      mul     $A
901      add     %rax, $X[5]
902      adc     \%0, %rdx
903      add     $X[0], $X[5]
904      adc     \%0, %rdx

906      mov     %rdx, $X[1]

908      # -----
909      # sixth pass 56...57
910      # -----
911      mov     (+8*5)($pA), %rax

913      mov     $X[6], %rax
914      mul     $A
915      add     %rax, $X[5]
916      adc     \%0, %rdx
917      mov     $X[5], (+$pDst_o+8*11)($pDst)

919      mov     %rdx, $X[0]

```



```

920     mov     $X[7],%rax
921     mul     $A
922     add     %rax,$X[1]
923     adc     \0,$rdx
924     add     $X[0],$X[1]
925     adc     \0,$rdx
926     mov     $X[1],(+SpDst_o+8*12)($pDst)

928     mov     %rdx,$X[2]

930     # -----
931     # seventh pass 67
932     # -----
933     mov     $X[6],$A

935     mov     $X[7],%rax
936     mul     $A
937     add     %rax,$X[2]
938     adc     \0,$rdx
939     mov     $X[2],(+SpDst_o+8*13)($pDst)

941     mov     %rdx,(+SpDst_o+8*14)($pDst)

943     # start finalize (add in squares, and double off-terms)
944     mov     (+SpDst_o+8*1)($pDst),$X[0]
945     mov     (+SpDst_o+8*2)($pDst),$X[1]
946     mov     (+SpDst_o+8*3)($pDst),$X[2]
947     mov     (+SpDst_o+8*4)($pDst),$X[3]
948     mov     (+SpDst_o+8*5)($pDst),$X[4]
949     mov     (+SpDst_o+8*6)($pDst),$X[5]

951     mov     (+8*3)($pA),%rax
952     mul     %rax
953     mov     %rax,$x6
954     mov     %rdx,$X[6]

956     add     $X[0],$X[0]
957     adc     $X[1],$X[1]
958     adc     $X[2],$X[2]
959     adc     $X[3],$X[3]
960     adc     $X[4],$X[4]
961     adc     $X[5],$X[5]
962     adc     \0,$X[6]

964     mov     (+8*0)($pA),%rax
965     mul     %rax
966     mov     %rax,(+SpDst_o+8*0)($pDst)
967     mov     %rdx,$A

969     mov     (+8*1)($pA),%rax
970     mul     %rax

972     add     $A,$X[0]
973     adc     %rax,$X[1]
974     adc     \0,$rdx

976     mov     %rdx,$A
977     mov     $X[0],(+SpDst_o+8*1)($pDst)
978     mov     $X[1],(+SpDst_o+8*2)($pDst)

980     mov     (+8*2)($pA),%rax
981     mul     %rax

983     add     $A,$X[2]
984     adc     %rax,$X[3]
985     adc     \0,$rdx

```

```

987     mov     %rdx,$A

989     mov     $X[2],(+SpDst_o+8*3)($pDst)
990     mov     $X[3],(+SpDst_o+8*4)($pDst)

992     xor     $tmp,$tmp
993     add     $A,$X[4]
994     adc     $x6,$X[5]
995     adc     \0,$tmp

997     mov     $X[4],(+SpDst_o+8*5)($pDst)
998     mov     $X[5],(+SpDst_o+8*6)($pDst)

1000     # %%tmp has 0/1 in column 7
1001     # %%A6 has a full value in column 7

1003     mov     (+SpDst_o+8*7)($pDst),$X[0]
1004     mov     (+SpDst_o+8*8)($pDst),$X[1]
1005     mov     (+SpDst_o+8*9)($pDst),$X[2]
1006     mov     (+SpDst_o+8*10)($pDst),$X[3]
1007     mov     (+SpDst_o+8*11)($pDst),$X[4]
1008     mov     (+SpDst_o+8*12)($pDst),$X[5]
1009     mov     (+SpDst_o+8*13)($pDst),$x6
1010     mov     (+SpDst_o+8*14)($pDst),$x7

1012     mov     $X[7],%rax
1013     mul     %rax
1014     mov     %rax,$X[7]
1015     mov     %rdx,$A

1017     add     $X[0],$X[0]
1018     adc     $X[1],$X[1]
1019     adc     $X[2],$X[2]
1020     adc     $X[3],$X[3]
1021     adc     $X[4],$X[4]
1022     adc     $X[5],$X[5]
1023     adc     $x6,$x6
1024     adc     $x7,$x7
1025     adc     \0,$A

1027     add     $tmp,$X[0]

1029     mov     (+8*4)($pA),%rax
1030     mul     %rax

1032     add     $X[6],$X[0]
1033     adc     %rax,$X[1]
1034     adc     \0,$rdx

1036     mov     %rdx,$tmp

1038     mov     $X[0],(+SpDst_o+8*7)($pDst)
1039     mov     $X[1],(+SpDst_o+8*8)($pDst)

1041     mov     (+8*5)($pA),%rax
1042     mul     %rax

1044     add     $tmp,$X[2]
1045     adc     %rax,$X[3]
1046     adc     \0,$rdx

1048     mov     %rdx,$tmp

1050     mov     $X[2],(+SpDst_o+8*9)($pDst)
1051     mov     $X[3],(+SpDst_o+8*10)($pDst)

```

```

1053     mov     (+8*6)($pA), %rax
1054     mul     %rax

1056     add     $tmp, $X[4]
1057     adc     %rax, $X[5]
1058     adc     \%0, %rdx

1060     mov     $X[4], (+$pDst_o+8*11)($pDst)
1061     mov     $X[5], (+$pDst_o+8*12)($pDst)

1063     add     %rdx, $x6
1064     adc     $X[7], $x7
1065     adc     \%0, $A

1067     mov     $x6, (+$pDst_o+8*13)($pDst)
1068     mov     $x7, (+$pDst_o+8*14)($pDst)
1069     mov     $A, (+$pDst_o+8*15)($pDst)
1070
1071 }

1073 #
1074 # sqr_reduce: subroutine to compute Result = reduce(Result * Result)
1075 #
1076 # input and result also in: r9, r8, r15, r14, r13, r12, r11, r10
1077 #
1078 $code.=<<<;
1079 .type    sqr_reduce,@abi-omnipotent
1080 .align 16
1081 sqr_reduce:
1082     mov     (+$pResult_offset+8)(%rsp), %rcx
1083
1084     &SQR_512("%rsp+$tmp16_offset+8", "%rcx", [map("%r$", (10..15, 8..9))], "%
1085 $code.=<<<;
1086     # tail recursion optimization: jmp to mont_reduce and return from there
1087     jmp     mont_reduce
1088     # call mont_reduce
1089     # ret
1090 .size    sqr_reduce,.-sqr_reduce
1091
1092 }}}

1094 #
1095 # MAIN FUNCTION
1096 #

1098 #mod_exp_512(UINT64 *result, /* 512 bits, 8 qwords */
1099 #             UINT64 *g, /* 512 bits, 8 qwords */
1100 #             UINT64 *exp, /* 512 bits, 8 qwords */
1101 #             struct mod_ctx_512 *data)

1103 # window size = 5
1104 # table size = 2^5 = 32
1105 #table_entries equ 32
1106 #table_size equ table_entries * 8
1107 $code.=<<<;
1108 .globl mod_exp_512
1109 .type mod_exp_512,@function,4
1110 mod_exp_512:
1111     push    %rbp
1112     push    %rbx
1113     push    %r12
1114     push    %r13
1115     push    %r14
1116     push    %r15

```

```

1118     # adjust stack down and then align it with cache boundary
1119     mov     %rsp, %r8
1120     sub     \%mem_size, %rsp
1121     and     \%-64, %rsp

1123     # store previous stack pointer and arguments
1124     mov     %r8, (+$rsp_offset)(%rsp)
1125     mov     %rdi, (+$pResult_offset)(%rsp)
1126     mov     %rsi, (+$pG_offset)(%rsp)
1127     mov     %rcx, (+$pData_offset)(%rsp)
1128
.Lbody:
1129     # transform g into montgomery space
1130     # GT = reduce(g * C2) = reduce(g * (2^256))
1131     # reduce expects to have the input in [tmp16]
1132     pxor     %xmm4, %xmm4
1133     movdqu   (+16*0)(%rsi), %xmm0
1134     movdqu   (+16*1)(%rsi), %xmm1
1135     movdqu   (+16*2)(%rsi), %xmm2
1136     movdqu   (+16*3)(%rsi), %xmm3
1137     movdqa   %xmm4, (+$tmp16_offset+16*0)(%rsp)
1138     movdqa   %xmm4, (+$tmp16_offset+16*1)(%rsp)
1139     movdqa   %xmm4, (+$tmp16_offset+16*6)(%rsp)
1140     movdqa   %xmm4, (+$tmp16_offset+16*7)(%rsp)
1141     movdqa   %xmm0, (+$tmp16_offset+16*2)(%rsp)
1142     movdqa   %xmm1, (+$tmp16_offset+16*3)(%rsp)
1143     movdqa   %xmm2, (+$tmp16_offset+16*4)(%rsp)
1144     movdqa   %xmm3, (+$tmp16_offset+16*5)(%rsp)

1146     # load pExp before rdx gets blown away
1147     movdqu   (+16*0)(%rdx), %xmm0
1148     movdqu   (+16*1)(%rdx), %xmm1
1149     movdqu   (+16*2)(%rdx), %xmm2
1150     movdqu   (+16*3)(%rdx), %xmm3

1152     lea     (+$GT_offset)(%rsp), %rbx
1153     mov     %rbx, (+$red_result_addr_offset)(%rsp)
1154     call    mont_reduce

1156     # Initialize tmp = C
1157     lea     (+$tmp_offset)(%rsp), %rcx
1158     xor     %rax, %rax
1159     mov     %rax, (+8*0)(%rcx)
1160     mov     %rax, (+8*1)(%rcx)
1161     mov     %rax, (+8*3)(%rcx)
1162     mov     %rax, (+8*4)(%rcx)
1163     mov     %rax, (+8*5)(%rcx)
1164     mov     %rax, (+8*6)(%rcx)
1165     mov     %rax, (+8*7)(%rcx)
1166     mov     %rax, (+$exp_offset+8*8)(%rsp)
1167     movq     \%1, (+8*2)(%rcx)

1169     lea     (+$garray_offset)(%rsp), %rbp
1170     mov     %rcx, %rsi
1171     mov     %rbp, %rdi
1172
1174     &swizzle("%rdi", "%rcx", "%rax", "%rbx");

1176     # for (rax = 31; rax != 0; rax--) {
1177     #     tmp = reduce(tmp * G)
1178     #     swizzle(pg, tmp);
1179     #     pg += 2; }
1180 $code.=<<<;
1181     mov     \%31, %rax
1182     mov     %rax, (+$i_offset)(%rsp)
1183     mov     %rbp, (+$pg_offset)(%rsp)

```

```

1184      # rsi -> pTmp
1185      mov     %rsi, (+$red_result_addr_offset)(%rsp)
1186      mov     (+8*0)(%rsi), %r10
1187      mov     (+8*1)(%rsi), %r11
1188      mov     (+8*2)(%rsi), %r12
1189      mov     (+8*3)(%rsi), %r13
1190      mov     (+8*4)(%rsi), %r14
1191      mov     (+8*5)(%rsi), %r15
1192      mov     (+8*6)(%rsi), %r8
1193      mov     (+8*7)(%rsi), %r9
1194 init_loop:
1195      lea     (+$GT_offset)(%rsp), %rdi
1196      call    mont_mul_a3b
1197      lea     (+$tmp_offset)(%rsp), %rsi
1198      mov     (+$pg_offset)(%rsp), %rbp
1199      add     $2, %rbp
1200      mov     %rbp, (+$pg_offset)(%rsp)
1201      mov     %rsi, %rcx          # rcx = rsi = addr of tmp
1202      ____

1204      &swizzle("%rbp", "%rcx", "%rax", "%rbx");
1205 $code.=<<____;
1206      mov     (+$i_offset)(%rsp), %rax
1207      sub     $1, %rax
1208      mov     %rax, (+$i_offset)(%rsp)
1209      jne     init_loop

1211      #
1212      # Copy exponent onto stack
1213      movdqa  %xmm0, (+$exp_offset+16*0)(%rsp)
1214      movdqa  %xmm1, (+$exp_offset+16*1)(%rsp)
1215      movdqa  %xmm2, (+$exp_offset+16*2)(%rsp)
1216      movdqa  %xmm3, (+$exp_offset+16*3)(%rsp)

1219      #
1220      # Do exponentiation
1221      # Initialize result to G[exp{511:507}]
1222      mov     (+$exp_offset+62)(%rsp), %eax
1223      mov     %rax, %rdx
1224      shr     $11, %rax
1225      and     $0x07FF, %edx
1226      mov     %edx, (+$exp_offset+62)(%rsp)
1227      lea     (+$garray_offset)(%rsp,%rax,2), %rsi
1228      mov     (+$pResult_offset)(%rsp), %rdx
1229      ____

1231      &unswizzle("%rdx", "%rsi", "%rbp", "%rbx", "%rax");

1233      #
1234      # Loop variables
1235      # rcx = [loop_idx] = index: 510-5 to 0 by 5
1236 $code.=<<____;
1237      movq     $505, (+$loop_idx_offset)(%rsp)

1239      mov     (+$pResult_offset)(%rsp), %rcx
1240      mov     %rcx, (+$red_result_addr_offset)(%rsp)
1241      mov     (+8*0)(%rcx), %r10
1242      mov     (+8*1)(%rcx), %r11
1243      mov     (+8*2)(%rcx), %r12
1244      mov     (+8*3)(%rcx), %r13
1245      mov     (+8*4)(%rcx), %r14
1246      mov     (+8*5)(%rcx), %r15
1247      mov     (+8*6)(%rcx), %r8
1248      mov     (+8*7)(%rcx), %r9
1249      jmp     sqr_2

```

```

1251 main_loop_a3b:
1252      call    sqr_reduce
1253      call    sqr_reduce
1254      call    sqr_reduce
1255      #
1256      # Do multiply, first look up proper value in Garray      # bit index
1257      #
1258      mov     (+$loop_idx_offset)(%rsp), %rcx          # bit index
1259      mov     %rcx, %rax
1260      shr     $4, %rax          # rax is word pointer
1261      mov     (+$exp_offset)(%rsp,%rax,2), %edx
1262      and     $15, %rcx
1263      shrq    %cl, %rdx
1264      and     $0x1F, %rdx
1265      lea     (+$garray_offset)(%rsp,%rdx,2), %rsi
1266      lea     (+$tmp_offset)(%rsp), %rdx
1267      mov     %rdx, %rdi
1268      ____

1269      &unswizzle("%rdx", "%rsi", "%rbp", "%rbx", "%rax");
1270      # rdi = tmp = pG
1271      ____

1272      #
1273      # Call mod_mul_a1(pDst, pSrc1, pSrc2, pM, pData)
1274      # result result pG      M      Data
1275      #
1276      $code.=<<____;
1277      mov     (+$pResult_offset)(%rsp), %rsi
1278      call    mont_mul_a3b

1284      #
1285      # finish loop
1286      mov     (+$loop_idx_offset)(%rsp), %rcx
1287      sub     $5, %rcx
1288      mov     %rcx, (+$loop_idx_offset)(%rsp)
1289      jge     main_loop_a3b

1291      #

1293 end_main_loop_a3b:
1294      # transform result out of Montgomery space
1295      # result = reduce(result)
1296      mov     (+$pResult_offset)(%rsp), %rdx
1297      pxor    %xmm4, %xmm4
1298      movdqu  (+16*0)(%rdx), %xmm0
1299      movdqu  (+16*1)(%rdx), %xmm1
1300      movdqu  (+16*2)(%rdx), %xmm2
1301      movdqu  (+16*3)(%rdx), %xmm3
1302      movdqa  %xmm4, (+$tmp16_offset+16*4)(%rsp)
1303      movdqa  %xmm4, (+$tmp16_offset+16*5)(%rsp)
1304      movdqa  %xmm4, (+$tmp16_offset+16*6)(%rsp)
1305      movdqa  %xmm4, (+$tmp16_offset+16*7)(%rsp)
1306      movdqa  %xmm0, (+$tmp16_offset+16*0)(%rsp)
1307      movdqa  %xmm1, (+$tmp16_offset+16*1)(%rsp)
1308      movdqa  %xmm2, (+$tmp16_offset+16*2)(%rsp)
1309      movdqa  %xmm3, (+$tmp16_offset+16*3)(%rsp)
1310      call    mont_reduce

1312      # If result > m, subtract m
1313      # load result into r15:r8
1314      mov     (+$pResult_offset)(%rsp), %rax
1315      mov     (+8*0)(%rax), %r8

```

```

1316     mov     (+8*1)(%rax), %r9
1317     mov     (+8*2)(%rax), %r10
1318     mov     (+8*3)(%rax), %r11
1319     mov     (+8*4)(%rax), %r12
1320     mov     (+8*5)(%rax), %r13
1321     mov     (+8*6)(%rax), %r14
1322     mov     (+8*7)(%rax), %r15

1324     # subtract m
1325     mov     (+$pData_offset)(%rsp), %rbx
1326     add     \$$M, %rbx

1328     sub     (+8*0)(%rbx), %r8
1329     sbb     (+8*1)(%rbx), %r9
1330     sbb     (+8*2)(%rbx), %r10
1331     sbb     (+8*3)(%rbx), %r11
1332     sbb     (+8*4)(%rbx), %r12
1333     sbb     (+8*5)(%rbx), %r13
1334     sbb     (+8*6)(%rbx), %r14
1335     sbb     (+8*7)(%rbx), %r15

1337     # if Carry is clear, replace result with difference
1338     mov     (+8*0)(%rax), %rsi
1339     mov     (+8*1)(%rax), %rdi
1340     mov     (+8*2)(%rax), %rcx
1341     mov     (+8*3)(%rax), %rdx
1342     cmovnc %r8, %rsi
1343     cmovnc %r9, %rdi
1344     cmovnc %r10, %rcx
1345     cmovnc %r11, %rdx
1346     mov     %rsi, (+8*0)(%rax)
1347     mov     %rdi, (+8*1)(%rax)
1348     mov     %rcx, (+8*2)(%rax)
1349     mov     %rdx, (+8*3)(%rax)

1351     mov     (+8*4)(%rax), %rsi
1352     mov     (+8*5)(%rax), %rdi
1353     mov     (+8*6)(%rax), %rcx
1354     mov     (+8*7)(%rax), %rdx
1355     cmovnc %r12, %rsi
1356     cmovnc %r13, %rdi
1357     cmovnc %r14, %rcx
1358     cmovnc %r15, %rdx
1359     mov     %rsi, (+8*4)(%rax)
1360     mov     %rdi, (+8*5)(%rax)
1361     mov     %rcx, (+8*6)(%rax)
1362     mov     %rdx, (+8*7)(%rax)

1364     mov     (+$rsp_offset)(%rsp), %rsi
1365     mov     0(%rsi), %r15
1366     mov     8(%rsi), %r14
1367     mov     16(%rsi), %r13
1368     mov     24(%rsi), %r12
1369     mov     32(%rsi), %rbx
1370     mov     40(%rsi), %rbp
1371     lea     48(%rsi), %rsp
1372 .Lepilogue:
1373     ret
1374 .size mod_exp_512, . - mod_exp_512
1375 ____

1377 if ($win64) {
1378 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec, ULONG64 frame,
1379 # CONTEXT *context, DISPATCHER_CONTEXT *disp)
1380 my $rec="%rcx";
1381 my $frame="%rdx";

```

```

1382 my $context="%r8";
1383 my $disp="%r9";

1385 $code.<=<____;
1386 .extern __imp_RtlVirtualUnwind
1387 .type   mod_exp_512_se_handler, \@abi-omnipotent
1388 .align  16
1389 mod_exp_512_se_handler:
1390     push    %rsi
1391     push    %rdi
1392     push    %rbx
1393     push    %rbp
1394     push    %r12
1395     push    %r13
1396     push    %r14
1397     push    %r15
1398     pushfq  %rsp
1399     sub     \$$4, %rsp

1401     mov     120($context), %rax
1402     mov     248($context), %rbx
1403     # pull context->Rax
1404     # pull context->Rip
1405     lea     .Lbody(%rip), %r10
1406     cmp     %r10, %rbx
1407     jb      .Lin_prologue
1408     # context->Rip<prologue label

1408     mov     152($context), %rax
1409     # pull context->Rsp

1410     lea     .Lepilogue(%rip), %r10
1411     cmp     %r10, %rbx
1412     jae     .Lin_prologue
1413     # context->Rip>=epilogue label

1414     mov     $rsp_offset(%rax), %rax
1415     # pull saved Rsp

1416     mov     32(%rax), %rbx
1417     mov     40(%rax), %rbp
1418     mov     24(%rax), %r12
1419     mov     16(%rax), %r13
1420     mov     8(%rax), %r14
1421     mov     0(%rax), %r15
1422     lea     48(%rax), %rax
1423     mov     %rbx, 144($context)
1424     mov     %rbp, 160($context)
1425     mov     %r12, 216($context)
1426     mov     %r13, 224($context)
1427     mov     %r14, 232($context)
1428     mov     %r15, 240($context)
1429     # restore context->Rbx
1430     # restore context->Rbp
1431     # restore context->R12
1432     # restore context->R13
1433     # restore context->R14
1434     # restore context->R15

1430 .Lin_prologue:
1431     mov     8(%rax), %rdi
1432     mov     16(%rax), %rsi
1433     mov     %rax, 152($context)
1434     mov     %rsi, 168($context)
1435     mov     %rdi, 176($context)
1436     # restore context->Rsp
1437     # restore context->Rsi
1438     # restore context->Rdi

1437     mov     40($disp), %rdi
1438     mov     $context, %rsi
1439     mov     \$$154, %ecx
1440     .long    0xa548f3fc
1441     # cld; rep movsq

1442     mov     $disp, %rsi
1443     xor     %rcx, %rcx
1444     mov     8(%rsi), %rdx
1445     mov     0(%rsi), %r8
1446     mov     16(%rsi), %r9
1447     mov     40(%rsi), %r10
1448     # arg1, UNW_FLAG_NHANDLER
1449     # arg2, disp->ImageBase
1450     # arg3, disp->ControlPc
1451     # arg4, disp->FunctionEntry
1452     # disp->ContextRecord

```

```

1448     lea     56(%rsi),%r11      # &disp->HandlerData
1449     lea     24(%rsi),%r12      # &disp->EstablisherFrame
1450     mov     %r10,32(%rsp)      # arg5
1451     mov     %r11,40(%rsp)      # arg6
1452     mov     %r12,48(%rsp)      # arg7
1453     mov     %rcx,56(%rsp)      # arg8, (NULL)
1454     call    *__imp_RtlVirtualUnwind(%rip)

1456     mov     \%$1,%eax          # ExceptionContinueSearch
1457     add     \%$64,%rsp
1458     popfq
1459     pop     %r15
1460     pop     %r14
1461     pop     %r13
1462     pop     %r12
1463     pop     %rbp
1464     pop     %rbx
1465     pop     %rdi
1466     pop     %rsi
1467     ret
1468 .size     mod_exp_512_se_handler,.-mod_exp_512_se_handler

1470 .section      .pdata
1471 .align 4
1472 .rva          .LSEH_begin_mod_exp_512
1473 .rva          .LSEH_end_mod_exp_512
1474 .rva          .LSEH_info_mod_exp_512

1476 .section      .xdata
1477 .align 8
1478 .LSEH_info_mod_exp_512:
1479 .byte 9,0,0,0
1480 .rva      mod_exp_512_se_handler
1481 ____
1482 }

1484 sub reg_part {
1485 my ($reg,$conv)=@_;
1486 if ($reg =~ /\%r[0-9]+/) { $reg .= $conv; }
1487 elsif ($conv eq "b") { $reg =~ s/\%[er]([^\x]+)x?/\%$1l/; }
1488 elsif ($conv eq "w") { $reg =~ s/\%[er]([^\x]+)\.)/\%$1/; }
1489 elsif ($conv eq "d") { $reg =~ s/\%[er]([^\x]+)\.)/\%e$1/; }
1490 return $reg;
1491 }

1493 $code =~ s/(%[a-z0-9]+)#([bwd])/reg_part($1,$2)/gem;
1494 $code =~ s/\'([^\']*)\'/eval $1/gem;
1495 $code =~ s/(\([^\(]+\)))/eval $1/gem;
1496 print $code;
1497 close STDOUT;

```

```

*****
11986 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/rc4-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 # =====
4 # [Re]written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====

10 # At some point it became apparent that the original SSLeay RC4
11 # assembler implementation performs suboptimally on latest IA-32
12 # microarchitectures. After re-tuning performance has changed as
13 # following:
14 #
15 # Pentium      -10%
16 # Pentium III  +12%
17 # AMD          +50% (*)
18 # P4           +250% (**)
19 #
20 # (*) This number is actually a trade-off:-) It's possible to
21 # achieve +72%, but at the cost of -48% off PIII performance.
22 # In other words code performing further 13% faster on AMD
23 # would perform almost 2 times slower on Intel PIII...
24 # For reference! This code delivers ~80% of rc4-amd64.pl
25 # performance on the same Opteron machine.
26 # (**) This number requires compressed key schedule set up by
27 # RC4_set_key [see commentary below for further details].
28 #
29 #                                     <appro@fy.chalmers.se>

31 # May 2011
32 #
33 # Optimize for Core2 and Westmere [and incidentally Opteron]. Current
34 # performance in cycles per processed byte (less is better) and
35 # improvement relative to previous version of this module is:
36 #
37 # Pentium      10.2                # original numbers
38 # Pentium III  7.8(*)
39 # Intel P4     7.5
40 #
41 # Opteron      6.1/+20%              # new MMX numbers
42 # Core2        5.3/+67% (**)
43 # Westmere     5.1/+94% (**)
44 # Sandy Bridge 5.0/+8%
45 # Atom         12.6/+6%
46 #
47 # (*) PIII can actually deliver 6.6 cycles per byte with MMX code,
48 # but this specific code performs poorly on Core2. And vice
49 # versa, below MMX/SSE code delivering 5.8/7.1 on Core2 performs
50 # poorly on PIII, at 8.0/14.5:-) As PIII is not a "hot" CPU
51 # [anymore], I chose to discard PIII-specific code path and opt
52 # for original IALU-only code, which is why MMX/SSE code path
53 # is guarded by SSE2 bit (see below), not MMX/SSE.
54 # (**) Performance vs. block size on Core2 and Westmere had a maximum
55 # at ... 64 bytes block size. And it was quite a maximum, 40-60%
56 # in comparison to largest 8KB block size. Above improvement
57 # coefficients are for the largest block size.

59 $0 =~ m/(.*[\\\/\\\/])[^\\\/\\\/]+$/; $dir=$1;
60 push(@INC, "${dir}", "${dir}../../perlasm");
61 require "x86asm.pl";

```

```

63 &asm_init($ARGV[0], "rc4-586.pl");

65 $xx="eax";
66 $yy="ebx";
67 $tx="ecx";
68 $ty="edx";
69 $inp="esi";
70 $out="ebp";
71 $dat="edi";

73 sub RC4_loop {
74     my $i=shift;
75     my $func = ($i==0)?*mov:*or;

77         &add    (&LB($yy), &LB($tx));
78         &mov     ($ty, &DWP(0, $dat, $yy, 4));
79         &mov     (&DWP(0, $dat, $yy, 4), $tx);
80         &mov     (&DWP(0, $dat, $xx, 4), $ty);
81         &add     ($ty, $tx);
82         &inc     (&LB($xx));
83         &and     ($ty, 0xff);
84         &ror     ($out, 8)          if ($i!=0);
85         if ($i<3) {
86             &mov     ($tx, &DWP(0, $dat, $xx, 4));
87         } else {
88             &mov     ($tx, &wparam(3));      # reload [re-biased] out
89         }
90         &$func     ($out, &DWP(0, $dat, $ty, 4));
91     }

93 if ($alt=0) {
94     # >20% faster on Atom and Sandy Bridge![], 8% faster on Opteron,
95     # but ~40% slower on Core2 and Westmere... Attempt to add movz
96     # brings down Opteron by 25%, Atom and Sandy Bridge by 15%, yet
97     # on Core2 with movz it's almost 20% slower than below alternative
98     # code... Yes, it's a total mess...
99     my @XX=($xx, $out);
100     $RC4_loop_mmx = sub {          # SSE actually...
101         my $i=shift;
102         my $j=$i<=0?0:$i>>1;
103         my $mm=$i<=0?"mm0":"mm".($i&1);

105         &add     (&LB($yy), &LB($tx));
106         &lea     (@XX[1], &DWP(1, @XX[0]));
107         &pxor    ("mm2", "mm0")          if ($i==0);
108         &psllq   ("mm1", 8)              if ($i==0);
109         &and     (@XX[1], 0xff);
110         &pxor    ("mm0", "mm0")          if ($i<=0);
111         &mov     ($ty, &DWP(0, $dat, $yy, 4));
112         &mov     (&DWP(0, $dat, $yy, 4), $tx);
113         &pxor    ("mm1", "mm2")          if ($i==0);
114         &mov     (&DWP(0, $dat, $xx[0], 4), $ty);
115         &add     (&LB($ty), &LB($tx));
116         &movd    (@XX[0], "mm7")          if ($i==0);
117         &mov     ($tx, &DWP(0, $dat, @XX[1], 4));
118         &pxor    ("mm1", "mm1")          if ($i==1);
119         &movq     ("mm2", &QWP(0, $inp))   if ($i==1);
120         &movq     (&QWP(-8, @XX[0], $inp), "mm1") if ($i==0);
121         &pinsrw   ($mm, &DWP(0, $dat, $ty, 4), $j);

123         push     (@XX, shift(@XX))      if ($i>=0);
124     }
125 } else {
126     # Using pinsrw here improves performane on Intel CPUs by 2-3%, but
127     # brings down AMD by 7%...

```

```

128 $RC4_loop_mmx = sub {
129     my $i=shift;

131     &add    (&LB($yy),&LB($tx));
132     &psllq  ("mm1",8*($i-1)&7)          if (abs($i)!=1);
133     &mov     ($ty,&DWP(0,$dat,$yy,4));
134     &mov     (&DWP(0,$dat,$yy,4),$tx);
135     &mov     (&DWP(0,$dat,$xx,4),$ty);
136     &inc     ($xx);
137     &add     ($ty,$tx);
138     &movz    ($xx,&LB($xx));              # (*)
139     &movz    ($ty,&LB($ty));              # (*)
140     &pxor    ("mm2",$i==1?"mm0":"mm1")   if ($i>=0);
141     &movq    (&mm0,&QWP(0,$inp))         if ($i<=0);
142     &movq    (&QWP(-8,($out,$inp)),"mm2") if ($i==0);
143     &mov     ($tx,&DWP(0,$dat,$xx,4));
144     &movd    ($i>0?"mm1":"mm2",&DWP(0,$dat,$ty,4));

146     # (*) This is the key to Core2 and Westmere performance.
147     # Without movz out-of-order execution logic confuses
148     # itself and fails to reorder loads and stores. Problem
149     # appears to be fixed in Sandy Bridge...
150 }
151 }

153 &external_label("OPENSSL_ia32cap_P");

155 # void RC4(RC4_KEY *key,size_t len,const unsigned char *inp,unsigned char *out);
156 &function_begin("RC4");
157     &mov     ($dat,&wparam(0));          # load key schedule pointer
158     &mov     ($ty,&wparam(1));            # load len
159     &mov     ($inp,&wparam(2));           # load inp
160     &mov     ($out,&wparam(3));           # load out

162     &xor     ($xx,$xx);                  # avoid partial register stalls
163     &xor     ($yy,$yy);

165     &cmp     ($ty,0);                   # safety net
166     &jc      (&label("abort"));

168     &mov     (&LB($xx),&BP(0,$dat));    # load key->x
169     &mov     (&LB($yy),&BP(4,$dat));    # load key->y
170     &add     ($dat,8);

172     &lea     ($tx,&DWP(0,$inp,$ty));
173     &sub     ($out,$inp);                # re-bias out
174     &mov     (&wparam(1),$tx);          # save input+len

176     &inc     (&LB($xx));

178     # detect compressed key schedule...
179     &cmp     (&DWP(256,$dat),-1);
180     &jc      (&label("RC4_CHAR"));

182     &mov     ($tx,&DWP(0,$dat,$xx,4));

184     &and     ($ty,-4);                  # how many 4-byte chunks?
185     &jz      (&label("loop1"));

187     &test    ($ty,-8);
188     &mov     (&wparam(3),$out);        # $out as accumulator in these loops
189     &jz      (&label("go4loop4"));

191     &picmeup($out,"OPENSSL_ia32cap_P");
192     &bt      (&DWP(0,$out),26);        # check SSE2 bit [could have been MMX]
193     &jnc     (&label("go4loop4"));

```

```

195     &mov     ($out,&wparam(3))           if (!Salt);
196     &movd    ("mm7",&wparam(3))          if (Salt);
197     &and     ($ty,-8);
198     &lea     ($ty,&DWP(-8,$inp,$ty));
199     &mov     (&DWP(-4,$dat),$ty);      # save input+(len/8)*8-8

201     &$RC4_loop_mmx(-1);
202     &jmp(&label("loop_mmx_enter"));

204     &set_label("loop_mmx",16);
205     &$RC4_loop_mmx(0);
206     &set_label("loop_mmx_enter");
207     for ($i=1;$i<8;$i++) { &$RC4_loop_mmx($i); }
208     &mov     ($ty,$yy);
209     &xor     ($xx,$yy);                # this is second key to Core2
210     &mov     (&LB($yy),&LB($ty));      # and Westmere performance...
211     &cmp     ($inp,&DWP(-4,$dat));
212     &lea     ($inp,&DWP(8,$inp));
213     &jb      (&label("loop_mmx"));

215     if (Salt) {
216         &movd    ($out,"mm7");
217         &pxor    ("mm2","mm0");
218         &psllq   ("mm1",8);
219         &pxor    ("mm1","mm2");
220         &movq    (&QWP(-8,$out,$inp),"mm1");
221     } else {
222         &psllq   ("mm1",56);
223         &pxor    ("mm2","mm1");
224         &movq    (&QWP(-8,$out,$inp),"mm2");
225     }
226     &emms     ();

228     &cmp     ($inp,&wparam(1));          # compare to input+len
229     &jc      (&label("done"));
230     &jmp     (&label("loop1"));

232     &set_label("go4loop4",16);
233     &lea     ($ty,&DWP(-4,$inp,$ty));
234     &mov     (&wparam(2),$ty);          # save input+(len/4)*4-4

236     &set_label("loop4");
237     for ($i=0;$i<4;$i++) { RC4_loop($i); }
238     &ror     ($out,8);
239     &xor     ($out,&DWP(0,$inp));
240     &cmp     ($inp,&wparam(2));          # compare to input+(len/4)*4-4
241     &mov     (&DWP(0,$tx,$inp,$out)); # $tx holds re-biased out here
242     &lea     ($inp,&DWP(4,$inp));
243     &mov     ($tx,&DWP(0,$dat,$xx,4));
244     &jb      (&label("loop4"));

246     &cmp     ($inp,&wparam(1));          # compare to input+len
247     &jc      (&label("done"));
248     &mov     ($out,&wparam(3));          # restore $out

250     &set_label("loop1",16);
251     &add     (&LB($yy),&LB($tx));
252     &mov     ($ty,&DWP(0,$dat,$yy,4));
253     &mov     (&DWP(0,$dat,$yy,4),$tx);
254     &mov     (&DWP(0,$dat,$xx,4),$ty);
255     &add     ($ty,$tx);
256     &inc     (&LB($xx));
257     &and     ($ty,0xff);
258     &mov     ($ty,&DWP(0,$dat,$ty,4));
259     &xor     (&LB($ty),&BP(0,$inp));

```

```

260      &lea    ($inp,&DWP(1,$inp));
261      &mov     ($tx,&DWP(0,$dat,$xx,4));
262      &cmp     ($inp,&wparam(1));      # compare to input+len
263      &mov     (&BP(-1,$out,$inp),&LB($ty));
264      &jb      (&label("loop1"));

266      &jmp     (&label("done"));

268 # this is essentially Intel P4 specific codepath...
269 &set_label("RC4_CHAR",16);
270 &movz     ($tx,&BP(0,$dat,$xx));
271 # strangely enough unrolled loop performs over 20% slower...
272 &set_label("cloop1");
273      &add     (&LB($yy),&LB($tx));
274      &movz     ($ty,&BP(0,$dat,$yy));
275      &mov     (&BP(0,$dat,$yy),&LB($tx));
276      &mov     (&BP(0,$dat,$xx),&LB($ty));
277      &add     (&LB($ty),&LB($tx));
278      &movz     ($ty,&BP(0,$dat,$ty));
279      &add     (&LB($xx),1);
280      &xor     (&LB($ty),&BP(0,$inp));
281      &lea     ($inp,&DWP(1,$inp));
282      &movz     ($tx,&BP(0,$dat,$xx));
283      &cmp     ($inp,&wparam(1));
284      &mov     (&BP(-1,$out,$inp),&LB($ty));
285      &jb      (&label("cloop1"));

287 &set_label("done");
288      &dec     (&LB($xx));
289      &mov     (&DWP(-4,$dat,$yy);      # save key->y
290      &mov     (&BP(-8,$dat),&LB($xx));  # save key->x
291 &set_label("abort");
292 &function_end("RC4");

294 #####

296 $inp="esi";
297 $out="edi";
298 $idi="ebp";
299 $ido="ecx";
300 $idx="edx";

302 # void RC4_set_key(RC4_KEY *key,int len,const unsigned char *data);
303 &function_begin("private_RC4_set_key");
304      &mov     ($out,&wparam(0));      # load key
305      &mov     ($idi,&wparam(1));      # load len
306      &mov     ($inp,&wparam(2));      # load data
307      &picmeup($idx,"OPENSSL_ia32cap_P");

309      &lea     ($out,&DWP(2*4,$out));    # &key->data
310      &lea     ($inp,&DWP(0,$inp,$idi)); # $inp to point at the end
311      &neg     ($idi);
312      &xor     ("eax","eax");
313      &mov     (&DWP(-4,$out),$idi);    # borrow key->y

315      &bt      (&DWP(0,$idx),20);      # check for bit#20
316      &jc      (&label("c1stloop"));

318 &set_label("w1stloop",16);
319      &mov     (&DWP(0,$out,"eax",4),"eax"); # key->data[i]=i;
320      &add     (&LB("eax"),1);             # i++;
321      &jnc     (&label("w1stloop"));

323      &xor     ($ido,$ido);
324      &xor     ($idx,$idx);

```

```

326 &set_label("w2ndloop",16);
327      &mov     ("eax",&DWP(0,$out,$ido,4));
328      &add     (&LB($idx),&BP(0,$inp,$idi));
329      &add     (&LB($idx),&LB("eax"));
330      &add     ($idi,1);
331      &mov     ("ebx",&DWP(0,$out,$idx,4));
332      &jnz     (&label("wnowrap"));
333      &mov     ($idi,&DWP(-4,$out));
334      &set_label("wnowrap");
335      &mov     (&DWP(0,$out,$idx,4),"eax");
336      &mov     (&DWP(0,$out,$ido,4),"ebx");
337      &add     (&LB($ido),1);
338      &jnc     (&label("w2ndloop"));
339      &jmp     (&label("exit"));

341 # Unlike all other x86 [and x86_64] implementations, Intel P4 core
342 # [including EM64T] was found to perform poorly with above "32-bit" key
343 # schedule, a.k.a. RC4_INT. Performance improvement for IA-32 hand-coded
344 # assembler turned out to be 3.5x if re-coded for compressed 8-bit one,
345 # a.k.a. RC4_CHAR! It's however inappropriate to just switch to 8-bit
346 # schedule for x86[ 64], because non-P4 implementations suffer from
347 # significant performance losses then, e.g. PIII exhibits >2x
348 # deterioration, and so does Opteron. In order to assure optimal
349 # all-round performance, we detect P4 at run-time and set up compressed
350 # key schedule, which is recognized by RC4 procedure.

352 &set_label("c1stloop",16);
353      &mov     (&BP(0,$out,"eax"),&LB("eax")); # key->data[i]=i;
354      &add     (&LB("eax"),1);                 # i++;
355      &jnc     (&label("c1stloop"));

357      &xor     ($ido,$ido);
358      &xor     ($idx,$idx);
359      &xor     ("ebx","ebx");

361 &set_label("c2ndloop",16);
362      &mov     (&LB("eax"),&BP(0,$out,$ido));
363      &add     (&LB($idx),&BP(0,$inp,$idi));
364      &add     (&LB($idx),&LB("eax"));
365      &add     ($idi,1);
366      &mov     (&LB("ebx"),&BP(0,$out,$idx));
367      &jnz     (&label("cnowrap"));
368      &mov     ($idi,&DWP(-4,$out));
369      &set_label("cnowrap");
370      &mov     (&BP(0,$out,$idx),&LB("eax"));
371      &mov     (&BP(0,$out,$ido),&LB("ebx"));
372      &add     (&LB($ido),1);
373      &jnc     (&label("c2ndloop"));

375      &mov     (&DWP(256,$out),-1);           # mark schedule as compressed

377 &set_label("exit");
378      &xor     ("eax","eax");
379      &mov     (&DWP(-8,$out),"eax");          # key->x=0;
380      &mov     (&DWP(-4,$out),"eax");          # key->y=0;
381 &function_end("private_RC4_set_key");

383 # const char *RC4_options(void);
384 &function_begin_B("RC4_options");
385      &call    (&label("pic_point"));
386 &set_label("pic_point");
387      &blndpop("eax");
388      &lea     ("eax",&DWP(&label("opts")."-".&label("pic_point"),"eax"));
389      &picmeup("edx","OPENSSL_ia32cap_P");
390      &mov     ("edx",&DWP(0,"edx"));
391      &bt      ("edx",20);

```



```
392      &jc      (&label("1xchar"));
393      &bt      ("edx",26);
394      &jnc     (&label("ret"));
395      &add     ("eax",25);
396      &ret     ();
397 &set_label("1xchar");
398      &add     ("eax",12);
399 &set_label("ret");
400      &ret     ();
401 &set_label("opts",64);
402 &asciz      ("rc4(4x,int)");
403 &asciz      ("rc4(1x,char)");
404 &asciz      ("rc4(8x,mmx)");
405 &asciz      ("RC4 for x86, CRYPTOGAMS by <appro\@openssl.org>");
406 &align      (64);
407 &function_end_B("RC4_options");

409 &asm_finish();
```

new/usr/src/lib/openssl/libsunw_crypto/pl/rc4-md5-x86_64.pl

1

```
*****
15970 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/rc4-md5-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@openssl.org> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====

10 # June 2011
11 #
12 # This is RC4+MD5 "stitch" implementation. The idea, as spelled in
13 # http://download.intel.com/design/intarch/papers/323686.pdf, is that
14 # since both algorithms exhibit instruction-level parallelism, ILP,
15 # below theoretical maximum, interleaving them would allow to utilize
16 # processor resources better and achieve better performance. RC4
17 # instruction sequence is virtually identical to rc4-x86_64.pl, which
18 # is heavily based on submission by Maxim Perminov, Maxim Locktyukhin
19 # and Jim Guilford of Intel. MD5 is fresh implementation aiming to
20 # minimize register usage, which was used as "main thread" with RC4
21 # weaved into it, one RC4 round per one MD5 round. In addition to the
22 # stitched subroutine the script can generate standalone replacement
23 # md5_block_asm_data_order and RC4. Below are performance numbers in
24 # cycles per processed byte, less is better, for these the standalone
25 # subroutines, sum of them, and stitched one:
26 #
27 #
28 #      RC4      MD5      RC4+MD5  stitch  gain
29 # Opteron      6.5(*)   5.4      11.9    7.0   +70%(*)
30 # Core2         6.5     5.8      12.3    7.7   +60%
31 # Westmere      4.3     5.2       9.5    7.0   +36%
32 # Sandy Bridge  4.2     5.5       9.7    6.8   +43%
33 # Atom          9.3     6.5      15.8   11.1   +42%
34 #
35 # (*) rc4-x86_64.pl delivers 5.3 on Opteron, so real improvement
36 # is +53%...

37 my ($rc4,$md5)=(1,1); # what to generate?
38 my $D="#" if (!$md5); # if set to "#", MD5 is stitched into RC4(),
39 # but its result is discarded. Idea here is
40 # to be able to use 'openssl speed rc4' for
41 # benchmarking the stitched subroutine...

43 my $flavour = shift;
44 my $output = shift;
45 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

47 my $win64=0; $win64=1 if ($flavour =~ /[nm]asm[mingw64/ || $output =~ /\.asm$/);

49 $0 =~ m/(.*[\\\/\s])[^\\\/\s]+$/; my $dir=$1; my $xlate;
50 ( $xlate="$dir\x86_64-xlate.pl" and -f $xlate ) or
51 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
52 die "can't locate x86_64-xlate.pl";

54 open OUT,"| \"\$X\" $xlate $flavour $output";
55 *STDOUT=*OUT;

57 my ($dat,$in0,$out,$ctx,$inp,$len, $func,$nargs);

59 if ($rc4 && !$md5) {
60     ($dat,$len,$in0,$out) = ("%rdi","%rsi","%rdx","%rcx");
61     $func="RC4"; $nargs=4;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/rc4-md5-x86_64.pl

2

```
62 } elsif ($md5 && !$rc4) {
63     ($ctx,$inp,$len) = ("%rdi","%rsi","%rdx");
64     $func="md5_block_asm_data_order"; $nargs=3;
65 } else {
66     ($dat,$in0,$out,$ctx,$inp,$len) = ("%rdi","%rsi","%rdx","%rcx","%r8","%r9");
67     $func="rc4_md5_enc"; $nargs=6;
68     # void rc4_md5_enc(
69     #         RC4_KEY *key, #
70     #         const void *in0, # RC4 input
71     #         void *out, # RC4 output
72     #         MD5_CTX *ctx, #
73     #         const void *inp, # MD5 input
74     #         size_t len); # number of 64-byte blocks
75 }

77 my @K=( 0xd76aa478,0xe8c7b756,0x242070db,0xc1bdccee,
78         0xf57c0faf,0x4787c62a,0xa8304613,0xfd469501,
79         0x698098d8,0x8b44f7af,0xffff5bb1,0x895cd7be,
80         0x6b901122,0xfd987193,0xa679438e,0x49b40821,

82         0xf61e2562,0xc040b340,0x265e5a51,0xe9b6c7aa,
83         0xd62f105d,0x02441453,0xd8a1e681,0xe7d3fbc8,
84         0x21e1cde6,0xc33707d6,0xf4d50d87,0x455a14ed,
85         0xa9e3e905,0xfcefa3f8,0x676f02d9,0x8d2a4c8a,

87         0xffffa394,0x8771f681,0x6d9d6122,0xfde5380c,
88         0xa4beea44,0x4bdecfa9,0xf6bb4b60,0xbebfbcb7,
89         0x289b7ec6,0xeaad127fa,0xd4ef3085,0x04881d05,
90         0xd9d4d039,0xe6db99e5,0x1fa27cf8,0xc4ac5665,

92         0xf4292244,0x432aff97,0xab9423a7,0xfc93a039,
93         0x655b59c3,0x8f0ccc92,0xfffff47d,0x85845dd1,
94         0x6fa87e4f,0xfe2ce6e0,0xa3014314,0x4e0811a1,
95         0xf7537e82,0xbd3af235,0x2ad7d2bb,0xeb86d391 );

97 my @V=("%r8d","%r9d","%r10d","%r11d"); # MD5 registers
98 my $tmp="%r12d";

100 my @XX=("%rbp","%rsi"); # RC4 registers
101 my @TX=("%rax","%rbx");
102 my $YY="%rcx";
103 my $TY="%rdx";

105 my $MOD=32; # 16, 32 or 64

107 $code.<<=;
108 .text
109 .align 16

111 .globl $func
112 .type $func,@function,$nargs
113 $func:
114     cmp     \ $0,$len
115     je      .Labort
116     push    %rbx
117     push    %rbp
118     push    %r12
119     push    %r13
120     push    %r14
121     push    %r15
122     sub     \ $0,%rsp

123 .Lbody:
124     if ($rc4) {
125         $code.<<=;
126         $D#md5# mov     $ctx,%r11 # reassign arguments
```

```

128     mov     $len,%r12
129     mov     $in0,%r13
130     mov     $out,%r14
131     $D#md5# mov     $inp,%r15
132
133     $ctx="%r11" if ($md5);           # reassign arguments
134     $len="%r12";
135     $in0="%r13";
136     $out="%r14";
137     $inp="%r15" if ($md5);
138     $inp=$in0 if (!$md5);
139     $code.=<<";
140     xor     $XX[0],$XX[0]
141     xor     $YY,$YY
142
143     lea     8($dat),$dat
144     mov     -8($dat),$XX[0]#b
145     mov     -4($dat),$YY#b
146
147     inc     $XX[0]#b
148     sub     $in0,$out
149     movl    ($dat,$XX[0],4),$TX[0]#d
150
151     $code.=<< if (!$md5);
152     xor     $TX[1],$TX[1]
153     test    \$.128,$len
154     jz      .Loop1
155     sub     $XX[0],$TX[1]
156     and     \$.MOD-1,$TX[1]
157     jz      .Loop${MOD}_is_hot
158     sub     $TX[1],$len
159     .Loop${MOD}_warmup:
160     add     $TX[0]#b,$YY#b
161     movl    ($dat,$YY,4),$TY#d
162     movl    $TX[0]#d,($dat,$YY,4)
163     movl    $TY#d,($dat,$XX[0],4)
164     add     $TY#b,$TX[0]#b
165     inc     $XX[0]#b
166     movl    ($dat,$TX[0],4),$TY#d
167     movl    ($dat,$XX[0],4),$TX[0]#d
168     xorb    ($in0),$TY#b
169     movb    $TY#b,($out,$in0)
170     lea     1($in0),$in0
171     dec     $TX[1]
172     jnz     .Loop${MOD}_warmup
173
174     mov     $YY,$TX[1]
175     xor     $YY,$YY
176     mov     $TX[1]#b,$YY#b
177
178     .Loop${MOD}_is_hot:
179     mov     $len,32(%rsp)           # save original $len
180     shr     \$.6,$len              # number of 64-byte blocks
181
182     if ($D && !$md5) {              # stitch in dummy MD5
183     $md5=1;
184     $ctx="%r11";
185     $inp="%r15";
186     $code.=<<";
187     mov     %rsp,$ctx
188     mov     $in0,$inp
189
190     }
191 }
192 $code.=<<";
193 #rc4# add     $TX[0]#b,$YY#b

```

```

194 #rc4# lea     ($dat,$XX[0],4),$XX[1]
195     shl     \$.6,$len
196     add     $inp,$len                # pointer to the end of input
197     mov     $len,16(%rsp)
198
199 #md5# mov     $ctx,24(%rsp)          # save pointer to MD5_CTX
200 #md5# mov     0*4($ctx),$V[0]       # load current hash value from MD5_CTX
201 #md5# mov     1*4($ctx),$V[1]
202 #md5# mov     2*4($ctx),$V[2]
203 #md5# mov     3*4($ctx),$V[3]
204     jmp     .Loop
205
206 .align    16
207 .Loop:
208 #md5# mov     $V[0],0*4(%rsp)       # put aside current hash value
209 #md5# mov     $V[1],1*4(%rsp)
210 #md5# mov     $V[2],2*4(%rsp)
211 #md5# mov     $V[3],$tmp            # forward reference
212 #md5# mov     $V[3],3*4(%rsp)
213
214
215 sub R0 {
216 my ($i,$a,$b,$c,$d)=@_;
217 my @rot0=(7,12,17,22);
218 my $j=$i%16;
219 my $k=$i%MOD;
220 my $xmm="%xmm".($j&1);
221 $code.=" movdqu ($in0),%xmm2\n" if ($rc4 && $j==15);
222 $code.=" add     \$$MOD,$XX[0]#b\n" if ($rc4 && $j==15 && $k==MOD-1);
223 $code.=" pxor    $xmm,$xmm\n" if ($rc4 && $j<=1);
224 $code.=<<";
225 #rc4# movl    ($dat,$YY,4),$TY#d
226 #md5# xor     $c,$tmp
227 #rc4# movl    $TX[0]#d,($dat,$YY,4)
228 #md5# and     $b,$tmp
229 #md5# add     4*'$j'($inp),$a
230 #rc4# add     $TY#b,$TX[0]#b
231 #rc4# movl    '4*(($k+1)%MOD)'(''$k==MOD-1?'$dat,$XX[0],4':'$XX[1]'),$TX[1]#
232 #md5# add     \$$K[$i],$a
233 #md5# xor     $d,$tmp
234 #rc4# movz    $TX[0]#b,$TX[0]#d
235 #rc4# movl    $TY#d,4*$k($XX[1])
236 #md5# add     $tmp,$a
237 #rc4# add     $TX[1]#b,$YY#b
238 #md5# rol     \$$rot0[$j%4],$a
239 #md5# mov     '$j==15?'$b':'$c',$tmp # forward reference
240 #rc4# pinsrw  \$$('$j>>1)&7',($dat,$TX[0],4),$xmm\n
241 #md5# add     $b,$a
242
243     $code.=<< if ($rc4 && $j==15 && $k==MOD-1);
244     mov     $YY,$XX[1]
245     xor     $YY,$YY                # keyword to partial register
246     mov     $XX[1]#b,$YY#b
247     lea     ($dat,$XX[0],4),$XX[1]
248
249     $code.=<< if ($rc4 && $j==15);
250     psllq    \$.8,%xmm1
251     pxor     %xmm0,%xmm2
252     pxor     %xmm1,%xmm2
253
254 }
255 sub R1 {
256 my ($i,$a,$b,$c,$d)=@_;
257 my @rot1=(5,9,14,20);
258 my $j=$i%16;
259 my $k=$i%MOD;

```

```

260 my $xmm="%xmm".($j&1);
261 $code.=" movdqu 16($in0),%xmm3\n" if ($rc4 && $j==15);
262 $code.=" add \$$MOD,$XX[0]#b\n" if ($rc4 && $j==15 && $k==MOD-1);
263 $code.=" pxor $xmm,$xmm\n" if ($rc4 && $j<=1);
264 $code.=<<<";
265 #rc4# movl ($dat,$YY,4),$TY#d
266 #md5# xor $b,$tmp
267 #rc4# movl $TX[0]#d,($dat,$YY,4)
268 #md5# and $d,$tmp
269 #md5# add 4*((1+5*$j)%16)'($inp),$a
270 #rc4# add $TY#b,$TX[0]#b
271 #rc4# movl '4*(($k+1)%MOD)'(' $k==MOD-1?"$dat,$XX[0],4":"$XX[1]"'),$TX[1]#
272 #md5# add \$$K[$i],$a
273 #md5# xor $c,$tmp
274 #rc4# movz $TX[0]#b,$TX[0]#d
275 #rc4# movl $TY#d,4*$k($XX[1])
276 #md5# add $tmp,$a
277 #rc4# add $TX[1]#b,$YY#b
278 #md5# rol \$$rot1[$j%4],$a
279 #md5# mov ' $j==15?"$c":"$b"', $tmp # forward reference
280 #rc4# pinsrw \$( $j>>1)&7', ($dat,$TX[0],4),$xmm\n
281 #md5# add $b,$a
282
283 $code.=<<< if ($rc4 && $j==15 && $k==MOD-1);
284 mov $YY,$XX[1]
285 xor $YY,$YY # keyword to partial register
286 mov $XX[1]#b,$YY#b
287 lea ($dat,$XX[0],4),$XX[1]
288
289 $code.=<<< if ($rc4 && $j==15);
290 psllq \$(8,%xmm1)
291 pxor %xmm0,%xmm3
292 pxor %xmm1,%xmm3
293
294 }
295 sub R2 {
296 my ($i,$a,$b,$c,$d)=@_;
297 my @rot2=(4,11,16,23);
298 my $j=$i%16;
299 my $k=$i%MOD;
300 my $xmm="%xmm".($j&1);
301 $code.=" movdqu 32($in0),%xmm4\n" if ($rc4 && $j==15);
302 $code.=" add \$$MOD,$XX[0]#b\n" if ($rc4 && $j==15 && $k==MOD-1);
303 $code.=" pxor $xmm,$xmm\n" if ($rc4 && $j<=1);
304 $code.=<<<";
305 #rc4# movl ($dat,$YY,4),$TY#d
306 #md5# xor $c,$tmp
307 #rc4# movl $TX[0]#d,($dat,$YY,4)
308 #md5# xor $b,$tmp
309 #md5# add 4*((5+3*$j)%16)'($inp),$a
310 #rc4# add $TY#b,$TX[0]#b
311 #rc4# movl '4*(($k+1)%MOD)'(' $k==MOD-1?"$dat,$XX[0],4":"$XX[1]"'),$TX[1]#
312 #md5# add \$$K[$i],$a
313 #rc4# movz $TX[0]#b,$TX[0]#d
314 #md5# add $tmp,$a
315 #rc4# movl $TY#d,4*$k($XX[1])
316 #rc4# add $TX[1]#b,$YY#b
317 #md5# rol \$$rot2[$j%4],$a
318 #md5# mov ' $j==15?"$c":"$b"', $tmp # forward reference
319 #rc4# pinsrw \$( $j>>1)&7', ($dat,$TX[0],4),$xmm\n
320 #md5# add $b,$a
321
322 $code.=<<< if ($rc4 && $j==15 && $k==MOD-1);
323 mov $YY,$XX[1]
324 xor $YY,$YY # keyword to partial register
325 mov $XX[1]#b,$YY#b

```

```

326 lea ($dat,$XX[0],4),$XX[1]
327
328 $code.=<<< if ($rc4 && $j==15);
329 psllq \$(8,%xmm1)
330 pxor %xmm0,%xmm4
331 pxor %xmm1,%xmm4
332
333 }
334 sub R3 {
335 my ($i,$a,$b,$c,$d)=@_;
336 my @rot3=(6,10,15,21);
337 my $j=$i%16;
338 my $k=$i%MOD;
339 my $xmm="%xmm".($j&1);
340 $code.=" movdqu 48($in0),%xmm5\n" if ($rc4 && $j==15);
341 $code.=" add \$$MOD,$XX[0]#b\n" if ($rc4 && $j==15 && $k==MOD-1);
342 $code.=" pxor $xmm,$xmm\n" if ($rc4 && $j<=1);
343 $code.=<<<";
344 #rc4# movl ($dat,$YY,4),$TY#d
345 #md5# xor $d,$tmp
346 #rc4# movl $TX[0]#d,($dat,$YY,4)
347 #md5# or $b,$tmp
348 #md5# add 4*((7*$j)%16)'($inp),$a
349 #rc4# add $TY#b,$TX[0]#b
350 #rc4# movl '4*(($k+1)%MOD)'(' $k==MOD-1?"$dat,$XX[0],4":"$XX[1]"'),$TX[1]#
351 #md5# add \$$K[$i],$a
352 #rc4# movz $TX[0]#b,$TX[0]#d
353 #md5# xor $c,$tmp
354 #rc4# movl $TY#d,4*$k($XX[1])
355 #md5# add $tmp,$a
356 #rc4# add $TX[1]#b,$YY#b
357 #md5# rol \$$rot3[$j%4],$a
358 #md5# mov \$( -1,$tmp # forward reference
359 #rc4# pinsrw \$( $j>>1)&7', ($dat,$TX[0],4),$xmm\n
360 #md5# add $b,$a
361
362 $code.=<<< if ($rc4 && $j==15);
363 mov $XX[0],$XX[1]
364 xor $XX[0],$XX[0] # keyword to partial register
365 mov $XX[1]#b,$XX[0]#b
366 mov $YY,$XX[1]
367 xor $YY,$YY # keyword to partial register
368 mov $XX[1]#b,$YY#b
369 lea ($dat,$XX[0],4),$XX[1]
370 psllq \$(8,%xmm1)
371 pxor %xmm0,%xmm5
372 pxor %xmm1,%xmm5
373
374 }
375
376 my $i=0;
377 for (; $i<16; $i++) { R0($i,@V); unshift(@V,pop(@V)); push(@TX,shift(@TX)); }
378 for (; $i<32; $i++) { R1($i,@V); unshift(@V,pop(@V)); push(@TX,shift(@TX)); }
379 for (; $i<48; $i++) { R2($i,@V); unshift(@V,pop(@V)); push(@TX,shift(@TX)); }
380 for (; $i<64; $i++) { R3($i,@V); unshift(@V,pop(@V)); push(@TX,shift(@TX)); }
381
382 $code.=<<<";
383 #md5# add 0*4(%rsp),SV[0] # accumulate hash value
384 #md5# add 1*4(%rsp),SV[1]
385 #md5# add 2*4(%rsp),SV[2]
386 #md5# add 3*4(%rsp),SV[3]
387
388 #rc4# movdqu %xmm2,($out,$in0) # write RC4 output
389 #rc4# movdqu %xmm3,16($out,$in0)
390 #rc4# movdqu %xmm4,32($out,$in0)
391 #rc4# movdqu %xmm5,48($out,$in0)

```

```

392 #md5# lea 64($inp), $inp
393 #rc4# lea 64($in0), $in0
394 cmp 16(%rsp), $inp # are we done?
395 jb .Loop

397 #md5# mov 24(%rsp), $len # restore pointer to MD5_CTX
398 #rc4# sub $TX[0]#b, $YY#b # correct $YY
399 #md5# mov $V[0], 0*4($len) # write MD5_CTX
400 #md5# mov $V[1], 1*4($len)
401 #md5# mov $V[2], 2*4($len)
402 #md5# mov $V[3], 3*4($len)
403
404 $code.=<< if ($src4 && (!$md5 || $D));
405 mov 32(%rsp), $len # restore original $len
406 and $63, $len # remaining bytes
407 jnz .Loop1
408 jmp .Ldone
409
410 .align 16
411 .Loop1:
412 add $TX[0]#b, $YY#b
413 movl ($dat, $YY, 4), $TY#d
414 movl $TX[0]#d, ($dat, $YY, 4)
415 movl $TY#d, ($dat, $XX[0], 4)
416 add $TY#b, $TX[0]#b
417 inc $XX[0]#b
418 movl ($dat, $TX[0], 4), $TY#d
419 movl ($dat, $XX[0], 4), $TX[0]#d
420 xorb ($in0), $TY#b
421 movb $TY#b, ($out, $in0)
422 lea 1($in0), $in0
423 dec $len
424 jnz .Loop1

426 .Ldone:
427
428 $code.=<<
429 #rc4# sub $1, $XX[0]#b
430 #rc4# movl $XX[0]#d, -8($dat)
431 #rc4# movl $YY#d, -4($dat)

433 mov 40(%rsp), %r15
434 mov 48(%rsp), %r14
435 mov 56(%rsp), %r13
436 mov 64(%rsp), %r12
437 mov 72(%rsp), %rbp
438 mov 80(%rsp), %rbx
439 lea 88(%rsp), %rsp
440 .Lepilogue:
441 .Labort:
442 ret
443 .size $func, .-$func
444
446 if ($src4 && $D) { # sole purpose of this section is to provide
447 # option to use the generated module as drop-in
448 # replacement for rc4-x86_64.pl for debugging
449 # and testing purposes...
450 my ($idx, $ido)=("%r8", "%r9");
451 my ($dat, $len, $inp)=("%rdi", "%rsi", "%rdx");

453 $code.=<<
454 .globl RC4_set_key
455 .type RC4_set_key, \@function, 3
456 .align 16
457 RC4_set_key:

```

```

458 lea 8($dat), $dat
459 lea ($inp, $len), $inp
460 neg $len
461 mov $len, %rcx
462 xor %eax, %eax
463 xor $ido, $ido
464 xor %r10, %r10
465 xor %r11, %r11
466 jmp .Lw1stloop

468 .align 16
469 .Lw1stloop:
470 mov %eax, ($dat, %rax, 4)
471 add $1, %al
472 jnc .Lw1stloop

474 xor $ido, $ido
475 xor $idx, $idx
476 .align 16
477 .Lw2ndloop:
478 mov ($dat, $ido, 4), %r10d
479 add ($inp, $len, 1), $idx#b
480 add %r10b, $idx#b
481 add $1, $len
482 mov ($dat, $idx, 4), %r11d
483 cmovz %rcx, $len
484 mov %r10d, ($dat, $idx, 4)
485 mov %r11d, ($dat, $ido, 4)
486 add $1, $ido#b
487 jnc .Lw2ndloop

489 xor %eax, %eax
490 mov %eax, -8($dat)
491 mov %eax, -4($dat)
492 ret
493 .size RC4_set_key, .-RC4_set_key

495 .globl RC4_options
496 .type RC4_options, \@abi-omnipotent
497 .align 16
498 RC4_options:
499 lea .Lopts(%rip), %rax
500 ret
501 .align 64
502 .Lopts:
503 .asciz "rc4(64x,int)"
504 .align 64
505 .size RC4_options, .-RC4_options
506
507 }
508 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec, ULONG64 frame,
509 # CONTEXT *context, DISPATCHER_CONTEXT *disp)
510 if ($win64) {
511 my $rec="%rcx";
512 my $frame="%rdx";
513 my $context="%r8";
514 my $disp="%r9";

516 $code.=<<
517 .extern __imp_RtlVirtualUnwind
518 .type se_handler, \@abi-omnipotent
519 .align 16
520 se_handler:
521 push %rsi
522 push %rdi
523 push %rbx

```

```

524      push    %rbp
525      push    %r12
526      push    %r13
527      push    %r14
528      push    %r15
529      pushfq
530      sub     \$64,%rsp

532      mov     120($context),%rax    # pull context->Rax
533      mov     248($context),%rbx    # pull context->Rip

535      lea     .Lbody(%rip),%r10
536      cmp     %r10,%rbx            # context->Rip<.Lbody
537      jb      .Lin_prologue

539      mov     152($context),%rax    # pull context->Rsp

541      lea     .Lepilogue(%rip),%r10
542      cmp     %r10,%rbx            # context->Rip>=.Lepilogue
543      jae     .Lin_prologue

545      mov     40(%rax),%r15
546      mov     48(%rax),%r14
547      mov     56(%rax),%r13
548      mov     64(%rax),%r12
549      mov     72(%rax),%rbp
550      mov     80(%rax),%rbx
551      lea     88(%rax),%rax

553      mov     %rbx,144($context)    # restore context->Rbx
554      mov     %rbp,160($context)    # restore context->Rbp
555      mov     %r12,216($context)    # restore context->R12
556      mov     %r13,224($context)    # restore context->R13
557      mov     %r14,232($context)    # restore context->R14
558      mov     %r15,240($context)    # restore context->R15

560 .Lin_prologue:
561      mov     8(%rax),%rdi
562      mov     16(%rax),%rsi
563      mov     %rax,152($context)    # restore context->Rsp
564      mov     %rsi,168($context)    # restore context->Rsi
565      mov     %rdi,176($context)    # restore context->Rdi

567      mov     40($disp),%rdi        # disp->ContextRecord
568      mov     $context,%rsi         # context
569      mov     \$154,%ecx            # sizeof(CONTEXT)
570      .long   0xa548f3fc            # cld; rep movsq

572      mov     $disp,%rsi
573      xor     %rcx,%rcx             # arg1, UNW_FLAG_NHANDLER
574      mov     8(%rsi),%rdx          # arg2, disp->ImageBase
575      mov     0(%rsi),%r8           # arg3, disp->ControlPc
576      mov     16(%rsi),%r9          # arg4, disp->FunctionEntry
577      mov     40(%rsi),%r10         # disp->ContextRecord
578      lea     56(%rsi),%r11         # &disp->HandlerData
579      lea     24(%rsi),%r12         # &disp->EstablisherFrame
580      mov     %r10,32(%rsp)         # arg5
581      mov     %r11,40(%rsp)         # arg6
582      mov     %r12,48(%rsp)         # arg7
583      mov     %rcx,56(%rsp)         # arg8, (NULL)
584      call    *__imp_RtlVirtualUnwind(%rip)

586      mov     \$1,%eax              # ExceptionContinueSearch
587      add     \$64,%rsp
588      popfq
589      pop     %r15

```

```

590      pop     %r14
591      pop     %r13
592      pop     %r12
593      pop     %rbp
594      pop     %rbx
595      pop     %rdi
596      pop     %rsi
597      ret
598 .size     se_handler,.-se_handler

600 .section    .pdata
601 .align     4
602 .rva       .LSEH_begin_func
603 .rva       .LSEH_end_func
604 .rva       .LSEH_info_func

606 .section    .xdata
607 .align     8
608 .LSEH_info_func:
609 .byte      9,0,0,0
610 .rva       se_handler
611
612 }

614 sub reg_part {
615 my ($reg,$conv)=@_;
616 if ($reg =~ /%r[0-9]+/) { $reg .= $conv; }
617 elsif ($conv eq "b") { $reg =~ s/%[er]([^\x]+)x?/%$1l/; }
618 elsif ($conv eq "w") { $reg =~ s/%[er]([^\x]+)%$1/; }
619 elsif ($conv eq "d") { $reg =~ s/%[er]([^\x]+)%e$1/; }
620 return $reg;
621 }

623 $code =~ s/(%[a-z0-9]+)#([bwd])/reg_part($1,$2)/gem;
624 $code =~ s/\'([^\']*)\'/eval $1/gem;
625 $code =~ s/pinsrw\s+\$0,/movd /gm;

627 $code =~ s/#md5#//gm if ($md5);
628 $code =~ s/#rc4#//gm if ($rc4);

630 print $code;

632 close STDOUT;

```

```

*****
15813 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/rc4-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # July 2004
11 #
12 # 2.22x RC4 tune-up:-) It should be noted though that my hand [as in
13 # "hand-coded assembler"] doesn't stand for the whole improvement
14 # coefficient. It turned out that eliminating RC4_CHAR from config
15 # line results in ~40% improvement (yes, even for C implementation).
16 # Presumably it has everything to do with AMD cache architecture and
17 # RAW or whatever penalties. Once again! The module *requires* config
18 # line *without* RC4_CHAR! As for coding "secret," I bet on partial
19 # register arithmetics. For example instead of 'inc %r8; and $255,%r8'
20 # I simply 'inc %r8b'. Even though optimization manual discourages
21 # to operate on partial registers, it turned out to be the best bet.
22 # At least for AMD... How IA32E would perform remains to be seen...

24 # November 2004
25 #
26 # As was shown by Marc Bevand reordering of couple of load operations
27 # results in even higher performance gain of 3.3x:-) At least on
28 # Opteron... For reference, 1x in this case is RC4_CHAR C-code
29 # compiled with gcc 3.3.2, which performs at ~54MBps per 1GHz clock.
30 # Latter means that if you want to *estimate* what to expect from
31 # *your* Opteron, then multiply 54 by 3.3 and clock frequency in GHz.

33 # November 2004
34 #
35 # Intel P4 EM64T core was found to run the AMD64 code really slow...
36 # The only way to achieve comparable performance on P4 was to keep
37 # RC4_CHAR. Kind of ironic, huh? As it's apparently impossible to
38 # compose blended code, which would perform even within 30% marginal
39 # on either AMD and Intel platforms, I implement both cases. See
40 # rc4_key.c for further details...

42 # April 2005
43 #
44 # P4 EM64T core appears to be "allergic" to 64-bit inc/dec. Replacing
45 # those with add/sub results in 50% performance improvement of folded
46 # loop...

48 # May 2005
49 #
50 # As was shown by Zou Nanhai loop unrolling can improve Intel EM64T
51 # performance by >30% [unlike P4 32-bit case that is]. But this is
52 # provided that loads are reordered even more aggressively! Both code
53 # paths, AMD64 and EM64T, reorder loads in essentially same manner
54 # as my IA-64 implementation. On Opteron this resulted in modest 5%
55 # improvement [I had to test it], while final Intel P4 performance
56 # achieves respectful 432MBps on 2.8GHz processor now. For reference.
57 # If executed on Xeon, current RC4_CHAR code-path is 2.7x faster than
58 # RC4_INT code-path. While if executed on Opteron, it's only 25%
59 # slower than the RC4_INT one [meaning that if CPU  $\mu$ -arch detection
60 # is not implemented, then this final RC4_CHAR code-path should be
61 # preferred, as it provides better *all-round* performance].

```

```

63 # March 2007
64 #
65 # Intel Core2 was observed to perform poorly on both code paths:- ( It
66 # apparently suffers from some kind of partial register stall, which
67 # occurs in 64-bit mode only [as virtually identical 32-bit loop was
68 # observed to outperform 64-bit one by almost 50%]. Adding two movzb to
69 # cloop1 boosts its performance by 80%! This loop appears to be optimal
70 # fit for Core2 and therefore the code was modified to skip cloop8 on
71 # this CPU.

73 # May 2010
74 #
75 # Intel Westmere was observed to perform suboptimally. Adding yet
76 # another movzb to cloop1 improved performance by almost 50%! Core2
77 # performance is improved too, but nominally...

79 # May 2011
80 #
81 # The only code path that was not modified is P4-specific one. Non-P4
82 # Intel code path optimization is heavily based on submission by Maxim
83 # Perminov, Maxim Locktyukhin and Jim Guilford of Intel. I've used
84 # some of the ideas even in attempt to optimize the original RC4_INT
85 # code path... Current performance in cycles per processed byte (less
86 # is better) and improvement coefficients relative to previous
87 # version of this module are:
88 #
89 # Opteron          5.3/+0%(*)
90 # P4                6.5
91 # Core2            6.2/+15%(**)
92 # Westmere         4.2/+60%
93 # Sandy Bridge     4.2/+120%
94 # Atom             9.3/+80%
95 #
96 # (*) But corresponding loop has less instructions, which should have
97 # positive effect on upcoming Bulldozer, which has one less ALU.
98 # For reference, Intel code runs at 6.8 cpb rate on Opteron.
99 # (**) Note that Core2 result is ~15% lower than corresponding result
100 # for 32-bit code, meaning that it's possible to improve it,
101 # but more than likely at the cost of the others (see rc4-586.pl
102 # to get the idea)...

104 $flavour = shift;
105 $output = shift;
106 if ($flavour =~ /\.\/) { $output = $flavour; undef $flavour; }

108 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

110 $0 =~ m/([^\s\|])([^\s\|]+)/; $dir=$1;
111 ( $xlate="$dir\x86_64-xlate.pl" and -f $xlate ) or
112 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
113 die "can't locate x86_64-xlate.pl";

115 open OUT,"| \"\$^X\" $xlate $flavour $output";
116 *STDOUT=OUT;

118 $dat="%rdi";      # arg1
119 $len="%rsi";      # arg2
120 $inp="%rdx";      # arg3
121 $out="%rcx";      # arg4

123 {
124 $code=<<__
125 .text
126 .extern OPENSSL_ia32cap_P

```

```

128 .globl RC4
129 .type RC4, @function, 4
130 .align 16
131 RC4: or $len, $len
132 jne .Lentry
133 ret
134 .Lentry:
135 push %rbx
136 push %r12
137 push %r13
138 .Lprologue:
139 mov $len, %r11
140 mov $inp, %r12
141 mov $out, %r13
142
143 my $len="%r11"; # reassign input arguments
144 my $inp="%r12";
145 my $out="%r13";
146
147 my @XX=("%r10", "%rsi");
148 my @TX=("%rax", "%rbx");
149 my $YY="%rcx";
150 my $TY="%rdx";
151
152 $code.=<<";
153 xor $XX[0], $XX[0]
154 xor $YY, $YY
155
156 lea 8($dat), $dat
157 mov -8($dat), $XX[0]#b
158 mov -4($dat), $YY#b
159 cmpl \$.1, 256($dat)
160 je .LRC4_CHAR
161 mov OPENSSL_ia32cap_P(%rip), %r8d
162 xor $TX[1], $TX[1]
163 inc $XX[0]#b
164 sub $XX[0], $TX[1]
165 sub $inp, $out
166 movl ($dat, $XX[0], 4), $TX[0]#d
167 test \$.16, $len
168 jz .Lloop1
169 bt \$.30, %r8d # Intel CPU?
170 jc .Lintel
171 and \$.7, $TX[1]
172 lea 1($XX[0]), $XX[1]
173 jz .Loop8
174 sub $TX[1], $len
175 .Loop8_warmup:
176 add $TX[0]#b, $YY#b
177 movl ($dat, $YY, 4), $TY#d
178 movl $TX[0]#d, ($dat, $YY, 4)
179 movl $TY#d, ($dat, $XX[0], 4)
180 add $TY#b, $TX[0]#b
181 inc $XX[0]#b
182 movl ($dat, $TX[0], 4), $TY#d
183 movl ($dat, $XX[0], 4), $TX[0]#d
184 xorb ($inp), $TY#b
185 movb $TY#b, ($out, $inp)
186 lea 1($inp), $inp
187 dec $TX[1]
188 jnz .Loop8_warmup
189
190 lea 1($XX[0]), $XX[1]
191 jmp .Loop8
192 .align 16
193 .Loop8:

```

```

194
195 for ($i=0; $i<8; $i++) {
196 $code.=<< if ($i==7);
197 add \$.8, $XX[1]#b
198
199 $code.=<<";
200 add $TX[0]#b, $YY#b
201 movl ($dat, $YY, 4), $TY#d
202 movl $TX[0]#d, ($dat, $YY, 4)
203 movl '4*($i==7?-1:$i)'($dat, $XX[1], 4), $TX[1]#d
204 ror \$.8, %r8 # ror is redundant when $i=0
205 movl $TY#d, 4*$i($dat, $XX[0], 4)
206 add $TX[0]#b, $TY#b
207 movb ($dat, $TY, 4), %r8b
208
209 push(@TX, shift(@TX)); #push(@XX, shift(@XX)); # "rotate" registers
210 }
211 $code.=<<";
212 add \$.8, $XX[0]#b
213 ror \$.8, %r8
214 sub \$.8, $len
215
216 xor ($inp), %r8
217 mov %r8, ($out, $inp)
218 lea 8($inp), $inp
219
220 test \$.8, $len
221 jnz .Loop8
222 cmp \$.0, $len
223 jne .Lloop1
224 jmp .Lexit
225
226 .align 16
227 .Lintel:
228 test \$.32, $len
229 jz .Lloop1
230 and \$.15, $TX[1]
231 jz .Loop16_is_hot
232 sub $TX[1], $len
233 .Loop16_warmup:
234 add $TX[0]#b, $YY#b
235 movl ($dat, $YY, 4), $TY#d
236 movl $TX[0]#d, ($dat, $YY, 4)
237 movl $TY#d, ($dat, $XX[0], 4)
238 add $TY#b, $TX[0]#b
239 inc $XX[0]#b
240 movl ($dat, $TX[0], 4), $TY#d
241 movl ($dat, $XX[0], 4), $TX[0]#d
242 xorb ($inp), $TY#b
243 movb $TY#b, ($out, $inp)
244 lea 1($inp), $inp
245 dec $TX[1]
246 jnz .Loop16_warmup
247
248 mov $YY, $TX[1]
249 xor $YY, $YY
250 mov $TX[1]#b, $YY#b
251
252 .Loop16_is_hot:
253 lea ($dat, $XX[0], 4), $XX[1]
254
255 sub RC4_loop {
256 my $i=shift;
257 my $j=$i<0?0:$i;
258 my $xmm="%xmm".($j&1);

```



```

260 $code.=" add    \ $16,$XX[0]#b\n"          if ($i==15);
261 $code.=" movdqu ($inp),%xmm2\n"             if ($i==15);
262 $code.=" add    $TX[0]#b,$YY#b\n"           if ($i<=0);
263 $code.=" movl   ($dat,$YY,4),$TY#d\n";
264 $code.=" pxor   %xmm0,%xmm2\n"             if ($i==0);
265 $code.=" psllq  \ $8,%xmm1\n"              if ($i==0);
266 $code.=" pxor   $xmm,$xmm\n"              if ($i<=1);
267 $code.=" movl   $TX[0]#d,($dat,$YY,4)\n";
268 $code.=" add    $TY#b,$TX[0]#b\n";
269 $code.=" movl   '4*($j+1)'($XX[1]),$TX[1]#d\n" if ($i<15);
270 $code.=" movz   $TX[0]#b,$TX[0]#d\n";
271 $code.=" movl   $TY#d,4*$j($XX[1])\n";
272 $code.=" pxor   %xmm1,%xmm2\n"             if ($i==0);
273 $code.=" lea    ($dat,$XX[0],4),$XX[1]\n"   if ($i==15);
274 $code.=" add    $TX[1]#b,$YY#b\n"           if ($i<15);
275 $code.=" pinsrw \ $'($j>1)&7',($dat,$TX[0],4),$xmm\n";
276 $code.=" movdqu %xmm2,($out,$inp)\n"       if ($i==0);
277 $code.=" lea    16($inp),$inp\n"           if ($i==0);
278 $code.=" movl   ($XX[1]),$TX[1]#d\n"       if ($i==15);
279 }
280 RC4_loop(-1);
281 $code.=<<<__;;
282 jmp      .Loop16_enter
283 .align 16
284 .Loop16:
285 ____
287 for ($i=0;$i<16;$i++) {
288     $code.=" .Loop16_enter:\n"             if ($i==1);
289     RC4_loop($i);
290     push(@TX,shift(@TX));                 # "rotate" registers
291 }
292 $code.=<<<__;;
293 mov     $YY,$TX[1]
294 xor     $YY,$YY                           # keyword to partial register
295 sub     \ $16,$len
296 mov     $TX[1]#b,$YY#b
297 test    \ $-16,$len
298 jnz     .Loop16
300 psllq   \ $8,%xmm1
301 pxor    %xmm0,%xmm2
302 pxor    %xmm1,%xmm2
303 movdqu  %xmm2,($out,$inp)
304 lea     16($inp),$inp
306 cmp     \ $0,$len
307 jne     .Lloop1
308 jmp     .Lexit
310 .align 16
311 .Lloop1:
312 add     $TX[0]#b,$YY#b
313 movl    ($dat,$YY,4),$TY#d
314 movl    $TX[0]#d,($dat,$YY,4)
315 movl    $TY#d,($dat,$XX[0],4)
316 add     $TY#b,$TX[0]#b
317 inc     $XX[0]#b
318 movl    ($dat,$TX[0],4),$TY#d
319 movl    ($dat,$XX[0],4),$TX[0]#d
320 xorb    ($inp),$TY#b
321 movb    $TY#b,($out,$inp)
322 lea     1($inp),$inp
323 dec     $len
324 jnz     .Lloop1
325 jmp     .Lexit

```

```

327 .align 16
328 .LRC4_CHAR:
329     add     \ $1,$XX[0]#b
330     movzb   ($dat,$XX[0]),$TX[0]#d
331     test    \ $-8,$len
332     jz      .Lcloop1
333     jmp     .Lcloop8
334 .align 16
335 .Lcloop8:
336     mov     ($inp),%r8d
337     mov     4($inp),%r9d
338 ____
339 # unroll 2x4-wise, because 64-bit rotates kill Intel P4...
340 for ($i=0;$i<4;$i++) {
341     $code.=<<<__;;
342     add     $TX[0]#b,$YY#b
343     lea     1($XX[0]),$XX[1]
344     movzb   ($dat,$YY),$TY#d
345     movzb   $XX[1]#b,$XX[1]#d
346     movzb   ($dat,$XX[1]),$TX[1]#d
347     movb    $TX[0]#b,($dat,$YY)
348     cmp     $XX[1],$YY
349     movb    $TY#b,($dat,$XX[0])
350     jne     .Lcmov$1                      # Intel cmov is sloooow...
351     mov     $TX[0],$TX[1]
352     .Lcmov$1:
353     add     $TX[0]#b,$TY#b
354     xor     ($dat,$TY),%r8b
355     ror     \ $8,%r8d
356 ____
357     push(@TX,shift(@TX)); push(@XX,shift(@XX)); # "rotate" registers
358 }
359 for ($i=4;$i<8;$i++) {
360     $code.=<<<__;;
361     add     $TX[0]#b,$YY#b
362     lea     1($XX[0]),$XX[1]
363     movzb   ($dat,$YY),$TY#d
364     movzb   $XX[1]#b,$XX[1]#d
365     movzb   ($dat,$XX[1]),$TX[1]#d
366     movb    $TX[0]#b,($dat,$YY)
367     cmp     $XX[1],$YY
368     movb    $TY#b,($dat,$XX[0])
369     jne     .Lcmov$1                      # Intel cmov is sloooow...
370     mov     $TX[0],$TX[1]
371     .Lcmov$1:
372     add     $TX[0]#b,$TY#b
373     xor     ($dat,$TY),%r9b
374     ror     \ $8,%r9d
375 ____
376     push(@TX,shift(@TX)); push(@XX,shift(@XX)); # "rotate" registers
377 }
378 $code.=<<<__;;
379     lea     -8($len),$len
380     mov     %r8d,($out)
381     lea     8($inp),$inp
382     mov     %r9d,4($out)
383     lea     8($out),$out
385     test    \ $-8,$len
386     jnz     .Lcloop8
387     cmp     \ $0,$len
388     jne     .Lcloop1
389     jmp     .Lexit
390 ____
391 $code.=<<<__;;

```

```

392 .align 16
393 .Lcloop1:
394     add     $TX[0]#b,$YY#b
395     movzb   $YY#b,$YY#d
396     movzb   ($dat,$YY),$TY#d
397     movb    $TX[0]#b,($dat,$YY)
398     movb    $TY#b,($dat,$XX[0])
399     add     $TX[0]#b,$TY#b
400     add     \ $1,$XX[0]#b
401     movzb   $TY#b,$TY#d
402     movzb   $XX[0]#b,$XX[0]#d
403     movzb   ($dat,$TY),$TY#d
404     movzb   ($dat,$XX[0]),$TX[0]#d
405     xorb    ($inp),$TY#b
406     lea     1($inp),$inp
407     movb    $TY#b,($out)
408     lea     1($out),$out
409     sub     \ $1,$len
410     jnz     .Lcloop1
411     jmp     .Lexit

413 .align 16
414 .Lexit:
415     sub     \ $1,$XX[0]#b
416     movl    $XX[0]#d,-8($dat)
417     movl    $YY#d,-4($dat)

419     mov     (%rsp),%r13
420     mov     8(%rsp),%r12
421     mov     16(%rsp),%rbx
422     add     \ $24,%rsp
423 .Lepilogue:
424     ret
425 .size RC4,.-RC4
426
427 }

429 $idx="%r8";
430 $ido="%r9";

432 $code.=<<__;;
433 .globl private_RC4_set_key
434 .type private_RC4_set_key, \@function,3
435 .align 16
436 private_RC4_set_key:
437     lea     8($dat),$dat
438     lea     ($inp,$len),$inp
439     neg     $len
440     mov     $len,%rcx
441     xor     %eax,%eax
442     xor     $ido,$ido
443     xor     %r10,%r10
444     xor     %r11,%r11

446     mov     OPENSSL_ia32cap_P(%rip),$idx#d
447     bt     \ $20,$idx#d # RC4_CHAR?
448     jc     .Lc1stloop
449     jmp     .Lw1stloop

451 .align 16
452 .Lw1stloop:
453     mov     %eax,($dat,%rax,4)
454     add     \ $1,%al
455     jnc     .Lw1stloop

457     xor     $ido,$ido

```

```

458     xor     $idx,$idx
459 .align 16
460 .Lw2ndloop:
461     mov     ($dat,$ido,4),%r10d
462     add     ($inp,$len,1),$idx#b
463     add     %r10b,$idx#b
464     add     \ $1,$len
465     mov     ($dat,$idx,4),%r11d
466     cmovz   %rcx,$len
467     mov     %r10d,($dat,$idx,4)
468     mov     %r11d,($dat,$ido,4)
469     add     \ $1,$ido#b
470     jnc     .Lw2ndloop
471     jmp     .Lexit_key

473 .align 16
474 .Lc1stloop:
475     mov     %al,($dat,%rax)
476     add     \ $1,%al
477     jnc     .Lc1stloop

479     xor     $ido,$ido
480     xor     $idx,$idx
481 .align 16
482 .Lc2ndloop:
483     mov     ($dat,$ido),%r10b
484     add     ($inp,$len),$idx#b
485     add     %r10b,$idx#b
486     add     \ $1,$len
487     mov     ($dat,$idx),%r11b
488     jnz     .Lcnowrap
489     mov     %rcx,$len
490 .Lcnowrap:
491     mov     %r10b,($dat,$idx)
492     mov     %r11b,($dat,$ido)
493     add     \ $1,$ido#b
494     jnc     .Lc2ndloop
495     movl    \ $-1,256($dat)

497 .align 16
498 .Lexit_key:
499     xor     %eax,%eax
500     mov     %eax,-8($dat)
501     mov     %eax,-4($dat)
502     ret
503 .size private_RC4_set_key,.-private_RC4_set_key

505 .globl RC4_options
506 .type RC4_options,\@abi-omnipotent
507 .align 16
508 RC4_options:
509     lea     .Lopts(%rip),%rax
510     mov     OPENSSL_ia32cap_P(%rip),%edx
511     bt     \ $20,%edx
512     jc     .L8xchar
513     bt     \ $30,%edx
514     jnc     .Ldone
515     add     \ $25,%rax
516     ret
517 .L8xchar:
518     add     \ $12,%rax
519 .Ldone:
520     ret
521 .align 64
522 .Lopts:
523 .asciz    "rc4(8x,int)"

```

```

524 .asciz "rc4(8x,char)"
525 .asciz "rc4(16x,int)"
526 .asciz "RC4 for x86_64, CRYPTOGAMS by <appro\@openssl.org>"
527 .align 64
528 .size RC4_options,.-RC4_options
529 ____

531 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
532 #                                CONTEXT *context,DISPATCHER_CONTEXT *disp)
533 if ($win64) {
534   $rec="%rcx";
535   $frame="%rdx";
536   $context="%r8";
537   $disp="%r9";

539   $code.<=____;
540   .extern __imp_RtlVirtualUnwind
541   .type stream_se_handler, \@abi-omnipotent
542   .align 16
543   stream_se_handler:
544     push %rsi
545     push %rdi
546     push %rbx
547     push %rbp
548     push %r12
549     push %r13
550     push %r14
551     push %r15
552     pushfq
553     sub    \ $64,%rsp

555     mov    120($context),%rax    # pull context->Rax
556     mov    248($context),%rbx    # pull context->Rip

558     lea    .Lprologue(%rip),%r10
559     cmp    %r10,%rbx            # context->Rip<prologue label
560     jb     .Lin_prologue

562     mov    152($context),%rax    # pull context->Rsp

564     lea    .Lepilogue(%rip),%r10
565     cmp    %r10,%rbx            # context->Rip>=epilogue label
566     jae    .Lin_prologue

568     lea    24(%rax),%rax

570     mov    -8(%rax),%rbx
571     mov    -16(%rax),%r12
572     mov    -24(%rax),%r13
573     mov    %rbx,144($context)   # restore context->Rbx
574     mov    %r12,216($context)   # restore context->R12
575     mov    %r13,224($context)   # restore context->R13

577 .Lin_prologue:
578     mov    8(%rax),%rdi
579     mov    16(%rax),%rsi
580     mov    %rax,152($context)   # restore context->Rsp
581     mov    %rsi,168($context)   # restore context->Rsi
582     mov    %rdi,176($context)   # restore context->Rdi

584     jmp    .Lcommon_seh_exit
585 .size    stream_se_handler,.-stream_se_handler

587 .type    key_se_handler,\@abi-omnipotent
588 .align 16
589 key_se_handler:

```

```

590     push    %rsi
591     push    %rdi
592     push    %rbx
593     push    %rbp
594     push    %r12
595     push    %r13
596     push    %r14
597     push    %r15
598     pushfq
599     sub    \ $64,%rsp

601     mov    152($context),%rax    # pull context->Rsp
602     mov    8(%rax),%rdi
603     mov    16(%rax),%rsi
604     mov    %rsi,168($context)   # restore context->Rsi
605     mov    %rdi,176($context)   # restore context->Rdi

607 .Lcommon_seh_exit:

609     mov    40($disp),%rdi        # disp->ContextRecord
610     mov    $context,%rsi        # context
611     mov    \ $154,%ecx          # sizeof(CONTEXT)
612     .long  0xa548f3fc           # cld; rep movsq

614     mov    $disp,%rsi
615     xor    %rcx,%rcx            # arg1, UNW_FLAG_NHANDLER
616     mov    8(%rsi),%rdx        # arg2, disp->ImageBase
617     mov    0(%rsi),%r8         # arg3, disp->ControlPc
618     mov    16(%rsi),%r9        # arg4, disp->FunctionEntry
619     mov    40(%rsi),%r10       # disp->ContextRecord
620     lea    56(%rsi),%r11       # &disp->HandlerData
621     lea    24(%rsi),%r12       # &disp->EstablisherFrame
622     mov    %r10,32(%rsp)       # arg5
623     mov    %r11,40(%rsp)       # arg6
624     mov    %r12,48(%rsp)       # arg7
625     mov    %rcx,56(%rsp)       # arg8, (NULL)
626     call   *__imp_RtlVirtualUnwind(%rip)

628     mov    \ $1,%eax           # ExceptionContinueSearch
629     add    \ $64,%rsp

630     popfq
631     pop    %r15
632     pop    %r14
633     pop    %r13
634     pop    %r12
635     pop    %rbp
636     pop    %rbx
637     pop    %rdi
638     pop    %rsi
639     ret

640 .size    key_se_handler,.-key_se_handler

642 .section    .pdata
643 .align 4
644     .rva    .LSEH_begin_RC4
645     .rva    .LSEH_end_RC4
646     .rva    .LSEH_info_RC4

648     .rva    .LSEH_begin_private_RC4_set_key
649     .rva    .LSEH_end_private_RC4_set_key
650     .rva    .LSEH_info_private_RC4_set_key

652 .section    .xdata
653 .align 8
654 .LSEH_info_RC4:
655     .byte    9,0,0,0

```

```
656         .rva    stream_se_handler
657 .LSEH_info_private_RC4_set_key:
658         .byte    9,0,0,0
659         .rva    key_se_handler
660     _____
661 }

663 sub reg_part {
664 my ($reg,$conv)=@_;
665     if ($reg =~ /[0-9]+/)      { $reg .= $conv; }
666     elsif ($conv eq "b")      { $reg =~ s/%[er]([^\x]+)x?/%$1l/; }
667     elsif ($conv eq "w")      { $reg =~ s/%[er](.+)/%$1/; }
668     elsif ($conv eq "d")      { $reg =~ s/%[er](.+)/%e$1/; }
669     return $reg;
670 }

672 $code =~ s/(%[a-z0-9]+)#([bwd])/reg_part($1,$2)/gem;
673 $code =~ s/\'([^\']*)\'/eval $1/gem;

675 print $code;

677 close STDOUT;
```

```
*****
16243 Fri May 30 18:32:04 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/rmd-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #!/usr/local/bin/perl

3 # Normal is the
4 # ripemd160_block_asm_data_order(RIPEMD160_CTX *c, ULONG *X,int blocks);

6 $normal=0;

8 $0 =~ m/(.*[\\\/\[\]\^\$\&]+)/; $dir=$1;
9 push(@INC,"${dir}","${dir}../../perlasm");
10 require "x86asm.pl";

12 &asm_init($ARGV[0],$0);

14 $A="ecx";
15 $B="esi";
16 $C="edi";
17 $D="ebx";
18 $E="ebp";
19 $tmp1="eax";
20 $tmp2="edx";

22 $KL1=0x5A827999;
23 $KL2=0x6ED9EBA1;
24 $KL3=0x8F1BBCDC;
25 $KL4=0xA953FD4E;
26 $KR0=0x50A28BE6;
27 $KR1=0x5C4DD124;
28 $KR2=0x6D703EF3;
29 $KR3=0x7A6D76E9;

32 @wl=( 0, 1, 2, 3, 4, 5, 6, 7, 8, 9,10,11,12,13,14,15,
33        7, 4,13, 1,10, 6,15, 3,12, 0, 9, 5, 2,14,11, 8,
34        3,10,14, 4, 9,15, 8, 1, 2, 7, 0, 6,13,11, 5,12,
35        1, 9,11,10, 0, 8,12, 4,13, 3, 7,15,14, 5, 6, 2,
36        4, 0, 5, 9, 7,12, 2,10,14, 1, 3, 8,11, 6,15,13,
37        );

39 @wr=( 5,14, 7, 0, 9, 2,11, 4,13, 6,15, 8, 1,10, 3,12,
40        6,11, 3, 7, 0,13, 5,10,14,15, 8,12, 4, 9, 1, 2,
41        15, 5, 1, 3, 7,14, 6, 9,11, 8,12, 2,10, 0, 4,13,
42        8, 6, 4, 1, 3,11,15, 0, 5,12, 2,13, 9, 7,10,14,
43        12,15,10, 4, 1, 5, 8, 7, 6, 2,13,14, 0, 3, 9,11,
44        );

46 @sl=( 11,14,15,12, 5, 8, 7, 9,11,13,14,15, 6, 7, 9, 8,
47        7, 6, 8,13,11, 9, 7,15, 7,12,15, 9,11, 7,13,12,
48        11,13, 6, 7,14, 9,13,15,14, 8,13, 6, 5,12, 7, 5,
49        11,12,14,15,14,15, 9, 8, 9,14, 5, 6, 8, 6, 5,12,
50        9,15, 5,11, 6, 8,13,12, 5,12,13,14,11, 8, 5, 6,
51        );

53 @sr=( 8, 9, 9,11,13,15,15, 5, 7, 7, 8,11,14,14,12, 6,
54        9,13,15, 7,12, 8, 9,11, 7, 7,12, 7, 6,15,13,11,
55        9, 7,15,11, 8, 6, 6,14,12,13, 5,14,13,13, 7, 5,
56        15, 5, 8,11,14,14, 6,14, 6, 9,12, 9,12, 5,15, 8,
57        8, 5,12, 9,12, 5,14, 6, 8,13, 6, 5,15,13,11,11,
58        );

60 &ripemd160_block("ripemd160_block_asm_data_order");
61 &asm_finish();
```

```
63 sub Xv
64 {
65     local($n)=@_;
66     return(&swtmp($n));
67     # tmp on stack
68 }

70 sub Np
71 {
72     local($p)=@_;
73     local(%n)=( $A, $E, $B, $A, $C, $B, $D, $C, $E, $D );
74     return($n{$p});
75 }

77 sub RIP1
78 {
79     local($a,$b,$c,$d,$e,$pos,$s,$so,$pos2)=@_;

81     &comment($p++);
82     if ($p & 1)
83     {
84         #&mov($tmp1, $c) if $so == -1;
85         &xor($tmp1, $d) if $so == -1;
86         &mov($tmp2, &Xv($pos));
87         &xor($tmp1, $b);
88         &add($a, $tmp2);
89         &rotl($c, 10);
90         &add($a, $tmp1);
91         &mov($tmp1, &Np($c)); # NEXT
92         # XXX
93         &rotl($a, $s);
94         &add($a, $e);
95     }
96     else
97     {
98         &xor($tmp1, $d);
99         &mov($tmp2, &Xv($pos));
100        &xor($tmp1, $b);
101        &add($a, $tmp1);
102        &mov($tmp1, &Np($c)) if $so <= 0;
103        &mov($tmp1, -1) if $so == 1;
104        # XXX if $so == 2;
105        &rotl($c, 10);
106        &add($a, $tmp2);
107        &xor($tmp1, &Np($d)) if $so <= 0;
108        &mov($tmp2, &Xv($pos2)) if $so == 1;
109        &mov($tmp2, &wparam(0)) if $so == 2;
110        &rotl($a, $s);
111        &add($a, $e);
112    }
113 }

115 sub RIP2
116 {
117     local($a,$b,$c,$d,$e,$pos,$pos2,$s,$k,$so)=@_;

119 # XXXXXX
120     &comment($p++);
121     if ($p & 1)
122     {
123         &mov($tmp2, &Xv($pos)) if $so < -1;
124         &mov($tmp1, -1) if $so < -1;

126         &add($a, $tmp2);
127         &mov($tmp2, $c);
```

```

128     &sub($tmp1, $b);
129     &and($tmp2, $b);
130     &and($tmp1, $d);
131     &or($tmp2, $tmp1);
132     &mov($tmp1, &Xv($pos2)) if $so <= 0; # XXXXXXXXXXXXXXXX
133     # XXX
134     &rotr($c, 10);
135     &lea($a, &DWP($K, $a, $tmp2, 1));
136     &mov($tmp2, -1) if $so <= 0;
137     # XXX
138     &rotr($a, $s);
139     &add($a, $e);
140   }
141   else
142   {
143     # XXX
144     &add($a, $tmp1);
145     &mov($tmp1, $c);
146     &sub($tmp2, $b);
147     &and($tmp1, $b);
148     &and($tmp2, $d);
149     if ($so != 2)
150     {
151       &or($tmp1, $tmp2);
152       &mov($tmp2, &Xv($pos2)) if $so <= 0;
153       &mov($tmp2, -1) if $so == 1;
154       &rotr($c, 10);
155       &lea($a, &DWP($K, $a, $tmp1, 1));
156       &mov($tmp1, -1) if $so <= 0;
157       &sub($tmp2, &Np($c)) if $so == 1;
158     } else {
159       &or($tmp2, $tmp1);
160       &mov($tmp1, &Np($c));
161       &rotr($c, 10);
162       &lea($a, &DWP($K, $a, $tmp2, 1));
163       &xor($tmp1, &Np($d));
164     }
165     &rotr($a, $s);
166     &add($a, $e);
167   }
168 }

170 sub RIP3
171 {
172   local($a, $b, $c, $d, $e, $pos, $s, $K, $o, $pos2) = @_;

174   &comment($p++);
175   if ($p & 1)
176   {
177     # &mov($tmp2, -1) if $so < -1;
178     # &sub($tmp2, $c) if $so < -1;
179     &mov($tmp1, &Xv($pos));
180     &or($tmp2, $b);
181     &add($a, $tmp1);
182     &xor($tmp2, $d);
183     &mov($tmp1, -1) if $so <= 0; # NEXT
184     # XXX
185     &rotr($c, 10);
186     &lea($a, &DWP($K, $a, $tmp2, 1));
187     &sub($tmp1, &Np($c)) if $so <= 0; # NEXT
188     # XXX
189     &rotr($a, $s);
190     &add($a, $e);
191   }
192   else
193   {

```

```

194     &mov($tmp2, &Xv($pos));
195     &or($tmp1, $b);
196     &add($a, $tmp2);
197     &xor($tmp1, $d);
198     &mov($tmp2, -1) if $so <= 0; # NEXT
199     &mov($tmp2, -1) if $so == 1;
200     &mov($tmp2, &Xv($pos2)) if $so == 2;
201     &rotr($c, 10);
202     &lea($a, &DWP($K, $a, $tmp1, 1));
203     &sub($tmp2, &Np($c)) if $so <= 0; # NEXT
204     &mov($tmp1, &Np($d)) if $so == 1;
205     &mov($tmp1, -1) if $so == 2;
206     &rotr($a, $s);
207     &add($a, $e);
208   }
209 }

211 sub RIP4
212 {
213   local($a, $b, $c, $d, $e, $pos, $s, $K, $o) = @_;

215   &comment($p++);
216   if ($p & 1)
217   {
218     # &mov($tmp2, -1) if $so == -2;
219     # &mov($tmp1, $d) if $so == -2;
220     &sub($tmp2, $d);
221     &and($tmp1, $b);
222     &and($tmp2, $c);
223     &or($tmp2, $tmp1);
224     &mov($tmp1, &Xv($pos));
225     &rotr($c, 10);
226     &lea($a, &DWP($K, $a, $tmp2));
227     &mov($tmp2, -1) unless $so > 0; # NEXT
228     # XXX
229     &add($a, $tmp1);
230     &mov($tmp1, &Np($d)) unless $so > 0; # NEXT
231     # XXX
232     &rotr($a, $s);
233     &add($a, $e);
234   }
235   else
236   {
237     &sub($tmp2, $d);
238     &and($tmp1, $b);
239     &and($tmp2, $c);
240     &or($tmp2, $tmp1);
241     &mov($tmp1, &Xv($pos));
242     &rotr($c, 10);
243     &lea($a, &DWP($K, $a, $tmp2));
244     &mov($tmp2, -1) if $so == 0; # NEXT
245     &mov($tmp2, -1) if $so == 1;
246     &mov($tmp2, -1) if $so == 2;
247     # XXX
248     &add($a, $tmp1);
249     &mov($tmp1, &Np($d)) if $so == 0; # NEXT
250     &sub($tmp2, &Np($d)) if $so == 1;
251     &sub($tmp2, &Np($c)) if $so == 2;
252     # XXX
253     &rotr($a, $s);
254     &add($a, $e);
255   }
256 }

258 sub RIP5
259 {

```

```

260     local($a,$b,$c,$d,$e,$pos,$s,$k,$o)=@_;
262     &comment($p++);
263     if ($p & 1)
264     {
265         &mov($tmp2,    -1) if $o == -2;
266         &sub($tmp2,    $d) if $o == -2;
267         &mov($tmp1,    &Xv($pos));
268         &or($tmp2,     $c);
269         &add($a,       $tmp1);
270         &xor($tmp2,    $b);
271         &mov($tmp1,    -1) if $o <= 0;
272         # XXX
273         &rotr($c,      10);
274         &lea($a,       &DWP($K,$a,$tmp2,1));
275         &sub($tmp1,    &Np($d)) if $o <= 0;
276         # XXX
277         &rotr($a,      $s);
278         &add($a,       $e);
279     }
280     else
281     {
282         &mov($tmp2,    &Xv($pos));
283         &or($tmp1,     $c);
284         &add($a,       $tmp2);
285         &xor($tmp1,    $b);
286         &mov($tmp2,    -1) if $o <= 0;
287         &mov($tmp2,    &wparam(0)) if $o == 1; # Middle code
288         &mov($tmp2,    -1) if $o == 2;
289         &rotr($c,      10);
290         &lea($a,       &DWP($K,$a,$tmp1,1));
291         &sub($tmp2,    &Np($d)) if $o <= 0;
292         &mov(&swtmp(16), $a) if $o == 1;
293         &mov($tmp1,    &Np($d)) if $o == 2;
294         &rotr($a,      $s);
295         &add($a,       $e);
296     }
297 }
299 sub ripemd160_block
300 {
301     local($name)=@_;
303     &function_begin_B($name,"",3);
305     # parameter 1 is the RIPEMD160_CTX structure.
306     # A      0
307     # B      4
308     # C      8
309     # D     12
310     # E     16
312     &mov($tmp2,    &wparam(0));
313     &mov($tmp1,    &wparam(1));
314     &push("esi");
315     &mov($a,       &DWP( 0,$tmp2,"",0));
316     &push("edi");
317     &mov($b,       &DWP( 4,$tmp2,"",0));
318     &push("ebp");
319     &mov($c,       &DWP( 8,$tmp2,"",0));
320     &push("ebx");
321     &stack_push(16+5+6);
322     # Special comment about the figure of 6.
323     # Idea is to pad the current frame so
324     # that the top of the stack gets fairly
325     # aligned. Well, as you realize it would

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326     # always depend on how the frame below is
327     # aligned. The good news are that gcc-2.95
328     # and later does keep first argument at
329     # least double-wise aligned.
330     # <appro@fy.chalmers.se>
332     &set_label("start") unless $normal;
333     &comment("");
335     # &mov($tmp1,    &wparam(1)); # Done at end of loop
336     # &mov($tmp2,    &wparam(0)); # Done at end of loop
338     for ($z=0; $z<16; $z+=2)
339     {
340         &mov($D,      &DWP( $z*4,$tmp1,"",0));
341         &mov($E,      &DWP( ($z+1)*4,$tmp1,"",0));
342         &mov(&swtmp($z), $D);
343         &mov(&swtmp($z+1), $E);
344     }
345     &mov($tmp1,    $C);
346     &mov($D,      &DWP(12,$tmp2,"",0));
347     &mov($E,      &DWP(16,$tmp2,"",0));
349     &RIP1($A,$B,$C,$D,$E,$swl[ 0],$ssl[ 0],-1);
350     &RIP1($E,$A,$B,$C,$D,$swl[ 1],$ssl[ 1],0);
351     &RIP1($D,$E,$A,$B,$C,$swl[ 2],$ssl[ 2],0);
352     &RIP1($C,$D,$E,$A,$B,$swl[ 3],$ssl[ 3],0);
353     &RIP1($B,$C,$D,$E,$A,$swl[ 4],$ssl[ 4],0);
354     &RIP1($A,$B,$C,$D,$E,$swl[ 5],$ssl[ 5],0);
355     &RIP1($E,$A,$B,$C,$D,$swl[ 6],$ssl[ 6],0);
356     &RIP1($D,$E,$A,$B,$C,$swl[ 7],$ssl[ 7],0);
357     &RIP1($C,$D,$E,$A,$B,$swl[ 8],$ssl[ 8],0);
358     &RIP1($B,$C,$D,$E,$A,$swl[ 9],$ssl[ 9],0);
359     &RIP1($A,$B,$C,$D,$E,$swl[10],$ssl[10],0);
360     &RIP1($E,$A,$B,$C,$D,$swl[11],$ssl[11],0);
361     &RIP1($D,$E,$A,$B,$C,$swl[12],$ssl[12],0);
362     &RIP1($C,$D,$E,$A,$B,$swl[13],$ssl[13],0);
363     &RIP1($B,$C,$D,$E,$A,$swl[14],$ssl[14],0);
364     &RIP1($A,$B,$C,$D,$E,$swl[15],$ssl[15],1,$swl[16]);
366     &RIP2($E,$A,$B,$C,$D,$swl[16],$swl[17],$ssl[16],$skl1,-1);
367     &RIP2($D,$E,$A,$B,$C,$swl[17],$swl[18],$ssl[17],$skl1,0);
368     &RIP2($C,$D,$E,$A,$B,$swl[18],$swl[19],$ssl[18],$skl1,0);
369     &RIP2($B,$C,$D,$E,$A,$swl[19],$swl[20],$ssl[19],$skl1,0);
370     &RIP2($A,$B,$C,$D,$E,$swl[20],$swl[21],$ssl[20],$skl1,0);
371     &RIP2($E,$A,$B,$C,$D,$swl[21],$swl[22],$ssl[21],$skl1,0);
372     &RIP2($D,$E,$A,$B,$C,$swl[22],$swl[23],$ssl[22],$skl1,0);
373     &RIP2($C,$D,$E,$A,$B,$swl[23],$swl[24],$ssl[23],$skl1,0);
374     &RIP2($B,$C,$D,$E,$A,$swl[24],$swl[25],$ssl[24],$skl1,0);
375     &RIP2($A,$B,$C,$D,$E,$swl[25],$swl[26],$ssl[25],$skl1,0);
376     &RIP2($E,$A,$B,$C,$D,$swl[26],$swl[27],$ssl[26],$skl1,0);
377     &RIP2($D,$E,$A,$B,$C,$swl[27],$swl[28],$ssl[27],$skl1,0);
378     &RIP2($C,$D,$E,$A,$B,$swl[28],$swl[29],$ssl[28],$skl1,0);
379     &RIP2($B,$C,$D,$E,$A,$swl[29],$swl[30],$ssl[29],$skl1,0);
380     &RIP2($A,$B,$C,$D,$E,$swl[30],$swl[31],$ssl[30],$skl1,0);
381     &RIP2($E,$A,$B,$C,$D,$swl[31],$swl[32],$ssl[31],$skl1,1);
383     &RIP3($D,$E,$A,$B,$C,$swl[32],$ssl[32],$skl2,-1);
384     &RIP3($C,$D,$E,$A,$B,$swl[33],$ssl[33],$skl2,0);
385     &RIP3($B,$C,$D,$E,$A,$swl[34],$ssl[34],$skl2,0);
386     &RIP3($A,$B,$C,$D,$E,$swl[35],$ssl[35],$skl2,0);
387     &RIP3($E,$A,$B,$C,$D,$swl[36],$ssl[36],$skl2,0);
388     &RIP3($D,$E,$A,$B,$C,$swl[37],$ssl[37],$skl2,0);
389     &RIP3($C,$D,$E,$A,$B,$swl[38],$ssl[38],$skl2,0);
390     &RIP3($B,$C,$D,$E,$A,$swl[39],$ssl[39],$skl2,0);
391     &RIP3($A,$B,$C,$D,$E,$swl[40],$ssl[40],$skl2,0);

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392  &RIP3($E,$A,$B,$C,$D,$swl[41],$ssl[41],$SKL2,0);
393  &RIP3($D,$E,$A,$B,$C,$swl[42],$ssl[42],$SKL2,0);
394  &RIP3($C,$D,$E,$A,$B,$swl[43],$ssl[43],$SKL2,0);
395  &RIP3($B,$C,$D,$E,$A,$swl[44],$ssl[44],$SKL2,0);
396  &RIP3($A,$B,$C,$D,$E,$swl[45],$ssl[45],$SKL2,0);
397  &RIP3($E,$A,$B,$C,$D,$swl[46],$ssl[46],$SKL2,0);
398  &RIP3($D,$E,$A,$B,$C,$swl[47],$ssl[47],$SKL2,1);

400  &RIP4($C,$D,$E,$A,$B,$swl[48],$ssl[48],$SKL3,-1);
401  &RIP4($B,$C,$D,$E,$A,$swl[49],$ssl[49],$SKL3,0);
402  &RIP4($A,$B,$C,$D,$E,$swl[50],$ssl[50],$SKL3,0);
403  &RIP4($E,$A,$B,$C,$D,$swl[51],$ssl[51],$SKL3,0);
404  &RIP4($D,$E,$A,$B,$C,$swl[52],$ssl[52],$SKL3,0);
405  &RIP4($C,$D,$E,$A,$B,$swl[53],$ssl[53],$SKL3,0);
406  &RIP4($B,$C,$D,$E,$A,$swl[54],$ssl[54],$SKL3,0);
407  &RIP4($A,$B,$C,$D,$E,$swl[55],$ssl[55],$SKL3,0);
408  &RIP4($E,$A,$B,$C,$D,$swl[56],$ssl[56],$SKL3,0);
409  &RIP4($D,$E,$A,$B,$C,$swl[57],$ssl[57],$SKL3,0);
410  &RIP4($C,$D,$E,$A,$B,$swl[58],$ssl[58],$SKL3,0);
411  &RIP4($B,$C,$D,$E,$A,$swl[59],$ssl[59],$SKL3,0);
412  &RIP4($A,$B,$C,$D,$E,$swl[60],$ssl[60],$SKL3,0);
413  &RIP4($E,$A,$B,$C,$D,$swl[61],$ssl[61],$SKL3,0);
414  &RIP4($D,$E,$A,$B,$C,$swl[62],$ssl[62],$SKL3,0);
415  &RIP4($C,$D,$E,$A,$B,$swl[63],$ssl[63],$SKL3,1);

417  &RIP5($B,$C,$D,$E,$A,$swl[64],$ssl[64],$SKL4,-1);
418  &RIP5($A,$B,$C,$D,$E,$swl[65],$ssl[65],$SKL4,0);
419  &RIP5($E,$A,$B,$C,$D,$swl[66],$ssl[66],$SKL4,0);
420  &RIP5($D,$E,$A,$B,$C,$swl[67],$ssl[67],$SKL4,0);
421  &RIP5($C,$D,$E,$A,$B,$swl[68],$ssl[68],$SKL4,0);
422  &RIP5($B,$C,$D,$E,$A,$swl[69],$ssl[69],$SKL4,0);
423  &RIP5($A,$B,$C,$D,$E,$swl[70],$ssl[70],$SKL4,0);
424  &RIP5($E,$A,$B,$C,$D,$swl[71],$ssl[71],$SKL4,0);
425  &RIP5($D,$E,$A,$B,$C,$swl[72],$ssl[72],$SKL4,0);
426  &RIP5($C,$D,$E,$A,$B,$swl[73],$ssl[73],$SKL4,0);
427  &RIP5($B,$C,$D,$E,$A,$swl[74],$ssl[74],$SKL4,0);
428  &RIP5($A,$B,$C,$D,$E,$swl[75],$ssl[75],$SKL4,0);
429  &RIP5($E,$A,$B,$C,$D,$swl[76],$ssl[76],$SKL4,0);
430  &RIP5($D,$E,$A,$B,$C,$swl[77],$ssl[77],$SKL4,0);
431  &RIP5($C,$D,$E,$A,$B,$swl[78],$ssl[78],$SKL4,0);
432  &RIP5($B,$C,$D,$E,$A,$swl[79],$ssl[79],$SKL4,1);

434  # &mov($tmp2, &wparam(0)); # moved into last RIP5
435  # &mov(&swtmp(16), $A);
436  &mov($A, &DWP( 0,$tmp2,"",0));
437  &mov(&swtmp(16+1), $B);
438  &mov(&swtmp(16+2), $C);
439  &mov($B, &DWP( 4,$tmp2,"",0));
440  &mov(&swtmp(16+3), $D);
441  &mov($C, &DWP( 8,$tmp2,"",0));
442  &mov(&swtmp(16+4), $E);
443  &mov($D, &DWP(12,$tmp2,"",0));
444  &mov($E, &DWP(16,$tmp2,"",0));

446  &RIP5($A,$B,$C,$D,$E,$swr[ 0],$ssr[ 0],$SKR0,-2);
447  &RIP5($E,$A,$B,$C,$D,$swr[ 1],$ssr[ 1],$SKR0,0);
448  &RIP5($D,$E,$A,$B,$C,$swr[ 2],$ssr[ 2],$SKR0,0);
449  &RIP5($C,$D,$E,$A,$B,$swr[ 3],$ssr[ 3],$SKR0,0);
450  &RIP5($B,$C,$D,$E,$A,$swr[ 4],$ssr[ 4],$SKR0,0);
451  &RIP5($A,$B,$C,$D,$E,$swr[ 5],$ssr[ 5],$SKR0,0);
452  &RIP5($E,$A,$B,$C,$D,$swr[ 6],$ssr[ 6],$SKR0,0);
453  &RIP5($D,$E,$A,$B,$C,$swr[ 7],$ssr[ 7],$SKR0,0);
454  &RIP5($C,$D,$E,$A,$B,$swr[ 8],$ssr[ 8],$SKR0,0);
455  &RIP5($B,$C,$D,$E,$A,$swr[ 9],$ssr[ 9],$SKR0,0);
456  &RIP5($A,$B,$C,$D,$E,$swr[10],$ssr[10],$SKR0,0);
457  &RIP5($E,$A,$B,$C,$D,$swr[11],$ssr[11],$SKR0,0);

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458  &RIP5($D,$E,$A,$B,$C,$swr[12],$ssr[12],$SKR0,0);
459  &RIP5($C,$D,$E,$A,$B,$swr[13],$ssr[13],$SKR0,0);
460  &RIP5($B,$C,$D,$E,$A,$swr[14],$ssr[14],$SKR0,0);
461  &RIP5($A,$B,$C,$D,$E,$swr[15],$ssr[15],$SKR0,2);

463  &RIP4($E,$A,$B,$C,$D,$swr[16],$ssr[16],$SKR1,-2);
464  &RIP4($D,$E,$A,$B,$C,$swr[17],$ssr[17],$SKR1,0);
465  &RIP4($C,$D,$E,$A,$B,$swr[18],$ssr[18],$SKR1,0);
466  &RIP4($B,$C,$D,$E,$A,$swr[19],$ssr[19],$SKR1,0);
467  &RIP4($A,$B,$C,$D,$E,$swr[20],$ssr[20],$SKR1,0);
468  &RIP4($E,$A,$B,$C,$D,$swr[21],$ssr[21],$SKR1,0);
469  &RIP4($D,$E,$A,$B,$C,$swr[22],$ssr[22],$SKR1,0);
470  &RIP4($C,$D,$E,$A,$B,$swr[23],$ssr[23],$SKR1,0);
471  &RIP4($B,$C,$D,$E,$A,$swr[24],$ssr[24],$SKR1,0);
472  &RIP4($A,$B,$C,$D,$E,$swr[25],$ssr[25],$SKR1,0);
473  &RIP4($E,$A,$B,$C,$D,$swr[26],$ssr[26],$SKR1,0);
474  &RIP4($D,$E,$A,$B,$C,$swr[27],$ssr[27],$SKR1,0);
475  &RIP4($C,$D,$E,$A,$B,$swr[28],$ssr[28],$SKR1,0);
476  &RIP4($B,$C,$D,$E,$A,$swr[29],$ssr[29],$SKR1,0);
477  &RIP4($A,$B,$C,$D,$E,$swr[30],$ssr[30],$SKR1,0);
478  &RIP4($E,$A,$B,$C,$D,$swr[31],$ssr[31],$SKR1,2);

480  &RIP3($D,$E,$A,$B,$C,$swr[32],$ssr[32],$SKR2,-2);
481  &RIP3($C,$D,$E,$A,$B,$swr[33],$ssr[33],$SKR2,0);
482  &RIP3($B,$C,$D,$E,$A,$swr[34],$ssr[34],$SKR2,0);
483  &RIP3($A,$B,$C,$D,$E,$swr[35],$ssr[35],$SKR2,0);
484  &RIP3($E,$A,$B,$C,$D,$swr[36],$ssr[36],$SKR2,0);
485  &RIP3($D,$E,$A,$B,$C,$swr[37],$ssr[37],$SKR2,0);
486  &RIP3($C,$D,$E,$A,$B,$swr[38],$ssr[38],$SKR2,0);
487  &RIP3($B,$C,$D,$E,$A,$swr[39],$ssr[39],$SKR2,0);
488  &RIP3($A,$B,$C,$D,$E,$swr[40],$ssr[40],$SKR2,0);
489  &RIP3($E,$A,$B,$C,$D,$swr[41],$ssr[41],$SKR2,0);
490  &RIP3($D,$E,$A,$B,$C,$swr[42],$ssr[42],$SKR2,0);
491  &RIP3($C,$D,$E,$A,$B,$swr[43],$ssr[43],$SKR2,0);
492  &RIP3($B,$C,$D,$E,$A,$swr[44],$ssr[44],$SKR2,0);
493  &RIP3($A,$B,$C,$D,$E,$swr[45],$ssr[45],$SKR2,0);
494  &RIP3($E,$A,$B,$C,$D,$swr[46],$ssr[46],$SKR2,0);
495  &RIP3($D,$E,$A,$B,$C,$swr[47],$ssr[47],$SKR2,2,$swr[48]);

497  &RIP2($C,$D,$E,$A,$B,$swr[48],$swr[49],$ssr[48],$SKR3,-2);
498  &RIP2($B,$C,$D,$E,$A,$swr[49],$swr[50],$ssr[49],$SKR3,0);
499  &RIP2($A,$B,$C,$D,$E,$swr[50],$swr[51],$ssr[50],$SKR3,0);
500  &RIP2($E,$A,$B,$C,$D,$swr[51],$swr[52],$ssr[51],$SKR3,0);
501  &RIP2($D,$E,$A,$B,$C,$swr[52],$swr[53],$ssr[52],$SKR3,0);
502  &RIP2($C,$D,$E,$A,$B,$swr[53],$swr[54],$ssr[53],$SKR3,0);
503  &RIP2($B,$C,$D,$E,$A,$swr[54],$swr[55],$ssr[54],$SKR3,0);
504  &RIP2($A,$B,$C,$D,$E,$swr[55],$swr[56],$ssr[55],$SKR3,0);
505  &RIP2($E,$A,$B,$C,$D,$swr[56],$swr[57],$ssr[56],$SKR3,0);
506  &RIP2($D,$E,$A,$B,$C,$swr[57],$swr[58],$ssr[57],$SKR3,0);
507  &RIP2($C,$D,$E,$A,$B,$swr[58],$swr[59],$ssr[58],$SKR3,0);
508  &RIP2($B,$C,$D,$E,$A,$swr[59],$swr[60],$ssr[59],$SKR3,0);
509  &RIP2($A,$B,$C,$D,$E,$swr[60],$swr[61],$ssr[60],$SKR3,0);
510  &RIP2($E,$A,$B,$C,$D,$swr[61],$swr[62],$ssr[61],$SKR3,0);
511  &RIP2($D,$E,$A,$B,$C,$swr[62],$swr[63],$ssr[62],$SKR3,0);
512  &RIP2($C,$D,$E,$A,$B,$swr[63],$swr[64],$ssr[63],$SKR3,2);

514  &RIP1($B,$C,$D,$E,$A,$swr[64],$ssr[64],-2);
515  &RIP1($A,$B,$C,$D,$E,$swr[65],$ssr[65],0);
516  &RIP1($E,$A,$B,$C,$D,$swr[66],$ssr[66],0);
517  &RIP1($D,$E,$A,$B,$C,$swr[67],$ssr[67],0);
518  &RIP1($C,$D,$E,$A,$B,$swr[68],$ssr[68],0);
519  &RIP1($B,$C,$D,$E,$A,$swr[69],$ssr[69],0);
520  &RIP1($A,$B,$C,$D,$E,$swr[70],$ssr[70],0);
521  &RIP1($E,$A,$B,$C,$D,$swr[71],$ssr[71],0);
522  &RIP1($D,$E,$A,$B,$C,$swr[72],$ssr[72],0);
523  &RIP1($C,$D,$E,$A,$B,$swr[73],$ssr[73],0);

```



```

524      &RIP1($B,$C,$D,$E,$A,$swr[74],$ssr[74],0);
525      &RIP1($A,$B,$C,$D,$E,$swr[75],$ssr[75],0);
526      &RIP1($E,$A,$B,$C,$D,$swr[76],$ssr[76],0);
527      &RIP1($D,$E,$A,$B,$C,$swr[77],$ssr[77],0);
528      &RIP1($C,$D,$E,$A,$B,$swr[78],$ssr[78],0);
529      &RIP1($B,$C,$D,$E,$A,$swr[79],$ssr[79],2);

531      # &mov($tmp2, &wparam(0)); # Moved into last round

533      &mov($tmp1, &DWP( 4,$tmp2,"",0)); # ctx->B
534      &add($D, $tmp1);
535      &mov($tmp1, &swtmp(16+2)); # $c
536      &add($D, $tmp1);

538      &mov($tmp1, &DWP( 8,$tmp2,"",0)); # ctx->C
539      &add($E, $tmp1);
540      &mov($tmp1, &swtmp(16+3)); # $d
541      &add($E, $tmp1);

543      &mov($tmp1, &DWP(12,$tmp2,"",0)); # ctx->D
544      &add($A, $tmp1);
545      &mov($tmp1, &swtmp(16+4)); # $e
546      &add($A, $tmp1);

549      &mov($tmp1, &DWP(16,$tmp2,"",0)); # ctx->E
550      &add($B, $tmp1);
551      &mov($tmp1, &swtmp(16+0)); # $a
552      &add($B, $tmp1);

554      &mov($tmp1, &DWP( 0,$tmp2,"",0)); # ctx->A
555      &add($C, $tmp1);
556      &mov($tmp1, &swtmp(16+1)); # $b
557      &add($C, $tmp1);

559      &mov($tmp1, &wparam(2));

561      &mov(&DWP( 0,$tmp2,"",0), $D);
562      &mov(&DWP( 4,$tmp2,"",0), $E);
563      &mov(&DWP( 8,$tmp2,"",0), $A);
564      &sub($tmp1,1);
565      &mov(&DWP(12,$tmp2,"",0), $B);
566      &mov(&DWP(16,$tmp2,"",0), $C);

568      &jle(&label("get_out"));

570      &mov(&wparam(2), $tmp1);
571      &mov($C, $A);
572      &mov($tmp1, &wparam(1));
573      &mov($A, $D);
574      &add($tmp1, 64);
575      &mov($B, $E);
576      &mov(&wparam(1), $tmp1);

578      &jmp(&label("start"));

580      &set_label("get_out");

582      &stack_pop(16+5+6);

584      &pop("ebx");
585      &pop("ebp");
586      &pop("edi");
587      &pop("esi");
588      &ret();
589      &function_end_B($name);

```

```

590      }

```



```

128 $tmp1="ebp";
130 @V=($A,$B,$C,$D,$E,$T);

132 $alt=0; # 1 denotes alternative IALU implementation, which performs
133         # 8% *worse* on P4, same on Westmere and Atom, 2% better on
134         # Sandy Bridge...

136 sub BODY_00_15
137 {
138     local($n,$a,$b,$c,$d,$e,$f)=@_;

140     &comment("00_15 $n");

142     &mov($f,$c);           # f to hold F_00_19(b,c,d)
143     if ($n==0) { &mov($tmp1,$a); }
144     else { &mov($a,$tmp1); }
145     &rotr($tmp1,5);        # tmp1=ROTATE(a,5)
146     &xor($f,$d);
147     &add($tmp1,$e);        # tmp1+=e;
148     &mov($e,&swtmp(($n%16))); # e becomes volatile and is loaded
149                             # with xi, also note that e becomes
150                             # f in next round...
151     &and($f,$b);
152     &rotr($b,2);           # b=ROTATE(b,30)
153     &xor($f,$d);           # f holds F_00_19(b,c,d)
154     &lea($tmp1,&DWP(0x5a827999,$tmp1,$e)); # tmp1+=K_00_19+xi

156     if ($n==15) { &mov($e,&swtmp(($n+1)%16)); # pre-fetch f for next round
157                  &add($f,$tmp1); } # f+=tmp1
158     else { &add($tmp1,$f); } # f becomes a in next round
159     &mov($tmp1,$a)         if ($alt && $n==15);
160 }

162 sub BODY_16_19
163 {
164     local($n,$a,$b,$c,$d,$e,$f)=@_;

166     &comment("16_19 $n");

168 if ($alt) {
169     &xor($c,$d);
170     &xor($f,&swtmp(($n+2)%16)); # f to hold Xupdate(xi,xa,xb,xc,xd)
171     &and($tmp1,$c);           # tmp1 to hold F_00_19(b,c,d), b&=c^d
172     &xor($f,&swtmp(($n+8)%16));
173     &xor($tmp1,$d);           # tmp1=F_00_19(b,c,d)
174     &xor($f,&swtmp(($n+13)%16)); # f holds xa^xb^xc^xd
175     &rotr($f,1);             # f=ROTATE(f,1)
176     &add($e,$tmp1);          # e+=F_00_19(b,c,d)
177     &xor($c,$d);             # restore $c
178     &mov($tmp1,$a);          # b in next round
179     &rotr($b,$n==16?2:7);    # b=ROTATE(b,30)
180     &mov(&swtmp($n%16),$f);  # xi=f
181     &rotr($a,5);             # ROTATE(a,5)
182     &lea($f,&DWP(0x5a827999,$f,$e)); # f+=F_00_19(b,c,d)+e
183     &mov($e,&swtmp(($n+1)%16)); # pre-fetch f for next round
184     &add($f,$a);             # f+=ROTATE(a,5)
185 } else {
186     &mov($tmp1,$c);          # tmp1 to hold F_00_19(b,c,d)
187     &xor($f,&swtmp(($n+2)%16)); # f to hold Xupdate(xi,xa,xb,xc,xd)
188     &xor($tmp1,$d);
189     &xor($f,&swtmp(($n+8)%16));
190     &and($tmp1,$b);
191     &xor($f,&swtmp(($n+13)%16)); # f holds xa^xb^xc^xd
192     &rotr($f,1);             # f=ROTATE(f,1)
193     &xor($tmp1,$d);          # tmp1=F_00_19(b,c,d)

```

```

194     &add($e,$tmp1);         # e+=F_00_19(b,c,d)
195     &mov($tmp1,$a);
196     &rotr($b,2);            # b=ROTATE(b,30)
197     &mov(&swtmp($n%16),$f); # xi=f
198     &rotr($tmp1,5);         # ROTATE(a,5)
199     &lea($f,&DWP(0x5a827999,$f,$e)); # f+=F_00_19(b,c,d)+e
200     &mov($e,&swtmp(($n+1)%16)); # pre-fetch f for next round
201     &add($f,$tmp1);        # f+=ROTATE(a,5)
202 }
203 }

205 sub BODY_20_39
206 {
207     local($n,$a,$b,$c,$d,$e,$f)=@_;
208     local $K=($n<40)?0x6ed9eba1:0xca62c1d6;

210     &comment("20_39 $n");

212 if ($alt) {
213     &xor($tmp1,$c);         # tmp1 to hold F_20_39(b,c,d), b^=c
214     &xor($f,&swtmp(($n+2)%16)); # f to hold Xupdate(xi,xa,xb,xc,xd)
215     &xor($tmp1,$d);         # tmp1 holds F_20_39(b,c,d)
216     &xor($f,&swtmp(($n+8)%16));
217     &add($e,$tmp1);         # e+=F_20_39(b,c,d)
218     &xor($f,&swtmp(($n+13)%16)); # f holds xa^xb^xc^xd
219     &rotr($f,1);           # f=ROTATE(f,1)
220     &mov($tmp1,$a);        # b in next round
221     &rotr($b,7);           # b=ROTATE(b,30)
222     &mov(&swtmp($n%16),$f)  if ($n<77); # xi=f
223     &rotr($a,5);           # ROTATE(a,5)
224     &xor($b,$c);           if ($n==39); # warm up for BODY_40_59
225     &and($tmp1,$b);        if ($n==39);
226     &lea($f,&DWP($K,$f,$e)); # f+=e+K_XX_YY
227     &mov($e,&swtmp(($n+1)%16)); if ($n<79); # pre-fetch f for next round
228     &add($f,$a);           # f+=ROTATE(a,5)
229     &rotr($a,5);          if ($n==79);
230 } else {
231     &mov($tmp1,$b);        # tmp1 to hold F_20_39(b,c,d)
232     &xor($f,&swtmp(($n+2)%16)); # f to hold Xupdate(xi,xa,xb,xc,xd)
233     &xor($tmp1,$c);
234     &xor($f,&swtmp(($n+8)%16));
235     &xor($tmp1,$d);        # tmp1 holds F_20_39(b,c,d)
236     &xor($f,&swtmp(($n+13)%16)); # f holds xa^xb^xc^xd
237     &rotr($f,1);           # f=ROTATE(f,1)
238     &add($e,$tmp1);        # e+=F_20_39(b,c,d)
239     &rotr($b,2);           # b=ROTATE(b,30)
240     &mov($tmp1,$a);
241     &rotr($tmp1,5);        # ROTATE(a,5)
242     &mov(&swtmp($n%16),$f) if ($n<77); # xi=f
243     &lea($f,&DWP($K,$f,$e)); # f+=e+K_XX_YY
244     &mov($e,&swtmp(($n+1)%16)); if ($n<79); # pre-fetch f for next round
245     &add($f,$tmp1);        # f+=ROTATE(a,5)
246 }
247 }

249 sub BODY_40_59
250 {
251     local($n,$a,$b,$c,$d,$e,$f)=@_;

253     &comment("40_59 $n");

255 if ($alt) {
256     &add($e,$tmp1);        # e+=b&(c^d)
257     &xor($f,&swtmp(($n+2)%16)); # f to hold Xupdate(xi,xa,xb,xc,xd)
258     &mov($tmp1,$d);
259     &xor($f,&swtmp(($n+8)%16));

```

```

260     &xor($c,$d);          # restore $c
261     &xor($f,&swtmp(($n+13)%16)); # f holds xa^xb^xc^xd
262     &rotr($f,1);          # f=ROTATE(f,1)
263     &and($tmp1,$c);
264     &rotr($b,7);          # b=ROTATE(b,30)
265     &add($e,$tmp1);       # e+=c&d
266     &mov($tmp1,$a);       # b in next round
267     &mov(&swtmp($n%16),$f); # xi=f
268     &rotr($a,5);          # ROTATE(a,5)
269     &xor($b,$c);          if ($n<59);
270     &and($tmp1,$b)        if ($n<59);# tmp1 to hold F_40_59(b,c,d)
271     &lea($f,&DWP(0x8f1bbcdc,$f,$e));# f+=K_40_59+e+(b&(c^d))
272     &mov($e,&swtmp(($n+1)%16)); # pre-fetch f for next round
273     &add($f,$a);          # f+=ROTATE(a,5)
274 } else {
275     &mov($tmp1,$c);       # tmp1 to hold F_40_59(b,c,d)
276     &xor($f,&swtmp(($n+2)%16)); # f to hold Xupdate(xi,xa,xb,xc,xd)
277     &xor($tmp1,$d);
278     &xor($f,&swtmp(($n+8)%16));
279     &and($tmp1,$b);
280     &xor($f,&swtmp(($n+13)%16)); # f holds xa^xb^xc^xd
281     &rotr($f,1);          # f=ROTATE(f,1)
282     &add($tmp1,$e);       # b&(c^d)+=e
283     &rotr($b,2);          # b=ROTATE(b,30)
284     &mov($e,$a);          # e becomes volatile
285     &rotr($e,5);          # ROTATE(a,5)
286     &mov(&swtmp($n%16),$f); # xi=f
287     &lea($f,&DWP(0x8f1bbcdc,$f,$tmp1));# f+=K_40_59+e+(b&(c^d))
288     &mov($tmp1,$c);
289     &add($f,$e);          # f+=ROTATE(a,5)
290     &and($tmp1,$d);
291     &mov($e,&swtmp(($n+1)%16)); # pre-fetch f for next round
292     &add($f,$tmp1);       # f+=c&d
293 }
294 }

296 &function_begin("sha1_block_data_order");
297 if ($xmm) {
298     &static_label("ssse3_shortcut");
299     &static_label("avx_shortcut") if ($ymm);
300     &static_label("K_XX_XX");

302     &call(&label("pic_point")); # make it PIC!
303     &set_label("pic_point");
304     &blindpop($tmp1);
305     &picmeup($t,"OPENSSL_ia32cap_P",$tmp1,&label("pic_point"));
306     &lea($tmp1,&DWP(&label("K_XX_XX")."-".&label("pic_point"),$tmp1));

308     &mov($a,&DWP(0,$t));
309     &mov($d,&DWP(4,$t));
310     &test($d,1<<9);        # check SSSE3 bit
311     &jz(&label("x86"));
312     &test($a,1<<24);        # check FXSR bit
313     &jz(&label("x86"));
314     if ($ymm) {
315         &and($d,1<<28);      # mask AVX bit
316         &and($a,1<<30);      # mask "Intel CPU" bit
317         &or($a,$d);
318         &cmp($a,1<<28|1<<30);
319         &jne(&label("avx_shortcut"));
320     }
321     &jmp(&label("ssse3_shortcut"));
322     &set_label("x86",16);
323 }
324 &mov($tmp1,&wparam(0)); # SHA_CTX *c
325 &mov($t,&wparam(1));   # const void *input

```

```

326     &mov($a,&wparam(2)); # size_t num
327     &stack_push(16+3);    # allocate X[16]
328     &shl($a,6);
329     &add($a,$t);
330     &mov(&wparam(2),$a); # pointer beyond the end of input
331     &mov($e,&DWP(16,$tmp1));# pre-load E
332     &jmp(&label("loop"));

334 &set_label("loop",16);

336     # copy input chunk to X, but reversing byte order!
337     for($i=0;$i<16;$i+=4)
338     {
339         &mov($a,&DWP(4*($i+0),$t));
340         &mov($b,&DWP(4*($i+1),$t));
341         &mov($c,&DWP(4*($i+2),$t));
342         &mov($d,&DWP(4*($i+3),$t));
343         &bswap($a);
344         &bswap($b);
345         &bswap($c);
346         &bswap($d);
347         &mov(&swtmp($i+0),$a);
348         &mov(&swtmp($i+1),$b);
349         &mov(&swtmp($i+2),$c);
350         &mov(&swtmp($i+3),$d);
351     }
352     &mov(&wparam(1),$t); # redundant in 1st spin

354     &mov($a,&DWP(0,$tmp1)); # load SHA_CTX
355     &mov($b,&DWP(4,$tmp1));
356     &mov($c,&DWP(8,$tmp1));
357     &mov($d,&DWP(12,$tmp1));
358     # E is pre-loaded

360     for($i=0;$i<16;$i++) { &BODY_00_15($i,@v); unshift(@v,pop(@v)); }
361     for($i<20;$i++) { &BODY_16_19($i,@v); unshift(@v,pop(@v)); }
362     for($i<40;$i++) { &BODY_20_39($i,@v); unshift(@v,pop(@v)); }
363     for($i<60;$i++) { &BODY_40_59($i,@v); unshift(@v,pop(@v)); }
364     for($i<80;$i++) { &BODY_20_39($i,@v); unshift(@v,pop(@v)); }

366     (($v[5] eq $d) and ($v[0] eq $e)) or die; # double-check

368     &mov($tmp1,&wparam(0)); # re-load SHA_CTX*
369     &mov($d,&wparam(1));    # D is last "T" and is discarded

371     &add($e,&DWP(0,$tmp1)); # E is last "A"...
372     &add($t,&DWP(4,$tmp1));
373     &add($a,&DWP(8,$tmp1));
374     &add($b,&DWP(12,$tmp1));
375     &add($c,&DWP(16,$tmp1));

377     &mov(&DWP(0,$tmp1),$e); # update SHA_CTX
378     &add($d,64);            # advance input pointer
379     &mov(&DWP(4,$tmp1),$t);
380     &cmp($d,&wparam(2));    # have we reached the end yet?
381     &mov(&DWP(8,$tmp1),$a);
382     &mov($e,$c);           # C is last "E" which needs to be "pre-loaded"
383     &mov(&DWP(12,$tmp1),$b);
384     &mov($t,$d);           # input pointer
385     &mov(&DWP(16,$tmp1),$c);
386     &jb(&label("loop"));

388     &stack_pop(16+3);
389     &function_end("sha1_block_data_order");

391 if ($xmm) {

```

```

392 #####
393 # The SSE3 implementation.
394 #
395 # %xmm[0-7] are used as ring @X[] buffer containing quadruples of last
396 # 32 elements of the message schedule or Xupdate outputs. First 4
397 # quadruples are simply byte-swapped input, next 4 are calculated
398 # according to method originally suggested by Dean Gaudet (modulo
399 # being implemented in SSE3). Once 8 quadruples or 32 elements are
400 # collected, it switches to routine proposed by Max Locktyukhin.
401 #
402 # Calculations inevitably require temporary registers, and there are
403 # no %xmm registers left to spare. For this reason part of the ring
404 # buffer, X[2..4] to be specific, is offloaded to 3 quadruples ring
405 # buffer on the stack. Keep in mind that X[2] is alias X[-6], X[3] -
406 # X[-5], and X[4] - X[-4]...
407 #
408 # Another notable optimization is aggressive stack frame compression
409 # aiming to minimize amount of 9-byte instructions...
410 #
411 # Yet another notable optimization is "jumping" $B variable. It means
412 # that there is no register permanently allocated for $B value. This
413 # allowed to eliminate one instruction from body_20_39...
414 #
415 my $Xi=4; # 4xSIMD Xupdate round, start pre-seeded
416 my @X=map("xmm$_", (4..7,0..3)); # pre-seeded for $Xi=4
417 my @V=($A,$B,$C,$D,$E); # hash round
418 my $j=0;
419 my @T=($T,$tmp1);
420 my $inp;

422 my $_rol=sub { &rol($_) };
423 my $_ror=sub { &ror($_) };

425 &function_begin(" sha1_block_data_order_ssse3");
426 &call (&label("pic_point")); # make it PIC!
427 &set_label("pic_point");
428 &blndpop($tmp1);
429 &lea ($tmp1,&DWP(&label("K_XX_XX")."-."&label("pic_point"),$tmp1));
430 &set_label("ssse3_shortcut");

432 &movdqa (@X[3],&QWP(0,$tmp1)); # K_00_19
433 &movdqa (@X[4],&QWP(16,$tmp1)); # K_20_39
434 &movdqa (@X[5],&QWP(32,$tmp1)); # K_40_59
435 &movdqa (@X[6],&QWP(48,$tmp1)); # K_60_79
436 &movdqa (@X[2],&QWP(64,$tmp1)); # pbswap mask

438 &mov ($E,&wparam(0)); # load argument block
439 &mov ($inp,@T[1],&wparam(1));
440 &mov ($D,&wparam(2));
441 &mov (@T[0],"esp");

443 # stack frame layout
444 #
445 # +0 X[0]+K X[1]+K X[2]+K X[3]+K # XMM->IALU xfer area
446 # X[4]+K X[5]+K X[6]+K X[7]+K
447 # X[8]+K X[9]+K X[10]+K X[11]+K
448 # X[12]+K X[13]+K X[14]+K X[15]+K
449 #
450 # +64 X[0] X[1] X[2] X[3] # XMM->XMM backtrace area
451 # X[4] X[5] X[6] X[7]
452 # X[8] X[9] X[10] X[11] # even borrowed for K_00_19
453 #
454 # +112 K_20_39 K_20_39 K_20_39 K_20_39 # constants
455 # K_40_59 K_40_59 K_40_59 K_40_59
456 # K_60_79 K_60_79 K_60_79 K_60_79
457 # K_00_19 K_00_19 K_00_19 K_00_19

```

```

458 # pbswap mask
459 #
460 # +192 ctx # argument block
461 # +196 inp
462 # +200 end
463 # +204 esp
464 &sub ("esp",208);
465 &and ("esp",-64);

467 &movdqa (&QWP(112+0,"esp"),@X[4]); # copy constants
468 &movdqa (&QWP(112+16,"esp"),@X[5]);
469 &movdqa (&QWP(112+32,"esp"),@X[6]);
470 &shl ($D,6); # len*64
471 &movdqa (&QWP(112+48,"esp"),@X[3]);
472 &add ($D,$inp); # end of input
473 &movdqa (&QWP(112+64,"esp"),@X[2]);
474 &add ($inp,64);
475 &mov (&DWP(192+0,"esp"),$E); # save argument block
476 &mov (&DWP(192+4,"esp"),$inp);
477 &mov (&DWP(192+8,"esp"),$D);
478 &mov (&DWP(192+12,"esp"),@T[0]); # save original %esp

480 &mov ($A,&DWP(0,$E)); # load context
481 &mov ($B,&DWP(4,$E));
482 &mov ($C,&DWP(8,$E));
483 &mov ($D,&DWP(12,$E));
484 &mov ($E,&DWP(16,$E));
485 &mov (@T[0],$B); # magic seed

487 &movdqu (@X[-4&7],&QWP(-64,$inp)); # load input to %xmm[0-3]
488 &movdqu (@X[-3&7],&QWP(-48,$inp));
489 &movdqu (@X[-2&7],&QWP(-32,$inp));
490 &movdqu (@X[-1&7],&QWP(-16,$inp));
491 &pshufb (@X[-4&7],@X[2]); # byte swap
492 &pshufb (@X[-3&7],@X[2]);
493 &pshufb (@X[-2&7],@X[2]);
494 &movdqa (&QWP(112-16,"esp"),@X[3]); # borrow last backtrace slot
495 &pshufb (@X[-1&7],@X[2]);
496 &paddd (@X[-4&7],@X[3]); # add K_00_19
497 &paddd (@X[-3&7],@X[3]);
498 &paddd (@X[-2&7],@X[3]);
499 &movdqa (&QWP(0,"esp"),@X[-4&7]); # X[]+K xfer to IALU
500 &psubd (@X[-4&7],@X[3]); # restore X[]
501 &movdqa (&QWP(0+16,"esp"),@X[-3&7]);
502 &psubd (@X[-3&7],@X[3]);
503 &movdqa (&QWP(0+32,"esp"),@X[-2&7]);
504 &psubd (@X[-2&7],@X[3]);
505 &movdqa (@X[0],@X[-3&7]);
506 &jmp (&label("loop"));

508 #####
509 # SSE instruction sequence is first broken to groups of independent
510 # instructions, independent in respect to their inputs and shifter
511 # (not all architectures have more than one). Then IALU instructions
512 # are "knitted in" between the SSE groups. Distance is maintained for
513 # SSE latency of 2 in hope that it fits better upcoming AMD Bulldozer
514 # [which allegedly also implements SSSE3]...
515 #
516 # Temporary registers usage. X[2] is volatile at the entry and at the
517 # end is restored from backtrace ring buffer. X[3] is expected to
518 # contain current K_XX_XX constant and is used to calculate X[-1]+K
519 # from previous round, it becomes volatile the moment the value is
520 # saved to stack for transfer to IALU. X[4] becomes volatile whenever
521 # X[-4] is accumulated and offloaded to backtrace ring buffer, at the
522 # end it is loaded with next K_XX_XX [which becomes X[3] in next
523 # round]...

```

```

524 #
525 sub Xupdate_sse3_16_31()          # recall that $Xi starts with 4
526 { use integer;
527   my $body = shift;
528   my @insns = (&$body, &$body, &$body, &$body);    # 40 instructions
529   my ($a, $b, $c, $d, $e);

531     eval(shift(@insns));
532     eval(shift(@insns));
533     &palgnr(@X[0], @X[-4&7], 8);    # compose "X[-14]" in "X[0]"
534     &movdqa (@X[2], @X[-1&7]);
535     eval(shift(@insns));
536     eval(shift(@insns));

538     &padd    (@X[3], @X[-1&7]);
539     &movdqa  (&QWP(64+16*((&$Xi-4)%3), "esp"), @X[-4&7]); # save X[] to b
540     eval(shift(@insns));
541     eval(shift(@insns));
542     &psrldq (@X[2], 4);
543     eval(shift(@insns));
544     eval(shift(@insns));
545     &pxor   (@X[0], @X[-4&7]);    # "X[0]^=X[-16]"
546     eval(shift(@insns));
547     eval(shift(@insns));

549     &pxor   (@X[2], @X[-2&7]);    # "X[-3]^X[-8]"
550     eval(shift(@insns));
551     eval(shift(@insns));
552     eval(shift(@insns));
553     eval(shift(@insns));

555     &pxor   (@X[0], @X[2]);        # "X[0]^=X[-3]^X[-8]"
556     eval(shift(@insns));
557     eval(shift(@insns));
558     &movdqa  (&QWP(0+16*((&$Xi-1)%3), "esp"), @X[3]);    # X[]+K xfer to
559     eval(shift(@insns));
560     eval(shift(@insns));

562     &movdqa (@X[4], @X[0]);
563     &movdqa (@X[2], @X[0]);
564     eval(shift(@insns));
565     eval(shift(@insns));
566     eval(shift(@insns));
567     eval(shift(@insns));

569     &pslldq (@X[4], 12);           # "X[0]<<96, extract one dword"
570     &padd    (@X[0], @X[0]);
571     eval(shift(@insns));
572     eval(shift(@insns));
573     eval(shift(@insns));
574     eval(shift(@insns));

576     &psrld  (@X[2], 31);
577     eval(shift(@insns));
578     eval(shift(@insns));
579     &movdqa (@X[3], @X[4]);
580     eval(shift(@insns));
581     eval(shift(@insns));

583     &psrld  (@X[4], 30);
584     &por    (@X[0], @X[2]);        # "X[0]<<=1"
585     eval(shift(@insns));
586     eval(shift(@insns));
587     &movdqa (@X[2], &QWP(64+16*((&$Xi-6)%3), "esp")) if (&$Xi>5);
588     eval(shift(@insns));
589     eval(shift(@insns));

```

```

591     &pslld  (@X[3], 2);
592     &pxor   (@X[0], @X[4]);
593     eval(shift(@insns));
594     eval(shift(@insns));
595     &movdqa (@X[4], &QWP(112-16+16*((&$Xi)/5), "esp"));    # K_XX_X
596     eval(shift(@insns));
597     eval(shift(@insns));

599     &pxor   (@X[0], @X[3]);        # "X[0]^=(X[0]<<96)<<2"
600     &movdqa (@X[1], @X[-2&7])    if (&$Xi<7);
601     eval(shift(@insns));
602     eval(shift(@insns));

604     foreach (@insns) { eval; }    # remaining instructions [if any]

606     $Xi++;        push(@X, shift(@X));    # "rotate" X[]
607 }

609 sub Xupdate_sse3_32_79()
610 { use integer;
611   my $body = shift;
612   my @insns = (&$body, &$body, &$body, &$body);    # 32 to 48 instructions
613   my ($a, $b, $c, $d, $e);

615     &movdqa (@X[2], @X[-1&7])    if (&$Xi==8);
616     eval(shift(@insns));        # body_20_39
617     &pxor   (@X[0], @X[-4&7]);    # "X[0]^=X[-32]^X[-16]"
618     &palgnr(@X[2], @X[-2&7], 8);    # compose "X[-6]"
619     eval(shift(@insns));
620     eval(shift(@insns));
621     eval(shift(@insns));        # rol

623     &pxor   (@X[0], @X[-7&7]);    # "X[0]^=X[-28]"
624     &movdqa  (&QWP(64+16*((&$Xi-4)%3), "esp"), @X[-4&7]);    # save X
625     eval(shift(@insns));
626     eval(shift(@insns));
627     if (&$Xi%5) {
628       &movdqa (@X[4], @X[3]);    # "perpetuate" K_XX_XX...
629     } else {
630       &movdqa (@X[4], &QWP(112-16+16*((&$Xi)/5), "esp"));
631     }
632     &padd    (@X[3], @X[-1&7]);
633     eval(shift(@insns));        # ror
634     eval(shift(@insns));

636     &pxor   (@X[0], @X[2]);        # "X[0]^=X[-6]"
637     eval(shift(@insns));        # body_20_39
638     eval(shift(@insns));
639     eval(shift(@insns));
640     eval(shift(@insns));        # rol

642     &movdqa (@X[2], @X[0]);
643     &movdqa  (&QWP(0+16*((&$Xi-1)%3), "esp"), @X[3]);    # X[]+K xfer to
644     eval(shift(@insns));
645     eval(shift(@insns));
646     eval(shift(@insns));        # ror
647     eval(shift(@insns));

649     &pslld  (@X[0], 2);
650     eval(shift(@insns));        # body_20_39
651     eval(shift(@insns));
652     &psrld  (@X[2], 30);
653     eval(shift(@insns));
654     eval(shift(@insns));        # rol
655     eval(shift(@insns));

```

```

656     eval(shift(@insns));
657     eval(shift(@insns));           # ror
658     eval(shift(@insns));

660     &por (@X[0],@X[2]);           # "X[0]"<<=2
661     eval(shift(@insns));           # body_20_39
662     eval(shift(@insns));
663     &movdqa (@X[2],&QWP(64+16*((&Xi-6)%3),"esp")); if(&Xi<19);
664     eval(shift(@insns));
665     eval(shift(@insns));           # rol
666     eval(shift(@insns));
667     eval(shift(@insns));
668     eval(shift(@insns));           # ror
669     &movdqa (@X[3],@X[0]) if (&Xi<19);
670     eval(shift(@insns));

672     foreach (@insns) { eval; }    # remaining instructions

674     &Xi++;           push(@X,shift(@X));   # "rotate" X[1]
675 }

677 sub Xuplast_ssse3_80()
678 { use integer;
679   my $body = shift;
680   my @insns = (&$body,&$body,&$body,&$body);   # 32 instructions
681   my ($a,$b,$c,$d,$e);

683     eval(shift(@insns));
684     &padd (@X[3],@X[-1&7]);
685     eval(shift(@insns));
686     eval(shift(@insns));
687     eval(shift(@insns));
688     eval(shift(@insns));

690     &movdqa (&QWP(0+16*((&Xi-1)&3),"esp"),@X[3]);   # X[]+K xfer IAL

692     foreach (@insns) { eval; }    # remaining instructions

694     &mov ($inp=@T[1],&DWP(192+4,"esp"));
695     &cmp ($inp,&DWP(192+8,"esp"));
696     &je (&label("done"));

698     &movdqa (@X[3],&QWP(112+48,"esp"));   # K_00_19
699     &movdqa (@X[2],&QWP(112+64,"esp"));   # pbswap mask
700     &movdqu (@X[-4&7],&QWP(0,$inp));     # load input
701     &movdqu (@X[-3&7],&QWP(16,$inp));
702     &movdqu (@X[-2&7],&QWP(32,$inp));
703     &movdqu (@X[-1&7],&QWP(48,$inp));
704     &add ($inp,64);
705     &pshufb (@X[-4&7],@X[2]);           # byte swap
706     &mov (&DWP(192+4,"esp"),$inp);
707     &movdqa (&QWP(112-16,"esp"),@X[3]); # borrow last backtrace slot

709     &Xi=0;
710 }

712 sub Xloop_ssse3()
713 { use integer;
714   my $body = shift;
715   my @insns = (&$body,&$body,&$body,&$body);   # 32 instructions
716   my ($a,$b,$c,$d,$e);

718     eval(shift(@insns));
719     eval(shift(@insns));
720     &pshufb (@X[($&Xi-3)&7],@X[2]);
721     eval(shift(@insns));

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```

722     eval(shift(@insns));
723     &padd (@X[($&Xi-4)&7],@X[3]);
724     eval(shift(@insns));
725     eval(shift(@insns));
726     eval(shift(@insns));
727     eval(shift(@insns));
728     &movdqa (&QWP(0+16*&Xi,"esp"),@X[($&Xi-4)&7]);   # X[]+K xfer to IALU
729     eval(shift(@insns));
730     eval(shift(@insns));
731     &psubd (@X[($&Xi-4)&7],@X[3]);

733     foreach (@insns) { eval; }
734     &Xi++;
735 }

737 sub Xtail_ssse3()
738 { use integer;
739   my $body = shift;
740   my @insns = (&$body,&$body,&$body,&$body);   # 32 instructions
741   my ($a,$b,$c,$d,$e);

743     foreach (@insns) { eval; }
744 }

746 sub body_00_19 () {
747   ( ($a,$b,$c,$d,$e)=@V;'.
748     &add ($e,&DWP(4*($j&15),"esp"));'.   # X[]+K xfer
749     &xor ($c,$d);'.
750     &mov (@T[1],$a);'.   # $b in next round
751     &$_rol ($a,5);'.
752     &and (@T[0],$c);'.   # ($b&($c^$d))
753     &xor ($c,$d);'.   # restore $c
754     &xor (@T[0],$d);'.
755     &add ($e,$a);'.
756     &$_ror ($b,$j??7:2);'.   # $b>>>2
757     &add ($e,@T[0]);'.   .' $j++; unshift(@V,pop(@V)); unshift(@T,pop(@T));
758     &add ($e,@T[0]);'.
759   );
760 }

762 sub body_20_39 () {
763   ( ($a,$b,$c,$d,$e)=@V;'.
764     &add ($e,&DWP(4*($j++&15),"esp"));'.   # X[]+K xfer
765     &xor (@T[0],$d);'.   # ($b^$d)
766     &mov (@T[1],$a);'.   # $b in next round
767     &$_rol ($a,5);'.
768     &xor (@T[0],$c);'.   # ($b^$d^$c)
769     &add ($e,$a);'.
770     &$_ror ($b,7);'.   # $b>>>2
771     &add ($e,@T[0]);'.   .' unshift(@V,pop(@V)); unshift(@T,pop(@T));'.
772     &add ($e,@T[0]);'.
773   );
774 }

776 sub body_40_59 () {
777   ( ($a,$b,$c,$d,$e)=@V;'.
778     &mov (@T[1],$c);'.
779     &xor ($c,$d);'.
780     &add ($e,&DWP(4*($j++&15),"esp"));'.   # X[]+K xfer
781     &and (@T[1],$d);'.
782     &and (@T[0],$c);'.   # ($b&($c^$d))
783     &$_ror ($b,7);'.   # $b>>>2
784     &add ($e,@T[1]);'.
785     &mov (@T[1],$a);'.   # $b in next round
786     &$_rol ($a,5);'.
787   );

```

```

788     ' &add    ($e,@T[0]);',
789     ' &xor    ($c,$d);',      # restore $c
790     ' &add    ($e,$a);',      . 'unshift(@V,pop(@V)); unshift(@T,pop(@T));'
791     );
792 }

794 &set_label("loop",16);
795     &Xupdate_ssse3_16_31(\&body_00_19);
796     &Xupdate_ssse3_16_31(\&body_00_19);
797     &Xupdate_ssse3_16_31(\&body_00_19);
798     &Xupdate_ssse3_16_31(\&body_00_19);
799     &Xupdate_ssse3_32_79(\&body_00_19);
800     &Xupdate_ssse3_32_79(\&body_20_39);
801     &Xupdate_ssse3_32_79(\&body_20_39);
802     &Xupdate_ssse3_32_79(\&body_20_39);
803     &Xupdate_ssse3_32_79(\&body_20_39);
804     &Xupdate_ssse3_32_79(\&body_20_39);
805     &Xupdate_ssse3_32_79(\&body_40_59);
806     &Xupdate_ssse3_32_79(\&body_40_59);
807     &Xupdate_ssse3_32_79(\&body_40_59);
808     &Xupdate_ssse3_32_79(\&body_40_59);
809     &Xupdate_ssse3_32_79(\&body_40_59);
810     &Xupdate_ssse3_32_79(\&body_20_39);
811     &Xuplast_ssse3_80(\&body_20_39);      # can jump to "done"

813     $saved_j=$j; @saved_V=@V;

815     &Xloop_ssse3(\&body_20_39);
816     &Xloop_ssse3(\&body_20_39);
817     &Xloop_ssse3(\&body_20_39);

819     &mov      (@T[1],&DWP(192,"esp"));      # update context
820     &add      ($a,&DWP(0,@T[1]));
821     &add      (@T[0],&DWP(4,@T[1]));          # $b
822     &add      ($c,&DWP(8,@T[1]));
823     &mov      (&DWP(0,@T[1]),$a);
824     &add      ($d,&DWP(12,@T[1]));
825     &mov      (&DWP(4,@T[1]),@T[0]);
826     &add      ($e,&DWP(16,@T[1]));
827     &mov      (&DWP(8,@T[1]),$c);
828     &mov      ($b,@T[0]);
829     &mov      (&DWP(12,@T[1]),$d);
830     &mov      (&DWP(16,@T[1]),$e);
831     &movdqa   (@X[0],@X[-3&7]);

833     &jmp      (&label("loop"));

835 &set_label("done",16);      $j=$saved_j; @V=@saved_V;

837     &Xtail_ssse3(\&body_20_39);
838     &Xtail_ssse3(\&body_20_39);
839     &Xtail_ssse3(\&body_20_39);

841     &mov      (@T[1],&DWP(192,"esp"));      # update context
842     &add      ($a,&DWP(0,@T[1]));
843     &mov      ("esp",&DWP(192+12,"esp"));    # restore %esp
844     &add      (@T[0],&DWP(4,@T[1]));          # $b
845     &add      ($c,&DWP(8,@T[1]));
846     &mov      (&DWP(0,@T[1]),$a);
847     &add      ($d,&DWP(12,@T[1]));
848     &mov      (&DWP(4,@T[1]),@T[0]);
849     &add      ($e,&DWP(16,@T[1]));
850     &mov      (&DWP(8,@T[1]),$c);
851     &mov      (&DWP(12,@T[1]),$d);
852     &mov      (&DWP(16,@T[1]),$e);

```

```

854 &function_end("_sha1_block_data_order_ssse3");

856 if ($sym) {
857     my $Xi=4;      # 4xSIMD Xupdate round, start pre-seeded
858     my @X=map("xmm$_",(4..7,0..3)); # pre-seeded for $Xi=4
859     my @V=($a,$b,$c,$d,$e);
860     my $j=0;      # hash round
861     my @T=($T,$tmp1);
862     my $inp;

864     my $_rol=sub { &shld(@_[0],@_) };
865     my $_ror=sub { &shrd(@_[0],@_) };

867 &function_begin("_sha1_block_data_order_avx");
868     &call      (&label("pic_point")); # make it PIC!
869     &set_label("pic_point");
870     &blindpop($tmp1);
871     &lea      ($tmp1,&DWP(&label("K_XX_XX")."-".&label("pic_point"),$tmp1));
872     &set_label("avx_shortcut");
873     &vzeroall();

875     &vmovdqa  (@X[3],&QWP(0,$tmp1));      # K_00_19
876     &vmovdqa  (@X[4],&QWP(16,$tmp1));      # K_20_39
877     &vmovdqa  (@X[5],&QWP(32,$tmp1));      # K_40_59
878     &vmovdqa  (@X[6],&QWP(48,$tmp1));      # K_60_79
879     &vmovdqa  (@X[2],&QWP(64,$tmp1));      # pbswap mask

881     &mov      ($e,&wparam(0));      # load argument block
882     &mov      ($inp=@T[1],&wparam(1));
883     &mov      ($d,&wparam(2));
884     &mov      (@T[0],"esp");

886     # stack frame layout
887     #
888     # +0      X[0]+K X[1]+K X[2]+K X[3]+K # XMM->IALU xfer area
889     #          X[4]+K X[5]+K X[6]+K X[7]+K
890     #          X[8]+K X[9]+K X[10]+K X[11]+K
891     #          X[12]+K X[13]+K X[14]+K X[15]+K
892     #
893     # +64      X[0] X[1] X[2] X[3] # XMM->XMM backtrace area
894     #          X[4] X[5] X[6] X[7]
895     #          X[8] X[9] X[10] X[11] # even borrowed for K_00_19
896     #
897     # +112     K_20_39 K_20_39 K_20_39 K_20_39 # constants
898     #          K_40_59 K_40_59 K_40_59 K_40_59
899     #          K_60_79 K_60_79 K_60_79 K_60_79
900     #          K_00_19 K_00_19 K_00_19 K_00_19
901     #          pbswap mask
902     #
903     # +192     ctx # argument block
904     # +196     inp
905     # +200     end
906     # +204     esp
907     &sub      ("esp",208);
908     &and      ("esp",-64);

910     &vmovdqa  (&QWP(112+0,"esp"),@X[4]); # copy constants
911     &vmovdqa  (&QWP(112+16,"esp"),@X[5]);
912     &vmovdqa  (&QWP(112+32,"esp"),@X[6]);
913     &shl      ($d,6); # len*64
914     &vmovdqa  (&QWP(112+48,"esp"),@X[3]);
915     &add      ($d,$inp); # end of input
916     &vmovdqa  (&QWP(112+64,"esp"),@X[2]);
917     &add      ($inp,64);
918     &mov      (&DWP(192+0,"esp"),$e); # save argument block
919     &mov      (&DWP(192+4,"esp"),$inp);

```



```

920      &mov      (&DWP(192+8,"esp"),$D);
921      &mov      (&DWP(192+12,"esp"),@T[0]);      # save original %esp

923      &mov      ($A,&DWP(0,$E));                  # load context
924      &mov      ($B,&DWP(4,$E));
925      &mov      ($C,&DWP(8,$E));
926      &mov      ($D,&DWP(12,$E));
927      &mov      ($E,&DWP(16,$E));
928      &mov      (@T[0],$B);                        # magic seed

930      &vmovdqu(@X[-4&7],&QWP(-64,$inp));           # load input to %xmm[0-3]
931      &vmovdqu(@X[-3&7],&QWP(-48,$inp));
932      &vmovdqu(@X[-2&7],&QWP(-32,$inp));
933      &vmovdqu(@X[-1&7],&QWP(-16,$inp));
934      &vpshufb(@X[-4&7],@X[-4&7],@X[2]);          # byte swap
935      &vpshufb(@X[-3&7],@X[-3&7],@X[2]);
936      &vpshufb(@X[-2&7],@X[-2&7],@X[2]);
937      &vmovdqa(&QWP(112-16,"esp"),@X[3]);         # borrow last backtrace slot
938      &vpshufb(@X[-1&7],@X[-1&7],@X[2]);
939      &vpadd    (@X[0],@X[-4&7],@X[3]);            # add K_00_19
940      &vpadd    (@X[1],@X[-3&7],@X[3]);
941      &vpadd    (@X[2],@X[-2&7],@X[3]);
942      &vmovdqa(&QWP(0,"esp"),@X[0]);              # X[]+K xfer to IALU
943      &vmovdqa(&QWP(0+16,"esp"),@X[1]);
944      &vmovdqa(&QWP(0+32,"esp"),@X[2]);
945      &jmp      (&label("loop"));

947 sub Xupdate_avx_16_31()      # recall that $Xi starts with 4
948 { use integer;
949   my $body = shift;
950   my @insns = (&$body,&$body,&$body,&$body);      # 40 instructions
951   my ($a,$b,$c,$d,$e);

953       eval(shift(@insns));
954       eval(shift(@insns));
955       &vpalignr(@X[0],@X[-3&7],@X[-4&7],8);      # compose "X[-14]" in "X[0]"
956       eval(shift(@insns));
957       eval(shift(@insns));

959       &vpadd    (@X[3],@X[3],@X[-1&7]);
960       &vmovdqa    (&QWP(64+16*((&$Xi-4)%3),"esp"),@X[-4&7]);# save X[] to b
961       eval(shift(@insns));
962       eval(shift(@insns));
963       &vpsrldq(@X[2],@X[-1&7],4);                # "X[-3]", 3 dwords
964       eval(shift(@insns));
965       eval(shift(@insns));
966       &vpxor    (@X[0],@X[0],@X[-4&7]);          # "X[0]^="X[-16]"
967       eval(shift(@insns));
968       eval(shift(@insns));

970       &vpxor    (@X[2],@X[2],@X[-2&7]);          # "X[-3]^"X[-8]"
971       eval(shift(@insns));
972       eval(shift(@insns));
973       &vmovdqa    (&QWP(0+16*((&$Xi-1)%3),"esp"),@X[3]);  # X[]+K xfer to
974       eval(shift(@insns));
975       eval(shift(@insns));

977       &vpxor    (@X[0],@X[0],@X[2]);              # "X[0]^="X[-3]^"X[-8]"
978       eval(shift(@insns));
979       eval(shift(@insns));
980       eval(shift(@insns));
981       eval(shift(@insns));

983       &vpsrld    (@X[2],@X[0],31);
984       eval(shift(@insns));
985       eval(shift(@insns));

```

```

986       eval(shift(@insns));
987       eval(shift(@insns));

989       &vpsrldq(@X[4],@X[0],12);                  # "X[0]"<<96, extract one dword
990       &vpadd    (@X[0],@X[0],@X[0]);
991       eval(shift(@insns));
992       eval(shift(@insns));
993       eval(shift(@insns));
994       eval(shift(@insns));

996       &vpsrld    (@X[3],@X[4],30);
997       &vpxor    (@X[0],@X[0],@X[2]);              # "X[0]"<<=1
998       eval(shift(@insns));
999       eval(shift(@insns));
1000      eval(shift(@insns));
1001      eval(shift(@insns));

1003      &vpsrld    (@X[4],@X[4],2);
1004      &vmovdqa    (@X[2],&QWP(64+16*((&$Xi-6)%3),"esp")); if (&$Xi>5);
1005      eval(shift(@insns));
1006      eval(shift(@insns));
1007      &vpxor    (@X[0],@X[0],@X[3]);
1008      eval(shift(@insns));
1009      eval(shift(@insns));
1010      eval(shift(@insns));
1011      eval(shift(@insns));

1013      &vpxor    (@X[0],@X[0],@X[4]);              # "X[0]"^="X[0]"<<96)<<=2
1014      eval(shift(@insns));
1015      eval(shift(@insns));
1016      &vmovdqa    (@X[4],&QWP(112-16+16*((&$Xi)/5),"esp"));      # K_XX_X
1017      eval(shift(@insns));
1018      eval(shift(@insns));

1020      foreach (@insns) { eval; }                  # remaining instructions [if any]

1022      $Xi++;      push(@X,shift(@X));              # "rotate" X[]
1023  }

1025 sub Xupdate_avx_32_79()
1026 { use integer;
1027   my $body = shift;
1028   my @insns = (&$body,&$body,&$body,&$body);      # 32 to 48 instructions
1029   my ($a,$b,$c,$d,$e);

1031       &vpalignr(@X[2],@X[-1&7],@X[-2&7],8);      # compose "X[-6]"
1032       &vpxor    (@X[0],@X[0],@X[-4&7]);          # "X[0]"="X[-32]^"X[-16]"
1033       eval(shift(@insns));                      # body_20_39
1034       eval(shift(@insns));
1035       eval(shift(@insns));
1036       eval(shift(@insns));                      # rol

1038       &vpxor    (@X[0],@X[0],@X[-7&7]);          # "X[0]"^="X[-28]"
1039       &vmovdqa    (&QWP(64+16*((&$Xi-4)%3),"esp"),@X[-4&7]);      # save x
1040       eval(shift(@insns));
1041       eval(shift(@insns));
1042       if (&$Xi%5) {
1043         &vmovdqa    (@X[4],@X[3]);      # "perpetuate" K_XX_XX...
1044       } else {
1045         &vmovdqa    (@X[4],&QWP(112-16+16*((&$Xi)/5),"esp"));
1046       }
1047       &vpadd    (@X[3],@X[3],@X[-1&7]);
1048       eval(shift(@insns));                      # ror
1049       eval(shift(@insns));

1051       &vpxor    (@X[0],@X[0],@X[2]);              # "X[0]"^="X[-6]"

```

```

1052     eval(shift(@insns));           # body_20_39
1053     eval(shift(@insns));
1054     eval(shift(@insns));
1055     eval(shift(@insns));           # rol

1057     &vpsrld (@X[2],@X[0],30);
1058     &vmovdqa (&QWP(0+16*(($Xi-1)&3),"esp"),@X[3]); # X[]+K xfer to
1059     eval(shift(@insns));
1060     eval(shift(@insns));
1061     eval(shift(@insns));           # ror
1062     eval(shift(@insns));

1064     &vpslld (@X[0],@X[0],2);
1065     eval(shift(@insns));           # body_20_39
1066     eval(shift(@insns));
1067     eval(shift(@insns));
1068     eval(shift(@insns));           # rol
1069     eval(shift(@insns));
1070     eval(shift(@insns));
1071     eval(shift(@insns));           # ror
1072     eval(shift(@insns));

1074     &vpor (@X[0],@X[0],@X[2]); # "X[0]"<<=2
1075     eval(shift(@insns));           # body_20_39
1076     eval(shift(@insns));
1077     &vmovdqa (@X[2],&QWP(64+16*(($Xi-6)%3),"esp")) if($Xi<19);
1078     eval(shift(@insns));
1079     eval(shift(@insns));           # rol
1080     eval(shift(@insns));
1081     eval(shift(@insns));
1082     eval(shift(@insns));           # ror
1083     eval(shift(@insns));

1085     foreach (@insns) { eval; } # remaining instructions

1087     $Xi++;      push(@X,shift(@X)); # "rotate" X[]
1088 }

1090 sub Xuplast_avx_80()
1091 { use integer;
1092   my $body = shift;
1093   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
1094   my ($a,$b,$c,$d,$e);

1096     eval(shift(@insns));
1097     &vpadd (@X[3],@X[3],@X[-1&7]);
1098     eval(shift(@insns));
1099     eval(shift(@insns));
1100     eval(shift(@insns));
1101     eval(shift(@insns));

1103     &vmovdqa (&QWP(0+16*(($Xi-1)&3),"esp"),@X[3]); # X[]+K xfer IAL

1105     foreach (@insns) { eval; } # remaining instructions

1107     &mov ($inp=@T[1],&DWP(192+4,"esp"));
1108     &cmp ($inp,&DWP(192+8,"esp"));
1109     &jc (&label("done"));

1111     &vmovdqa(@X[3],&QWP(112+48,"esp")); # K_00_19
1112     &vmovdqa(@X[2],&QWP(112+64,"esp")); # pbswap mask
1113     &vmovdqu(@X[-4&7],&QWP(0,$inp)); # load input
1114     &vmovdqu(@X[-3&7],&QWP(16,$inp));
1115     &vmovdqu(@X[-2&7],&QWP(32,$inp));
1116     &vmovdqu(@X[-1&7],&QWP(48,$inp));
1117     &add ($inp,64);

```

```

1118     &vpshufb(@X[-4&7],@X[-4&7],@X[2]); # byte swap
1119     &mov (&DWP(192+4,"esp"),$inp);
1120     &vmovdqa(&QWP(112-16,"esp"),@X[3]); # borrow last backtrace slot

1122     $Xi=0;
1123 }

1125 sub Xloop_avx()
1126 { use integer;
1127   my $body = shift;
1128   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
1129   my ($a,$b,$c,$d,$e);

1131     eval(shift(@insns));
1132     eval(shift(@insns));
1133     &vpshufb (@X[($Xi-3)&7],@X[($Xi-3)&7],@X[2]);
1134     eval(shift(@insns));
1135     eval(shift(@insns));
1136     &vpadd (@X[$Xi&7],@X[($Xi-4)&7],@X[3]);
1137     eval(shift(@insns));
1138     eval(shift(@insns));
1139     eval(shift(@insns));
1140     eval(shift(@insns));
1141     &vmovdqa (&QWP(0+16*$Xi,"esp"),@X[$Xi&7]); # X[]+K xfer to
1142     eval(shift(@insns));
1143     eval(shift(@insns));

1145     foreach (@insns) { eval; }
1146     $Xi++;
1147 }

1149 sub Xtail_avx()
1150 { use integer;
1151   my $body = shift;
1152   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
1153   my ($a,$b,$c,$d,$e);

1155     foreach (@insns) { eval; }
1156 }

1158 &set_label("loop",16);
1159 &Xupdate_avx_16_31(\&body_00_19);
1160 &Xupdate_avx_16_31(\&body_00_19);
1161 &Xupdate_avx_16_31(\&body_00_19);
1162 &Xupdate_avx_16_31(\&body_00_19);
1163 &Xupdate_avx_32_79(\&body_00_19);
1164 &Xupdate_avx_32_79(\&body_20_39);
1165 &Xupdate_avx_32_79(\&body_20_39);
1166 &Xupdate_avx_32_79(\&body_20_39);
1167 &Xupdate_avx_32_79(\&body_20_39);
1168 &Xupdate_avx_32_79(\&body_20_39);
1169 &Xupdate_avx_32_79(\&body_40_59);
1170 &Xupdate_avx_32_79(\&body_40_59);
1171 &Xupdate_avx_32_79(\&body_40_59);
1172 &Xupdate_avx_32_79(\&body_40_59);
1173 &Xupdate_avx_32_79(\&body_40_59);
1174 &Xupdate_avx_32_79(\&body_20_39);
1175 &Xuplast_avx_80(\&body_20_39); # can jump to "done"

1177     $saved_j=$j; @saved_V=@V;

1179     &Xloop_avx(\&body_20_39);
1180     &Xloop_avx(\&body_20_39);
1181     &Xloop_avx(\&body_20_39);

1183     &mov (@T[1],&DWP(192,"esp")); # update context

```

```
1184      &add      ($A,&DWP(0,@T[1]));
1185      &add      (@T[0],&DWP(4,@T[1]));          # $b
1186      &add      ($C,&DWP(8,@T[1]));
1187      &mov      (&DWP(0,@T[1]),$A);
1188      &add      ($D,&DWP(12,@T[1]));
1189      &mov      (&DWP(4,@T[1]),@T[0]);
1190      &add      ($E,&DWP(16,@T[1]));
1191      &mov      (&DWP(8,@T[1]),$C);
1192      &mov      ($B,@T[0]);
1193      &mov      (&DWP(12,@T[1]),$D);
1194      &mov      (&DWP(16,@T[1]),$E);

1196      &jmp      (&label("loop"));

1198 &set_label("done",16);          $j=$saved_j; @V=@saved_V;

1200      &Xtail_avx(\&body_20_39);
1201      &Xtail_avx(\&body_20_39);
1202      &Xtail_avx(\&body_20_39);

1204      &vzeroall();

1206      &mov      (@T[1],&DWP(192,"esp"));          # update context
1207      &add      ($A,&DWP(0,@T[1]));
1208      &mov      ("esp",&DWP(192+12,"esp"));          # restore %esp
1209      &add      (@T[0],&DWP(4,@T[1]));          # $b
1210      &add      ($C,&DWP(8,@T[1]));
1211      &mov      (&DWP(0,@T[1]),$A);
1212      &add      ($D,&DWP(12,@T[1]));
1213      &mov      (&DWP(4,@T[1]),@T[0]);
1214      &add      ($E,&DWP(16,@T[1]));
1215      &mov      (&DWP(8,@T[1]),$C);
1216      &mov      (&DWP(12,@T[1]),$D);
1217      &mov      (&DWP(16,@T[1]),$E);
1218 &function_end("_sha1_block_data_order_avx");
1219 }
1220 &set_label("K_XX_XX",64);
1221 &data_word(0x5a827999,0x5a827999,0x5a827999,0x5a827999);          # K_00_19
1222 &data_word(0x6ed9eba1,0x6ed9eba1,0x6ed9eba1,0x6ed9eba1);          # K_20_39
1223 &data_word(0x8f1bbcdc,0x8f1bbcdc,0x8f1bbcdc,0x8f1bbcdc);          # K_40_59
1224 &data_word(0xca62c1d6,0xca62c1d6,0xca62c1d6,0xca62c1d6);          # K_60_79
1225 &data_word(0x00010203,0x04050607,0x08090a0b,0x0c0d0e0f);          # pbswap mask
1226 }
1227 &asciz("SHA1 block transform for x86, CRYPTOGAMS by <appro@openssl.org>");

1229 &asm_finish();
```

new/usr/src/lib/openssl/libsunw_crypto/pl/sha1-x86_64.pl

1

```
*****
30275 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/sha1-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # sha1_block procedure for x86_64.
11 #
12 # It was brought to my attention that on EM64T compiler-generated code
13 # was far behind 32-bit assembler implementation. This is unlike on
14 # Opteron where compiler-generated code was only 15% behind 32-bit
15 # assembler, which originally made it hard to motivate the effort.
16 # There was suggestion to mechanically translate 32-bit code, but I
17 # dismissed it, reasoning that x86_64 offers enough register bank
18 # capacity to fully utilize SHA-1 parallelism. Therefore this fresh
19 # implementation:-) However! While 64-bit code does perform better
20 # on Opteron, I failed to beat 32-bit assembler on EM64T core. Well,
21 # x86_64 does offer larger *addressable* bank, but out-of-order core
22 # reaches for even more registers through dynamic aliasing, and EM64T
23 # core must have managed to run-time optimize even 32-bit code just as
24 # good as 64-bit one. Performance improvement is summarized in the
25 # following table:
26 #
27 #          gcc 3.4          32-bit asm          cycles/byte
28 # Opteron      +45%          +20%              6.8
29 # Xeon P4       +65%          +0%              9.9
30 # Core2        +60%          +10%             7.0
31 #
32 # August 2009.
33 #
34 # The code was revised to minimize code size and to maximize
35 # "distance" between instructions producing input to 'lea'
36 # instruction and the 'lea' instruction itself, which is essential
37 # for Intel Atom core.
38 #
39 # October 2010.
40 #
41 # Add SSSE3, Supplemental[!] SSE3, implementation. The idea behind it
42 # is to offload message schedule denoted by Wt in NIST specification,
43 # or Xupdate in OpenSSL source, to SIMD unit. See sha1-586.pl module
44 # for background and implementation details. The only difference from
45 # 32-bit code is that 64-bit code doesn't have to spill @X[] elements
46 # to free temporary registers.
47 #
48 # April 2011.
49 #
50 # Add AVX code path. See sha1-586.pl for further information.
51 #
52 #####
53 # Current performance is summarized in following table. Numbers are
54 # CPU clock cycles spent to process single byte (less is better).
55 #
56 #          x86_64          SSSE3          AVX
57 # P4          9.8          -
58 # Opteron     6.6          -
59 # Core2       6.7          6.1/+10%      -
60 # Atom       11.0         9.7/+13%      -
61 # Westmere   7.1          5.6/+27%      -
```

new/usr/src/lib/openssl/libsunw_crypto/pl/sha1-x86_64.pl

2

```
62 # Sandy Bridge 7.9          6.3/+25%      5.2/+51%

64 $flavour = shift;
65 $output = shift;
66 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

68 $win64=0; $win64=1 if ($flavour =~ /([nm]asm|mingw64/ || $output =~ /\.asm$/));

70 $0 =~ m/(.*[\\\/])(^\\\/)+$/; $dir=$1;
71 ( $xlate="{dir}x86_64-xlate.pl" and -f $xlate ) or
72 ( $xlate="{dir}../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
73 die "can't locate x86_64-xlate.pl";

75 $avx=1 if ( 'ENV{CC}' -Wa,-v -c -o /dev/null -x assembler /dev/null 2>&1'
76           =~ /GNU assembler version ([2-9]\.[0-9]+)/ &&
77           $1>=2.19);
78 $avx=1 if ( !$avx && $win64 && ($flavour =~ /nasm/ || $ENV{ASM} =~ /nasm/) &&
79           'nasm -v 2>&1' =~ /NASM version ([2-9]\.[0-9]+)/ &&
80           $1>=2.09);
81 $avx=1 if ( !$avx && $win64 && ($flavour =~ /masm/ || $ENV{ASM} =~ /ml64/) &&
82           'ml64 2>&1' =~ /Version ([0-9]+)/ &&
83           $1>=10);

85 open OUT,"| \"^X\" $xlate $flavour $output";
86 *STDOUT=*OUT;

88 $ctx="%rdi";      # 1st arg
89 $inp="%rsi";      # 2nd arg
90 $num="%rdx";      # 3rd arg

92 # reassign arguments in order to produce more compact code
93 $ctx="%r8";
94 $inp="%r9";
95 $num="%r10";

97 $t0="%eax";
98 $t1="%ebx";
99 $t2="%ecx";
100 @xi=("%edx","%ebp");
101 $A="%esi";
102 $B="%edi";
103 $C="%r11d";
104 $D="%r12d";
105 $E="%r13d";

107 @V=($A,$B,$C,$D,$E);

109 sub BODY_00_19 {
110 my ($i,$a,$b,$c,$d,$e)=@_;
111 my $j=$i+1;
112 $code.=<<< if ($i==0);
113           mov     '4*$i'($inp),$xi[0]
114           bswap   $xi[0]
115           mov     $xi[0],'4*$i'(%rsp)
116
117 $code.=<<< if ($i<15);
118           mov     $c,$t0
119           mov     '4*$j'($inp),$xi[1]
120           mov     $a,$t2
121           xor     $d,$t0
122           bswap   $xi[1]
123           rol     \5,$t2
124           lea     0x5a827999($xi[0],$e),$e
125           and     $b,$t0
126           mov     $xi[1],'4*$j'(%rsp)
127           add     $t2,$e
```

```

128     xor     $d,$t0
129     rol     \30,$b
130     add     $t0,$e
131
132     $code.=<<__ if ($i>=15);
133     mov     '4*($j%16)'(%rsp),$xi[1]
134     mov     $c,$t0
135     mov     $a,$t2
136     xor     '4* (($j+2)%16)'(%rsp),$xi[1]
137     xor     $d,$t0
138     rol     \5,$t2
139     xor     '4* (($j+8)%16)'(%rsp),$xi[1]
140     and     $b,$t0
141     lea     0x5a827999($xi[0],$e),$e
142     xor     '4* (($j+13)%16)'(%rsp),$xi[1]
143     xor     $d,$t0
144     rol     \1,$xi[1]
145     add     $t2,$e
146     rol     \30,$b
147     mov     $xi[1],'4*($j%16)'(%rsp)
148     add     $t0,$e
149
150     unshift(@xi,pop(@xi));
151 }

153 sub BODY_20_39 {
154 my ($i,$a,$b,$c,$d,$e)=@_;
155 my $j=$i+1;
156 my $K=($i<40)?0x6ed9eba1:0xca62c1d6;
157 $code.=<<__ if ($i<79);
158     mov     '4*($j%16)'(%rsp),$xi[1]
159     mov     $c,$t0
160     mov     $a,$t2
161     xor     '4* (($j+2)%16)'(%rsp),$xi[1]
162     xor     $b,$t0
163     rol     \5,$t2
164     lea     $K($xi[0],$e),$e
165     xor     '4* (($j+8)%16)'(%rsp),$xi[1]
166     xor     $d,$t0
167     add     $t2,$e
168     xor     '4* (($j+13)%16)'(%rsp),$xi[1]
169     rol     \30,$b
170     add     $t0,$e
171     rol     \1,$xi[1]
172
173     $code.=<<__ if ($i<76);
174     mov     $xi[1],'4*($j%16)'(%rsp)
175
176     $code.=<<__ if ($i==79);
177     mov     $c,$t0
178     mov     $a,$t2
179     xor     $b,$t0
180     lea     $K($xi[0],$e),$e
181     rol     \5,$t2
182     xor     $d,$t0
183     add     $t2,$e
184     rol     \30,$b
185     add     $t0,$e
186
187     unshift(@xi,pop(@xi));
188 }

190 sub BODY_40_59 {
191 my ($i,$a,$b,$c,$d,$e)=@_;
192 my $j=$i+1;
193 $code.=<<__;
```

```

194     mov     '4*($j%16)'(%rsp),$xi[1]
195     mov     $c,$t0
196     mov     $c,$t1
197     xor     '4* (($j+2)%16)'(%rsp),$xi[1]
198     and     $d,$t0
199     mov     $a,$t2
200     xor     '4* (($j+8)%16)'(%rsp),$xi[1]
201     xor     $d,$t1
202     lea     0x8f1bbcdc($xi[0],$e),$e
203     rol     \5,$t2
204     xor     '4* (($j+13)%16)'(%rsp),$xi[1]
205     add     $t0,$e
206     and     $b,$t1
207     rol     \1,$xi[1]
208     add     $t1,$e
209     rol     \30,$b
210     mov     $xi[1],'4*($j%16)'(%rsp)
211     add     $t2,$e
212
213     unshift(@xi,pop(@xi));
214 }

216 $code.=<<__;
```

```

217 .text
218 .extern OPENSSL_ia32cap_P

220 .globl sha1_block_data_order
221 .type sha1_block_data_order,\@function,3
222 .align 16
223 sha1_block_data_order:
224     mov     OPENSSL_ia32cap_P+0(%rip),%r9d
225     mov     OPENSSL_ia32cap_P+4(%rip),%r8d
226     test    \1<<9',%r8d          # check SSE3 bit
227     jz      .Lialu
228
229     $code.=<<__ if ($avx);
230     and     \1<<28',%r8d          # mask AVX bit
231     and     \1<<30',%r9d          # mask "Intel CPU" bit
232     or      %r9d,%r8d
233     cmp     \1<<28|1<<30',%r8d
234     je      _avx_shortcut
235
236     $code.=<<__;
```

```

237     jmp     _sse3_shortcut

239 .align 16
240 .Lialu:
241     push    %rbx
242     push    %rbp
243     push    %r12
244     push    %r13
245     mov     %rsp,%r11
246     mov     %rdi,$ctx            # reassigned argument
247     sub     \8+16*4',%rsp
248     mov     %rsi,$inp            # reassigned argument
249     and     \-64,%rsp
250     mov     %rdx,$num            # reassigned argument
251     mov     %r11,'16*4'(%rsp)
252 .Lprologue:

254     mov     0($ctx),$A
255     mov     4($ctx),$B
256     mov     8($ctx),$C
257     mov     12($ctx),$D
258     mov     16($ctx),$E
259     jmp     .Lloop
```

```

261 .align 16
262 .Lloop:
263 ____
264 for($i=0;$i<20;$i++) { &BODY_00_19($i,@V); unshift(@V,pop(@V)); }
265 for($i<40;$i++) { &BODY_20_39($i,@V); unshift(@V,pop(@V)); }
266 for($i<60;$i++) { &BODY_40_59($i,@V); unshift(@V,pop(@V)); }
267 for($i<80;$i++) { &BODY_20_39($i,@V); unshift(@V,pop(@V)); }
268 $code.=<<____;
269     add    0($ctx),$A
270     add    4($ctx),$B
271     add    8($ctx),$C
272     add    12($ctx),$D
273     add    16($ctx),$E
274     mov    $A,0($ctx)
275     mov    $B,4($ctx)
276     mov    $C,8($ctx)
277     mov    $D,12($ctx)
278     mov    $E,16($ctx)

280     sub    \ $1,$num
281     lea    '16*4'($inp),$inp
282     jnz    .Lloop

284     mov    '16*4'($rsp),%rsi
285     mov    (%rsi),%r13
286     mov    8(%rsi),%r12
287     mov    16(%rsi),%rbp
288     mov    24(%rsi),%rbx
289     lea    32(%rsi),%rsp
290 .Lepilogue:
291     ret
292 .size    sha1_block_data_order,.-sha1_block_data_order
293 ____
294 {{{
295 my $Xi=4;
296 my @X=map("%xmm$ ",(4..7,0..3));
297 my @Tx=map("%xmm$ ",(8..10));
298 my @V=($A,$B,$C,$D,$E)=("%eax","%ebx","%ecx","%edx","%ebp"); # size optimizat
299 my @T=("%esi","%edi");
300 my $j=0;
301 my $K_XX_XX="%r11";

303 my $_rol=sub { &rol(@) };
304 my $_ror=sub { &ror(@) };

306 $code.=<<____;
307 .type    sha1_block_data_order_ssse3,@function,3
308 .align 16
309 sha1_block_data_order_ssse3:
310 _ssse3_shortcut:
311     push    %rbx
312     push    %rbp
313     push    %r12
314     lea     '-64-($win64?5*16:0)'(%rsp),%rsp
315 ____
316 $code.=<<____ if ($win64);
317     movaps  %xmm6,64+0(%rsp)
318     movaps  %xmm7,64+16(%rsp)
319     movaps  %xmm8,64+32(%rsp)
320     movaps  %xmm9,64+48(%rsp)
321     movaps  %xmm10,64+64(%rsp)
322 .Lprologue_ssse3:
323 ____
324 $code.=<<____;
325     mov     %rdi,$ctx # reassigned argument

```

```

326     mov     %rsi,$inp # reassigned argument
327     mov     %rdx,$num # reassigned argument

329     shl     \ $6,$num
330     add     $inp,$num
331     lea     K_XX_XX(%rip),$K_XX_XX

333     mov     0($ctx),$A # load context
334     mov     4($ctx),$B
335     mov     8($ctx),$C
336     mov     12($ctx),$D
337     mov     $B,@T[0] # magic seed
338     mov     16($ctx),$E

340     movdqa  64($K_XX_XX),@X[2] # pbswap mask
341     movdqa  0($K_XX_XX),@Tx[1] # K_00_19
342     movdqu  0($inp),@X[-4&7] # load input to %xmm[0-3]
343     movdqu  16($inp),@X[-3&7]
344     movdqu  32($inp),@X[-2&7]
345     movdqu  48($inp),@X[-1&7]
346     pshufb  @X[2],@X[-4&7] # byte swap
347     add     \ $64,$inp
348     pshufb  @X[2],@X[-3&7]
349     pshufb  @X[2],@X[-2&7]
350     pshufb  @X[2],@X[-1&7]
351     paddb   @Tx[1],@X[-4&7] # add K_00_19
352     paddb   @Tx[1],@X[-3&7]
353     paddb   @Tx[1],@X[-2&7]
354     movdqa  @X[-4&7],0(%rsp) # X[]+K xfer to IALU
355     psubb   @Tx[1],@X[-4&7] # restore X[]
356     movdqa  @X[-3&7],16(%rsp)
357     psubb   @Tx[1],@X[-3&7]
358     movdqa  @X[-2&7],32(%rsp)
359     psubb   @Tx[1],@X[-2&7]
360     jmp     .Loop_ssse3
361 ____

363 sub AUTOLOAD() # thunk [simplified] 32-bit style perlasm
364 { my $opcode = $AUTOLOAD; $opcode =~ s/.*:.*//;
365   my $arg = pop;
366   $arg = "\$arg" if ($arg*1 eq $arg);
367   $code .= "\t$opcode\t".join(' ', $arg, reverse @_)."\n";
368 }

370 sub Xupdate_ssse3_16_31() # recall that $Xi starts with 4
371 { use integer;
372   my $body = shift;
373   my @insns = ($body,$body,$body,$body); # 40 instructions
374   my ($a,$b,$c,$d,$e);

376     &movdqa (@X[0],@X[-3&7]);
377     eval(shift(@insns));
378     eval(shift(@insns));
379     &movdqa (@Tx[0],@X[-1&7]);
380     &palgnr @X[0],@X[-4&7],8; # compose "X[-14]" in "X[0]"
381     eval(shift(@insns));
382     eval(shift(@insns));

384     &paddb (@Tx[1],@X[-1&7]);
385     eval(shift(@insns));
386     eval(shift(@insns));
387     &psrldq (@Tx[0],4); # "X[-3]", 3 dwords
388     eval(shift(@insns));
389     eval(shift(@insns));
390     &pxor (@X[0],@X[-4&7]); # "X[0]^="X[-16]"
391     eval(shift(@insns));

```

```

392     eval(shift(@insns));
394     &pxor (@Tx[0],@X[-2&7]);      # "X[-3]^"X[-8]"
395     eval(shift(@insns));
396     eval(shift(@insns));
397     eval(shift(@insns));
398     eval(shift(@insns));
400     &pxor (@X[0],@Tx[0]);          # "X[0]^"X[-3]^"X[-8]"
401     eval(shift(@insns));
402     eval(shift(@insns));
403     &movdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
404     eval(shift(@insns));
405     eval(shift(@insns));
407     &movdqa (@Tx[2],@X[0]);
408     &movdqa (@Tx[0],@X[0]);
409     eval(shift(@insns));
410     eval(shift(@insns));
411     eval(shift(@insns));
412     eval(shift(@insns));
414     &pslldq (@Tx[2],12);          # "X[0]"<<96, extract one dword
415     &padd (@X[0],@X[0]);
416     eval(shift(@insns));
417     eval(shift(@insns));
418     eval(shift(@insns));
419     eval(shift(@insns));
421     &psrld (@Tx[0],31);
422     eval(shift(@insns));
423     eval(shift(@insns));
424     &movdqa (@Tx[1],@Tx[2]);
425     eval(shift(@insns));
426     eval(shift(@insns));
428     &psrld (@Tx[2],30);
429     &por (@X[0],@Tx[0]);          # "X[0]"<<=1
430     eval(shift(@insns));
431     eval(shift(@insns));
432     eval(shift(@insns));
433     eval(shift(@insns));
435     &pslld (@Tx[1],2);
436     &pxor (@X[0],@Tx[2]);
437     eval(shift(@insns));
438     eval(shift(@insns));
439     &movdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX"); # K_XX_X
440     eval(shift(@insns));
441     eval(shift(@insns));
443     &pxor (@X[0],@Tx[1]);          # "X[0]^"("X[0]">>96)<<2
445     foreach (@insns) { eval; }    # remaining instructions [if any]
447     $Xi++;      push(@X,shift(@X)); # "rotate" X[]
448     push(@Tx,shift(@Tx));
449 }
451 sub Xupdate_ssse3_32_79()
452 { use integer;
453   my $body = shift;
454   my @insns = (&$body,&$body,&$body,&$body); # 32 to 48 instructions
455   my ($a,$b,$c,$d,$e);
457   &movdqa (@Tx[0],@X[-1&7])      if ($Xi==8);

```

```

458     eval(shift(@insns));          # body_20_39
459     &pxor (@X[0],@X[-4&7]);        # "X[0]"="X[-32]^"X[-16]"
460     &palgnr (@Tx[0],@X[-2&7],8);  # compose "X[-6]"
461     eval(shift(@insns));
462     eval(shift(@insns));
463     eval(shift(@insns));          # rol
465     &pxor (@X[0],@X[-7&7]);        # "X[0]"^="X[-28]"
466     eval(shift(@insns));
467     eval(shift(@insns)) if (@insns[0] !~ /&ro[rl]/);
468     if ($Xi%5) {
469       &movdqa (@Tx[2],@Tx[1]);# "perpetuate" K_XX_XX...
470     } else { # ... or load next one
471       &movdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX");
472     }
473     &padd (@Tx[1],@X[-1&7]);
474     eval(shift(@insns));          # ror
475     eval(shift(@insns));
477     &pxor (@X[0],@Tx[0]);          # "X[0]"^="X[-6]"
478     eval(shift(@insns));          # body_20_39
479     eval(shift(@insns));
480     eval(shift(@insns));
481     eval(shift(@insns));          # rol
483     &movdqa (@Tx[0],@X[0]);
484     &movdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
485     eval(shift(@insns));
486     eval(shift(@insns));
487     eval(shift(@insns));          # ror
488     eval(shift(@insns));
490     &pslld (@X[0],2);
491     eval(shift(@insns));          # body_20_39
492     eval(shift(@insns));
493     &psrld (@Tx[0],30);
494     eval(shift(@insns));
495     eval(shift(@insns));          # rol
496     eval(shift(@insns));
497     eval(shift(@insns));
498     eval(shift(@insns));          # ror
499     eval(shift(@insns));
501     &por (@X[0],@Tx[0]);          # "X[0]"<<=2
502     eval(shift(@insns));          # body_20_39
503     eval(shift(@insns));
504     &movdqa (@Tx[1],@X[0]) if ($Xi<19);
505     eval(shift(@insns));
506     eval(shift(@insns));          # rol
507     eval(shift(@insns));
508     eval(shift(@insns));
509     eval(shift(@insns));          # rol
510     eval(shift(@insns));
512     foreach (@insns) { eval; }    # remaining instructions
514     $Xi++;      push(@X,shift(@X)); # "rotate" X[]
515     push(@Tx,shift(@Tx));
516 }
518 sub Xuplast_ssse3_80()
519 { use integer;
520   my $body = shift;
521   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
522   my ($a,$b,$c,$d,$e);

```

```

524     eval(shift(@insns));
525     &padd    (@Tx[1],@X[-1&7]);
526     eval(shift(@insns));
527     eval(shift(@insns));
528     eval(shift(@insns));
529     eval(shift(@insns));

531     &movdqa    (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer IAL

533     foreach (@insns) { eval; }          # remaining instructions

535     &cmp    ($snp,$num);
536     &je     (".ldone_ssse3");

538     unshift(@Tx,pop(@Tx));

540     &movdqa (@X[2],"64($K_XX_XX)");      # pbswap mask
541     &movdqa (@Tx[1],"0($K_XX_XX)");      # k_00_19
542     &movdqu (@X[-4&7],"0($snp)");        # load input
543     &movdqu (@X[-3&7],"16($snp)");
544     &movdqu (@X[-2&7],"32($snp)");
545     &movdqu (@X[-1&7],"48($snp)");
546     &pshufb (@X[-4&7],@X[2]);            # byte swap
547     &add    ($snp,64);

549     $Xi=0;
550 }

552 sub Xloop_ssse3()
553 { use integer;
554   my $body = shift;
555   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
556   my ($a,$b,$c,$d,$e);

558     eval(shift(@insns));
559     eval(shift(@insns));
560     &pshufb (@X[($Xi-3)&7],@X[2]);
561     eval(shift(@insns));
562     eval(shift(@insns));
563     &padd    (@X[($Xi-4)&7],@Tx[1]);
564     eval(shift(@insns));
565     eval(shift(@insns));
566     eval(shift(@insns));
567     eval(shift(@insns));
568     &movdqa (eval(16*$Xi)."%rsp",@X[($Xi-4)&7]); # X[]+K xfer to IALU
569     eval(shift(@insns));
570     eval(shift(@insns));
571     &psubd  (@X[($Xi-4)&7],@Tx[1]);

573     foreach (@insns) { eval; }
574     $Xi++;
575 }

577 sub Xtail_ssse3()
578 { use integer;
579   my $body = shift;
580   my @insns = (&$body,&$body,&$body,&$body); # 32 instructions
581   my ($a,$b,$c,$d,$e);

583     foreach (@insns) { eval; }
584 }

586 sub body_00_19 () {
587   ( ($a,$b,$c,$d,$e)=@V;'.
588     &add    ($e,eval(4*($j&15))."%rsp");',          # X[]+K xfer
589   );

```

```

590     ' &xor    ($c,$d);',
591     ' &mov    (@T[1],$a);',          # $b in next round
592     ' &$_rol   ($a,5);',
593     ' &and    (@T[0],$c);',          # ($b&($c^$d))
594     ' &xor    ($c,$d);',          # restore $c
595     ' &xor    (@T[0],$d);',
596     ' &add    ($e,$a);',
597     ' &$_ror   ($b,$j??2);',        # $b>>2
598     ' &add    ($e,@T[0]);',        .' $j++; unshift(@V,pop(@V)); unshift(@T,pop(@T))
599   );
600 }

602 sub body_20_39 () {
603   ( ($a,$b,$c,$d,$e)=@V;'.
604     &add    ($e,eval(4*($j++&15))."%rsp");',          # X[]+K xfer
605     ' &xor    (@T[0],$d);',          # ($b^$d)
606     ' &mov    (@T[1],$a);',          # $b in next round
607     ' &$_rol   ($a,5);',
608     ' &xor    (@T[0],$c);',          # ($b^$d^$c)
609     ' &add    ($e,$a);',
610     ' &$_ror   ($b,7);',            # $b>>2
611     ' &add    ($e,@T[0]);',        .' unshift(@V,pop(@V)); unshift(@T,pop(@T));'
612   );
613 }
614 }

616 sub body_40_59 () {
617   ( ($a,$b,$c,$d,$e)=@V;'.
618     &mov    (@T[1],$c);',
619     ' &xor    ($c,$d);',
620     &add    ($e,eval(4*($j++&15))."%rsp");',          # X[]+K xfer
621     ' &and    (@T[1],$d);',
622     ' &and    (@T[0],$c);',          # ($b&($c^$d))
623     ' &$_ror   ($b,7);',            # $b>>2
624     ' &add    ($e,@T[1]);',
625     ' &mov    (@T[1],$a);',          # $b in next round
626     ' &$_rol   ($a,5);',
627     ' &add    ($e,@T[0]);',
628     ' &xor    ($c,$d);',          # restore $c
629     ' &add    ($e,$a);',          .' unshift(@V,pop(@V)); unshift(@T,pop(@T));'
630   );
631 }
632 }
633 $code.=<<<;
634 .align 16
635 .Loop_ssse3:
636
637     &Xupdate_ssse3_16_31(\&body_00_19);
638     &Xupdate_ssse3_16_31(\&body_00_19);
639     &Xupdate_ssse3_16_31(\&body_00_19);
640     &Xupdate_ssse3_16_31(\&body_00_19);
641     &Xupdate_ssse3_32_79(\&body_00_19);
642     &Xupdate_ssse3_32_79(\&body_20_39);
643     &Xupdate_ssse3_32_79(\&body_20_39);
644     &Xupdate_ssse3_32_79(\&body_20_39);
645     &Xupdate_ssse3_32_79(\&body_20_39);
646     &Xupdate_ssse3_32_79(\&body_20_39);
647     &Xupdate_ssse3_32_79(\&body_40_59);
648     &Xupdate_ssse3_32_79(\&body_40_59);
649     &Xupdate_ssse3_32_79(\&body_40_59);
650     &Xupdate_ssse3_32_79(\&body_40_59);
651     &Xupdate_ssse3_32_79(\&body_40_59);
652     &Xupdate_ssse3_32_79(\&body_20_39);
653     &Xuplast_ssse3_80(\&body_20_39);          # can jump to "done"

655     $saved_j=$j; @saved_V=@V;

```



```

657     &Xloop_ssse3(\&body_20_39);
658     &Xloop_ssse3(\&body_20_39);
659     &Xloop_ssse3(\&body_20_39);

661 $code.=<<__;;
662     add    0($ctx), $A                # update context
663     add    4($ctx), @T[0]
664     add    8($ctx), $C
665     add    12($ctx), $D
666     mov    $A, 0($ctx)
667     add    16($ctx), $E
668     mov    @T[0], 4($ctx)
669     mov    @T[0], $B                # magic seed
670     mov    $C, 8($ctx)
671     mov    $D, 12($ctx)
672     mov    $E, 16($ctx)
673     jmp    .Loop_ssse3

675 .align 16
676 .Ldone_ssse3:
677 ____
678     Sj=$saved_j; @V=@saved_V;

680     &Xtail_ssse3(\&body_20_39);
681     &Xtail_ssse3(\&body_20_39);
682     &Xtail_ssse3(\&body_20_39);

684 $code.=<<__;;
685     add    0($ctx), $A                # update context
686     add    4($ctx), @T[0]
687     add    8($ctx), $C
688     mov    $A, 0($ctx)
689     add    12($ctx), $D
690     mov    @T[0], 4($ctx)
691     add    16($ctx), $E
692     mov    $C, 8($ctx)
693     mov    $D, 12($ctx)
694     mov    $E, 16($ctx)
695 ____
696 $code.=<<__ if ($win64);
697     movaps 64+0(%rsp), %xmm6
698     movaps 64+16(%rsp), %xmm7
699     movaps 64+32(%rsp), %xmm8
700     movaps 64+48(%rsp), %xmm9
701     movaps 64+64(%rsp), %xmm10
702 ____
703 $code.=<<__;;
704     lea    '64+($win64?5*16:0)'(%rsp), %rsi
705     mov    0(%rsi), %r12
706     mov    8(%rsi), %rbp
707     mov    16(%rsi), %rbx
708     lea    24(%rsi), %rsp
709 .Lepilogue_ssse3:
710     ret
711 .size sha1_block_data_order_ssse3,.-sha1_block_data_order_ssse3
712 ____

714 if ($avx) {
715 my $Xi=4;
716 my @X=map("%xmm$", (4..7, 0..3));
717 my @Tx=map("%xmm$", (8..10));
718 my @V=($A, $B, $C, $D, $E) = ("%eax", "%ebx", "%ecx", "%edx", "%ebp"); # size optimizat
719 my @T=("%esi", "%edi");
720 my $j=0;
721 my $K_XX_XX="%r11";

```

```

723 my $_rol=sub { &shld(@_[0],@_) };
724 my $_ror=sub { &shrd(@_[0],@_) };

726 $code.=<<__;;
727 .type sha1_block_data_order_avx, \@function, 3
728 .align 16
729 sha1_block_data_order_avx:
730 _avx_shortcut:
731     push    %rbx
732     push    %rbp
733     push    %r12
734     lea     '-64-($win64?5*16:0)'(%rsp), %rsp
735 ____
736 $code.=<<__ if ($win64);
737     movaps %xmm6, 64+0(%rsp)
738     movaps %xmm7, 64+16(%rsp)
739     movaps %xmm8, 64+32(%rsp)
740     movaps %xmm9, 64+48(%rsp)
741     movaps %xmm10, 64+64(%rsp)
742 .Lprologue_avx:
743 ____
744 $code.=<<__;;
745     mov     %rdi, $ctx                # reassigned argument
746     mov     %rsi, $inp                # reassigned argument
747     mov     %rdx, $num                # reassigned argument
748     vzeroupper

750     shl     $6, $num
751     add     $inp, $num
752     lea     K_XX_XX(%rip), $K_XX_XX

754     mov     0($ctx), $A                # load context
755     mov     4($ctx), $B
756     mov     8($ctx), $C
757     mov     12($ctx), $D
758     mov     $B, @T[0]                # magic seed
759     mov     16($ctx), $E

761     vmovdqa 64($K_XX_XX), @X[2]        # pbswap mask
762     vmovdqa 0($K_XX_XX), @Tx[1]        # K_00_19
763     vmovdqu 0($inp), @X[-4&7]         # load input to %xmm[0-3]
764     vmovdqu 16($inp), @X[-3&7]
765     vmovdqu 32($inp), @X[-2&7]
766     vmovdqu 48($inp), @X[-1&7]
767     vpshufb @X[2], @X[-4&7], @X[-4&7] # byte swap
768     add     $64, $inp
769     vpshufb @X[2], @X[-3&7], @X[-3&7]
770     vpshufb @X[2], @X[-2&7], @X[-2&7]
771     vpshufb @X[2], @X[-1&7], @X[-1&7]
772     vpaddd  @Tx[1], @X[-4&7], @X[0]    # add K_00_19
773     vpaddd  @Tx[1], @X[-3&7], @X[1]
774     vpaddd  @Tx[1], @X[-2&7], @X[2]
775     vmovdqa @X[0], 0(%rsp)            # X[]+K xfer to IALU
776     vmovdqa @X[1], 16(%rsp)
777     vmovdqa @X[2], 32(%rsp)
778     jmp     .Loop_avx
779 ____

781 sub Xupdate_avx_16_31()                # recall that $Xi starts with 4
782 { use integer;
783   my $body = shift;
784   my @insns = ($body, &$body, &$body, &$body); # 40 instructions
785   my ($a, $b, $c, $d, $e);

787     eval(shift(@insns));

```

```

788     eval(shift(@insns));
789     &vpalignr(@X[0],@X[-3&7],@X[-4&7],8); # compose "X[-14]" in "X[0]"
790     eval(shift(@insns));
791     eval(shift(@insns));

793     &vpadd    (@Tx[1],@Tx[1],@X[-1&7]);
794     eval(shift(@insns));
795     eval(shift(@insns));
796     &vpsrldq(@Tx[0],@X[-1&7],4); # "X[-3]", 3 dwords
797     eval(shift(@insns));
798     eval(shift(@insns));
799     &vpxor (@X[0],@X[0],@X[-4&7]); # "X[0]"^="X[-16]"
800     eval(shift(@insns));
801     eval(shift(@insns));

803     &vpxor (@Tx[0],@Tx[0],@X[-2&7]); # "X[-3]"^"X[-8]"
804     eval(shift(@insns));
805     eval(shift(@insns));
806     eval(shift(@insns));
807     eval(shift(@insns));

809     &vpxor (@X[0],@X[0],@Tx[0]); # "X[0]"^="X[-3]"^"X[-8]"
810     eval(shift(@insns));
811     eval(shift(@insns));
812     &vmovdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
813     eval(shift(@insns));
814     eval(shift(@insns));

816     &vpsrld (@Tx[0],@X[0],31);
817     eval(shift(@insns));
818     eval(shift(@insns));
819     eval(shift(@insns));
820     eval(shift(@insns));

822     &vpslldq(@Tx[2],@X[0],12); # "X[0]"<<96, extract one dword
823     &vpadd (@X[0],@X[0],@X[0]);
824     eval(shift(@insns));
825     eval(shift(@insns));
826     eval(shift(@insns));
827     eval(shift(@insns));

829     &vpsrld (@Tx[1],@Tx[2],30);
830     &vpor (@X[0],@X[0],@Tx[0]); # "X[0]"<<=1
831     eval(shift(@insns));
832     eval(shift(@insns));
833     eval(shift(@insns));
834     eval(shift(@insns));

836     &vpslld (@Tx[2],@Tx[2],2);
837     &vpxor (@X[0],@X[0],@Tx[1]);
838     eval(shift(@insns));
839     eval(shift(@insns));
840     eval(shift(@insns));
841     eval(shift(@insns));

843     &vpxor (@X[0],@X[0],@Tx[2]); # "X[0]"^="(X[0]>>96)<<2
844     eval(shift(@insns));
845     eval(shift(@insns));
846     &vmovdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX"); # K_XX_X
847     eval(shift(@insns));
848     eval(shift(@insns));

851     foreach (@insns) { eval; } # remaining instructions [if any]
853     $Xi++; push(@X,shift(@X)); # "rotate" X[]

```

```

854     push(@Tx,shift(@Tx));
855 }

857 sub Xupdate_avx_32_79()
858 { use integer;
859   my $body = shift;
860   my @insns = (&$body,&$body,&$body,&$body); # 32 to 48 instructions
861   my ($a,$b,$c,$d,$e);

863     &vpalignr(@Tx[0],@X[-1&7],@X[-2&7],8); # compose "X[-6]"
864     &vpxor (@X[0],@X[0],@X[-4&7]); # "X[0]"^="X[-32]"^"X[-16]"
865     eval(shift(@insns)); # body_20_39
866     eval(shift(@insns));
867     eval(shift(@insns));
868     eval(shift(@insns)); # rol

870     &vpxor (@X[0],@X[0],@X[-7&7]); # "X[0]"^="X[-28]"
871     eval(shift(@insns));
872     eval(shift(@insns)) if (@insns[0] !~ /&ro[r]l/);
873     if ($Xi%5) {
874       &vmovdqa (@Tx[2],@Tx[1]); # "perpetuate" K_XX_XX...
875     } else { # ... or load next one
876       &vmovdqa (@Tx[2],eval(16*(($Xi)/5))."%K_XX_XX");
877     }
878     &vpadd (@Tx[1],@Tx[1],@X[-1&7]);
879     eval(shift(@insns)); # ror
880     eval(shift(@insns));

882     &vpxor (@X[0],@X[0],@Tx[0]); # "X[0]"^="X[-6]"
883     eval(shift(@insns)); # body_20_39
884     eval(shift(@insns));
885     eval(shift(@insns));
886     eval(shift(@insns)); # rol

888     &vpsrld (@Tx[0],@X[0],30);
889     &vmovdqa (eval(16*(($Xi-1)&3))."%rsp",@Tx[1]); # X[]+K xfer to
890     eval(shift(@insns));
891     eval(shift(@insns));
892     eval(shift(@insns)); # ror
893     eval(shift(@insns));

895     &vpslld (@X[0],@X[0],2);
896     eval(shift(@insns)); # body_20_39
897     eval(shift(@insns));
898     eval(shift(@insns));
899     eval(shift(@insns)); # rol
900     eval(shift(@insns));
901     eval(shift(@insns));
902     eval(shift(@insns)); # ror
903     eval(shift(@insns));

905     &vpor (@X[0],@X[0],@Tx[0]); # "X[0]"<<=2
906     eval(shift(@insns)); # body_20_39
907     eval(shift(@insns));
908     &vmovdqa (@Tx[1],@X[0]) if ($Xi<19);
909     eval(shift(@insns));
910     eval(shift(@insns)); # rol
911     eval(shift(@insns));
912     eval(shift(@insns));
913     eval(shift(@insns)); # rol
914     eval(shift(@insns));

916     foreach (@insns) { eval; } # remaining instructions

918     $Xi++; push(@X,shift(@X)); # "rotate" X[]
919     push(@Tx,shift(@Tx));

```

```

920 }

922 sub Xuplast_avx_80()
923 { use integer;
924   my $body = shift;
925   my @insns = (&$body, &$body, &$body, &$body); # 32 instructions
926   my ($a, $b, $c, $d, $e);

928   eval(shift(@insns));
929   &vpaddq (@Tx[1], @Tx[1], @X[-1&7]);
930   eval(shift(@insns));
931   eval(shift(@insns));
932   eval(shift(@insns));
933   eval(shift(@insns));

935   &movdqa (eval(16*((&$xi-1)&3))."%rsp", @Tx[1]); # X[K]+K xfer IAL

937   foreach (@insns) { eval; } # remaining instructions

939   &cmp ($inp, $num);
940   &je ("Ldone_avx");

942   unshift(@Tx, pop(@Tx));

944   &vmovdqa(@X[2], "64($K_XX_XX)"); # pbswap mask
945   &vmovdqa(@Tx[1], "0($K_XX_XX)"); # K_00_19
946   &vmovdqu(@X[-4&7], "0($inp)"); # load input
947   &vmovdqu(@X[-3&7], "16($inp)");
948   &vmovdqu(@X[-2&7], "32($inp)");
949   &vmovdqu(@X[-1&7], "48($inp)");
950   &vpshufb(@X[-4&7], @X[-4&7], @X[2]); # byte swap
951   &add ($inp, 64);

953   $xi=0;
954 }

956 sub Xloop_avx()
957 { use integer;
958   my $body = shift;
959   my @insns = (&$body, &$body, &$body, &$body); # 32 instructions
960   my ($a, $b, $c, $d, $e);

962   eval(shift(@insns));
963   eval(shift(@insns));
964   &vpshufb(@X[($xi-3)&7], @X[($xi-3)&7], @X[2]);
965   eval(shift(@insns));
966   eval(shift(@insns));
967   &vpaddq (@X[$xi&7], @X[($xi-4)&7], @Tx[1]);
968   eval(shift(@insns));
969   eval(shift(@insns));
970   eval(shift(@insns));
971   eval(shift(@insns));
972   &vmovdqa(eval(16*$xi)."%rsp", @X[$xi&7]); # X[K]+K xfer to IALU
973   eval(shift(@insns));
974   eval(shift(@insns));

976   foreach (@insns) { eval; }
977   $xi++;
978 }

980 sub Xtail_avx()
981 { use integer;
982   my $body = shift;
983   my @insns = (&$body, &$body, &$body, &$body); # 32 instructions
984   my ($a, $b, $c, $d, $e);

```

```

986   foreach (@insns) { eval; }
987 }

989 $code.=<<<;
990 .align 16
991 .Loop_avx:
992 ---
993   &Xupdate_avx_16_31(\&body_00_19);
994   &Xupdate_avx_16_31(\&body_00_19);
995   &Xupdate_avx_16_31(\&body_00_19);
996   &Xupdate_avx_16_31(\&body_00_19);
997   &Xupdate_avx_32_79(\&body_00_19);
998   &Xupdate_avx_32_79(\&body_20_39);
999   &Xupdate_avx_32_79(\&body_20_39);
1000   &Xupdate_avx_32_79(\&body_20_39);
1001   &Xupdate_avx_32_79(\&body_20_39);
1002   &Xupdate_avx_32_79(\&body_20_39);
1003   &Xupdate_avx_32_79(\&body_40_59);
1004   &Xupdate_avx_32_79(\&body_40_59);
1005   &Xupdate_avx_32_79(\&body_40_59);
1006   &Xupdate_avx_32_79(\&body_40_59);
1007   &Xupdate_avx_32_79(\&body_40_59);
1008   &Xupdate_avx_32_79(\&body_20_39);
1009   &Xuplast_avx_80(\&body_20_39); # can jump to "done"

1011   $saved_j=$j; @saved_V=@V;

1013   &Xloop_avx(\&body_20_39);
1014   &Xloop_avx(\&body_20_39);
1015   &Xloop_avx(\&body_20_39);

1017 $code.=<<<;
1018   add 0($ctx), $A # update context
1019   add 4($ctx), @T[0]
1020   add 8($ctx), $C
1021   add 12($ctx), $D
1022   mov $A, 0($ctx)
1023   add 16($ctx), $E
1024   mov @T[0], 4($ctx)
1025   mov @T[0], $B # magic seed
1026   mov $C, 8($ctx)
1027   mov $D, 12($ctx)
1028   mov $E, 16($ctx)
1029   jmp .Loop_avx

1031 .align 16
1032 .Ldone_avx:
1033 ---
1034   $j=$saved_j; @V=@saved_V;

1036   &Xtail_avx(\&body_20_39);
1037   &Xtail_avx(\&body_20_39);
1038   &Xtail_avx(\&body_20_39);

1040 $code.=<<<;
1041   vzeroupper

1043   add 0($ctx), $A # update context
1044   add 4($ctx), @T[0]
1045   add 8($ctx), $C
1046   mov $A, 0($ctx)
1047   add 12($ctx), $D
1048   mov @T[0], 4($ctx)
1049   add 16($ctx), $E
1050   mov $C, 8($ctx)
1051   mov $D, 12($ctx)

```

```

1052     mov     $E,16($ctx)
1053
1054 $code.=<< if ($win64);
1055     movaps  64+0($rsp),%xmm6
1056     movaps  64+16($rsp),%xmm7
1057     movaps  64+32($rsp),%xmm8
1058     movaps  64+48($rsp),%xmm9
1059     movaps  64+64($rsp),%xmm10
1060
1061 $code.=<<
1062     lea     '64+($win64*5*16:0)'($rsp),%rsi
1063     mov     0($rsi),%r12
1064     mov     8($rsi),%rbp
1065     mov     16($rsi),%rbx
1066     lea     24($rsi),%rsp
1067 .Lepilogue_avx:
1068     ret
1069 .size  sha1_block_data_order_avx,.-sha1_block_data_order_avx
1070
1071 }
1072 $code.=<<
1073 .align 64
1074 K_XX_XX:
1075 .long 0x5a827999,0x5a827999,0x5a827999,0x5a827999 # K_00_19
1076 .long 0x6ed9eba1,0x6ed9eba1,0x6ed9eba1,0x6ed9eba1 # K_20_39
1077 .long 0x8f1bbcdc,0x8f1bbcdc,0x8f1bbcdc,0x8f1bbcdc # K_40_59
1078 .long 0xca62c1d6,0xca62c1d6,0xca62c1d6,0xca62c1d6 # K_60_79
1079 .long 0x00010203,0x04050607,0x08090a0b,0x0c0d0e0f # pbswap mask
1080
1081 }}}
1082 $code.=<<
1083 .asciz "SHA1 block transform for x86_64, CRYPTOGAMS by <appro@openssl.org>"
1084 .align 64
1085
1087 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
1088 #                               CONTEXT *context,DISPATCHER_CONTEXT *disp)
1089 if ($win64) {
1090 $rec="%rcx";
1091 $frame="%rdx";
1092 $context="%r8";
1093 $disp="%r9";
1094
1095 $code.=<<
1096 .extern __imp_RtlVirtualUnwind
1097 .type se_handler,@abi-omnipotent
1098 .align 16
1099 se_handler:
1100     push    %rsi
1101     push    %rdi
1102     push    %rbx
1103     push    %rbp
1104     push    %r12
1105     push    %r13
1106     push    %r14
1107     push    %r15
1108     pushfq  %r15
1109     sub     $64,%rsp
1110
1111     mov     120($context),%rax # pull context->Rax
1112     mov     248($context),%rbx # pull context->Rip
1113
1114     lea     .Lprologue(%rip),%r10
1115     cmp     %r10,%rbx # context->Rip<.Lprologue
1116     jb     .Lcommon_seh_tail

```

```

1118     mov     152($context),%rax # pull context->Rsp
1119
1120     lea     .Lepilogue(%rip),%r10
1121     cmp     %r10,%rbx # context->Rip>=.Lepilogue
1122     jae     .Lcommon_seh_tail
1123
1124     mov     '16*4'(%rax),%rax # pull saved stack pointer
1125     lea     32(%rax),%rax
1126
1127     mov     -8(%rax),%rbx
1128     mov     -16(%rax),%rbp
1129     mov     -24(%rax),%r12
1130     mov     -32(%rax),%r13
1131     mov     %rbx,144($context) # restore context->Rbx
1132     mov     %rbp,160($context) # restore context->Rbp
1133     mov     %r12,216($context) # restore context->R12
1134     mov     %r13,224($context) # restore context->R13
1135
1136     jmp     .Lcommon_seh_tail
1137 .size  se_handler,.-se_handler
1138
1139 .type ssse3_handler,@abi-omnipotent
1140 .align 16
1141 ssse3_handler:
1142     push    %rsi
1143     push    %rdi
1144     push    %rbx
1145     push    %rbp
1146     push    %r12
1147     push    %r13
1148     push    %r14
1149     push    %r15
1150     pushfq  %r15
1151     sub     $64,%rsp
1152
1153     mov     120($context),%rax # pull context->Rax
1154     mov     248($context),%rbx # pull context->Rip
1155
1156     mov     8($disp),%rsi # disp->ImageBase
1157     mov     56($disp),%r11 # disp->HandlerData
1158
1159     mov     0(%r11),%r10d # HandlerData[0]
1160     lea     (%rsi,%r10),%r10 # prologue label
1161     cmp     %r10,%rbx # context->Rip<prologue label
1162     jb     .Lcommon_seh_tail
1163
1164     mov     152($context),%rax # pull context->Rsp
1165
1166     mov     4(%r11),%r10d # HandlerData[1]
1167     lea     (%rsi,%r10),%r10 # epilogue label
1168     cmp     %r10,%rbx # context->Rip>=epilogue label
1169     jae     .Lcommon_seh_tail
1170
1171     lea     64(%rax),%rsi
1172     lea     512($context),%rdi # &context.Xmm6
1173     mov     $10,%ecx
1174     .long 0xa548f3fc # cld; rep movsq
1175     lea     '24+64+5*16'(%rax),%rax # adjust stack pointer
1176
1177     mov     -8(%rax),%rbx
1178     mov     -16(%rax),%rbp
1179     mov     -24(%rax),%r12
1180     mov     %rbx,144($context) # restore context->Rbx
1181     mov     %rbp,160($context) # restore context->Rbp
1182     mov     %r12,216($context) # restore cotnext->R12

```

```

1184 .lcommon_seh_tail:
1185     mov     8(%rax),%rdi
1186     mov     16(%rax),%rsi
1187     mov     %rax,152($context)    # restore context->Rsp
1188     mov     %rsi,168($context)    # restore context->Rsi
1189     mov     %rdi,176($context)    # restore context->Rdi

1191     mov     40($disp),%rdi        # disp->ContextRecord
1192     mov     $context,%rsi        # context
1193     mov     \ $154,%ecx          # sizeof(CONTEXT)
1194     .long   0xa548f3fc           # cld; rep movsq

1196     mov     $disp,%rsi
1197     xor     %rcx,%rcx            # arg1, UNW_FLAG_NHANDLER
1198     mov     8(%rsi),%rdx        # arg2, disp->ImageBase
1199     mov     0(%rsi),%r8         # arg3, disp->ControlPc
1200     mov     16(%rsi),%r9        # arg4, disp->FunctionEntry
1201     mov     40(%rsi),%r10       # disp->ContextRecord
1202     lea     56(%rsi),%r11       # &disp->HandlerData
1203     lea     24(%rsi),%r12       # &disp->EstablisherFrame
1204     mov     %r10,32(%rsp)       # arg5
1205     mov     %r11,40(%rsp)       # arg6
1206     mov     %r12,48(%rsp)       # arg7
1207     mov     %rcx,56(%rsp)       # arg8, (NULL)
1208     call    *__imp_RtlVirtualUnwind(%rip)

1210     mov     \ $1,%eax           # ExceptionContinueSearch
1211     add     \ $64,%rsp
1212     popfq
1213     pop     %r15
1214     pop     %r14
1215     pop     %r13
1216     pop     %r12
1217     pop     %rbp
1218     pop     %rbx
1219     pop     %rdi
1220     pop     %rsi
1221     ret
1222 .size     ssse3_handler,.-ssse3_handler

1224 .section     .pdata
1225 .align      4
1226     .rva     .LSEH_begin_sha1_block_data_order
1227     .rva     .LSEH_end_sha1_block_data_order
1228     .rva     .LSEH_info_sha1_block_data_order
1229     .rva     .LSEH_begin_sha1_block_data_order_ssse3
1230     .rva     .LSEH_end_sha1_block_data_order_ssse3
1231     .rva     .LSEH_info_sha1_block_data_order_ssse3
1232
1233 $code.=<<__ if ($avx);
1234     .rva     .LSEH_begin_sha1_block_data_order_avx
1235     .rva     .LSEH_end_sha1_block_data_order_avx
1236     .rva     .LSEH_info_sha1_block_data_order_avx
1237
1238 $code.=<<__ ;
1239 .section     .xdata
1240 .align      8
1241 .LSEH_info_sha1_block_data_order:
1242     .byte    9,0,0,0
1243     .rva     se_handler
1244 .LSEH_info_sha1_block_data_order_ssse3:
1245     .byte    9,0,0,0
1246     .rva     ssse3_handler
1247     .rva     .Lprologue_ssse3,.Lepilogue_ssse3    # HandlerData[]
1248
1249 $code.=<<__ if ($avx);

```

```

1250 .LSEH_info_sha1_block_data_order_avx:
1251     .byte    9,0,0,0
1252     .rva     ssse3_handler
1253     .rva     .Lprologue_avx,.Lepilogue_avx    # HandlerData[]
1254
1255 }

1257 #####

1259 $code =~ s/\`([^\`]*)\`/eval $1/gem;
1260 print $code;
1261 close STDOUT;

```

```
*****
6976 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/sha256-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # SHA256 block transform for x86. September 2007.
11 #
12 # Performance in clock cycles per processed byte (less is better):
13 #
14 # Pentium PIII P4 AMD K8 Core2
15 # gcc 46 36 41 27 26
16 # icc 57 33 38 25 23
17 # x86 asm 40 30 33 20 18
18 # x86_64 asm(*) - - 21 16 16
19 #
20 # (*) x86_64 assembler performance is presented for reference
21 # purposes.
22 #
23 # Performance improvement over compiler generated code varies from
24 # 10% to 40% [see above]. Not very impressive on some µ-archs, but
25 # it's 5 times smaller and optimizies amount of writes.
26
27 $0 =~ m/(.*[\\\/\[\]\^\*\~\&])/; $dir=$1;
28 push(@INC,"${dir}","${dir}../../perlasm");
29 require "x86asm.pl";
30
31 &asm_init($ARGV[0], "sha512-586.pl", $ARGV[$#ARGV] eq "386");
32
33 $A="eax";
34 $E="edx";
35 $T="ebx";
36 $Aoff=&DWP(0,"esp");
37 $Boff=&DWP(4,"esp");
38 $Coff=&DWP(8,"esp");
39 $Doff=&DWP(12,"esp");
40 $Eoff=&DWP(16,"esp");
41 $Foff=&DWP(20,"esp");
42 $Goff=&DWP(24,"esp");
43 $Hoff=&DWP(28,"esp");
44 $Xoff=&DWP(32,"esp");
45 $K256="ebp";
46
47 sub BODY_00_15() {
48     my $in_16_63=shift;
49
50     &mov ("ecx", $E);
51     &add ($T, "edi") if ($in_16_63); # T += sigma1(X[
52     &ror ("ecx", 25-11);
53     &mov ("esi", $Foff);
54     &xor ("ecx", $E);
55     &ror ("ecx", 11-6);
56     &mov (&DWP(4*(8+15), "esp"), $T) if ($in_16_63); # save X[0]
57     &xor ("ecx", $E);
58     &ror ("ecx", 6); # Sigma1(e)
59     &mov ("edi", $Goff);
60     &add ($T, "ecx"); # T += Sigma1(e)
```

```
62     &xor ("esi", "edi");
63     &mov ($Eoff, $E); # modulo-scheduled
64     &mov ("ecx", $A);
65     &and ("esi", $E);
66     &mov ($E, $Doff); # e becomes d, which is e in next iteration
67     &xor ("esi", "edi"); # Ch(e,f,g)
68     &mov ("edi", $A);
69     &add ($T, "esi"); # T += Ch(e,f,g)
70
71     &ror ("ecx", 22-13);
72     &add ($T, $Hoff); # T += h
73     &xor ("ecx", $A);
74     &ror ("ecx", 13-2);
75     &mov ("esi", $Boff);
76     &xor ("ecx", $A);
77     &ror ("ecx", 2); # Sigma0(a)
78     &add ($E, $T); # d += T
79     &mov ("edi", $Coff);
80
81     &add ($T, "ecx"); # T += Sigma0(a)
82     &mov ($Aoff, $A); # modulo-scheduled
83
84     &mov ("ecx", $A);
85     &sub ("esp", 4);
86     &or ($A, "esi"); # a becomes h, which is a in next iteration
87     &and ("ecx", "esi");
88     &and ($A, "edi");
89     &mov ("esi", &DWP(0, $K256));
90     &or ($A, "ecx"); # h=Maj(a,b,c)
91
92     &add ($K256, 4);
93     &add ($A, $T); # h += T
94     &mov ($T, &DWP(4*(8+15+16-1), "esp")) if ($in_16_63); # preload T
95     &add ($E, "esi"); # d += K256[i]
96     &add ($A, "esi"); # h += K256[i]
97 }
98
99 &function_begin("sha256_block_data_order");
100 &mov ("esi", wparam(0)); # ctx
101 &mov ("edi", wparam(1)); # inp
102 &mov ("eax", wparam(2)); # num
103 &mov ("ebx", "esp"); # saved sp
104
105 &call (&label("pic_point")); # make it PIC!
106 &set_label("pic_point");
107 &blindpop($K256);
108 &lea ($K256, &DWP(&label("K256")."-".&label("pic_point"), $K256));
109
110 &sub ("esp", 16);
111 &and ("esp", -64);
112
113 &shl ("eax", 6);
114 &add ("eax", "edi");
115 &mov (&DWP(0, "esp"), "esi"); # ctx
116 &mov (&DWP(4, "esp"), "edi"); # inp
117 &mov (&DWP(8, "esp"), "eax"); # inp+num*128
118 &mov (&DWP(12, "esp"), "ebx"); # saved sp
119
120 &set_label("loop", 16);
121 # copy input block to stack reversing byte and dword order
122 for($i=0; $i<4; $i++) {
123     &mov ("eax", &DWP($i*16+0, "edi"));
124     &mov ("ebx", &DWP($i*16+4, "edi"));
125     &mov ("ecx", &DWP($i*16+8, "edi"));
126     &mov ("edx", &DWP($i*16+12, "edi"));
127     &bswap ("eax");
```

```

128     &bswap    ("ebx");
129     &bswap    ("ecx");
130     &bswap    ("edx");
131     &push     ("eax");
132     &push     ("ebx");
133     &push     ("ecx");
134     &push     ("edx");
135 }
136     &add      ("edi",64);
137     &sub      ("esp",4*8);          # place for A,B,C,D,E,F,G,H
138     &mov      (&DWP(4*(8+16)+4,"esp"),"edi");

140     # copy ctx->h[0-7] to A,B,C,D,E,F,G,H on stack
141     &mov      ($A,&DWP(0,"esi"));
142     &mov      ("ebx",&DWP(4,"esi"));
143     &mov      ("ecx",&DWP(8,"esi"));
144     &mov      ("edi",&DWP(12,"esi"));
145     # &mov    ($Aoff,$A);
146     &mov      ($Boff,"ebx");
147     &mov      ($Coff,"ecx");
148     &mov      ($Doff,"edi");
149     &mov      ($E,&DWP(16,"esi"));
150     &mov      ("ebx",&DWP(20,"esi"));
151     &mov      ("ecx",&DWP(24,"esi"));
152     &mov      ("edi",&DWP(28,"esi"));
153     # &mov    ($Eoff,$E);
154     &mov      ($Foff,"ebx");
155     &mov      ($Goff,"ecx");
156     &mov      ($Hoff,"edi");

158 &set_label("00_15",16);
159     &mov      ($T,&DWP(4*(8+15),"esp"));

161     &BODY_00_15();

163     &cmp      ("esi",0xc19bf174);
164     &jne      (&label("00_15"));

166     &mov      ($T,&DWP(4*(8+15+16-1),"esp")); # preloaded in BODY_00_15(1)
167 &set_label("16_63",16);
168     &mov      ("esi",$T);
169     &mov      ("ecx",&DWP(4*(8+15+16-14),"esp"));
170     &rrot      ("esi",18-7);
171     &mov      ("edi","ecx");
172     &xor      ("esi",$T);
173     &rrot      ("esi",7);
174     &shr      ($T,3);

176     &rrot      ("edi",19-17);
177     &xor      ("edi","esi");          # T = sigma0(X[-15])
178     &xor      ("edi","ecx");
179     &rrot      ("edi",17);
180     &shr      ("ecx",10);
181     &add      ($T,&DWP(4*(8+15+16),"esp")); # T += X[-16]
182     &xor      ("edi","ecx");          # sigma1(X[-2])

184     &add      ($T,&DWP(4*(8+15+16-9),"esp")); # T += X[-7]
185     # &add    ($T,"edi");          # T += sigma1(X[-2])
186     # &mov    (&DWP(4*(8+15),"esp"),$T); # save X[0]

188     &BODY_00_15(1);

190     &cmp      ("esi",0xc67178f2);
191     &jne      (&label("16_63"));

193     &mov      ("esi",&DWP(4*(8+16+64)+0,"esp"));#ctx

```

```

194     # &mov    ($A,$Aoff);
195     &mov      ("ebx",$Boff);
196     &mov      ("ecx",$Coff);
197     &mov      ("edi",$Doff);
198     &add      ($A,&DWP(0,"esi"));
199     &add      ("ebx",&DWP(4,"esi"));
200     &add      ("ecx",&DWP(8,"esi"));
201     &add      ("edi",&DWP(12,"esi"));
202     &mov      (&DWP(0,"esi"),$A);
203     &mov      (&DWP(4,"esi"),"ebx");
204     &mov      (&DWP(8,"esi"),"ecx");
205     &mov      (&DWP(12,"esi"),"edi");
206     # &mov    ($E,$Eoff);
207     &mov      ("eax",$Foff);
208     &mov      ("ebx",$Goff);
209     &mov      ("ecx",$Hoff);
210     &mov      ("edi",&DWP(4*(8+16+64)+4,"esp"));#inp
211     &add      ($E,&DWP(16,"esi"));
212     &add      ("eax",&DWP(20,"esi"));
213     &add      ("ebx",&DWP(24,"esi"));
214     &add      ("ecx",&DWP(28,"esi"));
215     &mov      (&DWP(16,"esi"),$E);
216     &mov      (&DWP(20,"esi"),"eax");
217     &mov      (&DWP(24,"esi"),"ebx");
218     &mov      (&DWP(28,"esi"),"ecx");

220     &add      ("esp",4*(8+16+64));          # destroy frame
221     &sub      ($K256,4*64);                  # rewind K

223     &cmp      ("edi",&DWP(8,"esp"));          # are we done yet?
224     &jb       (&label("loop"));

226     &mov      ("esp",&DWP(12,"esp"));        # restore sp
227 &function_end_A();

229 &set_label("K256",64); # Yes! I keep it in the code segment!
230     &data_word(0x428a2f98,0x71374491,0xb5c0fbcf,0xe9b5dba5);
231     &data_word(0x3956c25b,0x59f111f1,0x923f82a4,0xab1c5ed5);
232     &data_word(0xd807aa98,0x12835b01,0x243185be,0x550c7dc3);
233     &data_word(0x72be5d74,0x80deb1fe,0x9bdc06a7,0xc19bf174);
234     &data_word(0xe49b69c1,0xefbe4786,0x0fc19dc6,0x240ca1cc);
235     &data_word(0x2de92c6f,0x4a7484aa,0x5cb0a9dc,0x76f988da);
236     &data_word(0x983e5152,0xa831c66d,0xb00327c8,0xbf597fc7);
237     &data_word(0xc6e00bf3,0xd5a79147,0x06ca6351,0x14292967);
238     &data_word(0x27b70a85,0x2e1b2138,0x4d2c6dfe,0x53380d13);
239     &data_word(0x650a7354,0x766a0abb,0x81c2c92e,0x92722c85);
240     &data_word(0xa2bfe8a1,0xa81a664b,0xc24b8b70,0xc76c51a3);
241     &data_word(0xd192e819,0xd6990624,0xf40e3585,0x106aa070);
242     &data_word(0x19a4c116,0x1e376c08,0x2748774c,0x34b0bcb5);
243     &data_word(0x391c0cb3,0x4ed8aa4a,0x5b9cca4f,0x682e6ff3);
244     &data_word(0x748f82ee,0x78a5636f,0x84c87814,0x8cc70208);
245     &data_word(0x90befffa,0xa4506ceb,0xbef9a3f7,0xc67178f2);
246 &function_end_B("sha256_block_data_order");
247 &asciz("SHA256 block transform for x86, CRYPTOGAMS by <approv@openssl.org>");

249 &asm_finish();

```

```

*****
18166 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/sha512-586.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # SHA512 block transform for x86. September 2007.
11 #
12 # Performance in clock cycles per processed byte (less is better):
13 #
14 #           Pentium PIII    P4      AMD K8    Core2
15 # gcc       100      75      116      54      66
16 # icc       97       77       95       55      57
17 # x86 asm   61      56       82       36      40
18 # SSE2 asm  -       -       38       24      20
19 # x86_64 asm(*) -     -       30      10.0    10.5
20 #
21 # (*) x86_64 assembler performance is presented for reference
22 # purposes.
23 #
24 # IALU code-path is optimized for elder Pentiums. On vanilla Pentium
25 # performance improvement over compiler generated code reaches ~60%,
26 # while on PIII - ~35%. On newer µ-archs improvement varies from 15%
27 # to 50%, but it's less important as they are expected to execute SSE2
28 # code-path, which is commonly ~2-3x faster [than compiler generated
29 # code]. SSE2 code-path is as fast as original sha512-sse2.pl, even
30 # though it does not use 128-bit operations. The latter means that
31 # SSE2-aware kernel is no longer required to execute the code. Another
32 # difference is that new code optimizes amount of writes, but at the
33 # cost of increased data cache "footprint" by 1/2KB.

35 $0 =~ m/(.*[\\\/\\\/])[^\\\\/\\\/]+$/; $dir=$1;
36 push(@INC,"${dir}" "${dir}../../perlasm");
37 require "x86asm.pl";

39 &asm_init($ARGV[0],"sha512-586.pl",$ARGV[$#ARGV] eq "386");

41 $sse2=0;
42 for (@ARGV) { $sse2=1 if (/^-DOPENSSL_IA32_SSE2/); }

44 &external_label("OPENSSL_ia32cap_P") if ($sse2);

46 $Tlo=&DWP(0,"esp");    $Thi=&DWP(4,"esp");
47 $Alo=&DWP(8,"esp");    $Ahi=&DWP(8+4,"esp");
48 $Blo=&DWP(16,"esp");   $Bhi=&DWP(16+4,"esp");
49 $Clo=&DWP(24,"esp");   $Chi=&DWP(24+4,"esp");
50 $Dlo=&DWP(32,"esp");   $Dhi=&DWP(32+4,"esp");
51 $Elo=&DWP(40,"esp");   $Ehi=&DWP(40+4,"esp");
52 $Flo=&DWP(48,"esp");   $Fhi=&DWP(48+4,"esp");
53 $Glo=&DWP(56,"esp");   $Ghi=&DWP(56+4,"esp");
54 $Hlo=&DWP(64,"esp");   $Hhi=&DWP(64+4,"esp");
55 $K512="ebp";

57 $Asse2=&QWP(0,"esp");
58 $Bsse2=&QWP(8,"esp");
59 $Csse2=&QWP(16,"esp");
60 $Dsse2=&QWP(24,"esp");
61 $Esse2=&QWP(32,"esp");

```

```

62 $Fsse2=&QWP(40,"esp");
63 $Gsse2=&QWP(48,"esp");
64 $Hsse2=&QWP(56,"esp");

66 $A="mm0";    # B-D and
67 $E="mm4";    # F-H are commonly loaded to respectively mm1-mm3 and
68             # mm5-mm7, but it's done on on-demand basis...

70 sub BODY_00_15_sse2 {
71     my $prefetch=shift;

73     &movq    ("mm5",$Fsse2);    # load f
74     &movq    ("mm6",$Gsse2);    # load g
75     &movq    ("mm7",$Hsse2);    # load h

77     &movq    ("mm1",$E);        # %mm1 is sliding right
78     &movq    ("mm2",$E);        # %mm2 is sliding left
79     &psrlq    ("mm1",14);
80     &movq    ($Esse2,$E);        # modulo-scheduled save e
81     &psllq    ("mm2",23);
82     &movq    ("mm3","mm1");      # %mm3 is T1
83     &psrlq    ("mm1",4);
84     &pxor     ("mm3","mm2");
85     &psllq    ("mm2",23);
86     &pxor     ("mm3","mm1");
87     &psrlq    ("mm1",23);
88     &pxor     ("mm3","mm2");
89     &psllq    ("mm2",4);
90     &pxor     ("mm3","mm1");
91     &paddq    ("mm7",QWP(0,$K512)); # h+=K512[i]
92     &pxor     ("mm3","mm2");      # T1=Sigma1_512(e)

94     &pxor     ("mm5","mm6");      # f^=g
95     &movq     ("mm1",$Bsse2);      # load b
96     &pand     ("mm5",$E);          # f&=e
97     &movq     ("mm2",$Csse2);      # load c
98     &pxor     ("mm5","mm6");      # f^=g
99     &movq     ($E,$Dsse2);         # e = load d
100    &paddq     ("mm3","mm5");        # T1+=Ch(e,f,g)
101    &movq     (&QWP(0,"esp"),$A);   # modulo-scheduled save a
102    &paddq     ("mm3","mm7");        # T1+=h

104    &movq     ("mm5",$A);           # %mm5 is sliding right
105    &movq     ("mm6",$A);           # %mm6 is sliding left
106    &paddq     ("mm3",&QWP(8*9,"esp")); # T1+=X[0]
107    &psrlq     ("mm5",28);
108    &paddq     ($E,"mm3");          # e += T1
109    &psllq     ("mm6",25);
110    &movq     ("mm7","mm5");
111    &psrlq     ("mm5",6);
112    &pxor      ("mm7","mm6");
113    &psllq     ("mm6",5);
114    &pxor      ("mm7","mm5");
115    &psrlq     ("mm5",5);
116    &pxor      ("mm7","mm6");
117    &psllq     ("mm6",6);
118    &pxor      ("mm7","mm5");
119    &sub       ("esp",8);
120    &pxor      ("mm7","mm6");      # T2=Sigma0_512(a)

122    &movq     ("mm5",$A);          # %mm5=a
123    &por       ($A,"mm2");         # a|=c
124    &movq     ("mm6",&QWP(8*(9+16-14),"esp")) if ($prefetch);
125    &pand      ("mm5","mm2");      # %mm5=a&c
126    &pand      ($A,"mm1");         # a=(a|c)&b
127    &movq     ("mm2",&QWP(8*(9+16-1),"esp")) if ($prefetch);

```



```

128      &por      ("mm5", $A);          # %mm5=(a&c)|((a|c)&b)
129      &paddq     ("mm7", "mm5");        # T2+=Maj(a,b,c)
130      &movq      ($A, "mm3");           # a=T1

132      &mov      (&LB("edx"), &BP(0, $K512));
133      &paddq     ($A, "mm7");           # a+=T2
134      &add       ($K512, 8);
135  }

137  sub BODY_00_15_x86 {
138      #define Sigma1(x)      (ROTR((x),14) ^ ROTR((x),18) ^ ROTR((x),41))
139      # LO                   lo>>14^hi<<18 ^ lo>>18^hi<<14 ^ hi>>9^lo<<23
140      # HI                   hi>>14^lo<<18 ^ hi>>18^lo<<14 ^ lo>>9^hi<<23
141      &mov      ("ecx", $Elo);
142      &mov      ("edx", $Ehi);
143      &mov      ("esi", "ecx");

145      &shr      ("ecx", 9);             # lo>>9
146      &mov      ("edi", "edx");
147      &shr      ("edx", 9);             # hi>>9
148      &mov      ("ebx", "ecx");
149      &shl      ("esi", 14);            # lo<<14
150      &mov      ("eax", "edx");
151      &shl      ("edi", 14);            # hi<<14
152      &xor      ("ebx", "esi");

154      &shr      ("ecx", 14-9);          # lo>>14
155      &xor      ("eax", "edi");
156      &shr      ("edx", 14-9);          # hi>>14
157      &xor      ("eax", "ecx");
158      &shl      ("esi", 18-14);         # lo<<18
159      &xor      ("ebx", "edx");
160      &shl      ("edi", 18-14);         # hi<<18
161      &xor      ("ebx", "esi");

163      &shr      ("ecx", 18-14);          # lo>>18
164      &xor      ("eax", "edi");
165      &shr      ("edx", 18-14);          # hi>>18
166      &xor      ("eax", "ecx");
167      &shl      ("esi", 23-18);         # lo<<23
168      &xor      ("ebx", "edx");
169      &shl      ("edi", 23-18);         # hi<<23
170      &xor      ("eax", "esi");
171      &xor      ("ebx", "edi");         # T1 = Sigma1(e)

173      &mov      ("ecx", $Flo);
174      &mov      ("edx", $Fhi);
175      &mov      ("esi", $Glo);
176      &mov      ("edi", $Ghi);
177      &add      ("eax", $Hlo);
178      &adc      ("ebx", $Hhi);           # T1 += h
179      &xor      ("ecx", "esi");
180      &xor      ("edx", "edi");
181      &and      ("ecx", $Elo);
182      &and      ("edx", $Ehi);
183      &add      ("eax", &DWP(8*(9+15)+0, "esp"));
184      &adc      ("ebx", &DWP(8*(9+15)+4, "esp")); # T1 += X[0]
185      &xor      ("ecx", "esi");
186      &xor      ("edx", "edi");         # Ch(e,f,g) = (f^g)&e)^g

188      &mov      ("esi", &DWP(0, $K512));
189      &mov      ("edi", &DWP(4, $K512));
190      &add      ("eax", "ecx");
191      &adc      ("ebx", "edx");
192      &mov      ("ecx", $Dlo);
193      &mov      ("edx", $Dhi);

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```

194      &add      ("eax", "esi");
195      &adc      ("ebx", "edi");         # T1 += K[i]
196      &mov      ($Tlo, "eax");
197      &mov      ($Thi, "ebx");         # put T1 away
198      &add      ("eax", "ecx");
199      &adc      ("ebx", "edx");         # d += T1

201      #define Sigma0(x)      (ROTR((x),28) ^ ROTR((x),34) ^ ROTR((x),39))
202      # LO                   lo>>28^hi<<4 ^ hi>>2^lo<<30 ^ hi>>7^lo<<25
203      # HI                   hi>>28^lo<<4 ^ lo>>2^hi<<30 ^ lo>>7^hi<<25
204      &mov      ("ecx", $Alo);
205      &mov      ("edx", $Ahi);
206      &mov      ($Dlo, "eax");
207      &mov      ($Dhi, "ebx");
208      &mov      ("esi", "ecx");

210      &shr      ("ecx", 2);             # lo>>2
211      &mov      ("edi", "edx");
212      &shr      ("edx", 2);             # hi>>2
213      &mov      ("ebx", "ecx");
214      &shl      ("esi", 4);             # lo<<4
215      &mov      ("eax", "edx");
216      &shl      ("edi", 4);             # hi<<4
217      &xor      ("ebx", "esi");

219      &shr      ("ecx", 7-2);           # lo>>7
220      &xor      ("eax", "edi");
221      &shr      ("edx", 7-2);           # hi>>7
222      &xor      ("ebx", "ecx");
223      &shl      ("esi", 25-4);          # lo<<25
224      &xor      ("eax", "edx");
225      &shl      ("edi", 25-4);          # hi<<25
226      &xor      ("eax", "esi");

228      &shr      ("ecx", 28-7);          # lo>>28
229      &xor      ("ebx", "edi");
230      &shr      ("edx", 28-7);          # hi>>28
231      &xor      ("eax", "ecx");
232      &shl      ("esi", 30-25);         # lo<<30
233      &xor      ("ebx", "edx");
234      &shl      ("edi", 30-25);         # hi<<30
235      &xor      ("eax", "esi");
236      &xor      ("ebx", "edi");         # Sigma0(a)

238      &mov      ("ecx", $Alo);
239      &mov      ("edx", $Ahi);
240      &mov      ("esi", $Blo);
241      &mov      ("edi", $Bhi);
242      &add      ("eax", $Tlo);
243      &adc      ("ebx", $Thi);           # T1 = Sigma0(a)+T1
244      &or       ("ecx", "esi");
245      &or       ("edx", "edi");
246      &and      ("ecx", $Clo);
247      &and      ("edx", $Chi);
248      &and      ("esi", $Alo);
249      &and      ("edi", $Ahi);
250      &or       ("ecx", "esi");
251      &or       ("edx", "edi");         # Maj(a,b,c) = ((a|b)&c)|((a&b)

253      &add      ("eax", "ecx");
254      &adc      ("ebx", "edx");         # T1 += Maj(a,b,c)
255      &mov      ($Tlo, "eax");
256      &mov      ($Thi, "ebx");

258      &mov      (&LB("edx"), &BP(0, $K512));
259      &sub      ("esp", 8);

```

```

260      &lea      ($K512,&DWP(8,$K512));      # K++
261 }

264 &function_begin("sha512_block_data_order");
265      &mov      ("esi",wparam(0));      # ctx
266      &mov      ("edi",wparam(1));      # inp
267      &mov      ("eax",wparam(2));      # num
268      &mov      ("ebx","esp");      # saved sp

270      &call      (&label("pic_point"));      # make it PIC!
271 &set_label("pic_point");
272      &blindpop($K512);
273      &lea      ($K512,&DWP(&label("K512")."-".&label("pic_point"),$K512));

275      &sub      ("esp",16);
276      &and      ("esp",-64);

278      &shl      ("eax",7);
279      &add      ("eax","edi");
280      &mov      (&DWP(0,"esp"),"esi");      # ctx
281      &mov      (&DWP(4,"esp"),"edi");      # inp
282      &mov      (&DWP(8,"esp"),"eax");      # inp+num*128
283      &mov      (&DWP(12,"esp"),"ebx");      # saved sp

285 if ($sse2) {
286      &picmeup("edx","OPENSSL_ia32cap_P",$K512,&label("K512"));
287      &bt      (&DWP(0,"edx"),26);
288      &jnc      (&label("loop_x86"));

290      # load ctx->h[0-7]
291      &movq      ($A,&QWP(0,"esi"));
292      &movq      ("mm1",&QWP(8,"esi"));
293      &movq      ("mm2",&QWP(16,"esi"));
294      &movq      ("mm3",&QWP(24,"esi"));
295      &movq      ($E,&QWP(32,"esi"));
296      &movq      ("mm5",&QWP(40,"esi"));
297      &movq      ("mm6",&QWP(48,"esi"));
298      &movq      ("mm7",&QWP(56,"esi"));
299      &sub      ("esp",8*10);

301 &set_label("loop_sse2",16);
302      # &movq      ($Asse2,$A);
303      &movq      ($Bsse2,"mm1");
304      &movq      ($Csse2,"mm2");
305      &movq      ($Dsse2,"mm3");
306      # &movq      ($Esse2,$E);
307      &movq      ($Fsse2,"mm5");
308      &movq      ($Gsse2,"mm6");
309      &movq      ($Hsse2,"mm7");

311      &mov      ("ecx",&DWP(0,"edi"));
312      &mov      ("edx",&DWP(4,"edi"));
313      &add      ("edi",8);
314      &bswap      ("ecx");
315      &bswap      ("edx");
316      &mov      (&DWP(8*9+4,"esp"),"ecx");
317      &mov      (&DWP(8*9+0,"esp"),"edx");

319 &set_label("00_14_sse2",16);
320      &mov      ("eax",&DWP(0,"edi"));
321      &mov      ("ebx",&DWP(4,"edi"));
322      &add      ("edi",8);
323      &bswap      ("eax");
324      &bswap      ("ebx");
325      &mov      (&DWP(8*8+4,"esp"),"eax");

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```

326      &mov      (&DWP(8*8+0,"esp"),"ebx");

328      &BODY_00_15_sse2();

330      &cmp      (&LB("edx"),0x35);
331      &jne      (&label("00_14_sse2"));

333      &BODY_00_15_sse2(1);

335 &set_label("16_79_sse2",16);
336      #&movq      ("mm2",&QWP(8*(9+16-1),"esp"));      #prefetched in BODY_00_15
337      #&movq      ("mm6",&QWP(8*(9+16-14),"esp"));
338      &movq      ("mm1","mm2");

340      &psrlq      ("mm2",1);
341      &movq      ("mm7","mm6");
342      &psrlq      ("mm6",6);
343      &movq      ("mm3","mm2");

345      &psrlq      ("mm2",7-1);
346      &movq      ("mm5","mm6");
347      &psrlq      ("mm6",19-6);
348      &pxor      ("mm3","mm2");

350      &psrlq      ("mm2",8-7);
351      &pxor      ("mm5","mm6");
352      &psrlq      ("mm6",61-19);
353      &pxor      ("mm3","mm2");

355      &movq      ("mm2",&QWP(8*(9+16),"esp"));

357      &psllq      ("mm1",56);
358      &pxor      ("mm5","mm6");
359      &psllq      ("mm7",3);
360      &pxor      ("mm3","mm1");

362      &paddq      ("mm2",&QWP(8*(9+16-9),"esp"));

364      &psllq      ("mm1",63-56);
365      &pxor      ("mm5","mm7");
366      &psllq      ("mm7",45-3);
367      &pxor      ("mm3","mm1");
368      &pxor      ("mm5","mm7");

370      &paddq      ("mm3","mm5");
371      &paddq      ("mm3","mm2");
372      &movq      (&QWP(8*9,"esp"),"mm3");

374      &BODY_00_15_sse2(1);

376      &cmp      (&LB("edx"),0x17);
377      &jne      (&label("16_79_sse2"));

379      # &movq      ($A,$Asse2);
380      &movq      ("mm1",$Bsse2);
381      &movq      ("mm2",$Csse2);
382      &movq      ("mm3",$Dsse2);
383      # &movq      ($E,$Esse2);
384      &movq      ("mm5",$Fsse2);
385      &movq      ("mm6",$Gsse2);
386      &movq      ("mm7",$Hsse2);

388      &paddq      ($A,&QWP(0,"esi"));
389      &paddq      ("mm1",&QWP(8,"esi"));
390      &paddq      ("mm2",&QWP(16,"esi"));
391      &paddq      ("mm3",&QWP(24,"esi"));

```

```

392    &paddq    ($E, &QWP(32, "esi"));
393    &paddq    ("mm5", &QWP(40, "esi"));
394    &paddq    ("mm6", &QWP(48, "esi"));
395    &paddq    ("mm7", &QWP(56, "esi"));

397    &movq    (&QWP(0, "esi"), $A);
398    &movq    (&QWP(8, "esi"), "mm1");
399    &movq    (&QWP(16, "esi"), "mm2");
400    &movq    (&QWP(24, "esi"), "mm3");
401    &movq    (&QWP(32, "esi"), $E);
402    &movq    (&QWP(40, "esi"), "mm5");
403    &movq    (&QWP(48, "esi"), "mm6");
404    &movq    (&QWP(56, "esi"), "mm7");

406    &add     ("esp", 8*80);          # destroy frame
407    &sub     ($K512, 8*80);          # rewind K

409    &cmp     ("edi", &DWP(8*10+8, "esp")); # are we done yet?
410    &jb      (&label("loop_sse2"));

412    &emms    ();
413    &mov     ("esp", &DWP(8*10+12, "esp")); # restore sp
414    &function_end_A();
415 }
416 &set_label("loop_x86", 16);
417 # copy input block to stack reversing byte and qword order
418 for ($i=0; $i<8; $i++) {
419     &mov     ("eax", &DWP($i*16+0, "edi"));
420     &mov     ("ebx", &DWP($i*16+4, "edi"));
421     &mov     ("ecx", &DWP($i*16+8, "edi"));
422     &mov     ("edx", &DWP($i*16+12, "edi"));
423     &bswap   ("eax");
424     &bswap   ("ebx");
425     &bswap   ("ecx");
426     &bswap   ("edx");
427     &push    ("eax");
428     &push    ("ebx");
429     &push    ("ecx");
430     &push    ("edx");
431 }
432 &add     ("edi", 128);
433 &sub     ("esp", 9*8);
434 &mov     (&DWP(8*(9+16)+4, "esp"), "edi");

436 # copy ctx->h[0-7] to A,B,C,D,E,F,G,H on stack
437 &lea     ("edi", &DWP(8, "esp"));
438 &mov     ("ecx", 16);
439 &data_word(0xA5F3F689); # rep movsd

441 &set_label("00_15_x86", 16);
442 &BODY_00_15_x86();

444    &cmp     (&LB("edx"), 0x94);
445    &jne     (&label("00_15_x86"));

447 &set_label("16_79_x86", 16);
448 #define sigma0(x)    (ROTR((x), 1) ^ ROTR((x), 8) ^ ((x)>>7))
449 #   LO              lo>>1^hi<<31 ^ lo>>8^hi<<24 ^ lo>>7^hi<<25
450 #   HI              hi>>1^lo<<31 ^ hi>>8^lo<<24 ^ hi>>7
451 &mov     ("ecx", &DWP(8*(9+15+16-1)+0, "esp"));
452 &mov     ("edx", &DWP(8*(9+15+16-1)+4, "esp"));
453 &mov     ("esi", "ecx");

455    &shr     ("ecx", 1); # lo>>1
456    &mov     ("edi", "edx");
457    &shr     ("edx", 1); # hi>>1

```

```

458    &mov     ("eax", "ecx");
459    &shl     ("esi", 24); # lo<<24
460    &mov     ("ebx", "edx");
461    &shl     ("edi", 24); # hi<<24
462    &xor     ("ebx", "esi");

464    &shr     ("ecx", 7-1); # lo>>7
465    &xor     ("eax", "edi");
466    &shr     ("edx", 7-1); # hi>>7
467    &xor     ("eax", "ecx");
468    &shl     ("esi", 31-24); # lo<<31
469    &xor     ("ebx", "edx");
470    &shl     ("edi", 25-24); # hi<<25
471    &xor     ("ebx", "esi");

473    &shr     ("ecx", 8-7); # lo>>8
474    &xor     ("eax", "edi");
475    &shr     ("edx", 8-7); # hi>>8
476    &xor     ("eax", "ecx");
477    &shl     ("edi", 31-25); # hi<<31
478    &xor     ("ebx", "edx");
479    &xor     ("eax", "edi"); # T1 = sigma0(X[-15])

481    &mov     (&DWP(0, "esp"), "eax");
482    &mov     (&DWP(4, "esp"), "ebx"); # put T1 away

484    #define sigma1(x)    (ROTR((x), 19) ^ ROTR((x), 61) ^ ((x)>>6))
485    #   LO              lo>>19^hi<<13 ^ hi>>29^lo<<3 ^ lo>>6^hi<<26
486    #   HI              hi>>19^lo<<13 ^ lo>>29^hi<<3 ^ hi>>6
487    &mov     ("ecx", &DWP(8*(9+15+16-14)+0, "esp"));
488    &mov     ("edx", &DWP(8*(9+15+16-14)+4, "esp"));
489    &mov     ("esi", "ecx");

491    &shr     ("ecx", 6); # lo>>6
492    &mov     ("edi", "edx");
493    &shr     ("edx", 6); # hi>>6
494    &mov     ("eax", "ecx");
495    &shl     ("esi", 3); # lo<<3
496    &mov     ("ebx", "edx");
497    &shl     ("edi", 3); # hi<<3
498    &xor     ("eax", "esi");

500    &shr     ("ecx", 19-6); # lo>>19
501    &xor     ("ebx", "edi");
502    &shr     ("edx", 19-6); # hi>>19
503    &xor     ("eax", "ecx");
504    &shl     ("esi", 13-3); # lo<<13
505    &xor     ("ebx", "edx");
506    &shl     ("edi", 13-3); # hi<<13
507    &xor     ("ebx", "esi");

509    &shr     ("ecx", 29-19); # lo>>29
510    &xor     ("eax", "edi");
511    &shr     ("edx", 29-19); # hi>>29
512    &xor     ("ebx", "ecx");
513    &shl     ("edi", 26-13); # hi<<26
514    &xor     ("eax", "edx");
515    &xor     ("eax", "edi"); # sigma1(X[-2])

517    &mov     ("ecx", &DWP(8*(9+15+16)+0, "esp"));
518    &mov     ("edx", &DWP(8*(9+15+16)+4, "esp"));
519    &add     ("eax", &DWP(0, "esp"));
520    &adc     ("ebx", &DWP(4, "esp")); # T1 = sigma1(X[-2])+T1
521    &mov     ("esi", &DWP(8*(9+15+16-9)+0, "esp"));
522    &mov     ("edi", &DWP(8*(9+15+16-9)+4, "esp"));
523    &add     ("eax", "ecx");

```

```

524      &adc      ("ebx", "edx");          # T1 += X[-16]
525      &add      ("eax", "esi");
526      &adc      ("ebx", "edi");          # T1 += X[-7]
527      &mov      (&DWP(8*(9+15)+0, "esp"), "eax");
528      &mov      (&DWP(8*(9+15)+4, "esp"), "ebx"); # save X[0]

530      &BODY_00_15_x86();

532      &cmp      (&LB("edx"), 0x17);
533      &jne      (&label("16_79_x86"));

535      &mov      ("esi", &DWP(8*(9+16+80)+0, "esp")); # ctx
536      &mov      ("edi", &DWP(8*(9+16+80)+4, "esp")); # inp
537      for($i=0; $i<4; $i++) {
538          &mov      ("eax", &DWP($i*16+0, "esi"));
539          &mov      ("ebx", &DWP($i*16+4, "esi"));
540          &mov      ("ecx", &DWP($i*16+8, "esi"));
541          &mov      ("edx", &DWP($i*16+12, "esi"));
542          &add      ("eax", &DWP(8+($i*16)+0, "esp"));
543          &adc      ("ebx", &DWP(8+($i*16)+4, "esp"));
544          &mov      (&DWP($i*16+0, "esi"), "eax");
545          &mov      (&DWP($i*16+4, "esi"), "ebx");
546          &add      ("ecx", &DWP(8+($i*16)+8, "esp"));
547          &adc      ("edx", &DWP(8+($i*16)+12, "esp"));
548          &mov      (&DWP($i*16+8, "esi"), "ecx");
549          &mov      (&DWP($i*16+12, "esi"), "edx");
550      }
551      &add      ("esp", 8*(9+16+80));      # destroy frame
552      &sub      ($K512, 8*80);            # rewind K

554      &cmp      ("edi", &DWP(8, "esp"));   # are we done yet?
555      &jb       (&label("loop_x86"));

557      &mov      ("esp", &DWP(12, "esp"));  # restore sp
558      &function_end_A();

560      &set_label("K512", 64); # Yes! I keep it in the code segment!
561      &data_word(0xd728ae22, 0x428a2f98); # u64
562      &data_word(0x23ef65cd, 0x71374491); # u64
563      &data_word(0xec4d3b2f, 0xb5c0fbcf); # u64
564      &data_word(0x8189dbbc, 0xe9b5dba5); # u64
565      &data_word(0xf348b538, 0x3956c25b); # u64
566      &data_word(0xb605d019, 0x59f111f1); # u64
567      &data_word(0xaf194f9b, 0x923f82a4); # u64
568      &data_word(0xda6d8118, 0xab1c5ed5); # u64
569      &data_word(0xa3030242, 0xd807aa98); # u64
570      &data_word(0x45706fbc, 0x12835b01); # u64
571      &data_word(0x4eee4b28c, 0x243185be); # u64
572      &data_word(0xd5fff4e2, 0x550c7dc3); # u64
573      &data_word(0xf27b896f, 0x72be5d74); # u64
574      &data_word(0x3b1696b1, 0x80deb1fe); # u64
575      &data_word(0x25c71235, 0x9bdc06a7); # u64
576      &data_word(0xcf692694, 0xc19bf174); # u64
577      &data_word(0x9ef14ad2, 0xe49b69c1); # u64
578      &data_word(0x384f25e3, 0xefbe4786); # u64
579      &data_word(0x8b8cd5b5, 0x0fc19dc6); # u64
580      &data_word(0x77ac9c65, 0x240ca1cc); # u64
581      &data_word(0x592b0275, 0x2de92c6f); # u64
582      &data_word(0x6ea6e483, 0x4a7484aa); # u64
583      &data_word(0xbd41fbd4, 0x5cb0a9dc); # u64
584      &data_word(0x831153b5, 0x76f988da); # u64
585      &data_word(0xee66dfab, 0x983e5152); # u64
586      &data_word(0x2db43210, 0xa831c66d); # u64
587      &data_word(0x98fb213f, 0xb00327c8); # u64
588      &data_word(0xbeef0ee4, 0xbf597fc7); # u64
589      &data_word(0x3da88fc2, 0xc6e00bf3); # u64

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```

590      &data_word(0x930aa725, 0xd5a79147); # u64
591      &data_word(0xe003826f, 0x06ca6351); # u64
592      &data_word(0x0a0e6e70, 0x14292967); # u64
593      &data_word(0x46d22ffc, 0x27b70a85); # u64
594      &data_word(0x5c26c926, 0x2e1b2138); # u64
595      &data_word(0x5ac42aed, 0x4d2c6dfc); # u64
596      &data_word(0x9d95b3df, 0x53380d13); # u64
597      &data_word(0x8baf63de, 0x650a7354); # u64
598      &data_word(0x3c77b2a8, 0x766a0abb); # u64
599      &data_word(0x47edae66, 0x81c2c92e); # u64
600      &data_word(0x1482353b, 0x92722c85); # u64
601      &data_word(0x4cf10364, 0xa2bfe8a1); # u64
602      &data_word(0xabc423001, 0xa81a664b); # u64
603      &data_word(0xd0f89791, 0xc24b8b70); # u64
604      &data_word(0x0654be30, 0xc76c51a3); # u64
605      &data_word(0xd6ef5218, 0xd192e819); # u64
606      &data_word(0x5565a910, 0xd6990624); # u64
607      &data_word(0x5771202a, 0xf40e3585); # u64
608      &data_word(0x32b5d1b8, 0x106aa070); # u64
609      &data_word(0xb8d2d0c8, 0x19a4c116); # u64
610      &data_word(0x5141ab53, 0x1e376c08); # u64
611      &data_word(0xdf8eeb99, 0x2748774c); # u64
612      &data_word(0xe19b48a8, 0x34b0bcb5); # u64
613      &data_word(0xc5c95a63, 0x391c0cb3); # u64
614      &data_word(0xe3418acb, 0x4ed8aa4a); # u64
615      &data_word(0x7763e373, 0x5b9cca4f); # u64
616      &data_word(0xd6b2b8a3, 0x682e6fff3); # u64
617      &data_word(0x5defb2fc, 0x748f82ee); # u64
618      &data_word(0x43172f60, 0x78a5636f); # u64
619      &data_word(0xa1f0ab72, 0x84c87814); # u64
620      &data_word(0x1a6439ec, 0x8cc70208); # u64
621      &data_word(0x23631e28, 0x90bafffa); # u64
622      &data_word(0xde82bde9, 0xa4506ceb); # u64
623      &data_word(0xb2c67915, 0xbef9a3f7); # u64
624      &data_word(0xe372532b, 0xc67178f2); # u64
625      &data_word(0xea26619c, 0xca273ece); # u64
626      &data_word(0x21c0c207, 0xd186b8c7); # u64
627      &data_word(0xcde0eb1e, 0xead7dd6); # u64
628      &data_word(0xee6ed178, 0xf57d4ff7); # u64
629      &data_word(0x72176fba, 0x06f067aa); # u64
630      &data_word(0xa2c898a6, 0xa637dc5); # u64
631      &data_word(0xbef90dae, 0x113f9804); # u64
632      &data_word(0x131c471b, 0x1b710b35); # u64
633      &data_word(0x23047d84, 0x28db77f5); # u64
634      &data_word(0x40c72493, 0x32caab7b); # u64
635      &data_word(0x15c9bebc, 0x3c9ebe0a); # u64
636      &data_word(0x9c100d4c, 0x431d67c4); # u64
637      &data_word(0xcb3e42b6, 0x4cc5d4be); # u64
638      &data_word(0xfc657e2a, 0x597f299c); # u64
639      &data_word(0x3ad6faec, 0x5fcb6fab); # u64
640      &data_word(0x4a475817, 0x6c44198c); # u64
641      &function_end_B("sha512_block_data_order");
642      &asciz("SHA512 block transform for x86, CRYPTOGRAMS by <appro@openssl.org>");

644      &asm_finish();

```

new/usr/src/lib/openssl/libsunw_crypto/pl/sha512-x86_64.pl

1

```
*****
11902 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/sha512-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@fy.chalmers.se> for the OpenSSL
5 # project. Rights for redistribution and usage in source and binary
6 # forms are granted according to the OpenSSL license.
7 # =====
8 #
9 # sha256/512_block procedure for x86_64.
10 #
11 # 40% improvement over compiler-generated code on Opteron. On EM64T
12 # sha256 was observed to run >80% faster and sha512 - >40%. No magical
13 # tricks, just straight implementation... I really wonder why gcc
14 # [being armed with inline assembler] fails to generate as fast code.
15 # The only thing which is cool about this module is that it's very
16 # same instruction sequence used for both SHA-256 and SHA-512. In
17 # former case the instructions operate on 32-bit operands, while in
18 # latter - on 64-bit ones. All I had to do is to get one flavor right,
19 # the other one passed the test right away:-)
20 #
21 # sha256_block runs in ~1005 cycles on Opteron, which gives you
22 # asymptotic performance of 64*1000/1005=63.7MBps times CPU clock
23 # frequency in GHz. sha512_block runs in ~1275 cycles, which results
24 # in 128*1000/1275=100MBps per GHz. Is there room for improvement?
25 # Well, if you compare it to IA-64 implementation, which maintains
26 # X[16] in register bank[!], tends to 4 instructions per CPU clock
27 # cycle and runs in 1003 cycles, 1275 is very good result for 3-way
28 # issue Opteron pipeline and X[16] maintained in memory. So that *if*
29 # there is a way to improve it, *then* the only way would be to try to
30 # offload X[16] updates to SSE unit, but that would require "deeper"
31 # loop unroll, which in turn would naturally cause size blow-up, not
32 # to mention increased complexity! And once again, only *if* it's
33 # actually possible to noticeably improve overall ILP, instruction
34 # level parallelism, on a given CPU implementation in this case.
35 #
36 # Special note on Intel EM64T. While Opteron CPU exhibits perfect
37 # performance ratio of 1.5 between 64- and 32-bit flavors [see above],
38 # [currently available] EM64T CPUs apparently are far from it. On the
39 # contrary, 64-bit version, sha512_block, is ~30% *slower* than 32-bit
40 # sha256_block:-( This is presumably because 64-bit shifts/rotates
41 # apparently are not atomic instructions, but implemented in microcode.

43 $flavour = shift;
44 $output = shift;
45 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

47 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

49 $0 =~ m/(.*[\\\/\s])[^\\\/\s]+$/; $dir=$1;
50 ( $xlate="{dir}x86_64-xlate.pl" and -f $xlate ) or
51 ( $xlate="{dir}../perlasm/x86_64-xlate.pl" and -f $xlate ) or
52 die "can't locate x86_64-xlate.pl";

54 open OUT,"| \"$^X\" $xlate $flavour $output";
55 *STDOUT=*OUT;

57 if ($output =~ /\.512/) {
58     $func="sha512_block_data_order";
59     $TABLE="K512";
60     $SZ=8;
61     @ROT=($A,$B,$C,$D,$E,$F,$G,$H)=("%rax", "%rbx", "%rcx", "%rdx",
```

new/usr/src/lib/openssl/libsunw_crypto/pl/sha512-x86_64.pl

2

```
62     "%r8", "%r9", "%r10", "%r11");
63     ($T1,$A0,$A1,$A2)=("%r12", "%r13", "%r14", "%r15");
64     @Sigma0=(28,34,39);
65     @Sigma1=(14,18,41);
66     @sigma0=(1, 8, 7);
67     @sigma1=(19,61, 6);
68     $rounds=80;
69 } else {
70     $func="sha256_block_data_order";
71     $TABLE="K256";
72     $SZ=4;
73     @ROT=($A,$B,$C,$D,$E,$F,$G,$H)=("%eax", "%ebx", "%ecx", "%edx",
74     "%r8d", "%r9d", "%r10d", "%r11d");
75     ($T1,$A0,$A1,$A2)=("%r12d", "%r13d", "%r14d", "%r15d");
76     @Sigma0=( 2,13,22);
77     @Sigma1=( 6,11,25);
78     @sigma0=( 7,18, 3);
79     @sigma1=(17,19,10);
80     $rounds=64;
81 }

83 $ctx="%rdi"; # 1st arg
84 $round="%rdi"; # zaps $ctx
85 $inp="%rsi"; # 2nd arg
86 $tbl="%rbp";

88 $_ctx="16*$SZ+0*8(%rsp)";
89 $_inp="16*$SZ+1*8(%rsp)";
90 $_end="16*$SZ+2*8(%rsp)";
91 $_rsp="16*$SZ+3*8(%rsp)";
92 $framesz="16*$SZ+4*8";

95 sub ROUND_00_15()
96 { my ($i,$a,$b,$c,$d,$e,$f,$g,$h) = @_ ;

98 $code=<<<
99     ror    \$$Sigma1[2]-$Sigma1[1]', $a0
100     mov    $f,$a2
101     mov    $T1,'$SZ*($i&0xf)'(%rsp)

103     ror    \$$Sigma0[2]-$Sigma0[1]', $a1
104     xor    $e,$a0
105     xor    $g,$a2 # f^g

107     ror    \$$Sigma1[1]-$Sigma1[0]', $a0
108     add    $h,$T1 # T1+=h
109     xor    $a,$a1

111     add    ($tbl,$round,$SZ),$T1 # T1+=K[round]
112     and    $e,$a2 # (f^g)&e
113     mov    $b,$h

115     ror    \$$Sigma0[1]-$Sigma0[0]', $a1
116     xor    $e,$a0
117     xor    $g,$a2 # Ch(e,f,g)=((f^g)&e)^g

119     xor    $c,$h # b^c
120     xor    $a,$a1
121     add    $a2,$T1 # T1+=Ch(e,f,g)
122     mov    $b,$a2

124     ror    \$$Sigma1[0],$a0 # Sigma1(e)
125     and    $a,$h # h=(b^c)&a
126     and    $c,$a2 # b&c
```

```

128     ror     \$$sigma0[0], $a1      # Sigma0(a)
129     add     $a0, $T1                # T1+=Sigma1(e)
130     add     $a2, $h                  # h+=b&c (completes +=Maj(a,b,c))

132     add     $T1, $d                 # d+=T1
133     add     $T1, $h                 # h+=T1
134     lea     1($round), $round       # round++
135     add     $a1, $h                 # h+=Sigma0(a)

137 ____
138 }

140 sub ROUND_16_XX()
141 { my ($i, $a, $b, $c, $d, $e, $f, $g, $h) = @_ ;

143 $code.=<<____;
144     mov     '$SZ*($i+1)&0xf'(%rsp), $a0
145     mov     '$SZ*($i+14)&0xf'(%rsp), $a1
146     mov     $a0, $T1
147     mov     $a1, $a2

149     ror     \$$sigma0[1]-$sigma0[0]', $T1
150     xor     $a0, $T1
151     shr     \$$sigma0[2], $a0

153     ror     \$$sigma0[0], $T1
154     xor     $T1, $a0                # sigma0(X[(i+1)&0xf])
155     mov     '$SZ*($i+9)&0xf'(%rsp), $T1

157     ror     \$$sigma1[1]-$sigma1[0]', $a2
158     xor     $a1, $a2
159     shr     \$$sigma1[2], $a1

161     ror     \$$sigma1[0], $a2
162     add     $a0, $T1
163     xor     $a2, $a1                # sigma1(X[(i+14)&0xf])

165     add     '$SZ*($i&0xf)'(%rsp), $T1
166     mov     $e, $a0
167     add     $a1, $T1
168     mov     $a, $a1

169 ____
170     &ROUND_00_15(@_);
171 }

173 $code.=<<____;
174 .text

176 .globl $func
177 .type $func, @function, 4
178 .align 16
179 $func:
180     push    %rbx
181     push    %rbp
182     push    %r12
183     push    %r13
184     push    %r14
185     push    %r15
186     mov     %rsp, %r11              # copy %rsp
187     shl     \4, %rdx                # num*16
188     sub     \$$framesz, %rsp
189     lea     ($inp, %rdx, $SZ), %rdx # inp+num*16*$SZ
190     and     \-64, %rsp              # align stack frame
191     mov     $ctx, $ctx              # save ctx, 1st arg
192     mov     $inp, $inp              # save inp, 2nd arg
193     mov     %rdx, $end              # save end pointer, "3rd" arg

```

```

194     mov     %r11, $_rsp             # save copy of %rsp
195 .Lprologue:

197     lea     $TABLE(%rip), $tbl

199     mov     $SZ*0($ctx), $A
200     mov     $SZ*1($ctx), $B
201     mov     $SZ*2($ctx), $C
202     mov     $SZ*3($ctx), $D
203     mov     $SZ*4($ctx), $E
204     mov     $SZ*5($ctx), $F
205     mov     $SZ*6($ctx), $G
206     mov     $SZ*7($ctx), $H
207     jmp     .Lloop

209 .align 16
210 .Lloop:
211     xor     $round, $round

212 ____
213     for($i=0;$i<16;$i++) {
214         $code.="
215         $code.="                mov     $SZ*$i($inp), $T1\n";
216         $code.="                mov     @ROT[4], $a0\n";
217         $code.="                mov     @ROT[0], $a1\n";
218         $code.="                bswap   $T1\n";
219         &ROUND_00_15($i, @ROT);
220         unshift(@ROT, pop(@ROT));
221     }
222     $code.=<<____;
223     jmp     .Lrounds_16_xx
224 .Lrounds_16_xx:
225 ____
226     for(; $i<32;$i++) {
227         &ROUND_16_XX($i, @ROT);
228         unshift(@ROT, pop(@ROT));
229     }

231 $code.=<<____;
232     cmp     \$$rounds, $round
233     jb     .Lrounds_16_xx

235     mov     $ctx, $ctx
236     lea     16*$SZ($inp), $inp

238     add     $SZ*0($ctx), $A
239     add     $SZ*1($ctx), $B
240     add     $SZ*2($ctx), $C
241     add     $SZ*3($ctx), $D
242     add     $SZ*4($ctx), $E
243     add     $SZ*5($ctx), $F
244     add     $SZ*6($ctx), $G
245     add     $SZ*7($ctx), $H

247     cmp     $_end, $inp

249     mov     $A, $SZ*0($ctx)
250     mov     $B, $SZ*1($ctx)
251     mov     $C, $SZ*2($ctx)
252     mov     $D, $SZ*3($ctx)
253     mov     $E, $SZ*4($ctx)
254     mov     $F, $SZ*5($ctx)
255     mov     $G, $SZ*6($ctx)
256     mov     $H, $SZ*7($ctx)
257     jb     .Lloop

259     mov     $_rsp, %rsi

```

```

260      mov     (%rsi),%r15
261      mov     8(%rsi),%r14
262      mov     16(%rsi),%r13
263      mov     24(%rsi),%r12
264      mov     32(%rsi),%rbp
265      mov     40(%rsi),%rbx
266      lea     48(%rsi),%rsp
267 .Lepilogue:
268      ret
269 .size      $func,.-$func
270 ____

272 if ($SZ==4) {
273 $code.=<<____;
274 .align    64
275 .type     $TABLE,\@object
276 $TABLE:
277      .long   0x428a2f98,0x71374491,0xb5c0fbcf,0xe9b5dba5
278      .long   0x3956c25b,0x59f111f1,0x923f82a4,0xab1c5ed5
279      .long   0xd807aa98,0x12835b01,0x243185be,0x550c7dc3
280      .long   0x72be5d74,0x80deb1fe,0x9bdc06a7,0xc19bf174
281      .long   0xe49b69c1,0xefbe4786,0x0fc19dc6,0x240ca1cc
282      .long   0x2de92c6f,0x4a7484aa,0x5cb0a9dc,0x76f988da
283      .long   0x983e5152,0xa831c66d,0xb00327c8,0xbf597fc7
284      .long   0xc6e00bf3,0xd5a79147,0x06ca6351,0x14292967
285      .long   0x27b70a85,0x2e1b2138,0x4d2c6dfe,0x53380d13
286      .long   0x650a7354,0x766a0abb,0x81c2c92e,0x92722c85
287      .long   0xa2bfe8a1,0xa81a664b,0xc24b8b70,0xc76c51a3
288      .long   0xd192e819,0xd6990624,0xf40e3585,0x106aa070
289      .long   0x19a4c116,0x1e376c08,0x2748774c,0x34b0bcb5
290      .long   0x391c0cb3,0x4ed8aa4a,0x5b9cca4f,0x682e6ff3
291      .long   0x748f82ee,0x78a5636f,0x84c87814,0x8cc70208
292      .long   0x90befffa,0xa4506ceb,0xbef9a3f7,0xc67178f2
293
294 } else {
295 $code.=<<____;
296 .align    64
297 .type     $TABLE,\@object
298 $TABLE:
299      .quad   0x428a2f98d728ae22,0x7137449123ef65cd
300      .quad   0xb5c0fbcfec4d3b2f,0xe9b5dba58189dbbc
301      .quad   0x3956c25bf348b538,0x59f111f1b605d019
302      .quad   0x923f82a4af194f9b,0xab1c5ed5da6d8118
303      .quad   0xd807aa98a3030242,0x12835b0145706fbe
304      .quad   0x243185be4ee4b28c,0x550c7dc3d5ffbae2
305      .quad   0x72be5d74f27b896f,0x80deb1fe3b1696b1
306      .quad   0x9bdc06a725c71235,0xc19bf174cf692694
307      .quad   0xe49b69c19ef14ad2,0xefbe4786384f25e3
308      .quad   0x0fc19dc68b8cd5b5,0x240ca1cc77ac9c65
309      .quad   0x2de92c6f592b0275,0x4a7484aa6a6e483
310      .quad   0x5cb0a9dcdbd41fbd4,0x76f988da831153b5
311      .quad   0x983e5152ee66dfab,0xa831c66d2db43210
312      .quad   0xb00327c898fb213f,0xbf597fc7beef0ee4
313      .quad   0xc6e00bf33da88fc2,0xd5a79147930aa725
314      .quad   0x06ca6351e003826f,0x142929670a0e6e70
315      .quad   0x27b70a8546d22fffc,0x2e1b21385c26c926
316      .quad   0x4d2c6dfe5ac42aed,0x53380d139d95b3df
317      .quad   0x650a73548baf63de,0x766a0abb3c77b2a8
318      .quad   0x81c2c92e47edaee6,0x92722c851482353b
319      .quad   0xa2bfe8a14cf10364,0xa81a664bb423001
320      .quad   0xc24b8b70d0f89791,0xc76c51a30654be30
321      .quad   0xd192e819d6eef5218,0xd69906245565a910
322      .quad   0xf40e35855771202a,0x106aa07032bbd1b8
323      .quad   0x19a4c116b8d2d0c8,0x1e376c085141ab53
324      .quad   0x2748774cdf8eeb99,0x34b0bcb5e19b48a8
325      .quad   0x391c0cb3c5c95a63,0x4ed8aa4ae3418acb

```

```

326      .quad   0x5b9cca4f7763e373,0x682e6ff3d6b2b8a3
327      .quad   0x748f82ee5defb2fc,0x78a5636f43172f60
328      .quad   0x84c87814a1f0ab72,0x8cc702081a6439ec
329      .quad   0x90befffa23631e28,0xa4506cebde82bde9
330      .quad   0xbef9a3f7b2c67915,0xc67178f2e372532b
331      .quad   0xca273eceeaa26619c,0xd186b8c721c0c207
332      .quad   0xeadad7dd6cde0eb1e,0xf57d4f7fee6ed178
333      .quad   0x06f067aa72176fba,0x0a637dc5a2c898a6
334      .quad   0x113f9804bef90dae,0x1b710b35131c471b
335      .quad   0x28db77f523047d84,0x32caab7b40c72493
336      .quad   0x3c9ebe0a15c9bebc,0x431d67c49c100d4c
337      .quad   0x4cc5d4becb3e42b6,0x597f299cfc657e2a
338      .quad   0x5fcb6fab3ad6faec,0x6c44198c4a475817
339 ____
340 }

342 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
343 #                                CONTEXT *context,DISPATCHER_CONTEXT *disp)
344 if ($win64) {
345 $rec="%rcx";
346 $frame="%rdx";
347 $context="%r8";
348 $disp="%r9";

350 $code.=<<____;
351 .extern __imp_RtlVirtualUnwind
352 .type    se_handler,\@abi-omnipotent
353 .align   16
354 se_handler:
355      push    %rsi
356      push    %rdi
357      push    %rbx
358      push    %rbp
359      push    %r12
360      push    %r13
361      push    %r14
362      push    %r15
363      pushfq  %rsp
364      sub     \($64,%rsp

366      mov     120($context),%rax    # pull context->Rax
367      mov     248($context),%rbx    # pull context->Rip

369      lea     .Lprologue(%rip),%r10
370      cmp     %r10,%rbx
371      jb      .Lin_prologue        # context->Rip<.Lprologue

373      mov     152($context),%rax    # pull context->Rsp

375      lea     .Lepilogue(%rip),%r10
376      cmp     %r10,%rbx
377      jae     .Lin_prologue        # context->Rip>=.Lepilogue

379      mov     16*$SZ+3*8(%rax),%rax # pull $_rsp
380      lea     48(%rax),%rax

382      mov     -8(%rax),%rbx
383      mov     -16(%rax),%rbp
384      mov     -24(%rax),%r12
385      mov     -32(%rax),%r13
386      mov     -40(%rax),%r14
387      mov     -48(%rax),%r15
388      mov     %rbx,144($context)    # restore context->Rbx
389      mov     %rbp,160($context)    # restore context->Rbp
390      mov     %r12,216($context)    # restore context->R12
391      mov     %r13,224($context)    # restore context->R13

```

```

392      mov     %r14,232($context)      # restore context->R14
393      mov     %r15,240($context)      # restore context->R15

395 .Lin_prologue:
396      mov     8(%rax),%rdi
397      mov     16(%rax),%rsi
398      mov     %rax,152($context)      # restore context->Rsp
399      mov     %rsi,168($context)      # restore context->Rsi
400      mov     %rdi,176($context)      # restore context->Rdi

402      mov     40($disp),%rdi          # disp->ContextRecord
403      mov     $context,%rsi           # context
404      mov     \%$154,%ecx             # sizeof(CONTEXT)
405      .long    0xa548f3fc              # cld; rep movsq

407      mov     $disp,%rsi
408      xor     %rcx,%rcx                # arg1, UNW_FLAG_NHANDLER
409      mov     8(%rsi),%rdx             # arg2, disp->ImageBase
410      mov     0(%rsi),%r8              # arg3, disp->ControlPc
411      mov     16(%rsi),%r9             # arg4, disp->FunctionEntry
412      mov     40(%rsi),%r10            # disp->ContextRecord
413      lea     56(%rsi),%r11            # &disp->HandlerData
414      lea     24(%rsi),%r12            # &disp->EstablisherFrame
415      mov     %r10,32(%rsp)             # arg5
416      mov     %r11,40(%rsp)            # arg6
417      mov     %r12,48(%rsp)            # arg7
418      mov     %rcx,56(%rsp)            # arg8, (NULL)
419      call    *__imp_RtlVirtualUnwind(%rip)

421      mov     \%$1,%eax                # ExceptionContinueSearch
422      add     \%$64,%rsp
423      popfq
424      pop     %r15
425      pop     %r14
426      pop     %r13
427      pop     %r12
428      pop     %rbp
429      pop     %rbx
430      pop     %rdi
431      pop     %rsi
432      ret
433 .size      se_handler,.-se_handler

435 .section    .pdata
436 .align      4
437      .rva     .LSEH_begin_$func
438      .rva     .LSEH_end_$func
439      .rva     .LSEH_info_$func

441 .section    .xdata
442 .align      8
443 .LSEH_info_$func:
444      .byte     9,0,0,0
445      .rva     se_handler
446
447 }

449 $code =~ s/\'([^\']*)\'/eval $1/gem;
450 print $code;
451 close STDOUT;

```


new/usr/src/lib/openssl/libsunw_crypto/pl/vpaes-x86.pl

1

```
*****
27667 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/vpaes-x86.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 #####
4 ## Constant-time SSSE3 AES core implementation.
5 ## version 0.1
6 ##
7 ## By Mike Hamburg (Stanford University), 2009
8 ## Public domain.
9 ##
10 ## For details see http://shiftright.org/papers/vector_aes/ and
11 ## http://crypto.stanford.edu/vpaes/.

13 #####
14 # September 2011.
15 #
16 # Port vpaes-x86_64.pl as 32-bit "almost" drop-in replacement for
17 # aes-586.pl. "Almost" refers to the fact that AES_cbc_encrypt
18 # doesn't handle partial vectors (doesn't have to if called from
19 # EVP only). "Drop-in" implies that this module doesn't share key
20 # schedule structure with the original nor does it make assumption
21 # about its alignment...
22 #
23 # Performance summary. aes-586.pl column lists large-block CBC
24 # encrypt/decrypt/with-hyper-threading-off(*) results in cycles per
25 # byte processed with 128-bit key, and vpaes-x86.pl column - [also
26 # large-block CBC] encrypt/decrypt.
27 #
28 #               aes-586.pl               vpaes-x86.pl
29 #
30 # Core 2(**)    29.1/42.3/18.3            22.0/25.6(**)
31 # Nehalem       27.9/40.4/18.1            10.3/12.0
32 # Atom          102./119./60.1            64.5/85.3(**)
33 #
34 # (*) "Hyper-threading" in the context refers rather to cache shared
35 # among multiple cores, than to specifically Intel HTT. As vast
36 # majority of contemporary cores share cache, slower code path
37 # is common place. In other words "with-hyper-threading-off"
38 # results are presented mostly for reference purposes.
39 #
40 # (**) "Core 2" refers to initial 65nm design, a.k.a. Conroe.
41 #
42 # (***) Less impressive improvement on Core 2 and Atom is due to slow
43 # pshufb, yet it's respectable +32%/65% improvement on Core 2
44 # and +58%/40% on Atom (as implied, over "hyper-threading-safe"
45 # code path).
46 #
47 #
48 #               <appro@openssl.org>

49 $0 =~ m/(.*[\\\/])[^\\\/]+$/; $dir=$1;
50 push(@INC, "${dir}", "${dir}../../perlasm");
51 require "x86asm.pl";

53 &asm_init($ARGV[0], "vpaes-x86.pl", $x86only = $ARGV[$#ARGV] eq "386");

55 $PREFIX="vpaes";

57 my ($round, $base, $magic, $key, $const, $inp, $out)=
58 ("eax", "ebx", "ecx", "edx", "ebp", "esi", "edi");

60 &static_label("_vpaes_consts");
61 &static_label("_vpaes_schedule_low_round");
```

new/usr/src/lib/openssl/libsunw_crypto/pl/vpaes-x86.pl

2

```
63 &set_label("_vpaes_consts", 64);
64 $k_inv=-0x30; # inv, inva
65 &data_word(0x0D080180, 0x0E05060F, 0x0A0B0C02, 0x04070309);
66 &data_word(0x0F0B0780, 0x01040A06, 0x02050809, 0x030D0E0C);

68 $k_s0F=-0x10; # s0F
69 &data_word(0x0F0F0F0F, 0x0F0F0F0F, 0x0F0F0F0F, 0x0F0F0F0F);

71 $k_ipt=0x00; # input transform (lo, hi)
72 &data_word(0x5A2A7000, 0xC2B2E898, 0x52227808, 0xCABAE090);
73 &data_word(0x317C4D00, 0x4C01307D, 0xB0FDC81, 0xCD80B1FC);

75 $k_sb1=0x20; # sb1u, sb1t
76 &data_word(0xCB503E00, 0xB19BE18F, 0x142AF544, 0xA5DF7A6E);
77 &data_word(0xFAE22300, 0x3618D415, 0x0D2ED9EF, 0x3BF7CC1);
78 $k_sb2=0x40; # sb2u, sb2t
79 &data_word(0x0B712400, 0xE27A93C6, 0xBC982FCD, 0x5EB7E955);
80 &data_word(0x0AE12900, 0x69EB8840, 0xAB82234A, 0xC2A163C8);
81 $k_sbo=0x60; # sbou, sbot
82 &data_word(0x6FBDC700, 0xD0D26D17, 0xC502A878, 0x15AABF7A);
83 &data_word(0x5FBB6A00, 0xCFE474A5, 0x412B35FA, 0x8E1E90D1);

85 $k_mc_forward=0x80; # mc_forward
86 &data_word(0x00030201, 0x04070605, 0x080B0A09, 0x0C0F0E0D);
87 &data_word(0x04070605, 0x080B0A09, 0x0C0F0E0D, 0x00030201);
88 &data_word(0x080B0A09, 0x0C0F0E0D, 0x00030201, 0x04070605);
89 &data_word(0x0C0F0E0D, 0x00030201, 0x04070605, 0x080B0A09);

91 $k_mc_backward=0xc0; # mc_backward
92 &data_word(0x02010003, 0x06050407, 0x0A09080B, 0x0E0D0C0F);
93 &data_word(0x0E0D0C0F, 0x02010003, 0x06050407, 0x0A09080B);
94 &data_word(0x0A09080B, 0x0E0D0C0F, 0x02010003, 0x06050407);
95 &data_word(0x06050407, 0x0A09080B, 0x0E0D0C0F, 0x02010003);

97 $k_sr=0x100; # sr
98 &data_word(0x03020100, 0x07060504, 0x0B0A0908, 0x0F0E0D0C);
99 &data_word(0x0F0A0500, 0x030E0904, 0x07020D08, 0x0B06010C);
100 &data_word(0x0B020900, 0x0F060D04, 0x030A0108, 0x070E050C);
101 &data_word(0x070A0D00, 0x0B0E0104, 0x0F020508, 0x0306090C);

103 $k_rcon=0x140; # rcon
104 &data_word(0xAF9DEEB6, 0x1F8391B9, 0x4D7C7D81, 0x702A9808);

106 $k_s63=0x150; # s63: all equal to 0x63 transformed
107 &data_word(0x5B5B5B5B, 0x5B5B5B5B, 0x5B5B5B5B, 0x5B5B5B5B);

109 $k_opt=0x160; # output transform
110 &data_word(0xD6B66000, 0xFF9F4929, 0xDEBE6808, 0xF7974121);
111 &data_word(0x50BCEC00, 0x01EDBD51, 0x805C0CE0, 0xE10D5DB1);

113 $k_deskew=0x180; # deskew tables: inverts the sbow's "skew"
114 &data_word(0x47A4E300, 0x07E4A340, 0x5DBEF91A, 0x1DFEB95A);
115 &data_word(0x83EA6900, 0x5F36B5DC, 0xF49D1E77, 0x2841C2AB);
116 ##
117 ## Decryption stuff
118 ## Key schedule constants
119 ##
120 $k_dksd=0x1a0; # decryption key schedule: invskew x*D
121 &data_word(0xA3E44700, 0xFEB91A5D, 0x5A1DBEF9, 0x0740E3A4);
122 &data_word(0xB5368300, 0x41C277F4, 0xAB289D1E, 0x5FDC69EA);
123 $k_dksb=0x1c0; # decryption key schedule: invskew x*B
124 &data_word(0x8550D500, 0x9A4FCA1F, 0x1CC94C99, 0x03D65386);
125 &data_word(0xB6FC4A00, 0x115BEDA7, 0x7E3482C8, 0xD993256F);
126 $k_dkse=0x1e0; # decryption key schedule: invskew x*E + 0x63
127 &data_word(0x1FC9D600, 0xD5031CCA, 0x994F5086, 0x53859A4C);
```

```

128      &data_word(0x4FDC7BE8,0xA2319605,0x20B31487,0xCD5EF96A);
129 $k_dks9=0x200;      # decryption key schedule: invskew x*9
130      &data_word(0x7ED9A700,0xB6116FC8,0x82255BFC,0x4AED9334);
131      &data_word(0x27143300,0x45765162,0xE9DAFDCE,0x8BB89FAC);

133 ##
134 ##   Decryption stuff
135 ##   Round function constants
136 ##
137 $k_dipt=0x220;      # decryption input transform
138      &data_word(0x0B545F00,0x0F505B04,0x114E451A,0x154A411E);
139      &data_word(0x60056500,0x86E383E6,0xF491F194,0x12771772);

141 $k_dsb9=0x240;      # decryption sbox output *9*u, *9*t
142      &data_word(0x9A86D600,0x851C0353,0x4F994CC9,0xCAD51F50);
143      &data_word(0xEC074900,0xC03B1789,0xB2FBA565,0x725E2C9E);
144 $k_dsbD=0x260;      # decryption sbox output *D*u, *D*t
145      &data_word(0xE6B1A200,0x7D57CCDF,0x882A4439,0xF56E9B13);
146      &data_word(0x24C6CB00,0x3CE2FAF7,0x15DEEFD3,0x2931180D);
147 $k_dsbB=0x280;      # decryption sbox output *B*u, *B*t
148      &data_word(0x96B44200,0xD0226492,0xB0F2D404,0x602646F6);
149      &data_word(0xCD596700,0xC19498A6,0x3255AA6B,0xF3FF0C3E);
150 $k_dsbE=0x2a0;      # decryption sbox output *E*u, *E*t
151      &data_word(0x26D4D000,0x46F29296,0x64B4F6B0,0x22426004);
152      &data_word(0xFFAAC100,0x0C55A6CD,0x98593E32,0x9467F36B);
153 $k_dsbO=0x2c0;      # decryption sbox final output
154      &data_word(0x7EF94000,0x1387EA53,0xD4943E2D,0xC7AA6DB9);
155      &data_word(0x93441D00,0x12D7560F,0xD8C58E9C,0xCA4B8159);
156 &asciz ("Vector Permutation AES for x86/SSSE3, Mike Hamburg (Stanford Universit
157 &align (64);

159 &function_begin_B("vpaes_preheat");
160      &add ($const,&DWP(0,"esp"));
161      &movdqa ("xmm7",&QWP($k_inv,$const));
162      &movdqa ("xmm6",&QWP($k_s0F,$const));
163      &ret ();
164 &function_end_B("vpaes_preheat");

166 ##
167 ##   _aes_encrypt_core
168 ##
169 ##   AES-encrypt %xmm0.
170 ##
171 ##   Inputs:
172 ##       %xmm0 = input
173 ##       %xmm6-%xmm7 as in vpaes_preheat
174 ##       (%edx) = scheduled keys
175 ##
176 ##   Output in %xmm0
177 ##   Clobbers %xmm1-%xmm5, %eax, %ebx, %ecx, %edx
178 ##
179 ##
180 &function_begin_B("vpaes_encrypt_core");
181      &mov ($magic,16);
182      &mov ($round,&DWP(240,$key));
183      &movdqa ("xmm1","xmm6");
184      &movdqa ("xmm2",&QWP($k_ipt,$const));
185      &pandn ("xmm1","xmm0");
186      &movdqu ("xmm5",&QWP(0,$key));
187      &psrld ("xmm1",4);
188      &pand ("xmm0","xmm6");
189      &pshufb ("xmm2","xmm0");
190      &movdqa ("xmm0",&QWP($k_ipt+16,$const));
191      &pshufb ("xmm0","xmm1");
192      &pxor ("xmm2","xmm5");
193      &pxor ("xmm0","xmm2");

```

```

194      &add ($key,16);
195      &lea ($base,&DWP($k_mc_backward,$const));
196      &jmp (&label("enc_entry"));

199 &set_label("enc_loop",16);
200      # middle of middle round
201      &movdqa ("xmm4",&QWP($k_sb1,$const)); # 4 : sb1u
202      &pshufb ("xmm4","xmm2"); # 4 = sb1u
203      &pxor ("xmm4","xmm5"); # 4 = sb1u + k
204      &movdqa ("xmm0",&QWP($k_sb1+16,$const)); # 0 : sb1t
205      &pshufb ("xmm0","xmm3"); # 0 = sb1t
206      &pxor ("xmm0","xmm4"); # 0 = A
207      &movdqa ("xmm5",&QWP($k_sb2,$const)); # 4 : sb2u
208      &pshufb ("xmm5","xmm2"); # 4 = sb2u
209      &movdqa ("xmm1",&QWP(-0x40,$base,$magic));# .Lk_mc_forward[]
210      &movdqa ("xmm2",&QWP($k_sb2+16,$const));# 2 : sb2t
211      &pshufb ("xmm2","xmm3"); # 2 = sb2t
212      &pxor ("xmm2","xmm5"); # 2 = 2A
213      &movdqa ("xmm4",&QWP(0,$base,$magic));# .Lk_mc_backward[]
214      &movdqa ("xmm3","xmm0"); # 3 = A
215      &pshufb ("xmm0","xmm1"); # 0 = B
216      &add ($key,16); # next key
217      &pxor ("xmm0","xmm2"); # 0 = 2A+B
218      &pshufb ("xmm3","xmm4"); # 3 = D
219      &add ($magic,16); # next mc
220      &pxor ("xmm3","xmm0"); # 3 = 2A+B+D
221      &pshufb ("xmm0","xmm1"); # 0 = 2B+C
222      &and ($magic,0x30); # ... mod 4
223      &pxor ("xmm0","xmm3"); # 0 = 2A+3B+C+D
224      &sub ($round,1); # nr--

226 &set_label("enc_entry");
227      # top of round
228      &movdqa ("xmm1","xmm6"); # 1 : i
229      &pandn ("xmm1","xmm0"); # 1 = i<4
230      &psrld ("xmm1",4); # 1 = i
231      &pand ("xmm0","xmm6"); # 0 = k
232      &movdqa ("xmm5",&QWP($k_inv+16,$const));# 2 : a/k
233      &pshufb ("xmm5","xmm0"); # 2 = a/k
234      &pxor ("xmm0","xmm1"); # 0 = j
235      &movdqa ("xmm3","xmm7"); # 3 : 1/i
236      &pshufb ("xmm3","xmm1"); # 3 = 1/i
237      &pxor ("xmm3","xmm5"); # 3 = iak = 1/i + a/k
238      &movdqa ("xmm4","xmm7"); # 4 : 1/j
239      &pshufb ("xmm4","xmm0"); # 4 = 1/j
240      &pxor ("xmm4","xmm5"); # 4 = jak = 1/j + a/k
241      &movdqa ("xmm2","xmm7"); # 2 : 1/ia
242      &pshufb ("xmm2","xmm3"); # 2 = 1/ia
243      &pxor ("xmm2","xmm0"); # 2 = io
244      &movdqa ("xmm3","xmm7"); # 3 : 1/jak
245      &movdqu ("xmm5",&QWP(0,$key));
246      &pshufb ("xmm3","xmm4"); # 3 = 1/jak
247      &pxor ("xmm3","xmm1"); # 3 = jo
248      &jnz (&label("enc_loop"));

250      # middle of last round
251      &movdqa ("xmm4",&QWP($k_sbo,$const)); # 3 : sbou .Lk_sbo
252      &movdqa ("xmm0",&QWP($k_sbo+16,$const));# 3 : sbot .Lk_sbo+16
253      &pshufb ("xmm4","xmm2"); # 4 = sbou
254      &pxor ("xmm4","xmm5"); # 4 = sb1u + k
255      &pshufb ("xmm0","xmm3"); # 0 = sb1t
256      &movdqa ("xmm1",&QWP(0x40,$base,$magic));# .Lk_sr[]
257      &pxor ("xmm0","xmm4"); # 0 = A
258      &pshufb ("xmm0","xmm1");
259      &ret ();

```

```

260 &function_end_B("_vpaes_encrypt_core");

262 ##
263 ## Decryption core
264 ##
265 ## Same API as encryption core.
266 ##
267 &function_begin_B("_vpaes_decrypt_core");
268     &mov ($round,&DWP(240,$key));
269     &lea ($base,&DWP($k_dsbd,$const));
270     &movdqa ("xmm1","xmm6");
271     &movdqa ("xmm2",&QWP($k_dipt-$k_dsbd,$base));
272     &pandn ("xmm1","xmm0");
273     &mov ($magic,$round);
274     &psrld ("xmm1",4);
275     &movdqu ("xmm5",&QWP(0,$key));
276     &shl ($magic,4);
277     &pand ("xmm0","xmm6");
278     &pshufb ("xmm2","xmm0");
279     &movdqa ("xmm0",&QWP($k_dipt-$k_dsbd+16,$base));
280     &xor ($magic,0x30);
281     &pshufb ("xmm0","xmm1");
282     &and ($magic,0x30);
283     &pxor ("xmm2","xmm5");
284     &movdqa ("xmm5",&QWP($k_mc_forward+48,$const));
285     &pxor ("xmm0","xmm2");
286     &add ($key,16);
287     &lea ($magic,&DWP($k_sr-$k_dsbd,$base,$magic));
288     &jmp (&label("dec_entry"));

290 &set_label("dec_loop",16);
291 ##
292 ## Inverse mix columns
293 ##
294     &movdqa ("xmm4",&QWP(-0x20,$base)); # 4 : sb9u
295     &pshufb ("xmm4","xmm2"); # 4 = sb9u
296     &pxor ("xmm4","xmm0");
297     &movdqa ("xmm0",&QWP(-0x10,$base)); # 0 : sb9t
298     &pshufb ("xmm0","xmm3"); # 0 = sb9t
299     &pxor ("xmm0","xmm4"); # 0 = ch
300     &add ($key,16); # next round key

302     &pshufb ("xmm0","xmm5"); # MC ch
303     &movdqa ("xmm4",&QWP(0,$base)); # 4 : sbdu
304     &pshufb ("xmm4","xmm2"); # 4 = sbdu
305     &pxor ("xmm4","xmm0"); # 4 = ch
306     &movdqa ("xmm0",&QWP(0x10,$base)); # 0 : sbdt
307     &pshufb ("xmm0","xmm3"); # 0 = sbdt
308     &pxor ("xmm0","xmm4"); # 0 = ch
309     &sub ($round,1); # nr--

311     &pshufb ("xmm0","xmm5"); # MC ch
312     &movdqa ("xmm4",&QWP(0x20,$base)); # 4 : sbbu
313     &pshufb ("xmm4","xmm2"); # 4 = sbbu
314     &pxor ("xmm4","xmm0"); # 4 = ch
315     &movdqa ("xmm0",&QWP(0x30,$base)); # 0 : sbbt
316     &pshufb ("xmm0","xmm3"); # 0 = sbbt
317     &pxor ("xmm0","xmm4"); # 0 = ch

319     &pshufb ("xmm0","xmm5"); # MC ch
320     &movdqa ("xmm4",&QWP(0x40,$base)); # 4 : sbeu
321     &pshufb ("xmm4","xmm2"); # 4 = sbeu
322     &pxor ("xmm4","xmm0"); # 4 = ch
323     &movdqa ("xmm0",&QWP(0x50,$base)); # 0 : sbet
324     &pshufb ("xmm0","xmm3"); # 0 = sbet
325     &pxor ("xmm0","xmm4"); # 0 = ch

```

```

327     &alignr("xmm5","xmm5",12);

329 &set_label("dec_entry");
330     # top of round
331     &movdqa ("xmm1","xmm6"); # 1 : i
332     &pandn ("xmm1","xmm0"); # 1 = i<4
333     &psrld ("xmm1",4); # 1 = i
334     &pand ("xmm0","xmm6"); # 0 = k
335     &movdqa ("xmm2",&QWP($k_inv+16,$const)); # 2 : a/k
336     &pshufb ("xmm2","xmm0"); # 2 = a/k
337     &pxor ("xmm0","xmm1"); # 0 = j
338     &movdqa ("xmm3","xmm7"); # 3 : 1/i
339     &pshufb ("xmm3","xmm1"); # 3 = 1/i
340     &pxor ("xmm3","xmm2"); # 3 = iak = 1/i + a/k
341     &movdqa ("xmm4","xmm7"); # 4 : 1/j
342     &pshufb ("xmm4","xmm0"); # 4 = 1/j
343     &pxor ("xmm4","xmm2"); # 4 = jak = 1/j + a/k
344     &movdqa ("xmm2","xmm7"); # 2 : 1/ia
345     &pshufb ("xmm2","xmm3"); # 2 = 1/ia
346     &pxor ("xmm2","xmm0"); # 2 = io
347     &movdqa ("xmm3","xmm7"); # 3 : 1/jak
348     &pshufb ("xmm3","xmm4"); # 3 = 1/jak
349     &pxor ("xmm3","xmm1"); # 3 = jo
350     &movdqu ("xmm0",&QWP(0,$key));
351     &jnz (&label("dec_loop"));

353     # middle of last round
354     &movdqa ("xmm4",&QWP(0x60,$base)); # 3 : sbou
355     &pshufb ("xmm4","xmm2"); # 4 = sbou
356     &pxor ("xmm4","xmm0"); # 4 = sbiu + k
357     &movdqa ("xmm0",&QWP(0x70,$base)); # 0 : sbot
358     &movdqa ("xmm2",&QWP(0,$magic));
359     &pshufb ("xmm0","xmm3"); # 0 = sb1t
360     &pxor ("xmm0","xmm4"); # 0 = A
361     &pshufb ("xmm0","xmm2");
362     &ret ();

363 &function_end_B("_vpaes_decrypt_core");

365 #####
366 ##
367 ## AES key schedule
368 ##
369 #####
370 &function_begin_B("_vpaes_schedule_core");
371     &add ($const,&DWP(0,"esp"));
372     &movdqu ("xmm0",&QWP(0,$inp)); # load key (unaligned)
373     &movdqa ("xmm2",&QWP($k_rcon,$const)); # load rcon

375     # input transform
376     &movdqa ("xmm3","xmm0");
377     &lea ($base,&DWP($k_ipt,$const));
378     &movdqa (&QWP(4,"esp"),"xmm2"); # xmm8
379     &call ("_vpaes_schedule_transform");
380     &movdqa ("xmm7","xmm0");

382     &test ($out,$out);
383     &jnz (&label("schedule_am_decrypting"));

385     # encrypting, output zeroth round key after transform
386     &movdqu (&QWP(0,$key),"xmm0");
387     &jmp (&label("schedule_go"));

389 &set_label("schedule_am_decrypting");
390     # decrypting, output zeroth round key after shiftrows
391     &movdqa ("xmm1",&QWP($k_sr,$const,$magic));

```

```

392     &pshufb ("xmm3", "xmm1");
393     &movdqu (&QWP(0, $key), "xmm3");
394     &xor     ($magic, 0x30);

396 &set_label("schedule_go");
397     &cmp     ($round, 192);
398     &ja      (&label("schedule_256"));
399     &je      (&label("schedule_192"));
400     # 128: fall though

402 ##
403 ## .schedule_128
404 ##
405 ## 128-bit specific part of key schedule.
406 ##
407 ## This schedule is really simple, because all its parts
408 ## are accomplished by the subroutines.
409 ##
410 &set_label("schedule_128");
411     &mov     ($round, 10);

413 &set_label("loop_schedule_128");
414     &call    ("_vpaes_schedule_round");
415     &dec     ($round);
416     &jz      (&label("schedule_mangle_last"));
417     &call    ("_vpaes_schedule_mangle"); # write output
418     &jmp     (&label("loop_schedule_128"));

420 ##
421 ## .aes_schedule_192
422 ##
423 ## 192-bit specific part of key schedule.
424 ##
425 ## The main body of this schedule is the same as the 128-bit
426 ## schedule, but with more smearing. The long, high side is
427 ## stored in %xmm7 as before, and the short, low side is in
428 ## the high bits of %xmm6.
429 ##
430 ## This schedule is somewhat nastier, however, because each
431 ## round produces 192 bits of key material, or 1.5 round keys.
432 ## Therefore, on each cycle we do 2 rounds and produce 3 round
433 ## keys.
434 ##
435 &set_label("schedule_192", 16);
436     &movdqu ("xmm0", &QWP(8, $inp)); # load key part 2 (very unaligne
437     &call    ("_vpaes_schedule_transform"); # input transform
438     &movdqa ("xmm6", "xmm0"); # save short part
439     &pxor    ("xmm4", "xmm4"); # clear 4
440     &movhps ("xmm6", "xmm4"); # clobber low side with zeros
441     &mov     ($round, 4);

443 &set_label("loop_schedule_192");
444     &call    ("_vpaes_schedule_round");
445     &palgrn ("xmm0", "xmm6", 8);
446     &call    ("_vpaes_schedule_mangle"); # save key n
447     &call    ("_vpaes_schedule_192_smear");
448     &call    ("_vpaes_schedule_mangle"); # save key n+1
449     &call    ("_vpaes_schedule_round");
450     &dec     ($round);
451     &jz      (&label("schedule_mangle_last"));
452     &call    ("_vpaes_schedule_mangle"); # save key n+2
453     &call    ("_vpaes_schedule_192_smear");
454     &jmp     (&label("loop_schedule_192"));

456 ##
457 ## .aes_schedule_256

```

```

458 ##
459 ## 256-bit specific part of key schedule.
460 ##
461 ## The structure here is very similar to the 128-bit
462 ## schedule, but with an additional "low side" in
463 ## %xmm6. The low side's rounds are the same as the
464 ## high side's, except no rcon and no rotation.
465 ##
466 &set_label("schedule_256", 16);
467     &movdqu ("xmm0", &QWP(16, $inp)); # load key part 2 (unaligned)
468     &call    ("_vpaes_schedule_transform"); # input transform
469     &mov     ($round, 7);

471 &set_label("loop_schedule_256");
472     &call    ("_vpaes_schedule_mangle"); # output low result
473     &movdqa ("xmm6", "xmm0"); # save cur_lo in xmm6

475     # high round
476     &call    ("_vpaes_schedule_round");
477     &dec     ($round);
478     &jz      (&label("schedule_mangle_last"));
479     &call    ("_vpaes_schedule_mangle");

481     # low round. swap xmm7 and xmm6
482     &pshufd ("xmm0", "xmm0", 0xFF);
483     &movdqa (&QWP(20, "esp"), "xmm7");
484     &movdqa ("xmm7", "xmm6");
485     &call    ("_vpaes_schedule_low_round");
486     &movdqa ("xmm7", &QWP(20, "esp"));

488     &jmp     (&label("loop_schedule_256"));

490 ##
491 ## .aes_schedule_mangle_last
492 ##
493 ## Mangler for last round of key schedule
494 ## Mangles %xmm0
495 ## when encrypting, outputs out(%xmm0) ^ 63
496 ## when decrypting, outputs uns skew(%xmm0)
497 ##
498 ## Always called right before return... jumps to cleanup and exits
499 ##
500 &set_label("schedule_mangle_last", 16);
501     # schedule last round key from xmm0
502     &lea     ($base, &DWP($k_deskew, $const));
503     &test     ($out, $out);
504     &jnz      (&label("schedule_mangle_last_dec"));

506     # encrypting
507     &movdqa ("xmm1", &QWP($k_sr, $const, $magic));
508     &pshufb ("xmm0", "xmm1"); # output permute
509     &lea     ($base, &DWP($k_opt, $const)); # prepare to output transform
510     &add     ($key, 32);

512 &set_label("schedule_mangle_last_dec");
513     &add     ($key, -16);
514     &pxor    ("xmm0", &QWP($k_s63, $const));
515     &call    ("_vpaes_schedule_transform"); # output transform
516     &movdqu (&QWP(0, $key), "xmm0"); # save last key

518     # cleanup
519     &pxor    ("xmm0", "xmm0");
520     &pxor    ("xmm1", "xmm1");
521     &pxor    ("xmm2", "xmm2");
522     &pxor    ("xmm3", "xmm3");
523     &pxor    ("xmm4", "xmm4");

```

```

524     &pxor    ("xmm5", "xmm5");
525     &pxor    ("xmm6", "xmm6");
526     &pxor    ("xmm7", "xmm7");
527     &ret     ();
528 &function_end_B("_vpaes_schedule_core");

530 ##
531 ## .aes_schedule_192_smear
532 ##
533 ## Smear the short, low side in the 192-bit key schedule.
534 ##
535 ## Inputs:
536 ##   %xmm7: high side, b a x y
537 ##   %xmm6: low side, d c 0 0
538 ##   %xmm13: 0
539 ##
540 ## Outputs:
541 ##   %xmm6: b+c+d b+c 0 0
542 ##   %xmm0: b+c+d b+c b a
543 ##
544 &function_begin_B("_vpaes_schedule_192_smear");
545     &pshufd   ("xmm0", "xmm6", 0x80);      # d c 0 0 -> c 0 0 0
546     &pxor    ("xmm6", "xmm0");             # -> c+d c 0 0
547     &pshufd   ("xmm0", "xmm7", 0xFE);      # b a _ _ -> b b b a
548     &pxor    ("xmm6", "xmm0");             # -> b+c+d b+c b a
549     &movdqa   ("xmm0", "xmm6");
550     &pxor    ("xmm1", "xmm1");
551     &movhlps  ("xmm6", "xmm1");            # clobber low side with zeros
552     &ret     ();
553 &function_end_B("_vpaes_schedule_192_smear");

555 ##
556 ## .aes_schedule_round
557 ##
558 ## Runs one main round of the key schedule on %xmm0, %xmm7
559 ##
560 ## Specifically, runs subbytes on the high dword of %xmm0
561 ## then rotates it by one byte and xors into the low dword of
562 ## %xmm7.
563 ##
564 ## Adds rcon from low byte of %xmm8, then rotates %xmm8 for
565 ## next rcon.
566 ##
567 ## Smears the dwords of %xmm7 by xoring the low into the
568 ## second low, result into third, result into highest.
569 ##
570 ## Returns results in %xmm7 = %xmm0.
571 ## Clobbers %xmm1-%xmm5.
572 ##
573 &function_begin_B("_vpaes_schedule_round");
574     # extract rcon from xmm8
575     &movdqa   ("xmm2", &QWP(8, "esp"));    # xmm8
576     &pxor    ("xmm1", "xmm1");
577     &palgnr   ("xmm1", "xmm2", 15);
578     &palgnr   ("xmm2", "xmm2", 15);
579     &pxor    ("xmm7", "xmm1");

581     # rotate
582     &pshufd   ("xmm0", "xmm0", 0xFF);
583     &palgnr   ("xmm0", "xmm0", 1);

585     # fall through...
586     &movdqa   (&QWP(8, "esp"), "xmm2");    # xmm8

588     # low round: same as high round, but no rotation and no rcon.
589 &set_label("_vpaes_schedule_low_round");

```

```

590     # smear xmm7
591     &movdqa   ("xmm1", "xmm7");
592     &pslldq   ("xmm7", 4);
593     &pxor    ("xmm7", "xmm1");
594     &movdqa   ("xmm1", "xmm7");
595     &pslldq   ("xmm7", 8);
596     &pxor    ("xmm7", "xmm1");
597     &pxor    ("xmm7", &QWP($k_s63, $const));

599     # subbyte
600     &movdqa   ("xmm4", &QWP($k_s0F, $const));
601     &movdqa   ("xmm5", &QWP($k_inv, $const)); # 4 : 1/j
602     &movdqa   ("xmm1", "xmm4");
603     &pandn    ("xmm1", "xmm0");
604     &psrld    ("xmm1", 4);                  # 1 = i
605     &pand     ("xmm0", "xmm4");              # 0 = k
606     &movdqa   ("xmm2", &QWP($k_inv+16, $const)); # 2 = a/k
607     &pshufb   ("xmm2", "xmm0");              # 2 = a/k
608     &pxor    ("xmm0", "xmm1");              # 0 = j
609     &movdqa   ("xmm3", "xmm5");              # 3 = 1/i
610     &pshufb   ("xmm3", "xmm1");              # 3 = 1/i
611     &pxor    ("xmm3", "xmm2");              # 3 = iak = 1/i + a/k
612     &movdqa   ("xmm4", "xmm5");              # 4 : 1/j
613     &pshufb   ("xmm4", "xmm0");              # 4 = 1/j
614     &pxor    ("xmm4", "xmm2");              # 4 = jak = 1/j + a/k
615     &movdqa   ("xmm2", "xmm5");              # 2 : 1/iak
616     &pshufb   ("xmm2", "xmm3");              # 2 = 1/iak
617     &pxor    ("xmm2", "xmm0");              # 2 = io
618     &movdqa   ("xmm3", "xmm5");              # 3 : 1/jak
619     &pshufb   ("xmm3", "xmm4");              # 3 = 1/jak
620     &pxor    ("xmm3", "xmm1");              # 3 = jo
621     &movdqa   ("xmm4", &QWP($k_sb1, $const)); # 4 : sbou
622     &pshufb   ("xmm4", "xmm2");              # 4 = sbou
623     &movdqa   ("xmm0", &QWP($k_sb1+16, $const)); # 0 : sbot
624     &pshufb   ("xmm0", "xmm3");              # 0 = sb1t
625     &pxor    ("xmm0", "xmm4");              # 0 = sbou output

627     # add in smeared stuff
628     &pxor    ("xmm0", "xmm7");
629     &movdqa   ("xmm7", "xmm0");
630     &ret     ();
631 &function_end_B("_vpaes_schedule_round");

633 ##
634 ## .aes_schedule_transform
635 ##
636 ## Linear-transform %xmm0 according to tables at (%ebx)
637 ##
638 ## Output in %xmm0
639 ## Clobbers %xmm1, %xmm2
640 ##
641 &function_begin_B("_vpaes_schedule_transform");
642     &movdqa   ("xmm2", &QWP($k_s0F, $const));
643     &movdqa   ("xmm1", "xmm2");
644     &pandn    ("xmm1", "xmm0");
645     &psrld    ("xmm1", 4);
646     &pand     ("xmm0", "xmm2");
647     &movdqa   ("xmm2", &QWP(0, $base));
648     &pshufb   ("xmm2", "xmm0");
649     &movdqa   ("xmm0", &QWP(16, $base));
650     &pshufb   ("xmm0", "xmm1");
651     &pxor    ("xmm0", "xmm2");
652     &ret     ();
653 &function_end_B("_vpaes_schedule_transform");

655 ##

```

```

656 ## .aes_schedule_mangle
657 ##
658 ## Mangle xmm0 from (basis-transformed) standard version
659 ## to our version.
660 ##
661 ## On encrypt,
662 ##   xor with 0x63
663 ##   multiply by circulant 0,1,1,1
664 ##   apply shiftrows transform
665 ##
666 ## On decrypt,
667 ##   xor with 0x63
668 ##   multiply by "inverse mixcolumns" circulant E,B,D,9
669 ##   deskew
670 ##   apply shiftrows transform
671 ##
672 ##
673 ## Writes out to (%edx), and increments or decrements it
674 ## Keeps track of round number mod 4 in %ecx
675 ## Preserves xmm0
676 ## Clobbers xmm1-xmm5
677 ##
678 &function_begin_B("vpaes_schedule_mangle");
679     &movdqa ("xmm4", "xmm0"); # save xmm0 for later
680     &movdqa ("xmm5", &QWP($k_mc_forward, $const));
681     &test ($out, $out);
682     &jnz (&label("schedule_mangle_dec"));

684     # encrypting
685     &add ($key, 16);
686     &pxor ("xmm4", &QWP($k_s63, $const));
687     &pshufb ("xmm4", "xmm5");
688     &movdqa ("xmm3", "xmm4");
689     &pshufb ("xmm4", "xmm5");
690     &pxor ("xmm3", "xmm4");
691     &pshufb ("xmm4", "xmm5");
692     &pxor ("xmm3", "xmm4");

694     &jmp (&label("schedule_mangle_both"));

696 &set_label("schedule_mangle_dec", 16);
697     # inverse mix columns
698     &movdqa ("xmm2", &QWP($k_s0F, $const));
699     &lea ($inp, &DWP($k_dksd, $const));
700     &movdqa ("xmm1", "xmm2");
701     &pandn ("xmm1", "xmm4");
702     &psrld ("xmm1", 4); # 1 = hi
703     &pand ("xmm4", "xmm2"); # 4 = lo

705     &movdqa ("xmm2", &QWP(0, $inp));
706     &pshufb ("xmm2", "xmm4");
707     &movdqa ("xmm3", &QWP(0x10, $inp));
708     &pshufb ("xmm3", "xmm1");
709     &pxor ("xmm3", "xmm2");
710     &pshufb ("xmm3", "xmm5");

712     &movdqa ("xmm2", &QWP(0x20, $inp));
713     &pshufb ("xmm2", "xmm4");
714     &pxor ("xmm2", "xmm3");
715     &movdqa ("xmm3", &QWP(0x30, $inp));
716     &pshufb ("xmm3", "xmm1");
717     &pxor ("xmm3", "xmm2");
718     &pshufb ("xmm3", "xmm5");

720     &movdqa ("xmm2", &QWP(0x40, $inp));
721     &pshufb ("xmm2", "xmm4");

```

```

722     &pxor ("xmm2", "xmm3");
723     &movdqa ("xmm3", &QWP(0x50, $inp));
724     &pshufb ("xmm3", "xmm1");
725     &pxor ("xmm3", "xmm2");
726     &pshufb ("xmm3", "xmm5");

728     &movdqa ("xmm2", &QWP(0x60, $inp));
729     &pshufb ("xmm2", "xmm4");
730     &pxor ("xmm2", "xmm3");
731     &movdqa ("xmm3", &QWP(0x70, $inp));
732     &pshufb ("xmm3", "xmm1");
733     &pxor ("xmm3", "xmm2");

735     &add ($key, -16);

737 &set_label("schedule_mangle_both");
738     &movdqa ("xmm1", &QWP($k_sr, $const, $magic));
739     &pshufb ("xmm3", "xmm1");
740     &add ($magic, -16);
741     &and ($magic, 0x30);
742     &movdqu (&QWP(0, $key), "xmm3");
743     &ret ();
744 &function_end_B("vpaes_schedule_mangle");

746 #
747 # Interface to OpenSSL
748 #
749 &function_begin("${PREFIX}_set_encrypt_key");
750     &mov ($inp, &wparam(0)); # inp
751     &lea ($base, &DWP(-56, "esp"));
752     &mov ($round, &wparam(1)); # bits
753     &and ($base, -16);
754     &mov ($key, &wparam(2)); # key
755     &xchg ($base, "esp"); # alloca
756     &mov (&DWP(48, "esp"), $base);

758     &mov ($base, $round);
759     &shr ($base, 5);
760     &add ($base, 5);
761     &mov (&DWP(240, $key), $base); # AES_KEY->rounds = nbits/32+5;
762     &mov ($magic, 0x30);
763     &mov ($out, 0);

765     &lea ($const, &DWP(&label("_vpaes_consts")."+0x30-", &label("pic_point")));
766     &call ("vpaes_schedule_core");
767 &set_label("pic_point");

769     &mov ("esp", &DWP(48, "esp"));
770     &xor ("eax", "eax");
771 &function_end("${PREFIX}_set_encrypt_key");

773 &function_begin("${PREFIX}_set_decrypt_key");
774     &mov ($inp, &wparam(0)); # inp
775     &lea ($base, &DWP(-56, "esp"));
776     &mov ($round, &wparam(1)); # bits
777     &and ($base, -16);
778     &mov ($key, &wparam(2)); # key
779     &xchg ($base, "esp"); # alloca
780     &mov (&DWP(48, "esp"), $base);

782     &mov ($base, $round);
783     &shr ($base, 5);
784     &add ($base, 5);
785     &mov (&DWP(240, $key), $base); # AES_KEY->rounds = nbits/32+5;
786     &shl ($base, 4);
787     &lea ($key, &DWP(16, $key, $base));

```

```

789      &mov      ($out,1);
790      &mov      ($magic,$round);
791      &shr      ($magic,1);
792      &and      ($magic,32);
793      &xor      ($magic,32);                # nbist==192?0:32;

795      &lea      ($const,&DWP(&label("_vpaes_consts")."+0x30-".&label("pic_point"
796      &call      ("_vpaes_schedule_core");
797 &set_label("pic_point");

799      &mov      ("esp",&DWP(48,"esp"));
800      &xor      ("eax","eax");
801 &function_end("${PREFIX}_set_decrypt_key");

803 &function_begin("${PREFIX}_encrypt");
804      &lea      ($const,&DWP(&label("_vpaes_consts")."+0x30-".&label("pic_point"
805      &call      ("_vpaes_preheat");
806 &set_label("pic_point");
807      &mov      ($inp,&wparam(0));          # inp
808      &lea      ($base,&DWP(-56,"esp"));
809      &mov      ($out,&wparam(1));          # out
810      &and      ($base,-16);
811      &mov      ($key,&wparam(2));          # key
812      &xchg      ($base,"esp");             # alloca
813      &mov      (&DWP(48,"esp"),$base);

815      &movdqu   ("xmm0",&QWP(0,$inp));
816      &call      ("_vpaes_encrypt_core");
817      &movdqu   (&QWP(0,$out),"xmm0");

819      &mov      ("esp",&DWP(48,"esp"));
820 &function_end("${PREFIX}_encrypt");

822 &function_begin("${PREFIX}_decrypt");
823      &lea      ($const,&DWP(&label("_vpaes_consts")."+0x30-".&label("pic_point"
824      &call      ("_vpaes_preheat");
825 &set_label("pic_point");
826      &mov      ($inp,&wparam(0));          # inp
827      &lea      ($base,&DWP(-56,"esp"));
828      &mov      ($out,&wparam(1));          # out
829      &and      ($base,-16);
830      &mov      ($key,&wparam(2));          # key
831      &xchg      ($base,"esp");             # alloca
832      &mov      (&DWP(48,"esp"),$base);

834      &movdqu   ("xmm0",&QWP(0,$inp));
835      &call      ("_vpaes_decrypt_core");
836      &movdqu   (&QWP(0,$out),"xmm0");

838      &mov      ("esp",&DWP(48,"esp"));
839 &function_end("${PREFIX}_decrypt");

841 &function_begin("${PREFIX}_cbc_encrypt");
842      &mov      ($inp,&wparam(0));          # inp
843      &mov      ($out,&wparam(1));          # out
844      &mov      ($round,&wparam(2));        # len
845      &mov      ($key,&wparam(3));          # key
846      &sub      ($round,16);
847      &jc        (&label("cbc_abort"));
848      &lea      ($base,&DWP(-56,"esp"));
849      &mov      ($const,&wparam(4));        # ivp
850      &and      ($base,-16);
851      &mov      ($magic,&wparam(5));        # enc
852      &xchg      ($base,"esp");             # alloca
853      &movdqu   ("xmm1",&QWP(0,$const));    # load IV

```

```

854      &sub      ($out,$inp);
855      &mov      (&DWP(48,"esp"),$base);

857      &mov      (&DWP(0,"esp"),$out);      # save out
858      &mov      (&DWP(4,"esp"),$key);      # save key
859      &mov      (&DWP(8,"esp"),$const);    # save ivp
860      &mov      ($out,$round);             # $out works as $len

862      &lea      ($const,&DWP(&label("_vpaes_consts")."+0x30-".&label("pic_point"
863      &call      ("_vpaes_preheat");
864 &set_label("pic_point");
865      &cmp      ($magic,0);
866      &jc        (&label("cbc_dec_loop"));
867      &jmp      (&label("cbc_enc_loop"));

869 &set_label("cbc_enc_loop",16);
870      &movdqu   ("xmm0",&QWP(0,$inp));      # load input
871      &pxor      ("xmm0","xmm1");          # inp^=iv
872      &call      ("_vpaes_encrypt_core");
873      &mov      ($base,&DWP(0,"esp"));      # restore out
874      &mov      ($key,&DWP(4,"esp"));      # restore key
875      &movdqa    ("xmm1","xmm0");
876      &movdqu   (&QWP(0,$base,$inp),"xmm0"); # write output
877      &lea      ($inp,&DWP(16,$inp));
878      &sub      ($out,16);
879      &jnc      (&label("cbc_enc_loop"));
880      &jmp      (&label("cbc_done"));

882 &set_label("cbc_dec_loop",16);
883      &movdqu   ("xmm0",&QWP(0,$inp));      # load input
884      &movdqa    (&QWP(16,"esp"),"xmm1"); # save IV
885      &movdqa    (&QWP(32,"esp"),"xmm0");  # save future IV
886      &call      ("_vpaes_decrypt_core");
887      &mov      ($base,&DWP(0,"esp"));      # restore out
888      &mov      ($key,&DWP(4,"esp"));      # restore key
889      &pxor      ("xmm0",&QWP(16,"esp"));    # out^=iv
890      &movdqa    ("xmm1",&QWP(32,"esp"));    # load next IV
891      &movdqu   (&QWP(0,$base,$inp),"xmm0"); # write output
892      &lea      ($inp,&DWP(16,$inp));
893      &sub      ($out,16);
894      &jnc      (&label("cbc_dec_loop"));

896 &set_label("cbc_done");
897      &mov      ($base,&DWP(8,"esp"));      # restore ivp
898      &mov      ("esp",&DWP(48,"esp"));
899      &movdqu   (&QWP(0,$base),"xmm1");    # write IV
900 &set_label("cbc_abort");
901 &function_end("${PREFIX}_cbc_encrypt");

903 &asm_finish();

```

new/usr/src/lib/openssl/libsunw_crypto/pl/vpaes-x86_64.pl

1

```
*****
30553 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/vpaes-x86_64.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 #####
4 ## Constant-time SSSE3 AES core implementation.
5 ## version 0.1
6 ##
7 ## By Mike Hamburg (Stanford University), 2009
8 ## Public domain.
9 ##
10 ## For details see http://shiftright.org/papers/vector_aes/ and
11 ## http://crypto.stanford.edu/vpaes/.

13 #####
14 # September 2011.
15 #
16 # Interface to OpenSSL as "almost" drop-in replacement for
17 # aes-x86_64.pl. "Almost" refers to the fact that AES_cbc_encrypt
18 # doesn't handle partial vectors (doesn't have to if called from
19 # EVP only). "Drop-in" implies that this module doesn't share key
20 # schedule structure with the original nor does it make assumption
21 # about its alignment...
22 #
23 # Performance summary. aes-x86_64.pl column lists large-block CBC
24 # encrypt/decrypt/with-hyper-threading-off(*) results in cycles per
25 # byte processed with 128-bit key, and vpaes-x86_64.pl column -
26 # [also large-block CBC] encrypt/decrypt.
27 #
28 #          aes-x86_64.pl          vpaes-x86_64.pl
29 #
30 # Core 2(**)    30.5/43.7/14.3    21.8/25.7(***)
31 # Nehalem      30.5/42.2/14.6     9.8/11.8
32 # Atom         63.9/79.0/32.1     64.0/84.8(***)
33 #
34 # (*) "Hyper-threading" in the context refers rather to cache shared
35 # among multiple cores, than to specifically Intel HTT. As vast
36 # majority of contemporary cores share cache, slower code path
37 # is common place. In other words "with-hyper-threading-off"
38 # results are presented mostly for reference purposes.
39 #
40 # (**) "Core 2" refers to initial 65nm design, a.k.a. Conroe.
41 #
42 # (***) Less impressive improvement on Core 2 and Atom is due to slow
43 # pshufb, yet it's respectable +40%/78% improvement on Core 2
44 # (as implied, over "hyper-threading-safe" code path).
45 #
46 #                                     <appro@openssl.org>

48 $flavour = shift;
49 $output = shift;
50 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

52 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

54 $0 =~ m/(.*[\\\/\s])[^\\\/\s]+$/; $dir=$1;
55 ( $xlate="$dir\x86_64-xlate.pl" and -f $xlate ) or
56 ( $xlate="$dir/../perlasm/x86_64-xlate.pl" and -f $xlate ) or
57 die "can't locate x86_64-xlate.pl";

59 open OUT,"| \"$^X\" $xlate $flavour $output";
60 *STDOUT=*OUT;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/vpaes-x86_64.pl

2

```
62 $PREFIX="vpaes";

64 $code.=<<<;
65 .text

67 ##
68 ## _aes_encrypt_core
69 ##
70 ## AES-encrypt %xmm0.
71 ##
72 ## Inputs:
73 ##   %xmm0 = input
74 ##   %xmm9-%xmm15 as in _vpaes_preheat
75 ##   (%rdx) = scheduled keys
76 ##
77 ## Output in %xmm0
78 ## Clobbers %xmm1-%xmm5, %r9, %r10, %r11, %rax
79 ## Preserves %xmm6 - %xmm8 so you get some local vectors
80 ##
81 ##
82 .type _vpaes_encrypt_core, \@abi-omnipotent
83 .align 16
84 _vpaes_encrypt_core:
85     mov     %rdx, %r9
86     mov     %r11, %r11
87     mov     240(%rdx), %eax
88     movdqa %xmm9, %xmm1
89     movdqa .Lk_ip1(%rip), %xmm2 # iptlo
90     pandn %xmm0, %xmm1
91     movdqu (%r9), %xmm5 # round0 key
92     psrld %r9, %xmm1
93     pand %xmm9, %xmm0
94     pshufb %xmm0, %xmm2
95     movdqa .Lk_ip1+16(%rip), %xmm0 # ipthi
96     pshufb %xmm1, %xmm0
97     pxor %xmm5, %xmm2
98     pxor %xmm2, %xmm0
99     add %r9, %r9
100     lea .Lk_mc_backward(%rip), %r10
101     jmp .Lenc_entry

103 .align 16
104 .Lenc_loop:
105     # middle of middle round
106     movdqa %xmm13, %xmm4 # 4 : sb1u
107     pshufb %xmm2, %xmm4 # 4 : sb1u
108     pxor %xmm5, %xmm4 # 4 : sb1u + k
109     movdqa %xmm12, %xmm0 # 0 : sb1t
110     pshufb %xmm3, %xmm0 # 0 : sb1t
111     pxor %xmm4, %xmm0 # 0 : A
112     movdqa %xmm15, %xmm5 # 4 : sb2u
113     pshufb %xmm2, %xmm5 # 4 : sb2u
114     movdqa -0x40(%r11,%r10), %xmm1 # .Lk_mc_forward[]
115     movdqa %xmm14, %xmm2 # 2 : sb2t
116     pshufb %xmm3, %xmm2 # 2 : sb2t
117     pxor %xmm5, %xmm2 # 2 : 2A
118     movdqa (%r11,%r10), %xmm4 # .Lk_mc_backward[]
119     movdqa %xmm0, %xmm3 # 3 : A
120     pshufb %xmm1, %xmm0 # 0 : B
121     add %r9, %r9 # next key
122     pxor %xmm2, %xmm0 # 0 : 2A+B
123     pshufb %xmm4, %xmm3 # 3 : D
124     add %r11, %r11 # next mc
125     pxor %xmm0, %xmm3 # 3 : 2A+B+D
126     pshufb %xmm1, %xmm0 # 0 : 2B+C
127     and %r11, %r11 # ... mod 4
```



```

128     pxor     %xmm3, %xmm0    # 0 = 2A+3B+C+D
129     sub      $1, %rax        # nr--

131 .Lenc_entry:
132     # top of round
133     movdqa   %xmm9, %xmm1    # 1 : i
134     pandn    %xmm0, %xmm1    # 1 = i<<4
135     psrl     $4, %xmm1       # 1 = i
136     pand     %xmm9, %xmm0    # 0 = k
137     movdqa   %xmm11, %xmm5   # 2 : a/k
138     pshufb   %xmm0, %xmm5    # 2 = a/k
139     pxor     %xmm1, %xmm0    # 0 = j
140     movdqa   %xmm10, %xmm3    # 3 : 1/i
141     pshufb   %xmm1, %xmm3    # 3 = 1/i
142     pxor     %xmm5, %xmm3    # 3 = iak = 1/i + a/k
143     movdqa   %xmm10, %xmm4    # 4 : 1/j
144     pshufb   %xmm0, %xmm4    # 4 = 1/j
145     pxor     %xmm5, %xmm4    # 4 = jak = 1/j + a/k
146     movdqa   %xmm10, %xmm2    # 2 : 1/ia
147     pshufb   %xmm3, %xmm2    # 2 = 1/ia
148     pxor     %xmm0, %xmm2    # 2 = io
149     movdqa   %xmm10, %xmm3    # 3 : 1/ja
150     movdqu   (%r9), %xmm5
151     pshufb   %xmm4, %xmm3    # 3 = 1/ja
152     pxor     %xmm1, %xmm3    # 3 = jo
153     jnz      .Lenc_loop

155     # middle of last round
156     movdqa   -0x60(%r10), %xmm4    # 3 : sbou      .Lk_sbo
157     movdqa   -0x50(%r10), %xmm0    # 0 : sbot      .Lk_sbo+16
158     pshufb   %xmm2, %xmm4    # 4 = sbou
159     pxor     %xmm5, %xmm4    # 4 = sb1u + k
160     pshufb   %xmm3, %xmm0    # 0 = sb1t
161     movdqa   0x40(%r11,%r10), %xmm1    # .Lk_sr[]
162     pxor     %xmm4, %xmm0    # 0 = A
163     pshufb   %xmm1, %xmm0
164     ret

165 .size      _vpaes_encrypt_core,.-vpaes_encrypt_core
166
167 ##
168 ##  Decryption core
169 ##
170 ##  Same API as encryption core.
171 ##
172 .type      _vpaes_decrypt_core,@abi-omnipotent
173 .align     16
174 _vpaes_decrypt_core:
175     mov      %rdx, %r9        # load key
176     mov      240(%rdx),%eax
177     movdqa   %xmm9, %xmm1
178     movdqa   .Lk_dipt(%rip), %xmm2    # iptlo
179     pandn    %xmm0, %xmm1
180     mov      %rax, %r11
181     psrl     $4, %xmm1
182     movdqu   (%r9), %xmm5      # round0 key
183     shl     $4, %r11
184     pand     %xmm9, %xmm0
185     pshufb   %xmm0, %xmm2
186     movdqa   .Lk_dipt+16(%rip), %xmm0 # ipthi
187     xor      $0x30, %r11
188     lea      .Lk_dsbd(%rip),%r10
189     pshufb   %xmm1, %xmm0
190     and      $0x30, %r11
191     pxor     %xmm5, %xmm2
192     movdqa   .Lk_mc_forward+48(%rip), %xmm5
193     pxor     %xmm2, %xmm0

```

```

194     add      $16, %r9
195     add      %r10, %r11
196     jmp      .Ldec_entry

198 .align     16
199 .Ldec_loop:
200 ##
201 ##  Inverse mix columns
202 ##
203     movdqa   -0x20(%r10),%xmm4    # 4 : sb9u
204     pshufb   %xmm2, %xmm4        # 4 = sb9u
205     pxor     %xmm0, %xmm4
206     movdqa   -0x10(%r10),%xmm0    # 0 : sb9t
207     pshufb   %xmm3, %xmm0        # 0 = sb9t
208     pxor     %xmm4, %xmm0        # 0 = ch
209     add      $16, %r9            # next round key

211     pshufb   %xmm5, %xmm0        # MC ch
212     movdqa   0x00(%r10),%xmm4    # 4 : sbdu
213     pshufb   %xmm2, %xmm4        # 4 = sbdu
214     pxor     %xmm0, %xmm4        # 4 = ch
215     movdqa   0x10(%r10),%xmm0    # 0 : sbdt
216     pshufb   %xmm3, %xmm0        # 0 = sbdt
217     pxor     %xmm4, %xmm0        # 0 = ch
218     sub      $1, %rax            # nr--
219
220     pshufb   %xmm5, %xmm0        # MC ch
221     movdqa   0x20(%r10),%xmm4    # 4 : sbbu
222     pshufb   %xmm2, %xmm4        # 4 = sbbu
223     pxor     %xmm0, %xmm4        # 4 = ch
224     movdqa   0x30(%r10),%xmm0    # 0 : sbbt
225     pshufb   %xmm3, %xmm0        # 0 = sbbt
226     pxor     %xmm4, %xmm0        # 0 = ch
227
228     pshufb   %xmm5, %xmm0        # MC ch
229     movdqa   0x40(%r10),%xmm4    # 4 : sbeu
230     pshufb   %xmm2, %xmm4        # 4 = sbeu
231     pxor     %xmm0, %xmm4        # 4 = ch
232     movdqa   0x50(%r10),%xmm0    # 0 : sbet
233     pshufb   %xmm3, %xmm0        # 0 = sbet
234     pxor     %xmm4, %xmm0        # 0 = ch

236     palignr  $12, %xmm5, %xmm5

238 .Ldec_entry:
239     # top of round
240     movdqa   %xmm9, %xmm1    # 1 : i
241     pandn    %xmm0, %xmm1    # 1 = i<<4
242     psrl     $4, %xmm1       # 1 = i
243     pand     %xmm9, %xmm0    # 0 = k
244     movdqa   %xmm11, %xmm2    # 2 : a/k
245     pshufb   %xmm0, %xmm2    # 2 = a/k
246     pxor     %xmm1, %xmm0    # 0 = j
247     movdqa   %xmm10, %xmm3    # 3 : 1/i
248     pshufb   %xmm1, %xmm3    # 3 = 1/i
249     pxor     %xmm2, %xmm3    # 3 = iak = 1/i + a/k
250     movdqa   %xmm10, %xmm4    # 4 : 1/j
251     pshufb   %xmm0, %xmm4    # 4 = 1/j
252     pxor     %xmm2, %xmm4    # 4 = jak = 1/j + a/k
253     movdqa   %xmm10, %xmm2    # 2 : 1/ia
254     pshufb   %xmm3, %xmm2    # 2 = 1/ia
255     pxor     %xmm0, %xmm2    # 2 = io
256     movdqa   %xmm10, %xmm3    # 3 : 1/ja
257     pshufb   %xmm4, %xmm3    # 3 = 1/ja
258     pxor     %xmm1, %xmm3    # 3 = jo
259     movdqu   (%r9), %xmm0

```

```

260      jnz      .Ldec_loop

262      # middle of last round
263      movdqa   0x60(%r10), %xmm4      # 3 : sbou
264      pshufb   %xmm2, %xmm4      # 4 = sbou
265      pxor     %xmm0, %xmm4      # 4 = sb1u + k
266      movdqa   0x70(%r10), %xmm0      # 0 : sbot
267      movdqa   -0x160(%r11), %xmm2      # .Lk_sr-.Lk_dsbd=-0x160
268      pshufb   %xmm3, %xmm0      # 0 = sb1t
269      pxor     %xmm4, %xmm0      # 0 = A
270      pshufb   %xmm2, %xmm0
271      ret
272 .size      _vpaes_decrypt_core,.-_vpaes_decrypt_core

274 #####
275 ##
276 ##          AES key schedule          ##
277 ##
278 #####
279 .type      _vpaes_schedule_core,@abi-omnipotent
280 .align     16
281 _vpaes_schedule_core:
282     # rdi = key
283     # rsi = size in bits
284     # rdx = buffer
285     # rcx = direction.  0=encrypt, 1=decrypt

287     call     _vpaes_preheat      # load the tables
288     movdqa   .Lk_rcon(%rip), %xmm8 # load rcon
289     movdqu   (%rdi), %xmm0      # load key (unaligned)

291     # input transform
292     movdqa   %xmm0, %xmm3
293     lea      .Lk_ipt(%rip), %r11
294     call     _vpaes_schedule_transform
295     movdqa   %xmm0, %xmm7

297     lea      .Lk_sr(%rip),%r10
298     test     %rcx, %rcx
299     jnz      .Lschedule_am_decrypting

301     # encrypting, output zeroth round key after transform
302     movdqu   %xmm0, (%rdx)
303     jmp      .Lschedule_go

305 .Lschedule_am_decrypting:
306     # decrypting, output zeroth round key after shiftrows
307     movdqa   (%r8,%r10),%xmm1
308     pshufb   %xmm1, %xmm3
309     movdqu   %xmm3, (%rdx)
310     xor      \%0x30, %r8

312 .Lschedule_go:
313     cmp      \%192, %esi
314     ja      .Lschedule_256
315     je      .Lschedule_192
316     # 128: fall though

318 ##
319 ## .schedule_128
320 ##
321 ## 128-bit specific part of key schedule.
322 ##
323 ## This schedule is really simple, because all its parts
324 ## are accomplished by the subroutines.
325 ##

```

```

326 .Lschedule_128:
327     mov      \%10, %esi
328
329 .Loop_schedule_128:
330     call     _vpaes_schedule_round
331     dec      %rsi
332     jz       .Lschedule_mangle_last
333     call     _vpaes_schedule_mangle # write output
334     jmp      .Loop_schedule_128

336 ##
337 ## .aes_schedule_192
338 ##
339 ## 192-bit specific part of key schedule.
340 ##
341 ## The main body of this schedule is the same as the 128-bit
342 ## schedule, but with more smearing. The long, high side is
343 ## stored in %xmm7 as before, and the short, low side is in
344 ## the high bits of %xmm6.
345 ##
346 ## This schedule is somewhat nastier, however, because each
347 ## round produces 192 bits of key material, or 1.5 round keys.
348 ## Therefore, on each cycle we do 2 rounds and produce 3 round
349 ## keys.
350 ##
351 .align     16
352 .Lschedule_192:
353     movdqu   8(%rdi),%xmm0      # load key part 2 (very unaligned)
354     call     _vpaes_schedule_transform # input transform
355     movdqa   %xmm0, %xmm6      # save short part
356     pxor     %xmm4, %xmm4      # clear 4
357     movhps   %xmm4, %xmm6      # clobber low side with zeros
358     mov      \%4, %esi

360 .Loop_schedule_192:
361     call     _vpaes_schedule_round
362     paligr   \%8,%xmm6,%xmm0
363     call     _vpaes_schedule_mangle # save key n
364     call     _vpaes_schedule_192_smear
365     call     _vpaes_schedule_mangle # save key n+1
366     call     _vpaes_schedule_round
367     dec      %rsi
368     jz       .Lschedule_mangle_last
369     call     _vpaes_schedule_mangle # save key n+2
370     call     _vpaes_schedule_192_smear
371     jmp      .Loop_schedule_192

373 ##
374 ## .aes_schedule_256
375 ##
376 ## 256-bit specific part of key schedule.
377 ##
378 ## The structure here is very similar to the 128-bit
379 ## schedule, but with an additional "low side" in
380 ## %xmm6. The low side's rounds are the same as the
381 ## high side's, except no rcon and no rotation.
382 ##
383 .align     16
384 .Lschedule_256:
385     movdqu   16(%rdi),%xmm0      # load key part 2 (unaligned)
386     call     _vpaes_schedule_transform # input transform
387     mov      \%7, %esi
388
389 .Loop_schedule_256:
390     call     _vpaes_schedule_mangle # output low result
391     movdqa   %xmm0, %xmm6      # save cur_lo in xmm6

```

```

393     # high round
394     call    _vpaes_schedule_round
395     dec     %rsi
396     jz      .Lschedule_mangle_last
397     call    _vpaes_schedule_mangle

399     # low round. swap xmm7 and xmm6
400     pshufd  \0xFF, %xmm0, %xmm0
401     movdqa  %xmm7, %xmm5
402     movdqa  %xmm6, %xmm7
403     call    _vpaes_schedule_low_round
404     movdqa  %xmm5, %xmm7
405
406     jmp     .Loop_schedule_256

408
409 ##
410 ## .aes_schedule_mangle_last
411 ##
412 ## Mangler for last round of key schedule
413 ## Mangles %xmm0
414 ##   when encrypting, outputs out(%xmm0) ^ 63
415 ##   when decrypting, outputs unskew(%xmm0)
416 ##
417 ## Always called right before return... jumps to cleanup and exits
418 ##
419 .align 16
420 .Lschedule_mangle_last:
421     # schedule last round key from xmm0
422     lea     .Lk_deskew(%rip),%r11 # prepare to deskew
423     test    %rcx, %rcx
424     jnz     .Lschedule_mangle_last_dec

426     # encrypting
427     movdqa  (%r8,%r10),%xmm1
428     pshufb  %xmm1, %xmm0          # output permute
429     lea     .Lk_opt(%rip), %r11   # prepare to output transform
430     add     $32, %rdx

432 .Lschedule_mangle_last_dec:
433     add     $-16, %rdx
434     pxor    .Lk_s63(%rip), %xmm0
435     call    _vpaes_schedule_transform # output transform
436     movdqu  %xmm0, (%rdx)          # save last key

438     # cleanup
439     pxor    %xmm0, %xmm0
440     pxor    %xmm1, %xmm1
441     pxor    %xmm2, %xmm2
442     pxor    %xmm3, %xmm3
443     pxor    %xmm4, %xmm4
444     pxor    %xmm5, %xmm5
445     pxor    %xmm6, %xmm6
446     pxor    %xmm7, %xmm7
447     ret

448 .size     _vpaes_schedule_core,.-_vpaes_schedule_core

450 ##
451 ## .aes_schedule_192_smear
452 ##
453 ## Smear the short, low side in the 192-bit key schedule.
454 ##
455 ## Inputs:
456 ##   %xmm7: high side, b a x y
457 ##   %xmm6: low side, d c 0 0

```

```

458 ##   %xmm13: 0
459 ##
460 ## Outputs:
461 ##   %xmm6: b+c+d b+c 0 0
462 ##   %xmm0: b+c+d b+c b a
463 ##
464 .type     _vpaes_schedule_192_smear,\@abi-omnipotent
465 .align 16
466 _vpaes_schedule_192_smear:
467     pshufd  \0x80, %xmm6, %xmm0 # d c 0 0 -> c 0 0 0
468     pxor    %xmm0, %xmm6        # -> c+d c 0 0
469     pshufd  \0xFE, %xmm7, %xmm0 # b a _ _ -> b b b a
470     pxor    %xmm0, %xmm6        # -> b+c+d b+c b a
471     movdqa  %xmm6, %xmm0
472     pxor    %xmm1, %xmm1
473     movhps  %xmm1, %xmm6        # clobber low side with zeros
474     ret
475 .size     _vpaes_schedule_192_smear,.-_vpaes_schedule_192_smear

477 ##
478 ## .aes_schedule_round
479 ##
480 ## Runs one main round of the key schedule on %xmm0, %xmm7
481 ##
482 ## Specifically, runs subbytes on the high dword of %xmm0
483 ## then rotates it by one byte and xors into the low dword of
484 ## %xmm7.
485 ##
486 ## Adds rcon from low byte of %xmm8, then rotates %xmm8 for
487 ## next rcon.
488 ##
489 ## Smears the dwords of %xmm7 by xoring the low into the
490 ## second low, result into third, result into highest.
491 ##
492 ## Returns results in %xmm7 = %xmm0.
493 ## Clobbers %xmm1-%xmm4, %r11.
494 ##
495 .type     _vpaes_schedule_round,\@abi-omnipotent
496 .align 16
497 _vpaes_schedule_round:
498     # extract rcon from xmm8
499     pxor    %xmm1, %xmm1
500     palignr \15, %xmm8, %xmm1
501     palignr \15, %xmm8, %xmm8
502     pxor    %xmm1, %xmm7

504     # rotate
505     pshufd  \0xFF, %xmm0, %xmm0
506     palignr \1, %xmm0, %xmm0
507
508     # fall through...
509
510     # low round: same as high round, but no rotation and no rcon.
511 _vpaes_schedule_low_round:
512     # smear xmm7
513     movdqa  %xmm7, %xmm1
514     pslldq  \4, %xmm7
515     pxor    %xmm1, %xmm7
516     movdqa  %xmm7, %xmm1
517     pslldq  \8, %xmm7
518     pxor    %xmm1, %xmm7
519     pxor    .Lk_s63(%rip), %xmm7

521     # subbytes
522     movdqa  %xmm9, %xmm1
523     pandn   %xmm0, %xmm1

```

```

524     psrld    \ $4,    %xmm1    # 1 = i
525     pand     %xmm9,    %xmm0    # 0 = k
526     movdqa   %xmm11,   %xmm2    # 2 : a/k
527     pshufb   %xmm0,    %xmm2    # 2 = a/k
528     pxor     %xmm1,    %xmm0    # 0 = j
529     movdqa   %xmm10,   %xmm3    # 3 : 1/i
530     pshufb   %xmm1,    %xmm3    # 3 = 1/i
531     pxor     %xmm2,    %xmm3    # 3 = iak = 1/i + a/k
532     movdqa   %xmm10,   %xmm4    # 4 : 1/j
533     pshufb   %xmm0,    %xmm4    # 4 = 1/j
534     pxor     %xmm2,    %xmm4    # 4 = jak = 1/j + a/k
535     movdqa   %xmm10,   %xmm2    # 2 : 1/ia
536     pshufb   %xmm3,    %xmm2    # 2 = 1/ia
537     pxor     %xmm0,    %xmm2    # 2 = io
538     movdqa   %xmm10,   %xmm3    # 3 : 1/jak
539     pshufb   %xmm4,    %xmm3    # 3 = 1/jak
540     pxor     %xmm1,    %xmm3    # 3 = jo
541     movdqa   %xmm13,   %xmm4    # 4 : sbou
542     pshufb   %xmm2,    %xmm4    # 4 = sbou
543     movdqa   %xmm12,   %xmm0    # 0 : sbot
544     pshufb   %xmm3,    %xmm0    # 0 = sb1t
545     pxor     %xmm4,    %xmm0    # 0 = sbou output

547     # add in smeared stuff
548     pxor     %xmm7,    %xmm0
549     movdqa   %xmm0,    %xmm7
550     ret
551 .size      _vpaes_schedule_round,.-_vpaes_schedule_round

553 ##
554 ## .aes_schedule_transform
555 ##
556 ## Linear-transform %xmm0 according to tables at (%r11)
557 ##
558 ## Requires that %xmm9 = 0x0F0F... as in preheat
559 ## Output in %xmm0
560 ## Clobbers %xmm1, %xmm2
561 ##
562 .type      _vpaes_schedule_transform,@abi-omnipotent
563 .align     16
564 _vpaes_schedule_transform:
565     movdqa   %xmm9,    %xmm1
566     pandn    %xmm0,    %xmm1
567     psrld    \ $4,    %xmm1
568     pand     %xmm9,    %xmm0
569     movdqa   (%r11),   %xmm2    # lo
570     pshufb   %xmm0,    %xmm2
571     movdqa   16(%r11), %xmm0    # hi
572     pshufb   %xmm1,    %xmm0
573     pxor     %xmm2,    %xmm0
574     ret
575 .size      _vpaes_schedule_transform,.-_vpaes_schedule_transform

577 ##
578 ## .aes_schedule_mangle
579 ##
580 ## Mangle xmm0 from (basis-transformed) standard version
581 ## to our version.
582 ##
583 ## On encrypt,
584 ##   xor with 0x63
585 ##   multiply by circulant 0,1,1,1
586 ##   apply shiftrows transform
587 ##
588 ## On decrypt,
589 ##   xor with 0x63

```

```

590 ## multiply by "inverse mixcolumns" circulant E,B,D,9
591 ## deskew
592 ## apply shiftrows transform
593 ##
594 ##
595 ## Writes out to (%rdx), and increments or decrements it
596 ## Keeps track of round number mod 4 in %r8
597 ## Preserves xmm0
598 ## Clobbers xmm1-xmm5
599 ##
600 .type      _vpaes_schedule_mangle,@abi-omnipotent
601 .align     16
602 _vpaes_schedule_mangle:
603     movdqa   %xmm0,    %xmm4    # save xmm0 for later
604     movdqa   .Lk_mc_forward(%rip),%xmm5
605     test     %rcx,    %rcx
606     jnz      .Lschedule_mangle_dec

608     # encrypting
609     add      \ $16,    %rdx
610     pxor     .Lk_s63(%rip),%xmm4
611     pshufb   %xmm5,    %xmm4
612     movdqa   %xmm4,    %xmm3
613     pshufb   %xmm5,    %xmm4
614     pxor     %xmm4,    %xmm3
615     pshufb   %xmm5,    %xmm4
616     pxor     %xmm4,    %xmm3

618     jmp      .Lschedule_mangle_both
619 .align     16
620 .Lschedule_mangle_dec:
621     # inverse mix columns
622     lea      .Lk_dksd(%rip),%r11
623     movdqa   %xmm9,    %xmm1
624     pandn    %xmm4,    %xmm1
625     psrld    \ $4,    %xmm1    # 1 = hi
626     pand     %xmm9,    %xmm4    # 4 = lo

628     movdqa   0x00(%r11), %xmm2
629     pshufb   %xmm4,    %xmm2
630     movdqa   0x10(%r11), %xmm3
631     pshufb   %xmm1,    %xmm3
632     pxor     %xmm2,    %xmm3
633     pshufb   %xmm5,    %xmm3

635     movdqa   0x20(%r11), %xmm2
636     pshufb   %xmm4,    %xmm2
637     pxor     %xmm3,    %xmm2
638     movdqa   0x30(%r11), %xmm3
639     pshufb   %xmm1,    %xmm3
640     pxor     %xmm2,    %xmm3
641     pshufb   %xmm5,    %xmm3

643     movdqa   0x40(%r11), %xmm2
644     pshufb   %xmm4,    %xmm2
645     pxor     %xmm3,    %xmm2
646     movdqa   0x50(%r11), %xmm3
647     pshufb   %xmm1,    %xmm3
648     pxor     %xmm2,    %xmm3
649     pshufb   %xmm5,    %xmm3

651     movdqa   0x60(%r11), %xmm2
652     pshufb   %xmm4,    %xmm2
653     pxor     %xmm3,    %xmm2
654     movdqa   0x70(%r11), %xmm3
655     pshufb   %xmm1,    %xmm3

```

```

656     pxor    %xmm2, %xmm3
658     add     \$.16, %rdx

660 .Lschedule_mangle_both:
661     movdqa  (%r8,%r10),%xmm1
662     pshufb  %xmm1,%xmm3
663     add     \$.16, %r8
664     and     \$0x30, %r8
665     movdqu  %xmm3, (%rdx)
666     ret
667 .size      _vpaes_schedule_mangle,.-_vpaes_schedule_mangle

669 #
670 # Interface to OpenSSL
671 #
672 .globl  ${PREFIX}_set_encrypt_key
673 .type   ${PREFIX}_set_encrypt_key,@function,3
674 .align  16
675 ${PREFIX}_set_encrypt_key:
676
677 $code.=<<__ if ($win64);
678     lea     -0xb8(%rsp),%rsp
679     movaps  %xmm6,0x10(%rsp)
680     movaps  %xmm7,0x20(%rsp)
681     movaps  %xmm8,0x30(%rsp)
682     movaps  %xmm9,0x40(%rsp)
683     movaps  %xmm10,0x50(%rsp)
684     movaps  %xmm11,0x60(%rsp)
685     movaps  %xmm12,0x70(%rsp)
686     movaps  %xmm13,0x80(%rsp)
687     movaps  %xmm14,0x90(%rsp)
688     movaps  %xmm15,0xa0(%rsp)
689 .Lenc_key_body:
690
691 $code.=<<__ ;
692     mov     %esi,%eax
693     shr     \$5,%eax
694     add     \$5,%eax
695     mov     %eax,240(%rdx) # AES_KEY->rounds = nbits/32+5;

697     mov     \$0,%ecx
698     mov     \$0x30,%r8d
699     call    _vpaes_schedule_core
700
701 $code.=<<__ if ($win64);
702     movaps  0x10(%rsp),%xmm6
703     movaps  0x20(%rsp),%xmm7
704     movaps  0x30(%rsp),%xmm8
705     movaps  0x40(%rsp),%xmm9
706     movaps  0x50(%rsp),%xmm10
707     movaps  0x60(%rsp),%xmm11
708     movaps  0x70(%rsp),%xmm12
709     movaps  0x80(%rsp),%xmm13
710     movaps  0x90(%rsp),%xmm14
711     movaps  0xa0(%rsp),%xmm15
712     lea     0xb8(%rsp),%rsp
713 .Lenc_key_epilogue:
714
715 $code.=<<__ ;
716     xor     %eax,%eax
717     ret
718 .size      ${PREFIX}_set_encrypt_key,.-${PREFIX}_set_encrypt_key

720 .globl  ${PREFIX}_set_decrypt_key
721 .type   ${PREFIX}_set_decrypt_key,@function,3

```

```

722 .align  16
723 ${PREFIX}_set_decrypt_key:
724
725 $code.=<<__ if ($win64);
726     lea     -0xb8(%rsp),%rsp
727     movaps  %xmm6,0x10(%rsp)
728     movaps  %xmm7,0x20(%rsp)
729     movaps  %xmm8,0x30(%rsp)
730     movaps  %xmm9,0x40(%rsp)
731     movaps  %xmm10,0x50(%rsp)
732     movaps  %xmm11,0x60(%rsp)
733     movaps  %xmm12,0x70(%rsp)
734     movaps  %xmm13,0x80(%rsp)
735     movaps  %xmm14,0x90(%rsp)
736     movaps  %xmm15,0xa0(%rsp)
737 .Ldec_key_body:
738
739 $code.=<<__ ;
740     mov     %esi,%eax
741     shr     \$5,%eax
742     add     \$5,%eax
743     mov     %eax,240(%rdx) # AES_KEY->rounds = nbits/32+5;
744     shl     \$4,%eax
745     lea     16(%rdx,%rax),%rdx

747     mov     \$1,%ecx
748     mov     %esi,%r8d
749     shr     \$1,%r8d
750     and     \$32,%r8d
751     xor     \$32,%r8d # nbits==192?0:32
752     call    _vpaes_schedule_core
753
754 $code.=<<__ if ($win64);
755     movaps  0x10(%rsp),%xmm6
756     movaps  0x20(%rsp),%xmm7
757     movaps  0x30(%rsp),%xmm8
758     movaps  0x40(%rsp),%xmm9
759     movaps  0x50(%rsp),%xmm10
760     movaps  0x60(%rsp),%xmm11
761     movaps  0x70(%rsp),%xmm12
762     movaps  0x80(%rsp),%xmm13
763     movaps  0x90(%rsp),%xmm14
764     movaps  0xa0(%rsp),%xmm15
765     lea     0xb8(%rsp),%rsp
766 .Ldec_key_epilogue:
767
768 $code.=<<__ ;
769     xor     %eax,%eax
770     ret
771 .size      ${PREFIX}_set_decrypt_key,.-${PREFIX}_set_decrypt_key

773 .globl  ${PREFIX}_encrypt
774 .type   ${PREFIX}_encrypt,@function,3
775 .align  16
776 ${PREFIX}_encrypt:
777
778 $code.=<<__ if ($win64);
779     lea     -0xb8(%rsp),%rsp
780     movaps  %xmm6,0x10(%rsp)
781     movaps  %xmm7,0x20(%rsp)
782     movaps  %xmm8,0x30(%rsp)
783     movaps  %xmm9,0x40(%rsp)
784     movaps  %xmm10,0x50(%rsp)
785     movaps  %xmm11,0x60(%rsp)
786     movaps  %xmm12,0x70(%rsp)
787     movaps  %xmm13,0x80(%rsp)

```

```

788     movaps    %xmm14,0x90(%rsp)
789     movaps    %xmm15,0xa0(%rsp)
790 .Lenc_body:
791     __
792 $code.=<<__ ;
793     movdqu    (%rdi),%xmm0
794     call      _vpaes_preheat
795     call      _vpaes_encrypt_core
796     movdqu    %xmm0,(%rsi)
797     __
798 $code.=<<__ if ($win64);
799     movaps    0x10(%rsp),%xmm6
800     movaps    0x20(%rsp),%xmm7
801     movaps    0x30(%rsp),%xmm8
802     movaps    0x40(%rsp),%xmm9
803     movaps    0x50(%rsp),%xmm10
804     movaps    0x60(%rsp),%xmm11
805     movaps    0x70(%rsp),%xmm12
806     movaps    0x80(%rsp),%xmm13
807     movaps    0x90(%rsp),%xmm14
808     movaps    0xa0(%rsp),%xmm15
809     lea       0xb8(%rsp),%rsp
810 .Lenc_epilogue:
811     __
812 $code.=<<__ ;
813     ret
814 .size    ${PREFIX}_encrypt,.-${PREFIX}_encrypt

816 .globl  ${PREFIX}_decrypt
817 .type   ${PREFIX}_decrypt,@function,3
818 .align  16
819 ${PREFIX}_decrypt:
820     __
821 $code.=<<__ if ($win64);
822     lea       -0xb8(%rsp),%rsp
823     movaps    %xmm6,0x10(%rsp)
824     movaps    %xmm7,0x20(%rsp)
825     movaps    %xmm8,0x30(%rsp)
826     movaps    %xmm9,0x40(%rsp)
827     movaps    %xmm10,0x50(%rsp)
828     movaps    %xmm11,0x60(%rsp)
829     movaps    %xmm12,0x70(%rsp)
830     movaps    %xmm13,0x80(%rsp)
831     movaps    %xmm14,0x90(%rsp)
832     movaps    %xmm15,0xa0(%rsp)
833 .Ldec_body:
834     __
835 $code.=<<__ ;
836     movdqu    (%rdi),%xmm0
837     call      _vpaes_preheat
838     call      _vpaes_decrypt_core
839     movdqu    %xmm0,(%rsi)
840     __
841 $code.=<<__ if ($win64);
842     movaps    0x10(%rsp),%xmm6
843     movaps    0x20(%rsp),%xmm7
844     movaps    0x30(%rsp),%xmm8
845     movaps    0x40(%rsp),%xmm9
846     movaps    0x50(%rsp),%xmm10
847     movaps    0x60(%rsp),%xmm11
848     movaps    0x70(%rsp),%xmm12
849     movaps    0x80(%rsp),%xmm13
850     movaps    0x90(%rsp),%xmm14
851     movaps    0xa0(%rsp),%xmm15
852     lea       0xb8(%rsp),%rsp
853 .Ldec_epilogue:

```

```

854     __
855 $code.=<<__ ;
856     ret
857 .size    ${PREFIX}_decrypt,.-${PREFIX}_decrypt
858     __
859 {
860 my ($inp,$out,$len,$key,$ivp,$enc)=("%rdi","%rsi","rdx","rcx","r8","r9");
861 # void AES_cbc_encrypt (const void char *inp, unsigned char *out,
862 #                       size_t length, const AES_KEY *key,
863 #                       unsigned char *ivp,const int enc);
864 $code.=<<__ ;
865 .globl  ${PREFIX}_cbc_encrypt
866 .type   ${PREFIX}_cbc_encrypt,@function,6
867 .align  16
868 ${PREFIX}_cbc_encrypt:
869     xchg     $key,$len
870     __
871 ($len,$key)=(($key,$len));
872 $code.=<<__ ;
873     sub      \ $16,$len
874     jc       .Lcbc_abort
875     __
876 $code.=<<__ if ($win64);
877     lea       -0xb8(%rsp),%rsp
878     movaps    %xmm6,0x10(%rsp)
879     movaps    %xmm7,0x20(%rsp)
880     movaps    %xmm8,0x30(%rsp)
881     movaps    %xmm9,0x40(%rsp)
882     movaps    %xmm10,0x50(%rsp)
883     movaps    %xmm11,0x60(%rsp)
884     movaps    %xmm12,0x70(%rsp)
885     movaps    %xmm13,0x80(%rsp)
886     movaps    %xmm14,0x90(%rsp)
887     movaps    %xmm15,0xa0(%rsp)
888 .Lcbc_body:
889     __
890 $code.=<<__ ;
891     movdqu    ($ivp),%xmm6                # load IV
892     sub       $inp,$out
893     call      _vpaes_preheat
894     cmp       \ $0,${enc}d
895     je        .Lcbc_dec_loop
896     jmp       .Lcbc_enc_loop
897 .align  16
898 .Lcbc_enc_loop:
899     movdqu    ($inp),%xmm0
900     pxor      %xmm6,%xmm0
901     call      _vpaes_encrypt_core
902     movdqa    %xmm0,%xmm6
903     movdqu    %xmm0,($out,$inp)
904     lea       16($inp),$inp
905     sub       \ $16,$len
906     jnc       .Lcbc_enc_loop
907     jmp       .Lcbc_done
908 .align  16
909 .Lcbc_dec_loop:
910     movdqu    ($inp),%xmm0
911     movdqa    %xmm0,%xmm7
912     call      _vpaes_decrypt_core
913     pxor      %xmm6,%xmm0
914     movdqa    %xmm7,%xmm6
915     movdqu    %xmm0,($out,$inp)
916     lea       16($inp),$inp
917     sub       \ $16,$len
918     jnc       .Lcbc_dec_loop
919 .Lcbc_done:

```

```

920      movdqu  %xmm6, ($ivp)          # save IV
921
922  $code.<=<< if ($win64);
923      movaps  0x10(%rsp), %xmm6
924      movaps  0x20(%rsp), %xmm7
925      movaps  0x30(%rsp), %xmm8
926      movaps  0x40(%rsp), %xmm9
927      movaps  0x50(%rsp), %xmm10
928      movaps  0x60(%rsp), %xmm11
929      movaps  0x70(%rsp), %xmm12
930      movaps  0x80(%rsp), %xmm13
931      movaps  0x90(%rsp), %xmm14
932      movaps  0xa0(%rsp), %xmm15
933      lea     0xb8(%rsp), %rsp
934  .Lcbc_epilogue:
935
936  $code.<=<< __;
937  .Lcbc_abort:
938      ret
939  .size  ${PREFIX}_cbc_encrypt, .-${PREFIX}_cbc_encrypt
940
941  }
942  $code.<=<< __;
943  ##
944  ##  _aes_preheat
945  ##
946  ##  Fills register %r10 -> .aes_consts (so you can -fPIC)
947  ##  and %xmm9-%xmm15 as specified below.
948  ##
949  .type  _vpaes_preheat, \@abi-omnipotent
950  .align 16
951  _vpaes_preheat:
952      lea     .Lk_s0F(%rip), %r10
953      movdqa  -0x20(%r10), %xmm10    # .Lk_inv
954      movdqa  -0x10(%r10), %xmm11    # .Lk_inv+16
955      movdqa  0x00(%r10), %xmm9      # .Lk_s0F
956      movdqa  0x30(%r10), %xmm13     # .Lk_sb1
957      movdqa  0x40(%r10), %xmm12     # .Lk_sb1+16
958      movdqa  0x50(%r10), %xmm15     # .Lk_sb2
959      movdqa  0x60(%r10), %xmm14     # .Lk_sb2+16
960      ret
961  .size  _vpaes_preheat, .-_vpaes_preheat
962  #####
963  ##
964  ##          Constants
965  ##
966  #####
967  .type  _vpaes_consts, \@object
968  .align 64
969  _vpaes_consts:
970  .Lk_inv:  # inv, inva
971      .quad  0x0E05060F0D080180, 0x040703090A0B0C02
972      .quad  0x01040A060F0B0780, 0x030D0E0C02050809
973
974  .Lk_s0F:  # s0F
975      .quad  0x0F0F0F0F0F0F0F, 0x0F0F0F0F0F0F0F
976
977  .Lk_ipt:  # input transform (lo, hi)
978      .quad  0xC2B2E8985A2A7000, 0xCABAE09052227808
979      .quad  0x4C01307D317C4D00, 0xCD80B1FCB0FDC81
980
981  .Lk_sb1:  # sb1u, sb1t
982      .quad  0xB19BE18FCB503E00, 0xA5DF7A6E142AF544
983      .quad  0x3618D415FAE22300, 0x3BF7CCC10D2ED9EF
984  .Lk_sb2:  # sb2u, sb2t
985      .quad  0xE27A93C60B712400, 0x5EB7E955BC982FCD

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```

986      .quad  0x69EB88400AE12900, 0xC2A163C8AB82234A
987  .Lk_sbo:  # sbou, shot
988      .quad  0xD0D26D176FBDC700, 0x15AABF7AC502A878
989      .quad  0xCFE47A455FB86A00, 0x8E1E90D1412B35FA
990
991  .Lk_mc_forward: # mc_forward
992      .quad  0x0407060500030201, 0x0C0F0E0D080B0A09
993      .quad  0x080B0A0904070605, 0x000302010C0F0E0D
994      .quad  0x0C0F0E0D080B0A09, 0x0407060500030201
995      .quad  0x000302010C0F0E0D, 0x080B0A0904070605
996
997  .Lk_mc_backward: # mc_backward
998      .quad  0x0605040702010003, 0x0E0D0C0F0A09080B
999      .quad  0x020100030E0D0C0F, 0x0A09080B06050407
1000     .quad  0x0E0D0C0F0A09080B, 0x0605040702010003
1001     .quad  0x0A09080B06050407, 0x020100030E0D0C0F
1002
1003  .Lk_sr:   # sr
1004      .quad  0x0706050403020100, 0x0F0E0D0C0B0A0908
1005      .quad  0x030E09040F0A0500, 0x0B06010C07020D08
1006      .quad  0x0F060D040B020900, 0x070E050C030A0108
1007      .quad  0x0B0E0104070A0D00, 0x0306090C0F020508
1008
1009  .Lk_rcon: # rcon
1010      .quad  0x1F8391B9AF9DEEB6, 0x702A98084D7C7D81
1011
1012  .Lk_s63:  # s63: all equal to 0x63 transformed
1013      .quad  0x5B5B5B5B5B5B5B5B, 0x5B5B5B5B5B5B5B5B
1014
1015  .Lk_opt:  # output transform
1016      .quad  0xFF9F4929D6B66000, 0xF7974121DEBE6808
1017      .quad  0x01EDBD5150BCEC00, 0xE10D5DB1B05C0CE0
1018
1019  .Lk_deskew: # deskew tables: inverts the sbou's "skew"
1020      .quad  0x07E4A34047A4E300, 0x1DFEB95A5DBEF91A
1021      .quad  0x5F36B5DC83EA6900, 0x2841C2ABF49D1E77
1022
1023  ##
1024  ##  Decryption stuff
1025  ##  Key schedule constants
1026  ##
1027  .Lk_dksd: # decryption key schedule: invskew x*D
1028      .quad  0xFEB91A5DA3E44700, 0x0740E3A45A1DBEF9
1029      .quad  0x41C277F4B5368300, 0x5FDC69EAA8289D1E
1030  .Lk_dksb: # decryption key schedule: invskew x*B
1031      .quad  0x9A4FCA1F8550D500, 0x03D653861CC94C99
1032      .quad  0x115BEDA7B6FC4A00, 0xD993256F7E3482C8
1033  .Lk_dkse: # decryption key schedule: invskew x'E + 0x63
1034      .quad  0xD5031CCA1FC9D600, 0x53859A4C994F5086
1035      .quad  0xA23196054FDC7BE8, 0xCD5EF96A20B31487
1036  .Lk_dks9: # decryption key schedule: invskew x*F
1037      .quad  0xB6116FC87ED9A700, 0x4AED933482255BFC
1038      .quad  0x4576516227143300, 0x8BB89FACE9DAFDCE
1039
1040  ##
1041  ##  Decryption stuff
1042  ##  Round function constants
1043  ##
1044  .Lk_dipt:  # decryption input transform
1045      .quad  0x0F505B040B545F00, 0x154A411E114E451A
1046      .quad  0x86E383E660056500, 0x12771772F491F194
1047
1048  .Lk_dsb9:  # decryption sbou output *9*u, *9*t
1049      .quad  0x851C03539A86D600, 0xCAD51F504F994CC9
1050      .quad  0xC03B1789ECD74900, 0x725E2C9EB2FBA565
1051  .Lk_dsbD:  # decryption sbou output *D*u, *D*t

```

```

1052 .quad 0x7D57CCDFE6B1A200, 0xF56E9B13882A4439
1053 .quad 0x3CE2FAF724C6CB00, 0x2931180D15DEEFD3
1054 .Lk_dsbb: # decryption sbbox output *B*u, *B*t
1055 .quad 0xD022649296B44200, 0x602646F6B0F2D404
1056 .quad 0xC19498A6CD596700, 0xF3FF0C3E3255AA6B
1057 .Lk_dsbe: # decryption sbbox output *E*u, *E*t
1058 .quad 0x46F2929626D4D000, 0x2242600464B4F6B0
1059 .quad 0x0C55A6CDFFAAC100, 0x9467F36B98593E32
1060 .Lk_dsbo: # decryption sbbox final output
1061 .quad 0x1387EA537EF94000, 0xC7AA6DB9D4943E2D
1062 .quad 0x12D7560F93441D00, 0xCA4B8159D8C58E9C
1063 .asciz "Vector Permutation AES for x86_64/SSSE3, Mike Hamburg (Stanford Univers
1064 .align 64
1065 .size _vpaes_consts, .-vpaes_consts
1066 ____

1068 if ($win64) {
1069 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec, ULONG64 frame,
1070 # CONTEXT *context, DISPATCHER_CONTEXT *disp)
1071 $rec="%rcx";
1072 $frame="%rdx";
1073 $context="%r8";
1074 $disp="%r9";

1076 $code.=<<<____;
1077 .extern __imp_RtlVirtualUnwind
1078 .type se_handler, @abi-omnipotent
1079 .align 16
1080 se_handler:
1081 push %rsi
1082 push %rdi
1083 push %rbx
1084 push %rbp
1085 push %r12
1086 push %r13
1087 push %r14
1088 push %r15
1089 pushfq
1090 sub \($4,%rsp

1092 mov 120($context),%rax # pull context->Rax
1093 mov 248($context),%rbx # pull context->Rip

1095 mov 8($disp),%rsi # disp->ImageBase
1096 mov 56($disp),%r11 # disp->HandlerData

1098 mov 0(%r11),%r10d # HandlerData[0]
1099 lea (%rsi,%r10),%r10 # prologue label
1100 cmp %r10,%rbx # context->Rip<prologue label
1101 jb .Lin_prologue

1103 mov 152($context),%rax # pull context->Rsp

1105 mov 4(%r11),%r10d # HandlerData[1]
1106 lea (%rsi,%r10),%r10 # epilogue label
1107 cmp %r10,%rbx # context->Rip>=epilogue label
1108 jae .Lin_prologue

1110 lea 16(%rax),%rsi # %xmm save area
1111 lea 512($context),%rdi # &context.Xmm6
1112 mov \($20,%ecx # 10*sizeof(%xmm0)/sizeof(%rax)
1113 .long 0xa548f3fc # cld; rep movsq
1114 lea 0xb8(%rax),%rax # adjust stack pointer

1116 .Lin_prologue:
1117 mov 8(%rax),%rdi

```

```

1118 mov 16(%rax),%rsi
1119 mov %rax,152($context) # restore context->Rsp
1120 mov %rsi,168($context) # restore context->Rsi
1121 mov %rdi,176($context) # restore context->Rdi

1123 mov 40($disp),%rdi # disp->ContextRecord
1124 mov $context,%rsi # context
1125 mov \($'1232/8',%ecx # sizeof(CONTEXT)
1126 .long 0xa548f3fc # cld; rep movsq

1128 mov $disp,%rsi
1129 xor %rcx,%rcx # arg1, UNW_FLAG_NHANDLER
1130 mov 8(%rsi),%rdx # arg2, disp->ImageBase
1131 mov 0(%rsi),%r8 # arg3, disp->ControlPc
1132 mov 16(%rsi),%r9 # arg4, disp->FunctionEntry
1133 mov 40(%rsi),%r10 # disp->ContextRecord
1134 lea 56(%rsi),%r11 # &disp->HandlerData
1135 lea 24(%rsi),%r12 # &disp->EstablisherFrame
1136 mov %r10,32(%rsp) # arg5
1137 mov %r11,40(%rsp) # arg6
1138 mov %r12,48(%rsp) # arg7
1139 mov %rcx,56(%rsp) # arg8, (NULL)
1140 call *__imp_RtlVirtualUnwind(%rip)

1142 mov \($1,%eax # ExceptionContinueSearch
1143 add \($64,%rsp
1144 popfq
1145 pop %r15
1146 pop %r14
1147 pop %r13
1148 pop %r12
1149 pop %rbp
1150 pop %rbx
1151 pop %rdi
1152 pop %rsi
1153 ret
1154 .size se_handler, .-se_handler

1156 .section .pdata
1157 .align 4
1158 .rva .LSEH_begin_${PREFIX}_set_encrypt_key
1159 .rva .LSEH_end_${PREFIX}_set_encrypt_key
1160 .rva .LSEH_info_${PREFIX}_set_encrypt_key

1162 .rva .LSEH_begin_${PREFIX}_set_decrypt_key
1163 .rva .LSEH_end_${PREFIX}_set_decrypt_key
1164 .rva .LSEH_info_${PREFIX}_set_decrypt_key

1166 .rva .LSEH_begin_${PREFIX}_encrypt
1167 .rva .LSEH_end_${PREFIX}_encrypt
1168 .rva .LSEH_info_${PREFIX}_encrypt

1170 .rva .LSEH_begin_${PREFIX}_decrypt
1171 .rva .LSEH_end_${PREFIX}_decrypt
1172 .rva .LSEH_info_${PREFIX}_decrypt

1174 .rva .LSEH_begin_${PREFIX}_cbc_encrypt
1175 .rva .LSEH_end_${PREFIX}_cbc_encrypt
1176 .rva .LSEH_info_${PREFIX}_cbc_encrypt

1178 .section .xdata
1179 .align 8
1180 .LSEH_info_${PREFIX}_set_encrypt_key:
1181 .byte 9,0,0,0
1182 .rva se_handler
1183 .rva .Lenc_key_body, .Lenc_key_epilogue # HandlerData[]

```



```
1184 .LSEH_info_${PREFIX}_set_decrypt_key:
1185     .byte    9,0,0,0
1186     .rva     se_handler
1187     .rva     .Ldec_key_body, .Ldec_key_epilogue    # HandlerData[]
1188 .LSEH_info_${PREFIX}_encrypt:
1189     .byte    9,0,0,0
1190     .rva     se_handler
1191     .rva     .Lenc_body, .Lenc_epilogue            # HandlerData[]
1192 .LSEH_info_${PREFIX}_decrypt:
1193     .byte    9,0,0,0
1194     .rva     se_handler
1195     .rva     .Ldec_body, .Ldec_epilogue            # HandlerData[]
1196 .LSEH_info_${PREFIX}_cbc_encrypt:
1197     .byte    9,0,0,0
1198     .rva     se_handler
1199     .rva     .Lcbc_body, .Lcbc_epilogue            # HandlerData[]
1200 }
1201 }

1203 $code =~ s/\`([^\`]*)\`/eval($1)/gem;

1205 print $code;

1207 close STDOUT;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86-gf2m.pl

1

```
*****
7713 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86-gf2m.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@openssl.org> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # May 2011
11 #
12 # The module implements bn_GF2m_mul_2x2 polynomial multiplication used
13 # in bn_gf2m.c. It's kind of low-hanging mechanical port from C for
14 # the time being... Except that it has three code paths: pure integer
15 # code suitable for any x86 CPU, MMX code suitable for PIII and later
16 # and PCLMULQDQ suitable for Westmere and later. Improvement varies
17 # from one benchmark and µ-arch to another. Below are interval values
18 # for 163- and 571-bit ECDH benchmarks relative to compiler-generated
19 # code:
20 #
21 # PIII          16%-30%
22 # P4            12%-12%
23 # Opteron      18%-40%
24 # Core2        19%-44%
25 # Atom         38%-64%
26 # Westmere     53%-121%(PCLMULQDQ)/20%-32%(MMX)
27 # Sandy Bridge 72%-127%(PCLMULQDQ)/27%-23%(MMX)
28 #
29 # Note that above improvement coefficients are not coefficients for
30 # bn_GF2m_mul_2x2 itself. For example 120% ECDH improvement is result
31 # of bn_GF2m_mul_2x2 being >4x faster. As it gets faster, benchmark
32 # is more and more dominated by other subroutines, most notably by
33 # BN_GF2m_mod[_mul]_arr...

35 $0 =~ m/(.*[\\\/\[\]\^\.\*\+\$\/; $dir=$1;
36 push(@INC,"${dir}" "${dir}../../perlasm");
37 require "x86asm.pl";

39 &asm_init($ARGV[0],$0,$x86only = $ARGV[$#ARGV] eq "386");

41 $sse2=0;
42 for (@ARGV) { $sse2=1 if (/^-DOPENSSL_IA32_SSE2/); }

44 &external_label("OPENSSL_ia32cap_P") if ($sse2);

46 $a="eax";
47 $b="ebx";
48 ($a1,$a2,$a4)=("ecx","edx","ebp");

50 $R="mm0";
51 @T=("mm1","mm2");
52 ($A,$B,$B30,$B31)=("mm2","mm3","mm4","mm5");
53 @i=("esi","edi");

55                                     if (!$x86only) {
56 &function_begin_B("_mul_1x1_mmx");
57     &sub    ("esp",32+4);
58     &mov    ($a1,$a);
59     &lea    ($a2,&DWP(0,$a,$a));
60     &and    ($a1,0x3fffffff);
61     &lea    ($a4,&DWP(0,$a2,$a2));
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86-gf2m.pl

2

```
62     &mov    (&DWP(0*4,"esp"),0);
63     &and    ($a2,0x7fffffff);
64     &movd    ($a,$a);
65     &movd    ($b,$b);
66     &mov    (&DWP(1*4,"esp"),$a1); # a1
67     &xor    ($a1,$a2); # a1^a2
68     &pxor    ($B31,$B31);
69     &pxor    ($B30,$B30);
70     &mov    (&DWP(2*4,"esp"),$a2); # a2
71     &xor    ($a2,$a4); # a2^a4
72     &mov    (&DWP(3*4,"esp"),$a1); # a1^a2
73     &pcmpgtd($B31,$a); # broadcast 31st bit
74     &paddd    ($a,$a); # $A<=1
75     &xor    ($a1,$a2); # a1^a4=a1^a2^a2^a4
76     &mov    (&DWP(4*4,"esp"),$a4); # a4
77     &xor    ($a4,$a2); # a2=a4^a2^a4
78     &pand    ($B31,$b);
79     &pcmpgtd($B30,$a); # broadcast 30th bit
80     &mov    (&DWP(5*4,"esp"),$a1); # a1^a4
81     &xor    ($a4,$a1); # a1^a2^a4
82     &psllq    ($B31,31);
83     &pand    ($B30,$b);
84     &mov    (&DWP(6*4,"esp"),$a2); # a2^a4
85     &mov    (@i[0],0x7);
86     &mov    (&DWP(7*4,"esp"),$a4); # a1^a2^a4
87     &mov    ($a4,@i[0]);
88     &and    (@i[0],$b);
89     &shr    ($b,3);
90     &mov    (@i[1],$a4);
91     &psllq    ($B30,30);
92     &and    (@i[1],$b);
93     &shr    ($b,3);
94     &movd    ($R,&DWP(0,"esp",@i[0],4));
95     &mov    (@i[0],$a4);
96     &and    (@i[0],$b);
97     &shr    ($b,3);
98     for($n=1;$n<9;$n++) {
99         &movd    (@T[1],&DWP(0,"esp",@i[1],4));
100         &mov    (@i[1],$a4);
101         &psllq    (@T[1],3*$n);
102         &and    (@i[1],$b);
103         &shr    ($b,3);
104         &pxor    ($R,@T[1]);

106     push(@i,shift(@i)); push(@T,shift(@T));
107 }
108 &movd    (@T[1],&DWP(0,"esp",@i[1],4));
109 &pxor    ($R,$B30);
110 &psllq    (@T[1],3*$n++);
111 &pxor    ($R,@T[1]);

113 &movd    (@T[0],&DWP(0,"esp",@i[0],4));
114 &pxor    ($R,$B31);
115 &psllq    (@T[0],3*$n);
116 &add    ("esp",32+4);
117 &pxor    ($R,@T[0]);
118 &ret    ();
119 &function_end_B("_mul_1x1_mmx");
120 }

122 ($lo,$hi)=("eax","edx");
123 @T=("ecx","ebp");

125 &function_begin_B("_mul_1x1_ialu");
126     &sub    ("esp",32+4);
127     &mov    ($a1,$a);
```

```

128     &lea    ($a2,&DWP(0,$a,$a));
129     &lea    ($a4,&DWP(0,"", $a,4));
130     &and    ($a1,0x3fffffff);
131     &lea    (@i[1],&DWP(0,$lo,$lo));
132     &sar    ($lo,31);           # broadcast 31st bit
133     &mov    (&DWP(0*4,"esp"),0);
134     &and    ($a2,0xffffffff);
135     &mov    (&DWP(1*4,"esp"),$a1); # a1
136     &xor    ($a1,$a2);          # a1^a2
137     &mov    (&DWP(2*4,"esp"),$a2); # a2
138     &xor    ($a2,$a4);          # a2^a4
139     &mov    (&DWP(3*4,"esp"),$a1); # a1^a2
140     &xor    ($a1,$a2);          # a1^a4=a1^a2^a2^a4
141     &mov    (&DWP(4*4,"esp"),$a4); # a4
142     &xor    ($a4,$a2);          # a2=a4^a2^a4
143     &mov    (&DWP(5*4,"esp"),$a1); # a1^a4
144     &xor    ($a4,$a1);          # a1^a2^a4
145     &sar    (@i[1],31);          # broadcast 30th bit
146     &and    ($lo,$b);
147     &mov    (&DWP(6*4,"esp"),$a2); # a2^a4
148     &and    (@i[1],$b);
149     &mov    (&DWP(7*4,"esp"),$a4); # a1^a2^a4
150     &mov    ($hi,$lo);
151     &shl    ($lo,31);
152     &mov    (@T[0],@i[1]);
153     &shr    ($hi,1);

155     &mov    (@i[0],0x7);
156     &shl    (@i[1],30);
157     &and    (@i[0],$b);
158     &shr    (@T[0],2);
159     &xor    ($lo,@i[1]);

161     &shr    ($b,3);
162     &mov    (@i[1],0x7);          # 5-byte instruction!?
163     &and    (@i[1],$b);
164     &shr    ($b,3);
165     &xor    ($hi,@T[0]);
166     &xor    ($lo,&DWP(0,"esp",@i[0],4));
167     &mov    (@i[0],0x7);
168     &and    (@i[0],$b);
169     &shr    ($b,3);
170     for($n=1;$n<9;$n++) {
171         &mov    (@T[1],&DWP(0,"esp",@i[1],4));
172         &mov    (@i[1],0x7);
173         &mov    (@T[0],@T[1]);
174         &shl    (@T[1],3*$n);
175         &and    (@i[1],$b);
176         &shr    (@T[0],32-3*$n);
177         &xor    ($lo,@T[1]);
178         &shr    ($b,3);
179         &xor    ($hi,@T[0]);

181     }
182     push(@i,shift(@i)); push(@T,shift(@T));
183     &mov    (@T[1],&DWP(0,"esp",@i[1],4));
184     &mov    (@T[0],@T[1]);
185     &shl    (@T[1],3*$n);
186     &mov    (@i[1],&DWP(0,"esp",@i[0],4));
187     &shr    (@T[0],32-3*$n); $n++;
188     &mov    (@i[0],@i[1]);
189     &xor    ($lo,@T[1]);
190     &shl    (@i[1],3*$n);
191     &xor    ($hi,@T[0]);
192     &shr    (@i[0],32-3*$n);
193     &xor    ($lo,@i[1]);

```

```

194     &xor    ($hi,@i[0]);

196     &add    ("esp",32+4);
197     &ret    ();
198 &function_end_B("_mul_1x1_ialu");

200 # void bn_GF2m_mul_2x2(BN_ULONG *r, BN_ULONG a1, BN_ULONG a0, BN_ULONG b1, BN_ULONG b0)
201 &function_begin_B("bn_GF2m_mul_2x2");
202 if (!$x86only) {
203     &picmeup("edx","OPENSSL_ia32cap_P");
204     &mov    ("eax",&DWP(0,"edx"));
205     &mov    ("edx",&DWP(4,"edx"));
206     &test    ("eax",1<<23);          # check MMX bit
207     &jz      (&label("ialu"));
208     if ($sse2) {
209         &test    ("eax",1<<24);          # check FXSR bit
210         &jz      (&label("mmx"));
211         &test    ("edx",1<<1);          # check PCLMULQDQ bit
212         &jz      (&label("mmx"));

214         &movups    ("xmm0",&QWP(8,"esp"));
215         &shufps    ("xmm0","xmm0",0b10110001);
216         &pclmulq    ("xmm0","xmm0",1);
217         &mov    ("eax",&DWP(4,"esp"));
218         &movups    (&QWP(0,"eax"),"xmm0");
219         &ret    ();

221 &set_label("mmx",16);
222 }
223     &push    ("ebp");
224     &push    ("ebx");
225     &push    ("esi");
226     &push    ("edi");
227     &mov    ($a,&wparam(1));
228     &mov    ($b,&wparam(3));
229     &call    ("_mul_1x1_mmx");          # a1*b1
230     &movq    ("mm7",$R);

232     &mov    ($a,&wparam(2));
233     &mov    ($b,&wparam(4));
234     &call    ("_mul_1x1_mmx");          # a0*b0
235     &movq    ("mm6",$R);

237     &mov    ($a,&wparam(1));
238     &mov    ($b,&wparam(3));
239     &xor    ($a,&wparam(2));
240     &xor    ($b,&wparam(4));
241     &call    ("_mul_1x1_mmx");          # (a0+a1)*(b0+b1)
242     &pxor    ($R,"mm7");
243     &mov    ($a,&wparam(0));
244     &pxor    ($R,"mm6");          # (a0+a1)*(b0+b1)-a1*b1-a0*b0

246     &movq    ($a,$R);
247     &psllq    ($R,32);
248     &pop    ("edi");
249     &psrlq    ($a,32);
250     &pop    ("esi");
251     &pxor    ($R,"mm6");
252     &pop    ("ebx");
253     &pxor    ($a,"mm7");
254     &movq    (&QWP(0,$a),$R);
255     &pop    ("ebp");
256     &movq    (&QWP(8,$a),$a);
257     &emms    ();
258     &ret    ();
259 &set_label("ialu",16);

```

```

260 }
261     &push    ("ebp");
262     &push    ("ebx");
263     &push    ("esi");
264     &push    ("edi");
265     &stack_push(4+1);

267     &mov     ($a,&wparam(1));
268     &mov     ($b,&wparam(3));
269     &call    ("_mul_1x1_ialu");      # a1•b1
270     &mov     (&DWP(8,"esp"),$lo);
271     &mov     (&DWP(12,"esp"),$hi);

273     &mov     ($a,&wparam(2));
274     &mov     ($b,&wparam(4));
275     &call    ("_mul_1x1_ialu");      # a0•b0
276     &mov     (&DWP(0,"esp"),$lo);
277     &mov     (&DWP(4,"esp"),$hi);

279     &mov     ($a,&wparam(1));
280     &mov     ($b,&wparam(3));
281     &xor     ($a,&wparam(2));
282     &xor     ($b,&wparam(4));
283     &call    ("_mul_1x1_ialu");      # (a0+a1)•(b0+b1)

285     &mov     ("ebp",&wparam(0));
286     @r=("ebx","ecx","edi","esi");
287     &mov     (@r[0],&DWP(0,"esp"));
288     &mov     (@r[1],&DWP(4,"esp"));
289     &mov     (@r[2],&DWP(8,"esp"));
290     &mov     (@r[3],&DWP(12,"esp"));

292     &xor     ($lo,$hi);
293     &xor     ($hi,@r[1]);
294     &xor     ($lo,@r[0]);
295     &mov     (&DWP(0,"ebp"),@r[0]);
296     &xor     ($hi,@r[2]);
297     &mov     (&DWP(12,"ebp"),@r[3]);
298     &xor     ($lo,@r[3]);
299     &stack_pop(4+1);
300     &xor     ($hi,@r[3]);
301     &pop     ("edi");
302     &xor     ($lo,$hi);
303     &pop     ("esi");
304     &mov     (&DWP(8,"ebp"),$hi);
305     &pop     ("ebx");
306     &mov     (&DWP(4,"ebp"),$lo);
307     &pop     ("ebp");
308     &ret     ();
309 &function_end_B("bn_GF2m_mul_2x2");

311 &asciz    ("GF(2^m) Multiplication for x86, CRYPTOGAMS by <appro@openssl.org>");
313 &asm_finish();

```



```

105 if($sse2) {
106   $acc0="mm0";      # mmx register bank layout
107   $acc1="mm1";
108   $scar0="mm2";
109   $scar1="mm3";
110   $mul0="mm4";
111   $mul1="mm5";
112   $temp="mm6";
113   $mask="mm7";

115   &picmeup("eax", "OPENSSL_ia32cap_P");
116   &bt      (&DWP(0,"eax"),26);
117   &jnc     (&label("non_sse2"));

119   &mov     ("eax",-1);
120   &movd    ($mask,"eax");      # mask 32 lower bits

122   &mov     ($ap,$_ap);        # load input pointers
123   &mov     ($bp,$_bp);
124   &mov     ($np,$_np);

126   &xor     ($i,$i);           # i=0
127   &xor     ($j,$j);           # j=0

129   &movd    ($mul0,&DWP(0,$bp)); # bp[0]
130   &movd    ($mul1,&DWP(0,$ap)); # ap[0]
131   &movd    ($scar1,&DWP(0,$np)); # np[0]

133   &pmulduq($mul1,$mul0);      # ap[0]*bp[0]
134   &movq     ($scar0,$mul1);
135   &movq     ($acc0,$mul1);
136   &pand     ($acc0,$mask);
137   # I wish movd worked for
138   # inter-register transfers

138   &pmulduq($mul1,$_n0);      # *=n0

140   &pmulduq($scar1,$mul1);
141   &paddq    ($scar1,$acc0);    # "t[0]"*np[0]*n0

143   &movd    ($acc1,&DWP(4,$np)); # np[1]
144   &movd    ($acc0,&DWP(4,$ap)); # ap[1]

146   &psrlq   ($scar0,32);
147   &psrlq   ($scar1,32);

149   &inc     ($j);              # j++
150   &set_label("1st",16);
151   &pmulduq($acc0,$mul0);      # ap[j]*bp[0]
152   &pmulduq($acc1,$mul1);      # np[j]*m1
153   &paddq    ($scar0,$acc0);    # +=c0
154   &paddq    ($scar1,$acc1);    # +=c1

156   &movq     ($acc0,$scar0);
157   &pand     ($acc0,$mask);
158   &movd     ($acc1,&DWP(4,$np,$j,4)); # np[j+1]
159   &paddq    ($scar1,$acc0);      # +=ap[j]*bp[0];
160   &movd     ($acc0,&DWP(4,$ap,$j,4)); # ap[j+1]
161   &psrlq    ($scar0,32);
162   &movd     (&DWP($frame-4,"esp",$j,4),$scar1); # tp[j-1]=
163   &psrlq    ($scar1,32);

165   &lea     ($j,&DWP(1,$j));
166   &cmp     ($j,$num);
167   &jl      (&label("1st"));

169   &pmulduq($acc0,$mul0);      # ap[num-1]*bp[0]
170   &pmulduq($acc1,$mul1);      # np[num-1]*m1

```

```

171   &paddq    ($scar0,$acc0);      # +=c0
172   &paddq    ($scar1,$acc1);      # +=c1

174   &movq     ($acc0,$scar0);
175   &pand     ($acc0,$mask);
176   &paddq    ($scar1,$acc0);
177   &movd     (&DWP($frame-4,"esp",$j,4),$scar1); # +=ap[num-1]*bp[0];
178   # tp[num-2]=

179   &psrlq    ($scar0,32);
180   &psrlq    ($scar1,32);

182   &paddq    ($scar1,$scar0);
183   &movq     (&QWP($frame,"esp",$num,4),$scar1); # tp[num].tp[num-1]

```

```

184      &inc      ($i);                # i++
185  &set_label("outer");
186      &xor      ($j,$j);                # j=0

188      &movd     ($mul0,&DWP(0,$bp,$i,4)); # bp[i]
189      &movd     ($mul1,&DWP(0,$ap));      # ap[0]
190      &movd     ($temp,&DWP($frame,"esp")); # tp[0]
191      &movd     ($scar1,&DWP(0,$np));      # np[0]
192      &pmuludq  ($mul1,$mul0);           # ap[0]*bp[i]

194      &paddq    ($mul1,$temp);           # +=tp[0]
195      &movq     ($acc0,$mul1);
196      &movq     ($scar0,$mul1);
197      &pand     ($acc0,$mask);

199      &pmuludq  ($mul1,$_n0q);           # *=n0

201      &pmuludq  ($scar1,$mul1);
202      &paddq    ($scar1,$acc0);

204      &movd     ($temp,&DWP($frame+4,"esp")); # tp[1]
205      &movd     ($acc1,&DWP(4,$np));        # np[1]
206      &movd     ($acc0,&DWP(4,$ap));        # ap[1]

208      &psrlq   ($scar0,32);
209      &psrlq   ($scar1,32);
210      &paddq   ($scar0,$temp);           # +=tp[1]

212      &inc     ($j);                # j++
213      &dec     ($num);
214  &set_label("inner");
215      &pmuludq ($acc0,$mul0);        # ap[j]*bp[i]
216      &pmuludq ($acc1,$mul1);        # np[j]*m1
217      &paddq   ($scar0,$acc0);        # +=c0
218      &paddq   ($scar1,$acc1);        # +=c1

220      &movq    ($acc0,$scar0);
221      &movd    ($temp,&DWP($frame+4,"esp",$j,4)); # tp[j+1]
222      &pand    ($acc0,$mask);
223      &movd    ($acc1,&DWP(4,$np,$j,4)); # np[j+1]
224      &paddq   ($scar1,$acc0);        # +=ap[j]*bp[i]+tp[j]
225      &movd    ($acc0,&DWP(4,$ap,$j,4)); # ap[j+1]
226      &psrlq   ($scar0,32);
227      &movd    (&DWP($frame-4,"esp",$j,4),$scar1); # tp[j-1]=
228      &psrlq   ($scar1,32);
229      &paddq   ($scar0,$temp);        # +=tp[j+1]

231      &dec     ($num);
232      &lea     ($j,&DWP(1,$j));        # j++
233      &jnz     (&label("inner"));

235      &mov     ($num,$j);
236      &pmuludq ($acc0,$mul0);        # ap[num-1]*bp[i]
237      &pmuludq ($acc1,$mul1);        # np[num-1]*m1
238      &paddq   ($scar0,$acc0);        # +=c0
239      &paddq   ($scar1,$acc1);        # +=c1

241      &movq    ($acc0,$scar0);
242      &pand    ($acc0,$mask);
243      &paddq   ($scar1,$acc0);        # +=ap[num-1]*bp[i]+tp[num-1]
244      &movd    (&DWP($frame-4,"esp",$j,4),$scar1); # tp[num-2]=
245      &psrlq   ($scar0,32);
246      &psrlq   ($scar1,32);

248      &movd    ($temp,&DWP($frame+4,"esp",$num,4)); # += tp[num]
249      &paddq   ($scar1,$scar0);

```

```

250      &paddq   ($scar1,$temp);
251      &movq    (&QWP($frame,"esp",$num,4),$scar1); # tp[num].tp[num-1]

253      &lea     ($i,&DWP(1,$i));        # i++
254      &cmp     ($i,$num);
255      &jle     (&label("outer"));

257      &emms    ();                    # done with mmx bank
258      &jmp     (&label("common_tail"));

260  &set_label("non_sse2",16);
261  }

```

```

262 if (0) {
263     &mov    ("esp", $sp);
264     &xor    ("eax", "eax"); # signal "not fast enough [yet]"
265     &jmp    (&label("just_leave"));
266     # While the below code provides competitive performance for
267     # all key lengths on modern Intel cores, it's still more
268     # than 10% slower for 4096-bit key elsewhere:-( "Competitive"
269     # means compared to the original integer-only assembler.
270     # 512-bit RSA sign is better by ~40%, but that's about all
271     # one can say about all CPUs...
272 } else {
273     $inp="esi"; # integer path uses these registers differently
274     $word="edi";
275     $carry="ebp";

277     &mov    ($inp, $ap);
278     &lea    ($carry, &DWP(1, $num));
279     &mov    ($word, $bp);
280     &xor    ($j, $j); # j=0
281     &mov    ("edx", $inp);
282     &and    ($carry, 1); # see if num is even
283     &sub    ("edx", $word); # see if ap==bp
284     &lea    ("eax", &DWP(4, $word, $num, 4)); # &bp[num]
285     &or     ($carry, "edx");
286     &mov    ($word, &DWP(0, $word)); # bp[0]
287     &jz     (&label("bn_sqr_mont"));
288     &mov    ($_bpend, "eax");
289     &mov    ("eax", &DWP(0, $inp));
290     &xor    ("edx", "edx");

292 &set_label("mull", 16);
293     &mov    ($carry, "edx");
294     &mul    ($word); # ap[j]*bp[0]
295     &add    ($carry, "eax");
296     &lea    ($j, &DWP(1, $j));
297     &adc    ("edx", 0);
298     &mov    ("eax", &DWP(0, $inp, $j, 4)); # ap[j+1]
299     &cmp    ($j, $num);
300     &mov    (&DWP($frame-4, "esp", $j, 4), $carry); # tp[j]=
301     &jl     (&label("mull"));

303     &mov    ($carry, "edx");
304     &mul    ($word); # ap[num-1]*bp[0]
305     &mov    ($word, $n0);
306     &add    ("eax", $carry);
307     &mov    ($inp, $np);
308     &adc    ("edx", 0);
309     &imul   ($word, &DWP($frame, "esp")); # n0*tp[0]

311     &mov    (&DWP($frame, "esp", $num, 4), "eax"); # tp[num-1]=
312     &xor    ($j, $j);
313     &mov    (&DWP($frame+4, "esp", $num, 4), "edx"); # tp[num]=
314     &mov    (&DWP($frame+8, "esp", $num, 4), $j); # tp[num+1]=

316     &mov    ("eax", &DWP(0, $inp)); # np[0]
317     &mul    ($word); # np[0]*m
318     &add    ("eax", &DWP($frame, "esp")); # +=tp[0]
319     &mov    ("eax", &DWP(4, $inp)); # np[1]
320     &adc    ("edx", 0);
321     &inc    ($j);

323     &jmp    (&label("2ndmadd"));

```



```

324 &set_label("1stmadd",16);
325     &mov    ($carry,"edx");
326     &mul    ($sword);
327     &add    ($carry,&DWP($frame,"esp",$j,4));
328     &lea    ($j,&DWP(1,$j));
329     &adc    ("edx",0);
330     &add    ($carry,"eax");
331     &mov    ("eax",&DWP(0,$inp,$j,4));
332     &adc    ("edx",0);
333     &cmp    ($j,$num);
334     &mov    (&DWP($frame-4,"esp",$j,4),$carry);
335     &jl     (&label("1stmadd"));

337     &mov    ($carry,"edx");
338     &mul    ($sword);
339     &add    ("eax",&DWP($frame,"esp",$num,4));
340     &mov    ($sword,$_n0);
341     &adc    ("edx",0);
342     &mov    ($inp,$_np);
343     &add    ($carry,"eax");
344     &adc    ("edx",0);
345     &imul   ($sword,&DWP($frame,"esp"));

347     &xor    ($j,$j);
348     &add    ("edx",&DWP($frame+4,"esp",$num,4));
349     &mov    (&DWP($frame,"esp",$num,4),$carry);
350     &adc    ($j,0);
351     &mov    ("eax",&DWP(0,$inp));
352     &mov    (&DWP($frame+4,"esp",$num,4),"edx");
353     &mov    (&DWP($frame+8,"esp",$num,4),$j);

355     &mul    ($sword);
356     &add    ("eax",&DWP($frame,"esp"));
357     &mov    ("eax",&DWP(4,$inp));
358     &adc    ("edx",0);
359     &mov    ($j,1);

```

```

360 &set_label("2ndmadd",16);
361     &mov    ($carry,"edx");
362     &mul    ($sword);
363     &add    ($carry,&DWP($frame,"esp",$j,4));
364     &lea    ($j,&DWP(1,$j));
365     &adc    ("edx",0);
366     &add    ($carry,"eax");
367     &mov    ("eax",&DWP(0,$inp,$j,4));
368     &adc    ("edx",0);
369     &cmp    ($j,$num);
370     &mov    (&DWP($frame-8,"esp",$j,4),$carry);
371     &jl     (&label("2ndmadd"));

373     &mov    ($carry,"edx");
374     &mul    ($sword);
375     &add    ($carry,&DWP($frame,"esp",$num,4));
376     &adc    ("edx",0);
377     &add    ($carry,"eax");
378     &adc    ("edx",0);
379     &mov    (&DWP($frame-4,"esp",$num,4),$carry);

381     &xor    ("eax","eax");
382     &mov    ($j,$_bp);
383     &add    ("edx",&DWP($frame+4,"esp",$num,4));
384     &adc    ("eax",&DWP($frame+8,"esp",$num,4));
385     &lea    ($j,&DWP(4,$j));
386     &mov    (&DWP($frame,"esp",$num,4),"edx");
387     &cmp    ($j,$_bpend);
388     &mov    (&DWP($frame+4,"esp",$num,4),"eax");
389     &jc     (&label("common_tail"));

391     &mov    ($sword,&DWP(0,$j));
392     &mov    ($inp,$_ap);
393     &mov    ($_bp,$j);
394     &xor    ($j,$j);
395     &xor    ("edx","edx");
396     &mov    ("eax",&DWP(0,$inp));
397     &jmp    (&label("1stmadd"));

```

```

398 &set_label("bn_sqr_mont", 16);
399 $sbit=$num;
400     &mov    ($_num,$num);
401     &mov    ($_bp,$j);                # i=0
402
403     &mov    ("eax", $sword);          # ap[0]
404     &mul    ($sword);                 # ap[0]*ap[0]
405     &mov    (&DWP($frame, "esp"), "eax"); # tp[0]=
406     &mov    ($sbit, "edx");
407     &shr    ("edx", 1);
408     &and    ($sbit, 1);
409     &inc    ($j);
410 &set_label("sqr", 16);
411     &mov    ("eax", &DWP(0, $inp, $j, 4)); # ap[j]
412     &mov    ($carry, "edx");
413     &mul    ($sword);                 # ap[j]*ap[0]
414     &add    ("eax", $carry);
415     &lea    ($j, &DWP(1, $j));
416     &adc    ("edx", 0);
417     &lea    ($carry, &DWP(0, $sbit, "eax", 2));
418     &shr    ("eax", 31);
419     &cmp    ($j, $_num);
420     &mov    ($sbit, "eax");
421     &mov    (&DWP($frame-4, "esp", $j, 4), $carry); # tp[j]=
422     &jl     (&label("sqr"));
423
424     &mov    ("eax", &DWP(0, $inp, $j, 4)); # ap[num-1]
425     &mov    ($carry, "edx");
426     &mul    ($sword);                 # ap[num-1]*ap[0]
427     &add    ("eax", $carry);
428     &mov    ($sword, $_n0);
429     &adc    ("edx", 0);
430     &mov    ($inp, $_np);
431     &lea    ($carry, &DWP(0, $sbit, "eax", 2));
432     &imul   ($sword, &DWP($frame, "esp")); # n0*tp[0]
433     &shr    ("eax", 31);
434     &mov    (&DWP($frame, "esp", $j, 4), $carry); # tp[num-1]=
435
436     &lea    ($carry, &DWP(0, "eax", "edx", 2));
437     &mov    ("eax", &DWP(0, $inp)); # np[0]
438     &shr    ("edx", 31);
439     &mov    (&DWP($frame+4, "esp", $j, 4), $carry); # tp[num]=
440     &mov    (&DWP($frame+8, "esp", $j, 4), "edx"); # tp[num+1]=
441
442     &mul    ($sword);                # np[0]*m
443     &add    ("eax", &DWP($frame, "esp")); # +=tp[0]
444     &mov    ($num, $j);
445     &adc    ("edx", 0);
446     &mov    ("eax", &DWP(4, $inp)); # np[1]
447     &mov    ($j, 1);

```

```

448 &set_label("3rdmadd",16);
449     &mov     ($carry,"edx");
450     &mul     ($sword);
451     &add     ($carry,&DWP($frame,"esp",$j,4));
452     &adc     ("edx",0);
453     &add     ($carry,"eax");
454     &mov     ("eax",&DWP(4,$inp,$j,4));
455     &adc     ("edx",0);
456     &mov     (&DWP($frame-4,"esp",$j,4),$carry);

458     &mov     ($carry,"edx");
459     &mul     ($sword);
460     &add     ($carry,&DWP($frame+4,"esp",$j,4));
461     &lea     ($j,&DWP(2,$j));
462     &adc     ("edx",0);
463     &add     ($carry,"eax");
464     &mov     ("eax",&DWP(0,$inp,$j,4));
465     &adc     ("edx",0);
466     &cmp     ($j,$num);
467     &mov     (&DWP($frame-8,"esp",$j,4),$carry);
468     &jl      (&label("3rdmadd"));

470     &mov     ($carry,"edx");
471     &mul     ($sword);
472     &add     ($carry,&DWP($frame,"esp",$num,4));
473     &adc     ("edx",0);
474     &add     ($carry,"eax");
475     &adc     ("edx",0);
476     &mov     (&DWP($frame-4,"esp",$num,4),$carry);

478     &mov     ($j,$_bp);
479     &xor     ("eax","eax");
480     &mov     ($inp,$_ap);
481     &add     ("edx",&DWP($frame+4,"esp",$num,4));
482     &adc     ("eax",&DWP($frame+8,"esp",$num,4));
483     &mov     (&DWP($frame,"esp",$num,4),"edx");
484     &cmp     ($j,$num);
485     &mov     (&DWP($frame+4,"esp",$num,4),"eax");
486     &jc      (&label("common_tail"));

```

```

487     &mov     ($sword,&DWP(4,$inp,$j,4));
488     &lea     ($j,&DWP(1,$j));
489     &mov     ("eax",$sword);
490     &mov     ($_bp,$j);
491     &mul     ($sword);
492     &add     ("eax",&DWP($frame,"esp",$j,4));
493     &adc     ("edx",0);
494     &mov     (&DWP($frame,"esp",$j,4),"eax");
495     &xor     ($carry,$carry);
496     &cmp     ($j,$num);
497     &lea     ($j,&DWP(1,$j));
498     &jc      (&label("sqrlast"));

500     &mov     ($sbit,"edx");
501     &shr     ("edx",1);
502     &and     ($sbit,1);
503 &set_label("sqrradd",16);
504     &mov     ("eax",&DWP(0,$inp,$j,4));
505     &mov     ($carry,"edx");
506     &mul     ($sword);
507     &add     ("eax",$carry);
508     &lea     ($carry,&DWP(0,"eax","eax"));
509     &adc     ("edx",0);
510     &shr     ("eax",31);
511     &add     ($carry,&DWP($frame,"esp",$j,4));
512     &lea     ($j,&DWP(1,$j));
513     &adc     ("eax",0);
514     &add     ($carry,$sbit);
515     &adc     ("eax",0);
516     &cmp     ($j,$_num);
517     &mov     (&DWP($frame-4,"esp",$j,4),$carry);
518     &mov     ($sbit,"eax");
519     &jle     (&label("sqrradd"));

521     &mov     ($carry,"edx");
522     &add     ("edx","edx");
523     &shr     ($carry,31);
524     &add     ("edx",$sbit);
525     &adc     ($carry,0);
526 &set_label("sqrlast");
527     &mov     ($sword,$_n0);
528     &mov     ($inp,$_np);
529     &imul     ($sword,&DWP($frame,"esp"));

531     &add     ("edx",&DWP($frame,"esp",$j,4));
532     &mov     ("eax",&DWP(0,$inp));
533     &adc     ($carry,0);
534     &mov     (&DWP($frame,"esp",$j,4),"edx");
535     &mov     (&DWP($frame+4,"esp",$j,4),$carry);

537     &mul     ($sword);
538     &add     ("eax",&DWP($frame,"esp"));
539     &lea     ($num,&DWP(-1,$j));
540     &adc     ("edx",0);
541     &mov     ($j,1);
542     &mov     ("eax",&DWP(4,$inp));

544     &jmp     (&label("3rdmadd"));
545 }

```

```
546 &set_label("common_tail",16);
547     &mov     ($np,$_np);          # load modulus pointer
548     &mov     ($rp,$_rp);          # load result pointer
549     &lea     ($stp,&DWP($frame,"esp")); # [$ap and $bp are zapped]

551     &mov     ("eax",&DWP(0,$stp)); # tp[0]
552     &mov     ($j,$num);           # j=num-1
553     &xor     ($i,$i);             # i=0 and clear CF!

555 &set_label("sub",16);
556     &sbb     ("eax",&DWP(0,$np,$i,4));
557     &mov     (&DWP(0,$rp,$i,4),"eax"); # rp[i]=tp[i]-np[i]
558     &dec     ($j);               # doesn't affect CF!
559     &mov     ("eax",&DWP(4,$stp,$i,4)); # tp[i+1]
560     &lea     ($i,&DWP(1,$i));      # i++
561     &jge     (&label("sub"));

563     &sbb     ("eax",0);           # handle upmost overflow bit
564     &and     ($stp,"eax");
565     &not     ("eax");
566     &mov     ($np,$rp);
567     &and     ($np,"eax");
568     &or      ($stp,$np);         # tp=carry?tp:rp

570 &set_label("copy",16);         # copy or in-place refresh
571     &mov     ("eax",&DWP(0,$stp,$num,4));
572     &mov     (&DWP(0,$rp,$num,4),"eax"); # rp[i]=tp[i]
573     &mov     (&DWP($frame,"esp",$num,4),$j); # zap temporary vector
574     &dec     ($num);
575     &jge     (&label("copy"));

577     &mov     ("esp",$_sp);       # pull saved stack pointer
578     &mov     ("eax",1);
579 &set_label("just_leave");
580 &function_end("bn_mul_mont");

582 &asciz("Montgomery Multiplication for x86, CRYPTOGAMS by <appro@openssl.org>");
584 &asm_finish();
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-gf2m.pl

1

```
*****
8577 Fri May 30 18:32:05 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-gf2m.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl
2 #
3 # =====
4 # Written by Andy Polyakov <appro@openssl.org> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====
9 #
10 # May 2011
11 #
12 # The module implements bn_GF2m_mul_2x2 polynomial multiplication used
13 # in bn_gf2m.c. It's kind of low-hanging mechanical port from C for
14 # the time being... Except that it has two code paths: code suitable
15 # for any x86_64 CPU and PCLMULQDQ one suitable for Westmere and
16 # later. Improvement varies from one benchmark and µ-arch to another.
17 # Vanilla code path is at most 20% faster than compiler-generated code
18 # [not very impressive], while PCLMULQDQ - whole 85%-160% better on
19 # 163- and 571-bit ECDH benchmarks on Intel CPUs. Keep in mind that
20 # these coefficients are not ones for bn_GF2m_mul_2x2 itself, as not
21 # all CPU time is burnt in it...

23 $flavour = shift;
24 $output = shift;
25 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

27 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

29 $0 =~ m/([^\s/\\])[^^\s/\\]+$/; $dir=$1;
30 ( $xlate="$dir/x86_64-xlate.pl" and -f $xlate ) or
31 ( $xlate="$dir/../perlasm/x86_64-xlate.pl" and -f $xlate ) or
32 die "can't locate x86_64-xlate.pl";

34 open OUT,"| \"$X\" $xlate $flavour $output";
35 *STDOUT=*OUT;

37 ($lo,$hi)=("%rax","%rdx");      $a=$lo;
38 ($i0,$i1)=("%rsi","%rdi");
39 ($t0,$t1)=("%rbx","%rcx");
40 ($b,$mask)=("%rbp","%r8");
41 ($a1,$a2,$a4,$a8,$a12,$a48)=map("%r$_",(9..15));
42 ($R,$Tx)=("%xmm0","%xmm1");

44 $code.=<<__;;
45 .text

47 .type    _mul_1x1,@abi-omnipotent
48 .align 16
49 _mul_1x1:
50     sub    \%128+8,%rsp
51     mov    \% -1,$a1
52     lea    ($a,$a),%i0
53     shr    \%3,$a1
54     lea    (,$a,4),%i1
55     and    $a,$a1                # a1=a0x1ffffffffffffffff
56     lea    (,$a,8),%a8
57     sar    \%63,$a               # broadcast 63rd bit
58     lea    ($a1,$a1),%a2
59     sar    \%63,%i0              # broadcast 62nd bit
60     lea    (,$a1,4),%a4
61     and    $b,$a
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-gf2m.pl

2

```
62     sar    \%63,%i1              # broadcast 61st bit
63     mov    $a,$hi               # $a is $lo
64     shl    \%63,$lo
65     and    $b,$i0
66     shr    \%1,$hi
67     mov    %i0,%t1
68     shl    \%62,%i0
69     and    $b,%i1
70     shr    \%2,%t1
71     xor    %i0,%lo
72     mov    %i1,%t0
73     shl    \%61,%i1
74     xor    %t1,%hi
75     shr    \%3,%t0
76     xor    %i1,%lo
77     xor    %t0,%hi

79     mov    $a1,$a12
80     movq    \%0,0(%rsp)          # tab[0]=0
81     xor     $a2,$a12            # a1^a2
82     mov     $a1,8(%rsp)         # tab[1]=a1
83     mov     $a4,$a48
84     mov     $a2,16(%rsp)        # tab[2]=a2
85     xor     $a8,$a48           # a4^a8
86     mov     $a12,24(%rsp)      # tab[3]=a1^a2

88     xor     $a4,$a1
89     mov     $a4,32(%rsp)       # tab[4]=a4
90     xor     $a4,$a2
91     mov     $a1,40(%rsp)      # tab[5]=a1^a4
92     xor     $a4,$a12
93     mov     $a2,48(%rsp)      # tab[6]=a2^a4
94     xor     $a48,$a1          # a1^a4^a4^a8=a1^a8
95     mov     $a12,56(%rsp)     # tab[7]=a1^a2^a4
96     xor     $a48,$a2          # a2^a4^a4^a8=a1^a8

98     mov     $a8,64(%rsp)      # tab[8]=a8
99     xor     $a48,$a12         # a1^a2^a4^a4^a8=a1^a2^a8
100    mov     $a1,72(%rsp)      # tab[9]=a1^a8
101    xor     $a4,$a1           # a1^a8^a4
102    mov     $a2,80(%rsp)      # tab[10]=a2^a8
103    xor     $a4,$a2           # a2^a8^a4
104    mov     $a12,88(%rsp)     # tab[11]=a1^a2^a8

106    xor     $a4,$a12          # a1^a2^a8^a4
107    mov     $a48,96(%rsp)     # tab[12]=a4^a8
108    mov     $mask,%i0
109    mov     $a1,104(%rsp)     # tab[13]=a1^a4^a8
110    and     $b,%i0
111    mov     $a2,112(%rsp)     # tab[14]=a2^a4^a8
112    shr     \%4,$b
113    mov     $a12,120(%rsp)    # tab[15]=a1^a2^a4^a8
114    mov     $mask,%i1
115    and     $b,%i1
116    shr     \%4,$b

118    movq    (%rsp,%i0,8),$R    # half of calculations is done in SSE2
119    mov     $mask,%i0
120    and     $b,%i0
121    shr     \%4,$b

122    for ($n=1;$n<8;$n++) {
123        $code.=<<__;;
124        mov     (%rsp,%i1,8),%t1
125        mov     $mask,%i1
126        mov     %t1,%t0
127
```

```

128     shl     \${8*$n-4}', $t1
129     and     $b, $i1
130     movq    (%rsp, $i0, 8), $Tx
131     shr     \${64-(8*$n-4)}', $t0
132     xor     $t1, $lo
133     pslldq  \${$n, $Tx
134     mov     $mask, $i0
135     shr     \${4, $b
136     xor     $t0, $hi
137     and     $b, $i0
138     shr     \${4, $b
139     pxor    $Tx, $R
140     ____
141     }
142     $code.=<<____;
143     mov     (%rsp, $i1, 8), $t1
144     mov     $t1, $t0
145     shl     \${8*$n-4}', $t1
146     movq    $R, $i0
147     shr     \${64-(8*$n-4)}', $t0
148     xor     $t1, $lo
149     psrldq  \${8, $R
150     xor     $t0, $hi
151     movq    $R, $i1
152     xor     $i0, $lo
153     xor     $i1, $hi

155     add     \${128+8}, %rsp
156     ret
157 .Lend_mul_1x1:
158 .size      _mul_1x1, .-_mul_1x1
159 ____

161 ($Rp, $a1, $a0, $b1, $b0) = $win64? ("%rcx", "%rdx", "%r8", "%r9", "%r10") : # Win64
162 ("%rdi", "%rsi", "%rdx", "%rcx", "%r8"); # Unix o

164 $code.=<<____;
165 .extern OPENSSL_ia32cap_P
166 .globl bn_GF2m_mul_2x2
167 .type bn_GF2m_mul_2x2, @abi-omnipotent
168 .align 16
169 bn_GF2m_mul_2x2:
170     mov     OPENSSL_ia32cap_P(%rip), %rax
171     bt     \${33, %rax
172     jnc     .Lvanilla_mul_2x2

174     movq    $a1, %xmm0
175     movq    $b1, %xmm1
176     movq    $a0, %xmm2
177 ____
178 $code.=<<____ if ($win64);
179     movq    40(%rsp), %xmm3
180 ____
181 $code.=<<____ if (!$win64);
182     movq    $b0, %xmm3
183 ____
184 $code.=<<____;
185     movdqa  %xmm0, %xmm4
186     movdqa  %xmm1, %xmm5
187     pcmulqdq \${0, %xmm1, %xmm0 # a1*b1
188     pxor    %xmm2, %xmm4
189     pxor    %xmm3, %xmm5
190     pcmulqdq \${0, %xmm3, %xmm2 # a0*b0
191     pcmulqdq \${0, %xmm5, %xmm4 # (a0+a1)*(b0+b1)
192     xorps   %xmm0, %xmm4
193     xorps   %xmm2, %xmm4 # (a0+a1)*(b0+b1)-a0*b0-a1*b1

```

```

194     movdqa  %xmm4, %xmm5
195     pslldq  \${8, %xmm4
196     psrldq  \${8, %xmm5
197     pxor    %xmm4, %xmm2
198     pxor    %xmm5, %xmm0
199     movdqu  %xmm2, 0($Rp)
200     movdqu  %xmm0, 16($Rp)
201     ret

203 .align 16
204 .Lvanilla_mul_2x2:
205     lea     -8*17(%rsp), %rsp
206 ____
207 $code.=<<____ if ($win64);
208     mov     '8*17+40'(%rsp), $b0
209     mov     %rdi, 8*15(%rsp)
210     mov     %rsi, 8*16(%rsp)
211 ____
212 $code.=<<____;
213     mov     %r14, 8*10(%rsp)
214     mov     %r13, 8*11(%rsp)
215     mov     %r12, 8*12(%rsp)
216     mov     %rbp, 8*13(%rsp)
217     mov     %rbx, 8*14(%rsp)
218 .Lbody_mul_2x2:
219     mov     $Rp, 32(%rsp) # save the arguments
220     mov     $a1, 40(%rsp)
221     mov     $a0, 48(%rsp)
222     mov     $b1, 56(%rsp)
223     mov     $b0, 64(%rsp)

225     mov     \${0xf, $mask
226     mov     $a1, $a
227     mov     $b1, $b
228     call    _mul_1x1 # a1*b1
229     mov     $lo, 16(%rsp)
230     mov     $hi, 24(%rsp)

232     mov     48(%rsp), $a
233     mov     64(%rsp), $b
234     call    _mul_1x1 # a0*b0
235     mov     $lo, 0(%rsp)
236     mov     $hi, 8(%rsp)

238     mov     40(%rsp), $a
239     mov     56(%rsp), $b
240     xor     48(%rsp), $a
241     xor     64(%rsp), $b
242     call    _mul_1x1 # (a0+a1)*(b0+b1)
243 ____
244     @r=( "%rbx", "%rcx", "%rdi", "%rsi" );
245 $code.=<<____;
246     mov     0(%rsp), @r[0]
247     mov     8(%rsp), @r[1]
248     mov     16(%rsp), @r[2]
249     mov     24(%rsp), @r[3]
250     mov     32(%rsp), %rbp

252     xor     $hi, $lo
253     xor     @r[1], $hi
254     xor     @r[0], $lo
255     mov     @r[0], 0(%rbp)
256     xor     @r[2], $hi
257     mov     @r[3], 24(%rbp)
258     xor     @r[3], $lo
259     xor     @r[3], $hi

```

```

260     xor     $hi,$lo
261     mov     $hi,16(%rbp)
262     mov     $lo,8(%rbp)

264     mov     8*10(%rsp),%r14
265     mov     8*11(%rsp),%r13
266     mov     8*12(%rsp),%r12
267     mov     8*13(%rsp),%rbp
268     mov     8*14(%rsp),%rbx
269
270     $code.=<<__ if ($win64);
271     mov     8*15(%rsp),%rdi
272     mov     8*16(%rsp),%rsi
273
274     $code.=<<__ ;
275     lea     8*17(%rsp),%rsp
276     ret
277
278 .Lend_mul_2x2:
279 .size     bn_GF2m_mul_2x2,.-bn_GF2m_mul_2x2
280 .asciz    "GF(2^m) Multiplication for x86_64, CRYPTOGAMS by <appro@openssl.org>"
281
283 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
284 #                               CONTEXT *context,DISPATCHER_CONTEXT *disp)
285 if ($win64) {
286   $rec="%rcx";
287   $frame="%rdx";
288   $context="%r8";
289   $disp="%r9";
290 }
291 $code.=<<__ ;
292 .extern __imp_RtlVirtualUnwind

294 .type     se_handler,@abi-omnipotent
295 .align    16
296 se_handler:
297     push    %rsi
298     push    %rdi
299     push    %rbx
300     push    %rbp
301     push    %r12
302     push    %r13
303     push    %r14
304     push    %r15
305     pushfq  \ $64,%rsp
306
308     mov     152($context),%rax    # pull context->Rsp
309     mov     248($context),%rbx    # pull context->Rip

311     lea     .Lbody_mul_2x2(%rip),%r10
312     cmp     %r10,%rbx             # context->Rip<"prologue" label
313     jbe     .Lin_prologue

315     mov     8*10(%rax),%r14        # mimic epilogue
316     mov     8*11(%rax),%r13
317     mov     8*12(%rax),%r12
318     mov     8*13(%rax),%rbp
319     mov     8*14(%rax),%rbx
320     mov     8*15(%rax),%rdi
321     mov     8*16(%rax),%rsi

323     mov     %rbx,144($context)    # restore context->Rbx
324     mov     %rbp,160($context)    # restore context->Rbp
325     mov     %rsi,168($context)    # restore context->Rsi

```

```

326     mov     %rdi,176($context)    # restore context->Rdi
327     mov     %r12,216($context)    # restore context->R12
328     mov     %r13,224($context)    # restore context->R13
329     mov     %r14,232($context)    # restore context->R14

331 .Lin_prologue:
332     lea     8*17(%rax),%rax
333     mov     %rax,152($context)    # restore context->Rsp

335     mov     40($disp),%rdi         # disp->ContextRecord
336     mov     $context,%rsi         # context
337     mov     \ $154,%ecx           # sizeof(CONTEXT)
338     .long   0xa548f3fc            # cld; rep movsq

340     mov     $disp,%rsi
341     xor     %rcx,%rcx             # arg1, UNW_FLAG_NHANDLER
342     mov     8(%rsi),%rdx          # arg2, disp->ImageBase
343     mov     0(%rsi),%r8           # arg3, disp->ControlPc
344     mov     16(%rsi),%r9          # arg4, disp->FunctionEntry
345     mov     40(%rsi),%r10         # disp->ContextRecord
346     lea     56(%rsi),%r11        # &disp->HandlerData
347     lea     24(%rsi),%r12        # &disp->EstablisherFrame
348     mov     %r10,32(%rsp)         # arg5
349     mov     %r11,40(%rsp)         # arg6
350     mov     %r12,48(%rsp)         # arg7
351     mov     %rcx,56(%rsp)         # arg8, (NULL)
352     call    *__imp_RtlVirtualUnwind(%rip)

354     mov     \ $1,%eax             # ExceptionContinueSearch
355     add     \ $64,%rsp
356     popfq
357     pop     %r15
358     pop     %r14
359     pop     %r13
360     pop     %r12
361     pop     %rbp
362     pop     %rbx
363     pop     %rdi
364     pop     %rsi
365     ret
366 .size     se_handler,.-se_handler

368 .section    .pdata
369 .align      4
370     .rva     _mul_1x1
371     .rva     .Lend_mul_1x1
372     .rva     .LSEH_info_1x1

374     .rva     .Lvanilla_mul_2x2
375     .rva     .Lend_mul_2x2
376     .rva     .LSEH_info_2x2
377 .section    .xdata
378 .align      8
379 .LSEH_info_1x1:
380     .byte    0x01,0x07,0x02,0x00
381     .byte    0x07,0x01,0x11,0x00    # sub rsp,128+8
382 .LSEH_info_2x2:
383     .byte    9,0,0,0
384     .rva     se_handler
385
386 }

388 $code =~ s/\`([^\`]*)\`/eval($1)/gem;
389 print $code;
390 close STDOUT;

```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-mont.pl

1

```
*****
36986 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-mont.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 # =====
4 # Written by Andy Polyakov <appro@openssl.org> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====

10 # October 2005.
11 #
12 # Montgomery multiplication routine for x86_64. While it gives modest
13 # 9% improvement of rsa4096 sign on Opteron, rsa512 sign runs more
14 # than twice, >2x, as fast. Most common rsa1024 sign is improved by
15 # respectful 50%. It remains to be seen if loop unrolling and
16 # dedicated squaring routine can provide further improvement...

18 # July 2011.
19 #
20 # Add dedicated squaring procedure. Performance improvement varies
21 # from platform to platform, but in average it's ~5%/15%/25%/33%
22 # for 512-/1024-/2048-/4096-bit RSA *sign* benchmarks respectively.

24 # August 2011.
25 #
26 # Unroll and modulo-schedule inner loops in such manner that they
27 # are "fallen through" for input lengths of 8, which is critical for
28 # 1024-bit RSA *sign*. Average performance improvement in comparison
29 # to *initial* version of this module from 2005 is ~0%/30%/40%/45%
30 # for 512-/1024-/2048-/4096-bit RSA *sign* benchmarks respectively.

32 $flavour = shift;
33 $output = shift;
34 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

36 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

38 $0 =~ m/([^\[\]\^\\\/\.\*\?]{1,})/; $dir=$1;
39 ( $xlate="$dir/x86_64-xlate.pl" and -f $xlate ) or
40 ( $xlate="$dir/../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
41 die "can't locate x86_64-xlate.pl";

43 open OUT, "| \"$^X\" $xlate $flavour $output";
44 *STDOUT=*OUT;

46 # int bn_mul_mont(
47   $rp="%rdi",      # BN_ULONG *rp,
48   $ap="%rsi",      # const BN_ULONG *ap,
49   $bp="%rdx",      # const BN_ULONG *bp,
50   $np="%rcx",      # const BN_ULONG *np,
51   $n0="%r8",       # const BN_ULONG *n0,
52   $num="%r9",       # int num);
53   $lo0="%r10";
54   $hi0="%r11";
55   $hi1="%r13";
56   $i="%r14";
57   $j="%r15";
58   $m0="%rbx";
59   $m1="%rbp";

61 $code=<<<__;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-mont.pl

2

```
62 .text

64 .globl bn_mul_mont
65 .type bn_mul_mont, @function, 6
66 .align 16
67 bn_mul_mont:
68     test    \3, ${num}d
69     jnz     .Lmul_enter
70     cmp     \8, ${num}d
71     jb      .Lmul_enter
72     cmp     $ap, $bp
73     jne     .Lmul4x_enter
74     jmp     .Lsqr4x_enter

76 .align 16
77 .Lmul_enter:
78     push    %rbx
79     push    %rbp
80     push    %r12
81     push    %r13
82     push    %r14
83     push    %r15

85     mov     ${num}d, ${num}d
86     lea     2($num), %r10
87     mov     %rsp, %r11
88     neg     %r10
89     lea     (%rsp, %r10, 8), %rsp      # tp=alloca(8*(num+2))
90     and     \-$1024, %rsp             # minimize TLB usage

92     mov     %r11, 8(%rsp, $num, 8)    # tp[num+1]=%rsp
93 .Lmul_body:
94     mov     $bp, %r12                 # reassign $bp
95     ---
96     $bp="%r12";
97 $code=<<<__;
```

98	mov	(\$n0), %n0	# pull n0[0] value
99	mov	(\$bp), %m0	# m0=bp[0]
100	mov	(\$ap), %rax	
102	xor	\$i, \$i	# i=0
103	xor	\$j, \$j	# j=0
105	mov	\$n0, %m1	
106	mulq	%m0	# ap[0]*bp[0]
107	mov	%rax, %lo0	
108	mov	(\$np), %rax	
110	imulq	%lo0, %m1	# "tp[0]"*n0
111	mov	%rdx, \$hi0	
113	mulq	%m1	# np[0]*m1
114	add	%rax, %lo0	# discarded
115	mov	8(\$ap), %rax	
116	adc	\\$0, %rdx	
117	mov	%rdx, \$hi1	
119	lea	1(\$j), \$j	# j++
120	jmp	.Llist_enter	
122	.align 16		
123	.Llist:		
124	add	%rax, \$hi1	
125	mov	(\$ap, \$j, 8), %rax	
126	adc	\\$0, %rdx	
127	add	\$hi0, \$hi1	# np[j]*m1+ap[j]*bp[0]


```

128      mov     $lo0,$hi0
129      adc     \ $0,%rdx
130      mov     $hi1,-16(%rsp,$j,8)    # tp[j-1]
131      mov     %rdx,$hi1

133 .L1st_enter:
134      mulq    $m0                    # ap[j]*bp[0]
135      add     %rax,$hi0
136      mov     ($np,$j,8),%rax
137      adc     \ $0,%rdx
138      lea     1($j),$j              # j++
139      mov     %rdx,$lo0

141      mulq    $m1                    # np[j]*m1
142      cmp     $num,$j
143      jne     .L1st

145      add     %rax,$hi1
146      mov     ($ap),%rax
147      adc     \ $0,%rdx
148      add     $hi0,$hi1
149      adc     \ $0,%rdx
150      mov     $hi1,-16(%rsp,$j,8)    # tp[j-1]
151      mov     %rdx,$hi1
152      mov     $lo0,$hi0

154      xor     %rdx,%rdx
155      add     $hi0,$hi1
156      adc     \ $0,%rdx
157      mov     $hi1,-8(%rsp,$num,8)
158      mov     %rdx,($rsp,$num,8)    # store upmost overflow bit

160      lea     1($i),$i
161      jmp     .Louter
162 .align 16
163 .Louter:
164      mov     ($bp,$i,8),$m0
165      xor     $j,$j
166      mov     $n0,$m1
167      mov     (%rsp),$lo0
168      mulq    $m0                    # ap[0]*bp[i]
169      add     %rax,$lo0
170      mov     ($np),%rax
171      adc     \ $0,%rdx
172      # ap[0]*bp[i]+tp[0]

173      imulq   $lo0,$m1                # tp[0]*n0
174      mov     %rdx,$hi0

176      mulq    $m1                    # np[0]*m1
177      add     %rax,$lo0
178      mov     8($ap),%rax
179      adc     \ $0,%rdx
180      mov     8(%rsp),$lo0
181      mov     %rdx,$hi1
182      # discarded

183      lea     1($j),$j
184      jmp     .Linner_enter

186 .align 16
187 .Linner:
188      add     %rax,$hi1
189      mov     ($ap,$j,8),%rax
190      adc     \ $0,%rdx
191      add     $lo0,$hi1
192      mov     (%rsp,$j,8),$lo0
193      adc     \ $0,%rdx
194      # np[j]*m1+ap[j]*bp[i]+tp[j]

```

```

194      mov     $hi1,-16(%rsp,$j,8)    # tp[j-1]
195      mov     %rdx,$hi1

197 .Linner_enter:
198      mulq    $m0                    # ap[j]*bp[i]
199      add     %rax,$hi0
200      mov     ($np,$j,8),%rax
201      adc     \ $0,%rdx
202      add     $hi0,$lo0
203      mov     %rdx,$hi0
204      adc     \ $0,$hi0
205      lea     1($j),$j              # j++

207      mulq    $m1                    # np[j]*m1
208      cmp     $num,$j
209      jne     .Linner

211      add     %rax,$hi1
212      mov     ($ap),%rax
213      adc     \ $0,%rdx
214      add     $lo0,$hi1
215      mov     (%rsp,$j,8),$lo0
216      adc     \ $0,%rdx
217      mov     $hi1,-16(%rsp,$j,8)    # tp[j-1]
218      mov     %rdx,$hi1

220      xor     %rdx,%rdx
221      add     $hi0,$hi1
222      adc     \ $0,%rdx
223      add     $lo0,$hi1
224      adc     \ $0,%rdx
225      mov     $hi1,-8(%rsp,$num,8)
226      mov     %rdx,($rsp,$num,8)    # store upmost overflow bit

228      lea     1($i),$i
229      cmp     $num,$i
230      jl      .Louter

232      xor     $i,$i
233      mov     (%rsp),%rax
234      lea     (%rsp),$ap
235      mov     $num,$j
236      jmp     .Lsub
237 .align 16
238 .Lsub:
239      sbb     ($np,$i,8),%rax
240      mov     %rax,($rp,$i,8)
241      lea     1($i),$i
242      dec     $j
243      jnz     .Lsub

245      sbb     \ $0,%rax
246      xor     $i,$i
247      and     %rax,$ap
248      not     %rax
249      mov     $rp,$np
250      and     %rax,$np
251      mov     $num,$j
252      or      $np,$ap
253      # j=num
254      # ap=borrow?tp:rp

254 .align 16
255 .Lcopy:
256      mov     ($ap,$i,8),%rax
257      mov     $i,($rsp,$i,8)
258      mov     %rax,($rp,$i,8)
259      lea     1($i),$i
260      sub     \ $1,$j
261      # copy or in-place refresh
262      # zap temporary vector
263      # rp[i]=tp[i]

```

```

260      jnz      .Lcopy
262      mov     8(%rsp,$num,8),%rsi      # restore %rsp
263      mov     \%1,%rax
264      mov     (%rsi),%r15
265      mov     8(%rsi),%r14
266      mov     16(%rsi),%r13
267      mov     24(%rsi),%r12
268      mov     32(%rsi),%rbp
269      mov     40(%rsi),%rbx
270      lea     48(%rsi),%rsp
271 .Lmul_epilogue:
272      ret
273 .size      bn_mul_mont,.-bn_mul_mont
274
275 {{{
276 my @A=("%r10", "%r11");
277 my @N=("%r13", "%r14");
278 $code.=<<<";
279 .type      bn_mul4x_mont,@function,6
280 .align     16
281 bn_mul4x_mont:
282 .Lmul4x_enter:
283      push    %rbx
284      push    %rbp
285      push    %r12
286      push    %r13
287      push    %r14
288      push    %r15
289
290      mov     ${num}d,${num}d
291      lea     4($num),%r10
292      mov     %rsp,%r11
293      neg     %r10
294      lea     (%rsp,%r10,8),%rsp      # tp=alloca(8*(num+4))
295      and     \%-$1024,%rsp          # minimize TLB usage
296
297      mov     %r11,8(%rsp,$num,8)    # tp[num+1]=%rsp
298 .Lmul4x_body:
299      mov     $rp,16(%rsp,$num,8)    # tp[num+2]=$rp
300      mov     %rdx,%r12              # reassign $bp
301
302      $bp="%r12";
303 $code.=<<<";
304      mov     ($n0),%n0              # pull n0[0] value
305      mov     ($bp),%m0              # m0=bp[0]
306      mov     ($ap),%rax
307
308      xor     $i,$i                  # i=0
309      xor     $j,$j                  # j=0
310
311      mov     $n0,$m1
312      mulq    $m0                    # ap[0]*bp[0]
313      mov     %rax,$A[0]
314      mov     ($np),%rax
315
316      imulq   $A[0],$m1              # "tp[0]"*n0
317      mov     %rdx,$A[1]
318
319      mulq    $m1                    # np[0]*m1
320      add     %rax,$A[0]              # discarded
321      mov     8($ap),%rax
322      adc     \%0,%rdx
323      mov     %rdx,$N[1]
324
325      mulq    $m0

```

```

326      add     %rax,$A[1]
327      mov     8($np),%rax
328      adc     \%0,%rdx
329      mov     %rdx,$A[0]
330
331      mulq    $m1
332      add     %rax,$N[1]
333      mov     16($ap),%rax
334      adc     \%0,%rdx
335      add     $A[1],$N[1]
336      lea     4($j),%j              # j++
337      adc     \%0,%rdx
338      mov     $N[1],(%rsp)
339      mov     %rdx,$N[0]
340      jmp     .L1st4x
341 .align     16
342 .L1st4x:
343      mulq    $m0                    # ap[j]*bp[0]
344      add     %rax,$A[0]
345      mov     -16($np,$j,8),%rax
346      adc     \%0,%rdx
347      mov     %rdx,$A[1]
348
349      mulq    $m1                    # np[j]*m1
350      add     %rax,$N[0]
351      mov     -8($ap,$j,8),%rax
352      adc     \%0,%rdx
353      add     $A[0],$N[0]            # np[j]*m1+ap[j]*bp[0]
354      adc     \%0,%rdx
355      mov     $N[0],-24(%rsp,$j,8)  # tp[j-1]
356      mov     %rdx,$N[1]
357
358      mulq    $m0                    # ap[j]*bp[0]
359      add     %rax,$A[1]
360      mov     -8($np,$j,8),%rax
361      adc     \%0,%rdx
362      mov     %rdx,$A[0]
363
364      mulq    $m1                    # np[j]*m1
365      add     %rax,$N[1]
366      mov     ($ap,$j,8),%rax
367      adc     \%0,%rdx
368      add     $A[1],$N[1]            # np[j]*m1+ap[j]*bp[0]
369      adc     \%0,%rdx
370      mov     $N[1],-16(%rsp,$j,8)  # tp[j-1]
371      mov     %rdx,$N[0]
372
373      mulq    $m0                    # ap[j]*bp[0]
374      add     %rax,$A[0]
375      mov     ($np,$j,8),%rax
376      adc     \%0,%rdx
377      mov     %rdx,$A[1]
378
379      mulq    $m1                    # np[j]*m1
380      add     %rax,$N[0]
381      mov     8($ap,$j,8),%rax
382      adc     \%0,%rdx
383      add     $A[0],$N[0]            # np[j]*m1+ap[j]*bp[0]
384      adc     \%0,%rdx
385      mov     $N[0],-8(%rsp,$j,8)    # tp[j-1]
386      mov     %rdx,$N[1]
387
388      mulq    $m0                    # ap[j]*bp[0]
389      add     %rax,$A[1]
390      mov     8($np,$j,8),%rax
391      adc     \%0,%rdx

```

```

392      lea      4($j),%rdx      # j++
393      mov      %rdx,%rax

395      mulq     $m1              # np[j]*m1
396      add      %rax,%rax
397      mov      -16($ap,%j,8),%rax
398      adc      \%0,%rdx
399      add      $A[1],%rdx      # np[j]*m1+ap[j]*bp[0]
400      adc      \%0,%rdx
401      mov      $N[1],-32(%rsp,%j,8) # tp[j-1]
402      mov      %rdx,%rdx
403      cmp      $num,%j
404      jl       .L1st4x

406      mulq     $m0              # ap[j]*bp[0]
407      add      %rax,$A[0]
408      mov      -16($np,%j,8),%rax
409      adc      \%0,%rdx
410      mov      %rdx,$A[1]

412      mulq     $m1              # np[j]*m1
413      add      %rax,%rax
414      mov      -8($ap,%j,8),%rax
415      adc      \%0,%rdx
416      add      $A[0],%rdx      # np[j]*m1+ap[j]*bp[0]
417      adc      \%0,%rdx
418      mov      $N[0],-24(%rsp,%j,8) # tp[j-1]
419      mov      %rdx,%rdx

421      mulq     $m0              # ap[j]*bp[0]
422      add      %rax,$A[1]
423      mov      -8($np,%j,8),%rax
424      adc      \%0,%rdx
425      mov      %rdx,$A[0]

427      mulq     $m1              # np[j]*m1
428      add      %rax,%rax
429      mov      ($ap,%j,8),%rax
430      adc      \%0,%rdx
431      add      $A[1],%rdx      # np[j]*m1+ap[j]*bp[0]
432      adc      \%0,%rdx
433      mov      $N[1],-16(%rsp,%j,8) # tp[j-1]
434      mov      %rdx,%rdx

436      xor      $N[1],$N[1]
437      add      $A[0],$N[0]
438      adc      \%0,$N[1]
439      mov      $N[0],-8(%rsp,%j,8)
440      mov      $N[1],(%rsp,%j,8) # store upmost overflow bit

442      lea      1($i),%i        # i++
443      .align 4
444      .Louter4x:
445      mov      ($bp,%i,8),%m0    # m0=bp[i]
446      xor      %j,%j            # j=0
447      mov      (%rsp),%A[0]
448      mov      $n0,%m1
449      mulq     $m0              # ap[0]*bp[i]
450      add      %rax,$A[0]      # ap[0]*bp[i]+tp[0]
451      mov      ($np),%rax
452      adc      \%0,%rdx

454      imulq    $A[0],%m1      # tp[0]*n0
455      mov      %rdx,$A[1]

457      mulq     $m1              # np[0]*m1

```

```

458      add      %rax,$A[0]      # "$N[0]", discarded
459      mov      8($ap),%rax
460      adc      \%0,%rdx
461      mov      %rdx,$N[1]

463      mulq     $m0              # ap[j]*bp[i]
464      add      %rax,$A[1]
465      mov      8($np),%rax
466      adc      \%0,%rdx
467      add      8(%rsp),%A[1]    # +tp[1]
468      adc      \%0,%rdx
469      mov      %rdx,$A[0]

471      mulq     $m1              # np[j]*m1
472      add      %rax,%rax
473      mov      16($ap),%rax
474      adc      \%0,%rdx
475      add      $A[1],%rdx      # np[j]*m1+ap[j]*bp[i]+tp[j]
476      lea      4($j),%j
477      adc      \%0,%rdx
478      mov      $N[1],(%rsp)    # tp[j-1]
479      mov      %rdx,%rdx
480      jmp      .Linner4x
481      .align 16
482      .Linner4x:
483      mulq     $m0              # ap[j]*bp[i]
484      add      %rax,$A[0]
485      mov      -16($np,%j,8),%rax
486      adc      \%0,%rdx
487      add      -16(%rsp,%j,8),%A[0] # ap[j]*bp[i]+tp[j]
488      adc      \%0,%rdx
489      mov      %rdx,$A[1]

491      mulq     $m1              # np[j]*m1
492      add      %rax,%rax
493      mov      -8($ap,%j,8),%rax
494      adc      \%0,%rdx
495      add      $A[0],%rdx
496      adc      \%0,%rdx
497      mov      $N[0],-24(%rsp,%j,8) # tp[j-1]
498      mov      %rdx,%rdx

500      mulq     $m0              # ap[j]*bp[i]
501      add      %rax,$A[1]
502      mov      -8($np,%j,8),%rax
503      adc      \%0,%rdx
504      add      -8(%rsp,%j,8),%A[1]
505      adc      \%0,%rdx
506      mov      %rdx,$A[0]

508      mulq     $m1              # np[j]*m1
509      add      %rax,%rax
510      mov      ($ap,%j,8),%rax
511      adc      \%0,%rdx
512      add      $A[1],%rdx
513      adc      \%0,%rdx
514      mov      $N[1],-16(%rsp,%j,8) # tp[j-1]
515      mov      %rdx,%rdx

517      mulq     $m0              # ap[j]*bp[i]
518      add      %rax,$A[0]
519      mov      ($np,%j,8),%rax
520      adc      \%0,%rdx
521      add      (%rsp,%j,8),%A[0] # ap[j]*bp[i]+tp[j]
522      adc      \%0,%rdx
523      mov      %rdx,$A[1]

```

```

525      mulq    $m1, %rax, %rax      # np[j]*m1
526      add     %rax, $N[0]
527      mov     8($ap, $j, 8), %rax
528      adc     \%0, %rdx
529      add     $A[0], $N[0]
530      adc     \%0, %rdx
531      mov     $N[0], -8(%rsp, $j, 8) # tp[j-1]
532      mov     %rdx, $N[1]

534      mulq    $m0, %rax, %rax      # ap[j]*bp[i]
535      add     %rax, $A[1]
536      mov     8($np, $j, 8), %rax
537      adc     \%0, %rdx
538      add     8(%rsp, $j, 8), $A[1]
539      adc     \%0, %rdx
540      lea     4($j), $j             # j++
541      mov     %rdx, $A[0]

543      mulq    $m1, %rax, %rax      # np[j]*m1
544      add     %rax, $N[1]
545      mov     -16($ap, $j, 8), %rax
546      adc     \%0, %rdx
547      add     $A[1], $N[1]
548      adc     \%0, %rdx
549      mov     $N[1], -32(%rsp, $j, 8) # tp[j-1]
550      mov     %rdx, $N[0]
551      cmp     $num, $j
552      jl      .Linner4x

554      mulq    $m0, %rax, %rax      # ap[j]*bp[i]
555      add     %rax, $A[0]
556      mov     -16($np, $j, 8), %rax
557      adc     \%0, %rdx
558      add     -16(%rsp, $j, 8), $A[0] # ap[j]*bp[i]+tp[j]
559      adc     \%0, %rdx
560      mov     %rdx, $A[1]

562      mulq    $m1, %rax, %rax      # np[j]*m1
563      add     %rax, $N[0]
564      mov     -8($ap, $j, 8), %rax
565      adc     \%0, %rdx
566      add     $A[0], $N[0]
567      adc     \%0, %rdx
568      mov     $N[0], -24(%rsp, $j, 8) # tp[j-1]
569      mov     %rdx, $N[1]

571      mulq    $m0, %rax, %rax      # ap[j]*bp[i]
572      add     %rax, $A[1]
573      mov     -8($np, $j, 8), %rax
574      adc     \%0, %rdx
575      add     -8(%rsp, $j, 8), $A[1]
576      adc     \%0, %rdx
577      lea     1($i), $i             # i++
578      mov     %rdx, $A[0]

580      mulq    $m1, %rax, %rax      # np[j]*m1
581      add     %rax, $N[1]
582      mov     ($ap), %rax           # ap[0]
583      adc     \%0, %rdx
584      add     $A[1], $N[1]
585      adc     \%0, %rdx
586      mov     $N[1], -16(%rsp, $j, 8) # tp[j-1]
587      mov     %rdx, $N[0]

589      xor     $N[1], $N[1]

```

```

590      add     $A[0], $N[0]
591      adc     \%0, $N[1]
592      add     (%rsp, $num, 8), $N[0] # pull upmost overflow bit
593      adc     \%0, $N[1]
594      mov     $N[0], -8(%rsp, $j, 8)
595      mov     $N[1], (%rsp, $j, 8)   # store upmost overflow bit

597      cmp     $num, $i
598      jl      .Louter4x
599
600      {
601      my @ri=("%rax", "%rdx", $m0, $m1);
602      $code.=<<";
603      mov     16(%rsp, $num, 8), $rp # restore $rp
604      mov     0(%rsp), @ri[0]      # tp[0]
605      pxor    %xmm0, %xmm0
606      mov     8(%rsp), @ri[1]      # tp[1]
607      shr     \%2, $num            # num/=4
608      lea     (%rsp), $ap          # borrow ap for tp
609      xor     $i, $i               # i=0 and clear CF!

611      sub     0($np), @ri[0]
612      mov     16($ap), @ri[2]      # tp[2]
613      mov     24($ap), @ri[3]      # tp[3]
614      sbb     8($np), @ri[1]
615      lea     -1($num), $j         # j=num/4-1
616      jmp     .Lsub4x
617      .align 16
618      .Lsub4x:
619      mov     @ri[0], 0($rp, $i, 8) # rp[i]=tp[i]-np[i]
620      mov     @ri[1], 8($rp, $i, 8) # rp[i]=tp[i]-np[i]
621      sbb     16($np, $i, 8), @ri[2]
622      mov     32($ap, $i, 8), @ri[0] # tp[i+1]
623      mov     40($ap, $i, 8), @ri[1]
624      sbb     24($np, $i, 8), @ri[3]
625      mov     @ri[2], 16($rp, $i, 8) # rp[i]=tp[i]-np[i]
626      mov     @ri[3], 24($rp, $i, 8) # rp[i]=tp[i]-np[i]
627      sbb     32($np, $i, 8), @ri[0]
628      mov     48($ap, $i, 8), @ri[2]
629      mov     56($ap, $i, 8), @ri[3]
630      sbb     40($np, $i, 8), @ri[1]
631      lea     4($i), $i
632      dec     $j
633      jnz     .Lsub4x

635      mov     @ri[0], 0($rp, $i, 8) # rp[i]=tp[i]-np[i]
636      mov     32($ap, $i, 8), @ri[0] # load overflow bit
637      sbb     16($np, $i, 8), @ri[2]
638      mov     @ri[1], 8($rp, $i, 8) # rp[i]=tp[i]-np[i]
639      sbb     24($np, $i, 8), @ri[3]
640      mov     @ri[2], 16($rp, $i, 8) # rp[i]=tp[i]-np[i]

642      sbb     \%0, @ri[0]          # handle upmost overflow bit
643      mov     @ri[3], 24($rp, $i, 8) # rp[i]=tp[i]-np[i]
644      xor     $i, $i               # i=0
645      and     @ri[0], $ap
646      not     @ri[0]
647      mov     $rp, $np
648      and     @ri[0], $np
649      lea     -1($num), $j
650      or      $np, $ap             # ap=borrow?tp:rp

652      movdqu  ($ap), %xmm1
653      movdqa  %xmm0, (%rsp)
654      movdqu  %xmm1, ($rp)
655      jmp     .Lcopy4x

```

```

656 .align 16
657 .Lcopy4x:                                # copy or in-place refresh
658     movdqu 16($ap,$i),%xmm2
659     movdqu 32($ap,$i),%xmm1
660     movdqa %xmm0,16($rsp,$i)
661     movdqu %xmm2,16($rp,$i)
662     movdqa %xmm0,32($rsp,$i)
663     movdqu %xmm1,32($rp,$i)
664     lea    32($i),$i
665     dec    $j
666     jnz    .Lcopy4x

668     shl    \ $2,$num
669     movdqu 16($ap,$i),%xmm2
670     movdqa %xmm0,16($rsp,$i)
671     movdqu %xmm2,16($rp,$i)
672
673 }
674 $code.=<<__ ;
675     mov     8($rsp,$num,8),%rsi    # restore %rsp
676     mov     \ $1,%rax
677     mov     (%rsi),%r15
678     mov     8($rsi),%r14
679     mov     16($rsi),%r13
680     mov     24($rsi),%r12
681     mov     32($rsi),%rbp
682     mov     40($rsi),%rbx
683     lea     48($rsi),%rsp
684 .Lmul4x_epilogue:
685     ret
686 .size bn_mul4x_mont,.-bn_mul4x_mont
687
688 }}}

```

```

689 {{{
690 #####
691 # void bn_sqr4x_mont(
692 my $rptr="%rdi";      # const BN_ULONG *rptr,
693 my $aptr="%rsi";      # const BN_ULONG *aptr,
694 my $bptr="%rdx";      # not used
695 my $nptr="%rcx";      # const BN_ULONG *nptr,
696 my $n0  ="%r8";      # const BN_ULONG *n0);
697 my $num ="%r9";      # int num, has to be divisible by 4 and
698                        # not less than 8

700 my ($i,$j,$stpr)=("%rbp", "%rcx", $rptr);
701 my @A0=("%r10", "%r11");
702 my @A1=("%r12", "%r13");
703 my ($a0,$a1,$ai)=("%r14", "%r15", "%rbx");

705 $code.=<<__ ;
706 .type bn_sqr4x_mont,\@function,6
707 .align 16
708 bn_sqr4x_mont:
709 .Lsqr4x_enter:
710     push    %rbx
711     push    %rbp
712     push    %r12
713     push    %r13
714     push    %r14
715     push    %r15

717     shl     \ $3,${num}d    # convert $num to bytes
718     xor     %r10,%r10
719     mov     %rsp,%r11        # put aside %rsp
720     sub     $num,%r10        # -$num
721     mov     ($n0),$n0        # *n0
722     lea     -72($rsp,%r10,2),%rsp # alloca(frame+2*$num)
723     and     \ $-1024,%rsp    # minimize TLB usage
724     #####
725     # Stack layout
726     #
727     # +0    saved $num, used in reduction section
728     # +8    &t[2*$num], used in reduction section
729     # +32    saved $rptr
730     # +40    saved $nptr
731     # +48    saved *n0
732     # +56    saved %rsp
733     # +64    t[2*$num]
734     #
735     mov     $rptr,32($rsp)    # save $rptr
736     mov     $nptr,40($rsp)
737     mov     $n0, 48($rsp)
738     mov     %r11, 56($rsp)    # save original %rsp
739 .Lsqr4x_body:
740     #####
741     # Squaring part:
742     #
743     # a) multiply-n-add everything but a[i]*a[i];
744     # b) shift result of a) by 1 to the left and accumulate
745     #    a[i]*a[i] products;
746     #
747     lea     32(%r10),$i      # $i=($num-32)
748     lea     ($aptr,$num),$aptr # end of a[] buffer, ($aptr,$i)=&ap[2]

750     mov     $num,$j          # $j=$num

752     # comments apply to $num==8 case
753     mov     -32($aptr,$i),$a0 # a[0]
754     lea     64($rsp,$num,2),$stpr # end of tp[] buffer, &tp[2*$num]

```

```

755      mov     -24($aptr,$i),%rax    # a[1]
756      lea     -32($ptr,$i),%r12     # end of tp[] window, &tp[2*$num-"i"]
757      mov     -16($aptr,$i),%r13     # a[2]
758      mov     %rax,%r14

760      mul     $a0,%rax              # a[1]*a[0]
761      mov     %rax,%r14              # a[1]*a[0]
762      mov     %r14,%r13              # a[2]
763      mov     %rdx,%r14              # a[1]*a[0]
764      mov     $a0,%r14,-24($ptr,$i) # t[1]

766      xor     $a0,%r14              # a[2]*a[0]
767      mul     $a0,%r14
768      add     %rax,%r14
769      mov     %r14,%r13
770      adc     %rdx,%r14
771      mov     $a0,%r14,-16($ptr,$i) # t[2]

773      lea     -16($i),%r14          # j=-16

776      mov     8($aptr,$j),%r14      # a[3]
777      mul     $a1,%r14              # a[2]*a[1]
778      mov     %rax,%r14              # a[2]*a[1]+t[3]
779      mov     %r14,%r13
780      mov     %rdx,%r14

782      xor     $a0,%r14
783      add     $a1,%r14
784      lea     16($j),%r14
785      adc     %r14,%r14
786      mul     $a0,%r14              # a[3]*a[0]
787      add     %rax,%r14              # a[3]*a[0]+a[2]*a[1]+t[3]
788      mov     %r14,%r13
789      adc     %rdx,%r14
790      mov     $a0,%r14,-8($ptr,$j)  # t[3]
791      jmp     .Lsqr4x_1st

793 .align 16
794 .Lsqr4x_1st:
795      mov     ($aptr,$j),%r14        # a[4]
796      xor     $a1,%r14
797      mul     $a1,%r14              # a[3]*a[1]
798      add     %rax,%r14              # a[3]*a[1]+t[4]
799      mov     %r14,%r13
800      adc     %rdx,%r14

802      xor     $a0,%r14
803      add     $a1,%r14
804      adc     %r14,%r14
805      mul     $a0,%r14              # a[4]*a[0]
806      add     %rax,%r14              # a[4]*a[0]+a[3]*a[1]+t[4]
807      mov     %r14,%r13
808      adc     %rdx,%r14
809      mov     $a0,%r14,($ptr,$j)    # t[4]

812      mov     8($aptr,$j),%r14      # a[5]
813      xor     $a1,%r14
814      mul     $a1,%r14              # a[4]*a[3]
815      add     %rax,%r14              # a[4]*a[3]+t[5]
816      mov     %r14,%r13
817      adc     %rdx,%r14

819      xor     $a0,%r14
820      add     $a1,%r14

```

```

821      adc     %r14,%r14
822      mul     $a0,%r14              # a[5]*a[2]
823      add     %rax,%r14              # a[5]*a[2]+a[4]*a[3]+t[5]
824      mov     %r14,%r13
825      adc     %rdx,%r14
826      mov     $a0,%r14,8($ptr,$j)   # t[5]

828      mov     16($aptr,$j),%r14     # a[6]
829      xor     $a1,%r14
830      mul     $a1,%r14              # a[5]*a[3]
831      add     %rax,%r14              # a[5]*a[3]+t[6]
832      mov     %r14,%r13
833      adc     %rdx,%r14

835      xor     $a0,%r14
836      add     $a1,%r14
837      adc     %r14,%r14
838      mul     $a0,%r14              # a[6]*a[2]
839      add     %rax,%r14              # a[6]*a[2]+a[5]*a[3]+t[6]
840      mov     %r14,%r13
841      adc     %rdx,%r14
842      mov     $a0,%r14,16($ptr,$j)  # t[6]

845      mov     24($aptr,$j),%r14     # a[7]
846      xor     $a1,%r14
847      mul     $a1,%r14              # a[6]*a[5]
848      add     %rax,%r14              # a[6]*a[5]+t[7]
849      mov     %r14,%r13
850      adc     %rdx,%r14

852      xor     $a0,%r14
853      add     $a1,%r14
854      lea     32($j),%r14
855      adc     %r14,%r14
856      mul     $a0,%r14              # a[7]*a[4]
857      add     %rax,%r14              # a[7]*a[4]+a[6]*a[5]+t[6]
858      mov     %r14,%r13
859      adc     %rdx,%r14
860      mov     $a0,%r14,-8($ptr,$j)  # t[7]

862      cmp     %r14,%r14
863      jne     .Lsqr4x_1st

865      xor     $a1,%r14
866      add     $a0,%r14
867      adc     %r14,%r14
868      mul     $a1,%r14              # a[7]*a[5]
869      add     %rax,%r14
870      adc     %rdx,%r14

872      mov     $a1,%r14,($ptr)        # t[8]
873      lea     16($i),%r14
874      mov     $a1,%r14,8($ptr)      # t[9]
875      jmp     .Lsqr4x_outer

877 .align 16
878 .Lsqr4x_outer:
879      mov     -32($aptr,$i),%r14     # comments apply to $num==6 case
880      lea     64(%rsp,$num,2),%r14   # end of tp[] buffer, &tp[2*$num]
881      mov     -24($aptr,$i),%r14     # a[1]
882      lea     -32($ptr,$i),%r14     # end of tp[] window, &tp[2*$num-"i"]
883      mov     -16($aptr,$i),%r14     # a[2]
884      mov     %r14,%r14

886      mov     -24($ptr,$i),%r14     # t[1]

```

```

887     xor    $A0[1], $A0[1]
888     mul    $a0, $a0           # a[1]*a[0]
889     add    %rax, $A0[0]       # a[1]*a[0]+t[1]
890     mov    $a1, %rax          # a[2]
891     adc    %rdx, $A0[1]
892     mov    $A0[0], -24($tptr, $i) # t[1]

894     xor    $A0[0], $A0[0]
895     add    -16($tptr, $i), $A0[1] # a[2]*a[0]+t[2]
896     adc    %rdx, $A0[0]
897     mul    $a0, $a0           # a[2]*a[0]
898     add    %rax, $A0[1]
899     mov    $a1, %rax
900     adc    %rdx, $A0[0]
901     mov    $A0[1], -16($tptr, $i) # t[2]

903     lea    -16($i), $j        # j=-16
904     xor    $A1[0], $A1[0]

907     mov    8($aptr, $j), $a1   # a[3]
908     xor    $A1[1], $A1[1]
909     add    8($tptr, $j), $A1[0]
910     adc    %rdx, $A1[1]
911     mul    $a1, $a1           # a[2]*a[1]
912     add    %rax, $A1[0]       # a[2]*a[1]+t[3]
913     mov    $a1, %rax
914     adc    %rdx, $A1[1]

916     xor    $A0[1], $A0[1]
917     add    $A1[0], $A0[0]
918     adc    %rdx, $A0[1]
919     mul    $a0, $a0           # a[3]*a[0]
920     add    %rax, $A0[0]       # a[3]*a[0]+a[2]*a[1]+t[3]
921     mov    $a1, %rax
922     adc    %rdx, $A0[1]
923     mov    $A0[0], 8($tptr, $j) # t[3]

925     lea    16($j), $j
926     jmp    .Lsqr4x_inner

928 .align 16
929 .Lsqr4x_inner:
930     mov    ($aptr, $j), $a1     # a[4]
931     xor    $A1[0], $A1[0]
932     add    ($tptr, $j), $A1[1]
933     adc    %rdx, $A1[0]
934     mul    $a1, $a1           # a[3]*a[1]
935     add    %rax, $A1[1]       # a[3]*a[1]+t[4]
936     mov    $a1, %rax
937     adc    %rdx, $A1[0]

939     xor    $A0[0], $A0[0]
940     add    $A1[1], $A0[1]
941     adc    %rdx, $A0[0]
942     mul    $a0, $a0           # a[4]*a[0]
943     add    %rax, $A0[1]       # a[4]*a[0]+a[3]*a[1]+t[4]
944     mov    $a1, %rax          # a[3]
945     adc    %rdx, $A0[0]
946     mov    $A0[1], ($tptr, $j) # t[4]

948     mov    8($aptr, $j), $a1   # a[5]
949     xor    $A1[1], $A1[1]
950     add    8($tptr, $j), $A1[0]
951     adc    %rdx, $A1[1]
952     mul    $a1, $a1           # a[4]*a[3]

```

```

953     add    %rax, $A1[0]       # a[4]*a[3]+t[5]
954     mov    $a1, %rax
955     adc    %rdx, $A1[1]

957     xor    $A0[1], $A0[1]
958     add    $A1[0], $A0[0]
959     lea    16($j), $j         # j++
960     adc    %rdx, $A0[1]
961     mul    $a0, $a0           # a[5]*a[2]
962     add    %rax, $A0[0]       # a[5]*a[2]+a[4]*a[3]+t[5]
963     mov    $a1, %rax
964     adc    %rdx, $A0[1]
965     mov    $A0[0], -8($tptr, $j) # t[5], "preloaded t[1]" below

967     cmp    %rdx, $j
968     jne    .Lsqr4x_inner

970     xor    $A1[0], $A1[0]
971     add    $A0[1], $A1[1]
972     adc    %rdx, $A1[0]
973     mul    $a1, $a1           # a[5]*a[3]
974     add    %rax, $A1[1]
975     adc    %rdx, $A1[0]

977     mov    $A1[1], ($tptr)     # t[6], "preloaded t[2]" below
978     mov    $A1[0], 8($tptr)   # t[7], "preloaded t[3]" below

980     add    %rdx, $i
981     jnz    .Lsqr4x_outer

983     # comments apply to $num==4 case
984     mov    -32($aptr), $a0     # a[0]
985     lea    64(%rsp, $num, 2), $tptr # end of tp[] buffer, &tp[2*$num]
986     mov    -24($aptr), %rax    # a[1]
987     lea    -32($tptr, $i), $tptr # end of tp[] window, &tp[2*$num-$i]
988     mov    -16($aptr), $a1     # a[2]
989     mov    %rax, $a1

991     xor    $A0[1], $A0[1]
992     mul    $a0, $a0           # a[1]*a[0]
993     add    %rax, $A0[0]       # a[1]*a[0]+t[1], preloaded t[1]
994     mov    $a1, %rax          # a[2]
995     adc    %rdx, $A0[1]
996     mov    $A0[0], -24($tptr) # t[1]

998     xor    $A0[0], $A0[0]
999     add    $A1[1], $A0[1]     # a[2]*a[0]+t[2], preloaded t[2]
1000    adc    %rdx, $A0[0]
1001    mul    $a0, $a0           # a[2]*a[0]
1002    add    %rax, $A0[1]
1003    mov    $a1, %rax
1004    adc    %rdx, $A0[0]
1005    mov    $A0[1], -16($tptr) # t[2]

1007    mov    -8($aptr), $a1     # a[3]
1008    mul    $a1, $a1           # a[2]*a[1]
1009    add    %rax, $A1[0]       # a[2]*a[1]+t[3], preloaded t[3]
1010    mov    $a1, %rax
1011    adc    %rdx, $A1[0]

1013    xor    $A0[1], $A0[1]
1014    add    $A1[0], $A0[0]
1015    mov    %rdx, $A1[1]
1016    adc    %rdx, $A1[1]
1017    mul    $a0, $a0           # a[3]*a[0]
1018    add    %rax, $A0[0]       # a[3]*a[0]+a[2]*a[1]+t[3]

```

```

1019      mov     Sai,%rax
1020      adc     %rdx,$A0[1]
1021      mov     $A0[0],-8($tptr)      # t[3]

1023      xor     $A1[0],$A1[0]
1024      add     $A0[1],$A1[1]
1025      adc     \S0,$A1[0]
1026      mul     Sai                    # a[3]*a[1]
1027      add     %rax,$A1[1]
1028      mov     -16($aptr),%rax      # a[2]
1029      adc     %rdx,$A1[0]

1031      mov     $A1[1],$($tptr)      # t[4]
1032      mov     $A1[0],8($tptr)      # t[5]

1034      mul     Sai                    # a[2]*a[3]
1035
1036 {
1037   my ($shift,$carry)=($a0,$a1);
1038   my @S=(@A1,$ai,$n0);
1039   $code.=<<<";
1040       add     \S16,$i
1041       xor     $shift,$shift
1042       sub     $num,$i              # $i=16-$num
1043       xor     $carry,$carry

1045       add     $A1[0],%rax          # t[5]
1046       adc     \S0,%rdx
1047       mov     %rax,8($tptr)        # t[5]
1048       mov     %rdx,16($tptr)      # t[6]
1049       mov     $carry,24($tptr)    # t[7]

1051       mov     -16($aptr,$i),%rax  # a[0]
1052       lea     64(%rsp,$num,2),$tptr
1053       xor     $A0[0],$A0[0]      # t[0]
1054       mov     -24($tptr,$i,2),$A0[1] # t[1]

1056       lea     ($shift,$A0[0],2),$S[0] # t[2*i]<<1 | shift
1057       shr     \S63,$A0[0]
1058       lea     ($j,$A0[1],2),$S[1]   # t[2*i+1]<<1 |
1059       shr     \S63,$A0[1]
1060       or      $A0[0],$S[1]          # | t[2*i]>>63
1061       mov     -16($tptr,$i,2),$A0[0] # t[2*i+2] # prefetch
1062       mov     $A0[1],$shift        # shift=t[2*i+1]>>63
1063       mul     %rax                  # a[i]*a[i]
1064       neg     $carry               # mov $carry,cf
1065       mov     -8($tptr,$i,2),$A0[1] # t[2*i+2+1] # prefetch
1066       adc     %rax,$S[0]
1067       mov     -8($aptr,$i),%rax    # a[i+1] # prefetch
1068       mov     $S[0],-32($tptr,$i,2)
1069       adc     %rdx,$S[1]

1071       lea     ($shift,$A0[0],2),$S[2] # t[2*i]<<1 | shift
1072       mov     $S[1],-24($tptr,$i,2)
1073       sbb     $carry,$carry        # mov cf,$carry
1074       shr     \S63,$A0[0]
1075       lea     ($j,$A0[1],2),$S[3]   # t[2*i+1]<<1 |
1076       shr     \S63,$A0[1]
1077       or      $A0[0],$S[3]          # | t[2*i]>>63
1078       mov     0($tptr,$i,2),$A0[0] # t[2*i+2] # prefetch
1079       mov     $A0[1],$shift        # shift=t[2*i+1]>>63
1080       mul     %rax                  # a[i]*a[i]
1081       neg     $carry               # mov $carry,cf
1082       mov     8($tptr,$i,2),$A0[1] # t[2*i+2+1] # prefetch
1083       adc     %rax,$S[2]
1084       mov     0($aptr,$i),%rax    # a[i+1] # prefetch

```

```

1085      mov     $S[2],-16($tptr,$i,2)
1086      adc     %rdx,$S[3]
1087      lea     16($i),$i
1088      mov     $S[3],-40($tptr,$i,2)
1089      sbb     $carry,$carry        # mov cf,$carry
1090      jmp     .Lsqr4x_shift_n_add

1092 .align 16
1093 .Lsqr4x_shift_n_add:
1094       lea     ($shift,$A0[0],2),$S[0] # t[2*i]<<1 | shift
1095       shr     \S63,$A0[0]
1096       lea     ($j,$A0[1],2),$S[1]   # t[2*i+1]<<1 |
1097       shr     \S63,$A0[1]
1098       or      $A0[0],$S[1]          # | t[2*i]>>63
1099       mov     -16($tptr,$i,2),$A0[0] # t[2*i+2] # prefetch
1100       mov     $A0[1],$shift        # shift=t[2*i+1]>>63
1101       mul     %rax                  # a[i]*a[i]
1102       neg     $carry               # mov $carry,cf
1103       mov     -8($tptr,$i,2),$A0[1] # t[2*i+2+1] # prefetch
1104       adc     %rax,$S[0]
1105       mov     -8($aptr,$i),%rax    # a[i+1] # prefetch
1106       mov     $S[0],-32($tptr,$i,2)
1107       adc     %rdx,$S[1]

1109       lea     ($shift,$A0[0],2),$S[2] # t[2*i]<<1 | shift
1110       mov     $S[1],-24($tptr,$i,2)
1111       sbb     $carry,$carry        # mov cf,$carry
1112       shr     \S63,$A0[0]
1113       lea     ($j,$A0[1],2),$S[3]   # t[2*i+1]<<1 |
1114       shr     \S63,$A0[1]
1115       or      $A0[0],$S[3]          # | t[2*i]>>63
1116       mov     0($tptr,$i,2),$A0[0] # t[2*i+2] # prefetch
1117       mov     $A0[1],$shift        # shift=t[2*i+1]>>63
1118       mul     %rax                  # a[i]*a[i]
1119       neg     $carry               # mov $carry,cf
1120       mov     8($tptr,$i,2),$A0[1] # t[2*i+2+1] # prefetch
1121       adc     %rax,$S[2]
1122       mov     0($aptr,$i),%rax    # a[i+1] # prefetch
1123       mov     $S[2],-16($tptr,$i,2)
1124       adc     %rdx,$S[3]

1126       lea     ($shift,$A0[0],2),$S[0] # t[2*i]<<1 | shift
1127       mov     $S[3],-8($tptr,$i,2)
1128       sbb     $carry,$carry        # mov cf,$carry
1129       shr     \S63,$A0[0]
1130       lea     ($j,$A0[1],2),$S[1]   # t[2*i+1]<<1 |
1131       shr     \S63,$A0[1]
1132       or      $A0[0],$S[1]          # | t[2*i]>>63
1133       mov     16($tptr,$i,2),$A0[0] # t[2*i+2] # prefetch
1134       mov     $A0[1],$shift        # shift=t[2*i+1]>>63
1135       mul     %rax                  # a[i]*a[i]
1136       neg     $carry               # mov $carry,cf
1137       mov     24($tptr,$i,2),$A0[1] # t[2*i+2+1] # prefetch
1138       adc     %rax,$S[0]
1139       mov     8($aptr,$i),%rax    # a[i+1] # prefetch
1140       mov     $S[0],0($tptr,$i,2)
1141       adc     %rdx,$S[1]

1143       lea     ($shift,$A0[0],2),$S[2] # t[2*i]<<1 | shift
1144       mov     $S[1],8($tptr,$i,2)
1145       sbb     $carry,$carry        # mov cf,$carry
1146       shr     \S63,$A0[0]
1147       lea     ($j,$A0[1],2),$S[3]   # t[2*i+1]<<1 |
1148       shr     \S63,$A0[1]
1149       or      $A0[0],$S[3]          # | t[2*i]>>63
1150       mov     32($tptr,$i,2),$A0[0] # t[2*i+2] # prefetch

```



```

1151     mov     $A0[1], $shift      # shift=t[2*i+1]>>63
1152     mul     %rax               # a[i]*a[i]
1153     neg     $carry             # mov $carry,cf
1154     mov     40($tptr,$i,2), $A0[1] # t[2*i+2+1] # prefetch
1155     adc     %rax, $S[2]
1156     mov     16($aptr,$i), %rax   # a[i+1] # prefetch
1157     mov     $S[2], 16($tptr,$i,2)
1158     adc     %rdx, $S[3]
1159     mov     $S[3], 24($tptr,$i,2)
1160     sbb     $carry, $carry       # mov cf,$carry
1161     add     \ $32, $i
1162     jnz     .Lsqr4x_shift_n_add

1164     lea     ($shift,$A0[0],2), $S[0] # t[2*i]<<1 | shift
1165     shr     \ $63, $A0[0]
1166     lea     ($j,$A0[1],2), $S[1]   # t[2*i+1]<<1 |
1167     shr     \ $63, $A0[1]
1168     or      $A0[0], $S[1]         # | t[2*i]>>63
1169     mov     -16($tptr), $A0[0]     # t[2*i+2] # prefetch
1170     mov     $A0[1], $shift       # shift=t[2*i+1]>>63
1171     mul     %rax               # a[i]*a[i]
1172     neg     $carry             # mov $carry,cf
1173     mov     -8($tptr), $A0[1]     # t[2*i+2+1] # prefetch
1174     adc     %rax, $S[0]
1175     mov     -8($aptr), %rax       # a[i+1] # prefetch
1176     mov     $S[0], -32($tptr)
1177     adc     %rdx, $S[1]

1179     lea     ($shift,$A0[0],2), $S[2] # t[2*i]<<1|shift
1180     mov     $S[1], -24($tptr)
1181     sbb     $carry, $carry       # mov cf,$carry
1182     shr     \ $63, $A0[0]
1183     lea     ($j,$A0[1],2), $S[3]   # t[2*i+1]<<1 |
1184     shr     \ $63, $A0[1]
1185     or      $A0[0], $S[3]         # | t[2*i]>>63
1186     mul     %rax               # a[i]*a[i]
1187     neg     $carry             # mov $carry,cf
1188     adc     %rax, $S[2]
1189     adc     %rdx, $S[3]
1190     mov     $S[2], -16($tptr)
1191     mov     $S[3], -8($tptr)
1192
1193 }

```

```

1194 #####
1195 # Montgomery reduction part, "word-by-word" algorithm.
1196 #
1197 {
1198     my ($stopbit,$nptr)=("%rbp", $aptr);
1199     my ($m0,$m1)=($a0,$a1);
1200     my @Ni=("%rbx", "%r9");
1201     $code.=<<<_ ;
1202     mov     40(%rsp), $nptr      # restore $nptr
1203     mov     48(%rsp), $n0       # restore *n0
1204     xor     $j, $j
1205     mov     $num, 0(%rsp)       # save $num
1206     sub     $num, $j            # $j=-$num
1207     mov     64(%rsp), $A0[0]    # t[0] # modsched #
1208     mov     $n0, $m0           # # modsched #
1209     lea     64(%rsp,$num,2), %rax # end of t[] buffer
1210     lea     64(%rsp,$num), $tptr # end of t[] window
1211     mov     %rax, 8(%rsp)       # save end of t[] buffer
1212     lea     ($nptr,$num), $nptr # end of n[] buffer
1213     xor     $stopbit, $stopbit  # $stopbit=0

1215     mov     0($nptr,$j), %rax   # n[0] # modsched #
1216     mov     8($nptr,$j), $Ni[1] # n[1] # modsched #
1217     imulq   $A0[0], $m0         # m0=t[0]*n0 # modsched #
1218     mov     %rax, $Ni[0]       # # modsched #
1219     jmp     .Lsqr4x_mont_outer

1221 .align 16
1222 .Lsqr4x_mont_outer:
1223     xor     $A0[1], $A0[1]
1224     mul     $m0                # n[0]*m0
1225     add     %rax, $A0[0]       # n[0]*m0+t[0]
1226     mov     $Ni[1], %rax
1227     adc     %rdx, $A0[1]
1228     mov     $n0, $m1

1230     xor     $A0[0], $A0[0]
1231     add     8($tptr,$j), $A0[1]
1232     adc     \ $0, $A0[0]
1233     mul     $m0                # n[1]*m0
1234     add     %rax, $A0[1]       # n[1]*m0+t[1]
1235     mov     $Ni[0], %rax
1236     adc     %rdx, $A0[0]

1238     imulq   $A0[1], $m1

1240     mov     16($nptr,$j), $Ni[0] # n[2]
1241     xor     $A1[1], $A1[1]
1242     add     $A0[1], $A1[0]
1243     adc     \ $0, $A1[1]
1244     mul     $m1                # n[0]*m1
1245     add     %rax, $A1[0]       # n[0]*m1+"t[1]"
1246     mov     $Ni[0], %rax
1247     adc     %rdx, $A1[1]
1248     mov     $A1[0], 8($tptr,$j) # "t[1]"

1250     xor     $A0[1], $A0[1]
1251     add     16($tptr,$j), $A0[0]
1252     adc     \ $0, $A0[1]
1253     mul     $m0                # n[2]*m0
1254     add     %rax, $A0[0]       # n[2]*m0+t[2]
1255     mov     $Ni[1], %rax
1256     adc     %rdx, $A0[1]

1258     mov     24($nptr,$j), $Ni[1] # n[3]
1259     xor     $A1[0], $A1[0]

```

```

1260      add    $A0[0], $A1[1]
1261      adc    \ $0, $A1[0]
1262      mul    $m1
1263      add    %rax, $A1[1]          # n[1]*m1
1264      mov    $Ni[1], %rax          # n[1]*m1+"t[2]"
1265      adc    %rdx, $A1[0]
1266      mov    $A1[1], 16($tptr, $j) # "t[2]"

1268      xor    $A0[0], $A0[0]
1269      add    24($tptr, $j), $A0[1]
1270      lea    32($j), $j
1271      adc    \ $0, $A0[0]
1272      mul    $m0
1273      add    %rax, $A0[1]          # n[3]*m0
1274      mov    $Ni[0], %rax          # n[3]*m0+t[3]
1275      adc    %rdx, $A0[0]
1276      jmp    .Lsqr4x_mont_inner

1278 .align 16
1279 .Lsqr4x_mont_inner:
1280      mov    ($nptr, $j), $Ni[0]   # n[4]
1281      xor    $A1[1], $A1[1]
1282      add    $A0[1], $A1[0]
1283      adc    \ $0, $A1[1]
1284      mul    $m1
1285      add    %rax, $A1[0]          # n[2]*m1
1286      mov    $Ni[0], %rax          # n[2]*m1+"t[3]"
1287      adc    %rdx, $A1[1]
1288      mov    $A1[0], -8($tptr, $j) # "t[3]"

1290      xor    $A0[1], $A0[1]
1291      add    ($tptr, $j), $A0[0]
1292      adc    \ $0, $A0[1]
1293      mul    $m0
1294      add    %rax, $A0[0]          # n[4]*m0
1295      mov    $Ni[1], %rax          # n[4]*m0+t[4]
1296      adc    %rdx, $A0[1]

1298      mov    8($nptr, $j), $Ni[1]  # n[5]
1299      xor    $A1[0], $A1[0]
1300      add    $A0[0], $A1[1]
1301      adc    \ $0, $A1[0]
1302      mul    $m1
1303      add    %rax, $A1[1]          # n[3]*m1
1304      mov    $Ni[1], %rax          # n[3]*m1+"t[4]"
1305      adc    %rdx, $A1[0]
1306      mov    $A1[1], ($tptr, $j)   # "t[4]"

1308      xor    $A0[0], $A0[0]
1309      add    8($tptr, $j), $A0[1]
1310      adc    \ $0, $A0[0]
1311      mul    $m0
1312      add    %rax, $A0[1]          # n[5]*m0
1313      mov    $Ni[0], %rax          # n[5]*m0+t[5]
1314      adc    %rdx, $A0[0]

1317      mov    16($nptr, $j), $Ni[0] # n[6]
1318      xor    $A1[1], $A1[1]
1319      add    $A0[1], $A1[0]
1320      adc    \ $0, $A1[1]
1321      mul    $m1
1322      add    %rax, $A1[0]          # n[4]*m1
1323      mov    $Ni[0], %rax          # n[4]*m1+"t[5]"
1324      adc    %rdx, $A1[1]
1325      mov    $A1[0], 8($tptr, $j)  # "t[5]"

```

```

1327      xor    $A0[1], $A0[1]
1328      add    16($tptr, $j), $A0[0]
1329      adc    \ $0, $A0[1]
1330      mul    $m0
1331      add    %rax, $A0[0]          # n[6]*m0
1332      mov    $Ni[1], %rax          # n[6]*m0+t[6]
1333      adc    %rdx, $A0[1]

1335      mov    24($nptr, $j), $Ni[1] # n[7]
1336      xor    $A1[0], $A1[0]
1337      add    $A0[0], $A1[1]
1338      adc    \ $0, $A1[0]
1339      mul    $m1
1340      add    %rax, $A1[1]          # n[5]*m1
1341      mov    $Ni[1], %rax          # n[5]*m1+"t[6]"
1342      adc    %rdx, $A1[0]
1343      mov    $A1[1], 16($tptr, $j) # "t[6]"

1345      xor    $A0[0], $A0[0]
1346      add    24($tptr, $j), $A0[1]
1347      lea    32($j), $j
1348      adc    \ $0, $A0[0]
1349      mul    $m0
1350      add    %rax, $A0[1]          # n[7]*m0
1351      mov    $Ni[0], %rax          # n[7]*m0+t[7]
1352      adc    %rdx, $A0[0]
1353      cmp    \ $0, $j
1354      jne    .Lsqr4x_mont_inner

1356      sub    0(%rsp), $j           # $j=-$num      # modsched #
1357      mov    $n0, $m0              #              # modsched #

1359      xor    $A1[1], $A1[1]
1360      add    $A0[1], $A1[0]
1361      adc    \ $0, $A1[1]
1362      mul    $m1
1363      add    %rax, $A1[0]          # n[6]*m1
1364      mov    $Ni[1], %rax          # n[6]*m1+"t[7]"
1365      adc    %rdx, $A1[1]
1366      mov    $A1[0], -8($tptr)     # "t[7]"

1368      xor    $A0[1], $A0[1]
1369      add    ($tptr), $A0[0]        # +t[8]
1370      adc    \ $0, $A0[1]
1371      mov    0($nptr, $j), $Ni[0]  # n[0]        # modsched #
1372      add    $stopbit, $A0[0]
1373      adc    \ $0, $A0[1]

1375      imulq  16($tptr, $j), $m0    # m0=t[0]*n0  # modsched #
1376      xor    $A1[0], $A1[0]
1377      mov    8($nptr, $j), $Ni[1]  # n[1]        # modsched #
1378      add    $A0[0], $A1[1]
1379      mov    16($tptr, $j), $A0[0] # t[0]        # modsched #
1380      adc    \ $0, $A1[0]
1381      mul    $m1
1382      add    %rax, $A1[1]          # n[7]*m1
1383      mov    $Ni[0], %rax          # n[7]*m1+"t[8]"
1384      adc    %rdx, $A1[0]          #              # modsched #
1385      mov    $A1[1], ($tptr)       # "t[8]"

1387      xor    $stopbit, $stopbit
1388      add    8($tptr), $A1[0]       # +t[9]
1389      adc    $stopbit, $stopbit
1390      add    $A0[1], $A1[0]
1391      lea    16($tptr), $tptr      # "t[$num]>>128"

```

```

1392      adc    \%0,$stopbit
1393      mov    $A1[0],-8($tptr)      # "t[9]"
1394      cmp    8(%rsp),$tptr        # are we done?
1395      jb     .Lsqr4x_mont_outer

1397      mov    0(%rsp),$num         # restore $num
1398      mov    $stopbit,($tptr)     # save $stopbit
1399
1400 }

```

```

1401 #####
1402 # Post-condition, 4x unrolled copy from bn_mul_mont
1403 #
1404 {
1405 my ($tptr,$nptr)=("%rbx",$aptr);
1406 my @ri=("%rax","%rdx","%r10","%r11");
1407 $code.=<<";
1408      mov     64(%rsp,$num),@ri[0]      # tp[0]
1409      lea     64(%rsp,$num),$tptr       # upper half of t[2*$num] holds result
1410      mov     40(%rsp),$nptr           # restore $nptr
1411      shr     \%5,$num                # num/4
1412      mov     8($tptr),@ri[1]          # t[1]
1413      xor     $i,$i                   # i=0 and clear CF!

1415      mov     32(%rsp),$rptr           # restore $rptr
1416      sub     0($nptr),@ri[0]
1417      mov     16($tptr),@ri[2]         # t[2]
1418      mov     24($tptr),@ri[3]         # t[3]
1419      sbb     8($nptr),@ri[1]
1420      lea     -1($num),$j              # j=num/4-1
1421      jmp     .Lsqr4x_sub
1422 .align 16
1423 .Lsqr4x_sub:
1424      mov     @ri[0],0($rptr,$i,8)     # rp[i]=tp[i]-np[i]
1425      mov     @ri[1],8($rptr,$i,8)     # rp[i]=tp[i]-np[i]
1426      sbb     16($nptr,$i,8),@ri[2]
1427      mov     32($tptr,$i,8),@ri[0]    # tp[i+1]
1428      mov     40($tptr,$i,8),@ri[1]
1429      sbb     24($nptr,$i,8),@ri[3]
1430      mov     @ri[2],16($rptr,$i,8)    # rp[i]=tp[i]-np[i]
1431      mov     @ri[3],24($rptr,$i,8)    # rp[i]=tp[i]-np[i]
1432      sbb     32($nptr,$i,8),@ri[0]
1433      mov     48($tptr,$i,8),@ri[2]
1434      mov     56($tptr,$i,8),@ri[3]
1435      sbb     40($nptr,$i,8),@ri[1]
1436      lea     4($i),$i                # i++
1437      dec     $j                      # doesn't affect CF!
1438      jnz     .Lsqr4x_sub

1440      mov     @ri[0],0($rptr,$i,8)     # rp[i]=tp[i]-np[i]
1441      mov     32($tptr,$i,8),@ri[0]    # load overflow bit
1442      sbb     16($nptr,$i,8),@ri[2]
1443      mov     @ri[1],8($rptr,$i,8)     # rp[i]=tp[i]-np[i]
1444      sbb     24($nptr,$i,8),@ri[3]
1445      mov     @ri[2],16($rptr,$i,8)    # rp[i]=tp[i]-np[i]

1447      sbb     \%0,@ri[0]               # handle upmost overflow bit
1448      mov     @ri[3],24($rptr,$i,8)    # rp[i]=tp[i]-np[i]
1449      xor     $i,$i                   # i=0
1450      and     @ri[0],$tptr
1451      not     @ri[0]
1452      mov     $rptr,$nptr
1453      and     @ri[0],$nptr
1454      lea     -1($num),$j
1455      or      $nptr,$tptr              # tp=borrow?tp:rp

1457      pxor    %xmm0,%xmm0
1458      lea     64(%rsp,$num,8),$nptr
1459      movdqu  ($tptr),%xmm1
1460      lea     ($nptr,$num,8),$nptr
1461      movdqa  %xmm0,64(%rsp)           # zap lower half of temporary vector
1462      movdqa  %xmm0,($nptr)            # zap upper half of temporary vector
1463      movdqu  %xmm1,($rptr)
1464      jmp     .Lsqr4x_copy
1465 .align 16
1466 .Lsqr4x_copy:                        # copy or in-place refresh

```

```

1467      movdqu 16($tptr,$i),%xmm2
1468      movdqu 32($tptr,$i),%xmm1
1469      movdqa %xmm0,80(%rsp,$i)      # zap lower half of temporary vector
1470      movdqa %xmm0,96(%rsp,$i)      # zap lower half of temporary vector
1471      movdqa %xmm0,16($nptr,$i)     # zap upper half of temporary vector
1472      movdqa %xmm0,32($nptr,$i)     # zap upper half of temporary vector
1473      movdqu %xmm2,16($rptr,$i)
1474      movdqu %xmm1,32($rptr,$i)
1475      lea     32($i),$i
1476      dec     $j
1477      jnz     .Lsqr4x_copy

1479      movdqu 16($tptr,$i),%xmm2
1480      movdqa %xmm0,80(%rsp,$i)      # zap lower half of temporary vector
1481      movdqa %xmm0,16($nptr,$i)     # zap upper half of temporary vector
1482      movdqu %xmm2,16($rptr,$i)
1483  }
1484  }
1485  $code.=<<__;;
1486      mov     56(%rsp),%rsi          # restore %rsp
1487      mov     \%1,%rax
1488      mov     0(%rsi),%r15
1489      mov     8(%rsi),%r14
1490      mov     16(%rsi),%r13
1491      mov     24(%rsi),%r12
1492      mov     32(%rsi),%rbp
1493      mov     40(%rsi),%rbx
1494      lea     48(%rsi),%rsp
1495  .Lsqr4x_epilogue:
1496      ret
1497  .size bn_sqr4x_mont,.-bn_sqr4x_mont
1498  }
1499  }
1500  $code.=<<__;;
1501  .asciz "Montgomery Multiplication for x86_64, CRYPTOGAMS by <appro@openssl.org
1502  .align 16
1503  __

1505 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
1506 #                               CONTEXT *context,DISPATCHER_CONTEXT *disp)
1507 if ($win64) {
1508   $rec="%rcx";
1509   $frame="%rdx";
1510   $context="%r8";
1511   $disp="%r9";

1513 $code.=<<__;;
1514 .extern __imp_RtlVirtualUnwind
1515 .type mul_handler,@abi-omnipotent
1516 .align 16
1517 mul_handler:
1518   push     %rsi
1519   push     %rdi
1520   push     %rbx
1521   push     %rbp
1522   push     %r12
1523   push     %r13
1524   push     %r14
1525   push     %r15
1526   pushfq
1527   sub     \%64,%rsp

1529   mov     120($context),%rax      # pull context->Rax
1530   mov     248($context),%rbx      # pull context->Rip

1532   mov     8($disp),%rsi          # disp->ImageBase

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```

1533      mov     56($disp),%r11      # disp->HandlerData

1535      mov     0(%r11),%r10d        # HandlerData[0]
1536      lea     (%rsi,%r10),%r10     # end of prologue label
1537      cmp     %r10,%rbx           # context->Rip<end of prologue label
1538      jnb     .Lcommon_seh_tail

1540      mov     152($context),%rax    # pull context->Rsp

1542      mov     4(%r11),%r10d        # HandlerData[1]
1543      lea     (%rsi,%r10),%r10     # end of prologue label
1544      cmp     %r10,%rbx           # context->Rip>=epilogue label
1545      jae     .Lcommon_seh_tail

1547      mov     192($context),%r10    # pull $num
1548      mov     8(%rax,%r10,8),%rax   # pull saved stack pointer
1549      lea     48(%rax),%rax

1551      mov     -8(%rax),%rbx
1552      mov     -16(%rax),%rbp
1553      mov     -24(%rax),%r12
1554      mov     -32(%rax),%r13
1555      mov     -40(%rax),%r14
1556      mov     -48(%rax),%r15
1557      mov     %rbx,144($context)    # restore context->Rbx
1558      mov     %rbp,160($context)    # restore context->Rbp
1559      mov     %r12,216($context)    # restore context->R12
1560      mov     %r13,224($context)    # restore context->R13
1561      mov     %r14,232($context)    # restore context->R14
1562      mov     %r15,240($context)    # restore context->R15

1564      jmp     .Lcommon_seh_tail
1565  .size mul_handler,.-mul_handler

1567 .type sqr_handler,@abi-omnipotent
1568 .align 16
1569 sqr_handler:
1570   push     %rsi
1571   push     %rdi
1572   push     %rbx
1573   push     %rbp
1574   push     %r12
1575   push     %r13
1576   push     %r14
1577   push     %r15
1578   pushfq
1579   sub     \%64,%rsp

1581   mov     120($context),%rax      # pull context->Rax
1582   mov     248($context),%rbx      # pull context->Rip

1584   lea     .Lsqr4x_body(%rip),%r10
1585   cmp     %r10,%rbx              # context->Rip<.Lsqr_body
1586   jnb     .Lcommon_seh_tail

1588   mov     152($context),%rax      # pull context->Rsp

1590   lea     .Lsqr4x_epilogue(%rip),%r10
1591   cmp     %r10,%rbx              # context->Rip>=.Lsqr_epilogue
1592   jae     .Lcommon_seh_tail

1594   mov     56(%rax),%rax           # pull saved stack pointer
1595   lea     48(%rax),%rax

1597   mov     -8(%rax),%rbx
1598   mov     -16(%rax),%rbp

```

```

1599     mov     -24(%rax),%r12
1600     mov     -32(%rax),%r13
1601     mov     -40(%rax),%r14
1602     mov     -48(%rax),%r15
1603     mov     %rbx,144($context)    # restore context->Rbx
1604     mov     %rbp,160($context)    # restore context->Rbp
1605     mov     %r12,216($context)    # restore context->R12
1606     mov     %r13,224($context)    # restore context->R13
1607     mov     %r14,232($context)    # restore context->R14
1608     mov     %r15,240($context)    # restore context->R15

1610 .Lcommon_seh_tail:
1611     mov     8(%rax),%rdi
1612     mov     16(%rax),%rsi
1613     mov     %rax,152($context)    # restore context->Rsp
1614     mov     %rsi,168($context)    # restore context->Rsi
1615     mov     %rdi,176($context)    # restore context->Rdi

1617     mov     40($disp),%rdi        # disp->ContextRecord
1618     mov     $context,%rsi        # context
1619     mov     \154,%ecx            # sizeof(CONTEXT)
1620     .long   0xa548f3fc           # cld; rep movsq

1622     mov     $disp,%rsi
1623     xor     %rcx,%rcx            # arg1, UNW_FLAG_NHANDLER
1624     mov     8(%rsi),%rdx        # arg2, disp->ImageBase
1625     mov     0(%rsi),%r8         # arg3, disp->ControlPc
1626     mov     16(%rsi),%r9        # arg4, disp->FunctionEntry
1627     mov     40(%rsi),%r10       # disp->ContextRecord
1628     lea     56(%rsi),%r11       # &disp->HandlerData
1629     lea     24(%rsi),%r12       # &disp->EstablisherFrame
1630     mov     %r10,32(%rsp)        # arg5
1631     mov     %r11,40(%rsp)        # arg6
1632     mov     %r12,48(%rsp)        # arg7
1633     mov     %rcx,56(%rsp)        # arg8, (NULL)
1634     call    *__imp_RtlVirtualUnwind(%rip)

1636     mov     \1,$eax              # ExceptionContinueSearch
1637     add     \154,%rsp
1638     popfq
1639     pop     %r15
1640     pop     %r14
1641     pop     %r13
1642     pop     %r12
1643     pop     %rbp
1644     pop     %rbx
1645     pop     %rdi
1646     pop     %rsi
1647     ret
1648 .size     sqr_handler,.-sqr_handler

1650 .section .pdata
1651 .align   4
1652     .rva   .LSEH_begin_bn_mul_mont
1653     .rva   .LSEH_end_bn_mul_mont
1654     .rva   .LSEH_info_bn_mul_mont

1656     .rva   .LSEH_begin_bn_mul4x_mont
1657     .rva   .LSEH_end_bn_mul4x_mont
1658     .rva   .LSEH_info_bn_mul4x_mont

1660     .rva   .LSEH_begin_bn_sqr4x_mont
1661     .rva   .LSEH_end_bn_sqr4x_mont
1662     .rva   .LSEH_info_bn_sqr4x_mont

1664 .section .xdata

```

```

1665 .align   8
1666 .LSEH_info_bn_mul_mont:
1667     .byte   9,0,0,0
1668     .rva    mul_handler
1669     .rva    .Lmul_body,.Lmul_epilogue    # HandlerData[]
1670 .LSEH_info_bn_mul4x_mont:
1671     .byte   9,0,0,0
1672     .rva    mul_handler
1673     .rva    .Lmul4x_body,.Lmul4x_epilogue # HandlerData[]
1674 .LSEH_info_bn_sqr4x_mont:
1675     .byte   9,0,0,0
1676     .rva    sqr_handler
1677     _____
1678 }

1680 print $code;
1681 close STDOUT;

```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-mont5.pl

1

```
*****
22488 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-mont5.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 # =====
4 # Written by Andy Polyakov <appro@openssl.org> for the OpenSSL
5 # project. The module is, however, dual licensed under OpenSSL and
6 # CRYPTOGAMS licenses depending on where you obtain it. For further
7 # details see http://www.openssl.org/~appro/cryptogams/.
8 # =====

10 # August 2011.
11 #
12 # Companion to x86_64-mont.pl that optimizes cache-timing attack
13 # countermeasures. The subroutines are produced by replacing bp[i]
14 # references in their x86_64-mont.pl counterparts with cache-neutral
15 # references to powers table computed in BN_mod_exp_mont_consttime.
16 # In addition subroutine that scatters elements of the powers table
17 # is implemented, so that scatter-/gathering can be tuned without
18 # bn_exp.c modifications.

20 $flavour = shift;
21 $output = shift;
22 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

24 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

26 $0 =~ m/(.*[\\\/])[^\\\/]+$/; $dir=$1;
27 ( $xlate="$dir"x86_64-xlate.pl" and -f $xlate ) or
28 ( $xlate="$dir"../../perlasm/x86_64-xlate.pl" and -f $xlate ) or
29 die "can't locate x86_64-xlate.pl";

31 open OUT,"| \"$^X\" $xlate $flavour $output";
32 *STDOUT=*OUT;

34 # int bn_mul_mont_gather5(
35   $rp="%rdi";      # BN_ULONG *rp,
36   $ap="%rsi";      # const BN_ULONG *ap,
37   $bp="%rdx";      # const BN_ULONG *bp,
38   $np="%rcx";      # const BN_ULONG *np,
39   $n0="%r8";       # const BN_ULONG *n0,
40   $num="%r9";      # int num,
41   $idx;            # int idx);
42   # 0 to 2^5-1, "index" in $bp holding
43   # pre-computed powers of a', interlaced
44   # in such manner that b[0] is $bp[idx],
45   # b[1] is [2^5+idx], etc.

46 $lo0="%r10";
47 $hi0="%r11";
48 $hi1="%r13";
49 $i="%r14";
50 $j="%r15";
51 $m0="%rbx";
52 $m1="%rbp";

53 $code=<<<;
54 .text

56 .globl bn_mul_mont_gather5
57 .type bn_mul_mont_gather5,@function,6
58 .align 64
59 bn_mul_mont_gather5:
60     test    \3,$(num)d
61     jnz     .Lmul_enter
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-mont5.pl

2

```
62     cmp     \8,$(num)d
63     jb      .Lmul_enter
64     jmp     .Lmul4x_enter

66 .align 16
67 .Lmul_enter:
68     mov     ${num}d,${num}d
69     mov     '($win64?56:8)'(%rsp),%r10d    # load 7th argument
70     push    %rbx
71     push    %rbp
72     push    %r12
73     push    %r13
74     push    %r14
75     push    %r15
76
77 $code=<<< if ($win64);
78     lea     -0x28(%rsp),%rsp
79     movaps  %xmm6,($rsp)
80     movaps  %xmm7,0x10(%rsp)
81 .Lmul_alloca:
82
83 $code=<<<;
84     mov     %rsp,%rax
85     lea     2($num),%r11
86     neg     %r11
87     lea     (%rsp,%r11,8),%rsp    # tp=alloca(8*(num+2))
88     and     \-$1024,%rsp        # minimize TLB usage

90     mov     %rax,8(%rsp,$num,8)    # tp[num+1]=%rsp
91 .Lmul_body:
92     mov     $bp,%r12    # reassign $bp
93
94     $bp="%r12";
95     $STRIDE=2*5*8;      # 5 is "window size"
96     $N=$STRIDE/4;       # should match cache line size
97
98 $code=<<<;
99     mov     %r10,%r11
100    shr     \$(log($N/8)/log(2))',%r10
101    and     \$(N/8-1)',%r11
102    not     %r10
103    lea     .Lmagic_masks(%rip),%rax
104    and     \$(2*5/($N/8)-1)',%r10    # 5 is "window size"
105    lea     96($bp,%r11,8),$bp    # pointer within 1st cache line
106    movq    0(%rax,%r10,8),%xmm4    # set of masks denoting which
107    movq    8(%rax,%r10,8),%xmm5    # cache line contains element
108    movq    16(%rax,%r10,8),%xmm6    # denoted by 7th argument
109    movq    24(%rax,%r10,8),%xmm7

110    movq    '0*$STRIDE/4-96'($bp),%xmm0
111    movq    '1*$STRIDE/4-96'($bp),%xmm1
112    pand    %xmm4,%xmm0
113    movq    '2*$STRIDE/4-96'($bp),%xmm2
114    pand    %xmm5,%xmm1
115    movq    '3*$STRIDE/4-96'($bp),%xmm3
116    pand    %xmm6,%xmm2
117    por     %xmm1,%xmm0
118    pand    %xmm7,%xmm3
119    por     %xmm2,%xmm0
120    lea     $STRIDE($bp),$bp
121    por     %xmm3,%xmm0

123    movq    %xmm0,$m0    # m0=bp[0]

125    mov     ($n0),$n0    # pull n0[0] value
126    mov     ($ap),%rax
```

```

128      xor    $i,$i          # i=0
129      xor    $j,$j          # j=0

131      movq   '0*$STRIDE/4-96'($bp),%xmm0
132      movq   '1*$STRIDE/4-96'($bp),%xmm1
133      pand   %xmm4,%xmm0
134      movq   '2*$STRIDE/4-96'($bp),%xmm2
135      pand   %xmm5,%xmm1

137      mov     $n0,$m1
138      mulq    $m0            # ap[0]*bp[0]
139      mov     %rax,$lo0
140      mov     ($np),%rax

142      movq   '3*$STRIDE/4-96'($bp),%xmm3
143      pand   %xmm6,%xmm2
144      por    %xmm1,%xmm0
145      pand   %xmm7,%xmm3

147      imulq  $lo0,$m1       # "tp[0]"*n0
148      mov     %rdx,$hi0

150      por    %xmm2,%xmm0
151      lea     $STRIDE($bp),$bp
152      por    %xmm3,%xmm0

154      mulq    $m1            # np[0]*m1
155      add     %rax,$lo0      # discarded
156      mov     8($ap),%rax
157      adc     \%0,%rdx
158      mov     %rdx,$hi1

160      lea     1($j),$j       # j++
161      jmp     .L1st_enter

163 .align 16
164 .L1st:
165      add     %rax,$hi1
166      mov     ($ap,$j,8),%rax
167      adc     \%0,%rdx
168      add     $hi0,$hi1      # np[j]*m1+ap[j]*bp[0]
169      mov     $lo0,$hi0
170      adc     \%0,%rdx
171      mov     $hi1,-16(%rsp,$j,8) # tp[j-1]
172      mov     %rdx,$hi1

174 .L1st_enter:
175      mulq    $m0            # ap[j]*bp[0]
176      add     %rax,$hi0
177      mov     ($np,$j,8),%rax
178      adc     \%0,%rdx
179      lea     1($j),$j       # j++
180      mov     %rdx,$lo0

182      mulq    $m1            # np[j]*m1
183      cmp     $num,$j
184      jne     .L1st

186      movq    %xmm0,$m0      # bp[1]

188      add     %rax,$hi1
189      mov     ($ap),%rax     # ap[0]
190      adc     \%0,%rdx
191      add     $hi0,$hi1      # np[j]*m1+ap[j]*bp[0]
192      adc     \%0,%rdx
193      mov     $hi1,-16(%rsp,$j,8) # tp[j-1]

```

```

194      mov     %rdx,$hi1
195      mov     $lo0,$hi0

197      xor     %rdx,%rdx
198      add     $hi0,$hi1
199      adc     \%0,%rdx
200      mov     $hi1,-8(%rsp,$num,8)
201      mov     %rdx,($rsp,$num,8) # store upmost overflow bit

203      lea     1($i),$i       # i++
204      jmp     .Louter
205 .align 16
206 .Louter:
207      xor     $j,$j          # j=0
208      mov     $n0,$m1
209      mov     (%rsp),$lo0

211      movq   '0*$STRIDE/4-96'($bp),%xmm0
212      movq   '1*$STRIDE/4-96'($bp),%xmm1
213      pand   %xmm4,%xmm0
214      movq   '2*$STRIDE/4-96'($bp),%xmm2
215      pand   %xmm5,%xmm1

217      mulq    $m0            # ap[0]*bp[i]
218      add     %rax,$lo0      # ap[0]*bp[i]+tp[0]
219      mov     ($np),%rax
220      adc     \%0,%rdx

222      movq   '3*$STRIDE/4-96'($bp),%xmm3
223      pand   %xmm6,%xmm2
224      por    %xmm1,%xmm0
225      pand   %xmm7,%xmm3

227      imulq  $lo0,$m1       # tp[0]*n0
228      mov     %rdx,$hi0

230      por    %xmm2,%xmm0
231      lea     $STRIDE($bp),$bp
232      por    %xmm3,%xmm0

234      mulq    $m1            # np[0]*m1
235      add     %rax,$lo0      # discarded
236      mov     8($ap),%rax
237      adc     \%0,%rdx
238      mov     8(%rsp),$lo0   # tp[1]
239      mov     %rdx,$hi1

241      lea     1($j),$j       # j++
242      jmp     .Linner_enter

244 .align 16
245 .Linner:
246      add     %rax,$hi1
247      mov     ($ap,$j,8),%rax
248      adc     \%0,%rdx
249      add     $lo0,$hi1      # np[j]*m1+ap[j]*bp[i]+tp[j]
250      mov     (%rsp,$j,8),$lo0
251      adc     \%0,%rdx
252      mov     $hi1,-16(%rsp,$j,8) # tp[j-1]
253      mov     %rdx,$hi1

255 .Linner_enter:
256      mulq    $m0            # ap[j]*bp[i]
257      add     %rax,$hi0
258      mov     ($np,$j,8),%rax
259      adc     \%0,%rdx

```

```

260      add    $hi0,$lo0      # ap[j]*bp[i]+tp[j]
261      mov    %rdx,$hi0
262      adc    \0,$hi0
263      lea    1($j),$j      # j++

265      mulq   $m1            # np[j]*m1
266      cmp    $num,$j
267      jne    .Linner

269      movq   %xmm0,$m0      # bp[i+1]

271      add    %rax,$hi1
272      mov    ($ap),%rax      # ap[0]
273      adc    \0,%rdx
274      add    $lo0,$hi1      # np[j]*m1+ap[j]*bp[i]+tp[j]
275      mov    (%rsp,$j,8),$lo0
276      adc    \0,%rdx
277      mov    $hi1,-16(%rsp,$j,8) # tp[j-1]
278      mov    %rdx,$hi1

280      xor    %rdx,%rdx
281      add    $hi0,$hi1
282      adc    \0,%rdx
283      add    $lo0,$hi1      # pull upmost overflow bit
284      adc    \0,%rdx
285      mov    $hi1,-8(%rsp,$num,8)
286      mov    %rdx, (%rsp,$num,8) # store upmost overflow bit

288      lea    1($i),$i      # i++
289      cmp    $num,$i
290      jl     .Louter

292      xor    $i,$i          # i=0 and clear CF!
293      mov    (%rsp),%rax
294      lea    (%rsp),$ap      # borrow ap for tp
295      mov    $num,$j        # j=num
296      jmp    .Lsub

297      .align 16
298      .Lsub: sbb    ($np,$i,8),%rax
299      mov    %rax, ($rp,$i,8) # rp[i]=tp[i]-np[i]
300      mov    8($ap,$i,8),%rax # tp[i+1]
301      lea    1($i),$i      # i++
302      dec    $j            # doesn't affect CF!
303      jnz    .Lsub

305      sbb    \0,%rax      # handle upmost overflow bit
306      xor    $i,$i
307      and    %rax,$ap
308      not    %rax
309      mov    $rp,$np
310      and    %rax,$np
311      mov    $num,$j      # j=num
312      or     $np,$ap      # ap=borrow?tp:rp
313      .align 16
314      .Lcopy:
315      mov    ($ap,$i,8),%rax
316      mov    $i, (%rsp,$i,8) # zap temporary vector
317      mov    %rax, ($rp,$i,8) # rp[i]=tp[i]
318      lea    1($i),$i
319      sub    \1,$j
320      jnz    .Lcopy

322      mov    8(%rsp,$num,8),%rsi # restore %rsp
323      mov    \1,%rax
324      .
325      $code.=<<< if ($win64);

```

```

326      movaps (%rsi),%xmm6
327      movaps 0x10(%rsi),%xmm7
328      lea    0x28(%rsi),%rsi
329      .
330      $code.=<<<
331      mov    (%rsi),%r15
332      mov    8(%rsi),%r14
333      mov    16(%rsi),%r13
334      mov    24(%rsi),%r12
335      mov    32(%rsi),%rbp
336      mov    40(%rsi),%rbx
337      lea    48(%rsi),%rsp
338      .Lmul_epilogue:
339      ret
340      .size   bn_mul_mont_gather5,.-bn_mul_mont_gather5
341      .
342      {{
343      my @A=("%r10", "%r11");
344      my @N=("%r13", "%r12");
345      $code.=<<<
346      .type   bn_mul4x_mont_gather5,\@function,6
347      .align 16
348      bn_mul4x_mont_gather5:
349      .Lmul4x_enter:
350      mov     ${num}d,${num}d
351      mov     '($win64?56:8)'(%rsp),%r10d # load 7th argument
352      push    %rbx
353      push    %rbp
354      push    %r12
355      push    %r13
356      push    %r14
357      push    %r15
358      .
359      $code.=<<< if ($win64);
360      lea     -0x28(%rsp),%rsp
361      movaps  %xmm6, (%rsp)
362      movaps  %xmm7, 0x10(%rsp)
363      .Lmul4x_alloca:
364      .
365      $code.=<<<
366      mov     %rsp,%rax
367      lea     4($num),%r11
368      neg     %r11
369      lea     (%rsp,%r11,8),%rsp # tp=alloca(8*(num+4))
370      and     \-$-1024,%rsp      # minimize TLB usage

372      mov     %rax,8(%rsp,$num,8) # tp[num+1]=%rsp
373      .Lmul4x_body:
374      mov     $rp,16(%rsp,$num,8) # tp[num+2]=$rp
375      mov     %rdx,%r12          # reassign $bp
376      .
377      $bp="%r12";
378      $stride=2*5*8;             # 5 is "window size"
379      $n=$stride/4;              # should match cache line size
380      $code.=<<<
381      mov     %r10,%r11
382      shr     \'$log($n/8)/log(2)',%r10
383      and     \'$n/8-1',%r11
384      not     %r10
385      lea     .Lmagic_masks(%rip),%rax
386      and     \'$2*5/($n/8)-1',%r10 # 5 is "window size"
387      lea     96($bp,%r11,8),$bp     # pointer within 1st cache line
388      movq    0(%rax,%r10,8),%xmm4   # set of masks denoting which
389      movq    8(%rax,%r10,8),%xmm5   # cache line contains element
390      movq    16(%rax,%r10,8),%xmm6 # denoted by 7th argument
391      movq    24(%rax,%r10,8),%xmm7

```



```

393      movq    '0*$STRIDE/4-96'($bp),%xmm0
394      movq    '1*$STRIDE/4-96'($bp),%xmm1
395      pand    %xmm4,%xmm0
396      movq    '2*$STRIDE/4-96'($bp),%xmm2
397      pand    %xmm5,%xmm1
398      movq    '3*$STRIDE/4-96'($bp),%xmm3
399      pand    %xmm6,%xmm2
400      por     %xmm1,%xmm0
401      pand    %xmm7,%xmm3
402      por     %xmm2,%xmm0
403      lea     $STRIDE($bp),%rbp
404      por     %xmm3,%xmm0

406      movq    %xmm0,%m0          # m0=bp[0]
407      mov     (%m0),%n0          # pull n0[0] value
408      mov     ($ap),%rax

410      xor     $i,$i              # i=0
411      xor     $j,$j              # j=0

413      movq    '0*$STRIDE/4-96'($bp),%xmm0
414      movq    '1*$STRIDE/4-96'($bp),%xmm1
415      pand    %xmm4,%xmm0
416      movq    '2*$STRIDE/4-96'($bp),%xmm2
417      pand    %xmm5,%xmm1

419      mov     $n0,%m1
420      mulq    %m0                # ap[0]*bp[0]
421      mov     %rax,$A[0]
422      mov     ($np),%rax

424      movq    '3*$STRIDE/4-96'($bp),%xmm3
425      pand    %xmm6,%xmm2
426      por     %xmm1,%xmm0
427      pand    %xmm7,%xmm3

429      imulq   $A[0],%m1         # "tp[0]"*n0
430      mov     %rdx,$A[1]

432      por     %xmm2,%xmm0
433      lea     $STRIDE($bp),%rbp
434      por     %xmm3,%xmm0

436      mulq    %m1                # np[0]*m1
437      add     %rax,$A[0]         # discarded
438      mov     8($ap),%rax
439      adc     \%0,%rdx
440      mov     %rdx,$N[1]

442      mulq    %m0
443      add     %rax,$A[1]
444      mov     8($np),%rax
445      adc     \%0,%rdx
446      mov     %rdx,$A[0]

448      mulq    %m1
449      add     %rax,$N[1]
450      mov     16($ap),%rax
451      adc     \%0,%rdx
452      add     $A[1],$N[1]
453      lea     4($j),%j          # j++
454      adc     \%0,%rdx
455      mov     $N[1],(%rsp)
456      mov     %rdx,$N[0]
457      jmp     .L1st4x

```

```

458      .align 16
459      .L1st4x:
460      mulq    %m0                # ap[j]*bp[0]
461      add     %rax,$A[0]
462      mov     -16($np,%j,8),%rax
463      adc     \%0,%rdx
464      mov     %rdx,$A[1]

466      mulq    %m1                # np[j]*m1
467      add     %rax,$N[0]
468      mov     -8($ap,%j,8),%rax
469      adc     \%0,%rdx
470      add     $A[0],$N[0]        # np[j]*m1+ap[j]*bp[0]
471      adc     \%0,%rdx
472      mov     $N[0],-24(%rsp,%j,8) # tp[j-1]
473      mov     %rdx,$N[1]

475      mulq    %m0                # ap[j]*bp[0]
476      add     %rax,$A[1]
477      mov     -8($np,%j,8),%rax
478      adc     \%0,%rdx
479      mov     %rdx,$A[0]

481      mulq    %m1                # np[j]*m1
482      add     %rax,$N[1]
483      mov     ($ap,%j,8),%rax
484      adc     \%0,%rdx
485      add     $A[1],$N[1]        # np[j]*m1+ap[j]*bp[0]
486      adc     \%0,%rdx
487      mov     $N[1],-16(%rsp,%j,8) # tp[j-1]
488      mov     %rdx,$N[0]

490      mulq    %m0                # ap[j]*bp[0]
491      add     %rax,$A[0]
492      mov     ($np,%j,8),%rax
493      adc     \%0,%rdx
494      mov     %rdx,$A[1]

496      mulq    %m1                # np[j]*m1
497      add     %rax,$N[0]
498      mov     8($ap,%j,8),%rax
499      adc     \%0,%rdx
500      add     $A[0],$N[0]        # np[j]*m1+ap[j]*bp[0]
501      adc     \%0,%rdx
502      mov     $N[0],-8(%rsp,%j,8) # tp[j-1]
503      mov     %rdx,$N[1]

505      mulq    %m0                # ap[j]*bp[0]
506      add     %rax,$A[1]
507      mov     8($np,%j,8),%rax
508      adc     \%0,%rdx
509      lea     4($j),%j          # j++
510      mov     %rdx,$A[0]

512      mulq    %m1                # np[j]*m1
513      add     %rax,$N[1]
514      mov     -16($ap,%j,8),%rax
515      adc     \%0,%rdx
516      add     $A[1],$N[1]        # np[j]*m1+ap[j]*bp[0]
517      adc     \%0,%rdx
518      mov     $N[1],-32(%rsp,%j,8) # tp[j-1]
519      mov     %rdx,$N[0]
520      cmp     $num,%j
521      jl      .L1st4x

523      mulq    %m0                # ap[j]*bp[0]

```

```

524      add    %rax,$A[0]
525      mov    -16($np,$j,8),%rax
526      adc    \%0,%rdx
527      mov    %rdx,$A[1]

529      mulq   $m1                    # np[j]*m1
530      add    %rax,$N[0]
531      mov    -8($ap,$j,8),%rax
532      adc    \%0,%rdx
533      add    $A[0],$N[0]             # np[j]*m1+ap[j]*bp[0]
534      adc    \%0,%rdx
535      mov    $N[0],-24(%rsp,$j,8)    # tp[j-1]
536      mov    %rdx,$N[1]

538      mulq   $m0                    # ap[j]*bp[0]
539      add    %rax,$A[1]
540      mov    -8($np,$j,8),%rax
541      adc    \%0,%rdx
542      mov    %rdx,$A[0]

544      mulq   $m1                    # np[j]*m1
545      add    %rax,$N[1]
546      mov    ($ap),%rax
547      adc    \%0,%rdx
548      add    $A[1],$N[1]             # np[j]*m1+ap[j]*bp[0]
549      adc    \%0,%rdx
550      mov    $N[1],-16(%rsp,$j,8)    # tp[j-1]
551      mov    %rdx,$N[0]

553      movq   %xmm0,$m0              # bp[1]

555      xor    $N[1],$N[1]
556      add    $A[0],$N[0]
557      adc    \%0,$N[1]
558      mov    $N[0],-8(%rsp,$j,8)
559      mov    $N[1],(%rsp,$j,8)      # store upmost overflow bit

561      lea    1($i),$i               # i++
562      .align 4
563      .Louter4x:
564      xor    $j,$j                  # j=0
565      movq   '0*$STRIDE/4-96'($bp),%xmm0
566      movq   '1*$STRIDE/4-96'($bp),%xmm1
567      pand   %xmm4,%xmm0
568      movq   '2*$STRIDE/4-96'($bp),%xmm2
569      pand   %xmm5,%xmm1

571      mov    (%rsp),$A[0]
572      mov    $n0,$m1
573      mulq   $m0                    # ap[0]*bp[i]
574      add    %rax,$A[0]             # ap[0]*bp[i]+tp[0]
575      mov    ($np),%rax
576      adc    \%0,%rdx

578      movq   '3*$STRIDE/4-96'($bp),%xmm3
579      pand   %xmm6,%xmm2
580      por    %xmm1,%xmm0
581      pand   %xmm7,%xmm3

583      imulq  $A[0],$m1              # tp[0]*n0
584      mov    %rdx,$A[1]

586      por    %xmm2,%xmm0
587      lea    $STRIDE($bp),$bp
588      por    %xmm3,%xmm0

```

```

590      mulq   $m1                    # np[0]*m1
591      add    %rax,$A[0]             # "$N[0]", discarded
592      mov    8($ap),%rax
593      adc    \%0,%rdx
594      mov    %rdx,$N[1]

596      mulq   $m0                    # ap[j]*bp[i]
597      add    %rax,$A[1]
598      mov    8($np),%rax
599      adc    \%0,%rdx
600      add    8(%rsp),$A[1]
601      adc    \%0,%rdx
602      mov    %rdx,$A[0]

604      mulq   $m1                    # np[j]*m1
605      add    %rax,$N[1]
606      mov    16($ap),%rax
607      adc    \%0,%rdx
608      add    $A[1],$N[1]             # np[j]*m1+ap[j]*bp[i]+tp[j]
609      lea    4($j),$j               # j+=2
610      adc    \%0,%rdx
611      mov    %rdx,$N[0]
612      jmp    .Linner4x
613      .align 16
614      .Linner4x:
615      mulq   $m0                    # ap[j]*bp[i]
616      add    %rax,$A[0]
617      mov    -16($np,$j,8),%rax
618      adc    \%0,%rdx
619      add    -16(%rsp,$j,8),$A[0]    # ap[j]*bp[i]+tp[j]
620      adc    \%0,%rdx
621      mov    %rdx,$A[1]

623      mulq   $m1                    # np[j]*m1
624      add    %rax,$N[0]
625      mov    -8($ap,$j,8),%rax
626      adc    \%0,%rdx
627      add    $A[0],$N[0]
628      adc    \%0,%rdx
629      mov    $N[1],-32(%rsp,$j,8)    # tp[j-1]
630      mov    %rdx,$N[1]

632      mulq   $m0                    # ap[j]*bp[i]
633      add    %rax,$A[1]
634      mov    -8($np,$j,8),%rax
635      adc    \%0,%rdx
636      add    -8(%rsp,$j,8),$A[1]
637      adc    \%0,%rdx
638      mov    %rdx,$A[0]

640      mulq   $m1                    # np[j]*m1
641      add    %rax,$N[1]
642      mov    ($ap,$j,8),%rax
643      adc    \%0,%rdx
644      add    $A[1],$N[1]
645      adc    \%0,%rdx
646      mov    $N[0],-24(%rsp,$j,8)    # tp[j-1]
647      mov    %rdx,$N[0]

649      mulq   $m0                    # ap[j]*bp[i]
650      add    %rax,$A[0]
651      mov    ($np,$j,8),%rax
652      adc    \%0,%rdx
653      add    (%rsp,$j,8),$A[0]
654      adc    \%0,%rdx
655      mov    %rdx,$A[1]

```

```

657      mulq    $m1                # np[j]*m1
658      add     %rax,$N[0]
659      mov     8($ap,$j,8),%rax
660      adc     \%0,%rdx
661      add     $A[0],$N[0]
662      adc     \%0,%rdx
663      mov     $N[1],-16(%rsp,$j,8) # tp[j-1]
664      mov     %rdx,$N[1]

666      mulq    $m0                # ap[j]*bp[i]
667      add     %rax,$A[1]
668      mov     8($np,$j,8),%rax
669      adc     \%0,%rdx
670      add     8(%rsp,$j,8),$A[1]
671      adc     \%0,%rdx
672      lea     4($j),$j           # j++
673      mov     %rdx,$A[0]

675      mulq    $m1                # np[j]*m1
676      add     %rax,$N[1]
677      mov     -16($ap,$j,8),%rax
678      adc     \%0,%rdx
679      add     $A[1],$N[1]
680      adc     \%0,%rdx
681      mov     $N[0],-40(%rsp,$j,8) # tp[j-1]
682      mov     %rdx,$N[0]
683      cmp     $num,$j
684      jl      .Linner4x

686      mulq    $m0                # ap[j]*bp[i]
687      add     %rax,$A[0]
688      mov     -16($np,$j,8),%rax
689      adc     \%0,%rdx
690      add     -16(%rsp,$j,8),$A[0] # ap[j]*bp[i]+tp[j]
691      adc     \%0,%rdx
692      mov     %rdx,$A[1]

694      mulq    $m1                # np[j]*m1
695      add     %rax,$N[0]
696      mov     -8($ap,$j,8),%rax
697      adc     \%0,%rdx
698      add     $A[0],$N[0]
699      adc     \%0,%rdx
700      mov     $N[1],-32(%rsp,$j,8) # tp[j-1]
701      mov     %rdx,$N[1]

703      mulq    $m0                # ap[j]*bp[i]
704      add     %rax,$A[1]
705      mov     -8($np,$j,8),%rax
706      adc     \%0,%rdx
707      add     -8(%rsp,$j,8),$A[1]
708      adc     \%0,%rdx
709      lea     1($i),$i           # i++
710      mov     %rdx,$A[0]

712      mulq    $m1                # np[j]*m1
713      add     %rax,$N[1]
714      mov     ($ap),%rax         # ap[0]
715      adc     \%0,%rdx
716      add     $A[1],$N[1]
717      adc     \%0,%rdx
718      mov     $N[0],-24(%rsp,$j,8) # tp[j-1]
719      mov     %rdx,$N[0]

721      movq    %xmm0,$m0         # bp[i+1]

```

```

722      mov     $N[1],-16(%rsp,$j,8) # tp[j-1]

724      xor     $N[1],$N[1]
725      add     $A[0],$N[0]
726      adc     \%0,$N[1]
727      add     (%rsp,$num,8),$N[0] # pull upmost overflow bit
728      adc     \%0,$N[1]
729      mov     $N[0],-8(%rsp,$j,8)
730      mov     $N[1],(%rsp,$j,8)    # store upmost overflow bit

732      cmp     $num,$i
733      jl      .Louter4x
734
735      {
736      my @ri=("%rax","%rdx",$m0,$m1);
737      $code.=<<";
738      mov     16(%rsp,$num,8),$rp # restore $rp
739      mov     0(%rsp),@ri[0]     # tp[0]
740      pxor    %xmm0,%xmm0
741      mov     8(%rsp),@ri[1]     # tp[1]
742      shr     \%2,$num           # num/=4
743      lea     (%rsp),$ap         # borrow ap for tp
744      xor     $i,$i              # i=0 and clear CF!

746      sub     0($np),@ri[0]
747      mov     16($ap),@ri[2]     # tp[2]
748      mov     24($ap),@ri[3]     # tp[3]
749      sbb     8($np),@ri[1]
750      lea     -1($num),$j        # j=num/4-1
751      jmp     .Lsub4x

752      .align 16
753      .Lsub4x:
754      mov     @ri[0],0($rp,$i,8) # rp[i]=tp[i]-np[i]
755      mov     @ri[1],8($rp,$i,8) # rp[i]=tp[i]-np[i]
756      sbb     16($np,$i,8),@ri[2]
757      mov     32($ap,$i,8),@ri[0] # tp[i+1]
758      mov     40($ap,$i,8),@ri[1]
759      sbb     24($np,$i,8),@ri[3]
760      mov     @ri[2],16($rp,$i,8) # rp[i]=tp[i]-np[i]
761      mov     @ri[3],24($rp,$i,8) # rp[i]=tp[i]-np[i]
762      sbb     32($np,$i,8),@ri[0]
763      mov     48($ap,$i,8),@ri[2]
764      mov     56($ap,$i,8),@ri[3]
765      sbb     40($np,$i,8),@ri[1]
766      lea     4($i),$i           # i++
767      dec     $j                 # doesn't affect CF!
768      jnz     .Lsub4x

770      mov     @ri[0],0($rp,$i,8) # rp[i]=tp[i]-np[i]
771      mov     32($ap,$i,8),@ri[0] # load overflow bit
772      sbb     16($np,$i,8),@ri[2]
773      mov     @ri[1],8($rp,$i,8) # rp[i]=tp[i]-np[i]
774      sbb     24($np,$i,8),@ri[3]
775      mov     @ri[2],16($rp,$i,8) # rp[i]=tp[i]-np[i]

777      sbb     \%0,@ri[0]         # handle upmost overflow bit
778      mov     @ri[3],24($rp,$i,8) # rp[i]=tp[i]-np[i]
779      xor     $i,$i              # i=0
780      and     @ri[0],$ap
781      not     @ri[0]
782      mov     $rp,$np
783      and     @ri[0],$np
784      lea     -1($num),$j
785      or      $np,$ap           # ap=borrow?tp:rp

787      movdqu  ($ap),%xmm1

```

```

788      movdqa %xmm0, (%rsp)
789      movdqu %xmm1, ($rp)
790      jmp     .Lcopy4x
791 .align 16
792 .Lcopy4x:                                # copy or in-place refresh
793      movdqu 16($ap, $i), %xmm2
794      movdqu 32($ap, $i), %xmm1
795      movdqa %xmm0, 16($rsp, $i)
796      movdqu %xmm2, 16($rp, $i)
797      movdqa %xmm0, 32($rsp, $i)
798      movdqu %xmm1, 32($rp, $i)
799      lea    32($i), $i
800      dec    $j
801      jnz    .Lcopy4x

803      shl    $2, $num
804      movdqu 16($ap, $i), %xmm2
805      movdqa %xmm0, 16($rsp, $i)
806      movdqu %xmm2, 16($rp, $i)
807
808 }
809 $code.=<<<__ if ($win64);
810      mov     8($rsp, $num, 8), %rsi      # restore %rsp
811      mov     $1, %rax
812
813 $code.=<<<__ if ($win64);
814      movaps (%rsi), %xmm6
815      movaps 0x10(%rsi), %xmm7
816      lea    0x28(%rsi), %rsi
817
818 $code.=<<<__ if ($win64);
819      mov     (%rsi), %r15
820      mov     8(%rsi), %r14
821      mov     16(%rsi), %r13
822      mov     24(%rsi), %r12
823      mov     32(%rsi), %rbp
824      mov     40(%rsi), %rbx
825      lea    48(%rsi), %rsp
826 .Lmul4x_epilogue:
827      ret
828 .size bn_mul4x_mont_gather5, .-bn_mul4x_mont_gather5
829 }}}
830 }}}

832 {
833 my ($inp, $num, $tbl, $idx) = $win64 ? ("%rcx", "%rdx", "%r8", "%r9") : # Win64 order
834                                     ("%rdi", "%rsi", "%rdx", "%rcx"); # Unix order
835 my $out = $inp;
836 my $STRIDE = 2**5*8;
837 my $N = $STRIDE/4;

839 $code.=<<<__ if ($win64);
840 .globl bn_scatter5
841 .type bn_scatter5, @abi-omnipotent
842 .align 16
843 bn_scatter5:
844      cmp     $0, $num
845      jz      .Lscatter_epilogue
846      lea     ($tbl, $idx, 8), $tbl
847 .Lscatter:
848      mov     ($inp), %rax
849      lea     8($inp), $inp
850      mov     %rax, ($tbl)
851      lea     32*8($tbl), $tbl
852      sub     $1, $num
853      jnz     .Lscatter

```

```

854 .Lscatter_epilogue:
855      ret
856 .size bn_scatter5, .-bn_scatter5

858 .globl bn_gather5
859 .type bn_gather5, @abi-omnipotent
860 .align 16
861 bn_gather5:
862
863 $code.=<<<__ if ($win64);
864 .LSEH_begin_bn_gather5:
865      # I can't trust assembler to use specific encoding:-(
866      .byte 0x48, 0x83, 0xec, 0x28      #sub    $0x28, %rsp
867      .byte 0x0f, 0x29, 0x34, 0x24      #movaps %xmm6, (%rsp)
868      .byte 0x0f, 0x29, 0x7c, 0x24, 0x10 #movdqa %xmm7, 0x10(%rsp)
869
870 $code.=<<<__ if ($win64);
871      mov     $idx, %r11
872      shr     $'log($N/8)/log(2)', $idx
873      and     $'N/8-1', %r11
874      not     $idx
875      lea     .Lmagic_masks($rip), %rax
876      and     $'2**5/($N/8)-1', $idx # 5 is "window size"
877      lea     96($tbl, %r11, 8), $tbl # pointer within 1st cache line
878      movq    0(%rax, $idx, 8), %xmm4 # set of masks denoting which
879      movq    8(%rax, $idx, 8), %xmm5 # cache line contains element
880      movq    16(%rax, $idx, 8), %xmm6 # denoted by 7th argument
881      movq    24(%rax, $idx, 8), %xmm7
882      jmp     .Lgather
883 .align 16
884 .Lgather:
885      movq    '0*$STRIDE/4-96'($tbl), %xmm0
886      movq    '1*$STRIDE/4-96'($tbl), %xmm1
887      pand    %xmm4, %xmm0
888      movq    '2*$STRIDE/4-96'($tbl), %xmm2
889      pand    %xmm5, %xmm1
890      movq    '3*$STRIDE/4-96'($tbl), %xmm3
891      pand    %xmm6, %xmm2
892      por     %xmm1, %xmm0
893      pand    %xmm7, %xmm3
894      por     %xmm2, %xmm0
895      lea     $STRIDE($tbl), $tbl
896      por     %xmm3, %xmm0

898      movq    %xmm0, ($out)      # m0=bp[0]
899      lea     8($out), $out
900      sub     $1, $num
901      jnz     .Lgather
902
903 $code.=<<<__ if ($win64);
904      movaps (%rsp), %xmm6
905      movaps 0x10(%rsp), %xmm7
906      lea     0x28(%rsp), %rsp
907
908 $code.=<<<__ if ($win64);
909      ret
910 .LSEH_end_bn_gather5:
911 .size bn_gather5, .-bn_gather5
912
913 }
914 $code.=<<<__ if ($win64);
915 .align 64
916 .Lmagic_masks:
917      .long 0, 0, 0, 0, 0, 0, -1, -1
918      .long 0, 0, 0, 0, 0, 0, 0, 0
919 .asciz "Montgomery Multiplication with scatter/gather for x86_64, CRYPTOgams by

```

```

920 ____
922 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec, ULONG64 frame,
923 #                               CONTEXT *context, DISPATCHER_CONTEXT *disp)
924 if ($win64) {
925   $rec="%rcx";
926   $frame="%rdx";
927   $context="%r8";
928   $disp="%r9";
929
930   $code.=<<____;
931   .extern __imp_RtlVirtualUnwind
932   .type mul_handler, \@abi-omnipotent
933   .align 16
934   mul_handler:
935     push    %rsi
936     push    %rdi
937     push    %rbx
938     push    %rbp
939     push    %r12
940     push    %r13
941     push    %r14
942     push    %r15
943     pushfq
944     sub     \ $64,%rsp
945
946     mov     120($context),%rax    # pull context->Rax
947     mov     248($context),%rbx    # pull context->Rip
948
949     mov     8($disp),%rsi         # disp->ImageBase
950     mov     56($disp),%r11        # disp->HandlerData
951
952     mov     0(%r11),%r10d         # HandlerData[0]
953     lea     (%rsi,%r10),%r10      # end of prologue label
954     cmp     %r10,%rbx             # context->Rip<end of prologue label
955     jnb     .Lcommon_seh_tail
956
957     lea     '40+48'(%rax),%rax
958
959     mov     4(%r11),%r10d         # HandlerData[1]
960     lea     (%rsi,%r10),%r10      # end of alloca label
961     cmp     %r10,%rbx             # context->Rip<end of alloca label
962     jnb     .Lcommon_seh_tail
963
964     mov     152($context),%rax    # pull context->Rsp
965
966     mov     8(%r11),%r10d         # HandlerData[2]
967     lea     (%rsi,%r10),%r10      # epilogue label
968     cmp     %r10,%rbx             # context->Rip>=epilogue label
969     jae     .Lcommon_seh_tail
970
971     mov     192($context),%r10    # pull $num
972     mov     8(%rax,%r10,8),%rax    # pull saved stack pointer
973
974     movaps  (%rax),%xmm0
975     movaps  16(%rax),%xmm1
976     lea     '40+48'(%rax),%rax
977
978     mov     -8(%rax),%rbx
979     mov     -16(%rax),%rbp
980     mov     -24(%rax),%r12
981     mov     -32(%rax),%r13
982     mov     -40(%rax),%r14
983     mov     -48(%rax),%r15
984     mov     %rbx,144($context)    # restore context->Rbx
985     mov     %rbp,160($context)    # restore context->Rbp

```

```

986     mov     %r12,216($context)    # restore context->R12
987     mov     %r13,224($context)    # restore context->R13
988     mov     %r14,232($context)    # restore context->R14
989     mov     %r15,240($context)    # restore context->R15
990     movups  %xmm0,512($context)    # restore context->Xmm6
991     movups  %xmm1,528($context)    # restore context->Xmm7
992
993   .Lcommon_seh_tail:
994     mov     8(%rax),%rdi
995     mov     16(%rax),%rsi
996     mov     %rax,152($context)    # restore context->Rsp
997     mov     %rsi,168($context)    # restore context->Rsi
998     mov     %rdi,176($context)    # restore context->Rdi
999
1000     mov     40($disp),%rdi        # disp->ContextRecord
1001     mov     $context,%rsi         # context
1002     mov     \ $154,%ecx           # sizeof(CONTEXT)
1003     .long   0xa548f3fc            # cld; rep movsq
1004
1005     mov     $disp,%rsi
1006     xor     %rcx,%rcx             # arg1, UNW_FLAG_NHANDLER
1007     mov     8(%rsi),%rdx         # arg2, disp->ImageBase
1008     mov     0(%rsi),%r8          # arg3, disp->ControlPc
1009     mov     16(%rsi),%r9         # arg4, disp->FunctionEntry
1010     mov     40(%rsi),%r10        # disp->ContextRecord
1011     lea     56(%rsi),%r11        # &disp->HandlerData
1012     lea     24(%rsi),%r12        # &disp->EstablisherFrame
1013     mov     %r10,32(%rsp)        # arg5
1014     mov     %r11,40(%rsp)        # arg6
1015     mov     %r12,48(%rsp)        # arg7
1016     mov     %rcx,56(%rsp)        # arg8, (NULL)
1017     call    *__imp_RtlVirtualUnwind(%rip)
1018
1019     mov     \ $1,%eax            # ExceptionContinueSearch
1020     add     \ $64,%rsp
1021     popfq
1022     pop     %r15
1023     pop     %r14
1024     pop     %r13
1025     pop     %r12
1026     pop     %rbp
1027     pop     %rbx
1028     pop     %rdi
1029     pop     %rsi
1030     ret
1031   .size mul_handler,.-mul_handler
1032
1033   .section .pdata
1034   .align 4
1035     .rva    .LSEH_begin_bn_mul_mont_gather5
1036     .rva    .LSEH_end_bn_mul_mont_gather5
1037     .rva    .LSEH_info_bn_mul_mont_gather5
1038
1039     .rva    .LSEH_begin_bn_mul4x_mont_gather5
1040     .rva    .LSEH_end_bn_mul4x_mont_gather5
1041     .rva    .LSEH_info_bn_mul4x_mont_gather5
1042
1043     .rva    .LSEH_begin_bn_gather5
1044     .rva    .LSEH_end_bn_gather5
1045     .rva    .LSEH_info_bn_gather5
1046
1047   .section .xdata
1048   .align 8
1049   .LSEH_info_bn_mul_mont_gather5:
1050     .byte   9,0,0,0
1051     .rva    mul_handler

```

```
1052      .rva      .Lmul_alloca, .Lmul_body, .Lmul_epilogue      # HandlerData[]
1053      .align      8
1054      .LSEH_info_bn_mul4x_mont_gather5:
1055      .byte      9,0,0,0
1056      .rva      mul_handler
1057      .rva      .Lmul4x_alloca, .Lmul4x_body, .Lmul4x_epilogue      # HandlerData[]
1058      .align      8
1059      .LSEH_info_bn_gather5:
1060      .byte      0x01,0x0d,0x05,0x00
1061      .byte      0x0d,0x78,0x01,0x00      #movaps 0x10(rsp),xmm7
1062      .byte      0x08,0x68,0x00,0x00      #movaps (rsp),xmm6
1063      .byte      0x04,0x42,0x00,0x00      #sub    rsp,0x28
1064      .align      8
1065      _____
1066      }

1068      $code =~ s/\`([^\`]*)\`/eval($1)/gem;

1070      print $code;
1071      close STDOUT;
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-xlate.pl

1

```
*****
34231 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-xlate.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 #!/usr/bin/env perl

3 # Ascetic x86_64 AT&T to MASM/NASM assembler translator by <appro>.
4 #
5 # Why AT&T to MASM and not vice versa? Several reasons. Because AT&T
6 # format is way easier to parse. Because it's simpler to "gear" from
7 # Unix ABI to Windows one [see cross-reference "card" at the end of
8 # file]. Because Linux targets were available first...
9 #
10 # In addition the script also "distills" code suitable for GNU
11 # assembler, so that it can be compiled with more rigid assemblers,
12 # such as Solaris /usr/ccs/bin/as.
13 #
14 # This translator is not designed to convert *arbitrary* assembler
15 # code from AT&T format to MASM one. It's designed to convert just
16 # enough to provide for dual-ABI OpenSSL modules development...
17 # There *are* limitations and you might have to modify your assembler
18 # code or this script to achieve the desired result...
19 #
20 # Currently recognized limitations:
21 #
22 # - can't use multiple ops per line;
23 #
24 # Dual-ABI styling rules.
25 #
26 # 1. Adhere to Unix register and stack layout [see cross-reference
27 # ABI "card" at the end for explanation].
28 # 2. Forget about "red zone," stick to more traditional blended
29 # stack frame allocation. If volatile storage is actually required
30 # that is. If not, just leave the stack as is.
31 # 3. Functions tagged with ".type name,@function" get crafted with
32 # unified Win64 prologue and epilogue automatically. If you want
33 # to take care of ABI differences yourself, tag functions as
34 # ".type name,@abi-omnipotent" instead.
35 # 4. To optimize the Win64 prologue you can specify number of input
36 # arguments as ".type name,@function,N." Keep in mind that if N is
37 # larger than 6, then you *have to* write "abi-omnipotent" code,
38 # because >6 cases can't be addressed with unified prologue.
39 # 5. Name local labels as .L*, do *not* use dynamic labels such as 1:
40 # (sorry about latter).
41 # 6. Don't use [or hand-code with .byte] "rep ret." "ret" mnemonic is
42 # required to identify the spots, where to inject Win64 epilogue!
43 # But on the pros, it's then prefixed with rep automatically:-)
44 # 7. Stick to explicit ip-relative addressing. If you have to use
45 # GOTPCREL addressing, stick to mov symbol@GOTPCREL(%rip),%r??
46 # Both are recognized and translated to proper Win64 addressing
47 # modes. To support legacy code a synthetic directive, .picmeup,
48 # is implemented. It puts address of the *next* instruction into
49 # target register, e.g.:
50 #
51 #             .picmeup      %rax
52 #             lea           .Label-.(%rax),%rax
53 #
54 # 8. In order to provide for structured exception handling unified
55 # Win64 prologue copies %rsp value to %rax. For further details
56 # see SEH paragraph at the end.
57 # 9. .init segment is allowed to contain calls to functions only.
58 # a. If function accepts more than 4 arguments *and* >4th argument
59 # is declared as non 64-bit value, do clear its upper part.
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-xlate.pl

2

```
60 my $flavour = shift;
61 my $output = shift;
62 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

64 open STDOUT,">$output" || die "can't open $output: $!"
65     if (defined($output));

67 my $gas=1;      $gas=0 if ($output =~ /\.asm$/);
68 my $self=1;     $self=0 if (!$gas);
69 my $win64=0;
70 my $prefix="sunw_";
71 my $decor=".L";

73 my $asmref=8 + 50727*2**-32; # 8.00.50727 shipped with VS2005
74 my $asm=0;
75 my $PTR=" PTR";

77 my $asmref=2.03;
78 my $asm=0;

80 if ($flavour eq "mingw64") { $gas=1; $self=0; $win64=1;
81                             $prefix='echo __USER_LABEL_PREFIX__ | ENV{CC}
82                             }
83                             chomp($prefix);
84 elif ($flavour eq "macosx") { $gas=1; $self=0; $prefix="_"; $decor="L$"; }
85 elif ($flavour eq "masm") { $gas=0; $self=0; $asm=$asmref; $win64=1; $decor
86 elif ($flavour eq "nasm") { $gas=0; $self=0; $asm=$asmref; $win64=1; $decor
87 elif (!$gas)
88 { if ($ENV{ASM} =~ m/nasm/ && 'nasm -v' =~ m/version ([0-9]+)\.([0-9]+)/i)
89   { $asm = $1 + $2*0.01; $PTR=""; }
90   elsif ('ml64 2>&1' =~ m/Version ([0-9]+)\.([0-9]+)\.([0-9]+)/i)
91   { $asm = $1 + $2*2**-16 + $4*2**-32; }
92   die "no assembler found on %PATH" if (!$asm || $asm);
93   $win64=1;
94   $self=0;
95   $decor="\$\$";
96 }

98 my $current_segment;
99 my $current_function;
100 my %globals;

102 { package opcode; # pick up opcodes
103     sub re {
104         my $self = shift; # single instance in enough...
105         local *line = shift;
106         undef $ret;

108         if ($line =~ /\^([a-z][a-z0-9]*)/i) {
109             $self->{op} = $1;
110             $ret = $self;
111             $line = substr($line,@+0); $line =~ s/^\s+//;

113             undef $self->{sz};
114             if ($self->{op} =~ /\^(movz)?([bw]).*/i) { # movz is pain...
115                 $self->{op} = $1;
116                 $self->{sz} = $2;
117             } elsif ($self->{op} =~ /call|jmp/) {
118                 $self->{sz} = "";
119             } elsif ($self->{op} =~ /\p/ && $' !~ /\^(\ush|op|insrw)/) { # SSEn
120                 $self->{sz} = "";
121             } elsif ($self->{op} =~ /\v/) { # VEX
122                 $self->{sz} = "";
123             } elsif ($self->{op} =~ /movq/ && $line =~ /\%xmm/) {
124                 $self->{sz} = "";
125             } elsif ($self->{op} =~ /\^([a-z]{3})([qlwb])/) {
```

```
new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-xlate.pl
```

```

192 $ret;
193 }
194 sub out {
195     my $self = shift;

197     if ($gas) {
198         # Solaris /usr/ccs/bin/as can't handle multiplications
199         # in $self->{value}
200         $self->{value} = s/(?![\w$\.])(0x?[0-9a-f]+)/oct($1)/egi;
201         $self->{value} = s/([0-9]+\s*[\*\^\%])\s*[0-9]+)/eval($1)/eg;
202         sprintf "%$s", $self->{value};
203     } else {
204         $self->{value} = s/(0b[0-1]+)/oct($1)/eig;
205         $self->{value} = s/0x([0-9a-f]+)/0$1h/ig if ($masm);
206         sprintf "%s", $self->{value};
207     }
208 }
209 }
210 { package ea; # pick up effective addresses: expr(%reg,%reg,scale)
211     sub re {
212         my $self = shift; # single instance in enough...
213         local *line = shift;
214         undef $ret;

216         # optional * ---vvv--- appears in indirect jmp/call
217         if ($line =~ /\^(\^?)([^\,]*)\(([\w\,]+\)\)/) {
218             $self->{asterisk} = $1;
219             $self->{label} = $2;
220             ($self->{base}, $self->{index}, $self->{scale}) = split(/,/,$3);
221             $self->{scale} = 1 if (!defined($self->{scale}));
222             $ret = $self;
223             $line = substr($line,@+0]; $line =~ s/\^s+//;

225             if ($win64 && $self->{label} =~ s/\@GOTPCREL//) {
226                 die if (opcode->mnemonic() ne "mov");
227                 opcode->mnemonic("lea");
228             }
229             $self->{base} = s/\^//;
230             $self->{index} = s/\^// if (defined($self->{index}));
231         }
232         $ret;
233     }
234 sub size {
235     sub out {
236         my $self = shift;
237         my $sz = shift;

239         $self->{label} = s/([_a-z][_a-z0-9]*)/$globals{$1} or $1/gei;
240         $self->{label} = s/\.L/$decor/g;

242         # Silently convert all EAs to 64-bit. This is required for
243         # elder GNU assembler and results in more compact code,
244         # *but* most importantly AES module depends on this feature!
245         $self->{index} = s/\^[er](\.[0-9xpi])[d]?$/r\1/;
246         $self->{base} = s/\^[er](\.[0-9xpi])[d]?$/r\1/;

248         # Solaris /usr/ccs/bin/as can't handle multiplications
249         # in $self->{label}, new gas requires sign extension...
250         use integer;
251         $self->{label} = s/(?![\w$\.])(0x?[0-9a-f]+)/oct($1)/egi;
252         $self->{label} = s/([0-9]+\s*[\*\^\%])\s*[0-9]+)/eval($1)/eg;
253         $self->{label} = s/([0-9]+)/$1<32>>32/eg;

255         if ($gas) {
256             $self->{label} = s/\_imp\_imp\_ if ($flavour eq "mingw64");

```



```

321     $ret;
322 }
323 sub out {

```

```

387         $func .= "    mov     r9,QWORD${PTR}[48+rsp]\n" if ($narg>5);
388         $func .= "\n";
389     } else {

```

```
new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64-xlate.pl
```

```

445         if (Type eq "\@function") {
446             undef $current_function;
447             $current_function->{name} = $sym;
448             $current_function->{abi} = "svr4";
449             $current_function->{narg} = $narg;
450             $current_function->{scope} = defined($gl
451         } elsif (Type eq "\@abi-omnipotent") {
452             undef $current_function;
453             $current_function->{name} = $sym;
454             $current_function->{scope} = defined($gl
455         }
456         $line =~ s/\@abi\omnipotent\@function/;
457         $line =~ s/\@function.*\@function/;
458         $line =~ s/$sym/$globals{$sym} or $sym/e;
459         last;
460     };
461     /\.asciz/    && do { if ($line =~ /\^(.*)"/) {
462         $dir = ".byte";
463         $line = join(" ", unpack("C*", $1), 0);
464     }
465     };
466     /\.rva|\.long|\.quad/
467     && do { $line =~ s/([_a-z][_a-z0-9]*)/$globals{$1} o
468     $line =~ s/\./L/$decor/g;
469     last;
470     };
471     /\.size/    && do { $line =~ s/([_a-z][_a-z0-9]*)/$globals{$1} o
472     last;
473     };
474 }
475
476 if ($gas) {
477     $self->{value} = $dir . "\t" . $line;
478
479     if ($dir =~ /\.extern/) {
480         $self->{value} = ""; # swallow extern
481     } elsif (!$self && $dir =~ /\.type/) {
482         $self->{value} = "";
483         $self->{value} = ".def\t" . ($globals{$1} or $1) . ";\t" .
484             (defined($globals{$1})?" .scl 2;":" .scl 3;") .
485             "\t.type 32;\t.endif"
486         if ($win64 && $line =~ /\([^,]+\),\@function/);
487     } elsif (!$self && $dir =~ /\.size/) {
488         $self->{value} = "";
489         if (defined($current_function)) {
490             $self->{value} = "$decor;SEH_end_$current_function->{n
491             if ($win64 && $current_function->{abi} eq "svr4"
492             undef $current_function;
493         }
494     } elsif (!$self && $dir =~ /\.align/) {
495         $self->{value} = ".p2align\t" . (log($line)/log(2));
496     } elsif ($dir eq ".section") {
497         $current_segment=$line;
498         if (!$self && $current_segment eq ".init") {
499             if ($flavour eq "macosx") { $self->{value} = ".mod
500             elsif ($flavour eq "mingw64") { $self->{value} = ".sec
501         }
502     }
503     } elsif ($dir =~ /\.(\text|data)/) {
504         $current_segment="$1";
505     } elsif ($dir =~ /\.hidden/) {
506         if ($flavour eq "macosx") { $self->{value} = ".private-e
507         elsif ($flavour eq "mingw64") { $self->{value} = ""; }
508         else { $self->{value} = ".hidden\t$prefix$line"; }
509     } elsif ($dir =~ /\.comm/) {
510         $self->{value} = "$dir\t$prefix$line";
511     }
512 }

```

```

522     $self->{value} =~ s|,([0-9]+),([0-9]+)$|", $1, ". log($2)/log(2
523   }
524   $line = "";
525   return $self;
526 }

528 # non-gas case or nasm/masm
529 SWITCH: for ($dir) {
530   /\.text/    && do { my $v=undef;
531                     if ($nasm) {
532                       $v="section      .text code align=64\n";
533                     } else {
534                       $v="$current_segment\tENDS\n" if ($curre
535                       $current_segment = ".text\n";
536                       $v="$current_segment\ttSEGMENT ";
537                       $v="$masm>=$masmref ? "ALIGN(64)" : "PAG
538                       $v=" 'CODE'";
539                     }
540                     $self->{value} = $v;
541                     last;
542   };
543   /\.data/    && do { my $v=undef;
544                     if ($nasm) {
545                       $v="section      .data data align=8\n";
546                     } else {
547                       $v="$current_segment\tENDS\n" if ($curre
548                       $current_segment = " DATA";
549                       $v="$current_segment\ttSEGMENT";
550                     }
551                     $self->{value} = $v;
552                     last;
553   };
554   /\.section/ && do { my $v=undef;
555                     $line =~ s/([^\s,]*).*/$1/;
556                     $line = ".CRT\$XCU" if ($line eq ".init");
557                     if ($nasm) {
558                       $v="section      $line";
559                       if ($line =~ /\.([px])data/) {
560                         $v.=" rdata align=";
561                         $v="$1 eq \"p\" ? 4 : 8;
562                       } elsif ($line =~ /\.CRT\$/i) {
563                         $v.=" rdata align=8";
564                       }
565                     } else {
566                       $v="$current_segment\tENDS\n" if ($curre
567                       $v="$line\ttSEGMENT";
568                       if ($line =~ /\.([px])data/) {
569                         $v.=" READONLY";
570                         $v.=" ALIGN(\".$1 eq \"p\" ? 4 : 8).")
571                       } elsif ($line =~ /\.CRT\$/i) {
572                         $v.=" READONLY ";
573                         $v="$masm>=$masmref ? "ALIGN(8)" : "
574                       }
575                     }
576                     $current_segment = $line;
577                     $self->{value} = $v;
578                     last;
579   };
580   /\.extern/  && do { $self->{value} = "EXTERN\t".$line;
581                     $self->{value} .= ":NEAR" if ($masm);
582                     last;
583   };
584   /\.globl|.global/
585   && do { $self->{value} = $masm?"PUBLIC":"global";
586         $self->{value} .= "\t".$line;
587         last;

```

```

588   };
589   /\.size/    && do { if (defined($current_function)) {
590                     undef $self->{value};
591                     if ($current_function->{abi} eq "svr4")
592                       $self->{value}="{decor}SEH_end_Scur
593                       $self->{value}.=":\n" if ($masm);
594                     }
595                     $self->{value}="$current_function->{nam
596                     undef $current_function;
597                   }
598                   last;
599   };
600   /\.align/  && do { $self->{value} = "ALIGN\t".$line; last; };
601   /\. (value|long|rva|quad)/
602   && do { my $sz = substr($1,0,1);
603         my @arr = split(/,\s*/, $line);
604         my $last = pop(@arr);
605         my $conv = sub { my $var=shift;
606                         $var=~s/^(0b[0-1]+)/oct(
607                         $var=~s/^(0x[0-9a-f]+)/0
608                         if ($sz eq "D" && ($curr
609                         { $var=~s/([_a-z$@][_a
610                         $var;
611                         };
612
613         $sz =~ tr/bvrlq/BWDDQ/;
614         $self->{value} = "\tD$sz\t";
615         for (@arr) { $self->{value} .= &$conv($_).",
616         $self->{value} .= &$conv($last);
617         last;
618       };
619   /\.byte/   && do { my @str=split(/,\s*/, $line);
620                     map(s/(0b[0-1]+)/oct($1)/eig,@str);
621                     map(s/(0x[0-9a-f]+)/0$1h/ig,@str) if ($masm)
622                     while ($#str>15) {
623                       $self->{value}.="DB\t"
624                       .join(",",@str[0..15])."\n";
625                       foreach (0..15) { shift @str; }
626                     }
627                     $self->{value}.="DB\t"
628                     .join(",",@str) if (@str);
629                     last;
630   };
631   /\.comm/   && do { my @str=split(/,\s*/, $line);
632                     my $v=undef;
633                     if ($nasm) {
634                       $v.="common      $prefix@str[0] @str[1]";
635                     } else {
636                       $v="$current_segment\tENDS\n" if ($curre
637                       $current_segment = " DATA";
638                       $v="$current_segment\ttSEGMENT\n";
639                       $v="COMM          @str[0]:DWORD:".@str[1]/
640                     }
641                     $self->{value} = $v;
642                     last;
643   };
644   }
645   $line = "";
646 }

648 $ret;
649 }
650 sub out {
651   my $self = shift;
652   $self->{value};
653 }

```

```

654 }

656 sub rex {
657     local *opcode=shift;
658     my ($dst,$src,$rex)=@_;

660     $rex|=0x04 if($dst>=8);
661     $rex|=0x01 if($src>=8);
662     push @opcode,($rex|0x40) if ($rex);
663 }

665 # older gas and m64 don't handle SSE>2 instructions
666 my %regrm = (
667     "%eax"=>0, "%ecx"=>1, "%edx"=>2, "%ebx"=>3,
668     "%esp"=>4, "%ebp"=>5, "%esi"=>6, "%edi"=>7
669 );

669 my $movq = sub {
670     my $arg = shift;
671     my @opcode=(0x66);
672     if ($arg =~ /%xmm([0-9]+)/, \s*%r(\w+)/) {
673         my ($src,$dst)=(0x1,$2);
674         if ($dst !~ /[0-9]+)/ { $dst = $regrm{"%e$dst"}; }
675         rex(\@opcode,$src,$dst,0x8);
676         push @opcode,0x0f,0x7e;
677         push @opcode,0xc0|(($src&7)<<3)|($dst&7); # ModR/M
678         @opcode;
679     } elsif ($arg =~ /%r(\w+), \s*%xmm([0-9]+)/) {
680         my ($src,$dst)=(0x2,$1);
681         if ($dst !~ /[0-9]+)/ { $dst = $regrm{"%e$dst"}; }
682         rex(\@opcode,$src,$dst,0x8);
683         push @opcode,0x0f,0x6e;
684         push @opcode,0xc0|(($src&7)<<3)|($dst&7); # ModR/M
685         @opcode;
686     } else {
687         ();
688     }
689 };

691 my $pextrd = sub {
692     if (shift =~ /\$([0-9]+)/, \s*%xmm([0-9]+)/, \s*(%w+)/) {
693         my @opcode=(0x66);
694         $imm=$1;
695         $src=$2;
696         $dst=$3;
697         if ($dst =~ /%r([0-9]+)/d) { $dst = $1; }
698         elsif ($dst =~ /%e/) { $dst = $regrm{"%e$dst"}; }
699         rex(\@opcode,$src,$dst);
700         push @opcode,0x0f,0x3a,0x16;
701         push @opcode,0xc0|(($src&7)<<3)|($dst&7); # ModR/M
702         push @opcode,$imm;
703         @opcode;
704     } else {
705         ();
706     }
707 };

709 my $pinsrd = sub {
710     if (shift =~ /\$([0-9]+)/, \s*(%w+), \s*%xmm([0-9]+)/) {
711         my @opcode=(0x66);
712         $imm=$1;
713         $src=$2;
714         $dst=$3;
715         if ($src =~ /%r([0-9]+)/) { $src = $1; }
716         elsif ($src =~ /%e/) { $src = $regrm{"%e$src"}; }
717         rex(\@opcode,$dst,$src);
718         push @opcode,0x0f,0x3a,0x22;
719         push @opcode,0xc0|(($dst&7)<<3)|($src&7); # ModR/M

```

```

720     push @opcode,$imm;
721     @opcode;
722 } else {
723     ();
724 }
725 };

727 my $pshufb = sub {
728     if (shift =~ /%xmm([0-9]+)/, \s*%xmm([0-9]+)/) {
729         my @opcode=(0x66);
730         rex(\@opcode,$2,$1);
731         push @opcode,0x0f,0x38,0x00;
732         push @opcode,0xc0|($1&7)|(($2&7)<<3); # ModR/M
733         @opcode;
734     } else {
735         ();
736     }
737 };

739 my $palignr = sub {
740     if (shift =~ /\$([0-9]+)/, \s*%xmm([0-9]+)/, \s*%xmm([0-9]+)/) {
741         my @opcode=(0x66);
742         rex(\@opcode,$3,$2);
743         push @opcode,0x0f,0x3a,0x0f;
744         push @opcode,0xc0|($2&7)|(($3&7)<<3); # ModR/M
745         push @opcode,$1;
746         @opcode;
747     } else {
748         ();
749     }
750 };

752 my $pclmulqdq = sub {
753     if (shift =~ /\$([x0-9a-f]+)/, \s*%xmm([0-9]+)/, \s*%xmm([0-9]+)/) {
754         my @opcode=(0x66);
755         rex(\@opcode,$3,$2);
756         push @opcode,0x0f,0x3a,0x44;
757         push @opcode,0xc0|($2&7)|(($3&7)<<3); # ModR/M
758         my $c=$1;
759         push @opcode,$c=~/^0/?oct($c):$c;
760         @opcode;
761     } else {
762         ();
763     }
764 };

766 my $rdrand = sub {
767     if (shift =~ /%er(\w+)/) {
768         my @opcode=();
769         my $dst=$1;
770         if ($dst !~ /[0-9]+)/ { $dst = $regrm{"%e$dst"}; }
771         rex(\@opcode,0,$1,8);
772         push @opcode,0x0f,0xc7,0xf0|($dst&7);
773         @opcode;
774     } else {
775         ();
776     }
777 };

779 if ($nasm) {
780     print <<__;;
781     default rel
782     %define XMMWORD
783     __
784 } elsif ($masm) {
785     print <<__;;

```

```

786 OPTION DOTNAME
787 _____
788 }
789 while($line<=>) {
791     chomp($line);
793     $line =~ s/[#!].*$/; # get rid of asm-style comments...
794     $line =~ s|/\*.*\*/||; # ... and C-style comments...
795     $line =~ s|^\s+||; # ... and skip white spaces in beginning
797     undef $label;
798     undef $opcode;
799     undef @args;
801     if ($label=label->re($line)) { print $label->out(); }
803     if (directive->re($line)) {
804         printf "%s",directive->out();
805     } elsif ($opcode=opcode->re($line)) {
806         my $asm = eval("$". $opcode->mnemonic());
807         undef @bytes;
808         if ((ref($asm) eq 'CODE') && scalar(@bytes=&$asm($line))) {
809             print $gas?".byte\t":"DB\t",join(',',@bytes),"n";
810             next;
811         }
812     }
814     ARGUMENT: while (1) {
815         my $arg;
817         if ($arg=register->re($line)) { opcode->size($arg->size()); }
818         elsif ($arg=const->re($line)) { }
819         elsif ($arg=ea->re($line)) { }
820         elsif ($arg=expr->re($line)) { }
821         else { last ARGUMENT; }
823         push @args,$arg;
825         last ARGUMENT if ($line !~ /\^,/);
827         $line =~ s/\^,\s*//;
828     } # ARGUMENT:
830     if ($#args>=0) {
831         my $insn;
832         my $sz=opcode->size();
834         if ($gas) {
835             $insn = $opcode->out($#args>=1?$args[$#args]->size():$sz);
836             @args = map($_->out($sz),@args);
837             printf "\t%s\t%s",$insn,join(", ",@args);
838         } else {
839             $insn = $opcode->out();
840             foreach (@args) {
841                 my $arg = $_->out();
842                 # $insn.=$sz compensates for movq, pinsrw, ...
843                 if ($arg =~ /\^xmm[0-9]+$/ ) { $insn.=$sz; $sz="x" if(!$sz); l
844                 if ($arg =~ /\^mm[0-9]+$/ ) { $insn.=$sz; $sz="q" if(!$sz); l
845             }
846             @args = reverse(@args);
847             undef $sz if ($nasm && $opcode->mnemonic() eq "lea");
848             printf "\t%s\t%s",$insn,join(", ",map($_->out($sz),@args));
849         }
850     } else {
851         printf "\t%s",$opcode->out();

```

```

852     }
853 }
855     print $line,"n";
856 }
858 print "\n$current_segment\tENDS\n" if ($current_segment && $nasm);
859 print "END\n" if ($nasm);
861 close STDOUT;

```

```

863 #####
864 # Cross-reference x86_64 ABI "card"
865 #
866 #           Unix           Win64
867 # %rax      *             *
868 # %rbx      -             -
869 # %rcx      #4            #1
870 # %rdx      #3            #2
871 # %rsi      #2            -
872 # %rdi      #1            -
873 # %rbp      -             -
874 # %rsp      -             -
875 # %r8       #5            #3
876 # %r9       #6            #4
877 # %r10      *             *
878 # %r11      *             *
879 # %r12      -             -
880 # %r13      -             -
881 # %r14      -             -
882 # %r15      -             -
883 #
884 # (*) volatile register
885 # (-) preserved by callee
886 # (#) Nth argument, volatile
887 #
888 # In Unix terms top of stack is argument transfer area for arguments
889 # which could not be accommodated in registers. Or in other words 7th
890 # [integer] argument resides at 8(%rsp) upon function entry point.
891 # 128 bytes above %rsp constitute a "red zone" which is not touched
892 # by signal handlers and can be used as temporal storage without
893 # allocating a frame.
894 #
895 # In Win64 terms N*8 bytes on top of stack is argument transfer area,
896 # which belongs to/can be overwritten by callee. N is the number of
897 # arguments passed to callee, *but* not less than 4! This means that
898 # upon function entry point 5th argument resides at 40(%rsp), as well
899 # as that 32 bytes from 8(%rsp) can always be used as temporal
900 # storage [without allocating a frame]. One can actually argue that
901 # one can assume a "red zone" above stack pointer under Win64 as well.
902 # Point is that at apparently no occasion Windows kernel would alter
903 # the area above user stack pointer in true asynchronous manner...
904 #
905 # All the above means that if assembler programmer adheres to Unix
906 # register and stack layout, but disregards the "red zone" existence,
907 # it's possible to use following prologue and epilogue to "gear" from
908 # Unix to Win64 ABI in leaf functions with not more than 6 arguments.
909 #
910 # omnipotent_function:
911 # ifdef WIN64
912 #     movq    %rdi,8(%rsp)
913 #     movq    %rsi,16(%rsp)
914 #     movq    %rcx,%rdi    ; if 1st argument is actually present
915 #     movq    %rdx,%rsi    ; if 2nd argument is actually ...
916 #     movq    %r8,%rdx    ; if 3rd argument is ...
917 #     movq    %r9,%rcx    ; if 4th argument ...
918 #     movq    40(%rsp),%r8 ; if 5th ...
919 #     movq    48(%rsp),%r9 ; if 6th ...
920 # endif
921 # ...
922 # ifdef WIN64
923 #     movq    8(%rsp),%rdi
924 #     movq    16(%rsp),%rsi
925 # endif
926 #     ret
927 #

```

```

928 #####
929 # Win64 SEH, Structured Exception Handling.
930 #
931 # Unlike on Unix systems(*) lack of Win64 stack unwinding information
932 # has undesired side-effect at run-time: if an exception is raised in
933 # assembler subroutine such as those in question (basically we're
934 # referring to segmentation violations caused by malformed input
935 # parameters), the application is briskly terminated without invoking
936 # any exception handlers, most notably without generating memory dump
937 # or any user notification whatsoever. This poses a problem. It's
938 # possible to address it by registering custom language-specific
939 # handler that would restore processor context to the state at
940 # subroutine entry point and return "exception is not handled, keep
941 # unwinding" code. Writing such handler can be a challenge... But it's
942 # doable, though requires certain coding convention. Consider following
943 # snippet:
944 #
945 # .type function,@function
946 # function:
947 #     movq    %rsp,%rax    # copy rsp to volatile register
948 #     pushq   %r15         # save non-volatile registers
949 #     pushq   %rbx
950 #     pushq   %rbp
951 #     movq    %rsp,%r11
952 #     subq    %rdi,%r11    # prepare [variable] stack frame
953 #     andq    $-64,%r11
954 #     movq    %rax,0(%r11) # check for exceptions
955 #     movq    %r11,%rsp    # allocate [variable] stack frame
956 #     movq    %rax,0(%rsp) # save original rsp value
957 # magic_point:
958 #     ...
959 #     movq    0(%rsp),%rcx # pull original rsp value
960 #     movq    -24(%rcx),%rbp # restore non-volatile registers
961 #     movq    -16(%rcx),%rbx
962 #     movq    -8(%rcx),%r15
963 #     movq    %rcx,%rsp    # restore original rsp
964 #     ret
965 # .size function,.-function
966 #
967 # The key is that up to magic_point copy of original rsp value remains
968 # in chosen volatile register and no non-volatile register, except for
969 # rsp, is modified. While past magic_point rsp remains constant till
970 # the very end of the function. In this case custom language-specific
971 # exception handler would look like this:
972 #
973 # EXCEPTION_DISPOSITION handler (EXCEPTION_RECORD *rec,ULONG64 frame,
974 #     CONTEXT *context,DISPATCHER_CONTEXT *disp)
975 # {
976 #     ULONG64 *rsp = (ULONG64 *)context->Rax;
977 #     if (context->Rip >= magic_point)
978 #     {
979 #         rsp = ((ULONG64 **)context->Rsp)[0];
980 #         context->Rbp = rsp[-3];
981 #         context->Rbx = rsp[-2];
982 #         context->R15 = rsp[-1];
983 #     }
984 #     context->Rsp = (ULONG64)rsp;
985 #     context->Rdi = rsp[1];
986 #     context->Rsi = rsp[2];
987 #
988 #     memcpy (disp->ContextRecord,context,sizeof(CONTEXT));
989 #     RtlVirtualUnwind(UNW_FLAG_NHANDLER,disp->ImageBase,
990 #         disp->ControlPc,disp->FunctionEntry,disp->ContextRecord,
991 #         &disp->HandlerData,&disp->EstablisherFrame,NULL);
992 #     return ExceptionContinueSearch;
993 # }
994 #
995 # It's appropriate to implement this handler in assembler, directly in

```

```

994 # function's module. In order to do that one has to know members'
995 # offsets in CONTEXT and DISPATCHER_CONTEXT structures and some constant
996 # values. Here they are:
997 #
998 #     CONTEXT.Rax           120
999 #     CONTEXT.Rcx           128
1000 #     CONTEXT.Rdx           136
1001 #     CONTEXT.Rbx           144
1002 #     CONTEXT.Rsp           152
1003 #     CONTEXT.Rbp           160
1004 #     CONTEXT.Rsi           168
1005 #     CONTEXT.Rdi           176
1006 #     CONTEXT.R8            184
1007 #     CONTEXT.R9            192
1008 #     CONTEXT.R10           200
1009 #     CONTEXT.R11           208
1010 #     CONTEXT.R12           216
1011 #     CONTEXT.R13           224
1012 #     CONTEXT.R14           232
1013 #     CONTEXT.R15           240
1014 #     CONTEXT.Rip           248
1015 #     CONTEXT.Xmm6          512
1016 #     sizeof(CONTEXT)       1232
1017 #     DISPATCHER_CONTEXT.ControlPc 0
1018 #     DISPATCHER_CONTEXT.ImageBase 8
1019 #     DISPATCHER_CONTEXT.FunctionEntry 16
1020 #     DISPATCHER_CONTEXT.EstablisherFrame 24
1021 #     DISPATCHER_CONTEXT.TargetIp 32
1022 #     DISPATCHER_CONTEXT.ContextRecord 40
1023 #     DISPATCHER_CONTEXT.LanguageHandler 48
1024 #     DISPATCHER_CONTEXT.HandlerData 56
1025 #     UNW_FLAG_NHANDLER 0
1026 #     ExceptionContinueSearch 1
1027 #
1028 # In order to tie the handler to the function one has to compose
1029 # couple of structures: one for .xdata segment and one for .pdata.
1030 #
1031 # UNWIND_INFO structure for .xdata segment would be
1032 #
1033 # function_unwind_info:
1034 #     .byte 9,0,0,0
1035 #     .rva handler
1036 #
1037 # This structure designates exception handler for a function with
1038 # zero-length prologue, no stack frame or frame register.
1039 #
1040 # To facilitate composing of .pdata structures, auto-generated "gear"
1041 # prologue copies rsp value to rax and denotes next instruction with
1042 # .LSEH_begin_{function_name} label. This essentially defines the SEH
1043 # styling rule mentioned in the beginning. Position of this label is
1044 # chosen in such manner that possible exceptions raised in the "gear"
1045 # prologue would be accounted to caller and unwound from latter's frame.
1046 # End of function is marked with respective .LSEH_end_{function_name}
1047 # label. To summarize, .pdata segment would contain
1048 #
1049 #     .rva .LSEH_begin_function
1050 #     .rva .LSEH_end_function
1051 #     .rva function_unwind_info
1052 #
1053 # Reference to function_unwind_info from .xdata segment is the anchor.
1054 # In case you wonder why references are 32-bit .rvas and not 64-bit
1055 # .quads. References put into these two segments are required to be
1056 # *relative* to the base address of the current binary module, a.k.a.
1057 # image base. No Win64 module, be it .exe or .dll, can be larger than
1058 # 2GB and thus such relative references can be and are accommodated in
1059 # 32 bits.

```

```

1060 #
1061 # Having reviewed the example function code, one can argue that "movq
1062 # %rsp,%rax" above is redundant. It is not! Keep in mind that on Unix
1063 # rax would contain an undefined value. If this "offends" you, use
1064 # another register and refrain from modifying rax till magic_point is
1065 # reached, i.e. as if it was a non-volatile register. If more registers
1066 # are required prior [variable] frame setup is completed, note that
1067 # nobody says that you can have only one "magic point." You can
1068 # "liberate" non-volatile registers by denoting last stack off-load
1069 # instruction and reflecting it in finer grade unwind logic in handler.
1070 # After all, isn't it why it's called *language-specific* handler...
1071 #
1072 # Attentive reader can notice that exceptions would be mishandled in
1073 # auto-generated "gear" epilogue. Well, exception effectively can't
1074 # occur there, because if memory area used by it was subject to
1075 # segmentation violation, then it would be raised upon call to the
1076 # function (and as already mentioned be accounted to caller, which is
1077 # not a problem). If you're still not comfortable, then define tail
1078 # "magic point" just prior ret instruction and have handler treat it...
1079 #
1080 # (*) Note that we're talking about run-time, not debug-time. Lack of
1081 # unwind information makes debugging hard on both Windows and
1082 # Unix. "Unlike" refers to the fact that on Unix signal handler
1083 # will always be invoked, core dumped and appropriate exit code
1084 # returned to parent (for user notification).

```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64cpuid.pl

1

5680 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64cpuid.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #!/usr/bin/env perl

3 $flavour = shift;
4 $output = shift;
5 if ($flavour =~ /\./) { $output = $flavour; undef $flavour; }

7 $win64=0; $win64=1 if ($flavour =~ /[nm]asm|mingw64/ || $output =~ /\.asm$/);

9 $0 =~ m/(.*[\\\/])(^\\\/)+$/; $dir=$1;
10 ( $xlate="$dir\x86_64-xlate.pl" and -f $xlate ) or
11 ( $xlate="$dir"perlasm\x86_64-xlate.pl" and -f $xlate) or
12 die "can't locate x86_64-xlate.pl";

14 open OUT,"| \"^X\" $xlate $flavour $output";
15 *STDOUT=*OUT;

17 ($arg1,$arg2,$arg3,$arg4)=$win64?("%rcx","%rdx","%r8","%r9") : # Win64 order
18                                ("%rdi","%rsi","%rdx","%rcx"); # Unix order

20 print<<__ ;
21 .extern      OPENSSL_cpuid_setup
22 .hidden      OPENSSL_cpuid_setup
23 .extern      solaris_locking_setup
24 .hidden      solaris_locking_setup
25 .section     .init
26     call     solaris_locking_setup
27     call     OPENSSL_cpuid_setup

29 .hidden OPENSSL_ia32cap_P
30 .comm    OPENSSL_ia32cap_P,8,4

32 .text

34 .globl    OPENSSL_atomic_add
35 .type     OPENSSL_atomic_add,@abi-omnipotent
36 .align    16
37 OPENSSL_atomic_add:
38     movl   ($arg1),%eax
39 .Lspin:   leaq   ($arg2,%rax),%r8
40     .byte  0xf0      # lock
41     cmpxchgl    %r8d,($arg1)
42     jne     .Lspin
43     movl    %r8d,%eax
44     .byte  0x48,0x98      # cltq/cdq
45     ret
46 .size     OPENSSL_atomic_add,.-OPENSSL_atomic_add

48 .globl    OPENSSL_rdtsc
49 .type     OPENSSL_rdtsc,@abi-omnipotent
50 .align    16
51 OPENSSL_rdtsc:
52     rdtsc
53     shl    \%32,%rdx
54     or     %rdx,%rax
55     ret
56 .size     OPENSSL_rdtsc,.-OPENSSL_rdtsc

58 .globl    OPENSSL_ia32_cpuid
59 .type     OPENSSL_ia32_cpuid,@abi-omnipotent
60 .align    16
61 OPENSSL_ia32_cpuid:
```

new/usr/src/lib/openssl/libsunw_crypto/pl/x86_64cpuid.pl

2

```
62     mov     %rbx,%r8      # save %rbx

64     xor     %eax,%eax
65     cpuid
66     mov     %eax,%r11d     # max value for standard query level

68     xor     %eax,%eax
69     cmp     \%0x756e6547,%ebx # "Genu"
70     setne   %al
71     mov     %eax,%r9d
72     cmp     \%0x49656e69,%edx # "ineI"
73     setne   %al
74     or      %eax,%r9d
75     cmp     \%0x6c65746e,%ecx # "ntel"
76     setne   %al
77     or      %eax,%r9d
78     jz      .Lintel        # 0 indicates Intel CPU

80     cmp     \%0x68747541,%ebx # "Auth"
81     setne   %al
82     mov     %eax,%r10d
83     cmp     \%0x69746e65,%edx # "enti"
84     setne   %al
85     or      %eax,%r10d
86     cmp     \%0x444d4163,%ecx # "cAMD"
87     setne   %al
88     or      %eax,%r10d
89     jnz     .Lintel        # 0 indicates AMD CPU

91     # AMD specific
92     mov     \%0x80000000,%eax
93     cpuid
94     cmp     \%0x80000001,%eax
95     jb      .Lintel
96     mov     %eax,%r10d
97     mov     \%0x80000001,%eax
98     cpuid
99     or      %ecx,%r9d
100    and     \%0x00000081,%r9d    # isolate AMD XOP bit, 1<<11

102    cmp     \%0x80000008,%r10d
103    jb      .Lintel

105    mov     \%0x80000008,%eax
106    cpuid
107    movzb   %cl,%r10
108    inc     %r10                # number of cores - 1
                                # number of cores

110    mov     \%1,%eax
111    cpuid
112    bt      \%28,%edx            # test hyper-threading bit
113    jnc     .Lgeneric
114    shr     \%16,%ebx           # number of logical processors
115    cmp     %r10b,%bl
116    ja      .Lgeneric
117    and     \%0xffffffff,%edx
118    jmp     .Lgeneric

120 .Lintel:
121     cmp     \%4,%r11d
122     mov     \%$-1,%r10d
123     jb      .Lnocacheinfo

125     mov     \%4,%eax
126     mov     \%0,%ecx
127     cpuid                # query L1D
```



```

128      mov    %eax,%r10d
129      shr    \14,%r10d
130      and    \0xffff,%r10d          # number of cores -1 per L1D

132 .Lnocacheinfo:
133      mov    \1,%eax
134      cpuid
135      and    \0xbfeffff,%edx        # force reserved bits to 0
136      cmp    \0,%r9d
137      jne    .Lnotintel
138      or     \0x4000000,%edx        # set reserved bit#30 on Intel CPUs
139      and    \15,%ah
140      cmp    \15,%ah                # examine Family ID
141      jne    .Lnotintel
142      or     \0x00100000,%edx        # set reserved bit#20 to engage RC4_CHAR
143 .Lnotintel:
144      bt     \28,%edx                # test hyper-threading bit
145      jnc    .Lgeneric
146      and    \0xffffffff,%edx        # ~(1<<28)
147      cmp    \0,%r10d
148      jpe    .Lgeneric

150      or     \0x10000000,%edx        # 1<<28
151      shr    \16,%ebx
152      cmp    \1,%bl                 # see if cache is shared
153      ja     .Lgeneric
154      and    \0xffffffff,%edx        # ~(1<<28)
155 .Lgeneric:
156      and    \0x00000800,%r9d        # isolate AMD XOP flag
157      and    \0xffffffff7ff,%ecx
158      or     %ecx,%r9d              # merge AMD XOP flag

160      mov    %edx,%r10d              # %r9d:%r10d is copy of %ecx:%edx
161      bt     \27,%r9d                # check OSXSAVE bit
162      jnc    .Lclear_avx
163      xor    %ecx,%ecx                # XCR0
164      .byte  0x0f,0x01,0xd0          # xgetbv
165      and    \6,%eax                 # isolate XMM and YMM state support
166      cmp    \6,%eax
167      je     .Ldone
168 .Lclear_avx:
169      mov    \0xffffffff7ff,%eax     # ~(1<<28|1<<12|1<<11)
170      and    %eax,%r9d                # clear AVX, FMA and AMD XOP bits

171 .Ldone:
172      shl    \32,%r9
173      mov    %r10d,%eax
174      mov    %r8,%rbx                # restore %rbx
175      or     %r9,%rax
176      ret
177 .size    OPENSSL_ia32_cpuid,.-OPENSSL_ia32_cpuid

179 .globl    OPENSSL_cleanse
180 .type     OPENSSL_cleanse,@abi-omnipotent
181 .align    16
182 OPENSSL_cleanse:
183      xor    %rax,%rax
184      cmp    \15,$arg2
185      jae    .Lot
186      cmp    \0,$arg2
187      je     .Lret
188 .Little:
189      mov    %al,($arg1)
190      sub    \1,$arg2
191      lea    1($arg1),%arg1
192      jnz    .Little
193 .Lret:

```

```

194      ret
195 .align    16
196 .Lot:
197      test   \7,$arg1
198      jz     .Laligned
199      mov    %al,($arg1)
200      lea    -1($arg2),%arg2
201      lea    1($arg1),%arg1
202      jmp    .Lot
203 .Laligned:
204      mov    %rax,($arg1)
205      lea    -8($arg2),%arg2
206      test   \-8,$arg2
207      lea    8($arg1),%arg1
208      jnz    .Laligned
209      cmp    \0,$arg2
210      jne    .Little
211      ret
212 .size     OPENSSL_cleanse,.-OPENSSL_cleanse
213
215 print<<__ if (!$win64);
216 .globl    OPENSSL_wipe_cpu
217 .type     OPENSSL_wipe_cpu,@abi-omnipotent
218 .align    16
219 OPENSSL_wipe_cpu:
220      pxor   %xmm0,%xmm0
221      pxor   %xmm1,%xmm1
222      pxor   %xmm2,%xmm2
223      pxor   %xmm3,%xmm3
224      pxor   %xmm4,%xmm4
225      pxor   %xmm5,%xmm5
226      pxor   %xmm6,%xmm6
227      pxor   %xmm7,%xmm7
228      pxor   %xmm8,%xmm8
229      pxor   %xmm9,%xmm9
230      pxor   %xmm10,%xmm10
231      pxor   %xmm11,%xmm11
232      pxor   %xmm12,%xmm12
233      pxor   %xmm13,%xmm13
234      pxor   %xmm14,%xmm14
235      pxor   %xmm15,%xmm15
236      xorq   %rcx,%rcx
237      xorq   %rdx,%rdx
238      xorq   %rsi,%rsi
239      xorq   %rdi,%rdi
240      xorq   %r8,%r8
241      xorq   %r9,%r9
242      xorq   %r10,%r10
243      xorq   %r11,%r11
244      leaq   8(%rsp),%rax
245      ret
246 .size     OPENSSL_wipe_cpu,.-OPENSSL_wipe_cpu
247
248 print<<__ if ($win64);
249 .globl    OPENSSL_wipe_cpu
250 .type     OPENSSL_wipe_cpu,@abi-omnipotent
251 .align    16
252 OPENSSL_wipe_cpu:
253      pxor   %xmm0,%xmm0
254      pxor   %xmm1,%xmm1
255      pxor   %xmm2,%xmm2
256      pxor   %xmm3,%xmm3
257      pxor   %xmm4,%xmm4
258      pxor   %xmm5,%xmm5
259      xorq   %rcx,%rcx

```

```
260      xorq    %rdx,%rdx
261      xorq    %r8,%r8
262      xorq    %r9,%r9
263      xorq    %r10,%r10
264      xorq    %r11,%r11
265      leaq    8(%rsp),%rax
266      ret
267 .size      OPENSSL_wipe_cpu,.-OPENSSL_wipe_cpu
268 ____

270 print<<__;
271 .globl     OPENSSL_ia32_rdrand
272 .type      OPENSSL_ia32_rdrand,@abi-omnipotent
273 .align     16
274 OPENSSL_ia32_rdrand:
275      mov     \%8,%ecx
276 .Loop_rdrand:
277      rdrand  %rax
278      jc      .Lbreak_rdrand
279      loop    .Loop_rdrand
280 .Lbreak_rdrand:
281      cmp     \%0,%rax
282      cmov     %rcx,%rax
283      ret
284 .size      OPENSSL_ia32_rdrand,.-OPENSSL_ia32_rdrand
285 ____

287 close STDOUT;    # flush
```

```

*****
6344 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86asm.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 #!/usr/bin/env perl

3 # require 'x86asm.pl';
4 # &asm_init(<flavor>,"des-586.pl"[$i386only]);
5 # &function_begin("foo");
6 # ...
7 # &function_end("foo");
8 # &asm_finish

10 $out=();
11 $i386=0;

13 # AUTOLOAD is this context has quite unpleasant side effect, namely
14 # that typos in function calls effectively go to assembler output,
15 # but on the pros side we don't have to implement one subroutine per
16 # each opcode...
17 sub ::AUTOLOAD
18 { my $opcode = $AUTOLOAD;

20     die "more than 4 arguments passed to $opcode" if ($#>3);

22     $opcode =~ s/.*:://;
23     if ($opcode =~ /^push/) { $stack+=4; }
24     elsif ($opcode =~ /^pop/) { $stack-=4; }

26     &generic($opcode,@_) or die "undefined subroutine \&$AUTOLOAD";
27 }

29 sub ::emit
30 { my $opcode=shift;

32     if ($#==1) { push(@out,"\\t$opcode\\n"); }
33     else { push(@out,"\\t$opcode\\t".join(',','@_')."\\n"); }
34 }

36 sub ::LB
37 { $_[0] =~ m/^e?([a-d])x$/o or die "$_[0] does not have a 'low byte'";
38     $1."l";
39 }
40 sub ::HB
41 { $_[0] =~ m/^e?([a-d])x$/o or die "$_[0] does not have a 'high byte'";
42     $1."h";
43 }
44 sub ::stack_push{ my $num=$_[0]*4; $stack+=$num; &sub("esp",$num); }
45 sub ::stack_pop { my $num=$_[0]*4; $stack-=$num; &add("esp",$num); }
46 sub ::blindpop { &pop($_[0]); $stack+=4; }
47 sub ::wparam { &DWP($stack+4*$_[0],"esp"); }
48 sub ::swtmp { &DWP(4*$_[0],"esp"); }

50 sub ::bswap
51 { if ($i386) # emulate bswap for i386
52     { &comment("bswap @");
53       &xchg(&HB(@_),&LB(@_));
54       &rrol(@_,16);
55       &xchg(&HB(@_),&LB(@_));
56     }
57     else
58     { &generic("bswap",@_); }
59 }
60 # These are made-up opcodes introduced over the years essentially
61 # by ignorance, just alias them to real ones...

```

```

62 sub ::movb { &mov(@_); }
63 sub ::xorb { &xor(@_); }
64 sub ::rotr { &rol(@_); }
65 sub ::rotr { &ror(@_); }
66 sub ::exch { &xchg(@_); }
67 sub ::halt { &hlt; }
68 sub ::movz { &movzx(@_); }
69 sub ::pushf { &pushfd; }
70 sub ::popf { &popfd; }

72 # 3 argument instructions
73 sub ::movq
74 { my($p1,$p2,$optimize)=@_;

76     if ($optimize && $p1=~/^mm[0-7]$/ && $p2=~/^mm[0-7]$/)
77     # movq between mmx registers can sink Intel CPUs
78     { &::pshufw($p1,$p2,0xe4); }
79     else
80     { &::generic("movq",@_); }
81 }

83 # SSE>2 instructions
84 my %regrm = ( "eax"=>0, "ecx"=>1, "edx"=>2, "ebx"=>3,
85              "esp"=>4, "ebp"=>5, "esi"=>6, "edi"=>7 );
86 sub ::pextrd
87 { my($dst,$src,$imm)=@_;
88     if ("dst:$src" =~ /(e[a-dsd][ixp]):xmm([0-7])/)
89     { &::data_byte(0x66,0x0f,0x3a,0x16,0xc0|($2<<3)|$regrm{$1},$imm); }
90     else
91     { &::generic("pextrd",@_); }
92 }

94 sub ::pinsrd
95 { my($dst,$src,$imm)=@_;
96     if ("dst:$src" =~ /xmm([0-7]):(e[a-dsd][ixp])/)
97     { &::data_byte(0x66,0x0f,0x3a,0x22,0xc0|($1<<3)|$regrm{$2},$imm); }
98     else
99     { &::generic("pinsrd",@_); }
100 }

102 sub ::pshufb
103 { my($dst,$src)=@_;
104     if ("dst:$src" =~ /xmm([0-7]):xmm([0-7])/)
105     { &data_byte(0x66,0x0f,0x38,0x00,0xc0|($1<<3)|$2); }
106     else
107     { &::generic("pshufb",@_); }
108 }

110 sub ::palignr
111 { my($dst,$src,$imm)=@_;
112     if ("dst:$src" =~ /xmm([0-7]):xmm([0-7])/)
113     { &::data_byte(0x66,0x0f,0x3a,0x0f,0xc0|($1<<3)|$2,$imm); }
114     else
115     { &::generic("palignr",@_); }
116 }

118 sub ::pclmulqdq
119 { my($dst,$src,$imm)=@_;
120     if ("dst:$src" =~ /xmm([0-7]):xmm([0-7])/)
121     { &::data_byte(0x66,0x0f,0x3a,0x44,0xc0|($1<<3)|$2,$imm); }
122     else
123     { &::generic("pclmulqdq",@_); }
124 }

126 sub ::rdrand
127 { my($dst)=@_;

```

```

128 if ($dst =~ /(e[a-dsd][ixp])/)
129 { &::data_byte(0x0f,0xc7,0xf0|$regrm{$dst}); }
130 else
131 { &::generic("rdrand",@_); }
132 }

134 # label management
135 $lbdecor="L"; # local label decoration, set by package
136 $label="000";

138 sub ::islabel # see is argument is a known label
139 { my $i;
140   if ($_[0] eq "GLOBAL_OFFSET_TABLE_") { return $_[0]; }
141   foreach $i (values %label) { return $i if ($i eq $_[0]); }
142   $label{$_[0]}; # can be undef
143 }

145 sub ::label # instantiate a function-scope label
146 { if (!defined($label{$_[0]}))
147   { $label{$_[0]}="{lbdecor}$label$_[0]"; $label++; }
148   $label{$_[0]};
149 }

151 sub ::LABEL # instantiate a file-scope label
152 { $label{$_[0]}=$_[1] if (!defined($label{$_[0]}));
153   $label{$_[0]};
154 }

156 sub ::static_label { &::LABEL($_[0],$lbdecor.$_[0]); }

158 sub ::set_label_B { push(@out,"@_:\n"); }
159 sub ::set_label
160 { my $label=&::label($_[0]);
161   &::align($_[1]) if ($_[1]>1);
162   &::set_label_B($label);
163   $label;
164 }

166 sub ::wipe_labels # wipes function-scope labels
167 { foreach $i (keys %label)
168   { delete $label{$i} if ($label{$i} =~ /\^Q${lbdecor}\E[0-9]{3}/); }
169 }

171 # subroutine management
172 sub ::function_begin
173 { &function_begin_B(@_);
174   $stack=4;
175   &push("ebp");
176   &push("ebx");
177   &push("esi");
178   &push("edi");
179 }

181 sub ::function_end
182 { &pop("edi");
183   &pop("esi");
184   &pop("ebx");
185   &pop("ebp");
186   &ret();
187   &function_end_B(@_);
188   $stack=0;
189   &wipe_labels();
190 }

192 sub ::function_end_A
193 { &pop("edi");

```

```

194 &pop("esi");
195 &pop("ebx");
196 &pop("ebp");
197 &ret();
198 $stack+=16; # readjust esp as if we didn't pop anything
199 }

201 sub ::asciz
202 { my @str=unpack("C*",shift);
203   push @str,0;
204   while ($#str>15) {
205     &data_byte(@str[0..15]);
206     foreach (0..15) { shift @str; }
207   }
208   &data_byte(@str) if (@str);
209 }

211 sub ::asm_finish
212 { &file_end();
213   print @out;
214 }

216 sub ::asm_init
217 { my ($type,$fn,$cpu)=@_;

219   $filename=$fn;
220   $i386=$cpu;

222   $elf=$cpp=$coff=$aout=$macosx=$win32=$netware=$mwerks=$android=0;
223   if (($type eq "elf"))
224   { $elf=1; require "x86gas.pl"; }
225   elsif (($type eq "a.out"))
226   { $aout=1; require "x86gas.pl"; }
227   elsif (($type eq "coff" or $type eq "gaswin"))
228   { $coff=1; require "x86gas.pl"; }
229   elsif (($type eq "win32n"))
230   { $win32=1; require "x86nasm.pl"; }
231   elsif (($type eq "nw-nasm"))
232   { $netware=1; require "x86nasm.pl"; }
233   #elsif (($type eq "nw-mwasm"))
234   #{$netware=1; $mwerks=1; require "x86nasm.pl"; }
235   elsif (($type eq "win32"))
236   { $win32=1; require "x86masm.pl"; }
237   elsif (($type eq "macosx"))
238   { $aout=1; $macosx=1; require "x86gas.pl"; }
239   elsif (($type eq "android"))
240   { $elf=1; $android=1; require "x86gas.pl"; }
241   else
242   { print STDERR <<"EOF";
243     Pick one target type from
244     elf - Linux, FreeBSD, Solaris x86, etc.
245     a.out - DJGPP, elder OpenBSD, etc.
246     coff - GAS/COFF such as Win32 targets
247     win32n - Windows 95/Windows NT NASM format
248     nw-nasm - NetWare NASM format
249     macosx - Mac OS X
250 EOF
251     exit(1);
252   }

254   $pic=0;
255   for (@ARGV) { $pic=1 if (/-[fK]PIC/i); }

257   $filename =~ s/\.pl$//;
258   &file($filename);
259 }

```

```
261 sub ::hidden {}  
263 1;
```

```

*****
9113 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86cpuid.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1  #!/usr/bin/env perl

3  $0 =~ m/(.*[\\\/\s])[^\\\/\s]+$/; $dir=$1;
4  push(@INC, "$dir", "perlasm");
5  require "x86asm.pl";

7  &asm_init($ARGV[0], "x86cpuid");

9  for (@ARGV) { $sse2=1 if (/^-DOPENSSL_IA32_SSE2/); }

11 &function_begin("OPENSSL_ia32_cpuid");
12     &xor    ("edx", "edx");
13     &pushf  ();
14     &pop     ("eax");
15     &mov     ("ecx", "eax");
16     &xor     ("eax", 1<<21);
17     &push   ("eax");
18     &popf   ();
19     &pushf  ();
20     &pop     ("eax");
21     &xor     ("ecx", "eax");
22     &xor     ("eax", "eax");
23     &bt      ("ecx", 21);
24     &jnc     (&label("nocpuid"));
25     &cpuid  ();
26     &mov     ("edi", "eax");          # max value for standard query level

28     &xor     ("eax", "eax");
29     &cmp     ("ebx", 0x756e6547);      # "Genu"
30     &setne   (&LB("eax"));
31     &mov     ("ebp", "eax");
32     &cmp     ("edx", 0x49656e69);      # "ineI"
33     &setne   (&LB("eax"));
34     &or      ("ebp", "eax");
35     &cmp     ("ecx", 0x6c65746e);      # "ntel"
36     &setne   (&LB("eax"));
37     &or      ("ebp", "eax");          # 0 indicates Intel CPU
38     &jz      (&label("intel"));

40     &cmp     ("ebx", 0x68747541);      # "Auth"
41     &setne   (&LB("eax"));
42     &mov     ("esi", "eax");
43     &cmp     ("edx", 0x69746e65);      # "enti"
44     &setne   (&LB("eax"));
45     &or      ("esi", "eax");
46     &cmp     ("ecx", 0x444d4163);      # "cAMD"
47     &setne   (&LB("eax"));
48     &or      ("esi", "eax");          # 0 indicates AMD CPU
49     &jnz     (&label("intel"));

51     # AMD specific
52     &mov     ("eax", 0x80000000);
53     &cpuid   ();
54     &cmp     ("eax", 0x80000001);
55     &jb      (&label("intel"));
56     &mov     ("esi", "eax");
57     &mov     ("eax", 0x80000001);
58     &cpuid   ();
59     &or      ("ebp", "ecx");
60     &and     ("ebp", 1<<11|1);        # isolate XOP bit
61     &cmp     ("esi", 0x80000008);

```

```

62     &jb      (&label("intel"));

64     &mov     ("eax", 0x80000008);
65     &cpuid   ();
66     &movz    ("esi", &LB("ecx"));      # number of cores - 1
67     &inc     ("esi");                  # number of cores

69     &mov     ("eax", 1);
70     &xor     ("ecx", "ecx");
71     &cpuid   ();
72     &bt      ("edx", 28);
73     &jnc     (&label("generic"));
74     &shr     ("ebx", 16);
75     &and     ("ebx", 0xff);
76     &cmp     ("ebx", "esi");
77     &ja      (&label("generic"));
78     &and     ("edx", 0xffffffff);      # clear hyper-threading bit
79     &jmp     (&label("generic"));
80
81 &set_label("intel");
82     &cmp     ("edi", 4);
83     &mov     ("edi", -1);
84     &jb      (&label("nocacheinfo"));

86     &mov     ("eax", 4);
87     &mov     ("ecx", 0);                # query L1D
88     &cpuid   ();
89     &mov     ("edi", "eax");
90     &shr     ("edi", 14);
91     &and     ("edi", 0xfff);           # number of cores -1 per L1D

93 &set_label("nocacheinfo");
94     &mov     ("eax", 1);
95     &xor     ("ecx", "ecx");
96     &cpuid   ();
97     &and     ("edx", 0xbfeffff);        # force reserved bits #20, #30 to 0
98     &cmp     ("ebp", 0);
99     &jne     (&label("notintel"));
100    &or      ("edx", 1<<30);             # set reserved bit#30 on Intel CPUs
101    &and     (&HB("eax"), 15);          # familiy ID
102    &cmp     (&HB("eax"), 15);          # P4?
103    &jne     (&label("notintel"));
104    &or      ("edx", 1<<20);             # set reserved bit#20 to engage RC4_CHAR
105 &set_label("notintel");
106    &bt      ("edx", 28);
107    &jnc     (&label("generic"));
108    &and     ("edx", 0xffffffff);
109    &cmp     ("edi", 0);
110    &jc      (&label("generic"));

112    &or      ("edx", 0x10000000);
113    &shr     ("ebx", 16);
114    &cmp     (&LB("ebx"), 1);
115    &ja      (&label("generic"));
116    &and     ("edx", 0xffffffff);        # clear hyper-threading bit if not

118 &set_label("generic");
119    &and     ("ebp", 1<<11);             # isolate AMD XOP flag
120    &and     ("ecx", 0xffff7ff);        # force 11th bit to 0
121    &mov     ("esi", "edx");
122    &or      ("ebp", "ecx");            # merge AMD XOP flag

124    &bt      ("ecx", 27);
125    &jnc     (&label("clear_avx"));
126    &xor     ("ecx", "ecx");
127    &data_byte(0xf, 0x01, 0xd0);        # xgetbv

```

```

128     &and    ("eax",6);
129     &cmp    ("eax",6);
130     &jc     (&label("done"));
131     &cmp    ("eax",2);
132     &jc     (&label("clear_avx"));
133 &set_label("clear_xmm");
134     &and    ("ebp",0xfdfdfdf);    # clear AESNI and PCLMULQDQ bits
135     &and    ("esi",0xfeffffff);    # clear FXSR
136 &set_label("clear_avx");
137     &and    ("ebp",0xeffe7ff);    # clear AVX, FMA and AMD XOP bits
138 &set_label("done");
139     &mov    ("eax","esi");
140     &mov    ("edx","ebp");
141 &set_label("nocpuuid");
142 &function_end("OPENSSL_ia32_cpuid");

144 &external_label("OPENSSL_ia32cap_P");

146 &function_begin_B("OPENSSL_rdtsc", "EXTRN\tOPENSSL_ia32cap_P:DWORD");
147     &xor    ("eax","eax");
148     &xor    ("edx","edx");
149     &picmeup("ecx","OPENSSL_ia32cap_P");
150     &bt     (&DWP(0,"ecx"),4);
151     &jnc    (&label("notsc"));
152     &rdtsc ();
153 &set_label("notsc");
154     &ret    ();
155 &function_end_B("OPENSSL_rdtsc");

157 # This works in Ring 0 only [read DJGPP+MS-DOS+privileged DPMI host],
158 # but it's safe to call it on any [supported] 32-bit platform...
159 # Just check for [non-zero] return value...
160 &function_begin_B("OPENSSL_instrument_halt", "EXTRN\tOPENSSL_ia32cap_P:DWORD");
161     &picmeup("ecx","OPENSSL_ia32cap_P");
162     &bt     (&DWP(0,"ecx"),4);
163     &jnc    (&label("nohalt"));    # no TSC

165     &data_word(0x9058900e);    # push %cs; pop %eax
166     &and    ("eax",3);
167     &jnz    (&label("nohalt"));    # not enough privileges

169     &pushf ();
170     &pop    ("eax");
171     &bt     ("eax",9);
172     &jnc    (&label("nohalt"));    # interrupts are disabled

174     &rdtsc ();
175     &push    ("edx");
176     &push    ("eax");
177     &halt    ();
178     &rdtsc ();

180     &sub    ("eax",&DWP(0,"esp"));
181     &sbb    ("edx",&DWP(4,"esp"));
182     &add    ("esp",8);
183     &ret    ();

185 &set_label("nohalt");
186     &xor    ("eax","eax");
187     &xor    ("edx","edx");
188     &ret    ();
189 &function_end_B("OPENSSL_instrument_halt");

191 # Essentially there is only one use for this function. Under DJGPP:
192 #
193 #     #include <go32.h>

```

```

194 #     ...
195 #     i=OPENSSL_far_spin(_dos_ds,0x46c);
196 #     ...
197 # to obtain the number of spins till closest timer interrupt.

199 &function_begin_B("OPENSSL_far_spin");
200     &pushf ();
201     &pop    ("eax");
202     &bt     ("eax",9);
203     &jnc    (&label("nospin"));    # interrupts are disabled

205     &mov    ("eax",&DWP(4,"esp"));
206     &mov    ("ecx",&DWP(8,"esp"));
207     &data_word(0x90d88e1e);    # push %ds, mov %eax,%ds
208     &xor    ("eax","eax");
209     &mov    ("edx",&DWP(0,"ecx"));
210     &jmp    (&label("spin"));

212     &align    (16);
213 &set_label("spin");
214     &inc    ("eax");
215     &cmp    ("edx",&DWP(0,"ecx"));
216     &jc     (&label("spin"));

218     &data_word(0x1f909090);    # pop %ds
219     &ret    ();

221 &set_label("nospin");
222     &xor    ("eax","eax");
223     &xor    ("edx","edx");
224     &ret    ();
225 &function_end_B("OPENSSL_far_spin");

227 &function_begin_B("OPENSSL_wipe_cpu", "EXTRN\tOPENSSL_ia32cap_P:DWORD");
228     &xor    ("eax","eax");
229     &xor    ("edx","edx");
230     &picmeup("ecx","OPENSSL_ia32cap_P");
231     &mov    ("ecx",&DWP(0,"ecx"));
232     &bt     (&DWP(0,"ecx"),1);
233     &jnc    (&label("no_x87"));
234     if ($sse2) {
235         &and    ("ecx",1<<26|1<<24);    # check SSE2 and FXSR bits
236         &cmp    ("ecx",1<<26|1<<24);
237         &jne    (&label("no_sse2"));
238         &pxor    ("xmm0","xmm0");
239         &pxor    ("xmm1","xmm1");
240         &pxor    ("xmm2","xmm2");
241         &pxor    ("xmm3","xmm3");
242         &pxor    ("xmm4","xmm4");
243         &pxor    ("xmm5","xmm5");
244         &pxor    ("xmm6","xmm6");
245         &pxor    ("xmm7","xmm7");
246         &set_label("no_sse2");
247     }
248     # just a bunch of fldz to zap the fp/mm bank followed by finit...
249     &data_word(0xeed9eed9,0xeed9eed9,0xeed9eed9,0xeed9eed9,0x90e3db9b);
250 &set_label("no_x87");
251     &lea    ("eax",&DWP(4,"esp"));
252     &ret    ();
253 &function_end_B("OPENSSL_wipe_cpu");

255 &function_begin_B("OPENSSL_atomic_add");
256     &mov    ("edx",&DWP(4,"esp"));    # fetch the pointer, 1st arg
257     &mov    ("ecx",&DWP(8,"esp"));    # fetch the increment, 2nd arg
258     &push    ("ebx");
259     &nop    ();

```

```

260     &mov     ("eax",&DWP(0,"edx"));
261 &set_label("spin");
262     &lea     ("ebx",&DWP(0,"eax","ecx"));
263     &nop     ();
264     &data_word(0x1ab10ff0); # lock; cmpxchg %ebx,(%edx)    # %eax is envolv
265     &jne     (&label("spin"));
266     &mov     ("eax","ebx"); # OpenSSL expects the new value
267     &pop     ("ebx");
268     &ret     ();
269 &function_end_B("OPENSSL_atomic_add");

271 # This function can become handy under Win32 in situations when
272 # we don't know which calling convention, __stdcall or __cdecl(*),
273 # indirect callee is using. In C it can be deployed as
274 #
275 #ifdef OPENSSL_CPUID_OBJ
276 #     type OPENSSL_indirect_call(void *f,...);
277 #     ...
278 #     OPENSSL_indirect_call(func,[up to $max arguments]);
279 #endif
280 #
281 # (*) it's designed to work even for __fastcall if number of
282 # arguments is 1 or 2!
283 &function_begin_B("OPENSSL_indirect_call");
284 {
285     my ($max,$i)=(7,); # $max has to be chosen as 4*n-1
286                       # in order to preserve eventual
287                       # stack alignment
288     &push     ("ebp");
289     &mov     ("ebp","esp");
290     &sub     ("esp",$max*4);
291     &mov     ("ecx",&DWP(12,"ebp"));
292     &mov     (&DWP(0,"esp"),"ecx");
293     &mov     ("edx",&DWP(16,"ebp"));
294     &mov     (&DWP(4,"esp"),"edx");
295     for($i=2;$i<$max;$i++)
296     {
297         # Some copies will be redundant/bogus...
298         &mov     ("eax",&DWP(12+$i*4,"ebp"));
299         &mov     (&DWP(0+$i*4,"esp"),"eax");
300     }
301     &call_ptr (&DWP(8,"ebp"));# make the call...
302     &mov     ("esp","ebp"); # ... and just restore the stack pointer
303                       # without paying attention to what we called,
304                       # (__cdecl *func) or (__stdcall *one).
305     &pop     ("ebp");
306     &ret     ();
307 }
308 &function_end_B("OPENSSL_indirect_call");

310 &function_begin_B("OPENSSL_cleanse");
311     &mov     ("edx",&wparam(0));
312     &mov     ("ecx",&wparam(1));
313     &xor     ("eax","eax");
314     &cmp     ("ecx",7);
315     &jae     (&label("lot"));
316     &cmp     ("ecx",0);
317     &jbe     (&label("ret"));
318 &set_label("little");
319     &mov     (&BP(0,"edx"),"al");
320     &sub     ("ecx",1);
321     &lea     ("edx",&DWP(1,"edx"));
322     &jnz     (&label("little"));
323 &set_label("ret");
324     &ret     ();

```

```

326 &set_label("lot",16);
327     &test     ("edx",3);
328     &jz     (&label("aligned"));
329     &mov     (&BP(0,"edx"),"al");
330     &lea     ("ecx",&DWP(-1,"ecx"));
331     &lea     ("edx",&DWP(1,"edx"));
332     &jmp     (&label("lot"));
333 &set_label("aligned");
334     &mov     (&DWP(0,"edx"),"eax");
335     &lea     ("ecx",&DWP(-4,"ecx"));
336     &test     ("ecx",-4);
337     &lea     ("edx",&DWP(4,"edx"));
338     &jnz     (&label("aligned"));
339     &cmp     ("ecx",0);
340     &jne     (&label("little"));
341     &ret     ();
342 &function_end_B("OPENSSL_cleanse");

344 &function_begin_B("OPENSSL_ia32_rdrand");
345     &mov     ("ecx",8);
346 &set_label("loop");
347     &rdrand ("eax");
348     &jc     (&label("break"));
349     &loop   (&label("loop"));
350 &set_label("break");
351     &cmp     ("eax",0);
352     &cmov     ("eax","ecx");
353     &ret     ();
354 &function_end_B("OPENSSL_ia32_rdrand");

356 &initseg("solaris_locking_setup");
357 &initseg("OPENSSL_cpuid_setup");

359 &hidden("solaris_locking_setup");
360 &hidden("OPENSSL_cpuid_setup");
361 &hidden("OPENSSL_ia32cap_P");

363 &asm_finish();

```



```

*****
5990 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pl/x86gas.pl
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 #!/usr/bin/env perl

3 package x86gas;

5 *out=@::out;

7 $::lbdecor=$::aout?"L":".L";          # local label decoration
8 $nmdecor=($::aout or $::coff)?_"":"sunw_";    # external name decoration

10 $initseg="";

12 $align=16;
13 $align=log($align)/log(2) if ($::aout);
14 $com_start="#" if ($::aout or $::coff);

16 sub opsize()
17 { my $reg=shift;
18   if ($reg =~ m/^\%e/o)      { "l"; }
19   elsif ($reg =~ m/^\%[a-d][hl]$/o) { "b"; }
20   elsif ($reg =~ m/^\%[xm]/o)  { undef; }
21   else                        { "w"; }
22 }

24 # swap arguments;
25 # expand opcode with size suffix;
26 # prefix numeric constants with $;
27 sub ::generic
28 { my($opcode,@arg)=@_;
29   my($suffix,$dst,$src);

31   @arg=reverse(@arg);

33   for (@arg)
34   { s/^\(.*\)(e?[a-dsixphl]{2})$/$1$2/o;    # gp registers
35     s/^\([xy]?mm[0-7])$/%$1/o;             # xmm/mmx registers
36     s/^\(\\-?[0-9]+\)$/$1/o;                # constants
37     s/^\(\\-?0x[0-9a-f]+\)$/$1/o;           # constants
38   }

40   $dst = $arg[$#arg] if ($#arg>=0);
41   $src = $arg[$#arg-1] if ($#arg>=1);
42   if ($dst =~ m/^\%o) { $suffix=&opsize($dst); }
43   elsif ($src =~ m/^\%o) { $suffix=&opsize($src); }
44   else { $suffix="l"; }
45   undef $suffix if ($dst =~ m/^\%[xm]/o || $src =~ m/^\%[xm]/o);

47   if ($# ==0) { &::emit($opcode); }
48   elsif ($# ==1 && $opcode =~ m/^(call|cflush|j|loop|set)/o) { &::emit($opcode,$dst); }
49   else { &::emit($opcode,@arg); }
50   else { &::emit($opcode.$suffix,@arg); }

52 1;
53 }
54 #
55 # opcodes not covered by ::generic above, mostly inconsistent namings...
56 #
57 sub ::movzx { &::movzb(@_); }
58 sub ::pushfd { &::pushfl; }
59 sub ::popfd { &::popfl; }
60 sub ::cpuid { &::emit(".byte\t0x0f,0xa2"); }
61 sub ::rtdsc { &::emit(".byte\t0x0f,0x31"); }

```

```

63 sub ::call { &::emit("call",&::islabel($_[0]) or "$nmdecor$_[0]"); }
64 sub ::call_ptr { &::generic("call","*$_[0]"); }
65 sub ::jmp_ptr { &::generic("jmp","*$_[0]"); }

67 *::bswap = sub { &::emit("bswap","%$_[0]"); } if (!$::i386);

69 sub ::DWP
70 { my($addr,$reg1,$reg2,$idx)=@_;
71   my $ret="";

73   $addr =~ s/^\s+//;
74   # prepend global references with optional underscore
75   $addr =~ s/^\([^\s+~0-9][^\s+~]*\)/&::islabel($1) or "$nmdecor$1"/ige;

77   $reg1 = "%$reg1" if ($reg1);
78   $reg2 = "%$reg2" if ($reg2);

80   $ret .= $addr if (($addr ne "") && ($addr ne 0));

82   if ($reg2)
83   { $idx!= 0 or $idx=1;
84     $ret .= "($reg1,$reg2,$idx)";
85   }
86   elsif ($reg1)
87   { $ret .= "($reg1)"; }

89   $ret;
90 }

91 sub ::QWP { &::DWP(@_); }
92 sub ::BP { &::DWP(@_); }
93 sub ::WP { &::DWP(@_); }
94 sub ::BC { @_; }
95 sub ::DWC { @_; }

97 sub ::file
98 { push(@out,".file\t\"$_[0].s\"\n.text\n"); }

100 sub ::function_begin_B
101 { my $func=shift;
102   my $global=($func !~ /\s+_/);
103   my $begin="$::lbdecor}_{func}_begin";

105   &::LABEL($func,$global?"$begin":"$nmdecor$func");
106   $func=$nmdecor.$func;

108   push(@out,".globl\t$func\n") if ($global);
109   if ($::coff)
110   { push(@out,".def\t$func;\t.scl\t".(3-$global).";\t.type\t32;\t.endef\n");
111   }
112   else
113   { push(@out,".type\t$func,\@function\n"); }
114   push(@out,".align\t$align\n");
115   push(@out,"$func:\n");
116   push(@out,"$begin:\n") if ($global);
117   $::stack=4;
118 }

121 sub ::function_end_B
122 { my $func=shift;
123   push(@out,".size\t$nmdecor$func,-.&::LABEL($func).\"n\" if ($::elf);
124   $::stack=0;
125   &::wipe_labels();
126 }

```

```

128 sub ::comment
129 {
130     if (!defined($com_start) or $::elf)
131     {
132         # Regarding $::elf above...
133         # GNU and SVR4 as'es use different comment delimiters,
134         push(@out, "\n"); # so we just skip ELF comments...
135         return;
136     }
137     foreach (@_)
138     {
139         if (/^\s*$/)
140             { push(@out, "\n"); }
141         else
142             { push(@out, "\t$com_start $_ $com_end\n"); }
143     }
144 }

145 sub ::external_label
146 { foreach(@_) { &::LABEL($_, $nmdecor.$_); } }

148 sub ::public_label
149 { push(@out, ".globl\t".&::LABEL($_[0], $nmdecor.$_[0])."\n"); }

151 sub ::file_end
152 {
153     if ($::macosx)
154     {
155         if (%non_lazy_ptr)
156         {
157             push(@out, ".section __IMPORT, __pointers, non_lazy_symbol_pointers\n");
158             foreach $i (keys %non_lazy_ptr)
159             {
160                 push(@out, "$non_lazy_ptr{$i}:\n.indirect_symbol\t$i\n.long\t0\n");
161             }
162         }
163     }
164     if (grep {/\b${nmdecor}OPENSSL_ia32cap_P\b/i} @out) {
165         my $tmp=".comm\t${nmdecor}OPENSSL_ia32cap_P,8";
166         if ($::macosx) { push (@out, "$tmp,2\n"); }
167         elsif ($::elf) { push (@out, "$tmp,4\n"); }
168         else { push (@out, "$tmp\n"); }
169     }
170     push(@out, $initseg) if ($initseg);
171 }

168 sub ::data_byte { push(@out, ".byte\t".join(',', @_)."\n"); }
169 sub ::data_short { push(@out, ".value\t".join(',', @_)."\n"); }
170 sub ::data_word { push(@out, ".long\t".join(',', @_)."\n"); }

172 sub ::align
173 { my $val=$_[0], $p2,$i;
174   if ($::aout)
175   {
176     for ($p2=0; $val!=0; $val>=>1) { $p2++; }
177     $val=$p2-1;
178     $val.="0x90";
179   }
180   push(@out, ".align\t$val\n");
181 }

182 sub ::picmeup
183 { my($dst,$sym,$base,$relabel)=@_;

185     if (($:pic && ($:elf || $:aout)) || $:macosx)
186     {
187         if (!defined($base))
188         {
189             &::call(&::label("PIC_me_up"));
190             &::set_label("PIC_me_up");
191             &::blndpop($dst);
192             $base=$dst;
193             $relabel=&::label("PIC_me_up");
194         }
195     }
196     if ($:macosx)

```

```

194     { my $indirect=&::static_label("$nmdecor$sym$non_lazy_ptr");
195       &::mov($dst, &::DWP("$indirect-$relabel", $base));
196       $non_lazy_ptr{"$nmdecor$sym"}=$indirect;
197     }
198     else
199     { &::lea($dst, &::DWP("_GLOBAL_OFFSET_TABLE_+[-$relabel]",
200                           $base));
201       &::mov($dst, &::DWP("$sym@GOT", $dst));
202     }
203 }
204 else
205 { &::lea($dst, &::DWP($sym)); }
206 }

208 sub ::initseg
209 { my $f=$nmdecor.shift;

211     if ($:android)
212     { $initseg.<=<__;
213       .section .init_array
214       .align 4
215       .long $f
216     }
217     elsif ($:elf)
218     { $initseg.<=<__;
219       .section .init
220       call $f
221     }
222     elsif ($:coff)
223     { $initseg.<=<__; # applies to both Cygwin and Mingw
224       .section .ctors
225       .long $f
226     }
227     elsif ($:macosx)
228     { $initseg.<=<__;
229       .mod_init_func
230       .align 2
231       .long $f
232     }
233     elsif ($:aout)
234     { my $ctor="$nmdecor}_GLOBAL_${I}$f";
235       $initseg=".text\n";
236       $initseg=".type $ctor, @function\n" if ($:pic);
237       $initseg.<=<__; # OpenBSD way...
238       .globl $ctor
239       .align 2
240       $ctor:
241       jmp $f
242     }
243 }

250 sub ::dataseg
251 { push(@out, ".data\n"); }

253 *::hidden = sub { push(@out, ".hidden\t$nmdecor$_[0]\n"); } if ($:elf);

255 1;

```

new/usr/src/lib/openssl/libsunw_crypto/pqueue/pqueue.c

1

```
*****
5691 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/pqueue/pqueue.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/pqueue/pqueue.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * Copyright (c) 1999-2005 The OpenSSL Project. All rights reserved.
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53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 */
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/pqueue/pqueue.c

2

```
62 #include <openssl/pqueue.h>
64 typedef struct _pqueue
65 {
66     pitem *items;
67     int count;
68 } pqueue_s;
70 pitem *
71 pitem_new(unsigned char *prio64be, void *data)
72 {
73     pitem *item = (pitem *) OPENSSL_malloc(sizeof(pitem));
74     if (item == NULL) return NULL;
76     memcpy(item->priority, prio64be, sizeof(item->priority));
78     item->data = data;
79     item->next = NULL;
81     return item;
82 }
84 void
85 pitem_free(pitem *item)
86 {
87     if (item == NULL) return;
89     OPENSSL_free(item);
90 }
92 pqueue_s *
93 pqueue_new()
94 {
95     pqueue_s *pq = (pqueue_s *) OPENSSL_malloc(sizeof(pqueue_s));
96     if (pq == NULL) return NULL;
98     memset(pq, 0x00, sizeof(pqueue_s));
99     return pq;
100 }
102 void
103 pqueue_free(pqueue_s *pq)
104 {
105     if (pq == NULL) return;
107     OPENSSL_free(pq);
108 }
110 pitem *
111 pqueue_insert(pqueue_s *pq, pitem *item)
112 {
113     pitem *curr, *next;
115     if (pq->items == NULL)
116     {
117         pq->items = item;
118         return item;
119     }
121     for(curr = NULL, next = pq->items;
122         next != NULL;
123         curr = next, next = next->next)
124     {
125         /* we can compare 64-bit value in big-endian encoding
126          * with memcmp:-) */
127         int cmp = memcmp(next->priority, item->priority, 8);
```

```

128         if (cmp > 0)          /* next > item */
129         {
130             item->next = next;
131
132             if (curr == NULL)
133                 pq->items = item;
134             else
135                 curr->next = item;
136
137             return item;
138         }
139
140         else if (cmp == 0)      /* duplicates not allowed */
141             return NULL;
142     }
143
144     item->next = NULL;
145     curr->next = item;
146
147     return item;
148 }
149
150 pitem *
151 pqueue_peek(pqueue_s *pq)
152 {
153     return pq->items;
154 }
155
156 pitem *
157 pqueue_pop(pqueue_s *pq)
158 {
159     pitem *item = pq->items;
160
161     if (pq->items != NULL)
162         pq->items = pq->items->next;
163
164     return item;
165 }
166
167 pitem *
168 pqueue_find(pqueue_s *pq, unsigned char *prio64be)
169 {
170     pitem *next;
171     pitem *found = NULL;
172
173     if (pq->items == NULL)
174         return NULL;
175
176     for (next = pq->items; next->next != NULL; next = next->next)
177     {
178         if (memcmp(next->priority, prio64be, 8) == 0)
179         {
180             found = next;
181             break;
182         }
183     }
184
185     /* check the one last node */
186     if (memcmp(next->priority, prio64be, 8) == 0)
187         found = next;
188
189     if (!found)
190         return NULL;
191
192     #if 0 /* find works in peek mode */
193     if (prev == NULL)

```

```

194         pq->items = next->next;
195     else
196         prev->next = next->next;
197 #endif
198
199     return found;
200 }
201
202 void
203 pqueue_print(pqueue_s *pq)
204 {
205     pitem *item = pq->items;
206
207     while(item != NULL)
208     {
209         printf("item\t%02x%02x%02x%02x%02x%02x%02x%02x\n",
210             item->priority[0], item->priority[1],
211             item->priority[2], item->priority[3],
212             item->priority[4], item->priority[5],
213             item->priority[6], item->priority[7]);
214         item = item->next;
215     }
216 }
217
218 pitem *
219 pqueue_iterator(pqueue_s *pq)
220 {
221     return pqueue_peek(pq);
222 }
223
224 pitem *
225 pqueue_next(pitem **item)
226 {
227     pitem *ret;
228
229     if (item == NULL || *item == NULL)
230         return NULL;
231
232     /* *item != NULL */
233     ret = *item;
234     *item = (*item)->next;
235
236     return ret;
237 }
238
239 int
240 pqueue_size(pqueue_s *pq)
241 {
242     pitem *item = pq->items;
243     int count = 0;
244
245     while(item != NULL)
246     {
247         count++;
248         item = item->next;
249     }
250     return count;
251 }
252 }

```

```

*****
18938 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/md_rand.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rand/md_rand.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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4  *
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6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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```

```

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108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #define OPENSSL_FIPSEVP
113
114 #ifdef MD_RAND_DEBUG
115 # ifnndef NDEBUG
116 # define NDEBUG
117 # endif
118 #endif
119
120 #include <assert.h>
121 #include <stdio.h>
122 #include <string.h>
123
124 #include "e_os.h"
125
126 #include <openssl/crypto.h>
127 #include <openssl/rand.h>

```

```

128 #include "rand_lcl.h"
130 #include <openssl/err.h>

132 #ifdef BN_DEBUG
133 # define PREDICT
134 #endif

136 /* #define PREDICT      1 */

138 #define STATE_SIZE      1023
139 static int state_num=0, state_index=0;
140 static unsigned char state[STATE_SIZE+MD_DIGEST_LENGTH];
141 static unsigned char md[MD_DIGEST_LENGTH];
142 static long md_count[2]={0,0};
143 static double entropy=0;
144 static int initialized=0;

146 static unsigned int crypto_lock_rand = 0; /* may be set only when a thread
147                                           * holds CRYPTO_LOCK_RAND
148                                           * (to prevent double locking) */
149 /* access to lockin_thread is synchronized by CRYPTO_LOCK_RAND2 */
150 static CRYPTO_THREADID locking_threadid; /* valid iff crypto_lock_rand is set */

153 #ifdef PREDICT
154 int rand_predictable=0;
155 #endif

157 const char RAND_version[]="RAND" OPENSSL_VERSION_PTEXT;

159 static void ssleay_rand_cleanup(void);
160 static void ssleay_rand_seed(const void *buf, int num);
161 static void ssleay_rand_add(const void *buf, int num, double add_entropy);
162 static int ssleay_rand_bytes(unsigned char *buf, int num, int pseudo);
163 static int ssleay_rand_nopseudo_bytes(unsigned char *buf, int num);
164 static int ssleay_rand_pseudo_bytes(unsigned char *buf, int num);
165 static int ssleay_rand_status(void);

167 RAND_METHOD rand_ssleay_meth={
168     ssleay_rand_seed,
169     ssleay_rand_nopseudo_bytes,
170     ssleay_rand_cleanup,
171     ssleay_rand_add,
172     ssleay_rand_pseudo_bytes,
173     ssleay_rand_status
174 };

176 RAND_METHOD *RAND_SSLeay(void)
177 {
178     return(&rand_ssleay_meth);
179 }

181 static void ssleay_rand_cleanup(void)
182 {
183     OPENSSL_cleanse(state, sizeof(state));
184     state_num=0;
185     state_index=0;
186     OPENSSL_cleanse(md, MD_DIGEST_LENGTH);
187     md_count[0]=0;
188     md_count[1]=0;
189     entropy=0;
190     initialized=0;
191 }

193 static void ssleay_rand_add(const void *buf, int num, double add)

```

```

194 {
195     int i,j,k,st_idx;
196     long md_c[2];
197     unsigned char local_md[MD_DIGEST_LENGTH];
198     EVP_MD_CTX m;
199     int do_not_lock;

201     if (!num)
202         return;

204     /*
205     * (Based on the rand(3) manpage)
206     *
207     * The input is chopped up into units of 20 bytes (or less for
208     * the last block). Each of these blocks is run through the hash
209     * function as follows: The data passed to the hash function
210     * is the current 'md', the same number of bytes from the 'state'
211     * (the location determined by in incremented looping index) as
212     * the current 'block', the new key data 'block', and 'count',
213     * (which is incremented after each use).
214     * The result of this is kept in 'md' and also xored into the
215     * 'state' at the same locations that were used as input into the
216     * hash function.
217     */

219     /* check if we already have the lock */
220     if (crypto_lock_rand)
221     {
222         CRYPTO_THREADID cur;
223         CRYPTO_THREADID_current(&cur);
224         CRYPTO_r_lock(CRYPTO_LOCK_RAND2);
225         do_not_lock = !CRYPTO_THREADID_cmp(&locking_threadid, &cur);
226         CRYPTO_r_unlock(CRYPTO_LOCK_RAND2);
227     }
228     else
229         do_not_lock = 0;

231     if (!do_not_lock) CRYPTO_w_lock(CRYPTO_LOCK_RAND);
232     st_idx=state_index;

234     /* use our own copies of the counters so that even
235     * if a concurrent thread seeds with exactly the
236     * same data and uses the same subarray there's _some_
237     * difference */
238     md_c[0] = md_count[0];
239     md_c[1] = md_count[1];

241     memcpy(local_md, md, sizeof md);

243     /* state_index <= state_num <= STATE_SIZE */
244     state_index += num;
245     if (state_index >= STATE_SIZE)
246     {
247         state_index%=STATE_SIZE;
248         state_num=STATE_SIZE;
249     }
250     else if (state_num < STATE_SIZE)
251     {
252         if (state_index > state_num)
253             state_num=state_index;
254     }
255     /* state_index <= state_num <= STATE_SIZE */

257     /* state[st_idx], ..., state[(st_idx + num - 1) % STATE_SIZE]
258     * are what we will use now, but other threads may use them
259     * as well */

```

```

261     md_count[1] += (num / MD_DIGEST_LENGTH) + (num % MD_DIGEST_LENGTH > 0);
263     if (!do_not_lock) CRYPTO_w_unlock(CRYPTO_LOCK_RAND);

265     EVP_MD_CTX_init(&m);
266     for (i=0; i<num; i+=MD_DIGEST_LENGTH)
267     {
268         j=(num-i);
269         j=(j > MD_DIGEST_LENGTH)?MD_DIGEST_LENGTH:j;

271         MD_Init(&m);
272         MD_Update(&m, local_md, MD_DIGEST_LENGTH);
273         k=(st_idx+j)-STATE_SIZE;
274         if (k > 0)
275         {
276             MD_Update(&m, &(state[st_idx]), j-k);
277             MD_Update(&m, &(state[0]), k);
278         }
279         else
280             MD_Update(&m, &(state[st_idx]), j);

282         /* DO NOT REMOVE THE FOLLOWING CALL TO MD_Update()! */
283         MD_Update(&m, buf, j);
284         /* We know that line may cause programs such as
285          * purify and valgrind to complain about use of
286          * uninitialized data. The problem is not, it's
287          * with the caller. Removing that line will make
288          * sure you get really bad randomness and thereby
289          * other problems such as very insecure keys. */

291         MD_Update(&m, (unsigned char *)&(md_c[0]), sizeof(md_c));
292         MD_Final(&m, local_md);
293         md_c[1]++;

295         buf=(const char *)buf + j;

297         for (k=0; k<j; k++)
298         {
299             /* Parallel threads may interfere with this,
300              * but always each byte of the new state is
301              * the XOR of some previous value of its
302              * and local_md (intermediate values may be lost).
303              * Always using locking could hurt performance more
304              * than necessary given that conflicts occur only
305              * when the total seeding is longer than the random
306              * state. */
307             state[st_idx++]^=local_md[k];
308             if (st_idx >= STATE_SIZE)
309                 st_idx=0;
310         }
311     }
312     EVP_MD_CTX_cleanup(&m);

314     if (!do_not_lock) CRYPTO_w_lock(CRYPTO_LOCK_RAND);
315     /* Don't just copy back local_md into md -- this could mean that
316      * other thread's seeding remains without effect (except for
317      * the incremented counter). By XORing it we keep at least as
318      * much entropy as fits into md. */
319     for (k = 0; k < (int)sizeof(md); k++)
320     {
321         md[k] ^= local_md[k];
322     }
323     if (entropy < ENTROPY_NEEDED) /* stop counting when we have enough */
324         entropy += add;
325     if (!do_not_lock) CRYPTO_w_unlock(CRYPTO_LOCK_RAND);

```

```

326
327 #if !defined(OPENSSSL_THREADS) && !defined(OPENSSSL_SYS_WIN32)
328     assert(md_c[1] == md_count[1]);
329 #endif
330 }

332 static void ssleay_rand_seed(const void *buf, int num)
333 {
334     ssleay_rand_add(buf, num, (double)num);
335 }

337 static int ssleay_rand_bytes(unsigned char *buf, int num, int pseudo)
338 {
339     static volatile int stirred_pool = 0;
340     int i, j, k, st_num, st_idx;
341     int num_ceil;
342     int ok;
343     long md_c[2];
344     unsigned char local_md[MD_DIGEST_LENGTH];
345     EVP_MD_CTX m;
346 #ifndef GETPID_IS_MEANINGLESS
347     pid_t curr_pid = getpid();
348 #endif
349     int do_stir_pool = 0;

351 #ifdef PREDICT
352     if (rand_predictable)
353     {
354         static unsigned char val=0;

356         for (i=0; i<num; i++)
357             buf[i]=val++;
358         return(1);
359     }
360 #endif

362     if (num <= 0)
363         return 1;

365     EVP_MD_CTX_init(&m);
366     /* round upwards to multiple of MD_DIGEST_LENGTH/2 */
367     num_ceil = (1 + (num-1)/(MD_DIGEST_LENGTH/2)) * (MD_DIGEST_LENGTH/2);

369     /*
370      * (Based on the rand(3) manpage:)
371      *
372      * For each group of 10 bytes (or less), we do the following:
373      *
374      * Input into the hash function the local 'md' (which is initialized fro
375      * the global 'md' before any bytes are generated), the bytes that are t
376      * be overwritten by the random bytes, and bytes from the 'state'
377      * (incrementing looping index). From this digest output (which is kept
378      * in 'md'), the top (up to) 10 bytes are returned to the caller and the
379      * bottom 10 bytes are xored into the 'state'.
380      *
381      * Finally, after we have finished 'num' random bytes for the
382      * caller, 'count' (which is incremented) and the local and global 'md'
383      * are fed into the hash function and the results are kept in the
384      * global 'md'.
385      */
386 #ifdef OPENSSSL_FIPS
387     /* NB: in FIPS mode we are already under a lock */
388     if (!FIPS_mode())
389 #endif
390         CRYPTO_w_lock(CRYPTO_LOCK_RAND);

```

```

392  /* prevent ssl_rand_bytes() from trying to obtain the lock again */
393  CRYPTO_w_lock(CRYPTO_LOCK_RAND2);
394  CRYPTO_THREADID_current(&locking_threadid);
395  CRYPTO_w_unlock(CRYPTO_LOCK_RAND2);
396  crypto_lock_rand = 1;

398  if (!initialized)
399  {
400      RAND_poll();
401      initialized = 1;
402  }

403  if (!stirred_pool)
404      do_stir_pool = 1;
405
406  ok = (entropy >= ENTROPY_NEEDED);
407  if (!ok)
408  {
409      /* If the PRNG state is not yet unpredictable, then seeing
410       * the PRNG output may help attackers to determine the new
411       * state; thus we have to decrease the entropy estimate.
412       * Once we've had enough initial seeding we don't bother to
413       * adjust the entropy count, though, because we're not ambitious
414       * to provide *information-theoretic* randomness.
415       *
416       * NOTE: This approach fails if the program forks before
417       * we have enough entropy. Entropy should be collected
418       * in a separate input pool and be transferred to the
419       * output pool only when the entropy limit has been reached.
420       */
421      entropy -= num;
422      if (entropy < 0)
423          entropy = 0;
424  }

425

427  if (do_stir_pool)
428  {
429      /* In the output function only half of 'md' remains secret,
430       * so we better make sure that the required entropy gets
431       * 'evenly distributed' through 'state', our randomness pool.
432       * The input function (ssl_rand_add) chains all of 'md',
433       * which makes it more suitable for this purpose.
434       */

436      int n = STATE_SIZE; /* so that the complete pool gets accessed */
437      while (n > 0)
438      {
439          #if MD_DIGEST_LENGTH > 20
440              #error "Please adjust DUMMY_SEED."
441          #endif
442          #define DUMMY_SEED "....." /* at least MD_DIGEST_LENGTH */
443              /* Note that the seed does not matter, it's just that
444               * ssl_rand_add expects to have something to hash. */
445              ssl_rand_add(DUMMY_SEED, MD_DIGEST_LENGTH, 0.0);
446              n -= MD_DIGEST_LENGTH;
447          }
448      if (ok)
449          stirred_pool = 1;
450  }

452  st_idx=state_index;
453  st_num=state_num;
454  md_c[0] = md_count[0];
455  md_c[1] = md_count[1];
456  memcpy(local_md, md, sizeof md);

```

```

458  state_index+=num_ceil;
459  if (state_index > state_num)
460      state_index %= state_num;

462  /* state[st_idx], ..., state[(st_idx + num_ceil - 1) % st_num]
463   * are now ours (but other threads may use them too) */

465  md_count[0] += 1;

467  /* before unlocking, we must clear 'crypto_lock_rand' */
468  crypto_lock_rand = 0;
469  #ifdef OPENSSL_FIPS
470      if (!FIPS_mode())
471      #endif
472      CRYPTO_w_unlock(CRYPTO_LOCK_RAND);

474  while (num > 0)
475  {
476      /* num_ceil -= MD_DIGEST_LENGTH/2 */
477      j=(num >= MD_DIGEST_LENGTH/2)?MD_DIGEST_LENGTH/2:num;
478      num-=j;
479      MD_Init(&m);
480      #ifndef GETPID_IS_MEANINGLESS
481          if (curr_pid) /* just in the first iteration to save time */
482          {
483              MD_Update(&m, (unsigned char *)&curr_pid, sizeof curr_pid);
484              curr_pid = 0;
485          }
486      #endif
487      MD_Update(&m, local_md, MD_DIGEST_LENGTH);
488      MD_Update(&m, (unsigned char *)&(md_c[0]), sizeof(md_c));

490      #ifndef PURIFY /* purify complains */
491          /* The following line uses the supplied buffer as a small
492           * source of entropy: since this buffer is often uninitialised
493           * it may cause programs such as purify or valgrind to
494           * complain. So for those builds it is not used: the removal
495           * of such a small source of entropy has negligible impact on
496           * security.
497           */
498          MD_Update(&m, buf, j);
499      #endif

501      k=(st_idx+MD_DIGEST_LENGTH/2)-st_num;
502      if (k > 0)
503      {
504          MD_Update(&m, &(state[st_idx]), MD_DIGEST_LENGTH/2-k);
505          MD_Update(&m, &(state[0]), k);
506      }
507      else
508          MD_Update(&m, &(state[st_idx]), MD_DIGEST_LENGTH/2);
509      MD_Final(&m, local_md);

511      for (i=0; i<MD_DIGEST_LENGTH/2; i++)
512      {
513          state[st_idx++]^=local_md[i]; /* may compete with other
514          if (st_idx >= st_num)
515              st_idx=0;
516          if (i < j)
517              {buf++}=local_md[i+MD_DIGEST_LENGTH/2];
518          }
519      }

521  MD_Init(&m);
522  MD_Update(&m, (unsigned char *)&(md_c[0]), sizeof(md_c));
523  MD_Update(&m, local_md, MD_DIGEST_LENGTH);

```



```

524 #ifdef OPENSSL_FIPS
525     if (!FIPS_mode())
526 #endif
527         CRYPTO_w_lock(CRYPTO_LOCK_RAND);
528     MD_Update(&m,md,MD_DIGEST_LENGTH);
529     MD_Final(&m,md);
530 #ifdef OPENSSL_FIPS
531     if (!FIPS_mode())
532 #endif
533         CRYPTO_w_unlock(CRYPTO_LOCK_RAND);
534
535     EVP_MD_CTX_cleanup(&m);
536     if (ok)
537         return(1);
538     else if (pseudo)
539         return 0;
540     else
541     {
542         RANDerr(RAND_F_SSLEAY_RAND_BYTES,RAND_R_PRNG_NOT_SEEDED);
543         ERR_add_error_data(1, "You need to read the OpenSSL FAQ, "
544             "http://www.openssl.org/support/faq.html");
545         return(0);
546     }
547 }
548
549 static int ssleay_rand_nopseudo_bytes(unsigned char *buf, int num)
550 {
551     return ssleay_rand_bytes(buf, num, 0);
552 }
553
554 /* pseudo-random bytes that are guaranteed to be unique but not
555    unpredictable */
556 static int ssleay_rand_pseudo_bytes(unsigned char *buf, int num)
557 {
558     return ssleay_rand_bytes(buf, num, 1);
559 }
560
561 static int ssleay_rand_status(void)
562 {
563     CRYPTO_THREADID cur;
564     int ret;
565     int do_not_lock;
566
567     CRYPTO_THREADID_current(&cur);
568     /* check if we already have the lock
569      * (could happen if a RAND_poll() implementation calls RAND_status()) */
570     if (crypto_lock_rand)
571     {
572         CRYPTO_r_lock(CRYPTO_LOCK_RAND2);
573         do_not_lock = !CRYPTO_THREADID_cmp(&locking_threadid, &cur);
574         CRYPTO_r_unlock(CRYPTO_LOCK_RAND2);
575     }
576     else
577         do_not_lock = 0;
578
579     if (!do_not_lock)
580     {
581         CRYPTO_w_lock(CRYPTO_LOCK_RAND);
582
583         /* prevent ssleay_rand_bytes() from trying to obtain the lock ag
584         CRYPTO_w_lock(CRYPTO_LOCK_RAND2);
585         CRYPTO_THREADID_cpy(&locking_threadid, &cur);
586         CRYPTO_w_unlock(CRYPTO_LOCK_RAND2);
587         crypto_lock_rand = 1;
588     }
589 }

```

```

590     if (!initialized)
591     {
592         RAND_poll();
593         initialized = 1;
594     }
595
596     ret = entropy >= ENTROPY_NEEDED;
597
598     if (!do_not_lock)
599     {
600         /* before unlocking, we must clear 'crypto_lock_rand' */
601         crypto_lock_rand = 0;
602         CRYPTO_w_unlock(CRYPTO_LOCK_RAND);
603     }
604
605     return ret;
606 }

```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_egd.c

1

```
*****
8633 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/rand_egd.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rand/rand_egd.c */
2 /* Written by Ulf Moeller and Lutz Jaenicke for the OpenSSL project. */
3 /* =====
4 * Copyright (c) 1998-2000 The OpenSSL Project. All rights reserved.
5 *
6 * Redistribution and use in source and binary forms, with or without
7 * modification, are permitted provided that the following conditions
8 * are met:
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11 * notice, this list of conditions and the following disclaimer.
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38 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
39 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
40 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
41 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
42 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
43 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
44 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
45 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
46 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
47 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
48 * OF THE POSSIBILITY OF SUCH DAMAGE.
49 * =====
50 *
51 * This product includes cryptographic software written by Eric Young
52 * (eay@cryptsoft.com). This product includes software written by Tim
53 * Hudson (tjh@cryptsoft.com).
54 *
55 */

57 #include <openssl/e_os2.h>
58 #include <openssl/rand.h>
59 #include <openssl/buffer.h>

61 /*
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_egd.c

2

```
62 * Query the EGD <URL: http://www.lothar.com/tech/crypto/>.
63 *
64 * This module supplies three routines:
65 *
66 * RAND_query_egd_bytes(path, buf, bytes)
67 * will actually query "bytes" bytes of entropy from the egd-socket located
68 * at path and will write them to buf (if supplied) or will directly feed
69 * it to RAND_seed() if buf==NULL.
70 * The number of bytes is not limited by the maximum chunk size of EGD,
71 * which is 255 bytes. If more than 255 bytes are wanted, several chunks
72 * of entropy bytes are requested. The connection is left open until the
73 * query is completed.
74 * RAND_query_egd_bytes() returns with
75 * -1 if an error occurred during connection or communication.
76 * num the number of bytes read from the EGD socket. This number is either
77 * the number of bytes requested or smaller, if the EGD pool is
78 * drained and the daemon signals that the pool is empty.
79 * This routine does not touch any RAND_status(). This is necessary, since
80 * PRNG functions may call it during initialization.
81 *
82 * RAND_egd_bytes(path, bytes) will query "bytes" bytes and have them
83 * used to seed the PRNG.
84 * RAND_egd_bytes() is a wrapper for RAND_query_egd_bytes() with buf=NULL.
85 * Unlike RAND_query_egd_bytes(), RAND_status() is used to test the
86 * seed status so that the return value can reflect the seed state:
87 * -1 if an error occurred during connection or communication _or_
88 * if the PRNG has still not received the required seeding.
89 * num the number of bytes read from the EGD socket. This number is either
90 * the number of bytes requested or smaller, if the EGD pool is
91 * drained and the daemon signals that the pool is empty.
92 *
93 * RAND_egd(path) will query 255 bytes and use the bytes retrieved to seed
94 * the PRNG.
95 * RAND_egd() is a wrapper for RAND_egd_bytes() with numbytes=255.
96 */

98 #if defined(OPENSSL_SYS_WIN32) || defined(OPENSSL_SYS_VMS) || defined(OPENSSL_SY
99 int RAND_query_egd_bytes(const char *path, unsigned char *buf, int bytes)
100 {
101     return(-1);
102 }
103 int RAND_egd(const char *path)
104 {
105     return(-1);
106 }

108 int RAND_egd_bytes(const char *path,int bytes)
109 {
110     return(-1);
111 }
112 #else
113 #include <openssl/opensslconf.h>
114 #include <OPENSSL_UNISTD
115 #include <sys/types.h>
116 #include <sys/socket.h>
117 #ifndef NO_SYS_UN_H
118 # ifdef OPENSSL_SYS_VXWORKS
119 # include <streams/un.h>
120 # else
121 # include <sys/un.h>
122 # endif
123 #else
124 struct sockaddr_un {
125     short sun_family; /* AF_UNIX */
126     char sun_path[108]; /* path name (gag) */
127 };
```

```

128 #endif /* NO_SYS_UN_H */
129 #include <string.h>
130 #include <errno.h>

132 #ifndef offsetof
133 # define offsetof(TYPE, MEMBER) ((size_t) &((TYPE *)0)->MEMBER)
134 #endif

136 int RAND_query_egd_bytes(const char *path, unsigned char *buf, int bytes)
137 {
138     int ret = 0;
139     struct sockaddr_un addr;
140     int len, num, numbytes;
141     int fd = -1;
142     int success;
143     unsigned char egdbuf[2], tempbuf[255], *retrievebuf;

145     memset(&addr, 0, sizeof(addr));
146     addr.sun_family = AF_UNIX;
147     if (strlen(path) >= sizeof(addr.sun_path))
148         return (-1);
149     BUF_strncpy(addr.sun_path, path, sizeof addr.sun_path);
150     len = offsetof(struct sockaddr_un, sun_path) + strlen(path);
151     fd = socket(AF_UNIX, SOCK_STREAM, 0);
152     if (fd == -1) return (-1);
153     success = 0;
154     while (!success)
155     {
156         if (connect(fd, (struct sockaddr *)&addr, len) == 0)
157             success = 1;
158         else
159         {
160             switch (errno)
161             {
162 #ifdef EINTR
163                 case EINTR:
164 #endif
165 #ifdef EAGAIN
166                 case EAGAIN:
167 #endif
168 #ifdef EINPROGRESS
169                 case EINPROGRESS:
170 #endif
171 #ifdef EALREADY
172                 case EALREADY:
173 #endif
174                 /* No error, try again */
175                 break;
176 #ifdef EISCONN
177                 case EISCONN:
178                     success = 1;
179                     break;
180 #endif
181                 default:
182                     goto err; /* failure */
183             }
184         }
185     }

187     while(bytes > 0)
188     {
189         egdbuf[0] = 1;
190         egdbuf[1] = bytes < 255 ? bytes : 255;
191         numbytes = 0;
192         while (numbytes != 2)
193         {

```

```

194         num = write(fd, egdbuf + numbytes, 2 - numbytes);
195         if (num >= 0)
196             numbytes += num;
197         else
198         {
199             switch (errno)
200             {
201 #ifdef EINTR
202                 case EINTR:
203 #endif
204 #ifdef EAGAIN
205                 case EAGAIN:
206 #endif
207                 /* No error, try again */
208                 break;
209             default:
210                 ret = -1;
211                 goto err; /* failure */
212             }
213         }
214     }
215     numbytes = 0;
216     while (numbytes != 1)
217     {
218         num = read(fd, egdbuf, 1);
219         if (num == 0)
220             goto err; /* descriptor closed */
221         else if (num > 0)
222             numbytes += num;
223         else
224         {
225             switch (errno)
226             {
227 #ifdef EINTR
228                 case EINTR:
229 #endif
230 #ifdef EAGAIN
231                 case EAGAIN:
232 #endif
233                 /* No error, try again */
234                 break;
235             default:
236                 ret = -1;
237                 goto err; /* failure */
238             }
239         }
240     }
241     if(egdbuf[0] == 0)
242         goto err;
243     if (buf)
244         retrievebuf = buf + ret;
245     else
246         retrievebuf = tempbuf;
247     numbytes = 0;
248     while (numbytes != egdbuf[0])
249     {
250         num = read(fd, retrievebuf + numbytes, egdbuf[0] - numbytes);
251         if (num == 0)
252             goto err; /* descriptor closed */
253         else if (num > 0)
254             numbytes += num;
255         else
256         {
257             switch (errno)
258             {
259 #ifdef EINTR

```

```
260             case EINTR:
261 #endif
262 #ifdef EAGAIN
263             case EAGAIN:
264 #endif
265             /* No error, try again */
266             break;
267             default:
268                 ret = -1;
269                 goto err; /* failure */
270         }
271     }
272 }
273 ret += egdbuf[0];
274 bytes -= egdbuf[0];
275 if (!buf)
276     RAND_seed(tempbuf, egdbuf[0]);
277 }
278 err:
279     if (fd != -1) close(fd);
280     return(ret);
281 }

284 int RAND_egd_bytes(const char *path, int bytes)
285 {
286     int num, ret = 0;

288     num = RAND_query_egd_bytes(path, NULL, bytes);
289     if (num < 1) goto err;
290     if (RAND_status() == 1)
291         ret = num;
292 err:
293     return(ret);
294 }

297 int RAND_egd(const char *path)
298 {
299     return (RAND_egd_bytes(path, 255));
300 }

303 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_err.c

1

```
*****
3966 Fri May 30 18:32:06 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/rand_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rand/rand_err.c */
2 /* =====
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48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */
60
61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/rand.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_RAND,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_RAND,0,reason)
70
71 static ERR_STRING_DATA RAND_str_funcs[]=
72 {
73 {ERR_FUNC(RAND_F_RAND_GET_RAND_METHOD), "RAND_get_rand_method"},
74 {ERR_FUNC(RAND_F_RAND_INIT_FIPS), "RAND_init_fips"},
75 {ERR_FUNC(RAND_F_SSLEAY_RAND_BYTES), "SSLEAY_RAND_BYTES"},
76 {0,NULL}
77 };
78
79 static ERR_STRING_DATA RAND_str_reasons[]=
80 {
81 {ERR_REASON(RAND_R_DUAL_EC_DRBG_DISABLED),"dual ec drbg disabled"},
82 {ERR_REASON(RAND_R_ERROR_INITIALISING_DRBG),"error initialising drbg"},
83 {ERR_REASON(RAND_R_ERROR_INSTANTIATING_DRBG),"error instantiating drbg"},
84 {ERR_REASON(RAND_R_NO_FIPS_RANDOM_METHOD_SET),"no fips random method set"},
85 {ERR_REASON(RAND_R_PRNG_NOT_SEEDED), "PRNG not seeded"},
86 {0,NULL}
87 };
88
89 #endif
90
91 void ERR_load_RAND_strings(void)
92 {
93 #ifndef OPENSSL_NO_ERR
94
95     if (ERR_func_error_string(RAND_str_funcs[0].error) == NULL)
96     {
97         ERR_load_strings(0,RAND_str_funcs);
98         ERR_load_strings(0,RAND_str_reasons);
99     }
100 #endif
101 }
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_lib.c

1

```
*****
8652 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/rand_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rand/rand_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
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5  * This package is an SSL implementation written
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57 */

59 #include <stdio.h>
60 #include <time.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_lib.c

2

```
62 #include <openssl/rand.h>

64 #ifndef OPENSSL_NO_ENGINE
65 #include <openssl/engine.h>
66 #endif

68 #ifdef OPENSSL_FIPS
69 #include <openssl/fips.h>
70 #include <openssl/fips_rand.h>
71 #endif

73 #ifndef OPENSSL_NO_ENGINE
74 /* non-NULL if default_RAND_meth is ENGINE-provided */
75 static ENGINE *funct_ref = NULL;
76 #endif
77 static const RAND_METHOD *default_RAND_meth = NULL;

79 int RAND_set_rand_method(const RAND_METHOD *meth)
80 {
81 #ifndef OPENSSL_NO_ENGINE
82     if(funct_ref)
83     {
84         ENGINE_finish(funct_ref);
85         funct_ref = NULL;
86     }
87 #endif
88     default_RAND_meth = meth;
89     return 1;
90 }

92 const RAND_METHOD *RAND_get_rand_method(void)
93 {
94     if (!default_RAND_meth)
95     {
96 #ifndef OPENSSL_NO_ENGINE
97         ENGINE *e = ENGINE_get_default_RAND();
98         if(e)
99         {
100             default_RAND_meth = ENGINE_get_RAND(e);
101             if(!default_RAND_meth)
102             {
103                 ENGINE_finish(e);
104                 e = NULL;
105             }
106         }
107         if(e)
108             funct_ref = e;
109     }
110 #endif
111     default_RAND_meth = RAND_SSLeay();
112 }
113 return default_RAND_meth;
114 }

116 #ifndef OPENSSL_NO_ENGINE
117 int RAND_set_rand_engine(ENGINE *engine)
118 {
119     const RAND_METHOD *tmp_meth = NULL;
120     if(engine)
121     {
122         if(!ENGINE_init(engine))
123             return 0;
124         tmp_meth = ENGINE_get_RAND(engine);
125         if(!tmp_meth)
126         {
127             ENGINE_finish(engine);
```

```

128         return 0;
129     }
130 }
131 /* This function releases any prior ENGINE so call it first */
132 RAND_set_rand_method(tmp_meth);
133 funct_ref = engine;
134 return 1;
135 }
136 #endif

138 void RAND_cleanup(void)
139 {
140     const RAND_METHOD *meth = RAND_get_rand_method();
141     if (meth && meth->cleanup)
142         meth->cleanup();
143     RAND_set_rand_method(NULL);
144 }

146 void RAND_seed(const void *buf, int num)
147 {
148     const RAND_METHOD *meth = RAND_get_rand_method();
149     if (meth && meth->seed)
150         meth->seed(buf, num);
151 }

153 void RAND_add(const void *buf, int num, double entropy)
154 {
155     const RAND_METHOD *meth = RAND_get_rand_method();
156     if (meth && meth->add)
157         meth->add(buf, num, entropy);
158 }

160 int RAND_bytes(unsigned char *buf, int num)
161 {
162     const RAND_METHOD *meth = RAND_get_rand_method();
163     if (meth && meth->bytes)
164         return meth->bytes(buf, num);
165     return (-1);
166 }

168 int RAND_pseudo_bytes(unsigned char *buf, int num)
169 {
170     const RAND_METHOD *meth = RAND_get_rand_method();
171     if (meth && meth->pseudorand)
172         return meth->pseudorand(buf, num);
173     return (-1);
174 }

176 int RAND_status(void)
177 {
178     const RAND_METHOD *meth = RAND_get_rand_method();
179     if (meth && meth->status)
180         return meth->status();
181     return 0;
182 }

184 #ifdef OPENSSL_FIPS

186 /* FIPS DRBG initialisation code. This sets up the DRBG for use by the
187  * rest of OpenSSL.
188  */

190 /* Entropy gatherer: use standard OpenSSL PRNG to seed (this will gather
191  * entropy internally through RAND_poll().
192  */

```

```

194 static size_t drbg_get_entropy(DRBG_CTX *ctx, unsigned char **pout,
195                               int entropy, size_t min_len, size_t max_len)
196 {
197     /* Round up request to multiple of block size */
198     min_len = ((min_len + 19) / 20) * 20;
199     *pout = OPENSSL_malloc(min_len);
200     if (!*pout)
201         return 0;
202     if (RAND_SSLeay()->bytes(*pout, min_len) <= 0)
203     {
204         OPENSSL_free(*pout);
205         *pout = NULL;
206         return 0;
207     }
208     return min_len;
209 }

211 static void drbg_free_entropy(DRBG_CTX *ctx, unsigned char *out, size_t olen)
212 {
213     if (out)
214     {
215         OPENSSL_cleanse(out, olen);
216         OPENSSL_free(out);
217     }
218 }

220 /* Set "additional input" when generating random data. This uses the
221  * current PID, a time value and a counter.
222  */

224 static size_t drbg_get_adin(DRBG_CTX *ctx, unsigned char **pout)
225 {
226     /* Use of static variables is OK as this happens under a lock */
227     static unsigned char buf[16];
228     static unsigned long counter;
229     FIPS_get_timevec(buf, &counter);
230     *pout = buf;
231     return sizeof(buf);
232 }

234 /* RAND_add() and RAND_seed() pass through to OpenSSL PRNG so it is
235  * correctly seeded by RAND_poll().
236  */

238 static int drbg_rand_add(DRBG_CTX *ctx, const void *in, int inlen,
239                          double entropy)
240 {
241     RAND_SSLeay()->add(in, inlen, entropy);
242     return 1;
243 }

245 static int drbg_rand_seed(DRBG_CTX *ctx, const void *in, int inlen)
246 {
247     RAND_SSLeay()->seed(in, inlen);
248     return 1;
249 }

251 #ifndef OPENSSL_DRBG_DEFAULT_TYPE
252 #define OPENSSL_DRBG_DEFAULT_TYPE      NID_aes_256_ctr
253 #endif
254 #ifndef OPENSSL_DRBG_DEFAULT_FLAGS
255 #define OPENSSL_DRBG_DEFAULT_FLAGS     DRBG_FLAG_CTR_USE_DF
256 #endif

258 static int fips_drbg_type = OPENSSL_DRBG_DEFAULT_TYPE;
259 static int fips_drbg_flags = OPENSSL_DRBG_DEFAULT_FLAGS;

```

```
261 void RAND_set_fips_drbg_type(int type, int flags)
262 {
263     fips_drbg_type = type;
264     fips_drbg_flags = flags;
265 }
266
267 int RAND_init_fips(void)
268 {
269     DRBG_CTX *dctx;
270     size_t plen;
271     unsigned char pers[32], *p;
272 #ifndef OPENSSL_ALLOW_DUAL_EC_DRBG
273     if (fips_drbg_type >> 16)
274     {
275         RANDerr(RAND_F_RAND_INIT_FIPS, RAND_R_DUAL_EC_DRBG_DISABLED);
276         return 0;
277     }
278 #endif
279     dctx = FIPS_get_default_drbg();
280     if (FIPS_drbg_init(dctx, fips_drbg_type, fips_drbg_flags) <= 0)
281     {
282         RANDerr(RAND_F_RAND_INIT_FIPS, RAND_R_ERROR_INITIALISING_DRBG);
283         return 0;
284     }
285
286     FIPS_drbg_set_callbacks(dctx,
287                             drbg_get_entropy, drbg_free_entropy, 20,
288                             drbg_get_entropy, drbg_free_entropy);
289     FIPS_drbg_set_rand_callbacks(dctx, drbg_get_adin, 0,
290                                 drbg_rand_seed, drbg_rand_add);
291     /* Personalisation string: a string followed by date time vector */
292     strcpy((char *)pers, "OpenSSL DRBG2.0");
293     plen = drbg_get_adin(dctx, &p);
294     memcpy(pers + 16, p, plen);
295
296     if (FIPS_drbg_instantiate(dctx, pers, sizeof(pers)) <= 0)
297     {
298         RANDerr(RAND_F_RAND_INIT_FIPS, RAND_R_ERROR_INSTANTIATING_DRBG);
299         return 0;
300     }
301     FIPS_rand_set_method(FIPS_drbg_method());
302     return 1;
303 }
304
305 #endif
```


new/usr/src/lib/openssl/libsunw_crypto/rand/rand_nw.c

1

```
*****
7722 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/rand_nw.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rand/rand_nw.c */
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5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_nw.c

2

```
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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include "cryptlib.h"
113 #include <openssl/rand.h>
114 #include "rand_lcl.h"
115
116 #if defined (OPENSSL_SYS_NETWORK)
117
118 #if defined(NETWARE_LIBC)
119 #include <nks/thread.h>
120 #else
121 #include <nwthread.h>
122 #endif
123
124 extern int GetProcessSwitchCount(void);
125 #if !defined(NETWARE_LIBC) || (CURRENT_NDK_THRESHOLD < 509220000)
126 extern void *RunningProcess; /* declare here same as found in newer NDKs */
127 extern unsigned long GetSuperHighResolutionTimer(void);
```

```
128 #endif

130 /* the FAQ indicates we need to provide at least 20 bytes (160 bits) of seed
131 */
132 int RAND_poll(void)
133 {
134     unsigned long l;
135     unsigned long tsc;
136     int i;

138     /* There are several options to gather miscellaneous data
139     * but for now we will loop checking the time stamp counter (rdtsc) and
140     * the SuperHighResolutionTimer. Each iteration will collect 8 bytes
141     * of data but it is treated as only 1 byte of entropy. The call to
142     * ThreadSwitchWithDelay() will introduce additional variability into
143     * the data returned by rdtsc.
144     *
145     * Applications can agument the seed material by adding additional
146     * stuff with RAND_add() and should probably do so.
147     */
148     l = GetProcessSwitchCount();
149     RAND_add(&l, sizeof(l), 1);
150
151     /* need to cast the void* to unsigned long here */
152     l = (unsigned long)RunningProcess;
153     RAND_add(&l, sizeof(l), 1);

155     for( i=2; i<ENTROPY_NEEDED; i++)
156     {
157 #ifdef __MWERKS__
158         asm
159         {
160             rdtsc
161             mov tsc, eax
162         }
163 #elif defined(__GNUC__) && __GNUC__>=2 && !defined(OPENSSL_NO_ASM) && !defined(0
164         asm volatile("rdtsc":"=a"(tsc)::"edx");
165 #endif

167         RAND_add(&tsc, sizeof(tsc), 1);

169         l = GetSuperHighResolutionTimer();
170         RAND_add(&l, sizeof(l), 0);

172 # if defined(NETWARE_LIBC)
173     NXThreadYield();
174 # else /* NETWARE_CLIB */
175     ThreadSwitchWithDelay();
176 # endif
177     }

179     return 1;
180 }

182 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_os2.c

1

5687 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/rand_os2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 #include "cryptlib.h"
57 #include <openssl/rand.h>
58 #include "rand_lcl.h"
59
60 #ifdef OPENSSL_SYS_OS2
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_os2.c

2

```
62 #define INCL_DOSPROCESS
63 #define INCL_DOSPROFILE
64 #define INCL_DOSMISC
65 #define INCL_DOSMODULEMGR
66 #include <os2.h>
67
68 #define CMD_KI_RDCNT (0x63)
69
70 typedef struct _CPUUTIL {
71     ULONG ulTimeLow; /* Low 32 bits of time stamp */
72     ULONG ulTimeHigh; /* High 32 bits of time stamp */
73     ULONG ulIdleLow; /* Low 32 bits of idle time */
74     ULONG ulIdleHigh; /* High 32 bits of idle time */
75     ULONG ulBusyLow; /* Low 32 bits of busy time */
76     ULONG ulBusyHigh; /* High 32 bits of busy time */
77     ULONG ulIntrLow; /* Low 32 bits of interrupt time */
78     ULONG ulIntrHigh; /* High 32 bits of interrupt time */
79 } CPUUTIL;
80
81 #ifndef __KLIBC__
82 APIRET APIENTRY(*DosPerfSysCall) (ULONG ulCommand, ULONG ulParm1, ULONG ulParm2,
83 APIRET APIENTRY(*DosQuerySysState) (ULONG func, ULONG arg1, ULONG pid, ULONG _re
84 #endif
85 HMODULE hDoscalls = 0;
86
87 int RAND_poll(void)
88 {
89     char failed_module[20];
90     QWORD qwTime;
91     ULONG SysVars[QSV_FOREGROUND_PROCESS];
92
93     if (hDoscalls == 0) {
94         ULONG rc = DosLoadModule(failed_module, sizeof(failed_module), "DOSCALLS
95
96 #ifndef __KLIBC__
97     if (rc == 0) {
98         rc = DosQueryProcAddr(hDoscalls, 976, NULL, (PFN *)&DosPerfSysCall);
99
100         if (rc)
101             DosPerfSysCall = NULL;
102
103         rc = DosQueryProcAddr(hDoscalls, 368, NULL, (PFN *)&DosQuerySysState
104
105         if (rc)
106             DosQuerySysState = NULL;
107     }
108 #endif
109 }
110
111 /* Sample the hi-res timer, runs at around 1.1 MHz */
112 DosTmrQueryTime(&qwTime);
113 RAND_add(&qwTime, sizeof(qwTime), 2);
114
115 /* Sample a bunch of system variables, includes various process & memory sta
116 DosQuerySysInfo(1, QSV_FOREGROUND_PROCESS, SysVars, sizeof(SysVars));
117 RAND_add(SysVars, sizeof(SysVars), 4);
118
119 /* If available, sample CPU registers that count at CPU MHz
120 * Only fairly new CPUs (PPro & K6 onwards) & OS/2 versions support this
121 */
122 if (DosPerfSysCall) {
123     CPUUTIL util;
124
125     if (DosPerfSysCall(CMD_KI_RDCNT, (ULONG)&util, 0, 0) == 0) {
126         RAND_add(&util, sizeof(util), 10);
127     }
128 }
```

```
128     else {
129 #ifndef __KLIBC__
130     DosPerfSysCall = NULL;
131 #endif
132     }
133 }

135 /* DosQuerySysState() gives us a huge quantity of process, thread, memory &
136 if (DosQuerySysState) {
137     char *buffer = OPENSSL_malloc(256 * 1024);

139     if (DosQuerySysState(0x1F, 0, 0, 0, buffer, 256 * 1024) == 0) {
140         /* First 4 bytes in buffer is a pointer to the thread count
141          * there should be at least 1 byte of entropy per thread
142          */
143         RAND_add(buffer, 256 * 1024, **(ULONG **)buffer);
144     }

146     OPENSSL_free(buffer);
147     return 1;
148 }

150 return 0;
151 }

153 #endif /* OPENSSL_SYS_OS2 */
```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_unix.c

1

```
*****
13510 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/rand_unix.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rand/rand_unix.c */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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7  * The implementation was written so as to conform with Netscapes SSL.
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```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_unix.c

2

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108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 #include <stdio.h>
112
113 #define USE_SOCKETS
114 #include "e_os.h"
115 #include "cryptlib.h"
116 #include <openssl/rand.h>
117 #include "rand_lcl.h"
118
119 #if !(defined(OPENSSL_SYS_WINDOWS) || defined(OPENSSL_SYS_WIN32) || defined(OPEN
120
121 #include <sys/types.h>
122 #include <sys/time.h>
123 #include <sys/times.h>
124 #include <sys/stat.h>
125 #include <fcntl.h>
126 #include <unistd.h>
127 #include <time.h>
```

```

128 #if defined(OPENSSL_SYS_LINUX) /* should actually be available virtually everywh
129 # include <poll.h>
130 #endif
131 #include <limits.h>
132 #ifndef FD_SETSIZE
133 # define FD_SETSIZE (8*sizeof(fd_set))
134 #endif

136 #if defined(OPENSSL_SYS_VOS)

138 /* The following algorithm repeatedly samples the real-time clock
139 (RTC) to generate a sequence of unpredictable data. The algorithm
140 relies upon the uneven execution speed of the code (due to factors
141 such as cache misses, interrupts, bus activity, and scheduling) and
142 upon the rather large relative difference between the speed of the
143 clock and the rate at which it can be read.

145 If this code is ported to an environment where execution speed is
146 more constant or where the RTC ticks at a much slower rate, or the
147 clock can be read with fewer instructions, it is likely that the
148 results would be far more predictable.

150 As a precaution, we generate 4 times the minimum required amount of
151 seed data. */

153 int RAND_poll(void)
154 {
155     short int code;
156     gid_t curr_gid;
157     pid_t curr_pid;
158     uid_t curr_uid;
159     int i, k;
160     struct timespec ts;
161     unsigned char v;

163 #ifdef OPENSSL_SYS_VOS_HPPA
164     long duration;
165     extern void s$sleep (long *_duration, short int *_code);
166 #else
167 #ifdef OPENSSL_SYS_VOS_IA32
168     long long duration;
169     extern void s$sleep2 (long long *_duration, short int *_code);
170 #else
171 #error "Unsupported Platform."
172 #endif /* OPENSSL_SYS_VOS_IA32 */
173 #endif /* OPENSSL_SYS_VOS_HPPA */

175     /* Seed with the gid, pid, and uid, to ensure *some*
176        variation between different processes. */

178     curr_gid = getgid();
179     RAND_add (&curr_gid, sizeof curr_gid, 1);
180     curr_gid = 0;

182     curr_pid = getpid();
183     RAND_add (&curr_pid, sizeof curr_pid, 1);
184     curr_pid = 0;

186     curr_uid = getuid();
187     RAND_add (&curr_uid, sizeof curr_uid, 1);
188     curr_uid = 0;

190     for (i=0; i<(ENTROPY_NEEDED*4); i++)
191     {
192         /* burn some cpu; hope for interrupts, cache
193            collisions, bus interference, etc. */

```

```

194         for (k=0; k<99; k++)
195             ts.tv_nsec = random ();

197 #ifdef OPENSSL_SYS_VOS_HPPA
198     /* sleep for 1/1024 of a second (976 us). */
199     duration = 1;
200     s$sleep (&duration, &code);
201 #else
202 #ifdef OPENSSL_SYS_VOS_IA32
203     /* sleep for 1/65536 of a second (15 us). */
204     duration = 1;
205     s$sleep2 (&duration, &code);
206 #endif /* OPENSSL_SYS_VOS_IA32 */
207 #endif /* OPENSSL_SYS_VOS_HPPA */

209     /* get wall clock time. */
210     clock_gettime (CLOCK_REALTIME, &ts);

212     /* take 8 bits */
213     v = (unsigned char) (ts.tv_nsec % 256);
214     RAND_add (&v, sizeof v, 1);
215     v = 0;
216 }
217 return 1;
218 }
219 #elif defined __OpenBSD__
220 int RAND_poll(void)
221 {
222     u_int32_t rnd = 0, i;
223     unsigned char buf[ENTROPY_NEEDED];

225     for (i = 0; i < sizeof(buf); i++) {
226         if (i % 4 == 0)
227             rnd = arc4random();
228         buf[i] = rnd;
229         rnd >>= 8;
230     }
231     RAND_add(buf, sizeof(buf), ENTROPY_NEEDED);
232     memset(buf, 0, sizeof(buf));

234     return 1;
235 }
236 #else /* !defined(__OpenBSD__) */
237 int RAND_poll(void)
238 {
239     unsigned long l;
240     pid_t curr_pid = getpid();
241 #if defined(DEVRANDOM) || defined(DEVRANDOM_EGD)
242     unsigned char tmpbuf[ENTROPY_NEEDED];
243     int n = 0;
244 #endif
245 #ifdef DEVRANDOM
246     static const char *randomfiles[] = { DEVRANDOM };
247     struct stat randomstats[sizeof(randomfiles)/sizeof(randomfiles[0])];
248     int fd;
249     unsigned int i;
250 #endif
251 #ifdef DEVRANDOM_EGD
252     static const char *egdsockets[] = { DEVRANDOM_EGD, NULL };
253     const char **egdsocket = NULL;
254 #endif

256 #ifdef DEVRANDOM
257     memset(randomstats, 0, sizeof(randomstats));
258     /* Use a random entropy pool device. Linux, FreeBSD and OpenBSD
259        * have this. Use /dev/urandom if you can as /dev/random may block

```

```

260      * if it runs out of random entries. */
262      for (i = 0; (i < sizeof(randomfiles)/sizeof(randomfiles[0])) &&
263            (n < ENTROPY_NEEDED); i++)
264      {
265          if ((fd = open(randomfiles[i], O_RDONLY
266 #ifdef O_NONBLOCK
267             | O_NONBLOCK
268 #endif
269 #ifdef O_BINARY
270             | O_BINARY
271 #endif
272 #ifdef O_NOCTTY /* If it happens to be a TTY (god forbid), do not make it
273                our controlling tty */
274             | O_NOCTTY
275 #endif
276             )) >= 0)
277          {
278              int usec = 10*1000; /* spend 10ms on each file */
279              int r;
280              unsigned int j;
281              struct stat *st=&randomstats[i];
282
283              /* Avoid using same input... Used to be O_NOFOLLOW
284               * above, but it's not universally appropriate... */
285              if (fstat(fd,st) != 0) { close(fd); continue; }
286              for (j=0;j<i;j++)
287              {
288                  if (randomstats[j].st_ino==st->st_ino &&
289                      randomstats[j].st_dev==st->st_dev)
290                      break;
291              }
292              if (j<i) { close(fd); continue; }
293
294              do
295              {
296                  int try_read = 0;
297
298                  #if defined(OPENSSL_SYS_BEOS_R5)
299                      /* select() is broken in BeOS R5, so we simply
300                       * try to read something and snooze if we could
301                       */
302                      try_read = 1;
303
304                  #elif defined(OPENSSL_SYS_LINUX)
305                      /* use poll() */
306                      struct pollfd pset;
307
308                      pset.fd = fd;
309                      pset.events = POLLIN;
310                      pset.revents = 0;
311
312                      if (poll(&pset, 1, usec / 1000) < 0)
313                          usec = 0;
314                      else
315                          try_read = (pset.revents & POLLIN) != 0;
316
317                  #else
318                      /* use select() */
319                      fd_set fset;
320                      struct timeval t;
321
322                      t.tv_sec = 0;
323                      t.tv_usec = usec;
324
325                      if (FD_SETSIZE > 0 && (unsigned)fd >= FD_SETSIZE

```

```

326                      /* can't use select, so just try to read
327                      try_read = 1;
328                      }
329                      else
330                      {
331                          FD_ZERO(&fset);
332                          FD_SET(fd, &fset);
333
334                          if (select(fd+1,&fset,NULL,NULL,&t) >= 0
335                              {
336                                  usec = t.tv_usec;
337                                  if (FD_ISSET(fd, &fset))
338                                      try_read = 1;
339                              }
340                      else
341                          usec = 0;
342                      }
343                  #endif
344
345                  if (try_read)
346                  {
347                      r = read(fd,(unsigned char *)tmpbuf+n, E
348                      if (r > 0)
349                          n += r;
350                  #if defined(OPENSSL_SYS_BEOS_R5)
351                      if (r == 0)
352                          snooze(t.tv_usec);
353                  #endif
354                  }
355                  else
356                      r = -1;
357
358                  /* Some Unixen will update t in select(), some
359                   won't. For those who won't, or if we
360                   didn't use select() in the first place,
361                   give up here, otherwise, we will do
362                   this once again for the remaining
363                   time. */
364                  if (usec == 10*1000)
365                      usec = 0;
366                  while ((r > 0 ||
367                        (errno == EINTR || errno == EAGAIN)) && usec != 0
368                  {
369                      close(fd);
370                  }
371                  }
372              }
373          #endif /* defined(DEVRANDOM) */
374
375          #ifdef DEVRANDOM_EGD
376              /* Use an EGD socket to read entropy from an EGD or PRNGD entropy
377               * collecting daemon. */
378
379              for (egdsocket = egdsockets; *egdsocket && n < ENTROPY_NEEDED; egdsocket)
380              {
381                  int r;
382
383                  r = RAND_query_egd_bytes(*egdsocket, (unsigned char *)tmpbuf+n,
384                                           ENTROPY_NEEDED-n);
385                  if (r > 0)
386                      n += r;
387              }
388          #endif /* defined(DEVRANDOM_EGD) */
389
390          #if defined(DEVRANDOM) || defined(DEVRANDOM_EGD)
391              if (n > 0)

```

```
392     {
393         RAND_add(tmpbuf, sizeof tmpbuf, (double)n);
394         OPENSSL_cleanse(tmpbuf, n);
395     }
396 #endif
397
398     /* put in some default random data, we need more than just this */
399     l=curr_pid;
400     RAND_add(&l, sizeof(l), 0.0);
401     l=getuid();
402     RAND_add(&l, sizeof(l), 0.0);
403
404     l=time(NULL);
405     RAND_add(&l, sizeof(l), 0.0);
406
407 #if defined(OPENSSL_SYS_BEOS)
408 {
409     system_info sysInfo;
410     get_system_info(&sysInfo);
411     RAND_add(&sysInfo, sizeof(sysInfo), 0);
412 }
413 #endif
414
415 #if defined(DEVRANDOM) || defined(DEVRANDOM_EGD)
416     return 1;
417 #else
418     return 0;
419 #endif
420 }
421
422 #endif /* defined(__OpenBSD__) */
423 #endif /* !(defined(OPENSSL_SYS_WINDOWS) || defined(OPENSSL_SYS_WIN32) || define
424
425
426 #if defined(OPENSSL_SYS_VXWORKS)
427 int RAND_poll(void)
428 {
429     return 0;
430 }
431 #endif
```


new/usr/src/lib/openssl/libsunw_crypto/rand/rand_win.c

1

```
*****
26805 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/rand_win.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rand/rand_win.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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```

new/usr/src/lib/openssl/libsunw_crypto/rand/rand_win.c

2

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106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include "cryptlib.h"
113 #include <openssl/rand.h>
114 #include "rand_lcl.h"
115
116 #if defined(OPENSSL_SYS_WINDOWS) || defined(OPENSSL_SYS_WIN32)
117 #include <windows.h>
118 #ifndef _WIN32_WINNT
119 #define _WIN32_WINNT 0x0400
120 #endif
121 #include <wincrypt.h>
122 #include <tlhelp32.h>
123
124 /* Limit the time spent walking through the heap, processes, threads and modules
125  * a maximum of 1000 miliseconds each, unless CryptoGenRandom failed */
126 #define MAXDELAY 1000
```

```

128 /* Intel hardware RNG CSP -- available from
129 * http://developer.intel.com/design/security/rng/redist_license.htm
130 */
131 #define PROV_INTEL_SEC 22
132 #define INTEL_DEF_PROV "Intel Hardware Cryptographic Service Provider"

134 static void readtimer(void);
135 static void readscreen(void);

137 /* It appears like CURSORINFO, PCURSORINFO and LPCURSORINFO are only defined
138 * when WINVER is 0x0500 and up, which currently only happens on Win2000.
139 * Unfortunately, those are typedefs, so they're a little bit difficult to
140 * detect properly. On the other hand, the macro CURSOR_SHOWING is defined
141 * within the same conditional, so it can be used to detect the absence of said
142 * typedefs. */

144 #ifndef CURSOR_SHOWING
145 /*
146 * Information about the global cursor.
147 */
148 typedef struct tagCURSORINFO
149 {
150     DWORD    cbSize;
151     DWORD    flags;
152     HCURSOR  hCursor;
153     POINT     ptScreenPos;
154 } CURSORINFO, *PCURSORINFO, *LPCURSORINFO;

156 #define CURSOR_SHOWING    0x00000001
157 #endif /* CURSOR_SHOWING */

159 #if !defined(OPENSSSL_SYS_WINCE)
160 typedef BOOL (WINAPI *CRYPTACQUIRECONTEXTW)(HCRYPTPROV *, LPCWSTR, LPCWSTR,
161     DWORD, DWORD);
162 typedef BOOL (WINAPI *CRYPTGENRANDOM)(HCRYPTPROV, DWORD, BYTE *);
163 typedef BOOL (WINAPI *CRYPTRELEASECONTEXT)(HCRYPTPROV, DWORD);

165 typedef HWND (WINAPI *GETFOREGROUNDWINDOW)(VOID);
166 typedef BOOL (WINAPI *GETCURSORINFO)(PCURSORINFO);
167 typedef DWORD (WINAPI *GETQUEUESTATUS)(UINT);

169 typedef HANDLE (WINAPI *CREATETOOLHELP32SNAPSHOT)(DWORD, DWORD);
170 typedef BOOL (WINAPI *CLOSETOOLHELP32SNAPSHOT)(HANDLE);
171 typedef BOOL (WINAPI *HEAP32FIRST)(LPHEAPENTRY32, DWORD, size_t);
172 typedef BOOL (WINAPI *HEAP32NEXT)(LPHEAPENTRY32);
173 typedef BOOL (WINAPI *HEAP32LIST)(HANDLE, LPHEAPLIST32);
174 typedef BOOL (WINAPI *PROCESS32)(HANDLE, LPPROCESSENTRY32);
175 typedef BOOL (WINAPI *THREAD32)(HANDLE, LPTHREADENTRY32);
176 typedef BOOL (WINAPI *MODULE32)(HANDLE, LPMODULEENTRY32);

178 #include <lmcons.h>
179 #include <lmstats.h>
180 #if 1 /* The NET API is Unicode only. It requires the use of the UNICODE
181 * macro. When UNICODE is defined LPWSTR becomes LPWSTR. LMSTR was
182 * added to the Platform SDK to allow the NET API to be used in
183 * non-Unicode applications provided that Unicode strings were still
184 * used for input. LMSTR is defined as LPWSTR.
185 */
186 typedef NET_API_STATUS (NET_API_FUNCTION * NETSTATGET)
187     (LPWSTR, LPWSTR, DWORD, DWORD, LPBYTE*);
188 typedef NET_API_STATUS (NET_API_FUNCTION * NETFREE)(LPBYTE);
189 #endif /* 1 */
190 #endif /* !OPENSSSL_SYS_WINCE */

192 int RAND_poll(void)
193 {

```

```

194     MEMORYSTATUS m;
195     HCRYPTPROV hProvider = 0;
196     DWORD w;
197     int good = 0;

199     /* Determine the OS version we are on so we can turn off things
200     * that do not work properly.
201     */
202     OSVERSIONINFO osverinfo ;
203     osverinfo.dwOSVersionInfoSize = sizeof(OSVERSIONINFO) ;
204     GetVersionEx( &osverinfo ) ;

206 #if defined(OPENSSSL_SYS_WINCE)
207 # if defined(_WIN32_WCE) && _WIN32_WCE>=300
208 /* Even though MSDN says _WIN32_WCE>=210, it doesn't seem to be available
209 * in commonly available implementations prior 300... */
210 {
211     BYTE buf[64];
212     /* poll the CryptoAPI PRNG */
213     /* The CryptoAPI returns sizeof(buf) bytes of randomness */
214     if (CryptAcquireContextW(&hProvider, NULL, NULL, PROV_RSA_FULL,
215         CRYPT_VERIFYCONTEXT))
216     {
217         if (CryptGenRandom(hProvider, sizeof(buf), buf))
218             RAND_add(buf, sizeof(buf), sizeof(buf));
219         CryptReleaseContext(hProvider, 0);
220     }
221 }
222 # endif
223 #else /* OPENSSSL_SYS_WINCE */
224 /*
225 * None of below libraries are present on Windows CE, which is
226 * why we #ifdef the whole section. This also excuses us from
227 * handling the GetProcAddress issue. The trouble is that in
228 * real Win32 API GetProcAddress is available in ANSI flavor
229 * only. In WinCE on the other hand GetProcAddress is a macro
230 * most commonly defined as GetProcAddressW, which accepts
231 * Unicode argument. If we were to call GetProcAddress under
232 * WinCE, I'd recommend to either redefine GetProcAddress as
233 * GetProcAddressA (there seem to be one in common CE spec) or
234 * implement own shim routine, which would accept ANSI argument
235 * and expand it to Unicode.
236 */
237 {
238     /* load functions dynamically - not available on all systems */
239     HMODULE advapi = LoadLibrary(TEXT("ADVAPI32.DLL"));
240     HMODULE kernel = LoadLibrary(TEXT("KERNEL32.DLL"));
241     HMODULE user = NULL;
242     HMODULE netapi = LoadLibrary(TEXT("NETAPI32.DLL"));
243     CRYPTACQUIRECONTEXTW acquire = NULL;
244     CRYPTGENRANDOM gen = NULL;
245     CRYPTRELEASECONTEXT release = NULL;
246     NETSTATGET netstatget = NULL;
247     NETFREE netfree = NULL;
248     BYTE buf[64];

250     if (netapi)
251     {
252         netstatget = (NETSTATGET) GetProcAddress(netapi, "NetStatisticsGe
253         netfree = (NETFREE) GetProcAddress(netapi, "NetApiBufferFree");
254     }

256     if (netstatget && netfree)
257     {
258         LPBYTE outbuf;
259         /* NetStatisticsGet() is a Unicode only function

```

```

260     * STAT_WORKSTATION_0 contains 45 fields and STAT_SERVER_0
261     * contains 17 fields. We treat each field as a source of
262     * one byte of entropy.
263     */
265     if (netstatget(NULL, L"LanmanWorkstation", 0, 0, &outbuf) == 0)
266     {
267         RAND_add(outbuf, sizeof(STAT_WORKSTATION_0), 45);
268         netfree(outbuf);
269     }
270     if (netstatget(NULL, L"LanmanServer", 0, 0, &outbuf) == 0)
271     {
272         RAND_add(outbuf, sizeof(STAT_SERVER_0), 17);
273         netfree(outbuf);
274     }
275 }

277 if (netapi)
278     FreeLibrary(netapi);

280 /* It appears like this can cause an exception deep within ADVAPI32.DLL
281  * at random times on Windows 2000. Reported by Jeffrey Altman.
282  * Only use it on NT.
283  */
284 /* Wolfgang Marczy <WMarczy@topcall.co.at> reports that
285  * the RegQueryValueEx call below can hang on NT4.0 (SP6).
286  * So we don't use this at all for now. */
287 #if 0
288 if ( osverinfo.dwPlatformId == VER_PLATFORM_WIN32_NT &&
289     osverinfo.dwMajorVersion < 5)
290 {
291     /* Read Performance Statistics from NT/2000 registry
292     * The size of the performance data can vary from call
293     * to call so we must guess the size of the buffer to use
294     * and increase its size if we get an ERROR_MORE_DATA
295     * return instead of ERROR_SUCCESS.
296     */
297     LONG rc=ERROR_MORE_DATA;
298     char * buf=NULL;
299     DWORD bufsz=0;
300     DWORD length;

302     while (rc == ERROR_MORE_DATA)
303     {
304         buf = realloc(buf, bufsz+8192);
305         if (!buf)
306             break;
307         bufsz += 8192;

309         length = bufsz;
310         rc = RegQueryValueEx(HKEY_PERFORMANCE_DATA, TEXT("Global
311             NULL, NULL, buf, &length);
312     }
313     if (rc == ERROR_SUCCESS)
314     {
315         /* For entropy count assume only least significant
316         * byte of each DWORD is random.
317         */
318         RAND_add(&length, sizeof(length), 0);
319         RAND_add(buf, length, length / 4.0);

321         /* Close the Registry Key to allow Windows to cleanup/cl
322         * the open handle
323         * Note: The 'HKEY_PERFORMANCE_DATA' key is implicitly o
324         * when the RegQueryValueEx above is done. Howeve
325         * it is not explicitly closed, it can cause disk

```

```

326     * partition manipulation problems.
327     */
328     RegCloseKey(HKEY_PERFORMANCE_DATA);
329 }
330 if (buf)
331     free(buf);
332 }
333 #endif

335 if (advapi)
336 {
337     /*
338     * If it's available, then it's available in both ANSI
339     * and UNICODE flavors even in Win9x, documentation says.
340     * We favor Unicode...
341     */
342     acquire = (CRYPTACQUIRECONTEXTW) GetProcAddress(advapi,
343         "CryptAcquireContextW");
344     gen = (CRYPTGENRANDOM) GetProcAddress(advapi,
345         "CryptGenRandom");
346     release = (CRYPTRELEASECONTEXT) GetProcAddress(advapi,
347         "CryptReleaseContext");
348 }

350 if (acquire && gen && release)
351 {
352     /* poll the CryptoAPI PRNG */
353     /* The CryptoAPI returns sizeof(buf) bytes of randomness */
354     if (acquire(&hProvider, NULL, NULL, PROV_RSA_FULL,
355         CRYPT_VERIFYCONTEXT))
356     {
357         if (gen(hProvider, sizeof(buf), buf) != 0)
358         {
359             RAND_add(buf, sizeof(buf), 0);
360             good = 1;
361             #if 0
362             printf("randomness from PROV_RSA_FULL\n");
363             #endif
364         }
365         release(hProvider, 0);
366     }

368     /* poll the Pentium PRG with CryptoAPI */
369     if (acquire(&hProvider, 0, INTEL_DEF_PROV, PROV_INTEL_SEC, 0))
370     {
371         if (gen(hProvider, sizeof(buf), buf) != 0)
372         {
373             RAND_add(buf, sizeof(buf), sizeof(buf));
374             good = 1;
375             #if 0
376             printf("randomness from PROV_INTEL_SEC\n");
377             #endif
378         }
379         release(hProvider, 0);
380     }
381 }

383 if (advapi)
384     FreeLibrary(advapi);

386 if ((osverinfo.dwPlatformId != VER_PLATFORM_WIN32_NT ||
387     !OPENSSL_isservice()) &&
388     (user = LoadLibrary(TEXT("USER32.DLL"))))
389 {
390     GETCURSORINFO cursor;
391     GETFOREGROUNDWINDOW win;

```

```

392     GETQUEUESTATUS queue;

394     win = (GETFOREGROUNDWINDOW) GetProcAddress(user, "GetForegroundW
395     cursor = (GETCURSORINFO) GetProcAddress(user, "GetCursorInfo");
396     queue = (GETQUEUESTATUS) GetProcAddress(user, "GetQueueStatus");

398     if (win)
399     {
400         /* window handle */
401         HWND h = win();
402         RAND_add(&h, sizeof(h), 0);
403     }
404     if (cursor)
405     {
406         /* unfortunately, its not safe to call GetCursorInfo()
407         * on NT4 even though it exists in SP3 (or SP6) and
408         * higher.
409         */
410         if ( osverinfo.dwPlatformId == VER_PLATFORM_WIN32_NT &&
411             osverinfo.dwMajorVersion < 5)
412             cursor = 0;
413     }
414     if (cursor)
415     {
416         /* cursor position */
417         /* assume 2 bytes of entropy */
418         CURSORINFO ci;
419         ci.cbSize = sizeof(CURSORINFO);
420         if (cursor(&ci))
421             RAND_add(&ci, ci.cbSize, 2);
422     }

424     if (queue)
425     {
426         /* message queue status */
427         /* assume 1 byte of entropy */
428         w = queue(QS_ALLEVENTS);
429         RAND_add(&w, sizeof(w), 1);
430     }

432     FreeLibrary(user);
433 }

435 /* Toolhelp32 snapshot: enumerate processes, threads, modules and heap
436 * http://msdn.microsoft.com/library/psdk/winbase/toolhelp_5pfd.htm
437 * (Win 9x and 2000 only, not available on NT)
438 *
439 * This seeding method was proposed in Peter Gutmann, Software
440 * Generation of Practically Strong Random Numbers,
441 * http://www.usenix.org/publications/library/proceedings/sec98/gutmann.
442 * revised version at http://www.cryptoe engines.com/~peter/06_random.pdf
443 * (The assignment of entropy estimates below is arbitrary, but based
444 * on Peter's analysis the full poll appears to be safe. Additional
445 * interactive seeding is encouraged.)
446 */

448 if (kernel)
449 {
450     CREATETOOLHELP32SNAPSHOT snap;
451     CLOSETOOLHELP32SNAPSHOT close_snap;
452     HANDLE handle;

454     HEAP32FIRST heap_first;
455     HEAP32NEXT heap_next;
456     HEAP32LIST heaplist_first, heaplist_next;
457     PROCESS32 process_first, process_next;

```

```

458     THREAD32 thread_first, thread_next;
459     MODULE32 module_first, module_next;

461     HEAPLIST32 hlist;
462     HEAPENTRY32 hentry;
463     PROCESSENTRY32 p;
464     THREADEENTRY32 t;
465     MODULEENTRY32 m;
466     DWORD starttime = 0;

468     snap = (CREATETOOLHELP32SNAPSHOT)
469     GetProcAddress(kernel, "CreateToolhelp32Snapshot");
470     close_snap = (CLOSETOOLHELP32SNAPSHOT)
471     GetProcAddress(kernel, "CloseToolhelp32Snapshot");
472     heap_first = (HEAP32FIRST) GetProcAddress(kernel, "Heap32First")
473     heap_next = (HEAP32NEXT) GetProcAddress(kernel, "Heap32Next");
474     heaplist_first = (HEAP32LIST) GetProcAddress(kernel, "Heap32List
475     heaplist_next = (HEAP32LIST) GetProcAddress(kernel, "Heap32ListN
476     process_first = (PROCESS32) GetProcAddress(kernel, "Process32Fir
477     process_next = (PROCESS32) GetProcAddress(kernel, "Process32Next
478     thread_first = (THREAD32) GetProcAddress(kernel, "Thread32First"
479     thread_next = (THREAD32) GetProcAddress(kernel, "Thread32Next");
480     module_first = (MODULE32) GetProcAddress(kernel, "Module32First"
481     module_next = (MODULE32) GetProcAddress(kernel, "Module32Next");

483     if (snap && heap_first && heap_next && heaplist_first &&
484         heaplist_next && process_first && process_next &&
485         thread_first && thread_next && module_first &&
486         module_next && (handle = snap(TH32CS_SNAPALL, 0))
487         != INVALID_HANDLE_VALUE)
488     {
489         /* heap list and heap walking */
490         /* HEAPLIST32 contains 3 fields that will change with
491         * each entry. Consider each field a source of 1 byte
492         * of entropy.
493         * HEAPENTRY32 contains 5 fields that will change with
494         * each entry. Consider each field a source of 1 byte
495         * of entropy.
496         */
497         ZeroMemory(&hlist, sizeof(HEAPLIST32));
498         hlist.dwSize = sizeof(HEAPLIST32);
499         if (good) starttime = GetTickCount();
500 #ifdef _MSC_VER
501         if (heaplist_first(handle, &hlist))
502         {
503             /*
504             following discussion on dev ML, exception on
505             platform) is theoretically of unknown origin;
506             loop here when this theoretical case occurs;
507             the expected (MSDN documented) exception-thro
508             Heap32Next() on WinCE.

510             based on patch in original message by Tanguy
511             Subject: RAND_poll() and CreateToolhelp32Snap
512             */
513             int ex_cnt_limit = 42;
514             do
515             {
516                 RAND_add(&hlist, hlist.dwSize, 3);
517                 __try
518                 {
519                     ZeroMemory(&hentry, sizeof(HEAPE
520                     hentry.dwSize = sizeof(HEAPENTRY32);
521                     if (heap_first(&hentry,
522                         hlist.th32ProcessID,
523                         hlist.th32HeapID))

```

```

524         {
525             int entrycnt = 80;
526             do
527                 RAND_add(&hentry,
528                     hentry.dwSize, 5
529                 while (heap_next(&hentry)
530                     && (!good || (GetTickCount()-sta
531                     && --entrycnt > 0);
532             }
533         }
534         __except (EXCEPTION_EXECUTE_HANDLER)
535         {
536             /* ignore access violati
537             ex_cnt_limit--;
538         }
539     } while (heaplist_next(handle, &hlist)
540         && (!good || (GetTickCount()-sta
541         && ex_cnt_limit > 0);
542     }
543
544 #else
545     if (heaplist_first(handle, &hlist))
546     {
547         do
548         {
549             {
550                 RAND_add(&hlist, hlist.dwSize, 3);
551                 hentry.dwSize = sizeof(HEAPENTRY32);
552                 if (heap_first(&hentry,
553                     hlist.th32ProcessID,
554                     hlist.th32HeapID))
555                 {
556                     int entrycnt = 80;
557                     do
558                         RAND_add(&hentry,
559                             hentry.dwSize, 5
560                         while (heap_next(&hentry)
561                             && --entrycnt > 0);
562                     }
563                 } while (heaplist_next(handle, &hlist)
564                     && (!good || (GetTickCount()-sta
565
566 #endif
567
568     /* process walking */
569     /* PROCESSENTRY32 contains 9 fields that will change
570     * with each entry. Consider each field a source of
571     * 1 byte of entropy.
572     */
573     p.dwSize = sizeof(PROCESSENTRY32);
574     if (good) starttime = GetTickCount();
575     if (process_first(handle, &p))
576     do
577         RAND_add(&p, p.dwSize, 9);
578     while (process_next(handle, &p) && (!good || (Ge
579
580     /* thread walking */
581     /* THREADENTRY32 contains 6 fields that will change
582     * with each entry. Consider each field a source of
583     * 1 byte of entropy.
584     */
585     t.dwSize = sizeof(THREADENTRY32);
586     if (good) starttime = GetTickCount();
587     if (thread_first(handle, &t))
588     do
589         RAND_add(&t, t.dwSize, 6);

```

```

590         while (thread_next(handle, &t) && (!good || (Get
591
592     /* module walking */
593     /* MODULEENTRY32 contains 9 fields that will change
594     * with each entry. Consider each field a source of
595     * 1 byte of entropy.
596     */
597     m.dwSize = sizeof(MODULEENTRY32);
598     if (good) starttime = GetTickCount();
599     if (module_first(handle, &m))
600     do
601         RAND_add(&m, m.dwSize, 9);
602     while (module_next(handle, &m)
603         && (!good || (GetTickCount()-sta
604
605     if (close_snap)
606         close_snap(handle);
607     else
608         CloseHandle(handle);
609
610     }
611     FreeLibrary(kernel);
612     }
613 #endif /* !OPENSSL_SYS_WINCE */
614
615     /* timer data */
616     readtimer();
617
618     /* memory usage statistics */
619     GlobalMemoryStatus(&m);
620     RAND_add(&m, sizeof(m), 1);
621
622     /* process ID */
623     w = GetCurrentProcessId();
624     RAND_add(&w, sizeof(w), 1);
625
626 #if 0
627     printf("Exiting RAND_poll\n");
628 #endif
629
630     return(1);
631 }
632
633 int RAND_event(UINT iMsg, WPARAM wParam, LPARAM lParam)
634 {
635     double add_entropy=0;
636
637     switch (iMsg)
638     {
639     case WM_KEYDOWN:
640     {
641         static WPARAM key;
642         if (key != wParam)
643             add_entropy = 0.05;
644         key = wParam;
645     }
646     break;
647     case WM_MOUSEMOVE:
648     {
649         static int lastx, lasty, lastdx, lastdy;
650         int x,y,dx,dy;
651
652         x=LOWORD(lParam);
653         y=HIWORD(lParam);
654         dx=lastx-x;

```

```

656         dy=lasty-y;
657         if (dx != 0 && dy != 0 && dx-lastdx != 0 && dy-lastdy !=
658             add_entropy=.2;
659             lastx=x, lasty=y;
660             lastdx=dx, lastdy=dy;
661         }
662         break;
663     }

665     readtimer();
666     RAND_add(&iMsg, sizeof(iMsg), add_entropy);
667     RAND_add(&wParam, sizeof(wParam), 0);
668     RAND_add(&lParam, sizeof(lParam), 0);
669
670     return (RAND_status());
671 }

674 void RAND_screen(void) /* function available for backward compatibility */
675 {
676     RAND_poll();
677     readscreen();
678 }

681 /* feed timing information to the PRNG */
682 static void readtimer(void)
683 {
684     DWORD w;
685     LARGE_INTEGER l;
686     static int have_perfc = 1;
687     #if defined(_MSC_VER) && defined(_M_X86)
688     static int have_tsc = 1;
689     DWORD cyclecount;

691     if (have_tsc) {
692         __try {
693             __asm {
694                 _emit 0x0f
695                 _emit 0x31
696                 mov cyclecount, eax
697             }
698             RAND_add(&cyclecount, sizeof(cyclecount), 1);
699         } __except(EXCEPTION_EXECUTE_HANDLER) {
700             have_tsc = 0;
701         }
702     }
703 #else
704 #define have_tsc 0
705 #endif

707     if (have_perfc) {
708         if (QueryPerformanceCounter(&l) == 0)
709             have_perfc = 0;
710         else
711             RAND_add(&l, sizeof(l), 0);
712     }

714     if (!have_tsc && !have_perfc) {
715         w = GetTickCount();
716         RAND_add(&w, sizeof(w), 0);
717     }
718 }

720 /* feed screen contents to PRNG */
721 /*****

```

```

722 *
723 * Created 960901 by Gertjan van Oosten, gertjan@West.NL, West Consulting B.V.
724 *
725 * Code adapted from
726 * <URL:http://support.microsoft.com/default.aspx?scid=kb;[LN];97193>;
727 * the original copyright message is:
728 *
729 * (C) Copyright Microsoft Corp. 1993. All rights reserved.
730 *
731 * You have a royalty-free right to use, modify, reproduce and
732 * distribute the Sample Files (and/or any modified version) in
733 * any way you find useful, provided that you agree that
734 * Microsoft has no warranty obligations or liability for any
735 * Sample Application Files which are modified.
736 */

738 static void readscreen(void)
739 {
740     #if !defined(OPENSAL_SYS_WINCE) && !defined(OPENSAL_SYS_WIN32_CYGWIN)
741     HDC hScrDC; /* screen DC */
742     HDC hMemDC; /* memory DC */
743     HBITMAP hBitmap; /* handle for our bitmap */
744     HBITMAP hOldBitmap; /* handle for previous bitmap */
745     BITMAP bm; /* bitmap properties */
746     unsigned int size; /* size of bitmap */
747     char *bmbits; /* contents of bitmap */
748     int w; /* screen width */
749     int h; /* screen height */
750     int y; /* y-coordinate of screen lines to grab */
751     int n = 16; /* number of screen lines to grab at a time */

753     if (check_winnt() && OPENSAL_isservice()>0)
754         return;

756     /* Create a screen DC and a memory DC compatible to screen DC */
757     hScrDC = CreateDC(TEXT("DISPLAY"), NULL, NULL, NULL);
758     hMemDC = CreateCompatibleDC(hScrDC);

760     /* Get screen resolution */
761     w = GetDeviceCaps(hScrDC, HORZRES);
762     h = GetDeviceCaps(hScrDC, VERTRES);

764     /* Create a bitmap compatible with the screen DC */
765     hBitmap = CreateCompatibleBitmap(hScrDC, w, h);

767     /* Select new bitmap into memory DC */
768     hOldBitmap = SelectObject(hMemDC, hBitmap);

770     /* Get bitmap properties */
771     GetObject(hBitmap, sizeof(BITMAP), (LPSTR)&bm);
772     size = (unsigned int)bm.bmWidthBytes * bm.bmHeight * bm.bmPlanes;

774     bmbits = OPENSAL_malloc(size);
775     if (bmbits) {
776         /* Now go through the whole screen, repeatedly grabbing n lines */
777         for (y = 0; y < h-n; y += n)
778         {
779             unsigned char md[MD_DIGEST_LENGTH];

781             /* Bitblt screen DC to memory DC */
782             BitBlt(hMemDC, 0, 0, w, n, hScrDC, 0, y, SRCCOPY);

784             /* Copy bitmap bits from memory DC to bmbits */
785             GetBitmapBits(hBitmap, size, bmbits);

787             /* Get the hash of the bitmap */

```

```
788     MD(bmbits, size, md);
790     /* Seed the random generator with the hash value */
791     RAND_add(md, MD_DIGEST_LENGTH, 0);
792 }
794     OPENSSL_free(bmbits);
795 }
797 /* Select old bitmap back into memory DC */
798 hBitmap = SelectObject(hMemDC, holdBitmap);
800 /* Clean up */
801 DeleteObject(hBitmap);
802 DeleteDC(hMemDC);
803 DeleteDC(hScrDC);
804 #endif /* !OPENSSL_SYS_WINCE */
805 }
807 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/rand/randfile.c

1

```
*****
9941 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rand/randfile.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rand/randfile.c */
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4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 /* We need to define this to get macros like S_IFBLK and S_IFCHR */
60 #if !defined(OPENSSSL_SYS_VXWORKS)
61 #define _XOPEN_SOURCE 500
```

new/usr/src/lib/openssl/libsunw_crypto/rand/randfile.c

2

```
62 #endif

64 #include <errno.h>
65 #include <stdio.h>
66 #include <stdlib.h>
67 #include <string.h>

69 #include "e_os.h"
70 #include <openssl/crypto.h>
71 #include <openssl/rand.h>
72 #include <openssl/buffer.h>

74 #ifdef OPENSSSL_SYS_VMS
75 #include <unixio.h>
76 #endif
77 #ifndef NO_SYS_TYPES_H
78 #include <sys/types.h>
79 #endif
80 #ifndef OPENSSSL_NO_POSIX_IO
81 #include <sys/stat.h>
82 #endif

84 #ifdef _WIN32
85 #define stat _stat
86 #define chmod _chmod
87 #define open _open
88 #define fdopen _fdopen
89 #endif

91 #undef BUFSIZE
92 #define BUFSIZE 1024
93 #define RAND_DATA 1024

95 #ifdef OPENSSSL_SYS_VMS
96 /* This declaration is a nasty hack to get around vms' extension to fopen
97  * for passing in sharing options being disabled by our /STANDARD=ANSI89 */
98 static FILE *(*const vms_fopen)(const char *, const char *, ...) =
99     (FILE (*)(const char *, const char *, ...))fopen;
100 #define VMS_OPEN_ATTRS "shr=get,put,upd,del","ctx=bin,stm","rfm=stm","rat=none",
101 #endif

103 /* #define RFILE ".rnd" - defined in ../e_os.h */

105 /* Note that these functions are intended for seed files only.
106  * Entropy devices and EGD sockets are handled in rand_unix.c */

108 int RAND_load_file(const char *file, long bytes)
109 {
110     /* If bytes >= 0, read up to 'bytes' bytes.
111      * if bytes == -1, read complete file. */

113     MS_STATIC unsigned char buf[BUFSIZE];
114     #ifndef OPENSSSL_NO_POSIX_IO
115     struct stat sb;
116     #endif
117     int i,ret=0,n;
118     FILE *in;

120     if (file == NULL) return(0);

122 #ifndef OPENSSSL_NO_POSIX_IO
123 #ifdef PURIFY
124     /* struct stat can have padding and unused fields that may not be
125      * initialized in the call to stat(). We need to clear the entire
126      * structure before calling RAND_add() to avoid complaints from
127      * applications such as Valgrind.
```



```

128     /*
129     memset(&sb, 0, sizeof(sb));
130 #endif
131     if (stat(file,&sb) < 0) return(0);
132     RAND_add(&sb,sizeof(sb),0.0);
133 #endif
134     if (bytes == 0) return(ret);

136 #ifdef OPENSSL_SYS_VMS
137     in=vms_fopen(file,"rb",VMS_OPEN_ATTRS);
138 #else
139     in=fopen(file,"rb");
140 #endif
141     if (in == NULL) goto err;
142 #if defined(S_IFBLK) && defined(S_IFCHR) && !defined(OPENSSL_NO_POSIX_IO)
143     if (sb.st_mode & (S_IFBLK | S_IFCHR)) {
144         /* this file is a device. we don't want read an infinite number
145         * of bytes from a random device, nor do we want to use buffered
146         * I/O because we will waste system entropy.
147         */
148         bytes = (bytes == -1) ? 2048 : bytes; /* ok, is 2048 enough? */
149 #ifndef OPENSSL_NO_SETVBUF_IONBF
150         setvbuf(in, NULL, _IONBF, 0); /* don't do buffered reads */
151 #endif /* ndef OPENSSL_NO_SETVBUF_IONBF */
152     }
153 #endif
154     for (;;)
155     {
156         if (bytes > 0)
157             n = (bytes < BUFSIZE)?(int)bytes:BUFSIZE;
158         else
159             n = BUFSIZE;
160         i=fread(buf,1,n,in);
161         if (i <= 0) break;
162 #ifdef PURIFY
163         RAND_add(buf,i,(double)i);
164 #else
165         /* even if n != i, use the full array */
166         RAND_add(buf,n,(double)i);
167 #endif
168         ret+=i;
169         if (bytes > 0)
170             {
171                 bytes-=n;
172                 if (bytes <= 0) break;
173             }
174     }
175     fclose(in);
176     OPENSSL_cleanse(buf,BUFSIZE);
177 err:
178     return(ret);
179 }

181 int RAND_write_file(const char *file)
182 {
183     unsigned char buf[BUFSIZE];
184     int i,ret=0,rand_err=0;
185     FILE *out = NULL;
186     int n;
187 #ifndef OPENSSL_NO_POSIX_IO
188     struct stat sb;
189
190     i=stat(file,&sb);
191     if (i != -1) {
192 #if defined(S_ISBLK) && defined(S_ISCHR)
193         if (S_ISBLK(sb.st_mode) || S_ISCHR(sb.st_mode)) {

```

```

194     /* this file is a device. we don't write back to it.
195     * we "succeed" on the assumption this is some sort
196     * of random device. Otherwise attempting to write to
197     * and chmod the device causes problems.
198     */
199     return(1);
200 }
201 #endif
202 }
203 #endif

205 #if defined(O_CREAT) && !defined(OPENSSL_NO_POSIX_IO) && !defined(OPENSSL_SYS_VM
206 {
207 #ifndef O_BINARY
208 #define O_BINARY 0
209 #endif
210     /* chmod(..., 0600) is too late to protect the file,
211     * permissions should be restrictive from the start */
212     int fd = open(file, O_WRONLY|O_CREAT|O_BINARY, 0600);
213     if (fd != -1)
214         out = fdopen(fd, "wb");
215 }
216 #endif

218 #ifdef OPENSSL_SYS_VMS
219     /* VMS NOTE: Prior versions of this routine created a _new_
220     * version of the rand file for each call into this routine, then
221     * deleted all existing versions named ; -1, and finally renamed
222     * the current version as ;1'. Under concurrent usage, this
223     * resulted in an RMS race condition in rename() which could
224     * orphan files (see vms message help for RMSS_REENT). With the
225     * fopen() calls below, openssl/VMS now shares the top-level
226     * version of the rand file. Note that there may still be
227     * conditions where the top-level rand file is locked. If so, this
228     * code will then create a new version of the rand file. Without
229     * the delete and rename code, this can result in ascending file
230     * versions that stop at version 32767, and this routine will then
231     * return an error. The remedy for this is to recode the calling
232     * application to avoid concurrent use of the rand file, or
233     * synchronize usage at the application level. Also consider
234     * whether or not you NEED a persistent rand file in a concurrent
235     * use situation.
236     */

238     out = vms_fopen(file,"rb+",VMS_OPEN_ATTRS);
239     if (out == NULL)
240         out = vms_fopen(file,"wb",VMS_OPEN_ATTRS);
241 #else
242     if (out == NULL)
243         out = fopen(file,"wb");
244 #endif
245     if (out == NULL) goto err;

247 #ifndef NO_CHMOD
248     chmod(file,0600);
249 #endif
250     n=RAND_DATA;
251     for (;;)
252     {
253         i=(n > BUFSIZE)?BUFSIZE:n;
254         n-=BUFSIZE;
255         if (RAND_bytes(buf,i) <= 0)
256             rand_err=1;
257         i=fwrite(buf,1,i,out);
258         if (i <= 0)
259             {

```

```

260             ret=0;
261             break;
262         }
263         ret+=i;
264         if (n <= 0) break;
265     }

267     fclose(out);
268     OPENSSL_cleanse(buf,BUFSIZE);
269 err:
270     return (rand_err ? -1 : ret);
271 }

273 const char *RAND_file_name(char *buf, size_t size)
274 {
275     char *s=NULL;
276 #ifdef __OpenBSD__
277     struct stat sb;
278 #endif

280     if (OPENSSL_issetugid() == 0)
281         s=getenv("RANDFILE");
282     if (s != NULL && *s && strlen(s) + 1 < size)
283     {
284         if (BUF_strncpy(buf,s,size) >= size)
285             return NULL;
286     }
287     else
288     {
289         if (OPENSSL_issetugid() == 0)
290             s=getenv("HOME");
291 #ifdef DEFAULT_HOME
292         if (s == NULL)
293         {
294             s = DEFAULT_HOME;
295         }
296 #endif
297         if (s && *s && strlen(s)+strlen(RFILE)+2 < size)
298         {
299             BUF_strncpy(buf,s,size);
300 #ifndef OPENSSL_SYS_VMS
301             BUF_strlcat(buf,"/",size);
302 #endif
303             BUF_strlcat(buf,RFILE,size);
304         }
305         else
306             buf[0] = '\0'; /* no file name */
307     }

309 #ifdef __OpenBSD__
310     /* given that all random loads just fail if the file can't be
311     * seen on a stat, we stat the file we're returning, if it
312     * fails, use /dev/arandom instead. this allows the user to
313     * use their own source for good random data, but defaults
314     * to something hopefully decent if that isn't available.
315     */

317     if (!buf[0])
318         if (BUF_strncpy(buf,"/dev/arandom",size) >= size) {
319             return(NULL);
320         }
321     if (stat(buf,&sb) == -1)
322         if (BUF_strncpy(buf,"/dev/arandom",size) >= size) {
323             return(NULL);
324         }

```

```

326 #endif
327     return(buf);
328 }

```

```

*****
6446 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2_cbc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rc2/rc2_cbc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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5  * This package is an SSL implementation written
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57 */
58
59 #include <openssl/rc2.h>
60 #include "rc2_loc1.h"

```

```

62 void RC2_cbc_encrypt(const unsigned char *in, unsigned char *out, long length,
63                      RC2_KEY *ks, unsigned char *iv, int encrypt)
64 {
65     register unsigned long tin0,tin1;
66     register unsigned long tout0,tout1,xor0,xor1;
67     register long l=length;
68     unsigned long tin[2];
69
70     if (encrypt)
71     {
72         c2l(iv,tout0);
73         c2l(iv,tout1);
74         iv-=8;
75         for (l-=8; l>=0; l-=8)
76         {
77             c2l(in,tin0);
78             c2l(in,tin1);
79             tin0^=tout0;
80             tin1^=tout1;
81             tin[0]=tin0;
82             tin[1]=tin1;
83             RC2_encrypt(tin,ks);
84             tout0=tin[0]; l2c(tout0,out);
85             tout1=tin[1]; l2c(tout1,out);
86         }
87         if (l != -8)
88         {
89             c2ln(in,tin0,tin1,l+8);
90             tin0^=tout0;
91             tin1^=tout1;
92             tin[0]=tin0;
93             tin[1]=tin1;
94             RC2_encrypt(tin,ks);
95             tout0=tin[0]; l2c(tout0,out);
96             tout1=tin[1]; l2c(tout1,out);
97         }
98         l2c(tout0,iv);
99         l2c(tout1,iv);
100     }
101     else
102     {
103         c2l(iv,xor0);
104         c2l(iv,xor1);
105         iv-=8;
106         for (l-=8; l>=0; l-=8)
107         {
108             c2l(in,tin0); tin[0]=tin0;
109             c2l(in,tin1); tin[1]=tin1;
110             RC2_decrypt(tin,ks);
111             tout0=tin[0]^xor0;
112             tout1=tin[1]^xor1;
113             l2c(tout0,out);
114             l2c(tout1,out);
115             xor0=tin0;
116             xor1=tin1;
117         }
118         if (l != -8)
119         {
120             c2l(in,tin0); tin[0]=tin0;
121             c2l(in,tin1); tin[1]=tin1;
122             RC2_decrypt(tin,ks);
123             tout0=tin[0]^xor0;
124             tout1=tin[1]^xor1;
125             l2cn(tout0,tout1,out,l+8);
126             xor0=tin0;
127             xor1=tin1;

```

```

128     }
129     l2c(xor0,iv);
130     l2c(xor1,iv);
131 }
132 tin0=tin1=tout0=tout1=xor0=xor1=0;
133 tin[0]=tin[1]=0;
134 }

136 void RC2_encrypt(unsigned long *d, RC2_KEY *key)
137 {
138     int i,n;
139     register RC2_INT *p0,*p1;
140     register RC2_INT x0,x1,x2,x3,t;
141     unsigned long l;

143     l=d[0];
144     x0=(RC2_INT)l&0xffff;
145     x1=(RC2_INT)(l>>16L);
146     l=d[1];
147     x2=(RC2_INT)l&0xffff;
148     x3=(RC2_INT)(l>>16L);

150     n=3;
151     i=5;

153     p0=p1= &(key->data[0]);
154     for (;;)
155     {
156         t=(x0+(x1& ~x3)+(x2&x3)+ *(p0++))&0xffff;
157         x0=(t<<1)|(t>>15);
158         t=(x1+(x2& ~x0)+(x3&x0)+ *(p0++))&0xffff;
159         x1=(t<<2)|(t>>14);
160         t=(x2+(x3& ~x1)+(x0&x1)+ *(p0++))&0xffff;
161         x2=(t<<3)|(t>>13);
162         t=(x3+(x0& ~x2)+(x1&x2)+ *(p0++))&0xffff;
163         x3=(t<<5)|(t>>11);

165         if (--i == 0)
166         {
167             if (--n == 0) break;
168             i=(n == 2)?6:5;

170             x0+=p1[x3&0x3f];
171             x1+=p1[x0&0x3f];
172             x2+=p1[x1&0x3f];
173             x3+=p1[x2&0x3f];
174         }
175     }

177     d[0]=(unsigned long)(x0&0xffff)|(((unsigned long)(x1&0xffff)<<16L);
178     d[1]=(unsigned long)(x2&0xffff)|(((unsigned long)(x3&0xffff)<<16L);
179 }

181 void RC2_decrypt(unsigned long *d, RC2_KEY *key)
182 {
183     int i,n;
184     register RC2_INT *p0,*p1;
185     register RC2_INT x0,x1,x2,x3,t;
186     unsigned long l;

188     l=d[0];
189     x0=(RC2_INT)l&0xffff;
190     x1=(RC2_INT)(l>>16L);
191     l=d[1];
192     x2=(RC2_INT)l&0xffff;
193     x3=(RC2_INT)(l>>16L);

```

```

195     n=3;
196     i=5;

198     p0= &(key->data[63]);
199     p1= &(key->data[0]);
200     for (;;)
201     {
202         t=((x3<<11)|(x3>>5))&0xffff;
203         x3=(t-(x0& ~x2)-(x1&x2)- *(p0--))&0xffff;
204         t=((x2<<13)|(x2>>3))&0xffff;
205         x2=(t-(x3& ~x1)-(x0&x1)- *(p0--))&0xffff;
206         t=((x1<<14)|(x1>>2))&0xffff;
207         x1=(t-(x2& ~x0)-(x3&x0)- *(p0--))&0xffff;
208         t=((x0<<15)|(x0>>1))&0xffff;
209         x0=(t-(x1& ~x3)-(x2&x3)- *(p0--))&0xffff;

211         if (--i == 0)
212         {
213             if (--n == 0) break;
214             i=(n == 2)?6:5;

216             x3=(x3-p1[x2&0x3f])&0xffff;
217             x2=(x2-p1[x1&0x3f])&0xffff;
218             x1=(x1-p1[x0&0x3f])&0xffff;
219             x0=(x0-p1[x3&0x3f])&0xffff;
220         }
221     }

223     d[0]=(unsigned long)(x0&0xffff)|(((unsigned long)(x1&0xffff)<<16L);
224     d[1]=(unsigned long)(x2&0xffff)|(((unsigned long)(x3&0xffff)<<16L);
225 }

```

new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2_ecb.c

1

3878 Fri May 30 18:32:07 2014
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4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <openssl/rc2.h>
60 #include "rc2_loc1.h"
61 #include <openssl/opensslv.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2_ecb.c

2

```
63 const char RC2_version[]="RC2" OPENSSL_VERSION_PTEXT;

65 /* RC2 as implemented frm a posting from
66  * Newsgroups: sci.crypt
67  * Sender: pgut01@cs.auckland.ac.nz (Peter Gutmann)
68  * Subject: Specification for Ron Rivests Cipher No.2
69  * Message-ID: <4fk39f$F70@net.auckland.ac.nz>
70  * Date: 11 Feb 1996 06:45:03 GMT
71  */

73 void RC2_ecb_encrypt(const unsigned char *in, unsigned char *out, RC2_KEY *ks,
74                      int encrypt)
75 {
76     unsigned long l,d[2];

78     c2l(in,l); d[0]=l;
79     c2l(in,l); d[1]=l;
80     if (encrypt)
81         RC2_encrypt(d,ks);
82     else
83         RC2_decrypt(d,ks);
84     l=d[0]; l2c(l,out);
85     l=d[1]; l2c(l,out);
86     l=d[0]=d[1]=0;
87 }
```

```

*****
6112 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2_skey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* crypto/rc2/rc2_skey.c */
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4  *
5  * This package is an SSL implementation written
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <openssl/crypto.h>
60 #include <openssl/rc2.h>
61 #include "rc2_loc1.h"

```

```

63 static const unsigned char key_table[256]={
64     0xd9,0x78,0xf9,0xc4,0x19,0xdd,0xb5,0xed,0x28,0xe9,0xfd,0x79,
65     0x4a,0xa0,0xd8,0x9d,0xc6,0x7e,0x37,0x83,0x2b,0x76,0x53,0x8e,
66     0x62,0x4c,0x64,0x88,0x44,0x8b,0xfb,0xa2,0x17,0x9a,0x59,0xf5,
67     0x87,0xb3,0x4f,0x13,0x61,0x45,0x6d,0x8d,0x09,0x81,0x7d,0x32,
68     0xbd,0x8f,0x40,0xeb,0x86,0xb7,0x7b,0xb0,0xf0,0x95,0x21,0x22,
69     0x5c,0x6b,0x4e,0x82,0x54,0xd6,0x65,0x93,0xce,0x60,0xb2,0x1c,
70     0x73,0x56,0xc0,0x14,0xa7,0x8c,0xf1,0xdc,0x12,0x75,0xca,0x1f,
71     0x3b,0xbe,0xe4,0xd1,0x42,0x3d,0xd4,0x30,0xa3,0x3c,0xb6,0x26,
72     0x6f,0xbf,0x0e,0xda,0x46,0x69,0x07,0x57,0x27,0xf2,0x1d,0x9b,
73     0xbc,0x94,0x43,0x03,0xf8,0x11,0xc7,0xf6,0x90,0xef,0x3e,0xe7,
74     0x06,0xc3,0xd5,0x2f,0xc8,0x66,0x1e,0xd7,0x08,0xe8,0xea,0xde,
75     0x80,0x52,0xee,0xf7,0x84,0xaa,0x72,0xac,0x35,0x4d,0x6a,0x2a,
76     0x96,0x1a,0xd2,0x71,0x5a,0x15,0x49,0x74,0x4b,0x9f,0xd0,0x5e,
77     0x04,0x18,0xa4,0xec,0xc2,0xe0,0x41,0x6e,0xf0,0x51,0xcb,0xcc,
78     0x24,0x91,0xaf,0x50,0xa1,0xf4,0x70,0x39,0x99,0x7c,0x3a,0x85,
79     0x23,0xb8,0xb4,0x7a,0xfc,0x02,0x36,0x5b,0x25,0x55,0x97,0x31,
80     0x2d,0x5d,0xfa,0x98,0xe3,0x8a,0x92,0xae,0x05,0xdf,0x29,0x10,
81     0x67,0x6c,0xba,0xc9,0xd3,0x00,0xe6,0xcf,0xe1,0x9e,0xa8,0x2c,
82     0x63,0x16,0x01,0x3f,0x58,0xe2,0x89,0xa9,0xd0,0x38,0x34,0x1b,
83     0xab,0x33,0xff,0xb0,0xbb,0x48,0x0c,0x5f,0xb9,0xb1,0xcd,0x2e,
84     0xc5,0xf3,0xdb,0x47,0xe5,0xa5,0x9c,0x77,0x0a,0xa6,0x20,0x68,
85     0xfe,0x7f,0xc1,0xad,
86     };
87
88 #if defined(_MSC_VER) && defined(_ARM_)
89 #pragma optimize("g",off)
90 #endif
91
92 /* It has come to my attention that there are 2 versions of the RC2
93  * key schedule. One which is normal, and another which has a hook to
94  * use a reduced key length.
95  * BSAFE uses the 'retarded' version. What I previously shipped is
96  * the same as specifying 1024 for the 'bits' parameter. Bsafe uses
97  * a version where the bits parameter is the same as len*8 */
98 void RC2_set_key(RC2_KEY *key, int len, const unsigned char *data, int bits)
99 #ifdef OPENSSL_FIPS
100 {
101     fips_cipher_abort(RC2);
102     private_RC2_set_key(key, len, data, bits);
103 }
104 void private_RC2_set_key(RC2_KEY *key, int len, const unsigned char *data, int b
105 #endif
106 {
107     int i,j;
108     unsigned char *k;
109     RC2_INT *ki;
110     unsigned int c,d;
111
112     k= (unsigned char *)&(key->data[0]);
113     *k=0; /* for if there is a zero length key */
114
115     if (len > 128) len=128;
116     if (bits <= 0) bits=1024;
117     if (bits > 1024) bits=1024;
118
119     for (i=0; i<len; i++)
120         k[i]=data[i];
121
122     /* expand table */
123     d=k[len-1];
124     j=0;
125     for (i=len; i < 128; i++,j++)
126     {
127         d=key_table[(k[j]+d)&0xff];

```

```
128         k[i]=d;
129     }

131     /* hmm... key reduction to 'bits' bits */

133     j=(bits+7)>>3;
134     i=128-j;
135     c= (0xff>>(-bits & 0x07));

137     d=key_table[k[i]&c];
138     k[i]=d;
139     while (i--)
140     {
141         d=key_table[k[i+j]^d];
142         k[i]=d;
143     }

145     /* copy from bytes into RC2_INT's */
146     ki= &(key->data[63]);
147     for (i=127; i>=0; i-=2)
148         *(ki--)=((k[i]<<8)|k[i-1])&0xffff;
149     }

151 #if defined(_MSC_VER)
152 #pragma optimize("",on)
153 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2cfb64.c

1

4489 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2cfb64.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/rc2/rc2cfb64.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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56 * [including the GNU Public Licence.]
57 */
```

```
59 #include <openssl/rc2.h>
60 #include "rc2_loc1.h"
```

new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2cfb64.c

2

```
62 /* The input and output encrypted as though 64bit cfb mode is being
63  * used. The extra state information to record how much of the
64  * 64bit block we have used is contained in *num;
65  */
66
67 void RC2_cfb64_encrypt(const unsigned char *in, unsigned char *out,
68                        long length, RC2_KEY *schedule, unsigned char *ivec,
69                        int *num, int encrypt)
70 {
71     register unsigned long v0,v1,t;
72     register int n= *num;
73     register long l=length;
74     unsigned long ti[2];
75     unsigned char *iv,c,cc;
76
77     iv=(unsigned char *)ivec;
78     if (encrypt)
79     {
80         while (l-->0)
81         {
82             if (n == 0)
83             {
84                 c2l(iv,v0); ti[0]=v0;
85                 c2l(iv,v1); ti[1]=v1;
86                 RC2_encrypt((unsigned long *)ti,schedule);
87                 iv=(unsigned char *)ivec;
88                 t=ti[0]; l2c(t,iv);
89                 t=ti[1]; l2c(t,iv);
90                 iv=(unsigned char *)ivec;
91             }
92             c= *(in++)^iv[n];
93             *(out++)=c;
94             iv[n]=c;
95             n=(n+1)&0x07;
96         }
97     }
98     else
99     {
100         while (l-->0)
101         {
102             if (n == 0)
103             {
104                 c2l(iv,v0); ti[0]=v0;
105                 c2l(iv,v1); ti[1]=v1;
106                 RC2_encrypt((unsigned long *)ti,schedule);
107                 iv=(unsigned char *)ivec;
108                 t=ti[0]; l2c(t,iv);
109                 t=ti[1]; l2c(t,iv);
110                 iv=(unsigned char *)ivec;
111             }
112             cc= *(in++);
113             c=iv[n];
114             iv[n]=cc;
115             *(out++)=c^cc;
116             n=(n+1)&0x07;
117         }
118     }
119     v0=v1=ti[0]=ti[1]=t=c=cc=0;
120     *num=n;
121 }
```


new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2ofb64.c

1

```
*****
4221 Fri May 30 18:32:07 2014
new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2ofb64.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rc2/rc2ofb64.c */
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4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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9  * This library is free for commercial and non-commercial use as long as
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <openssl/rc2.h>
60 #include "rc2_loc1.h"
```

new/usr/src/lib/openssl/libsunw_crypto/rc2/rc2ofb64.c

2

```
62 /* The input and output encrypted as though 64bit ofb mode is being
63  * used. The extra state information to record how much of the
64  * 64bit block we have used is contained in *num;
65  */
66 void RC2_ofb64_encrypt(const unsigned char *in, unsigned char *out,
67                        long length, RC2_KEY *schedule, unsigned char *ivec,
68                        int *num)
69 {
70     register unsigned long v0,v1,t;
71     register int n= *num;
72     register long l=length;
73     unsigned char d[8];
74     register char *dp;
75     unsigned long ti[2];
76     unsigned char *iv;
77     int save=0;
78
79     iv=(unsigned char *)ivec;
80     c2l(iv,v0);
81     c2l(iv,v1);
82     ti[0]=v0;
83     ti[1]=v1;
84     dp=(char *)d;
85     l2c(v0,dp);
86     l2c(v1,dp);
87     while (l-->0)
88     {
89         if (n == 0)
90         {
91             RC2_encrypt((unsigned long *)ti,schedule);
92             dp=(char *)d;
93             t=ti[0]; l2c(t,dp);
94             t=ti[1]; l2c(t,dp);
95             save++;
96         }
97         *(out++)= *(in++)^d[n];
98         n=(n+1)&0x07;
99     }
100     if (save)
101     {
102         v0=ti[0];
103         v1=ti[1];
104         iv=(unsigned char *)ivec;
105         l2c(v0,iv);
106         l2c(v1,iv);
107     }
108     t=v0=v1=ti[0]=ti[1]=0;
109     *num=n;
110 }
```

new/usr/src/lib/openssl/libsunw_crypto/rc4/rc4_utl.c

1

```
*****
2765 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rc4/rc4_utl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rc4/rc4_utl.c -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
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4  *
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45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 */

52 #include <openssl/openssl.h>
53 #include <openssl/crypto.h>
54 #include <openssl/rc4.h>

56 void RC4_set_key(RC4_KEY *key, int len, const unsigned char *data)
57 {
58 #ifdef OPENSSL_FIPS
59     fips_cipher_abort(RC4);
60 #endif
61     private_RC4_set_key(key, len, data);
```

new/usr/src/lib/openssl/libsunw_crypto/rc4/rc4_utl.c

2

```
62     }
```

new/usr/src/lib/openssl/libsunw_crypto/ripemd/rmd_dgst.c

1

10102 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/ripemd/rmd_dgst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/ripemd/rmd_dgst.c */
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "rmd_loc1.h"
61 #include <openssl/openssl.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ripemd/rmd_dgst.c

2

62 #include <openssl/crypto.h>

64 const char RMD160_version[]="RIPE-MD160" OPENSSL_VERSION_PTEXT;

```
66 # ifdef RMD160_ASM
67     void ripemd160_block_x86(RIPEMD160_CTX *c, unsigned long *p,size_t num);
68 # define ripemd160_block ripemd160_block_x86
69 # else
70     void ripemd160_block(RIPEMD160_CTX *c, unsigned long *p,size_t num);
71 # endif
```

73 fips_md_init(RIPEMD160)

```
74 {
75     memset (c,0,sizeof(*c));
76     c->A=RIPEMD160_A;
77     c->B=RIPEMD160_B;
78     c->C=RIPEMD160_C;
79     c->D=RIPEMD160_D;
80     c->E=RIPEMD160_E;
81     return 1;
82 }
```

84 #ifndef ripemd160_block_data_order

85 #ifdef X

86 #undef X

87 #endif

88 void ripemd160_block_data_order (RIPEMD160_CTX *ctx, const void *p, size_t num)

```
89 {
90     const unsigned char *data=p;
91     register unsigned MD32_REG_T A,B,C,D,E;
92     unsigned MD32_REG_T a,b,c,d,e,l;
93     #ifndef MD32_XARRAY
94         /* See comment in crypto/sha/sha_locl.h for details. */
95         unsigned MD32_REG_T      XX0, XX1, XX2, XX3, XX4, XX5, XX6, XX7,
96                                   XX8, XX9,XX10,XX11,XX12,XX13,XX14,XX15;
```

97 # define X(i) XX##i

98 #else

99 RIPEMD160_LONG XX[16];

100 # define X(i) XX[i]

101 #endif

103 for (;num--;)
104 {

106 A=ctx->A; B=ctx->B; C=ctx->C; D=ctx->D; E=ctx->E;

```
108         (void)HOST_c2l(data,l); X( 0)=l; (void)HOST_c2l(data,l); X( 1)=l;
109         RIP1(A,B,C,D,E,WL00,SL00); (void)HOST_c2l(data,l); X( 2)=l;
110         RIP1(E,A,B,C,D,WL01,SL01); (void)HOST_c2l(data,l); X( 3)=l;
111         RIP1(D,E,A,B,C,WL02,SL02); (void)HOST_c2l(data,l); X( 4)=l;
112         RIP1(C,D,E,A,B,WL03,SL03); (void)HOST_c2l(data,l); X( 5)=l;
113         RIP1(B,C,D,E,A,WL04,SL04); (void)HOST_c2l(data,l); X( 6)=l;
114         RIP1(A,B,C,D,E,WL05,SL05); (void)HOST_c2l(data,l); X( 7)=l;
115         RIP1(E,A,B,C,D,WL06,SL06); (void)HOST_c2l(data,l); X( 8)=l;
116         RIP1(D,E,A,B,C,WL07,SL07); (void)HOST_c2l(data,l); X( 9)=l;
117         RIP1(C,D,E,A,B,WL08,SL08); (void)HOST_c2l(data,l); X(10)=l;
118         RIP1(B,C,D,E,A,WL09,SL09); (void)HOST_c2l(data,l); X(11)=l;
119         RIP1(A,B,C,D,E,WL10,SL10); (void)HOST_c2l(data,l); X(12)=l;
120         RIP1(E,A,B,C,D,WL11,SL11); (void)HOST_c2l(data,l); X(13)=l;
121         RIP1(D,E,A,B,C,WL12,SL12); (void)HOST_c2l(data,l); X(14)=l;
122         RIP1(C,D,E,A,B,WL13,SL13); (void)HOST_c2l(data,l); X(15)=l;
123         RIP1(B,C,D,E,A,WL14,SL14);
124         RIP1(A,B,C,D,E,WL15,SL15);
```

126 RIP2(E,A,B,C,D,WL16,SL16,KL1);

127 RIP2(D,E,A,B,C,WL17,SL17,KL1);

```

128  RIP2(C,D,E,A,B,WL18,SL18,KL1);
129  RIP2(B,C,D,E,A,WL19,SL19,KL1);
130  RIP2(A,B,C,D,E,WL20,SL20,KL1);
131  RIP2(E,A,B,C,D,WL21,SL21,KL1);
132  RIP2(D,E,A,B,C,WL22,SL22,KL1);
133  RIP2(C,D,E,A,B,WL23,SL23,KL1);
134  RIP2(B,C,D,E,A,WL24,SL24,KL1);
135  RIP2(A,B,C,D,E,WL25,SL25,KL1);
136  RIP2(E,A,B,C,D,WL26,SL26,KL1);
137  RIP2(D,E,A,B,C,WL27,SL27,KL1);
138  RIP2(C,D,E,A,B,WL28,SL28,KL1);
139  RIP2(B,C,D,E,A,WL29,SL29,KL1);
140  RIP2(A,B,C,D,E,WL30,SL30,KL1);
141  RIP2(E,A,B,C,D,WL31,SL31,KL1);

143  RIP3(D,E,A,B,C,WL32,SL32,KL2);
144  RIP3(C,D,E,A,B,WL33,SL33,KL2);
145  RIP3(B,C,D,E,A,WL34,SL34,KL2);
146  RIP3(A,B,C,D,E,WL35,SL35,KL2);
147  RIP3(E,A,B,C,D,WL36,SL36,KL2);
148  RIP3(D,E,A,B,C,WL37,SL37,KL2);
149  RIP3(C,D,E,A,B,WL38,SL38,KL2);
150  RIP3(B,C,D,E,A,WL39,SL39,KL2);
151  RIP3(A,B,C,D,E,WL40,SL40,KL2);
152  RIP3(E,A,B,C,D,WL41,SL41,KL2);
153  RIP3(D,E,A,B,C,WL42,SL42,KL2);
154  RIP3(C,D,E,A,B,WL43,SL43,KL2);
155  RIP3(B,C,D,E,A,WL44,SL44,KL2);
156  RIP3(A,B,C,D,E,WL45,SL45,KL2);
157  RIP3(E,A,B,C,D,WL46,SL46,KL2);
158  RIP3(D,E,A,B,C,WL47,SL47,KL2);

160  RIP4(C,D,E,A,B,WL48,SL48,KL3);
161  RIP4(B,C,D,E,A,WL49,SL49,KL3);
162  RIP4(A,B,C,D,E,WL50,SL50,KL3);
163  RIP4(E,A,B,C,D,WL51,SL51,KL3);
164  RIP4(D,E,A,B,C,WL52,SL52,KL3);
165  RIP4(C,D,E,A,B,WL53,SL53,KL3);
166  RIP4(B,C,D,E,A,WL54,SL54,KL3);
167  RIP4(A,B,C,D,E,WL55,SL55,KL3);
168  RIP4(E,A,B,C,D,WL56,SL56,KL3);
169  RIP4(D,E,A,B,C,WL57,SL57,KL3);
170  RIP4(C,D,E,A,B,WL58,SL58,KL3);
171  RIP4(B,C,D,E,A,WL59,SL59,KL3);
172  RIP4(A,B,C,D,E,WL60,SL60,KL3);
173  RIP4(E,A,B,C,D,WL61,SL61,KL3);
174  RIP4(D,E,A,B,C,WL62,SL62,KL3);
175  RIP4(C,D,E,A,B,WL63,SL63,KL3);

177  RIP5(B,C,D,E,A,WL64,SL64,KL4);
178  RIP5(A,B,C,D,E,WL65,SL65,KL4);
179  RIP5(E,A,B,C,D,WL66,SL66,KL4);
180  RIP5(D,E,A,B,C,WL67,SL67,KL4);
181  RIP5(C,D,E,A,B,WL68,SL68,KL4);
182  RIP5(B,C,D,E,A,WL69,SL69,KL4);
183  RIP5(A,B,C,D,E,WL70,SL70,KL4);
184  RIP5(E,A,B,C,D,WL71,SL71,KL4);
185  RIP5(D,E,A,B,C,WL72,SL72,KL4);
186  RIP5(C,D,E,A,B,WL73,SL73,KL4);
187  RIP5(B,C,D,E,A,WL74,SL74,KL4);
188  RIP5(A,B,C,D,E,WL75,SL75,KL4);
189  RIP5(E,A,B,C,D,WL76,SL76,KL4);
190  RIP5(D,E,A,B,C,WL77,SL77,KL4);
191  RIP5(C,D,E,A,B,WL78,SL78,KL4);
192  RIP5(B,C,D,E,A,WL79,SL79,KL4);

```

```

194  a=A; b=B; c=C; d=D; e=E;
195  /* Do other half */
196  A=ctx->A; B=ctx->B; C=ctx->C; D=ctx->D; E=ctx->E;

198  RIP5(A,B,C,D,E,WR00,SR00,KR0);
199  RIP5(E,A,B,C,D,WR01,SR01,KR0);
200  RIP5(D,E,A,B,C,WR02,SR02,KR0);
201  RIP5(C,D,E,A,B,WR03,SR03,KR0);
202  RIP5(B,C,D,E,A,WR04,SR04,KR0);
203  RIP5(A,B,C,D,E,WR05,SR05,KR0);
204  RIP5(E,A,B,C,D,WR06,SR06,KR0);
205  RIP5(D,E,A,B,C,WR07,SR07,KR0);
206  RIP5(C,D,E,A,B,WR08,SR08,KR0);
207  RIP5(B,C,D,E,A,WR09,SR09,KR0);
208  RIP5(A,B,C,D,E,WR10,SR10,KR0);
209  RIP5(E,A,B,C,D,WR11,SR11,KR0);
210  RIP5(D,E,A,B,C,WR12,SR12,KR0);
211  RIP5(C,D,E,A,B,WR13,SR13,KR0);
212  RIP5(B,C,D,E,A,WR14,SR14,KR0);
213  RIP5(A,B,C,D,E,WR15,SR15,KR0);

215  RIP4(E,A,B,C,D,WR16,SR16,KR1);
216  RIP4(D,E,A,B,C,WR17,SR17,KR1);
217  RIP4(C,D,E,A,B,WR18,SR18,KR1);
218  RIP4(B,C,D,E,A,WR19,SR19,KR1);
219  RIP4(A,B,C,D,E,WR20,SR20,KR1);
220  RIP4(E,A,B,C,D,WR21,SR21,KR1);
221  RIP4(D,E,A,B,C,WR22,SR22,KR1);
222  RIP4(C,D,E,A,B,WR23,SR23,KR1);
223  RIP4(B,C,D,E,A,WR24,SR24,KR1);
224  RIP4(A,B,C,D,E,WR25,SR25,KR1);
225  RIP4(E,A,B,C,D,WR26,SR26,KR1);
226  RIP4(D,E,A,B,C,WR27,SR27,KR1);
227  RIP4(C,D,E,A,B,WR28,SR28,KR1);
228  RIP4(B,C,D,E,A,WR29,SR29,KR1);
229  RIP4(A,B,C,D,E,WR30,SR30,KR1);
230  RIP4(E,A,B,C,D,WR31,SR31,KR1);

232  RIP3(D,E,A,B,C,WR32,SR32,KR2);
233  RIP3(C,D,E,A,B,WR33,SR33,KR2);
234  RIP3(B,C,D,E,A,WR34,SR34,KR2);
235  RIP3(A,B,C,D,E,WR35,SR35,KR2);
236  RIP3(E,A,B,C,D,WR36,SR36,KR2);
237  RIP3(D,E,A,B,C,WR37,SR37,KR2);
238  RIP3(C,D,E,A,B,WR38,SR38,KR2);
239  RIP3(B,C,D,E,A,WR39,SR39,KR2);
240  RIP3(A,B,C,D,E,WR40,SR40,KR2);
241  RIP3(E,A,B,C,D,WR41,SR41,KR2);
242  RIP3(D,E,A,B,C,WR42,SR42,KR2);
243  RIP3(C,D,E,A,B,WR43,SR43,KR2);
244  RIP3(B,C,D,E,A,WR44,SR44,KR2);
245  RIP3(A,B,C,D,E,WR45,SR45,KR2);
246  RIP3(E,A,B,C,D,WR46,SR46,KR2);
247  RIP3(D,E,A,B,C,WR47,SR47,KR2);

249  RIP2(C,D,E,A,B,WR48,SR48,KR3);
250  RIP2(B,C,D,E,A,WR49,SR49,KR3);
251  RIP2(A,B,C,D,E,WR50,SR50,KR3);
252  RIP2(E,A,B,C,D,WR51,SR51,KR3);
253  RIP2(D,E,A,B,C,WR52,SR52,KR3);
254  RIP2(C,D,E,A,B,WR53,SR53,KR3);
255  RIP2(B,C,D,E,A,WR54,SR54,KR3);
256  RIP2(A,B,C,D,E,WR55,SR55,KR3);
257  RIP2(E,A,B,C,D,WR56,SR56,KR3);
258  RIP2(D,E,A,B,C,WR57,SR57,KR3);
259  RIP2(C,D,E,A,B,WR58,SR58,KR3);

```

```
260     RIP2(B, C, D, E, A, WR59, SR59, KR3);
261     RIP2(A, B, C, D, E, WR60, SR60, KR3);
262     RIP2(E, A, B, C, D, WR61, SR61, KR3);
263     RIP2(D, E, A, B, C, WR62, SR62, KR3);
264     RIP2(C, D, E, A, B, WR63, SR63, KR3);

266     RIP1(B, C, D, E, A, WR64, SR64);
267     RIP1(A, B, C, D, E, WR65, SR65);
268     RIP1(E, A, B, C, D, WR66, SR66);
269     RIP1(D, E, A, B, C, WR67, SR67);
270     RIP1(C, D, E, A, B, WR68, SR68);
271     RIP1(B, C, D, E, A, WR69, SR69);
272     RIP1(A, B, C, D, E, WR70, SR70);
273     RIP1(E, A, B, C, D, WR71, SR71);
274     RIP1(D, E, A, B, C, WR72, SR72);
275     RIP1(C, D, E, A, B, WR73, SR73);
276     RIP1(B, C, D, E, A, WR74, SR74);
277     RIP1(A, B, C, D, E, WR75, SR75);
278     RIP1(E, A, B, C, D, WR76, SR76);
279     RIP1(D, E, A, B, C, WR77, SR77);
280     RIP1(C, D, E, A, B, WR78, SR78);
281     RIP1(B, C, D, E, A, WR79, SR79);

283     D      =ctx->B+c+D;
284     ctx->B=ctx->C+d+E;
285     ctx->C=ctx->D+e+A;
286     ctx->D=ctx->E+a+B;
287     ctx->E=ctx->A+b+C;
288     ctx->A=D;

290     }
291 }
292 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/ripemd/rmd_one.c

1

3646 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/ripemd/rmd_one.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/ripemd/rmd_one.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <string.h>
61 #include <openssl/ripemd.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ripemd/rmd_one.c

2

```
62 #include <openssl/crypto.h>
63
64 unsigned char *RIPEMD160(const unsigned char *d, size_t n,
65                          unsigned char *md)
66 {
67     RIPEMD160_CTX c;
68     static unsigned char m[RIPEMD160_DIGEST_LENGTH];
69
70     if (md == NULL) md=m;
71     if (!RIPEMD160_Init(&c))
72         return NULL;
73     RIPEMD160_Update(&c,d,n);
74     RIPEMD160_Final(md,&c);
75     OPENSSL_cleanse(&c,sizeof(c)); /* security consideration */
76     return(md);
77 }
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_ameth.c

1

```
*****
16570 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_ameth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rsa/rsa_ameth.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_ameth.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/rsa.h>
64 #include <openssl/bn.h>
65 #ifndef OPENSSL_NO_CMS
66 #include <openssl/cms.h>
67 #endif
68 #include "asn1_locl.h"
69
70 static int rsa_pub_encode(X509_PUBKEY *pk, const EVP_PKEY *pkey)
71 {
72     unsigned char *penc = NULL;
73     int penclen;
74     penclen = i2d_RSAPublicKey(pkey->pkey.rsa, &penc);
75     if (penclen <= 0)
76         return 0;
77     if (X509_PUBKEY_set0_param(pk, OBJ_nid2obj(EVP_PKEY_RSA),
78                                V_ASN1_NULL, NULL, penc, penclen))
79         return 1;
80
81     OPENSSL_free(penc);
82     return 0;
83 }
84
85 static int rsa_pub_decode(EVP_PKEY *pkey, X509_PUBKEY *pubkey)
86 {
87     const unsigned char *p;
88     int pklen;
89     RSA *rsa = NULL;
90     if (!X509_PUBKEY_get0_param(NULL, &p, &pklen, NULL, pubkey))
91         return 0;
92     if (!(rsa = d2i_RSAPublicKey(NULL, &p, pklen)))
93     {
94         RSAerr(RSA_F_RSA_PUB_DECODE, ERR_R_RSA_LIB);
95         return 0;
96     }
97     EVP_PKEY_assign_RSA(pkey, rsa);
98     return 1;
99 }
100
101 static int rsa_pub_cmp(const EVP_PKEY *a, const EVP_PKEY *b)
102 {
103     if (BN_cmp(b->pkey.rsa->n, a->pkey.rsa->n) != 0
104         || BN_cmp(b->pkey.rsa->e, a->pkey.rsa->e) != 0)
105         return 0;
106     return 1;
107 }
108
109 static int old_rsa_priv_decode(EVP_PKEY *pkey,
110                                const unsigned char **pder, int derlen)
111 {
112     RSA *rsa;
113     if (!(rsa = d2i_RSAPrivateKey(NULL, pder, derlen)))
114     {
115         RSAerr(RSA_F_OLD_RSA_PRIV_DECODE, ERR_R_RSA_LIB);
116         return 0;
117     }
118     EVP_PKEY_assign_RSA(pkey, rsa);
119     return 1;
120 }
121
122 static int old_rsa_priv_encode(const EVP_PKEY *pkey, unsigned char **pder)
123 {
124     return i2d_RSAPrivateKey(pkey->pkey.rsa, pder);
125 }
126
127 static int rsa_priv_encode(PKCS8_PRIV_KEY_INFO *p8, const EVP_PKEY *pkey)
```

```

128     {
129         unsigned char *rk = NULL;
130         int rklen;
131         rklen = i2d_RSAPrivateKey(pkey->pkey.rsa, &rk);

133         if (rklen <= 0)
134         {
135             RSAerr(RSA_F_RSA_PRIV_ENCODE,ERR_R_MALLOC_FAILURE);
136             return 0;
137         }

139         if (!PKCS8_pkey_set0(p8, OBJ_nid2obj(NID_rsaEncryption), 0,
140                               V_ASN1_NULL, NULL, rk, rklen))
141         {
142             RSAerr(RSA_F_RSA_PRIV_ENCODE,ERR_R_MALLOC_FAILURE);
143             return 0;
144         }

146         return 1;
147     }

149 static int rsa_priv_decode(EVP_PKEY *pkey, PKCS8_PRIV_KEY_INFO *p8)
150 {
151     const unsigned char *p;
152     int pklen;
153     if (!PKCS8_pkey_get0(NULL, &p, &pklen, NULL, p8))
154         return 0;
155     return old_rsa_priv_decode(pkey, &p, pklen);
156 }

158 static int int_rsa_size(const EVP_PKEY *pkey)
159 {
160     return RSA_size(pkey->pkey.rsa);
161 }

163 static int rsa_bits(const EVP_PKEY *pkey)
164 {
165     return BN_num_bits(pkey->pkey.rsa->n);
166 }

168 static void int_rsa_free(EVP_PKEY *pkey)
169 {
170     RSA_free(pkey->pkey.rsa);
171 }

174 static void update_buflen(const BIGNUM *b, size_t *pbuflen)
175 {
176     size_t i;
177     if (!b)
178         return;
179     if (*pbuflen < (i = (size_t)BN_num_bytes(b)))
180         *pbuflen = i;
181 }

183 static int do_rsa_print(BIO *bp, const RSA *x, int off, int priv)
184 {
185     char *str;
186     const char *s;
187     unsigned char *m=NULL;
188     int ret=0, mod_len = 0;
189     size_t buf_len=0;

191     update_buflen(x->n, &buf_len);
192     update_buflen(x->e, &buf_len);

```

```

194     if (priv)
195     {
196         update_buflen(x->d, &buf_len);
197         update_buflen(x->p, &buf_len);
198         update_buflen(x->q, &buf_len);
199         update_buflen(x->dmp1, &buf_len);
200         update_buflen(x->dmq1, &buf_len);
201         update_buflen(x->iqmp, &buf_len);
202     }

204     m=(unsigned char *)OPENSSL_malloc(buf_len+10);
205     if (m == NULL)
206     {
207         RSAerr(RSA_F_DO_RSA_PRINT,ERR_R_MALLOC_FAILURE);
208         goto err;
209     }

211     if (x->n != NULL)
212         mod_len = BN_num_bits(x->n);

214     if(!BIO_indent(bp,off,128))
215         goto err;

217     if (priv && x->d)
218     {
219         if (BIO_printf(bp,"Private-Key: (%d bit)\n", mod_len)
220             <= 0) goto err;
221         str = "modulus:";
222         s = "publicExponent:";
223     }
224     else
225     {
226         if (BIO_printf(bp,"Public-Key: (%d bit)\n", mod_len)
227             <= 0) goto err;
228         str = "Modulus:";
229         s = "Exponent:";
230     }
231     if (!ASN1_bn_print(bp,str,x->n,m,off)) goto err;
232     if (!ASN1_bn_print(bp,s,x->e,m,off))
233         goto err;
234     if (priv)
235     {
236         if (!ASN1_bn_print(bp,"privateExponent:",x->d,m,off))
237             goto err;
238         if (!ASN1_bn_print(bp,"prime1:",x->p,m,off))
239             goto err;
240         if (!ASN1_bn_print(bp,"prime2:",x->q,m,off))
241             goto err;
242         if (!ASN1_bn_print(bp,"exponent1:",x->dmp1,m,off))
243             goto err;
244         if (!ASN1_bn_print(bp,"exponent2:",x->dmq1,m,off))
245             goto err;
246         if (!ASN1_bn_print(bp,"coefficient:",x->iqmp,m,off))
247             goto err;
248     }
249     ret=1;
250 err:
251     if (m != NULL) OPENSSL_free(m);
252     return(ret);
253 }

255 static int rsa_pub_print(BIO *bp, const EVP_PKEY *pkey, int indent,
256                          ASN1_PCTX *ctx)
257 {
258     return do_rsa_print(bp, pkey->pkey.rsa, indent, 0);
259 }

```



```

262 static int rsa_priv_print(BIO *bp, const EVP_PKEY *pkey, int indent,
263                          ASN1_PCTX *ctx)
264 {
265     return do_rsa_print(bp, pkey->pkey.rsa, indent, 1);
266 }

268 static RSA_PSS_PARAMS *rsa_pss_decode(const X509_ALGOR *alg,
269                                       X509_ALGOR **pmaskHash)
270 {
271     const unsigned char *p;
272     int plen;
273     RSA_PSS_PARAMS *pss;

275     *pmaskHash = NULL;

277     if (!alg->parameter || alg->parameter->type != V_ASN1_SEQUENCE)
278         return NULL;
279     p = alg->parameter->value.sequence->data;
280     plen = alg->parameter->value.sequence->length;
281     pss = d2i_RSA_PSS_PARAMS(NULL, &p, plen);

283     if (!pss)
284         return NULL;
285
286     if (pss->maskGenAlgorithm)
287     {
288         ASN1_TYPE *param = pss->maskGenAlgorithm->parameter;
289         if (OBJ_obj2nid(pss->maskGenAlgorithm->algorithm) == NID_mgf1
290             && param->type == V_ASN1_SEQUENCE)
291         {
292             p = param->value.sequence->data;
293             plen = param->value.sequence->length;
294             *pmaskHash = d2i_X509_ALGOR(NULL, &p, plen);
295         }
296     }

298     return pss;
299 }

301 static int rsa_pss_param_print(BIO *bp, RSA_PSS_PARAMS *pss,
302                               X509_ALGOR *maskHash, int indent)
303 {
304     int rv = 0;
305     if (!pss)
306     {
307         if (BIO_puts(bp, " (INVALID PSS PARAMETERS)\n") <= 0)
308             return 0;
309         return 1;
310     }
311     if (BIO_puts(bp, "\n") <= 0)
312         goto err;
313     if (!BIO_indent(bp, indent, 128))
314         goto err;
315     if (BIO_puts(bp, "Hash Algorithm: ") <= 0)
316         goto err;

318     if (pss->hashAlgorithm)
319     {
320         if (i2a_ASN1_OBJECT(bp, pss->hashAlgorithm->algorithm) <= 0)
321             goto err;
322     }
323     else if (BIO_puts(bp, "sha1 (default)") <= 0)
324         goto err;

```

```

326     if (BIO_puts(bp, "\n") <= 0)
327         goto err;

329     if (!BIO_indent(bp, indent, 128))
330         goto err;

332     if (BIO_puts(bp, "Mask Algorithm: ") <= 0)
333         goto err;
334     if (pss->maskGenAlgorithm)
335     {
336         if (i2a_ASN1_OBJECT(bp, pss->maskGenAlgorithm->algorithm) <= 0)
337             goto err;
338         if (BIO_puts(bp, " with ") <= 0)
339             goto err;
340         if (maskHash)
341         {
342             if (i2a_ASN1_OBJECT(bp, maskHash->algorithm) <= 0)
343                 goto err;
344         }
345         else if (BIO_puts(bp, "INVALID") <= 0)
346             goto err;
347     }
348     else if (BIO_puts(bp, "mgf1 with sha1 (default)") <= 0)
349         goto err;
350     BIO_puts(bp, "\n");

352     if (!BIO_indent(bp, indent, 128))
353         goto err;
354     if (BIO_puts(bp, "Salt Length: 0x") <= 0)
355         goto err;
356     if (pss->saltLength)
357     {
358         if (i2a_ASN1_INTEGER(bp, pss->saltLength) <= 0)
359             goto err;
360     }
361     else if (BIO_puts(bp, "0x14 (default)") <= 0)
362         goto err;
363     BIO_puts(bp, "\n");

365     if (!BIO_indent(bp, indent, 128))
366         goto err;
367     if (BIO_puts(bp, "Trailer Field: 0x") <= 0)
368         goto err;
369     if (pss->trailerField)
370     {
371         if (i2a_ASN1_INTEGER(bp, pss->trailerField) <= 0)
372             goto err;
373     }
374     else if (BIO_puts(bp, "BC (default)") <= 0)
375         goto err;
376     BIO_puts(bp, "\n");
377
378     rv = 1;

380     err:
381     return rv;

383 }

385 static int rsa_sig_print(BIO *bp, const X509_ALGOR *sigalg,
386                          const ASN1_STRING *sig,
387                          int indent, ASN1_PCTX *pctx)
388 {
389     if (OBJ_obj2nid(sigalg->algorithm) == NID_rsassaPss)
390     {
391         int rv;

```

```

392     RSA_PSS_PARAMS *pss;
393     X509_ALGOR *maskHash;
394     pss = rsa_pss_decode(sigalg, &maskHash);
395     rv = rsa_pss_param_print(bp, pss, maskHash, indent);
396     if (pss)
397         RSA_PSS_PARAMS_free(pss);
398     if (maskHash)
399         X509_ALGOR_free(maskHash);
400     if (!rv)
401         return 0;
402 }
403 else if (!sig && BIO_puts(bp, "\n") <= 0)
404     return 0;
405 if (sig)
406     return X509_signature_dump(bp, sig, indent);
407 return 1;
408 }

410 static int rsa_pkey_ctrl(EVP_PKEY *pkey, int op, long arg1, void *arg2)
411 {
412     X509_ALGOR *alg = NULL;
413     switch (op)
414     {
415     case ASN1_PKEY_CTRL_PKCS7_SIGN:
416         if (arg1 == 0)
417             PKCS7_SIGNER_INFO_get0_algs(arg2, NULL, NULL, &alg);
418         break;
419
420     case ASN1_PKEY_CTRL_PKCS7_ENCRYPT:
421         if (arg1 == 0)
422             PKCS7_RECIP_INFO_get0_alg(arg2, &alg);
423         break;
424
425 #ifndef OPENSSL_NO_CMS
426     case ASN1_PKEY_CTRL_CMS_SIGN:
427         if (arg1 == 0)
428             CMS_SignerInfo_get0_algs(arg2, NULL, NULL, NULL, &alg);
429         break;
430
431     case ASN1_PKEY_CTRL_CMS_ENVELOPE:
432         if (arg1 == 0)
433             CMS_RecipientInfo_ktri_get0_algs(arg2, NULL, NULL, &alg);
434         break;
435 #endif
436
437     case ASN1_PKEY_CTRL_DEFAULT_MD_NID:
438         *(int *)arg2 = NID_sha1;
439         return 1;
440
441     default:
442         return -2;
443     }
444 }
445
446 if (alg)
447     X509_ALGOR_set0(alg, OBJ_nid2obj(NID_rsaEncryption),
448                     V_ASN1_NULL, 0);
449
450 return 1;
451 }

454 /* Customised RSA item verification routine. This is called
455  * when a signature is encountered requiring special handling. We
456  * currently only handle PSS.
457  */

```

```

460 static int rsa_item_verify(EVP_MD_CTX *ctx, const ASN1_ITEM *it, void *asn,
461                            X509_ALGOR *sigalg, ASN1_BIT_STRING *sig,
462                            EVP_PKEY *pkey)
463 {
464     int rv = -1;
465     int saltlen;
466     const EVP_MD *mgf1md = NULL, *md = NULL;
467     RSA_PSS_PARAMS *pss;
468     X509_ALGOR *maskHash;
469     EVP_PKEY_CTX *pkctx;
470     /* Sanity check: make sure it is PSS */
471     if (OBJ_obj2nid(sigalg->algorithm) != NID_rsassaPss)
472     {
473         RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_UNSUPPORTED_SIGNATURE_TYPE);
474         return -1;
475     }
476     /* Decode PSS parameters */
477     pss = rsa_pss_decode(sigalg, &maskHash);
478
479     if (pss == NULL)
480     {
481         RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_INVALID_PSS_PARAMETERS);
482         goto err;
483     }
484     /* Check mask and lookup mask hash algorithm */
485     if (pss->maskGenAlgorithm)
486     {
487         if (OBJ_obj2nid(pss->maskGenAlgorithm->algorithm) != NID_mgf1)
488             RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_UNSUPPORTED_MASK_ALG);
489         goto err;
490     }
491     if (!maskHash)
492     {
493         RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_UNSUPPORTED_MASK_PAR);
494         goto err;
495     }
496     mgf1md = EVP_get_digestbyobj(maskHash->algorithm);
497     if (mgf1md == NULL)
498     {
499         RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_UNKNOWN_MASK_DIGEST);
500         goto err;
501     }
502 }
503
504 else
505     mgf1md = EVP_sha1();
506
507 if (pss->hashAlgorithm)
508 {
509     md = EVP_get_digestbyobj(pss->hashAlgorithm->algorithm);
510     if (md == NULL)
511     {
512         RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_UNKNOWN_PSS_DIGEST);
513         goto err;
514     }
515 }
516
517 else
518     md = EVP_sha1();
519
520 if (pss->saltLength)
521 {
522     saltlen = ASN1_INTEGER_get(pss->saltLength);
523     /* Could perform more salt length sanity checks but the main

```

```

524     /* RSA routines will trap other invalid values anyway.
525     */
526     if (saltlen < 0)
527     {
528         RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_INVALID_SALT_LENGTH)
529         goto err;
530     }
531 }
532 else
533     saltlen = 20;

535 /* low-level routines support only trailer field 0xbc (value 1)
536 * and PKCS#1 says we should reject any other value anyway.
537 */
538 if (pss->trailerField && ASN1_INTEGER_get(pss->trailerField) != 1)
539 {
540     RSAerr(RSA_F_RSA_ITEM_VERIFY, RSA_R_INVALID_TRAILER);
541     goto err;
542 }

544 /* We have all parameters now set up context */

546 if (!EVP_DigestVerifyInit(ctx, &pkctx, md, NULL, pkey))
547     goto err;

549 if (EVP_PKEY_CTX_set_rsa_padding(pkctx, RSA_PKCS1_PSS_PADDING) <= 0)
550     goto err;

552 if (EVP_PKEY_CTX_set_rsa_pss_saltlen(pkctx, saltlen) <= 0)
553     goto err;

555 if (EVP_PKEY_CTX_set_rsa_mgf1_md(pkctx, mgf1md) <= 0)
556     goto err;
557 /* Carry on */
558 rv = 2;

560 err:
561 RSA_PSS_PARAMS_free(pss);
562 if (maskHash)
563     X509_ALGOR_free(maskHash);
564 return rv;
565 }

567 static int rsa_item_sign(EVP_MD_CTX *ctx, const ASN1_ITEM *it, void *asn,
568                          X509_ALGOR *alg1, X509_ALGOR *alg2,
569                          ASN1_BIT_STRING *sig)
570 {
571     int pad_mode;
572     EVP_PKEY_CTX *pkctx = ctx->pkctx;
573     if (EVP_PKEY_CTX_get_rsa_padding(pkctx, &pad_mode) <= 0)
574         return 0;
575     if (pad_mode == RSA_PKCS1_PADDING)
576         return 2;
577     if (pad_mode == RSA_PKCS1_PSS_PADDING)
578     {
579         const EVP_MD *sigmd, *mgf1md;
580         RSA_PSS_PARAMS *pss = NULL;
581         X509_ALGOR *mgf1alg = NULL;
582         ASN1_STRING *os1 = NULL, *os2 = NULL;
583         EVP_PKEY *pk = EVP_PKEY_CTX_get0_pkey(pkctx);
584         int saltlen, rv = 0;
585         sigmd = EVP_MD_CTX_md(ctx);
586         if (EVP_PKEY_CTX_get_rsa_mgf1_md(pkctx, &mgf1md) <= 0)
587             goto err;
588         if (!EVP_PKEY_CTX_get_rsa_pss_saltlen(pkctx, &saltlen))
589             goto err;

```

```

590     if (saltlen == -1)
591         saltlen = EVP_MD_size(sigmd);
592     else if (saltlen == -2)
593     {
594         saltlen = EVP_PKEY_size(pk) - EVP_MD_size(sigmd) - 2;
595         if (((EVP_PKEY_bits(pk) - 1) & 0x7) == 0)
596             saltlen--;
597     }
598     pss = RSA_PSS_PARAMS_new();
599     if (!pss)
600         goto err;
601     if (saltlen != 20)
602     {
603         pss->saltLength = ASN1_INTEGER_new();
604         if (!pss->saltLength)
605             goto err;
606         if (!ASN1_INTEGER_set(pss->saltLength, saltlen))
607             goto err;
608     }
609     if (EVP_MD_type(sigmd) != NID_sha1)
610     {
611         pss->hashAlgorithm = X509_ALGOR_new();
612         if (!pss->hashAlgorithm)
613             goto err;
614         X509_ALGOR_set_md(pss->hashAlgorithm, sigmd);
615     }
616     if (EVP_MD_type(mgf1md) != NID_sha1)
617     {
618         ASN1_STRING *stmp = NULL;
619         /* need to embed algorithm ID inside another */
620         mgf1alg = X509_ALGOR_new();
621         X509_ALGOR_set_md(mgf1alg, mgf1md);
622         if (!ASN1_item_pack(mgf1alg, ASN1_ITEM_rptr(X509_ALGOR),
623                             &stmp))
624             goto err;
625         pss->maskGenAlgorithm = X509_ALGOR_new();
626         if (!pss->maskGenAlgorithm)
627             goto err;
628         X509_ALGOR_set0(pss->maskGenAlgorithm,
629                         OBJ_nid2obj(NID_mgf1),
630                         V_ASN1_SEQUENCE, stmp);
631     }
632     /* Finally create string with pss parameter encoding. */
633     if (!ASN1_item_pack(pss, ASN1_ITEM_rptr(RSA_PSS_PARAMS), &os1))
634         goto err;
635     if (alg2)
636     {
637         os2 = ASN1_STRING_dup(os1);
638         if (!os2)
639             goto err;
640         X509_ALGOR_set0(alg2, OBJ_nid2obj(NID_rsassaPss),
641                         V_ASN1_SEQUENCE, os2);
642     }
643     X509_ALGOR_set0(alg1, OBJ_nid2obj(NID_rsassaPss),
644                     V_ASN1_SEQUENCE, os1);
645     os1 = os2 = NULL;
646     rv = 3;
647     err:
648     if (mgf1alg)
649         X509_ALGOR_free(mgf1alg);
650     if (pss)
651         RSA_PSS_PARAMS_free(pss);
652     if (os1)
653         ASN1_STRING_free(os1);
654     return rv;
655 }

```

```
656     }
657     return 2;
658 }

660 const EVP_PKEY_ASN1_METHOD rsa_asn1_meths[] =
661 {
662     {
663         EVP_PKEY_RSA,
664         EVP_PKEY_RSA,
665         ASN1_PKEY_SIGPARAM_NULL,

667         "RSA",
668         "OpenSSL RSA method",

670         rsa_pub_decode,
671         rsa_pub_encode,
672         rsa_pub_cmp,
673         rsa_pub_print,

675         rsa_priv_decode,
676         rsa_priv_encode,
677         rsa_priv_print,

679         int_rsa_size,
680         rsa_bits,

682         0,0,0,0,0,0,

684         rsa_sig_print,
685         int_rsa_free,
686         rsa_pkey_ctrl,
687         old_rsa_priv_decode,
688         old_rsa_priv_encode,
689         rsa_item_verify,
690         rsa_item_sign
691     },

693     {
694         EVP_PKEY_RSA2,
695         EVP_PKEY_RSA,
696         ASN1_PKEY_ALIAS
697     }
698 };
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_asn1.c

1

```
*****
4473 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* rsa_asn1.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2000.
4  */
5 /* =====
6  * Copyright (c) 2000-2005 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_asn1.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/x509.h>
64 #include <openssl/asn1t.h>
65
66 /* Override the default free and new methods */
67 static int rsa_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
68                  void *exarg)
69 {
70     if(operation == ASN1_OP_NEW_PRE) {
71         *pval = (ASN1_VALUE *)RSA_new();
72         if(*pval) return 2;
73         return 0;
74     } else if(operation == ASN1_OP_FREE_PRE) {
75         RSA_free((RSA *)*pval);
76         *pval = NULL;
77         return 2;
78     }
79     return 1;
80 }
81
82 ASN1_SEQUENCE_cb(RSAPrivateKey, rsa_cb) = {
83     ASN1_SIMPLE(RSA, version, LONG),
84     ASN1_SIMPLE(RSA, n, BIGNUM),
85     ASN1_SIMPLE(RSA, e, BIGNUM),
86     ASN1_SIMPLE(RSA, d, BIGNUM),
87     ASN1_SIMPLE(RSA, p, BIGNUM),
88     ASN1_SIMPLE(RSA, q, BIGNUM),
89     ASN1_SIMPLE(RSA, dmp1, BIGNUM),
90     ASN1_SIMPLE(RSA, dmq1, BIGNUM),
91     ASN1_SIMPLE(RSA, iqmp, BIGNUM)
92 } ASN1_SEQUENCE_END_cb(RSA, RSAPrivateKey)
93
94 ASN1_SEQUENCE_cb(RSAPublicKey, rsa_cb) = {
95     ASN1_SIMPLE(RSA, n, BIGNUM),
96     ASN1_SIMPLE(RSA, e, BIGNUM),
97 } ASN1_SEQUENCE_END_cb(RSA, RSAPublicKey)
98
99 ASN1_SEQUENCE(RSA_PSS_PARAMS) = {
100     ASN1_EXP_OPT(RSA_PSS_PARAMS, hashAlgorithm, X509_ALGOR,0),
101     ASN1_EXP_OPT(RSA_PSS_PARAMS, maskGenAlgorithm, X509_ALGOR,1),
102     ASN1_EXP_OPT(RSA_PSS_PARAMS, saltLength, ASN1_INTEGER,2),
103     ASN1_EXP_OPT(RSA_PSS_PARAMS, trailerField, ASN1_INTEGER,3)
104 } ASN1_SEQUENCE_END(RSA_PSS_PARAMS)
105
106 IMPLEMENT_ASN1_FUNCTIONS(RSA_PSS_PARAMS)
107
108 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(RSA, RSAPrivateKey, RSAPrivateKey)
109
110 IMPLEMENT_ASN1_ENCODE_FUNCTIONS_const_fname(RSA, RSAPublicKey, RSAPublicKey)
111
112 RSA *RSAPublicKey_dup(RSA *rsa)
113 {
114     return ASN1_item_dup(ASN1_ITEM_rptr(RSAPublicKey), rsa);
115 }
116
117 RSA *RSAPrivateKey_dup(RSA *rsa)
118 {
119     return ASN1_item_dup(ASN1_ITEM_rptr(RSAPrivateKey), rsa);
120 }
121 }
```

```

*****
5364 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_chk.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rsa/rsa_chk.c  *- Mode: C; c-file-style: "eay"  *- */
2 /* =====
3 * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
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16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
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41 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 */
51 #include <openssl/bn.h>
52 #include <openssl/err.h>
53 #include <openssl/rsa.h>
55 int RSA_check_key(const RSA *key)
56 {
57     BIGNUM *i, *j, *k, *l, *m;
58     BN_CTX *ctx;
59     int r;
60     int ret=1;

```

```

63     if (!key->p || !key->q || !key->n || !key->e || !key->d)
64     {
65         RSAerr(RSA_F_RSA_CHECK_KEY, RSA_R_VALUE_MISSING);
66         return 0;
67     }
68
69     i = BN_new();
70     j = BN_new();
71     k = BN_new();
72     l = BN_new();
73     m = BN_new();
74     ctx = BN_CTX_new();
75     if (i == NULL || j == NULL || k == NULL || l == NULL ||
76         m == NULL || ctx == NULL)
77     {
78         ret = -1;
79         RSAerr(RSA_F_RSA_CHECK_KEY, ERR_R_MALLOC_FAILURE);
80         goto err;
81     }
82
83     /* p prime? */
84     r = BN_is_prime_ex(key->p, BN_prime_checks, NULL, NULL);
85     if (r != 1)
86     {
87         ret = r;
88         if (r != 0)
89             goto err;
90         RSAerr(RSA_F_RSA_CHECK_KEY, RSA_R_P_NOT_PRIME);
91     }
92
93     /* q prime? */
94     r = BN_is_prime_ex(key->q, BN_prime_checks, NULL, NULL);
95     if (r != 1)
96     {
97         ret = r;
98         if (r != 0)
99             goto err;
100         RSAerr(RSA_F_RSA_CHECK_KEY, RSA_R_Q_NOT_PRIME);
101     }
102
103     /* n = p*q? */
104     r = BN_mul(i, key->p, key->q, ctx);
105     if (!r) { ret = -1; goto err; }
106
107     if (BN_cmp(i, key->n) != 0)
108     {
109         ret = 0;
110         RSAerr(RSA_F_RSA_CHECK_KEY, RSA_R_N_DOES_NOT_EQUAL_P_Q);
111     }
112
113     /* d*e = 1 mod lcm(p-1,q-1)? */
114
115     r = BN_sub(i, key->p, BN_value_one());
116     if (!r) { ret = -1; goto err; }
117     r = BN_sub(j, key->q, BN_value_one());
118     if (!r) { ret = -1; goto err; }
119
120     /* now compute k = lcm(i,j) */
121     r = BN_mul(l, i, j, ctx);
122     if (!r) { ret = -1; goto err; }
123     r = BN_gcd(m, i, j, ctx);
124     if (!r) { ret = -1; goto err; }
125     r = BN_div(k, NULL, l, m, ctx); /* remainder is 0 */
126     if (!r) { ret = -1; goto err; }

```

```

128     r = BN_mod_mul(i, key->d, key->e, k, ctx);
129     if (!r) { ret = -1; goto err; }

131     if (!BN_is_one(i))
132     {
133         ret = 0;
134         RSAerr(RSA_F_RSA_CHECK_KEY, RSA_R_D_E_NOT_CONGRUENT_TO_1);
135     }
136
137     if (key->dmp1 != NULL && key->dmq1 != NULL && key->iqmp != NULL)
138     {
139         /* dmp1 = d mod (p-1)? */
140         r = BN_sub(i, key->p, BN_value_one());
141         if (!r) { ret = -1; goto err; }

143         r = BN_mod(j, key->d, i, ctx);
144         if (!r) { ret = -1; goto err; }

146         if (BN_cmp(j, key->dmp1) != 0)
147         {
148             ret = 0;
149             RSAerr(RSA_F_RSA_CHECK_KEY,
150                  RSA_R_DMP1_NOT_CONGRUENT_TO_D);
151         }
152
153         /* dmq1 = d mod (q-1)? */
154         r = BN_sub(i, key->q, BN_value_one());
155         if (!r) { ret = -1; goto err; }
156
157         r = BN_mod(j, key->d, i, ctx);
158         if (!r) { ret = -1; goto err; }

160         if (BN_cmp(j, key->dmq1) != 0)
161         {
162             ret = 0;
163             RSAerr(RSA_F_RSA_CHECK_KEY,
164                  RSA_R_DMQ1_NOT_CONGRUENT_TO_D);
165         }
166
167         /* iqmp = q^-1 mod p? */
168         if (!BN_mod_inverse(i, key->q, key->p, ctx))
169         {
170             ret = -1;
171             goto err;
172         }

174         if (BN_cmp(i, key->iqmp) != 0)
175         {
176             ret = 0;
177             RSAerr(RSA_F_RSA_CHECK_KEY,
178                  RSA_R_IQMP_NOT_INVERSE_OF_Q);
179         }
180     }

182 err:
183     if (i != NULL) BN_free(i);
184     if (j != NULL) BN_free(j);
185     if (k != NULL) BN_free(k);
186     if (l != NULL) BN_free(l);
187     if (m != NULL) BN_free(m);
188     if (ctx != NULL) BN_CTX_free(ctx);
189     return (ret);
190 }

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_crpt.c

1

7540 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_crpt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/rsa/rsa_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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17 * the code are not to be removed.
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21 * in documentation (online or textual) provided with the package.
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31 * 3. All advertising materials mentioning features or use of this software
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34 * Eric Young (eay@cryptsoft.com)"
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36 * being used are not cryptographic related :-).
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/crypto.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_crpt.c

2

```
62 #include <openssl/lhash.h>
63 #include <openssl/bn.h>
64 #include <openssl/rsa.h>
65 #include <openssl/rand.h>
66 #ifndef OPENSSL_NO_ENGINE
67 #include <openssl/engine.h>
68 #endif
69
70 int RSA_size(const RSA *r)
71 {
72     return(BN_num_bytes(r->n));
73 }
74
75 int RSA_public_encrypt(int flen, const unsigned char *from, unsigned char *to,
76     RSA *rsa, int padding)
77 {
78     #ifdef OPENSSL_FIPS
79     if (FIPS_mode()) && !(rsa->meth->flags & RSA_FLAG_FIPS_METHOD)
80         && !(rsa->flags & RSA_FLAG_NON_FIPS_ALLOW))
81     {
82         RSAerr(RSA_F_RSA_PUBLIC_ENCRYPT, RSA_R_NON_FIPS_RSA_METHOD);
83         return -1;
84     }
85 #endif
86     return(rsa->meth->rsa_pub_enc(flen, from, to, rsa, padding));
87 }
88
89 int RSA_private_encrypt(int flen, const unsigned char *from, unsigned char *to,
90     RSA *rsa, int padding)
91 {
92     #ifdef OPENSSL_FIPS
93     if (FIPS_mode()) && !(rsa->meth->flags & RSA_FLAG_FIPS_METHOD)
94         && !(rsa->flags & RSA_FLAG_NON_FIPS_ALLOW))
95     {
96         RSAerr(RSA_F_RSA_PRIVATE_ENCRYPT, RSA_R_NON_FIPS_RSA_METHOD);
97         return -1;
98     }
99 #endif
100     return(rsa->meth->rsa_priv_enc(flen, from, to, rsa, padding));
101 }
102
103 int RSA_private_decrypt(int flen, const unsigned char *from, unsigned char *to,
104     RSA *rsa, int padding)
105 {
106     #ifdef OPENSSL_FIPS
107     if (FIPS_mode()) && !(rsa->meth->flags & RSA_FLAG_FIPS_METHOD)
108         && !(rsa->flags & RSA_FLAG_NON_FIPS_ALLOW))
109     {
110         RSAerr(RSA_F_RSA_PRIVATE_DECRYPT, RSA_R_NON_FIPS_RSA_METHOD);
111         return -1;
112     }
113 #endif
114     return(rsa->meth->rsa_priv_dec(flen, from, to, rsa, padding));
115 }
116
117 int RSA_public_decrypt(int flen, const unsigned char *from, unsigned char *to,
118     RSA *rsa, int padding)
119 {
120     #ifdef OPENSSL_FIPS
121     if (FIPS_mode()) && !(rsa->meth->flags & RSA_FLAG_FIPS_METHOD)
122         && !(rsa->flags & RSA_FLAG_NON_FIPS_ALLOW))
123     {
124         RSAerr(RSA_F_RSA_PUBLIC_DECRYPT, RSA_R_NON_FIPS_RSA_METHOD);
125         return -1;
126     }
127 #endif
```



```

128     return(rsa->meth->rsa_pub_dec(flen, from, to, rsa, padding));
129 }

131 int RSA_flags(const RSA *r)
132 {
133     return((r == NULL)?0:r->meth->flags);
134 }

136 void RSA_blinding_off(RSA *rsa)
137 {
138     if (rsa->blinding != NULL)
139     {
140         BN_BLINDING_free(rsa->blinding);
141         rsa->blinding=NULL;
142     }
143     rsa->flags &= ~RSA_FLAG_BLINDING;
144     rsa->flags |= RSA_FLAG_NO_BLINDING;
145 }

147 int RSA_blinding_on(RSA *rsa, BN_CTX *ctx)
148 {
149     int ret=0;

151     if (rsa->blinding != NULL)
152         RSA_blinding_off(rsa);

154     rsa->blinding = RSA_setup_blinding(rsa, ctx);
155     if (rsa->blinding == NULL)
156         goto err;

158     rsa->flags |= RSA_FLAG_BLINDING;
159     rsa->flags &= ~RSA_FLAG_NO_BLINDING;
160     ret=1;
161 err:
162     return(ret);
163 }

165 static BIGNUM *rsa_get_public_exp(const BIGNUM *d, const BIGNUM *p,
166 const BIGNUM *q, BN_CTX *ctx)
167 {
168     BIGNUM *ret = NULL, *r0, *r1, *r2;

170     if (d == NULL || p == NULL || q == NULL)
171         return NULL;

173     BN_CTX_start(ctx);
174     r0 = BN_CTX_get(ctx);
175     r1 = BN_CTX_get(ctx);
176     r2 = BN_CTX_get(ctx);
177     if (r2 == NULL)
178         goto err;

180     if (!BN_sub(r1, p, BN_value_one())) goto err;
181     if (!BN_sub(r2, q, BN_value_one())) goto err;
182     if (!BN_mul(r0, r1, r2, ctx)) goto err;

184     ret = BN_mod_inverse(NULL, d, r0, ctx);
185 err:
186     BN_CTX_end(ctx);
187     return ret;
188 }

190 BN_BLINDING *RSA_setup_blinding(RSA *rsa, BN_CTX *in_ctx)
191 {
192     BIGNUM local_n;
193     BIGNUM *e,*n;

```

```

194     BN_CTX *ctx;
195     BN_BLINDING *ret = NULL;

197     if (in_ctx == NULL)
198     {
199         if ((ctx = BN_CTX_new()) == NULL) return 0;
200     }
201     else
202         ctx = in_ctx;

204     BN_CTX_start(ctx);
205     e = BN_CTX_get(ctx);
206     if (e == NULL)
207     {
208         RSAerr(RSA_F_RSA_SETUP_BLINDING, ERR_R_MALLOC_FAILURE);
209         goto err;
210     }

212     if (rsa->e == NULL)
213     {
214         e = rsa_get_public_exp(rsa->d, rsa->p, rsa->q, ctx);
215         if (e == NULL)
216         {
217             RSAerr(RSA_F_RSA_SETUP_BLINDING, RSA_R_NO_PUBLIC_EXPONENT);
218             goto err;
219         }
220     }
221     else
222         e = rsa->e;

224     if ((RAND_status() == 0) && rsa->d != NULL && rsa->d->d != NULL)
225     {
226         /* if PRNG is not properly seeded, resort to secret
227          * exponent as unpredictable seed */
228         RAND_add(rsa->d->d, rsa->d->dmax * sizeof rsa->d->d[0], 0.0);
229     }

232     if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
233     {
234         /* Set BN_FLG_CONSTTIME flag */
235         n = &local_n;
236         BN_with_flags(n, rsa->n, BN_FLG_CONSTTIME);
237     }
238     else
239         n = rsa->n;

241     ret = BN_BLINDING_create_param(NULL, e, n, ctx,
242                                     rsa->meth->bn_mod_exp, rsa->method_mod_n);
243     if (ret == NULL)
244     {
245         RSAerr(RSA_F_RSA_SETUP_BLINDING, ERR_R_BN_LIB);
246         goto err;
247     }
248     CRYPTO_THREADID_current(&BN_BLINDING_thread_id(ret));
249 err:
250     BN_CTX_end(ctx);
251     if (in_ctx == NULL)
252         BN_CTX_free(ctx);
253     if (rsa->e == NULL)
254         BN_free(e);

256     return ret;
257 }

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_depr.c

1

```
*****
3558 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_depr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rsa/rsa_depr.c */
2 /* =====
3  * Copyright (c) 1998-2002 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
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15  * distribution.
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17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
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43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NB: This file contains deprecated functions (compatibility wrappers to the
57  * "new" versions). */

59 #include <stdio.h>
60 #include <time.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_depr.c

2

```
62 #include <openssl/bn.h>
63 #include <openssl/rsa.h>

65 #ifdef OPENSSL_NO_DEPRECATED

67 static void *dummy=&dummy;

69 #else

71 RSA *RSA_generate_key(int bits, unsigned long e_value,
72                       void (*callback)(int,int,void *), void *cb_arg)
73 {
74     BN_GENCB cb;
75     int i;
76     RSA *rsa = RSA_new();
77     BIGNUM *e = BN_new();

79     if(!rsa || !e) goto err;

81     /* The problem is when building with 8, 16, or 32 BN_ULONG,
82      * unsigned long can be larger */
83     for (i=0; i<(int)sizeof(unsigned long)*8; i++)
84     {
85         if (e_value & (1UL<<i))
86             if (BN_set_bit(e,i) == 0)
87                 goto err;
88     }

90     BN_GENCB_set_old(&cb, callback, cb_arg);

92     if(RSA_generate_key_ex(rsa, bits, e, &cb)) {
93         BN_free(e);
94         return rsa;
95     }
96 err:
97     if(e) BN_free(e);
98     if(rsa) RSA_free(rsa);
99     return 0;
100 }
101 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_eay.c

1

```
*****
25183 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_eay.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_eay.c

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```
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108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include "cryptlib.h"
114 #include <openssl/bn.h>
115 #include <openssl/rsa.h>
116 #include <openssl/rand.h>
117
118 #ifndef RSA_NULL
119
120 static int RSA_eay_public_encrypt(int flen, const unsigned char *from,
121 unsigned char *to, RSA *rsa, int padding);
122 static int RSA_eay_private_encrypt(int flen, const unsigned char *from,
123 unsigned char *to, RSA *rsa, int padding);
124 static int RSA_eay_public_decrypt(int flen, const unsigned char *from,
125 unsigned char *to, RSA *rsa, int padding);
126 static int RSA_eay_private_decrypt(int flen, const unsigned char *from,
127 unsigned char *to, RSA *rsa, int padding);
```

```

128 static int RSA_eay_mod_exp(BIGNUM *r0, const BIGNUM *i, RSA *rsa, BN_CTX *ctx);
129 static int RSA_eay_init(RSA *rsa);
130 static int RSA_eay_finish(RSA *rsa);
131 static RSA_METHOD rsa_pkcs1_eay_meth={
132     "Eric Young's PKCS#1 RSA",
133     RSA_eay_public_encrypt,
134     RSA_eay_public_decrypt, /* signature verification */
135     RSA_eay_private_encrypt, /* signing */
136     RSA_eay_private_decrypt,
137     RSA_eay_mod_exp,
138     BN_mod_exp_mont, /* XXX probably we should not use Montgomery if e == 3
139     RSA_eay_init,
140     RSA_eay_finish,
141     0, /* flags */
142     NULL,
143     0, /* rsa_sign */
144     0, /* rsa_verify */
145     NULL /* rsa_keygen */
146 };

148 const RSA_METHOD *RSA_PKCS1_SSLeay(void)
149 {
150     return(&rsa_pkcs1_eay_meth);
151 }

153 static int RSA_eay_public_encrypt(int flen, const unsigned char *from,
154     unsigned char *to, RSA *rsa, int padding)
155 {
156     BIGNUM *f,*ret;
157     int i,j,k,num=0,r=-1;
158     unsigned char *buf=NULL;
159     BN_CTX *ctx=NULL;

161     if (BN_num_bits(rsa->n) > OPENSSL_RSA_MAX_MODULUS_BITS)
162     {
163         RSAerr(RSA_F_RSA_EAY_PUBLIC_ENCRYPT, RSA_R_MODULUS_TOO_LARGE);
164         return -1;
165     }

167     if (BN_ucmp(rsa->n, rsa->e) <= 0)
168     {
169         RSAerr(RSA_F_RSA_EAY_PUBLIC_ENCRYPT, RSA_R_BAD_E_VALUE);
170         return -1;
171     }

173     /* for large moduli, enforce exponent limit */
174     if (BN_num_bits(rsa->n) > OPENSSL_RSA_SMALL_MODULUS_BITS)
175     {
176         if (BN_num_bits(rsa->e) > OPENSSL_RSA_MAX_PUBEXP_BITS)
177         {
178             RSAerr(RSA_F_RSA_EAY_PUBLIC_ENCRYPT, RSA_R_BAD_E_VALUE);
179             return -1;
180         }
181     }

182     if ((ctx=BN_CTX_new()) == NULL) goto err;
183     BN_CTX_start(ctx);
184     f = BN_CTX_get(ctx);
185     ret = BN_CTX_get(ctx);
186     num=BN_num_bytes(rsa->n);
187     buf = OPENSSL_malloc(num);
188     if (!f || !ret || !buf)
189     {
190         RSAerr(RSA_F_RSA_EAY_PUBLIC_ENCRYPT,ERR_R_MALLOC_FAILURE);
191         goto err;
192     }
193 }

```

```

195     switch (padding)
196     {
197     case RSA_PKCS1_PADDING:
198         i=RSA_padding_add_PKCS1_type_2(buf,num,from,flen);
199         break;
200 #ifndef OPENSSL_NO_SHA
201     case RSA_PKCS1_OAEP_PADDING:
202         i=RSA_padding_add_PKCS1_OAEP(buf,num,from,flen,NULL,0);
203         break;
204 #endif
205     case RSA_SSLV23_PADDING:
206         i=RSA_padding_add_SSLv23(buf,num,from,flen);
207         break;
208     case RSA_NO_PADDING:
209         i=RSA_padding_add_none(buf,num,from,flen);
210         break;
211     default:
212         RSAerr(RSA_F_RSA_EAY_PUBLIC_ENCRYPT,RSA_R_UNKNOWN_PADDING_TYPE);
213         goto err;
214     }
215     if (i <= 0) goto err;

217     if (BN_bin2bn(buf,num,f) == NULL) goto err;
218
219     if (BN_ucmp(f, rsa->n) >= 0)
220     {
221         /* usually the padding functions would catch this */
222         RSAerr(RSA_F_RSA_EAY_PUBLIC_ENCRYPT,RSA_R_DATA_TOO_LARGE_FOR_MOD
223         goto err;
224     }

226     if (rsa->flags & RSA_FLAG_CACHE_PUBLIC)
227         if (!BN_MONT_CTX_set_locked(&rsa->method_mod_n, CRYPTO_LOCK_RSA
228         goto err;

230     if (!rsa->meth->bn_mod_exp(ret,f,rsa->e,rsa->n,ctx,
231         rsa->method_mod_n)) goto err;

233     /* put in leading 0 bytes if the number is less than the
234     * length of the modulus */
235     j=BN_num_bytes(ret);
236     i=BN_bin2bn(ret,&(to[num-j]));
237     for (k=0; k<(num-i); k++)
238         to[k]=0;

240     r=num;
241 err:
242     if (ctx != NULL)
243     {
244         BN_CTX_end(ctx);
245         BN_CTX_free(ctx);
246     }
247     if (buf != NULL)
248     {
249         OPENSSL_cleanse(buf,num);
250         OPENSSL_free(buf);
251     }
252     return(r);
253 }

255 static BN_BLINDING *rsa_get_blinding(RSA *rsa, int *local, BN_CTX *ctx)
256 {
257     BN_BLINDING *ret;
258     int got_write_lock = 0;
259     CRYPTO_THREADID cur;

```

```

261     CRYPTO_r_lock(CRYPTO_LOCK_RSA);
263     if (rsa->blinding == NULL)
264     {
265         CRYPTO_r_unlock(CRYPTO_LOCK_RSA);
266         CRYPTO_w_lock(CRYPTO_LOCK_RSA);
267         got_write_lock = 1;
269         if (rsa->blinding == NULL)
270             rsa->blinding = RSA_setup_blinding(rsa, ctx);
271     }
273     ret = rsa->blinding;
274     if (ret == NULL)
275         goto err;
277     CRYPTO_THREADID_current(&cur);
278     if (!CRYPTO_THREADID_cmp(&cur, BN_BLINDING_thread_id(ret)))
279     {
280         /* rsa->blinding is ours! */
282         *local = 1;
283     }
284     else
285     {
286         /* resort to rsa->mt_blinding instead */
288         *local = 0; /* instructs rsa_blinding_convert(), rsa_blinding_in
289                    * that the BN_BLINDING is shared, meaning that acce
290                    * require locks, and that the blinding factor must
291                    * stored outside the BN_BLINDING
292                    */
294         if (rsa->mt_blinding == NULL)
295         {
296             if (!got_write_lock)
297             {
298                 CRYPTO_r_unlock(CRYPTO_LOCK_RSA);
299                 CRYPTO_w_lock(CRYPTO_LOCK_RSA);
300                 got_write_lock = 1;
301             }
302             if (rsa->mt_blinding == NULL)
303                 rsa->mt_blinding = RSA_setup_blinding(rsa, ctx);
304         }
305         ret = rsa->mt_blinding;
306     }
307 err:
309     if (got_write_lock)
310         CRYPTO_w_unlock(CRYPTO_LOCK_RSA);
311     else
312         CRYPTO_r_unlock(CRYPTO_LOCK_RSA);
313     return ret;
314 }
315 }
317 static int rsa_blinding_convert(BN_BLINDING *b, BIGNUM *f, BIGNUM *unblind,
318                                BN_CTX *ctx)
319 {
320     if (unblind == NULL)
321     {
322         /* Local blinding: store the unblinding factor
323          * in BN_BLINDING. */
324         return BN_BLINDING_convert_ex(f, NULL, b, ctx);
325     }

```

```

326         /* Shared blinding: store the unblinding factor
327          * outside BN_BLINDING. */
328         int ret;
329         CRYPTO_w_lock(CRYPTO_LOCK_RSA_BLINDING);
330         ret = BN_BLINDING_convert_ex(f, unblind, b, ctx);
331         CRYPTO_w_unlock(CRYPTO_LOCK_RSA_BLINDING);
332         return ret;
333     }
334 }
336 static int rsa_blinding_invert(BN_BLINDING *b, BIGNUM *f, BIGNUM *unblind,
337                                BN_CTX *ctx)
338 {
339     /* For local blinding, unblind is set to NULL, and BN_BLINDING_invert_ex
340     * will use the unblinding factor stored in BN_BLINDING.
341     * If BN_BLINDING is shared between threads, unblind must be non-null:
342     * BN_BLINDING_invert_ex will then use the local unblinding factor,
343     * and will only read the modulus from BN_BLINDING.
344     * In both cases it's safe to access the blinding without a lock.
345     */
346     return BN_BLINDING_invert_ex(f, unblind, b, ctx);
347 }
349 /* signing */
350 static int RSA_eay_private_encrypt(int flen, const unsigned char *from,
351                                    unsigned char *to, RSA *rsa, int padding)
352 {
353     BIGNUM *f, *ret, *res;
354     int i, j, k, num=0, r=-1;
355     unsigned char *buf=NULL;
356     BN_CTX *ctx=NULL;
357     int local_blinding = 0;
358     /* Used only if the blinding structure is shared. A non-NULL unblind
359     * instructs rsa_blinding_convert() and rsa_blinding_invert() to store
360     * the unblinding factor outside the blinding structure. */
361     BIGNUM *unblind = NULL;
362     BN_BLINDING *blinding = NULL;
364     if ((ctx=BN_CTX_new()) == NULL) goto err;
365     BN_CTX_start(ctx);
366     f = BN_CTX_get(ctx);
367     ret = BN_CTX_get(ctx);
368     num = BN_num_bytes(rsa->n);
369     buf = OPENSSL_malloc(num);
370     if(!f || !ret || !buf)
371     {
372         RSAerr(RSA_F_RSA_EAY_PRIVATE_ENCRYPT,ERR_R_MALLOC_FAILURE);
373         goto err;
374     }
376     switch (padding)
377     {
378     case RSA_PKCS1_PADDING:
379         i=RSA_padding_add_PKCS1_type_1(buf, num, from, flen);
380         break;
381     case RSA_X931_PADDING:
382         i=RSA_padding_add_X931(buf, num, from, flen);
383         break;
384     case RSA_NO_PADDING:
385         i=RSA_padding_add_none(buf, num, from, flen);
386         break;
387     case RSA_SSLV23_PADDING:
388     default:
389         RSAerr(RSA_F_RSA_EAY_PRIVATE_ENCRYPT, RSA_R_UNKNOWN_PADDING_TYPE)
390         goto err;
391     }

```

```

392     if (i <= 0) goto err;

394     if (BN_bin2bn(buf,num,f) == NULL) goto err;
395
396     if (BN_ucmp(f, rsa->n) >= 0)
397     {
398         /* usually the padding functions would catch this */
399         RSAerr(RSA_F_RSA_EAY_PRIVATE_ENCRYPT, RSA_R_DATA_TOO_LARGE_FOR_MODULUS,
400             "data too large for modulus");
401         goto err;
402     }

403     if (!(rsa->flags & RSA_FLAG_NO_BLINDING))
404     {
405         blinding = rsa_get_blinding(rsa, &local_blinding, ctx);
406         if (blinding == NULL)
407         {
408             RSAerr(RSA_F_RSA_EAY_PRIVATE_ENCRYPT, ERR_R_INTERNAL_ERROR,
409                 "no blinding available");
410             goto err;
411         }
412     }

413     if (blinding != NULL)
414     {
415         if (!local_blinding && ((unblind = BN_CTX_get(ctx)) == NULL))
416         {
417             RSAerr(RSA_F_RSA_EAY_PRIVATE_ENCRYPT, ERR_R_MALLOC_FAILURE,
418                 "no blinding available");
419             goto err;
420         }
421         if (!rsa_blinding_convert(blinding, f, unblind, ctx))
422             goto err;
423     }

424     if ( (rsa->flags & RSA_FLAG_EXT_PKEY) ||
425         ((rsa->p != NULL) &&
426          (rsa->q != NULL) &&
427          (rsa->dp1 != NULL) &&
428          (rsa->dmq1 != NULL) &&
429          (rsa->iqmp != NULL)) )
430     {
431         if (!rsa->meth->rsa_mod_exp(ret, f, rsa, ctx)) goto err;
432     }
433     else
434     {
435         BIGNUM local_d;
436         BIGNUM *d = NULL;
437
438         if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
439         {
440             BN_init(&local_d);
441             d = &local_d;
442             BN_with_flags(d, rsa->d, BN_FLG_CONSTTIME);
443         }
444         else
445             d = rsa->d;

447         if (rsa->flags & RSA_FLAG_CACHE_PUBLIC)
448             if (!BN_MONT_CTX_set_locked(&rsa->_method_mod_n, CRYPTO_L,
449                 d, rsa->_method_mod_n)) goto err;

451         if (!rsa->meth->bn_mod_exp(ret, f, d, rsa->n, ctx,
452             rsa->_method_mod_n)) goto err;
453     }

455     if (blinding)
456         if (!rsa_blinding_invert(blinding, ret, unblind, ctx))
457             goto err;

```

```

459     if (padding == RSA_X931_PADDING)
460     {
461         BN_sub(f, rsa->n, ret);
462         if (BN_cmp(ret, f))
463             res = f;
464         else
465             res = ret;
466     }
467     else
468         res = ret;

470     /* put in leading 0 bytes if the number is less than the
471        * length of the modulus */
472     j = BN_num_bytes(res);
473     i = BN_bn2bin(res, &(to[num-j]));
474     for (k=0; k<(num-i); k++)
475         to[k] = 0;

477     r = num;
478 err:
479     if (ctx != NULL)
480     {
481         BN_CTX_end(ctx);
482         BN_CTX_free(ctx);
483     }
484     if (buf != NULL)
485     {
486         OPENSSL_cleanse(buf, num);
487         OPENSSL_free(buf);
488     }
489     return(r);
490 }

492 static int RSA_eay_private_decrypt(int flen, const unsigned char *from,
493     unsigned char *to, RSA *rsa, int padding)
494 {
495     BIGNUM *f, *ret;
496     int j, num=0, r=-1;
497     unsigned char *p;
498     unsigned char *buf=NULL;
499     BN_CTX *ctx=NULL;
500     int local_blinding = 0;
501     /* Used only if the blinding structure is shared. A non-NULL unblind
502        * instructs rsa_blinding_convert() and rsa_blinding_invert() to store
503        * the unblinding factor outside the blinding structure. */
504     BIGNUM *unblind = NULL;
505     BN_BLINDING *blinding = NULL;

507     if ((ctx = BN_CTX_new()) == NULL) goto err;
508     BN_CTX_start(ctx);
509     f = BN_CTX_get(ctx);
510     ret = BN_CTX_get(ctx);
511     num = BN_num_bytes(rsa->n);
512     buf = OPENSSL_malloc(num);
513     if (!f || !ret || !buf)
514     {
515         RSAerr(RSA_F_RSA_EAY_PRIVATE_DECRYPT, ERR_R_MALLOC_FAILURE,
516             "no blinding available");
517         goto err;
518     }

519     /* This check was for equality but PGP does evil things
520        * and chops off the top '0' bytes */
521     if (flen > num)
522     {
523         RSAerr(RSA_F_RSA_EAY_PRIVATE_DECRYPT, RSA_R_DATA_GREATER_THAN_MOD

```

```

524         goto err;
525     }

527     /* make data into a big number */
528     if (BN_bin2bn(from, (int)flen, f) == NULL) goto err;

530     if (BN_ucmp(f, rsa->n) >= 0)
531     {
532         RSAerr(RSA_F_RSA_EAY_PRIVATE_DECRYPT, RSA_R_DATA_TOO_LARGE_FOR_MODULUS, "data too large for modulus");
533         goto err;
534     }

536     if (!(rsa->flags & RSA_FLAG_NO_BLINDING))
537     {
538         blinding = rsa_get_blinding(rsa, &local_blinding, ctx);
539         if (blinding == NULL)
540         {
541             RSAerr(RSA_F_RSA_EAY_PRIVATE_DECRYPT, ERR_R_INTERNAL_ERROR, "no blinding available");
542             goto err;
543         }
544     }

546     if (blinding != NULL)
547     {
548         if (!local_blinding && ((unblind = BN_CTX_get(ctx)) == NULL))
549         {
550             RSAerr(RSA_F_RSA_EAY_PRIVATE_DECRYPT, ERR_R_MALLOC_FAILURE, "no blinding available");
551             goto err;
552         }
553         if (!rsa_blinding_convert(blinding, f, unblind, ctx))
554             goto err;
555     }

557     /* do the decrypt */
558     if ( (rsa->flags & RSA_FLAG_EXT_PKEY) ||
559         ((rsa->p != NULL) &&
560          (rsa->q != NULL) &&
561          (rsa->dmp1 != NULL) &&
562          (rsa->dmq1 != NULL) &&
563          (rsa->iqmp != NULL)) )
564     {
565         if (!rsa->meth->rsa_mod_exp(ret, f, rsa, ctx)) goto err;
566     }
567     else
568     {
569         BIGNUM local_d;
570         BIGNUM *d = NULL;
571
572         if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
573         {
574             d = &local_d;
575             BN_with_flags(d, rsa->d, BN_FLG_CONSTTIME);
576         }
577         else
578             d = rsa->d;

580         if (rsa->flags & RSA_FLAG_CACHE_PUBLIC)
581             if (!BN_MONT_CTX_set_locked(&rsa->method_mod_n, CRYPTO_LOCK_MODULUS, d, rsa->method_mod_n))
582                 goto err;
583         if (!rsa->meth->bn_mod_exp(ret, f, d, rsa->n, ctx,
584                                   rsa->method_mod_n))
585             goto err;
586     }

588     if (blinding)
589         if (!rsa_blinding_invert(blinding, ret, unblind, ctx))

```

```

590         goto err;

592     p=buf;
593     j=BN_bn2bin(ret,p); /* j is only used with no-padding mode */

595     switch (padding)
596     {
597     case RSA_PKCS1_PADDING:
598         r=RSA_padding_check_PKCS1_type_2(to, num, buf, j, num);
599         break;
600 #ifndef OPENSSL_NO_SHA
601     case RSA_PKCS1_OAEP_PADDING:
602         r=RSA_padding_check_PKCS1_OAEP(to, num, buf, j, num, NULL, 0);
603         break;
604 #endif
605     case RSA_SSLV23_PADDING:
606         r=RSA_padding_check_SSLV23(to, num, buf, j, num);
607         break;
608     case RSA_NO_PADDING:
609         r=RSA_padding_check_none(to, num, buf, j, num);
610         break;
611     default:
612         RSAerr(RSA_F_RSA_EAY_PRIVATE_DECRYPT, RSA_R_UNKNOWN_PADDING_TYPE, "unknown padding type");
613         goto err;
614     }
615     if (r < 0)
616         RSAerr(RSA_F_RSA_EAY_PRIVATE_DECRYPT, RSA_R_PADDING_CHECK_FAILED, "padding check failed");

618 err:
619     if (ctx != NULL)
620     {
621         BN_CTX_end(ctx);
622         BN_CTX_free(ctx);
623     }
624     if (buf != NULL)
625     {
626         OPENSSL_cleanse(buf, num);
627         OPENSSL_free(buf);
628     }
629     return(r);
630 }

632 /* signature verification */
633 static int RSA_eay_public_decrypt(int flen, const unsigned char *from,
634                                   unsigned char *to, RSA *rsa, int padding)
635 {
636     BIGNUM *f, *ret;
637     int i, num=0, r=-1;
638     unsigned char *p;
639     unsigned char *buf=NULL;
640     BN_CTX *ctx=NULL;

642     if (BN_num_bits(rsa->n) > OPENSSL_RSA_MAX_MODULUS_BITS)
643     {
644         RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT, RSA_R_MODULUS_TOO_LARGE, "modulus too large");
645         return -1;
646     }

648     if (BN_ucmp(rsa->n, rsa->e) <= 0)
649     {
650         RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT, RSA_R_BAD_E_VALUE, "bad e value");
651         return -1;
652     }

654     /* for large moduli, enforce exponent limit */
655     if (BN_num_bits(rsa->n) > OPENSSL_RSA_SMALL_MODULUS_BITS)

```

```

656     {
657         if (BN_num_bits(rsa->e) > OPENSSL_RSA_MAX_PUBEXP_BITS)
658         {
659             RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT, RSA_R_BAD_E_VALUE);
660             return -1;
661         }
662     }
663
664     if((ctx = BN_CTX_new()) == NULL) goto err;
665     BN_CTX_start(ctx);
666     f = BN_CTX_get(ctx);
667     ret = BN_CTX_get(ctx);
668     num=BN_num_bytes(rsa->n);
669     buf = OPENSSL_malloc(num);
670     if(!f || !ret || !buf)
671     {
672         RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT,ERR_R_MALLOC_FAILURE);
673         goto err;
674     }
675
676     /* This check was for equality but PGP does evil things
677      * and chops off the top '0' bytes */
678     if (flen > num)
679     {
680         RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT,RSA_R_DATA_GREATER_THAN_MOD_
681             goto err;
682     }
683
684     if (BN_bin2bn(from,flen,f) == NULL) goto err;
685
686     if (BN_ucmp(f, rsa->n) >= 0)
687     {
688         RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT,RSA_R_DATA_TOO_LARGE_FOR_MOD
689             goto err;
690     }
691
692     if (rsa->flags & RSA_FLAG_CACHE_PUBLIC)
693         if (!BN_MONT_CTX_set_locked(&rsa->_method_mod_n, CRYPTO_LOCK_RSA
694             goto err;
695
696     if (!rsa->meth->bn_mod_exp(ret,f,rsa->e,rsa->n,ctx,
697         rsa->_method_mod_n)) goto err;
698
699     if ((padding == RSA_X931_PADDING) && ((ret->d[0] & 0xf) != 12))
700         if (!BN_sub(ret, rsa->n, ret)) goto err;
701
702     p=buf;
703     i=BN_bn2bin(ret,p);
704
705     switch (padding)
706     {
707     case RSA_PKCS1_PADDING:
708         r=RSA_padding_check_PKCS1_type_1(to,num,buf,i,num);
709         break;
710     case RSA_X931_PADDING:
711         r=RSA_padding_check_X931(to,num,buf,i,num);
712         break;
713     case RSA_NO_PADDING:
714         r=RSA_padding_check_none(to,num,buf,i,num);
715         break;
716     default:
717         RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT,RSA_R_UNKNOWN_PADDING_TYPE);
718         goto err;
719     }
720     if (r < 0)
721         RSAerr(RSA_F_RSA_EAY_PUBLIC_DECRYPT,RSA_R_PADDING_CHECK_FAILED);

```

```

723 err:
724     if (ctx != NULL)
725     {
726         BN_CTX_end(ctx);
727         BN_CTX_free(ctx);
728     }
729     if (buf != NULL)
730     {
731         OPENSSL_cleanse(buf,num);
732         OPENSSL_free(buf);
733     }
734     return(r);
735 }
736
737 static int RSA_eay_mod_exp(BIGNUM *r0, const BIGNUM *I, RSA *rsa, BN_CTX *ctx)
738 {
739     BIGNUM *r1,*m1,*vrfy;
740     BIGNUM local_dmp1,local_dmqr1,local_c,local_r1;
741     BIGNUM *dmp1,*dmqr1,*c,*pr1;
742     int ret=0;
743
744     BN_CTX_start(ctx);
745     r1 = BN_CTX_get(ctx);
746     m1 = BN_CTX_get(ctx);
747     vrfy = BN_CTX_get(ctx);
748
749     {
750         BIGNUM local_p, local_q;
751         BIGNUM *p = NULL, *q = NULL;
752
753         /* Make sure BN_mod_inverse in Montgomery initialization uses the
754          * BN_FLG_CONSTTIME flag (unless RSA_FLAG_NO_CONSTTIME is set)
755          */
756         if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
757         {
758             BN_init(&local_p);
759             p = &local_p;
760             BN_with_flags(p, rsa->p, BN_FLG_CONSTTIME);
761
762             BN_init(&local_q);
763             q = &local_q;
764             BN_with_flags(q, rsa->q, BN_FLG_CONSTTIME);
765         }
766         else
767         {
768             p = rsa->p;
769             q = rsa->q;
770         }
771
772         if (rsa->flags & RSA_FLAG_CACHE_PRIVATE)
773         {
774             if (!BN_MONT_CTX_set_locked(&rsa->_method_mod_p, CRYPTO_
775                 goto err;
776             if (!BN_MONT_CTX_set_locked(&rsa->_method_mod_q, CRYPTO_
777                 goto err;
778         }
779     }
780
781     if (rsa->flags & RSA_FLAG_CACHE_PUBLIC)
782         if (!BN_MONT_CTX_set_locked(&rsa->_method_mod_n, CRYPTO_LOCK_RSA
783             goto err;
784
785     /* compute I mod q */
786     if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
787     {

```



```

788     c = &local_c;
789     BN_with_flags(c, I, BN_FLG_CONSTTIME);
790     if (!BN_mod(r1, c, rsa->q, ctx)) goto err;
791 }
792 else
793 {
794     if (!BN_mod(r1, I, rsa->q, ctx)) goto err;
795 }

797 /* compute r1^dmq1 mod q */
798 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
799 {
800     dmq1 = &local_dmq1;
801     BN_with_flags(dmq1, rsa->dmq1, BN_FLG_CONSTTIME);
802 }
803 else
804     dmq1 = rsa->dmq1;
805 if (!rsa->meth->bn_mod_exp(m1, r1, dmq1, rsa->q, ctx,
806     rsa->method_mod_q)) goto err;

808 /* compute I mod p */
809 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
810 {
811     c = &local_c;
812     BN_with_flags(c, I, BN_FLG_CONSTTIME);
813     if (!BN_mod(r1, c, rsa->p, ctx)) goto err;
814 }
815 else
816 {
817     if (!BN_mod(r1, I, rsa->p, ctx)) goto err;
818 }

820 /* compute r1^dmp1 mod p */
821 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
822 {
823     dmp1 = &local_dmp1;
824     BN_with_flags(dmp1, rsa->dmp1, BN_FLG_CONSTTIME);
825 }
826 else
827     dmp1 = rsa->dmp1;
828 if (!rsa->meth->bn_mod_exp(r0, r1, dmp1, rsa->p, ctx,
829     rsa->method_mod_p)) goto err;

831 if (!BN_sub(r0, r0, m1)) goto err;
832 /* This will help stop the size of r0 increasing, which does
833    * affect the multiply if it optimised for a power of 2 size */
834 if (BN_is_negative(r0))
835     if (!BN_add(r0, r0, rsa->p)) goto err;

837 if (!BN_mul(r1, r0, rsa->iqmp, ctx)) goto err;

839 /* Turn BN_FLG_CONSTTIME flag on before division operation */
840 if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
841 {
842     pr1 = &local_r1;
843     BN_with_flags(pr1, r1, BN_FLG_CONSTTIME);
844 }
845 else
846     pr1 = r1;
847 if (!BN_mod(r0, pr1, rsa->p, ctx)) goto err;

849 /* If p < q it is occasionally possible for the correction of
850    * adding 'p' if r0 is negative above to leave the result still
851    * negative. This can break the private key operations: the following
852    * second correction should *always* correct this rare occurrence.
853    * This will *never* happen with OpenSSL generated keys because

```

```

854     * they ensure p > q [steve]
855     */
856     if (BN_is_negative(r0))
857         if (!BN_add(r0, r0, rsa->p)) goto err;
858     if (!BN_mul(r1, r0, rsa->q, ctx)) goto err;
859     if (!BN_add(r0, r1, m1)) goto err;

861     if (rsa->e && rsa->n)
862     {
863         if (!rsa->meth->bn_mod_exp(vrfy, r0, rsa->e, rsa->n, ctx, rsa->metho
864         /* If 'I' was greater than (or equal to) rsa->n, the operation
865            * will be equivalent to using 'I mod n'. However, the result of
866            * the verify will *always* be less than 'n' so we don't check
867            * for absolute equality, just congruency. */
868         if (!BN_sub(vrfy, vrfy, I)) goto err;
869         if (!BN_mod(vrfy, vrfy, rsa->n, ctx)) goto err;
870         if (BN_is_negative(vrfy))
871             if (!BN_add(vrfy, vrfy, rsa->n)) goto err;
872         if (!BN_is_zero(vrfy))
873         {
874             /* 'I' and 'vrfy' aren't congruent mod n. Don't leak
875                * miscalculated CRT output, just do a raw (slower)
876                * mod_exp and return that instead. */

878             BIGNUM local_d;
879             BIGNUM *d = NULL;
880
881             if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
882             {
883                 d = &local_d;
884                 BN_with_flags(d, rsa->d, BN_FLG_CONSTTIME);
885             }
886             else
887                 d = rsa->d;
888             if (!rsa->meth->bn_mod_exp(r0, I, d, rsa->n, ctx,
889                 rsa->method_mod_n)) goto err;
890         }
891     }
892     ret=1;
893 err:
894     BN_CTX_end(ctx);
895     return(ret);
896 }

898 static int RSA_eay_init(RSA *rsa)
899 {
900     rsa->flags|=RSA_FLAG_CACHE_PUBLIC|RSA_FLAG_CACHE_PRIVATE;
901     return(1);
902 }

904 static int RSA_eay_finish(RSA *rsa)
905 {
906     if (rsa->method_mod_n != NULL)
907         BN_MONT_CTX_free(rsa->method_mod_n);
908     if (rsa->method_mod_p != NULL)
909         BN_MONT_CTX_free(rsa->method_mod_p);
910     if (rsa->method_mod_q != NULL)
911         BN_MONT_CTX_free(rsa->method_mod_q);
912     return(1);
913 }

915 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_err.c

1

```
*****
11138 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rsa/rsa_err.c */
2 /* =====
3  * Copyright (c) 1999-2011 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
8  *
9  * 1. Redistributions of source code must retain the above copyright
10  * notice, this list of conditions and the following disclaimer.
11  *
12  * 2. Redistributions in binary form must reproduce the above copyright
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16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
20  * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
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22  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23  * endorse or promote products derived from this software without
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26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
30  *
31  * 6. Redistributions of any form whatsoever must retain the following
32  * acknowledgment:
33  * "This product includes software developed by the OpenSSL Project
34  * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
35  *
36  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
37  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/rsa.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_RSA,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_RSA,0,reason)

71 static ERR_STRING_DATA RSA_str_functs[]=
72 {
73 {ERR_FUNC(RSA_F_CHECK_PADDING_MD), "CHECK_PADDING_MD"},
74 {ERR_FUNC(RSA_F_DO_RSA_PRINT), "DO_RSA_PRINT"},
75 {ERR_FUNC(RSA_F_INT_RSA_VERIFY), "INT_RSA_VERIFY"},
76 {ERR_FUNC(RSA_F_MEMORY_LOCK), "MEMORY_LOCK"},
77 {ERR_FUNC(RSA_F_OLD_RSA_PRIV_DECODE), "OLD_RSA_PRIV_DECODE"},
78 {ERR_FUNC(RSA_F_PKEY_RSA_CTRL), "PKEY_RSA_CTRL"},
79 {ERR_FUNC(RSA_F_PKEY_RSA_CTRL_STR), "PKEY_RSA_CTRL_STR"},
80 {ERR_FUNC(RSA_F_PKEY_RSA_SIGN), "PKEY_RSA_SIGN"},
81 {ERR_FUNC(RSA_F_PKEY_RSA_VERIFY), "PKEY_RSA_VERIFY"},
82 {ERR_FUNC(RSA_F_PKEY_RSA_VERIFYRECOVER), "PKEY_RSA_VERIFYRECOVER"},
83 {ERR_FUNC(RSA_F_RSA_BUILTIN_KEYGEN), "RSA_BUILTIN_KEYGEN"},
84 {ERR_FUNC(RSA_F_RSA_CHECK_KEY), "RSA_check_key"},
85 {ERR_FUNC(RSA_F_RSA_EAY_PRIVATE_DECRYPT), "RSA_EAY_PRIVATE_DECRYPT"},
86 {ERR_FUNC(RSA_F_RSA_EAY_PRIVATE_ENCRYPT), "RSA_EAY_PRIVATE_ENCRYPT"},
87 {ERR_FUNC(RSA_F_RSA_EAY_PUBLIC_DECRYPT), "RSA_EAY_PUBLIC_DECRYPT"},
88 {ERR_FUNC(RSA_F_RSA_EAY_PUBLIC_ENCRYPT), "RSA_EAY_PUBLIC_ENCRYPT"},
89 {ERR_FUNC(RSA_F_RSA_GENERATE_KEY), "RSA_generate_key"},
90 {ERR_FUNC(RSA_F_RSA_GENERATE_KEY_EX), "RSA_generate_key_ex"},
91 {ERR_FUNC(RSA_F_RSA_ITEM_VERIFY), "RSA_ITEM_VERIFY"},
92 {ERR_FUNC(RSA_F_RSA_MEMORY_LOCK), "RSA_memory_lock"},
93 {ERR_FUNC(RSA_F_RSA_NEW_METHOD), "RSA_new_method"},
94 {ERR_FUNC(RSA_F_RSA_NULL), "RSA_NULL"},
95 {ERR_FUNC(RSA_F_RSA_NULL_MOD_EXP), "RSA_NULL_MOD_EXP"},
96 {ERR_FUNC(RSA_F_RSA_NULL_PRIVATE_DECRYPT), "RSA_NULL_PRIVATE_DECRYPT"},
97 {ERR_FUNC(RSA_F_RSA_NULL_PRIVATE_ENCRYPT), "RSA_NULL_PRIVATE_ENCRYPT"},
98 {ERR_FUNC(RSA_F_RSA_NULL_PUBLIC_DECRYPT), "RSA_NULL_PUBLIC_DECRYPT"},
99 {ERR_FUNC(RSA_F_RSA_NULL_PUBLIC_ENCRYPT), "RSA_NULL_PUBLIC_ENCRYPT"},
100 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_NONE), "RSA_padding_add_none"},
101 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_PKCS1_OAEP), "RSA_padding_add_PKCS1_OAEP"},
102 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_PKCS1_PSS), "RSA_padding_add_PKCS1_PSS"},
103 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_PKCS1_PSS_MGF1), "RSA_padding_add_PKCS1_PSS_MGF1"},
104 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_PKCS1_TYPE_1), "RSA_padding_add_PKCS1_type_1"},
105 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_PKCS1_TYPE_2), "RSA_padding_add_PKCS1_type_2"},
106 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_SSLV23), "RSA_padding_add_SSLV23"},
107 {ERR_FUNC(RSA_F_RSA_PADDING_ADD_X931), "RSA_padding_add_X931"},
108 {ERR_FUNC(RSA_F_RSA_PADDING_CHECK_NONE), "RSA_padding_check_none"},
109 {ERR_FUNC(RSA_F_RSA_PADDING_CHECK_PKCS1_OAEP), "RSA_padding_check_PKCS1_OAEP"},
110 {ERR_FUNC(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_1), "RSA_padding_check_PKCS1_type_1"},
111 {ERR_FUNC(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_2), "RSA_padding_check_PKCS1_type_2"},
112 {ERR_FUNC(RSA_F_RSA_PADDING_CHECK_SSLV23), "RSA_padding_check_SSLV23"},
113 {ERR_FUNC(RSA_F_RSA_PADDING_CHECK_X931), "RSA_padding_check_X931"},
114 {ERR_FUNC(RSA_F_RSA_PRINT), "RSA_print"},
115 {ERR_FUNC(RSA_F_RSA_PRINT_FP), "RSA_print_fp"},
116 {ERR_FUNC(RSA_F_RSA_PRIVATE_DECRYPT), "RSA_private_decrypt"},
117 {ERR_FUNC(RSA_F_RSA_PRIVATE_ENCRYPT), "RSA_private_encrypt"},
118 {ERR_FUNC(RSA_F_RSA_PRIV_DECODE), "RSA_PRIV_DECODE"},
119 {ERR_FUNC(RSA_F_RSA_PRIV_ENCODE), "RSA_PRIV_ENCODE"},
120 {ERR_FUNC(RSA_F_RSA_PUBLIC_DECRYPT), "RSA_public_decrypt"},
121 {ERR_FUNC(RSA_F_RSA_PUBLIC_ENCRYPT), "RSA_public_encrypt"},
122 {ERR_FUNC(RSA_F_RSA_PUB_DECODE), "RSA_PUB_DECODE"},
123 {ERR_FUNC(RSA_F_RSA_SETUP_BLINDING), "RSA_setup_blinding"},
124 {ERR_FUNC(RSA_F_RSA_SIGN), "RSA_sign"},
125 {ERR_FUNC(RSA_F_RSA_SIGN_ASN1_OCTET_STRING), "RSA_sign_ASN1_OCTET_STRING"},
126 {ERR_FUNC(RSA_F_RSA_VERIFY), "RSA_verify"},
127 {ERR_FUNC(RSA_F_RSA_VERIFY_ASN1_OCTET_STRING), "RSA_verify_ASN1_OCTET_STRING"},
```

```

128 {ERR_FUNC(RSA_F_RSA_VERIFY_PKCS1_PSS), "RSA_verify_PKCS1_PSS"},
129 {ERR_FUNC(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1), "RSA_verify_PKCS1_PSS_mgf1"},
130 {0, NULL}
131 };

133 static ERR_STRING_DATA RSA_str_reasons[]=
134 {
135 {ERR_REASON(RSA_R_ALGORITHM_MISMATCH), "algorithm mismatch"},
136 {ERR_REASON(RSA_R_BAD_E_VALUE), "bad e value"},
137 {ERR_REASON(RSA_R_BAD_FIXED_HEADER_DECRYPT), "bad fixed header decrypt"},
138 {ERR_REASON(RSA_R_BAD_PAD_BYTE_COUNT), "bad pad byte count"},
139 {ERR_REASON(RSA_R_BAD_SIGNATURE), "bad signature"},
140 {ERR_REASON(RSA_R_BLOCK_TYPE_IS_NOT_01), "block type is not 01"},
141 {ERR_REASON(RSA_R_BLOCK_TYPE_IS_NOT_02), "block type is not 02"},
142 {ERR_REASON(RSA_R_DATA_GREATER_THAN_MOD_LEN), "data greater than mod len"},
143 {ERR_REASON(RSA_R_DATA_TOO_LARGE), "data too large"},
144 {ERR_REASON(RSA_R_DATA_TOO_LARGE_FOR_KEY_SIZE), "data too large for key size"},
145 {ERR_REASON(RSA_R_DATA_TOO_LARGE_FOR_MODULUS), "data too large for modulus"},
146 {ERR_REASON(RSA_R_DATA_TOO_SMALL), "data too small"},
147 {ERR_REASON(RSA_R_DATA_TOO_SMALL_FOR_KEY_SIZE), "data too small for key size"},
148 {ERR_REASON(RSA_R_DIGEST_TOO_BIG_FOR_RSA_KEY), "digest too big for rsa key"},
149 {ERR_REASON(RSA_R_DMP1_NOT_CONGRUENT_TO_D), "dmp1 not congruent to d"},
150 {ERR_REASON(RSA_R_DMQ1_NOT_CONGRUENT_TO_D), "dmq1 not congruent to d"},
151 {ERR_REASON(RSA_R_D_E_NOT_CONGRUENT_TO_1), "d e not congruent to 1"},
152 {ERR_REASON(RSA_R_FIRST_OCTET_INVALID), "first octet invalid"},
153 {ERR_REASON(RSA_R_ILLEGAL_OR_UNSUPPORTED_PADDING_MODE), "illegal or unsupported p"},
154 {ERR_REASON(RSA_R_INVALID_DIGEST_LENGTH), "invalid digest length"},
155 {ERR_REASON(RSA_R_INVALID_HEADER), "invalid header"},
156 {ERR_REASON(RSA_R_INVALID_KEYBITS), "invalid keybits"},
157 {ERR_REASON(RSA_R_INVALID_MESSAGE_LENGTH), "invalid message length"},
158 {ERR_REASON(RSA_R_INVALID_MGF1_MD), "invalid mgf1 md"},
159 {ERR_REASON(RSA_R_INVALID_PADDING), "invalid padding"},
160 {ERR_REASON(RSA_R_INVALID_PADDING_MODE), "invalid padding mode"},
161 {ERR_REASON(RSA_R_INVALID_PSS_PARAMETERS), "invalid pss parameters"},
162 {ERR_REASON(RSA_R_INVALID_PSS_SALTLEN), "invalid pss saltlen"},
163 {ERR_REASON(RSA_R_INVALID_SALT_LENGTH), "invalid salt length"},
164 {ERR_REASON(RSA_R_INVALID_TRAILER), "invalid trailer"},
165 {ERR_REASON(RSA_R_INVALID_X931_DIGEST), "invalid x931 digest"},
166 {ERR_REASON(RSA_R_IQMP_NOT_INVERSE_OF_Q), "iqmp not inverse of q"},
167 {ERR_REASON(RSA_R_KEY_SIZE_TOO_SMALL), "key size too small"},
168 {ERR_REASON(RSA_R_LAST_OCTET_INVALID), "last octet invalid"},
169 {ERR_REASON(RSA_R_MODULUS_TOO_LARGE), "modulus too large"},
170 {ERR_REASON(RSA_R_NON_FIPS_RSA_METHOD), "non fips rsa method"},
171 {ERR_REASON(RSA_R_NO_PUBLIC_EXPONENT), "no public exponent"},
172 {ERR_REASON(RSA_R_NULL_BEFORE_BLOCK_MISSING), "null before block missing"},
173 {ERR_REASON(RSA_R_N_DOES_NOT_EQUAL_P_Q), "n does not equal p q"},
174 {ERR_REASON(RSA_R_OAEP_DECODING_ERROR), "oaep decoding error"},
175 {ERR_REASON(RSA_R_OPERATION_NOT_ALLOWED_IN_FIPS_MODE), "operation not allowed in"},
176 {ERR_REASON(RSA_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE), "operation not suppo"},
177 {ERR_REASON(RSA_R_PADDING_CHECK_FAILED), "padding check failed"},
178 {ERR_REASON(RSA_R_P_NOT_PRIME), "p not prime"},
179 {ERR_REASON(RSA_R_Q_NOT_PRIME), "q not prime"},
180 {ERR_REASON(RSA_R_RSA_OPERATIONS_NOT_SUPPORTED), "rsa operations not supported"},
181 {ERR_REASON(RSA_R_SLEN_CHECK_FAILED), "salt length check failed"},
182 {ERR_REASON(RSA_R_SLEN_RECOVERY_FAILED), "salt length recovery failed"},
183 {ERR_REASON(RSA_R_SSLV3_ROLLBACK_ATTACK), "sslv3 rollback attack"},
184 {ERR_REASON(RSA_R_THE_ASN1_OBJECT_IDENTIFIER_IS_NOT_KNOWN_FOR_THIS_MD), "the asn1"},
185 {ERR_REASON(RSA_R_UNKNOWN_ALGORITHM_TYPE), "unknown algorithm type"},
186 {ERR_REASON(RSA_R_UNKNOWN_MASK_DIGEST), "unknown mask digest"},
187 {ERR_REASON(RSA_R_UNKNOWN_PADDING_TYPE), "unknown padding type"},
188 {ERR_REASON(RSA_R_UNKNOWN_PSS_DIGEST), "unknown pss digest"},
189 {ERR_REASON(RSA_R_UNSUPPORTED_MASK_ALGORITHM), "unsupported mask algorithm"},
190 {ERR_REASON(RSA_R_UNSUPPORTED_MASK_PARAMETER), "unsupported mask parameter"},
191 {ERR_REASON(RSA_R_UNSUPPORTED_SIGNATURE_TYPE), "unsupported signature type"},
192 {ERR_REASON(RSA_R_VALUE_MISSING), "value missing"},
193 {ERR_REASON(RSA_R_WRONG_SIGNATURE_LENGTH), "wrong signature length"},

```

```

194 {0, NULL}
195 };

197 #endif

199 void ERR_load_RSA_strings(void)
200 {
201 #ifndef OPENSSL_NO_ERR
202
203     if (ERR_func_error_string(RSA_str_funcs[0].error) == NULL)
204     {
205         ERR_load_strings(0, RSA_str_funcs);
206         ERR_load_strings(0, RSA_str_reasons);
207     }
208 #endif
209 }

```

```

*****
7844 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_gen.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rsa/rsa_gen.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
60 /* NB: these functions have been "upgraded", the deprecated versions (which are
61 * compatibility wrappers using these functions) are in rsa_depr.c.

```

```

62 * - Geoff
63 */
64
65 #include <stdio.h>
66 #include <time.h>
67 #include "cryptlib.h"
68 #include <openssl/bn.h>
69 #include <openssl/rsa.h>
70 #ifdef OPENSSL_FIPS
71 #include <openssl/fips.h>
72 #endif
73
74 static int rsa_builtin_keygen(RSA *rsa, int bits, BIGNUM *e_value, BN_GENCB *cb)
75 {
76 /* NB: this wrapper would normally be placed in rsa_lib.c and the static
77 * implementation would probably be in rsa_eay.c. Nonetheless, is kept here so
78 * that we don't introduce a new linker dependency. Eg. any application that
79 * wasn't previously linking object code related to key-generation won't have to
80 * now just because key-generation is part of RSA_METHOD. */
81 int RSA_generate_key_ex(RSA *rsa, int bits, BIGNUM *e_value, BN_GENCB *cb)
82 {
83 #ifdef OPENSSL_FIPS
84 if (FIPS_mode()) && !(rsa->meth->flags & RSA_FLAG_FIPS_METHOD)
85 && !(rsa->flags & RSA_FLAG_NON_FIPS_ALLOW))
86 {
87 RSAerr(RSA_F_RSA_GENERATE_KEY_EX, RSA_R_NON_FIPS_RSA_METHOD);
88 return 0;
89 }
90 #endif
91 if (rsa->meth->rsa_keygen)
92 return rsa->meth->rsa_keygen(rsa, bits, e_value, cb);
93 #ifdef OPENSSL_FIPS
94 if (FIPS_mode())
95 return FIPS_rsa_generate_key_ex(rsa, bits, e_value, cb);
96 #endif
97 return rsa_builtin_keygen(rsa, bits, e_value, cb);
98 }
99
100 static int rsa_builtin_keygen(RSA *rsa, int bits, BIGNUM *e_value, BN_GENCB *cb)
101 {
102 BIGNUM *r0=NULL, *r1=NULL, *r2=NULL, *r3=NULL, *tmp;
103 BIGNUM local_r0, local_d, local_p;
104 BIGNUM *pr0, *d, *p;
105 int bitsp, bitsq, ok= -1, n=0;
106 BN_CTX *ctx=NULL;
107
108 ctx=BN_CTX_new();
109 if (ctx == NULL) goto err;
110 BN_CTX_start(ctx);
111 r0 = BN_CTX_get(ctx);
112 r1 = BN_CTX_get(ctx);
113 r2 = BN_CTX_get(ctx);
114 r3 = BN_CTX_get(ctx);
115 if (r3 == NULL) goto err;
116
117 bitsp=(bits+1)/2;
118 bitsq=bits-bitsp;
119
120 /* We need the RSA components non-NULL */
121 if(!rsa->n && ((rsa->n=BN_new()) == NULL)) goto err;
122 if(!rsa->d && ((rsa->d=BN_new()) == NULL)) goto err;
123 if(!rsa->e && ((rsa->e=BN_new()) == NULL)) goto err;
124 if(!rsa->p && ((rsa->p=BN_new()) == NULL)) goto err;
125 if(!rsa->q && ((rsa->q=BN_new()) == NULL)) goto err;
126 if(!rsa->dmp1 && ((rsa->dmp1=BN_new()) == NULL)) goto err;
127 if(!rsa->dmq1 && ((rsa->dmq1=BN_new()) == NULL)) goto err;

```

```

128     if(!rsa->iqmp && ((rsa->iqmp=BN_new()) == NULL)) goto err;
130     BN_copy(rsa->e, e_value);

132     /* generate p and q */
133     for (;;)
134     {
135         if(!BN_generate_prime_ex(rsa->p, bitsp, 0, NULL, NULL, cb))
136             goto err;
137         if (!BN_sub(r2,rsa->p,BN_value_one())) goto err;
138         if (!BN_gcd(r1,r2,rsa->e,ctx)) goto err;
139         if (BN_is_one(r1)) break;
140         if(!BN_GENCB_call(cb, 2, n++))
141             goto err;
142     }
143     if(!BN_GENCB_call(cb, 3, 0))
144         goto err;
145     for (;;)
146     {
147         /* When generating ridiculously small keys, we can get stuck
148          * continually regenerating the same prime values. Check for
149          * this and bail if it happens 3 times. */
150         unsigned int degenerate = 0;
151         do
152         {
153             if(!BN_generate_prime_ex(rsa->q, bitsq, 0, NULL, NULL, c
154                 goto err;
155             } while((BN_cmp(rsa->p, rsa->q) == 0) && (++degenerate <
156             if(degenerate == 3)
157             {
158                 ok = 0; /* we set our own err */
159                 RSAerr(RSA_F_RSA_BUILTIN_KEYGEN,RSA_R_KEY_SIZE_TOO_SMALL
160                     goto err;
161             }
162             if (!BN_sub(r2,rsa->q,BN_value_one())) goto err;
163             if (!BN_gcd(r1,r2,rsa->e,ctx)) goto err;
164             if (BN_is_one(r1))
165                 break;
166             if(!BN_GENCB_call(cb, 2, n++))
167                 goto err;
168         }
169         if(!BN_GENCB_call(cb, 3, 1))
170             goto err;
171         if (BN_cmp(rsa->p,rsa->q) < 0)
172         {
173             tmp=rsa->p;
174             rsa->p=rsa->q;
175             rsa->q=tmp;
176         }

178     /* calculate n */
179     if (!BN_mul(rsa->n,rsa->p,rsa->q,ctx)) goto err;

181     /* calculate d */
182     if (!BN_sub(r1,rsa->p,BN_value_one())) goto err; /* p-1 */
183     if (!BN_sub(r2,rsa->q,BN_value_one())) goto err; /* q-1 */
184     if (!BN_mul(r0,r1,r2,ctx)) goto err; /* (p-1)(q-1) */
185     if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
186     {
187         pr0 = &local_r0;
188         BN_with_flags(pr0, r0, BN_FLG_CONSTTIME);
189     }
190     else
191         pr0 = r0;
192     if (!BN_mod_inverse(rsa->d,rsa->e,pr0,ctx)) goto err; /* d */

```

```

194     /* set up d for correct BN_FLG_CONSTTIME flag */
195     if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
196     {
197         d = &local_d;
198         BN_with_flags(d, rsa->d, BN_FLG_CONSTTIME);
199     }
200     else
201         d = rsa->d;

203     /* calculate d mod (p-1) */
204     if (!BN_mod(rsa->dmp1,d,r1,ctx)) goto err;

206     /* calculate d mod (q-1) */
207     if (!BN_mod(rsa->dmq1,d,r2,ctx)) goto err;

209     /* calculate inverse of q mod p */
210     if (!(rsa->flags & RSA_FLAG_NO_CONSTTIME))
211     {
212         p = &local_p;
213         BN_with_flags(p, rsa->p, BN_FLG_CONSTTIME);
214     }
215     else
216         p = rsa->p;
217     if (!BN_mod_inverse(rsa->iqmp,rsa->q,p,ctx)) goto err;

219     ok=1;
220 err:
221     if (ok == -1)
222     {
223         RSAerr(RSA_F_RSA_BUILTIN_KEYGEN,ERR_LIB_BN);
224         ok=0;
225     }
226     if (ctx != NULL)
227     {
228         BN_CTX_end(ctx);
229         BN_CTX_free(ctx);
230     }

232     return ok;
233 }

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_lib.c

1

```
*****
8769 Fri May 30 18:32:08 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/rsa/rsa_lib.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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21 * in documentation (online or textual) provided with the package.
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <openssl/crypto.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_lib.c

2

```
62 #include <openssl/lhash.h>
63 #include <openssl/bn.h>
64 #include <openssl/rsa.h>
65 #include <openssl/rand.h>
66 #ifndef OPENSSL_NO_ENGINE
67 #include <openssl/engine.h>
68 #endif

70 #ifdef OPENSSL_FIPS
71 #include <openssl/fips.h>
72 #endif

74 const char RSA_version[]="RSA" OPENSSL_VERSION_PTEXT;

76 static const RSA_METHOD *default_RSA_meth=NULL;

78 RSA *RSA_new(void)
79 {
80     RSA *r=RSA_new_method(NULL);

82     return r;
83 }

85 void RSA_set_default_method(const RSA_METHOD *meth)
86 {
87     default_RSA_meth = meth;
88 }

90 const RSA_METHOD *RSA_get_default_method(void)
91 {
92     if (default_RSA_meth == NULL)
93     {
94 #ifdef OPENSSL_FIPS
95         if (FIPS_mode())
96             return FIPS_rsa_pkcs1_ssleay();
97         else
98             return RSA_PKCS1_SSLeay();
99 #else
100 #ifdef RSA_NULL
101         default_RSA_meth=RSA_null_method();
102 #else
103         default_RSA_meth=RSA_PKCS1_SSLeay();
104 #endif
105 #endif
106     }

108     return default_RSA_meth;
109 }

111 const RSA_METHOD *RSA_get_method(const RSA *rsa)
112 {
113     return rsa->meth;
114 }

116 int RSA_set_method(RSA *rsa, const RSA_METHOD *meth)
117 {
118     /* NB: The caller is specifically setting a method, so it's not up to us
119     * to deal with which ENGINE it comes from. */
120     const RSA_METHOD *mtmp;
121     mtmp = rsa->meth;
122     if (mtmp->finish) mtmp->finish(rsa);
123 #ifndef OPENSSL_NO_ENGINE
124     if (rsa->engine)
125     {
126         ENGINE_finish(rsa->engine);
127         rsa->engine = NULL;
128     }
129 #endif
130     if (meth)
131     {
132         rsa->meth = meth;
133     }
134     return 1;
135 }
```

```

128     }
129 #endif
130     rsa->meth = meth;
131     if (meth->init) meth->init(rsa);
132     return 1;
133 }

135 RSA *RSA_new_method(ENGINE *engine)
136 {
137     RSA *ret;

139     ret=(RSA *)OPENSSL_malloc(sizeof(RSA));
140     if (ret == NULL)
141     {
142         RSAerr(RSA_F_RSA_NEW_METHOD,ERR_R_MALLOC_FAILURE);
143         return NULL;
144     }

146     ret->meth = RSA_get_default_method();
147 #ifndef OPENSSL_NO_ENGINE
148     if (engine)
149     {
150         if (!ENGINE_init(engine))
151         {
152             RSAerr(RSA_F_RSA_NEW_METHOD, ERR_R_ENGINE_LIB);
153             OPENSSL_free(ret);
154             return NULL;
155         }
156         ret->engine = engine;
157     }
158     else
159         ret->engine = ENGINE_get_default_RSA();
160     if(ret->engine)
161     {
162         ret->meth = ENGINE_get_RSA(ret->engine);
163         if(!ret->meth)
164         {
165             RSAerr(RSA_F_RSA_NEW_METHOD,
166                   ERR_R_ENGINE_LIB);
167             ENGINE_finish(ret->engine);
168             OPENSSL_free(ret);
169             return NULL;
170         }
171     }
172 #endif

174     ret->pad=0;
175     ret->version=0;
176     ret->n=NULL;
177     ret->e=NULL;
178     ret->d=NULL;
179     ret->p=NULL;
180     ret->q=NULL;
181     ret->dmp1=NULL;
182     ret->dmq1=NULL;
183     ret->iqmp=NULL;
184     ret->references=1;
185     ret->_method_mod_n=NULL;
186     ret->_method_mod_p=NULL;
187     ret->_method_mod_q=NULL;
188     ret->blinding=NULL;
189     ret->mt_blinding=NULL;
190     ret->bignum_data=NULL;
191     if (!CRYPTO_new_ex_data(CRYPTO_EX_INDEX_RSA, ret, &ret->ex_data))
192     {
193         return NULL;

```

```

194 #ifndef OPENSSL_NO_ENGINE
195     if (ret->engine)
196         ENGINE_finish(ret->engine);
197 #endif
198     OPENSSL_free(ret);
199     return(NULL);
200 }

202     if ((ret->meth->init != NULL) && !ret->meth->init(ret))
203     {
204 #ifndef OPENSSL_NO_ENGINE
205         if (ret->engine)
206             ENGINE_finish(ret->engine);
207 #endif
208         CRYPTO_free_ex_data(CRYPTO_EX_INDEX_RSA, ret, &ret->ex_data);
209         OPENSSL_free(ret);
210         ret=NULL;
211     }
212     return(ret);
213 }

215 void RSA_free(RSA *r)
216 {
217     int i;

219     if (r == NULL) return;

221     i=CRYPTO_add(&r->references, -1, CRYPTO_LOCK_RSA);
222 #ifdef REF_PRINT
223     REF_PRINT("RSA", r);
224 #endif
225     if (i > 0) return;
226 #ifdef REF_CHECK
227     if (i < 0)
228     {
229         fprintf(stderr, "RSA_free, bad reference count\n");
230         abort();
231     }
232 #endif

234     if (r->meth->finish)
235         r->meth->finish(r);
236 #ifndef OPENSSL_NO_ENGINE
237     if (r->engine)
238         ENGINE_finish(r->engine);
239 #endif

241     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_RSA, r, &r->ex_data);

243     if (r->n != NULL) BN_clear_free(r->n);
244     if (r->e != NULL) BN_clear_free(r->e);
245     if (r->d != NULL) BN_clear_free(r->d);
246     if (r->p != NULL) BN_clear_free(r->p);
247     if (r->q != NULL) BN_clear_free(r->q);
248     if (r->dmp1 != NULL) BN_clear_free(r->dmp1);
249     if (r->dmq1 != NULL) BN_clear_free(r->dmq1);
250     if (r->iqmp != NULL) BN_clear_free(r->iqmp);
251     if (r->blinding != NULL) BN_BLINDING_free(r->blinding);
252     if (r->mt_blinding != NULL) BN_BLINDING_free(r->mt_blinding);
253     if (r->bignum_data != NULL) OPENSSL_free_locked(r->bignum_data);
254     OPENSSL_free(r);
255 }

257 int RSA_up_ref(RSA *r)
258 {
259     int i = CRYPTO_add(&r->references, 1, CRYPTO_LOCK_RSA);

```

```

260 #ifdef REF_PRINT
261     REF_PRINT("RSA",r);
262 #endif
263 #ifdef REF_CHECK
264     if (i < 2)
265     {
266         fprintf(stderr, "RSA_up_ref, bad reference count\n");
267         abort();
268     }
269 #endif
270     return ((i > 1) ? 1 : 0);
271 }

273 int RSA_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
274     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
275 {
276     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_RSA, argl, argp,
277     new_func, dup_func, free_func);
278 }

280 int RSA_set_ex_data(RSA *r, int idx, void *arg)
281 {
282     return(CRYPTO_set_ex_data(&r->ex_data,idx,arg));
283 }

285 void *RSA_get_ex_data(const RSA *r, int idx)
286 {
287     return(CRYPTO_get_ex_data(&r->ex_data,idx));
288 }

290 int RSA_memory_lock(RSA *r)
291 {
292     int i,j,k,off;
293     char *p;
294     BIGNUM *bn,**t[6],*b;
295     BN_ULONG *ul;

297     if (r->d == NULL) return(1);
298     t[0]= &r->d;
299     t[1]= &r->p;
300     t[2]= &r->q;
301     t[3]= &r->dmp1;
302     t[4]= &r->dmq1;
303     t[5]= &r->iqmp;
304     k=sizeof(BIGNUM)*6;
305     off=k/sizeof(BN_ULONG)+1;
306     j=1;
307     for (i=0; i<6; i++)
308     {
309         j+= (*t[i])->top;
310         if ((p=OPENSSL_malloc_locked((off+j)*sizeof(BN_ULONG))) == NULL)
311         {
312             RSAerr(RSA_F_RSA_MEMORY_LOCK,ERR_R_MALLOC_FAILURE);
313             return(0);
314         }
315         bn=(BIGNUM *)p;
316         ul=(BN_ULONG *)&(p[off]);
317         for (i=0; i<6; i++)
318         {
319             b= (*t[i]);
320             *(t[i])= &(bn[i]);
321             memcpy((char *)&(bn[i]),(char *)b,sizeof(BIGNUM));
322             bn[i].flags=BN_FLG_STATIC_DATA;
323             bn[i].d=ul;
324             memcpy((char *)ul,b->d,sizeof(BN_ULONG)*b->top);
325             ul+=b->top;
326             BN_clear_free(b);

```

```

326     }
327
328     /* I should fix this so it can still be done */
329     r->flags&= ~(RSA_FLAG_CACHE_PRIVATE|RSA_FLAG_CACHE_PUBLIC);

331     r->bignum_data=p;
332     return(1);
333 }

```


new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_none.c

1

3974 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_none.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/rsa/rsa_none.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_none.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/rand.h>
64
65 int RSA_padding_add_none(unsigned char *to, int tlen,
66                          const unsigned char *from, int flen)
67 {
68     if (flen > tlen)
69     {
70         RSAerr(RSA_F_RSA_PADDING_ADD_NONE, RSA_R_DATA_TOO_LARGE_FOR_KEY_S
71              );
72         return(0);
73     }
74
75     if (flen < tlen)
76     {
77         RSAerr(RSA_F_RSA_PADDING_ADD_NONE, RSA_R_DATA_TOO_SMALL_FOR_KEY_S
78              );
79         return(0);
80     }
81
82     memcpy(to, from, (unsigned int)flen);
83     return(1);
84 }
85
86 int RSA_padding_check_none(unsigned char *to, int tlen,
87                          const unsigned char *from, int flen, int num)
88 {
89     if (flen > tlen)
90     {
91         RSAerr(RSA_F_RSA_PADDING_CHECK_NONE, RSA_R_DATA_TOO_LARGE);
92         return(-1);
93     }
94
95     memset(to, 0, tlen - flen);
96     memcpy(to + tlen - flen, from, flen);
97     return(tlen);
98 }
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_null.c

1

```
*****
5333 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_null.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* rsa_null.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_null.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/rand.h>
64
65 /* This is a dummy RSA implementation that just returns errors when called.
66  * It is designed to allow some RSA functions to work while stopping those
67  * covered by the RSA patent. That is RSA, encryption, decryption, signing
68  * and verify is not allowed but RSA key generation, key checking and other
69  * operations (like storing RSA keys) are permitted.
70  */
71
72 static int RSA_null_public_encrypt(int flen, const unsigned char *from,
73                                   unsigned char *to, RSA *rsa, int padding);
74 static int RSA_null_private_encrypt(int flen, const unsigned char *from,
75                                   unsigned char *to, RSA *rsa, int padding);
76 static int RSA_null_public_decrypt(int flen, const unsigned char *from,
77                                   unsigned char *to, RSA *rsa, int padding);
78 static int RSA_null_private_decrypt(int flen, const unsigned char *from,
79                                   unsigned char *to, RSA *rsa, int padding);
80 #if 0 /* not currently used */
81 static int RSA_null_mod_exp(const BIGNUM *r0, const BIGNUM *i, RSA *rsa);
82 #endif
83 static int RSA_null_init(RSA *rsa);
84 static int RSA_null_finish(RSA *rsa);
85 static RSA_METHOD rsa_null_meth={
86     "Null RSA",
87     RSA_null_public_encrypt,
88     RSA_null_public_decrypt,
89     RSA_null_private_encrypt,
90     RSA_null_private_decrypt,
91     NULL,
92     NULL,
93     RSA_null_init,
94     RSA_null_finish,
95     0,
96     NULL,
97     NULL,
98     NULL,
99     NULL
100 };
101
102 const RSA_METHOD *RSA_null_method(void)
103 {
104     return(&rsa_null_meth);
105 }
106
107 static int RSA_null_public_encrypt(int flen, const unsigned char *from,
108                                   unsigned char *to, RSA *rsa, int padding)
109 {
110     RSAerr(RSA_F_RSA_NULL_PUBLIC_ENCRYPT, RSA_R_RSA_OPERATIONS_NOT_SUPPORTED
111     return -1;
112 }
113
114 static int RSA_null_private_encrypt(int flen, const unsigned char *from,
115                                   unsigned char *to, RSA *rsa, int padding)
116 {
117     RSAerr(RSA_F_RSA_NULL_PRIVATE_ENCRYPT, RSA_R_RSA_OPERATIONS_NOT_SUPPORTE
118     return -1;
119 }
120
121 static int RSA_null_private_decrypt(int flen, const unsigned char *from,
122                                   unsigned char *to, RSA *rsa, int padding)
123 {
124     RSAerr(RSA_F_RSA_NULL_PRIVATE_DECRYPT, RSA_R_RSA_OPERATIONS_NOT_SUPPORTE
125     return -1;
126 }
```

```
128 static int RSA_null_public_decrypt(int flen, const unsigned char *from,
129     unsigned char *to, RSA *rsa, int padding)
130 {
131     RSAerr(RSA_F_RSA_NULL_PUBLIC_DECRYPT, RSA_R_RSA_OPERATIONS_NOT_SUPPORTED)
132     return -1;
133 }

135 #if 0 /* not currently used */
136 static int RSA_null_mod_exp(BIGNUM *r0, BIGNUM *I, RSA *rsa)
137 {
138     ...err(RSA_F_RSA_NULL_MOD_EXP, RSA_R_RSA_OPERATIONS_NOT_SUPPORTED);
139     return -1;
140 }
141 #endif

143 static int RSA_null_init(RSA *rsa)
144 {
145     return(1);
146 }

148 static int RSA_null_finish(RSA *rsa)
149 {
150     return(1);
151 }
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_oaep.c

1

```
*****
6288 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_oaep.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rsa/rsa_oaep.c */
2 /* Written by Ulf Moeller. This software is distributed on an "AS IS"
3    basis, WITHOUT WARRANTY OF ANY KIND, either express or implied. */

5 /* EME-OAEP as defined in RFC 2437 (PKCS #1 v2.0) */

7 /* See Victor Shoup, "OAEP reconsidered," Nov. 2000,
8    * <URL: http://www.shoup.net/papers/oaep.ps.Z>
9    * for problems with the security proof for the
10   * original OAEP scheme, which EME-OAEP is based on.
11   *
12   * A new proof can be found in E. Fujisaki, T. Okamoto,
13   * D. Pointcheval, J. Stern, "RSA-OAEP is Still Alive!",
14   * Dec. 2000, <URL: http://eprint.iacr.org/2000/061/>.
15   * The new proof has stronger requirements for the
16   * underlying permutation: "partial-one-wayness" instead
17   * of one-wayness. For the RSA function, this is
18   * an equivalent notion.
19   */

22 #if !defined(OPENSSSL_NO_SHA) && !defined(OPENSSSL_NO_SHA1)
23 #include <stdio.h>
24 #include "cryptlib.h"
25 #include <openssl/bn.h>
26 #include <openssl/rsa.h>
27 #include <openssl/evp.h>
28 #include <openssl/rand.h>
29 #include <openssl/sha.h>

31 static int MGF1(unsigned char *mask, long len,
32                 const unsigned char *seed, long seedlen);

34 int RSA_padding_add_PKCS1_OAEP(unsigned char *to, int tlen,
35                                const unsigned char *from, int flen,
36                                const unsigned char *param, int plen)
37 {
38     int i, emlen = tlen - 1;
39     unsigned char *db, *seed;
40     unsigned char *dbmask, seedmask[SHA_DIGEST_LENGTH];

42     if (flen > emlen - 2 * SHA_DIGEST_LENGTH - 1)
43     {
44         RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_OAEP,
45              RSA_R_DATA_TOO_LARGE_FOR_KEY_SIZE);
46         return 0;
47     }

49     if (emlen < 2 * SHA_DIGEST_LENGTH + 1)
50     {
51         RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_OAEP, RSA_R_KEY_SIZE_TOO_SMALL);
52         return 0;
53     }

55     to[0] = 0;
56     seed = to + 1;
57     db = to + SHA_DIGEST_LENGTH + 1;

59     if (!EVP_Digest((void *)param, plen, db, NULL, EVP_sha1(), NULL))
60         return 0;
61     memset(db + SHA_DIGEST_LENGTH, 0,
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_oaep.c

2

```
62         emlen - flen - 2 * SHA_DIGEST_LENGTH - 1);
63     db[emlen - flen - SHA_DIGEST_LENGTH - 1] = 0x01;
64     memcpy(db + emlen - flen - SHA_DIGEST_LENGTH, from, (unsigned int) flen)
65     if (RAND_bytes(seed, SHA_DIGEST_LENGTH) <= 0)
66         return 0;
67 #ifdef PKCS_TESTVECT
68     memcpy(seed,
69            "\xaa\xfd\x12\xf6\x59\xca\xe6\x34\x89\xb4\x79\xe5\x07\xd6\xde\xc2\xf0
70            20);
71 #endif

73     dbmask = OPENSSL_malloc(emlen - SHA_DIGEST_LENGTH);
74     if (dbmask == NULL)
75     {
76         RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_OAEP, ERR_R_MALLOC_FAILURE);
77         return 0;
78     }

80     if (MGF1(dbmask, emlen - SHA_DIGEST_LENGTH, seed, SHA_DIGEST_LENGTH) < 0)
81         return 0;
82     for (i = 0; i < emlen - SHA_DIGEST_LENGTH; i++)
83         db[i] ^= dbmask[i];

85     if (MGF1(seedmask, SHA_DIGEST_LENGTH, db, emlen - SHA_DIGEST_LENGTH) < 0)
86         return 0;
87     for (i = 0; i < SHA_DIGEST_LENGTH; i++)
88         seed[i] ^= seedmask[i];

90     OPENSSL_free(dbmask);
91     return 1;
92 }

94 int RSA_padding_check_PKCS1_OAEP(unsigned char *to, int tlen,
95                                  const unsigned char *from, int flen, int num,
96                                  const unsigned char *param, int plen)
97 {
98     int i, dblen, mlen = -1;
99     const unsigned char *maskeddb;
100     int lzero;
101     unsigned char *db = NULL, seed[SHA_DIGEST_LENGTH], phash[SHA_DIGEST_LENGTH];
102     unsigned char *padded_from;
103     int bad = 0;

105     if (--num < 2 * SHA_DIGEST_LENGTH + 1)
106         /* 'num' is the length of the modulus, i.e. does not depend on the
107          * particular ciphertext. */
108         goto decoding_err;

110     lzero = num - flen;
111     if (lzero < 0)
112     {
113         /* signalling this error immediately after detection might allow
114          * for side-channel attacks (e.g. timing if 'plen' is huge
115          * -- cf. James H. Manger, "A Chosen Ciphertext Attack on RSA Optimal
116          * Asymmetric Encryption Padding (OAEP) [...]", CRYPTO 2001),
117          * so we use a 'bad' flag */
118         bad = 1;
119         lzero = 0;
120         flen = num; /* don't overflow the memcpy to padded_from */
121     }

123     dblen = num - SHA_DIGEST_LENGTH;
124     db = OPENSSL_malloc(dblen + num);
125     if (db == NULL)
126     {
127         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_OAEP, ERR_R_MALLOC_FAILURE)
```

```

128         return -1;
129     }

131     /* Always do this zero-padding copy (even when lzero == 0)
132      * to avoid leaking timing info about the value of lzero. */
133     padded_from = db + dblen;
134     memset(padded_from, 0, lzero);
135     memcpy(padded_from + lzero, from, flen);

137     maskeddb = padded_from + SHA_DIGEST_LENGTH;

139     if (MGF1(seed, SHA_DIGEST_LENGTH, maskeddb, dblen))
140         return -1;
141     for (i = 0; i < SHA_DIGEST_LENGTH; i++)
142         seed[i] ^= padded_from[i];

144     if (MGF1(db, dblen, seed, SHA_DIGEST_LENGTH))
145         return -1;
146     for (i = 0; i < dblen; i++)
147         db[i] ^= maskeddb[i];

149     if (!EVP_Digest((void *)param, plen, phash, NULL, EVP_sha1(), NULL))
150         return -1;

152     if (CRYPTO_memcmp(db, phash, SHA_DIGEST_LENGTH) != 0 || bad)
153         goto decoding_err;
154     else
155     {
156         for (i = SHA_DIGEST_LENGTH; i < dblen; i++)
157             if (db[i] != 0x00)
158                 break;
159         if (i == dblen || db[i] != 0x01)
160             goto decoding_err;
161         else
162         {
163             /* everything looks OK */

165             mlen = dblen - ++i;
166             if (tlen < mlen)
167             {
168                 RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_OAEP, RSA_R
169                     mlen = -1;
170             }
171             else
172                 memcpy(to, db + i, mlen);
173         }
174     }
175     OPENSSL_free(db);
176     return mlen;

178 decoding_err:
179     /* to avoid chosen ciphertext attacks, the error message should not reve
180      * which kind of decoding error happened */
181     RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_OAEP, RSA_R_OAEP_DECODING_ERROR);
182     if (db != NULL) OPENSSL_free(db);
183     return -1;
184 }

186 int PKCS1_MGF1(unsigned char *mask, long len,
187               const unsigned char *seed, long seedlen, const EVP_MD *dgst)
188 {
189     long i, outlen = 0;
190     unsigned char cnt[4];
191     EVP_MD_CTX c;
192     unsigned char md[EVP_MAX_MD_SIZE];
193     int mdlen;

```

```

194     int rv = -1;

196     EVP_MD_CTX_init(&c);
197     mdlen = EVP_MD_size(dgst);
198     if (mdlen < 0)
199         goto err;
200     for (i = 0; outlen < len; i++)
201     {
202         cnt[0] = (unsigned char)((i >> 24) & 255);
203         cnt[1] = (unsigned char)((i >> 16) & 255);
204         cnt[2] = (unsigned char)((i >> 8) & 255);
205         cnt[3] = (unsigned char)(i & 255);
206         if (!EVP_DigestInit_ex(&c, dgst, NULL)
207             || !EVP_DigestUpdate(&c, seed, seedlen)
208             || !EVP_DigestUpdate(&c, cnt, 4))
209             goto err;
210         if (outlen + mdlen <= len)
211         {
212             if (!EVP_DigestFinal_ex(&c, mask + outlen, NULL))
213                 goto err;
214             outlen += mdlen;
215         }
216         else
217         {
218             if (!EVP_DigestFinal_ex(&c, md, NULL))
219                 goto err;
220             memcpy(mask + outlen, md, len - outlen);
221             outlen = len;
222         }
223     }
224     rv = 0;
225     err:
226     EVP_MD_CTX_cleanup(&c);
227     return rv;
228 }

230 static int MGF1(unsigned char *mask, long len, const unsigned char *seed,
231               long seedlen)
232 {
233     return PKCS1_MGF1(mask, len, seed, seedlen, EVP_sha1());
234 }
235 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pk1.c

1

6356 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pk1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/rsa/rsa_pk1.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
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21 * in documentation (online or textual) provided with the package.
22 *
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pk1.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/rand.h>
64
65 int RSA_padding_add_PKCS1_type_1(unsigned char *to, int tlen,
66                                 const unsigned char *from, int flen)
67 {
68     int j;
69     unsigned char *p;
70
71     if (flen > (tlen-RSA_PKCS1_PADDING_SIZE))
72     {
73         RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_TYPE_1, RSA_R_DATA_TOO_LARGE_F);
74         return(0);
75     }
76
77     p=(unsigned char *)to;
78
79     *(p++)=0;
80     *(p++)=1; /* Private Key BT (Block Type) */
81
82     /* pad out with 0xff data */
83     j=tlen-3-flen;
84     memset(p,0xff,j);
85     p+=j;
86     *(p++)='\0';
87     memcpy(p,from,(unsigned int)flen);
88     return(1);
89 }
90
91 int RSA_padding_check_PKCS1_type_1(unsigned char *to, int tlen,
92                                    const unsigned char *from, int flen, int num)
93 {
94     int i,j;
95     const unsigned char *p;
96
97     p=from;
98     if ((num != (flen+1)) || (*(p++) != 01))
99     {
100         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_1, RSA_R_BLOCK_TYPE_IS_WRONG);
101         return(-1);
102     }
103
104     /* scan over padding data */
105     j=flen-1; /* one for type. */
106     for (i=0; i<j; i++)
107     {
108         if (*p != 0xff) /* should decrypt to 0xff */
109         {
110             if (*p == 0)
111             { p++; break; }
112             else
113             { RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_1, RSA_R_INVALID_PADDING);
114               return(-1);
115             }
116         }
117         p++;
118     }
119
120     if (i == j)
121     {
122         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_1, RSA_R_NULL_BEFORE_BLOCK);
123         return(-1);
124     }
125
126     if (i < 8)
127     {
```

```

128     RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_1, RSA_R_BAD_PAD_BYTE_C
129     return(-1);
130     }
131     i++; /* Skip over the '\0' */
132     j-=i;
133     if (j > tlen)
134     {
135         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_1, RSA_R_DATA_TOO_LARGE
136         return(-1);
137     }
138     memcpy(to, p, (unsigned int)j);
139
140     return(j);
141 }
142
143 int RSA_padding_add_PKCS1_type_2(unsigned char *to, int tlen,
144     const unsigned char *from, int flen)
145 {
146     int i, j;
147     unsigned char *p;
148
149     if (flen > (tlen-11))
150     {
151         RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_TYPE_2, RSA_R_DATA_TOO_LARGE_F
152         return(0);
153     }
154
155     p=(unsigned char *)to;
156
157     *(p++)=0;
158     *(p++)=2; /* Public Key BT (Block Type) */
159
160     /* pad out with non-zero random data */
161     j=tlen-3-flen;
162
163     if (RAND_bytes(p, j) <= 0)
164         return(0);
165     for (i=0; i<j; i++)
166     {
167         if (*p == '\0')
168             do
169             {
170                 if (RAND_bytes(p, 1) <= 0)
171                     return(0);
172                 } while (*p == '\0');
173         p++;
174     }
175
176     *(p++)='\0';
177
178     memcpy(p, from, (unsigned int)flen);
179     return(1);
180 }
181
182 int RSA_padding_check_PKCS1_type_2(unsigned char *to, int tlen,
183     const unsigned char *from, int flen, int num)
184 {
185     int i, j;
186     const unsigned char *p;
187
188     p=from;
189     if ((num != (flen+1)) || (*(p++) != 02))
190     {
191         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_2, RSA_R_BLOCK_TYPE_IS_
192         return(-1);
193     }
194 }
195 #ifdef PKCS1_CHECK

```

```

194     return(num-11);
195 #endif
196
197     /* scan over padding data */
198     j=flen-1; /* one for type. */
199     for (i=0; i<j; i++)
200         if (*(p++) == 0) break;
201
202     if (i == j)
203     {
204         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_2, RSA_R_NULL_BEFORE_BL
205         return(-1);
206     }
207
208     if (i < 8)
209     {
210         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_2, RSA_R_BAD_PAD_BYTE_C
211         return(-1);
212     }
213     i++; /* Skip over the '\0' */
214     j-=i;
215     if (j > tlen)
216     {
217         RSAerr(RSA_F_RSA_PADDING_CHECK_PKCS1_TYPE_2, RSA_R_DATA_TOO_LARGE
218         return(-1);
219     }
220     memcpy(to, p, (unsigned int)j);
221
222     return(j);
223 }

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pmeth.c

1

```
*****
16336 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pmeth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rsa/rsa_pmeth.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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13  * notice, this list of conditions and the following disclaimer.
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20  * 3. All advertising materials mentioning features or use of this
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43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pmeth.c

2

```
62 #include <openssl/x509.h>
63 #include <openssl/rsa.h>
64 #include <openssl/bn.h>
65 #include <openssl/evp.h>
66 #ifndef OPENSSL_NO_CMS
67 #include <openssl/cms.h>
68 #endif
69 #ifdef OPENSSL_FIPS
70 #include <openssl/fips.h>
71 #endif
72 #include "evp_locl.h"
73 #include "rsa_locl.h"
74
75 /* RSA pkey context structure */
76
77 typedef struct
78 {
79     /* Key gen parameters */
80     int nbits;
81     BIGNUM *pub_exp;
82     /* Keygen callback info */
83     int gentmp[2];
84     /* RSA padding mode */
85     int pad_mode;
86     /* message digest */
87     const EVP_MD *md;
88     /* message digest for MGF1 */
89     const EVP_MD *mgf1md;
90     /* PSS/OAEP salt length */
91     int saltlen;
92     /* Temp buffer */
93     unsigned char *tbuf;
94 } RSA_PKEY_CTX;
95
96 static int pkey_rsa_init(EVP_PKEY_CTX *ctx)
97 {
98     RSA_PKEY_CTX *rctx;
99     rctx = OPENSSL_malloc(sizeof(RSA_PKEY_CTX));
100     if (!rctx)
101         return 0;
102     rctx->nbits = 1024;
103     rctx->pub_exp = NULL;
104     rctx->pad_mode = RSA_PKCS1_PADDING;
105     rctx->md = NULL;
106     rctx->mgf1md = NULL;
107     rctx->tbuf = NULL;
108
109     rctx->saltlen = -2;
110
111     ctx->data = rctx;
112     ctx->keygen_info = rctx->gentmp;
113     ctx->keygen_info_count = 2;
114
115     return 1;
116 }
117
118 static int pkey_rsa_copy(EVP_PKEY_CTX *dst, EVP_PKEY_CTX *src)
119 {
120     RSA_PKEY_CTX *dctx, *sctx;
121     if (!pkey_rsa_init(dst))
122         return 0;
123     sctx = src->data;
124     dctx = dst->data;
125     dctx->nbits = sctx->nbits;
126     if (sctx->pub_exp)
127         {
```



```

128         dctx->pub_exp = BN_dup(sctx->pub_exp);
129         if (!dctx->pub_exp)
130             return 0;
131     }
132     dctx->pad_mode = sctx->pad_mode;
133     dctx->md = sctx->md;
134     return 1;
135 }

137 static int setup_tbuf(RSA_PKEY_CTX *ctx, EVP_PKEY_CTX *pk)
138 {
139     if (ctx->tbuf)
140         return 1;
141     ctx->tbuf = OPENSSL_malloc(EVP_PKEY_size(pk->pkey));
142     if (!ctx->tbuf)
143         return 0;
144     return 1;
145 }

147 static void pkey_rsa_cleanup(EVP_PKEY_CTX *ctx)
148 {
149     RSA_PKEY_CTX *rctx = ctx->data;
150     if (rctx)
151     {
152         if (rctx->pub_exp)
153             BN_free(rctx->pub_exp);
154         if (rctx->tbuf)
155             OPENSSL_free(rctx->tbuf);
156         OPENSSL_free(rctx);
157     }
158 }

159 #ifdef OPENSSL_FIPS
160 /* FIP checker. Return value indicates status of context parameters:
161  * 1 : redirect to FIPS.
162  * 0 : don't redirect to FIPS.
163  * -1 : illegal operation in FIPS mode.
164  */

166 static int pkey_fips_check_ctx(EVP_PKEY_CTX *ctx)
167 {
168     RSA_PKEY_CTX *rctx = ctx->data;
169     RSA *rsa = ctx->pkey->pkey.rsa;
170     int rv = -1;
171     if (!FIPS_mode())
172         return 0;
173     if (rsa->flags & RSA_FLAG_NON_FIPS_ALLOW)
174         rv = 0;
175     if (!(rsa->meth->flags & RSA_FLAG_FIPS_METHOD) && rv)
176         return -1;
177     if (rctx->md && !(rctx->md->flags & EVP_MD_FLAG_FIPS))
178         return rv;
179     if (rctx->mgf1md && !(rctx->mgf1md->flags & EVP_MD_FLAG_FIPS))
180         return rv;
181     return 1;
182 }
183 #endif

185 static int pkey_rsa_sign(EVP_PKEY_CTX *ctx, unsigned char *sig, size_t *siglen,
186                          const unsigned char *tbs, size_t tbslen)
187 {
188     int ret;
189     RSA_PKEY_CTX *rctx = ctx->data;
190     RSA *rsa = ctx->pkey->pkey.rsa;

192 #ifdef OPENSSL_FIPS
193     ret = pkey_fips_check_ctx(ctx);

```

```

194     if (ret < 0)
195     {
196         RSAerr(RSA_F_PKEY_RSA_SIGN, RSA_R_OPERATION_NOT_ALLOWED_IN_FIPS_
197              );
198         return -1;
199     }
200 #endif

201     if (rctx->md)
202     {
203         if (tbslen != (size_t)EVP_MD_size(rctx->md))
204         {
205             RSAerr(RSA_F_PKEY_RSA_SIGN,
206                  RSA_R_INVALID_DIGEST_LENGTH);
207             return -1;
208         }
209 #ifdef OPENSSL_FIPS
210         if (ret > 0)
211         {
212             unsigned int slen;
213             ret = FIPS_rsa_sign_digest(rsa, tbs, tbslen, rctx->md,
214                                       rctx->pad_mode,
215                                       rctx->saltlen,
216                                       rctx->mgf1md,
217                                       sig, &slen);
218             if (ret > 0)
219                 *siglen = slen;
220             else
221                 *siglen = 0;
222             return ret;
223         }
224 #endif

226         if (EVP_MD_type(rctx->md) == NID_mdcc2)
227         {
228             unsigned int sltmp;
229             if (rctx->pad_mode != RSA_PKCS1_PADDING)
230                 return -1;
231             ret = RSA_sign_ASN1_OCTET_STRING(NID_mdcc2,
232                                             tbs, tbslen, sig, &sltmp, rsa);

234             if (ret <= 0)
235                 return ret;
236             ret = sltmp;
237         }
238     else if (rctx->pad_mode == RSA_X931_PADDING)
239     {
240         if (!setup_tbuf(rctx, ctx))
241             return -1;
242         memcpy(rctx->tbuf, tbs, tbslen);
243         rctx->tbuf[tbslen] =
244             RSA_X931_hash_id(EVP_MD_type(rctx->md));
245         ret = RSA_private_encrypt(tbslen + 1, rctx->tbuf,
246                                 sig, rsa, RSA_X931_PADDING);
247     }
248     else if (rctx->pad_mode == RSA_PKCS1_PADDING)
249     {
250         unsigned int sltmp;
251         ret = RSA_sign(EVP_MD_type(rctx->md),
252                       tbs, tbslen, sig, &sltmp, rsa);
253         if (ret <= 0)
254             return ret;
255         ret = sltmp;
256     }
257     else if (rctx->pad_mode == RSA_PKCS1_PSS_PADDING)
258     {
259         if (!setup_tbuf(rctx, ctx))

```

```

260         return -1;
261         if (!RSA_padding_add_PKCS1_PSS_mgf1(rsa,
262             rctx->tbuf, tbs,
263             rctx->md, rctx->mgf1md,
264             rctx->saltlen))
265             return -1;
266         ret = RSA_private_encrypt(RSA_size(rsa), rctx->tbuf,
267             sig, rsa, RSA_NO_PADDING);
268     }
269     else
270         return -1;
271 }
272 else
273     ret = RSA_private_encrypt(tbslen, tbs, sig, ctx->pkey->pkey.rsa,
274         rctx->pad_mode);
275 if (ret < 0)
276     return ret;
277 *siglen = ret;
278 return 1;
279 }

282 static int pkey_rsa_verifyrecover(EVP_PKEY_CTX *ctx,
283     unsigned char *rout, size_t *routlen,
284     const unsigned char *sig, size_t siglen)
285 {
286     int ret;
287     RSA_PKEY_CTX *rctx = ctx->data;
288
289     if (rctx->md)
290     {
291         if (rctx->pad_mode == RSA_X931_PADDING)
292         {
293             if (!setup_tbuf(rctx, ctx))
294                 return -1;
295             ret = RSA_public_decrypt(siglen, sig,
296                 rctx->tbuf, ctx->pkey->pkey.rsa,
297                 RSA_X931_PADDING);
298             if (ret < 1)
299                 return 0;
300             ret--;
301             if (rctx->tbuf[ret] !=
302                 RSA_X931_hash_id(EVP_MD_type(rctx->md)))
303             {
304                 RSAerr(RSA_F_PKEY_RSA_VERIFYRECOVER,
305                     RSA_R_ALGORITHM_MISMATCH);
306                 return 0;
307             }
308             if (ret != EVP_MD_size(rctx->md))
309             {
310                 RSAerr(RSA_F_PKEY_RSA_VERIFYRECOVER,
311                     RSA_R_INVALID_DIGEST_LENGTH);
312                 return 0;
313             }
314             if (rout)
315                 memcpy(rout, rctx->tbuf, ret);
316         }
317         else if (rctx->pad_mode == RSA_PKCS1_PADDING)
318         {
319             size_t sltmp;
320             ret = int_rsa_verify(EVP_MD_type(rctx->md),
321                 NULL, 0, rout, &sltmp,
322                 sig, siglen, ctx->pkey->pkey.rsa);
323             if (ret <= 0)
324                 return 0;
325             ret = sltmp;

```

```

326     }
327     else
328         return -1;
329 }
330 else
331     ret = RSA_public_decrypt(siglen, sig, rout, ctx->pkey->pkey.rsa,
332         rctx->pad_mode);
333 if (ret < 0)
334     return ret;
335 *routlen = ret;
336 return 1;
337 }

339 static int pkey_rsa_verify(EVP_PKEY_CTX *ctx,
340     const unsigned char *sig, size_t siglen,
341     const unsigned char *tbs, size_t tbslen)
342 {
343     RSA_PKEY_CTX *rctx = ctx->data;
344     RSA *rsa = ctx->pkey->pkey.rsa;
345     size_t rslen;
346 #ifdef OPENSSL_FIPS
347     int rv;
348     rv = pkey_fips_check_ctx(ctx);
349     if (rv < 0)
350     {
351         RSAerr(RSA_F_PKEY_RSA_VERIFY, RSA_R_OPERATION_NOT_ALLOWED_IN_FIP
352             return -1;
353     }
354 #endif
355 if (rctx->md)
356 {
357 #ifdef OPENSSL_FIPS
358     if (rv > 0)
359     {
360         return FIPS_rsa_verify_digest(rsa,
361             tbs, tbslen,
362             rctx->md,
363             rctx->pad_mode,
364             rctx->saltlen,
365             rctx->mgf1md,
366             sig, siglen);
367     }
368 #endif
369 }
370 #endif
371 if (rctx->pad_mode == RSA_PKCS1_PADDING)
372     return RSA_verify(EVP_MD_type(rctx->md), tbs, tbslen,
373         sig, siglen, rsa);
374 if (rctx->pad_mode == RSA_X931_PADDING)
375 {
376     if (pkey_rsa_verifyrecover(ctx, NULL, &rslen,
377         sig, siglen) <= 0)
378         return 0;
379 }
380 else if (rctx->pad_mode == RSA_PKCS1_PSS_PADDING)
381 {
382     int ret;
383     if (!setup_tbuf(rctx, ctx))
384         return -1;
385     ret = RSA_public_decrypt(siglen, sig, rctx->tbuf,
386         rsa, RSA_NO_PADDING);
387     if (ret <= 0)
388         return 0;
389     ret = RSA_verify_PKCS1_PSS_mgf1(rsa, tbs,
390         rctx->md, rctx->mgf1md,
391         rctx->tbuf, rctx->saltlen);
392     if (ret <= 0)

```

```

392         return 0;
393         return 1;
394     }
395     else
396         return -1;
397 }
398 else
399 {
400     if (!setup_tbuf(rctx, ctx))
401         return -1;
402     rslen = RSA_public_decrypt(siglen, sig, rctx->tbuf,
403                               rsa, rctx->pad_mode);
404     if (rslen == 0)
405         return 0;
406 }
408 if ((rslen != tbslen) || memcmp(tbs, rctx->tbuf, rslen))
409     return 0;
411 return 1;
412 }
413 }
414
416 static int pkey_rsa_encrypt(EVP_PKEY_CTX *ctx,
417                             unsigned char *out, size_t *outlen,
418                             const unsigned char *in, size_t inlen)
419 {
420     int ret;
421     RSA_PKEY_CTX *rctx = ctx->data;
422     ret = RSA_public_encrypt(inlen, in, out, ctx->pkey->pkey.rsa,
423                             rctx->pad_mode);
424     if (ret < 0)
425         return ret;
426     *outlen = ret;
427     return 1;
428 }
430 static int pkey_rsa_decrypt(EVP_PKEY_CTX *ctx,
431                             unsigned char *out, size_t *outlen,
432                             const unsigned char *in, size_t inlen)
433 {
434     int ret;
435     RSA_PKEY_CTX *rctx = ctx->data;
436     ret = RSA_private_decrypt(inlen, in, out, ctx->pkey->pkey.rsa,
437                              rctx->pad_mode);
438     if (ret < 0)
439         return ret;
440     *outlen = ret;
441     return 1;
442 }
444 static int check_padding_md(const EVP_MD *md, int padding)
445 {
446     if (!md)
447         return 1;
449     if (padding == RSA_NO_PADDING)
450     {
451         RSAerr(RSA_F_CHECK_PADDING_MD, RSA_R_INVALID_PADDING_MODE);
452         return 0;
453     }
455     if (padding == RSA_X931_PADDING)
456     {
457         if (RSA_X931_hash_id(EVP_MD_type(md)) == -1)

```

```

458     {
459         RSAerr(RSA_F_CHECK_PADDING_MD,
460               RSA_R_INVALID_X931_DIGEST);
461         return 0;
462     }
463     return 1;
464 }
466 return 1;
467 }
468
470 static int pkey_rsa_ctrl(EVP_PKEY_CTX *ctx, int type, int p1, void *p2)
471 {
472     RSA_PKEY_CTX *rctx = ctx->data;
473     switch (type)
474     {
475     case EVP_PKEY_CTRL_RSA_PADDING:
476         if ((p1 >= RSA_PKCS1_PADDING) && (p1 <= RSA_PKCS1_PSS_PADDING))
477         {
478             if (!check_padding_md(rctx->md, p1))
479                 return 0;
480             if (p1 == RSA_PKCS1_PSS_PADDING)
481             {
482                 if (!(ctx->operation &
483                      (EVP_PKEY_OP_SIGN | EVP_PKEY_OP_VERIFY)))
484                     goto bad_pad;
485                 if (!rctx->md)
486                     rctx->md = EVP_sha1();
487             }
488             if (p1 == RSA_PKCS1_OAEP_PADDING)
489             {
490                 if (!(ctx->operation & EVP_PKEY_OP_TYPE_CRYPT))
491                     goto bad_pad;
492                 if (!rctx->md)
493                     rctx->md = EVP_sha1();
494             }
495             rctx->pad_mode = p1;
496             return 1;
497         }
498     bad_pad:
499         RSAerr(RSA_F_PKEY_RSA_CTRL,
500               RSA_R_ILLEGAL_OR_UNSUPPORTED_PADDING_MODE);
501         return -2;
503     case EVP_PKEY_CTRL_GET_RSA_PADDING:
504         *(int *)p2 = rctx->pad_mode;
505         return 1;
507     case EVP_PKEY_CTRL_RSA_PSS_SALTLEN:
508     case EVP_PKEY_CTRL_GET_RSA_PSS_SALTLEN:
509         if (rctx->pad_mode != RSA_PKCS1_PSS_PADDING)
510         {
511             RSAerr(RSA_F_PKEY_RSA_CTRL, RSA_R_INVALID_PSS_SALTLEN);
512             return -2;
513         }
514         if (type == EVP_PKEY_CTRL_GET_RSA_PSS_SALTLEN)
515             *(int *)p2 = rctx->saltlen;
516     else
517     {
518         if (p1 < -2)
519             return -2;
520         rctx->saltlen = p1;
521     }
522     return 1;

```

```

524     case EVP_PKEY_CTRL_RSA_KEYGEN_BITS:
525         if (p1 < 256)
526             {
527                 RSAerr(RSA_F_PKEY_RSA_CTRL, RSA_R_INVALID_KEYBITS);
528                 return -2;
529             }
530         rctx->nbits = p1;
531         return 1;

533     case EVP_PKEY_CTRL_RSA_KEYGEN_PUBEXP:
534         if (!p2)
535             return -2;
536         rctx->pub_exp = p2;
537         return 1;

539     case EVP_PKEY_CTRL_MD:
540         if (!check_padding_md(p2, rctx->pad_mode))
541             return 0;
542         rctx->md = p2;
543         return 1;

545     case EVP_PKEY_CTRL_RSA_MGF1_MD:
546     case EVP_PKEY_CTRL_GET_RSA_MGF1_MD:
547         if (rctx->pad_mode != RSA_PKCS1_PSS_PADDING)
548             {
549                 RSAerr(RSA_F_PKEY_RSA_CTRL, RSA_R_INVALID_MGF1_MD);
550                 return -2;
551             }
552         if (type == EVP_PKEY_CTRL_GET_RSA_MGF1_MD)
553             {
554                 if (rctx->mgf1md)
555                     *(const EVP_MD **)p2 = rctx->mgf1md;
556                 else
557                     *(const EVP_MD **)p2 = rctx->md;
558             }
559         else
560             rctx->mgf1md = p2;
561         return 1;

563     case EVP_PKEY_CTRL_DIGESTINIT:
564     case EVP_PKEY_CTRL_PKCS7_ENCRYPT:
565     case EVP_PKEY_CTRL_PKCS7_DECRYPT:
566     case EVP_PKEY_CTRL_PKCS7_SIGN:
567         return 1;
568 #ifndef OPENSSL_NO_CMS
569     case EVP_PKEY_CTRL_CMS_DECRYPT:
570     {
571         X509_ALGOR *alg = NULL;
572         ASN1_OBJECT *encalg = NULL;
573         if (p2)
574             CMS_RecipientInfo_ktri_get0_algs(p2, NULL, NULL, &alg);
575         if (alg)
576             X509_ALGOR_get0(&encalg, NULL, NULL, alg);
577         if (encalg && OBJ_obj2nid(encalg) == NID_rsasoaep)
578             rctx->pad_mode = RSA_PKCS1_OAEP_PADDING;
579     }
580     case EVP_PKEY_CTRL_CMS_ENCRYPT:
581     case EVP_PKEY_CTRL_CMS_SIGN:
582         return 1;
583 #endif
584     case EVP_PKEY_CTRL_PEER_KEY:
585         RSAerr(RSA_F_PKEY_RSA_CTRL,
586             RSA_R_OPERATION_NOT_SUPPORTED_FOR_THIS_KEYTYPE);
587         return -2;

589     default:

```

```

590         return -2;

592     }
593 }
594
595 static int pkey_rsa_ctrl_str(EVP_PKEY_CTX *ctx,
596                             const char *type, const char *value)
597 {
598     if (!value)
599     {
600         RSAerr(RSA_F_PKEY_RSA_CTRL_STR, RSA_R_VALUE_MISSING);
601         return 0;
602     }
603     if (!strcmp(type, "rsa_padding_mode"))
604     {
605         int pm;
606         if (!strcmp(value, "pkcs1"))
607             pm = RSA_PKCS1_PADDING;
608         else if (!strcmp(value, "sslv23"))
609             pm = RSA_SSLV23_PADDING;
610         else if (!strcmp(value, "none"))
611             pm = RSA_NO_PADDING;
612         else if (!strcmp(value, "oaep"))
613             pm = RSA_PKCS1_OAEP_PADDING;
614         else if (!strcmp(value, "oaep"))
615             pm = RSA_PKCS1_OAEP_PADDING;
616         else if (!strcmp(value, "x931"))
617             pm = RSA_X931_PADDING;
618         else if (!strcmp(value, "pss"))
619             pm = RSA_PKCS1_PSS_PADDING;
620         else
621             {
622                 RSAerr(RSA_F_PKEY_RSA_CTRL_STR,
623                     RSA_R_UNKNOWN_PADDING_TYPE);
624                 return -2;
625             }
626         return EVP_PKEY_CTX_set_rsa_padding(ctx, pm);
627     }

629     if (!strcmp(type, "rsa_pss_saltlen"))
630     {
631         int saltlen;
632         saltlen = atoi(value);
633         return EVP_PKEY_CTX_set_rsa_pss_saltlen(ctx, saltlen);
634     }

636     if (!strcmp(type, "rsa_keygen_bits"))
637     {
638         int nbits;
639         nbits = atoi(value);
640         return EVP_PKEY_CTX_set_rsa_keygen_bits(ctx, nbits);
641     }

643     if (!strcmp(type, "rsa_keygen_pubexp"))
644     {
645         int ret;
646         BIGNUM *pubexp = NULL;
647         if (!BN_asc2bn(&pubexp, value))
648             return 0;
649         ret = EVP_PKEY_CTX_set_rsa_keygen_pubexp(ctx, pubexp);
650         if (ret <= 0)
651             BN_free(pubexp);
652         return ret;
653     }

655     return -2;

```

```

656     }
658 static int pkey_rsa_keygen(EVP_PKEY_CTX *ctx, EVP_PKEY *pkey)
659 {
660     RSA *rsa = NULL;
661     RSA_PKEY_CTX *rctx = ctx->data;
662     BN_GENCB *pcb, cb;
663     int ret;
664     if (!rctx->pub_exp)
665     {
666         rctx->pub_exp = BN_new();
667         if (!rctx->pub_exp || !BN_set_word(rctx->pub_exp, RSA_F4))
668             return 0;
669     }
670     rsa = RSA_new();
671     if (!rsa)
672         return 0;
673     if (ctx->pkey_genctx)
674     {
675         pcb = &cb;
676         evp_pkey_set_cb_translate(pcb, ctx);
677     }
678     else
679         pcb = NULL;
680     ret = RSA_generate_key_ex(rsa, rctx->nbits, rctx->pub_exp, pcb);
681     if (ret > 0)
682         EVP_PKEY_assign_RSA(pkey, rsa);
683     else
684         RSA_free(rsa);
685     return ret;
686 }
688 const EVP_PKEY_METHOD rsa_pkey_meth =
689 {
690     EVP_PKEY_RSA,
691     EVP_PKEY_FLAG_AUTOARGLEN,
692     pkey_rsa_init,
693     pkey_rsa_copy,
694     pkey_rsa_cleanup,
696     0, 0,
698     0,
699     pkey_rsa_keygen,
701     0,
702     pkey_rsa_sign,
704     0,
705     pkey_rsa_verify,
707     0,
708     pkey_rsa_verifyrecover,
711     0, 0, 0, 0,
713     0,
714     pkey_rsa_encrypt,
716     0,
717     pkey_rsa_decrypt,
719     0, 0,
721     pkey_rsa_ctrl,

```

```

722     pkey_rsa_ctrl_str
725     };

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_prn.c

1

```
*****
3377 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_prn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rsa/rsa_prn.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2006.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/rsa.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_prn.c

2

```
62 #include <openssl/evp.h>
63
64 #ifndef OPENSSL_NO_FP_API
65 int RSA_print_fp(FILE *fp, const RSA *x, int off)
66 {
67     BIO *b;
68     int ret;
69
70     if ((b=BIO_new(BIO_s_file())) == NULL)
71     {
72         RSAerr(RSA_F_RSA_PRINT_FP,ERR_R_BUF_LIB);
73         return(0);
74     }
75     BIO_set_fp(b,fp,BIO_NOCLOSE);
76     ret=RSA_print(b,x,off);
77     BIO_free(b);
78     return(ret);
79 }
80 #endif
81
82 int RSA_print(BIO *bp, const RSA *x, int off)
83 {
84     EVP_PKEY *pk;
85     int ret;
86     pk = EVP_PKEY_new();
87     if (!pk || !EVP_PKEY_set1_RSA(pk, (RSA *)x))
88         return 0;
89     ret = EVP_PKEY_print_private(bp, pk, off, NULL);
90     EVP_PKEY_free(pk);
91     return ret;
92 }
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pss.c

1

```
*****
8064 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pss.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* rsa_pss.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2005.
4  */
5 /* =====
6  * Copyright (c) 2005 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_pss.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/evp.h>
64 #include <openssl/rand.h>
65 #include <openssl/sha.h>

67 static const unsigned char zeroes[] = {0,0,0,0,0,0,0,0};

69 #if defined(_MSC_VER) && defined(_ARM_)
70 #pragma optimize("g", off)
71 #endif

73 int RSA_verify_PKCS1_PSS(RSA *rsa, const unsigned char *mHash,
74                          const EVP_MD *Hash, const unsigned char *EM, int sLen)
75 {
76     return RSA_verify_PKCS1_PSS_mgf1(rsa, mHash, Hash, NULL, EM, sLen);
77 }

79 int RSA_verify_PKCS1_PSS_mgf1(RSA *rsa, const unsigned char *mHash,
80                                const EVP_MD *Hash, const EVP_MD *mgf1Hash,
81                                const unsigned char *EM, int sLen)
82 {
83     int i;
84     int ret = 0;
85     int hLen, maskedDBLen, MSBits, emLen;
86     const unsigned char *H;
87     unsigned char *DB = NULL;
88     EVP_MD_CTX ctx;
89     unsigned char H_[EVP_MAX_MD_SIZE];
90     EVP_MD_CTX_init(&ctx);

92     if (mgf1Hash == NULL)
93         mgf1Hash = Hash;

95     hLen = EVP_MD_size(Hash);
96     if (hLen < 0)
97         goto err;
98     /*
99     * Negative sLen has special meanings:
100     * -1      sLen == hLen
101     * -2      salt length is autorecovered from signature
102     * -N      reserved
103     */
104     if (sLen == -1)    sLen = hLen;
105     else if (sLen == -2) sLen = -2;
106     else if (sLen < -2)
107     {
108         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, RSA_R_SLEN_CHECK_FAILED)
109         goto err;
110     }

112     MSBits = (BN_num_bits(rsa->n) - 1) & 0x7;
113     emLen = RSA_size(rsa);
114     if (EM[0] & (0xFF << MSBits))
115     {
116         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, RSA_R_FIRST_OCTET_INVALID)
117         goto err;
118     }
119     if (MSBits == 0)
120     {
121         EM++;
122         emLen--;
123     }
124     if (emLen < (hLen + sLen + 2)) /* sLen can be small negative */
125     {
126         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, RSA_R_DATA_TOO_LARGE);
127         goto err;
128     }
```

```

128     }
129     if (EM[emLen - 1] != 0xbc)
130     {
131         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, RSA_R_LAST_OCTET_INVALID);
132         goto err;
133     }
134     maskedDBLen = emLen - hLen - 1;
135     H = EM + maskedDBLen;
136     DB = OPENSSL_malloc(maskedDBLen);
137     if (!DB)
138     {
139         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, ERR_R_MALLOC_FAILURE);
140         goto err;
141     }
142     if (PKCS1_MGF1(DB, maskedDBLen, H, hLen, mgf1Hash) < 0)
143         goto err;
144     for (i = 0; i < maskedDBLen; i++)
145         DB[i] ^= EM[i];
146     if (MSBits)
147         DB[0] &= 0xFF >> (8 - MSBits);
148     for (i = 0; DB[i] == 0 && i < (maskedDBLen-1); i++) ;
149     if (DB[i++] != 0x1)
150     {
151         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, RSA_R_SLEN_RECOVERY_FAIL);
152         goto err;
153     }
154     if (sLen >= 0 && (maskedDBLen - i) != sLen)
155     {
156         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, RSA_R_SLEN_CHECK_FAILED);
157         goto err;
158     }
159     if (!EVP_DigestInit_ex(&ctx, Hash, NULL))
160         || !EVP_DigestUpdate(&ctx, zeroes, sizeof zeroes)
161         || !EVP_DigestUpdate(&ctx, mHash, hLen))
162         goto err;
163     if (maskedDBLen - i)
164     {
165         if (!EVP_DigestUpdate(&ctx, DB + i, maskedDBLen - i))
166             goto err;
167     }
168     if (!EVP_DigestFinal_ex(&ctx, H_, NULL))
169         goto err;
170     if (memcmp(H_, H, hLen))
171     {
172         RSAerr(RSA_F_RSA_VERIFY_PKCS1_PSS_MGF1, RSA_R_BAD_SIGNATURE);
173         ret = 0;
174     }
175     else
176         ret = 1;
177
178     err:
179     if (DB)
180         OPENSSL_free(DB);
181     EVP_MD_CTX_cleanup(&ctx);
182
183     return ret;
184
185 }
186
187 int RSA_padding_add_PKCS1_PSS(RSA *rsa, unsigned char *EM,
188                               const unsigned char *mHash,
189                               const EVP_MD *Hash, int sLen)
190 {
191     return RSA_padding_add_PKCS1_PSS_mgf1(rsa, EM, mHash, Hash, NULL, sLen);
192 }

```

```

194 int RSA_padding_add_PKCS1_PSS_mgf1(RSA *rsa, unsigned char *EM,
195                                     const unsigned char *mHash,
196                                     const EVP_MD *Hash, const EVP_MD *mgf1Hash, int sLen)
197 {
198     int i;
199     int ret = 0;
200     int hLen, maskedDBLen, MSBits, emLen;
201     unsigned char *H, *salt = NULL, *p;
202     EVP_MD_CTX ctx;
203
204     if (mgf1Hash == NULL)
205         mgf1Hash = Hash;
206
207     hLen = EVP_MD_size(Hash);
208     if (hLen < 0)
209         goto err;
210     /*
211     * Negative sLen has special meanings:
212     * -1      sLen == hLen
213     * -2      salt length is maximized
214     * -N      reserved
215     */
216     if (sLen == -1)      sLen = hLen;
217     else if (sLen == -2)  sLen = -2;
218     else if (sLen < -2)
219     {
220         RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_PSS_MGF1, RSA_R_SLEN_CHECK_FA);
221         goto err;
222     }
223
224     MSBits = (BN_num_bits(rsa->n) - 1) & 0x7;
225     emLen = RSA_size(rsa);
226     if (MSBits == 0)
227     {
228         *EM++ = 0;
229         emLen--;
230     }
231     if (sLen == -2)
232     {
233         sLen = emLen - hLen - 2;
234     }
235     else if (emLen < (hLen + sLen + 2))
236     {
237         RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_PSS_MGF1, RSA_R_DATA_TOO_LARGE);
238         goto err;
239     }
240     if (sLen > 0)
241     {
242         salt = OPENSSL_malloc(sLen);
243         if (!salt)
244         {
245             RSAerr(RSA_F_RSA_PADDING_ADD_PKCS1_PSS_MGF1, ERR_R_MALLOC);
246             goto err;
247         }
248         if (RAND_bytes(salt, sLen) <= 0)
249             goto err;
250     }
251     maskedDBLen = emLen - hLen - 1;
252     H = EM + maskedDBLen;
253     EVP_MD_CTX_init(&ctx);
254     if (!EVP_DigestInit_ex(&ctx, Hash, NULL))
255         || !EVP_DigestUpdate(&ctx, zeroes, sizeof zeroes)
256         || !EVP_DigestUpdate(&ctx, mHash, hLen))
257         goto err;
258     if (sLen && !EVP_DigestUpdate(&ctx, salt, sLen))
259         goto err;

```



```
260     if (!EVP_DigestFinal_ex(&ctx, H, NULL))
261         goto err;
262     EVP_MD_CTX_cleanup(&ctx);

264     /* Generate dbMask in place then perform XOR on it */
265     if (PKCS1_MGF1(EM, maskedDBLen, H, hLen, mgf1Hash))
266         goto err;

268     p = EM;

270     /* Initial PS XORs with all zeroes which is a NOP so just update
271      * pointer. Note from a test above this value is guaranteed to
272      * be non-negative.
273      */
274     p += emLen - sLen - hLen - 2;
275     *p++ ^= 0x1;
276     if (sLen > 0)
277     {
278         for (i = 0; i < sLen; i++)
279             *p++ ^= salt[i];
280     }
281     if (MSBits)
282         EM[0] &= 0xFF >> (8 - MSBits);

284     /* H is already in place so just set final 0xbc */

286     EM[emLen - 1] = 0xbc;

288     ret = 1;

290 err:
291     if (salt)
292         OPENSSL_free(salt);

294     return ret;

296 }

298 #if defined(_MSC_VER)
299 #pragma optimize("",on)
300 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_saos.c

1

5234 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_saos.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/rsa/rsa_saos.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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18 * If this package is used in a product, Eric Young should be given attribution
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22 *
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34 * Eric Young (eay@cryptsoft.com)"
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_saos.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/objects.h>
64 #include <openssl/x509.h>
65
66 int RSA_sign_ASN1_OCTET_STRING(int type,
67     const unsigned char *m, unsigned int m_len,
68     unsigned char *sigret, unsigned int *siglen, RSA *rsa)
69 {
70     ASN1_OCTET_STRING sig;
71     int i,j,ret=1;
72     unsigned char *p,*s;
73
74     sig.type=V_ASN1_OCTET_STRING;
75     sig.length=m_len;
76     sig.data=(unsigned char *)m;
77
78     i=i2d_ASN1_OCTET_STRING(&sig,NULL);
79     j=RSA_size(rsa);
80     if (i > (j-RSA_PKCS1_PADDING_SIZE))
81     {
82         RSAerr(RSA_F_RSA_SIGN_ASN1_OCTET_STRING,RSA_R_DIGEST_TOO_BIG_FOR
83             return(0);
84     }
85     s=(unsigned char *)OPENSSL_malloc((unsigned int)j+1);
86     if (s == NULL)
87     {
88         RSAerr(RSA_F_RSA_SIGN_ASN1_OCTET_STRING,ERR_R_MALLOC_FAILURE);
89         return(0);
90     }
91     p=s;
92     i2d_ASN1_OCTET_STRING(&sig,&p);
93     i=RSA_private_encrypt(i,s,sigret,rsa,RSA_PKCS1_PADDING);
94     if (i <= 0)
95         ret=0;
96     else
97         *siglen=i;
98
99     OPENSSL_cleanse(s,(unsigned int)j+1);
100    OPENSSL_free(s);
101    return(ret);
102 }
103
104 int RSA_verify_ASN1_OCTET_STRING(int dtype,
105     const unsigned char *m,
106     unsigned int m_len, unsigned char *sigbuf, unsigned int siglen,
107     RSA *rsa)
108 {
109     int i,ret=0;
110     unsigned char *s;
111     const unsigned char *p;
112     ASN1_OCTET_STRING *sig=NULL;
113
114     if (siglen != (unsigned int)RSA_size(rsa))
115     {
116         RSAerr(RSA_F_RSA_VERIFY_ASN1_OCTET_STRING,RSA_R_WRONG_SIGNATURE
117             return(0);
118     }
119
120     s=(unsigned char *)OPENSSL_malloc((unsigned int)siglen);
121     if (s == NULL)
122     {
123         RSAerr(RSA_F_RSA_VERIFY_ASN1_OCTET_STRING,ERR_R_MALLOC_FAILURE);
124         goto err;
125     }
126     i=RSA_public_decrypt((int)siglen,sigbuf,s,rsa,RSA_PKCS1_PADDING);
```

```
128     if (i <= 0) goto err;
130     p=s;
131     sig=d2i_ASN1_OCTET_STRING(NULL,&p,(long)i);
132     if (sig == NULL) goto err;
134     if ( ((unsigned int)sig->length != m_len) ||
135          (memcmp(m,sig->data,m_len) != 0))
136     {
137         RSAerr(RSA_F_RSA_VERIFY_ASN1_OCTET_STRING,RSA_R_BAD_SIGNATURE);
138     }
139     else
140         ret=1;
141 err:
142     if (sig != NULL) M_ASN1_OCTET_STRING_free(sig);
143     if (s != NULL)
144     {
145         OPENSSL_cleanse(s,(unsigned int)siglen);
146         OPENSSL_free(s);
147     }
148     return(ret);
149 }
```

```
*****
9367 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_sign.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/rsa/rsa_sign.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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38 * the apps directory (application code) you must include an acknowledgement:
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

```
62 #include <openssl/rsa.h>
63 #include <openssl/objects.h>
64 #include <openssl/x509.h>
65 #include "rsa_locl.h"
66
67 /* Size of an SSL signature: MD5+SHA1 */
68 #define SSL_SIG_LENGTH 36
69
70 int RSA_sign(int type, const unsigned char *m, unsigned int m_len,
71             unsigned char *sigret, unsigned int *siglen, RSA *rsa)
72 {
73     X509_SIG sig;
74     ASN1_TYPE parameter;
75     int i, j, ret=1;
76     unsigned char *p, *tmps = NULL;
77     const unsigned char *s = NULL;
78     X509_ALGOR algor;
79     ASN1_OCTET_STRING digest;
80 #ifdef OPENSSL_FIPS
81     if (FIPS_mode() && !(rsa->meth->flags & RSA_FLAG_FIPS_METHOD)
82         && !(rsa->flags & RSA_FLAG_NON_FIPS_ALLOW))
83     {
84         RSAerr(RSA_F_RSA_SIGN, RSA_R_NON_FIPS_RSA_METHOD);
85         return 0;
86     }
87 #endif
88     if((rsa->flags & RSA_FLAG_SIGN_VER) && rsa->meth->rsa_sign)
89     {
90         return rsa->meth->rsa_sign(type, m, m_len,
91                                   sigret, siglen, rsa);
92     }
93     /* Special case: SSL signature, just check the length */
94     if(type == NID_md5_sha1) {
95         if(m_len != SSL_SIG_LENGTH) {
96             RSAerr(RSA_F_RSA_SIGN, RSA_R_INVALID_MESSAGE_LENGTH);
97             return(0);
98         }
99         i = SSL_SIG_LENGTH;
100         s = m;
101     } else {
102         sig.algor = &algor;
103         sig.algor->algorithm = OBJ_nid2obj(type);
104         if (sig.algor->algorithm == NULL)
105         {
106             RSAerr(RSA_F_RSA_SIGN, RSA_R_UNKNOWN_ALGORITHM_TYPE);
107             return(0);
108         }
109         if (sig.algor->algorithm->length == 0)
110         {
111             RSAerr(RSA_F_RSA_SIGN, RSA_R_THE_ASN1_OBJECT_IDENTIFIER_I);
112             return(0);
113         }
114         parameter.type = V_ASN1_NULL;
115         parameter.value.ptr = NULL;
116         sig.algor->parameter = &parameter;
117
118         sig.digest = &digest;
119         sig.digest->data = (unsigned char *)m; /* TMP UGLY CAST */
120         sig.digest->length = m_len;
121
122         i = i2d_X509_SIG(&sig, NULL);
123     }
124     j = RSA_size(rsa);
125     if (i > (j - RSA_PKCS1_PADDING_SIZE))
126     {
127         RSAerr(RSA_F_RSA_SIGN, RSA_R_DIGEST_TOO_BIG_FOR_RSA_KEY);
```

```

128         return(0);
129     }
130     if(type != NID_md5_sha1) {
131         tmps=(unsigned char *)OPENSSL_malloc((unsigned int)j+1);
132         if (tmps == NULL)
133             {
134                 RSAerr(RSA_F_RSA_SIGN,ERR_R_MALLOC_FAILURE);
135                 return(0);
136             }
137         p=tmps;
138         i2d_X509_SIG(&sig,&p);
139         s=tmps;
140     }
141     i=RSA_private_encrypt(i,s,sigret,rsa,RSA_PKCS1_PADDING);
142     if (i <= 0)
143         ret=0;
144     else
145         *siglen=i;
146
147     if(type != NID_md5_sha1) {
148         OPENSSL_cleanse(tmps,(unsigned int)j+1);
149         OPENSSL_free(tmps);
150     }
151     return(ret);
152 }

```

```

154 int int_rsa_verify(int dtype, const unsigned char *m,
155                    unsigned int m_len,
156                    unsigned char *rm, size_t *prm_len,
157                    const unsigned char *sigbuf, size_t siglen,
158                    RSA *rsa)
159 {
160     int i,ret=0,sigtype;
161     unsigned char *s;
162     X509_SIG *sig=NULL;

```

```

164 #ifdef OPENSSL_FIPS
165     if (FIPS_mode()) && !(rsa->meth->flags & RSA_FLAG_FIPS_METHOD)
166         && !(rsa->flags & RSA_FLAG_NON_FIPS_ALLOW)
167     {
168         RSAerr(RSA_F_INT_RSA_VERIFY, RSA_R_NON_FIPS_RSA_METHOD);
169         return 0;
170     }
171 #endif

```

```

173     if (siglen != (unsigned int)RSA_size(rsa))
174     {
175         RSAerr(RSA_F_INT_RSA_VERIFY, RSA_R_WRONG_SIGNATURE_LENGTH);
176         return(0);
177     }

```

```

179     if((dtype == NID_md5_sha1) && rm)
180     {
181         i = RSA_public_decrypt((int)siglen,
182                                sigbuf,rm,rsa,RSA_PKCS1_PADDING);
183         if (i <= 0)
184             return 0;
185         *prm_len = i;
186         return 1;
187     }

```

```

189     s=(unsigned char *)OPENSSL_malloc((unsigned int)siglen);
190     if (s == NULL)
191     {
192         RSAerr(RSA_F_INT_RSA_VERIFY,ERR_R_MALLOC_FAILURE);
193         goto err;

```

```

194     }
195     if((dtype == NID_md5_sha1) && (m_len != SSL_SIG_LENGTH) ) {
196         RSAerr(RSA_F_INT_RSA_VERIFY,RSA_R_INVALID_MESSAGE_LENGTH
197               goto err;
198     }
199     i=RSA_public_decrypt((int)siglen,sigbuf,s,rsa,RSA_PKCS1_PADDING);

```

```

201     if (i <= 0) goto err;
202     /* Oddball MDC2 case: signature can be OCTET STRING.
203      * check for correct tag and length octets.
204      */
205     if (dtype == NID_mdc2 && i == 18 && s[0] == 0x04 && s[1] == 0x10)
206     {
207         if (rm)
208         {
209             memcpy(rm, s + 2, 16);
210             *prm_len = 16;
211             ret = 1;
212         }
213         else if(memcmp(m, s + 2, 16))
214             RSAerr(RSA_F_INT_RSA_VERIFY,RSA_R_BAD_SIGNATURE);
215         else
216             ret = 1;
217     }

```

```

219     /* Special case: SSL signature */
220     if(dtype == NID_md5_sha1) {
221         if((i != SSL_SIG_LENGTH) || memcmp(s, m, SSL_SIG_LENGTH))
222             RSAerr(RSA_F_INT_RSA_VERIFY,RSA_R_BAD_SIGNATURE)
223         else ret = 1;
224     } else {
225         const unsigned char *p=s;
226         sig=d2i_X509_SIG(NULL,&p,(long)i);

```

```

228         if (sig == NULL) goto err;

```

```

230         /* Excess data can be used to create forgeries */
231         if(p != s+i)
232         {
233             RSAerr(RSA_F_INT_RSA_VERIFY,RSA_R_BAD_SIGNATURE);
234             goto err;
235         }

```

```

237         /* Parameters to the signature algorithm can also be used to
238          * create forgeries */
239         if(sig->algor->parameter
240            && ASN1_TYPE_get(sig->algor->parameter) != V_ASN1_NULL)
241         {
242             RSAerr(RSA_F_INT_RSA_VERIFY,RSA_R_BAD_SIGNATURE);
243             goto err;
244         }

```

```

246         sigtype=OBJ_obj2nid(sig->algor->algorithm);

```

```

249 #ifdef RSA_DEBUG
250     /* put a backward compatibility flag in EAY */
251     fprintf(stderr,"in(%s) expect(%s)\n",OBJ_nid2ln(sigtype),
252            OBJ_nid2ln(dtype));
253 #endif
254     if (sigtype != dtype)
255     {
256         if (((dtype == NID_md5) &&
257              (sigtype == NID_md5withRSAEncryption)) ||
258             ((dtype == NID_md2) &&
259              (sigtype == NID_md2withRSAEncryption)))

```

```

260     {
261         /* ok, we will let it through */
262         #if !defined(OPENSSL_NO_STDIO) && !defined(OPENSSL_SYS_WIN16)
263             fprintf(stderr,"signature has problems, re-make
264         #endif
265     }
266     else
267     {
268         RSAerr(RSA_F_INT_RSA_VERIFY,
269             RSA_R_ALGORITHM_MISMATCH);
270         goto err;
271     }
272 }
273 if (rm)
274 {
275     const EVP_MD *md;
276     md = EVP_get_digestbynid(dtype);
277     if (md && (EVP_MD_size(md) != sig->digest->length))
278         RSAerr(RSA_F_INT_RSA_VERIFY,
279             RSA_R_INVALID_DIGEST_LENGTH);
280     else
281     {
282         memcpy(rm, sig->digest->data,
283             sig->digest->length);
284         *prm_len = sig->digest->length;
285         ret = 1;
286     }
287 }
288 else if (((unsigned int)sig->digest->length != m_len) ||
289     (memcmp(m, sig->digest->data, m_len) != 0))
290 {
291     RSAerr(RSA_F_INT_RSA_VERIFY, RSA_R_BAD_SIGNATURE);
292 }
293 else
294     ret=1;
295 }
296 err:
297 if (sig != NULL) X509_SIG_free(sig);
298 if (s != NULL)
299 {
300     OPENSSL_cleanse(s, (unsigned int)siglen);
301     OPENSSL_free(s);
302 }
303 return(ret);
304 }
306 int RSA_verify(int dtype, const unsigned char *m, unsigned int m_len,
307     const unsigned char *sigbuf, unsigned int siglen,
308     RSA *rsa)
309 {
310     if((rsa->flags & RSA_FLAG_SIGN_VER) && rsa->meth->rsa_verify)
311     {
312         return rsa->meth->rsa_verify(dtype, m, m_len,
313             sigbuf, siglen, rsa);
314     }
315 }
317 return int_rsa_verify(dtype, m, m_len, NULL, NULL, sigbuf, siglen, rsa);
318 }

```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_ssl.c

1

```
*****
4942 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_ssl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/rsa/rsa_ssl.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
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24 * modification, are permitted provided that the following conditions
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_ssl.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/rand.h>
64
65 int RSA_padding_add_SSLv23(unsigned char *to, int tlen,
66 const unsigned char *from, int flen)
67 {
68     int i,j;
69     unsigned char *p;
70
71     if (flen > (tlen-11))
72     {
73         RSAerr(RSA_F_RSA_PADDING_ADD_SSLV23,RSA_R_DATA_TOO_LARGE_FOR_KEY);
74         return(0);
75     }
76
77     p=(unsigned char *)to;
78
79     *(p++)=0;
80     *(p++)=2; /* Public Key BT (Block Type) */
81
82     /* pad out with non-zero random data */
83     j=tlen-3-8-flen;
84
85     if (RAND_bytes(p,j) <= 0)
86         return(0);
87     for (i=0; i<j; i++)
88     {
89         if (*p == '\0')
90             do {
91                 if (RAND_bytes(p,1) <= 0)
92                     return(0);
93             } while (*p == '\0');
94         p++;
95     }
96
97     memset(p,3,8);
98     p+=8;
99     *(p++)='\0';
100
101     memcpy(p,from,(unsigned int)flen);
102     return(1);
103 }
104
105 int RSA_padding_check_SSLv23(unsigned char *to, int tlen,
106 const unsigned char *from, int flen, int num)
107 {
108     int i,j,k;
109     const unsigned char *p;
110
111     p=from;
112     if (flen < 10)
113     {
114         RSAerr(RSA_F_RSA_PADDING_CHECK_SSLV23,RSA_R_DATA_TOO_SMALL);
115         return(-1);
116     }
117     if ((num != (flen+1)) || (*(p++) != 02))
118     {
119         RSAerr(RSA_F_RSA_PADDING_CHECK_SSLV23,RSA_R_BLOCK_TYPE_IS_NOT_02);
120         return(-1);
121     }
122
123     /* scan over padding data */
124     j=flen-1; /* one for type */
125     for (i=0; i<j; i++)
126         if (*(p++) == 0) break;
```

```
128     if ((i == j) || (i < 8))
129     {
130         RSAerr(RSA_F_RSA_PADDING_CHECK_SSLV23, RSA_R_NULL_BEFORE_BLOCK_MI
131             return(-1);
132     }
133     for (k = -9; k < -1; k++)
134     {
135         if (p[k] != 0x03) break;
136     }
137     if (k == -1)
138     {
139         RSAerr(RSA_F_RSA_PADDING_CHECK_SSLV23, RSA_R_SSLV3_ROLLBACK_ATTAC
140             return(-1);
141     }
143     i++; /* Skip over the '\0' */
144     j = i;
145     if (j > tlen)
146     {
147         RSAerr(RSA_F_RSA_PADDING_CHECK_SSLV23, RSA_R_DATA_TOO_LARGE);
148         return(-1);
149     }
150     memcpy(to, p, (unsigned int)j);
152     return(j);
153 }
```


new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_x931.c

1

```
*****
4667 Fri May 30 18:32:09 2014
new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_x931.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* rsa_x931.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2005.
4  */
5 /* =====
6  * Copyright (c) 2005 The OpenSSL Project. All rights reserved.
7  *
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20  * 3. All advertising materials mentioning features or use of this
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/rsa/rsa_x931.c

2

```
62 #include <openssl/rsa.h>
63 #include <openssl/rand.h>
64 #include <openssl/objects.h>
65
66 int RSA_padding_add_X931(unsigned char *to, int tlen,
67                          const unsigned char *from, int flen)
68 {
69     int j;
70     unsigned char *p;
71
72     /* Absolute minimum amount of padding is 1 header nibble, 1 padding
73      * nibble and 2 trailer bytes: but 1 hash if is already in 'from'.
74      */
75
76     j = tlen - flen - 2;
77
78     if (j < 0)
79     {
80         RSAerr(RSA_F_RSA_PADDING_ADD_X931, RSA_R_DATA_TOO_LARGE_FOR_KEY_S
81              );
82         return -1;
83     }
84
85     p=(unsigned char *)to;
86
87     /* If no padding start and end nibbles are in one byte */
88     if (j == 0)
89         *p++ = 0x6A;
90     else
91     {
92         *p++ = 0x6B;
93         if (j > 1)
94         {
95             memset(p, 0xBB, j - 1);
96             p += j - 1;
97         }
98         *p++ = 0xBA;
99     }
100     memcpy(p, from, (unsigned int)flen);
101     p += flen;
102     *p = 0xCC;
103     return(1);
104 }
105
106 int RSA_padding_check_X931(unsigned char *to, int tlen,
107                           const unsigned char *from, int flen, int num)
108 {
109     int i = 0, j;
110     const unsigned char *p;
111
112     p=from;
113     if ((num != flen) || ((*p != 0x6A) && (*p != 0x6B)))
114     {
115         RSAerr(RSA_F_RSA_PADDING_CHECK_X931, RSA_R_INVALID_HEADER);
116         return -1;
117     }
118
119     if (*p++ == 0x6B)
120     {
121         j=flen-3;
122         for (i = 0; i < j; i++)
123         {
124             unsigned char c = *p++;
125             if (c == 0xBA)
126                 break;
127             if (c != 0xBB)
```

```
128         RSAerr(RSA_F_RSA_PADDING_CHECK_X931,
129                RSA_R_INVALID_PADDING);
130         return -1;
131     }
132 }
133
134     j -= i;
135
136     if (i == 0)
137     {
138         RSAerr(RSA_F_RSA_PADDING_CHECK_X931, RSA_R_INVALID_PADDING);
139         return -1;
140     }
141
142 }
143 else j = flen - 2;
144
145 if (p[j] != 0xCC)
146 {
147     RSAerr(RSA_F_RSA_PADDING_CHECK_X931, RSA_R_INVALID_TRAILER);
148     return -1;
149 }
150
151 memcpy(to, p, (unsigned int)j);
152
153 return(j);
154 }
155
156 /* Translate between X931 hash ids and NIDs */
157
158 int RSA_X931_hash_id(int nid)
159 {
160     switch (nid)
161     {
162     case NID_sha1:
163         return 0x33;
164
165     case NID_sha256:
166         return 0x34;
167
168     case NID_sha384:
169         return 0x36;
170
171     case NID_sha512:
172         return 0x35;
173
174     }
175     return -1;
176 }
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha1_one.c

1

```
*****
3604 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/sha/sha1_one.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/sha/sha1_one.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <string.h>
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha1_one.c

2

```
62 #include <openssl/sha.h>
64 #ifndef OPENSSL_NO_SHA1
65 unsigned char *SHA1(const unsigned char *d, size_t n, unsigned char *md)
66 {
67     SHA_CTX c;
68     static unsigned char m[SHA_DIGEST_LENGTH];
69
70     if (md == NULL) md=m;
71     if (!SHA1_Init(&c))
72         return NULL;
73     SHA1_Update(&c,d,n);
74     SHA1_Final(md,&c);
75     OPENSSL_cleanse(&c,sizeof(c));
76     return(md);
77 }
78 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha1dgst.c

1

3515 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/sha/sha1dgst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/sha/sha1dgst.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
22 *
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <openssl/crypto.h>
60 #include <openssl/opensslconf.h>
61 #if !defined(OPENSSL_NO_SHA1) && !defined(OPENSSL_NO_SHA)
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha1dgst.c

2

```
63 #undef SHA_0
64 #define SHA_1

66 #include <openssl/opensslv.h>

68 const char SHA1_version[]="SHA1" OPENSSL_VERSION_PTEXT;

70 /* The implementation is in ../md32_common.h */

72 #include "sha_locl.h"

74 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha256.c

1

```
*****
9306 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/sha/sha256.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/sha/sha256.c */
2 /* =====
3  * Copyright (c) 2004 The OpenSSL Project. All rights reserved
4  * according to the OpenSSL license [found in ../LICENSE].
5  * =====
6  */
7 #include <openssl/opensslconf.h>
8 #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_SHA256)

10 #include <stdlib.h>
11 #include <string.h>

13 #include <openssl/crypto.h>
14 #include <openssl/sha.h>
15 #include <openssl/opensslv.h>

17 const char SHA256_version[]="SHA-256" OPENSSL_VERSION_PTEXT;

19 fips_md_init_ctx(SHA224, SHA256)
20 {
21     memset (c,0,sizeof(*c));
22     c->h[0]=0xc1059ed8UL; c->h[1]=0x367cd507UL;
23     c->h[2]=0x3070dd17UL; c->h[3]=0xf70e5939UL;
24     c->h[4]=0xffc00b31UL; c->h[5]=0x68581511UL;
25     c->h[6]=0x64f98fa7UL; c->h[7]=0xbefa4fa4UL;
26     c->md_len=SHA224_DIGEST_LENGTH;
27     return 1;
28 }

30 fips_md_init(SHA256)
31 {
32     memset (c,0,sizeof(*c));
33     c->h[0]=0x6a09e667UL; c->h[1]=0xbb67ae85UL;
34     c->h[2]=0x3c6ef372UL; c->h[3]=0xa54ff53aUL;
35     c->h[4]=0x510e527fUL; c->h[5]=0x9b05688cUL;
36     c->h[6]=0x1f83d9abUL; c->h[7]=0x5be0cd19UL;
37     c->md_len=SHA256_DIGEST_LENGTH;
38     return 1;
39 }

41 unsigned char *SHA224(const unsigned char *d, size_t n, unsigned char *md)
42 {
43     SHA256_CTX c;
44     static unsigned char m[SHA224_DIGEST_LENGTH];

46     if (md == NULL) md=m;
47     SHA224_Init(&c);
48     SHA256_Update(&c,d,n);
49     SHA256_Final(md,&c);
50     OPENSSL_cleanse(&c,sizeof(c));
51     return(md);
52 }

54 unsigned char *SHA256(const unsigned char *d, size_t n, unsigned char *md)
55 {
56     SHA256_CTX c;
57     static unsigned char m[SHA256_DIGEST_LENGTH];

59     if (md == NULL) md=m;
60     SHA256_Init(&c);
61     SHA256_Update(&c,d,n);
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha256.c

2

```
62     SHA256_Final(md,&c);
63     OPENSSL_cleanse(&c,sizeof(c));
64     return(md);
65 }

67 int SHA224_Update(SHA256_CTX *c, const void *data, size_t len)
68 { return SHA256_Update (c,data,len); }
69 int SHA224_Final (unsigned char *md, SHA256_CTX *c)
70 { return SHA256_Final (md,c); }

72 #define DATA_ORDER_IS_BIG_ENDIAN

74 #define HASH_LONG          SHA_LONG
75 #define HASH_CTX          SHA256_CTX
76 #define HASH_CBLOCK      SHA_CBLOCK
77 /*
78  * Note that FIPS180-2 discusses "Truncation of the Hash Function Output."
79  * default: case below covers for it. It's not clear however if it's
80  * permitted to truncate to amount of bytes not divisible by 4. I bet not,
81  * but if it is, then default: case shall be extended. For reference.
82  * Idea behind separate cases for pre-defined lengths is to let the
83  * compiler decide if it's appropriate to unroll small loops.
84  */
85 #define HASH_MAKE_STRING(c,s) do { \
86     unsigned long ll; \
87     unsigned int nn; \
88     switch ((c)->md_len) \
89     { case SHA224_DIGEST_LENGTH: \
90         for (nn=0;nn<SHA224_DIGEST_LENGTH/4;nn++) \
91             { ll=(c)->h[nn]; (void)HOST_l2c(ll,(s)); } \
92         break; \
93     case SHA256_DIGEST_LENGTH: \
94         for (nn=0;nn<SHA256_DIGEST_LENGTH/4;nn++) \
95             { ll=(c)->h[nn]; (void)HOST_l2c(ll,(s)); } \
96         break; \
97     default: \
98         if ((c)->md_len > SHA256_DIGEST_LENGTH) \
99             return 0; \
100         for (nn=0;nn<(c)->md_len/4;nn++) \
101             { ll=(c)->h[nn]; (void)HOST_l2c(ll,(s)); } \
102         break; \
103     } \
104 } while (0)

106 #define HASH_UPDATE          SHA256_Update
107 #define HASH_TRANSFORM      SHA256_Transform
108 #define HASH_FINAL          SHA256_Final
109 #define HASH_BLOCK_DATA_ORDER sha256_block_data_order
110 #ifndef SHA256_ASM
111 static
112 #endif
113 void sha256_block_data_order (SHA256_CTX *ctx, const void *in, size_t num);

115 #include "md32_common.h"

117 #ifndef SHA256_ASM
118 static const SHA_LONG K256[64] = {
119     0x428a2f98UL,0x71374491UL,0xb5c0fbcfUL,0xe9b5dba5UL,
120     0x3956c25bUL,0x59f111f1UL,0x923f82a4UL,0xab1c5ed5UL,
121     0xd807aa98UL,0x12835b01UL,0x243185beUL,0x550c7dc3UL,
122     0x72be5d74UL,0x80deb1feUL,0x9bdc06a7UL,0xc19b174UL,
123     0xe49b69c1UL,0xefbe4786UL,0x0fc19dc6UL,0x240ca1ccUL,
124     0x2de92c6fUL,0x4a7484aaUL,0x5cb0a9dcUL,0x76f988daUL,
125     0x983e5152UL,0xa831c66dUL,0xb00327c8UL,0xbf597fc7UL,
126     0xc6e00bf3UL,0xd5a79147UL,0x06ca6351UL,0x14292967UL,
127     0x27b70a85UL,0x2e1b2138UL,0x4d2c6dfcUL,0x53380d13UL,
```

```

128     0x650a7354UL, 0x766a0abbUL, 0x81c2c92eUL, 0x92722c85UL,
129     0xa2bfe8a1UL, 0xa81a664bUL, 0xc24b8b70UL, 0xc76c51a3UL,
130     0xd192e819UL, 0xd6990624UL, 0xf40e3585UL, 0x106aa070UL,
131     0x19a4c116UL, 0x1e376c08UL, 0x2748774cUL, 0x34b0bcb5UL,
132     0x391c0cb3UL, 0x4ed8aa4aUL, 0x5b9cca4fUL, 0x682e6fffUL,
133     0x748f82eeUL, 0x78a5636fUL, 0x84c87814UL, 0x8cc70208UL,
134     0x90bfeffaUL, 0xa4506cebUL, 0xbef9a3f7UL, 0xc67178f2UL };

136 /*
137  * FIPS specification refers to right rotations, while our ROTATE macro
138  * is left one. This is why you might notice that rotation coefficients
139  * differ from those observed in FIPS document by 32-N...
140  */
141 #define Sigma0(x)      (ROTATE((x),30) ^ ROTATE((x),19) ^ ROTATE((x),10))
142 #define Sigma1(x)      (ROTATE((x),26) ^ ROTATE((x),21) ^ ROTATE((x),7))
143 #define sigma0(x)      (ROTATE((x),25) ^ ROTATE((x),14) ^ ((x)>>3))
144 #define sigma1(x)      (ROTATE((x),15) ^ ROTATE((x),13) ^ ((x)>>10))

146 #define Ch(x,y,z)      (((x) & (y)) ^ ((~(x)) & (z)))
147 #define Maj(x,y,z)      (((x) & (y)) ^ ((x) & (z)) ^ ((y) & (z)))

149 #ifdef OPENSSSL_SMALL_FOOTPRINT

151 static void sha256_block_data_order (SHA256_CTX *ctx, const void *in, size_t num
152 {
153     unsigned MD32_REG_T a,b,c,d,e,f,g,h,s0,s1,T1,T2;
154     SHA_LONG    X[16],l;
155     int i;
156     const unsigned char *data=in;

158     while (num--) {

160         a = ctx->h[0]; b = ctx->h[1]; c = ctx->h[2]; d = ctx->h[3];
161         e = ctx->h[4]; f = ctx->h[5]; g = ctx->h[6]; h = ctx->h[7];

163         for (i=0;i<16;i++)
164         {
165             HOST_c2l(data,l); T1 = X[i] = l;
166             T1 += h + Sigma1(e) + Ch(e,f,g) + K256[i];
167             T2 = Sigma0(a) + Maj(a,b,c);
168             h = g; g = f; f = e; e = d + T1;
169             d = c; c = b; b = a; a = T1 + T2;
170         }

172         for (;i<64;i++)
173         {
174             s0 = X[(i+1)&0xf]; s0 = sigma0(s0);
175             s1 = X[(i+14)&0xf]; s1 = sigma1(s1);

177             T1 = X[i&0xf] += s0 + s1 + X[(i+9)&0xf];
178             T1 += h + Sigma1(e) + Ch(e,f,g) + K256[i];
179             T2 = Sigma0(a) + Maj(a,b,c);
180             h = g; g = f; f = e; e = d + T1;
181             d = c; c = b; b = a; a = T1 + T2;
182         }

184         ctx->h[0] += a; ctx->h[1] += b; ctx->h[2] += c; ctx->h[3] += d;
185         ctx->h[4] += e; ctx->h[5] += f; ctx->h[6] += g; ctx->h[7] += h;

187     }
188 }

190 #else

192 #define ROUND_00_15(i,a,b,c,d,e,f,g,h) do { \
193     T1 += h + Sigma1(e) + Ch(e,f,g) + K256[i]; \

```

```

194     h = Sigma0(a) + Maj(a,b,c); \
195     d += T1; h += T1; } while (0)

197 #define ROUND_16_63(i,a,b,c,d,e,f,g,h,X) do { \
198     s0 = X[(i+1)&0xf]; s0 = sigma0(s0); \
199     s1 = X[(i+14)&0xf]; s1 = sigma1(s1); \
200     T1 = X[(i)&0xf] += s0 + s1 + X[(i+9)&0xf]; \
201     ROUND_00_15(i,a,b,c,d,e,f,g,h); } while (0)

203 static void sha256_block_data_order (SHA256_CTX *ctx, const void *in, size_t num
204 {
205     unsigned MD32_REG_T a,b,c,d,e,f,g,h,s0,s1,T1;
206     SHA_LONG    X[16];
207     int i;
208     const unsigned char *data=in;
209     const union { long one; char little; } is_endian = {1};

211     while (num--) {

213         a = ctx->h[0]; b = ctx->h[1]; c = ctx->h[2]; d = ctx->h[3];
214         e = ctx->h[4]; f = ctx->h[5]; g = ctx->h[6]; h = ctx->h[7];

216         if (!is_endian.little && sizeof(SHA_LONG)==4 && ((size_t)in%4)==0)
217         {
218             const SHA_LONG *W=(const SHA_LONG *)data;

220             T1 = X[0] = W[0]; ROUND_00_15(0,a,b,c,d,e,f,g,h);
221             T1 = X[1] = W[1]; ROUND_00_15(1,h,a,b,c,d,e,f,g);
222             T1 = X[2] = W[2]; ROUND_00_15(2,g,h,a,b,c,d,e,f);
223             T1 = X[3] = W[3]; ROUND_00_15(3,f,g,h,a,b,c,d,e);
224             T1 = X[4] = W[4]; ROUND_00_15(4,e,f,g,h,a,b,c,d);
225             T1 = X[5] = W[5]; ROUND_00_15(5,d,e,f,g,h,a,b,c);
226             T1 = X[6] = W[6]; ROUND_00_15(6,c,d,e,f,g,h,a,b);
227             T1 = X[7] = W[7]; ROUND_00_15(7,b,c,d,e,f,g,h,a);
228             T1 = X[8] = W[8]; ROUND_00_15(8,a,b,c,d,e,f,g,h);
229             T1 = X[9] = W[9]; ROUND_00_15(9,h,a,b,c,d,e,f,g);
230             T1 = X[10] = W[10]; ROUND_00_15(10,g,h,a,b,c,d,e,f);
231             T1 = X[11] = W[11]; ROUND_00_15(11,f,g,h,a,b,c,d,e);
232             T1 = X[12] = W[12]; ROUND_00_15(12,e,f,g,h,a,b,c,d);
233             T1 = X[13] = W[13]; ROUND_00_15(13,d,e,f,g,h,a,b,c);
234             T1 = X[14] = W[14]; ROUND_00_15(14,c,d,e,f,g,h,a,b);
235             T1 = X[15] = W[15]; ROUND_00_15(15,b,c,d,e,f,g,h,a);

237         data += SHA256_CBLOCK;
238     }
239     else
240     {
241         SHA_LONG l;

243         HOST_c2l(data,l); T1 = X[0] = l; ROUND_00_15(0,a,b,c,d,e,f,g,h)
244         HOST_c2l(data,l); T1 = X[1] = l; ROUND_00_15(1,h,a,b,c,d,e,f,g)
245         HOST_c2l(data,l); T1 = X[2] = l; ROUND_00_15(2,g,h,a,b,c,d,e,f)
246         HOST_c2l(data,l); T1 = X[3] = l; ROUND_00_15(3,f,g,h,a,b,c,d,e)
247         HOST_c2l(data,l); T1 = X[4] = l; ROUND_00_15(4,e,f,g,h,a,b,c,d)
248         HOST_c2l(data,l); T1 = X[5] = l; ROUND_00_15(5,d,e,f,g,h,a,b,c)
249         HOST_c2l(data,l); T1 = X[6] = l; ROUND_00_15(6,c,d,e,f,g,h,a,b)
250         HOST_c2l(data,l); T1 = X[7] = l; ROUND_00_15(7,b,c,d,e,f,g,h,a)
251         HOST_c2l(data,l); T1 = X[8] = l; ROUND_00_15(8,a,b,c,d,e,f,g,h)
252         HOST_c2l(data,l); T1 = X[9] = l; ROUND_00_15(9,h,a,b,c,d,e,f,g)
253         HOST_c2l(data,l); T1 = X[10] = l; ROUND_00_15(10,g,h,a,b,c,d,e,f)
254         HOST_c2l(data,l); T1 = X[11] = l; ROUND_00_15(11,f,g,h,a,b,c,d,e)
255         HOST_c2l(data,l); T1 = X[12] = l; ROUND_00_15(12,e,f,g,h,a,b,c,d)
256         HOST_c2l(data,l); T1 = X[13] = l; ROUND_00_15(13,d,e,f,g,h,a,b,c)
257         HOST_c2l(data,l); T1 = X[14] = l; ROUND_00_15(14,c,d,e,f,g,h,a,b)
258         HOST_c2l(data,l); T1 = X[15] = l; ROUND_00_15(15,b,c,d,e,f,g,h,a)
259     }

```

```
261     for (i=16;i<64;i+=8)
262     {
263         ROUND_16_63(i+0,a,b,c,d,e,f,g,h,X);
264         ROUND_16_63(i+1,h,a,b,c,d,e,f,g,X);
265         ROUND_16_63(i+2,g,h,a,b,c,d,e,f,X);
266         ROUND_16_63(i+3,f,g,h,a,b,c,d,e,X);
267         ROUND_16_63(i+4,e,f,g,h,a,b,c,d,X);
268         ROUND_16_63(i+5,d,e,f,g,h,a,b,c,X);
269         ROUND_16_63(i+6,c,d,e,f,g,h,a,b,X);
270         ROUND_16_63(i+7,b,c,d,e,f,g,h,a,X);
271     }
272
273     ctx->h[0] += a; ctx->h[1] += b; ctx->h[2] += c; ctx->h[3] += d;
274     ctx->h[4] += e; ctx->h[5] += f; ctx->h[6] += g; ctx->h[7] += h;
275
276     }
277
278 #endif
279 #endif /* SHA256_ASM */
280
281 #endif /* OPENSSSL_NO_SHA256 */
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha512.c

1

```
*****
18710 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/sha/sha512.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/sha/sha512.c */
2 /* =====
3  * Copyright (c) 2004 The OpenSSL Project. All rights reserved
4  * according to the OpenSSL license [found in ../LICENSE].
5  * =====
6  */
7 #include <openssl/opensslconf.h>
8 #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_SHA512)
9 /*
10  * IMPLEMENTATION NOTES.
11  *
12  * As you might have noticed 32-bit hash algorithms:
13  *
14  * - permit SHA_LONG to be wider than 32-bit (case on CRAY);
15  * - optimized versions implement two transform functions: one operating
16  *   on [aligned] data in host byte order and one - on data in input
17  *   stream byte order;
18  * - share common byte-order neutral collector and padding function
19  *   implementations, ../md32_common.h;
20  *
21  * Neither of the above applies to this SHA-512 implementations. Reasons
22  * [in reverse order] are:
23  *
24  * - it's the only 64-bit hash algorithm for the moment of this writing,
25  *   there is no need for common collector/padding implementation [yet];
26  * - by supporting only one transform function [which operates on
27  *   *aligned* data in input stream byte order, big-endian in this case]
28  *   we minimize burden of maintenance in two ways: a) collector/padding
29  *   function is simpler; b) only one transform function to stare at;
30  * - SHA_LONG64 is required to be exactly 64-bit in order to be able to
31  *   apply a number of optimizations to mitigate potential performance
32  *   penalties caused by previous design decision;
33  *
34  * Caveat lector.
35  *
36  * Implementation relies on the fact that "long long" is 64-bit on
37  * both 32- and 64-bit platforms. If some compiler vendor comes up
38  * with 128-bit long long, adjustment to sha.h would be required.
39  * As this implementation relies on 64-bit integer type, it's totally
40  * inappropriate for platforms which don't support it, most notably
41  * 16-bit platforms.
42  *
43  *                                     <appro@fy.chalmers.se>
44  */
45 #include <stdlib.h>
46 #include <string.h>
47
48 #include <openssl/crypto.h>
49 #include <openssl/sha.h>
50 #include <openssl/opensslv.h>
51
52 #include "cryptlib.h"
53
54 const char SHA512_version[]="SHA-512" OPENSSL_VERSION_PTEXT;
55
56 #if defined(__i386) || defined(__i386__) || defined(_M_IX86) || \
57     defined(_x86_64) || defined(_M_AMD64) || defined(_M_X64) || \
58     defined(__s390__) || defined(__s390x__) || \
59     defined(SHA512_ASM)
60 #define SHA512_BLOCK_CAN_MANAGE_UNALIGNED_DATA
61 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha512.c

2

```
62 fips_md_init_ctx(SHA384, SHA512)
63 {
64     c->h[0]=U64(0xcbbb9d5dc1059ed8);
65     c->h[1]=U64(0x629a292a367cd507);
66     c->h[2]=U64(0x9159015a3070dd17);
67     c->h[3]=U64(0x152fecdd8f70e5939);
68     c->h[4]=U64(0x67332667ffc00b31);
69     c->h[5]=U64(0x8eb44a8768581511);
70     c->h[6]=U64(0xdb0c2e0d64f98fa7);
71     c->h[7]=U64(0x47b5481dbefa4fa4);
72
73     c->Nl=0;          c->Nh=0;
74     c->num=0;         c->md_len=SHA384_DIGEST_LENGTH;
75     return 1;
76 }
77
78 fips_md_init(SHA512)
79 {
80     c->h[0]=U64(0x6a09e667f3bcc908);
81     c->h[1]=U64(0xbb67ae8584caa73b);
82     c->h[2]=U64(0x3c6ef372fe94f82b);
83     c->h[3]=U64(0xa54ff53a5f1d36f1);
84     c->h[4]=U64(0x510e527fade682d1);
85     c->h[5]=U64(0x9b05688c2b3e6c1f);
86     c->h[6]=U64(0x1f83d9abfb41bd6b);
87     c->h[7]=U64(0x5be0cd19137e2179);
88
89     c->Nl=0;          c->Nh=0;
90     c->num=0;         c->md_len=SHA512_DIGEST_LENGTH;
91     return 1;
92 }
93
94 #ifndef SHA512_ASM
95 static
96 #endif
97 void sha512_block_data_order (SHA512_CTX *ctx, const void *in, size_t num);
98
99 int SHA512_Final (unsigned char *md, SHA512_CTX *c)
100 {
101     unsigned char *p=(unsigned char *)c->u.p;
102     size_t n=c->num;
103
104     p[n]=0x80;          /* There always is a room for one */
105     n++;
106     if (n > (sizeof(c->u)-16))
107         memset (p+n,0,sizeof(c->u)-n), n=0,
108         sha512_block_data_order (c,p,1);
109
110     memset (p+n,0,sizeof(c->u)-16-n);
111     #ifdef B_ENDIAN
112     c->u.d[SHA_LBLOCK-2] = c->Nh;
113     c->u.d[SHA_LBLOCK-1] = c->Nl;
114     #else
115     p[sizeof(c->u)-1] = (unsigned char)(c->Nl);
116     p[sizeof(c->u)-2] = (unsigned char)(c->Nl>>8);
117     p[sizeof(c->u)-3] = (unsigned char)(c->Nl>>16);
118     p[sizeof(c->u)-4] = (unsigned char)(c->Nl>>24);
119     p[sizeof(c->u)-5] = (unsigned char)(c->Nl>>32);
120     p[sizeof(c->u)-6] = (unsigned char)(c->Nl>>40);
121     p[sizeof(c->u)-7] = (unsigned char)(c->Nl>>48);
122     p[sizeof(c->u)-8] = (unsigned char)(c->Nl>>56);
123     p[sizeof(c->u)-9] = (unsigned char)(c->Nh);
124     p[sizeof(c->u)-10] = (unsigned char)(c->Nh>>8);
125     p[sizeof(c->u)-11] = (unsigned char)(c->Nh>>16);
126     p[sizeof(c->u)-12] = (unsigned char)(c->Nh>>24);
127     p[sizeof(c->u)-13] = (unsigned char)(c->Nh>>32);
```



```

128     p[sizeof(c->u)-14] = (unsigned char)(c->Nh>>40);
129     p[sizeof(c->u)-15] = (unsigned char)(c->Nh>>48);
130     p[sizeof(c->u)-16] = (unsigned char)(c->Nh>>56);
131 #endif

133     sha512_block_data_order (c,p,1);

135     if (md==0) return 0;

137     switch (c->md_len)
138     {
139         /* Let compiler decide if it's appropriate to unroll... */
140         case SHA384_DIGEST_LENGTH:
141             for (n=0;n<SHA384_DIGEST_LENGTH/8;n++)
142             {
143                 SHA_LONG64 t = c->h[n];

145                 *(md++) = (unsigned char)(t>>56);
146                 *(md++) = (unsigned char)(t>>48);
147                 *(md++) = (unsigned char)(t>>40);
148                 *(md++) = (unsigned char)(t>>32);
149                 *(md++) = (unsigned char)(t>>24);
150                 *(md++) = (unsigned char)(t>>16);
151                 *(md++) = (unsigned char)(t>>8);
152                 *(md++) = (unsigned char)(t);
153             }
154             break;
155         case SHA512_DIGEST_LENGTH:
156             for (n=0;n<SHA512_DIGEST_LENGTH/8;n++)
157             {
158                 SHA_LONG64 t = c->h[n];

160                 *(md++) = (unsigned char)(t>>56);
161                 *(md++) = (unsigned char)(t>>48);
162                 *(md++) = (unsigned char)(t>>40);
163                 *(md++) = (unsigned char)(t>>32);
164                 *(md++) = (unsigned char)(t>>24);
165                 *(md++) = (unsigned char)(t>>16);
166                 *(md++) = (unsigned char)(t>>8);
167                 *(md++) = (unsigned char)(t);
168             }
169             break;
170         /* ... as well as make sure md_len is not abused. */
171         default:
172             return 0;
173     }

174     return 1;
175 }

177 int SHA384_Final (unsigned char *md,SHA512_CTX *c)
178 { return SHA512_Final (md,c); }

180 int SHA512_Update (SHA512_CTX *c, const void *_data, size_t len)
181 {
182     SHA_LONG64 l;
183     unsigned char *p=c->u.p;
184     const unsigned char *data=(const unsigned char *)_data;

186     if (len==0) return 1;

188     l = (c->Nl+(((SHA_LONG64)len)<<3))&U64(0xffffffffffffffff));
189     if (l < c->Nl) c->Nh++;
190     if (sizeof(len)>=8) c->Nh+=(((SHA_LONG64)len)>>61);
191     c->Nl=l;

193     if (c->num != 0)

```

```

194     {
195         size_t n = sizeof(c->u) - c->num;

197         if (len < n)
198         {
199             memcpy (p+c->num,data,len), c->num += (unsigned int)len;
200             return 1;
201         }
202         else
203         {
204             memcpy (p+c->num,data,n), c->num = 0;
205             len=n, data+=n;
206             sha512_block_data_order (c,p,1);
207         }
208     }

209     if (len >= sizeof(c->u))
210     {
211         #ifndef SHA512_BLOCK_CAN_MANAGE_UNALIGNED_DATA
212             if ((size_t)data%sizeof(c->u.d[0]) != 0)
213                 while (len >= sizeof(c->u))
214                     memcpy (p,data,sizeof(c->u)),
215                         sha512_block_data_order (c,p,1),
216                         len -= sizeof(c->u),
217                         data += sizeof(c->u);
218             else
219                 sha512_block_data_order (c,data,len/sizeof(c->u)),
220                     data += len,
221                     len %= sizeof(c->u),
222                     data -= len;
223         }
224     }

226     if (len != 0) memcpy (p,data,len), c->num = (int)len;

228     return 1;
229 }

231 int SHA384_Update (SHA512_CTX *c, const void *data, size_t len)
232 { return SHA512_Update (c,data,len); }

234 void SHA512_Transform (SHA512_CTX *c, const unsigned char *data)
235 {
236     #ifndef SHA512_BLOCK_CAN_MANAGE_UNALIGNED_DATA
237         if ((size_t)data%sizeof(c->u.d[0]) != 0)
238             memcpy(c->u.p,data,sizeof(c->u.p)),
239                 data = c->u.p;
240     #endif
241     sha512_block_data_order (c,data,1);
242 }

244 unsigned char *SHA384(const unsigned char *d, size_t n, unsigned char *md)
245 {
246     SHA512_CTX c;
247     static unsigned char m[SHA384_DIGEST_LENGTH];

249     if (md == NULL) md=m;
250     SHA384_Init(&c);
251     SHA512_Update(&c,d,n);
252     SHA512_Final(md,&c);
253     OPENSSL_cleanse(&c,sizeof(c));
254     return(md);
255 }

257 unsigned char *SHA512(const unsigned char *d, size_t n, unsigned char *md)
258 {
259     SHA512_CTX c;

```

```

260 static unsigned char m[SHA512_DIGEST_LENGTH];

262 if (md == NULL) md=m;
263 SHA512_Init(&c);
264 SHA512_Update(&c,d,n);
265 SHA512_Final(md,&c);
266 OPENSSL_cleanse(&c,sizeof(c));
267 return(md);
268 }

270 #ifndef SHA512_ASM
271 static const SHA_LONG64 K512[80] = {
272     U64(0x428a2f98d728ae22), U64(0x7137449123ef65cd),
273     U64(0xb5c0fbcfec4d3b2f), U64(0xe9b5dba58189dbbc),
274     U64(0x3956c25bf348b538), U64(0x59f111f1b605d019),
275     U64(0x923f82a4af194f9b), U64(0xab1c5ed5da6d8118),
276     U64(0xd807aa98a3030242), U64(0x1283500145706fbe),
277     U64(0x243185be4ee4b28c), U64(0x550c7dc3d5ffb4e2),
278     U64(0x72be5d74f27b896f), U64(0x80deb1fe3b1696b1),
279     U64(0x9bdc06a725c71235), U64(0xc19bf174cf692694),
280     U64(0xe49b69c19ef14ad2), U64(0xefbe4786384f25e3),
281     U64(0x0fc19dc68b8cd5b5), U64(0x240ca1cc77ac9c65),
282     U64(0x2de92c6f592b0275), U64(0x4a7484aa6ea6e483),
283     U64(0x5cb0a9dcbd41fbd4), U64(0x76f988da831153b5),
284     U64(0x983e5152ee66dfab), U64(0xa831c66d2db43210),
285     U64(0xb00327c898fb213f), U64(0xbf597fc7beef0ee4),
286     U64(0xc6e00bf33da88fc2), U64(0xd5a79147930aa725),
287     U64(0x06ca351e003826f), U64(0x142929670a0e6e70),
288     U64(0x27b70a8546d22ffc), U64(0x2e1b21385c26c926),
289     U64(0x4d2c6dfc5ac42aed), U64(0x53380d139d95b3df),
290     U64(0x650a73548baf63de), U64(0x766a0abb3c77b2a8),
291     U64(0x81c2c92e47edaee6), U64(0x92722c851482353b),
292     U64(0xa2bfe8a14cf10364), U64(0xa81a664bbc423001),
293     U64(0xc24b8b70d0f89791), U64(0xc76c51a30654be30),
294     U64(0xd192e819d6ef5218), U64(0xd69906245565a910),
295     U64(0xf40e35855771202a), U64(0x106aa07032bdbl1b8),
296     U64(0x19a4c116b8d2d0c8), U64(0x1e376c085141ab53),
297     U64(0x2748774cdf8eeb99), U64(0x34b0bcb5e19b48a8),
298     U64(0x391c0cb3c5c95a63), U64(0x4ed8aa4ae3418acb),
299     U64(0x5b9cca4f7763e373), U64(0x682e6ff3d6b2b8a3),
300     U64(0x748f82ee5defb2fc), U64(0x78a5636f43172f60),
301     U64(0x84c87814a1f0ab72), U64(0x8cc702081a6439ec),
302     U64(0x90bafffa23631e28), U64(0xa4506cebde82bde9),
303     U64(0xbef9a3f7b2c67915), U64(0xc67178f2e372532b),
304     U64(0xca273ecdea26619c), U64(0xd186b8c721c0c207),
305     U64(0xeada7dd6cde0eb1e), U64(0xf57d4f7fee6ed178),
306     U64(0x06f067aa72176fba), U64(0x0a637dc5a2c898a6),
307     U64(0x113f9804bef90dae), U64(0x1b710b35131c471b),
308     U64(0x28db77f523047d84), U64(0x32caab7b40c72493),
309     U64(0x3c9ebe0a15c9bebc), U64(0x431d67c49c100d4c),
310     U64(0x4cc5d4becb3e42b6), U64(0x597f299cfc657e2a),
311     U64(0x5fcb6fab3ad6faec), U64(0x6c44198c4a475817) };

313 #ifndef PEDANTIC
314 # if defined(__GNUC__) && __GNUC__ >= 2 && !defined(OPENSSL_NO_ASM) && !defined(OP
315 # if defined(__x86_64) || defined(__x86_64)
316 # define ROTR(a,n) ({ SHA_LONG64 ret; \
317     asm ("rorq %1,%0" \
318         : "=r"(ret) \
319         : "J"(n), "0"(a) \
320         : "cc"); ret; })
321 # if !defined(B_ENDIAN)
322 # define PULL64(x) ({ SHA_LONG64 ret=*((const SHA_LONG64 *)&(x)); \
323     asm ("bswapq %0" \
324         : "=r"(ret) \
325         : "0"(ret)); ret; })

```

```

326 # endif
327 # elif defined(__i386) || defined(__i386__) && !defined(B_ENDIAN)
328 # if defined(I386_ONLY)
329 # define PULL64(x) ({ const unsigned int *p=(const unsigned int *)&(x)); \
330     unsigned int hi=p[0],lo=p[1]; \
331     asm ("xchgb %ah,%al;xchgb %dh,%dl;" \
332         "roll $16,%eax; roll $16,%edx;" \
333         "xchgb %ah,%al;xchgb %dh,%dl;" \
334         : "=a"(lo), "=d"(hi) \
335         : "0"(lo), "1"(hi) : "cc"); \
336     ((SHA_LONG64)hi)<<32|lo; })
337 # else
338 # define PULL64(x) ({ const unsigned int *p=(const unsigned int *)&(x)); \
339     unsigned int hi=p[0],lo=p[1]; \
340     asm ("bswapl %0; bswapl %1;" \
341         : "=r"(lo), "=r"(hi) \
342         : "0"(lo), "1"(hi)); \
343     ((SHA_LONG64)hi)<<32|lo; })
344 # endif
345 # elif defined(_ARCH_PPC) && defined(_64BIT) || defined(_ARCH_PPC64)
346 # define ROTR(a,n) ({ SHA_LONG64 ret; \
347     asm ("rottrdi %0,%1,%2" \
348         : "=r"(ret) \
349         : "r"(a), "k"(n)); ret; })
350 # endif
351 # elif defined(_MSC_VER)
352 # if defined(_WIN64) /* applies to both IA-64 and AMD64 */
353 # pragma intrinsic(_rotr64)
354 # define ROTR(a,n) _rotr64((a),n)
355 # endif
356 # if defined(_M_IX86) && !defined(OPENSSL_NO_ASM) && !defined(OPENSSL_NO_INLINE)
357 # if defined(I386_ONLY)
358 static SHA_LONG64 __fastcall __pull64be(const void *x)
359 {
360     _asm mov edx, [ecx + 0]
361     _asm mov eax, [ecx + 4]
362     _asm xchg dh,dl
363     _asm xchg ah,al
364     _asm rol edx,16
365     _asm rol eax,16
366     _asm xchg dh,dl
367     _asm xchg ah,al
368 }
369 # else
370 static SHA_LONG64 __fastcall __pull64be(const void *x)
371 {
372     _asm mov edx, [ecx + 0]
373     _asm mov eax, [ecx + 4]
374     _asm bswap edx
375     _asm bswap eax
376 }
377 # endif
378 # define PULL64(x) __pull64be(&(x))
379 # if _MSC_VER <= 1200
380 # pragma inline_depth(0)
381 # endif
382 #endif

384 #ifndef PULL64
385 #define B(x,j) (((SHA_LONG64)*((const unsigned char *)&(x))+j))<<((7-j)*8)
386 #define PULL64(x) (B(x,0)|B(x,1)|B(x,2)|B(x,3)|B(x,4)|B(x,5)|B(x,6)|B(x,7))
387 #endif

389 #ifndef ROTR
390 #define ROTR(x,s) (((x)>>s) | (x)<<(64-s))
391 #endif

```

```

393 #define Sigma0(x)      (ROTR((x),28) ^ ROTR((x),34) ^ ROTR((x),39))
394 #define Sigma1(x)      (ROTR((x),14) ^ ROTR((x),18) ^ ROTR((x),41))
395 #define sigma0(x)      (ROTR((x),1) ^ ROTR((x),8) ^ ((x)>>7))
396 #define sigma1(x)      (ROTR((x),19) ^ ROTR((x),61) ^ ((x)>>6))

398 #define Ch(x,y,z)      (((x) & (y)) ^ ((~(x)) & (z)))
399 #define Maj(x,y,z)     (((x) & (y)) ^ ((x) & (z)) ^ ((y) & (z)))

402 #if defined(__i386) || defined(__i386__) || defined(_M_IX86)
403 /*
404  * This code should give better results on 32-bit CPU with less than
405  * ~24 registers, both size and performance wise...
406  */
407 static void sha512_block_data_order (SHA512_CTX *ctx, const void *in, size_t num
408 {
409     const SHA_LONG64 *W=in;
410     SHA_LONG64 A,E,T;
411     SHA_LONG64 X[9+80],*F;
412     int i;

414     while (num--) {

416         F = X+80;
417         A = ctx->h[0];      F[1] = ctx->h[1];
418         F[2] = ctx->h[2];    F[3] = ctx->h[3];
419         E = ctx->h[4];    F[5] = ctx->h[5];
420         F[6] = ctx->h[6];    F[7] = ctx->h[7];

422         for (i=0;i<16;i++,F--)
423         {
424             #ifdef B_ENDIAN
425                 T = W[i];
426             #else
427                 T = PULL64(W[i]);
428             #endif
429             F[0] = A;
430             F[4] = E;
431             F[8] = T;
432             T += F[7] + Sigma1(E) + Ch(E,F[5],F[6]) + K512[i];
433             E = F[3] + T;
434             A = T + Sigma0(A) + Maj(A,F[1],F[2]);
435         }

437         for (;i<80;i++,F--)
438         {
439             T = sigma0(F[8+16-1]);
440             T += sigma1(F[8+16-14]);
441             T += F[8+16] + F[8+16-9];

443             F[0] = A;
444             F[4] = E;
445             F[8] = T;
446             T += F[7] + Sigma1(E) + Ch(E,F[5],F[6]) + K512[i];
447             E = F[3] + T;
448             A = T + Sigma0(A) + Maj(A,F[1],F[2]);
449         }

451         ctx->h[0] += A;      ctx->h[1] += F[1];
452         ctx->h[2] += F[2];    ctx->h[3] += F[3];
453         ctx->h[4] += E;      ctx->h[5] += F[5];
454         ctx->h[6] += F[6];    ctx->h[7] += F[7];

456         W+=SHA_LBLOCK;
457     }

```

```

458     }
460 #elif defined(OPENSSL_SMALL_FOOTPRINT)

462 static void sha512_block_data_order (SHA512_CTX *ctx, const void *in, size_t num
463 {
464     const SHA_LONG64 *W=in;
465     SHA_LONG64 a,b,c,d,e,f,g,h,s0,s1,T1,T2;
466     SHA_LONG64 X[16];
467     int i;

469     while (num--) {

471         a = ctx->h[0]; b = ctx->h[1]; c = ctx->h[2]; d = ctx->h[3];
472         e = ctx->h[4]; f = ctx->h[5]; g = ctx->h[6]; h = ctx->h[7];

474         for (i=0;i<16;i++)
475         {
476             #ifdef B_ENDIAN
477                 T1 = X[i] = W[i];
478             #else
479                 T1 = X[i] = PULL64(W[i]);
480             #endif
481             T1 += h + Sigma1(e) + Ch(e,f,g) + K512[i];
482             T2 = Sigma0(a) + Maj(a,b,c);
483             h = g; g = f; f = e; e = d + T1;
484             d = c; c = b; b = a; a = T1 + T2;
485         }

487         for (;i<80;i++)
488         {
489             s0 = X[(i+1)&0xf]; s0 = sigma0(s0);
490             s1 = X[(i+14)&0xf]; s1 = sigma1(s1);

492             T1 = X[i&0xf] += s0 + s1 + X[(i+9)&0xf];
493             T1 += h + Sigma1(e) + Ch(e,f,g) + K512[i];
494             T2 = Sigma0(a) + Maj(a,b,c);
495             h = g; g = f; f = e; e = d + T1;
496             d = c; c = b; b = a; a = T1 + T2;
497         }

499         ctx->h[0] += a; ctx->h[1] += b; ctx->h[2] += c; ctx->h[3] += d;
500         ctx->h[4] += e; ctx->h[5] += f; ctx->h[6] += g; ctx->h[7] += h;

502         W+=SHA_LBLOCK;
503     }
504 }

506 #else

508 #define ROUND_00_15(i,a,b,c,d,e,f,g,h) do { \
509     T1 += h + Sigma1(e) + Ch(e,f,g) + K512[i]; \
510     h = Sigma0(a) + Maj(a,b,c); \
511     d += T1; h += T1; } while (0)

513 #define ROUND_16_80(i,j,a,b,c,d,e,f,g,h,X) do { \
514     s0 = X[(j+1)&0xf]; s0 = sigma0(s0); \
515     s1 = X[(j+14)&0xf]; s1 = sigma1(s1); \
516     T1 = X[(j)&0xf] += s0 + s1 + X[(j+9)&0xf]; \
517     ROUND_00_15(i+j,a,b,c,d,e,f,g,h); } while (0)

519 static void sha512_block_data_order (SHA512_CTX *ctx, const void *in, size_t num
520 {
521     const SHA_LONG64 *W=in;
522     SHA_LONG64 a,b,c,d,e,f,g,h,s0,s1,T1;
523     SHA_LONG64 X[16];

```

```

524     int i;

526         while (num--) {

528             a = ctx->h[0]; b = ctx->h[1]; c = ctx->h[2]; d = ctx->h[3];
529             e = ctx->h[4]; f = ctx->h[5]; g = ctx->h[6]; h = ctx->h[7];

531 #ifdef B_ENDIAN
532     T1 = X[0] = W[0];      ROUND_00_15(0,a,b,c,d,e,f,g,h);
533     T1 = X[1] = W[1];      ROUND_00_15(1,h,a,b,c,d,e,f,g);
534     T1 = X[2] = W[2];      ROUND_00_15(2,g,h,a,b,c,d,e,f);
535     T1 = X[3] = W[3];      ROUND_00_15(3,f,g,h,a,b,c,d,e);
536     T1 = X[4] = W[4];      ROUND_00_15(4,e,f,g,h,a,b,c,d);
537     T1 = X[5] = W[5];      ROUND_00_15(5,d,e,f,g,h,a,b,c);
538     T1 = X[6] = W[6];      ROUND_00_15(6,c,d,e,f,g,h,a,b);
539     T1 = X[7] = W[7];      ROUND_00_15(7,b,c,d,e,f,g,h,a);
540     T1 = X[8] = W[8];      ROUND_00_15(8,a,b,c,d,e,f,g,h);
541     T1 = X[9] = W[9];      ROUND_00_15(9,h,a,b,c,d,e,f,g);
542     T1 = X[10] = W[10];    ROUND_00_15(10,g,h,a,b,c,d,e,f);
543     T1 = X[11] = W[11];    ROUND_00_15(11,f,g,h,a,b,c,d,e);
544     T1 = X[12] = W[12];    ROUND_00_15(12,e,f,g,h,a,b,c,d);
545     T1 = X[13] = W[13];    ROUND_00_15(13,d,e,f,g,h,a,b,c);
546     T1 = X[14] = W[14];    ROUND_00_15(14,c,d,e,f,g,h,a,b);
547     T1 = X[15] = W[15];    ROUND_00_15(15,b,c,d,e,f,g,h,a);
548 #else
549     T1 = X[0] = PULL64(W[0]); ROUND_00_15(0,a,b,c,d,e,f,g,h);
550     T1 = X[1] = PULL64(W[1]); ROUND_00_15(1,h,a,b,c,d,e,f,g);
551     T1 = X[2] = PULL64(W[2]); ROUND_00_15(2,g,h,a,b,c,d,e,f);
552     T1 = X[3] = PULL64(W[3]); ROUND_00_15(3,f,g,h,a,b,c,d,e);
553     T1 = X[4] = PULL64(W[4]); ROUND_00_15(4,e,f,g,h,a,b,c,d);
554     T1 = X[5] = PULL64(W[5]); ROUND_00_15(5,d,e,f,g,h,a,b,c);
555     T1 = X[6] = PULL64(W[6]); ROUND_00_15(6,c,d,e,f,g,h,a,b);
556     T1 = X[7] = PULL64(W[7]); ROUND_00_15(7,b,c,d,e,f,g,h,a);
557     T1 = X[8] = PULL64(W[8]); ROUND_00_15(8,a,b,c,d,e,f,g,h);
558     T1 = X[9] = PULL64(W[9]); ROUND_00_15(9,h,a,b,c,d,e,f,g);
559     T1 = X[10] = PULL64(W[10]); ROUND_00_15(10,g,h,a,b,c,d,e,f);
560     T1 = X[11] = PULL64(W[11]); ROUND_00_15(11,f,g,h,a,b,c,d,e);
561     T1 = X[12] = PULL64(W[12]); ROUND_00_15(12,e,f,g,h,a,b,c,d);
562     T1 = X[13] = PULL64(W[13]); ROUND_00_15(13,d,e,f,g,h,a,b,c);
563     T1 = X[14] = PULL64(W[14]); ROUND_00_15(14,c,d,e,f,g,h,a,b);
564     T1 = X[15] = PULL64(W[15]); ROUND_00_15(15,b,c,d,e,f,g,h,a);
565 #endif

567     for (i=16;i<80;i+=16)
568     {
569         ROUND_16_80(i, 0,a,b,c,d,e,f,g,h,X);
570         ROUND_16_80(i, 1,h,a,b,c,d,e,f,g,X);
571         ROUND_16_80(i, 2,g,h,a,b,c,d,e,f,X);
572         ROUND_16_80(i, 3,f,g,h,a,b,c,d,e,X);
573         ROUND_16_80(i, 4,e,f,g,h,a,b,c,d,X);
574         ROUND_16_80(i, 5,d,e,f,g,h,a,b,c,X);
575         ROUND_16_80(i, 6,c,d,e,f,g,h,a,b,X);
576         ROUND_16_80(i, 7,b,c,d,e,f,g,h,a,X);
577         ROUND_16_80(i, 8,a,b,c,d,e,f,g,h,X);
578         ROUND_16_80(i, 9,h,a,b,c,d,e,f,g,X);
579         ROUND_16_80(i,10,g,h,a,b,c,d,e,f,X);
580         ROUND_16_80(i,11,f,g,h,a,b,c,d,e,X);
581         ROUND_16_80(i,12,e,f,g,h,a,b,c,d,X);
582         ROUND_16_80(i,13,d,e,f,g,h,a,b,c,X);
583         ROUND_16_80(i,14,c,d,e,f,g,h,a,b,X);
584         ROUND_16_80(i,15,b,c,d,e,f,g,h,a,X);
585     }

587     ctx->h[0] += a; ctx->h[1] += b; ctx->h[2] += c; ctx->h[3] += d;
588     ctx->h[4] += e; ctx->h[5] += f; ctx->h[6] += g; ctx->h[7] += h;

```

```

590                                     W+=SHA_LBLOCK;
591                                     }
592     }

594 #endif

596 #endif /* SHA512_ASM */

598 #else /* !OPENSSL_NO_SHA512 */

600 #if defined(PEDANTIC) || defined(__DECC) || defined(OPENSSL_SYS_MACOSX)
601 static void *dummy=&dummy;
602 #endif

604 #endif /* !OPENSSL_NO_SHA512 */

```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha_dgst.c

1

3513 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/sha/sha_dgst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/sha/shaldgst.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <openssl/crypto.h>
60 #include <openssl/opensslconf.h>
61 #if !defined(OPENSSL_NO_SHA0) && !defined(OPENSSL_NO_SHA)
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha_dgst.c

2

```
63 #undef SHA_1
64 #define SHA_0

66 #include <openssl/opensslv.h>

68 const char SHA_version[]="SHA" OPENSSL_VERSION_PTEXT;

70 /* The implementation is in ../md32_common.h */

72 #include "sha_locl.h"

74 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha_one.c

1

```
*****
3599 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/sha/sha_one.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/sha/sha_one.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <string.h>
61 #include <openssl/sha.h>
```

new/usr/src/lib/openssl/libsunw_crypto/sha/sha_one.c

2

```
62 #include <openssl/crypto.h>
64 #ifndef OPENSSL_NO_SHA0
65 unsigned char *SHA(const unsigned char *d, size_t n, unsigned char *md)
66 {
67     SHA_CTX c;
68     static unsigned char m[SHA_DIGEST_LENGTH];
69
70     if (md == NULL) md=m;
71     if (!SHA_Init(&c))
72         return NULL;
73     SHA_Update(&c,d,n);
74     SHA_Final(md,&c);
75     OPENSSL_cleanse(&c,sizeof(c));
76     return(md);
77 }
78 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/srp/srp_lib.c

1

```
*****
9485 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/srp/srp_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/srp/srp_lib.c */
2 /* Written by Christophe Renou (christophe.renou@edelweb.fr) with
3  * the precious help of Peter Sylvester (peter.sylvester@edelweb.fr)
4  * for the EdelKey project and contributed to the OpenSSL project 2004.
5  */
6 /* =====
7  * Copyright (c) 2004 The OpenSSL Project. All rights reserved.
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47 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
49 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
50 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 * =====
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */
59 #ifndef OPENSSL_NO_SRP
60 #include "cryptlib.h"
61 #include "srp_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/srp/srp_lib.c

2

```
62 #include <openssl/srp.h>
63 #include <openssl/evp.h>

65 #if (BN_BYTES == 8)
66 # if (defined(_WIN32) || defined(_WIN64)) && !defined(_MINGW32_)
67 #  define bn_pack4(a1,a2,a3,a4) ((a1##UI64<<48)|(a2##UI64<<32)|(a3##UI64<<16)|a4
68 # elif defined(__arch64__)
69 #  define bn_pack4(a1,a2,a3,a4) ((a1##UL<<48)|(a2##UL<<32)|(a3##UL<<16)|a4##UL)
70 # else
71 #  define bn_pack4(a1,a2,a3,a4) ((a1##ULL<<48)|(a2##ULL<<32)|(a3##ULL<<16)|a4##ULL)
72 # endif
73 #elif (BN_BYTES == 4)
74 # define bn_pack4(a1,a2,a3,a4) ((a3##UL<<16)|a4##UL), ((a1##UL<<16)|a2##UL)
75 #else
76 # error "unsupported BN_BYTES"
77 #endif

80 #include "srp_grps.h"

82 static BIGNUM *srp_Calc_k(BIGNUM *N, BIGNUM *g)
83 {
84     /* k = SHA1(N | PAD(g)) -- tls-srp draft 8 */

86     unsigned char digest[SHA_DIGEST_LENGTH];
87     unsigned char *tmp;
88     EVP_MD_CTX ctx;
89     int longg;
90     int longN = BN_num_bytes(N);

92     if ((tmp = OPENSSL_malloc(longN)) == NULL)
93         return NULL;
94     BN_bn2bin(N,tmp);

96     EVP_MD_CTX_init(&ctx);
97     EVP_DigestInit_ex(&ctx, EVP_sha1(), NULL);
98     EVP_DigestUpdate(&ctx, tmp, longN);

100     memset(tmp, 0, longN);
101     longg = BN_bn2bin(g,tmp);
102     /* use the zeros behind to pad on left */
103     EVP_DigestUpdate(&ctx, tmp + longg, longN-longg);
104     EVP_DigestUpdate(&ctx, tmp, longg);
105     OPENSSL_free(tmp);

107     EVP_DigestFinal_ex(&ctx, digest, NULL);
108     EVP_MD_CTX_cleanup(&ctx);
109     return BN_bin2bn(digest, sizeof(digest), NULL);
110 }

112 BIGNUM *SRP_Calc_u(BIGNUM *A, BIGNUM *B, BIGNUM *N)
113 {
114     /* k = SHA1(PAD(A) || PAD(B)) -- tls-srp draft 8 */

116     BIGNUM *u;
117     unsigned char cu[SHA_DIGEST_LENGTH];
118     unsigned char *cAB;
119     EVP_MD_CTX ctx;
120     int longN;
121     if ((A == NULL) || (B == NULL) || (N == NULL))
122         return NULL;

124     longN = BN_num_bytes(N);

126     if ((cAB = OPENSSL_malloc(2*longN)) == NULL)
127         return NULL;
```

```

129     memset(cAB, 0, longN);

131     EVP_MD_CTX_init(&ctx);
132     EVP_DigestInit_ex(&ctx, EVP_sha1(), NULL);
133     EVP_DigestUpdate(&ctx, cAB + BN_bn2bin(A, cAB+longN), longN);
134     EVP_DigestUpdate(&ctx, cAB + BN_bn2bin(B, cAB+longN), longN);
135     OPENSSL_free(cAB);
136     EVP_DigestFinal_ex(&ctx, cu, NULL);
137     EVP_MD_CTX_cleanup(&ctx);

139     if (!(u = BN_bin2bn(cu, sizeof(cu), NULL)))
140         return NULL;
141     if (!BN_is_zero(u))
142         return u;
143     BN_free(u);
144     return NULL;
145 }

147 BIGNUM *SRP_Calc_server_key(BIGNUM *A, BIGNUM *v, BIGNUM *u, BIGNUM *b, BIGNUM *
148 {
149     BIGNUM *tmp = NULL, *S = NULL;
150     BN_CTX *bn_ctx;
151
152     if (u == NULL || A == NULL || v == NULL || b == NULL || N == NULL)
153         return NULL;

155     if ((bn_ctx = BN_CTX_new()) == NULL ||
156         (tmp = BN_new()) == NULL ||
157         (S = BN_new()) == NULL)
158         goto err;

160     /* S = (A*v**u) ** b */

162     if (!BN_mod_exp(tmp, v, u, N, bn_ctx))
163         goto err;
164     if (!BN_mod_mul(tmp, A, tmp, N, bn_ctx))
165         goto err;
166     if (!BN_mod_exp(S, tmp, b, N, bn_ctx))
167         goto err;
168 err:
169     BN_CTX_free(bn_ctx);
170     BN_clear_free(tmp);
171     return S;
172 }

174 BIGNUM *SRP_Calc_B(BIGNUM *b, BIGNUM *N, BIGNUM *g, BIGNUM *v)
175 {
176     BIGNUM *kv = NULL, *gb = NULL;
177     BIGNUM *B = NULL, *k = NULL;
178     BN_CTX *bn_ctx;

180     if (b == NULL || N == NULL || g == NULL || v == NULL ||
181         (bn_ctx = BN_CTX_new()) == NULL)
182         return NULL;

184     if ((kv = BN_new()) == NULL ||
185         (gb = BN_new()) == NULL ||
186         (B = BN_new()) == NULL)
187         goto err;

189     /* B = g**b + k*v */

191     if (!BN_mod_exp(gb, g, b, N, bn_ctx) ||
192         !(k = srp_Calc_k(N, g)) ||
193         !BN_mod_mul(kv, v, k, N, bn_ctx) ||

```

```

194     !BN_mod_add(B, gb, kv, N, bn_ctx))
195     {
196         BN_free(B);
197         B = NULL;
198     }
199 err:
200     BN_CTX_free(bn_ctx);
201     BN_clear_free(kv);
202     BN_clear_free(gb);
203     BN_free(k);
204     return B;
205 }

207 BIGNUM *SRP_Calc_x(BIGNUM *s, const char *user, const char *pass)
208 {
209     unsigned char dig[SHA_DIGEST_LENGTH];
210     EVP_MD_CTX ctx;
211     unsigned char *cs;

213     if ((s == NULL) ||
214         (user == NULL) ||
215         (pass == NULL))
216         return NULL;

218     if ((cs = OPENSSL_malloc(BN_num_bytes(s))) == NULL)
219         return NULL;

221     EVP_MD_CTX_init(&ctx);
222     EVP_DigestInit_ex(&ctx, EVP_sha1(), NULL);
223     EVP_DigestUpdate(&ctx, user, strlen(user));
224     EVP_DigestUpdate(&ctx, ":", 1);
225     EVP_DigestUpdate(&ctx, pass, strlen(pass));
226     EVP_DigestFinal_ex(&ctx, dig, NULL);

228     EVP_DigestInit_ex(&ctx, EVP_sha1(), NULL);
229     BN_bn2bin(s, cs);
230     EVP_DigestUpdate(&ctx, cs, BN_num_bytes(s));
231     OPENSSL_free(cs);
232     EVP_DigestUpdate(&ctx, dig, sizeof(dig));
233     EVP_DigestFinal_ex(&ctx, dig, NULL);
234     EVP_MD_CTX_cleanup(&ctx);

236     return BN_bin2bn(dig, sizeof(dig), NULL);
237 }

239 BIGNUM *SRP_Calc_A(BIGNUM *a, BIGNUM *N, BIGNUM *g)
240 {
241     BN_CTX *bn_ctx;
242     BIGNUM *A = NULL;

244     if (a == NULL || N == NULL || g == NULL ||
245         (bn_ctx = BN_CTX_new()) == NULL)
246         return NULL;

248     if ((A = BN_new()) != NULL &&
249         !BN_mod_exp(A, g, a, N, bn_ctx))
250     {
251         BN_free(A);
252         A = NULL;
253     }
254     BN_CTX_free(bn_ctx);
255     return A;
256 }

259 BIGNUM *SRP_Calc_client_key(BIGNUM *N, BIGNUM *B, BIGNUM *g, BIGNUM *x, BIGNUM *

```



```

260 {
261     BIGNUM *tmp = NULL, *tmp2 = NULL, *tmp3 = NULL, *k = NULL, *K = NULL;
262     BN_CTX *bn_ctx;

264     if (u == NULL || B == NULL || N == NULL || g == NULL || x == NULL || a =
265         (bn_ctx = BN_CTX_new()) == NULL)
266         return NULL;

268     if ((tmp = BN_new()) == NULL ||
269         (tmp2 = BN_new()) == NULL ||
270         (tmp3 = BN_new()) == NULL ||
271         (K = BN_new()) == NULL)
272         goto err;
273
274     if (!BN_mod_exp(tmp, g, x, N, bn_ctx))
275         goto err;
276     if (!(k = srp_Calc_k(N, g)))
277         goto err;
278     if (!BN_mod_mul(tmp2, tmp, k, N, bn_ctx))
279         goto err;
280     if (!BN_mod_sub(tmp, B, tmp2, N, bn_ctx))
281         goto err;

283     if (!BN_mod_mul(tmp3, u, x, N, bn_ctx))
284         goto err;
285     if (!BN_mod_add(tmp2, a, tmp3, N, bn_ctx))
286         goto err;
287     if (!BN_mod_exp(K, tmp, tmp2, N, bn_ctx))
288         goto err;

290 err :
291     BN_CTX_free(bn_ctx);
292     BN_clear_free(tmp);
293     BN_clear_free(tmp2);
294     BN_clear_free(tmp3);
295     BN_free(k);
296     return K;
297 }

299 int SRP_Verify_B_mod_N(BIGNUM *B, BIGNUM *N)
300 {
301     BIGNUM *r;
302     BN_CTX *bn_ctx;
303     int ret = 0;

305     if (B == NULL || N == NULL ||
306         (bn_ctx = BN_CTX_new()) == NULL)
307         return 0;

309     if ((r = BN_new()) == NULL)
310         goto err;
311     /* Checks if B % N == 0 */
312     if (!BN_nnmod(r, B, N, bn_ctx))
313         goto err;
314     ret = !BN_is_zero(r);
315 err:
316     BN_CTX_free(bn_ctx);
317     BN_free(r);
318     return ret;
319 }

321 int SRP_Verify_A_mod_N(BIGNUM *A, BIGNUM *N)
322 {
323     /* Checks if A % N == 0 */
324     return SRP_Verify_B_mod_N(A, N);
325 }

```

```

328 /* Check if G and N are known parameters.
329    The values have been generated from the ietf-tls-srp draft version 8
330 */
331 char *SRP_check_known_gN_param(BIGNUM *g, BIGNUM *N)
332 {
333     size_t i;
334     if ((g == NULL) || (N == NULL))
335         return 0;

337     srp_bn_print(g);
338     srp_bn_print(N);

340     for(i = 0; i < KNOWN_GN_NUMBER; i++)
341     {
342         if (BN_cmp(knowngN[i].g, g) == 0 && BN_cmp(knowngN[i].N, N) == 0
343             return knowngN[i].id;
344     }
345     return NULL;
346 }

348 SRP_gN *SRP_get_default_gN(const char *id)
349 {
350     size_t i;

352     if (id == NULL)
353         return knowngN;
354     for(i = 0; i < KNOWN_GN_NUMBER; i++)
355     {
356         if (strcmp(knowngN[i].id, id) == 0)
357             return knowngN + i;
358     }
359     return NULL;
360 }
361 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/srp/srp_vfy.c

1

```
*****
15193 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/srp/srp_vfy.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/srp/srp_vfy.c */
2 /* Written by Christophe Renou (christophe.renou@edelweb.fr) with
3  * the precious help of Peter Sylvester (peter.sylvester@edelweb.fr)
4  * for the EdelKey project and contributed to the OpenSSL project 2004.
5  */
6 /* =====
7  * Copyright (c) 2004 The OpenSSL Project. All rights reserved.
8  *
9  * Redistribution and use in source and binary forms, with or without
10 * modification, are permitted provided that the following conditions
11 * are met:
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20 *
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44 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
45 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
46 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
47 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
49 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
50 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 * =====
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */
59 #ifndef OPENSSL_NO_SRP
60 #include "cryptlib.h"
61 #include "srp_lcl.h"
```

new/usr/src/lib/openssl/libsunw_crypto/srp/srp_vfy.c

2

```
62 #include <openssl/srp.h>
63 #include <openssl/evp.h>
64 #include <openssl/buffer.h>
65 #include <openssl/rand.h>
66 #include <openssl/txt_db.h>
67
68 #define SRP_RANDOM_SALT_LEN 20
69 #define MAX_LEN 2500
70
71 static char b64table[] =
72     "0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz.";
73
74 /* the following two conversion routines have been inspired by code from Stanfor
75
76 */
77 * Convert a base64 string into raw byte array representation.
78 */
79 static int t_fromb64(unsigned char *a, const char *src)
80 {
81     char *loc;
82     int i, j;
83     int size;
84
85     while(*src && (*src == ' ' || *src == '\t' || *src == '\n'))
86         ++src;
87     size = strlen(src);
88     i = 0;
89     while(i < size)
90     {
91         loc = strchr(b64table, src[i]);
92         if(loc == (char *) 0) break;
93         else a[i] = loc - b64table;
94         ++i;
95     }
96     size = i;
97     i = size - 1;
98     j = size;
99     while(1)
100     {
101         a[j] = a[i];
102         if(--i < 0) break;
103         a[j] |= (a[i] & 3) << 6;
104         --j;
105         a[j] = (unsigned char) ((a[i] & 0x3c) >> 2);
106         if(--i < 0) break;
107         a[j] |= (a[i] & 0xf) << 4;
108         --j;
109         a[j] = (unsigned char) ((a[i] & 0x30) >> 4);
110         if(--i < 0) break;
111         a[j] |= (a[i] << 2);
112
113         a[--j] = 0;
114         if(--i < 0) break;
115     }
116     while(a[j] == 0 && j <= size) ++j;
117     i = 0;
118     while (j <= size) a[i++] = a[j++];
119     return i;
120 }
121
122
123 /*
124 * Convert a raw byte string into a null-terminated base64 ASCII string.
125 */
126 static char *t_tob64(char *dst, const unsigned char *src, int size)
127 {
```

```

128     int c, pos = size % 3;
129     unsigned char b0 = 0, b1 = 0, b2 = 0, notleading = 0;
130     char *olddst = dst;

132     switch(pos)
133     {
134     case 1:
135         b2 = src[0];
136         break;
137     case 2:
138         b1 = src[0];
139         b2 = src[1];
140         break;
141     }

143     while(1)
144     {
145         c = (b0 & 0xfc) >> 2;
146         if(notleading || c != 0)
147         {
148             *dst++ = b64table[c];
149             notleading = 1;
150         }
151         c = ((b0 & 3) << 4) | ((b1 & 0xf0) >> 4);
152         if(notleading || c != 0)
153         {
154             *dst++ = b64table[c];
155             notleading = 1;
156         }
157         c = ((b1 & 0xf) << 2) | ((b2 & 0xc0) >> 6);
158         if(notleading || c != 0)
159         {
160             *dst++ = b64table[c];
161             notleading = 1;
162         }
163         c = b2 & 0x3f;
164         if(notleading || c != 0)
165         {
166             *dst++ = b64table[c];
167             notleading = 1;
168         }
169         if(pos >= size) break;
170         else
171         {
172             b0 = src[pos++];
173             b1 = src[pos++];
174             b2 = src[pos++];
175         }
176     }

178     *dst++ = '\0';
179     return olddst;
180 }

182 static void SRP_user_pwd_free(SRP_user_pwd *user_pwd)
183 {
184     if (user_pwd == NULL)
185         return;
186     BN_free(user_pwd->s);
187     BN_clear_free(user_pwd->v);
188     OPENSSL_free(user_pwd->id);
189     OPENSSL_free(user_pwd->info);
190     OPENSSL_free(user_pwd);
191 }

193 static SRP_user_pwd *SRP_user_pwd_new()

```

```

194     {
195         SRP_user_pwd *ret = OPENSSL_malloc(sizeof(SRP_user_pwd));
196         if (ret == NULL)
197             return NULL;
198         ret->N = NULL;
199         ret->g = NULL;
200         ret->s = NULL;
201         ret->v = NULL;
202         ret->id = NULL;
203         ret->info = NULL;
204         return ret;
205     }

207 static void SRP_user_pwd_set_gN(SRP_user_pwd *vinfo, const BIGNUM *g,
208                                 const BIGNUM *N)
209 {
210     vinfo->N = N;
211     vinfo->g = g;
212 }

214 static int SRP_user_pwd_set_ids(SRP_user_pwd *vinfo, const char *id,
215                                 const char *info)
216 {
217     if (id != NULL && NULL == (vinfo->id = BUF_strdup(id)))
218         return 0;
219     return (info == NULL || NULL != (vinfo->info = BUF_strdup(info))) ;
220 }

222 static int SRP_user_pwd_set_sv(SRP_user_pwd *vinfo, const char *s,
223                                 const char *v)
224 {
225     unsigned char tmp[MAX_LEN];
226     int len;

228     if (strlen(s) > MAX_LEN || strlen(v) > MAX_LEN)
229         return 0;
230     len = t_fromb64(tmp, v);
231     if (NULL == (vinfo->v = BN_bin2bn(tmp, len, NULL)))
232         return 0;
233     len = t_fromb64(tmp, s);
234     return ((vinfo->s = BN_bin2bn(tmp, len, NULL)) != NULL) ;
235 }

237 static int SRP_user_pwd_set_sv_BN(SRP_user_pwd *vinfo, BIGNUM *s, BIGNUM *v)
238 {
239     vinfo->v = v;
240     vinfo->s = s;
241     return (vinfo->s != NULL && vinfo->v != NULL) ;
242 }

244 SRP_VBASE *SRP_VBASE_new(char *seed_key)
245 {
246     SRP_VBASE *vb = (SRP_VBASE *) OPENSSL_malloc(sizeof(SRP_VBASE));

248     if (vb == NULL)
249         return NULL;
250     if (!{vb->users_pwd = sk_SRP_user_pwd_new_null(); ||
251         !(vb->gN_cache = sk_SRP_gN_cache_new_null())})
252     {
253         OPENSSL_free(vb);
254         return NULL;
255     }
256     vb->default_g = NULL;
257     vb->default_N = NULL;
258     vb->seed_key = NULL;
259     if ((seed_key != NULL) &&

```

```

260         (vb->seed_key = BUF_strdup(seed_key)) == NULL)
261     {
262         sk_SRP_user_pwd_free(vb->users_pwd);
263         sk_SRP_gN_cache_free(vb->gN_cache);
264         OPENSSL_free(vb);
265         return NULL;
266     }
267     return vb;
268 }

271 int SRP_VBASE_free(SRP_VBASE *vb)
272 {
273     sk_SRP_user_pwd_pop_free(vb->users_pwd, SRP_user_pwd_free);
274     sk_SRP_gN_cache_free(vb->gN_cache);
275     OPENSSL_free(vb->seed_key);
276     OPENSSL_free(vb);
277     return 0;
278 }

281 static SRP_gN_cache *SRP_gN_new_init(const char *ch)
282 {
283     unsigned char tmp[MAX_LEN];
284     int len;

286     SRP_gN_cache *newgN = (SRP_gN_cache *)OPENSSL_malloc(sizeof(SRP_gN_cache)
287 if (newgN == NULL)
288     return NULL;

290     if ((newgN->b64_bn = BUF_strdup(ch)) == NULL)
291         goto err;

293     len = t_fromb64(tmp, ch);
294     if ((newgN->bn = BN_bin2bn(tmp, len, NULL)))
295         return newgN;

297     OPENSSL_free(newgN->b64_bn);
298 err:
299     OPENSSL_free(newgN);
300     return NULL;
301 }

304 static void SRP_gN_free(SRP_gN_cache *gN_cache)
305 {
306     if (gN_cache == NULL)
307         return;
308     OPENSSL_free(gN_cache->b64_bn);
309     BN_free(gN_cache->bn);
310     OPENSSL_free(gN_cache);
311 }

313 static SRP_gN *SRP_get_gN_by_id(const char *id, STACK_OF(SRP_gN) *gN_tab)
314 {
315     int i;

317     SRP_gN *gN;
318     if (gN_tab != NULL)
319         for(i = 0; i < sk_SRP_gN_num(gN_tab); i++)
320         {
321             gN = sk_SRP_gN_value(gN_tab, i);
322             if (gN && (id == NULL || strcmp(gN->id, id) == 0))
323                 return gN;
324         }
325 }

```

```

326     return SRP_get_default_gN(id);
327 }

329 static BIGNUM *SRP_gN_place_bn(STACK_OF(SRP_gN_cache) *gN_cache, char *ch)
330 {
331     int i;
332     if (gN_cache == NULL)
333         return NULL;

335     /* search if we have already one... */
336     for(i = 0; i < sk_SRP_gN_cache_num(gN_cache); i++)
337     {
338         SRP_gN_cache *cache = sk_SRP_gN_cache_value(gN_cache, i);
339         if (strcmp(cache->b64_bn, ch) == 0)
340             return cache->bn;
341     }
342     /* it is the first time that we find it */
343     SRP_gN_cache *newgN = SRP_gN_new_init(ch);
344     if (newgN)
345     {
346         if (sk_SRP_gN_cache_insert(gN_cache, newgN, 0) > 0)
347             return newgN->bn;
348         SRP_gN_free(newgN);
349     }
350 }
351 return NULL;
352 }

354 /* this function parses verifier file. Format is:
355  * string(index):base64(N):base64(g):0
356  * string(username):base64(v):base64(salt):int(index)
357  */

360 int SRP_VBASE_init(SRP_VBASE *vb, char *verifier_file)
361 {
362     int error_code;
363     STACK_OF(SRP_gN) *SRP_gN_tab = sk_SRP_gN_new_null();
364     char *last_index = NULL;
365     int i;
366     char **pp;

368     SRP_gN *gN = NULL;
369     SRP_user_pwd *user_pwd = NULL;

371     TXT_DB *tmpdb = NULL;
372     BIO *in = BIO_new(BIO_s_file());

374     error_code = SRP_ERR_OPEN_FILE;

376     if (in == NULL || BIO_read_filename(in, verifier_file) <= 0)
377         goto err;

379     error_code = SRP_ERR_VBASE_INCOMPLETE_FILE;

381     if ((tmpdb = TXT_DB_read(in, DB_NUMBER)) == NULL)
382         goto err;

384     error_code = SRP_ERR_MEMORY;

387     if (vb->seed_key)
388     {
389         last_index = SRP_get_default_gN(NULL)->id;
390     }
391     for (i = 0; i < sk_OPENSSL_PSTRING_num(tmpdb->data); i++)

```

```

392     {
393         pp = sk_OPENSSL_PSTRING_value(tmpdb->data,i);
394         if (pp[DB_srptype][0] == DB_SRP_INDEX)
395         {
396             /*we add this couple in the internal Stack */
397
398             if ((gN = (SRP_gN *)OPENSSL_malloc(sizeof(SRP_gN))) == N
399                 goto err;
400
401             if (!(gN->id = BUF_strdup(pp[DB_srpidx])))
402             || !(gN->N = SRP_gN_place_bn(vb->gN_cache,pp[DB_srpveri
403             || !(gN->g = SRP_gN_place_bn(vb->gN_cache,pp[DB_srpsalt
404             || sk_SRP_gN_insert(SRP_gN_tab,gN,0) == 0)
405                 goto err;
406
407             gN = NULL;
408
409             if (vb->seed_key != NULL)
410             {
411                 last_index = pp[DB_srpidx];
412             }
413         }
414     else if (pp[DB_srptype][0] == DB_SRP_VALID)
415     {
416         /* it is a user .... */
417         SRP_gN *lgN;
418         if ((lgN = SRP_get_gN_by_id(pp[DB_srpidx],SRP_gN_tab))!=N
419             {
420                 error_code = SRP_ERR_MEMORY;
421                 if ((user_pwd = SRP_user_pwd_new()) == NULL)
422                     goto err;
423
424                 SRP_user_pwd_set_gN(user_pwd,lgN->g,lgN->N);
425                 if (!SRP_user_pwd_set_ids(user_pwd, pp[DB_srpidx]
426                     goto err;
427
428                 error_code = SRP_ERR_VBASE_BN_LIB;
429                 if (!SRP_user_pwd_set_sv(user_pwd, pp[DB_srpsalt
430                     goto err;
431
432                 if (sk_SRP_user_pwd_insert(vb->users_pwd, user_p
433                     goto err;
434                 user_pwd = NULL; /* abandon responsibility */
435             }
436         }
437     }
438
439     if (last_index != NULL)
440     {
441         /* this means that we want to simulate a default user */
442
443         if (((gN = SRP_get_gN_by_id(last_index,SRP_gN_tab))==NULL))
444         {
445             error_code = SRP_ERR_VBASE_BN_LIB;
446             goto err;
447         }
448         vb->default_g = gN->g ;
449         vb->default_N = gN->N ;
450         gN = NULL ;
451     }
452     error_code = SRP_NO_ERROR;
453
454 err:
455     /* there may be still some leaks to fix, if this fails, the application
456
457     if (gN != NULL)

```

```

458     {
459         OPENSSL_free(gN->id);
460         OPENSSL_free(gN);
461     }
462
463     SRP_user_pwd_free(user_pwd);
464
465     if (tmpdb) TXT_DB_free(tmpdb);
466     if (in) BIO_free_all(in);
467
468     sk_SRP_gN_free(SRP_gN_tab);
469
470     return error_code;
471
472 }
473
474 SRP_user_pwd *SRP_VBASE_get_by_user(SRP_VBASE *vb, char *username)
475 {
476     int i;
477     SRP_user_pwd *user;
478     unsigned char digv[SHA_DIGEST_LENGTH];
479     unsigned char digs[SHA_DIGEST_LENGTH];
480     EVP_MD_CTX ctx;
481
482     if (vb == NULL)
483         return NULL;
484     for(i = 0; i < sk_SRP_user_pwd_num(vb->users_pwd); i++)
485     {
486         user = sk_SRP_user_pwd_value(vb->users_pwd, i);
487         if (strcmp(user->id,username)==0)
488             return user;
489     }
490     if ((vb->seed_key == NULL) ||
491         (vb->default_g == NULL) ||
492         (vb->default_N == NULL))
493         return NULL;
494
495     /* if the user is unknown we set parameters as well if we have a seed_key */
496
497     if ((user = SRP_user_pwd_new()) == NULL)
498         return NULL;
499
500     SRP_user_pwd_set_gN(user,vb->default_g,vb->default_N);
501
502     if (!SRP_user_pwd_set_ids(user,username,NULL))
503         goto err;
504
505     RAND_pseudo_bytes(digv, SHA_DIGEST_LENGTH);
506     EVP_MD_CTX_init(&ctx);
507     EVP_DigestInit_ex(&ctx, EVP_sha1(), NULL);
508     EVP_DigestUpdate(&ctx, vb->seed_key, strlen(vb->seed_key));
509     EVP_DigestUpdate(&ctx, username, strlen(username));
510     EVP_DigestFinal_ex(&ctx, digs, NULL);
511     EVP_MD_CTX_cleanup(&ctx);
512     if (SRP_user_pwd_set_sv_BN(user, BN_bin2bn(digs,SHA_DIGEST_LENGTH,NULL),
513         return user;
514
515 err:
516     SRP_user_pwd_free(user);
517     return NULL;
518 }
519
520 /*
521  * create a verifier (*salt,*verifier,g and N are in base64)
522  */

```

```

524 char *SRP_create_verifier(const char *user, const char *pass, char **salt,
525                           char **verifier, const char *N, const char *g)
526 {
527     int len;
528     char *result=NULL;
529     char *vf;
530     BIGNUM *N_bn = NULL, *g_bn = NULL, *s = NULL, *v = NULL;
531     unsigned char tmp[MAX_LEN];
532     unsigned char tmp2[MAX_LEN];
533     char *defgNid = NULL;

535     if ((user == NULL)||
536         {pass == NULL}||
537         {salt == NULL}||
538         {verifier == NULL})
539         goto err;

541     if (N)
542     {
543         if (!(len = t_fromb64(tmp, N))) goto err;
544         N_bn = BN_bin2bn(tmp, len, NULL);
545         if (!(len = t_fromb64(tmp, g))) goto err;
546         g_bn = BN_bin2bn(tmp, len, NULL);
547         defgNid = "*";
548     }
549     else
550     {
551         SRP_gN *gN = SRP_get_gN_by_id(g, NULL) ;
552         if (gN == NULL)
553             goto err;
554         N_bn = gN->N;
555         g_bn = gN->g;
556         defgNid = gN->id;
557     }

559     if (*salt == NULL)
560     {
561         RAND_pseudo_bytes(tmp2, SRP_RANDOM_SALT_LEN);

563         s = BN_bin2bn(tmp2, SRP_RANDOM_SALT_LEN, NULL);
564     }
565     else
566     {
567         if (!(len = t_fromb64(tmp2, *salt)))
568             goto err;
569         s = BN_bin2bn(tmp2, len, NULL);
570     }

573     if(!SRP_create_verifier_BN(user, pass, &s, &v, N_bn, g_bn)) goto err;

575     BN_bn2bin(v,tmp);
576     if (((vf = OPENSSL_malloc(BN_num_bytes(v)*2)) == NULL))
577         goto err;
578     t_tob64(vf, tmp, BN_num_bytes(v));

580     *verifier = vf;
581     if (*salt == NULL)
582     {
583         char *tmp_salt;

585         if ((tmp_salt = OPENSSL_malloc(SRP_RANDOM_SALT_LEN * 2)) == NULL
586             {
587                 OPENSSL_free(vf);
588                 goto err;
589             }

```

```

590         t_tob64(tmp_salt, tmp2, SRP_RANDOM_SALT_LEN);
591         *salt = tmp_salt;
592     }

594     result=defgNid;

596 err:
597     if(N)
598     {
599         BN_free(N_bn);
600         BN_free(g_bn);
601     }
602     return result;
603 }

605 /*
606  * create a verifier (*salt,*verifier,g and N are BIGNUMs)
607  */
608 int SRP_create_verifier_BN(const char *user, const char *pass, BIGNUM **salt, BI
609 {
610     int result=0;
611     BIGNUM *x = NULL;
612     BN_CTX *bn_ctx = BN_CTX_new();
613     unsigned char tmp2[MAX_LEN];

615     if ((user == NULL)||
616         {pass == NULL}||
617         {salt == NULL}||
618         {verifier == NULL}||
619         {N == NULL}||
620         {g == NULL}||
621         {bn_ctx == NULL})
622         goto err;

624     srp_bn_print(N);
625     srp_bn_print(g);

627     if (*salt == NULL)
628     {
629         RAND_pseudo_bytes(tmp2, SRP_RANDOM_SALT_LEN);

631         *salt = BN_bin2bn(tmp2,SRP_RANDOM_SALT_LEN,NULL);
632     }

634     x = SRP_Calc_x(*salt,user,pass);

636     *verifier = BN_new();
637     if(*verifier == NULL) goto err;

639     if (!BN_mod_exp(*verifier,g,x,N,bn_ctx))
640     {
641         BN_clear_free(*verifier);
642         goto err;
643     }

645     srp_bn_print(*verifier);

647     result=1;

649 err:

651     BN_clear_free(x);
652     BN_CTX_free(bn_ctx);
653     return result;
654 }

```

new/usr/src/lib/openssl/libsunw_crypto/srp/srp_vfy.c

11

658 #endif

new/usr/src/lib/openssl/libsunw_crypto/stack/stack.c

1

```
*****
8562 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/stack/stack.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/stack/stack.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 /* Code for stacks
60  * Author - Eric Young v 1.0
61  * 1.2 eay 12-Mar-97 - Modified sk_find so that it _DOES_ return the
```

new/usr/src/lib/openssl/libsunw_crypto/stack/stack.c

2

```
62 * lowest index for the searched item.
63 *
64 * 1.1 eay - Take from netdb and added to SSLeay
65 *
66 * 1.0 eay - First version 29/07/92
67 */
68 #include <stdio.h>
69 #include "cryptlib.h"
70 #include <openssl/stack.h>
71 #include <openssl/objects.h>

73 #undef MIN_NODES
74 #define MIN_NODES 4

76 const char STACK_version[]="Stack" OPENSSL_VERSION_PTEXT;

78 #include <errno.h>

80 int (*sk_set_cmp_func(_STACK *sk, int (*c)(const void *, const void *)))
81 (const void *, const void *)
82 {
83     int (*old)(const void *,const void *)=sk->comp;

85     if (sk->comp != c)
86         sk->sorted=0;
87     sk->comp=c;

89     return old;
90 }

92 _STACK *sk_dup(_STACK *sk)
93 {
94     _STACK *ret;
95     char **s;

97     if ((ret=sk_new(sk->comp)) == NULL) goto err;
98     s=(char **)OPENSSL_realloc((char *)ret->data,
99                               (unsigned int)sizeof(char *)*sk->num_alloc);
100    if (s == NULL) goto err;
101    ret->data=s;

103    ret->num=sk->num;
104    memcpy(ret->data,sk->data,sizeof(char *)*sk->num);
105    ret->sorted=sk->sorted;
106    ret->num_alloc=sk->num_alloc;
107    ret->comp=sk->comp;
108    return(ret);

109 err:
110    if(ret)
111        sk_free(ret);
112    return(NULL);
113 }

115 _STACK *sk_new_null(void)
116 {
117     return sk_new((int (*)(const void *, const void *))0);
118 }

120 _STACK *sk_new(int (*c)(const void *, const void *))
121 {
122     _STACK *ret;
123     int i;

125     if ((ret=OPENSSL_malloc(sizeof(_STACK))) == NULL)
126         goto err;
127     if ((ret->data=OPENSSL_malloc(sizeof(char *)*MIN_NODES)) == NULL)
```



```

128         goto err;
129     for (i=0; i<MIN_NODES; i++)
130         ret->data[i]=NULL;
131     ret->comp=c;
132     ret->num_alloc=MIN_NODES;
133     ret->num=0;
134     ret->sorted=0;
135     return(ret);
136 err:
137     if(ret)
138         OPENSSL_free(ret);
139     return(NULL);
140 }

142 int sk_insert(_STACK *st, void *data, int loc)
143 {
144     char **s;

146     if(st == NULL) return 0;
147     if (st->num_alloc <= st->num+1)
148     {
149         s=OPENSSL_realloc((char *)st->data,
150             (unsigned int)sizeof(char *)*st->num_alloc*2);
151         if (s == NULL)
152             return(0);
153         st->data=s;
154         st->num_alloc*=2;
155     }
156     if ((loc >= (int)st->num) || (loc < 0))
157         st->data[st->num]=data;
158     else
159     {
160         int i;
161         char **f,**t;

163         f=st->data;
164         t=&(st->data[1]);
165         for (i=st->num; i>=loc; i--)
166             t[i]=f[i];
167
168 #ifdef undef /* no memmove on sunos :- ( */
169         memmove(&(st->data[loc+1]),
170             &(st->data[loc]),
171             sizeof(char *)*(st->num-loc));
172 #endif
173         st->data[loc]=data;
174     }
175     st->num++;
176     st->sorted=0;
177     return(st->num);
178 }

180 void *sk_delete_ptr(_STACK *st, void *p)
181 {
182     int i;

184     for (i=0; i<st->num; i++)
185         if (st->data[i] == p)
186             return(sk_delete(st,i));
187     return(NULL);
188 }

190 void *sk_delete(_STACK *st, int loc)
191 {
192     char *ret;
193     int i,j;

```

```

195     if(!st || (loc < 0) || (loc >= st->num)) return NULL;

197     ret=st->data[loc];
198     if (loc != st->num-1)
199     {
200         j=st->num-1;
201         for (i=loc; i<j; i++)
202             st->data[i]=st->data[i+1];
203         /* In theory memcpy is not safe for this
204          * memcpy( &(st->data[loc]),
205          *         &(st->data[loc+1]),
206          *         sizeof(char *)*(st->num-loc-1));
207          */
208     }
209     st->num--;
210     return(ret);
211 }

213 static int internal_find(_STACK *st, void *data, int ret_val_options)
214 {
215     const void * const *r;
216     int i;

218     if(st == NULL) return -1;

220     if (st->comp == NULL)
221     {
222         for (i=0; i<st->num; i++)
223             if (st->data[i] == data)
224                 return(i);
225         return(-1);
226     }
227     sk_sort(st);
228     if (data == NULL) return(-1);
229     r=OBJ_bsearch_ex(&data,st->data,st->num,sizeof(void *),st->comp,
230         ret_val_options);
231     if (r == NULL) return(-1);
232     return (int)((char **)r-st->data);
233 }

235 int sk_find(_STACK *st, void *data)
236 {
237     return internal_find(st, data, OBJ_BSEARCH_FIRST_VALUE_ON_MATCH);
238 }

239 int sk_find_ex(_STACK *st, void *data)
240 {
241     return internal_find(st, data, OBJ_BSEARCH_VALUE_ON_NOMATCH);
242 }

244 int sk_push(_STACK *st, void *data)
245 {
246     return(sk_insert(st,data,st->num));
247 }

249 int sk_unshift(_STACK *st, void *data)
250 {
251     return(sk_insert(st,data,0));
252 }

254 void *sk_shift(_STACK *st)
255 {
256     if (st == NULL) return(NULL);
257     if (st->num <= 0) return(NULL);
258     return(sk_delete(st,0));
259 }

```

```

261 void *sk_pop(_STACK *st)
262 {
263     if (st == NULL) return(NULL);
264     if (st->num <= 0) return(NULL);
265     return(sk_delete(st, st->num-1));
266 }

268 void sk_zero(_STACK *st)
269 {
270     if (st == NULL) return;
271     if (st->num <= 0) return;
272     memset((char *)st->data, 0, sizeof(st->data)*st->num);
273     st->num=0;
274 }

276 void sk_pop_free(_STACK *st, void (*func)(void *))
277 {
278     int i;

280     if (st == NULL) return;
281     for (i=0; i<st->num; i++)
282         if (st->data[i] != NULL)
283             func(st->data[i]);
284     sk_free(st);
285 }

287 void sk_free(_STACK *st)
288 {
289     if (st == NULL) return;
290     if (st->data != NULL) OPENSSL_free(st->data);
291     OPENSSL_free(st);
292 }

294 int sk_num(const _STACK *st)
295 {
296     if(st == NULL) return -1;
297     return st->num;
298 }

300 void *sk_value(const _STACK *st, int i)
301 {
302     if(!st || (i < 0) || (i >= st->num)) return NULL;
303     return st->data[i];
304 }

306 void *sk_set(_STACK *st, int i, void *value)
307 {
308     if(!st || (i < 0) || (i >= st->num)) return NULL;
309     return (st->data[i] = value);
310 }

312 void sk_sort(_STACK *st)
313 {
314     if (st && !st->sorted)
315     {
316         int (*comp_func)(const void *,const void *);

318         /* same comment as in sk_find ... previously st->comp was declar
319          * as a (void*,void*) callback type, but this made the populatio
320          * of the callback pointer illogical - our callbacks compare
321          * type** with type**, so we leave the casting until absolutely
322          * necessary (ie. "now"). */
323         comp_func=(int (*)(const void *,const void *))(st->comp);
324         qsort(st->data,st->num,sizeof(char *), comp_func);
325         st->sorted=1;

```

```

326     }
327 }

329 int sk_is_sorted(const _STACK *st)
330 {
331     if (!st)
332         return 1;
333     return st->sorted;
334 }

```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_asn1.c

1

```
*****
10368 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ts/ts_asn1.c */
2 /* Written by Nils Larsch for the OpenSSL project 2004.
3 */
4 /* =====
5 * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
6 *
7 * Redistribution and use in source and binary forms, with or without
8 * modification, are permitted provided that the following conditions
9 * are met:
10 *
11 * 1. Redistributions of source code must retain the above copyright
12 * notice, this list of conditions and the following disclaimer.
13 *
14 * 2. Redistributions in binary form must reproduce the above copyright
15 * notice, this list of conditions and the following disclaimer in
16 * the documentation and/or other materials provided with the
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18 *
19 * 3. All advertising materials mentioning features or use of this
20 * software must display the following acknowledgment:
21 * "This product includes software developed by the OpenSSL Project
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23 *
24 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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29 * 5. Products derived from this software may not be called "OpenSSL"
30 * nor may "OpenSSL" appear in their names without prior written
31 * permission of the OpenSSL Project.
32 *
33 * 6. Redistributions of any form whatsoever must retain the following
34 * acknowledgment:
35 * "This product includes software developed by the OpenSSL Project
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37 *
38 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
39 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
40 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
41 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
42 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
43 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
44 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
45 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
46 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
47 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
48 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
49 * OF THE POSSIBILITY OF SUCH DAMAGE.
50 * =====
51 *
52 * This product includes cryptographic software written by Eric Young
53 * (eay@cryptsoft.com). This product includes software written by Tim
54 * Hudson (tjh@cryptsoft.com).
55 *
56 */

58 #include <openssl/ts.h>
59 #include <openssl/err.h>
60 #include <openssl/asn1t.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_asn1.c

2

```
62 ASN1_SEQUENCE(TS_MSG_IMPRINT) = {
63     ASN1_SIMPLE(TS_MSG_IMPRINT, hash_algo, X509_ALGOR),
64     ASN1_SIMPLE(TS_MSG_IMPRINT, hashed_msg, ASN1_OCTET_STRING)
65 } ASN1_SEQUENCE_END(TS_MSG_IMPRINT)

67 IMPLEMENT_ASN1_FUNCTIONS_const(TS_MSG_IMPRINT)
68 IMPLEMENT_ASN1_DUP_FUNCTION(TS_MSG_IMPRINT)
69 #ifndef OPENSSL_NO_BIO
70 TS_MSG_IMPRINT *d2i_TS_MSG_IMPRINT_bio(BIO *bp, TS_MSG_IMPRINT **a)
71 {
72     return ASN1_d2i_bio_of(TS_MSG_IMPRINT, TS_MSG_IMPRINT_new, d2i_TS_MSG_IMPRINT, bp, a);
73 }

75 int i2d_TS_MSG_IMPRINT_bio(BIO *bp, TS_MSG_IMPRINT *a)
76 {
77     return ASN1_i2d_bio_of_const(TS_MSG_IMPRINT, i2d_TS_MSG_IMPRINT, bp, a);
78 }
79 #endif

80 #ifndef OPENSSL_NO_FP_API
81 TS_MSG_IMPRINT *d2i_TS_MSG_IMPRINT_fp(FILE *fp, TS_MSG_IMPRINT **a)
82 {
83     return ASN1_d2i_fp_of(TS_MSG_IMPRINT, TS_MSG_IMPRINT_new, d2i_TS_MSG_IMPRINT, fp, a);
84 }

86 int i2d_TS_MSG_IMPRINT_fp(FILE *fp, TS_MSG_IMPRINT *a)
87 {
88     return ASN1_i2d_fp_of_const(TS_MSG_IMPRINT, i2d_TS_MSG_IMPRINT, fp, a);
89 }
90 #endif

92 ASN1_SEQUENCE(TS_REQ) = {
93     ASN1_SIMPLE(TS_REQ, version, ASN1_INTEGER),
94     ASN1_SIMPLE(TS_REQ, msg_imprint, TS_MSG_IMPRINT),
95     ASN1_OPT(TS_REQ, policy_id, ASN1_OBJECT),
96     ASN1_OPT(TS_REQ, nonce, ASN1_INTEGER),
97     ASN1_OPT(TS_REQ, cert_req, ASN1_FBOOLEAN),
98     ASN1_IMP_SEQUENCE_OF_OPT(TS_REQ, extensions, X509_EXTENSION, 0)
99 } ASN1_SEQUENCE_END(TS_REQ)

101 IMPLEMENT_ASN1_FUNCTIONS_const(TS_REQ)
102 IMPLEMENT_ASN1_DUP_FUNCTION(TS_REQ)
103 #ifndef OPENSSL_NO_BIO
104 TS_REQ *d2i_TS_REQ_bio(BIO *bp, TS_REQ **a)
105 {
106     return ASN1_d2i_bio_of(TS_REQ, TS_REQ_new, d2i_TS_REQ, bp, a);
107 }

109 int i2d_TS_REQ_bio(BIO *bp, TS_REQ *a)
110 {
111     return ASN1_i2d_bio_of_const(TS_REQ, i2d_TS_REQ, bp, a);
112 }
113 #endif

114 #ifndef OPENSSL_NO_FP_API
115 TS_REQ *d2i_TS_REQ_fp(FILE *fp, TS_REQ **a)
116 {
117     return ASN1_d2i_fp_of(TS_REQ, TS_REQ_new, d2i_TS_REQ, fp, a);
118 }

120 int i2d_TS_REQ_fp(FILE *fp, TS_REQ *a)
121 {
122     return ASN1_i2d_fp_of_const(TS_REQ, i2d_TS_REQ, fp, a);
123 }
124 #endif

126 ASN1_SEQUENCE(TS_ACCURACY) = {
127     ASN1_OPT(TS_ACCURACY, seconds, ASN1_INTEGER),
```

```

128     ASN1_IMP_OPT(TS_ACCURACY, millis, ASN1_INTEGER, 0),
129     ASN1_IMP_OPT(TS_ACCURACY, micros, ASN1_INTEGER, 1)
130 } ASN1_SEQUENCE_END(TS_ACCURACY)

132 IMPLEMENT_ASN1_FUNCTIONS_const(TS_ACCURACY)
133 IMPLEMENT_ASN1_DUP_FUNCTION(TS_ACCURACY)

135 ASN1_SEQUENCE(TS_TST_INFO) = {
136     ASN1_SIMPLE(TS_TST_INFO, version, ASN1_INTEGER),
137     ASN1_SIMPLE(TS_TST_INFO, policy_id, ASN1_OBJECT),
138     ASN1_SIMPLE(TS_TST_INFO, msg_imprint, TS_MSG_IMPRINT),
139     ASN1_SIMPLE(TS_TST_INFO, serial, ASN1_INTEGER),
140     ASN1_SIMPLE(TS_TST_INFO, time, ASN1_GENERALIZEDTIME),
141     ASN1_OPT(TS_TST_INFO, accuracy, TS_ACCURACY),
142     ASN1_OPT(TS_TST_INFO, ordering, ASN1_FBOOLEAN),
143     ASN1_OPT(TS_TST_INFO, nonce, ASN1_INTEGER),
144     ASN1_EXP_OPT(TS_TST_INFO, tsa, GENERAL_NAME, 0),
145     ASN1_IMP_SEQUENCE_OF_OPT(TS_TST_INFO, extensions, X509_EXTENSION, 1)
146 } ASN1_SEQUENCE_END(TS_TST_INFO)

148 IMPLEMENT_ASN1_FUNCTIONS_const(TS_TST_INFO)
149 IMPLEMENT_ASN1_DUP_FUNCTION(TS_TST_INFO)
150 #ifndef OPENSSL_NO_BIO
151 TS_TST_INFO *d2i_TS_TST_INFO_bio(BIO *bp, TS_TST_INFO **a)
152 {
153     return ASN1_d2i_bio_of(TS_TST_INFO, TS_TST_INFO_new, d2i_TS_TST_INFO, bp, a);
154 }

156 int i2d_TS_TST_INFO_bio(BIO *bp, TS_TST_INFO *a)
157 {
158     return ASN1_i2d_bio_of_const(TS_TST_INFO, i2d_TS_TST_INFO, bp, a);
159 }
160 #endif
161 #ifndef OPENSSL_NO_FP_API
162 TS_TST_INFO *d2i_TS_TST_INFO_fp(FILE *fp, TS_TST_INFO **a)
163 {
164     return ASN1_d2i_fp_of(TS_TST_INFO, TS_TST_INFO_new, d2i_TS_TST_INFO, fp, a);
165 }

167 int i2d_TS_TST_INFO_fp(FILE *fp, TS_TST_INFO *a)
168 {
169     return ASN1_i2d_fp_of_const(TS_TST_INFO, i2d_TS_TST_INFO, fp, a);
170 }
171 #endif

173 ASN1_SEQUENCE(TS_STATUS_INFO) = {
174     ASN1_SIMPLE(TS_STATUS_INFO, status, ASN1_INTEGER),
175     ASN1_SEQUENCE_OF_OPT(TS_STATUS_INFO, text, ASN1_UTF8STRING),
176     ASN1_OPT(TS_STATUS_INFO, failure_info, ASN1_BIT_STRING)
177 } ASN1_SEQUENCE_END(TS_STATUS_INFO)

179 IMPLEMENT_ASN1_FUNCTIONS_const(TS_STATUS_INFO)
180 IMPLEMENT_ASN1_DUP_FUNCTION(TS_STATUS_INFO)

182 static int ts_resp_set_tst_info(TS_RESP *a)
183 {
184     long status;

186     status = ASN1_INTEGER_get(a->status_info->status);

188     if (a->token) {
189         if (status != 0 && status != 1) {
190             TSerr(TS_F_TS_RESP_SET_TST_INFO, TS_R_TOKEN_PRESENT);
191             return 0;
192         }
193         if (a->tst_info != NULL)

```

```

194         TS_TST_INFO_free(a->tst_info);
195         a->tst_info = PKCS7_to_TS_TST_INFO(a->token);
196         if (!a->tst_info) {
197             TSerr(TS_F_TS_RESP_SET_TST_INFO, TS_R_PKCS7_TO_TS_TST_IN
198                 return 0;
199         }
200     } else if (status == 0 || status == 1) {
201         TSerr(TS_F_TS_RESP_SET_TST_INFO, TS_R_TOKEN_NOT_PRESENT);
202         return 0;
203     }

205     return 1;
206 }

208 static int ts_resp_cb(int op, ASN1_VALUE **pval, const ASN1_ITEM *it,
209 void *exarg)
210 {
211     TS_RESP *ts_resp = (TS_RESP *)*pval;
212     if (op == ASN1_OP_NEW_POST) {
213         ts_resp->tst_info = NULL;
214     } else if (op == ASN1_OP_FREE_POST) {
215         if (ts_resp->tst_info != NULL)
216             TS_TST_INFO_free(ts_resp->tst_info);
217     } else if (op == ASN1_OP_D2I_POST) {
218         if (ts_resp_set_tst_info(ts_resp) == 0)
219             return 0;
220     }
221     return 1;
222 }

224 ASN1_SEQUENCE_cb(TS_RESP, ts_resp_cb) = {
225     ASN1_SIMPLE(TS_RESP, status_info, TS_STATUS_INFO),
226     ASN1_OPT(TS_RESP, token, PKCS7),
227 } ASN1_SEQUENCE_END_cb(TS_RESP, TS_RESP)

229 IMPLEMENT_ASN1_FUNCTIONS_const(TS_RESP)
230 IMPLEMENT_ASN1_DUP_FUNCTION(TS_RESP)
231 #ifndef OPENSSL_NO_BIO
232 TS_RESP *d2i_TS_RESP_bio(BIO *bp, TS_RESP **a)
233 {
234     return ASN1_d2i_bio_of(TS_RESP, TS_RESP_new, d2i_TS_RESP, bp, a);
235 }

237 int i2d_TS_RESP_bio(BIO *bp, TS_RESP *a)
238 {
239     return ASN1_i2d_bio_of_const(TS_RESP, i2d_TS_RESP, bp, a);
240 }
241 #endif
242 #ifndef OPENSSL_NO_FP_API
243 TS_RESP *d2i_TS_RESP_fp(FILE *fp, TS_RESP **a)
244 {
245     return ASN1_d2i_fp_of(TS_RESP, TS_RESP_new, d2i_TS_RESP, fp, a);
246 }

248 int i2d_TS_RESP_fp(FILE *fp, TS_RESP *a)
249 {
250     return ASN1_i2d_fp_of_const(TS_RESP, i2d_TS_RESP, fp, a);
251 }
252 #endif

254 ASN1_SEQUENCE(ESS_ISSUER_SERIAL) = {
255     ASN1_SEQUENCE_OF(ESS_ISSUER_SERIAL, issuer, GENERAL_NAME),
256     ASN1_SIMPLE(ESS_ISSUER_SERIAL, serial, ASN1_INTEGER)
257 } ASN1_SEQUENCE_END(ESS_ISSUER_SERIAL)

259 IMPLEMENT_ASN1_FUNCTIONS_const(ESS_ISSUER_SERIAL)

```

```
260 IMPLEMENT_ASN1_FUNCTIONS(ESS_ISSUER_SERIAL)

262 ASN1_SEQUENCE(ESS_CERT_ID) = {
263     ASN1_SIMPLE(ESS_CERT_ID, hash, ASN1_OCTET_STRING),
264     ASN1_OPT(ESS_CERT_ID, issuer_serial, ESS_ISSUER_SERIAL)
265 } ASN1_SEQUENCE_END(ESS_CERT_ID)

267 IMPLEMENT_ASN1_FUNCTIONS_const(ESS_CERT_ID)
268 IMPLEMENT_ASN1_FUNCTIONS(ESS_CERT_ID)

270 ASN1_SEQUENCE(ESS_SIGNING_CERT) = {
271     ASN1_SEQUENCE_OF(ESS_SIGNING_CERT, cert_ids, ESS_CERT_ID),
272     ASN1_SEQUENCE_OF_OPT(ESS_SIGNING_CERT, policy_info, POLICYINFO)
273 } ASN1_SEQUENCE_END(ESS_SIGNING_CERT)

275 IMPLEMENT_ASN1_FUNCTIONS_const(ESS_SIGNING_CERT)
276 IMPLEMENT_ASN1_FUNCTIONS(ESS_SIGNING_CERT)

278 /* Getting encapsulated TS_TST_INFO object from PKCS7. */
279 TS_TST_INFO *PKCS7_to_TS_TST_INFO(PKCS7 *token)
280 {
281     PKCS7_SIGNED *pkcs7_signed;
282     PKCS7 *enveloped;
283     ASN1_TYPE *tst_info_wrapper;
284     ASN1_OCTET_STRING *tst_info_der;
285     const unsigned char *p;

287     if (!PKCS7_type_is_signed(token))
288     {
289         TSerr(TS_F_PKCS7_TO_TS_TST_INFO, TS_R_BAD_PKCS7_TYPE);
290         return NULL;
291     }

293     /* Content must be present. */
294     if (PKCS7_get_detached(token))
295     {
296         TSerr(TS_F_PKCS7_TO_TS_TST_INFO, TS_R_DETACHED_CONTENT);
297         return NULL;
298     }

300     /* We have a signed data with content. */
301     pkcs7_signed = token->d.sign;
302     enveloped = pkcs7_signed->contents;
303     if (OBJ_obj2nid(enveloped->type) != NID_id_smime_ct_TSTInfo)
304     {
305         TSerr(TS_F_PKCS7_TO_TS_TST_INFO, TS_R_BAD_PKCS7_TYPE);
306         return NULL;
307     }

309     /* We have a DER encoded TST_INFO as the signed data. */
310     tst_info_wrapper = enveloped->d.other;
311     if (tst_info_wrapper->type != V_ASN1_OCTET_STRING)
312     {
313         TSerr(TS_F_PKCS7_TO_TS_TST_INFO, TS_R_BAD_TYPE);
314         return NULL;
315     }

317     /* We have the correct ASN1_OCTET_STRING type. */
318     tst_info_der = tst_info_wrapper->value.octet_string;
319     /* At last, decode the TST_INFO. */
320     p = tst_info_der->data;
321     return d2i_TS_TST_INFO(NULL, &p, tst_info_der->length);
322 }
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_conf.c

1

```
*****
13427 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_conf.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ts/ts_conf.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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13  * notice, this list of conditions and the following disclaimer.
14  *
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18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
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38  *
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40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */

59 #include <string.h>

61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_conf.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/pem.h>
64 #ifndef OPENSSL_NO_ENGINE
65 #include <openssl/engine.h>
66 #endif
67 #include <openssl/ts.h>

69 /* Macro definitions for the configuration file. */

71 #define BASE_SECTION "tsa"
72 #define ENV_DEFAULT_TSA "default_tsa"
73 #define ENV_SERIAL "serial"
74 #define ENV_CRYPTODEV "crypto_device"
75 #define ENV_SIGNER_CERT "signer_cert"
76 #define ENV_CERTS "certs"
77 #define ENV_SIGNER_KEY "signer_key"
78 #define ENV_DEFAULT_POLICY "default_policy"
79 #define ENV_OTHER_POLICIES "other_policies"
80 #define ENV_DIGESTS "digests"
81 #define ENV_ACCURACY "accuracy"
82 #define ENV_ORDERING "ordering"
83 #define ENV_TSA_NAME "tsa_name"
84 #define ENV_ESS_CERT_ID_CHAIN "ess_cert_id_chain"
85 #define ENV_VALUE_SECS "secs"
86 #define ENV_VALUE_MILLISECS "milliseconds"
87 #define ENV_VALUE_MICROSECS "microsecs"
88 #define ENV_CLOCK_PRECISION_DIGITS "clock_precision_digits"
89 #define ENV_VALUE_YES "yes"
90 #define ENV_VALUE_NO "no"

92 /* Function definitions for certificate and key loading. */

94 X509 *TS_CONF_load_cert(const char *file)
95 {
96     BIO *cert = NULL;
97     X509 *x = NULL;

99     if ((cert = BIO_new_file(file, "r")) == NULL) goto end;
100     x = PEM_read_bio_X509_AUX(cert, NULL, NULL, NULL);
101 end:
102     if (x == NULL)
103         fprintf(stderr, "unable to load certificate: %s\n", file);
104     BIO_free(cert);
105     return x;
106 }

108 STACK_OF(X509) *TS_CONF_load_certs(const char *file)
109 {
110     BIO *certs = NULL;
111     STACK_OF(X509) *othercerts = NULL;
112     STACK_OF(X509_INFO) *allcerts = NULL;
113     int i;

115     if (!(certs = BIO_new_file(file, "r"))) goto end;

117     if (!(othercerts = sk_X509_new_null())) goto end;
118     allcerts = PEM_X509_INFO_read_bio(certs, NULL, NULL, NULL);
119     for(i = 0; i < sk_X509_INFO_num(allcerts); i++)
120     {
121         X509_INFO *xi = sk_X509_INFO_value(allcerts, i);
122         if (xi->x509)
123         {
124             sk_X509_push(othercerts, xi->x509);
125             xi->x509 = NULL;
126         }
127     }
```

```

128 end:
129     if (othercerts == NULL)
130         fprintf(stderr, "unable to load certificates: %s\n", file);
131     sk_X509_INFO_pop_free(allcerts, X509_INFO_free);
132     BIO_free(cert);
133     return othercerts;
134 }

136 EVP_PKEY *TS_CONF_load_key(const char *file, const char *pass)
137 {
138     BIO *key = NULL;
139     EVP_PKEY *pkey = NULL;

141     if (!(key = BIO_new_file(file, "r"))) goto end;
142     pkey = PEM_read_bio_PrivateKey(key, NULL, NULL, (char *) pass);
143 end:
144     if (pkey == NULL)
145         fprintf(stderr, "unable to load private key: %s\n", file);
146     BIO_free(key);
147     return pkey;
148 }

150 /* Function definitions for handling configuration options. */

152 static void TS_CONF_lookup_fail(const char *name, const char *tag)
153 {
154     fprintf(stderr, "variable lookup failed for %s::%s\n", name, tag);
155 }

157 static void TS_CONF_invalid(const char *name, const char *tag)
158 {
159     fprintf(stderr, "invalid variable value for %s::%s\n", name, tag);
160 }

162 const char *TS_CONF_get_tsa_section(CONF *conf, const char *section)
163 {
164     if (!section)
165     {
166         section = NCONF_get_string(conf, BASE_SECTION, ENV_DEFAULT_TSA);
167         if (!section)
168             TS_CONF_lookup_fail(BASE_SECTION, ENV_DEFAULT_TSA);
169     }
170     return section;
171 }

173 int TS_CONF_set_serial(CONF *conf, const char *section, TS_serial_cb cb,
174                       TS_RESP_CTX *ctx)
175 {
176     int ret = 0;
177     char *serial = NCONF_get_string(conf, section, ENV_SERIAL);
178     if (!serial)
179     {
180         TS_CONF_lookup_fail(section, ENV_SERIAL);
181         goto err;
182     }
183     TS_RESP_CTX_set_serial_cb(ctx, cb, serial);

185     ret = 1;
186 err:
187     return ret;
188 }

190 #ifndef OPENSSL_NO_ENGINE

192 int TS_CONF_set_crypto_device(CONF *conf, const char *section,
193                               const char *device)

```

```

194     {
195         int ret = 0;
196
197         if (!device)
198             device = NCONF_get_string(conf, section,
199                                     ENV_CRYPTO_DEVICE);

201         if (device && !TS_CONF_set_default_engine(device))
202         {
203             TS_CONF_invalid(section, ENV_CRYPTO_DEVICE);
204             goto err;
205         }
206         ret = 1;
207 err:
208         return ret;
209     }

211 int TS_CONF_set_default_engine(const char *name)
212 {
213     ENGINE *e = NULL;
214     int ret = 0;

216     /* Leave the default if builtin specified. */
217     if (strcmp(name, "builtin") == 0) return 1;

219     if (!(e = ENGINE_by_id(name))) goto err;
220     /* Enable the use of the NCipher HSM for forked children. */
221     if (strcmp(name, "chil") == 0)
222         ENGINE_ctrl(e, ENGINE_CTRL_CHIL_SET_FORKCHECK, 1, 0, 0);
223     /* All the operations are going to be carried out by the engine. */
224     if (!ENGINE_set_default(e, ENGINE_METHOD_ALL)) goto err;
225     ret = 1;
226 err:
227     if (!ret)
228     {
229         TSerr(TS_F_TS_CONF_SET_DEFAULT_ENGINE,
230              TS_R_COULD_NOT_SET_ENGINE);
231         ERR_add_error_data(2, "engine:", name);
232     }
233     if (e) ENGINE_free(e);
234     return ret;
235 }

237 #endif

239 int TS_CONF_set_signer_cert(CONF *conf, const char *section,
240                             const char *cert, TS_RESP_CTX *ctx)
241 {
242     int ret = 0;
243     X509 *cert_obj = NULL;
244     if (!cert)
245         cert = NCONF_get_string(conf, section, ENV_SIGNER_CERT);
246     if (!cert)
247     {
248         TS_CONF_lookup_fail(section, ENV_SIGNER_CERT);
249         goto err;
250     }
251     if (!(cert_obj = TS_CONF_load_cert(cert)))
252         goto err;
253     if (!TS_RESP_CTX_set_signer_cert(ctx, cert_obj))
254         goto err;

256     ret = 1;
257 err:
258     X509_free(cert_obj);
259     return ret;

```

```

260     }

262 int TS_CONF_set_certs(CONF *conf, const char *section, const char *certs,
263                      TS_RESP_CTX *ctx)
264 {
265     int ret = 0;
266     STACK_OF(X509) *certs_obj = NULL;
267     if (!certs)
268         certs = NCONF_get_string(conf, section, ENV_CERTS);
269     /* Certificate chain is optional. */
270     if (!certs) goto end;
271     if (!(certs_obj = TS_CONF_load_certs(certs))) goto err;
272     if (!TS_RESP_CTX_set_certs(ctx, certs_obj)) goto err;
273 end:
274     ret = 1;
275 err:
276     sk_X509_pop_free(certs_obj, X509_free);
277     return ret;
278 }

280 int TS_CONF_set_signer_key(CONF *conf, const char *section,
281                           const char *key, const char *pass,
282                           TS_RESP_CTX *ctx)
283 {
284     int ret = 0;
285     EVP_PKEY *key_obj = NULL;
286     if (!key)
287         key = NCONF_get_string(conf, section, ENV_SIGNER_KEY);
288     if (!key)
289     {
290         TS_CONF_lookup_fail(section, ENV_SIGNER_KEY);
291         goto err;
292     }
293     if (!(key_obj = TS_CONF_load_key(key, pass))) goto err;
294     if (!TS_RESP_CTX_set_signer_key(ctx, key_obj)) goto err;

296     ret = 1;
297 err:
298     EVP_PKEY_free(key_obj);
299     return ret;
300 }

302 int TS_CONF_set_def_policy(CONF *conf, const char *section,
303                           const char *policy, TS_RESP_CTX *ctx)
304 {
305     int ret = 0;
306     ASN1_OBJECT *policy_obj = NULL;
307     if (!policy)
308         policy = NCONF_get_string(conf, section,
309                                  ENV_DEFAULT_POLICY);
310     if (!policy)
311     {
312         TS_CONF_lookup_fail(section, ENV_DEFAULT_POLICY);
313         goto err;
314     }
315     if (!(policy_obj = OBJ_txt2obj(policy, 0)))
316     {
317         TS_CONF_invalid(section, ENV_DEFAULT_POLICY);
318         goto err;
319     }
320     if (!TS_RESP_CTX_set_def_policy(ctx, policy_obj))
321         goto err;

323     ret = 1;
324 err:
325     ASN1_OBJECT_free(policy_obj);

```

```

326     return ret;
327 }

329 int TS_CONF_set_policies(CONF *conf, const char *section,
330                          TS_RESP_CTX *ctx)
331 {
332     int ret = 0;
333     int i;
334     STACK_OF(CONF_VALUE) *list = NULL;
335     char *policies = NCONF_get_string(conf, section,
336                                       ENV_OTHER_POLICIES);
337     /* If no other policy is specified, that's fine. */
338     if (policies && !(list = X509V3_parse_list(policies)))
339     {
340         TS_CONF_invalid(section, ENV_OTHER_POLICIES);
341         goto err;
342     }
343     for (i = 0; i < sk_CONF_VALUE_num(list); ++i)
344     {
345         CONF_VALUE *val = sk_CONF_VALUE_value(list, i);
346         const char *extval = val->value ? val->value : val->name;
347         ASN1_OBJECT *objtmp;
348         if (!(objtmp = OBJ_txt2obj(extval, 0)))
349         {
350             TS_CONF_invalid(section, ENV_OTHER_POLICIES);
351             goto err;
352         }
353         if (!TS_RESP_CTX_add_policy(ctx, objtmp))
354             goto err;
355         ASN1_OBJECT_free(objtmp);
356     }

358     ret = 1;
359 err:
360     sk_CONF_VALUE_pop_free(list, X509V3_conf_free);
361     return ret;
362 }

364 int TS_CONF_set_digests(CONF *conf, const char *section,
365                         TS_RESP_CTX *ctx)
366 {
367     int ret = 0;
368     int i;
369     STACK_OF(CONF_VALUE) *list = NULL;
370     char *digests = NCONF_get_string(conf, section, ENV_DIGESTS);
371     if (!digests)
372     {
373         TS_CONF_lookup_fail(section, ENV_DIGESTS);
374         goto err;
375     }
376     if (!(list = X509V3_parse_list(digests)))
377     {
378         TS_CONF_invalid(section, ENV_DIGESTS);
379         goto err;
380     }
381     if (sk_CONF_VALUE_num(list) == 0)
382     {
383         TS_CONF_invalid(section, ENV_DIGESTS);
384         goto err;
385     }
386     for (i = 0; i < sk_CONF_VALUE_num(list); ++i)
387     {
388         CONF_VALUE *val = sk_CONF_VALUE_value(list, i);
389         const char *extval = val->value ? val->value : val->name;
390         const EVP_MD *md;
391         if (!(md = EVP_get_digestbyname(extval)))

```



```

392         {
393             TS_CONF_invalid(section, ENV_DIGESTS);
394             goto err;
395         }
396         if (!TS_RESP_CTX_add_md(ctx, md))
397             goto err;
398     }
399
400     ret = 1;
401 err:
402     sk_CONF_VALUE_pop_free(list, X509V3_conf_free);
403     return ret;
404 }
405
406 int TS_CONF_set_accuracy(CONF *conf, const char *section, TS_RESP_CTX *ctx)
407 {
408     int ret = 0;
409     int i;
410     int secs = 0, millis = 0, micros = 0;
411     STACK_OF(CONF_VALUE) *list = NULL;
412     char *accuracy = NCONF_get_string(conf, section, ENV_ACCURACY);
413
414     if (accuracy && !(list = X509V3_parse_list(accuracy)))
415     {
416         TS_CONF_invalid(section, ENV_ACCURACY);
417         goto err;
418     }
419     for (i = 0; i < sk_CONF_VALUE_num(list); ++i)
420     {
421         CONF_VALUE *val = sk_CONF_VALUE_value(list, i);
422         if (strcmp(val->name, ENV_VALUE_SECS) == 0)
423             if (val->value) secs = atoi(val->value);
424         else if (strcmp(val->name, ENV_VALUE_MILLISECS) == 0)
425             if (val->value) millis = atoi(val->value);
426         else if (strcmp(val->name, ENV_VALUE_MICROSECS) == 0)
427             if (val->value) micros = atoi(val->value);
428         else
429             TS_CONF_invalid(section, ENV_ACCURACY);
430             goto err;
431     }
432     if (!TS_RESP_CTX_set_accuracy(ctx, secs, millis, micros))
433         goto err;
434
435     ret = 1;
436 err:
437     sk_CONF_VALUE_pop_free(list, X509V3_conf_free);
438     return ret;
439 }
440
441 int TS_CONF_set_clock_precision_digits(CONF *conf, const char *section,
442                                         TS_RESP_CTX *ctx)
443 {
444     int ret = 0;
445     long digits = 0;
446
447     /* If not specified, set the default value to 0, i.e. sec precision */
448     if (!NCONF_get_number_e(conf, section, ENV_CLOCK_PRECISION_DIGITS,
449                             &digits))

```

```

458         digits = 0;
459     if (digits < 0 || digits > TS_MAX_CLOCK_PRECISION_DIGITS)
460     {
461         TS_CONF_invalid(section, ENV_CLOCK_PRECISION_DIGITS);
462         goto err;
463     }
464
465     if (!TS_RESP_CTX_set_clock_precision_digits(ctx, digits))
466         goto err;
467
468     return 1;
469 err:
470     return ret;
471 }
472
473 static int TS_CONF_add_flag(CONF *conf, const char *section, const char *field,
474                             int flag, TS_RESP_CTX *ctx)
475 {
476     /* Default is false. */
477     const char *value = NCONF_get_string(conf, section, field);
478     if (value)
479     {
480         if (strcmp(value, ENV_VALUE_YES) == 0)
481             TS_RESP_CTX_add_flags(ctx, flag);
482         else if (strcmp(value, ENV_VALUE_NO) != 0)
483             TS_CONF_invalid(section, field);
484             return 0;
485     }
486
487     return 1;
488 }
489
490 int TS_CONF_set_ordering(CONF *conf, const char *section, TS_RESP_CTX *ctx)
491 {
492     return TS_CONF_add_flag(conf, section, ENV_ORDERING, TS_ORDERING, ctx);
493 }
494
495 int TS_CONF_set_tsa_name(CONF *conf, const char *section, TS_RESP_CTX *ctx)
496 {
497     return TS_CONF_add_flag(conf, section, ENV_TSA_NAME, TS_TSA_NAME, ctx);
498 }
499
500 int TS_CONF_set_ess_cert_id_chain(CONF *conf, const char *section,
501                                    TS_RESP_CTX *ctx)
502 {
503     return TS_CONF_add_flag(conf, section, ENV_ESS_CERT_ID_CHAIN,
504                             TS_ESS_CERT_ID_CHAIN, ctx);
505 }
506
507

```

```

*****
9072 Fri May 30 18:32:10 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ts/ts_err.c */
2 /* =====
3 * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
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48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */
60
61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/ts.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_TS,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_TS,0,reason)
70
71 static ERR_STRING_DATA TS_str_functs[]=
72 {
73 {ERR_FUNC(TS_F_D2I_TS_RESP), "d2i_TS_RESP"},
74 {ERR_FUNC(TS_F_DEF_SERIAL_CB), "DEF_SERIAL_CB"},
75 {ERR_FUNC(TS_F_DEF_TIME_CB), "DEF_TIME_CB"},
76 {ERR_FUNC(TS_F_ESS_ADD_SIGNING_CERT), "ESS_ADD_SIGNING_CERT"},
77 {ERR_FUNC(TS_F_ESS_CERT_ID_NEW_INIT), "ESS_CERT_ID_NEW_INIT"},
78 {ERR_FUNC(TS_F_ESS_SIGNING_CERT_NEW_INIT), "ESS_SIGNING_CERT_NEW_INIT"},
79 {ERR_FUNC(TS_F_INT_TS_RESP_VERIFY_TOKEN), "INT_TS_RESP_VERIFY_TOKEN"},
80 {ERR_FUNC(TS_F_PKCS7_TO_TS_TST_INFO), "PKCS7_to_TS_TST_INFO"},
81 {ERR_FUNC(TS_F_TS_ACCURACY_SET_MICROS), "TS_ACCURACY_set_micros"},
82 {ERR_FUNC(TS_F_TS_ACCURACY_SET_MILLIS), "TS_ACCURACY_set_millis"},
83 {ERR_FUNC(TS_F_TS_ACCURACY_SET_SECONDS), "TS_ACCURACY_set_seconds"},
84 {ERR_FUNC(TS_F_TS_CHECK_IMPRINTS), "TS_CHECK_IMPRINTS"},
85 {ERR_FUNC(TS_F_TS_CHECK_NONCES), "TS_CHECK_NONCES"},
86 {ERR_FUNC(TS_F_TS_CHECK_POLICY), "TS_CHECK_POLICY"},
87 {ERR_FUNC(TS_F_TS_CHECK_SIGNING_CERTS), "TS_CHECK_SIGNING_CERTS"},
88 {ERR_FUNC(TS_F_TS_CHECK_STATUS_INFO), "TS_CHECK_STATUS_INFO"},
89 {ERR_FUNC(TS_F_TS_COMPUTE_IMPRINT), "TS_COMPUTE_IMPRINT"},
90 {ERR_FUNC(TS_F_TS_CONF_SET_DEFAULT_ENGINE), "TS_CONF_set_default_engine"},
91 {ERR_FUNC(TS_F_TS_GET_STATUS_TEXT), "TS_GET_STATUS_TEXT"},
92 {ERR_FUNC(TS_F_TS_MSG_IMPRINT_SET_ALGO), "TS_MSG_IMPRINT_set_algo"},
93 {ERR_FUNC(TS_F_TS_REQ_SET_MSG_IMPRINT), "TS_REQ_set_msg_imprint"},
94 {ERR_FUNC(TS_F_TS_REQ_SET_NONCE), "TS_REQ_set_nonce"},
95 {ERR_FUNC(TS_F_TS_REQ_SET_POLICY_ID), "TS_REQ_set_policy_id"},
96 {ERR_FUNC(TS_F_TS_RESP_CREATE_RESPONSE), "TS_RESP_create_response"},
97 {ERR_FUNC(TS_F_TS_RESP_CREATE_TST_INFO), "TS_RESP_CREATE_TST_INFO"},
98 {ERR_FUNC(TS_F_TS_RESP_CTX_ADD_FAILURE_INFO), "TS_RESP_CTX_add_failure_info"},
99 {ERR_FUNC(TS_F_TS_RESP_CTX_ADD_MD), "TS_RESP_CTX_add_md"},
100 {ERR_FUNC(TS_F_TS_RESP_CTX_ADD_POLICY), "TS_RESP_CTX_add_policy"},
101 {ERR_FUNC(TS_F_TS_RESP_CTX_NEW), "TS_RESP_CTX_new"},
102 {ERR_FUNC(TS_F_TS_RESP_CTX_SET_ACCURACY), "TS_RESP_CTX_set_accuracy"},
103 {ERR_FUNC(TS_F_TS_RESP_CTX_SET_CERTS), "TS_RESP_CTX_set_certs"},
104 {ERR_FUNC(TS_F_TS_RESP_CTX_SET_DEF_POLICY), "TS_RESP_CTX_set_def_policy"},
105 {ERR_FUNC(TS_F_TS_RESP_CTX_SET_SIGNER_CERT), "TS_RESP_CTX_set_signer_cert"},
106 {ERR_FUNC(TS_F_TS_RESP_CTX_SET_STATUS_INFO), "TS_RESP_CTX_set_status_info"},
107 {ERR_FUNC(TS_F_TS_RESP_GET_POLICY), "TS_RESP_GET_POLICY"},
108 {ERR_FUNC(TS_F_TS_RESP_SET_GENTIME_WITH_PRECISION), "TS_RESP_SET_GENTIME_WITH"},
109 {ERR_FUNC(TS_F_TS_RESP_SET_STATUS_INFO), "TS_RESP_set_status_info"},
110 {ERR_FUNC(TS_F_TS_RESP_SET_TST_INFO), "TS_RESP_set_tst_info"},
111 {ERR_FUNC(TS_F_TS_RESP_SIGN), "TS_RESP_SIGN"},
112 {ERR_FUNC(TS_F_TS_RESP_VERIFY_SIGNATURE), "TS_RESP_verify_signature"},
113 {ERR_FUNC(TS_F_TS_RESP_VERIFY_TOKEN), "TS_RESP_verify_token"},
114 {ERR_FUNC(TS_F_TS_TST_INFO_SET_ACCURACY), "TS_TST_INFO_set_accuracy"},
115 {ERR_FUNC(TS_F_TS_TST_INFO_SET_MSG_IMPRINT), "TS_TST_INFO_set_msg_imprint"},
116 {ERR_FUNC(TS_F_TS_TST_INFO_SET_NONCE), "TS_TST_INFO_set_nonce"},
117 {ERR_FUNC(TS_F_TS_TST_INFO_SET_POLICY_ID), "TS_TST_INFO_set_policy_id"},
118 {ERR_FUNC(TS_F_TS_TST_INFO_SET_SERIAL), "TS_TST_INFO_set_serial"},
119 {ERR_FUNC(TS_F_TS_TST_INFO_SET_TIME), "TS_TST_INFO_set_time"},
120 {ERR_FUNC(TS_F_TS_TST_INFO_SET_TSA), "TS_TST_INFO_set_tsa"},
121 {ERR_FUNC(TS_F_TS_VERIFY), "TS_VERIFY"},
122 {ERR_FUNC(TS_F_TS_VERIFY_CERT), "TS_VERIFY_CERT"},
123 {ERR_FUNC(TS_F_TS_VERIFY_CTX_NEW), "TS_VERIFY_CTX_new"},
124 {0,NULL}
125 };
126
127 static ERR_STRING_DATA TS_str_reasons[]=

```

```

128     {
129     {ERR_REASON(TS_R_BAD_PKCS7_TYPE)      , "bad pkcs7 type"},
130     {ERR_REASON(TS_R_BAD_TYPE)           , "bad type"},
131     {ERR_REASON(TS_R_CERTIFICATE_VERIFY_ERROR), "certificate verify error"},
132     {ERR_REASON(TS_R_COULD_NOT_SET_ENGINE) , "could not set engine"},
133     {ERR_REASON(TS_R_COULD_NOT_SET_TIME)   , "could not set time"},
134     {ERR_REASON(TS_R_D2I_TS_RESP_INT_FAILED) , "d2i ts resp int failed"},
135     {ERR_REASON(TS_R_DETACHED_CONTENT)     , "detached content"},
136     {ERR_REASON(TS_R_ESS_ADD_SIGNING_CERT_ERROR), "ess add signing cert error"},
137     {ERR_REASON(TS_R_ESS_SIGNING_CERTIFICATE_ERROR), "ess signing certificate error"},
138     {ERR_REASON(TS_R_INVALID_NULL_POINTER) , "invalid null pointer"},
139     {ERR_REASON(TS_R_INVALID_SIGNER_CERTIFICATE_PURPOSE), "invalid signer certificate"},
140     {ERR_REASON(TS_R_MESSAGE_IMPRINT_MISMATCH), "message imprint mismatch"},
141     {ERR_REASON(TS_R_NONCE_MISMATCH)       , "nonce mismatch"},
142     {ERR_REASON(TS_R_NONCE_NOT_RETURNED)   , "nonce not returned"},
143     {ERR_REASON(TS_R_NO_CONTENT)           , "no content"},
144     {ERR_REASON(TS_R_NO_TIME_STAMP_TOKEN)  , "no time stamp token"},
145     {ERR_REASON(TS_R_PKCS7_ADD_SIGNATURE_ERROR), "pkcs7 add signature error"},
146     {ERR_REASON(TS_R_PKCS7_ADD_SIGNED_ATTR_ERROR), "pkcs7 add signed attr error"},
147     {ERR_REASON(TS_R_PKCS7_TO_TS_TST_INFO_FAILED), "pkcs7 to ts tst info failed"},
148     {ERR_REASON(TS_R_POLICY_MISMATCH)     , "policy mismatch"},
149     {ERR_REASON(TS_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE), "private key does not m"},
150     {ERR_REASON(TS_R_RESPONSE_SETUP_ERROR) , "response setup error"},
151     {ERR_REASON(TS_R_SIGNATURE_FAILURE)    , "signature failure"},
152     {ERR_REASON(TS_R_THERE_MUST_BE_ONE_SIGNER), "there must be one signer"},
153     {ERR_REASON(TS_R_TIME_SYSCALL_ERROR)   , "time syscall error"},
154     {ERR_REASON(TS_R_TOKEN_NOT_PRESENT)    , "token not present"},
155     {ERR_REASON(TS_R_TOKEN_PRESENT)        , "token present"},
156     {ERR_REASON(TS_R_TSA_NAME_MISMATCH)    , "tsa name mismatch"},
157     {ERR_REASON(TS_R_TSA_UNTRUSTED)        , "tsa untrusted"},
158     {ERR_REASON(TS_R_TST_INFO_SETUP_ERROR) , "tst info setup error"},
159     {ERR_REASON(TS_R_TS_DATASIGN)          , "ts datasign"},
160     {ERR_REASON(TS_R_UNACCEPTABLE_POLICY)  , "unacceptable policy"},
161     {ERR_REASON(TS_R_UNSUPPORTED_MD_ALGORITHM), "unsupported md algorithm"},
162     {ERR_REASON(TS_R_UNSUPPORTED_VERSION)  , "unsupported version"},
163     {ERR_REASON(TS_R_WRONG_CONTENT_TYPE)   , "wrong content type"},
164     {0, NULL}
165     };
166
167 #endif
168
169 void ERR_load_TS_strings(void)
170 {
171 #ifndef OPENSSL_NO_ERR
172
173     if (ERR_func_error_string(TS_str_functs[0].error) == NULL)
174     {
175         ERR_load_strings(0, TS_str_functs);
176         ERR_load_strings(0, TS_str_reasons);
177     }
178 #endif
179 }

```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_lib.c

1

```
*****
4694 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ts/ts_lib.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_lib.c

2

```
62 #include <openssl/bn.h>
63 #include <openssl/x509v3.h>
64 #include <openssl/ts.h>
65
66 /* Local function declarations. */
67
68 /* Function definitions. */
69
70 int TS_ASN1_INTEGER_print_bio(BIO *bio, const ASN1_INTEGER *num)
71 {
72     BIGNUM num_bn;
73     int result = 0;
74     char *hex;
75
76     BN_init(&num_bn);
77     ASN1_INTEGER_to_BN(num, &num_bn);
78     if ((hex = BN_bn2hex(&num_bn)))
79     {
80         result = BIO_write(bio, "0x", 2) > 0;
81         result = result && BIO_write(bio, hex, strlen(hex)) > 0;
82         OPENSSL_free(hex);
83     }
84     BN_free(&num_bn);
85
86     return result;
87 }
88
89 int TS_OBJ_print_bio(BIO *bio, const ASN1_OBJECT *obj)
90 {
91     char obj_txt[128];
92
93     int len = OBJ_obj2txt(obj_txt, sizeof(obj_txt), obj, 0);
94     BIO_write(bio, obj_txt, len);
95     BIO_write(bio, "\n", 1);
96
97     return 1;
98 }
99
100 int TS_ext_print_bio(BIO *bio, const STACK_OF(X509_EXTENSION) *extensions)
101 {
102     int i, critical, n;
103     X509_EXTENSION *ex;
104     ASN1_OBJECT *obj;
105
106     BIO_printf(bio, "Extensions:\n");
107     n = X509v3_get_ext_count(extensions);
108     for (i = 0; i < n; i++)
109     {
110         ex = X509v3_get_ext(extensions, i);
111         obj = X509_EXTENSION_get_object(ex);
112         i2a_ASN1_OBJECT(bio, obj);
113         critical = X509_EXTENSION_get_critical(ex);
114         BIO_printf(bio, ": %s\n", critical ? "critical" : "");
115         if (!X509V3_EXT_print(bio, ex, 0, 4))
116         {
117             BIO_printf(bio, "%4s", "");
118             M_ASN1_OCTET_STRING_print(bio, ex->value);
119         }
120         BIO_write(bio, "\n", 1);
121     }
122
123     return 1;
124 }
125
126 int TS_X509_ALGOR_print_bio(BIO *bio, const X509_ALGOR *alg)
127 {
128 }
```

```
128     int i = OBJ_obj2nid(alg->algorithm);
129     return BIO_printf(bio, "Hash Algorithm: %s\n",
130                       (i == NID_undef) ? "UNKNOWN" : OBJ_nid2ln(i));
131 }

133 int TS_MSG_IMPRINT_print_bio(BIO *bio, TS_MSG_IMPRINT *a)
134 {
135     const ASN1_OCTET_STRING *msg;

137     TS_X509_ALGOR_print_bio(bio, TS_MSG_IMPRINT_get_algo(a));

139     BIO_printf(bio, "Message data:\n");
140     msg = TS_MSG_IMPRINT_get_msg(a);
141     BIO_dump_indent(bio, (const char *)M_ASN1_STRING_data(msg),
142                    M_ASN1_STRING_length(msg), 4);

144     return 1;
145 }
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_req_print.c

1

```
*****
3697 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_req_print.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ts/ts_req_print.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_req_print.c

2

```
62 #include <openssl/bn.h>
63 #include <openssl/x509v3.h>
64 #include <openssl/ts.h>
66 /* Function definitions. */
68 int TS_REQ_print_bio(BIO *bio, TS_REQ *a)
69 {
70     int v;
71     ASN1_OBJECT *policy_id;
72     const ASN1_INTEGER *nonce;
74     if (a == NULL) return 0;
76     v = TS_REQ_get_version(a);
77     BIO_printf(bio, "Version: %d\n", v);
79     TS_MSG_IMPRINT_print_bio(bio, TS_REQ_get_msg_imprint(a));
81     BIO_printf(bio, "Policy OID: ");
82     policy_id = TS_REQ_get_policy_id(a);
83     if (policy_id == NULL)
84         BIO_printf(bio, "unspecified\n");
85     else
86         TS_OBJ_print_bio(bio, policy_id);
88     BIO_printf(bio, "Nonce: ");
89     nonce = TS_REQ_get_nonce(a);
90     if (nonce == NULL)
91         BIO_printf(bio, "unspecified");
92     else
93         TS_ASN1_INTEGER_print_bio(bio, nonce);
94     BIO_write(bio, "\n", 1);
96     BIO_printf(bio, "Certificate required: %s\n",
97               TS_REQ_get_cert_req(a) ? "yes" : "no");
99     TS_ext_print_bio(bio, TS_REQ_get_exts(a));
101     return 1;
102 }
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_req_utils.c

1

```
*****
6356 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_req_utils.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ts/ts_req_utils.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_req_utils.c

2

```
62 #include <openssl/x509v3.h>
63 #include <openssl/ts.h>
64
65 int TS_REQ_set_version(TS_REQ *a, long version)
66 {
67     return ASN1_INTEGER_set(a->version, version);
68 }
69
70 long TS_REQ_get_version(const TS_REQ *a)
71 {
72     return ASN1_INTEGER_get(a->version);
73 }
74
75 int TS_REQ_set_msg_imprint(TS_REQ *a, TS_MSG_IMPRINT *msg_imprint)
76 {
77     TS_MSG_IMPRINT *new_msg_imprint;
78
79     if (a->msg_imprint == msg_imprint)
80         return 1;
81     new_msg_imprint = TS_MSG_IMPRINT_dup(msg_imprint);
82     if (new_msg_imprint == NULL)
83     {
84         TSerr(TS_F_TS_REQ_SET_MSG_IMPRINT, ERR_R_MALLOC_FAILURE);
85         return 0;
86     }
87     TS_MSG_IMPRINT_free(a->msg_imprint);
88     a->msg_imprint = new_msg_imprint;
89     return 1;
90 }
91
92 TS_MSG_IMPRINT *TS_REQ_get_msg_imprint(TS_REQ *a)
93 {
94     return a->msg_imprint;
95 }
96
97 int TS_MSG_IMPRINT_set_algo(TS_MSG_IMPRINT *a, X509_ALGOR *alg)
98 {
99     X509_ALGOR *new_alg;
100
101     if (a->hash_algo == alg)
102         return 1;
103     new_alg = X509_ALGOR_dup(alg);
104     if (new_alg == NULL)
105     {
106         TSerr(TS_F_TS_MSG_IMPRINT_SET_ALGO, ERR_R_MALLOC_FAILURE);
107         return 0;
108     }
109     X509_ALGOR_free(a->hash_algo);
110     a->hash_algo = new_alg;
111     return 1;
112 }
113
114 X509_ALGOR *TS_MSG_IMPRINT_get_algo(TS_MSG_IMPRINT *a)
115 {
116     return a->hash_algo;
117 }
118
119 int TS_MSG_IMPRINT_set_msg(TS_MSG_IMPRINT *a, unsigned char *d, int len)
120 {
121     return ASN1_OCTET_STRING_set(a->hashed_msg, d, len);
122 }
123
124 ASN1_OCTET_STRING *TS_MSG_IMPRINT_get_msg(TS_MSG_IMPRINT *a)
125 {
126     return a->hashed_msg;
127 }
```

```

129 int TS_REQ_set_policy_id(TS_REQ *a, ASN1_OBJECT *policy)
130 {
131     ASN1_OBJECT *new_policy;
132
133     if (a->policy_id == policy)
134         return 1;
135     new_policy = OBJ_dup(policy);
136     if (new_policy == NULL)
137     {
138         TSerr(TS_F_TS_REQ_SET_POLICY_ID, ERR_R_MALLOC_FAILURE);
139         return 0;
140     }
141     ASN1_OBJECT_free(a->policy_id);
142     a->policy_id = new_policy;
143     return 1;
144 }
145
146 ASN1_OBJECT *TS_REQ_get_policy_id(TS_REQ *a)
147 {
148     return a->policy_id;
149 }
150
151 int TS_REQ_set_nonce(TS_REQ *a, const ASN1_INTEGER *nonce)
152 {
153     ASN1_INTEGER *new_nonce;
154
155     if (a->nonce == nonce)
156         return 1;
157     new_nonce = ASN1_INTEGER_dup(nonce);
158     if (new_nonce == NULL)
159     {
160         TSerr(TS_F_TS_REQ_SET_NONCE, ERR_R_MALLOC_FAILURE);
161         return 0;
162     }
163     ASN1_INTEGER_free(a->nonce);
164     a->nonce = new_nonce;
165     return 1;
166 }
167
168 const ASN1_INTEGER *TS_REQ_get_nonce(const TS_REQ *a)
169 {
170     return a->nonce;
171 }
172
173 int TS_REQ_set_cert_req(TS_REQ *a, int cert_req)
174 {
175     a->cert_req = cert_req ? 0xFF : 0x00;
176     return 1;
177 }
178
179 int TS_REQ_get_cert_req(const TS_REQ *a)
180 {
181     return a->cert_req ? 1 : 0;
182 }
183
184 STACK_OF(X509_EXTENSION) *TS_REQ_get_exts(TS_REQ *a)
185 {
186     return a->extensions;
187 }
188
189 void TS_REQ_ext_free(TS_REQ *a)
190 {
191     if (!a) return;
192     sk_X509_EXTENSION_pop_free(a->extensions, X509_EXTENSION_free);
193     a->extensions = NULL;

```

```

194     }
195
196 int TS_REQ_get_ext_count(TS_REQ *a)
197 {
198     return X509v3_get_ext_count(a->extensions);
199 }
200
201 int TS_REQ_get_ext_by_NID(TS_REQ *a, int nid, int lastpos)
202 {
203     return X509v3_get_ext_by_NID(a->extensions, nid, lastpos);
204 }
205
206 int TS_REQ_get_ext_by_OBJ(TS_REQ *a, ASN1_OBJECT *obj, int lastpos)
207 {
208     return X509v3_get_ext_by_OBJ(a->extensions, obj, lastpos);
209 }
210
211 int TS_REQ_get_ext_by_critical(TS_REQ *a, int crit, int lastpos)
212 {
213     return X509v3_get_ext_by_critical(a->extensions, crit, lastpos);
214 }
215
216 X509_EXTENSION *TS_REQ_get_ext(TS_REQ *a, int loc)
217 {
218     return X509v3_get_ext(a->extensions, loc);
219 }
220
221 X509_EXTENSION *TS_REQ_delete_ext(TS_REQ *a, int loc)
222 {
223     return X509v3_delete_ext(a->extensions, loc);
224 }
225
226 int TS_REQ_add_ext(TS_REQ *a, X509_EXTENSION *ex, int loc)
227 {
228     return X509v3_add_ext(&a->extensions, ex, loc) != NULL;
229 }
230
231 void *TS_REQ_get_ext_d2i(TS_REQ *a, int nid, int *crit, int *idx)
232 {
233     return X509v3_get_d2i(a->extensions, nid, crit, idx);
234 }

```


new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_print.c

1

```
*****
8426 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_print.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ts/ts_rsp_print.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
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50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_print.c

2

```
62 #include <openssl/bn.h>
63 #include <openssl/x509v3.h>
64 #include <openssl/ts.h>
65
66 struct status_map_st
67 {
68     int bit;
69     const char *text;
70 };
71
72 /* Local function declarations. */
73
74 static int TS_status_map_print(BIO *bio, struct status_map_st *a,
75                               ASN1_BIT_STRING *v);
76 static int TS_ACCURACY_print_bio(BIO *bio, const TS_ACCURACY *accuracy);
77
78 /* Function definitions. */
79
80 int TS_RESP_print_bio(BIO *bio, TS_RESP *a)
81 {
82     TS_TST_INFO *tst_info;
83
84     BIO_printf(bio, "Status info:\n");
85     TS_STATUS_INFO_print_bio(bio, TS_RESP_get_status_info(a));
86
87     BIO_printf(bio, "\nTST info:\n");
88     tst_info = TS_RESP_get_tst_info(a);
89     if (tst_info != NULL)
90         TS_TST_INFO_print_bio(bio, TS_RESP_get_tst_info(a));
91     else
92         BIO_printf(bio, "Not included.\n");
93
94     return 1;
95 }
96
97 int TS_STATUS_INFO_print_bio(BIO *bio, TS_STATUS_INFO *a)
98 {
99     static const char *status_map[] =
100     {
101         "Granted.",
102         "Granted with modifications.",
103         "Rejected.",
104         "Waiting.",
105         "Revocation warning.",
106         "Revoked."
107     };
108     static struct status_map_st failure_map[] =
109     {
110         { TS_INFO_BAD_ALG,
111           "unrecognized or unsupported algorithm identifier" },
112         { TS_INFO_BAD_REQUEST,
113           "transaction not permitted or supported" },
114         { TS_INFO_BAD_DATA_FORMAT,
115           "the data submitted has the wrong format" },
116         { TS_INFO_TIME_NOT_AVAILABLE,
117           "the TSA's time source is not available" },
118         { TS_INFO_UNACCEPTED_POLICY,
119           "the requested TSA policy is not supported by the TSA" },
120         { TS_INFO_UNACCEPTED_EXTENSION,
121           "the requested extension is not supported by the TSA" },
122         { TS_INFO_ADD_INFO_NOT_AVAILABLE,
123           "the additional information requested could not be understood" },
124         { TS_INFO_SYSTEM_FAILURE,
125           "or is not available" },
126         { TS_INFO_SYSTEM_FAILURE,
127           "the request cannot be handled due to system failure" },
128         { -1, NULL }
129     }
```

```

128     };
129     long status;
130     int i, lines = 0;

132     /* Printing status code. */
133     BIO_printf(bio, "Status: ");
134     status = ASN1_INTEGER_get(a->status);
135     if (0 <= status && status < (long)(sizeof(status_map)/sizeof(status_map[
136         BIO_printf(bio, "%s\n", status_map[status]);
137     else
138         BIO_printf(bio, "out of bounds\n");
139
140     /* Printing status description. */
141     BIO_printf(bio, "Status description: ");
142     for (i = 0; i < sk_ASN1_UTF8STRING_num(a->text); ++i)
143     {
144         if (i > 0)
145             BIO_puts(bio, "\t");
146         ASN1_STRING_print_ex(bio, sk_ASN1_UTF8STRING_value(a->text, i),
147             0);
148         BIO_puts(bio, "\n");
149     }
150     if (i == 0)
151         BIO_printf(bio, "unspecified\n");

153     /* Printing failure information. */
154     BIO_printf(bio, "Failure info: ");
155     if (a->failure_info != NULL)
156         lines = TS_status_map_print(bio, failure_map,
157             a->failure_info);
158     if (lines == 0)
159         BIO_printf(bio, "unspecified");
160     BIO_printf(bio, "\n");

162     return 1;
163 }

165 static int TS_status_map_print(BIO *bio, struct status_map_st *a,
166     ASN1_BIT_STRING *v)
167 {
168     int lines = 0;

170     for (; a->bit >= 0; ++a)
171     {
172         if (ASN1_BIT_STRING_get_bit(v, a->bit))
173         {
174             if (++lines > 1)
175                 BIO_printf(bio, ", ");
176             BIO_printf(bio, "%s", a->text);
177         }
178     }

180     return lines;
181 }

183 int TS_TST_INFO_print_bio(BIO *bio, TS_TST_INFO *a)
184 {
185     int v;
186     ASN1_OBJECT *policy_id;
187     const ASN1_INTEGER *serial;
188     const ASN1_GENERALIZEDTIME *gtime;
189     TS_ACCURACY *accuracy;
190     const ASN1_INTEGER *nonce;
191     GENERAL_NAME *tsa_name;

193     if (a == NULL) return 0;

```

```

195     /* Print version. */
196     v = TS_TST_INFO_get_version(a);
197     BIO_printf(bio, "Version: %d\n", v);

199     /* Print policy id. */
200     BIO_printf(bio, "Policy OID: ");
201     policy_id = TS_TST_INFO_get_policy_id(a);
202     TS_OBJ_print_bio(bio, policy_id);

204     /* Print message imprint. */
205     TS_MSG_IMPRINT_print_bio(bio, TS_TST_INFO_get_msg_imprint(a));

207     /* Print serial number. */
208     BIO_printf(bio, "Serial number: ");
209     serial = TS_TST_INFO_get_serial(a);
210     if (serial == NULL)
211         BIO_printf(bio, "unspecified");
212     else
213         TS_ASN1_INTEGER_print_bio(bio, serial);
214     BIO_write(bio, "\n", 1);

216     /* Print time stamp. */
217     BIO_printf(bio, "Time stamp: ");
218     gtime = TS_TST_INFO_get_time(a);
219     ASN1_GENERALIZEDTIME_print(bio, gtime);
220     BIO_write(bio, "\n", 1);

222     /* Print accuracy. */
223     BIO_printf(bio, "Accuracy: ");
224     accuracy = TS_TST_INFO_get_accuracy(a);
225     if (accuracy == NULL)
226         BIO_printf(bio, "unspecified");
227     else
228         TS_ACCURACY_print_bio(bio, accuracy);
229     BIO_write(bio, "\n", 1);

231     /* Print ordering. */
232     BIO_printf(bio, "Ordering: %s\n",
233         TS_TST_INFO_get_ordering(a) ? "yes" : "no");

235     /* Print nonce. */
236     BIO_printf(bio, "Nonce: ");
237     nonce = TS_TST_INFO_get_nonce(a);
238     if (nonce == NULL)
239         BIO_printf(bio, "unspecified");
240     else
241         TS_ASN1_INTEGER_print_bio(bio, nonce);
242     BIO_write(bio, "\n", 1);

244     /* Print TSA name. */
245     BIO_printf(bio, "TSA: ");
246     tsa_name = TS_TST_INFO_get_tsa(a);
247     if (tsa_name == NULL)
248         BIO_printf(bio, "unspecified");
249     else
250     {
251         STACK_OF(CONF_VALUE) *nval;
252         if ((nval = i2v_GENERAL_NAME(NULL, tsa_name, NULL)))
253             X509V3_EXT_val_prn(bio, nval, 0, 0);
254             sk_CONF_VALUE_pop_free(nval, X509V3_conf_free);
255     }
256     BIO_write(bio, "\n", 1);

258     /* Print extensions. */
259     TS_ext_print_bio(bio, TS_TST_INFO_get_exts(a));

```

```
261     return 1;
262 }

264 static int TS_ACCURACY_print_bio(BIO *bio, const TS_ACCURACY *accuracy)
265 {
266     const ASN1_INTEGER *seconds = TS_ACCURACY_get_seconds(accuracy);
267     const ASN1_INTEGER *millis = TS_ACCURACY_get_millis(accuracy);
268     const ASN1_INTEGER *micros = TS_ACCURACY_get_micros(accuracy);

270     if (seconds != NULL)
271         TS_ASN1_INTEGER_print_bio(bio, seconds);
272     else
273         BIO_printf(bio, "unspecified");
274     BIO_printf(bio, " seconds, ");
275     if (millis != NULL)
276         TS_ASN1_INTEGER_print_bio(bio, millis);
277     else
278         BIO_printf(bio, "unspecified");
279     BIO_printf(bio, " millis, ");
280     if (micros != NULL)
281         TS_ASN1_INTEGER_print_bio(bio, micros);
282     else
283         BIO_printf(bio, "unspecified");
284     BIO_printf(bio, " micros");

286     return 1;
287 }
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_sign.c

1

```
*****
29405 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_sign.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ts/ts_rsp_sign.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
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51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */

59 #include "cryptlib.h"

61 #if defined(OPENSSL_SYS_UNIX)
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_sign.c

2

```
62 #include <sys/time.h>
63 #endif

65 #include <openssl/objects.h>
66 #include <openssl/ts.h>
67 #include <openssl/pkcs7.h>

69 /* Private function declarations. */

71 static ASN1_INTEGER *def_serial_cb(struct TS_resp_ctx *, void *);
72 static int def_time_cb(struct TS_resp_ctx *, void *, long *sec, long *usec);
73 static int def_extension_cb(struct TS_resp_ctx *, X509_EXTENSION *, void *);

75 static void TS_RESP_CTX_init(TS_RESP_CTX *ctx);
76 static void TS_RESP_CTX_cleanup(TS_RESP_CTX *ctx);
77 static int TS_RESP_check_request(TS_RESP_CTX *ctx);
78 static ASN1_OBJECT *TS_RESP_get_policy(TS_RESP_CTX *ctx);
79 static TS_TST_INFO *TS_RESP_create_tst_info(TS_RESP_CTX *ctx,
80                                             ASN1_OBJECT *policy);
81 static int TS_RESP_process_extensions(TS_RESP_CTX *ctx);
82 static int TS_RESP_sign(TS_RESP_CTX *ctx);

84 static ESS_SIGNING_CERT *ESS_SIGNING_CERT_new_init(X509 *signcert,
85                                                    STACK_OF(X509) *certs);
86 static ESS_CERT_ID *ESS_CERT_ID_new_init(X509 *cert, int issuer_needed);
87 static int TS_TST_INFO_content_new(PKCS7 *p7);
88 static int ESS_add_signing_cert(PKCS7_SIGNER_INFO *si, ESS_SIGNING_CERT *sc);

90 static ASN1_GENERALIZEDTIME *TS_RESP_set_genTime_with_precision(
91     ASN1_GENERALIZEDTIME *, long, long, unsigned);

93 /* Default callbacks for response generation. */

95 static ASN1_INTEGER *def_serial_cb(struct TS_resp_ctx *ctx, void *data)
96 {
97     ASN1_INTEGER *serial = ASN1_INTEGER_new();
98     if (!serial) goto err;
99     if (!ASN1_INTEGER_set(serial, 1)) goto err;
100     return serial;
101 err:
102     TSerr(TS_F_DEF_SERIAL_CB, ERR_R_MALLOC_FAILURE);
103     TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
104                                "Error during serial number generation.");
105     return NULL;
106 }

108 #if defined(OPENSSL_SYS_UNIX)

110 /* Use the gettimeofday function call. */
111 static int def_time_cb(struct TS_resp_ctx *ctx, void *data,
112                       long *sec, long *usec)
113 {
114     struct timeval tv;
115     if (gettimeofday(&tv, NULL) != 0)
116     {
117         TSerr(TS_F_DEF_TIME_CB, TS_R_TIME_SYSCALL_ERROR);
118         TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
119                                    "Time is not available.");
120         TS_RESP_CTX_add_failure_info(ctx, TS_INFO_TIME_NOT_AVAILABLE);
121         return 0;
122     }
123     /* Return time to caller. */
124     *sec = tv.tv_sec;
125     *usec = tv.tv_usec;

127     return 1;
```

```

128     }
129
130 #else
131
132 /* Use the time function call that provides only seconds precision. */
133 static int def_time_cb(struct TS_rsp_ctx *ctx, void *data,
134                      long *sec, long *usec)
135 {
136     time_t t;
137     if (time(&t) == (time_t) -1)
138     {
139         TSerr(TS_F_DEF_TIME_CB, TS_R_TIME_SYSCALL_ERROR);
140         TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
141                                     "Time is not available.");
142         TS_RESP_CTX_add_failure_info(ctx, TS_INFO_TIME_NOT_AVAILABLE);
143         return 0;
144     }
145     /* Return time to caller, only second precision. */
146     *sec = (long) t;
147     *usec = 0;
148
149     return 1;
150 }
151
152 #endif
153
154 static int def_extension_cb(struct TS_rsp_ctx *ctx, X509_EXTENSION *ext,
155                          void *data)
156 {
157     /* No extensions are processed here. */
158     TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
159                                 "Unsupported extension.");
160     TS_RESP_CTX_add_failure_info(ctx, TS_INFO_UNACCEPTED_EXTENSION);
161     return 0;
162 }
163
164 /* TS_RESP_CTX management functions. */
165
166 TS_RESP_CTX *TS_RESP_CTX_new()
167 {
168     TS_RESP_CTX *ctx;
169
170     if (!(ctx = (TS_RESP_CTX *) OPENSSL_malloc(sizeof(TS_RESP_CTX))))
171     {
172         TSerr(TS_F_TS_RESP_CTX_NEW, ERR_R_MALLOC_FAILURE);
173         return NULL;
174     }
175     memset(ctx, 0, sizeof(TS_RESP_CTX));
176
177     /* Setting default callbacks. */
178     ctx->serial_cb = def_serial_cb;
179     ctx->time_cb = def_time_cb;
180     ctx->extension_cb = def_extension_cb;
181
182     return ctx;
183 }
184
185 void TS_RESP_CTX_free(TS_RESP_CTX *ctx)
186 {
187     if (!ctx) return;
188
189     X509_free(ctx->signer_cert);
190     EVP_PKEY_free(ctx->signer_key);
191     sk_X509_pop_free(ctx->certs, X509_free);
192     sk_ASN1_OBJECT_pop_free(ctx->policies, ASN1_OBJECT_free);
193     ASN1_OBJECT_free(ctx->default_policy);

```

```

194     sk_EVP_MD_free(ctx->mds); /* No EVP_MD_free method exists. */
195     ASN1_INTEGER_free(ctx->seconds);
196     ASN1_INTEGER_free(ctx->millis);
197     ASN1_INTEGER_free(ctx->micros);
198     OPENSSL_free(ctx);
199 }
200
201 int TS_RESP_CTX_set_signer_cert(TS_RESP_CTX *ctx, X509 *signer)
202 {
203     if (X509_check_purpose(signer, X509_PURPOSE_TIMESTAMP_SIGN, 0) != 1)
204     {
205         TSerr(TS_F_TS_RESP_CTX_SET_SIGNER_CERT,
206             TS_R_INVALID_SIGNER_CERTIFICATE_PURPOSE);
207         return 0;
208     }
209     if (ctx->signer_cert) X509_free(ctx->signer_cert);
210     ctx->signer_cert = signer;
211     CRYPTO_add(&ctx->signer_cert->references, +1, CRYPTO_LOCK_X509);
212     return 1;
213 }
214
215 int TS_RESP_CTX_set_signer_key(TS_RESP_CTX *ctx, EVP_PKEY *key)
216 {
217     if (ctx->signer_key) EVP_PKEY_free(ctx->signer_key);
218     ctx->signer_key = key;
219     CRYPTO_add(&ctx->signer_key->references, +1, CRYPTO_LOCK_EVP_PKEY);
220
221     return 1;
222 }
223
224 int TS_RESP_CTX_set_def_policy(TS_RESP_CTX *ctx, ASN1_OBJECT *def_policy)
225 {
226     if (ctx->default_policy) ASN1_OBJECT_free(ctx->default_policy);
227     if (!(ctx->default_policy = OBJ_dup(def_policy))) goto err;
228     return 1;
229 err:
230     TSerr(TS_F_TS_RESP_CTX_SET_DEF_POLICY, ERR_R_MALLOC_FAILURE);
231     return 0;
232 }
233
234 int TS_RESP_CTX_set_certs(TS_RESP_CTX *ctx, STACK_OF(X509) *certs)
235 {
236     int i;
237
238     if (ctx->certs)
239     {
240         sk_X509_pop_free(ctx->certs, X509_free);
241         ctx->certs = NULL;
242     }
243     if (!certs) return 1;
244     if (!(ctx->certs = sk_X509_dup(certs)))
245     {
246         TSerr(TS_F_TS_RESP_CTX_SET_CERTS, ERR_R_MALLOC_FAILURE);
247         return 0;
248     }
249     for (i = 0; i < sk_X509_num(ctx->certs); ++i)
250     {
251         X509 *cert = sk_X509_value(ctx->certs, i);
252         CRYPTO_add(&cert->references, +1, CRYPTO_LOCK_X509);
253     }
254
255     return 1;
256 }
257
258 int TS_RESP_CTX_add_policy(TS_RESP_CTX *ctx, ASN1_OBJECT *policy)
259 {

```

```

260     ASN1_OBJECT *copy = NULL;

262     /* Create new policy stack if necessary. */
263     if (!ctx->policies && !(ctx->policies = sk_ASN1_OBJECT_new_null()))
264         goto err;
265     if (!(copy = OBJ_dup(policy))) goto err;
266     if (!sk_ASN1_OBJECT_push(ctx->policies, copy)) goto err;

268     return 1;
269 err:
270     TSerr(TS_F_TS_RESP_CTX_ADD_POLICY, ERR_R_MALLOC_FAILURE);
271     ASN1_OBJECT_free(copy);
272     return 0;
273 }

275 int TS_RESP_CTX_add_md(TS_RESP_CTX *ctx, const EVP_MD *md)
276 {
277     /* Create new md stack if necessary. */
278     if (!ctx->mds && !(ctx->mds = sk_EVP_MD_new_null()))
279         goto err;
280     /* Add the shared md, no copy needed. */
281     if (!sk_EVP_MD_push(ctx->mds, (EVP_MD *)md)) goto err;

283     return 1;
284 err:
285     TSerr(TS_F_TS_RESP_CTX_ADD_MD, ERR_R_MALLOC_FAILURE);
286     return 0;
287 }

289 #define TS_RESP_CTX_accuracy_free(ctx) \
290     ASN1_INTEGER_free(ctx->seconds); \
291     ctx->seconds = NULL; \
292     ASN1_INTEGER_free(ctx->millis); \
293     ctx->millis = NULL; \
294     ASN1_INTEGER_free(ctx->micros); \
295     ctx->micros = NULL;

297 int TS_RESP_CTX_set_accuracy(TS_RESP_CTX *ctx,
298                             int secs, int millis, int micros)
299 {
301     TS_RESP_CTX_accuracy_free(ctx);
302     if (secs && !(ctx->seconds = ASN1_INTEGER_new())
303         || !ASN1_INTEGER_set(ctx->seconds, secs))
304         goto err;
305     if (millis && !(ctx->millis = ASN1_INTEGER_new())
306         || !ASN1_INTEGER_set(ctx->millis, millis))
307         goto err;
308     if (micros && !(ctx->micros = ASN1_INTEGER_new())
309         || !ASN1_INTEGER_set(ctx->micros, micros))
310         goto err;

312     return 1;
313 err:
314     TS_RESP_CTX_accuracy_free(ctx);
315     TSerr(TS_F_TS_RESP_CTX_SET_ACCURACY, ERR_R_MALLOC_FAILURE);
316     return 0;
317 }

319 void TS_RESP_CTX_add_flags(TS_RESP_CTX *ctx, int flags)
320 {
321     ctx->flags |= flags;
322 }

324 void TS_RESP_CTX_set_serial_cb(TS_RESP_CTX *ctx, TS_serial_cb cb, void *data)
325 {

```

```

326     ctx->serial_cb = cb;
327     ctx->serial_cb_data = data;
328 }

330 void TS_RESP_CTX_set_time_cb(TS_RESP_CTX *ctx, TS_time_cb cb, void *data)
331 {
332     ctx->time_cb = cb;
333     ctx->time_cb_data = data;
334 }

336 void TS_RESP_CTX_set_extension_cb(TS_RESP_CTX *ctx,
337                                   TS_extension_cb cb, void *data)
338 {
339     ctx->extension_cb = cb;
340     ctx->extension_cb_data = data;
341 }

343 int TS_RESP_CTX_set_status_info(TS_RESP_CTX *ctx,
344                                int status, const char *text)
345 {
346     TS_STATUS_INFO *si = NULL;
347     ASN1_UTF8STRING *utf8_text = NULL;
348     int ret = 0;

350     if (!(si = TS_STATUS_INFO_new())) goto err;
351     if (!ASN1_INTEGER_set(si->status, status)) goto err;
352     if (text)
353     {
354         if (!(utf8_text = ASN1_UTF8STRING_new())
355             || !ASN1_STRING_set(utf8_text, text, strlen(text)))
356             goto err;
357         if (!si->text && !(si->text = sk_ASN1_UTF8STRING_new_null()))
358             goto err;
359         if (!sk_ASN1_UTF8STRING_push(si->text, utf8_text)) goto err;
360         utf8_text = NULL; /* Ownership is lost. */
361     }
362     if (!TS_RESP_set_status_info(ctx->response, si)) goto err;
363     ret = 1;
364 err:
365     if (!ret)
366         TSerr(TS_F_TS_RESP_CTX_SET_STATUS_INFO, ERR_R_MALLOC_FAILURE);
367     TS_STATUS_INFO_free(si);
368     ASN1_UTF8STRING_free(utf8_text);
369     return ret;
370 }

372 int TS_RESP_CTX_set_status_info_cond(TS_RESP_CTX *ctx,
373                                     int status, const char *text)
374 {
375     int ret = 1;
376     TS_STATUS_INFO *si = TS_RESP_get_status_info(ctx->response);

378     if (ASN1_INTEGER_get(si->status) == TS_STATUS_GRANTED)
379     {
380         /* Status has not been set, set it now. */
381         ret = TS_RESP_CTX_set_status_info(ctx, status, text);
382     }

383     return ret;
384 }

386 int TS_RESP_CTX_add_failure_info(TS_RESP_CTX *ctx, int failure)
387 {
388     TS_STATUS_INFO *si = TS_RESP_get_status_info(ctx->response);
389     if (!si->failure_info && !(si->failure_info = ASN1_BIT_STRING_new()))
390         goto err;
391     if (!ASN1_BIT_STRING_set_bit(si->failure_info, failure, 1))

```

```

392         goto err;
393     return 1;
394 err:
395     TSerr(TS_F_TS_RESP_CTX_ADD_FAILURE_INFO, ERR_R_MALLOC_FAILURE);
396     return 0;
397 }
398
399 TS_REQ *TS_RESP_CTX_get_request(TS_RESP_CTX *ctx)
400 {
401     return ctx->request;
402 }
403
404 TS_TST_INFO *TS_RESP_CTX_get_tst_info(TS_RESP_CTX *ctx)
405 {
406     return ctx->tst_info;
407 }
408
409 int TS_RESP_CTX_set_clock_precision_digits(TS_RESP_CTX *ctx, unsigned precision)
410 {
411     if (precision > TS_MAX_CLOCK_PRECISION_DIGITS)
412         return 0;
413     ctx->clock_precision_digits = precision;
414     return 1;
415 }
416
417 /* Main entry method of the response generation. */
418 TS_RESP *TS_RESP_create_response(TS_RESP_CTX *ctx, BIO *req_bio)
419 {
420     ASN1_OBJECT *policy;
421     TS_RESP *response;
422     int result = 0;
423
424     TS_RESP_CTX_init(ctx);
425
426     /* Creating the response object. */
427     if (!(ctx->response = TS_RESP_new()))
428     {
429         TSerr(TS_F_TS_RESP_CREATE_RESPONSE, ERR_R_MALLOC_FAILURE);
430         goto end;
431     }
432
433     /* Parsing DER request. */
434     if (!(ctx->request = d2i_TS_REQ_bio(req_bio, NULL)))
435     {
436         TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
437                                     "Bad request format or "
438                                     "system error.");
439         TS_RESP_CTX_add_failure_info(ctx, TS_INFO_BAD_DATA_FORMAT);
440         goto end;
441     }
442
443     /* Setting default status info. */
444     if (!TS_RESP_CTX_set_status_info(ctx, TS_STATUS_GRANTED, NULL))
445         goto end;
446
447     /* Checking the request format. */
448     if (!TS_RESP_check_request(ctx)) goto end;
449
450     /* Checking acceptable policies. */
451     if (!(policy = TS_RESP_get_policy(ctx))) goto end;
452
453     /* Creating the TS_TST_INFO object. */
454     if (!(ctx->tst_info = TS_RESP_create_tst_info(ctx, policy)))
455         goto end;
456
457     /* Processing extensions. */

```

```

458     if (!TS_RESP_process_extensions(ctx)) goto end;
459
460     /* Generating the signature. */
461     if (!TS_RESP_sign(ctx)) goto end;
462
463     /* Everything was successful. */
464     result = 1;
465 end:
466     if (!result)
467     {
468         TSerr(TS_F_TS_RESP_CREATE_RESPONSE, TS_R_RESPONSE_SETUP_ERROR);
469         if (ctx->response != NULL)
470         {
471             if (TS_RESP_CTX_set_status_info_cond(ctx,
472                                                  TS_STATUS_REJECTION, "Error during response "
473                                                  "generation.") == 0)
474             {
475                 TS_RESP_free(ctx->response);
476                 ctx->response = NULL;
477             }
478         }
479         response = ctx->response;
480         ctx->response = NULL; /* Ownership will be returned to caller. */
481         TS_RESP_CTX_cleanup(ctx);
482         return response;
483     }
484
485     /* Initializes the variable part of the context. */
486     static void TS_RESP_CTX_init(TS_RESP_CTX *ctx)
487     {
488         ctx->request = NULL;
489         ctx->response = NULL;
490         ctx->tst_info = NULL;
491     }
492
493     /* Cleans up the variable part of the context. */
494     static void TS_RESP_CTX_cleanup(TS_RESP_CTX *ctx)
495     {
496         TS_REQ_free(ctx->request);
497         ctx->request = NULL;
498         TS_RESP_free(ctx->response);
499         ctx->response = NULL;
500         TS_TST_INFO_free(ctx->tst_info);
501         ctx->tst_info = NULL;
502     }
503
504     /* Checks the format and content of the request. */
505     static int TS_RESP_check_request(TS_RESP_CTX *ctx)
506     {
507         TS_REQ *request = ctx->request;
508         TS_MSG_IMPRINT *msg_imprint;
509         X509_ALGOR *md_alg;
510         int md_alg_id;
511         const ASN1_OCTET_STRING *digest;
512         EVP_MD *md = NULL;
513         int i;
514
515         /* Checking request version. */
516         if (TS_REQ_get_version(request) != 1)
517         {
518             TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
519                                         "Bad request version.");
520             TS_RESP_CTX_add_failure_info(ctx, TS_INFO_BAD_REQUEST);
521             return 0;
522         }
523     }

```

```

525 /* Checking message digest algorithm. */
526 msg_imprint = TS_REQ_get_msg_imprint(request);
527 md_alg = TS_MSG_IMPRINT_get_algo(msg_imprint);
528 md_alg_id = OBJ_obj2nid(md_alg->algorithm);
529 for (i = 0; !md && i < sk_EVP_MD_num(ctx->mds); ++i)
530 {
531     EVP_MD *current_md = sk_EVP_MD_value(ctx->mds, i);
532     if (md_alg_id == EVP_MD_type(current_md))
533         md = current_md;
534 }
535 if (!md)
536 {
537     TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
538                                "Message digest algorithm is "
539                                "not supported.");
540     TS_RESP_CTX_add_failure_info(ctx, TS_INFO_BAD_ALG);
541     return 0;
542 }
543
544 /* No message digest takes parameter. */
545 if (md_alg->parameter
546     && ASN1_TYPE_get(md_alg->parameter) != V_ASN1_NULL)
547 {
548     TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
549                                "Superfluous message digest "
550                                "parameter.");
551     TS_RESP_CTX_add_failure_info(ctx, TS_INFO_BAD_ALG);
552     return 0;
553 }
554 /* Checking message digest size. */
555 digest = TS_MSG_IMPRINT_get_msg(msg_imprint);
556 if (digest->length != EVP_MD_size(md))
557 {
558     TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
559                                "Bad message digest.");
560     TS_RESP_CTX_add_failure_info(ctx, TS_INFO_BAD_DATA_FORMAT);
561     return 0;
562 }
563
564 return 1;
565 }
566
567 /* Returns the TSA policy based on the requested and acceptable policies. */
568 static ASN1_OBJECT *TS_RESP_get_policy(TS_RESP_CTX *ctx)
569 {
570     ASN1_OBJECT *requested = TS_REQ_get_policy_id(ctx->request);
571     ASN1_OBJECT *policy = NULL;
572     int i;
573
574     if (ctx->default_policy == NULL)
575     {
576         TSerr(TS_F_TS_RESP_GET_POLICY, TS_R_INVALID_NULL_POINTER);
577         return NULL;
578     }
579     /* Return the default policy if none is requested or the default is
580      * requested. */
581     if (!requested || !OBJ_cmp(requested, ctx->default_policy))
582         policy = ctx->default_policy;
583
584     /* Check if the policy is acceptable. */
585     for (i = 0; !policy && i < sk_ASN1_OBJECT_num(ctx->policies); ++i)
586     {
587         ASN1_OBJECT *current = sk_ASN1_OBJECT_value(ctx->policies, i);
588         if (!OBJ_cmp(requested, current))
589             policy = current;
590     }

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```

590     }
591     if (!policy)
592     {
593         TSerr(TS_F_TS_RESP_GET_POLICY, TS_R_UNACCEPTABLE_POLICY);
594         TS_RESP_CTX_set_status_info(ctx, TS_STATUS_REJECTION,
595                                    "Requested policy is not "
596                                    "supported.");
597         TS_RESP_CTX_add_failure_info(ctx, TS_INFO_UNACCEPTED_POLICY);
598     }
599     return policy;
600 }
601
602 /* Creates the TS_TST_INFO object based on the settings of the context. */
603 static TS_TST_INFO *TS_RESP_create_tst_info(TS_RESP_CTX *ctx,
604                                             ASN1_OBJECT *policy)
605 {
606     int result = 0;
607     TS_TST_INFO *tst_info = NULL;
608     ASN1_INTEGER *serial = NULL;
609     ASN1_GENERALIZEDTIME *asn1_time = NULL;
610     long sec, usec;
611     TS_ACCURACY *accuracy = NULL;
612     const ASN1_INTEGER *nonce;
613     GENERAL_NAME *tsa_name = NULL;
614
615     if (!(tst_info = TS_TST_INFO_new())) goto end;
616     if (!TS_TST_INFO_set_version(tst_info, 1)) goto end;
617     if (!TS_TST_INFO_set_policy_id(tst_info, policy)) goto end;
618     if (!TS_TST_INFO_set_msg_imprint(tst_info, ctx->request->msg_imprint))
619         goto end;
620     if (!serial = (*ctx->serial_cb)(ctx, ctx->serial_cb_data))
621         || !TS_TST_INFO_set_serial(tst_info, serial))
622         goto end;
623     if (!(*ctx->time_cb)(ctx, ctx->time_cb_data, &sec, &usec)
624         || !(asn1_time = TS_RESP_set_genTime_with_precision(NULL,
625                                                             sec, usec,
626                                                             ctx->clock_precision_digits))
627         || !TS_TST_INFO_set_time(tst_info, asn1_time))
628         goto end;
629
630     /* Setting accuracy if needed. */
631     if ((ctx->seconds || ctx->millis || ctx->micros)
632         && !(accuracy = TS_ACCURACY_new()))
633         goto end;
634
635     if (ctx->seconds && !TS_ACCURACY_set_seconds(accuracy, ctx->seconds))
636         goto end;
637     if (ctx->millis && !TS_ACCURACY_set_millis(accuracy, ctx->millis))
638         goto end;
639     if (ctx->micros && !TS_ACCURACY_set_micros(accuracy, ctx->micros))
640         goto end;
641     if (accuracy && !TS_TST_INFO_set_accuracy(tst_info, accuracy))
642         goto end;
643
644     /* Setting ordering. */
645     if ((ctx->flags & TS_ORDERING)
646         && !TS_TST_INFO_set_ordering(tst_info, 1))
647         goto end;
648
649     /* Setting nonce if needed. */
650     if ((nonce = TS_REQ_get_nonce(ctx->request)) != NULL
651         && !TS_TST_INFO_set_nonce(tst_info, nonce))
652         goto end;
653
654     /* Setting TSA name to subject of signer certificate. */
655     if (ctx->flags & TS_TSA_NAME)

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```

656         {
657             if (!(tsa_name = GENERAL_NAME_new())) goto end;
658             tsa_name->type = GEN_DIRNAME;
659             tsa_name->d.dirn =
660                 X509_NAME_dup(ctx->signer_cert->cert_info->subject);
661             if (!(tsa_name->d.dirn) goto end;
662             if (!TS_TST_INFO_set_tsa(tst_info, tsa_name)) goto end;
663         }
665     result = 1;
666 end:
667     if (!result)
668     {
669         TS_TST_INFO_free(tst_info);
670         tst_info = NULL;
671         TSerr(TS_F_TS_RESP_CREATE_TST_INFO, TS_R_TST_INFO_SETUP_ERROR);
672         TS_RESP_CTX_set_status_info_cond(ctx, TS_STATUS_REJECTION,
673             "Error during TSTInfo ",
674             "generation.");
675     }
676     GENERAL_NAME_free(tsa_name);
677     TS_ACCURACY_free(accuracy);
678     ASN1_GENERALIZEDTIME_free(asn1_time);
679     ASN1_INTEGER_free(serial);
680     return tst_info;
681 }
682
684 /* Processing the extensions of the request. */
685 static int TS_RESP_process_extensions(TS_RESP_CTX *ctx)
686 {
687     STACK_OF(X509_EXTENSION) *exts = TS_REQ_get_exts(ctx->request);
688     int i;
689     int ok = 1;
691     for (i = 0; ok && i < sk_X509_EXTENSION_num(exts); ++i)
692     {
693         X509_EXTENSION *ext = sk_X509_EXTENSION_value(exts, i);
694         /* XXXXX The last argument was previously
695          (void *)ctx->extension_cb, but ISO C doesn't permit
696          converting a function pointer to void *. For lack of
697          better information, I'm placing a NULL there instead.
698          The callback can pick its own address out from the ctx
699          anyway...
700          */
701         ok = (*ctx->extension_cb)(ctx, ext, NULL);
702     }
704     return ok;
705 }
707 /* Functions for signing the TS_TST_INFO structure of the context. */
708 static int TS_RESP_sign(TS_RESP_CTX *ctx)
709 {
710     int ret = 0;
711     PKCS7 *p7 = NULL;
712     PKCS7_SIGNER_INFO *si;
713     STACK_OF(X509) *certs; /* Certificates to include in sc. */
714     ESS_SIGNING_CERT *sc = NULL;
715     ASN1_OBJECT *oid;
716     BIO *p7bio = NULL;
717     int i;
719     /* Check if signcert and pkey match. */
720     if (!X509_check_private_key(ctx->signer_cert, ctx->signer_key)) {
721         TSerr(TS_F_TS_RESP_SIGN,

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722         TS_R_PRIVATE_KEY_DOES_NOT_MATCH_CERTIFICATE);
723         goto err;
724     }
726     /* Create a new PKCS7 signed object. */
727     if (!(p7 = PKCS7_new())) {
728         TSerr(TS_F_TS_RESP_SIGN, ERR_R_MALLOC_FAILURE);
729         goto err;
730     }
731     if (!PKCS7_set_type(p7, NID_pkcs7_signed)) goto err;
733     /* Force SignedData version to be 3 instead of the default 1. */
734     if (!ASN1_INTEGER_set(p7->d.sign->version, 3)) goto err;
736     /* Add signer certificate and optional certificate chain. */
737     if (TS_REQ_get_cert_req(ctx->request))
738     {
739         PKCS7_add_certificate(p7, ctx->signer_cert);
740         if (ctx->certs)
741         {
742             for(i = 0; i < sk_X509_num(ctx->certs); ++i)
743             {
744                 X509 *cert = sk_X509_value(ctx->certs, i);
745                 PKCS7_add_certificate(p7, cert);
746             }
747         }
748     }
750     /* Add a new signer info. */
751     if (!(si = PKCS7_add_signature(p7, ctx->signer_cert,
752         ctx->signer_key, EVP_sha1()))
753     {
754         TSerr(TS_F_TS_RESP_SIGN, TS_R_PKCS7_ADD_SIGNATURE_ERROR);
755         goto err;
756     }
758     /* Add content type signed attribute to the signer info. */
759     oid = OBJ_nid2obj(NID_id_smime_ct_TSTInfo);
760     if (!PKCS7_add_signed_attribute(si, NID_pkcs9_contentType,
761         V_ASN1_OBJECT, oid))
762     {
763         TSerr(TS_F_TS_RESP_SIGN, TS_R_PKCS7_ADD_SIGNED_ATTR_ERROR);
764         goto err;
765     }
767     /* Create the ESS SigningCertificate attribute which contains
768     the signer certificate id and optionally the certificate chain. */
769     certs = ctx->flags & TS_ESS_CERT_ID_CHAIN ? ctx->certs : NULL;
770     if (!(sc = ESS_SIGNING_CERT_new_init(ctx->signer_cert, certs))
771     goto err;
773     /* Add SigningCertificate signed attribute to the signer info. */
774     if (!ESS_add_signing_cert(si, sc))
775     {
776         TSerr(TS_F_TS_RESP_SIGN, TS_R_ESS_ADD_SIGNING_CERT_ERROR);
777         goto err;
778     }
780     /* Add a new empty NID_id_smime_ct_TSTInfo encapsulated content. */
781     if (!TS_TST_INFO_content_new(p7)) goto err;
783     /* Add the DER encoded tst_info to the PKCS7 structure. */
784     if (!(p7bio = PKCS7_dataInit(p7, NULL))) {
785         TSerr(TS_F_TS_RESP_SIGN, ERR_R_MALLOC_FAILURE);
786         goto err;
787     }

```

```

789     /* Convert tst_info to DER. */
790     if (!i2d_TS_TST_INFO_bio(p7bio, ctx->tst_info))
791     {
792         TSerr(TS_F_TS_RESP_SIGN, TS_R_TS_DATASIGN);
793         goto err;
794     }

796     /* Create the signature and add it to the signer info. */
797     if (!PKCS7_dataFinal(p7, p7bio))
798     {
799         TSerr(TS_F_TS_RESP_SIGN, TS_R_TS_DATASIGN);
800         goto err;
801     }

803     /* Set new PKCS7 and TST_INFO objects. */
804     TS_RESP_set_tst_info(ctx->response, p7, ctx->tst_info);
805     p7 = NULL; /* Ownership is lost. */
806     ctx->tst_info = NULL; /* Ownership is lost. */

808     ret = 1;
809 err:
810     if (!ret)
811         TS_RESP_CTX_set_status_info_cond(ctx, TS_STATUS_REJECTION,
812                                         "Error during signature "
813                                         "generation.");
814     BIO_free_all(p7bio);
815     ESS_SIGNING_CERT_free(sc);
816     PKCS7_free(p7);
817     return ret;
818 }

820 static ESS_SIGNING_CERT *ESS_SIGNING_CERT_new_init(X509 *signcert,
821                                                    STACK_OF(X509) *certs)
822 {
823     ESS_CERT_ID *cid;
824     ESS_SIGNING_CERT *sc = NULL;
825     int i;

827     /* Creating the ESS_CERT_ID stack. */
828     if (!(sc = ESS_SIGNING_CERT_new())) goto err;
829     if (!sc->cert_ids && !(sc->cert_ids = sk_ESS_CERT_ID_new_null()))
830         goto err;

832     /* Adding the signing certificate id. */
833     if (!(cid = ESS_CERT_ID_new_init(signcert, 0))
834         || !sk_ESS_CERT_ID_push(sc->cert_ids, cid))
835         goto err;
836     /* Adding the certificate chain ids. */
837     for (i = 0; i < sk_X509_num(certs); ++i)
838     {
839         X509 *cert = sk_X509_value(certs, i);
840         if (!(cid = ESS_CERT_ID_new_init(cert, 1))
841             || !sk_ESS_CERT_ID_push(sc->cert_ids, cid))
842             goto err;
843     }

845     return sc;
846 err:
847     ESS_SIGNING_CERT_free(sc);
848     TSerr(TS_F_ESS_SIGNING_CERT_NEW_INIT, ERR_R_MALLOC_FAILURE);
849     return NULL;
850 }

852 static ESS_CERT_ID *ESS_CERT_ID_new_init(X509 *cert, int issuer_needed)
853 {

```

```

854     ESS_CERT_ID *cid = NULL;
855     GENERAL_NAME *name = NULL;
856
857     /* Recompute SHA1 hash of certificate if necessary (side effect). */
858     X509_check_purpose(cert, -1, 0);

860     if (!(cid = ESS_CERT_ID_new())) goto err;
861     if (!ASN1_OCTET_STRING_set(cid->hash, cert->sha1_hash,
862                               sizeof(cert->sha1_hash)))
863         goto err;

865     /* Setting the issuer/serial if requested. */
866     if (issuer_needed)
867     {
868         /* Creating issuer/serial structure. */
869         if (!cid->issuer_serial
870             && !(cid->issuer_serial = ESS_ISSUER_SERIAL_new()))
871             goto err;
872         /* Creating general name from the certificate issuer. */
873         if (!(name = GENERAL_NAME_new())) goto err;
874         name->type = GEN_DIRNAME;
875         if (!(name->d.dirn = X509_NAME_dup(cert->cert_info->issuer)))
876             goto err;
877         if (!sk_GENERAL_NAME_push(cid->issuer_serial->issuer, name))
878             goto err;
879         name = NULL; /* Ownership is lost. */
880         /* Setting the serial number. */
881         ASN1_INTEGER_free(cid->issuer_serial->serial);
882         if (!(cid->issuer_serial->serial =
883             ASN1_INTEGER_dup(cert->cert_info->serialNumber)))
884             goto err;
885     }

887     return cid;
888 err:
889     GENERAL_NAME_free(name);
890     ESS_CERT_ID_free(cid);
891     TSerr(TS_F_ESS_CERT_ID_NEW_INIT, ERR_R_MALLOC_FAILURE);
892     return NULL;
893 }

895 static int TS_TST_INFO_content_new(PKCS7 *p7)
896 {
897     PKCS7 *ret = NULL;
898     ASN1_OCTET_STRING *octet_string = NULL;

900     /* Create new encapsulated NID_id_smime_ct_TSTInfo content. */
901     if (!(ret = PKCS7_new())) goto err;
902     if (!(ret->d.other = ASN1_TYPE_new())) goto err;
903     ret->type = OBJ_nid2obj(NID_id_smime_ct_TSTInfo);
904     if (!(octet_string = ASN1_OCTET_STRING_new())) goto err;
905     ASN1_TYPE_set(ret->d.other, V_ASN1_OCTET_STRING, octet_string);
906     octet_string = NULL;

908     /* Add encapsulated content to signed PKCS7 structure. */
909     if (!PKCS7_set_content(p7, ret)) goto err;

911     return 1;
912 err:
913     ASN1_OCTET_STRING_free(octet_string);
914     PKCS7_free(ret);
915     return 0;
916 }

918 static int ESS_add_signing_cert(PKCS7_SIGNER_INFO *si, ESS_SIGNING_CERT *sc)
919 {

```

```

920     ASN1_STRING *seq = NULL;
921     unsigned char *p, *pp = NULL;
922     int len;

924     len = i2d_ESS_SIGNING_CERT(sc, NULL);
925     if (!(pp = (unsigned char *) OPENSSL_malloc(len)))
926     {
927         TSerr(TS_F_ESS_ADD_SIGNING_CERT, ERR_R_MALLOC_FAILURE);
928         goto err;
929     }
930     p = pp;
931     i2d_ESS_SIGNING_CERT(sc, &p);
932     if (!(seq = ASN1_STRING_new()) || !ASN1_STRING_set(seq, pp, len))
933     {
934         TSerr(TS_F_ESS_ADD_SIGNING_CERT, ERR_R_MALLOC_FAILURE);
935         goto err;
936     }
937     OPENSSL_free(pp); pp = NULL;
938     return PKCS7_add_signed_attribute(si,
939                                     NID_id_smime_aa_signingCertificate,
940                                     V_ASN1_SEQUENCE, seq);
941 err:
942     ASN1_STRING_free(seq);
943     OPENSSL_free(pp);

945     return 0;
946 }

949 static ASN1_GENERALIZEDTIME *
950 TS_RESP_set_genTime_with_precision(ASN1_GENERALIZEDTIME *asn1_time,
951                                   long sec, long usec, unsigned precision)
952 {
953     time_t time_sec = (time_t) sec;
954     struct tm *tm = NULL;
955     char genTime_str[17 + TS_MAX_CLOCK_PRECISION_DIGITS];
956     char *p = genTime_str;
957     char *p_end = genTime_str + sizeof(genTime_str);

959     if (precision > TS_MAX_CLOCK_PRECISION_DIGITS)
960         goto err;

962     if (!(tm = gmtime(&time_sec)))
963         goto err;

966     /*
967      * Put "genTime_str" in GeneralizedTime format. We work around the
968      * restrictions imposed by rfc3280 (i.e. "GeneralizedTime values MUST
969      * NOT include fractional seconds") and OpenSSL related functions to
970      * meet the rfc3161 requirement: "GeneralizedTime syntax can include
971      * fraction-of-second details".
972      */
973     p += BIO_snprintf(p, p_end - p,
974                      "%04d%02d%02d%02d%02d",
975                      tm->tm_year + 1900, tm->tm_mon + 1, tm->tm_mday,
976                      tm->tm_hour, tm->tm_min, tm->tm_sec);

977     if (precision > 0)
978     {
979         /* Add fraction of seconds (leave space for dot and null). */
980         BIO_snprintf(p, 2 + precision, "%ld", usec);
981         /* We cannot use the snprintf return value,
982          * because it might have been truncated. */
983         p += strlen(p);

985         /* To make things a bit harder, X.690 | ISO/IEC 8825-1 provides

```

```

986         the following restrictions for a DER-encoding, which OpenSSL
987         (specifically ASN1_GENERALIZEDTIME_check() function) doesn't
988         support:
989         "The encoding MUST terminate with a "Z" (which means "Zulu"
990         time). The decimal point element, if present, MUST be the
991         point option ".". The fractional-seconds elements,
992         if present, MUST omit all trailing 0's;
993         if the elements correspond to 0, they MUST be wholly
994         omitted, and the decimal point element also MUST be
995         omitted." */
996         /* Remove trailing zeros. The dot guarantees the exit
997         condition of this loop even if all the digits are zero. */
998         while (*--p == '0')
999             /* empty */;
1000         /* p points to either the dot or the last non-zero digit. */
1001         if (*p != '.') ++p;
1002     }
1003     /* Add the trailing Z and the terminating null. */
1004     *p++ = 'Z';
1005     *p++ = '\0';

1007     /* Now call OpenSSL to check and set our genTime value */
1008     if (!asn1_time && !(asn1_time = M_ASN1_GENERALIZEDTIME_new()))
1009         goto err;
1010     if (!ASN1_GENERALIZEDTIME_set_string(asn1_time, genTime_str))
1011     {
1012         ASN1_GENERALIZEDTIME_free(asn1_time);
1013         goto err;
1014     }

1016     return asn1_time;
1017 err:
1018     TSerr(TS_F_TS_RESP_SET_GENTIME_WITH_PRECISION, TS_R_COULD_NOT_SET_TIME);
1019     return NULL;
1020 }

```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_utils.c

1

```
*****
10072 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_utils.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ts/ts_rsp_utils.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
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13 * notice, this list of conditions and the following disclaimer.
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19 *
20 * 3. All advertising materials mentioning features or use of this
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24 *
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39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_utils.c

2

```
62 #include <openssl/ts.h>
63 #include <openssl/pkcs7.h>

65 /* Function definitions. */

67 int TS_RESP_set_status_info(TS_RESP *a, TS_STATUS_INFO *status_info)
68 {
69     TS_STATUS_INFO *new_status_info;

71     if (a->status_info == status_info)
72         return 1;
73     new_status_info = TS_STATUS_INFO_dup(status_info);
74     if (new_status_info == NULL)
75     {
76         TSerr(TS_F_TS_RESP_SET_STATUS_INFO, ERR_R_MALLOC_FAILURE);
77         return 0;
78     }
79     TS_STATUS_INFO_free(a->status_info);
80     a->status_info = new_status_info;

82     return 1;
83 }

85 TS_STATUS_INFO *TS_RESP_get_status_info(TS_RESP *a)
86 {
87     return a->status_info;
88 }

90 /* Caller loses ownership of PKCS7 and TS_TST_INFO objects. */
91 void TS_RESP_set_tst_info(TS_RESP *a, PKCS7 *p7, TS_TST_INFO *tst_info)
92 {
93     /* Set new PKCS7 and TST_INFO objects. */
94     PKCS7_free(a->token);
95     a->token = p7;
96     TS_TST_INFO_free(a->tst_info);
97     a->tst_info = tst_info;
98 }

100 PKCS7 *TS_RESP_get_token(TS_RESP *a)
101 {
102     return a->token;
103 }

105 TS_TST_INFO *TS_RESP_get_tst_info(TS_RESP *a)
106 {
107     return a->tst_info;
108 }

110 int TS_TST_INFO_set_version(TS_TST_INFO *a, long version)
111 {
112     return ASN1_INTEGER_set(a->version, version);
113 }

115 long TS_TST_INFO_get_version(const TS_TST_INFO *a)
116 {
117     return ASN1_INTEGER_get(a->version);
118 }

120 int TS_TST_INFO_set_policy_id(TS_TST_INFO *a, ASN1_OBJECT *policy)
121 {
122     ASN1_OBJECT *new_policy;

124     if (a->policy_id == policy)
125         return 1;
126     new_policy = OBJ_dup(policy);
127     if (new_policy == NULL)
```

```

128         {
129             TSerr(TS_F_TS_TST_INFO_SET_POLICY_ID, ERR_R_MALLOC_FAILURE);
130             return 0;
131         }
132     ASN1_OBJECT_free(a->policy_id);
133     a->policy_id = new_policy;
134     return 1;
135 }

137 ASN1_OBJECT *TS_TST_INFO_get_policy_id(TS_TST_INFO *a)
138 {
139     return a->policy_id;
140 }

142 int TS_TST_INFO_set_msg_imprint(TS_TST_INFO *a, TS_MSG_IMPRINT *msg_imprint)
143 {
144     TS_MSG_IMPRINT *new_msg_imprint;

146     if (a->msg_imprint == msg_imprint)
147         return 1;
148     new_msg_imprint = TS_MSG_IMPRINT_dup(msg_imprint);
149     if (new_msg_imprint == NULL)
150     {
151         TSerr(TS_F_TS_TST_INFO_SET_MSG_IMPRINT, ERR_R_MALLOC_FAILURE);
152         return 0;
153     }
154     TS_MSG_IMPRINT_free(a->msg_imprint);
155     a->msg_imprint = new_msg_imprint;
156     return 1;
157 }

159 TS_MSG_IMPRINT *TS_TST_INFO_get_msg_imprint(TS_TST_INFO *a)
160 {
161     return a->msg_imprint;
162 }

164 int TS_TST_INFO_set_serial(TS_TST_INFO *a, const ASN1_INTEGER *serial)
165 {
166     ASN1_INTEGER *new_serial;

168     if (a->serial == serial)
169         return 1;
170     new_serial = ASN1_INTEGER_dup(serial);
171     if (new_serial == NULL)
172     {
173         TSerr(TS_F_TS_TST_INFO_SET_SERIAL, ERR_R_MALLOC_FAILURE);
174         return 0;
175     }
176     ASN1_INTEGER_free(a->serial);
177     a->serial = new_serial;
178     return 1;
179 }

181 const ASN1_INTEGER *TS_TST_INFO_get_serial(const TS_TST_INFO *a)
182 {
183     return a->serial;
184 }

186 int TS_TST_INFO_set_time(TS_TST_INFO *a, const ASN1_GENERALIZEDTIME *gtime)
187 {
188     ASN1_GENERALIZEDTIME *new_time;

190     if (a->time == gtime)
191         return 1;
192     new_time = M_ASN1_GENERALIZEDTIME_dup(gtime);
193     if (new_time == NULL)

```

```

194         {
195             TSerr(TS_F_TS_TST_INFO_SET_TIME, ERR_R_MALLOC_FAILURE);
196             return 0;
197         }
198     ASN1_GENERALIZEDTIME_free(a->time);
199     a->time = new_time;
200     return 1;
201 }

203 const ASN1_GENERALIZEDTIME *TS_TST_INFO_get_time(const TS_TST_INFO *a)
204 {
205     return a->time;
206 }

208 int TS_TST_INFO_set_accuracy(TS_TST_INFO *a, TS_ACCURACY *accuracy)
209 {
210     TS_ACCURACY *new_accuracy;

212     if (a->accuracy == accuracy)
213         return 1;
214     new_accuracy = TS_ACCURACY_dup(accuracy);
215     if (new_accuracy == NULL)
216     {
217         TSerr(TS_F_TS_TST_INFO_SET_ACCURACY, ERR_R_MALLOC_FAILURE);
218         return 0;
219     }
220     TS_ACCURACY_free(a->accuracy);
221     a->accuracy = new_accuracy;
222     return 1;
223 }

225 TS_ACCURACY *TS_TST_INFO_get_accuracy(TS_TST_INFO *a)
226 {
227     return a->accuracy;
228 }

230 int TS_ACCURACY_set_seconds(TS_ACCURACY *a, const ASN1_INTEGER *seconds)
231 {
232     ASN1_INTEGER *new_seconds;

234     if (a->seconds == seconds)
235         return 1;
236     new_seconds = ASN1_INTEGER_dup(seconds);
237     if (new_seconds == NULL)
238     {
239         TSerr(TS_F_TS_ACCURACY_SET_SECONDS, ERR_R_MALLOC_FAILURE);
240         return 0;
241     }
242     ASN1_INTEGER_free(a->seconds);
243     a->seconds = new_seconds;
244     return 1;
245 }

247 const ASN1_INTEGER *TS_ACCURACY_get_seconds(const TS_ACCURACY *a)
248 {
249     return a->seconds;
250 }

252 int TS_ACCURACY_set_millis(TS_ACCURACY *a, const ASN1_INTEGER *millis)
253 {
254     ASN1_INTEGER *new_millis = NULL;

256     if (a->millis == millis)
257         return 1;
258     if (millis != NULL)
259     {

```

```

260         new_millis = ASN1_INTEGER_dup(millis);
261         if (new_millis == NULL)
262         {
263             TSerr(TS_F_TS_ACCURACY_SET_MILLIS,
264                 ERR_R_MALLOC_FAILURE);
265             return 0;
266         }
267     }
268     ASN1_INTEGER_free(a->millis);
269     a->millis = new_millis;
270     return 1;
271 }

273 const ASN1_INTEGER *TS_ACCURACY_get_millis(const TS_ACCURACY *a)
274 {
275     return a->millis;
276 }

278 int TS_ACCURACY_set_micros(TS_ACCURACY *a, const ASN1_INTEGER *micros)
279 {
280     ASN1_INTEGER *new_micros = NULL;
281
282     if (a->micros == micros)
283         return 1;
284     if (micros != NULL)
285     {
286         new_micros = ASN1_INTEGER_dup(micros);
287         if (new_micros == NULL)
288         {
289             TSerr(TS_F_TS_ACCURACY_SET_MICROS,
290                 ERR_R_MALLOC_FAILURE);
291             return 0;
292         }
293     }
294     ASN1_INTEGER_free(a->micros);
295     a->micros = new_micros;
296     return 1;
297 }

299 const ASN1_INTEGER *TS_ACCURACY_get_micros(const TS_ACCURACY *a)
300 {
301     return a->micros;
302 }

304 int TS_TST_INFO_set_ordering(TS_TST_INFO *a, int ordering)
305 {
306     a->ordering = ordering ? 0xFF : 0x00;
307     return 1;
308 }

310 int TS_TST_INFO_get_ordering(const TS_TST_INFO *a)
311 {
312     return a->ordering ? 1 : 0;
313 }

315 int TS_TST_INFO_set_nonce(TS_TST_INFO *a, const ASN1_INTEGER *nonce)
316 {
317     ASN1_INTEGER *new_nonce;
318
319     if (a->nonce == nonce)
320         return 1;
321     new_nonce = ASN1_INTEGER_dup(nonce);
322     if (new_nonce == NULL)
323     {
324         TSerr(TS_F_TS_TST_INFO_SET_NONCE, ERR_R_MALLOC_FAILURE);
325         return 0;

```

```

326     }
327     ASN1_INTEGER_free(a->nonce);
328     a->nonce = new_nonce;
329     return 1;
330 }

332 const ASN1_INTEGER *TS_TST_INFO_get_nonce(const TS_TST_INFO *a)
333 {
334     return a->nonce;
335 }

337 int TS_TST_INFO_set_tsa(TS_TST_INFO *a, GENERAL_NAME *tsa)
338 {
339     GENERAL_NAME *new_tsa;
340
341     if (a->tsa == tsa)
342         return 1;
343     new_tsa = GENERAL_NAME_dup(tsa);
344     if (new_tsa == NULL)
345     {
346         TSerr(TS_F_TS_TST_INFO_SET_TSA, ERR_R_MALLOC_FAILURE);
347         return 0;
348     }
349     GENERAL_NAME_free(a->tsa);
350     a->tsa = new_tsa;
351     return 1;
352 }

354 GENERAL_NAME *TS_TST_INFO_get_tsa(TS_TST_INFO *a)
355 {
356     return a->tsa;
357 }

359 STACK_OF(X509_EXTENSION) *TS_TST_INFO_get_exts(TS_TST_INFO *a)
360 {
361     return a->extensions;
362 }

364 void TS_TST_INFO_ext_free(TS_TST_INFO *a)
365 {
366     if (!a) return;
367     sk_X509_EXTENSION_pop_free(a->extensions, X509_EXTENSION_free);
368     a->extensions = NULL;
369 }

371 int TS_TST_INFO_get_ext_count(TS_TST_INFO *a)
372 {
373     return X509v3_get_ext_count(a->extensions);
374 }

376 int TS_TST_INFO_get_ext_by_NID(TS_TST_INFO *a, int nid, int lastpos)
377 {
378     return X509v3_get_ext_by_NID(a->extensions, nid, lastpos);
379 }

381 int TS_TST_INFO_get_ext_by_OBJ(TS_TST_INFO *a, ASN1_OBJECT *obj, int lastpos)
382 {
383     return X509v3_get_ext_by_OBJ(a->extensions, obj, lastpos);
384 }

386 int TS_TST_INFO_get_ext_by_critical(TS_TST_INFO *a, int crit, int lastpos)
387 {
388     return X509v3_get_ext_by_critical(a->extensions, crit, lastpos);
389 }

391 X509_EXTENSION *TS_TST_INFO_get_ext(TS_TST_INFO *a, int loc)

```

```
392     {
393     return X509v3_get_ext(a->extensions, loc);
394     }

396 X509_EXTENSION *TS_TST_INFO_delete_ext(TS_TST_INFO *a, int loc)
397 {
398     return X509v3_delete_ext(a->extensions, loc);
399     }

401 int TS_TST_INFO_add_ext(TS_TST_INFO *a, X509_EXTENSION *ex, int loc)
402 {
403     return X509v3_add_ext(&a->extensions, ex, loc) != NULL;
404     }

406 void *TS_TST_INFO_get_ext_d2i(TS_TST_INFO *a, int nid, int *crit, int *idx)
407 {
408     return X509V3_get_d2i(a->extensions, nid, crit, idx);
409     }
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_verify.c

1

```
*****
21702 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_verify.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/ts/ts_rsp_verify.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2002.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_rsp_verify.c

2

```
62 #include <openssl/ts.h>
63 #include <openssl/pkcs7.h>

65 /* Private function declarations. */

67 static int TS_verify_cert(X509_STORE *store, STACK_OF(X509) *untrusted,
68                          X509 *signer, STACK_OF(X509) **chain);
69 static int TS_check_signing_certs(PKCS7_SIGNER_INFO *si, STACK_OF(X509) *chain);
70 static ESS_SIGNING_CERT *ESS_get_signing_cert(PKCS7_SIGNER_INFO *si);
71 static int TS_find_cert(STACK_OF(ESS_CERT_ID) *cert_ids, X509 *cert);
72 static int TS_issuer_serial_cmp(ESS_ISSUER_SERIAL *is, X509_CINF *cinfo);
73 static int int_TS_RESP_verify_token(TS_VERIFY_CTX *ctx,
74                                     PKCS7 *token, TS_TST_INFO *tst_info);
75 static int TS_check_status_info(TS_RESP *response);
76 static char *TS_get_status_text(STACK_OF(ASN1_UTF8STRING) *text);
77 static int TS_check_policy(ASN1_OBJECT *req_oid, TS_TST_INFO *tst_info);
78 static int TS_compute_imprint(BIO *data, TS_TST_INFO *tst_info,
79                               X509_ALGOR **md_alg,
80                               unsigned char **imprint, unsigned *imprint_len);
81 static int TS_check_imprints(X509_ALGOR *algor_a,
82                              unsigned char *imprint_a, unsigned len_a,
83                              TS_TST_INFO *tst_info);
84 static int TS_check_nonces(const ASN1_INTEGER *a, TS_TST_INFO *tst_info);
85 static int TS_check_signer_name(GENERAL_NAME *tsa_name, X509 *signer);
86 static int TS_find_name(STACK_OF(GENERAL_NAME) *gen_names, GENERAL_NAME *name);

88 /*
89  * Local mapping between response codes and descriptions.
90  * Don't forget to change TS_STATUS_BUF_SIZE when modifying
91  * the elements of this array.
92  */
93 static const char *TS_status_text[] =
94 {
95     "granted",
96     "grantedWithMods",
97     "rejection",
98     "waiting",
99     "revocationWarning",
100     "revocationNotification" };

101 #define TS_STATUS_TEXT_SIZE    (sizeof(TS_status_text)/sizeof(*TS_status_text))

103 /*
104  * This must be greater or equal to the sum of the strings in TS_status_text
105  * plus the number of its elements.
106  */
107 #define TS_STATUS_BUF_SIZE    256

109 static struct
110 {
111     int code;
112     const char *text;
113     TS_failure_info[] =
114     {
115         { TS_INFO_BAD_ALG, "badAlg" },
116         { TS_INFO_BAD_REQUEST, "badRequest" },
117         { TS_INFO_BAD_DATA_FORMAT, "badDataFormat" },
118         { TS_INFO_TIME_NOT_AVAILABLE, "timeNotAvailable" },
119         { TS_INFO_UNACCEPTED_POLICY, "unacceptedPolicy" },
120         { TS_INFO_UNACCEPTED_EXTENSION, "unacceptedExtension" },
121         { TS_INFO_ADD_INFO_NOT_AVAILABLE, "addInfoNotAvailable" },
122         { TS_INFO_SYSTEM_FAILURE, "systemFailure" } };

123 #define TS_FAILURE_INFO_SIZE    (sizeof(TS_failure_info) / \
124                                 sizeof(*TS_failure_info))

126 /* Functions for verifying a signed TS_TST_INFO structure. */
```



```

128 /*
129  * This function carries out the following tasks:
130  *   - Checks if there is one and only one signer.
131  *   - Search for the signing certificate in 'certs' and in the response.
132  *   - Check the extended key usage and key usage fields of the signer
133  *   certificate (done by the path validation).
134  *   - Build and validate the certificate path.
135  *   - Check if the certificate path meets the requirements of the
136  *   SigningCertificate ESS signed attribute.
137  *   - Verify the signature value.
138  *   - Returns the signer certificate in 'signer', if 'signer' is not NULL.
139  */
140 int TS_RESP_verify_signature(PKCS7 *token, STACK_OF(X509) *certs,
141                             X509_STORE *store, X509 **signer_out)
142 {
143     STACK_OF(PKCS7_SIGNER_INFO) *sinfos = NULL;
144     PKCS7_SIGNER_INFO *si;
145     STACK_OF(X509) *signers = NULL;
146     X509 *signer;
147     STACK_OF(X509) *chain = NULL;
148     char buf[4096];
149     int i, j = 0, ret = 0;
150     BIO *p7bio = NULL;

152     /* Some sanity checks first. */
153     if (!token)
154     {
155         TSerr(TS_F_TS_RESP_VERIFY_SIGNATURE, TS_R_INVALID_NULL_POINTER);
156         goto err;
157     }

159     /* Check for the correct content type */
160     if (!PKCS7_type_is_signed(token))
161     {
162         TSerr(TS_F_TS_RESP_VERIFY_SIGNATURE, TS_R_WRONG_CONTENT_TYPE);
163         goto err;
164     }

166     /* Check if there is one and only one signer. */
167     sinfos = PKCS7_get_signer_info(token);
168     if (!sinfos || sk_PKCS7_SIGNER_INFO_num(sinfos) != 1)
169     {
170         TSerr(TS_F_TS_RESP_VERIFY_SIGNATURE,
171              TS_R_THERE_MUST_BE_ONE_SIGNER);
172         goto err;
173     }
174     si = sk_PKCS7_SIGNER_INFO_value(sinfos, 0);

176     /* Check for no content: no data to verify signature. */
177     if (PKCS7_get_detached(token))
178     {
179         TSerr(TS_F_TS_RESP_VERIFY_SIGNATURE, TS_R_NO_CONTENT);
180         goto err;
181     }

183     /* Get hold of the signer certificate, search only internal
184     certificates if it was requested. */
185     signers = PKCS7_get0_signers(token, certs, 0);
186     if (!signers || sk_X509_num(signers) != 1) goto err;
187     signer = sk_X509_value(signers, 0);

189     /* Now verify the certificate. */
190     if (!TS_verify_cert(store, certs, signer, &chain)) goto err;

192     /* Check if the signer certificate is consistent with the
193     ESS extension. */

```

```

194     if (!TS_check_signing_certs(si, chain)) goto err;

196     /* Creating the message digest. */
197     p7bio = PKCS7_dataInit(token, NULL);

199     /* We now have to 'read' from p7bio to calculate digests etc. */
200     while ((i = BIO_read(p7bio, buf, sizeof(buf))) > 0);

202     /* Verifying the signature. */
203     j = PKCS7_signatureVerify(p7bio, token, si, signer);
204     if (j <= 0)
205     {
206         TSerr(TS_F_TS_RESP_VERIFY_SIGNATURE, TS_R_SIGNATURE_FAILURE);
207         goto err;
208     }

210     /* Return the signer certificate if needed. */
211     if (signer_out)
212     {
213         *signer_out = signer;
214         CRYPTO_add(&signer->references, 1, CRYPTO_LOCK_X509);
215     }

217     ret = 1;

219 err:
220     BIO_free_all(p7bio);
221     sk_X509_pop_free(chain, X509_free);
222     sk_X509_free(signers);

224     return ret;
225 }

227 /*
228  * The certificate chain is returned in chain. Caller is responsible for
229  * freeing the vector.
230  */
231 static int TS_verify_cert(X509_STORE *store, STACK_OF(X509) *untrusted,
232                           X509 *signer, STACK_OF(X509) **chain)
233 {
234     X509_STORE_CTX cert_ctx;
235     int i;
236     int ret = 1;

238     /* chain is an out argument. */
239     *chain = NULL;
240     X509_STORE_CTX_init(&cert_ctx, store, signer, untrusted);
241     X509_STORE_CTX_set_purpose(&cert_ctx, X509_PURPOSE_TIMESTAMP_SIGN);
242     i = X509_verify_cert(&cert_ctx);
243     if (i <= 0)
244     {
245         int j = X509_STORE_CTX_get_error(&cert_ctx);
246         TSerr(TS_F_TS_VERIFY_CERT, TS_R_CERTIFICATE_VERIFY_ERROR);
247         ERR_add_error_data(2, "Verify error:",
248                          X509_verify_cert_error_string(j));
249         ret = 0;
250     }
251     else
252     {
253         /* Get a copy of the certificate chain. */
254         *chain = X509_STORE_CTX_get1_chain(&cert_ctx);
255     }

257     X509_STORE_CTX_cleanup(&cert_ctx);

259     return ret;

```

```

260     }
262 static int TS_check_signing_certs(PKCS7_SIGNER_INFO *si, STACK_OF(X509) *chain)
263 {
264     ESS_SIGNING_CERT *ss = ESS_get_signing_cert(si);
265     STACK_OF(ESS_CERT_ID) *cert_ids = NULL;
266     X509 *cert;
267     int i = 0;
268     int ret = 0;
270     if (!ss) goto err;
271     cert_ids = ss->cert_ids;
272     /* The signer certificate must be the first in cert_ids. */
273     cert = sk_X509_value(chain, 0);
274     if (TS_find_cert(cert_ids, cert) != 0) goto err;
275
276     /* Check the other certificates of the chain if there are more
277     than one certificate ids in cert_ids. */
278     if (sk_ESS_CERT_ID_num(cert_ids) > 1)
279     {
280         /* All the certificates of the chain must be in cert_ids. */
281         for (i = 1; i < sk_X509_num(chain); ++i)
282         {
283             cert = sk_X509_value(chain, i);
284             if (TS_find_cert(cert_ids, cert) < 0) goto err;
285         }
286     }
287     ret = 1;
288 err:
289     if (!ret)
290         TSerr(TS_F_TS_CHECK_SIGNING_CERTS,
291              TS_R_ESS_SIGNING_CERTIFICATE_ERROR);
292     ESS_SIGNING_CERT_free(ss);
293     return ret;
294 }
296 static ESS_SIGNING_CERT *ESS_get_signing_cert(PKCS7_SIGNER_INFO *si)
297 {
298     ASN1_TYPE *attr;
299     const unsigned char *p;
300     attr = PKCS7_get_signed_attribute(si,
301                                       NID_id_smime_aa_signingCertificate);
302     if (!attr) return NULL;
303     p = attr->value.sequence->data;
304     return d2i_ESS_SIGNING_CERT(NULL, &p, attr->value.sequence->length);
305 }
307 /* Returns < 0 if certificate is not found, certificate index otherwise. */
308 static int TS_find_cert(STACK_OF(ESS_CERT_ID) *cert_ids, X509 *cert)
309 {
310     int i;
312     if (!cert_ids || !cert) return -1;
314     /* Recompute SHA1 hash of certificate if necessary (side effect). */
315     X509_check_purpose(cert, -1, 0);
317     /* Look for cert in the cert_ids vector. */
318     for (i = 0; i < sk_ESS_CERT_ID_num(cert_ids); ++i)
319     {
320         ESS_CERT_ID *cid = sk_ESS_CERT_ID_value(cert_ids, i);
322         /* Check the SHA-1 hash first. */
323         if (cid->hash->length == sizeof(cert->sha1_hash)
324             && !memcmp(cid->hash->data, cert->sha1_hash,
325                        sizeof(cert->sha1_hash)))

```

```

326     {
327         /* Check the issuer/serial as well if specified. */
328         ESS_ISSUER_SERIAL *is = cid->issuer_serial;
329         if (!is || !TS_issuer_serial_cmp(is, cert->cert_info))
330             return i;
331     }
332 }
333
334     return -1;
335 }
337 static int TS_issuer_serial_cmp(ESS_ISSUER_SERIAL *is, X509_CINF *cinfo)
338 {
339     GENERAL_NAME *issuer;
341     if (!is || !cinfo || sk_GENERAL_NAME_num(is->issuer) != 1) return -1;
343     /* Check the issuer first. It must be a directory name. */
344     issuer = sk_GENERAL_NAME_value(is->issuer, 0);
345     if (issuer->type != GEN_DIRNAME
346         || X509_NAME_cmp(issuer->d.dirn, cinfo->issuer))
347         return -1;
349     /* Check the serial number, too. */
350     if (ASN1_INTEGER_cmp(is->serial, cinfo->serialNumber))
351         return -1;
353     return 0;
354 }
356 /*
357  * Verifies whether 'response' contains a valid response with regards
358  * to the settings of the context:
359  *   - Gives an error message if the TS_TST_INFO is not present.
360  *   - Calls TS_RESP_verify_token to verify the token content.
361  */
362 int TS_RESP_verify_response(TS_VERIFY_CTX *ctx, TS_RESP *response)
363 {
364     PKCS7 *token = TS_RESP_get_token(response);
365     TS_TST_INFO *tst_info = TS_RESP_get_tst_info(response);
366     int ret = 0;
368     /* Check if we have a successful TS_TST_INFO object in place. */
369     if (!TS_check_status_info(response)) goto err;
371     /* Check the contents of the time stamp token. */
372     if (!int_TS_RESP_verify_token(ctx, token, tst_info))
373         goto err;
375     ret = 1;
376 err:
377     return ret;
378 }
380 /*
381  * Tries to extract a TS_TST_INFO structure from the PKCS7 token and
382  * calls the internal int_TS_RESP_verify_token function for verifying it.
383  */
384 int TS_RESP_verify_token(TS_VERIFY_CTX *ctx, PKCS7 *token)
385 {
386     TS_TST_INFO *tst_info = PKCS7_to_TS_TST_INFO(token);
387     int ret = 0;
388     if (tst_info)
389     {
390         ret = int_TS_RESP_verify_token(ctx, token, tst_info);
391         TS_TST_INFO_free(tst_info);

```

```

392     }
393     return ret;
394 }

396 /*
397  * Verifies whether the 'token' contains a valid time stamp token
398  * with regards to the settings of the context. Only those checks are
399  * carried out that are specified in the context:
400  *   - Verifies the signature of the TS_TST_INFO.
401  *   - Checks the version number of the response.
402  *   - Check if the requested and returned policies math.
403  *   - Check if the message imprints are the same.
404  *   - Check if the nonces are the same.
405  *   - Check if the TSA name matches the signer.
406  *   - Check if the TSA name is the expected TSA.
407  */
408 static int int_TS_RESP_verify_token(TS_VERIFY_CTX *ctx,
409                                     PKCS7 *token, TS_TST_INFO *tst_info)
410 {
411     X509 *signer = NULL;
412     GENERAL_NAME *tsa_name = TS_TST_INFO_get_tsa(tst_info);
413     X509_ALGOR *md_alg = NULL;
414     unsigned char *imprint = NULL;
415     unsigned imprint_len = 0;
416     int ret = 0;

418     /* Verify the signature. */
419     if ((ctx->flags & TS_VFY_SIGNATURE)
420         && !TS_RESP_verify_signature(token, ctx->certs, ctx->store,
421                                     &signer))
422         goto err;
423
424     /* Check version number of response. */
425     if ((ctx->flags & TS_VFY_VERSION)
426         && TS_TST_INFO_get_version(tst_info) != 1)
427     {
428         TSerr(TS_F_INT_TS_RESP_VERIFY_TOKEN, TS_R_UNSUPPORTED_VERSION);
429         goto err;
430     }

432     /* Check policies. */
433     if ((ctx->flags & TS_VFY_POLICY)
434         && !TS_check_policy(ctx->policy, tst_info))
435         goto err;
436
437     /* Check message imprints. */
438     if ((ctx->flags & TS_VFY_IMPRINT)
439         && !TS_check_imprints(ctx->md_alg, ctx->imprint, ctx->imprint_len,
440                             tst_info))
441         goto err;
442
443     /* Compute and check message imprints. */
444     if ((ctx->flags & TS_VFY_DATA)
445         && (!TS_compute_imprint(ctx->data, tst_info,
446                                &md_alg, &imprint, &imprint_len)
447            || !TS_check_imprints(md_alg, imprint, imprint_len, tst_info)))
448         goto err;
449
450     /* Check nonces. */
451     if ((ctx->flags & TS_VFY_NONCE)
452         && !TS_check_nonces(ctx->nonce, tst_info))
453         goto err;
454
455     /* Check whether TSA name and signer certificate match. */
456     if ((ctx->flags & TS_VFY_SIGNER)
457         && tsa_name && !TS_check_signer_name(tsa_name, signer))

```

```

458     {
459         TSerr(TS_F_INT_TS_RESP_VERIFY_TOKEN, TS_R_TSA_NAME_MISMATCH);
460         goto err;
461     }

463     /* Check whether the TSA is the expected one. */
464     if ((ctx->flags & TS_VFY_TSA_NAME)
465         && !TS_check_signer_name(ctx->tsa_name, signer))
466     {
467         TSerr(TS_F_INT_TS_RESP_VERIFY_TOKEN, TS_R_TSA_UNTRUSTED);
468         goto err;
469     }

471     ret = 1;
472 err:
473     X509_free(signer);
474     X509_ALGOR_free(md_alg);
475     OPENSSL_free(imprint);
476     return ret;
477 }

479 static int TS_check_status_info(TS_RESP *response)
480 {
481     TS_STATUS_INFO *info = TS_RESP_get_status_info(response);
482     long status = ASN1_INTEGER_get(info->status);
483     const char *status_text = NULL;
484     char *embedded_status_text = NULL;
485     char failure_text[TS_STATUS_BUF_SIZE] = "";

487     /* Check if everything went fine. */
488     if (status == 0 || status == 1) return 1;

490     /* There was an error, get the description in status_text. */
491     if (0 <= status && status < (long)TS_STATUS_TEXT_SIZE)
492         status_text = TS_status_text[status];
493     else
494         status_text = "unknown code";

496     /* Set the embedded_status_text to the returned description. */
497     if (sk_ASN1_UTF8STRING_num(info->text) > 0
498         && !(embedded_status_text = TS_get_status_text(info->text)))
499         return 0;

501     /* Filling in failure_text with the failure information. */
502     if (info->failure_info)
503     {
504         int i;
505         int first = 1;
506         for (i = 0; i < (int)TS_FAILURE_INFO_SIZE; ++i)
507         {
508             if (ASN1_BIT_STRING_get_bit(info->failure_info,
509                                         TS_failure_info[i].code))
510             {
511                 if (!first)
512                     strcpy(failure_text, ",");
513                 else
514                     first = 0;
515                 strcat(failure_text, TS_failure_info[i].text);
516             }
517         }
518     }
519     if (failure_text[0] == '\0')
520         strcpy(failure_text, "unspecified");

522     /* Making up the error string. */
523     TSerr(TS_F_TS_CHECK_STATUS_INFO, TS_R_NO_TIME_STAMP_TOKEN);

```

```

524     ERR_add_error_data(6,
525         "status code: ", status_text,
526         ", status text: ", embedded_status_text ?
527         embedded_status_text : "unspecified",
528         ", failure codes: ", failure_text);
529     OPENSSL_free(embedded_status_text);

531     return 0;
532 }

534 static char *TS_get_status_text(STACK_OF(ASN1_UTF8STRING) *text)
535 {
536     int i;
537     unsigned int length = 0;
538     char *result = NULL;
539     char *p;

541     /* Determine length first. */
542     for (i = 0; i < sk_ASN1_UTF8STRING_num(text); ++i)
543     {
544         ASN1_UTF8STRING *current = sk_ASN1_UTF8STRING_value(text, i);
545         length += ASN1_STRING_length(current);
546         length += 1; /* separator character */
547     }
548     /* Allocate memory (closing '\0' included). */
549     if (!(result = OPENSSL_malloc(length)))
550     {
551         TSerr(TS_F_TS_GET_STATUS_TEXT, ERR_R_MALLOC_FAILURE);
552         return NULL;
553     }
554     /* Concatenate the descriptions. */
555     for (i = 0, p = result; i < sk_ASN1_UTF8STRING_num(text); ++i)
556     {
557         ASN1_UTF8STRING *current = sk_ASN1_UTF8STRING_value(text, i);
558         length = ASN1_STRING_length(current);
559         if (i > 0) *p++ = '/';
560         strncpy(p, (const char *)ASN1_STRING_data(current), length);
561         p += length;
562     }
563     /* We do have space for this, too. */
564     *p = '\0';
565     return result;
566 }
567

569 static int TS_check_policy(ASN1_OBJECT *req_oid, TS_TST_INFO *tst_info)
570 {
571     ASN1_OBJECT *resp_oid = TS_TST_INFO_get_policy_id(tst_info);

573     if (OBJ_cmp(req_oid, resp_oid) != 0)
574     {
575         TSerr(TS_F_TS_CHECK_POLICY, TS_R_POLICY_MISMATCH);
576         return 0;
577     }

579     return 1;
580 }

582 static int TS_compute_imprint(BIO *data, TS_TST_INFO *tst_info,
583     X509_ALGOR **md_alg,
584     unsigned char **imprint, unsigned *imprint_len)
585 {
586     TS_MSG_IMPRINT *msg_imprint = TS_TST_INFO_get_msg_imprint(tst_info);
587     X509_ALGOR *md_alg_resp = TS_MSG_IMPRINT_get_algo(msg_imprint);
588     const EVP_MD *md;
589     EVP_MD_CTX md_ctx;

```

```

590     unsigned char buffer[4096];
591     int length;

593     *md_alg = NULL;
594     *imprint = NULL;

596     /* Return the MD algorithm of the response. */
597     if (!(*md_alg = X509_ALGOR_dup(md_alg_resp))) goto err;

599     /* Getting the MD object. */
600     if (!(md = EVP_get_digestbyobj((*md_alg)->algorithm)))
601     {
602         TSerr(TS_F_TS_COMPUTE_IMPRINT, TS_R_UNSUPPORTED_MD_ALGORITHM);
603         goto err;
604     }

606     /* Compute message digest. */
607     length = EVP_MD_size(md);
608     if (length < 0)
609         goto err;
610     *imprint_len = length;
611     if (!(*imprint = OPENSSL_malloc(*imprint_len)))
612     {
613         TSerr(TS_F_TS_COMPUTE_IMPRINT, ERR_R_MALLOC_FAILURE);
614         goto err;
615     }

617     if (!EVP_DigestInit(&md_ctx, md))
618         goto err;
619     while ((length = BIO_read(data, buffer, sizeof(buffer))) > 0)
620     {
621         if (!EVP_DigestUpdate(&md_ctx, buffer, length))
622             goto err;
623     }
624     if (!EVP_DigestFinal(&md_ctx, *imprint, NULL))
625         goto err;

627     return 1;
628 err:
629     X509_ALGOR_free(*md_alg);
630     OPENSSL_free(*imprint);
631     *imprint_len = 0;
632     return 0;
633 }

635 static int TS_check_imprints(X509_ALGOR *algor_a,
636     unsigned char *imprint_a, unsigned len_a,
637     TS_TST_INFO *tst_info)
638 {
639     TS_MSG_IMPRINT *b = TS_TST_INFO_get_msg_imprint(tst_info);
640     X509_ALGOR *algor_b = TS_MSG_IMPRINT_get_algo(b);
641     int ret = 0;

643     /* algor_a is optional. */
644     if (algor_a)
645     {
646         /* Compare algorithm OIDs. */
647         if (OBJ_cmp(algor_a->algorithm, algor_b->algorithm)) goto err;

649         /* The parameter must be NULL in both. */
650         if ((algor_a->parameter
651             && ASN1_TYPE_get(algor_a->parameter) != V_ASN1_NULL)
652             || (algor_b->parameter
653             && ASN1_TYPE_get(algor_b->parameter) != V_ASN1_NULL))
654             goto err;
655     }

```

```

657     /* Compare octet strings. */
658     ret = len_a == (unsigned) ASN1_STRING_length(b->hashed_msg) &&
659         memcmp(imprint_a, ASN1_STRING_data(b->hashed_msg), len_a) == 0;
660 err:
661     if (!ret)
662         TSerr(TS_F_TS_CHECK_IMPRINTS, TS_R_MESSAGE_IMPRINT_MISMATCH);
663     return ret;
664 }

666 static int TS_check_nonces(const ASN1_INTEGER *a, TS_TST_INFO *tst_info)
667 {
668     const ASN1_INTEGER *b = TS_TST_INFO_get_nonce(tst_info);

670     /* Error if nonce is missing. */
671     if (!b)
672     {
673         TSerr(TS_F_TS_CHECK_NONCES, TS_R_NONCE_NOT_RETURNED);
674         return 0;
675     }

677     /* No error if a nonce is returned without being requested. */
678     if (ASN1_INTEGER_cmp(a, b) != 0)
679     {
680         TSerr(TS_F_TS_CHECK_NONCES, TS_R_NONCE_MISMATCH);
681         return 0;
682     }

684     return 1;
685 }

687 /* Check if the specified TSA name matches either the subject
688    or one of the subject alternative names of the TSA certificate. */
689 static int TS_check_signer_name(GENERAL_NAME *tsa_name, X509 *signer)
690 {
691     STACK_OF(GENERAL_NAME) *gen_names = NULL;
692     int idx = -1;
693     int found = 0;

695     /* Check the subject name first. */
696     if (tsa_name->type == GEN_DIRNAME
697         && X509_name_cmp(tsa_name->d.dirn, signer->cert_info->subject) == 0)
698         return 1;

700     /* Check all the alternative names. */
701     gen_names = X509_get_ext_d2i(signer, NID_subject_alt_name,
702                                  NULL, &idx);
703     while (gen_names != NULL
704            && !(found = TS_find_name(gen_names, tsa_name) >= 0))
705     {
706         /* Get the next subject alternative name,
707            although there should be no more than one. */
708         GENERAL_NAMES_free(gen_names);
709         gen_names = X509_get_ext_d2i(signer, NID_subject_alt_name,
710                                      NULL, &idx);
711     }
712     if (gen_names) GENERAL_NAMES_free(gen_names);
713     return found;
714 }

715

717 /* Returns 1 if name is in gen_names, 0 otherwise. */
718 static int TS_find_name(STACK_OF(GENERAL_NAME) *gen_names, GENERAL_NAME *name)
719 {
720     int i, found;
721     for (i = 0, found = 0; !found && i < sk_GENERAL_NAME_num(gen_names);

```

```

722         ++i)
723     {
724         GENERAL_NAME *current = sk_GENERAL_NAME_value(gen_names, i);
725         found = GENERAL_NAME_cmp(current, name) == 0;
726     }
727     return found ? i - 1 : -1;
728 }

```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_verify_ctx.c

1

```
*****
4983 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ts/ts_verify_ctx.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ts/ts_verify_ctx.c */
2 /* Written by Zoltan Glozik (zglozik@stones.com) for the OpenSSL
3  * project 2003.
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
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15  * 2. Redistributions in binary form must reproduce the above copyright
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18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
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38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
59 #include "cryptlib.h"
60 #include <openssl/objects.h>
61 #include <openssl/ts.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ts/ts_verify_ctx.c

2

```
63 TS_VERIFY_CTX *TS_VERIFY_CTX_new(void)
64 {
65     TS_VERIFY_CTX *ctx =
66         (TS_VERIFY_CTX *) OPENSSL_malloc(sizeof(TS_VERIFY_CTX));
67     if (ctx)
68         memset(ctx, 0, sizeof(TS_VERIFY_CTX));
69     else
70         TSerr(TS_F_TS_VERIFY_CTX_NEW, ERR_R_MALLOC_FAILURE);
71     return ctx;
72 }
73
74 void TS_VERIFY_CTX_init(TS_VERIFY_CTX *ctx)
75 {
76     OPENSSL_assert(ctx != NULL);
77     memset(ctx, 0, sizeof(TS_VERIFY_CTX));
78 }
79
80 void TS_VERIFY_CTX_free(TS_VERIFY_CTX *ctx)
81 {
82     if (!ctx) return;
83
84     TS_VERIFY_CTX_cleanup(ctx);
85     OPENSSL_free(ctx);
86 }
87
88 void TS_VERIFY_CTX_cleanup(TS_VERIFY_CTX *ctx)
89 {
90     if (!ctx) return;
91
92     X509_STORE_free(ctx->store);
93     sk_X509_pop_free(ctx->certs, X509_free);
94
95     ASN1_OBJECT_free(ctx->policy);
96
97     X509_ALGOR_free(ctx->md_alg);
98     OPENSSL_free(ctx->imprint);
99
100     BIO_free_all(ctx->data);
101
102     ASN1_INTEGER_free(ctx->nonce);
103
104     GENERAL_NAME_free(ctx->tsa_name);
105
106     TS_VERIFY_CTX_init(ctx);
107 }
108
109 TS_VERIFY_CTX *TS_REQ_to_TS_VERIFY_CTX(TS_REQ *req, TS_VERIFY_CTX *ctx)
110 {
111     TS_VERIFY_CTX *ret = ctx;
112     ASN1_OBJECT *policy;
113     TS_MSG_IMPRINT *imprint;
114     X509_ALGOR *md_alg;
115     ASN1_OCTET_STRING *msg;
116     const ASN1_INTEGER *nonce;
117
118     OPENSSL_assert(req != NULL);
119     if (ret)
120         TS_VERIFY_CTX_cleanup(ret);
121     else
122         if (!(ret = TS_VERIFY_CTX_new())) return NULL;
123
124     /* Setting flags. */
125     ret->flags = TS_VFY_ALL_IMPRINT & ~(TS_VFY_TSA_NAME | TS_VFY_SIGNATURE);
126
127     /* Setting policy. */
```

```
128     if ((policy = TS_REQ_get_policy_id(req)) != NULL)
129     {
130         if (!(ret->policy = OBJ_dup(policy))) goto err;
131     }
132     else
133         ret->flags &= ~TS_VFY_POLICY;
134
135     /* Setting md_alg, imprint and imprint_len. */
136     imprint = TS_REQ_get_msg_imprint(req);
137     md_alg = TS_MSG_IMPRINT_get_algo(imprint);
138     if (!(ret->md_alg = X509_ALGOR_dup(md_alg))) goto err;
139     msg = TS_MSG_IMPRINT_get_msg(imprint);
140     ret->imprint_len = ASN1_STRING_length(msg);
141     if (!(ret->imprint = OPENSSL_malloc(ret->imprint_len))) goto err;
142     memcpy(ret->imprint, ASN1_STRING_data(msg), ret->imprint_len);
143
144     /* Setting nonce. */
145     if ((nonce = TS_REQ_get_nonce(req)) != NULL)
146     {
147         if (!(ret->nonce = ASN1_INTEGER_dup(nonce))) goto err;
148     }
149     else
150         ret->flags &= ~TS_VFY_NONCE;
151
152     return ret;
153 err:
154     if (ctx)
155         TS_VERIFY_CTX_cleanup(ctx);
156     else
157         TS_VERIFY_CTX_free(ret);
158     return NULL;
159 }
```

new/usr/src/lib/openssl/libsunw_crypto/txt_db/txt_db.c

1

9967 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/txt_db/txt_db.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/txt_db/txt_db.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
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17 * the code are not to be removed.
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
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40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <string.h>
```

new/usr/src/lib/openssl/libsunw_crypto/txt_db/txt_db.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/buffer.h>
64 #include <openssl/txt_db.h>
65
66 #undef BUFSIZE
67 #define BUFSIZE 512
68
69 const char TXT_DB_version[]="TXT_DB" OPENSSL_VERSION_PTEXT;
70
71 TXT_DB *TXT_DB_read(BIO *in, int num)
72 {
73     TXT_DB *ret=NULL;
74     int er=1;
75     int esc=0;
76     long ln=0;
77     int i,add,n;
78     int size=BUFSIZE;
79     int offset=0;
80     char *p,*f;
81     OPENSSL_STRING *pp;
82     BUF_MEM *buf=NULL;
83
84     if ((buf=BUF_MEM_new()) == NULL) goto err;
85     if (!BUF_MEM_grow(buf,size)) goto err;
86
87     if ((ret=OPENSSL_malloc(sizeof(TXT_DB))) == NULL)
88         goto err;
89     ret->num_fields=num;
90     ret->index=NULL;
91     ret->qual=NULL;
92     if ((ret->data=sk_OPENSSL_PSTRING_new_null()) == NULL)
93         goto err;
94     if ((ret->index=OPENSSL_malloc(sizeof(*ret->index)*num)) == NULL)
95         goto err;
96     if ((ret->qual=OPENSSL_malloc(sizeof(*ret->qual)*num)) == NULL)
97         goto err;
98     for (i=0; i<num; i++)
99     {
100         ret->index[i]=NULL;
101         ret->qual[i]=NULL;
102     }
103
104     add=(num+1)*sizeof(char *);
105     buf->data[size-1]='\0';
106     offset=0;
107     for (;;)
108     {
109         if (offset != 0)
110         {
111             size+=BUFSIZE;
112             if (!BUF_MEM_grow_clean(buf,size)) goto err;
113         }
114         buf->data[offset]='\0';
115         BIO_gets(in,&(buf->data[offset]),size-offset);
116         ln++;
117         if (buf->data[offset] == '\0') break;
118         if ((offset == 0) && (buf->data[0] == '#')) continue;
119         i=strlen(&(buf->data[offset]));
120         offset+=i;
121         if (buf->data[offset-1] != '\n')
122             continue;
123     }
124     else
125     {
126         buf->data[offset-1]='\0'; /* blat the '\n' */
127         if (!(p=OPENSSL_malloc(add+offset))) goto err;
128         offset=0;
```



```

128     }
129     pp=(char **)p;
130     p+=add;
131     n=0;
132     pp[n++]=p;
133     i=0;
134     f=buf->data;
135
136     esc=0;
137     for (;;)
138     {
139         if (*f == '\0') break;
140         if (*f == '\t')
141         {
142             if (esc)
143                 p--;
144             else
145             {
146                 *(p++)='\0';
147                 f++;
148                 if (n >= num) break;
149                 pp[n++]=p;
150                 continue;
151             }
152         }
153         esc=(*f == '\\');
154         *(p++)= *(f++);
155     }
156     *(p++)='\0';
157     if ((n != num) || (*f != '\0'))
158     {
159         #if !defined(OPENSSL_NO_STDIO) && !defined(OPENSSL_SYS_WIN16) /* temporary fix
160         fprintf(stderr,"wrong number of fields on line %ld (look
161         #endif
162         er=2;
163         goto err;
164     }
165     pp[n]=p;
166     if (!sk_OPENSSL_PSTRING_push(ret->data,pp))
167     {
168         #if !defined(OPENSSL_NO_STDIO) && !defined(OPENSSL_SYS_WIN16) /* temporary fix
169         fprintf(stderr,"failure in sk_push\n");
170         #endif
171         er=2;
172         goto err;
173     }
174 }
175 er=0;
176 err:
177     BUF_MEM_free(buf);
178     if (er)
179     {
180         #if !defined(OPENSSL_NO_STDIO) && !defined(OPENSSL_SYS_WIN16)
181         if (er == 1) fprintf(stderr,"OPENSSL_malloc failure\n");
182         #endif
183         if (ret != NULL)
184         {
185             if (ret->data != NULL) sk_OPENSSL_PSTRING_free(ret->data);
186             if (ret->index != NULL) OPENSSL_free(ret->index);
187             if (ret->qual != NULL) OPENSSL_free(ret->qual);
188             if (ret != NULL) OPENSSL_free(ret);
189         }
190         return(NULL);
191     }
192     else
193         return(ret);

```

```

194     }
195
196     OPENSSL_STRING *TXT_DB_get_by_index(TXT_DB *db, int idx, OPENSSL_STRING *value)
197     {
198         OPENSSL_STRING *ret;
199         LHASH_OF(OPENSSL_STRING) *lh;
200
201         if (idx >= db->num_fields)
202         {
203             db->error=DB_ERROR_INDEX_OUT_OF_RANGE;
204             return(NULL);
205         }
206         lh=db->index[idx];
207         if (lh == NULL)
208         {
209             db->error=DB_ERROR_NO_INDEX;
210             return(NULL);
211         }
212         ret=lh_OPENSSL_STRING_retrieve(lh,value);
213         db->error=DB_ERROR_OK;
214         return(ret);
215     }
216
217     int TXT_DB_create_index(TXT_DB *db, int field, int (*qual)(OPENSSL_STRING *),
218                           LHASH_HASH_FN_TYPE hash, LHASH_COMP_FN_TYPE cmp)
219     {
220         LHASH_OF(OPENSSL_STRING) *idx;
221         OPENSSL_STRING *r;
222         int i,n;
223
224         if (field >= db->num_fields)
225         {
226             db->error=DB_ERROR_INDEX_OUT_OF_RANGE;
227             return(0);
228         }
229         /* FIXME: we lose type checking at this point */
230         if ((idx=(LHASH_OF(OPENSSL_STRING) *)lh_new(hash,cmp)) == NULL)
231         {
232             db->error=DB_ERROR_MALLOC;
233             return(0);
234         }
235         n=sk_OPENSSL_PSTRING_num(db->data);
236         for (i=0; i<n; i++)
237         {
238             r=sk_OPENSSL_PSTRING_value(db->data,i);
239             if ((qual != NULL) && (qual(r) == 0)) continue;
240             if ((r=lh_OPENSSL_STRING_insert(idx,r)) != NULL)
241             {
242                 db->error=DB_ERROR_INDEX_CLASH;
243                 db->arg1=sk_OPENSSL_PSTRING_find(db->data,r);
244                 db->arg2=i;
245                 lh_OPENSSL_STRING_free(idx);
246                 return(0);
247             }
248         }
249         if (db->index[field] != NULL) lh_OPENSSL_STRING_free(db->index[field]);
250         db->index[field]=idx;
251         db->qual[field]=qual;
252         return(1);
253     }
254
255     long TXT_DB_write(BIO *out, TXT_DB *db)
256     {
257         long i,j,n,nn,l,tot=0;
258         char *p,**pp,*f;
259         BUF_MEM *buf=NULL;

```

```

260     long ret= -1;

262     if ((buf=BUF_MEM_new()) == NULL)
263         goto err;
264     n=sk_OPENSSL_PSTRING_num(db->data);
265     nn=db->num_fields;
266     for (i=0; i<n; i++)
267     {
268         pp=sk_OPENSSL_PSTRING_value(db->data,i);

270         l=0;
271         for (j=0; j<nn; j++)
272         {
273             if (pp[j] != NULL)
274                 l+=strlen(pp[j]);
275         }

276         if (!BUF_MEM_grow_clean(buf,(int)(l*2+nn))) goto err;

278         p=buf->data;
279         for (j=0; j<nn; j++)
280         {
281             f=pp[j];
282             if (f != NULL)
283                 for (;;)
284                 {
285                     if (*f == '\0') break;
286                     if (*f == '\t') *(p++)='\';
287                     *(p++)= *(f++);
288                 }
289             *(p++)='\t';
290         }
291         p[-1]='\n';
292         j=p-buf->data;
293         if (BIO_write(out,buf->data,(int)j) != j)
294             goto err;
295         tot+=j;
296     }
297     ret=tot;
298 err:
299     if (buf != NULL) BUF_MEM_free(buf);
300     return(ret);
301 }

303 int TXT_DB_insert(TXT_DB *db, OPENSSL_STRING *row)
304 {
305     int i;
306     OPENSSL_STRING *r;

308     for (i=0; i<db->num_fields; i++)
309     {
310         if (db->index[i] != NULL)
311         {
312             if ((db->qual[i] != NULL) &&
313                 (db->qual[i](row) == 0)) continue;
314             r=lh_OPENSSL_STRING_retrieve(db->index[i],row);
315             if (r != NULL)
316             {
317                 db->error=DB_ERROR_INDEX_CLASH;
318                 db->arg1=i;
319                 db->arg_row=r;
320                 goto err;
321             }
322         }
323     }

324     /* We have passed the index checks, now just append and insert */
325     if (!sk_OPENSSL_PSTRING_push(db->data,row))

```

```

326     {
327         db->error=DB_ERROR_MALLOC;
328         goto err;
329     }

331     for (i=0; i<db->num_fields; i++)
332     {
333         if (db->index[i] != NULL)
334         {
335             if ((db->qual[i] != NULL) &&
336                 (db->qual[i](row) == 0)) continue;
337             (void)lh_OPENSSL_STRING_insert(db->index[i],row);
338         }
339     }

340     return(1);
341 err:
342     return(0);
343 }

345 void TXT_DB_free(TXT_DB *db)
346 {
347     int i,n;
348     char **p,*max;

350     if(db == NULL)
351         return;

353     if (db->index != NULL)
354     {
355         for (i=db->num_fields-1; i>=0; i--)
356             if (db->index[i] != NULL) lh_OPENSSL_STRING_free(db->index[i]);
357         OPENSSL_free(db->index);
358     }

359     if (db->qual != NULL)
360         OPENSSL_free(db->qual);
361     if (db->data != NULL)
362     {
363         for (i=sk_OPENSSL_PSTRING_num(db->data)-1; i>=0; i--)
364         {
365             /* check if any 'fields' have been allocated
366              * from outside of the initial block */
367             p=sk_OPENSSL_PSTRING_value(db->data,i);
368             max=p[db->num_fields]; /* last address */
369             if (max == NULL) /* new row */
370             {
371                 for (n=0; n<db->num_fields; n++)
372                     if (p[n] != NULL) OPENSSL_free(p[n]);
373             }
374             else
375             {
376                 for (n=0; n<db->num_fields; n++)
377                 {
378                     if (((p[n] < (char *)p) || (p[n] > max))
379                         && (p[n] != NULL))
380                         OPENSSL_free(p[n]);
381                 }
382             }
383             OPENSSL_free(sk_OPENSSL_PSTRING_value(db->data,i));
384         }
385         sk_OPENSSL_PSTRING_free(db->data);
386     }
387     OPENSSL_free(db);
388 }

```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_compat.c

1

```
*****
3055 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ui/ui_compat.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ui/ui_compat.c -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
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49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com).  This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55 #include <string.h>
56 #include <openssl/ui_compat.h>
57
58
59 int _ossl_old_des_read_pw_string(char *buf,int length,const char *prompt,int ver
60 {
61     return UI_UTIL_read_pw_string(buf, length, prompt, verify);
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_compat.c

2

```
62     }
63
64 int _ossl_old_des_read_pw(char *buf,char *buff,int size,const char *prompt,int v
65 {
66     return UI_UTIL_read_pw(buf, buff, size, prompt, verify);
67 }
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_err.c

1

```
*****
4586 Fri May 30 18:32:11 2014
new/usr/src/lib/openssl/libsunw_crypto/ui/ui_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ui/ui_err.c */
2 /* =====
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48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */
60
61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/ui.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_UI,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_UI,0,reason)
70
71 static ERR_STRING_DATA UI_str_functs[]=
72 {
73 {ERR_FUNC(UI_F_GENERAL_ALLOCATE_BOOLEAN), "GENERAL_ALLOCATE_BOOLEAN"},
74 {ERR_FUNC(UI_F_GENERAL_ALLOCATE_PROMPT), "GENERAL_ALLOCATE_PROMPT"},
75 {ERR_FUNC(UI_F_GENERAL_ALLOCATE_STRING), "GENERAL_ALLOCATE_STRING"},
76 {ERR_FUNC(UI_F_UI_CTRL), "UI_ctrl"},
77 {ERR_FUNC(UI_F_UI_DUP_ERROR_STRING), "UI_dup_error_string"},
78 {ERR_FUNC(UI_F_UI_DUP_INFO_STRING), "UI_dup_info_string"},
79 {ERR_FUNC(UI_F_UI_DUP_INPUT_BOOLEAN), "UI_dup_input_boolean"},
80 {ERR_FUNC(UI_F_UI_DUP_INPUT_STRING), "UI_dup_input_string"},
81 {ERR_FUNC(UI_F_UI_DUP_VERIFY_STRING), "UI_dup_verify_string"},
82 {ERR_FUNC(UI_F_UI_GET0_RESULT), "UI_get0_result"},
83 {ERR_FUNC(UI_F_UI_NEW_METHOD), "UI_new_method"},
84 {ERR_FUNC(UI_F_UI_SET_RESULT), "UI_set_result"},
85 {0,NULL}};
86
87 static ERR_STRING_DATA UI_str_reasons[]=
88 {
89 {ERR_REASON(UI_R_COMMON_OK_AND_CANCEL_CHARACTERS), "common ok and cancel characte"},
90 {ERR_REASON(UI_R_INDEX_TOO_LARGE), "index too large"},
91 {ERR_REASON(UI_R_INDEX_TOO_SMALL), "index too small"},
92 {ERR_REASON(UI_R_NO_RESULT_BUFFER), "no result buffer"},
93 {ERR_REASON(UI_R_RESULT_TOO_LARGE), "result too large"},
94 {ERR_REASON(UI_R_RESULT_TOO_SMALL), "result too small"},
95 {ERR_REASON(UI_R_UNKNOWN_CONTROL_COMMAND), "unknown control command"},
96 {0,NULL}};
97
98
99 #endif
100
101 void ERR_load_UI_strings(void)
102 {
103 #ifndef OPENSSL_NO_ERR
104
105     if (ERR_func_error_string(UI_str_functs[0].error) == NULL)
106     {
107         ERR_load_strings(0,UI_str_functs);
108         ERR_load_strings(0,UI_str_reasons);
109     }
110 #endif
111 }
112 }
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_lib.c

1

```
*****
20587 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/ui/ui_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ui/ui_lib.c -*- mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) for the OpenSSL
3  * project 2001.
4  */
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55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <string.h>
59 #include "cryptlib.h"
60 #include <openssl/e_os2.h>
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_lib.c

2

```
62 #include <openssl/buffer.h>
63 #include <openssl/ui.h>
64 #include <openssl/err.h>
65 #include "ui_locl.h"
66
67 IMPLEMENT_STACK_OF(UI_STRING_ST)
68
69 static const UI_METHOD *default_UI_meth=NULL;
70
71 UI *UI_new(void)
72 {
73     return(UI_new_method(NULL));
74 }
75
76 UI *UI_new_method(const UI_METHOD *method)
77 {
78     UI *ret;
79
80     ret=(UI *)OPENSSL_malloc(sizeof(UI));
81     if (ret == NULL)
82     {
83         UIerr(UI_F_UI_NEW_METHOD,ERR_R_MALLOC_FAILURE);
84         return NULL;
85     }
86     if (method == NULL)
87         ret->meth=UI_get_default_method();
88     else
89         ret->meth=method;
90
91     ret->strings=NULL;
92     ret->user_data=NULL;
93     ret->flags=0;
94     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_UI, ret, &ret->ex_data);
95     return ret;
96 }
97
98 static void free_string(UI_STRING *uis)
99 {
100     if (uis->flags & OUT_STRING_FREEABLE)
101     {
102         OPENSSL_free((char *)uis->out_string);
103         switch(uis->type)
104         {
105             case UIT_BOOLEAN:
106                 OPENSSL_free((char *)uis->_.boolean_data.action_desc);
107                 OPENSSL_free((char *)uis->_.boolean_data.ok_chars);
108                 OPENSSL_free((char *)uis->_.boolean_data.cancel_chars);
109                 break;
110             default:
111                 break;
112         }
113     }
114     OPENSSL_free(uis);
115 }
116
117 void UI_free(UI *ui)
118 {
119     if (ui == NULL)
120         return;
121     sk_UI_STRING_pop_free(ui->strings,free_string);
122     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_UI, ui, &ui->ex_data);
123     OPENSSL_free(ui);
124 }
125
126 static int allocate_string_stack(UI *ui)
127 {
```

```

128     if (ui->strings == NULL)
129     {
130         ui->strings=sk_UI_STRING_new_null();
131         if (ui->strings == NULL)
132         {
133             return -1;
134         }
135     }
136     return 0;
137 }

139 static UI_STRING *general_allocate_prompt(UI *ui, const char *prompt,
140 int prompt_freeable, enum UI_string_types type, int input_flags,
141 char *result_buf)
142 {
143     UI_STRING *ret = NULL;

145     if (prompt == NULL)
146     {
147         UIerr(UI_F_GENERAL_ALLOCATE_PROMPT, ERR_R_PASSED_NULL_PARAMETER);
148     }
149     else if ((type == UIT_PROMPT || type == UIT_VERIFY
150 || type == UIT_BOOLEAN) && result_buf == NULL)
151     {
152         UIerr(UI_F_GENERAL_ALLOCATE_PROMPT, UI_R_NO_RESULT_BUFFER);
153     }
154     else if ((ret = (UI_STRING *)OPENSSL_malloc(sizeof(UI_STRING))))
155     {
156         ret->out_string=prompt;
157         ret->flags=prompt_freeable ? OUT_STRING_FREEABLE : 0;
158         ret->input_flags=input_flags;
159         ret->type=type;
160         ret->result_buf=result_buf;
161     }
162     return ret;
163 }

165 static int general_allocate_string(UI *ui, const char *prompt,
166 int prompt_freeable, enum UI_string_types type, int input_flags,
167 char *result_buf, int minsize, int maxsize, const char *test_buf)
168 {
169     int ret = -1;
170     UI_STRING *s = general_allocate_prompt(ui, prompt, prompt_freeable,
171 type, input_flags, result_buf);

173     if (s)
174     {
175         if (allocate_string_stack(ui) >= 0)
176         {
177             s->_string_data.result_minsize=minsize;
178             s->_string_data.result_maxsize=maxsize;
179             s->_string_data.test_buf=test_buf;
180             ret=sk_UI_STRING_push(ui->strings, s);
181             /* sk_push() returns 0 on error. Let's adapt that */
182             if (ret <= 0) ret--;
183         }
184         else
185             free_string(s);
186     }
187     return ret;
188 }

190 static int general_allocate_boolean(UI *ui,
191 const char *prompt, const char *action_desc,
192 const char *ok_chars, const char *cancel_chars,
193 int prompt_freeable, enum UI_string_types type, int input_flags,

```

```

194     char *result_buf)
195     {
196         int ret = -1;
197         UI_STRING *s;
198         const char *p;

200         if (ok_chars == NULL)
201         {
202             UIerr(UI_F_GENERAL_ALLOCATE_BOOLEAN, ERR_R_PASSED_NULL_PARAMETER)
203         }
204         else if (cancel_chars == NULL)
205         {
206             UIerr(UI_F_GENERAL_ALLOCATE_BOOLEAN, ERR_R_PASSED_NULL_PARAMETER)
207         }
208         else
209         {
210             for(p = ok_chars; *p; p++)
211             {
212                 if (strchr(cancel_chars, *p))
213                 {
214                     UIerr(UI_F_GENERAL_ALLOCATE_BOOLEAN,
215 UI_R_COMMON_OK_AND_CANCEL_CHARACTERS);
216                 }
217             }

219             s = general_allocate_prompt(ui, prompt, prompt_freeable,
220 type, input_flags, result_buf);

222             if (s)
223             {
224                 if (allocate_string_stack(ui) >= 0)
225                 {
226                     s->_boolean_data.action_desc = action_desc;
227                     s->_boolean_data.ok_chars = ok_chars;
228                     s->_boolean_data.cancel_chars = cancel_chars;
229                     ret=sk_UI_STRING_push(ui->strings, s);
230                     /* sk_push() returns 0 on error.
231                     Let's adapt that */
232                     if (ret <= 0) ret--;
233                 }
234                 else
235                     free_string(s);
236             }
237         }
238         return ret;
239     }

241 /* Returns the index to the place in the stack or -1 for error. Uses a
242 direct reference to the prompt. */
243 int UI_add_input_string(UI *ui, const char *prompt, int flags,
244 char *result_buf, int minsize, int maxsize)
245 {
246     return general_allocate_string(ui, prompt, 0,
247 UIT_PROMPT, flags, result_buf, minsize, maxsize, NULL);
248 }

250 /* Same as UI_add_input_string(), excepts it takes a copy of the prompt */
251 int UI_dup_input_string(UI *ui, const char *prompt, int flags,
252 char *result_buf, int minsize, int maxsize)
253 {
254     char *prompt_copy=NULL;

256     if (prompt)
257     {
258         prompt_copy=BUF_strdup(prompt);
259         if (prompt_copy == NULL)

```

```

260     {
261         UIerr(UI_F_UI_DUP_INPUT_STRING,ERR_R_MALLOC_FAILURE);
262         return 0;
263     }
264 }
265
266     return general_allocate_string(ui, prompt_copy, 1,
267         UIT_PROMPT, flags, result_buf, minsize, maxsize, NULL);
268 }
269
270 int UI_add_verify_string(UI *ui, const char *prompt, int flags,
271     char *result_buf, int minsize, int maxsize, const char *test_buf)
272 {
273     return general_allocate_string(ui, prompt, 0,
274         UIT_VERIFY, flags, result_buf, minsize, maxsize, test_buf);
275 }
276
277 int UI_dup_verify_string(UI *ui, const char *prompt, int flags,
278     char *result_buf, int minsize, int maxsize, const char *test_buf)
279 {
280     char *prompt_copy=NULL;
281
282     if (prompt)
283     {
284         prompt_copy=BUF_strdup(prompt);
285         if (prompt_copy == NULL)
286         {
287             UIerr(UI_F_UI_DUP_VERIFY_STRING,ERR_R_MALLOC_FAILURE);
288             return -1;
289         }
290     }
291
292     return general_allocate_string(ui, prompt_copy, 1,
293         UIT_VERIFY, flags, result_buf, minsize, maxsize, test_buf);
294 }
295
296 int UI_add_input_boolean(UI *ui, const char *prompt, const char *action_desc,
297     const char *ok_chars, const char *cancel_chars,
298     int flags, char *result_buf)
299 {
300     return general_allocate_boolean(ui, prompt, action_desc,
301         ok_chars, cancel_chars, 0, UIT_BOOLEAN, flags, result_buf);
302 }
303
304 int UI_dup_input_boolean(UI *ui, const char *prompt, const char *action_desc,
305     const char *ok_chars, const char *cancel_chars,
306     int flags, char *result_buf)
307 {
308     char *prompt_copy = NULL;
309     char *action_desc_copy = NULL;
310     char *ok_chars_copy = NULL;
311     char *cancel_chars_copy = NULL;
312
313     if (prompt)
314     {
315         prompt_copy=BUF_strdup(prompt);
316         if (prompt_copy == NULL)
317         {
318             UIerr(UI_F_UI_DUP_INPUT_BOOLEAN,ERR_R_MALLOC_FAILURE);
319             goto err;
320         }
321     }
322
323     if (action_desc)
324     {
325         action_desc_copy=BUF_strdup(action_desc);

```

```

326         if (action_desc_copy == NULL)
327         {
328             UIerr(UI_F_UI_DUP_INPUT_BOOLEAN,ERR_R_MALLOC_FAILURE);
329             goto err;
330         }
331     }
332
333     if (ok_chars)
334     {
335         ok_chars_copy=BUF_strdup(ok_chars);
336         if (ok_chars_copy == NULL)
337         {
338             UIerr(UI_F_UI_DUP_INPUT_BOOLEAN,ERR_R_MALLOC_FAILURE);
339             goto err;
340         }
341     }
342
343     if (cancel_chars)
344     {
345         cancel_chars_copy=BUF_strdup(cancel_chars);
346         if (cancel_chars_copy == NULL)
347         {
348             UIerr(UI_F_UI_DUP_INPUT_BOOLEAN,ERR_R_MALLOC_FAILURE);
349             goto err;
350         }
351     }
352
353     return general_allocate_boolean(ui, prompt_copy, action_desc_copy,
354         ok_chars_copy, cancel_chars_copy, 1, UIT_BOOLEAN, flags,
355         result_buf);
356 err:
357     if (prompt_copy) OPENSSL_free(prompt_copy);
358     if (action_desc_copy) OPENSSL_free(action_desc_copy);
359     if (ok_chars_copy) OPENSSL_free(ok_chars_copy);
360     if (cancel_chars_copy) OPENSSL_free(cancel_chars_copy);
361     return -1;
362 }
363
364 int UI_add_info_string(UI *ui, const char *text)
365 {
366     return general_allocate_string(ui, text, 0, UIT_INFO, 0, NULL, 0, 0,
367         NULL);
368 }
369
370 int UI_dup_info_string(UI *ui, const char *text)
371 {
372     char *text_copy=NULL;
373
374     if (text)
375     {
376         text_copy=BUF_strdup(text);
377         if (text_copy == NULL)
378         {
379             UIerr(UI_F_UI_DUP_INFO_STRING,ERR_R_MALLOC_FAILURE);
380             return -1;
381         }
382     }
383
384     return general_allocate_string(ui, text_copy, 1, UIT_INFO, 0, NULL,
385         0, 0, NULL);
386 }
387
388 int UI_add_error_string(UI *ui, const char *text)
389 {
390     return general_allocate_string(ui, text, 0, UIT_ERROR, 0, NULL, 0, 0,
391         NULL);

```

```

392     }
394 int UI_dup_error_string(UI *ui, const char *text)
395 {
396     char *text_copy=NULL;
398     if (text)
399     {
400         text_copy=BUF_strdup(text);
401         if (text_copy == NULL)
402         {
403             UIerr(UI_F_UI_DUP_ERROR_STRING,ERR_R_MALLOC_FAILURE);
404             return -1;
405         }
406     }
407     return general_allocate_string(ui, text_copy, 1, UIT_ERROR, 0, NULL,
408     0, 0, NULL);
409 }
411 char *UI_construct_prompt(UI *ui, const char *object_desc,
412 const char *object_name)
413 {
414     char *prompt = NULL;
416     if (ui->meth->ui_construct_prompt)
417         prompt = ui->meth->ui_construct_prompt(ui,
418         object_desc, object_name);
419     else
420     {
421         char prompt1[] = "Enter ";
422         char prompt2[] = " for ";
423         char prompt3[] = ":";
424         int len = 0;
426         if (object_desc == NULL)
427             return NULL;
428         len = sizeof(prompt1) - 1 + strlen(object_desc);
429         if (object_name)
430             len += sizeof(prompt2) - 1 + strlen(object_name);
431         len += sizeof(prompt3) - 1;
433         prompt = (char *)OPENSSL_malloc(len + 1);
434         BUF_strncpy(prompt, prompt1, len + 1);
435         BUF_strcat(prompt, object_desc, len + 1);
436         if (object_name)
437         {
438             BUF_strcat(prompt, prompt2, len + 1);
439             BUF_strcat(prompt, object_name, len + 1);
440         }
441         BUF_strcat(prompt, prompt3, len + 1);
442     }
443     return prompt;
444 }
446 void *UI_add_user_data(UI *ui, void *user_data)
447 {
448     void *old_data = ui->user_data;
449     ui->user_data = user_data;
450     return old_data;
451 }
453 void *UI_get0_user_data(UI *ui)
454 {
455     return ui->user_data;
456 }

```

```

458 const char *UI_get0_result(UI *ui, int i)
459 {
460     if (i < 0)
461     {
462         UIerr(UI_F_UI_GET0_RESULT,UI_R_INDEX_TOO_SMALL);
463         return NULL;
464     }
465     if (i >= sk_UI_STRING_num(ui->strings))
466     {
467         UIerr(UI_F_UI_GET0_RESULT,UI_R_INDEX_TOO_LARGE);
468         return NULL;
469     }
470     return UI_get0_result_string(sk_UI_STRING_value(ui->strings, i));
471 }
473 static int print_error(const char *str, size_t len, UI *ui)
474 {
475     UI_STRING uis;
477     memset(&uis, 0, sizeof(uis));
478     uis.type = UIT_ERROR;
479     uis.out_string = str;
481     if (ui->meth->ui_write_string
482         && !ui->meth->ui_write_string(ui, &uis))
483         return -1;
484     return 0;
485 }
487 int UI_process(UI *ui)
488 {
489     int i, ok=0;
491     if (ui->meth->ui_open_session && !ui->meth->ui_open_session(ui))
492         return -1;
494     if (ui->flags & UI_FLAG_PRINT_ERRORS)
495         ERR_print_errors_cb(
496             (int (*)(const char *, size_t, void *))print_error,
497             (void *)ui);
499     for(i=0; i<sk_UI_STRING_num(ui->strings); i++)
500     {
501         if (ui->meth->ui_write_string
502             && !ui->meth->ui_write_string(ui,
503             sk_UI_STRING_value(ui->strings, i)))
504         {
505             ok=-1;
506             goto err;
507         }
508     }
510     if (ui->meth->ui_flush)
511         switch(ui->meth->ui_flush(ui))
512         {
513             case -1: /* Interrupt/Cancel/something... */
514                 ok = -2;
515                 goto err;
516             case 0: /* Errors */
517                 ok = -1;
518                 goto err;
519             default: /* Success */
520                 ok = 0;
521                 break;
522         }

```



```

524     for(i=0; i<sk_UI_STRING_num(ui->strings); i++)
525     {
526         if (ui->meth->ui_read_string)
527         {
528             switch(ui->meth->ui_read_string(ui,
529                 sk_UI_STRING_value(ui->strings, i)))
530             {
531                 case -1: /* Interrupt/Cancel/something... */
532                     ok = -2;
533                     goto err;
534                 case 0: /* Errors */
535                     ok = -1;
536                     goto err;
537                 default: /* Success */
538                     ok = 0;
539                     break;
540             }
541         }
542     }
543 err:
544     if (ui->meth->ui_close_session && !ui->meth->ui_close_session(ui))
545         return -1;
546     return ok;
547 }

549 int UI_ctrl(UI *ui, int cmd, long i, void *p, void (*f)(void))
550 {
551     if (ui == NULL)
552     {
553         UIerr(UI_F_UI_CTRL, ERR_R_PASSED_NULL_PARAMETER);
554         return -1;
555     }
556     switch(cmd)
557     {
558     case UI_CTRL_PRINT_ERRORS:
559     {
560         int save_flag = !(ui->flags & UI_FLAG_PRINT_ERRORS);
561         if (i)
562             ui->flags |= UI_FLAG_PRINT_ERRORS;
563         else
564             ui->flags &= ~UI_FLAG_PRINT_ERRORS;
565         return save_flag;
566     }
567     case UI_CTRL_IS_REDOABLE:
568         return !(ui->flags & UI_FLAG_REDOABLE);
569     default:
570         break;
571     }
572     UIerr(UI_F_UI_CTRL, UI_R_UNKNOWN_CONTROL_COMMAND);
573     return -1;
574 }

576 int UI_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
577     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
578 {
579     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_UI, argl, argp,
580         new_func, dup_func, free_func);
581 }

583 int UI_set_ex_data(UI *r, int idx, void *arg)
584 {
585     return(CRYPTO_set_ex_data(&r->ex_data, idx, arg));
586 }

588 void *UI_get_ex_data(UI *r, int idx)
589 {

```

```

590     return(CRYPTO_get_ex_data(&r->ex_data, idx));
591 }

593 void UI_set_default_method(const UI_METHOD *meth)
594 {
595     default_UI_meth=meth;
596 }

598 const UI_METHOD *UI_get_default_method(void)
599 {
600     if (default_UI_meth == NULL)
601     {
602         default_UI_meth=UI_OpenSSL();
603     }
604     return default_UI_meth;
605 }

607 const UI_METHOD *UI_get_method(UI *ui)
608 {
609     return ui->meth;
610 }

612 const UI_METHOD *UI_set_method(UI *ui, const UI_METHOD *meth)
613 {
614     ui->meth=meth;
615     return ui->meth;
616 }

619 UI_METHOD *UI_create_method(char *name)
620 {
621     UI_METHOD *ui_method = (UI_METHOD *)OPENSSL_malloc(sizeof(UI_METHOD));

623     if (ui_method)
624     {
625         memset(ui_method, 0, sizeof(*ui_method));
626         ui_method->name = BUF_strdup(name);
627     }
628     return ui_method;
629 }

631 /* BIG FSKING WARNING!!!! If you use this on a statically allocated method
632    (that is, it hasn't been allocated using UI_create_method(), you deserve
633    anything Murphy can throw at you and more! You have been warned. */
634 void UI_destroy_method(UI_METHOD *ui_method)
635 {
636     OPENSSL_free(ui_method->name);
637     ui_method->name = NULL;
638     OPENSSL_free(ui_method);
639 }

641 int UI_method_set_opener(UI_METHOD *method, int (*opener)(UI *ui))
642 {
643     if (method)
644     {
645         method->ui_open_session = opener;
646         return 0;
647     }
648     else
649         return -1;
650 }

652 int UI_method_set_writer(UI_METHOD *method, int (*writer)(UI *ui, UI_STRING *uis)
653 {
654     if (method)
655     {

```

```

656         method->ui_write_string = writer;
657         return 0;
658     }
659     else
660         return -1;
661 }

663 int UI_method_set_flusher(UI_METHOD *method, int (*flusher)(UI *ui))
664 {
665     if (method)
666     {
667         method->ui_flush = flusher;
668         return 0;
669     }
670     else
671         return -1;
672 }

674 int UI_method_set_reader(UI_METHOD *method, int (*reader)(UI *ui, UI_STRING *uis)
675 {
676     if (method)
677     {
678         method->ui_read_string = reader;
679         return 0;
680     }
681     else
682         return -1;
683 }

685 int UI_method_set_closer(UI_METHOD *method, int (*closer)(UI *ui))
686 {
687     if (method)
688     {
689         method->ui_close_session = closer;
690         return 0;
691     }
692     else
693         return -1;
694 }

696 int UI_method_set_prompt_constructor(UI_METHOD *method, char *(*prompt_construct
697 {
698     if (method)
699     {
700         method->ui_construct_prompt = prompt_constructor;
701         return 0;
702     }
703     else
704         return -1;
705 }

707 int (*UI_method_get_opener(UI_METHOD *method))(UI*)
708 {
709     if (method)
710         return method->ui_open_session;
711     else
712         return NULL;
713 }

715 int (*UI_method_get_writer(UI_METHOD *method))(UI*, UI_STRING*)
716 {
717     if (method)
718         return method->ui_write_string;
719     else
720         return NULL;
721 }

```

```

723 int (*UI_method_get_flusher(UI_METHOD *method))(UI*)
724 {
725     if (method)
726         return method->ui_flush;
727     else
728         return NULL;
729 }

731 int (*UI_method_get_reader(UI_METHOD *method))(UI*, UI_STRING*)
732 {
733     if (method)
734         return method->ui_read_string;
735     else
736         return NULL;
737 }

739 int (*UI_method_get_closer(UI_METHOD *method))(UI*)
740 {
741     if (method)
742         return method->ui_close_session;
743     else
744         return NULL;
745 }

747 char* (*UI_method_get_prompt_constructor(UI_METHOD *method))(UI*, const char*, c
748 {
749     if (method)
750         return method->ui_construct_prompt;
751     else
752         return NULL;
753 }

755 enum UI_string_types UI_get_string_type(UI_STRING *uis)
756 {
757     if (!uis)
758         return UIT_NONE;
759     return uis->type;
760 }

762 int UI_get_input_flags(UI_STRING *uis)
763 {
764     if (!uis)
765         return 0;
766     return uis->input_flags;
767 }

769 const char *UI_get0_output_string(UI_STRING *uis)
770 {
771     if (!uis)
772         return NULL;
773     return uis->out_string;
774 }

776 const char *UI_get0_action_string(UI_STRING *uis)
777 {
778     if (!uis)
779         return NULL;
780     switch(uis->type)
781     {
782     case UIT_PROMPT:
783     case UIT_BOOLEAN:
784         return uis->_boolean_data.action_desc;
785     default:
786         return NULL;
787     }

```

```

788     }
790 const char *UI_get0_result_string(UI_STRING *uis)
791 {
792     if (!uis)
793         return NULL;
794     switch(uis->type)
795     {
796     case UIT_PROMPT:
797     case UIT_VERIFY:
798         return uis->result_buf;
799     default:
800         return NULL;
801     }
802 }
804 const char *UI_get0_test_string(UI_STRING *uis)
805 {
806     if (!uis)
807         return NULL;
808     switch(uis->type)
809     {
810     case UIT_VERIFY:
811         return uis->_string_data.test_buf;
812     default:
813         return NULL;
814     }
815 }
817 int UI_get_result_minsize(UI_STRING *uis)
818 {
819     if (!uis)
820         return -1;
821     switch(uis->type)
822     {
823     case UIT_PROMPT:
824     case UIT_VERIFY:
825         return uis->_string_data.result_minsize;
826     default:
827         return -1;
828     }
829 }
831 int UI_get_result_maxsize(UI_STRING *uis)
832 {
833     if (!uis)
834         return -1;
835     switch(uis->type)
836     {
837     case UIT_PROMPT:
838     case UIT_VERIFY:
839         return uis->_string_data.result_maxsize;
840     default:
841         return -1;
842     }
843 }
845 int UI_set_result(UI *ui, UI_STRING *uis, const char *result)
846 {
847     int l = strlen(result);
849     ui->flags &= ~UI_FLAG_REDOABLE;
851     if (!uis)
852         return -1;
853     switch (uis->type)

```

```

854     {
855     case UIT_PROMPT:
856     case UIT_VERIFY:
857     {
858         char number1[DECIMAL_SIZE(uis->_string_data.result_minsize)+1];
859         char number2[DECIMAL_SIZE(uis->_string_data.result_maxsize)+1];
861         BIO_snprintf(number1, sizeof(number1), "%d",
862                     uis->_string_data.result_minsize);
863         BIO_snprintf(number2, sizeof(number2), "%d",
864                     uis->_string_data.result_maxsize);
866         if (l < uis->_string_data.result_minsize)
867         {
868             ui->flags |= UI_FLAG_REDOABLE;
869             UIerr(UI_F_UI_SET_RESULT, UI_R_RESULT_TOO_SMALL);
870             ERR_add_error_data(5, "You must type in ",
871                               number1, " to ", number2, " characters");
872             return -1;
873         }
874         if (l > uis->_string_data.result_maxsize)
875         {
876             ui->flags |= UI_FLAG_REDOABLE;
877             UIerr(UI_F_UI_SET_RESULT, UI_R_RESULT_TOO_LARGE);
878             ERR_add_error_data(5, "You must type in ",
879                               number1, " to ", number2, " characters");
880             return -1;
881         }
882     }
884     if (!uis->result_buf)
885     {
886         UIerr(UI_F_UI_SET_RESULT, UI_R_NO_RESULT_BUFFER);
887         return -1;
888     }
890     BUF_strncpy(uis->result_buf, result,
891                uis->_string_data.result_maxsize + 1);
892     break;
893 case UIT_BOOLEAN:
894     {
895         const char *p;
897         if (!uis->result_buf)
898         {
899             UIerr(UI_F_UI_SET_RESULT, UI_R_NO_RESULT_BUFFER);
900             return -1;
901         }
903         uis->result_buf[0] = '\0';
904         for(p = result; *p; p++)
905         {
906             if (strchr(uis->_boolean_data.ok_chars, *p))
907             {
908                 uis->result_buf[0] =
909                     uis->_boolean_data.ok_chars[0];
910                 break;
911             }
912             if (strchr(uis->_boolean_data.cancel_chars, *p))
913             {
914                 uis->result_buf[0] =
915                     uis->_boolean_data.cancel_chars[0];
916                 break;
917             }
918         }
919     default:

```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_lib.c

15

```
920         break;
921     }
922 }
923 return 0;
924 }
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_openssl.c

1

```
*****
18958 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/ui/ui_openssl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ui/ui_openssl.c *- mode:C; c-file-style: "eay" -*- */
2 /* Written by Richard Levitte (richard@levitte.org) and others
3  * for the OpenSSL project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
16 * notice, this list of conditions and the following disclaimer in
17 * the documentation and/or other materials provided with the
18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
23 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
26 * endorse or promote products derived from this software without
27 * prior written permission. For written permission, please contact
28 * openssl-core@openssl.org.
29 *
30 * 5. Products derived from this software may not be called "OpenSSL"
31 * nor may "OpenSSL" appear in their names without prior written
32 * permission of the OpenSSL Project.
33 *
34 * 6. Redistributions of any form whatsoever must retain the following
35 * acknowledgment:
36 * "This product includes software developed by the OpenSSL Project
37 * for use in the OpenSSL Toolkit (http://www.openssl.org/)"
38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */
57
58 /* The lowest level part of this file was previously in crypto/des/read_pwd.c,
59 * Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
60 * All rights reserved.
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_openssl.c

2

```
62 *
63 * This package is an SSL implementation written
64 * by Eric Young (eay@cryptsoft.com).
65 * The implementation was written so as to conform with Netscapes SSL.
66 *
67 * This library is free for commercial and non-commercial use as long as
68 * the following conditions are aheared to. The following conditions
69 * apply to all code found in this distribution, be it the RC4, RSA,
70 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
71 * included with this distribution is covered by the same copyright terms
72 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
73 *
74 * Copyright remains Eric Young's, and as such any Copyright notices in
75 * the code are not to be removed.
76 * If this package is used in a product, Eric Young should be given attribution
77 * as the author of the parts of the library used.
78 * This can be in the form of a textual message at program startup or
79 * in documentation (online or textual) provided with the package.
80 *
81 * Redistribution and use in source and binary forms, with or without
82 * modification, are permitted provided that the following conditions
83 * are met:
84 * 1. Redistributions of source code must retain the copyright
85 * notice, this list of conditions and the following disclaimer.
86 * 2. Redistributions in binary form must reproduce the above copyright
87 * notice, this list of conditions and the following disclaimer in the
88 * documentation and/or other materials provided with the distribution.
89 * 3. All advertising materials mentioning features or use of this software
90 * must display the following acknowledgement:
91 * "This product includes cryptographic software written by
92 * Eric Young (eay@cryptsoft.com)"
93 * The word 'cryptographic' can be left out if the rouines from the library
94 * being used are not cryptographic related :-).
95 * 4. If you include any Windows specific code (or a derivative thereof) from
96 * the apps directory (application code) you must include an acknowledgement:
97 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
98 *
99 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
100 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
101 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
102 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
103 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
104 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
105 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
106 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
107 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
108 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
109 * SUCH DAMAGE.
110 *
111 * The licence and distribution terms for any publically available version or
112 * derivative of this code cannot be changed. i.e. this code cannot simply be
113 * copied and put under another distribution licence
114 * [including the GNU Public Licence.]
115 */
116
117
118 #include <openssl/e_os2.h>
119
120 /* need for #define POSIX_C_SOURCE arises whenever you pass -ansi to gcc
121 * [maybe others?], because it masks interfaces not discussed in standard,
122 * sigaction and fileno included. -pedantic would be more appropriate for
123 * the intended purposes, but we can't prevent users from adding -ansi.
124 */
125 #if defined(OPENSSL_SYSNAME_VXWORKS)
126 #include <sys/types.h>
127 #endif
```

```

129 #if !defined(_POSIX_C_SOURCE) && defined(OPENSSL_SYS_VMS)
130 #ifndef _POSIX_C_SOURCE
131 #define _POSIX_C_SOURCE 2
132 #endif
133 #endif
134 #include <signal.h>
135 #include <stdio.h>
136 #include <string.h>
137 #include <errno.h>

139 #if !defined(OPENSSL_SYS_MSDOS) && !defined(OPENSSL_SYS_VMS)
140 # ifdef OPENSSL_UNISTD
141 #  include OPENSSL_UNISTD
142 # else
143 #  include <unistd.h>
144 # endif
145 /* If unistd.h defines _POSIX_VERSION, we conclude that we
146  * are on a POSIX system and have sigaction and termios. */
147 # if defined(_POSIX_VERSION)

149 #  define SIGACTION
150 #  if !defined(TERMIO) && !defined(TERMIO) && !defined(SGTTY)
151 #   define TERMIO
152 #  endif

154 # endif
155 #endif

157 #ifdef WIN16TTY
158 # undef OPENSSL_SYS_WIN16
159 # undef WIN16
160 # undef _WINDOWS
161 # include <graph.h>
162 #endif

164 /* 06-Apr-92 Luke Brennan      Support for VMS */
165 #include "ui_locl.h"
166 #include "cryptlib.h"

168 #ifdef OPENSSL_SYS_VMS          /* prototypes for sys$whatever */
169 # include <starlet.h>
170 # ifdef __DECC
171 #  pragma message disable DOLLARID
172 # endif
173 #endif

175 #ifdef WIN_CONSOLE_BUG
176 # include <windows.h>
177 #ifndef OPENSSL_SYS_WINCE
178 # include <wincon.h>
179 #endif
180 #endif

183 /* There are 5 types of terminal interface supported,
184  * TERMIO, TERMIOS, VMS, MSDOS and SGTTY
185  */

187 #if defined(__sgi) && !defined(TERMIO)
188 # define TERMIOS
189 # undef TERMIO
190 # undef SGTTY
191 #endif

193 #if defined(linux) && !defined(TERMIO)

```

```

194 # undef TERMIOS
195 # define TERMIO
196 # undef SGTTY
197 #endif

199 #ifdef _LIBC
200 # undef TERMIOS
201 # define TERMIO
202 # undef SGTTY
203 #endif

205 #if !defined(TERMIO) && !defined(TERMIO) && !defined(OPENSSL_SYS_VMS) && !defin
206 # undef TERMIOS
207 # undef TERMIO
208 # define SGTTY
209 #endif

211 #if defined(OPENSSL_SYS_VXWORKS)
212 #undef TERMIOS
213 #undef TERMIO
214 #undef SGTTY
215 #endif

217 #if defined(OPENSSL_SYS_NETWARE)
218 #undef TERMIOS
219 #undef TERMIO
220 #undef SGTTY
221 #endif

223 #ifdef TERMIOS
224 # include <termios.h>
225 # define TTY_STRUCT          struct termios
226 # define TTY_FLAGS          c_lflag
227 # define TTY_get(tty,data)  tcgetattr(tty,data)
228 # define TTY_set(tty,data)  tcsetattr(tty,TCSANOW,data)
229 #endif

231 #ifdef TERMIO
232 # include <termio.h>
233 # define TTY_STRUCT          struct termio
234 # define TTY_FLAGS          c_lflag
235 # define TTY_get(tty,data)  ioctl(tty,TCGETA,data)
236 # define TTY_set(tty,data)  ioctl(tty,TCSETA,data)
237 #endif

239 #ifdef SGTTY
240 # include <sgtty.h>
241 # define TTY_STRUCT          struct sgttyb
242 # define TTY_FLAGS          sg_flags
243 # define TTY_get(tty,data)  ioctl(tty,TIOCGETP,data)
244 # define TTY_set(tty,data)  ioctl(tty,TIOCSERP,data)
245 #endif

247 #if !defined(_LIBC) && !defined(OPENSSL_SYS_MSDOS) && !defined(OPENSSL_SYS_VMS)
248 # include <sys/ioctl.h>
249 #endif

251 #ifdef OPENSSL_SYS_MSDOS
252 # include <conio.h>
253 #endif

255 #ifdef OPENSSL_SYS_VMS
256 # include <ssdef.h>
257 # include <iodef.h>
258 # include <ttdef.h>
259 # include <descrip.h>

```

```

260 struct IOSB {
261     short iosb$w_value;
262     short iosb$w_count;
263     long iosb$l_info;
264 };
265 #endif

267 #ifdef OPENSSSL_SYS_SUNOS
268     typedef int sig_atomic_t;
269 #endif

271 #if defined(OPENSSSL_SYS_MACINTOSH_CLASSIC) || defined(MAC_OS_GUSI_SOURCE) || def
272 /*
273  * This one needs work. As a matter of fact the code is unoperational
274  * and this is only a trick to get it compiled.
275  *                                     <appro@fy.chalmers.se>
276  */
277 # define TTY_STRUCT int
278 #endif

280 #ifndef NX509_SIG
281 # define NX509_SIG 32
282 #endif

285 /* Define globals. They are protected by a lock */
286 #ifdef SIGACTION
287 static struct sigaction savsig[NX509_SIG];
288 #else
289 static void (*savsig[NX509_SIG])(int );
290 #endif

292 #ifdef OPENSSSL_SYS_VMS
293 static struct IOSB iosb;
294 static $DESCRIPTOR(terminal,"TT");
295 static long tty_orig[3], tty_new[3]; /* XXX Is there any guarantee that this w
296 static long status;
297 static unsigned short channel = 0;
298 #else
299 #if !defined(OPENSSSL_SYS_MSDOS) || defined(__DJGPP__)
300 static TTY_STRUCT tty_orig,tty_new;
301 #endif
302 #endif
303 static FILE *tty_in, *tty_out;
304 static int is_a_tty;

306 /* Declare static functions */
307 #if !defined(OPENSSSL_SYS_WIN16) && !defined(OPENSSSL_SYS_WINCE)
308 static int read_till_nl(FILE *);
309 static void recsig(int);
310 static void pushsig(void);
311 static void popsig(void);
312 #endif
313 #if defined(OPENSSSL_SYS_MSDOS) && !defined(OPENSSSL_SYS_WIN16)
314 static int noecho_fgets(char *buf, int size, FILE *tty);
315 #endif
316 static int read_string_inner(UI *ui, UI_STRING *uis, int echo, int strip_nl);

318 static int read_string(UI *ui, UI_STRING *uis);
319 static int write_string(UI *ui, UI_STRING *uis);

321 static int open_console(UI *ui);
322 static int echo_console(UI *ui);
323 static int noecho_console(UI *ui);
324 static int close_console(UI *ui);

```

```

326 static UI_METHOD ui_openssl =
327 {
328     "OpenSSL default user interface",
329     open_console,
330     write_string,
331     NULL, /* No flusher is needed for command lines */
332     read_string,
333     close_console,
334     NULL
335 };

337 /* The method with all the built-in thingies */
338 UI_METHOD *UI_OpenSSL(void)
339 {
340     return &ui_openssl;
341 }

343 /* The following function makes sure that info and error strings are printed
344 before any prompt. */
345 static int write_string(UI *ui, UI_STRING *uis)
346 {
347     switch (UI_get_string_type(uis))
348     {
349     case UIT_ERROR:
350     case UIT_INFO:
351         fputs(UI_get0_output_string(uis), tty_out);
352         fflush(tty_out);
353         break;
354     default:
355         break;
356     }
357     return 1;
358 }

360 static int read_string(UI *ui, UI_STRING *uis)
361 {
362     int ok = 0;

364     switch (UI_get_string_type(uis))
365     {
366     case UIT_BOOLEAN:
367         fputs(UI_get0_output_string(uis), tty_out);
368         fputs(UI_get0_action_string(uis), tty_out);
369         fflush(tty_out);
370         return read_string_inner(ui, uis,
371                                 UI_get_input_flags(uis) & UI_INPUT_FLAG_ECHO, 0);
372     case UIT_PROMPT:
373         fputs(UI_get0_output_string(uis), tty_out);
374         fflush(tty_out);
375         return read_string_inner(ui, uis,
376                                 UI_get_input_flags(uis) & UI_INPUT_FLAG_ECHO, 1);
377     case UIT_VERIFY:
378         fprintf(tty_out, "Verifying - %s",
379                UI_get0_output_string(uis));
380         fflush(tty_out);
381         if ((ok = read_string_inner(ui, uis,
382                                    UI_get_input_flags(uis) & UI_INPUT_FLAG_ECHO, 1)) <= 0)
383             return ok;
384         if (strcmp(UI_get0_result_string(uis),
385                  UI_get0_test_string(uis)) != 0)
386         {
387             fprintf(tty_out, "Verify failure\n");
388             fflush(tty_out);
389             return 0;
390         }
391         break;

```

```

392     default:
393         break;
394     }
395     return 1;
396 }

399 #if !defined(OPENSSL_SYS_WIN16) && !defined(OPENSSL_SYS_WINCE)
400 /* Internal functions to read a string without echoing */
401 static int read_till_nl(FILE *in)
402 {
403     #define SIZE 4
404     char buf[SIZE+1];

406     do {
407         if (!fgets(buf, SIZE, in))
408             return 0;
409     } while (strchr(buf, '\n') == NULL);
410     return 1;
411 }

413 static volatile sig_atomic_t intr_signal;
414 #endif

416 static int read_string_inner(UI *ui, UI_STRING *uis, int echo, int strip_nl)
417 {
418     static int ps;
419     int ok;
420     char result[BUFSIZ];
421     int maxsize = BUFSIZ-1;
422     #if !defined(OPENSSL_SYS_WIN16) && !defined(OPENSSL_SYS_WINCE)
423     char *p;

425     intr_signal=0;
426     ok=0;
427     ps=0;

429     pushsig();
430     ps=1;

432     if (!echo && !noecho_console(ui))
433         goto error;
434     ps=2;

436     result[0]='\0';
437     #ifdef OPENSSL_SYS_MSDOS
438     if (!echo)
439     {
440         noecho_fgets(result, maxsize, tty_in);
441         p=result; /* FIXME: noecho_fgets doesn't return errors */
442     }
443     else
444         p=fgets(result, maxsize, tty_in);
445     #else
446     p=fgets(result, maxsize, tty_in);
447     #endif
448     if(!p)
449         goto error;
450     if (feof(tty_in)) goto error;
451     if (ferror(tty_in)) goto error;
452     if ((p=(char *)strchr(result, '\n')) != NULL)
453     {
454         if (strip_nl)
455             *p='\0';
456     }
457     else

```

```

458         if (!read_till_nl(tty_in))
459             goto error;
460         if (UI_set_result(ui, uis, result) >= 0)
461             ok=1;

463     error:
464         if (intr_signal == SIGINT)
465             ok=-1;
466         if (!echo) fprintf(tty_out, "\n");
467         if (ps >= 2 && !echo && !echo_console(ui))
468             ok=0;

470         if (ps >= 1)
471             popsig();
472     #else
473         ok=1;
474     #endif

476     OPENSSL_cleanse(result, BUFSIZ);
477     return ok;
478 }

481 /* Internal functions to open, handle and close a channel to the console. */
482 static int open_console(UI *ui)
483 {
484     CRYPTO_w_lock(CRYPTO_LOCK_UI);
485     is_a_tty = 1;

487     #if defined(OPENSSL_SYS_MACINTOSH_CLASSIC) || defined(OPENSSL_SYS_VXWORKS) || de
488         tty_in=stdin;
489         tty_out=stderr;
490     #else
491     #   ifdef OPENSSL_SYS_MSDOS
492     #       define DEV_TTY "con"
493     #   else
494     #       define DEV_TTY "/dev/tty"
495     #   endif
496         if ((tty_in=fopen(DEV_TTY, "r")) == NULL)
497             tty_in=stdin;
498         if ((tty_out=fopen(DEV_TTY, "w")) == NULL)
499             tty_out=stderr;
500     #endif

502     #if defined(TTY_get) && !defined(OPENSSL_SYS_VMS)
503         if (TTY_get(fileno(tty_in), &tty_orig) == -1)
504         {
505             #ifdef ENOTTY
506                 if (errno == ENOTTY)
507                     is_a_tty=0;
508                 else
509                     #endif
510             #ifdef EINVAL
511                 /* Ariel Glenn ariel@columbia.edu reports that solaris
512                  * can return EINVAL instead. This should be ok */
513                 if (errno == EINVAL)
514                     is_a_tty=0;
515                 else
516                     #endif
517                 return 0;
518             }
519     #endif
520     #ifdef OPENSSL_SYS_VMS
521     status = sys$assign(&terminal, &channel, 0, 0);
522     if (status != SSS_NORMAL)
523         return 0;

```



```

524     status=sys$qiow(0,channel,IO$_SENSEMODE,&iosb,0,0,tty_orig,12,0,0,0);
525     if ((status != SSS_NORMAL) || (iosb.iosb$w_value != SSS_NORMAL))
526         return 0;
527 #endif
528     return 1;
529 }

531 static int noecho_console(UI *ui)
532 {
533 #ifdef TTY_FLAGS
534     memcpy(&(tty_new),&(tty_orig),sizeof(tty_orig));
535     tty_new.TTY_FLAGS &= ~ECHO;
536 #endif

538 #if defined(TTY_set) && !defined(OPENSSL_SYS_VMS)
539     if (is_a_tty && (TTY_set(fileno(tty_in),&tty_new) == -1))
540         return 0;
541 #endif
542 #ifdef OPENSSL_SYS_VMS
543     tty_new[0] = tty_orig[0];
544     tty_new[1] = tty_orig[1] | TTSM_NOECHO;
545     tty_new[2] = tty_orig[2];
546     status = sys$qiow(0,channel,IO$_SETMODE,&iosb,0,0,tty_new,12,0,0,0);
547     if ((status != SSS_NORMAL) || (iosb.iosb$w_value != SSS_NORMAL))
548         return 0;
549 #endif
550     return 1;
551 }

553 static int echo_console(UI *ui)
554 {
555 #if defined(TTY_set) && !defined(OPENSSL_SYS_VMS)
556     memcpy(&(tty_new),&(tty_orig),sizeof(tty_orig));
557     tty_new.TTY_FLAGS |= ECHO;
558 #endif

560 #if defined(TTY_set) && !defined(OPENSSL_SYS_VMS)
561     if (is_a_tty && (TTY_set(fileno(tty_in),&tty_new) == -1))
562         return 0;
563 #endif
564 #ifdef OPENSSL_SYS_VMS
565     tty_new[0] = tty_orig[0];
566     tty_new[1] = tty_orig[1] & ~TTSM_NOECHO;
567     tty_new[2] = tty_orig[2];
568     status = sys$qiow(0,channel,IO$_SETMODE,&iosb,0,0,tty_new,12,0,0,0);
569     if ((status != SSS_NORMAL) || (iosb.iosb$w_value != SSS_NORMAL))
570         return 0;
571 #endif
572     return 1;
573 }

575 static int close_console(UI *ui)
576 {
577     if (tty_in != stdin) fclose(tty_in);
578     if (tty_out != stderr) fclose(tty_out);
579 #ifdef OPENSSL_SYS_VMS
580     status = sys$dassgn(channel);
581 #endif
582     CRYPTO_w_unlock(CRYPTO_LOCK_UI);

584     return 1;
585 }

588 #if !defined(OPENSSL_SYS_WIN16) && !defined(OPENSSL_SYS_WINCE)
589 /* Internal functions to handle signals and act on them */

```

```

590 static void pushsig(void)
591 {
592 #ifndef OPENSSL_SYS_WIN32
593     int i;
594 #endif
595 #ifdef SIGACTION
596     struct sigaction sa;

598     memset(&sa,0,sizeof sa);
599     sa.sa_handler=recsig;
600 #endif

602 #ifdef OPENSSL_SYS_WIN32
603     savsig[SIGABRT]=signal(SIGABRT,recsig);
604     savsig[SIGFPE]=signal(SIGFPE,recsig);
605     savsig[SIGILL]=signal(SIGILL,recsig);
606     savsig[SIGINT]=signal(SIGINT,recsig);
607     savsig[SIGSEGV]=signal(SIGSEGV,recsig);
608     savsig[SIGTERM]=signal(SIGTERM,recsig);
609 #else
610     for (i=1; i<NX509_SIG; i++)
611     {
612 #ifdef SIGUSR1
613         if (i == SIGUSR1)
614             continue;
615 #endif
616 #ifdef SIGUSR2
617         if (i == SIGUSR2)
618             continue;
619 #endif
620 #ifdef SIGKILL
621         if (i == SIGKILL) /* We can't make any action on that. */
622             continue;
623 #endif
624 #ifdef SIGACTION
625         sigaction(i,&sa,&savsig[i]);
626 #else
627         savsig[i]=signal(i,recsig);
628 #endif
629     }
630 #endif

632 #ifdef SIGWINCH
633     signal(SIGWINCH,SIG_DFL);
634 #endif
635 }

637 static void popsig(void)
638 {
639 #ifdef OPENSSL_SYS_WIN32
640     signal(SIGABRT,savsig[SIGABRT]);
641     signal(SIGFPE,savsig[SIGFPE]);
642     signal(SIGILL,savsig[SIGILL]);
643     signal(SIGINT,savsig[SIGINT]);
644     signal(SIGSEGV,savsig[SIGSEGV]);
645     signal(SIGTERM,savsig[SIGTERM]);
646 #else
647     int i;
648     for (i=1; i<NX509_SIG; i++)
649     {
650 #ifdef SIGUSR1
651         if (i == SIGUSR1)
652             continue;
653 #endif
654 #ifdef SIGUSR2
655         if (i == SIGUSR2)

```

```
656             continue;
657 #endif
658 #ifdef SIGACTION
659     sigaction(i,&savsig[i],NULL);
660 #else
661     signal(i,savsig[i]);
662 #endif
663 }
664 #endif
665 }
666
667 static void reccsig(int i)
668 {
669     intr_signal=i;
670 }
671 #endif
672
673 /* Internal functions specific for Windows */
674 #if defined(OPENSSL_SYS_MSDOS) && !defined(OPENSSL_SYS_WIN16) && !defined(OPENSS
675 static int noecho_fgets(char *buf, int size, FILE *tty)
676 {
677     int i;
678     char *p;
679
680     p=buf;
681     for (;;)
682     {
683         if (size == 0)
684         {
685             *p='\0';
686             break;
687         }
688         size--;
689 #ifdef WIN16TTY
690         i=_inchar();
691 #elif defined(_WIN32)
692         i=_getch();
693 #else
694         i=getch();
695 #endif
696         if (i == '\r') i='\n';
697         *(p++)=i;
698         if (i == '\n')
699         {
700             *p='\0';
701             break;
702         }
703     }
704 #ifdef WIN_CONSOLE_BUG
705     /* Win95 has several evil console bugs: one of these is that the
706     * last character read using getch() is passed to the next read: this is
707     * usually a CR so this can be trouble. No STDIO fix seems to work but
708     * flushing the console appears to do the trick.
709     */
710     {
711         HANDLE inh;
712         inh = GetStdHandle(STD_INPUT_HANDLE);
713         FlushConsoleInputBuffer(inh);
714     }
715 #endif
716     return(strlen(buf));
717 }
718 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_util.c

1

```
*****
3382 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/ui/ui_util.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/ui/ui_util.c -*- mode:C; c-file-style: "eay" -*- */
2 /* =====
3 * Copyright (c) 2001-2002 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
10 * notice, this list of conditions and the following disclaimer.
11 *
12 * 2. Redistributions in binary form must reproduce the above copyright
13 * notice, this list of conditions and the following disclaimer in
14 * the documentation and/or other materials provided with the
15 * distribution.
16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
19 * "This product includes software developed by the OpenSSL Project
20 * for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23 * endorse or promote products derived from this software without
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26 *
27 * 5. Products derived from this software may not be called "OpenSSL"
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29 * permission of the OpenSSL Project.
30 *
31 * 6. Redistributions of any form whatsoever must retain the following
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35 *
36 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT 'AS IS' AND ANY
37 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
56 #include <string.h>
57 #include "ui_locl.h"
59 int UI_UTIL_read_pw_string(char *buf,int length,const char *prompt,int verify)
60 {
61     char buff[BUFSIZ];
```

new/usr/src/lib/openssl/libsunw_crypto/ui/ui_util.c

2

```
62     int ret;
64     ret=UI_UTIL_read_pw(buf,buff,(length>BUFSIZ)?BUFSIZ:length,prompt,verify)
65     OPENSSL_cleanse(buff,BUFSIZ);
66     return(ret);
67 }
69 int UI_UTIL_read_pw(char *buf,char *buff,int size,const char *prompt,int verify)
70 {
71     int ok = 0;
72     UI *ui;
74     if (size < 1)
75         return -1;
77     ui = UI_new();
78     if (ui)
79     {
80         ok = UI_add_input_string(ui,prompt,0,buf,0,size-1);
81         if (ok >= 0 && verify)
82             ok = UI_add_verify_string(ui,prompt,0,buff,0,size-1,
83                                     buff);
84         if (ok >= 0)
85             ok=UI_process(ui);
86         UI_free(ui);
87     }
88     if (ok > 0)
89         ok = 0;
90     return(ok);
91 }
```

new/usr/src/lib/openssl/libsunw_crypto/uid.c

1

```
*****
3190 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/uid.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/uid.c */
2 /* =====
3 * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
10 * notice, this list of conditions and the following disclaimer.
11 *
12 * 2. Redistributions in binary form must reproduce the above copyright
13 * notice, this list of conditions and the following disclaimer in
14 * the documentation and/or other materials provided with the
15 * distribution.
16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
19 * "This product includes software developed by the OpenSSL Project
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21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
23 * endorse or promote products derived from this software without
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26 *
27 * 5. Products derived from this software may not be called "OpenSSL"
28 * nor may "OpenSSL" appear in their names without prior written
29 * permission of the OpenSSL Project.
30 *
31 * 6. Redistributions of any form whatsoever must retain the following
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42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 #include <openssl/crypto.h>
57 #include <openssl/opensslconf.h>
58
59 #if defined(__OpenBSD__) || (defined(__FreeBSD__) && __FreeBSD__ > 2)
60
61 #include OPENSSL_UNISTD
```

new/usr/src/lib/openssl/libsunw_crypto/uid.c

2

```
63 int OPENSSL_issetugid(void)
64 {
65     return issetugid();
66 }
67
68 #elif defined(OPENSSL_SYS_WIN32) || defined(OPENSSL_SYS_VXWORKS) || defined(OPEN
69
70 int OPENSSL_issetugid(void)
71 {
72     return 0;
73 }
74
75 #else
76
77 #include OPENSSL_UNISTD
78 #include <sys/types.h>
79
80 int OPENSSL_issetugid(void)
81 {
82     if (getuid() != geteuid()) return 1;
83     if (getgid() != getegid()) return 1;
84     return 0;
85 }
86 #endif
```



```

128     BY_DIR *ld;
129     char *dir = NULL;

131     ld=(BY_DIR *)ctx->method_data;

133     switch (cmd)
134     {
135     case X509_L_ADD_DIR:
136         if (argl == X509_FILETYPE_DEFAULT)
137         {
138             dir=(char *)getenv(X509_get_default_cert_dir_env());
139             if (dir)
140                 ret=add_cert_dir(ld,dir,X509_FILETYPE_PEM);
141             else
142                 ret=add_cert_dir(ld,X509_get_default_cert_dir(),
143                                 X509_FILETYPE_PEM);
144             if (!ret)
145             {
146                 X509err(X509_F_DIR_CTRL,X509_R_LOADING_CERT_DIR)
147             }
148         }
149         else
150             ret=add_cert_dir(ld,argp,(int)argl);
151         break;
152     }
153     return(ret);
154 }

156 static int new_dir(X509_LOOKUP *lu)
157 {
158     BY_DIR *a;

160     if ((a=(BY_DIR *)OPENSSL_malloc(sizeof(BY_DIR))) == NULL)
161         return(0);
162     if ((a->buffer=BUF_MEM_new()) == NULL)
163     {
164         OPENSSL_free(a);
165         return(0);
166     }
167     a->dirs=NULL;
168     lu->method_data=(char *)a;
169     return(1);
170 }

172 static void by_dir_hash_free(BY_DIR_HASH *hash)
173 {
174     OPENSSL_free(hash);
175 }

177 static int by_dir_hash_cmp(const BY_DIR_HASH * const *a,
178                           const BY_DIR_HASH * const *b)
179 {
180     if ((*a)->hash > (*b)->hash)
181         return 1;
182     if ((*a)->hash < (*b)->hash)
183         return -1;
184     return 0;
185 }

187 static void by_dir_entry_free(BY_DIR_ENTRY *ent)
188 {
189     if (ent->dir)
190         OPENSSL_free(ent->dir);
191     if (ent->hashes)
192         sk_BY_DIR_HASH_pop_free(ent->hashes, by_dir_hash_free);
193     OPENSSL_free(ent);

```

```

194     }

196 static void free_dir(X509_LOOKUP *lu)
197 {
198     BY_DIR *a;

200     a=(BY_DIR *)lu->method_data;
201     if (a->dirs != NULL)
202         sk_BY_DIR_ENTRY_pop_free(a->dirs, by_dir_entry_free);
203     if (a->buffer != NULL)
204         BUF_MEM_free(a->buffer);
205     OPENSSL_free(a);
206 }

208 static int add_cert_dir(BY_DIR *ctx, const char *dir, int type)
209 {
210     int j,len;
211     const char *s,*ss,*p;

213     if (dir == NULL || !*dir)
214     {
215         X509err(X509_F_ADD_CERT_DIR,X509_R_INVALID_DIRECTORY);
216         return 0;
217     }

219     s=dir;
220     p=s;
221     do
222     {
223         if ((*p == LIST_SEPARATOR_CHAR) || (*p == '\0'))
224         {
225             BY_DIR_ENTRY *ent;
226             ss=s;
227             s=p+1;
228             len=(int)(p-ss);
229             if (len == 0) continue;
230             for (j=0; j < sk_BY_DIR_ENTRY_num(ctx->dirs); j++)
231             {
232                 ent = sk_BY_DIR_ENTRY_value(ctx->dirs, j);
233                 if (strlen(ent->dir) == (size_t)len &&
234                     strncmp(ent->dir,ss,(unsigned int)len) == 0)
235                     break;
236             }
237             if (j < sk_BY_DIR_ENTRY_num(ctx->dirs))
238                 continue;
239             if (ctx->dirs == NULL)
240             {
241                 ctx->dirs = sk_BY_DIR_ENTRY_new_null();
242                 if (!ctx->dirs)
243                 {
244                     X509err(X509_F_ADD_CERT_DIR,ERR_R_MALLOC)
245                     return 0;
246                 }
247             }
248             ent = OPENSSL_malloc(sizeof(BY_DIR_ENTRY));
249             if (!ent)
250                 return 0;
251             ent->dir_type = type;
252             ent->hashes = sk_BY_DIR_HASH_new(by_dir_hash_cmp);
253             ent->dir = OPENSSL_malloc((unsigned int)len+1);
254             if (!ent->dir || !ent->hashes)
255             {
256                 by_dir_entry_free(ent);
257                 return 0;
258             }
259             strncpy(ent->dir,ss,(unsigned int)len);

```

```

260     ent->dir[len] = '\0';
261     if (!sk_BY_DIR_ENTRY_push(ctx->dirs, ent))
262     {
263         by_dir_entry_free(ent);
264         return 0;
265     }
266 } while (*p++ != '\0');
267 return 1;
268 }
269
271 static int get_cert_by_subject(X509_LOOKUP *xl, int type, X509_NAME *name,
272                               X509_OBJECT *ret)
273 {
274     BY_DIR *ctx;
275     union {
276         struct {
277             X509 st_x509;
278             X509_CINF st_x509_cinf;
279             } x509;
280         struct {
281             X509_CRL st_crl;
282             X509_CRL_INFO st_crl_info;
283             } crl;
284     } data;
285     int ok=0;
286     int i,j,k;
287     unsigned long h;
288     BUF_MEM *b=NULL;
289     X509_OBJECT stmp,*tmp;
290     const char *postfix="";
291
292     if (name == NULL) return(0);
293
294     stmp.type=type;
295     if (type == X509_LU_X509)
296     {
297         data.x509.st_x509.cert_info= &data.x509.st_x509_cinf;
298         data.x509.st_x509_cinf.subject=name;
299         stmp.data.x509= &data.x509.st_x509;
300         postfix="";
301     }
302     else if (type == X509_LU_CRL)
303     {
304         data.crl.st_crl.crl= &data.crl.st_crl_info;
305         data.crl.st_crl_info.issuer=name;
306         stmp.data.crl= &data.crl.st_crl;
307         postfix="r";
308     }
309     else
310     {
311         X509err(X509_F_GET_CERT_BY_SUBJECT,X509_R_WRONG_LOOKUP_TYPE);
312         goto finish;
313     }
314
315     if ((b=BUF_MEM_new()) == NULL)
316     {
317         X509err(X509_F_GET_CERT_BY_SUBJECT,ERR_R_BUF_LIB);
318         goto finish;
319     }
320
321     ctx=(BY_DIR *)xl->method_data;
322
323     h=X509_NAME_hash(name);
324     for (i=0; i < sk_BY_DIR_ENTRY_num(ctx->dirs); i++)
325     {

```

```

326     BY_DIR_ENTRY *ent;
327     int idx;
328     BY_DIR_HASH htmp, *hent;
329     ent = sk_BY_DIR_ENTRY_value(ctx->dirs, i);
330     j=strlen(ent->dir)+1+8+6+1+1;
331     if (!BUF_MEM_grow(b,j))
332     {
333         X509err(X509_F_GET_CERT_BY_SUBJECT,ERR_R_MALLOC_FAILURE)
334         goto finish;
335     }
336     if (type == X509_LU_CRL && ent->hashes)
337     {
338         htmp.hash = h;
339         CRYPTO_r_lock(CRYPTO_LOCK_X509_STORE);
340         idx = sk_BY_DIR_HASH_find(ent->hashes, &htmp);
341         if (idx >= 0)
342         {
343             hent = sk_BY_DIR_HASH_value(ent->hashes, idx);
344             k = hent->suffix;
345         }
346         else
347         {
348             hent = NULL;
349             k=0;
350         }
351         CRYPTO_r_unlock(CRYPTO_LOCK_X509_STORE);
352     }
353     else
354     {
355         k = 0;
356         hent = NULL;
357     }
358     for (;;)
359     {
360         char c = '/';
361         #ifndef OPENSSL_SYS_VMS
362         c = ent->dir[strlen(ent->dir)-1];
363         if (c != ':' && c != '>' && c != ']')
364         {
365             /* If no separator is present, we assume the
366              directory specifier is a logical name, and
367              add a colon. We really should use better
368              VMS routines for merging things like this,
369              but this will do for now...
370              -- Richard Levitte */
371             c = ':';
372         }
373         else
374         {
375             c = '\0';
376         }
377         #endif
378         if (c == '\0')
379         {
380             /* This is special. When c == '\0', no
381              directory separator should be added. */
382             BIO_snprintf(b->data,b->max,
383                         "%s%08lx.%s%d", ent->dir,h,
384                         postfix,k);
385         }
386         else
387         {
388             BIO_snprintf(b->data,b->max,
389                         "%s%c%08lx.%s%d", ent->dir,c,h,
390                         postfix,k);
391         }

```

```

392 #ifndef OPENSSL_NO_POSIX_IO
393 #ifdef _WIN32
394 #define stat _stat
395 #endif
396     {
397         struct stat st;
398         if (stat(b->data,&st) < 0)
399             break;
400     }
401 #endif
402     /* found one. */
403     if (type == X509_LU_X509)
404     {
405         if ((X509_load_cert_file(xl,b->data,
406             ent->dir_type)) == 0)
407             break;
408     }
409     else if (type == X509_LU_CRL)
410     {
411         if ((X509_load_crl_file(xl,b->data,
412             ent->dir_type)) == 0)
413             break;
414     }
415     /* else case will caught higher up */
416     k++;
417 }
418
419 /* we have added it to the cache so now pull
420  * it out again */
421 CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
422 j = sk_X509_OBJECT_find(xl->store_ctx->objs,&stmp);
423 if(j != -1) tmp=sk_X509_OBJECT_value(xl->store_ctx->objs,j);
424 else tmp = NULL;
425 CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
426
427
428 /* If a CRL, update the last file suffix added for this */
429 if (type == X509_LU_CRL)
430 {
431     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
432     /* Look for entry again in case another thread added
433      * an entry first.
434      */
435     if (!hent)
436     {
437         htmp.hash = h;
438         idx = sk_BY_DIR_HASH_find(ent->hashes, &htmp);
439         if (idx >= 0)
440             hent =
441                 sk_BY_DIR_HASH_value(ent->hashes, idx);
442     }
443     if (!hent)
444     {
445         hent = OPENSSL_malloc(sizeof(BY_DIR_HASH));
446         hent->hash = h;
447         hent->suffix = k;
448         if (!sk_BY_DIR_HASH_push(ent->hashes, hent))
449         {
450             CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
451             OPENSSL_free(hent);
452             ok = 0;
453             goto finish;
454         }
455     }
456     else if (hent->suffix < k)
457 
```

```

458         hent->suffix = k;
459
460         CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
461     }
462
463     if (tmp != NULL)
464     {
465         ok=1;
466         ret->type=tmp->type;
467         memcpy(&ret->data,&tmp->data,sizeof(ret->data));
468         /* If we were going to up the reference count,
469          * we would need to do it on a perl 'type'
470          * basis */
471         /* CRYPTO_add(&tmp->data.x509->references,1,
472             CRYPTO_LOCK_X509);*/
473         goto finish;
474     }
475
476 finish:
477     if (b != NULL) BUF_MEM_free(b);
478     return(ok);
479 }
480 
```



```
*****
8007 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/by_file.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /* crypto/x509/by_file.c */
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56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <time.h>
61 #include <errno.h>
```

```
63 #include "cryptlib.h"
64 #include <openssl/lhash.h>
65 #include <openssl/buffer.h>
66 #include <openssl/x509.h>
67 #include <openssl/pem.h>
68
69 #ifndef OPENSSL_NO_STDIO
70
71 static int by_file_ctrl(X509_LOOKUP *ctx, int cmd, const char *argc,
72                        long argl, char **ret);
73 X509_LOOKUP_METHOD x509_file_lookup=
74 {
75     "Load file into cache",
76     NULL, /* new */
77     NULL, /* free */
78     NULL, /* init */
79     NULL, /* shutdown */
80     by_file_ctrl, /* ctrl */
81     NULL, /* get_by_subject */
82     NULL, /* get_by_issuer_serial */
83     NULL, /* get_by_fingerprint */
84     NULL, /* get_by_alias */
85 };
86
87 X509_LOOKUP_METHOD *X509_LOOKUP_file(void)
88 {
89     return(&x509_file_lookup);
90 }
91
92 static int by_file_ctrl(X509_LOOKUP *ctx, int cmd, const char *argp, long argl,
93                        char **ret)
94 {
95     int ok=0;
96     char *file;
97
98     switch (cmd)
99     {
100     case X509_L_FILE_LOAD:
101         if (argl == X509_FILETYPE_DEFAULT)
102         {
103             file = (char *)getenv(X509_get_default_cert_file_env());
104             if (file)
105                 ok = (X509_load_cert_crl_file(ctx, file,
106                                                X509_FILETYPE_PEM) != 0);
107         }
108         else
109             ok = (X509_load_cert_crl_file(ctx, X509_get_defau
110                                            X509_FILETYPE_PEM) != 0);
111
112         if (!ok)
113         {
114             X509err(X509_F_BY_FILE_CTRL, X509_R_LOADING_DEFUAU
115                    );
116         }
117         else
118         {
119             if (argl == X509_FILETYPE_PEM)
120                 ok = (X509_load_cert_crl_file(ctx, argp,
121                                                X509_FILETYPE_PEM) != 0);
122             else
123                 ok = (X509_load_cert_file(ctx, argp, (int)argl) !=
124                       0);
125             break;
126         }
127     }
128     return(ok);
129 }
```

```

128     }
129
130 int X509_load_cert_file(X509_LOOKUP *ctx, const char *file, int type)
131 {
132     int ret=0;
133     BIO *in=NULL;
134     int i,count=0;
135     X509 *x=NULL;
136
137     if (file == NULL) return(1);
138     in=BIO_new(BIO_s_file_internal());
139
140     if ((in == NULL) || (BIO_read_filename(in,file) <= 0))
141     {
142         X509err(X509_F_X509_LOAD_CERT_FILE,ERR_R_SYS_LIB);
143         goto err;
144     }
145
146     if (type == X509_FILETYPE_PEM)
147     {
148         for (;;)
149         {
150             x=PEM_read_bio_X509_AUX(in,NULL,NULL,NULL);
151             if (x == NULL)
152             {
153                 if ((ERR_GET_REASON(ERR_peek_last_error()) ==
154                     PEM_R_NO_START_LINE) && (count > 0))
155                 {
156                     ERR_clear_error();
157                     break;
158                 }
159                 else
160                 {
161                     X509err(X509_F_X509_LOAD_CERT_FILE,
162                         ERR_R_PEM_LIB);
163                     goto err;
164                 }
165             }
166             i=X509_STORE_add_cert(ctx->store_ctx,x);
167             if (!i) goto err;
168             count++;
169             X509_free(x);
170             x=NULL;
171         }
172         ret=count;
173     }
174     else if (type == X509_FILETYPE_ASN1)
175     {
176         x=d2i_X509_bio(in,NULL);
177         if (x == NULL)
178         {
179             X509err(X509_F_X509_LOAD_CERT_FILE,ERR_R_ASN1_LIB);
180             goto err;
181         }
182         i=X509_STORE_add_cert(ctx->store_ctx,x);
183         if (!i) goto err;
184         ret=i;
185     }
186     else
187     {
188         X509err(X509_F_X509_LOAD_CERT_FILE,X509_R_BAD_X509_FILETYPE);
189         goto err;
190     }
191 err:
192     if (x != NULL) X509_free(x);
193     if (in != NULL) BIO_free(in);

```

```

194     return(ret);
195 }
196
197 int X509_load_crl_file(X509_LOOKUP *ctx, const char *file, int type)
198 {
199     int ret=0;
200     BIO *in=NULL;
201     int i,count=0;
202     X509_CRL *x=NULL;
203
204     if (file == NULL) return(1);
205     in=BIO_new(BIO_s_file_internal());
206
207     if ((in == NULL) || (BIO_read_filename(in,file) <= 0))
208     {
209         X509err(X509_F_X509_LOAD_CRL_FILE,ERR_R_SYS_LIB);
210         goto err;
211     }
212
213     if (type == X509_FILETYPE_PEM)
214     {
215         for (;;)
216         {
217             x=PEM_read_bio_X509_CRL(in,NULL,NULL,NULL);
218             if (x == NULL)
219             {
220                 if ((ERR_GET_REASON(ERR_peek_last_error()) ==
221                     PEM_R_NO_START_LINE) && (count > 0))
222                 {
223                     ERR_clear_error();
224                     break;
225                 }
226                 else
227                 {
228                     X509err(X509_F_X509_LOAD_CRL_FILE,
229                         ERR_R_PEM_LIB);
230                     goto err;
231                 }
232             }
233             i=X509_STORE_add_crl(ctx->store_ctx,x);
234             if (!i) goto err;
235             count++;
236             X509_CRL_free(x);
237             x=NULL;
238         }
239         ret=count;
240     }
241     else if (type == X509_FILETYPE_ASN1)
242     {
243         x=d2i_X509_CRL_bio(in,NULL);
244         if (x == NULL)
245         {
246             X509err(X509_F_X509_LOAD_CRL_FILE,ERR_R_ASN1_LIB);
247             goto err;
248         }
249         i=X509_STORE_add_crl(ctx->store_ctx,x);
250         if (!i) goto err;
251         ret=i;
252     }
253     else
254     {
255         X509err(X509_F_X509_LOAD_CRL_FILE,X509_R_BAD_X509_FILETYPE);
256         goto err;
257     }
258 err:
259     if (x != NULL) X509_CRL_free(x);

```

```
260     if (in != NULL) BIO_free(in);
261     return(ret);
262 }

264 int X509_load_cert_crl_file(X509_LOOKUP *ctx, const char *file, int type)
265 {
266     STACK_OF(X509_INFO) *inf;
267     X509_INFO *itmp;
268     BIO *in;
269     int i, count = 0;
270     if(type != X509_FILETYPE_PEM)
271         return X509_load_cert_file(ctx, file, type);
272     in = BIO_new_file(file, "r");
273     if(!in) {
274         X509err(X509_F_X509_LOAD_CERT_CRL_FILE,ERR_R_SYS_LIB);
275         return 0;
276     }
277     inf = PEM_X509_INFO_read_bio(in, NULL, NULL, NULL);
278     BIO_free(in);
279     if(!inf) {
280         X509err(X509_F_X509_LOAD_CERT_CRL_FILE,ERR_R_PEM_LIB);
281         return 0;
282     }
283     for(i = 0; i < sk_X509_INFO_num(inf); i++) {
284         itmp = sk_X509_INFO_value(inf, i);
285         if(itmp->x509) {
286             X509_STORE_add_cert(ctx->store_ctx, itmp->x509);
287             count++;
288         }
289         if(itmp->crl) {
290             X509_STORE_add_crl(ctx->store_ctx, itmp->crl);
291             count++;
292         }
293     }
294     sk_X509_INFO_pop_free(inf, X509_INFO_free);
295     return count;
296 }

299 #endif /* OPENSSSL_NO_STDIO */
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_att.c

1

10651 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_att.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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8  *
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10 * the following conditions are aheared to. The following conditions
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57 */
58
59 #include <stdio.h>
60 #include <openssl/stack.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_att.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65 #include <openssl/x509.h>
66 #include <openssl/x509v3.h>
67
68 int X509at_get_attr_count(const STACK_OF(X509_ATTRIBUTE) *x)
69 {
70     return sk_X509_ATTRIBUTE_num(x);
71 }
72
73 int X509at_get_attr_by_NID(const STACK_OF(X509_ATTRIBUTE) *x, int nid,
74                             int lastpos)
75 {
76     ASN1_OBJECT *obj;
77
78     obj=OBJ_nid2obj(nid);
79     if (obj == NULL) return(-2);
80     return(X509at_get_attr_by_OBJ(x,obj, lastpos));
81 }
82
83 int X509at_get_attr_by_OBJ(const STACK_OF(X509_ATTRIBUTE) *sk, ASN1_OBJECT *obj,
84                             int lastpos)
85 {
86     int n;
87     X509_ATTRIBUTE *ex;
88
89     if (sk == NULL) return(-1);
90     lastpos++;
91     if (lastpos < 0)
92         lastpos=0;
93     n=sk_X509_ATTRIBUTE_num(sk);
94     for ( ; lastpos < n; lastpos++)
95     {
96         ex=sk_X509_ATTRIBUTE_value(sk, lastpos);
97         if (OBJ_cmp(ex->object,obj) == 0)
98             return(lastpos);
99     }
100     return(-1);
101 }
102
103 X509_ATTRIBUTE *X509at_get_attr(const STACK_OF(X509_ATTRIBUTE) *x, int loc)
104 {
105     if (x == NULL || sk_X509_ATTRIBUTE_num(x) <= loc || loc < 0)
106         return NULL;
107     else
108         return sk_X509_ATTRIBUTE_value(x, loc);
109 }
110
111 X509_ATTRIBUTE *X509at_delete_attr(STACK_OF(X509_ATTRIBUTE) *x, int loc)
112 {
113     X509_ATTRIBUTE *ret;
114
115     if (x == NULL || sk_X509_ATTRIBUTE_num(x) <= loc || loc < 0)
116         return(NULL);
117     ret=sk_X509_ATTRIBUTE_delete(x, loc);
118     return(ret);
119 }
120
121 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr(STACK_OF(X509_ATTRIBUTE) **x,
122                                             X509_ATTRIBUTE *attr)
123 {
124     X509_ATTRIBUTE *new_attr=NULL;
125     STACK_OF(X509_ATTRIBUTE) *sk=NULL;
126
127     if (x == NULL)
```

```

128     {
129         X509err(X509_F_X509AT_ADD1_ATTR, ERR_R_PASSED_NULL_PARAMETER);
130         goto err2;
131     }

133     if (*x == NULL)
134     {
135         if ((sk=sk_X509_ATTRIBUTE_new_null()) == NULL)
136             goto err;
137     }
138     else
139         sk= *x;

141     if ((new_attr=X509_ATTRIBUTE_dup(attr)) == NULL)
142         goto err2;
143     if (!sk_X509_ATTRIBUTE_push(sk,new_attr))
144         goto err;
145     if (*x == NULL)
146         *x=sk;
147     return(sk);
err:
148     X509err(X509_F_X509AT_ADD1_ATTR,ERR_R_MALLOC_FAILURE);
149 err2:
150     if (new_attr != NULL) X509_ATTRIBUTE_free(new_attr);
151     if (sk != NULL) sk_X509_ATTRIBUTE_free(sk);
152     return(NULL);
153 }
154 }

156 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr_by_OBJ(STACK_OF(X509_ATTRIBUTE) **x,
157     const ASN1_OBJECT *obj, int type,
158     const unsigned char *bytes, int len)
159 {
160     X509_ATTRIBUTE *attr;
161     STACK_OF(X509_ATTRIBUTE) *ret;
162     attr = X509_ATTRIBUTE_create_by_OBJ(NULL, obj, type, bytes, len);
163     if(!attr) return 0;
164     ret = X509at_add1_attr(x, attr);
165     X509_ATTRIBUTE_free(attr);
166     return ret;
167 }

169 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr_by_NID(STACK_OF(X509_ATTRIBUTE) **x,
170     int nid, int type,
171     const unsigned char *bytes, int len)
172 {
173     X509_ATTRIBUTE *attr;
174     STACK_OF(X509_ATTRIBUTE) *ret;
175     attr = X509_ATTRIBUTE_create_by_NID(NULL, nid, type, bytes, len);
176     if(!attr) return 0;
177     ret = X509at_add1_attr(x, attr);
178     X509_ATTRIBUTE_free(attr);
179     return ret;
180 }

182 STACK_OF(X509_ATTRIBUTE) *X509at_add1_attr_by_txt(STACK_OF(X509_ATTRIBUTE) **x,
183     const char *attrname, int type,
184     const unsigned char *bytes, int len)
185 {
186     X509_ATTRIBUTE *attr;
187     STACK_OF(X509_ATTRIBUTE) *ret;
188     attr = X509_ATTRIBUTE_create_by_txt(NULL, attrname, type, bytes, len);
189     if(!attr) return 0;
190     ret = X509at_add1_attr(x, attr);
191     X509_ATTRIBUTE_free(attr);
192     return ret;
193 }

```

```

195 void *X509at_get0_data_by_OBJ(STACK_OF(X509_ATTRIBUTE) *x,
196     ASN1_OBJECT *obj, int lastpos, int type)
197 {
198     int i;
199     X509_ATTRIBUTE *at;
200     i = X509at_get_attr_by_OBJ(x, obj, lastpos);
201     if (i == -1)
202         return NULL;
203     if ((lastpos <= -2) && (X509at_get_attr_by_OBJ(x, obj, i) != -1))
204         return NULL;
205     at = X509at_get_attr(x, i);
206     if (lastpos <= -3 && (X509_ATTRIBUTE_count(at) != 1))
207         return NULL;
208     return X509_ATTRIBUTE_get0_data(at, 0, type, NULL);
209 }

211 X509_ATTRIBUTE *X509_ATTRIBUTE_create_by_NID(X509_ATTRIBUTE **attr, int nid,
212     int atrtype, const void *data, int len)
213 {
214     ASN1_OBJECT *obj;
215     X509_ATTRIBUTE *ret;

217     obj=OBJ_nid2obj(nid);
218     if (obj == NULL)
219     {
220         X509err(X509_F_X509_ATTRIBUTE_CREATE_BY_NID,X509_R_UNKNOWN_NID);
221         return(NULL);
222     }
223     ret=X509_ATTRIBUTE_create_by_OBJ(attr,obj,atrtype,data,len);
224     if (ret == NULL) ASN1_OBJECT_free(obj);
225     return(ret);
226 }

228 X509_ATTRIBUTE *X509_ATTRIBUTE_create_by_OBJ(X509_ATTRIBUTE **attr,
229     const ASN1_OBJECT *obj, int atrtype, const void *data, int len)
230 {
231     X509_ATTRIBUTE *ret;

233     if ((attr == NULL) || (*attr == NULL))
234     {
235         if ((ret=X509_ATTRIBUTE_new()) == NULL)
236         {
237             X509err(X509_F_X509_ATTRIBUTE_CREATE_BY_OBJ,ERR_R_MALLOC);
238             return(NULL);
239         }
240     }
241     else
242         ret= *attr;

244     if (!X509_ATTRIBUTE_set1_object(ret,obj))
245         goto err;
246     if (!X509_ATTRIBUTE_set1_data(ret,atrtype,data,len))
247         goto err;

249     if ((attr != NULL) && (*attr == NULL)) *attr=ret;
250     return(ret);
251 err:
252     if ((attr == NULL) || (ret != *attr))
253         X509_ATTRIBUTE_free(ret);
254     return(NULL);
255 }

257 X509_ATTRIBUTE *X509_ATTRIBUTE_create_by_txt(X509_ATTRIBUTE **attr,
258     const char *atrname, int type, const unsigned char *bytes, int l
259     {

```

```

260     ASN1_OBJECT *obj;
261     X509_ATTRIBUTE *nattr;

263     obj=OBJ_txt2obj(atrname, 0);
264     if (obj == NULL)
265     {
266         X509err(X509_F_X509_ATTRIBUTE_CREATE_BY_TXT,
267                 X509_R_INVALID_FIELD_NAME);
268         ERR_add_error_data(2, "name=", atrname);
269         return(NULL);
270     }
271     nattr = X509_ATTRIBUTE_create_by_OBJ(attr,obj,type,bytes,len);
272     ASN1_OBJECT_free(obj);
273     return nattr;
274 }

276 int X509_ATTRIBUTE_set1_object(X509_ATTRIBUTE *attr, const ASN1_OBJECT *obj)
277 {
278     if ((attr == NULL) || (obj == NULL))
279         return(0);
280     ASN1_OBJECT_free(attr->object);
281     attr->object=OBJ_dup(obj);
282     return(1);
283 }

285 int X509_ATTRIBUTE_set1_data(X509_ATTRIBUTE *attr, int attrtype, const void *dat
286 {
287     ASN1_TYPE *ttmp;
288     ASN1_STRING *stmp = NULL;
289     int atype = 0;
290     if (!attr) return 0;
291     if (attrtype & MBSTRING_FLAG) {
292         stmp = ASN1_STRING_set_by_NID(NULL, data, len, attrtype,
293                                     OBJ_obj2nid(attr->object));
294         if (!stmp) {
295             X509err(X509_F_X509_ATTRIBUTE_SET1_DATA, ERR_R_ASN1_LIB);
296             return 0;
297         }
298         atype = stmp->type;
299     } else if (len != -1){
300         if (!(stmp = ASN1_STRING_type_new(attrtype))) goto err;
301         if (!ASN1_STRING_set(stmp, data, len)) goto err;
302         atype = attrtype;
303     }
304     if (!(attr->value.set = sk_ASN1_TYPE_new_null())) goto err;
305     attr->single = 0;
306     /* This is a bit naughty because the attribute should really have
307      * at least one value but some types use and zero length SET and
308      * require this.
309      */
310     if (attrtype == 0)
311         return 1;
312     if (!(ttmp = ASN1_TYPE_new())) goto err;
313     if ((len == -1) && !(attrtype & MBSTRING_FLAG))
314     {
315         if (!ASN1_TYPE_set1(ttmp, attrtype, data))
316             goto err;
317     }
318     else
319         ASN1_TYPE_set(ttmp, atype, stmp);
320     if (!sk_ASN1_TYPE_push(attr->value.set, ttmp)) goto err;
321     return 1;
322 err:
323     X509err(X509_F_X509_ATTRIBUTE_SET1_DATA, ERR_R_MALLOC_FAILURE);
324     return 0;
325 }

```

```

327 int X509_ATTRIBUTE_count(X509_ATTRIBUTE *attr)
328 {
329     if (!attr->single) return sk_ASN1_TYPE_num(attr->value.set);
330     if (attr->value.single) return 1;
331     return 0;
332 }

334 ASN1_OBJECT *X509_ATTRIBUTE_get0_object(X509_ATTRIBUTE *attr)
335 {
336     if (attr == NULL) return(NULL);
337     return(attr->object);
338 }

340 void *X509_ATTRIBUTE_get0_data(X509_ATTRIBUTE *attr, int idx,
341                               int attrtype, void *data)
342 {
343     ASN1_TYPE *ttmp;
344     ttmp = X509_ATTRIBUTE_get0_type(attr, idx);
345     if (!ttmp) return NULL;
346     if (attrtype != ASN1_TYPE_get(ttmp)){
347         X509err(X509_F_X509_ATTRIBUTE_GET0_DATA, X509_R_WRONG_TYPE);
348         return NULL;
349     }
350     return ttmp->value.ptr;
351 }

353 ASN1_TYPE *X509_ATTRIBUTE_get0_type(X509_ATTRIBUTE *attr, int idx)
354 {
355     if (attr == NULL) return(NULL);
356     if (idx >= X509_ATTRIBUTE_count(attr)) return NULL;
357     if (!attr->single) return sk_ASN1_TYPE_value(attr->value.set, idx);
358     else return attr->value.single;
359 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_cmp.c

1

9566 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_cmp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_cmp.c */
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4  *
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <ctype.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_cmp.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/objects.h>
64 #include <openssl/x509.h>
65 #include <openssl/x509v3.h>
```

```
67 int X509_issuer_and_serial_cmp(const X509 *a, const X509 *b)
68 {
69     int i;
70     X509_CINF *ai,*bi;
71
72     ai=a->cert_info;
73     bi=b->cert_info;
74     i=M_ASN1_INTEGER_cmp(ai->serialNumber,bi->serialNumber);
75     if (i) return(i);
76     return(X509_NAME_cmp(ai->issuer,bi->issuer));
77 }
78
79 #ifndef OPENSSL_NO_MD5
80 unsigned long X509_issuer_and_serial_hash(X509 *a)
81 {
82     unsigned long ret=0;
83     EVP_MD_CTX ctx;
84     unsigned char md[16];
85     char *f;
86
87     EVP_MD_CTX_init(&ctx);
88     f=X509_NAME_oneline(a->cert_info->issuer,NULL,0);
89     if (!EVP_DigestInit_ex(&ctx, EVP_md5(), NULL))
90         goto err;
91     if (!EVP_DigestUpdate(&ctx,(unsigned char *)f,strlen(f)))
92         goto err;
93     OPENSSL_free(f);
94     if(!EVP_DigestUpdate(&ctx,(unsigned char *)a->cert_info->serialNumber->d
95         (unsigned long)a->cert_info->serialNumber->length))
96         goto err;
97     if (!EVP_DigestFinal_ex(&ctx,&(md[0]),NULL))
98         goto err;
99     ret=((unsigned long)md[0] << 24) | ((unsigned long)md[1] << 16) |
100        ((unsigned long)md[2] << 8) | ((unsigned long)md[3]);
101     return(ret);
102 err:
103     EVP_MD_CTX_cleanup(&ctx);
104     return(0);
105 }
106 #endif
107
108 int X509_issuer_name_cmp(const X509 *a, const X509 *b)
109 {
110     return(X509_NAME_cmp(a->cert_info->issuer,b->cert_info->issuer));
111 }
112
113 int X509_subject_name_cmp(const X509 *a, const X509 *b)
114 {
115     return(X509_NAME_cmp(a->cert_info->subject,b->cert_info->subject));
116 }
117
118 int X509_CRL_cmp(const X509_CRL *a, const X509_CRL *b)
119 {
120     return(X509_NAME_cmp(a->crl->issuer,b->crl->issuer));
121 }
122
123 #ifndef OPENSSL_NO_SHA
124 int X509_CRL_match(const X509_CRL *a, const X509_CRL *b)
125 {
126     return memcmp(a->sha1_hash, b->sha1_hash, 20);
127 }
```

```

128 #endif

130 X509_NAME *X509_get_issuer_name(X509 *a)
131 {
132     return(a->cert_info->issuer);
133 }

135 unsigned long X509_issuer_name_hash(X509 *x)
136 {
137     return(X509_NAME_hash(x->cert_info->issuer));
138 }

140 #ifndef OPENSSL_NO_MD5
141 unsigned long X509_issuer_name_hash_old(X509 *x)
142 {
143     return(X509_NAME_hash_old(x->cert_info->issuer));
144 }
145 #endif

147 X509_NAME *X509_get_subject_name(X509 *a)
148 {
149     return(a->cert_info->subject);
150 }

152 ASN1_INTEGER *X509_get_serialNumber(X509 *a)
153 {
154     return(a->cert_info->serialNumber);
155 }

157 unsigned long X509_subject_name_hash(X509 *x)
158 {
159     return(X509_NAME_hash(x->cert_info->subject));
160 }

162 #ifndef OPENSSL_NO_MD5
163 unsigned long X509_subject_name_hash_old(X509 *x)
164 {
165     return(X509_NAME_hash_old(x->cert_info->subject));
166 }
167 #endif

169 #ifndef OPENSSL_NO_SHA
170 /* Compare two certificates: they must be identical for
171  * this to work. NB: Although "cmp" operations are generally
172  * prototyped to take "const" arguments (eg. for use in
173  * STACKs), the way X509 handling is - these operations may
174  * involve ensuring the hashes are up-to-date and ensuring
175  * certain cert information is cached. So this is the point
176  * where the "depth-first" constification tree has to halt
177  * with an evil cast.
178  */
179 int X509_cmp(const X509 *a, const X509 *b)
180 {
181     /* ensure hash is valid */
182     X509_check_purpose((X509 *)a, -1, 0);
183     X509_check_purpose((X509 *)b, -1, 0);

185     return memcmp(a->sha1_hash, b->sha1_hash, SHA_DIGEST_LENGTH);
186 }
187 #endif

190 int X509_NAME_cmp(const X509_NAME *a, const X509_NAME *b)
191 {
192     int ret;

```

```

194     /* Ensure canonical encoding is present and up to date */

196     if (!a->canon_enc || a->modified)
197     {
198         ret = i2d_X509_NAME((X509_NAME *)a, NULL);
199         if (ret < 0)
200             return -2;
201     }

203     if (!b->canon_enc || b->modified)
204     {
205         ret = i2d_X509_NAME((X509_NAME *)b, NULL);
206         if (ret < 0)
207             return -2;
208     }

210     ret = a->canon_enclen - b->canon_enclen;

212     if (ret)
213         return ret;

215     return memcmp(a->canon_enc, b->canon_enc, a->canon_enclen);

217 }

219 unsigned long X509_NAME_hash(X509_NAME *x)
220 {
221     unsigned long ret=0;
222     unsigned char md[SHA_DIGEST_LENGTH];

224     /* Make sure X509_NAME structure contains valid cached encoding */
225     i2d_X509_NAME(x, NULL);
226     if (!EVP_Digest(x->canon_enc, x->canon_enclen, md, NULL, EVP_sha1(),
227                     NULL))
228         return 0;

230     ret=((unsigned long)md[0])|(((unsigned long)md[1]<<8L)|
231                                ((unsigned long)md[2]<<16L)|((unsigned long)md[3]<<24L)
232                                )&0xffffffffL;
233     return(ret);
234 }

237 #ifndef OPENSSL_NO_MD5
238 /* I now DER encode the name and hash it. Since I cache the DER encoding,
239  * this is reasonably efficient. */

241 unsigned long X509_NAME_hash_old(X509_NAME *x)
242 {
243     EVP_MD_CTX md_ctx;
244     unsigned long ret=0;
245     unsigned char md[16];

247     /* Make sure X509_NAME structure contains valid cached encoding */
248     i2d_X509_NAME(x, NULL);
249     EVP_MD_CTX_init(&md_ctx);
250     EVP_MD_CTX_set_flags(&md_ctx, EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
251     if (EVP_DigestInit_ex(&md_ctx, EVP_md5(), NULL)
252         && EVP_DigestUpdate(&md_ctx, x->bytes->data, x->bytes->length)
253         && EVP_DigestFinal_ex(&md_ctx, md, NULL))
254         ret=((unsigned long)md[0])|(((unsigned long)md[1]<<8L)|
255                                    ((unsigned long)md[2]<<16L)|((unsigned long)md[3]<<24L)
256                                    )&0xffffffffL;
257     EVP_MD_CTX_cleanup(&md_ctx);

259     return(ret);

```



```

260     }
261 #endif

263 /* Search a stack of X509 for a match */
264 X509 *X509_find_by_issuer_and_serial(STACK_OF(X509) *sk, X509_NAME *name,
265     ASN1_INTEGER *serial)
266 {
267     int i;
268     X509_CINF cinf;
269     X509 x,*x509=NULL;

271     if(!sk) return NULL;

273     x.cert_info= &cinf;
274     cinf.serialNumber=serial;
275     cinf.issuer=name;

277     for (i=0; i<sk_X509_num(sk); i++)
278     {
279         x509=sk_X509_value(sk,i);
280         if (X509_issuer_and_serial_cmp(x509,&x) == 0)
281             return(x509);
282     }
283     return(NULL);
284 }

286 X509 *X509_find_by_subject(STACK_OF(X509) *sk, X509_NAME *name)
287 {
288     X509 *x509;
289     int i;

291     for (i=0; i<sk_X509_num(sk); i++)
292     {
293         x509=sk_X509_value(sk,i);
294         if (X509_NAME_cmp(X509_get_subject_name(x509),name) == 0)
295             return(x509);
296     }
297     return(NULL);
298 }

300 EVP_PKEY *X509_get_pubkey(X509 *x)
301 {
302     if ((x == NULL) || (x->cert_info == NULL))
303         return(NULL);
304     return(X509_PUBKEY_get(x->cert_info->key));
305 }

307 ASN1_BIT_STRING *X509_get0_pubkey_bitstr(const X509 *x)
308 {
309     if(!x) return NULL;
310     return x->cert_info->key->public_key;
311 }

313 int X509_check_private_key(X509 *x, EVP_PKEY *k)
314 {
315     EVP_PKEY *xk;
316     int ret;

318     xk=X509_get_pubkey(x);

320     if (xk)
321         ret = EVP_PKEY_cmp(xk, k);
322     else
323         ret = -2;

325     switch (ret)

```

```

326     {
327         case 1:
328             break;
329         case 0:
330             X509err(X509_F_X509_CHECK_PRIVATE_KEY,X509_R_KEY_VALUES_MISMATCH);
331             break;
332         case -1:
333             X509err(X509_F_X509_CHECK_PRIVATE_KEY,X509_R_KEY_TYPE_MISMATCH);
334             break;
335         case -2:
336             X509err(X509_F_X509_CHECK_PRIVATE_KEY,X509_R_UNKNOWN_KEY_TYPE);
337     }
338     if (xk)
339         EVP_PKEY_free(xk);
340     if (ret > 0)
341         return 1;
342     return 0;
343 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_d2.c

1

4337 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_d2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_d2.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
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45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_d2.c

2

62 #include <openssl/x509.h>

```
64 #ifndef OPENSSL_NO_STDIO
65 int X509_STORE_set_default_paths(X509_STORE *ctx)
66 {
67     X509_LOOKUP *lookup;
68
69     lookup=X509_STORE_add_lookup(ctx,X509_LOOKUP_file());
70     if (lookup == NULL) return(0);
71     X509_LOOKUP_load_file(lookup,NULL,X509_FILETYPE_DEFAULT);
72
73     lookup=X509_STORE_add_lookup(ctx,X509_LOOKUP_hash_dir());
74     if (lookup == NULL) return(0);
75     X509_LOOKUP_add_dir(lookup,NULL,X509_FILETYPE_DEFAULT);
76
77     /* clear any errors */
78     ERR_clear_error();
79
80     return(1);
81 }
82
83 int X509_STORE_load_locations(X509_STORE *ctx, const char *file,
84                             const char *path)
85 {
86     X509_LOOKUP *lookup;
87
88     if (file != NULL)
89     {
90         lookup=X509_STORE_add_lookup(ctx,X509_LOOKUP_file());
91         if (lookup == NULL) return(0);
92         if (X509_LOOKUP_load_file(lookup,file,X509_FILETYPE_PEM) != 1)
93             return(0);
94     }
95     if (path != NULL)
96     {
97         lookup=X509_STORE_add_lookup(ctx,X509_LOOKUP_hash_dir());
98         if (lookup == NULL) return(0);
99         if (X509_LOOKUP_add_dir(lookup,path,X509_FILETYPE_PEM) != 1)
100             return(0);
101     }
102     if ((path == NULL) && (file == NULL))
103         return(0);
104     return(1);
105 }
106
107 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_def.c

1

3762 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_def.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_def.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/crypto.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_def.c

2

62 #include <openssl/x509.h>

```
64 const char *X509_get_default_private_dir(void)
65 { return(X509_PRIVATE_DIR); }
66
67 const char *X509_get_default_cert_area(void)
68 { return(X509_CERT_AREA); }
69
70 const char *X509_get_default_cert_dir(void)
71 { return(X509_CERT_DIR); }
72
73 const char *X509_get_default_cert_file(void)
74 { return(X509_CERT_FILE); }
75
76 const char *X509_get_default_cert_dir_env(void)
77 { return(X509_CERT_DIR_ENV); }
78
79 const char *X509_get_default_cert_file_env(void)
80 { return(X509_CERT_FILE_ENV); }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_err.c

1

```
*****
8110 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* crypto/x509/x509_err.c */
2 /* =====
3  * Copyright (c) 1999-2006 The OpenSSL Project. All rights reserved.
4  *
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15  * distribution.
16  *
17  * 3. All advertising materials mentioning features or use of this
18  * software must display the following acknowledgment:
19  * "This product includes software developed by the OpenSSL Project
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21  *
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25  * openssl-core@OpenSSL.org.
26  *
27  * 5. Products derived from this software may not be called "OpenSSL"
28  * nor may "OpenSSL" appear in their names without prior written
29  * permission of the OpenSSL Project.
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35  *
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39  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  * =====
49  *
50  * This product includes cryptographic software written by Eric Young
51  * (eay@cryptsoft.com). This product includes software written by Tim
52  * Hudson (tjh@cryptsoft.com).
53  *
54  */

56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_err.c

2

```
62 #include <openssl/err.h>
63 #include <openssl/x509.h>

65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR

68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_X509,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_X509,0,reason)

71 static ERR_STRING_DATA X509_str_functs[]=
72 {
73 {ERR_FUNC(X509_F_ADD_CERT_DIR), "ADD_CERT_DIR"},
74 {ERR_FUNC(X509_F_BY_FILE_CTRL), "BY_FILE_CTRL"},
75 {ERR_FUNC(X509_F_CHECK_POLICY), "CHECK_POLICY"},
76 {ERR_FUNC(X509_F_DIR_CTRL), "DIR_CTRL"},
77 {ERR_FUNC(X509_F_GET_CERT_BY_SUBJECT), "GET_CERT_BY_SUBJECT"},
78 {ERR_FUNC(X509_F_NETSCAPE_SPKI_B64_DECODE), "NETSCAPE_SPKI_b64_decode"},
79 {ERR_FUNC(X509_F_NETSCAPE_SPKI_B64_ENCODE), "NETSCAPE_SPKI_b64_encode"},
80 {ERR_FUNC(X509_F_X509AT_ADD1_ATTR), "X509at_add1_attr"},
81 {ERR_FUNC(X509_F_X509V3_ADD_EXT), "X509v3_add_ext"},
82 {ERR_FUNC(X509_F_X509_ATTRIBUTE_CREATE_BY_NID), "X509_ATTRIBUTE_create_by_NID"},
83 {ERR_FUNC(X509_F_X509_ATTRIBUTE_CREATE_BY_OBJ), "X509_ATTRIBUTE_create_by_OBJ"},
84 {ERR_FUNC(X509_F_X509_ATTRIBUTE_CREATE_BY_TXT), "X509_ATTRIBUTE_create_by_txt"},
85 {ERR_FUNC(X509_F_X509_ATTRIBUTE_GET0_DATA), "X509_ATTRIBUTE_get0_data"},
86 {ERR_FUNC(X509_F_X509_ATTRIBUTE_SET1_DATA), "X509_ATTRIBUTE_set1_data"},
87 {ERR_FUNC(X509_F_X509_CHECK_PRIVATE_KEY), "X509_check_private_key"},
88 {ERR_FUNC(X509_F_X509_CRL_PRINT_FP), "X509_CRL_print_fp"},
89 {ERR_FUNC(X509_F_X509_EXTENSION_CREATE_BY_NID), "X509_EXTENSION_create_by_NID"},
90 {ERR_FUNC(X509_F_X509_EXTENSION_CREATE_BY_OBJ), "X509_EXTENSION_create_by_OBJ"},
91 {ERR_FUNC(X509_F_X509_GET_PUBKEY_PARAMETERS), "X509_get_pubkey_parameters"},
92 {ERR_FUNC(X509_F_X509_LOAD_CERT_CRL_FILE), "X509_load_cert_crl_file"},
93 {ERR_FUNC(X509_F_X509_LOAD_CERT_FILE), "X509_load_cert_file"},
94 {ERR_FUNC(X509_F_X509_LOAD_CRL_FILE), "X509_load_crl_file"},
95 {ERR_FUNC(X509_F_X509_NAME_ADD_ENTRY), "X509_NAME_add_entry"},
96 {ERR_FUNC(X509_F_X509_NAME_ENTRY_CREATE_BY_NID), "X509_NAME_ENTRY_create_by_NID"},
97 {ERR_FUNC(X509_F_X509_NAME_ENTRY_CREATE_BY_TXT), "X509_NAME_ENTRY_create_by_txt"},
98 {ERR_FUNC(X509_F_X509_NAME_ENTRY_SET_OBJECT), "X509_NAME_ENTRY_set_object"},
99 {ERR_FUNC(X509_F_X509_NAME_ONELINE), "X509_NAME_oneline"},
100 {ERR_FUNC(X509_F_X509_NAME_PRINT), "X509_NAME_print"},
101 {ERR_FUNC(X509_F_X509_PRINT_EX_FP), "X509_print_ex_fp"},
102 {ERR_FUNC(X509_F_X509_PUBKEY_GET), "X509_PUBKEY_get"},
103 {ERR_FUNC(X509_F_X509_PUBKEY_SET), "X509_PUBKEY_set"},
104 {ERR_FUNC(X509_F_X509_REQ_CHECK_PRIVATE_KEY), "X509_REQ_check_private_key"},
105 {ERR_FUNC(X509_F_X509_REQ_PRINT_EX), "X509_REQ_print_ex"},
106 {ERR_FUNC(X509_F_X509_REQ_PRINT_FP), "X509_REQ_print_fp"},
107 {ERR_FUNC(X509_F_X509_REQ_TO_X509), "X509_REQ_to_X509"},
108 {ERR_FUNC(X509_F_X509_STORE_ADD_CERT), "X509_STORE_add_cert"},
109 {ERR_FUNC(X509_F_X509_STORE_ADD_CRL), "X509_STORE_add_crl"},
110 {ERR_FUNC(X509_F_X509_STORE_CTX_GET1_ISSUER), "X509_STORE_CTX_get1_issuer"},
111 {ERR_FUNC(X509_F_X509_STORE_CTX_INIT), "X509_STORE_CTX_init"},
112 {ERR_FUNC(X509_F_X509_STORE_CTX_NEW), "X509_STORE_CTX_new"},
113 {ERR_FUNC(X509_F_X509_STORE_CTX_PURPOSE_INHERIT), "X509_STORE_CTX_purpose_inherit"},
114 {ERR_FUNC(X509_F_X509_TO_X509_REQ), "X509_to_X509_REQ"},
115 {ERR_FUNC(X509_F_X509_TRUST_ADD), "X509_TRUST_add"},
116 {ERR_FUNC(X509_F_X509_TRUST_SET), "X509_TRUST_set"},
117 {ERR_FUNC(X509_F_X509_VERIFY_CERT), "X509_verify_cert"},
118 {0,NULL}
119 };

121 static ERR_STRING_DATA X509_str_reasons[]=
122 {
123 {ERR_REASON(X509_R_BAD_X509_FILETYPE), "bad x509 filetype"},
124 {ERR_REASON(X509_R_BASE64_DECODE_ERROR), "base64 decode error"},
125 {ERR_REASON(X509_R_CANT_CHECK_DH_KEY), "cant check dh key"},
126 {ERR_REASON(X509_R_CERT_ALREADY_IN_HASH_TABLE), "cert already in hash table"},
127 {ERR_REASON(X509_R_ERR_ASN1_LIB), "err asn1 lib"},
128 }
```

```
128 {ERR_REASON(X509_R_INVALID_DIRECTORY)      , "invalid directory"},
129 {ERR_REASON(X509_R_INVALID_FIELD_NAME)      , "invalid field name"},
130 {ERR_REASON(X509_R_INVALID_TRUST)           , "invalid trust"},
131 {ERR_REASON(X509_R_KEY_TYPE_MISMATCH)       , "key type mismatch"},
132 {ERR_REASON(X509_R_KEY_VALUES_MISMATCH)     , "key values mismatch"},
133 {ERR_REASON(X509_R_LOADING_CERT_DIR)        , "loading cert dir"},
134 {ERR_REASON(X509_R_LOADING_DEFAULTS)        , "loading defaults"},
135 {ERR_REASON(X509_R_METHOD_NOT_SUPPORTED)     , "method not supported"},
136 {ERR_REASON(X509_R_NO_CERT_SET_FOR_US_TO_VERIFY), "no cert set for us to verify"},
137 {ERR_REASON(X509_R_PUBLIC_KEY_DECODE_ERROR), "public key decode error"},
138 {ERR_REASON(X509_R_PUBLIC_KEY_ENCODE_ERROR), "public key encode error"},
139 {ERR_REASON(X509_R_SHOULD_RETRY)            , "should retry"},
140 {ERR_REASON(X509_R_UNABLE_TO_FIND_PARAMETERS_IN_CHAIN), "unable to find parameter"},
141 {ERR_REASON(X509_R_UNABLE_TO_GET_CERTS_PUBLIC_KEY), "unable to get certs public k"},
142 {ERR_REASON(X509_R_UNKNOWN_KEY_TYPE)        , "unknown key type"},
143 {ERR_REASON(X509_R_UNKNOWN_NID)             , "unknown nid"},
144 {ERR_REASON(X509_R_UNKNOWN_PURPOSE_ID)      , "unknown purpose id"},
145 {ERR_REASON(X509_R_UNKNOWN_TRUST_ID)        , "unknown trust id"},
146 {ERR_REASON(X509_R_UNSUPPORTED_ALGORITHM)   , "unsupported algorithm"},
147 {ERR_REASON(X509_R_WRONG_LOOKUP_TYPE)       , "wrong lookup type"},
148 {ERR_REASON(X509_R_WRONG_TYPE)             , "wrong type"},
149 {0, NULL}
150 };

152 #endif

154 void ERR_load_X509_strings(void)
155 {
156 #ifndef OPENSSL_NO_ERR
157
158     if (ERR_func_error_string(X509_str_functs[0].error) == NULL)
159     {
160         ERR_load_strings(0, X509_str_functs);
161         ERR_load_strings(0, X509_str_reasons);
162     }
163 #endif
164 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_ext.c

1

7074 Fri May 30 18:32:12 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_ext.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_ext.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
26 * 1. Redistributions of source code must retain the copyright
27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/stack.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_ext.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65 #include <openssl/x509.h>
66 #include <openssl/x509v3.h>
67
68 int X509_CRL_get_ext_count(X509_CRL *x)
69 {
70     return(X509v3_get_ext_count(x->crl->extensions));
71 }
72
73 int X509_CRL_get_ext_by_NID(X509_CRL *x, int nid, int lastpos)
74 {
75     return(X509v3_get_ext_by_NID(x->crl->extensions,nid,lastpos));
76 }
77
78 int X509_CRL_get_ext_by_OBJ(X509_CRL *x, ASN1_OBJECT *obj, int lastpos)
79 {
80     return(X509v3_get_ext_by_OBJ(x->crl->extensions,obj,lastpos));
81 }
82
83 int X509_CRL_get_ext_by_critical(X509_CRL *x, int crit, int lastpos)
84 {
85     return(X509v3_get_ext_by_critical(x->crl->extensions,crit,lastpos));
86 }
87
88 X509_EXTENSION *X509_CRL_get_ext(X509_CRL *x, int loc)
89 {
90     return(X509v3_get_ext(x->crl->extensions,loc));
91 }
92
93 X509_EXTENSION *X509_CRL_delete_ext(X509_CRL *x, int loc)
94 {
95     return(X509v3_delete_ext(x->crl->extensions,loc));
96 }
97
98 void *X509_CRL_get_ext_d2i(X509_CRL *x, int nid, int *crit, int *idx)
99 {
100     return X509v3_get_d2i(x->crl->extensions, nid, crit, idx);
101 }
102
103 int X509_CRL_add1_ext_i2d(X509_CRL *x, int nid, void *value, int crit,
104                          unsigned long flags)
105 {
106     return X509v3_add1_i2d(&x->crl->extensions, nid, value, crit, flags);
107 }
108
109 int X509_CRL_add_ext(X509_CRL *x, X509_EXTENSION *ex, int loc)
110 {
111     return(X509v3_add_ext(&(x->crl->extensions),ex,loc) != NULL);
112 }
113
114 int X509_get_ext_count(X509 *x)
115 {
116     return(X509v3_get_ext_count(x->cert_info->extensions));
117 }
118
119 int X509_get_ext_by_NID(X509 *x, int nid, int lastpos)
120 {
121     return(X509v3_get_ext_by_NID(x->cert_info->extensions,nid,lastpos));
122 }
123
124 int X509_get_ext_by_OBJ(X509 *x, ASN1_OBJECT *obj, int lastpos)
125 {
126     return(X509v3_get_ext_by_OBJ(x->cert_info->extensions,obj,lastpos));
127 }
```

```

128     }
129
130 int X509_get_ext_by_critical(X509 *x, int crit, int lastpos)
131 {
132     return(X509v3_get_ext_by_critical(x->cert_info->extensions,crit,lastpos))
133 }
134
135 X509_EXTENSION *X509_get_ext(X509 *x, int loc)
136 {
137     return(X509v3_get_ext(x->cert_info->extensions,loc));
138 }
139
140 X509_EXTENSION *X509_delete_ext(X509 *x, int loc)
141 {
142     return(X509v3_delete_ext(x->cert_info->extensions,loc));
143 }
144
145 int X509_add_ext(X509 *x, X509_EXTENSION *ex, int loc)
146 {
147     return(X509v3_add_ext(&(x->cert_info->extensions),ex,loc) != NULL);
148 }
149
150 void *X509_get_ext_d2i(X509 *x, int nid, int *crit, int *idx)
151 {
152     return X509v3_get_d2i(x->cert_info->extensions, nid, crit, idx);
153 }
154
155 int X509_add1_ext_i2d(X509 *x, int nid, void *value, int crit,
156                      unsigned long flags)
157 {
158     return X509v3_add1_i2d(&(x->cert_info->extensions), nid, value, crit,
159                          flags);
160 }
161
162 int X509_REVOKED_get_ext_count(X509_REVOKED *x)
163 {
164     return(X509v3_get_ext_count(x->extensions));
165 }
166
167 int X509_REVOKED_get_ext_by_NID(X509_REVOKED *x, int nid, int lastpos)
168 {
169     return(X509v3_get_ext_by_NID(x->extensions,nid,lastpos));
170 }
171
172 int X509_REVOKED_get_ext_by_OBJ(X509_REVOKED *x, ASN1_OBJECT *obj,
173                                 int lastpos)
174 {
175     return(X509v3_get_ext_by_OBJ(x->extensions,obj,lastpos));
176 }
177
178 int X509_REVOKED_get_ext_by_critical(X509_REVOKED *x, int crit, int lastpos)
179 {
180     return(X509v3_get_ext_by_critical(x->extensions,crit,lastpos));
181 }
182
183 X509_EXTENSION *X509_REVOKED_get_ext(X509_REVOKED *x, int loc)
184 {
185     return(X509v3_get_ext(x->extensions,loc));
186 }
187
188 X509_EXTENSION *X509_REVOKED_delete_ext(X509_REVOKED *x, int loc)
189 {
190     return(X509v3_delete_ext(x->extensions,loc));
191 }
192
193 int X509_REVOKED_add_ext(X509_REVOKED *x, X509_EXTENSION *ex, int loc)

```

```

194     {
195         return(X509v3_add_ext(&(x->extensions),ex,loc) != NULL);
196     }
197
198 void *X509_REVOKED_get_ext_d2i(X509_REVOKED *x, int nid, int *crit, int *idx)
199 {
200     return X509v3_get_d2i(x->extensions, nid, crit, idx);
201 }
202
203 int X509_REVOKED_add1_ext_i2d(X509_REVOKED *x, int nid, void *value, int crit,
204                               unsigned long flags)
205 {
206     return X509v3_add1_i2d(&(x->extensions), nid, value, crit, flags);
207 }
208
209 IMPLEMENT_STACK_OF(X509_EXTENSION)
210 IMPLEMENT_ASN1_SET_OF(X509_EXTENSION)

```

```

*****
17798 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_lu.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509_lu.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/lhash.h>

```

```

62 #include <openssl/x509.h>
63 #include <openssl/x509v3.h>
64
65 X509_LOOKUP *X509_LOOKUP_new(X509_LOOKUP_METHOD *method)
66 {
67     X509_LOOKUP *ret;
68
69     ret=(X509_LOOKUP *)OPENSSL_malloc(sizeof(X509_LOOKUP));
70     if (ret == NULL) return NULL;
71
72     ret->init=0;
73     ret->skip=0;
74     ret->method=method;
75     ret->method_data=NULL;
76     ret->store_ctx=NULL;
77     if ((method->new_item != NULL) && !method->new_item(ret))
78     {
79         OPENSSL_free(ret);
80         return NULL;
81     }
82     return ret;
83 }
84
85 void X509_LOOKUP_free(X509_LOOKUP *ctx)
86 {
87     if (ctx == NULL) return;
88     if (ctx->method != NULL &&
89         ctx->method->free != NULL)
90         ctx->method->free(ctx);
91     OPENSSL_free(ctx);
92 }
93
94 int X509_LOOKUP_init(X509_LOOKUP *ctx)
95 {
96     if (ctx->method == NULL) return 0;
97     if (ctx->method->init != NULL)
98         return ctx->method->init(ctx);
99     else
100         return 1;
101 }
102
103 int X509_LOOKUP_shutdown(X509_LOOKUP *ctx)
104 {
105     if (ctx->method == NULL) return 0;
106     if (ctx->method->shutdown != NULL)
107         return ctx->method->shutdown(ctx);
108     else
109         return 1;
110 }
111
112 int X509_LOOKUP_ctrl(X509_LOOKUP *ctx, int cmd, const char *argc, long argl,
113                     char **ret)
114 {
115     if (ctx->method == NULL) return -1;
116     if (ctx->method->ctrl != NULL)
117         return ctx->method->ctrl(ctx,cmd,argc,argl,ret);
118     else
119         return 1;
120 }
121
122 int X509_LOOKUP_by_subject(X509_LOOKUP *ctx, int type, X509_NAME *name,
123                          X509_OBJECT *ret)
124 {
125     if ((ctx->method == NULL) || (ctx->method->get_by_subject == NULL))
126         return X509_LU_FAIL;
127     if (ctx->skip) return 0;

```



```

128     return ctx->method->get_by_subject(ctx,type,name,ret);
129 }

131 int X509_LOOKUP_by_issuer_serial(X509_LOOKUP *ctx, int type, X509_NAME *name,
132     ASN1_INTEGER *serial, X509_OBJECT *ret)
133 {
134     if ((ctx->method == NULL) ||
135         (ctx->method->get_by_issuer_serial == NULL))
136         return X509_LU_FAIL;
137     return ctx->method->get_by_issuer_serial(ctx,type,name,serial,ret);
138 }

140 int X509_LOOKUP_by_fingerprint(X509_LOOKUP *ctx, int type,
141     unsigned char *bytes, int len, X509_OBJECT *ret)
142 {
143     if ((ctx->method == NULL) || (ctx->method->get_by_fingerprint == NULL))
144         return X509_LU_FAIL;
145     return ctx->method->get_by_fingerprint(ctx,type,bytes,len,ret);
146 }

148 int X509_LOOKUP_by_alias(X509_LOOKUP *ctx, int type, char *str, int len,
149     X509_OBJECT *ret)
150 {
151     if ((ctx->method == NULL) || (ctx->method->get_by_alias == NULL))
152         return X509_LU_FAIL;
153     return ctx->method->get_by_alias(ctx,type,str,len,ret);
154 }

156 static int x509_object_cmp(const X509_OBJECT * const *a, const X509_OBJECT * con
157 {
158     int ret;
159
161     ret=((*a)->type - (*b)->type);
162     if (ret) return ret;
163     switch ((*a)->type)
164     {
165     case X509_LU_X509:
166         ret=X509_subject_name_cmp((*a)->data.x509, (*b)->data.x509);
167         break;
168     case X509_LU_CRL:
169         ret=X509_CRL_cmp((*a)->data.crl, (*b)->data.crl);
170         break;
171     default:
172         /* abort(); */
173         return 0;
174     }
175     return ret;
176 }

178 X509_STORE *X509_STORE_new(void)
179 {
180     X509_STORE *ret;

182     if ((ret=(X509_STORE *)OPENSSL_malloc(sizeof(X509_STORE))) == NULL)
183         return NULL;
184     ret->objs = sk_X509_OBJECT_new(x509_object_cmp);
185     ret->cache=1;
186     ret->get_cert_methods=sk_X509_LOOKUP_new_null();
187     ret->verify=0;
188     ret->verify_cb=0;

190     if ((ret->param = X509_VERIFY_PARAM_new()) == NULL)
191         return NULL;

193     ret->get_issuer = 0;

```

```

194     ret->check_issued = 0;
195     ret->check_revocation = 0;
196     ret->get_crl = 0;
197     ret->check_crl = 0;
198     ret->cert_crl = 0;
199     ret->lookup_certs = 0;
200     ret->lookup_crls = 0;
201     ret->cleanup = 0;

203     if (!CRYPTO_new_ex_data(CRYPTO_EX_INDEX_X509_STORE, ret, &ret->ex_data))
204     {
205         sk_X509_OBJECT_free(ret->objs);
206         OPENSSL_free(ret);
207         return NULL;
208     }

210     ret->references=1;
211     return ret;
212 }

214 static void cleanup(X509_OBJECT *a)
215 {
216     if (a->type == X509_LU_X509)
217     {
218         X509_free(a->data.x509);
219     }
220     else if (a->type == X509_LU_CRL)
221     {
222         X509_CRL_free(a->data.crl);
223     }
224     else
225     {
226         /* abort(); */
227     }

229     OPENSSL_free(a);
230 }

232 void X509_STORE_free(X509_STORE *vfy)
233 {
234     int i;
235     STACK_OF(X509_LOOKUP) *sk;
236     X509_LOOKUP *lu;

238     if (vfy == NULL)
239         return;

241     sk=vfy->get_cert_methods;
242     for (i=0; i<sk_X509_LOOKUP_num(sk); i++)
243     {
244         lu=sk_X509_LOOKUP_value(sk,i);
245         X509_LOOKUP_shutdown(lu);
246         X509_LOOKUP_free(lu);
247     }
248     sk_X509_LOOKUP_free(sk);
249     sk_X509_OBJECT_pop_free(vfy->objs, cleanup);

251     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_X509_STORE, vfy, &vfy->ex_data);
252     if (vfy->param)
253         X509_VERIFY_PARAM_free(vfy->param);
254     OPENSSL_free(vfy);
255 }

257 X509_LOOKUP *X509_STORE_add_lookup(X509_STORE *v, X509_LOOKUP_METHOD *m)
258 {
259     int i;

```

```

260     STACK_OF(X509_LOOKUP) *sk;
261     X509_LOOKUP *lu;

263     sk=v->get_cert_methods;
264     for (i=0; i<sk_X509_LOOKUP_num(sk); i++)
265     {
266         lu=sk_X509_LOOKUP_value(sk,i);
267         if (m == lu->method)
268         {
269             return lu;
270         }
271     }
272     /* a new one */
273     lu=X509_LOOKUP_new(m);
274     if (lu == NULL)
275         return NULL;
276     else
277     {
278         lu->store_ctx=v;
279         if (sk_X509_LOOKUP_push(v->get_cert_methods, lu))
280             return lu;
281         else
282         {
283             X509_LOOKUP_free(lu);
284             return NULL;
285         }
286     }
287 }

289 int X509_STORE_get_by_subject(X509_STORE_CTX *vs, int type, X509_NAME *name,
290                             X509_OBJECT *ret)
291 {
292     X509_STORE *ctx=vs->ctx;
293     X509_LOOKUP *lu;
294     X509_OBJECT stmp,*tmp;
295     int i,j;

297     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
298     tmp=X509_OBJECT_retrieve_by_subject(ctx->objs, type, name);
299     CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);

301     if (tmp == NULL || type == X509_LU_CRL)
302     {
303         for (i=vs->current_method; i<sk_X509_LOOKUP_num(ctx->get_cert_me
304             {
305                 lu=sk_X509_LOOKUP_value(ctx->get_cert_methods,i);
306                 j=X509_LOOKUP_by_subject(lu, type, name, &stmp);
307                 if (j < 0)
308                 {
309                     vs->current_method=j;
310                     return j;
311                 }
312                 else if (j)
313                 {
314                     tmp= &stmp;
315                     break;
316                 }
317             }
318         vs->current_method=0;
319         if (tmp == NULL)
320             return 0;
321     }

323 /*     if (ret->data.ptr != NULL)
324         X509_OBJECT_free_contents(ret); */

```

```

326     ret->type=tmp->type;
327     ret->data.ptr=tmp->data.ptr;

329     X509_OBJECT_up_ref_count(ret);

331     return 1;
332 }

334 int X509_STORE_add_cert(X509_STORE *ctx, X509 *x)
335 {
336     X509_OBJECT *obj;
337     int ret=1;

339     if (x == NULL) return 0;
340     obj=(X509_OBJECT *)OPENSSL_malloc(sizeof(X509_OBJECT));
341     if (obj == NULL)
342     {
343         X509err(X509_F_X509_STORE_ADD_CERT, ERR_R_MALLOC_FAILURE);
344         return 0;
345     }
346     obj->type=X509_LU_X509;
347     obj->data.x509=x;

349     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);

351     X509_OBJECT_up_ref_count(obj);

353     if (X509_OBJECT_retrieve_match(ctx->objs, obj))
354     {
355         X509_OBJECT_free_contents(obj);
356         OPENSSL_free(obj);
357         X509err(X509_F_X509_STORE_ADD_CERT, X509_R_CERT_ALREADY_IN_HASH_T
358             ret=0;
359     }
360     else sk_X509_OBJECT_push(ctx->objs, obj);

362     CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);

364     return ret;
365 }

367 int X509_STORE_add_crl(X509_STORE *ctx, X509_CRL *x)
368 {
369     X509_OBJECT *obj;
370     int ret=1;

372     if (x == NULL) return 0;
373     obj=(X509_OBJECT *)OPENSSL_malloc(sizeof(X509_OBJECT));
374     if (obj == NULL)
375     {
376         X509err(X509_F_X509_STORE_ADD_CRL, ERR_R_MALLOC_FAILURE);
377         return 0;
378     }
379     obj->type=X509_LU_CRL;
380     obj->data.crl=x;

382     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);

384     X509_OBJECT_up_ref_count(obj);

386     if (X509_OBJECT_retrieve_match(ctx->objs, obj))
387     {
388         X509_OBJECT_free_contents(obj);
389         OPENSSL_free(obj);
390         X509err(X509_F_X509_STORE_ADD_CRL, X509_R_CERT_ALREADY_IN_HASH_TA
391             ret=0;

```

```

392     }
393     else sk_X509_OBJECT_push(ctx->objs, obj);
394
395     CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
396
397     return ret;
398 }
399
400 void X509_OBJECT_up_ref_count(X509_OBJECT *a)
401 {
402     switch (a->type)
403     {
404     case X509_LU_X509:
405         CRYPTO_add(&a->data.x509->references,1,CRYPTO_LOCK_X509);
406         break;
407     case X509_LU_CRL:
408         CRYPTO_add(&a->data.crl->references,1,CRYPTO_LOCK_X509_CRL);
409         break;
410     }
411 }
412
413 void X509_OBJECT_free_contents(X509_OBJECT *a)
414 {
415     switch (a->type)
416     {
417     case X509_LU_X509:
418         X509_free(a->data.x509);
419         break;
420     case X509_LU_CRL:
421         X509_CRL_free(a->data.crl);
422         break;
423     }
424 }
425
426 static int x509_object_idx_cnt(STACK_OF(X509_OBJECT) *h, int type,
427                               X509_NAME *name, int *pnmatch)
428 {
429     X509_OBJECT stmp;
430     X509 *x509_s;
431     X509_CINF cinf_s;
432     X509_CRL crl_s;
433     X509_CRL_INFO crl_info_s;
434     int idx;
435
436     stmp.type=type;
437     switch (type)
438     {
439     case X509_LU_X509:
440         stmp.data.x509= &x509_s;
441         x509_s.cert_info= &cinf_s;
442         cinf_s.subject=name;
443         break;
444     case X509_LU_CRL:
445         stmp.data.crl= &crl_s;
446         crl_s.crl= &crl_info_s;
447         crl_info_s.issuer=name;
448         break;
449     default:
450         /* abort(); */
451         return -1;
452     }
453
454     idx = sk_X509_OBJECT_find(h,&stmp);
455     if (idx >= 0 && pnmatch)
456     {
457         int tid;

```

```

458         const X509_OBJECT *tobj, *pstmp;
459         *pnmatch = 1;
460         pstmp = &stmp;
461         for (tid = idx + 1; tid < sk_X509_OBJECT_num(h); tid++)
462         {
463             tobj = sk_X509_OBJECT_value(h, tid);
464             if (x509_object_cmp(&tobj, &stmp))
465                 break;
466             (*pnmatch)++;
467         }
468     }
469     return idx;
470 }
471
472 int X509_OBJECT_idx_by_subject(STACK_OF(X509_OBJECT) *h, int type,
473                               X509_NAME *name)
474 {
475     return x509_object_idx_cnt(h, type, name, NULL);
476 }
477
478 X509_OBJECT *X509_OBJECT_retrieve_by_subject(STACK_OF(X509_OBJECT) *h, int type,
479                                              X509_NAME *name)
480 {
481     int idx;
482     idx = X509_OBJECT_idx_by_subject(h, type, name);
483     if (idx == -1) return NULL;
484     return sk_X509_OBJECT_value(h, idx);
485 }
486
487 STACK_OF(X509)* X509_STORE_get1_certs(X509_STORE_CTX *ctx, X509_NAME *nm)
488 {
489     int i, idx, cnt;
490     STACK_OF(X509) *sk;
491     X509 *x;
492     X509_OBJECT *obj;
493     sk = sk_X509_new_null();
494     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
495     idx = x509_object_idx_cnt(ctx->ctx->objs, X509_LU_X509, nm, &cnt);
496     if (idx < 0)
497     {
498         /* Nothing found in cache: do lookup to possibly add new
499          * objects to cache
500          */
501         X509_OBJECT xobj;
502         CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
503         if (!X509_STORE_get_by_subject(ctx, X509_LU_X509, nm, &xobj))
504         {
505             sk_X509_free(sk);
506             return NULL;
507         }
508         X509_OBJECT_free_contents(&xobj);
509         CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
510         idx = x509_object_idx_cnt(ctx->ctx->objs,X509_LU_X509,nm, &cnt);
511         if (idx < 0)
512         {
513             CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
514             sk_X509_free(sk);
515             return NULL;
516         }
517     }
518     for (i = 0; i < cnt; i++, idx++)
519     {
520         obj = sk_X509_OBJECT_value(ctx->ctx->objs, idx);
521         x = obj->data.x509;
522         CRYPTO_add(&x->references, 1, CRYPTO_LOCK_X509);

```

```

524         if (!sk_X509_push(sk, x))
525             {
526                 CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
527                 X509_free(x);
528                 sk_X509_pop_free(sk, X509_free);
529                 return NULL;
530             }
531     }
532     CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
533     return sk;
534 }
535
536 STACK_OF(X509_CRL)* X509_STORE_get1_crls(X509_STORE_CTX *ctx, X509_NAME *nm)
537 {
538     int i, idx, cnt;
539     STACK_OF(X509_CRL) *sk;
540     X509_CRL *x;
541     X509_OBJECT *obj, xobj;
542     sk = sk_X509_CRL_new_null();
543     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
544     /* Check cache first */
545     idx = x509_object_idx_cnt(ctx->ctx->objs, X509_LU_CRL, nm, &cnt);
546
547     /* Always do lookup to possibly add new CRLs to cache
548      */
549     CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
550     if (!X509_STORE_get_by_subject(ctx, X509_LU_CRL, nm, &xobj))
551     {
552         sk_X509_CRL_free(sk);
553         return NULL;
554     }
555     X509_OBJECT_free_contents(&xobj);
556     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
557     idx = x509_object_idx_cnt(ctx->ctx->objs, X509_LU_CRL, nm, &cnt);
558     if (idx < 0)
559     {
560         CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
561         sk_X509_CRL_free(sk);
562         return NULL;
563     }
564
565     for (i = 0; i < cnt; i++, idx++)
566     {
567         obj = sk_X509_OBJECT_value(ctx->ctx->objs, idx);
568         x = obj->data.crl;
569         CRYPTO_add(&x->references, 1, CRYPTO_LOCK_X509_CRL);
570         if (!sk_X509_CRL_push(sk, x))
571             {
572                 CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
573                 X509_CRL_free(x);
574                 sk_X509_CRL_pop_free(sk, X509_CRL_free);
575                 return NULL;
576             }
577     }
578     CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
579     return sk;
580 }
581
582 X509_OBJECT *X509_OBJECT_retrieve_match(STACK_OF(X509_OBJECT) *h, X509_OBJECT *x)
583 {
584     int idx, i;
585     X509_OBJECT *obj;
586     idx = sk_X509_OBJECT_find(h, x);
587     if (idx == -1) return NULL;
588     if ((x->type != X509_LU_X509) && (x->type != X509_LU_CRL))

```

```

590         return sk_X509_OBJECT_value(h, idx);
591     for (i = idx; i < sk_X509_OBJECT_num(h); i++)
592     {
593         obj = sk_X509_OBJECT_value(h, i);
594         if (x509_object_cmp((const X509_OBJECT **)&obj, (const X509_OBJE
595             return NULL;
596         if (x->type == X509_LU_X509)
597             {
598                 if (!X509_cmp(obj->data.x509, x->data.x509))
599                     return obj;
600             }
601         else if (x->type == X509_LU_CRL)
602             {
603                 if (!X509_CRL_match(obj->data.crl, x->data.crl))
604                     return obj;
605             }
606         else
607             return obj;
608     }
609     return NULL;
610 }
611
612 /* Try to get issuer certificate from store. Due to limitations
613 * of the API this can only retrieve a single certificate matching
614 * a given subject name. However it will fill the cache with all
615 * matching certificates, so we can examine the cache for all
616 * matches.
617 * Return values are:
618 * 1 lookup successful.
619 * 0 certificate not found.
620 * -1 some other error.
621 */
622 int X509_STORE_CTX_get1_issuer(X509 **issuer, X509_STORE_CTX *ctx, X509 *x)
623 {
624     X509_NAME *xn;
625     X509_OBJECT obj, *pobj;
626     int i, ok, idx, ret;
627     xn=X509_get_issuer_name(x);
628     ok=X509_STORE_get_by_subject(ctx, X509_LU_X509, xn, &obj);
629     if (ok != X509_LU_X509)
630     {
631         if (ok == X509_LU_RETRY)
632             {
633                 X509_OBJECT_free_contents(&obj);
634                 X509err(X509_F_X509_STORE_CTX_GET1_ISSUER, X509_R_SHOULD
635                     return -1;
636             }
637         else if (ok != X509_LU_FAIL)
638             {
639                 X509_OBJECT_free_contents(&obj);
640                 /* not good :-/, break anyway */
641                 return -1;
642             }
643         return 0;
644     }
645     /* If certificate matches all OK */
646     if (ctx->check_issued(ctx, x, obj.data.x509))
647     {
648         *issuer = obj.data.x509;
649         return 1;
650     }
651     X509_OBJECT_free_contents(&obj);
652
653     /* Else find index of first cert accepted by 'check_issued' */

```

```
656     ret = 0;
657     CRYPTO_w_lock(CRYPTO_LOCK_X509_STORE);
658     idx = X509_OBJECT_idx_by_subject(ctx->ctx->objs, X509_LU_X509, xn);
659     if (idx != -1) /* should be true as we've had at least one match */
660     {
661         /* Look through all matching certs for suitable issuer */
662         for (i = idx; i < sk_X509_OBJECT_num(ctx->ctx->objs); i++)
663         {
664             pobj = sk_X509_OBJECT_value(ctx->ctx->objs, i);
665             /* See if we've run past the matches */
666             if (pobj->type != X509_LU_X509)
667                 break;
668             if (X509_NAME_cmp(xn, X509_get_subject_name(pobj->data.x
669             break;
670             if (ctx->check_issued(ctx, x, pobj->data.x509))
671             {
672                 *issuer = pobj->data.x509;
673                 X509_OBJECT_up_ref_count(pobj);
674                 ret = 1;
675                 break;
676             }
677         }
678     }
679     CRYPTO_w_unlock(CRYPTO_LOCK_X509_STORE);
680     return ret;
681 }

683 int X509_STORE_set_flags(X509_STORE *ctx, unsigned long flags)
684 {
685     return X509_VERIFY_PARAM_set_flags(ctx->param, flags);
686 }

688 int X509_STORE_set_depth(X509_STORE *ctx, int depth)
689 {
690     X509_VERIFY_PARAM_set_depth(ctx->param, depth);
691     return 1;
692 }

694 int X509_STORE_set_purpose(X509_STORE *ctx, int purpose)
695 {
696     return X509_VERIFY_PARAM_set_purpose(ctx->param, purpose);
697 }

699 int X509_STORE_set_trust(X509_STORE *ctx, int trust)
700 {
701     return X509_VERIFY_PARAM_set_trust(ctx->param, trust);
702 }

704 int X509_STORE_set1_param(X509_STORE *ctx, X509_VERIFY_PARAM *param)
705 {
706     return X509_VERIFY_PARAM_set1(ctx->param, param);
707 }

709 void X509_STORE_set_verify_cb(X509_STORE *ctx,
710                               int (*verify_cb)(int, X509_STORE_CTX *))
711 {
712     ctx->verify_cb = verify_cb;
713 }

715 IMPLEMENT_STACK_OF(X509_LOOKUP)
716 IMPLEMENT_STACK_OF(X509_OBJECT)
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_obj.c

1

```
*****
6508 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_obj.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509_obj.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
25 * are met:
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
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37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/lhash.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_obj.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64 #include <openssl/buffer.h>
66 char *X509_NAME_oneline(X509_NAME *a, char *buf, int len)
67 {
68     X509_NAME_ENTRY *ne;
69     int i;
70     int n, lold, l, l1, l2, num, j, type;
71     const char *s;
72     char *p;
73     unsigned char *q;
74     BUF_MEM *b=NULL;
75     static const char hex[17]="0123456789ABCDEF";
76     int gs_doit[4];
77     char tmp_buf[80];
78 #ifdef CHARSET_EBCDIC
79     char ebcdic_buf[1024];
80 #endif
82     if (buf == NULL)
83     {
84         if ((b=BUF_MEM_new()) == NULL) goto err;
85         if (!BUF_MEM_grow(b,200)) goto err;
86         b->data[0]='\0';
87         len=200;
88     }
89     if (a == NULL)
90     {
91         if(b)
92         {
93             buf=b->data;
94             OPENSSL_free(b);
95         }
96         strncpy(buf,"NO X509_NAME", len);
97         buf[len-1]='\0';
98         return buf;
99     }
101     len--; /* space for '\0' */
102     l=0;
103     for (i=0; i<sk_X509_NAME_ENTRY_num(a->entries); i++)
104     {
105         ne=sk_X509_NAME_ENTRY_value(a->entries,i);
106         n=OBJ_obj2nid(ne->object);
107         if ((n == NID_undef) || ((s=OBJ_nid2sn(n)) == NULL))
108         {
109             i2t_ASN1_OBJECT(tmp_buf, sizeof(tmp_buf), ne->object);
110             s=tmp_buf;
111         }
112         l1=strlen(s);
114         type=ne->value->type;
115         num=ne->value->length;
116         q=ne->value->data;
117 #ifdef CHARSET_EBCDIC
118         if (type == V_ASN1_GENERALSTRING ||
119             type == V_ASN1_VISIBLESTRING ||
120             type == V_ASN1_PRINTABLESTRING ||
121             type == V_ASN1_TELETEXTSTRING ||
122             type == V_ASN1_VISIBLESTRING ||
123             type == V_ASN1_IA5STRING) {
124             ascii2ebcdic(ebcdic_buf, q,
125                         (num > sizeof ebcdic_buf)
126                         ? sizeof ebcdic_buf : num);
127             q=ebcdic_buf;
```

```

128     }
129 #endif

131     if ((type == V_ASN1_GENERALSTRING) && ((num%4) == 0))
132     {
133         gs_doit[0]=gs_doit[1]=gs_doit[2]=gs_doit[3]=0;
134         for (j=0; j<num; j++)
135             if (q[j] != 0) gs_doit[j&3]=1;

137         if (gs_doit[0]|gs_doit[1]|gs_doit[2])
138             gs_doit[0]=gs_doit[1]=gs_doit[2]=gs_doit[3]=1;
139         else
140         {
141             gs_doit[0]=gs_doit[1]=gs_doit[2]=0;
142             gs_doit[3]=1;
143         }
144     }
145     else
146         gs_doit[0]=gs_doit[1]=gs_doit[2]=gs_doit[3]=1;

148     for (l2=j=0; j<num; j++)
149     {
150         if (!gs_doit[j&3]) continue;
151         l2++;
152 #ifndef CHARSET_EBCDIC
153         if ((q[j] < ' ') || (q[j] > '~')) l2+=3;
154 #else
155         if ((os_toascii[q[j]] < os_toascii[' ']) ||
156             (os_toascii[q[j]] > os_toascii['~'])) l2+=3;
157 #endif
158     }

160     lold=l;
161     l+=1+l1+1+l2;
162     if (b != NULL)
163     {
164         if (!BUF_MEM_grow(b,l+1)) goto err;
165         p= &(b->data[lold]);
166     }
167     else if (l > len)
168     {
169         break;
170     }
171     else
172     {
173         p= &(buf[lold]);
174         *p+=',';
175         memcpy(p,s,(unsigned int)l1); p+=l1;
176         *p+=',';

177 #ifndef CHARSET_EBCDIC /* q was assigned above already. */
178         q=ne->value->data;
179 #endif

181         for (j=0; j<num; j++)
182         {
183             if (!gs_doit[j&3]) continue;
184 #ifndef CHARSET_EBCDIC
185             n=q[j];
186             if ((n < ' ') || (n > '~'))
187             {
188                 *(p++)='\\';
189                 *(p++)='x';
190                 *(p++)=hex[(n>>4)&0x0f];
191                 *(p++)=hex[n&0x0f];
192             }
193             else

```

```

194         *(p++)=n;
195 #else
196         n=os_toascii[q[j]];
197         if ((n < os_toascii[' ']) ||
198             (n > os_toascii['~']))
199         {
200             *(p++)='\\';
201             *(p++)='x';
202             *(p++)=hex[(n>>4)&0x0f];
203             *(p++)=hex[n&0x0f];
204         }
205         else
206             *(p++)=q[j];
207 #endif
208     }
209     *p='\0';
210 }
211 if (b != NULL)
212 {
213     p=b->data;
214     OPENSSL_free(b);
215 }
216 else
217     p=buf;
218 if (i == 0)
219     *p = '\0';
220 return(p);
221 err:
222 X509err(X509_F_X509_NAME_ONLINE,ERR_R_MALLOC_FAILURE);
223 if (b != NULL) BUF_MEM_free(b);
224 return(NULL);
225 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_r2x.c

1

```
*****
4439 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_r2x.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509_r2x.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_r2x.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/asn1.h>
64 #include <openssl/x509.h>
65 #include <openssl/objects.h>
66 #include <openssl/buffer.h>
68 X509 *X509_REQ_to_X509(X509_REQ *r, int days, EVP_PKEY *pkey)
69 {
70     X509 *ret=NULL;
71     X509_CINF *xi=NULL;
72     X509_NAME *xn;
74     if ((ret=X509_new()) == NULL)
75     {
76         X509err(X509_F_X509_REQ_TO_X509,ERR_R_MALLOC_FAILURE);
77         goto err;
78     }
80     /* duplicate the request */
81     xi=ret->cert_info;
83     if (sk_X509_ATTRIBUTE_num(r->req_info->attributes) != 0)
84     {
85         if ((xi->version=M_ASN1_INTEGER_new()) == NULL) goto err;
86         if (!ASN1_INTEGER_set(xi->version,2)) goto err;
87         /* xi->extensions=ri->attributes; <- bad, should not ever be done
88            ri->attributes=NULL; */
89     }
91     xn=X509_REQ_get_subject_name(r);
92     if (X509_set_subject_name(ret,X509_NAME_dup(xn)) == 0)
93         goto err;
94     if (X509_set_issuer_name(ret,X509_NAME_dup(xn)) == 0)
95         goto err;
97     if (X509_gmtime_adj(xi->validity->notBefore,0) == NULL)
98         goto err;
99     if (X509_gmtime_adj(xi->validity->notAfter,(long)60*60*24*days) == NULL)
100         goto err;
102     X509_set_pubkey(ret,X509_REQ_get_pubkey(r));
104     if (!X509_sign(ret,pkey,EVP_md5()))
105         goto err;
106     if (0)
107     {
108 err:
109         X509_free(ret);
110         ret=NULL;
111     }
112     return(ret);
113 }
```


new/usr/src/lib/openssl/libsunw_crypto/x509/x509_req.c

1

```
*****
9390 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_req.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509_req.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
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46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
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53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/bn.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_req.c

2

```
62 #include <openssl/evp.h>
63 #include <openssl/asn1.h>
64 #include <openssl/asn1t.h>
65 #include <openssl/x509.h>
66 #include <openssl/objects.h>
67 #include <openssl/buffer.h>
68 #include <openssl/pem.h>
69
70 X509_REQ *X509_to_X509_REQ(X509 *x, EVP_PKEY *pkey, const EVP_MD *md)
71 {
72     X509_REQ *ret;
73     X509_REQ_INFO *ri;
74     int i;
75     EVP_PKEY *pktmp;
76
77     ret=X509_REQ_new();
78     if (ret == NULL)
79     {
80         X509err(X509_F_X509_TO_X509_REQ, ERR_R_MALLOC_FAILURE);
81         goto err;
82     }
83
84     ri=ret->req_info;
85
86     ri->version->length=1;
87     ri->version->data=(unsigned char *)OPENSSL_malloc(1);
88     if (ri->version->data == NULL) goto err;
89     ri->version->data[0]=0; /* version == 0 */
90
91     if (!X509_REQ_set_subject_name(ret,X509_get_subject_name(x)))
92         goto err;
93
94     pktmp = X509_get_pubkey(x);
95     i=X509_REQ_set_pubkey(ret,pktmp);
96     EVP_PKEY_free(pktmp);
97     if (!i) goto err;
98
99     if (pkey != NULL)
100     {
101         if (!X509_REQ_sign(ret,pkey,md))
102             goto err;
103     }
104     return(ret);
105 err:
106     X509_REQ_free(ret);
107     return(NULL);
108 }
109
110 EVP_PKEY *X509_REQ_get_pubkey(X509_REQ *req)
111 {
112     if ((req == NULL) || (req->req_info == NULL))
113         return(NULL);
114     return(X509_PUBKEY_get(req->req_info->pubkey));
115 }
116
117 int X509_REQ_check_private_key(X509_REQ *x, EVP_PKEY *k)
118 {
119     EVP_PKEY *xk=NULL;
120     int ok=0;
121
122     xk=X509_REQ_get_pubkey(x);
123     switch (EVP_PKEY_cmp(xk, k))
124     {
125     case 1:
126         ok=1;
127         break;
```

```

128     case 0:
129         X509err(X509_F_X509_REQ_CHECK_PRIVATE_KEY, X509_R_KEY_VALUES_MISM
130         break;
131     case -1:
132         X509err(X509_F_X509_REQ_CHECK_PRIVATE_KEY, X509_R_KEY_TYPE_MISMAT
133         break;
134     case -2:
135 #ifndef OPENSSSL_NO_EC
136         if (k->type == EVP_PKEY_EC)
137             {
138                 X509err(X509_F_X509_REQ_CHECK_PRIVATE_KEY, ERR_R_EC_LIB)
139                 break;
140             }
141 #endif
142 #ifndef OPENSSSL_NO_DH
143         if (k->type == EVP_PKEY_DH)
144             {
145                 /* No idea */
146                 X509err(X509_F_X509_REQ_CHECK_PRIVATE_KEY, X509_R_CANT_CH
147                 break;
148             }
149 #endif
150         X509err(X509_F_X509_REQ_CHECK_PRIVATE_KEY, X509_R_UNKNOWN_KEY_TYP
151     }

153     EVP_PKEY_free(xk);
154     return(ok);
155 }

157 /* It seems several organisations had the same idea of including a list of
158  * extensions in a certificate request. There are at least two OIDs that are
159  * used and there may be more: so the list is configurable.
160  */

162 static int ext_nid_list[] = { NID_ext_req, NID_ms_ext_req, NID_undef};

164 static int *ext_nids = ext_nid_list;

166 int X509_REQ_extension_nid(int req_nid)
167 {
168     int i, nid;
169     for(i = 0; ; i++) {
170         nid = ext_nids[i];
171         if(nid == NID_undef) return 0;
172         else if (req_nid == nid) return 1;
173     }
174 }

176 int *X509_REQ_get_extension_nids(void)
177 {
178     return ext_nids;
179 }

180 void X509_REQ_set_extension_nids(int *nids)
181 {
182     ext_nids = nids;
183 }

186 STACK_OF(X509_EXTENSION) *X509_REQ_get_extensions(X509_REQ *req)
187 {
188     X509_ATTRIBUTE *attr;
189     ASN1_TYPE *ext = NULL;
190     int idx, *pnid;
191     const unsigned char *p;

193     if ((req == NULL) || (req->req_info == NULL) || !ext_nids)

```

```

194         return(NULL);
195     for (pnid = ext_nids; *pnid != NID_undef; pnid++)
196     {
197         idx = X509_REQ_get_attr_by_NID(req, *pnid, -1);
198         if (idx == -1)
199             continue;
200         attr = X509_REQ_get_attr(req, idx);
201         if(attr->single) ext = attr->value.single;
202         else if(sk_ASN1_TYPE_num(attr->value.set))
203             ext = sk_ASN1_TYPE_value(attr->value.set, 0);
204         break;
205     }
206     if(!ext || (ext->type != V_ASN1_SEQUENCE))
207         return NULL;
208     p = ext->value.sequence->data;
209     return (STACK_OF(X509_EXTENSION) *)
210         ASN1_item_d2i(NULL, &p, ext->value.sequence->length,
211         ASN1_ITEM_rptr(X509_EXTENSIONS));
212 }

214 /* Add a STACK_OF extensions to a certificate request: allow alternative OIDs
215  * in case we want to create a non standard one.
216  */

218 int X509_REQ_add_extensions_nid(X509_REQ *req, STACK_OF(X509_EXTENSION) *exts,
219                                int nid)
220 {
221     ASN1_TYPE *at = NULL;
222     X509_ATTRIBUTE *attr = NULL;
223     if(!(at = ASN1_TYPE_new()) ||
224        !(at->value.sequence = ASN1_STRING_new())) goto err;

226     at->type = V_ASN1_SEQUENCE;
227     /* Generate encoding of extensions */
228     at->value.sequence->length =
229         ASN1_item_i2d((ASN1_VALUE *)exts,
230                       &at->value.sequence->data,
231                       ASN1_ITEM_rptr(X509_EXTENSIONS));
232     if(!(attr = X509_ATTRIBUTE_new())) goto err;
233     if(!(attr->value.set = sk_ASN1_TYPE_new_null())) goto err;
234     if(!sk_ASN1_TYPE_push(attr->value.set, at)) goto err;
235     at = NULL;
236     attr->single = 0;
237     attr->object = OBJ_nid2obj(nid);
238     if (!req->req_info->attributes)
239     {
240         if (!(req->req_info->attributes = sk_X509_ATTRIBUTE_new_null()))
241             goto err;
242     }
243     if(!sk_X509_ATTRIBUTE_push(req->req_info->attributes, attr)) goto err;
244     return 1;
245 err:
246     X509_ATTRIBUTE_free(attr);
247     ASN1_TYPE_free(at);
248     return 0;
249 }

250 /* This is the normal usage: use the "official" OID */
251 int X509_REQ_add_extensions(X509_REQ *req, STACK_OF(X509_EXTENSION) *exts)
252 {
253     return X509_REQ_add_extensions_nid(req, exts, NID_ext_req);
254 }

256 /* Request attribute functions */

258 int X509_REQ_get_attr_count(const X509_REQ *req)
259 {

```

```
260     return X509at_get_attr_count(req->req_info->attributes);
261 }

263 int X509_REQ_get_attr_by_NID(const X509_REQ *req, int nid,
264                             int lastpos)
265 {
266     return X509at_get_attr_by_NID(req->req_info->attributes, nid, lastpos);
267 }

269 int X509_REQ_get_attr_by_OBJ(const X509_REQ *req, ASN1_OBJECT *obj,
270                             int lastpos)
271 {
272     return X509at_get_attr_by_OBJ(req->req_info->attributes, obj, lastpos);
273 }

275 X509_ATTRIBUTE *X509_REQ_get_attr(const X509_REQ *req, int loc)
276 {
277     return X509at_get_attr(req->req_info->attributes, loc);
278 }

280 X509_ATTRIBUTE *X509_REQ_delete_attr(X509_REQ *req, int loc)
281 {
282     return X509at_delete_attr(req->req_info->attributes, loc);
283 }

285 int X509_REQ_add1_attr(X509_REQ *req, X509_ATTRIBUTE *attr)
286 {
287     if(X509at_add1_attr(&req->req_info->attributes, attr)) return 1;
288     return 0;
289 }

291 int X509_REQ_add1_attr_by_OBJ(X509_REQ *req,
292                             const ASN1_OBJECT *obj, int type,
293                             const unsigned char *bytes, int len)
294 {
295     if(X509at_add1_attr_by_OBJ(&req->req_info->attributes, obj,
296                             type, bytes, len)) return 1;
297     return 0;
298 }

300 int X509_REQ_add1_attr_by_NID(X509_REQ *req,
301                             int nid, int type,
302                             const unsigned char *bytes, int len)
303 {
304     if(X509at_add1_attr_by_NID(&req->req_info->attributes, nid,
305                             type, bytes, len)) return 1;
306     return 0;
307 }

309 int X509_REQ_add1_attr_by_txt(X509_REQ *req,
310                             const char *attrname, int type,
311                             const unsigned char *bytes, int len)
312 {
313     if(X509at_add1_attr_by_txt(&req->req_info->attributes, attrname,
314                             type, bytes, len)) return 1;
315     return 0;
316 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_set.c

1

5181 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_set.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_set.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
23 * Redistribution and use in source and binary forms, with or without
24 * modification, are permitted provided that the following conditions
25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
39 * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
40 *
41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND
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44 * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_set.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/x509.h>
65
66 int X509_set_version(X509 *x, long version)
67 {
68     if (x == NULL) return(0);
69     if (x->cert_info->version == NULL)
70     {
71         if ((x->cert_info->version=M_ASN1_INTEGER_new()) == NULL)
72             return(0);
73     }
74     return(ASN1_INTEGER_set(x->cert_info->version,version));
75 }
76
77 int X509_set_serialNumber(X509 *x, ASN1_INTEGER *serial)
78 {
79     ASN1_INTEGER *in;
80
81     if (x == NULL) return(0);
82     in=x->cert_info->serialNumber;
83     if (in != serial)
84     {
85         in=M_ASN1_INTEGER_dup(serial);
86         if (in != NULL)
87         {
88             M_ASN1_INTEGER_free(x->cert_info->serialNumber);
89             x->cert_info->serialNumber=in;
90         }
91     }
92     return(in != NULL);
93 }
94
95 int X509_set_issuer_name(X509 *x, X509_NAME *name)
96 {
97     if ((x == NULL) || (x->cert_info == NULL)) return(0);
98     return(X509_NAME_set(&x->cert_info->issuer,name));
99 }
100
101 int X509_set_subject_name(X509 *x, X509_NAME *name)
102 {
103     if ((x == NULL) || (x->cert_info == NULL)) return(0);
104     return(X509_NAME_set(&x->cert_info->subject,name));
105 }
106
107 int X509_set_notBefore(X509 *x, const ASN1_TIME *tm)
108 {
109     ASN1_TIME *in;
110
111     if ((x == NULL) || (x->cert_info->validity == NULL)) return(0);
112     in=x->cert_info->validity->notBefore;
113     if (in != tm)
114     {
115         in=M_ASN1_TIME_dup(tm);
116         if (in != NULL)
117         {
118             M_ASN1_TIME_free(x->cert_info->validity->notBefore);
119             x->cert_info->validity->notBefore=in;
120         }
121     }
122     return(in != NULL);
123 }
124
125 int X509_set_notAfter(X509 *x, const ASN1_TIME *tm)
126 {
127     ASN1_TIME *in;
```

```
129     if ((x == NULL) || (x->cert_info->validity == NULL)) return(0);
130     in=x->cert_info->validity->notAfter;
131     if (in != tm)
132     {
133         in=M_ASN1_TIME_dup(tm);
134         if (in != NULL)
135         {
136             M_ASN1_TIME_free(x->cert_info->validity->notAfter);
137             x->cert_info->validity->notAfter=in;
138         }
139     }
140     return(in != NULL);
141 }

143 int X509_set_pubkey(X509 *x, EVP_PKEY *pkey)
144 {
145     if ((x == NULL) || (x->cert_info == NULL)) return(0);
146     return(X509_PUBKEY_set(&(x->cert_info->key),pkey));
147 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_trs.c

1

```
*****
9015 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_trs.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* x509_trs.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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13  * notice, this list of conditions and the following disclaimer.
14  *
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17  * the documentation and/or other materials provided with the
18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
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43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_trs.c

2

```
64 static int tr_cmp(const X509_TRUST * const *a,
65                   const X509_TRUST * const *b);
66 static void trtable_free(X509_TRUST *p);
67
68 static int trust_1oidany(X509_TRUST *trust, X509 *x, int flags);
69 static int trust_1oid(X509_TRUST *trust, X509 *x, int flags);
70 static int trust_compat(X509_TRUST *trust, X509 *x, int flags);
71
72 static int obj_trust(int id, X509 *x, int flags);
73 static int (*default_trust)(int id, X509 *x, int flags) = obj_trust;
74
75 /* WARNING: the following table should be kept in order of trust
76  * and without any gaps so we can just subtract the minimum trust
77  * value to get an index into the table
78  */
79
80 static X509_TRUST trstandard[] = {
81 {X509_TRUST_COMPAT, 0, trust_compat, "compatible", 0, NULL},
82 {X509_TRUST_SSL_CLIENT, 0, trust_1oidany, "SSL Client", NID_client_auth, NULL},
83 {X509_TRUST_SSL_SERVER, 0, trust_1oidany, "SSL Server", NID_server_auth, NULL},
84 {X509_TRUST_EMAIL, 0, trust_1oidany, "S/MIME email", NID_email_protect, NULL},
85 {X509_TRUST_OBJECT_SIGN, 0, trust_1oidany, "Object Signer", NID_code_sign, NULL},
86 {X509_TRUST_OCSP_SIGN, 0, trust_1oid, "OCSP responder", NID_OCSP_sign, NULL},
87 {X509_TRUST_OCSP_REQUEST, 0, trust_1oid, "OCSP request", NID_ad_OCSP, NULL},
88 {X509_TRUST_TSA, 0, trust_1oidany, "TSA server", NID_time_stamp, NULL}
89 };
90
91 #define X509_TRUST_COUNT (sizeof(trstandard)/sizeof(X509_TRUST))
92
93 IMPLEMENT_STACK_OF(X509_TRUST)
94
95 static STACK_OF(X509_TRUST) *trtable = NULL;
96
97 static int tr_cmp(const X509_TRUST * const *a,
98                  const X509_TRUST * const *b)
99 {
100     return (*a)->trust - (*b)->trust;
101 }
102
103 int (*X509_TRUST_set_default(int (*trust)(int, X509 *, int)))(int, X509 *, int)
104 {
105     int (*oldtrust)(int, X509 *, int);
106     oldtrust = default_trust;
107     default_trust = trust;
108     return oldtrust;
109 }
110
111 int X509_check_trust(X509 *x, int id, int flags)
112 {
113     X509_TRUST *pt;
114     int idx;
115     if(id == -1) return 1;
116     /* We get this as a default value */
117     if (id == 0)
118     {
119         int rv;
120         rv = obj_trust(NID_anyExtendedKeyUsage, x, 0);
121         if (rv != X509_TRUST_UNTRUSTED)
122             return rv;
123         return trust_compat(NULL, x, 0);
124     }
125     idx = X509_TRUST_get_by_id(id);
126     if(idx == -1) return default_trust(id, x, flags);
127 }
```

```

128     pt = X509_TRUST_get0(idx);
129     return pt->check_trust(pt, x, flags);
130 }

132 int X509_TRUST_get_count(void)
133 {
134     if(!trtable) return X509_TRUST_COUNT;
135     return sk_X509_TRUST_num(trtable) + X509_TRUST_COUNT;
136 }

138 X509_TRUST * X509_TRUST_get0(int idx)
139 {
140     if(idx < 0) return NULL;
141     if(idx < (int)X509_TRUST_COUNT) return trstandard + idx;
142     return sk_X509_TRUST_value(trtable, idx - X509_TRUST_COUNT);
143 }

145 int X509_TRUST_get_by_id(int id)
146 {
147     X509_TRUST tmp;
148     int idx;
149     if((id >= X509_TRUST_MIN) && (id <= X509_TRUST_MAX))
150         return id - X509_TRUST_MIN;
151     tmp.trust = id;
152     if(!trtable) return -1;
153     idx = sk_X509_TRUST_find(trtable, &tmp);
154     if(idx == -1) return -1;
155     return idx + X509_TRUST_COUNT;
156 }

158 int X509_TRUST_set(int *t, int trust)
159 {
160     if(X509_TRUST_get_by_id(trust) == -1) {
161         X509err(X509_F_X509_TRUST_SET, X509_R_INVALID_TRUST);
162         return 0;
163     }
164     *t = trust;
165     return 1;
166 }

168 int X509_TRUST_add(int id, int flags, int (*ck)(X509_TRUST *, X509 *, int),
169                    char *name, int arg1, void *arg2)
170 {
171     int idx;
172     X509_TRUST *trtmp;
173     /* This is set according to what we change: application can't set it */
174     flags &= ~X509_TRUST_DYNAMIC;
175     /* This will always be set for application modified trust entries */
176     flags |= X509_TRUST_DYNAMIC_NAME;
177     /* Get existing entry if any */
178     idx = X509_TRUST_get_by_id(id);
179     /* Need a new entry */
180     if(idx == -1) {
181         if(!trtmp = OPENSSL_malloc(sizeof(X509_TRUST))) {
182             X509err(X509_F_X509_TRUST_ADD, ERR_R_MALLOC_FAILURE);
183             return 0;
184         }
185         trtmp->flags = X509_TRUST_DYNAMIC;
186     } else trtmp = X509_TRUST_get0(idx);

188     /* OPENSSL_free existing name if dynamic */
189     if(trtmp->flags & X509_TRUST_DYNAMIC_NAME) OPENSSL_free(trtmp->name);
190     /* dup supplied name */
191     if(!trtmp->name = BUF_strdup(name)) {
192         X509err(X509_F_X509_TRUST_ADD, ERR_R_MALLOC_FAILURE);
193         return 0;

```

```

194     }
195     /* Keep the dynamic flag of existing entry */
196     trtmp->flags &= X509_TRUST_DYNAMIC;
197     /* Set all other flags */
198     trtmp->flags |= flags;

200     trtmp->trust = id;
201     trtmp->check_trust = ck;
202     trtmp->arg1 = arg1;
203     trtmp->arg2 = arg2;

205     /* If its a new entry manage the dynamic table */
206     if(idx == -1) {
207         if(!trtable && !(trtable = sk_X509_TRUST_new(tr_cmp))) {
208             X509err(X509_F_X509_TRUST_ADD, ERR_R_MALLOC_FAILURE);
209             return 0;
210         }
211         if (!sk_X509_TRUST_push(trtable, trtmp)) {
212             X509err(X509_F_X509_TRUST_ADD, ERR_R_MALLOC_FAILURE);
213             return 0;
214         }
215     }
216     return 1;
217 }

219 static void trtable_free(X509_TRUST *p)
220 {
221     if(!p) return;
222     if (p->flags & X509_TRUST_DYNAMIC)
223     {
224         if (p->flags & X509_TRUST_DYNAMIC_NAME)
225             OPENSSL_free(p->name);
226         OPENSSL_free(p);
227     }
228 }

230 void X509_TRUST_cleanup(void)
231 {
232     unsigned int i;
233     for(i = 0; i < X509_TRUST_COUNT; i++) trtable_free(trstandard + i);
234     sk_X509_TRUST_pop_free(trtable, trtable_free);
235     trtable = NULL;
236 }

238 int X509_TRUST_get_flags(X509_TRUST *xp)
239 {
240     return xp->flags;
241 }

243 char *X509_TRUST_get0_name(X509_TRUST *xp)
244 {
245     return xp->name;
246 }

248 int X509_TRUST_get_trust(X509_TRUST *xp)
249 {
250     return xp->trust;
251 }

253 static int trust_1oidany(X509_TRUST *trust, X509 *x, int flags)
254 {
255     if(x->aux && (x->aux->trust || x->aux->reject))
256         return obj_trust(trust->arg1, x, flags);
257     /* we don't have any trust settings: for compatibility
258      * we return trusted if it is self signed
259     */

```

```
260     return trust_compat(trust, x, flags);
261 }

263 static int trust_1oid(X509_TRUST *trust, X509 *x, int flags)
264 {
265     if(x->aux) return obj_trust(trust->arg1, x, flags);
266     return X509_TRUST_UNTRUSTED;
267 }

269 static int trust_compat(X509_TRUST *trust, X509 *x, int flags)
270 {
271     X509_check_purpose(x, -1, 0);
272     if(x->ex_flags & EXFLAG_SS) return X509_TRUST_TRUSTED;
273     else return X509_TRUST_UNTRUSTED;
274 }

276 static int obj_trust(int id, X509 *x, int flags)
277 {
278     ASN1_OBJECT *obj;
279     int i;
280     X509_CERT_AUX *ax;
281     ax = x->aux;
282     if(!ax) return X509_TRUST_UNTRUSTED;
283     if(ax->reject) {
284         for(i = 0; i < sk_ASN1_OBJECT_num(ax->reject); i++) {
285             obj = sk_ASN1_OBJECT_value(ax->reject, i);
286             if(OBJ_obj2nid(obj) == id) return X509_TRUST_REJECTED;
287         }
288     }
289     if(ax->trust) {
290         for(i = 0; i < sk_ASN1_OBJECT_num(ax->trust); i++) {
291             obj = sk_ASN1_OBJECT_value(ax->trust, i);
292             if(OBJ_obj2nid(obj) == id) return X509_TRUST_TRUSTED;
293         }
294     }
295     return X509_TRUST_UNTRUSTED;
296 }
```


new/usr/src/lib/openssl/libsunw_crypto/x509/x509_txt.c

1

8366 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_txt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_txt.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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16 * Copyright remains Eric Young's, and as such any Copyright notices in
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
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49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <time.h>
61 #include <errno.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_txt.c

2

```
63 #include "cryptlib.h"
64 #include <openssl/lhash.h>
65 #include <openssl/buffer.h>
66 #include <openssl/evp.h>
67 #include <openssl/asn1.h>
68 #include <openssl/x509.h>
69 #include <openssl/objects.h>
70
71 const char *X509_verify_cert_error_string(long n)
72 {
73     static char buf[100];
74
75     switch ((int)n)
76     {
77     case X509_V_OK:
78         return("ok");
79     case X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT:
80         return("unable to get issuer certificate");
81     case X509_V_ERR_UNABLE_TO_GET_CRL:
82         return("unable to get certificate CRL");
83     case X509_V_ERR_UNABLE_TO_DECRYPT_CERT_SIGNATURE:
84         return("unable to decrypt certificate's signature");
85     case X509_V_ERR_UNABLE_TO_DECRYPT_CRL_SIGNATURE:
86         return("unable to decrypt CRL's signature");
87     case X509_V_ERR_UNABLE_TO_DECODE_ISSUER_PUBLIC_KEY:
88         return("unable to decode issuer public key");
89     case X509_V_ERR_CERT_SIGNATURE_FAILURE:
90         return("certificate signature failure");
91     case X509_V_ERR_CRL_SIGNATURE_FAILURE:
92         return("CRL signature failure");
93     case X509_V_ERR_CERT_NOT_YET_VALID:
94         return("certificate is not yet valid");
95     case X509_V_ERR_CRL_NOT_YET_VALID:
96         return("CRL is not yet valid");
97     case X509_V_ERR_CERT_HAS_EXPIRED:
98         return("certificate has expired");
99     case X509_V_ERR_CRL_HAS_EXPIRED:
100         return("CRL has expired");
101     case X509_V_ERR_ERROR_IN_CERT_NOT_BEFORE_FIELD:
102         return("format error in certificate's notBefore field");
103     case X509_V_ERR_ERROR_IN_CERT_NOT_AFTER_FIELD:
104         return("format error in certificate's notAfter field");
105     case X509_V_ERR_ERROR_IN_CRL_LAST_UPDATE_FIELD:
106         return("format error in CRL's lastUpdate field");
107     case X509_V_ERR_ERROR_IN_CRL_NEXT_UPDATE_FIELD:
108         return("format error in CRL's nextUpdate field");
109     case X509_V_ERR_OUT_OF_MEM:
110         return("out of memory");
111     case X509_V_ERR_DEPTH_ZERO_SELF_SIGNED_CERT:
112         return("self signed certificate");
113     case X509_V_ERR_SELF_SIGNED_CERT_IN_CHAIN:
114         return("self signed certificate in certificate chain");
115     case X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT_LOCALLY:
116         return("unable to get local issuer certificate");
117     case X509_V_ERR_UNABLE_TO_VERIFY_LEAF_SIGNATURE:
118         return("unable to verify the first certificate");
119     case X509_V_ERR_CERT_CHAIN_TOO_LONG:
120         return("certificate chain too long");
121     case X509_V_ERR_CERT_REVOKED:
122         return("certificate revoked");
123     case X509_V_ERR_INVALID_CA:
124         return("invalid CA certificate");
125     case X509_V_ERR_INVALID_NON_CA:
126         return("invalid non-CA certificate (has CA markings)");
127     case X509_V_ERR_PATH_LENGTH_EXCEEDED:
```

```

128     return ("path length constraint exceeded");
129 case X509_V_ERR_PROXY_PATH_LENGTH_EXCEEDED:
130     return("proxy path length constraint exceeded");
131 case X509_V_ERR_PROXY_CERTIFICATES_NOT_ALLOWED:
132     return("proxy certificates not allowed, please set the appropria
133 case X509_V_ERR_INVALID_PURPOSE:
134     return ("unsupported certificate purpose");
135 case X509_V_ERR_CERT_UNTRUSTED:
136     return ("certificate not trusted");
137 case X509_V_ERR_CERT_REJECTED:
138     return ("certificate rejected");
139 case X509_V_ERR_APPLICATION_VERIFICATION:
140     return("application verification failure");
141 case X509_V_ERR_SUBJECT_ISSUER_MISMATCH:
142     return("subject issuer mismatch");
143 case X509_V_ERR_AKID_SKID_MISMATCH:
144     return("authority and subject key identifier mismatch");
145 case X509_V_ERR_AKID_ISSUER_SERIAL_MISMATCH:
146     return("authority and issuer serial number mismatch");
147 case X509_V_ERR_KEYUSAGE_NO_CERTSIGN:
148     return("key usage does not include certificate signing");
149 case X509_V_ERR_UNABLE_TO_GET_CRL_ISSUER:
150     return("unable to get CRL issuer certificate");
151 case X509_V_ERR_UNHANDLED_CRITICAL_EXTENSION:
152     return("unhandled critical extension");
153 case X509_V_ERR_KEYUSAGE_NO_CRL_SIGN:
154     return("key usage does not include CRL signing");
155 case X509_V_ERR_KEYUSAGE_NO_DIGITAL_SIGNATURE:
156     return("key usage does not include digital signature");
157 case X509_V_ERR_UNHANDLED_CRITICAL_CRL_EXTENSION:
158     return("unhandled critical CRL extension");
159 case X509_V_ERR_INVALID_EXTENSION:
160     return("invalid or inconsistent certificate extension");
161 case X509_V_ERR_INVALID_POLICY_EXTENSION:
162     return("invalid or inconsistent certificate policy extension");
163 case X509_V_ERR_NO_EXPLICIT_POLICY:
164     return("no explicit policy");
165 case X509_V_ERR_DIFFERENT_CRL_SCOPE:
166     return("Different CRL scope");
167 case X509_V_ERR_UNSUPPORTED_EXTENSION_FEATURE:
168     return("Unsupported extension feature");
169 case X509_V_ERR_UNNESTED_RESOURCE:
170     return("RFC 3779 resource not subset of parent's resources");
171
172 case X509_V_ERR_PERMITTED_VIOLATION:
173     return("permitted subtree violation");
174 case X509_V_ERR_EXCLUDED_VIOLATION:
175     return("excluded subtree violation");
176 case X509_V_ERR_SUBTREE_MINMAX:
177     return("name constraints minimum and maximum not supported");
178 case X509_V_ERR_UNSUPPORTED_CONSTRAINT_TYPE:
179     return("unsupported name constraint type");
180 case X509_V_ERR_UNSUPPORTED_CONSTRAINT_SYNTAX:
181     return("unsupported or invalid name constraint syntax");
182 case X509_V_ERR_UNSUPPORTED_NAME_SYNTAX:
183     return("unsupported or invalid name syntax");
184 case X509_V_ERR_CRL_PATH_VALIDATION_ERROR:
185     return("CRL path validation error");
186
187 default:
188     BIO_snprintf(buf, sizeof buf, "error number %ld", n);
189     return(buf);
190 }
191 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_v3.c

1

7785 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_v3.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_v3.c */
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4  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/stack.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_v3.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65 #include <openssl/x509.h>
66 #include <openssl/x509v3.h>
67
68 int X509v3_get_ext_count(const STACK_OF(X509_EXTENSION) *x)
69 {
70     if (x == NULL) return(0);
71     return(sk_X509_EXTENSION_num(x));
72 }
73
74 int X509v3_get_ext_by_NID(const STACK_OF(X509_EXTENSION) *x, int nid,
75                           int lastpos)
76 {
77     ASN1_OBJECT *obj;
78
79     obj=OBJ_nid2obj(nid);
80     if (obj == NULL) return(-2);
81     return(X509v3_get_ext_by_OBJ(x,obj,lastpos));
82 }
83
84 int X509v3_get_ext_by_OBJ(const STACK_OF(X509_EXTENSION) *sk, ASN1_OBJECT *obj,
85                           int lastpos)
86 {
87     int n;
88     X509_EXTENSION *ex;
89
90     if (sk == NULL) return(-1);
91     lastpos++;
92     if (lastpos < 0)
93         lastpos=0;
94     n=sk_X509_EXTENSION_num(sk);
95     for ( ; lastpos < n; lastpos++)
96     {
97         ex=sk_X509_EXTENSION_value(sk,lastpos);
98         if (OBJ_cmp(ex->object,obj) == 0)
99             return(lastpos);
100     }
101     return(-1);
102 }
103
104 int X509v3_get_ext_by_critical(const STACK_OF(X509_EXTENSION) *sk, int crit,
105                                int lastpos)
106 {
107     int n;
108     X509_EXTENSION *ex;
109
110     if (sk == NULL) return(-1);
111     lastpos++;
112     if (lastpos < 0)
113         lastpos=0;
114     n=sk_X509_EXTENSION_num(sk);
115     for ( ; lastpos < n; lastpos++)
116     {
117         ex=sk_X509_EXTENSION_value(sk,lastpos);
118         if ( ((ex->critical > 0) && crit) ||
119             ((ex->critical <= 0) && !crit))
120             return(lastpos);
121     }
122     return(-1);
123 }
124
125 X509_EXTENSION *X509v3_get_ext(const STACK_OF(X509_EXTENSION) *x, int loc)
126 {
127     if (x == NULL || sk_X509_EXTENSION_num(x) <= loc || loc < 0)
```

```

128         return NULL;
129     else
130         return sk_X509_EXTENSION_value(x, loc);
131 }

133 X509_EXTENSION *X509v3_delete_ext(STACK_OF(X509_EXTENSION) *x, int loc)
134 {
135     X509_EXTENSION *ret;

137     if (x == NULL || sk_X509_EXTENSION_num(x) <= loc || loc < 0)
138         return(NULL);
139     ret=sk_X509_EXTENSION_delete(x, loc);
140     return(ret);
141 }

143 STACK_OF(X509_EXTENSION) *X509v3_add_ext(STACK_OF(X509_EXTENSION) **x,
144     X509_EXTENSION *ex, int loc)
145 {
146     X509_EXTENSION *new_ex=NULL;
147     int n;
148     STACK_OF(X509_EXTENSION) *sk=NULL;

150     if (x == NULL)
151     {
152         X509err(X509_F_X509V3_ADD_EXT, ERR_R_PASSED_NULL_PARAMETER);
153         goto err2;
154     }

156     if (*x == NULL)
157     {
158         if ((sk=sk_X509_EXTENSION_new_null()) == NULL)
159             goto err;
160     }
161     else
162         sk= *x;

164     n=sk_X509_EXTENSION_num(sk);
165     if (loc > n) loc=n;
166     else if (loc < 0) loc=n;

168     if ((new_ex=X509_EXTENSION_dup(ex)) == NULL)
169         goto err2;
170     if (!sk_X509_EXTENSION_insert(sk, new_ex, loc))
171         goto err;
172     if (*x == NULL)
173         *x=sk;
174     return(sk);
175 err:
176     X509err(X509_F_X509V3_ADD_EXT, ERR_R_MALLOC_FAILURE);
177 err2:
178     if (new_ex != NULL) X509_EXTENSION_free(new_ex);
179     if (sk != NULL) sk_X509_EXTENSION_free(sk);
180     return(NULL);
181 }

183 X509_EXTENSION *X509_EXTENSION_create_by_NID(X509_EXTENSION **ex, int nid,
184     int crit, ASN1_OCTET_STRING *data)
185 {
186     ASN1_OBJECT *obj;
187     X509_EXTENSION *ret;

189     obj=OBJ_nid2obj(nid);
190     if (obj == NULL)
191     {
192         X509err(X509_F_X509_EXTENSION_CREATE_BY_NID, X509_R_UNKNOWN_NID);
193         return(NULL);

```

```

194     }
195     ret=X509_EXTENSION_create_by_OBJ(ex, obj, crit, data);
196     if (ret == NULL) ASN1_OBJECT_free(obj);
197     return(ret);
198 }

200 X509_EXTENSION *X509_EXTENSION_create_by_OBJ(X509_EXTENSION **ex,
201     ASN1_OBJECT *obj, int crit, ASN1_OCTET_STRING *data)
202 {
203     X509_EXTENSION *ret;

205     if ((ex == NULL) || (*ex == NULL))
206     {
207         if ((ret=X509_EXTENSION_new()) == NULL)
208         {
209             X509err(X509_F_X509_EXTENSION_CREATE_BY_OBJ, ERR_R_MALLOC);
210             return(NULL);
211         }
212     }
213     else
214         ret= *ex;

216     if (!X509_EXTENSION_set_object(ret, obj))
217         goto err;
218     if (!X509_EXTENSION_set_critical(ret, crit))
219         goto err;
220     if (!X509_EXTENSION_set_data(ret, data))
221         goto err;

222     if ((ex != NULL) && (*ex == NULL)) *ex=ret;
223     return(ret);
224 err:
225     if ((ex == NULL) || (ret != *ex))
226         X509_EXTENSION_free(ret);
227     return(NULL);
228 }

231 int X509_EXTENSION_set_object(X509_EXTENSION *ex, ASN1_OBJECT *obj)
232 {
233     if ((ex == NULL) || (obj == NULL))
234         return(0);
235     ASN1_OBJECT_free(ex->object);
236     ex->object=OBJ_dup(obj);
237     return(1);
238 }

240 int X509_EXTENSION_set_critical(X509_EXTENSION *ex, int crit)
241 {
242     if (ex == NULL) return(0);
243     ex->critical=(crit)?0xFF:-1;
244     return(1);
245 }

247 int X509_EXTENSION_set_data(X509_EXTENSION *ex, ASN1_OCTET_STRING *data)
248 {
249     int i;

251     if (ex == NULL) return(0);
252     i=M_ASN1_OCTET_STRING_set(ex->value, data->data, data->length);
253     if (!i) return(0);
254     return(1);
255 }

257 ASN1_OBJECT *X509_EXTENSION_get_object(X509_EXTENSION *ex)
258 {
259     if (ex == NULL) return(NULL);

```

```
260     return(ex->object);
261 }

263 ASN1_OCTET_STRING *X509_EXTENSION_get_data(X509_EXTENSION *ex)
264 {
265     if (ex == NULL) return(NULL);
266     return(ex->value);
267 }

269 int X509_EXTENSION_get_critical(X509_EXTENSION *ex)
270 {
271     if (ex == NULL) return(0);
272     if(ex->critical > 0) return 1;
273     return 0;
274 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_vfy.c

1

54663 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_vfy.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509_vfy.c */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <time.h>
61 #include <errno.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_vfy.c

2

```
63 #include "cryptlib.h"
64 #include <openssl/crypto.h>
65 #include <openssl/lhash.h>
66 #include <openssl/buffer.h>
67 #include <openssl/evp.h>
68 #include <openssl/asn1.h>
69 #include <openssl/x509.h>
70 #include <openssl/x509v3.h>
71 #include <openssl/objects.h>
72
73 /* CRL score values */
74
75 /* No unhandled critical extensions */
76
77 #define CRL_SCORE_NOCRITICAL    0x100
78
79 /* certificate is within CRL scope */
80
81 #define CRL_SCORE_SCOPE        0x080
82
83 /* CRL times valid */
84
85 #define CRL_SCORE_TIME         0x040
86
87 /* Issuer name matches certificate */
88
89 #define CRL_SCORE_ISSUER_NAME  0x020
90
91 /* If this score or above CRL is probably valid */
92
93 #define CRL_SCORE_VALID (CRL_SCORE_NOCRITICAL|CRL_SCORE_TIME|CRL_SCORE_SCOPE)
94
95 /* CRL issuer is certificate issuer */
96
97 #define CRL_SCORE_ISSUER_CERT  0x018
98
99 /* CRL issuer is on certificate path */
100
101 #define CRL_SCORE_SAME_PATH    0x008
102
103 /* CRL issuer matches CRL AKID */
104
105 #define CRL_SCORE_AKID        0x004
106
107 /* Have a delta CRL with valid times */
108
109 #define CRL_SCORE_TIME_DELTA   0x002
110
111 static int null_callback(int ok,X509_STORE_CTX *e);
112 static int check_issued(X509_STORE_CTX *ctx, X509 *x, X509 *issuer);
113 static X509 *find_issuer(X509_STORE_CTX *ctx, STACK_OF(X509) *sk, X509 *x);
114 static int check_chain_extensions(X509_STORE_CTX *ctx);
115 static int check_name_constraints(X509_STORE_CTX *ctx);
116 static int check_trust(X509_STORE_CTX *ctx);
117 static int check_revocation(X509_STORE_CTX *ctx);
118 static int check_cert(X509_STORE_CTX *ctx);
119 static int check_policy(X509_STORE_CTX *ctx);
120
121 static int get_crl_score(X509_STORE_CTX *ctx, X509 **pissuer,
122                        unsigned int *preasons,
123                        X509_CRL *crl, X509 *x);
124 static int get_crl_delta(X509_STORE_CTX *ctx,
125                        X509_CRL **pcrl, X509_CRL **pdcr, X509 *x);
126 static void get_delta_sk(X509_STORE_CTX *ctx, X509_CRL **dcrl, int *pcrl_score,
127                        X509_CRL *base, STACK_OF(X509_CRL) *crls);
```

```

128 static void crl_akid_check(X509_STORE_CTX *ctx, X509_CRL *crl,
129                          X509 **pissuer, int *pcrl_score);
130 static int crl_crl_dp_check(X509 *x, X509_CRL *crl, int crl_score,
131                          unsigned int *preasons);
132 static int check_crl_path(X509_STORE_CTX *ctx, X509 *x);
133 static int check_crl_chain(X509_STORE_CTX *ctx,
134                          STACK_OF(X509) *cert_path,
135                          STACK_OF(X509) *crl_path);

137 static int internal_verify(X509_STORE_CTX *ctx);
138 const char X509_version[]="X.509" OPENSSL_VERSION_PTEXT;

141 static int null_callback(int ok, X509_STORE_CTX *e)
142 {
143     return ok;
144 }

146 #if 0
147 static int x509_subject_cmp(X509 **a, X509 **b)
148 {
149     return X509_subject_name_cmp(*a,*b);
150 }
151 #endif

153 /* Given a certificate try and find an exact match in the store */

155 static X509 *lookup_cert_match(X509_STORE_CTX *ctx, X509 *x)
156 {
157     STACK_OF(X509) *certs;
158     X509 *xtmp = NULL;
159     int i;
160     /* Lookup all certs with matching subject name */
161     certs = ctx->lookup_certs(ctx, X509_get_subject_name(x));
162     if (certs == NULL)
163         return NULL;
164     /* Look for exact match */
165     for (i = 0; i < sk_X509_num(certs); i++)
166     {
167         xtmp = sk_X509_value(certs, i);
168         if (!X509_cmp(xtmp, x))
169             break;
170     }
171     if (i < sk_X509_num(certs))
172         CRYPTO_add(&xtmp->references,1,CRYPTO_LOCK_X509);
173     else
174         xtmp = NULL;
175     sk_X509_pop_free(certs, X509_free);
176     return xtmp;
177 }

180 int X509_verify_cert(X509_STORE_CTX *ctx)
181 {
182     X509 *x,*xtmp,*chain_ss=NULL;
183     int bad_chain = 0;
184     X509_VERIFY_PARAM *param = ctx->param;
185     int depth,i,ok=0;
186     int num;
187     int (*cb)(int xok,X509_STORE_CTX *xctx);
188     STACK_OF(X509) *sktmp=NULL;
189     if (ctx->cert == NULL)
190     {
191         X509err(X509_F_X509_VERIFY_CERT,X509_R_NO_CERT_SET_FOR_US_TO_VERIFY);
192         return -1;
193     }

```

```

195     cb=ctx->verify_cb;

197     /* first we make sure the chain we are going to build is
198      * present and that the first entry is in place */
199     if (ctx->chain == NULL)
200     {
201         if ( ((ctx->chain=sk_X509_new_null()) == NULL) ||
202              (!sk_X509_push(ctx->chain,ctx->cert)))
203         {
204             X509err(X509_F_X509_VERIFY_CERT,ERR_R_MALLOC_FAILURE);
205             goto end;
206         }
207         CRYPTO_add(&ctx->cert->references,1,CRYPTO_LOCK_X509);
208         ctx->last_untrusted=1;
209     }

211     /* We use a temporary STACK so we can chop and hack at it */
212     if (ctx->untrusted != NULL
213         && (sktmp=sk_X509_dup(ctx->untrusted)) == NULL)
214     {
215         X509err(X509_F_X509_VERIFY_CERT,ERR_R_MALLOC_FAILURE);
216         goto end;
217     }

219     num=sk_X509_num(ctx->chain);
220     x=sk_X509_value(ctx->chain,num-1);
221     depth=param->depth;

224     for (;;)
225     {
226         /* If we have enough, we break */
227         if (depth < num) break; /* FIXME: If this happens, we should take
228                                  * note of it and, if appropriate, use the
229                                  * X509_V_ERR_CERT_CHAIN_TOO_LONG error
230                                  * code later.
231                                  */

233         /* If we are self signed, we break */
234         if (ctx->check_issued(ctx, x,x)) break;

236         /* If we were passed a cert chain, use it first */
237         if (ctx->untrusted != NULL)
238         {
239             xtmp=find_issuer(ctx, sktmp,x);
240             if (xtmp != NULL)
241             {
242                 if (!sk_X509_push(ctx->chain,xtmp))
243                 {
244                     X509err(X509_F_X509_VERIFY_CERT,ERR_R_MALLOC_FAILURE);
245                     goto end;
246                 }
247                 CRYPTO_add(&xtmp->references,1,CRYPTO_LOCK_X509);
248                 (void)sk_X509_delete_ptr(sktmp,xtmp);
249                 ctx->last_untrusted++;
250                 x=xtmp;
251                 num++;
252                 /* reparse the full chain for
253                  * the next one */
254                 continue;
255             }
256         }
257         break;
258     }

```

```

260 /* at this point, chain should contain a list of untrusted
261 * certificates. We now need to add at least one trusted one,
262 * if possible, otherwise we complain. */

264 /* Examine last certificate in chain and see if it
265 * is self signed.
266 */

268 i=sk_X509_num(ctx->chain);
269 x=sk_X509_value(ctx->chain,i-1);
270 if (ctx->check_issued(ctx, x, x))
271 {
272     /* we have a self signed certificate */
273     if (sk_X509_num(ctx->chain) == 1)
274     {
275         /* We have a single self signed certificate: see if
276         * we can find it in the store. We must have an exact
277         * match to avoid possible impersonation.
278         */
279         ok = ctx->get_issuer(&xtmp, ctx, x);
280         if ((ok <= 0) || X509_cmp(x, xtmp))
281         {
282             ctx->error=X509_V_ERR_DEPTH_ZERO_SELF_SIGNED_CER
283             ctx->current_cert=x;
284             ctx->error_depth=i-1;
285             if (ok == 1) X509_free(xtmp);
286             bad_chain = 1;
287             ok=cb(0,ctx);
288             if (!ok) goto end;
289         }
290     }
291     else
292     {
293         /* We have a match: replace certificate with sto
294         * so we get any trust settings.
295         */
296         X509_free(x);
297         x = xtmp;
298         (void)sk_X509_set(ctx->chain, i - 1, x);
299         ctx->last_untrusted=0;
300     }
301 }
302 else
303 {
304     /* extract and save self signed certificate for later us
305     chain_ss=sk_X509_pop(ctx->chain);
306     ctx->last_untrusted--;
307     num--;
308     x=sk_X509_value(ctx->chain,num-1);
309 }

311 /* We now lookup certs from the certificate store */
312 for (;;)
313 {
314     /* If we have enough, we break */
315     if (depth < num) break;

317     /* If we are self signed, we break */
318     if (ctx->check_issued(ctx,x,x)) break;

320     ok = ctx->get_issuer(&xtmp, ctx, x);

322     if (ok < 0) return ok;
323     if (ok == 0) break;

325     x = xtmp;

```

```

326     if (!sk_X509_push(ctx->chain,x))
327     {
328         X509_free(xtmp);
329         X509err(X509_F_X509_VERIFY_CERT,ERR_R_MALLOC_FAILURE);
330         return 0;
331     }
332     num++;
333 }

335 /* we now have our chain, lets check it... */

337 i = check_trust(ctx);

339 /* If explicitly rejected error */
340 if (i == X509_TRUST_REJECTED)
341     goto end;
342 /* If not explicitly trusted then indicate error */
343 if (i != X509_TRUST_TRUSTED)
344 {
345     if ((chain_ss == NULL) || !ctx->check_issued(ctx, x, chain_ss))
346     {
347         if (ctx->last_untrusted >= num)
348             ctx->error=X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT
349         else
350             ctx->error=X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT;
351         ctx->current_cert=x;
352     }
353     else
354     {
355         sk_X509_push(ctx->chain,chain_ss);
356         num++;
357         ctx->last_untrusted=num;
358         ctx->current_cert=chain_ss;
359         ctx->error=X509_V_ERR_SELF_SIGNED_CERT_IN_CHAIN;
360         chain_ss=NULL;
361     }
362 }

364     ctx->error_depth=num-1;
365     bad_chain = 1;
366     ok=cb(0,ctx);
367     if (!ok) goto end;
368 }

370 /* We have the chain complete: now we need to check its purpose */
371 ok = check_chain_extensions(ctx);

373 if (!ok) goto end;

375 /* Check name constraints */

377 ok = check_name_constraints(ctx);
378
379 if (!ok) goto end;

381 /* We may as well copy down any DSA parameters that are required */
382 X509_get_pubkey_parameters(NULL,ctx->chain);

384 /* Check revocation status: we do this after copying parameters
385 * because they may be needed for CRL signature verification.
386 */

388 ok = ctx->check_revocation(ctx);
389 if(!ok) goto end;

391 /* At this point, we have a chain and need to verify it */

```



```

392     if (ctx->verify != NULL)
393         ok=ctx->verify(ctx);
394     else
395         ok=internal_verify(ctx);
396     if(!ok) goto end;

398 #ifndef OPENSSSL_NO_RFC3779
399     /* RFC 3779 path validation, now that CRL check has been done */
400     ok = v3_asid_validate_path(ctx);
401     if (!ok) goto end;
402     ok = v3_addr_validate_path(ctx);
403     if (!ok) goto end;
404 #endif

406     /* If we get this far evaluate policies */
407     if (!bad_chain && (ctx->param->flags & X509_V_FLAG_POLICY_CHECK))
408         ok = ctx->check_policy(ctx);
409     if(!ok) goto end;
410     if (0)
411     {
412     end:
413         X509_get_pubkey_parameters(NULL,ctx->chain);
414     }
415     if (sktmp != NULL) sk_X509_free(sktmp);
416     if (chain_ss != NULL) X509_free(chain_ss);
417     return ok;
418 }

421 /* Given a STACK_OF(X509) find the issuer of cert (if any)
422 */

424 static X509 *find_issuer(X509_STORE_CTX *ctx, STACK_OF(X509) *sk, X509 *x)
425 {
426     int i;
427     X509 *issuer;
428     for (i = 0; i < sk_X509_num(sk); i++)
429     {
430         issuer = sk_X509_value(sk, i);
431         if (ctx->check_issued(ctx, x, issuer))
432             return issuer;
433     }
434     return NULL;
435 }

437 /* Given a possible certificate and issuer check them */

439 static int check_issued(X509_STORE_CTX *ctx, X509 *x, X509 *issuer)
440 {
441     int ret;
442     ret = X509_check_issued(issuer, x);
443     if (ret == X509_V_OK)
444         return 1;
445     /* If we haven't asked for issuer errors don't set ctx */
446     if (!(ctx->param->flags & X509_V_FLAG_CB_ISSUER_CHECK))
447         return 0;

449     ctx->error = ret;
450     ctx->current_cert = x;
451     ctx->current_issuer = issuer;
452     return ctx->verify_cb(0, ctx);
453 }

454 }

456 /* Alternative lookup method: look from a STACK stored in other_ctx */

```

```

458 static int get_issuer_sk(X509 **issuer, X509_STORE_CTX *ctx, X509 *x)
459 {
460     *issuer = find_issuer(ctx, ctx->other_ctx, x);
461     if (*issuer)
462     {
463         CRYPTO_add(&(*issuer)->references,1,CRYPTO_LOCK_X509);
464         return 1;
465     }
466     else
467         return 0;
468 }

471 /* Check a certificate chains extensions for consistency
472  * with the supplied purpose
473 */

475 static int check_chain_extensions(X509_STORE_CTX *ctx)
476 {
477     #ifdef OPENSSSL_NO_CHAIN_VERIFY
478         return 1;
479     #else
480         int i, ok=0, must_be_ca, plen = 0;
481         X509 *x;
482         int (*cb)(int xok,X509_STORE_CTX *xctx);
483         int proxy_path_length = 0;
484         int purpose;
485         int allow_proxy_certs;
486         cb=ctx->verify_cb;

488         /* must_be_ca can have 1 of 3 values:
489         -1: we accept both CA and non-CA certificates, to allow direct
490            use of self-signed certificates (which are marked as CA).
491         0:  we only accept non-CA certificates. This is currently not
492            used, but the possibility is present for future extensions.
493         1:  we only accept CA certificates. This is currently used for
494            all certificates in the chain except the leaf certificate.
495         */
496         must_be_ca = -1;

498         /* CRL path validation */
499         if (ctx->parent)
500         {
501             allow_proxy_certs = 0;
502             purpose = X509_PURPOSE_CRL_SIGN;
503         }
504         else
505         {
506             allow_proxy_certs =
507                 !(ctx->param->flags & X509_V_FLAG_ALLOW_PROXY_CERTS);
508             /* A hack to keep people who don't want to modify their
509                software happy */
510             if (getenv("OPENSSSL_ALLOW_PROXY_CERTS"))
511                 allow_proxy_certs = 1;
512             purpose = ctx->param->purpose;
513         }

515         /* Check all untrusted certificates */
516         for (i = 0; i < ctx->last_untrusted; i++)
517         {
518             int ret;
519             x = sk_X509_value(ctx->chain, i);
520             if (!(ctx->param->flags & X509_V_FLAG_IGNORE_CRITICAL)
521                 && (x->ex_flags & EXFLAG_CRITICAL))
522             {
523                 ctx->error = X509_V_ERR_UNHANDLED_CRITICAL_EXTENSION;

```

```

524         ctx->error_depth = i;
525         ctx->current_cert = x;
526         ok=cb(0,ctx);
527         if (!ok) goto end;
528     }
529     if (!allow_proxy_certs && (x->ex_flags & EXFLAG_PROXY))
530     {
531         ctx->error = X509_V_ERR_PROXY_CERTIFICATES_NOT_ALLOWED;
532         ctx->error_depth = i;
533         ctx->current_cert = x;
534         ok=cb(0,ctx);
535         if (!ok) goto end;
536     }
537     ret = X509_check_ca(x);
538     switch(must_be_ca)
539     {
540     case -1:
541         if ((ctx->param->flags & X509_V_FLAG_X509_STRICT)
542             && (ret != 1) && (ret != 0))
543         {
544             ret = 0;
545             ctx->error = X509_V_ERR_INVALID_CA;
546         }
547         else
548             ret = 1;
549         break;
550     case 0:
551         if (ret != 0)
552         {
553             ret = 0;
554             ctx->error = X509_V_ERR_INVALID_NON_CA;
555         }
556         else
557             ret = 1;
558         break;
559     default:
560         if ((ret == 0)
561             || ((ctx->param->flags & X509_V_FLAG_X509_STRICT)
562                 && (ret != 1)))
563         {
564             ret = 0;
565             ctx->error = X509_V_ERR_INVALID_CA;
566         }
567         else
568             ret = 1;
569         break;
570     }
571     if (ret == 0)
572     {
573         ctx->error_depth = i;
574         ctx->current_cert = x;
575         ok=cb(0,ctx);
576         if (!ok) goto end;
577     }
578     if (ctx->param->purpose > 0)
579     {
580         ret = X509_check_purpose(x, purpose, must_be_ca > 0);
581         if ((ret == 0)
582             || ((ctx->param->flags & X509_V_FLAG_X509_STRICT)
583                 && (ret != 1)))
584         {
585             ctx->error = X509_V_ERR_INVALID_PURPOSE;
586             ctx->error_depth = i;
587             ctx->current_cert = x;
588             ok=cb(0,ctx);
589             if (!ok) goto end;

```

```

590     }
591     }
592     /* Check pathlen if not self issued */
593     if ((i > 1) && !(x->ex_flags & EXFLAG_SI)
594         && (x->ex_pathlen != -1)
595         && (plen > (x->ex_pathlen + proxy_path_length + 1)))
596     {
597         ctx->error = X509_V_ERR_PATH_LENGTH_EXCEEDED;
598         ctx->error_depth = i;
599         ctx->current_cert = x;
600         ok=cb(0,ctx);
601         if (!ok) goto end;
602     }
603     /* Increment path length if not self issued */
604     if (!(x->ex_flags & EXFLAG_SI))
605         plen++;
606     /* If this certificate is a proxy certificate, the next
607        certificate must be another proxy certificate or a EE
608        certificate. If not, the next certificate must be a
609        CA certificate. */
610     if (x->ex_flags & EXFLAG_PROXY)
611     {
612         if (x->ex_pcpathlen != -1 && i > x->ex_pcpathlen)
613         {
614             ctx->error =
615                 X509_V_ERR_PROXY_PATH_LENGTH_EXCEEDED;
616             ctx->error_depth = i;
617             ctx->current_cert = x;
618             ok=cb(0,ctx);
619             if (!ok) goto end;
620         }
621         proxy_path_length++;
622         must_be_ca = 0;
623     }
624     else
625         must_be_ca = 1;
626 }
627 ok = 1;
628 end:
629 return ok;
630 #endif
631 }

```

```

633 static int check_name_constraints(X509_STORE_CTX *ctx)
634 {
635     X509 *x;
636     int i, j, rv;
637     /* Check name constraints for all certificates */
638     for (i = sk_X509_num(ctx->chain) - 1; i >= 0; i--)
639     {
640         x = sk_X509_value(ctx->chain, i);
641         /* Ignore self issued certs unless last in chain */
642         if (i && (x->ex_flags & EXFLAG_SI))
643             continue;
644         /* Check against constraints for all certificates higher in
645            * chain including trust anchor. Trust anchor not strictly
646            * speaking needed but if it includes constraints it is to be
647            * assumed it expects them to be obeyed.
648            */
649         for (j = sk_X509_num(ctx->chain) - 1; j > i; j--)
650         {
651             NAME_CONSTRAINTS *nc = sk_X509_value(ctx->chain, j)->nc;
652             if (nc)
653             {
654                 rv = NAME_CONSTRAINTS_check(x, nc);
655                 if (rv != X509_V_OK)

```

```

656         {
657             ctx->error = rv;
658             ctx->error_depth = i;
659             ctx->current_cert = x;
660             if (!ctx->verify_cb(0, ctx))
661                 return 0;
662         }
663     }
664 }
665
666 return 1;
667 }

```

```

669 static int check_trust(X509_STORE_CTX *ctx)
670 {
671     int i, ok;
672     X509 *x = NULL;
673     int (*cb)(int xok, X509_STORE_CTX *xctx);
674     cb = ctx->verify_cb;
675     /* Check all trusted certificates in chain */
676     for (i = ctx->last_untrusted; i < sk_X509_num(ctx->chain); i++)
677     {
678         x = sk_X509_value(ctx->chain, i);
679         ok = X509_check_trust(x, ctx->param->trust, 0);
680         /* If explicitly trusted return trusted */
681         if (ok == X509_TRUST_TRUSTED)
682             return X509_TRUST_TRUSTED;
683         /* If explicitly rejected notify callback and reject if
684          * not overridden.
685          */
686         if (ok == X509_TRUST_REJECTED)
687         {
688             ctx->error_depth = i;
689             ctx->current_cert = x;
690             ctx->error = X509_V_ERR_CERT_REJECTED;
691             ok = cb(0, ctx);
692             if (!ok)
693                 return X509_TRUST_REJECTED;
694         }
695     }
696     /* If we accept partial chains and have at least one trusted
697     * certificate return success.
698     */
699     if (ctx->param->flags & X509_V_FLAG_PARTIAL_CHAIN)
700     {
701         X509 *mx;
702         if (ctx->last_untrusted < sk_X509_num(ctx->chain))
703             return X509_TRUST_TRUSTED;
704         x = sk_X509_value(ctx->chain, 0);
705         mx = lookup_cert_match(ctx, x);
706         if (mx)
707         {
708             (void)sk_X509_set(ctx->chain, 0, mx);
709             X509_free(x);
710             ctx->last_untrusted = 0;
711             return X509_TRUST_TRUSTED;
712         }
713     }
714
715     /* If no trusted certs in chain at all return untrusted and
716     * allow standard (no issuer cert) etc errors to be indicated.
717     */
718     return X509_TRUST_UNTRUSTED;
719 }

```

```

721 static int check_revocation(X509_STORE_CTX *ctx)

```

```

722 {
723     int i, last, ok;
724     if (!(ctx->param->flags & X509_V_FLAG_CRL_CHECK))
725         return 1;
726     if (ctx->param->flags & X509_V_FLAG_CRL_CHECK_ALL)
727         last = sk_X509_num(ctx->chain) - 1;
728     else
729     {
730         /* If checking CRL paths this isn't the EE certificate */
731         if (ctx->parent)
732             return 1;
733         last = 0;
734     }
735     for(i = 0; i <= last; i++)
736     {
737         ctx->error_depth = i;
738         ok = check_cert(ctx);
739         if (!ok) return ok;
740     }
741     return 1;
742 }

```

```

744 static int check_cert(X509_STORE_CTX *ctx)
745 {
746     X509_CRL *crl = NULL, *dcrl = NULL;
747     X509 *x;
748     int ok, cnum;
749     unsigned int last_reasons;
750     cnum = ctx->error_depth;
751     x = sk_X509_value(ctx->chain, cnum);
752     ctx->current_cert = x;
753     ctx->current_issuer = NULL;
754     ctx->current_crl_score = 0;
755     ctx->current_reasons = 0;
756     while (ctx->current_reasons != CRLDP_ALL_REASONS)
757     {
758         last_reasons = ctx->current_reasons;
759         /* Try to retrieve relevant CRL */
760         if (ctx->get_crl)
761             ok = ctx->get_crl(ctx, &crl, x);
762         else
763             ok = get_crl_delta(ctx, &crl, &dcrl, x);
764         /* If error looking up CRL, nothing we can do except
765          * notify callback
766          */
767         if(!ok)
768         {
769             ctx->error = X509_V_ERR_UNABLE_TO_GET_CRL;
770             ok = ctx->verify_cb(0, ctx);
771             goto err;
772         }
773         ctx->current_crl = crl;
774         ok = ctx->check_crl(ctx, crl);
775         if (!ok)
776             goto err;
777
778         if (dcrl)
779         {
780             ok = ctx->check_crl(ctx, dcrl);
781             if (!ok)
782                 goto err;
783             ok = ctx->cert_crl(ctx, dcrl, x);
784             if (!ok)
785                 goto err;
786         }
787     }

```

```

788         ok = 1;
790         /* Don't look in full CRL if delta reason is removefromCRL */
791         if (ok != 2)
792         {
793             ok = ctx->cert_crl(ctx, crl, x);
794             if (!ok)
795                 goto err;
796         }
798         X509_CRL_free(crl);
799         X509_CRL_free(dcr1);
800         crl = NULL;
801         dcr1 = NULL;
802         /* If reasons not updated we wont get anywhere by
803          * another iteration, so exit loop.
804          */
805         if (last_reasons == ctx->current_reasons)
806         {
807             ctx->error = X509_V_ERR_UNABLE_TO_GET_CRL;
808             ok = ctx->verify_cb(0, ctx);
809             goto err;
810         }
811     }
812     err:
813     X509_CRL_free(crl);
814     X509_CRL_free(dcr1);
816     ctx->current_crl = NULL;
817     return ok;
819 }
821 /* Check CRL times against values in X509_STORE_CTX */
823 static int check_crl_time(X509_STORE_CTX *ctx, X509_CRL *crl, int notify)
824 {
825     time_t *ptime;
826     int i;
827     if (notify)
828         ctx->current_crl = crl;
829     if (ctx->param->flags & X509_V_FLAG_USE_CHECK_TIME)
830         ptime = &ctx->param->check_time;
831     else
832         ptime = NULL;
834     i=X509_cmp_time(X509_CRL_get_lastUpdate(crl), ptime);
835     if (i == 0)
836     {
837         if (!notify)
838             return 0;
839         ctx->error=X509_V_ERR_ERROR_IN_CRL_LAST_UPDATE_FIELD;
840         if (!ctx->verify_cb(0, ctx))
841             return 0;
842     }
844     if (i > 0)
845     {
846         if (!notify)
847             return 0;
848         ctx->error=X509_V_ERR_CRL_NOT_YET_VALID;
849         if (!ctx->verify_cb(0, ctx))
850             return 0;
851     }
853     if(X509_CRL_get_nextUpdate(crl))

```

```

854     {
855         i=X509_cmp_time(X509_CRL_get_nextUpdate(crl), ptime);
857         if (i == 0)
858         {
859             if (!notify)
860                 return 0;
861             ctx->error=X509_V_ERR_ERROR_IN_CRL_NEXT_UPDATE_FIELD;
862             if (!ctx->verify_cb(0, ctx))
863                 return 0;
864         }
865         /* Ignore expiry of base CRL is delta is valid */
866         if ((i < 0) && !(ctx->current_crl_score & CRL_SCORE_TIME_DELTA))
867         {
868             if (!notify)
869                 return 0;
870             ctx->error=X509_V_ERR_CRL_HAS_EXPIRED;
871             if (!ctx->verify_cb(0, ctx))
872                 return 0;
873         }
874     }
876     if (notify)
877         ctx->current_crl = NULL;
879     return 1;
880 }
882 static int get_crl_sk(X509_STORE_CTX *ctx, X509_CRL **pcrl, X509_CRL **pdcr1,
883                     X509 **pissuer, int *pscore, unsigned int *preasons,
884                     STACK_OF(X509_CRL) *crls)
885 {
886     int i, crl_score, best_score = *pscore;
887     unsigned int reasons, best_reasons = 0;
888     X509 *x = ctx->current_cert;
889     X509_CRL *crl, *best_crl = NULL;
890     X509 *crl_issuer = NULL, *best_crl_issuer = NULL;
892     for (i = 0; i < sk_X509_CRL_num(crls); i++)
893     {
894         crl = sk_X509_CRL_value(crls, i);
895         reasons = *preasons;
896         crl_score = get_crl_score(ctx, &crl_issuer, &reasons, crl, x);
898         if (crl_score > best_score)
899         {
900             best_crl = crl;
901             best_crl_issuer = crl_issuer;
902             best_score = crl_score;
903             best_reasons = reasons;
904         }
905     }
907     if (best_crl)
908     {
909         if (*pcrl)
910             X509_CRL_free(*pcrl);
911         *pcrl = best_crl;
912         *pissuer = best_crl_issuer;
913         *pscore = best_score;
914         *preasons = best_reasons;
915         CRYPTO_add(&best_crl->references, 1, CRYPTO_LOCK_X509_CRL);
916         if (*pdcr1)
917         {
918             X509_CRL_free(*pdcr1);
919             *pdcr1 = NULL;

```

```

920     }
921     get_delta_sk(ctx, pdcrl, pscore, best_crl, crls);
922 }

924 if (best_score >= CRL_SCORE_VALID)
925     return 1;

927 return 0;
928 }

930 /* Compare two CRL extensions for delta checking purposes. They should be
931  * both present or both absent. If both present all fields must be identical.
932  */

934 static int crl_extension_match(X509_CRL *a, X509_CRL *b, int nid)
935 {
936     ASN1_OCTET_STRING *exta, *extb;
937     int i;
938     i = X509_CRL_get_ext_by_NID(a, nid, -1);
939     if (i >= 0)
940     {
941         /* Can't have multiple occurrences */
942         if (X509_CRL_get_ext_by_NID(a, nid, i) != -1)
943             return 0;
944         exta = X509_EXTENSION_get_data(X509_CRL_get_ext(a, i));
945     }
946     else
947         exta = NULL;

949     i = X509_CRL_get_ext_by_NID(b, nid, -1);

951     if (i >= 0)
952     {
953         if (X509_CRL_get_ext_by_NID(b, nid, i) != -1)
954             return 0;
955         extb = X509_EXTENSION_get_data(X509_CRL_get_ext(b, i));
956     }
957     else
958         extb = NULL;

961     if (!exta && !extb)
962         return 1;

964     if (!exta || !extb)
965         return 0;

968     if (ASN1_OCTET_STRING_cmp(exta, extb))
969         return 0;

971     return 1;
972 }

974 /* See if a base and delta are compatible */

976 static int check_delta_base(X509_CRL *delta, X509_CRL *base)
977 {
978     /* Delta CRL must be a delta */
979     if (!delta->base_crl_number)
980         return 0;
981     /* Base must have a CRL number */
982     if (!base->crl_number)
983         return 0;
984     /* Issuer names must match */
985     if (X509_NAME_cmp(X509_CRL_get_issuer(base),

```

```

986         X509_CRL_get_issuer(delta)))
987     return 0;
988     /* AKID and IDP must match */
989     if (!crl_extension_match(delta, base, NID_authority_key_identifier))
990         return 0;
991     if (!crl_extension_match(delta, base, NID_issuing_distribution_point))
992         return 0;
993     /* Delta CRL base number must not exceed Full CRL number. */
994     if (ASN1_INTEGER_cmp(delta->base_crl_number, base->crl_number) > 0)
995         return 0;
996     /* Delta CRL number must exceed full CRL number */
997     if (ASN1_INTEGER_cmp(delta->crl_number, base->crl_number) > 0)
998         return 1;
999     return 0;
1000 }

1002 /* For a given base CRL find a delta... maybe extend to delta scoring
1003  * or retrieve a chain of deltas...
1004  */

1006 static void get_delta_sk(X509_STORE_CTX *ctx, X509_CRL **dcrl, int *pscore,
1007                        X509_CRL *base, STACK_OF(X509_CRL) *crls)
1008 {
1009     X509_CRL *delta;
1010     int i;
1011     if (!(ctx->param->flags & X509_V_FLAG_USE_DELTAS))
1012         return;
1013     if (!(ctx->current_cert->ex_flags | base->flags) & EXFLAG_FRESHEST))
1014         return;
1015     for (i = 0; i < sk_X509_CRL_num(crls); i++)
1016     {
1017         delta = sk_X509_CRL_value(crls, i);
1018         if (check_delta_base(delta, base))
1019         {
1020             if (check_crl_time(ctx, delta, 0))
1021                 *pscore |= CRL_SCORE_TIME_DELTA;
1022             CRYPTO_add(&delta->references, 1, CRYPTO_LOCK_X509_CRL);
1023             *dcrl = delta;
1024             return;
1025         }
1026     }
1027     *dcrl = NULL;
1028 }

1030 /* For a given CRL return how suitable it is for the supplied certificate 'x'.
1031  * The return value is a mask of several criteria.
1032  * If the issuer is not the certificate issuer this is returned in *pissuer.
1033  * The reasons mask is also used to determine if the CRL is suitable: if
1034  * no new reasons the CRL is rejected, otherwise reasons is updated.
1035  */

1037 static int get_crl_score(X509_STORE_CTX *ctx, X509 **pissuer,
1038                        unsigned int *preasons,
1039                        X509_CRL *crl, X509 *x)
1040 {
1041
1042     int crl_score = 0;
1043     unsigned int tmp_reasons = *preasons, crl_reasons;

1045     /* First see if we can reject CRL straight away */

1047     /* Invalid IDP cannot be processed */
1048     if (crl->idp_flags & IDP_INVALID)
1049         return 0;
1050     /* Reason codes or indirect CRLs need extended CRL support */
1051     if (!(ctx->param->flags & X509_V_FLAG_EXTENDED_CRL_SUPPORT))

```

```

1052     {
1053         if (crl->idp_flags & (IDP_INDIRECT | IDP_REASONS))
1054             return 0;
1055     }
1056     else if (crl->idp_flags & IDP_REASONS)
1057     {
1058         /* If no new reasons reject */
1059         if (!(crl->idp_reasons & ~tmp_reasons))
1060             return 0;
1061     }
1062     /* Don't process deltas at this stage */
1063     else if (crl->base_crl_number)
1064         return 0;
1065     /* If issuer name doesn't match certificate need indirect CRL */
1066     if (X509_NAME_cmp(X509_get_issuer_name(x), X509_CRL_get_issuer(crl)))
1067     {
1068         if (!(crl->idp_flags & IDP_INDIRECT))
1069             return 0;
1070     }
1071     else
1072         crl_score |= CRL_SCORE_ISSUER_NAME;
1073
1074     if (!(crl->flags & EXFLAG_CRITICAL))
1075         crl_score |= CRL_SCORE_NOCRITICAL;
1076
1077     /* Check expiry */
1078     if (check_crl_time(ctx, crl, 0))
1079         crl_score |= CRL_SCORE_TIME;
1080
1081     /* Check authority key ID and locate certificate issuer */
1082     crl_akid_check(ctx, crl, pissuer, &crl_score);
1083
1084     /* If we can't locate certificate issuer at this point forget it */
1085
1086     if (!(crl_score & CRL_SCORE_AKID))
1087         return 0;
1088
1089     /* Check cert for matching CRL distribution points */
1090
1091     if (crl_crl_dp_check(x, crl, crl_score, &crl_reasons))
1092     {
1093         /* If no new reasons reject */
1094         if (!(crl_reasons & ~tmp_reasons))
1095             return 0;
1096         tmp_reasons |= crl_reasons;
1097         crl_score |= CRL_SCORE_SCOPE;
1098     }
1099
1100     *preasons = tmp_reasons;
1101
1102     return crl_score;
1103 }
1104
1105 static void crl_akid_check(X509_STORE_CTX *ctx, X509_CRL *crl,
1106                          X509 **pissuer, int *pcrl_score)
1107 {
1108     X509 *crl_issuer = NULL;
1109     X509_NAME *cnm = X509_CRL_get_issuer(crl);
1110     int cidx = ctx->error_depth;
1111     int i;
1112
1113     if (cidx != sk_X509_num(ctx->chain) - 1)
1114         cidx++;
1115
1116     crl_issuer = sk_X509_value(ctx->chain, cidx);

```

```

1119     if (X509_check_akid(crl_issuer, crl->akid) == X509_V_OK)
1120     {
1121         if (*pcrl_score & CRL_SCORE_ISSUER_NAME)
1122         {
1123             *pcrl_score |= CRL_SCORE_AKID | CRL_SCORE_ISSUER_CERT;
1124             *pissuer = crl_issuer;
1125             return;
1126         }
1127     }
1128
1129     for (cidx++; cidx < sk_X509_num(ctx->chain); cidx++)
1130     {
1131         crl_issuer = sk_X509_value(ctx->chain, cidx);
1132         if (X509_NAME_cmp(X509_get_subject_name(crl_issuer), cnm))
1133             continue;
1134         if (X509_check_akid(crl_issuer, crl->akid) == X509_V_OK)
1135         {
1136             *pcrl_score |= CRL_SCORE_AKID | CRL_SCORE_SAME_PATH;
1137             *pissuer = crl_issuer;
1138             return;
1139         }
1140     }
1141
1142     /* Anything else needs extended CRL support */
1143
1144     if (!(ctx->param->flags & X509_V_FLAG_EXTENDED_CRL_SUPPORT))
1145         return;
1146
1147     /* Otherwise the CRL issuer is not on the path. Look for it in the
1148     * set of untrusted certificates.
1149     */
1150     for (i = 0; i < sk_X509_num(ctx->untrusted); i++)
1151     {
1152         crl_issuer = sk_X509_value(ctx->untrusted, i);
1153         if (X509_NAME_cmp(X509_get_subject_name(crl_issuer), cnm))
1154             continue;
1155         if (X509_check_akid(crl_issuer, crl->akid) == X509_V_OK)
1156         {
1157             *pissuer = crl_issuer;
1158             *pcrl_score |= CRL_SCORE_AKID;
1159             return;
1160         }
1161     }
1162
1163     /* Check the path of a CRL issuer certificate. This creates a new
1164     * X509_STORE_CTX and populates it with most of the parameters from the
1165     * parent. This could be optimised somewhat since a lot of path checking
1166     * will be duplicated by the parent, but this will rarely be used in
1167     * practice.
1168     */
1169
1170     static int check_crl_path(X509_STORE_CTX *ctx, X509 *x)
1171     {
1172         X509_STORE_CTX crl_ctx;
1173         int ret;
1174         /* Don't allow recursive CRL path validation */
1175         if (ctx->parent)
1176             return 0;
1177         if (!X509_STORE_CTX_init(&crl_ctx, ctx->ctx, x, ctx->untrusted))
1178             return -1;
1179
1180         crl_ctx.crls = ctx->crls;
1181         /* Copy verify params across */
1182         X509_STORE_CTX_set0_param(&crl_ctx, ctx->param);

```

```

1185     crl_ctx.parent = ctx;
1186     crl_ctx.verify_cb = ctx->verify_cb;

1188     /* Verify CRL issuer */
1189     ret = X509_verify_cert(&crl_ctx);

1191     if (ret <= 0)
1192         goto err;

1194     /* Check chain is acceptable */

1196     ret = check_crl_chain(ctx, ctx->chain, crl_ctx.chain);
1197     err:
1198     X509_STORE_CTX_cleanup(&crl_ctx);
1199     return ret;
1200 }

1202 /* RFC3280 says nothing about the relationship between CRL path
1203  * and certificate path, which could lead to situations where a
1204  * certificate could be revoked or validated by a CA not authorised
1205  * to do so. RFC5280 is more strict and states that the two paths must
1206  * end in the same trust anchor, though some discussions remain...
1207  * until this is resolved we use the RFC5280 version
1208  */

1210 static int check_crl_chain(X509_STORE_CTX *ctx,
1211                          STACK_OF(X509) *cert_path,
1212                          STACK_OF(X509) *crl_path)
1213 {
1214     X509 *cert_ta, *crl_ta;
1215     cert_ta = sk_X509_value(cert_path, sk_X509_num(cert_path) - 1);
1216     crl_ta = sk_X509_value(crl_path, sk_X509_num(crl_path) - 1);
1217     if (!X509_cmp(cert_ta, crl_ta))
1218         return 1;
1219     return 0;
1220 }

1222 /* Check for match between two dist point names: three separate cases.
1223  * 1. Both are relative names and compare X509_NAME types.
1224  * 2. One full, one relative. Compare X509_NAME to GENERAL_NAMES.
1225  * 3. Both are full names and compare two GENERAL_NAMES.
1226  * 4. One is NULL: automatic match.
1227  */

1230 static int idp_check_dp(DIST_POINT_NAME *a, DIST_POINT_NAME *b)
1231 {
1232     X509_NAME *nm = NULL;
1233     GENERAL_NAMES *gens = NULL;
1234     GENERAL_NAME *gena, *genb;
1235     int i, j;
1236     if (!a || !b)
1237         return 1;
1238     if (a->type == 1)
1239     {
1240         if (!a->dpname)
1241             return 0;
1242         /* Case 1: two X509_NAME */
1243         if (b->type == 1)
1244         {
1245             if (!b->dpname)
1246                 return 0;
1247             if (!X509_NAME_cmp(a->dpname, b->dpname))
1248                 return 1;
1249             else

```

```

1250         return 0;
1251     }
1252     /* Case 2: set name and GENERAL_NAMES appropriately */
1253     nm = a->dpname;
1254     gens = b->name.fullname;
1255 }
1256 else if (b->type == 1)
1257 {
1258     if (!b->dpname)
1259         return 0;
1260     /* Case 2: set name and GENERAL_NAMES appropriately */
1261     gens = a->name.fullname;
1262     nm = b->dpname;
1263 }

1265 /* Handle case 2 with one GENERAL_NAMES and one X509_NAME */
1266 if (nm)
1267 {
1268     for (i = 0; i < sk_GENERAL_NAME_num(gens); i++)
1269     {
1270         gena = sk_GENERAL_NAME_value(gens, i);
1271         if (gena->type != GEN_DIRNAME)
1272             continue;
1273         if (!X509_NAME_cmp(nm, gena->d.directoryName))
1274             return 1;
1275     }
1276     return 0;
1277 }

1279 /* Else case 3: two GENERAL_NAMES */

1281 for (i = 0; i < sk_GENERAL_NAME_num(a->name.fullname); i++)
1282 {
1283     gena = sk_GENERAL_NAME_value(a->name.fullname, i);
1284     for (j = 0; j < sk_GENERAL_NAME_num(b->name.fullname); j++)
1285     {
1286         genb = sk_GENERAL_NAME_value(b->name.fullname, j);
1287         if (!GENERAL_NAME_cmp(gena, genb))
1288             return 1;
1289     }
1290 }

1292 return 0;

1294 }

1296 static int crldp_check_crlissuer(DIST_POINT *dp, X509_CRL *crl, int crl_score)
1297 {
1298     int i;
1299     X509_NAME *nm = X509_CRL_get_issuer(crl);
1300     /* If no CRLissuer return is successful iff don't need a match */
1301     if (!dp->CRLissuer)
1302         return !!(crl_score & CRL_SCORE_ISSUER_NAME);
1303     for (i = 0; i < sk_GENERAL_NAME_num(dp->CRLissuer); i++)
1304     {
1305         GENERAL_NAME *gen = sk_GENERAL_NAME_value(dp->CRLissuer, i);
1306         if (gen->type != GEN_DIRNAME)
1307             continue;
1308         if (!X509_NAME_cmp(gen->d.directoryName, nm))
1309             return 1;
1310     }
1311     return 0;
1312 }

1314 /* Check CRLDP and IDP */

```

```

1316 static int crl_crl_dp_check(X509 *x, X509_CRL *crl, int crl_score,
1317                             unsigned int *preasons)
1318 {
1319     int i;
1320     if (crl->idp_flags & IDP_ONLYATTR)
1321         return 0;
1322     if (x->ex_flags & EXFLAG_CA)
1323     {
1324         if (crl->idp_flags & IDP_ONLYUSER)
1325             return 0;
1326     }
1327     else
1328     {
1329         if (crl->idp_flags & IDP_ONLYCA)
1330             return 0;
1331     }
1332     *preasons = crl->idp_reasons;
1333     for (i = 0; i < sk_DIST_POINT_num(x->crl_dp); i++)
1334     {
1335         DIST_POINT *dp = sk_DIST_POINT_value(x->crl_dp, i);
1336         if (crl_dp_check_crlissuer(dp, crl, crl_score))
1337         {
1338             if (!crl->idp ||
1339                 idp_check_dp(dp->distpoint, crl->idp->distpoint))
1340             {
1341                 *preasons &= dp->dp_reasons;
1342                 return 1;
1343             }
1344         }
1345     }
1346     if ((!crl->idp || !crl->idp->distpoint) && (crl_score & CRL_SCORE_ISSUER))
1347         return 1;
1348     return 0;
1349 }

1351 /* Retrieve CRL corresponding to current certificate.
1352  * If deltas enabled try to find a delta CRL too
1353  */
1354 static int get_crl_delta(X509_STORE_CTX *ctx,
1355                         X509_CRL **pcrl, X509_CRL **pdcr, X509 *x)
1356 {
1357     int ok;
1358     X509 *issuer = NULL;
1359     int crl_score = 0;
1360     unsigned int reasons;
1361     X509_CRL *crl = NULL, *dcr = NULL;
1362     STACK_OF(X509_CRL) *skcrl;
1363     X509_NAME *nm = X509_get_issuer_name(x);
1364     reasons = ctx->current_reasons;
1365     ok = get_crl_sk(ctx, &crl, &dcr, &issuer, &crl_score, &reasons, ctx->crls);
1366
1367     if (ok)
1368         goto done;
1369
1370     /* Lookup CRLs from store */
1371
1372     skcrl = ctx->lookup_crls(ctx, nm);
1373
1374     /* If no CRLs found and a near match from get_crl_sk use that */
1375     if (!skcrl && crl)
1376         goto done;
1377
1378     get_crl_sk(ctx, &crl, &dcr, &issuer, &crl_score, &reasons, skcrl);

```

```

1382     sk_X509_CRL_pop_free(skcrl, X509_CRL_free);
1383
1384     done:
1385
1386     /* If we got any kind of CRL use it and return success */
1387     if (crl)
1388     {
1389         ctx->current_issuer = issuer;
1390         ctx->current_crl_score = crl_score;
1391         ctx->current_reasons = reasons;
1392         *pcrl = crl;
1393         *pdcr = dcr;
1394         return 1;
1395     }
1396
1397     return 0;
1398 }

1400 /* Check CRL validity */
1401 static int check_crl(X509_STORE_CTX *ctx, X509_CRL *crl)
1402 {
1403     X509 *issuer = NULL;
1404     EVP_PKEY *ikey = NULL;
1405     int ok = 0, cnum, cnum;
1406     cnum = ctx->error_depth;
1407     cnum = sk_X509_num(ctx->chain) - 1;
1408     /* if we have an alternative CRL issuer cert use that */
1409     if (ctx->current_issuer)
1410         issuer = ctx->current_issuer;
1411
1412     /* Else find CRL issuer: if not last certificate then issuer
1413      * is next certificate in chain.
1414      */
1415     else if (cnum < cnum)
1416         issuer = sk_X509_value(ctx->chain, cnum + 1);
1417     else
1418     {
1419         issuer = sk_X509_value(ctx->chain, cnum);
1420         /* If not self signed, can't check signature */
1421         if (!ctx->check_issued(ctx, issuer, issuer))
1422         {
1423             ctx->error = X509_V_ERR_UNABLE_TO_GET_CRL_ISSUER;
1424             ok = ctx->verify_cb(0, ctx);
1425             if (!ok) goto err;
1426         }
1427     }
1428
1429     if (issuer)
1430     {
1431         /* Skip most tests for deltas because they have already
1432          * been done
1433          */
1434         if (!crl->base_crl_number)
1435         {
1436             /* Check for cRLSign bit if keyUsage present */
1437             if ((issuer->ex_flags & EXFLAG_KUSAGE) &&
1438                 !(issuer->ex_kusage & KU_CRL_SIGN))
1439             {
1440                 ctx->error = X509_V_ERR_KEYUSAGE_NO_CRL_SIGN;
1441                 ok = ctx->verify_cb(0, ctx);
1442                 if (!ok) goto err;
1443             }
1444
1445             if (!(ctx->current_crl_score & CRL_SCORE_SCOPE))
1446             {
1447                 ctx->error = X509_V_ERR_DIFFERENT_CRL_SCOPE;

```



```

1448         ok = ctx->verify_cb(0, ctx);
1449         if(!ok) goto err;
1450     }

1452     if (!(ctx->current_crl_score & CRL_SCORE_SAME_PATH))
1453     {
1454         if (check_crl_path(ctx, ctx->current_issuer) <=
1455             {
1456                 ctx->error = X509_V_ERR_CRL_PATH_VALIDAT
1457                 ok = ctx->verify_cb(0, ctx);
1458                 if(!ok) goto err;
1459             }
1460     }

1462     if (crl->idp_flags & IDP_INVALID)
1463     {
1464         ctx->error = X509_V_ERR_INVALID_EXTENSION;
1465         ok = ctx->verify_cb(0, ctx);
1466         if(!ok) goto err;
1467     }

1470 }

1472 if (!(ctx->current_crl_score & CRL_SCORE_TIME))
1473 {
1474     ok = check_crl_time(ctx, crl, 1);
1475     if (!ok)
1476         goto err;
1477 }

1479 /* Attempt to get issuer certificate public key */
1480 ikey = X509_get_pubkey(issuer);

1482 if(!ikey)
1483 {
1484     ctx->error=X509_V_ERR_UNABLE_TO_DECODE_ISSUER_PUBLIC_KEY
1485     ok = ctx->verify_cb(0, ctx);
1486     if (!ok) goto err;
1487 }
1488 else
1489 {
1490     /* Verify CRL signature */
1491     if(X509_CRL_verify(crl, ikey) <= 0)
1492     {
1493         ctx->error=X509_V_ERR_CRL_SIGNATURE_FAILURE;
1494         ok = ctx->verify_cb(0, ctx);
1495         if (!ok) goto err;
1496     }
1497 }
1498 }

1500 ok = 1;

1502 err:
1503 EVP_PKEY_free(ikey);
1504 return ok;
1505 }

1507 /* Check certificate against CRL */
1508 static int cert_crl(X509_STORE_CTX *ctx, X509_CRL *crl, X509 *x)
1509 {
1510     int ok;
1511     X509_REVOKED *rev;
1512     /* The rules changed for this... previously if a CRL contained
1513        * unhandled critical extensions it could still be used to indicate

```

```

1514     * a certificate was revoked. This has since been changed since
1515     * critical extension can change the meaning of CRL entries.
1516     */
1517     if (!(ctx->param->flags & X509_V_FLAG_IGNORE_CRITICAL)
1518         && (crl->flags & EXFLAG_CRITICAL))
1519     {
1520         ctx->error = X509_V_ERR_UNHANDLED_CRITICAL_CRL_EXTENSION;
1521         ok = ctx->verify_cb(0, ctx);
1522         if(!ok)
1523             return 0;
1524     }
1525     /* Look for serial number of certificate in CRL
1526     * If found make sure reason is not removeFromCRL.
1527     */
1528     if (X509_CRL_get0_by_cert(crl, &rev, x))
1529     {
1530         if (rev->reason == CRL_REASON_REMOVE_FROM_CRL)
1531             return 2;
1532         ctx->error = X509_V_ERR_CERT_REVOKED;
1533         ok = ctx->verify_cb(0, ctx);
1534         if (!ok)
1535             return 0;
1536     }

1538     return 1;
1539 }

1541 static int check_policy(X509_STORE_CTX *ctx)
1542 {
1543     int ret;
1544     if (ctx->parent)
1545         return 1;
1546     ret = X509_policy_check(&ctx->tree, &ctx->explicit_policy, ctx->chain,
1547                             ctx->param->policies, ctx->param->flags);
1548     if (ret == 0)
1549     {
1550         X509err(X509_F_CHECK_POLICY, ERR_R_MALLOC_FAILURE);
1551         return 0;
1552     }
1553     /* Invalid or inconsistent extensions */
1554     if (ret == -1)
1555     {
1556         /* Locate certificates with bad extensions and notify
1557            * callback.
1558            */
1559         X509 *x;
1560         int i;
1561         for (i = 1; i < sk_X509_num(ctx->chain); i++)
1562         {
1563             x = sk_X509_value(ctx->chain, i);
1564             if (!(x->ex_flags & EXFLAG_INVALID_POLICY))
1565                 continue;
1566             ctx->current_cert = x;
1567             ctx->error = X509_V_ERR_INVALID_POLICY_EXTENSION;
1568             if(!ctx->verify_cb(0, ctx))
1569                 return 0;
1570         }
1571         return 1;
1572     }
1573     if (ret == -2)
1574     {
1575         ctx->current_cert = NULL;
1576         ctx->error = X509_V_ERR_NO_EXPLICIT_POLICY;
1577         return ctx->verify_cb(0, ctx);
1578     }

```

```

1580     if (ctx->param->flags & X509_V_FLAG_NOTIFY_POLICY)
1581     {
1582         ctx->current_cert = NULL;
1583         ctx->error = X509_V_OK;
1584         if (!ctx->verify_cb(2, ctx))
1585             return 0;
1586     }
1588     return 1;
1589 }
1591 static int check_cert_time(X509_STORE_CTX *ctx, X509 *x)
1592 {
1593     time_t *ptime;
1594     int i;
1596     if (ctx->param->flags & X509_V_FLAG_USE_CHECK_TIME)
1597         ptime = &ctx->param->check_time;
1598     else
1599         ptime = NULL;
1601     i=X509_cmp_time(X509_get_notBefore(x), ptime);
1602     if (i == 0)
1603     {
1604         ctx->error=X509_V_ERR_ERROR_IN_CERT_NOT_BEFORE_FIELD;
1605         ctx->current_cert=x;
1606         if (!ctx->verify_cb(0, ctx))
1607             return 0;
1608     }
1610     if (i > 0)
1611     {
1612         ctx->error=X509_V_ERR_CERT_NOT_YET_VALID;
1613         ctx->current_cert=x;
1614         if (!ctx->verify_cb(0, ctx))
1615             return 0;
1616     }
1618     i=X509_cmp_time(X509_get_notAfter(x), ptime);
1619     if (i == 0)
1620     {
1621         ctx->error=X509_V_ERR_ERROR_IN_CERT_NOT_AFTER_FIELD;
1622         ctx->current_cert=x;
1623         if (!ctx->verify_cb(0, ctx))
1624             return 0;
1625     }
1627     if (i < 0)
1628     {
1629         ctx->error=X509_V_ERR_CERT_HAS_EXPIRED;
1630         ctx->current_cert=x;
1631         if (!ctx->verify_cb(0, ctx))
1632             return 0;
1633     }
1635     return 1;
1636 }
1638 static int internal_verify(X509_STORE_CTX *ctx)
1639 {
1640     int ok=0,n;
1641     X509 *xs,*xi;
1642     EVP_PKEY *pkey=NULL;
1643     int (*cb)(int xok,X509_STORE_CTX *xctx);
1644     cb=ctx->verify_cb;

```

```

1647     n=sk_X509_num(ctx->chain);
1648     ctx->error_depth=n-1;
1649     n--;
1650     xi=sk_X509_value(ctx->chain,n);
1652     if (ctx->check_issued(ctx, xi, xi))
1653         xs=xi;
1654     else
1655     {
1656         if (ctx->param->flags & X509_V_FLAG_PARTIAL_CHAIN && n == 0)
1657             return check_cert_time(ctx, xi);
1658         if (n <= 0)
1659         {
1660             ctx->error=X509_V_ERR_UNABLE_TO_VERIFY_LEAF_SIGNATURE;
1661             ctx->current_cert=xi;
1662             ok=cb(0,ctx);
1663             goto end;
1664         }
1665         else
1666         {
1667             n--;
1668             ctx->error_depth=n;
1669             xs=sk_X509_value(ctx->chain,n);
1670         }
1671     }
1673     /* ctx->error=0; not needed */
1674     while (n >= 0)
1675     {
1676         ctx->error_depth=n;
1678         /* Skip signature check for self signed certificates unless
1679          * explicitly asked for. It doesn't add any security and
1680          * just wastes time.
1681          */
1682         if (!xs->valid && (xs != xi || (ctx->param->flags & X509_V_FLAG_
1683             {
1684                 if ((pkey=X509_get_pubkey(xi)) == NULL)
1685                 {
1686                     ctx->error=X509_V_ERR_UNABLE_TO_DECODE_ISSUER_PU
1687                     ctx->current_cert=xi;
1688                     ok=(*cb)(0,ctx);
1689                     if (!ok) goto end;
1690                 }
1691                 else if (X509_verify(xs,pkey) <= 0)
1692                 {
1693                     ctx->error=X509_V_ERR_CERT_SIGNATURE_FAILURE;
1694                     ctx->current_cert=xs;
1695                     ok=(*cb)(0,ctx);
1696                     if (!ok)
1697                     {
1698                         EVP_PKEY_free(pkey);
1699                         goto end;
1700                     }
1701                 }
1702                 EVP_PKEY_free(pkey);
1703                 pkey=NULL;
1704             }
1706         xs->valid = 1;
1708         ok = check_cert_time(ctx, xs);
1709         if (!ok)
1710             goto end;

```

```

1712         /* The last error (if any) is still in the error value */
1713         ctx->current_issuer=xi;
1714         ctx->current_cert=xs;
1715         ok=(*cb)(1,ctx);
1716         if (!ok) goto end;

1718         n--;
1719         if (n >= 0)
1720         {
1721             xi=xs;
1722             xs=sk_X509_value(ctx->chain,n);
1723         }
1724     }
1725     ok=1;
1726 end:
1727     return ok;
1728 }

1730 int X509_cmp_current_time(const ASN1_TIME *ctm)
1731 {
1732     return X509_cmp_time(ctm, NULL);
1733 }

1735 int X509_cmp_time(const ASN1_TIME *ctm, time_t *cmp_time)
1736 {
1737     char *str;
1738     ASN1_TIME atm;
1739     long offset;
1740     char buff1[24],buff2[24],*p;
1741     int i,j;

1743     p=buff1;
1744     i=ctm->length;
1745     str=(char *)ctm->data;
1746     if (ctm->type == V_ASN1_UTCTIME)
1747     {
1748         if ((i < 11) || (i > 17)) return 0;
1749         memcpy(p,str,10);
1750         p+=10;
1751         str+=10;
1752     }
1753     else
1754     {
1755         if (i < 13) return 0;
1756         memcpy(p,str,12);
1757         p+=12;
1758         str+=12;
1759     }

1761     if ((*str == 'Z') || (*str == '-') || (*str == '+'))
1762     {
1763         *(p++)='0'; *(p++)='0';
1764     }
1765     else
1766     {
1767         *(p++)= *(str++);
1768         *(p++)= *(str++);
1769         /* Skip any fractional seconds... */
1770         if (*str == '.')
1771         {
1772             str++;
1773             while ((*str >= '0') && (*str <= '9')) str++;
1774         }
1775     }
1776     *(p++)='Z';
1777     *(p++)='\0';

```

```

1778     if (*str == 'Z')
1779         offset=0;
1780     else
1781     {
1782         if ((*str != '+') && (*str != '-'))
1783             return 0;
1784         offset=((str[1]-'0')*10+(str[2]-'0'))*60;
1785         offset+=(str[3]-'0')*10+(str[4]-'0');
1786         if (*str == '-')
1787             offset= -offset;
1788     }
1789     atm.type=ctm->type;
1790     atm.flags = 0;
1791     atm.length=sizeof(buff2);
1792     atm.data=(unsigned char *)buff2;

1794     if (X509_time_adj(&atm, offset*60, cmp_time) == NULL)
1795         return 0;

1797     if (ctm->type == V_ASN1_UTCTIME)
1798     {
1799         i=(buff1[0]-'0')*10+(buff1[1]-'0');
1800         if (i < 50) i+=100; /* cf. RFC 2459 */
1801         j=(buff2[0]-'0')*10+(buff2[1]-'0');
1802         if (j < 50) j+=100;

1804         if (i < j) return -1;
1805         if (i > j) return 1;
1806     }
1807     i=strcmp(buff1,buff2);
1808     if (i == 0) /* wait a second then return younger :- */
1809         return -1;
1810     else
1811         return i;
1812 }

1814 ASN1_TIME *X509_gmtime_adj(ASN1_TIME *s, long adj)
1815 {
1816     return X509_time_adj(s, adj, NULL);
1817 }

1819 ASN1_TIME *X509_time_adj(ASN1_TIME *s, long offset_sec, time_t *in_tm)
1820 {
1821     return X509_time_adj_ex(s, 0, offset_sec, in_tm);
1822 }

1824 ASN1_TIME *X509_time_adj_ex(ASN1_TIME *s,
1825                             int offset_day, long offset_sec, time_t *in_tm)
1826 {
1827     time_t t;

1829     if (in_tm) t = *in_tm;
1830     else time(&t);

1832     if (s && !(s->flags & ASN1_STRING_FLAG_MSTRING))
1833     {
1834         if (s->type == V_ASN1_UTCTIME)
1835             return ASN1_UTCTIME_adj(s,t, offset_day, offset_sec);
1836         if (s->type == V_ASN1_GENERALIZEDTIME)
1837             return ASN1_GENERALIZEDTIME_adj(s, t, offset_day,
1838                                             offset_sec);
1839     }
1840     return ASN1_TIME_adj(s, t, offset_day, offset_sec);
1841 }

1843 int X509_get_pubkey_parameters(EVP_PKEY *pkey, STACK_OF(X509) *chain)

```

```

1844     {
1845         EVP_PKEY *ktmp=NULL, *ktmp2;
1846         int i,j;

1848         if ((pkey != NULL) && !EVP_PKEY_missing_parameters(pkey)) return 1;

1850         for (i=0; i<sk_X509_num(chain); i++)
1851         {
1852             ktmp=X509_get_pubkey(sk_X509_value(chain,i));
1853             if (ktmp == NULL)
1854             {
1855                 X509err(X509_F_X509_GET_PUBKEY_PARAMETERS,X509_R_UNABLE
1856                     return 0;
1857             }
1858             if (!EVP_PKEY_missing_parameters(ktmp))
1859                 break;
1860             else
1861             {
1862                 EVP_PKEY_free(ktmp);
1863                 ktmp=NULL;
1864             }
1865         }
1866         if (ktmp == NULL)
1867         {
1868             X509err(X509_F_X509_GET_PUBKEY_PARAMETERS,X509_R_UNABLE_TO_FIND
1869                 return 0;
1870         }

1872         /* first, populate the other certs */
1873         for (j=i-1; j >= 0; j--)
1874         {
1875             ktmp2=X509_get_pubkey(sk_X509_value(chain,j));
1876             EVP_PKEY_copy_parameters(ktmp2,ktmp);
1877             EVP_PKEY_free(ktmp2);
1878         }
1879         if (pkey != NULL) EVP_PKEY_copy_parameters(pkey,ktmp);
1880         EVP_PKEY_free(ktmp);
1881         return 1;
1882     }
1883 }

1885 int X509_STORE_CTX_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_fu
1886     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
1887 {
1888     /* This function is (usually) called only once, by
1889     * SSL_get_ex_data_X509_STORE_CTX_idx (ssl/ssl_cert.c). */
1890     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_X509_STORE_CTX, argl, arg
1891         new_func, dup_func, free_func);
1892 }

1894 int X509_STORE_CTX_set_ex_data(X509_STORE_CTX *ctx, int idx, void *data)
1895 {
1896     return CRYPTO_set_ex_data(&ctx->ex_data,idx,data);
1897 }

1899 void *X509_STORE_CTX_get_ex_data(X509_STORE_CTX *ctx, int idx)
1900 {
1901     return CRYPTO_get_ex_data(&ctx->ex_data,idx);
1902 }

1904 int X509_STORE_CTX_get_error(X509_STORE_CTX *ctx)
1905 {
1906     return ctx->error;
1907 }

1909 void X509_STORE_CTX_set_error(X509_STORE_CTX *ctx, int err)

```

```

1910     {
1911         ctx->error=err;
1912     }

1914 int X509_STORE_CTX_get_error_depth(X509_STORE_CTX *ctx)
1915 {
1916     return ctx->error_depth;
1917 }

1919 X509 *X509_STORE_CTX_get_current_cert(X509_STORE_CTX *ctx)
1920 {
1921     return ctx->current_cert;
1922 }

1924 STACK_OF(X509) *X509_STORE_CTX_get_chain(X509_STORE_CTX *ctx)
1925 {
1926     return ctx->chain;
1927 }

1929 STACK_OF(X509) *X509_STORE_CTX_get1_chain(X509_STORE_CTX *ctx)
1930 {
1931     int i;
1932     X509 *x;
1933     STACK_OF(X509) *chain;
1934     if (!ctx->chain || !(chain = sk_X509_dup(ctx->chain))) return NULL;
1935     for (i = 0; i < sk_X509_num(chain); i++)
1936     {
1937         x = sk_X509_value(chain, i);
1938         CRYPTO_add(&x->references, 1, CRYPTO_LOCK_X509);
1939     }
1940     return chain;
1941 }

1943 X509 *X509_STORE_CTX_get0_current_issuer(X509_STORE_CTX *ctx)
1944 {
1945     return ctx->current_issuer;
1946 }

1948 X509_CRL *X509_STORE_CTX_get0_current_crl(X509_STORE_CTX *ctx)
1949 {
1950     return ctx->current_crl;
1951 }

1953 X509_STORE_CTX *X509_STORE_CTX_get0_parent_ctx(X509_STORE_CTX *ctx)
1954 {
1955     return ctx->parent;
1956 }

1958 void X509_STORE_CTX_set_cert(X509_STORE_CTX *ctx, X509 *x)
1959 {
1960     ctx->cert=x;
1961 }

1963 void X509_STORE_CTX_set_chain(X509_STORE_CTX *ctx, STACK_OF(X509) *sk)
1964 {
1965     ctx->untrusted=sk;
1966 }

1968 void X509_STORE_CTX_set0_crls(X509_STORE_CTX *ctx, STACK_OF(X509_CRL) *sk)
1969 {
1970     ctx->crls=sk;
1971 }

1973 int X509_STORE_CTX_set_purpose(X509_STORE_CTX *ctx, int purpose)
1974 {
1975     return X509_STORE_CTX_purpose_inherit(ctx, 0, purpose, 0);

```

```

1976     }
1978 int X509_STORE_CTX_set_trust(X509_STORE_CTX *ctx, int trust)
1979 {
1980     return X509_STORE_CTX_purpose_inherit(ctx, 0, 0, trust);
1981 }
1983 /* This function is used to set the X509_STORE_CTX purpose and trust
1984  * values. This is intended to be used when another structure has its
1985  * own trust and purpose values which (if set) will be inherited by
1986  * the ctx. If they aren't set then we will usually have a default
1987  * purpose in mind which should then be used to set the trust value.
1988  * An example of this is SSL use: an SSL structure will have its own
1989  * purpose and trust settings which the application can set: if they
1990  * aren't set then we use the default of SSL client/server.
1991  */
1993 int X509_STORE_CTX_purpose_inherit(X509_STORE_CTX *ctx, int def_purpose,
1994                                  int purpose, int trust)
1995 {
1996     int idx;
1997     /* If purpose not set use default */
1998     if (!purpose) purpose = def_purpose;
1999     /* If we have a purpose then check it is valid */
2000     if (purpose)
2001     {
2002         X509_PURPOSE *ptmp;
2003         idx = X509_PURPOSE_get_by_id(purpose);
2004         if (idx == -1)
2005         {
2006             X509err(X509_F_X509_STORE_CTX_PURPOSE_INHERIT,
2007                    X509_R_UNKNOWN_PURPOSE_ID);
2008             return 0;
2009         }
2010         ptmp = X509_PURPOSE_get0(idx);
2011         if (ptmp->trust == X509_TRUST_DEFAULT)
2012         {
2013             idx = X509_PURPOSE_get_by_id(def_purpose);
2014             if (idx == -1)
2015             {
2016                 X509err(X509_F_X509_STORE_CTX_PURPOSE_INHERIT,
2017                        X509_R_UNKNOWN_PURPOSE_ID);
2018                 return 0;
2019             }
2020             ptmp = X509_PURPOSE_get0(idx);
2021         }
2022         /* If trust not set then get from purpose default */
2023         if (!trust) trust = ptmp->trust;
2024     }
2025     if (trust)
2026     {
2027         idx = X509_TRUST_get_by_id(trust);
2028         if (idx == -1)
2029         {
2030             X509err(X509_F_X509_STORE_CTX_PURPOSE_INHERIT,
2031                    X509_R_UNKNOWN_TRUST_ID);
2032             return 0;
2033         }
2034     }
2036     if (purpose && !ctx->param->purpose) ctx->param->purpose = purpose;
2037     if (trust && !ctx->param->trust) ctx->param->trust = trust;
2038     return 1;
2039 }
2041 X509_STORE_CTX *X509_STORE_CTX_new(void)

```

```

2042 {
2043     X509_STORE_CTX *ctx;
2044     ctx = (X509_STORE_CTX *)OPENSSL_malloc(sizeof(X509_STORE_CTX));
2045     if (!ctx)
2046     {
2047         X509err(X509_F_X509_STORE_CTX_NEW, ERR_R_MALLOC_FAILURE);
2048         return NULL;
2049     }
2050     memset(ctx, 0, sizeof(X509_STORE_CTX));
2051     return ctx;
2052 }
2054 void X509_STORE_CTX_free(X509_STORE_CTX *ctx)
2055 {
2056     X509_STORE_CTX_cleanup(ctx);
2057     OPENSSL_free(ctx);
2058 }
2060 int X509_STORE_CTX_init(X509_STORE_CTX *ctx, X509_STORE *store, X509 *x509,
2061                        STACK_OF(X509) *chain)
2062 {
2063     int ret = 1;
2064     ctx->ctx=store;
2065     ctx->current_method=0;
2066     ctx->cert=x509;
2067     ctx->untrusted=chain;
2068     ctx->crls = NULL;
2069     ctx->last_untrusted=0;
2070     ctx->other_ctx=NULL;
2071     ctx->valid=0;
2072     ctx->chain=NULL;
2073     ctx->error=0;
2074     ctx->explicit_policy=0;
2075     ctx->error_depth=0;
2076     ctx->current_cert=NULL;
2077     ctx->current_issuer=NULL;
2078     ctx->current_crl=NULL;
2079     ctx->current_crl_score=0;
2080     ctx->current_reasons=0;
2081     ctx->tree = NULL;
2082     ctx->parent = NULL;
2084     ctx->param = X509_VERIFY_PARAM_new();
2086     if (!ctx->param)
2087     {
2088         X509err(X509_F_X509_STORE_CTX_INIT, ERR_R_MALLOC_FAILURE);
2089         return 0;
2090     }
2092     /* Inherit callbacks and flags from X509_STORE if not set
2093      * use defaults.
2094      */
2097     if (store)
2098         ret = X509_VERIFY_PARAM_inherit(ctx->param, store->param);
2099     else
2100         ctx->param->inh_flags |= X509_VP_FLAG_DEFAULT|X509_VP_FLAG_ONCE;
2102     if (store)
2103     {
2104         ctx->verify_cb = store->verify_cb;
2105         ctx->cleanup = store->cleanup;
2106     }
2107     else

```

```

2108         ctx->cleanup = 0;
2110     if (ret)
2111         ret = X509_VERIFY_PARAM_inherit(ctx->param,
2112                                         X509_VERIFY_PARAM_lookup("default"));
2114     if (ret == 0)
2115     {
2116         X509err(X509_F_X509_STORE_CTX_INIT, ERR_R_MALLOC_FAILURE);
2117         return 0;
2118     }
2120     if (store && store->check_issued)
2121         ctx->check_issued = store->check_issued;
2122     else
2123         ctx->check_issued = check_issued;
2125     if (store && store->get_issuer)
2126         ctx->get_issuer = store->get_issuer;
2127     else
2128         ctx->get_issuer = X509_STORE_CTX_get1_issuer;
2130     if (store && store->verify_cb)
2131         ctx->verify_cb = store->verify_cb;
2132     else
2133         ctx->verify_cb = null_callback;
2135     if (store && store->verify)
2136         ctx->verify = store->verify;
2137     else
2138         ctx->verify = internal_verify;
2140     if (store && store->check_revocation)
2141         ctx->check_revocation = store->check_revocation;
2142     else
2143         ctx->check_revocation = check_revocation;
2145     if (store && store->get_crl)
2146         ctx->get_crl = store->get_crl;
2147     else
2148         ctx->get_crl = NULL;
2150     if (store && store->check_crl)
2151         ctx->check_crl = store->check_crl;
2152     else
2153         ctx->check_crl = check_crl;
2155     if (store && store->cert_crl)
2156         ctx->cert_crl = store->cert_crl;
2157     else
2158         ctx->cert_crl = cert_crl;
2160     if (store && store->lookup_certs)
2161         ctx->lookup_certs = store->lookup_certs;
2162     else
2163         ctx->lookup_certs = X509_STORE_get1_certs;
2165     if (store && store->lookup_crls)
2166         ctx->lookup_crls = store->lookup_crls;
2167     else
2168         ctx->lookup_crls = X509_STORE_get1_crls;
2170     ctx->check_policy = check_policy;
2173     /* This memset() can't make any sense anyway, so it's removed. As

```

```

2174     * X509_STORE_CTX_cleanup does a proper "free" on the ex_data, we put a
2175     * corresponding "new" here and remove this bogus initialisation. */
2176     /* memset(&(ctx->ex_data), 0, sizeof(CRYPTO_EX_DATA)); */
2177     if (!CRYPTO_new_ex_data(CRYPTO_EX_INDEX_X509_STORE_CTX, ctx,
2178                           &(ctx->ex_data)))
2179     {
2180         OPENSSL_free(ctx);
2181         X509err(X509_F_X509_STORE_CTX_INIT, ERR_R_MALLOC_FAILURE);
2182         return 0;
2183     }
2184     return 1;
2185 }
2187 /* Set alternative lookup method: just a STACK of trusted certificates.
2188  * This avoids X509_STORE nastiness where it isn't needed.
2189  */
2191 void X509_STORE_CTX_trusted_stack(X509_STORE_CTX *ctx, STACK_OF(X509) *sk)
2192 {
2193     ctx->other_ctx = sk;
2194     ctx->get_issuer = get_issuer_sk;
2195 }
2197 void X509_STORE_CTX_cleanup(X509_STORE_CTX *ctx)
2198 {
2199     if (ctx->cleanup) ctx->cleanup(ctx);
2200     if (ctx->param != NULL)
2201     {
2202         if (ctx->parent == NULL)
2203             X509_VERIFY_PARAM_free(ctx->param);
2204         ctx->param=NULL;
2205     }
2206     if (ctx->tree != NULL)
2207     {
2208         X509_policy_tree_free(ctx->tree);
2209         ctx->tree=NULL;
2210     }
2211     if (ctx->chain != NULL)
2212     {
2213         sk_X509_pop_free(ctx->chain, X509_free);
2214         ctx->chain=NULL;
2215     }
2216     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_X509_STORE_CTX, ctx, &(ctx->ex_data));
2217     memset(&(ctx->ex_data), 0, sizeof(CRYPTO_EX_DATA));
2218 }
2220 void X509_STORE_CTX_set_depth(X509_STORE_CTX *ctx, int depth)
2221 {
2222     X509_VERIFY_PARAM_set_depth(ctx->param, depth);
2223 }
2225 void X509_STORE_CTX_set_flags(X509_STORE_CTX *ctx, unsigned long flags)
2226 {
2227     X509_VERIFY_PARAM_set_flags(ctx->param, flags);
2228 }
2230 void X509_STORE_CTX_set_time(X509_STORE_CTX *ctx, unsigned long flags, time_t t)
2231 {
2232     X509_VERIFY_PARAM_set_time(ctx->param, t);
2233 }
2235 void X509_STORE_CTX_set_verify_cb(X509_STORE_CTX *ctx,
2236                                  int (*verify_cb)(int, X509_STORE_CTX *))
2237 {
2238     ctx->verify_cb=verify_cb;
2239 }

```

```
2241 X509_POLICY_TREE *X509_STORE_CTX_get0_policy_tree(X509_STORE_CTX *ctx)
2242 {
2243     return ctx->tree;
2244 }
2246 int X509_STORE_CTX_get_explicit_policy(X509_STORE_CTX *ctx)
2247 {
2248     return ctx->explicit_policy;
2249 }
2251 int X509_STORE_CTX_set_default(X509_STORE_CTX *ctx, const char *name)
2252 {
2253     const X509_VERIFY_PARAM *param;
2254     param = X509_VERIFY_PARAM_lookup(name);
2255     if (!param)
2256         return 0;
2257     return X509_VERIFY_PARAM_inherit(ctx->param, param);
2258 }
2260 X509_VERIFY_PARAM *X509_STORE_CTX_get0_param(X509_STORE_CTX *ctx)
2261 {
2262     return ctx->param;
2263 }
2265 void X509_STORE_CTX_set0_param(X509_STORE_CTX *ctx, X509_VERIFY_PARAM *param)
2266 {
2267     if (ctx->param)
2268         X509_VERIFY_PARAM_free(ctx->param);
2269     ctx->param = param;
2270 }
2272 IMPLEMENT_STACK_OF(X509)
2273 IMPLEMENT_ASN1_SET_OF(X509)
2275 IMPLEMENT_STACK_OF(X509_NAME)
2277 IMPLEMENT_STACK_OF(X509_ATTRIBUTE)
2278 IMPLEMENT_ASN1_SET_OF(X509_ATTRIBUTE)
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_vpm.c

1

```
*****
12002 Fri May 30 18:32:13 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509_vpm.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* x509_vpm.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2004.
4  */
5 /* =====
6  * Copyright (c) 2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
11 *
12 * 1. Redistributions of source code must retain the above copyright
13 * notice, this list of conditions and the following disclaimer.
14 *
15 * 2. Redistributions in binary form must reproduce the above copyright
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18 * distribution.
19 *
20 * 3. All advertising materials mentioning features or use of this
21 * software must display the following acknowledgment:
22 * "This product includes software developed by the OpenSSL Project
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24 *
25 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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32 * permission of the OpenSSL Project.
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34 * 6. Redistributions of any form whatsoever must retain the following
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37 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
38 *
39 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */

59 #include <stdio.h>

61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509_vpm.c

2

```
62 #include <openssl/crypto.h>
63 #include <openssl/lhash.h>
64 #include <openssl/buffer.h>
65 #include <openssl/x509.h>
66 #include <openssl/x509v3.h>

68 /* X509_VERIFY_PARAM functions */

70 static void x509_verify_param_zero(X509_VERIFY_PARAM *param)
71 {
72     if (!param)
73         return;
74     param->name = NULL;
75     param->purpose = 0;
76     param->trust = 0;
77     /*param->inh_flags = X509_VP_FLAG_DEFAULT;*/
78     param->inh_flags = 0;
79     param->flags = 0;
80     param->depth = -1;
81     if (param->policies)
82     {
83         sk_ASN1_OBJECT_pop_free(param->policies, ASN1_OBJECT_free);
84         param->policies = NULL;
85     }
86 }

88 X509_VERIFY_PARAM *X509_VERIFY_PARAM_new(void)
89 {
90     X509_VERIFY_PARAM *param;
91     param = OPENSSL_malloc(sizeof(X509_VERIFY_PARAM));
92     memset(param, 0, sizeof(X509_VERIFY_PARAM));
93     x509_verify_param_zero(param);
94     return param;
95 }

97 void X509_VERIFY_PARAM_free(X509_VERIFY_PARAM *param)
98 {
99     x509_verify_param_zero(param);
100     OPENSSL_free(param);
101 }

103 /* This function determines how parameters are "inherited" from one structure
104  * to another. There are several different ways this can happen.
105  *
106  * 1. If a child structure needs to have its values initialized from a parent
107  * they are simply copied across. For example SSL_CTX copied to SSL.
108  * 2. If the structure should take on values only if they are currently unset.
109  * For example the values in an SSL structure will take appropriate value
110  * for SSL servers or clients but only if the application has not set new
111  * ones.
112  *
113  * The "inh_flags" field determines how this function behaves.
114  *
115  * Normally any values which are set in the default are not copied from the
116  * destination and verify flags are Ored together.
117  *
118  * If X509_VP_FLAG_DEFAULT is set then anything set in the source is copied
119  * to the destination. Effectively the values in "to" become default values
120  * which will be used only if nothing new is set in "from".
121  *
122  * If X509_VP_FLAG_OVERWRITE is set then all value are copied across whether
123  * they are set or not. Flags is still Ored though.
124  *
125  * If X509_VP_FLAG_RESET_FLAGS is set then the flags value is copied instead
126  * of Ored.
127  */
```



```

128 * If X509_VP_FLAG_LOCKED is set then no values are copied.
129 *
130 * If X509_VP_FLAG_ONCE is set then the current inh_flags setting is zeroed
131 * after the next call.
132 */

134 /* Macro to test if a field should be copied from src to dest */

136 #define test_x509_verify_param_copy(field, def) \
137     (to_overwrite || \
138      ((src->field != def) && (to_default || (dest->field == def))))

140 /* Macro to test and copy a field if necessary */

142 #define x509_verify_param_copy(field, def) \
143     if (test_x509_verify_param_copy(field, def)) \
144         dest->field = src->field
145

147 int X509_VERIFY_PARAM_inherit(X509_VERIFY_PARAM *dest,
148                               const X509_VERIFY_PARAM *src)
149 {
150     unsigned long inh_flags;
151     int to_default, to_overwrite;
152     if (!src)
153         return 1;
154     inh_flags = dest->inh_flags | src->inh_flags;

156     if (inh_flags & X509_VP_FLAG_ONCE)
157         dest->inh_flags = 0;

159     if (inh_flags & X509_VP_FLAG_LOCKED)
160         return 1;

162     if (inh_flags & X509_VP_FLAG_DEFAULT)
163         to_default = 1;
164     else
165         to_default = 0;

167     if (inh_flags & X509_VP_FLAG_OVERWRITE)
168         to_overwrite = 1;
169     else
170         to_overwrite = 0;

172     x509_verify_param_copy(purpose, 0);
173     x509_verify_param_copy(trust, 0);
174     x509_verify_param_copy(depth, -1);

176     /* If overwrite or check time not set, copy across */

178     if (to_overwrite || !(dest->flags & X509_V_FLAG_USE_CHECK_TIME))
179     {
180         dest->check_time = src->check_time;
181         dest->flags &= ~X509_V_FLAG_USE_CHECK_TIME;
182         /* Don't need to copy flag: that is done below */
183     }

185     if (inh_flags & X509_VP_FLAG_RESET_FLAGS)
186         dest->flags = 0;

188     dest->flags |= src->flags;

190     if (test_x509_verify_param_copy(policies, NULL))
191     {
192         if (!X509_VERIFY_PARAM_set1_policies(dest, src->policies))
193             return 0;

```

```

194     }

196     return 1;
197 }

199 int X509_VERIFY_PARAM_set1(X509_VERIFY_PARAM *to,
200                             const X509_VERIFY_PARAM *from)
201 {
202     unsigned long save_flags = to->inh_flags;
203     int ret;
204     to->inh_flags |= X509_VP_FLAG_DEFAULT;
205     ret = X509_VERIFY_PARAM_inherit(to, from);
206     to->inh_flags = save_flags;
207     return ret;
208 }

210 int X509_VERIFY_PARAM_set1_name(X509_VERIFY_PARAM *param, const char *name)
211 {
212     if (param->name)
213         OPENSSL_free(param->name);
214     param->name = BUF_strdup(name);
215     if (param->name)
216         return 1;
217     return 0;
218 }

220 int X509_VERIFY_PARAM_set_flags(X509_VERIFY_PARAM *param, unsigned long flags)
221 {
222     param->flags |= flags;
223     if (flags & X509_V_FLAG_POLICY_MASK)
224         param->flags |= X509_V_FLAG_POLICY_CHECK;
225     return 1;
226 }

228 int X509_VERIFY_PARAM_clear_flags(X509_VERIFY_PARAM *param, unsigned long flags)
229 {
230     param->flags &= ~flags;
231     return 1;
232 }

234 unsigned long X509_VERIFY_PARAM_get_flags(X509_VERIFY_PARAM *param)
235 {
236     return param->flags;
237 }

239 int X509_VERIFY_PARAM_set_purpose(X509_VERIFY_PARAM *param, int purpose)
240 {
241     return X509_PURPOSE_set(&param->purpose, purpose);
242 }

244 int X509_VERIFY_PARAM_set_trust(X509_VERIFY_PARAM *param, int trust)
245 {
246     return X509_TRUST_set(&param->trust, trust);
247 }

249 void X509_VERIFY_PARAM_set_depth(X509_VERIFY_PARAM *param, int depth)
250 {
251     param->depth = depth;
252 }

254 void X509_VERIFY_PARAM_set_time(X509_VERIFY_PARAM *param, time_t t)
255 {
256     param->check_time = t;
257     param->flags |= X509_V_FLAG_USE_CHECK_TIME;
258 }

```

```

260 int X509_VERIFY_PARAM_add0_policy(X509_VERIFY_PARAM *param, ASN1_OBJECT *policy)
261 {
262     if (!param->policies)
263     {
264         param->policies = sk_ASN1_OBJECT_new_null();
265         if (!param->policies)
266             return 0;
267     }
268     if (!sk_ASN1_OBJECT_push(param->policies, policy))
269         return 0;
270     return 1;
271 }

273 int X509_VERIFY_PARAM_set1_policies(X509_VERIFY_PARAM *param,
274                                     STACK_OF(ASN1_OBJECT) *policies)
275 {
276     int i;
277     ASN1_OBJECT *oid, *doid;
278     if (!param)
279         return 0;
280     if (param->policies)
281         sk_ASN1_OBJECT_pop_free(param->policies, ASN1_OBJECT_free);

283     if (!policies)
284     {
285         param->policies = NULL;
286         return 1;
287     }

289     param->policies = sk_ASN1_OBJECT_new_null();
290     if (!param->policies)
291         return 0;

293     for (i = 0; i < sk_ASN1_OBJECT_num(policies); i++)
294     {
295         oid = sk_ASN1_OBJECT_value(policies, i);
296         doid = OBJ_dup(oid);
297         if (!doid)
298             return 0;
299         if (!sk_ASN1_OBJECT_push(param->policies, doid))
300         {
301             ASN1_OBJECT_free(doid);
302             return 0;
303         }
304     }
305     param->flags |= X509_V_FLAG_POLICY_CHECK;
306     return 1;
307 }

309 int X509_VERIFY_PARAM_get_depth(const X509_VERIFY_PARAM *param)
310 {
311     return param->depth;
312 }

314 /* Default verify parameters: these are used for various
315  * applications and can be overridden by the user specified table.
316  * NB: the 'name' field *must* be in alphabetical order because it
317  * will be searched using OBJ_search.
318  */

320 static const X509_VERIFY_PARAM default_table[] = {
321     {
322         "default", /* X509 default parameters */
323         0, /* Check time */
324         0, /* internal flags */
325         0, /* flags */

```

```

326     0, /* purpose */
327     0, /* trust */
328     100, /* depth */
329     NULL, /* policies */
330 },
331 {
332     "pkcs7", /* S/MIME sign parameters */
333     0, /* Check time */
334     0, /* internal flags */
335     0, /* flags */
336     X509_PURPOSE_SMIME_SIGN, /* purpose */
337     X509_TRUST_EMAIL, /* trust */
338     -1, /* depth */
339     NULL, /* policies */
340 },
341 {
342     "smime_sign", /* S/MIME sign parameters */
343     0, /* Check time */
344     0, /* internal flags */
345     0, /* flags */
346     X509_PURPOSE_SMIME_SIGN, /* purpose */
347     X509_TRUST_EMAIL, /* trust */
348     -1, /* depth */
349     NULL, /* policies */
350 },
351 {
352     "ssl_client", /* SSL/TLS client parameters */
353     0, /* Check time */
354     0, /* internal flags */
355     0, /* flags */
356     X509_PURPOSE_SSL_CLIENT, /* purpose */
357     X509_TRUST_SSL_CLIENT, /* trust */
358     -1, /* depth */
359     NULL, /* policies */
360 },
361 {
362     "ssl_server", /* SSL/TLS server parameters */
363     0, /* Check time */
364     0, /* internal flags */
365     0, /* flags */
366     X509_PURPOSE_SSL_SERVER, /* purpose */
367     X509_TRUST_SSL_SERVER, /* trust */
368     -1, /* depth */
369     NULL, /* policies */
370     };

372 static STACK_OF(X509_VERIFY_PARAM) *param_table = NULL;

374 static int table_cmp(const X509_VERIFY_PARAM *a, const X509_VERIFY_PARAM *b)
375 {
376     return strcmp(a->name, b->name);
377 }

380 DECLARE_OBJ_BSEARCH_CMP_FN(X509_VERIFY_PARAM, X509_VERIFY_PARAM,
381                             table);
382 IMPLEMENT_OBJ_BSEARCH_CMP_FN(X509_VERIFY_PARAM, X509_VERIFY_PARAM,
383                               table);

385 static int param_cmp(const X509_VERIFY_PARAM * const *a,
386                     const X509_VERIFY_PARAM * const *b)
387 {
388     return strcmp((*a)->name, (*b)->name);
389 }

391 int X509_VERIFY_PARAM_add0_table(X509_VERIFY_PARAM *param)

```

```
392     {
393         int idx;
394         X509_VERIFY_PARAM *ptmp;
395         if (!param_table)
396         {
397             param_table = sk_X509_VERIFY_PARAM_new(param_cmp);
398             if (!param_table)
399                 return 0;
400         }
401     else
402     {
403         idx = sk_X509_VERIFY_PARAM_find(param_table, param);
404         if (idx != -1)
405         {
406             ptmp = sk_X509_VERIFY_PARAM_value(param_table, idx);
407             X509_VERIFY_PARAM_free(ptmp);
408             (void)sk_X509_VERIFY_PARAM_delete(param_table, idx);
409         }
410     }
411     if (!sk_X509_VERIFY_PARAM_push(param_table, param))
412         return 0;
413     return 1;
414 }

416 const X509_VERIFY_PARAM *X509_VERIFY_PARAM_lookup(const char *name)
417 {
418     int idx;
419     X509_VERIFY_PARAM pm;

421     pm.name = (char *)name;
422     if (param_table)
423     {
424         idx = sk_X509_VERIFY_PARAM_find(param_table, &pm);
425         if (idx != -1)
426             return sk_X509_VERIFY_PARAM_value(param_table, idx);
427     }
428     return OBJ_bsearch_table(&pm, default_table,
429                             sizeof(default_table)/sizeof(X509_VERIFY_PARAM));
430 }

432 void X509_VERIFY_PARAM_table_cleanup(void)
433 {
434     if (param_table)
435         sk_X509_VERIFY_PARAM_pop_free(param_table,
436                                         X509_VERIFY_PARAM_free);
437     param_table = NULL;
438 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509cset.c

1

```
*****
4869 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509cset.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509cset.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 2001 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
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13  * notice, this list of conditions and the following disclaimer.
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25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509cset.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/x509.h>
65
66 int X509_CRL_set_version(X509_CRL *x, long version)
67 {
68     if (x == NULL) return(0);
69     if (x->crl->version == NULL)
70     {
71         if ((x->crl->version=M_ASN1_INTEGER_new()) == NULL)
72             return(0);
73     }
74     return(ASN1_INTEGER_set(x->crl->version,version));
75 }
76
77 int X509_CRL_set_issuer_name(X509_CRL *x, X509_NAME *name)
78 {
79     if ((x == NULL) || (x->crl == NULL)) return(0);
80     return(X509_NAME_set(&x->crl->issuer,name));
81 }
82
83
84 int X509_CRL_set_lastUpdate(X509_CRL *x, const ASN1_TIME *tm)
85 {
86     ASN1_TIME *in;
87
88     if (x == NULL) return(0);
89     in=x->crl->lastUpdate;
90     if (in != tm)
91     {
92         in=M_ASN1_TIME_dup(tm);
93         if (in != NULL)
94         {
95             M_ASN1_TIME_free(x->crl->lastUpdate);
96             x->crl->lastUpdate=in;
97         }
98     }
99     return(in != NULL);
100 }
101
102 int X509_CRL_set_nextUpdate(X509_CRL *x, const ASN1_TIME *tm)
103 {
104     ASN1_TIME *in;
105
106     if (x == NULL) return(0);
107     in=x->crl->nextUpdate;
108     if (in != tm)
109     {
110         in=M_ASN1_TIME_dup(tm);
111         if (in != NULL)
112         {
113             M_ASN1_TIME_free(x->crl->nextUpdate);
114             x->crl->nextUpdate=in;
115         }
116     }
117     return(in != NULL);
118 }
119
120 int X509_CRL_sort(X509_CRL *c)
121 {
122     int i;
123     X509_REVOKED *r;
124     /* sort the data so it will be written in serial
125      * number order */
126     sk_X509_REVOKED_sort(c->crl->revoked);
127     for (i=0; i<sk_X509_REVOKED_num(c->crl->revoked); i++)
```

```
128     {
129         r=sk_X509_REVOKED_value(c->crl->revoked,i);
130         r->sequence=i;
131     }
132     c->crl->enc.modified = 1;
133     return 1;
134 }

136 int X509_REVOKED_set_revocationDate(X509_REVOKED *x, ASN1_TIME *tm)
137 {
138     ASN1_TIME *in;
139
140     if (x == NULL) return(0);
141     in=x->revocationDate;
142     if (in != tm)
143     {
144         in=M_ASN1_TIME_dup(tm);
145         if (in != NULL)
146         {
147             M_ASN1_TIME_free(x->revocationDate);
148             x->revocationDate=in;
149         }
150     }
151     return(in != NULL);
152 }

154 int X509_REVOKED_set_serialNumber(X509_REVOKED *x, ASN1_INTEGER *serial)
155 {
156     ASN1_INTEGER *in;
157
158     if (x == NULL) return(0);
159     in=x->serialNumber;
160     if (in != serial)
161     {
162         in=M_ASN1_INTEGER_dup(serial);
163         if (in != NULL)
164         {
165             M_ASN1_INTEGER_free(x->serialNumber);
166             x->serialNumber=in;
167         }
168     }
169     return(in != NULL);
170 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509name.c

1

10804 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509name.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x509name.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
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15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
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21 * in documentation (online or textual) provided with the package.
22 *
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24 * modification, are permitted provided that the following conditions
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/stack.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509name.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65 #include <openssl/x509.h>
66
67 int X509_NAME_get_text_by_NID(X509_NAME *name, int nid, char *buf, int len)
68 {
69     ASN1_OBJECT *obj;
70
71     obj=OBJ_nid2obj(nid);
72     if (obj == NULL) return(-1);
73     return(X509_NAME_get_text_by_OBJ(name,obj,buf, len));
74 }
75
76 int X509_NAME_get_text_by_OBJ(X509_NAME *name, ASN1_OBJECT *obj, char *buf,
77     int len)
78 {
79     int i;
80     ASN1_STRING *data;
81
82     i=X509_NAME_get_index_by_OBJ(name,obj,-1);
83     if (i < 0) return(-1);
84     data=X509_NAME_ENTRY_get_data(X509_NAME_get_entry(name,i));
85     i=(data->length > (len-1))?(len-1):data->length;
86     if (buf == NULL) return(data->length);
87     memcpy(buf,data->data,i);
88     buf[i]='\0';
89     return(i);
90 }
91
92 int X509_NAME_entry_count(X509_NAME *name)
93 {
94     if (name == NULL) return(0);
95     return(sk_X509_NAME_ENTRY_num(name->entries));
96 }
97
98 int X509_NAME_get_index_by_NID(X509_NAME *name, int nid, int lastpos)
99 {
100     ASN1_OBJECT *obj;
101
102     obj=OBJ_nid2obj(nid);
103     if (obj == NULL) return(-2);
104     return(X509_NAME_get_index_by_OBJ(name,obj,lastpos));
105 }
106
107 /* NOTE: you should be passing -1, not 0 as lastpos */
108 int X509_NAME_get_index_by_OBJ(X509_NAME *name, ASN1_OBJECT *obj,
109     int lastpos)
110 {
111     int n;
112     X509_NAME_ENTRY *ne;
113     STACK_OF(X509_NAME_ENTRY) *sk;
114
115     if (name == NULL) return(-1);
116     if (lastpos < 0)
117         lastpos= -1;
118     sk=name->entries;
119     n=sk_X509_NAME_ENTRY_num(sk);
120     for (lastpos++; lastpos < n; lastpos++)
121     {
122         ne=sk_X509_NAME_ENTRY_value(sk,lastpos);
123         if (OBJ_cmp(ne->object,obj) == 0)
124             return(lastpos);
125     }
126     return(-1);
127 }
```

```

129 X509_NAME_ENTRY *X509_NAME_get_entry(X509_NAME *name, int loc)
130 {
131     if(name == NULL || sk_X509_NAME_ENTRY_num(name->entries) <= loc
132        || loc < 0)
133         return(NULL);
134     else
135         return(sk_X509_NAME_ENTRY_value(name->entries, loc));
136 }

138 X509_NAME_ENTRY *X509_NAME_delete_entry(X509_NAME *name, int loc)
139 {
140     X509_NAME_ENTRY *ret;
141     int i, n, set_prev, set_next;
142     STACK_OF(X509_NAME_ENTRY) *sk;

144     if (name == NULL || sk_X509_NAME_ENTRY_num(name->entries) <= loc
145        || loc < 0)
146         return(NULL);
147     sk=name->entries;
148     ret=sk_X509_NAME_ENTRY_delete(sk, loc);
149     n=sk_X509_NAME_ENTRY_num(sk);
150     name->modified=1;
151     if (loc == n) return(ret);

153     /* else we need to fixup the set field */
154     if (loc != 0)
155         set_prev=(sk_X509_NAME_ENTRY_value(sk, loc-1)->set);
156     else
157         set_prev=ret->set-1;
158     set_next=sk_X509_NAME_ENTRY_value(sk, loc)->set;

160     /* set_prev is the previous set
161     * set is the current set
162     * set_next is the following
163     * prev 1 1    1 1    1 1    1 1
164     * set   1    1    2    2
165     * next  1 1    2 2    2 2    3 2
166     * so basically only if prev and next differ by 2, then
167     * re-number down by 1 */
168     if (set_prev+1 < set_next)
169         for (i=loc; i<n; i++)
170             sk_X509_NAME_ENTRY_value(sk, i)->set--;
171     return(ret);
172 }

174 int X509_NAME_add_entry_by_OBJ(X509_NAME *name, ASN1_OBJECT *obj, int type,
175                                unsigned char *bytes, int len, int loc, int set)
176 {
177     X509_NAME_ENTRY *ne;
178     int ret;
179     ne = X509_NAME_ENTRY_create_by_OBJ(NULL, obj, type, bytes, len);
180     if(!ne) return 0;
181     ret = X509_NAME_add_entry(name, ne, loc, set);
182     X509_NAME_ENTRY_free(ne);
183     return ret;
184 }

186 int X509_NAME_add_entry_by_NID(X509_NAME *name, int nid, int type,
187                                unsigned char *bytes, int len, int loc, int set)
188 {
189     X509_NAME_ENTRY *ne;
190     int ret;
191     ne = X509_NAME_ENTRY_create_by_NID(NULL, nid, type, bytes, len);
192     if(!ne) return 0;
193     ret = X509_NAME_add_entry(name, ne, loc, set);

```

```

194     X509_NAME_ENTRY_free(ne);
195     return ret;
196 }

198 int X509_NAME_add_entry_by_txt(X509_NAME *name, const char *field, int type,
199                                const unsigned char *bytes, int len, int loc, int set)
200 {
201     X509_NAME_ENTRY *ne;
202     int ret;
203     ne = X509_NAME_ENTRY_create_by_txt(NULL, field, type, bytes, len);
204     if(!ne) return 0;
205     ret = X509_NAME_add_entry(name, ne, loc, set);
206     X509_NAME_ENTRY_free(ne);
207     return ret;
208 }

210 /* if set is -1, append to previous set, 0 'a new one', and 1,
211 * prepend to the guy we are about to stomp on. */
212 int X509_NAME_add_entry(X509_NAME *name, X509_NAME_ENTRY *ne, int loc,
213                          int set)
214 {
215     X509_NAME_ENTRY *new_name=NULL;
216     int n, i, inc;
217     STACK_OF(X509_NAME_ENTRY) *sk;

219     if (name == NULL) return(0);
220     sk=name->entries;
221     n=sk_X509_NAME_ENTRY_num(sk);
222     if (loc > n) loc=n;
223     else if (loc < 0) loc=n;

225     name->modified=1;

227     if (set == -1)
228     {
229         if (loc == 0)
230         {
231             set=0;
232             inc=1;
233         }
234         else
235         {
236             set=sk_X509_NAME_ENTRY_value(sk, loc-1)->set;
237             inc=0;
238         }
239     }
240     else /* if (set >= 0) */
241     {
242         if (loc >= n)
243         {
244             if (loc != 0)
245                 set=sk_X509_NAME_ENTRY_value(sk, loc-1)->set+1;
246             else
247                 set=0;
248         }
249         else
250             set=sk_X509_NAME_ENTRY_value(sk, loc)->set;
251         inc=(set == 0)?1:0;
252     }

254     if ((new_name=X509_NAME_ENTRY_dup(ne)) == NULL)
255         goto err;
256     new_name->set=set;
257     if (!sk_X509_NAME_ENTRY_insert(sk, new_name, loc))
258     {
259         X509err(X509_F_X509_NAME_ADD_ENTRY, ERR_R_MALLOC_FAILURE);

```

```

260         goto err;
261     }
262     if (inc)
263     {
264         n=sk_X509_NAME_ENTRY_num(sk);
265         for (i=loc+1; i<n; i++)
266             sk_X509_NAME_ENTRY_value(sk,i-1)->set+=1;
267     }
268     return(1);
269 err:
270     if (new_name != NULL)
271         X509_NAME_ENTRY_free(new_name);
272     return(0);
273 }

```

```

275 X509_NAME_ENTRY *X509_NAME_ENTRY_create_by_txt(X509_NAME_ENTRY **ne,
276     const char *field, int type, const unsigned char *bytes, int len
277     {
278         ASN1_OBJECT *obj;
279         X509_NAME_ENTRY *nentry;

```

```

281         obj=OBJ_txt2obj(field, 0);
282         if (obj == NULL)
283         {
284             X509err(X509_F_X509_NAME_ENTRY_CREATE_BY_TXT,
285                 X509_R_INVALID_FIELD_NAME);
286             ERR_add_error_data(2, "name=", field);
287             return(NULL);
288         }
289         nentry = X509_NAME_ENTRY_create_by_OBJ(ne, obj, type, bytes, len);
290         ASN1_OBJECT_free(obj);
291         return nentry;
292     }

```

```

294 X509_NAME_ENTRY *X509_NAME_ENTRY_create_by_NID(X509_NAME_ENTRY **ne, int nid,
295     int type, unsigned char *bytes, int len)
296     {
297         ASN1_OBJECT *obj;
298         X509_NAME_ENTRY *nentry;

```

```

300         obj=OBJ_nid2obj(nid);
301         if (obj == NULL)
302         {
303             X509err(X509_F_X509_NAME_ENTRY_CREATE_BY_NID, X509_R_UNKNOWN_NID)
304             return(NULL);
305         }
306         nentry = X509_NAME_ENTRY_create_by_OBJ(ne, obj, type, bytes, len);
307         ASN1_OBJECT_free(obj);
308         return nentry;
309     }

```

```

311 X509_NAME_ENTRY *X509_NAME_ENTRY_create_by_OBJ(X509_NAME_ENTRY **ne,
312     ASN1_OBJECT *obj, int type, const unsigned char *bytes, int len)
313     {
314         X509_NAME_ENTRY *ret;

```

```

316         if ((ne == NULL) || (*ne == NULL))
317         {
318             if ((ret=X509_NAME_ENTRY_new()) == NULL)
319                 return(NULL);
320         }
321         else
322             ret= *ne;

```

```

324         if (!X509_NAME_ENTRY_set_object(ret,obj))
325             goto err;

```

```

326         if (!X509_NAME_ENTRY_set_data(ret, type, bytes, len))
327             goto err;

```

```

329         if ((ne != NULL) && (*ne == NULL)) *ne=ret;
330         return(ret);
331 err:
332         if ((ne == NULL) || (ret != *ne))
333             X509_NAME_ENTRY_free(ret);
334         return(NULL);
335     }

```

```

337 int X509_NAME_ENTRY_set_object(X509_NAME_ENTRY *ne, ASN1_OBJECT *obj)
338     {
339         if ((ne == NULL) || (obj == NULL))
340         {
341             X509err(X509_F_X509_NAME_ENTRY_SET_OBJECT, ERR_R_PASSED_NULL_PARAM)
342             return(0);
343         }
344         ASN1_OBJECT_free(ne->object);
345         ne->object=OBJ_dup(obj);
346         return((ne->object == NULL)?0:1);
347     }

```

```

349 int X509_NAME_ENTRY_set_data(X509_NAME_ENTRY *ne, int type,
350     const unsigned char *bytes, int len)
351     {
352         int i;

```

```

354         if ((ne == NULL) || ((bytes == NULL) && (len != 0))) return(0);
355         if ((type > 0) && (type & MBSTRING_FLAG))
356             return ASN1_STRING_set_by_NID(&ne->value, bytes,
357                 len, type,
358                 OBJ_obj2nid(ne->object)) ? 1 : 0;
359         if (len < 0) len=strlen((const char *)bytes);
360         i=ASN1_STRING_set(ne->value, bytes, len);
361         if (!i) return(0);
362         if (type != V_ASN1_UNDEF)
363         {
364             if (type == V_ASN1_APP_CHOOSE)
365                 ne->value->type=ASN1_PRINTABLE_type(bytes, len);
366             else
367                 ne->value->type=type;
368         }
369         return(1);
370     }

```

```

372 ASN1_OBJECT *X509_NAME_ENTRY_get_object(X509_NAME_ENTRY *ne)
373     {
374         if (ne == NULL) return(NULL);
375         return(ne->object);
376     }

```

```

378 ASN1_STRING *X509_NAME_ENTRY_get_data(X509_NAME_ENTRY *ne)
379     {
380         if (ne == NULL) return(NULL);
381         return(ne->value);
382     }

```


new/usr/src/lib/openssl/libsunw_crypto/x509/x509rset.c

1

```
*****
3830 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509rset.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509rset.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
15 *
16 * Copyright remains Eric Young's, and as such any Copyright notices in
17 * the code are not to be removed.
18 * If this package is used in a product, Eric Young should be given attribution
19 * as the author of the parts of the library used.
20 * This can be in the form of a textual message at program startup or
21 * in documentation (online or textual) provided with the package.
22 *
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25 * are met:
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27 * notice, this list of conditions and the following disclaimer.
28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
37 * 4. If you include any Windows specific code (or a derivative thereof) from
38 * the apps directory (application code) you must include an acknowledgement:
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41 * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS'' AND
42 * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509rset.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/x509.h>
65
66 int X509_REQ_set_version(X509_REQ *x, long version)
67 {
68     if (x == NULL) return(0);
69     return(ASN1_INTEGER_set(x->req_info->version, version));
70 }
71
72 int X509_REQ_set_subject_name(X509_REQ *x, X509_NAME *name)
73 {
74     if ((x == NULL) || (x->req_info == NULL)) return(0);
75     return(X509_NAME_set(&x->req_info->subject, name));
76 }
77
78 int X509_REQ_set_pubkey(X509_REQ *x, EVP_PKEY *pkey)
79 {
80     if ((x == NULL) || (x->req_info == NULL)) return(0);
81     return(X509_PUBKEY_set(&x->req_info->pubkey, pkey));
82 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509spki.c

1

```
*****
4379 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509spki.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* x509spki.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
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50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/x509.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509spki.c

2

```
63 int NETSCAPE_SPKI_set_pubkey(NETSCAPE_SPKI *x, EVP_PKEY *pkey)
64 {
65     if ((x == NULL) || (x->spkac == NULL)) return(0);
66     return(X509_PUBKEY_set(&(x->spkac->pubkey), pkey));
67 }

69 EVP_PKEY *NETSCAPE_SPKI_get_pubkey(NETSCAPE_SPKI *x)
70 {
71     if ((x == NULL) || (x->spkac == NULL))
72         return(NULL);
73     return(X509_PUBKEY_get(x->spkac->pubkey));
74 }

76 /* Load a Netscape SPKI from a base64 encoded string */

78 NETSCAPE_SPKI * NETSCAPE_SPKI_b64_decode(const char *str, int len)
79 {
80     unsigned char *spki_der;
81     const unsigned char *p;
82     int spki_len;
83     NETSCAPE_SPKI *spki;
84     if(len <= 0) len = strlen(str);
85     if (!(spki_der = OPENSSL_malloc(len + 1))) {
86         X509err(X509_F_NETSCAPE_SPKI_B64_DECODE, ERR_R_MALLOC_FAILURE);
87         return NULL;
88     }
89     spki_len = EVP_DecodeBlock(spki_der, (const unsigned char *)str, len);
90     if(spki_len < 0) {
91         X509err(X509_F_NETSCAPE_SPKI_B64_DECODE,
92                 X509_R_BASE64_DECODE_ERROR);
93         OPENSSL_free(spki_der);
94         return NULL;
95     }
96     p = spki_der;
97     spki = d2i_NETSCAPE_SPKI(NULL, &p, spki_len);
98     OPENSSL_free(spki_der);
99     return spki;
100 }

102 /* Generate a base64 encoded string from an SPKI */

104 char * NETSCAPE_SPKI_b64_encode(NETSCAPE_SPKI *spki)
105 {
106     unsigned char *der_spki, *p;
107     char *b64_str;
108     int der_len;
109     der_len = i2d_NETSCAPE_SPKI(spki, NULL);
110     der_spki = OPENSSL_malloc(der_len);
111     b64_str = OPENSSL_malloc(der_len * 2);
112     if(!der_spki || !b64_str) {
113         X509err(X509_F_NETSCAPE_SPKI_B64_ENCODE, ERR_R_MALLOC_FAILURE);
114         return NULL;
115     }
116     p = der_spki;
117     i2d_NETSCAPE_SPKI(spki, &p);
118     EVP_EncodeBlock((unsigned char *)b64_str, der_spki, der_len);
119     OPENSSL_free(der_spki);
120     return b64_str;
121 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509type.c

1

```
*****
4479 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x509type.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509/x509type.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
13 * included with this distribution is covered by the same copyright terms
14 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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19 * as the author of the parts of the library used.
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21 * in documentation (online or textual) provided with the package.
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24 * modification, are permitted provided that the following conditions
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29 * notice, this list of conditions and the following disclaimer in the
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31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/evp.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509type.c

2

```
62 #include <openssl/objects.h>
63 #include <openssl/x509.h>
64
65 int X509_certificate_type(X509 *x, EVP_PKEY *pkey)
66 {
67     EVP_PKEY *pk;
68     int ret=0,i;
69
70     if (x == NULL) return(0);
71
72     if (pkey == NULL)
73         pk=X509_get_pubkey(x);
74     else
75         pk=pkey;
76
77     if (pk == NULL) return(0);
78
79     switch (pk->type)
80     {
81     case EVP_PKEY_RSA:
82         ret=EVP_PK_RSA|EVP_PKT_SIGN;
83         /* if (!sign only extension) */
84         ret|=EVP_PKT_ENC;
85         break;
86     case EVP_PKEY_DSA:
87         ret=EVP_PK_DSA|EVP_PKT_SIGN;
88         break;
89     case EVP_PKEY_EC:
90         ret=EVP_PK_EC|EVP_PKT_SIGN|EVP_PKT_EXCH;
91         break;
92     case EVP_PKEY_DH:
93         ret=EVP_PK_DH|EVP_PKT_EXCH;
94         break;
95     case NID_id_GostR3410_94:
96     case NID_id_GostR3410_2001:
97         ret=EVP_PKT_EXCH|EVP_PKT_SIGN;
98         break;
99     default:
100         break;
101     }
102
103     i=OBJ_obj2nid(x->sig_alg->algorithm);
104     if (i && OBJ_find_sigid_algs(i, NULL, &i))
105     {
106
107         switch (i)
108         {
109         case NID_rsaEncryption:
110         case NID_rsa:
111             ret|=EVP_PKS_RSA;
112             break;
113         case NID_dsa:
114         case NID_dsa_2:
115             ret|=EVP_PKS_DSA;
116             break;
117         case NID_X9_62_id_ecPublicKey:
118             ret|=EVP_PKS_EC;
119             break;
120         default:
121             break;
122         }
123     }
124
125     if (EVP_PKEY_size(pk) <= 1024/8) /* /8 because it's 1024 bits we look
126                                         for, not bytes */
127         ret|=EVP_PKT_EXP;
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x509type.c

3

```
128     if(pkey==NULL) EVP_PKEY_free(pk);  
129     return(ret);  
130 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x_all.c

1

14640 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509/x_all.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* crypto/x509/x_all.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
11 * apply to all code found in this distribution, be it the RC4, RSA,
12 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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21 * in documentation (online or textual) provided with the package.
22 *
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30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
32 * must display the following acknowledgement:
33 * "This product includes cryptographic software written by
34 * Eric Young (eay@cryptsoft.com)"
35 * The word 'cryptographic' can be left out if the rouines from the library
36 * being used are not cryptographic related :-).
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38 * the apps directory (application code) you must include an acknowledgement:
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */

59 #include <stdio.h>
60 #include <openssl/stack.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509/x_all.c

2

```
62 #include <openssl/buffer.h>
63 #include <openssl/asn1.h>
64 #include <openssl/evp.h>
65 #include <openssl/x509.h>
66 #ifndef OPENSSL_NO_RSA
67 #include <openssl/rsa.h>
68 #endif
69 #ifndef OPENSSL_NO_DSA
70 #include <openssl/dsa.h>
71 #endif

73 int X509_verify(X509 *a, EVP_PKEY *r)
74 {
75     return(ASN1_item_verify(ASN1_ITEM_rptr(X509_CINF), a->sig_alg,
76                             a->signature, a->cert_info, r));
77 }

79 int X509_REQ_verify(X509_REQ *a, EVP_PKEY *r)
80 {
81     return( ASN1_item_verify(ASN1_ITEM_rptr(X509_REQ_INFO),
82                              a->sig_alg, a->signature, a->req_info, r));
83 }

85 int NETSCAPE_SPKI_verify(NETSCAPE_SPKI *a, EVP_PKEY *r)
86 {
87     return(ASN1_item_verify(ASN1_ITEM_rptr(NETSCAPE_SPKAC),
88                             a->sig_algor, a->signature, a->spkac, r));
89 }

91 int X509_sign(X509 *x, EVP_PKEY *pkey, const EVP_MD *md)
92 {
93     x->cert_info->enc.modified = 1;
94     return(ASN1_item_sign(ASN1_ITEM_rptr(X509_CINF), x->cert_info->signature
95                           x->sig_alg, x->signature, x->cert_info, pkey, md));
96 }

98 int X509_sign_ctx(X509 *x, EVP_MD_CTX *ctx)
99 {
100     x->cert_info->enc.modified = 1;
101     return ASN1_item_sign_ctx(ASN1_ITEM_rptr(X509_CINF),
102                              x->cert_info->signature,
103                              x->sig_alg, x->signature, x->cert_info, ctx);
104 }

106 int X509_REQ_sign(X509_REQ *x, EVP_PKEY *pkey, const EVP_MD *md)
107 {
108     return(ASN1_item_sign(ASN1_ITEM_rptr(X509_REQ_INFO), x->sig_alg, NULL,
109                           x->signature, x->req_info, pkey, md));
110 }

112 int X509_REQ_sign_ctx(X509_REQ *x, EVP_MD_CTX *ctx)
113 {
114     return ASN1_item_sign_ctx(ASN1_ITEM_rptr(X509_REQ_INFO),
115                              x->sig_alg, NULL, x->signature, x->req_info, ctx);
116 }

118 int X509_CRL_sign(X509_CRL *x, EVP_PKEY *pkey, const EVP_MD *md)
119 {
120     x->crl->enc.modified = 1;
121     return(ASN1_item_sign(ASN1_ITEM_rptr(X509_CRL_INFO), x->crl->sig_alg,
122                           x->sig_alg, x->signature, x->crl, pkey, md));
123 }

125 int X509_CRL_sign_ctx(X509_CRL *x, EVP_MD_CTX *ctx)
126 {
127     x->crl->enc.modified = 1;
```

```

128     return ASN1_item_sign_ctx(ASN1_ITEM_rptr(X509_CRL_INFO),
129                               x->crl->sig_alg, x->sig_alg, x->signature, x->crl, ctx);
130 }

132 int NETSCAPE_SPKI_sign(NETSCAPE_SPKI *x, EVP_PKEY *pkey, const EVP_MD *md)
133 {
134     return(ASN1_item_sign(ASN1_ITEM_rptr(NETSCAPE_SPKAC), x->sig_algor, NULL,
135                           x->signature, x->spkac, pkey, md));
136 }

138 #ifndef OPENSSL_NO_FP_API
139 X509 *d2i_X509_fp(FILE *fp, X509 **x509)
140 {
141     return ASN1_item_d2i_fp(ASN1_ITEM_rptr(X509), fp, x509);
142 }

144 int i2d_X509_fp(FILE *fp, X509 *x509)
145 {
146     return ASN1_item_i2d_fp(ASN1_ITEM_rptr(X509), fp, x509);
147 }
148 #endif

150 X509 *d2i_X509_bio(BIO *bp, X509 **x509)
151 {
152     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(X509), bp, x509);
153 }

155 int i2d_X509_bio(BIO *bp, X509 *x509)
156 {
157     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(X509), bp, x509);
158 }

160 #ifndef OPENSSL_NO_FP_API
161 X509_CRL *d2i_X509_CRL_fp(FILE *fp, X509_CRL **crl)
162 {
163     return ASN1_item_d2i_fp(ASN1_ITEM_rptr(X509_CRL), fp, crl);
164 }

166 int i2d_X509_CRL_fp(FILE *fp, X509_CRL *crl)
167 {
168     return ASN1_item_i2d_fp(ASN1_ITEM_rptr(X509_CRL), fp, crl);
169 }
170 #endif

172 X509_CRL *d2i_X509_CRL_bio(BIO *bp, X509_CRL **crl)
173 {
174     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(X509_CRL), bp, crl);
175 }

177 int i2d_X509_CRL_bio(BIO *bp, X509_CRL *crl)
178 {
179     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(X509_CRL), bp, crl);
180 }

182 #ifndef OPENSSL_NO_FP_API
183 PKCS7 *d2i_PKCS7_fp(FILE *fp, PKCS7 **p7)
184 {
185     return ASN1_item_d2i_fp(ASN1_ITEM_rptr(PKCS7), fp, p7);
186 }

188 int i2d_PKCS7_fp(FILE *fp, PKCS7 *p7)
189 {
190     return ASN1_item_i2d_fp(ASN1_ITEM_rptr(PKCS7), fp, p7);
191 }
192 #endif

```

```

194 PKCS7 *d2i_PKCS7_bio(BIO *bp, PKCS7 **p7)
195 {
196     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(PKCS7), bp, p7);
197 }

199 int i2d_PKCS7_bio(BIO *bp, PKCS7 *p7)
200 {
201     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(PKCS7), bp, p7);
202 }

204 #ifndef OPENSSL_NO_FP_API
205 X509_REQ *d2i_X509_REQ_fp(FILE *fp, X509_REQ **req)
206 {
207     return ASN1_item_d2i_fp(ASN1_ITEM_rptr(X509_REQ), fp, req);
208 }

210 int i2d_X509_REQ_fp(FILE *fp, X509_REQ *req)
211 {
212     return ASN1_item_i2d_fp(ASN1_ITEM_rptr(X509_REQ), fp, req);
213 }
214 #endif

216 X509_REQ *d2i_X509_REQ_bio(BIO *bp, X509_REQ **req)
217 {
218     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(X509_REQ), bp, req);
219 }

221 int i2d_X509_REQ_bio(BIO *bp, X509_REQ *req)
222 {
223     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(X509_REQ), bp, req);
224 }

226 #ifndef OPENSSL_NO_RSA
228 #ifndef OPENSSL_NO_FP_API
229 RSA *d2i_RSAPrivateKey_fp(FILE *fp, RSA **rsa)
230 {
231     return ASN1_item_d2i_fp(ASN1_ITEM_rptr(RSAPrivateKey), fp, rsa);
232 }

234 int i2d_RSAPrivateKey_fp(FILE *fp, RSA *rsa)
235 {
236     return ASN1_item_i2d_fp(ASN1_ITEM_rptr(RSAPrivateKey), fp, rsa);
237 }

239 RSA *d2i_RSAPublicKey_fp(FILE *fp, RSA **rsa)
240 {
241     return ASN1_item_d2i_fp(ASN1_ITEM_rptr(RSAPublicKey), fp, rsa);
242 }

245 RSA *d2i_RSA_PUBKEY_fp(FILE *fp, RSA **rsa)
246 {
247     return ASN1_d2i_fp((void (*)(void))
248                        RSA_new, (D2I_OF(void))d2i_RSA_PUBKEY, fp,
249                        (void **)rsa);
250 }

252 int i2d_RSAPublicKey_fp(FILE *fp, RSA *rsa)
253 {
254     return ASN1_item_i2d_fp(ASN1_ITEM_rptr(RSAPublicKey), fp, rsa);
255 }

257 int i2d_RSA_PUBKEY_fp(FILE *fp, RSA *rsa)
258 {
259     return ASN1_i2d_fp((I2D_OF(void))i2d_RSA_PUBKEY, fp, rsa);

```

```

260     }
261 #endif

263 RSA *d2i_RSAPrivateKey_bio(BIO *bp, RSA **rsa)
264 {
265     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(RSAPrivateKey), bp, rsa);
266 }

268 int i2d_RSAPrivateKey_bio(BIO *bp, RSA *rsa)
269 {
270     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(RSAPrivateKey), bp, rsa);
271 }

273 RSA *d2i_RSAPublicKey_bio(BIO *bp, RSA **rsa)
274 {
275     return ASN1_item_d2i_bio(ASN1_ITEM_rptr(RSAPublicKey), bp, rsa);
276 }

279 RSA *d2i_RSA_PUBKEY_bio(BIO *bp, RSA **rsa)
280 {
281     return ASN1_d2i_bio_of(RSA, RSA_new, d2i_RSA_PUBKEY, bp, rsa);
282 }

284 int i2d_RSAPublicKey_bio(BIO *bp, RSA *rsa)
285 {
286     return ASN1_item_i2d_bio(ASN1_ITEM_rptr(RSAPublicKey), bp, rsa);
287 }

289 int i2d_RSA_PUBKEY_bio(BIO *bp, RSA *rsa)
290 {
291     return ASN1_i2d_bio_of(RSA, i2d_RSA_PUBKEY, bp, rsa);
292 }
293 #endif

295 #ifndef OPENSSL_NO_DSA
296 #ifndef OPENSSL_NO_FP_API
297 DSA *d2i_DSAPrivateKey_fp(FILE *fp, DSA **dsa)
298 {
299     return ASN1_d2i_fp_of(DSA, DSA_new, d2i_DSAPrivateKey, fp, dsa);
300 }

302 int i2d_DSAPrivateKey_fp(FILE *fp, DSA *dsa)
303 {
304     return ASN1_i2d_fp_of_const(DSA, i2d_DSAPrivateKey, fp, dsa);
305 }

307 DSA *d2i_DSA_PUBKEY_fp(FILE *fp, DSA **dsa)
308 {
309     return ASN1_d2i_fp_of(DSA, DSA_new, d2i_DSA_PUBKEY, fp, dsa);
310 }

312 int i2d_DSA_PUBKEY_fp(FILE *fp, DSA *dsa)
313 {
314     return ASN1_i2d_fp_of(DSA, i2d_DSA_PUBKEY, fp, dsa);
315 }
316 #endif

318 DSA *d2i_DSAPrivateKey_bio(BIO *bp, DSA **dsa)
319 {
320     return ASN1_d2i_bio_of(DSA, DSA_new, d2i_DSAPrivateKey, bp, dsa);
321 };
322 }

324 int i2d_DSAPrivateKey_bio(BIO *bp, DSA *dsa)
325 {

```

```

326     return ASN1_i2d_bio_of_const(DSA, i2d_DSAPrivateKey, bp, dsa);
327 }

329 DSA *d2i_DSA_PUBKEY_bio(BIO *bp, DSA **dsa)
330 {
331     return ASN1_d2i_bio_of(DSA, DSA_new, d2i_DSA_PUBKEY, bp, dsa);
332 }

334 int i2d_DSA_PUBKEY_bio(BIO *bp, DSA *dsa)
335 {
336     return ASN1_i2d_bio_of(DSA, i2d_DSA_PUBKEY, bp, dsa);
337 }

339 #endif

341 #ifndef OPENSSL_NO_EC
342 #ifndef OPENSSL_NO_FP_API
343 EC_KEY *d2i_EC_PUBKEY_fp(FILE *fp, EC_KEY **eckey)
344 {
345     return ASN1_d2i_fp_of(EC_KEY, EC_KEY_new, d2i_EC_PUBKEY, fp, eckey);
346 }

347 int i2d_EC_PUBKEY_fp(FILE *fp, EC_KEY *eckey)
348 {
349     return ASN1_i2d_fp_of(EC_KEY, i2d_EC_PUBKEY, fp, eckey);
350 }
351 }

353 EC_KEY *d2i_ECPrivateKey_fp(FILE *fp, EC_KEY **eckey)
354 {
355     return ASN1_d2i_fp_of(EC_KEY, EC_KEY_new, d2i_ECPrivateKey, fp, eckey);
356 }
357 }

358 int i2d_ECPrivateKey_fp(FILE *fp, EC_KEY *eckey)
359 {
360     return ASN1_i2d_fp_of(EC_KEY, i2d_ECPrivateKey, fp, eckey);
361 }
362 #endif
363 EC_KEY *d2i_EC_PUBKEY_bio(BIO *bp, EC_KEY **eckey)
364 {
365     return ASN1_d2i_bio_of(EC_KEY, EC_KEY_new, d2i_EC_PUBKEY, bp, eckey);
366 }
367 }

368 int i2d_EC_PUBKEY_bio(BIO *bp, EC_KEY *eckey)
369 {
370     return ASN1_i2d_bio_of(EC_KEY, i2d_EC_PUBKEY, bp, eckey);
371 }

373 EC_KEY *d2i_ECPrivateKey_bio(BIO *bp, EC_KEY **eckey)
374 {
375     return ASN1_d2i_bio_of(EC_KEY, EC_KEY_new, d2i_ECPrivateKey, bp, eckey);
376 }
377 }

378 int i2d_ECPrivateKey_bio(BIO *bp, EC_KEY *eckey)
379 {
380     return ASN1_i2d_bio_of(EC_KEY, i2d_ECPrivateKey, bp, eckey);
381 }
382 #endif

385 int X509_pubkey_digest(const X509 *data, const EVP_MD *type, unsigned char *md,
386                       unsigned int *len)
387 {
388     ASN1_BIT_STRING *key;
389     key = X509_get0_pubkey_bitstr(data);
390     if(!key) return 0;
391     return EVP_Digest(key->data, key->length, md, len, type, NULL);

```

```

392     }
394 int X509_digest(const X509 *data, const EVP_MD *type, unsigned char *md,
395                unsigned int *len)
396 {
397     return(ASN1_item_digest(ASN1_ITEM_rptr(X509), type, (char *)data, md, len));
398 }
400 int X509_CRL_digest(const X509_CRL *data, const EVP_MD *type, unsigned char *md,
401                    unsigned int *len)
402 {
403     return(ASN1_item_digest(ASN1_ITEM_rptr(X509_CRL), type, (char *)data, md, len));
404 }
406 int X509_REQ_digest(const X509_REQ *data, const EVP_MD *type, unsigned char *md,
407                    unsigned int *len)
408 {
409     return(ASN1_item_digest(ASN1_ITEM_rptr(X509_REQ), type, (char *)data, md, len));
410 }
412 int X509_NAME_digest(const X509_NAME *data, const EVP_MD *type, unsigned char *md,
413                    unsigned int *len)
414 {
415     return(ASN1_item_digest(ASN1_ITEM_rptr(X509_NAME), type, (char *)data, md, len));
416 }
418 int PKCS7_ISSUER_AND_SERIAL_digest(PKCS7_ISSUER_AND_SERIAL *data, const EVP_MD *type,
419                                   unsigned char *md, unsigned int *len)
420 {
421     return(ASN1_item_digest(ASN1_ITEM_rptr(PKCS7_ISSUER_AND_SERIAL), type,
422                            (char *)data, md, len));
423 }
426 #ifndef OPENSSL_NO_FP_API
427 X509_SIG *d2i_PKCS8_fp(FILE *fp, X509_SIG **p8)
428 {
429     return ASN1_d2i_fp_of(X509_SIG, X509_SIG_new, d2i_X509_SIG, fp, p8);
430 }
432 int i2d_PKCS8_fp(FILE *fp, X509_SIG *p8)
433 {
434     return ASN1_i2d_fp_of(X509_SIG, i2d_X509_SIG, fp, p8);
435 }
436 #endif
438 X509_SIG *d2i_PKCS8_bio(BIO *bp, X509_SIG **p8)
439 {
440     return ASN1_d2i_bio_of(X509_SIG, X509_SIG_new, d2i_X509_SIG, bp, p8);
441 }
443 int i2d_PKCS8_bio(BIO *bp, X509_SIG *p8)
444 {
445     return ASN1_i2d_bio_of(X509_SIG, i2d_X509_SIG, bp, p8);
446 }
448 #ifndef OPENSSL_NO_FP_API
449 PKCS8_PRIV_KEY_INFO *d2i_PKCS8_PRIV_KEY_INFO_fp(FILE *fp,
450                                                  PKCS8_PRIV_KEY_INFO **p8inf)
451 {
452     return ASN1_d2i_fp_of(PKCS8_PRIV_KEY_INFO, PKCS8_PRIV_KEY_INFO_new,
453                          d2i_PKCS8_PRIV_KEY_INFO, fp, p8inf);
454 }
456 int i2d_PKCS8_PRIV_KEY_INFO_fp(FILE *fp, PKCS8_PRIV_KEY_INFO *p8inf)
457 {

```

```

458     return ASN1_i2d_fp_of(PKCS8_PRIV_KEY_INFO, i2d_PKCS8_PRIV_KEY_INFO, fp,
459                          p8inf);
460 }
462 int i2d_PKCS8PrivateKeyInfo_fp(FILE *fp, EVP_PKEY *key)
463 {
464     PKCS8_PRIV_KEY_INFO *p8inf;
465     int ret;
466     p8inf = EVP_PKEY2PKCS8(key);
467     if(!p8inf) return 0;
468     ret = i2d_PKCS8_PRIV_KEY_INFO_fp(fp, p8inf);
469     PKCS8_PRIV_KEY_INFO_free(p8inf);
470     return ret;
471 }
473 int i2d_PrivateKey_fp(FILE *fp, EVP_PKEY *pkey)
474 {
475     return ASN1_i2d_fp_of(EVP_PKEY, i2d_PrivateKey, fp, pkey);
476 }
478 EVP_PKEY *d2i_PrivateKey_fp(FILE *fp, EVP_PKEY **a)
479 {
480     return ASN1_d2i_fp_of(EVP_PKEY, EVP_PKEY_new, d2i_PrivateKey, fp, a);
481 }
483 int i2d_PUBKEY_fp(FILE *fp, EVP_PKEY *pkey)
484 {
485     return ASN1_i2d_fp_of(EVP_PKEY, i2d_PUBKEY, fp, pkey);
486 }
488 EVP_PKEY *d2i_PUBKEY_fp(FILE *fp, EVP_PKEY **a)
489 {
490     return ASN1_d2i_fp_of(EVP_PKEY, EVP_PKEY_new, d2i_PUBKEY, fp, a);
491 }
493 #endif
495 PKCS8_PRIV_KEY_INFO *d2i_PKCS8_PRIV_KEY_INFO_bio(BIO *bp,
496                                                  PKCS8_PRIV_KEY_INFO **p8inf)
497 {
498     return ASN1_d2i_bio_of(PKCS8_PRIV_KEY_INFO, PKCS8_PRIV_KEY_INFO_new,
499                          d2i_PKCS8_PRIV_KEY_INFO, bp, p8inf);
500 }
502 int i2d_PKCS8_PRIV_KEY_INFO_bio(BIO *bp, PKCS8_PRIV_KEY_INFO *p8inf)
503 {
504     return ASN1_i2d_bio_of(PKCS8_PRIV_KEY_INFO, i2d_PKCS8_PRIV_KEY_INFO, bp,
505                          p8inf);
506 }
508 int i2d_PKCS8PrivateKeyInfo_bio(BIO *bp, EVP_PKEY *key)
509 {
510     PKCS8_PRIV_KEY_INFO *p8inf;
511     int ret;
512     p8inf = EVP_PKEY2PKCS8(key);
513     if(!p8inf) return 0;
514     ret = i2d_PKCS8_PRIV_KEY_INFO_bio(bp, p8inf);
515     PKCS8_PRIV_KEY_INFO_free(p8inf);
516     return ret;
517 }
519 int i2d_PrivateKey_bio(BIO *bp, EVP_PKEY *pkey)
520 {
521     return ASN1_i2d_bio_of(EVP_PKEY, i2d_PrivateKey, bp, pkey);
522 }

```



```
524 EVP_PKEY *d2i_PrivateKey_bio(BIO *bp, EVP_PKEY **a)
525 {
526     return ASN1_d2i_bio_of(EVP_PKEY, EVP_PKEY_new, d2i_AutoPrivateKey, bp, a);
527 }

529 int i2d_PUBKEY_bio(BIO *bp, EVP_PKEY *pkey)
530 {
531     return ASN1_i2d_bio_of(EVP_PKEY, i2d_PUBKEY, bp, pkey);
532 }

534 EVP_PKEY *d2i_PUBKEY_bio(BIO *bp, EVP_PKEY **a)
535 {
536     return ASN1_d2i_bio_of(EVP_PKEY, EVP_PKEY_new, d2i_PUBKEY, bp, a);
537 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_cache.c

1

7726 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_cache.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* pcy_cache.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2004.
4  */
5 /* =====
6  * Copyright (c) 2004 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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13  * notice, this list of conditions and the following disclaimer.
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19  *
20  * 3. All advertising materials mentioning features or use of this
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46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include "cryptlib.h"
59 #include <openssl/x509.h>
60 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_cache.c

2

```
63 #include "pcy_int.h"
64
65 static int policy_data_cmp(const X509_POLICY_DATA * const *a,
66                           const X509_POLICY_DATA * const *b);
67 static int policy_cache_set_int(long *out, ASN1_INTEGER *value);
68
69 /* Set cache entry according to CertificatePolicies extension.
70  * Note: this destroys the passed CERTIFICATEPOLICIES structure.
71  */
72
73 static int policy_cache_create(X509 *x,
74                               CERTIFICATEPOLICIES *policies, int crit)
75 {
76     int i;
77     int ret = 0;
78     X509_POLICY_CACHE *cache = x->policy_cache;
79     X509_POLICY_DATA *data = NULL;
80     POLICYINFO *policy;
81     if (sk_POLICYINFO_num(policies) == 0)
82         goto bad_policy;
83     cache->data = sk_X509_POLICY_DATA_new(policy_data_cmp);
84     if (!cache->data)
85         goto bad_policy;
86     for (i = 0; i < sk_POLICYINFO_num(policies); i++)
87     {
88         policy = sk_POLICYINFO_value(policies, i);
89         data = policy_data_new(policy, NULL, crit);
90         if (!data)
91             goto bad_policy;
92         /* Duplicate policy OIDs are illegal: reject if matches
93          * found.
94          */
95         if (OBJ_obj2nid(data->valid_policy) == NID_any_policy)
96             if (cache->anyPolicy)
97             {
98                 ret = -1;
99                 goto bad_policy;
100             }
101         cache->anyPolicy = data;
102     }
103     else if (sk_X509_POLICY_DATA_find(cache->data, data) != -1)
104     {
105         ret = -1;
106         goto bad_policy;
107     }
108     else if (!sk_X509_POLICY_DATA_push(cache->data, data))
109         goto bad_policy;
110     data = NULL;
111 }
112
113 ret = 1;
114 bad_policy:
115 if (ret == -1)
116     x->ex_flags |= EXFLAG_INVALID_POLICY;
117 if (data)
118     policy_data_free(data);
119 sk_POLICYINFO_pop_free(policies, POLICYINFO_free);
120 if (ret <= 0)
121 {
122     sk_X509_POLICY_DATA_pop_free(cache->data, policy_data_free);
123     cache->data = NULL;
124 }
125 return ret;
126 }
```

```

128 static int policy_cache_new(X509 *x)
129 {
130     X509_POLICY_CACHE *cache;
131     ASN1_INTEGER *ext_any = NULL;
132     POLICY_CONSTRAINTS *ext_pcons = NULL;
133     CERTIFICATEPOLICIES *ext_cpols = NULL;
134     POLICY_MAPPINGS *ext_pmaps = NULL;
135     int i;
136     cache = OPENSSL_malloc(sizeof(X509_POLICY_CACHE));
137     if (!cache)
138         return 0;
139     cache->anyPolicy = NULL;
140     cache->data = NULL;
141     cache->any_skip = -1;
142     cache->explicit_skip = -1;
143     cache->map_skip = -1;
144
145     x->policy_cache = cache;
146
147     /* Handle requireExplicitPolicy *first*. Need to process this
148      * even if we don't have any policies.
149      */
150     ext_pcons = X509_get_ext_d2i(x, NID_policy_constraints, &i, NULL);
151
152     if (!ext_pcons)
153     {
154         if (i != -1)
155             goto bad_cache;
156     }
157     else
158     {
159         if (!ext_pcons->requireExplicitPolicy
160             && !ext_pcons->inhibitPolicyMapping)
161             goto bad_cache;
162         if (!policy_cache_set_int(&cache->explicit_skip,
163             ext_pcons->requireExplicitPolicy))
164             goto bad_cache;
165         if (!policy_cache_set_int(&cache->map_skip,
166             ext_pcons->inhibitPolicyMapping))
167             goto bad_cache;
168     }
169
170     /* Process CertificatePolicies */
171
172     ext_cpols = X509_get_ext_d2i(x, NID_certificate_policies, &i, NULL);
173     /* If no CertificatePolicies extension or problem decoding then
174      * there is no point continuing because the valid policies will be
175      * NULL.
176      */
177     if (!ext_cpols)
178     {
179         /* If not absent some problem with extension */
180         if (i != -1)
181             goto bad_cache;
182         return 1;
183     }
184
185     i = policy_cache_create(x, ext_cpols, i);
186
187     /* NB: ext_cpols freed by policy_cache_set_policies */
188
189     if (i <= 0)
190         return i;
191
192     ext_pmaps = X509_get_ext_d2i(x, NID_policy_mappings, &i, NULL);

```

```

195     if (!ext_pmaps)
196     {
197         /* If not absent some problem with extension */
198         if (i != -1)
199             goto bad_cache;
200     }
201     else
202     {
203         i = policy_cache_set_mapping(x, ext_pmaps);
204         if (i <= 0)
205             goto bad_cache;
206     }
207
208     ext_any = X509_get_ext_d2i(x, NID_inhibit_any_policy, &i, NULL);
209
210     if (!ext_any)
211     {
212         if (i != -1)
213             goto bad_cache;
214     }
215     else if (!policy_cache_set_int(&cache->any_skip, ext_any))
216         goto bad_cache;
217
218     if (0)
219     {
220         bad_cache:
221         x->ex_flags |= EXFLAG_INVALID_POLICY;
222     }
223
224     if (ext_pcons)
225         POLICY_CONSTRAINTS_free(ext_pcons);
226
227     if (ext_any)
228         ASN1_INTEGER_free(ext_any);
229
230     return 1;
231 }
232
233 void policy_cache_free(X509_POLICY_CACHE *cache)
234 {
235     if (!cache)
236         return;
237     if (cache->anyPolicy)
238         policy_data_free(cache->anyPolicy);
239     if (cache->data)
240         sk_X509_POLICY_DATA_pop_free(cache->data, policy_data_free);
241     OPENSSL_free(cache);
242 }
243
244 const X509_POLICY_CACHE *policy_cache_set(X509 *x)
245 {
246     if (x->policy_cache == NULL)
247     {
248         CRYPTO_w_lock(CRYPTO_LOCK_X509);
249         policy_cache_new(x);
250         CRYPTO_w_unlock(CRYPTO_LOCK_X509);
251     }
252
253     return x->policy_cache;
254 }

```

```
260 X509_POLICY_DATA *policy_cache_find_data(const X509_POLICY_CACHE *cache,
261                                           const ASN1_OBJECT *id)
262 {
263     int idx;
264     X509_POLICY_DATA tmp;
265     tmp.valid_policy = (ASN1_OBJECT *)id;
266     idx = sk_X509_POLICY_DATA_find(cache->data, &tmp);
267     if (idx == -1)
268         return NULL;
269     return sk_X509_POLICY_DATA_value(cache->data, idx);
270 }

272 static int policy_data_cmp(const X509_POLICY_DATA * const *a,
273                             const X509_POLICY_DATA * const *b)
274 {
275     return OBJ_cmp((*a)->valid_policy, (*b)->valid_policy);
276 }

278 static int policy_cache_set_int(long *out, ASN1_INTEGER *value)
279 {
280     if (value == NULL)
281         return 1;
282     if (value->type == V_ASN1_NEG_INTEGER)
283         return 0;
284     *out = ASN1_INTEGER_get(value);
285     return 1;
286 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_data.c

1

4377 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_data.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* pcy_data.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2004.
4  */
5 /* =====
6  * Copyright (c) 2004 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include "cryptlib.h"
59 #include <openssl/x509.h>
60 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_data.c

2

```
63 #include "pcy_int.h"
64
65 /* Policy Node routines */
66
67 void policy_data_free(X509_POLICY_DATA *data)
68 {
69     ASN1_OBJECT_free(data->valid_policy);
70     /* Don't free qualifiers if shared */
71     if (!(data->flags & POLICY_DATA_FLAG_SHARED_QUALIFIERS))
72         sk_POLICYQUALINFO_pop_free(data->qualifier_set,
73                                     POLICYQUALINFO_free);
74     sk_ASN1_OBJECT_pop_free(data->expected_policy_set, ASN1_OBJECT_free);
75     OPENSSL_free(data);
76 }
77
78 /* Create a data based on an existing policy. If 'id' is NULL use the
79  * oid in the policy, otherwise use 'id'. This behaviour covers the two
80  * types of data in RFC3280: data with from a CertificatePolicies extension
81  * and additional data with just the qualifiers of anyPolicy and ID from
82  * another source.
83  */
84
85 X509_POLICY_DATA *policy_data_new(POLICYINFO *policy,
86                                     const ASN1_OBJECT *cid, int crit)
87 {
88     X509_POLICY_DATA *ret;
89     ASN1_OBJECT *id;
90     if (!policy && !cid)
91         return NULL;
92     if (cid)
93     {
94         id = OBJ_dup(cid);
95         if (!id)
96             return NULL;
97     }
98     else
99         id = NULL;
100     ret = OPENSSL_malloc(sizeof(X509_POLICY_DATA));
101     if (!ret)
102         return NULL;
103     ret->expected_policy_set = sk_ASN1_OBJECT_new_null();
104     if (!ret->expected_policy_set)
105     {
106         OPENSSL_free(ret);
107         if (id)
108             ASN1_OBJECT_free(id);
109         return NULL;
110     }
111
112     if (crit)
113         ret->flags = POLICY_DATA_FLAG_CRITICAL;
114     else
115         ret->flags = 0;
116
117     if (id)
118         ret->valid_policy = id;
119     else
120     {
121         ret->valid_policy = policy->policyid;
122         policy->policyid = NULL;
123     }
124
125     if (policy)
126     {
127         ret->qualifier_set = policy->qualifiers;
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_data.c

3

```
128         policy->qualifiers = NULL;
129     }
130     else
131         ret->qualifier_set = NULL;
133     return ret;
134 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_lib.c

1

```
*****
4692 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* pcy_lib.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2004.
4  */
5 /* =====
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52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

60 #include "cryptlib.h"
61 #include <openssl/x509.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_lib.c

2

```
62 #include <openssl/x509v3.h>
64 #include "pcy_int.h"
66 /* accessor functions */
68 /* X509_POLICY_TREE stuff */

70 int X509_policy_tree_level_count(const X509_POLICY_TREE *tree)
71 {
72     if (!tree)
73         return 0;
74     return tree->nlevel;
75 }

77 X509_POLICY_LEVEL *
78 X509_policy_tree_get0_level(const X509_POLICY_TREE *tree, int i)
79 {
80     if (!tree || (i < 0) || (i >= tree->nlevel))
81         return NULL;
82     return tree->levels + i;
83 }

85 STACK_OF(X509_POLICY_NODE) *
86 X509_policy_tree_get0_policies(const X509_POLICY_TREE *tree)
87 {
88     if (!tree)
89         return NULL;
90     return tree->auth_policies;
91 }

93 STACK_OF(X509_POLICY_NODE) *
94 X509_policy_tree_get0_user_policies(const X509_POLICY_TREE *tree)
95 {
96     if (!tree)
97         return NULL;
98     if (tree->flags & POLICY_FLAG_ANY_POLICY)
99         return tree->auth_policies;
100     else
101         return tree->user_policies;
102 }

104 /* X509_POLICY_LEVEL stuff */

106 int X509_policy_level_node_count(X509_POLICY_LEVEL *level)
107 {
108     int n;
109     if (!level)
110         return 0;
111     if (level->anyPolicy)
112         n = 1;
113     else
114         n = 0;
115     if (level->nodes)
116         n += sk_X509_POLICY_NODE_num(level->nodes);
117     return n;
118 }

120 X509_POLICY_NODE *X509_policy_level_get0_node(X509_POLICY_LEVEL *level, int i)
121 {
122     if (!level)
123         return NULL;
124     if (level->anyPolicy)
125     {
126         if (i == 0)
127             return level->anyPolicy;
```

```
128         i--;
129     }
130     return sk_X509_POLICY_NODE_value(level->nodes, i);
131 }

133 /* X509_POLICY_NODE stuff */

135 const ASN1_OBJECT *X509_policy_node_get0_policy(const X509_POLICY_NODE *node)
136 {
137     if (!node)
138         return NULL;
139     return node->data->valid_policy;
140 }

142 #if 0
143 int X509_policy_node_get_critical(const X509_POLICY_NODE *node)
144 {
145     if (node_critical(node))
146         return 1;
147     return 0;
148 }
149 #endif

151 STACK_OF(POLICYQUALINFO) *
152     X509_policy_node_get0_qualifiers(const X509_POLICY_NODE *node)
153 {
154     if (!node)
155         return NULL;
156     return node->data->qualifier_set;
157 }

159 const X509_POLICY_NODE *
160     X509_policy_node_get0_parent(const X509_POLICY_NODE *node)
161 {
162     if (!node)
163         return NULL;
164     return node->parent;
165 }
```


new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_map.c

1

```
*****
4597 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_map.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pcy_map.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2004.
4  */
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52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include "cryptlib.h"
60 #include <openssl/x509.h>
61 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_map.c

2

```
63 #include "pcy_int.h"

65 /* Set policy mapping entries in cache.
66  * Note: this modifies the passed POLICY_MAPPINGS structure
67  */

69 int policy_cache_set_mapping(X509 *x, POLICY_MAPPINGS *maps)
70 {
71     POLICY_MAPPING *map;
72     X509_POLICY_DATA *data;
73     X509_POLICY_CACHE *cache = x->policy_cache;
74     int i;
75     int ret = 0;
76     if (sk_POLICY_MAPPING_num(maps) == 0)
77     {
78         ret = -1;
79         goto bad_mapping;
80     }
81     for (i = 0; i < sk_POLICY_MAPPING_num(maps); i++)
82     {
83         map = sk_POLICY_MAPPING_value(maps, i);
84         /* Reject if map to or from anyPolicy */
85         if ((OBJ_obj2nid(map->subjectDomainPolicy) == NID_any_policy)
86             || (OBJ_obj2nid(map->issuerDomainPolicy) == NID_any_policy))
87         {
88             ret = -1;
89             goto bad_mapping;
90         }

92         /* Attempt to find matching policy data */
93         data = policy_cache_find_data(cache, map->issuerDomainPolicy);
94         /* If we don't have anyPolicy can't map */
95         if (!data && !cache->anyPolicy)
96             continue;

98         /* Create a NODE from anyPolicy */
99         if (!data)
100         {
101             data = policy_data_new(NULL, map->issuerDomainPolicy,
102                                     cache->anyPolicy->flags
103                                     & POLICY_DATA_FLAG_CRITICAL);
104             if (!data)
105                 goto bad_mapping;
106             data->qualifier_set = cache->anyPolicy->qualifier_set;
107             /*map->issuerDomainPolicy = NULL;*/
108             data->flags |= POLICY_DATA_FLAG_MAPPED_ANY;
109             data->flags |= POLICY_DATA_FLAG_SHARED_QUALIFIERS;
110             if (!sk_X509_POLICY_DATA_push(cache->data, data))
111             {
112                 policy_data_free(data);
113                 goto bad_mapping;
114             }
115         }
116         else
117             data->flags |= POLICY_DATA_FLAG_MAPPED;
118         if (!sk_ASN1_OBJECT_push(data->expected_policy_set,
119                                 map->subjectDomainPolicy))
120             goto bad_mapping;
121         map->subjectDomainPolicy = NULL;
122     }

123 }

125 ret = 1;
126 bad_mapping:
127 if (ret == -1)
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_map.c

3

```
128         x->ex_flags |= EXFLAG_INVALID_POLICY;
129         sk_POLICY_MAPPING_pop_free(maps, POLICY_MAPPING_free);
130         return ret;
132     }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_node.c

1

```
*****
5624 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_node.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pcy_node.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2004.
4  */
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55 * Hudson (tjh@cryptsoft.com).
56 *
57 */
59 #include <openssl/asn1.h>
60 #include <openssl/x509.h>
61 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_node.c

2

```
63 #include "pcy_int.h"
65 static int node_cmp(const X509_POLICY_NODE * const *a,
66                    const X509_POLICY_NODE * const *b)
67 {
68     return OBJ_cmp((*a)->data->valid_policy, (*b)->data->valid_policy);
69 }
71 STACK_OF(X509_POLICY_NODE) *policy_node_cmp_new(void)
72 {
73     return sk_X509_POLICY_NODE_new(node_cmp);
74 }
76 X509_POLICY_NODE *tree_find_sk(STACK_OF(X509_POLICY_NODE) *nodes,
77                                const ASN1_OBJECT *id)
78 {
79     X509_POLICY_DATA n;
80     X509_POLICY_NODE l;
81     int idx;
83     n.valid_policy = (ASN1_OBJECT *)id;
84     l.data = &n;
86     idx = sk_X509_POLICY_NODE_find(nodes, &l);
87     if (idx == -1)
88         return NULL;
90     return sk_X509_POLICY_NODE_value(nodes, idx);
92 }
94 X509_POLICY_NODE *level_find_node(const X509_POLICY_LEVEL *level,
95                                    const X509_POLICY_NODE *parent,
96                                    const ASN1_OBJECT *id)
97 {
98     X509_POLICY_NODE *node;
99     int i;
100     for (i = 0; i < sk_X509_POLICY_NODE_num(level->nodes); i++)
101     {
102         node = sk_X509_POLICY_NODE_value(level->nodes, i);
103         if (node->parent == parent)
104         {
105             if (!OBJ_cmp(node->data->valid_policy, id))
106                 return node;
107         }
108     }
109     return NULL;
110 }
112 X509_POLICY_NODE *level_add_node(X509_POLICY_LEVEL *level,
113                                  const X509_POLICY_DATA *data,
114                                  X509_POLICY_NODE *parent,
115                                  X509_POLICY_TREE *tree)
116 {
117     X509_POLICY_NODE *node;
118     node = OPENSSL_malloc(sizeof(X509_POLICY_NODE));
119     if (!node)
120         return NULL;
121     node->data = data;
122     node->parent = parent;
123     node->nchild = 0;
124     if (level)
125     {
126         if (OBJ_obj2nid(data->valid_policy) == NID_any_policy)
127             return node;
128     }
```

```

128         if (level->anyPolicy)
129             goto node_error;
130         level->anyPolicy = node;
131     }
132     else
133     {
134
135         if (!level->nodes)
136             level->nodes = policy_node_cmp_new();
137         if (!level->nodes)
138             goto node_error;
139         if (!sk_X509_POLICY_NODE_push(level->nodes, node))
140             goto node_error;
141     }
142 }
143
144 if (tree)
145 {
146     if (!tree->extra_data)
147         tree->extra_data = sk_X509_POLICY_DATA_new_null();
148     if (!tree->extra_data)
149         goto node_error;
150     if (!sk_X509_POLICY_DATA_push(tree->extra_data, data))
151         goto node_error;
152 }
153
154 if (parent)
155     parent->nchild++;
156
157 return node;
158
159 node_error:
160 policy_node_free(node);
161 return 0;
162
163 }
164
165 void policy_node_free(X509_POLICY_NODE *node)
166 {
167     OPENSSL_free(node);
168 }
169
170 /* See if a policy node matches a policy OID. If mapping enabled look through
171  * expected policy set otherwise just valid policy.
172  */
173
174 int policy_node_match(const X509_POLICY_LEVEL *lvl,
175                      const X509_POLICY_NODE *node, const ASN1_OBJECT *oid)
176 {
177     int i;
178     ASN1_OBJECT *policy_oid;
179     const X509_POLICY_DATA *x = node->data;
180
181     if (
182         (lvl->flags & X509_V_FLAG_INHIBIT_MAP)
183         || !(x->flags & POLICY_DATA_FLAG_MAP_MASK))
184     {
185         if (!OBJ_cmp(x->valid_policy, oid))
186             return 1;
187         return 0;
188     }
189
190     for (i = 0; i < sk_ASN1_OBJECT_num(x->expected_policy_set); i++)
191     {
192         policy_oid = sk_ASN1_OBJECT_value(x->expected_policy_set, i);
193         if (!OBJ_cmp(policy_oid, oid))
194             return 1;
195     }
196     return 0;
197 }

```

```

194     }
195     return 0;
196
197 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_tree.c

1

```
*****
21274 Fri May 30 18:32:14 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_tree.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* pcy_tree.c */
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52  *
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55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include "cryptlib.h"
60 #include <openssl/x509.h>
61 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/pcy_tree.c

2

```
63 #include "pcy_int.h"
64
65 /* Enable this to print out the complete policy tree at various point during
66  * evaluation.
67  */
68
69 /*#define OPENSSL_POLICY_DEBUG*/
70
71 #ifdef OPENSSL_POLICY_DEBUG
72
73 static void expected_print(BIO *err, X509_POLICY_LEVEL *lev,
74                           X509_POLICY_NODE *node, int indent)
75 {
76     if ( (lev->flags & X509_V_FLAG_INHIBIT_MAP)
77          || !(node->data->flags & POLICY_DATA_FLAG_MAP_MASK))
78         BIO_puts(err, " Not Mapped\n");
79     else
80     {
81         int i;
82         STACK_OF(ASN1_OBJECT) *pset = node->data->expected_policy_set;
83         ASN1_OBJECT *oid;
84         BIO_puts(err, " Expected: ");
85         for (i = 0; i < sk_ASN1_OBJECT_num(pset); i++)
86         {
87             oid = sk_ASN1_OBJECT_value(pset, i);
88             if (i)
89                 BIO_puts(err, ", ");
90             i2a_ASN1_OBJECT(err, oid);
91         }
92         BIO_puts(err, "\n");
93     }
94 }
95
96 static void tree_print(char *str, X509_POLICY_TREE *tree,
97                        X509_POLICY_LEVEL *curr)
98 {
99     X509_POLICY_LEVEL *plev;
100     X509_POLICY_NODE *node;
101     int i;
102     BIO *err;
103     err = BIO_new_fp(stderr, BIO_NOCLOSE);
104     if (!curr)
105         curr = tree->levels + tree->nlevel;
106     else
107         curr++;
108     BIO_printf(err, "Level print after %s\n", str);
109     BIO_printf(err, "Printing Up to Level %ld\n", curr - tree->levels);
110     for (plev = tree->levels; plev != curr; plev++)
111     {
112         BIO_printf(err, "Level %ld, flags = %x\n",
113                    plev - tree->levels, plev->flags);
114         for (i = 0; i < sk_X509_POLICY_NODE_num(plev->nodes); i++)
115         {
116             node = sk_X509_POLICY_NODE_value(plev->nodes, i);
117             X509_POLICY_NODE_print(err, node, 2);
118             expected_print(err, plev, node, 2);
119             BIO_printf(err, " Flags: %x\n", node->data->flags);
120         }
121         if (plev->anyPolicy)
122             X509_POLICY_NODE_print(err, plev->anyPolicy, 2);
123     }
124
125     BIO_free(err);
126
127 }
```

```

128 #else
130 #define tree_print(a,b,c) /* */
132 #endif

134 /* Initialize policy tree. Return values:
135  * 0 Some internal error occurred.
136  * -1 Inconsistent or invalid extensions in certificates.
137  * 1 Tree initialized OK.
138  * 2 Policy tree is empty.
139  * 5 Tree OK and requireExplicitPolicy true.
140  * 6 Tree empty and requireExplicitPolicy true.
141  */

143 static int tree_init(X509_POLICY_TREE **ptree, STACK_OF(X509) *certs,
144                    unsigned int flags)
145 {
146     X509_POLICY_TREE *tree;
147     X509_POLICY_LEVEL *level;
148     const X509_POLICY_CACHE *cache;
149     X509_POLICY_DATA *data = NULL;
150     X509 *x;
151     int ret = 1;
152     int i, n;
153     int explicit_policy;
154     int any_skip;
155     int map_skip;
156     *ptree = NULL;
157     n = sk_X509_num(certs);

159 #if 0
160     /* Disable policy mapping for now... */
161     flags |= X509_V_FLAG_INHIBIT_MAP;
162 #endif

164     if (flags & X509_V_FLAG_EXPLICIT_POLICY)
165         explicit_policy = 0;
166     else
167         explicit_policy = n + 1;

169     if (flags & X509_V_FLAG_INHIBIT_ANY)
170         any_skip = 0;
171     else
172         any_skip = n + 1;

174     if (flags & X509_V_FLAG_INHIBIT_MAP)
175         map_skip = 0;
176     else
177         map_skip = n + 1;

179     /* Can't do anything with just a trust anchor */
180     if (n == 1)
181         return 1;
182     /* First setup policy cache in all certificates apart from the
183      * trust anchor. Note any bad cache results on the way. Also can
184      * calculate explicit_policy value at this point.
185      */
186     for (i = n - 2; i >= 0; i--)
187     {
188         x = sk_X509_value(certs, i);
189         X509_check_purpose(x, -1, -1);
190         cache = policy_cache_set(x);
191         /* If cache NULL something bad happened: return immediately */
192         if (cache == NULL)
193             return 0;

```

```

194     /* If inconsistent extensions keep a note of it but continue */
195     if (x->ex_flags & EXFLAG_INVALID_POLICY)
196         ret = -1;
197     /* Otherwise if we have no data (hence no CertificatePolicies)
198      * and haven't already set an inconsistent code note it.
199      */
200     else if ((ret == 1) && !cache->data)
201         ret = 2;
202     if (explicit_policy > 0)
203     {
204         if (!(x->ex_flags & EXFLAG_SI))
205             explicit_policy--;
206         if ((cache->explicit_skip != -1)
207             && (cache->explicit_skip < explicit_policy))
208             explicit_policy = cache->explicit_skip;
209     }
210 }

212 if (ret != 1)
213 {
214     if (ret == 2 && !explicit_policy)
215         return 6;
216     return ret;
217 }

220 /* If we get this far initialize the tree */
222 tree = OPENSSL_malloc(sizeof(X509_POLICY_TREE));

224 if (!tree)
225     return 0;

227 tree->flags = 0;
228 tree->levels = OPENSSL_malloc(sizeof(X509_POLICY_LEVEL) * n);
229 tree->nlevel = 0;
230 tree->extra_data = NULL;
231 tree->auth_policies = NULL;
232 tree->user_policies = NULL;

234 if (!tree->levels)
235 {
236     OPENSSL_free(tree);
237     return 0;
238 }

240 memset(tree->levels, 0, n * sizeof(X509_POLICY_LEVEL));

242 tree->nlevel = n;

244 level = tree->levels;

246 /* Root data: initialize to anyPolicy */

248 data = policy_data_new(NULL, OBJ_nid2obj(NID_any_policy), 0);

250 if (!data || !level_add_node(level, data, NULL, tree))
251     goto bad_tree;

253 for (i = n - 2; i >= 0; i--)
254 {
255     level++;
256     x = sk_X509_value(certs, i);
257     cache = policy_cache_set(x);
258     CRYPTO_add(&x->references, 1, CRYPTO_LOCK_X509);
259     level->cert = x;

```

```

261     if (!cache->anyPolicy)
262         level->flags |= X509_V_FLAG_INHIBIT_ANY;

264     /* Determine inhibit any and inhibit map flags */
265     if (any_skip == 0)
266     {
267         /* Any matching allowed if certificate is self
268          * issued and not the last in the chain.
269          */
270         if (!(x->ex_flags & EXFLAG_SI) || (i == 0))
271             level->flags |= X509_V_FLAG_INHIBIT_ANY;
272     }
273     else
274     {
275         if (!(x->ex_flags & EXFLAG_SI))
276             any_skip--;
277         if ((cache->any_skip >= 0)
278             && (cache->any_skip < any_skip))
279             any_skip = cache->any_skip;
280     }

282     if (map_skip == 0)
283         level->flags |= X509_V_FLAG_INHIBIT_MAP;
284     else
285     {
286         if (!(x->ex_flags & EXFLAG_SI))
287             map_skip--;
288         if ((cache->map_skip >= 0)
289             && (cache->map_skip < map_skip))
290             map_skip = cache->map_skip;
291     }

293 }

295 *ptree = tree;

297 if (explicit_policy)
298     return 1;
299 else
300     return 5;

302 bad_tree:

304 X509_policy_tree_free(tree);

306 return 0;

308 }

310 static int tree_link_matching_nodes(X509_POLICY_LEVEL *curr,
311                                     const X509_POLICY_DATA *data)
312 {
313     X509_POLICY_LEVEL *last = curr - 1;
314     X509_POLICY_NODE *node;
315     int i, matched = 0;
316     /* Iterate through all in nodes linking matches */
317     for (i = 0; i < sk_X509_POLICY_NODE_num(last->nodes); i++)
318     {
319         node = sk_X509_POLICY_NODE_value(last->nodes, i);
320         if (policy_node_match(last, node, data->valid_policy))
321         {
322             if (!level_add_node(curr, data, node, NULL))
323                 return 0;
324             matched = 1;
325         }

```

```

326     }
327     if (!matched && last->anyPolicy)
328     {
329         if (!level_add_node(curr, data, last->anyPolicy, NULL))
330             return 0;
331     }
332     return 1;
333 }

335 /* This corresponds to RFC3280 6.1.3(d)(1):
336  * link any data from CertificatePolicies onto matching parent
337  * or anyPolicy if no match.
338  */

340 static int tree_link_nodes(X509_POLICY_LEVEL *curr,
341                             const X509_POLICY_CACHE *cache)
342 {
343     int i;
344     X509_POLICY_DATA *data;

346     for (i = 0; i < sk_X509_POLICY_DATA_num(cache->data); i++)
347     {
348         data = sk_X509_POLICY_DATA_value(cache->data, i);
349         /* If a node is mapped any it doesn't have a corresponding
350          * CertificatePolicies entry.
351          * However such an identical node would be created
352          * if anyPolicy matching is enabled because there would be
353          * no match with the parent valid_policy_set. So we create
354          * link because then it will have the mapping flags
355          * right and we can prune it later.
356          */
357         #if 0
358             if ((data->flags & POLICY_DATA_FLAG_MAPPED_ANY)
359                 && !(curr->flags & X509_V_FLAG_INHIBIT_ANY))
360                 continue;
361         #endif

362         /* Look for matching nodes in previous level */
363         if (!tree_link_matching_nodes(curr, data))
364             return 0;
365     }
366     return 1;
367 }

369 /* This corresponds to RFC3280 6.1.3(d)(2):
370  * Create new data for any unmatched policies in the parent and link
371  * to anyPolicy.
372  */

374 static int tree_add_unmatched(X509_POLICY_LEVEL *curr,
375                                 const X509_POLICY_CACHE *cache,
376                                 const ASN1_OBJECT *id,
377                                 X509_POLICY_NODE *node,
378                                 X509_POLICY_TREE *tree)
379 {
380     X509_POLICY_DATA *data;
381     if (id == NULL)
382         id = node->data->valid_policy;
383     /* Create a new node with qualifiers from anyPolicy and
384      * id from unmatched node.
385      */
386     data = policy_data_new(NULL, id, node_critical(node));

388     if (data == NULL)
389         return 0;
390     /* Curr may not have anyPolicy */
391     data->qualifier_set = cache->anyPolicy->qualifier_set;

```

```

392 data->flags |= POLICY_DATA_FLAG_SHARED_QUALIFIERS;
393 if (!level_add_node(curr, data, node, tree))
394 {
395     policy_data_free(data);
396     return 0;
397 }
398
399 return 1;
400 }
401
402 static int tree_link_unmatched(X509_POLICY_LEVEL *curr,
403                               const X509_POLICY_CACHE *cache,
404                               X509_POLICY_NODE *node,
405                               X509_POLICY_TREE *tree)
406 {
407     const X509_POLICY_LEVEL *last = curr - 1;
408     int i;
409
410     if (
411         (last->flags & X509_V_FLAG_INHIBIT_MAP)
412         || !(node->data->flags & POLICY_DATA_FLAG_MAPPED))
413     {
414         /* If no policy mapping: matched if one child present */
415         if (node->nchild)
416             return 1;
417         if (!tree_add_unmatched(curr, cache, NULL, node, tree))
418             return 0;
419         /* Add it */
420     }
421     else
422     {
423         /* If mapping: matched if one child per expected policy set */
424         STACK_OF(ASN1_OBJECT) *expset = node->data->expected_policy_set;
425         if (node->nchild == sk_ASN1_OBJECT_num(expset))
426             return 1;
427         /* Locate unmatched nodes */
428         for (i = 0; i < sk_ASN1_OBJECT_num(expset); i++)
429         {
430             ASN1_OBJECT *oid = sk_ASN1_OBJECT_value(expset, i);
431             if (level_find_node(curr, node, oid))
432                 continue;
433             if (!tree_add_unmatched(curr, cache, oid, node, tree))
434                 return 0;
435         }
436     }
437
438     return 1;
439 }
440
441 static int tree_link_any(X509_POLICY_LEVEL *curr,
442                         const X509_POLICY_CACHE *cache,
443                         X509_POLICY_TREE *tree)
444 {
445     int i;
446     /*X509_POLICY_DATA *data;*/
447     X509_POLICY_NODE *node;
448     X509_POLICY_LEVEL *last = curr - 1;
449
450     for (i = 0; i < sk_X509_POLICY_NODE_num(last->nodes); i++)
451     {
452         node = sk_X509_POLICY_NODE_value(last->nodes, i);
453
454         if (!tree_link_unmatched(curr, cache, node, tree))
455             return 0;
456     }

```

```

458 #if 0
459
460     /* Skip any node with any children: we only want unmatched
461     * nodes.
462     *
463     * Note: need something better for policy mapping
464     * because each node may have multiple children
465     */
466     if (node->nchild)
467         continue;
468
469     /* Create a new node with qualifiers from anyPolicy and
470     * id from unmatched node.
471     */
472     data = policy_data_new(NULL, node->data->valid_policy,
473                           node_critical(node));
474
475     if (data == NULL)
476         return 0;
477     /* Curr may not have anyPolicy */
478     data->qualifier_set = cache->anyPolicy->qualifier_set;
479     data->flags |= POLICY_DATA_FLAG_SHARED_QUALIFIERS;
480     if (!level_add_node(curr, data, node, tree))
481     {
482         policy_data_free(data);
483         return 0;
484     }
485
486 #endif
487
488     }
489     /* Finally add link to anyPolicy */
490     if (last->anyPolicy)
491     {
492         if (!level_add_node(curr, cache->anyPolicy,
493                           last->anyPolicy, NULL))
494             return 0;
495     }
496     return 1;
497 }
498
499 /* Prune the tree: delete any child mapped child data on the current level
500 * then proceed up the tree deleting any data with no children. If we ever
501 * have no data on a level we can halt because the tree will be empty.
502 */
503
504 static int tree_prune(X509_POLICY_TREE *tree, X509_POLICY_LEVEL *curr)
505 {
506     STACK_OF(X509_POLICY_NODE) *nodes;
507     X509_POLICY_NODE *node;
508     int i;
509     nodes = curr->nodes;
510     if (curr->flags & X509_V_FLAG_INHIBIT_MAP)
511     {
512         for (i = sk_X509_POLICY_NODE_num(nodes) - 1; i >= 0; i--)
513         {
514             node = sk_X509_POLICY_NODE_value(nodes, i);
515             /* Delete any mapped data: see RFC3280 XXXX */
516             if (node->data->flags & POLICY_DATA_FLAG_MAP_MASK)
517             {
518                 node->parent->nchild--;
519                 OPENSSL_free(node);
520                 (void)sk_X509_POLICY_NODE_delete(nodes, i);
521             }
522         }
523     }

```



```

525     for(;;) {
526         --curr;
527         nodes = curr->nodes;
528         for (i = sk_X509_POLICY_NODE_num(nodes) - 1; i >= 0; i--)
529             {
530                 node = sk_X509_POLICY_NODE_value(nodes, i);
531                 if (node->nchild == 0)
532                     {
533                         node->parent->nchild--;
534                         OPENSSL_free(node);
535                         (void)sk_X509_POLICY_NODE_delete(nodes, i);
536                     }
537             }
538         if (curr->anyPolicy && !curr->anyPolicy->nchild)
539             {
540                 if (curr->anyPolicy->parent)
541                     curr->anyPolicy->parent->nchild--;
542                 OPENSSL_free(curr->anyPolicy);
543                 curr->anyPolicy = NULL;
544             }
545         if (curr == tree->levels)
546             {
547                 /* If we zapped anyPolicy at top then tree is empty */
548                 if (!curr->anyPolicy)
549                     return 2;
550                 return 1;
551             }
552     }
554     return 1;
556 }

558 static int tree_add_auth_node(STACK_OF(X509_POLICY_NODE) **pnodes,
559                             X509_POLICY_NODE *pcy)
560 {
561     if (!*pnodes)
562     {
563         *pnodes = policy_node_cmp_new();
564         if (!*pnodes)
565             return 0;
566     }
567     else if (sk_X509_POLICY_NODE_find(*pnodes, pcy) != -1)
568         return 1;
569     if (!sk_X509_POLICY_NODE_push(*pnodes, pcy))
570         return 0;
571     return 1;
573 }

575 }

577 /* Calculate the authority set based on policy tree.
578  * The 'pnodes' parameter is used as a store for the set of policy nodes
579  * used to calculate the user set. If the authority set is not anyPolicy
580  * then pnodes will just point to the authority set. If however the authority
581  * set is anyPolicy then the set of valid policies (other than anyPolicy)
582  * is store in pnodes. The return value of '2' is used in this case to indicate
583  * that pnodes should be freed.
584  */

586 static int tree_calculate_authority_set(X509_POLICY_TREE *tree,
587                                       STACK_OF(X509_POLICY_NODE) **pnodes)
588 {
589     X509_POLICY_LEVEL *curr;

```

```

590     X509_POLICY_NODE *node, *anyptr;
591     STACK_OF(X509_POLICY_NODE) **addnodes;
592     int i, j;
593     curr = tree->levels + tree->nlevel - 1;

595     /* If last level contains anyPolicy set is anyPolicy */
596     if (curr->anyPolicy)
597     {
598         if (!tree_add_auth_node(&tree->auth_policies, curr->anyPolicy))
599             return 0;
600         addnodes = pnodes;
601     }
602     else
603         /* Add policies to authority set */
604         addnodes = &tree->auth_policies;

606     curr = tree->levels;
607     for (i = 1; i < tree->nlevel; i++)
608     {
609         /* If no anyPolicy node on this level it can't
610          * appear on lower levels so end search.
611          */
612         if (!anyptr = curr->anyPolicy)
613             break;
614         curr++;
615         for (j = 0; j < sk_X509_POLICY_NODE_num(curr->nodes); j++)
616             {
617                 node = sk_X509_POLICY_NODE_value(curr->nodes, j);
618                 if ((node->parent == anyptr)
619                     && !tree_add_auth_node(addnodes, node))
620                     return 0;
621             }
622     }

624     if (addnodes == pnodes)
625         return 2;

627     *pnodes = tree->auth_policies;

629     return 1;
630 }

632 static int tree_calculate_user_set(X509_POLICY_TREE *tree,
633                                   STACK_OF(ASN1_OBJECT) *policy_oids,
634                                   STACK_OF(X509_POLICY_NODE) *auth_nodes)
635 {
636     int i;
637     X509_POLICY_NODE *node;
638     ASN1_OBJECT *oid;

640     X509_POLICY_NODE *anyPolicy;
641     X509_POLICY_DATA *extra;

643     /* Check if anyPolicy present in authority constrained policy set:
644      * this will happen if it is a leaf node.
645      */

647     if (sk_ASN1_OBJECT_num(policy_oids) <= 0)
648         return 1;

650     anyPolicy = tree->levels[tree->nlevel - 1].anyPolicy;

652     for (i = 0; i < sk_ASN1_OBJECT_num(policy_oids); i++)
653     {
654         oid = sk_ASN1_OBJECT_value(policy_oids, i);
655         if (OBJ_obj2nid(oid) == NID_any_policy)

```

```

656     {
657         tree->flags |= POLICY_FLAG_ANY_POLICY;
658         return 1;
659     }
660 }

662 for (i = 0; i < sk_ASN1_OBJECT_num(policy_oids); i++)
663 {
664     oid = sk_ASN1_OBJECT_value(policy_oids, i);
665     node = tree_find_sk(auth_nodes, oid);
666     if (!node)
667     {
668         if (!anyPolicy)
669             continue;
670         /* Create a new node with policy ID from user set
671          * and qualifiers from anyPolicy.
672          */
673         extra = policy_data_new(NULL, oid,
674                                node_critical(anyPolicy));
675         if (!extra)
676             return 0;
677         extra->qualifier_set = anyPolicy->data->qualifier_set;
678         extra->flags = POLICY_DATA_FLAG_SHARED_QUALIFIERS
679                     | POLICY_DATA_FLAG_EXTRA_NODE;
680         node = level_add_node(NULL, extra, anyPolicy->parent,
681                             tree);
682     }
683     if (!tree->user_policies)
684     {
685         tree->user_policies = sk_X509_POLICY_NODE_new_null();
686         if (!tree->user_policies)
687             return 1;
688     }
689     if (!sk_X509_POLICY_NODE_push(tree->user_policies, node))
690         return 0;
691 }
692 return 1;

694 }

696 static int tree_evaluate(X509_POLICY_TREE *tree)
697 {
698     int ret, i;
699     X509_POLICY_LEVEL *curr = tree->levels + 1;
700     const X509_POLICY_CACHE *cache;

702     for(i = 1; i < tree->nlevel; i++, curr++)
703     {
704         cache = policy_cache_set(curr->cert);
705         if (!tree_link_nodes(curr, cache))
706             return 0;

708         if (!(curr->flags & X509_V_FLAG_INHIBIT_ANY)
709             && !tree_link_any(curr, cache, tree))
710             return 0;
711         tree_print("before tree_prune()", tree, curr);
712         ret = tree_prune(tree, curr);
713         if (ret != 1)
714             return ret;
715     }

717     return 1;

719 }

721 static void exnode_free(X509_POLICY_NODE *node)

```

```

722     {
723         if (node->data && (node->data->flags & POLICY_DATA_FLAG_EXTRA_NODE))
724             OPENSSL_free(node);
725     }

728 void X509_policy_tree_free(X509_POLICY_TREE *tree)
729 {
730     X509_POLICY_LEVEL *curr;
731     int i;

733     if (!tree)
734         return;

736     sk_X509_POLICY_NODE_free(tree->auth_policies);
737     sk_X509_POLICY_NODE_pop_free(tree->user_policies, exnode_free);

739     for(i = 0, curr = tree->levels; i < tree->nlevel; i++, curr++)
740     {
741         if (curr->cert)
742             X509_free(curr->cert);
743         if (curr->nodes)
744             sk_X509_POLICY_NODE_pop_free(curr->nodes,
745                                         policy_node_free);
746         if (curr->anyPolicy)
747             policy_node_free(curr->anyPolicy);
748     }

750     if (tree->extra_data)
751         sk_X509_POLICY_DATA_pop_free(tree->extra_data,
752                                     policy_data_free);

754     OPENSSL_free(tree->levels);
755     OPENSSL_free(tree);

757 }

759 /* Application policy checking function.
760  * Return codes:
761  * 0 Internal Error.
762  * 1 Successful.
763  * -1 One or more certificates contain invalid or inconsistent extensions
764  * -2 User constrained policy set empty and requireExplicit true.
765  */

767 int X509_policy_check(X509_POLICY_TREE **ptree, int *pexplicit_policy,
768                      STACK_OF(X509) *certs,
769                      STACK_OF(ASN1_OBJECT) *policy_oids,
770                      unsigned int flags)
771 {
772     int ret;
773     X509_POLICY_TREE *tree = NULL;
774     STACK_OF(X509_POLICY_NODE) *nodes, *auth_nodes = NULL;
775     *ptree = NULL;

777     *pexplicit_policy = 0;
778     ret = tree_init(&tree, certs, flags);

780     switch (ret)
781     {

783         /* Tree empty requireExplicit False: OK */
784         case 2:
785             return 1;

787         /* Some internal error */

```

```

788     case -1:
789         return -1;

791     /* Some internal error */
792     case 0:
793         return 0;

795     /* Tree empty requireExplicit True: Error */

797     case 6:
798         *pexplicit_policy = 1;
799         return -2;

801     /* Tree OK requireExplicit True: OK and continue */
802     case 5:
803         *pexplicit_policy = 1;
804         break;

806     /* Tree OK: continue */

808     case 1:
809         if (!tree)
810             /*
811              * tree_init() returns success and a null tree
812              * if it's just looking at a trust anchor.
813              * I'm not sure that returning success here is
814              * correct, but I'm sure that reporting this
815              * as an internal error which our caller
816              * interprets as a malloc failure is wrong.
817              */
818             return 1;
819         break;
820     }

822     if (!tree) goto error;
823     ret = tree_evaluate(tree);

825     tree_print("tree_evaluate()", tree, NULL);

827     if (ret <= 0)
828         goto error;

830     /* Return value 2 means tree empty */
831     if (ret == 2)
832     {
833         X509_policy_tree_free(tree);
834         if (*pexplicit_policy)
835             return -2;
836         else
837             return 1;
838     }

840     /* Tree is not empty: continue */

842     ret = tree_calculate_authority_set(tree, &auth_nodes);

844     if (!ret)
845         goto error;

847     if (!tree_calculate_user_set(tree, policy_oids, auth_nodes))
848         goto error;

849     if (ret == 2)
850         sk_X509_POLICY_NODE_free(auth_nodes);
851     if (tree)

```

```

854         *ptree = tree;

856     if (*pexplicit_policy)
857     {
858         nodes = X509_policy_tree_get0_user_policies(tree);
859         if (sk_X509_POLICY_NODE_num(nodes) <= 0)
860             return -2;
861     }

863     return 1;

865     error:

867     X509_policy_tree_free(tree);

869     return 0;

871 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_addr.c

1

```
*****
37252 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_addr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Contributed to the OpenSSL Project by the American Registry for
3  * Internet Numbers ("ARIN").
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 /*
59  * Implementation of RFC 3779 section 2.2.
60  */
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_addr.c

2

```
62 #include <stdio.h>
63 #include <stdlib.h>
64
65 #include "cryptlib.h"
66 #include <openssl/conf.h>
67 #include <openssl/asn1.h>
68 #include <openssl/asn1t.h>
69 #include <openssl/buffer.h>
70 #include <openssl/x509v3.h>
71
72 #ifndef OPENSSL_NO_RFC3779
73
74 /*
75  * OpenSSL ASN.1 template translation of RFC 3779 2.2.3.
76  */
77
78 ASN1_SEQUENCE(IPAddressRange) = {
79     ASN1_SIMPLE(IPAddressRange, min, ASN1_BIT_STRING),
80     ASN1_SIMPLE(IPAddressRange, max, ASN1_BIT_STRING)
81 } ASN1_SEQUENCE_END(IPAddressRange)
82
83 ASN1_CHOICE(IPAddressOrRange) = {
84     ASN1_SIMPLE(IPAddressOrRange, u.addressPrefix, ASN1_BIT_STRING),
85     ASN1_SIMPLE(IPAddressOrRange, u.addressRange, IPAddressRange)
86 } ASN1_CHOICE_END(IPAddressOrRange)
87
88 ASN1_CHOICE(IPAddressChoice) = {
89     ASN1_SIMPLE(IPAddressChoice, u.inherit, ASN1_NULL),
90     ASN1_SEQUENCE_OF(IPAddressChoice, u.addressesOrRanges, IPAddressOrRange)
91 } ASN1_CHOICE_END(IPAddressChoice)
92
93 ASN1_SEQUENCE(IPAddressFamily) = {
94     ASN1_SIMPLE(IPAddressFamily, addressFamily, ASN1_OCTET_STRING),
95     ASN1_SIMPLE(IPAddressFamily, ipAddressChoice, IPAddressChoice)
96 } ASN1_SEQUENCE_END(IPAddressFamily)
97
98 ASN1_ITEM_TEMPLATE(IPAddrBlocks) =
99     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0,
100     IPAddrBlocks, IPAddressFamily)
101 ASN1_ITEM_TEMPLATE_END(IPAddrBlocks)
102
103 IMPLEMENT_ASN1_FUNCTIONS(IPAddressRange)
104 IMPLEMENT_ASN1_FUNCTIONS(IPAddressOrRange)
105 IMPLEMENT_ASN1_FUNCTIONS(IPAddressChoice)
106 IMPLEMENT_ASN1_FUNCTIONS(IPAddressFamily)
107
108 /*
109  * How much buffer space do we need for a raw address?
110  */
111 #define ADDR_RAW_BUF_LEN 16
112
113 /*
114  * What's the address length associated with this AFI?
115  */
116 static int length_from_afi(const unsigned afi)
117 {
118     switch (afi) {
119     case IANA_AFI_IPV4:
120         return 4;
121     case IANA_AFI_IPV6:
122         return 16;
123     default:
124         return 0;
125     }
126 }
```

```

128 /*
129  * Extract the AFI from an IPAddressFamily.
130  */
131 unsigned int v3_addr_get_afi(const IPAddressFamily *f)
132 {
133     return ((f != NULL &&
134             f->addressFamily != NULL &&
135             f->addressFamily->data != NULL)
136            ? ((f->addressFamily->data[0] << 8) |
137              (f->addressFamily->data[1]))
138            : 0);
139 }

141 /*
142  * Expand the bitstring form of an address into a raw byte array.
143  * At the moment this is coded for simplicity, not speed.
144  */
145 static int addr_expand(unsigned char *addr,
146                       const ASN1_BIT_STRING *bs,
147                       const int length,
148                       const unsigned char fill)
149 {
150     if (bs->length < 0 || bs->length > length)
151         return 0;
152     if (bs->length > 0) {
153         memcpy(addr, bs->data, bs->length);
154         if ((bs->flags & 7) != 0) {
155             unsigned char mask = 0xFF >> (8 - (bs->flags & 7));
156             if (fill == 0)
157                 addr[bs->length - 1] &= ~mask;
158             else
159                 addr[bs->length - 1] |= mask;
160         }
161     }
162     memset(addr + bs->length, fill, length - bs->length);
163     return 1;
164 }

166 /*
167  * Extract the prefix length from a bitstring.
168  */
169 #define addr_prefixlen(bs) ((int) ((bs->length * 8 - ((bs->flags & 7)))

171 /*
172  * i2r handler for one address bitstring.
173  */
174 static int i2r_address(BIO *out,
175                       const unsigned afi,
176                       const unsigned char fill,
177                       const ASN1_BIT_STRING *bs)
178 {
179     unsigned char addr[ADDR_RAW_BUF_LEN];
180     int i, n;

182     if (bs->length < 0)
183         return 0;
184     switch (afi) {
185     case IANA_AFI_IPV4:
186         if (!addr_expand(addr, bs, 4, fill))
187             return 0;
188         BIO_printf(out, "%d.%d.%d.%d", addr[0], addr[1], addr[2], addr[3]);
189         break;
190     case IANA_AFI_IPV6:
191         if (!addr_expand(addr, bs, 16, fill))
192             return 0;
193         for (n = 16; n > 1 && addr[n-1] == 0x00 && addr[n-2] == 0x00; n -= 2)

```

```

194     ;
195     for (i = 0; i < n; i += 2)
196         BIO_printf(out, "%x%s", (addr[i] << 8) | addr[i+1], (i < 14 ? ":" : ""));
197     if (i < 16)
198         BIO_puts(out, ":");
199     if (i == 0)
200         BIO_puts(out, ":");
201     break;
202 default:
203     for (i = 0; i < bs->length; i++)
204         BIO_printf(out, "%s%02x", (i > 0 ? ":" : ""), bs->data[i]);
205     BIO_printf(out, "[%d]", (int) (bs->flags & 7));
206     break;
207 }
208 return 1;
209 }

211 /*
212  * i2r handler for a sequence of addresses and ranges.
213  */
214 static int i2r_IPAddressOrRanges(BIO *out,
215                                  const int indent,
216                                  const IPAddressOrRanges *aors,
217                                  const unsigned afi)
218 {
219     int i;
220     for (i = 0; i < sk_IPAddressOrRange_num(aors); i++) {
221         const IPAddressOrRange *aor = sk_IPAddressOrRange_value(aors, i);
222         BIO_printf(out, "%s", indent, "");
223         switch (aor->type) {
224         case IPAddressOrRange_addressPrefix:
225             if (!i2r_address(out, afi, 0x00, aor->u.addressPrefix))
226                 return 0;
227             BIO_printf(out, "%d\n", addr_prefixlen(aor->u.addressPrefix));
228             continue;
229         case IPAddressOrRange_addressRange:
230             if (!i2r_address(out, afi, 0x00, aor->u.addressRange->min))
231                 return 0;
232             BIO_puts(out, "-");
233             if (!i2r_address(out, afi, 0xFF, aor->u.addressRange->max))
234                 return 0;
235             BIO_puts(out, "\n");
236             continue;
237         }
238     }
239     return 1;
240 }

242 /*
243  * i2r handler for an IPAddrBlocks extension.
244  */
245 static int i2r_IPAddrBlocks(const X509V3_EXT_METHOD *method,
246                             void *ext,
247                             BIO *out,
248                             int indent)
249 {
250     const IPAddrBlocks *addr = ext;
251     int i;
252     for (i = 0; i < sk_IPAddressFamily_num(addr); i++) {
253         IPAddressFamily *f = sk_IPAddressFamily_value(addr, i);
254         const unsigned int afi = v3_addr_get_afi(f);
255         switch (afi) {
256         case IANA_AFI_IPV4:
257             BIO_printf(out, "%sIPv4", indent, "");
258             break;
259         case IANA_AFI_IPV6:

```

```

260     BIO_printf(out, "%sIPv6", indent, "");
261     break;
262 default:
263     BIO_printf(out, "%sUnknown AFI %u", indent, "", afi);
264     break;
265 }
266 if (f->addressFamily->length > 2) {
267     switch (f->addressFamily->data[2]) {
268     case 1:
269         BIO_puts(out, " (Unicast)");
270         break;
271     case 2:
272         BIO_puts(out, " (Multicast)");
273         break;
274     case 3:
275         BIO_puts(out, " (Unicast/Multicast)");
276         break;
277     case 4:
278         BIO_puts(out, " (MPLS)");
279         break;
280     case 64:
281         BIO_puts(out, " (Tunnel)");
282         break;
283     case 65:
284         BIO_puts(out, " (VPLS)");
285         break;
286     case 66:
287         BIO_puts(out, " (BGP MDT)");
288         break;
289     case 128:
290         BIO_puts(out, " (MPLS-labeled VPN)");
291         break;
292     default:
293         BIO_printf(out, " (Unknown SAFI %u)",
294             (unsigned) f->addressFamily->data[2]);
295         break;
296     }
297 }
298 switch (f->ipAddressChoice->type) {
299 case IPAddressChoice_inherit:
300     BIO_puts(out, ": inherit\n");
301     break;
302 case IPAddressChoice_addressesOrRanges:
303     BIO_puts(out, ":\n");
304     if (!i2r_IPAddressOrRanges(out,
305         indent + 2,
306         f->ipAddressChoice->u.addressesOrRanges,
307         afi))
308         return 0;
309     break;
310 }
311 }
312 return 1;
313 }
314
315 /*
316  * Sort comparison function for a sequence of IPAddressOrRange
317  * elements.
318  *
319  * There's no sane answer we can give if addr_expand() fails, and an
320  * assertion failure on externally supplied data is seriously uncool,
321  * so we just arbitrarily declare that if given invalid inputs this
322  * function returns -1. If this messes up your preferred sort order
323  * for garbage input, tough noogies.
324  */
325 static int IPAddressOrRange_cmp(const IPAddressOrRange *a,

```

```

326     const IPAddressOrRange *b,
327     const int length)
328 {
329     unsigned char addr_a[ADDR_RAW_BUF_LEN], addr_b[ADDR_RAW_BUF_LEN];
330     int prefixlen_a = 0, prefixlen_b = 0;
331     int r;
332
333     switch (a->type) {
334     case IPAddressOrRange_addressPrefix:
335         if (!addr_expand(addr_a, a->u.addressPrefix, length, 0x00))
336             return -1;
337         prefixlen_a = addr_prefixlen(a->u.addressPrefix);
338         break;
339     case IPAddressOrRange_addressRange:
340         if (!addr_expand(addr_a, a->u.addressRange->min, length, 0x00))
341             return -1;
342         prefixlen_a = length * 8;
343         break;
344     }
345
346     switch (b->type) {
347     case IPAddressOrRange_addressPrefix:
348         if (!addr_expand(addr_b, b->u.addressPrefix, length, 0x00))
349             return -1;
350         prefixlen_b = addr_prefixlen(b->u.addressPrefix);
351         break;
352     case IPAddressOrRange_addressRange:
353         if (!addr_expand(addr_b, b->u.addressRange->min, length, 0x00))
354             return -1;
355         prefixlen_b = length * 8;
356         break;
357     }
358
359     if ((r = memcmp(addr_a, addr_b, length)) != 0)
360         return r;
361     else
362         return prefixlen_a - prefixlen_b;
363 }
364
365 /*
366  * IPv4-specific closure over IPAddressOrRange_cmp, since sk_sort()
367  * comparison routines are only allowed two arguments.
368  */
369 static int v4IPAddressOrRange_cmp(const IPAddressOrRange * const *a,
370     const IPAddressOrRange * const *b)
371 {
372     return IPAddressOrRange_cmp(*a, *b, 4);
373 }
374
375 /*
376  * IPv6-specific closure over IPAddressOrRange_cmp, since sk_sort()
377  * comparison routines are only allowed two arguments.
378  */
379 static int v6IPAddressOrRange_cmp(const IPAddressOrRange * const *a,
380     const IPAddressOrRange * const *b)
381 {
382     return IPAddressOrRange_cmp(*a, *b, 16);
383 }
384
385 /*
386  * Calculate whether a range collapses to a prefix.
387  * See last paragraph of RFC 3779 2.2.3.7.
388  */
389 static int range_should_be_prefix(const unsigned char *min,
390     const unsigned char *max,
391     const int length)

```

```

392 {
393     unsigned char mask;
394     int i, j;

396     OPENSSL_assert(memcmp(min, max, length) <= 0);
397     for (i = 0; i < length && min[i] == max[i]; i++)
398         ;
399     for (j = length - 1; j >= 0 && min[j] == 0x00 && max[j] == 0xFF; j--)
400         ;
401     if (i < j)
402         return -1;
403     if (i > j)
404         return i * 8;
405     mask = min[i] ^ max[i];
406     switch (mask) {
407     case 0x01: j = 7; break;
408     case 0x03: j = 6; break;
409     case 0x07: j = 5; break;
410     case 0x0F: j = 4; break;
411     case 0x1F: j = 3; break;
412     case 0x3F: j = 2; break;
413     case 0x7F: j = 1; break;
414     default: return -1;
415     }
416     if ((min[i] & mask) != 0 || (max[i] & mask) != mask)
417         return -1;
418     else
419         return i * 8 + j;
420 }

422 /*
423  * Construct a prefix.
424  */
425 static int make_addressPrefix(IPAddressOrRange **result,
426                             unsigned char *addr,
427                             const int prefixlen)
428 {
429     int bytelen = (prefixlen + 7) / 8, bitlen = prefixlen % 8;
430     IPAddressOrRange *aor = IPAddressOrRange_new();

432     if (aor == NULL)
433         return 0;
434     aor->type = IPAddressOrRange_addressPrefix;
435     if (aor->u.addressPrefix == NULL &&
436         (aor->u.addressPrefix = ASN1_BIT_STRING_new()) == NULL)
437         goto err;
438     if (!ASN1_BIT_STRING_set(aor->u.addressPrefix, addr, bytelen))
439         goto err;
440     aor->u.addressPrefix->flags &= ~7;
441     aor->u.addressPrefix->flags |= ASN1_STRING_FLAG_BITS_LEFT;
442     if (bitlen > 0) {
443         aor->u.addressPrefix->data[bytelen - 1] &= ~(0xFF >> bitlen);
444         aor->u.addressPrefix->flags |= 8 - bitlen;
445     }
446     *result = aor;
447     return 1;
448 }

450 err:
451     IPAddressOrRange_free(aor);
452     return 0;
453 }

455 /*
456  * Construct a range. If it can be expressed as a prefix,
457  * return a prefix instead. Doing this here simplifies

```

```

458  * the rest of the code considerably.
459  */
460 static int make_addressRange(IPAddressOrRange **result,
461                             unsigned char *min,
462                             unsigned char *max,
463                             const int length)
464 {
465     IPAddressOrRange *aor;
466     int i, prefixlen;

468     if ((prefixlen = range_should_be_prefix(min, max, length)) >= 0)
469         return make_addressPrefix(result, min, prefixlen);

471     if ((aor = IPAddressOrRange_new()) == NULL)
472         return 0;
473     aor->type = IPAddressOrRange_addressRange;
474     OPENSSL_assert(aor->u.addressRange == NULL);
475     if ((aor->u.addressRange = IPAddressRange_new()) == NULL)
476         goto err;
477     if (aor->u.addressRange->min == NULL &&
478         (aor->u.addressRange->min = ASN1_BIT_STRING_new()) == NULL)
479         goto err;
480     if (aor->u.addressRange->max == NULL &&
481         (aor->u.addressRange->max = ASN1_BIT_STRING_new()) == NULL)
482         goto err;

484     for (i = length; i > 0 && min[i - 1] == 0x00; --i)
485         ;
486     if (!ASN1_BIT_STRING_set(aor->u.addressRange->min, min, i))
487         goto err;
488     aor->u.addressRange->min->flags &= ~7;
489     aor->u.addressRange->min->flags |= ASN1_STRING_FLAG_BITS_LEFT;
490     if (i > 0) {
491         unsigned char b = min[i - 1];
492         int j = 1;
493         while ((b & (0xFFU >> j)) != 0)
494             ++j;
495         aor->u.addressRange->min->flags |= 8 - j;
496     }

498     for (i = length; i > 0 && max[i - 1] == 0xFF; --i)
499         ;
500     if (!ASN1_BIT_STRING_set(aor->u.addressRange->max, max, i))
501         goto err;
502     aor->u.addressRange->max->flags &= ~7;
503     aor->u.addressRange->max->flags |= ASN1_STRING_FLAG_BITS_LEFT;
504     if (i > 0) {
505         unsigned char b = max[i - 1];
506         int j = 1;
507         while ((b & (0xFFU >> j)) != (0xFFU >> j))
508             ++j;
509         aor->u.addressRange->max->flags |= 8 - j;
510     }

512     *result = aor;
513     return 1;

515 err:
516     IPAddressOrRange_free(aor);
517     return 0;
518 }

520 /*
521  * Construct a new address family or find an existing one.
522  */
523 static IPAddressFamily *make_IPAddressFamily(IPAddrBlocks *addr,

```

```

524                                     const unsigned afi,
525                                     const unsigned *safi)
526 {
527     IPAddressFamily *f;
528     unsigned char key[3];
529     unsigned keylen;
530     int i;

532     key[0] = (afi >> 8) & 0xFF;
533     key[1] = afi & 0xFF;
534     if (safi != NULL) {
535         key[2] = *safi & 0xFF;
536         keylen = 3;
537     } else {
538         keylen = 2;
539     }

541     for (i = 0; i < sk_IPAddressFamily_num(addr); i++) {
542         f = sk_IPAddressFamily_value(addr, i);
543         OPENSSL_assert(f->addressFamily->data != NULL);
544         if (f->addressFamily->length == keylen &&
545             !memcmp(f->addressFamily->data, key, keylen))
546             return f;
547     }

549     if ((f = IPAddressFamily_new()) == NULL)
550         goto err;
551     if (f->ipAddressChoice == NULL &&
552         (f->ipAddressChoice = IPAddressChoice_new()) == NULL)
553         goto err;
554     if (f->addressFamily == NULL &&
555         (f->addressFamily = ASN1_OCTET_STRING_new()) == NULL)
556         goto err;
557     if (!ASN1_OCTET_STRING_set(f->addressFamily, key, keylen))
558         goto err;
559     if (!sk_IPAddressFamily_push(addr, f))
560         goto err;

562     return f;

564 err:
565     IPAddressFamily_free(f);
566     return NULL;
567 }

569 /*
570  * Add an inheritance element.
571  */
572 int v3_addr_add_inherit(IPAddrBlocks *addr,
573                         const unsigned afi,
574                         const unsigned *safi)
575 {
576     IPAddressFamily *f = make_IPAddressFamily(addr, afi, safi);
577     if (f == NULL ||
578         f->ipAddressChoice == NULL ||
579         (f->ipAddressChoice->type == IPAddressChoice_addressesOrRanges &&
580          f->ipAddressChoice->u.addressesOrRanges != NULL))
581         return 0;
582     if (f->ipAddressChoice->type == IPAddressChoice_inherit &&
583         f->ipAddressChoice->u.inherit != NULL)
584         return 1;
585     if (f->ipAddressChoice->u.inherit == NULL &&
586         (f->ipAddressChoice->u.inherit = ASN1_NULL_new()) == NULL)
587         return 0;
588     f->ipAddressChoice->type = IPAddressChoice_inherit;
589     return 1;

```

```

590 }

592 /*
593  * Construct an IPAddressOrRange sequence, or return an existing one.
594  */
595 static IPAddressOrRanges *make_prefix_or_range(IPAddrBlocks *addr,
596                                                const unsigned afi,
597                                                const unsigned *safi)
598 {
599     IPAddressFamily *f = make_IPAddressFamily(addr, afi, safi);
600     IPAddressOrRanges *aors = NULL;

602     if (f == NULL ||
603         f->ipAddressChoice == NULL ||
604         (f->ipAddressChoice->type == IPAddressChoice_inherit &&
605          f->ipAddressChoice->u.inherit != NULL))
606         return NULL;
607     if (f->ipAddressChoice->type == IPAddressChoice_addressesOrRanges)
608         aors = f->ipAddressChoice->u.addressesOrRanges;
609     if (aors != NULL)
610         return aors;
611     if ((aors = sk_IPAddressOrRange_new_null()) == NULL)
612         return NULL;
613     switch (afi) {
614     case IANA_AFI_IPV4:
615         (void) sk_IPAddressOrRange_set_cmp_func(aors, v4IPAddressOrRange_cmp);
616         break;
617     case IANA_AFI_IPV6:
618         (void) sk_IPAddressOrRange_set_cmp_func(aors, v6IPAddressOrRange_cmp);
619         break;
620     }
621     f->ipAddressChoice->type = IPAddressChoice_addressesOrRanges;
622     f->ipAddressChoice->u.addressesOrRanges = aors;
623     return aors;
624 }

626 /*
627  * Add a prefix.
628  */
629 int v3_addr_add_prefix(IPAddrBlocks *addr,
630                       const unsigned afi,
631                       const unsigned *safi,
632                       unsigned char *a,
633                       const int prefixlen)
634 {
635     IPAddressOrRanges *aors = make_prefix_or_range(addr, afi, safi);
636     IPAddressOrRange *aor;
637     if (aors == NULL || !make_addressPrefix(&aor, a, prefixlen))
638         return 0;
639     if (sk_IPAddressOrRange_push(aors, aor))
640         return 1;
641     IPAddressOrRange_free(aor);
642     return 0;
643 }

645 /*
646  * Add a range.
647  */
648 int v3_addr_add_range(IPAddrBlocks *addr,
649                      const unsigned afi,
650                      const unsigned *safi,
651                      unsigned char *min,
652                      unsigned char *max)
653 {
654     IPAddressOrRanges *aors = make_prefix_or_range(addr, afi, safi);
655     IPAddressOrRange *aor;

```



```

656 int length = length_from_afi(afi);
657 if (aors == NULL)
658     return 0;
659 if (!make_addressRange(&aor, min, max, length))
660     return 0;
661 if (sk_IPAddressOrRange_push(aors, aor))
662     return 1;
663 IPAddressOrRange_free(aor);
664 return 0;
665 }

667 /*
668  * Extract min and max values from an IPAddressOrRange.
669  */
670 static int extract_min_max(IPAddressOrRange *aor,
671     unsigned char *min,
672     unsigned char *max,
673     int length)
674 {
675     if (aor == NULL || min == NULL || max == NULL)
676         return 0;
677     switch (aor->type) {
678     case IPAddressOrRange_addressPrefix:
679         return (addr_expand(min, aor->u.addressPrefix, length, 0x00) &&
680             addr_expand(max, aor->u.addressPrefix, length, 0xFF));
681     case IPAddressOrRange_addressRange:
682         return (addr_expand(min, aor->u.addressRange->min, length, 0x00) &&
683             addr_expand(max, aor->u.addressRange->max, length, 0xFF));
684     }
685     return 0;
686 }

688 /*
689  * Public wrapper for extract_min_max().
690  */
691 int v3_addr_get_range(IPAddressOrRange *aor,
692     const unsigned afi,
693     unsigned char *min,
694     unsigned char *max,
695     const int length)
696 {
697     int afi_length = length_from_afi(afi);
698     if (aor == NULL || min == NULL || max == NULL ||
699         afi_length == 0 || length < afi_length ||
700         (aor->type != IPAddressOrRange_addressPrefix &&
701             aor->type != IPAddressOrRange_addressRange) ||
702         !extract_min_max(aor, min, max, afi_length))
703         return 0;

705     return afi_length;
706 }

708 /*
709  * Sort comparison function for a sequence of IPAddressFamily.
710  *
711  * The last paragraph of RFC 3779 2.2.3.3 is slightly ambiguous about
712  * the ordering: I can read it as meaning that IPv6 without a SAFI
713  * comes before IPv4 with a SAFI, which seems pretty weird. The
714  * examples in appendix B suggest that the author intended the
715  * null-SAFI rule to apply only within a single AFI, which is what I
716  * would have expected and is what the following code implements.
717  */
718 static int IPAddressFamily_cmp(const IPAddressFamily * const *a,
719     const IPAddressFamily * const *b)
720 {
721     const ASN1_OCTET_STRING *a = (*a)->addressFamily;

```

```

722 const ASN1_OCTET_STRING *b = (*b)->addressFamily;
723 int len = ((a->length <= b->length) ? a->length : b->length);
724 int cmp = memcmp(a->data, b->data, len);
725 return cmp ? cmp : a->length - b->length;
726 }

728 /*
729  * Check whether an IPAddrBlocks is in canonical form.
730  */
731 int v3_addr_is_canonical(IPAddrBlocks *addr)
732 {
733     unsigned char a_min[ADDR_RAW_BUF_LEN], a_max[ADDR_RAW_BUF_LEN];
734     unsigned char b_min[ADDR_RAW_BUF_LEN], b_max[ADDR_RAW_BUF_LEN];
735     IPAddressRanges *aors;
736     int i, j, k;

738     /*
739      * Empty extension is canonical.
740      */
741     if (addr == NULL)
742         return 1;

744     /*
745      * Check whether the top-level list is in order.
746      */
747     for (i = 0; i < sk_IPAddressFamily_num(addr) - 1; i++) {
748         const IPAddressFamily *a = sk_IPAddressFamily_value(addr, i);
749         const IPAddressFamily *b = sk_IPAddressFamily_value(addr, i + 1);
750         if (IPAddressFamily_cmp(&a, &b) >= 0)
751             return 0;
752     }

754     /*
755      * Top level's ok, now check each address family.
756      */
757     for (i = 0; i < sk_IPAddressFamily_num(addr); i++) {
758         IPAddressFamily *f = sk_IPAddressFamily_value(addr, i);
759         int length = length_from_afi(v3_addr_get_afi(f));

761         /*
762          * Inheritance is canonical. Anything other than inheritance or
763          * a SEQUENCE OF IPAddressOrRange is an ASN.1 error or something.
764          */
765         if (f == NULL || f->ipAddressChoice == NULL)
766             return 0;
767         switch (f->ipAddressChoice->type) {
768         case IPAddressChoice_inherit:
769             continue;
770         case IPAddressChoice_addressesOrRanges:
771             break;
772         default:
773             return 0;
774         }

776         /*
777          * It's an IPAddressOrRanges sequence, check it.
778          */
779         aors = f->ipAddressChoice->u.addressesOrRanges;
780         if (sk_IPAddressOrRange_num(aors) == 0)
781             return 0;
782         for (j = 0; j < sk_IPAddressOrRange_num(aors) - 1; j++) {
783             IPAddressOrRange *a = sk_IPAddressOrRange_value(aors, j);
784             IPAddressOrRange *b = sk_IPAddressOrRange_value(aors, j + 1);

786             if (!extract_min_max(a, a_min, a_max, length) ||
787                 !extract_min_max(b, b_min, b_max, length))

```

```

788     return 0;

790     /*
791     * Punt misordered list, overlapping start, or inverted range.
792     */
793     if (memcmp(a_min, b_min, length) >= 0 ||
794         memcmp(a_min, a_max, length) > 0 ||
795         memcmp(b_min, b_max, length) > 0)
796         return 0;

798     /*
799     * Punt if adjacent or overlapping. Check for adjacency by
800     * subtracting one from b_min first.
801     */
802     for (k = length - 1; k >= 0 && b_min[k]-- == 0x00; k--)
803         ;
804     if (memcmp(a_max, b_min, length) >= 0)
805         return 0;

807     /*
808     * Check for range that should be expressed as a prefix.
809     */
810     if (a->type == IPAddressOrRange_addressRange &&
811         range_should_be_prefix(a_min, a_max, length) >= 0)
812         return 0;
813 }

815 /*
816 * Check range to see if it's inverted or should be a
817 * prefix.
818 */
819 j = sk_IPAddressOrRange_num(aors) - 1;
820 {
821     IPAddressOrRange *a = sk_IPAddressOrRange_value(aors, j);
822     if (a != NULL && a->type == IPAddressOrRange_addressRange) {
823         if (!extract_min_max(a, a_min, a_max, length))
824             return 0;
825         if (memcmp(a_min, a_max, length) > 0 ||
826             range_should_be_prefix(a_min, a_max, length) >= 0)
827             return 0;
828     }
829 }
830 }

832 /*
833 * If we made it through all that, we're happy.
834 */
835 return 1;
836 }

838 /*
839 * Whack an IPAddressOrRanges into canonical form.
840 */
841 static int IPAddressOrRanges_canonize(IPAddressOrRanges *aors,
842                                       const unsigned afi)
843 {
844     int i, j, length = length_from_afi(afi);

846     /*
847     * Sort the IPAddressOrRanges sequence.
848     */
849     sk_IPAddressOrRange_sort(aors);

851     /*
852     * Clean up representation issues, punt on duplicates or overlaps.
853     */

```

```

854     for (i = 0; i < sk_IPAddressOrRange_num(aors) - 1; i++) {
855         IPAddressOrRange *a = sk_IPAddressOrRange_value(aors, i);
856         IPAddressOrRange *b = sk_IPAddressOrRange_value(aors, i + 1);
857         unsigned char a_min[ADDR_RAW_BUF_LEN], a_max[ADDR_RAW_BUF_LEN];
858         unsigned char b_min[ADDR_RAW_BUF_LEN], b_max[ADDR_RAW_BUF_LEN];

860         if (!extract_min_max(a, a_min, a_max, length) ||
861             !extract_min_max(b, b_min, b_max, length))
862             return 0;

864         /*
865         * Punt inverted ranges.
866         */
867         if (memcmp(a_min, a_max, length) > 0 ||
868             memcmp(b_min, b_max, length) > 0)
869             return 0;

871         /*
872         * Punt overlaps.
873         */
874         if (memcmp(a_max, b_min, length) >= 0)
875             return 0;

877         /*
878         * Merge if a and b are adjacent. We check for
879         * adjacency by subtracting one from b_min first.
880         */
881         for (j = length - 1; j >= 0 && b_min[j]-- == 0x00; j--)
882             ;
883         if (memcmp(a_max, b_min, length) == 0) {
884             IPAddressOrRange *merged;
885             if (!make_addressRange(&merged, a_min, b_max, length))
886                 return 0;
887             (void) sk_IPAddressOrRange_set(aors, i, merged);
888             (void) sk_IPAddressOrRange_delete(aors, i + 1);
889             IPAddressOrRange_free(a);
890             IPAddressOrRange_free(b);
891             --i;
892             continue;
893         }
894     }

896     /*
897     * Check for inverted final range.
898     */
899     j = sk_IPAddressOrRange_num(aors) - 1;
900     {
901         IPAddressOrRange *a = sk_IPAddressOrRange_value(aors, j);
902         if (a != NULL && a->type == IPAddressOrRange_addressRange) {
903             unsigned char a_min[ADDR_RAW_BUF_LEN], a_max[ADDR_RAW_BUF_LEN];
904             extract_min_max(a, a_min, a_max, length);
905             if (memcmp(a_min, a_max, length) > 0)
906                 return 0;
907         }
908     }

910     return 1;
911 }

913 /*
914 * Whack an IPAddrBlocks extension into canonical form.
915 */
916 int v3_addr_canonize(IPAddrBlocks *addr)
917 {
918     int i;
919     for (i = 0; i < sk_IPAddressFamily_num(addr); i++) {

```

```

920     IPAddressFamily *f = sk_IPAddressFamily_value(addr, i);
921     if (f->ipAddressChoice->type == IPAddressChoice_addressesOrRanges &&
922         !IPAddressOrRanges_canonize(f->ipAddressChoice->u.addressesOrRanges,
923         v3_addr_get_afi(f)))
924         return 0;
925 }
926 {void} sk_IPAddressFamily_set_cmp_func(addr, IPAddressFamily_cmp);
927 sk_IPAddressFamily_sort(addr);
928 OPENSSL_assert(v3_addr_is_canonical(addr));
929 return 1;
930 }

932 /*
933  * v2i handler for the IPAddrBlocks extension.
934  */
935 static void *v2i_IPAddrBlocks(const struct v3_ext_method *method,
936                               struct v3_ext_ctx *ctx,
937                               STACK_OF(CONF_VALUE) *values)
938 {
939     static const char v4addr_chars[] = "0123456789.";
940     static const char v6addr_chars[] = "0123456789.:abcdefABCDEF";
941     IPAddrBlocks *addr = NULL;
942     char *s = NULL, *t;
943     int i;
944
945     if ((addr = sk_IPAddressFamily_new(IPAddressFamily_cmp)) == NULL) {
946         X509V3err(X509V3_F_V2I_IPADDRBLOCKS, ERR_R_MALLOC_FAILURE);
947         return NULL;
948     }

950     for (i = 0; i < sk_CONF_VALUE_num(values); i++) {
951         CONF_VALUE *val = sk_CONF_VALUE_value(values, i);
952         unsigned char min[ADDR_RAW_BUF_LEN], max[ADDR_RAW_BUF_LEN];
953         unsigned afi, *safi = NULL, safi_;
954         const char *addr_chars;
955         int prefixlen, i1, i2, delim, length;

957         if (!name_cmp(val->name, "IPv4")) {
958             afi = IANA_AFI_IPV4;
959         } else if (!name_cmp(val->name, "IPv6")) {
960             afi = IANA_AFI_IPV6;
961         } else if (!name_cmp(val->name, "IPv4-SAFI")) {
962             afi = IANA_AFI_IPV4;
963             safi = &safi_;
964         } else if (!name_cmp(val->name, "IPv6-SAFI")) {
965             afi = IANA_AFI_IPV6;
966             safi = &safi_;
967         } else {
968             X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_EXTENSION_NAME_ERROR);
969             X509V3_conf_err(val);
970             goto err;
971         }

973         switch (afi) {
974             case IANA_AFI_IPV4:
975                 addr_chars = v4addr_chars;
976                 break;
977             case IANA_AFI_IPV6:
978                 addr_chars = v6addr_chars;
979                 break;
980         }

982         length = length_from_afi(afi);

984         /*
985          * Handle SAFI, if any, and BUF_strdup() so we can null-terminate

```

```

986     * the other input values.
987     */
988     if (safi != NULL) {
989         *safi = strtoul(val->value, &t, 0);
990         t += strspn(t, " \t");
991         if (*safi > 0xFF || *t++ != ':') {
992             X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_INVALID_SAFI);
993             X509V3_conf_err(val);
994             goto err;
995         }
996         t += strspn(t, " \t");
997         s = BUF_strdup(t);
998     } else {
999         s = BUF_strdup(val->value);
1000     }
1001     if (s == NULL) {
1002         X509V3err(X509V3_F_V2I_IPADDRBLOCKS, ERR_R_MALLOC_FAILURE);
1003         goto err;
1004     }

1006     /*
1007      * Check for inheritance. Not worth additional complexity to
1008      * optimize this (seldom-used) case.
1009      */
1010     if (!strcmp(s, "inherit")) {
1011         if (!v3_addr_add_inherit(addr, afi, safi)) {
1012             X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_INVALID_INHERITANCE);
1013             X509V3_conf_err(val);
1014             goto err;
1015         }
1016         OPENSSL_free(s);
1017         s = NULL;
1018         continue;
1019     }

1021     i1 = strspn(s, addr_chars);
1022     i2 = i1 + strspn(s + i1, " \t");
1023     delim = s[i2++];
1024     s[i1] = '\0';

1026     if (a2i_ipadd(min, s) != length) {
1027         X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_INVALID_IPADDRESS);
1028         X509V3_conf_err(val);
1029         goto err;
1030     }

1032     switch (delim) {
1033     case '/':
1034         prefixlen = (int) strtoul(s + i2, &t, 10);
1035         if (t == s + i2 || *t != '\0') {
1036             X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_EXTENSION_VALUE_ERROR);
1037             X509V3_conf_err(val);
1038             goto err;
1039         }
1040         if (!v3_addr_add_prefix(addr, afi, safi, min, prefixlen)) {
1041             X509V3err(X509V3_F_V2I_IPADDRBLOCKS, ERR_R_MALLOC_FAILURE);
1042             goto err;
1043         }
1044         break;
1045     case '.':
1046         i1 = i2 + strspn(s + i2, " \t");
1047         i2 = i1 + strspn(s + i1, addr_chars);
1048         if (i1 == i2 || s[i2] != '\0') {
1049             X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_EXTENSION_VALUE_ERROR);
1050             X509V3_conf_err(val);
1051             goto err;

```

```

1052     }
1053     if (a2i_ipadd(max, s + i1) != length) {
1054         X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_INVALID_IPADDRESS);
1055         X509V3_conf_err(val);
1056         goto err;
1057     }
1058     if (memcmp(min, max, length_from_afi(afi)) > 0) {
1059         X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_EXTENSION_VALUE_ERROR);
1060         X509V3_conf_err(val);
1061         goto err;
1062     }
1063     if (!v3_addr_add_range(addr, afi, safi, min, max)) {
1064         X509V3err(X509V3_F_V2I_IPADDRBLOCKS, ERR_R_MALLOC_FAILURE);
1065         goto err;
1066     }
1067     break;
1068 case '\0':
1069     if (!v3_addr_add_prefix(addr, afi, safi, min, length * 8)) {
1070         X509V3err(X509V3_F_V2I_IPADDRBLOCKS, ERR_R_MALLOC_FAILURE);
1071         goto err;
1072     }
1073     break;
1074 default:
1075     X509V3err(X509V3_F_V2I_IPADDRBLOCKS, X509V3_R_EXTENSION_VALUE_ERROR);
1076     X509V3_conf_err(val);
1077     goto err;
1078 }
1080     OPENSSL_free(s);
1081     s = NULL;
1082 }
1084 /*
1085  * Canonize the result, then we're done.
1086  */
1087 if (!v3_addr_canonize(addr))
1088     goto err;
1089 return addr;
1091 err:
1092     OPENSSL_free(s);
1093     sk_IPAddressFamily_pop_free(addr, IPAddressFamily_free);
1094     return NULL;
1095 }
1097 /*
1098  * OpenSSL dispatch
1099  */
1100 const X509V3_EXT_METHOD v3_addr = {
1101     NID_sbgp_ipAddrBlock, /* nid */
1102     0, /* flags */
1103     ASN1_ITEM_ref(IPAddrBlocks), /* template */
1104     0, 0, 0, 0, /* old functions, ignored */
1105     0, /* i2s */
1106     0, /* s2i */
1107     0, /* i2v */
1108     v2i_IPAddrBlocks, /* v2i */
1109     i2r_IPAddrBlocks, /* i2r */
1110     0, /* r2i */
1111     NULL /* extension-specific data */
1112 };
1114 /*
1115  * Figure out whether extension sues inheritance.
1116  */
1117 int v3_addr_inherits(IPAddrBlocks *addr)

```

```

1118 {
1119     int i;
1120     if (addr == NULL)
1121         return 0;
1122     for (i = 0; i < sk_IPAddressFamily_num(addr); i++) {
1123         IPAddressFamily *f = sk_IPAddressFamily_value(addr, i);
1124         if (f->ipAddressChoice->type == IPAddressChoice_inherit)
1125             return 1;
1126     }
1127     return 0;
1128 }
1130 /*
1131  * Figure out whether parent contains child.
1132  */
1133 static int addr_contains(IPAddressOrRanges *parent,
1134                          IPAddressOrRanges *child,
1135                          int length)
1136 {
1137     unsigned char p_min[ADDR_RAW_BUF_LEN], p_max[ADDR_RAW_BUF_LEN];
1138     unsigned char c_min[ADDR_RAW_BUF_LEN], c_max[ADDR_RAW_BUF_LEN];
1139     int p, c;
1141     if (child == NULL || parent == child)
1142         return 1;
1143     if (parent == NULL)
1144         return 0;
1146     p = 0;
1147     for (c = 0; c < sk_IPAddressOrRange_num(child); c++) {
1148         if (!extract_min_max(sk_IPAddressOrRange_value(child, c),
1149                             c_min, c_max, length))
1150             return -1;
1151         for (; p++ < sk_IPAddressOrRange_num(parent)) {
1152             if (p >= sk_IPAddressOrRange_num(parent))
1153                 return 0;
1154             if (!extract_min_max(sk_IPAddressOrRange_value(parent, p),
1155                                 p_min, p_max, length))
1156                 return 0;
1157             if (memcmp(p_max, c_max, length) < 0)
1158                 continue;
1159             if (memcmp(p_min, c_min, length) > 0)
1160                 return 0;
1161             break;
1162         }
1163     }
1165     return 1;
1166 }
1168 /*
1169  * Test whether a is a subset of b.
1170  */
1171 int v3_addr_subset(IPAddrBlocks *a, IPAddrBlocks *b)
1172 {
1173     int i;
1174     if (a == NULL || a == b)
1175         return 1;
1176     if (b == NULL || v3_addr_inherits(a) || v3_addr_inherits(b))
1177         return 0;
1178     (void) sk_IPAddressFamily_set_cmp_func(b, IPAddressFamily_cmp);
1179     for (i = 0; i < sk_IPAddressFamily_num(a); i++) {
1180         IPAddressFamily *fa = sk_IPAddressFamily_value(a, i);
1181         int j = sk_IPAddressFamily_find(b, fa);
1182         IPAddressFamily *fb;
1183         fb = sk_IPAddressFamily_value(b, j);

```

```

1184     if (fb == NULL)
1185         return 0;
1186     if (!addr_contains(fb->ipAddressChoice->u.addressesOrRanges,
1187                        fa->ipAddressChoice->u.addressesOrRanges,
1188                        length_from_afi(v3_addr_get_afi(fb))))
1189         return 0;
1190 }
1191 return 1;
1192 }

1194 /*
1195  * Validation error handling via callback.
1196  */
1197 #define validation_err(_err_) \
1198     do { \
1199         if (ctx != NULL) { \
1200             ctx->error = _err_; \
1201             ctx->error_depth = i; \
1202             ctx->current_cert = x; \
1203             ret = ctx->verify_cb(0, ctx); \
1204         } else { \
1205             ret = 0; \
1206         } \
1207         if (!ret) \
1208             goto done; \
1209     } while (0)

1211 /*
1212  * Core code for RFC 3779 2.3 path validation.
1213  */
1214 static int v3_addr_validate_path_internal(X509_STORE_CTX *ctx,
1215                                           STACK_OF(X509) *chain,
1216                                           IPAddrBlocks *ext)
1217 {
1218     IPAddrBlocks *child = NULL;
1219     int i, j, ret = 1;
1220     X509 *x;

1222     OPENSSL_assert(chain != NULL && sk_X509_num(chain) > 0);
1223     OPENSSL_assert(ctx != NULL || ext != NULL);
1224     OPENSSL_assert(ctx == NULL || ctx->verify_cb != NULL);

1226     /*
1227      * Figure out where to start. If we don't have an extension to
1228      * check, we're done. Otherwise, check canonical form and
1229      * set up for walking up the chain.
1230      */
1231     if (ext != NULL) {
1232         i = -1;
1233         x = NULL;
1234     } else {
1235         i = 0;
1236         x = sk_X509_value(chain, i);
1237         OPENSSL_assert(x != NULL);
1238         if ((ext = x->rfc3779_addr) == NULL)
1239             goto done;
1240     }
1241     if (!v3_addr_is_canonical(ext))
1242         validation_err(X509_V_ERR_INVALID_EXTENSION);
1243     (void) sk_IPAddressFamily_set_cmp_func(ext, IPAddressFamily_cmp);
1244     if ((child = sk_IPAddressFamily_dup(ext)) == NULL) {
1245         X509V3err(X509V3_F_V3_ADDR_VALIDATE_PATH_INTERNAL, ERR_R_MALLOC_FAILURE);
1246         ret = 0;
1247         goto done;
1248     }

```

```

1250     /*
1251      * Now walk up the chain. No cert may list resources that its
1252      * parent doesn't list.
1253      */
1254     for (i++; i < sk_X509_num(chain); i++) {
1255         x = sk_X509_value(chain, i);
1256         OPENSSL_assert(x != NULL);
1257         if (!v3_addr_is_canonical(x->rfc3779_addr))
1258             validation_err(X509_V_ERR_INVALID_EXTENSION);
1259         if (x->rfc3779_addr == NULL) {
1260             for (j = 0; j < sk_IPAddressFamily_num(child); j++) {
1261                 IPAddressFamily *fc = sk_IPAddressFamily_value(child, j);
1262                 if (fc->ipAddressChoice->type != IPAddressChoice_inherit) {
1263                     validation_err(X509_V_ERR_UNNESTED_RESOURCE);
1264                     break;
1265                 }
1266             }
1267             continue;
1268         }
1269         (void) sk_IPAddressFamily_set_cmp_func(x->rfc3779_addr, IPAddressFamily_cmp);
1270         for (j = 0; j < sk_IPAddressFamily_num(child); j++) {
1271             IPAddressFamily *fc = sk_IPAddressFamily_value(child, j);
1272             int k = sk_IPAddressFamily_find(x->rfc3779_addr, fc);
1273             IPAddressFamily *fp = sk_IPAddressFamily_value(x->rfc3779_addr, k);
1274             if (fp == NULL) {
1275                 if (fc->ipAddressChoice->type == IPAddressChoice_addressesOrRanges) {
1276                     validation_err(X509_V_ERR_UNNESTED_RESOURCE);
1277                     break;
1278                 }
1279                 continue;
1280             }
1281             if (fp->ipAddressChoice->type == IPAddressChoice_addressesOrRanges) {
1282                 if (fc->ipAddressChoice->type == IPAddressChoice_inherit ||
1283                     addr_contains(fp->ipAddressChoice->u.addressesOrRanges,
1284                                fc->ipAddressChoice->u.addressesOrRanges,
1285                                length_from_afi(v3_addr_get_afi(fc))))
1286                     sk_IPAddressFamily_set(child, j, fp);
1287             } else
1288                 validation_err(X509_V_ERR_UNNESTED_RESOURCE);
1289         }
1290     }
1291 }

1293 /*
1294  * Trust anchor can't inherit.
1295  */
1296 OPENSSL_assert(x != NULL);
1297 if (x->rfc3779_addr != NULL) {
1298     for (j = 0; j < sk_IPAddressFamily_num(x->rfc3779_addr); j++) {
1299         IPAddressFamily *fp = sk_IPAddressFamily_value(x->rfc3779_addr, j);
1300         if (fp->ipAddressChoice->type == IPAddressChoice_inherit &&
1301             sk_IPAddressFamily_find(child, fp) >= 0)
1302             validation_err(X509_V_ERR_UNNESTED_RESOURCE);
1303     }
1304 }

1306 done:
1307     sk_IPAddressFamily_free(child);
1308     return ret;
1309 }

1311 #undef validation_err

1313 /*
1314  * RFC 3779 2.3 path validation -- called from X509_verify_cert().
1315  */

```

```
1316 int v3_addr_validate_path(X509_STORE_CTX *ctx)
1317 {
1318     return v3_addr_validate_path_internal(ctx, ctx->chain, NULL);
1319 }

1321 /*
1322  * RFC 3779 2.3 path validation of an extension.
1323  * Test whether chain covers extension.
1324  */
1325 int v3_addr_validate_resource_set(STACK_OF(X509) *chain,
1326                                   IPAddrBlocks *ext,
1327                                   int allow_inheritance)
1328 {
1329     if (ext == NULL)
1330         return 1;
1331     if (chain == NULL || sk_X509_num(chain) == 0)
1332         return 0;
1333     if (!allow_inheritance && v3_addr_inherits(ext))
1334         return 0;
1335     return v3_addr_validate_path_internal(NULL, chain, ext);
1336 }

1338 #endif /* OPENSSE_NO_RFC3779 */
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_akey.c

1

```
*****
6531 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_akey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_akey.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_akey.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/x509v3.h>
65
66 static STACK_OF(CONF_VALUE) *i2v_AUTHORITY_KEYID(X509V3_EXT_METHOD *method,
67  * AUTHORITY_KEYID *akeyid, STACK_OF(CONF_VALUE) *extlist);
68 static AUTHORITY_KEYID *v2i_AUTHORITY_KEYID(X509V3_EXT_METHOD *method,
69  * X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *values);
70
71 const X509V3_EXT_METHOD v3_akey_id =
72 {
73     NID_authority_key_identifier,
74     X509V3_EXT_MULTILINE, ASN1_ITEM_ref(AUTHORITY_KEYID),
75     0,0,0,0,
76     0,0,
77     (X509V3_EXT_I2V)i2v_AUTHORITY_KEYID,
78     (X509V3_EXT_V2I)v2i_AUTHORITY_KEYID,
79     0,0,
80     NULL
81 };
82
83 static STACK_OF(CONF_VALUE) *i2v_AUTHORITY_KEYID(X509V3_EXT_METHOD *method,
84  * AUTHORITY_KEYID *akeyid, STACK_OF(CONF_VALUE) *extlist)
85 {
86     char *tmp;
87     if(akeyid->keyid) {
88         tmp = hex_to_string(akeyid->keyid->data, akeyid->keyid->length);
89         X509V3_add_value("keyid", tmp, &extlist);
90         OPENSSL_free(tmp);
91     }
92     if(akeyid->issuer)
93         extlist = i2v_GENERAL_NAMES(NULL, akeyid->issuer, extlist);
94     if(akeyid->serial) {
95         tmp = hex_to_string(akeyid->serial->data,
96  * akeyid->serial->length);
97         X509V3_add_value("serial", tmp, &extlist);
98         OPENSSL_free(tmp);
99     }
100     return extlist;
101 }
102
103 /* Currently two options:
104  * keyid: use the issuers subject keyid, the value 'always' means its is
105  * an error if the issuer certificate doesn't have a key id.
106  * issuer: use the issuers cert issuer and serial number. The default is
107  * to only use this if keyid is not present. With the option 'always'
108  * this is always included.
109  */
110
111 static AUTHORITY_KEYID *v2i_AUTHORITY_KEYID(X509V3_EXT_METHOD *method,
112  * X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *values)
113 {
114     char keyid=0, issuer=0;
115     int i;
116     CONF_VALUE *cnf;
117     ASN1_OCTET_STRING *ikeyid = NULL;
118     X509_NAME *isname = NULL;
119     GENERAL_NAMES *gens = NULL;
120     GENERAL_NAME *gen = NULL;
121     ASN1_INTEGER *serial = NULL;
122     X509_EXTENSION *ext;
123     X509 *cert;
124     AUTHORITY_KEYID *akeyid;
125
126     for(i = 0; i < sk_CONF_VALUE_num(values); i++)
127     {
```

```

128     cnf = sk_CONF_VALUE_value(values, i);
129     if(!strcmp(cnf->name, "keyid"))
130     {
131         keyid = 1;
132         if(cnf->value && !strcmp(cnf->value, "always"))
133             keyid = 2;
134     }
135     else if(!strcmp(cnf->name, "issuer"))
136     {
137         issuer = 1;
138         if(cnf->value && !strcmp(cnf->value, "always"))
139             issuer = 2;
140     }
141     else
142     {
143         X509V3err(X509V3_F_V2I_AUTHORITY_KEYID, X509V3_R_UNKNOWN_
144         ERR_add_error_data(2, "name=", cnf->name);
145         return NULL;
146     }
147 }

149 if(!ctx || !ctx->issuer_cert)
150 {
151     if(ctx && (ctx->flags==CTX_TEST))
152         return AUTHORITY_KEYID_new();
153     X509V3err(X509V3_F_V2I_AUTHORITY_KEYID, X509V3_R_NO_ISSUER_CERTIF
154     return NULL;
155 }

157 cert = ctx->issuer_cert;

159 if(keyid)
160 {
161     i = X509_get_ext_by_NID(cert, NID_subject_key_identifier, -1);
162     if((i >= 0) && (ext = X509_get_ext(cert, i)))
163         ikeyid = X509V3_EXT_d2i(ext);
164     if(keyid==2 && !ikeyid)
165     {
166         X509V3err(X509V3_F_V2I_AUTHORITY_KEYID, X509V3_R_UNABLE_T
167         return NULL;
168     }
169 }

171 if((issuer && !ikeyid) || (issuer == 2))
172 {
173     isname = X509_NAME_dup(X509_get_issuer_name(cert));
174     serial = M_ASN1_INTEGER_dup(X509_get_serialNumber(cert));
175     if(!isname || !serial)
176     {
177         X509V3err(X509V3_F_V2I_AUTHORITY_KEYID, X509V3_R_UNABLE_T
178         goto err;
179     }
180 }

182 if(!(akeyid = AUTHORITY_KEYID_new())) goto err;

184 if(isname)
185 {
186     if(!(gens = sk_GENERAL_NAME_new_null()))
187         || !(gen = GENERAL_NAME_new())
188         || !sk_GENERAL_NAME_push(gens, gen)
189     {
190         X509V3err(X509V3_F_V2I_AUTHORITY_KEYID, ERR_R_MALLOC_FAIL
191         goto err;
192     }
193     gen->type = GEN_DIRNAME;

```

```

194         gen->d.dirn = isname;
195     }

197     akeyid->issuer = gens;
198     akeyid->serial = serial;
199     akeyid->keyid = ikeyid;

201     return akeyid;

203 err:
204     X509_NAME_free(isname);
205     M_ASN1_INTEGER_free(serial);
206     M_ASN1_OCTET_STRING_free(ikeyid);
207     return NULL;
208 }

```


new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_akeya.c

1

```
*****
3189 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_akeya.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_akey_asn1.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
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52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_akeya.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/x509v3.h>

66 ASN1_SEQUENCE(AUTHORITY_KEYID) = {
67     ASN1_IMP_OPT(AUTHORITY_KEYID, keyid, ASN1_OCTET_STRING, 0),
68     ASN1_IMP_SEQUENCE_OF_OPT(AUTHORITY_KEYID, issuer, GENERAL_NAME, 1),
69     ASN1_IMP_OPT(AUTHORITY_KEYID, serial, ASN1_INTEGER, 2)
70 } ASN1_SEQUENCE_END(AUTHORITY_KEYID)

72 IMPLEMENT_ASN1_FUNCTIONS(AUTHORITY_KEYID)
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_alt.c

1

```
*****
15706 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_alt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_alt.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_alt.c

2

```
62 #include <openssl/x509v3.h>

64 static GENERAL_NAMES *v2i_subject_alt(X509V3_EXT_METHOD *method, X509V3_CTX *ctx
65 static GENERAL_NAMES *v2i_issuer_alt(X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
66 static int copy_email(X509V3_CTX *ctx, GENERAL_NAMES *gens, int move_p);
67 static int copy_issuer(X509V3_CTX *ctx, GENERAL_NAMES *gens);
68 static int do_othername(GENERAL_NAME *gen, char *value, X509V3_CTX *ctx);
69 static int do_dirname(GENERAL_NAME *gen, char *value, X509V3_CTX *ctx);

71 const X509V3_EXT_METHOD v3_alt[] = {
72 { NID_subject_alt_name, 0, ASN1_ITEM_ref(GENERAL_NAMES),
73 0,0,0,0,
74 0,0,
75 (X509V3_EXT_I2V)i2v_GENERAL_NAMES,
76 (X509V3_EXT_V2I)v2i_subject_alt,
77 NULL, NULL, NULL},

79 { NID_issuer_alt_name, 0, ASN1_ITEM_ref(GENERAL_NAMES),
80 0,0,0,0,
81 0,0,
82 (X509V3_EXT_I2V)i2v_GENERAL_NAMES,
83 (X509V3_EXT_V2I)v2i_issuer_alt,
84 NULL, NULL, NULL},

86 { NID_certificate_issuer, 0, ASN1_ITEM_ref(GENERAL_NAMES),
87 0,0,0,0,
88 0,0,
89 (X509V3_EXT_I2V)i2v_GENERAL_NAMES,
90 NULL, NULL, NULL, NULL},
91 };

93 STACK_OF(CONF_VALUE) *i2v_GENERAL_NAMES(X509V3_EXT_METHOD *method,
94 GENERAL_NAMES *gens, STACK_OF(CONF_VALUE) *ret)
95 {
96     int i;
97     GENERAL_NAME *gen;
98     for(i = 0; i < sk_GENERAL_NAME_num(gens); i++) {
99         gen = sk_GENERAL_NAME_value(gens, i);
100         ret = i2v_GENERAL_NAME(method, gen, ret);
101     }
102     if(!ret) return sk_CONF_VALUE_new_null();
103     return ret;
104 }

106 STACK_OF(CONF_VALUE) *i2v_GENERAL_NAME(X509V3_EXT_METHOD *method,
107 GENERAL_NAME *gen, STACK_OF(CONF_VALUE) *ret)
108 {
109     unsigned char *p;
110     char oline[256], htmp[5];
111     int i;
112     switch (gen->type)
113     {
114         case GEN_OTHERNAME:
115             X509V3_add_value("othername", "<unsupported>", &ret);
116             break;

118         case GEN_X400:
119             X509V3_add_value("X400Name", "<unsupported>", &ret);
120             break;

122         case GEN_EDIPARTY:
123             X509V3_add_value("EdiPartyName", "<unsupported>", &ret);
124             break;

126         case GEN_EMAIL:
127             X509V3_add_value_uchar("email", gen->d.ia5->data, &ret);
```

```

128         break;

130     case GEN_DNS:
131         X509V3_add_value_uchar("DNS",gen->d.ia5->data, &ret);
132         break;

134     case GEN_URI:
135         X509V3_add_value_uchar("URI",gen->d.ia5->data, &ret);
136         break;

138     case GEN_DIRNAME:
139         X509_NAME_oneline(gen->d.dirn, oline, 256);
140         X509V3_add_value("DirName",oline, &ret);
141         break;

143     case GEN_IPADD:
144         p = gen->d.ip->data;
145         if(gen->d.ip->length == 4)
146             BIO_snprintf(oline, sizeof oline,
147                          "%d.%d.%d.%d", p[0], p[1], p[2], p[3]);
148         else if(gen->d.ip->length == 16)
149             {
150                 oline[0] = 0;
151                 for (i = 0; i < 8; i++)
152                     {
153                         BIO_snprintf(htmp, sizeof htmp,
154                                      "%X", p[i] << 8 | p[i+1]);
155                         p += 2;
156                         strcat(oline, htmp);
157                         if (i != 7)
158                             strcat(oline, ":");
159                     }
160             }
161         else
162             {
163                 X509V3_add_value("IP Address","<invalid>", &ret);
164                 break;
165             }
166         X509V3_add_value("IP Address",oline, &ret);
167         break;

169     case GEN_RID:
170         i2t_ASN1_OBJECT(oline, 256, gen->d.rid);
171         X509V3_add_value("Registered ID",oline, &ret);
172         break;
173     }
174     return ret;
175 }

177 int GENERAL_NAME_print(BIO *out, GENERAL_NAME *gen)
178 {
179     unsigned char *p;
180     int i;
181     switch (gen->type)
182     {
183         case GEN_OTHERNAME:
184             BIO_printf(out, "othername:<unsupported>");
185             break;

187         case GEN_X400:
188             BIO_printf(out, "X400Name:<unsupported>");
189             break;

191         case GEN_EDIPARTY:
192             /* Maybe fix this: it is supported now */
193             BIO_printf(out, "EdiPartyName:<unsupported>");

```

```

194         break;

196     case GEN_EMAIL:
197         BIO_printf(out, "email:%s",gen->d.ia5->data);
198         break;

200     case GEN_DNS:
201         BIO_printf(out, "DNS:%s",gen->d.ia5->data);
202         break;

204     case GEN_URI:
205         BIO_printf(out, "URI:%s",gen->d.ia5->data);
206         break;

208     case GEN_DIRNAME:
209         BIO_printf(out, "DirName: ");
210         X509_NAME_print_ex(out, gen->d.dirn, 0, XN_FLAG_ONELINE);
211         break;

213     case GEN_IPADD:
214         p = gen->d.ip->data;
215         if(gen->d.ip->length == 4)
216             BIO_printf(out, "IP Address:%d.%d.%d.%d",
217                        p[0], p[1], p[2], p[3]);
218         else if(gen->d.ip->length == 16)
219             {
220                 BIO_printf(out, "IP Address");
221                 for (i = 0; i < 8; i++)
222                     {
223                         BIO_printf(out, ":%X", p[i] << 8 | p[i+1]);
224                         p += 2;
225                     }
226                 BIO_puts(out, "\n");
227             }
228         else
229             {
230                 BIO_printf(out, "IP Address:<invalid>");
231                 break;
232             }
233         break;

235     case GEN_RID:
236         BIO_printf(out, "Registered ID");
237         i2a_ASN1_OBJECT(out, gen->d.rid);
238         break;
239     }
240     return 1;
241 }

243 static GENERAL_NAMES *v2i_issuer_alt(X509V3_EXT_METHOD *method,
244                                       X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
245 {
246     GENERAL_NAMES *gens = NULL;
247     CONF_VALUE *cnf;
248     int i;
249     if(!((gens = sk_GENERAL_NAME_new_null())) {
250         X509V3err(X509V3_F_V2I_ISSUER_ALT,ERR_R_MALLOC_FAILURE);
251         return NULL;
252     }
253     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
254         cnf = sk_CONF_VALUE_value(nval, i);
255         if(!name_cmp(cnf->name, "issuer") && cnf->value &&
256             !strcmp(cnf->value, "copy")) {
257             if(!copy_issuer(ctx, gens)) goto err;
258         } else {
259             GENERAL_NAME *gen;

```

```

260         if(!(gen = v2i_GENERAL_NAME(method, ctx, cnf)))
261             goto err;
262         sk_GENERAL_NAME_push(gens, gen);
263     }
264 }
265 return gens;
266 err:
267 sk_GENERAL_NAME_pop_free(gens, GENERAL_NAME_free);
268 return NULL;
269 }

271 /* Append subject altname of issuer to issuer alt name of subject */

273 static int copy_issuer(X509V3_CTX *ctx, GENERAL_NAMES *gens)
274 {
275     GENERAL_NAMES *ialt;
276     GENERAL_NAME *gen;
277     X509_EXTENSION *ext;
278     int i;
279     if(ctx && (ctx->flags == CTX_TEST)) return 1;
280     if(!ctx || !ctx->issuer_cert) {
281         X509V3err(X509V3_F_COPY_ISSUER, X509V3_R_NO_ISSUER_DETAILS);
282         goto err;
283     }
284     i = X509_get_ext_by_NID(ctx->issuer_cert, NID_subject_alt_name, -1);
285     if(i < 0) return 1;
286     if(!(ext = X509_get_ext(ctx->issuer_cert, i)) ||
287        !(ialt = X509V3_EXT_d2i(ext))) {
288         X509V3err(X509V3_F_COPY_ISSUER, X509V3_R_ISSUER_DECODE_ERROR);
289         goto err;
290     }

292     for(i = 0; i < sk_GENERAL_NAME_num(ialt); i++) {
293         gen = sk_GENERAL_NAME_value(ialt, i);
294         if(!sk_GENERAL_NAME_push(gens, gen)) {
295             X509V3err(X509V3_F_COPY_ISSUER, ERR_R_MALLOC_FAILURE);
296             goto err;
297         }
298     }
299     sk_GENERAL_NAME_free(ialt);

301     return 1;
302 err:
303     return 0;
304 }

306 }

308 static GENERAL_NAMES *v2i_subject_alt(X509V3_EXT_METHOD *method,
309                                       X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
310 {
311     GENERAL_NAMES *gens = NULL;
312     CONF_VALUE *cnf;
313     int i;
314     if(!(gens = sk_GENERAL_NAME_new_null())) {
315         X509V3err(X509V3_F_V2I_SUBJECT_ALT, ERR_R_MALLOC_FAILURE);
316         return NULL;
317     }
318     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
319         cnf = sk_CONF_VALUE_value(nval, i);
320         if(!name_cmp(cnf->name, "email") && cnf->value &&
321            !strcmp(cnf->value, "copy")) {
322             if(!copy_email(ctx, gens, 0)) goto err;
323         } else if(!name_cmp(cnf->name, "email") && cnf->value &&
324                    !strcmp(cnf->value, "move")) {
325             if(!copy_email(ctx, gens, 1)) goto err;

```

```

326     } else {
327         GENERAL_NAME *gen;
328         if(!(gen = v2i_GENERAL_NAME(method, ctx, cnf)))
329             goto err;
330         sk_GENERAL_NAME_push(gens, gen);
331     }
332 }
333 return gens;
334 err:
335 sk_GENERAL_NAME_pop_free(gens, GENERAL_NAME_free);
336 return NULL;
337 }

339 /* Copy any email addresses in a certificate or request to
340  * GENERAL_NAMES
341  */

343 static int copy_email(X509V3_CTX *ctx, GENERAL_NAMES *gens, int move_p)
344 {
345     X509_NAME *nm;
346     ASN1_IA5STRING *email = NULL;
347     X509_NAME_ENTRY *ne;
348     GENERAL_NAME *gen = NULL;
349     int i;
350     if(ctx != NULL && ctx->flags == CTX_TEST)
351         return 1;
352     if(!ctx || !ctx->subject_cert && !ctx->subject_req) {
353         X509V3err(X509V3_F_COPY_EMAIL, X509V3_R_NO_SUBJECT_DETAILS);
354         goto err;
355     }
356     /* Find the subject name */
357     if(ctx->subject_cert) nm = X509_get_subject_name(ctx->subject_cert);
358     else nm = X509_REQ_get_subject_name(ctx->subject_req);

360     /* Now add any email address(es) to STACK */
361     i = -1;
362     while((i = X509_NAME_get_index_by_NID(nm,
363                                           NID_pkcs9_emailAddress, i)) >= 0) {
364         ne = X509_NAME_get_entry(nm, i);
365         email = M_ASN1_IA5STRING_dup(X509_NAME_ENTRY_get_data(ne));
366         if(move_p)
367             {
368                 X509_NAME_delete_entry(nm, i);
369                 X509_NAME_ENTRY_free(ne);
370                 i--;
371             }
372         if(!email || !(gen = GENERAL_NAME_new())) {
373             X509V3err(X509V3_F_COPY_EMAIL, ERR_R_MALLOC_FAILURE);
374             goto err;
375         }
376         gen->d.ia5 = email;
377         email = NULL;
378         gen->type = GEN_EMAIL;
379         if(!sk_GENERAL_NAME_push(gens, gen)) {
380             X509V3err(X509V3_F_COPY_EMAIL, ERR_R_MALLOC_FAILURE);
381             goto err;
382         }
383         gen = NULL;
384     }

386     return 1;
387 err:
388     GENERAL_NAME_free(gen);
389     M_ASN1_IA5STRING_free(email);

```

```

392     return 0;
393 }
394 }

396 GENERAL_NAMES *v2i_GENERAL_NAMES(const X509V3_EXT_METHOD *method,
397                                   X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
398 {
399     GENERAL_NAME *gen;
400     GENERAL_NAMES *gens = NULL;
401     CONF_VALUE *cnf;
402     int i;
403     if(!(gens = sk_GENERAL_NAME_new_null())) {
404         X509V3err(X509V3_F_V2I_GENERAL_NAMES, ERR_R_MALLOC_FAILURE);
405         return NULL;
406     }
407     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
408         cnf = sk_CONF_VALUE_value(nval, i);
409         if(!(gen = v2i_GENERAL_NAME(method, ctx, cnf))) goto err;
410         sk_GENERAL_NAME_push(gens, gen);
411     }
412     return gens;
413 err:
414     sk_GENERAL_NAME_pop_free(gens, GENERAL_NAME_free);
415     return NULL;
416 }

418 GENERAL_NAME *v2i_GENERAL_NAME(const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
419                                CONF_VALUE *cnf)
420 {
421     return v2i_GENERAL_NAME_ex(NULL, method, ctx, cnf, 0);
422 }

424 GENERAL_NAME *a2i_GENERAL_NAME(GENERAL_NAME *out,
425                                const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
426                                int gen_type, char *value, int is_nc)
427 {
428     char is_string = 0;
429     GENERAL_NAME *gen = NULL;

431     if(!value)
432     {
433         X509V3err(X509V3_F_A2I_GENERAL_NAME, X509V3_R_MISSING_VALUE);
434         return NULL;
435     }

437     if (out)
438         gen = out;
439     else
440     {
441         gen = GENERAL_NAME_new();
442         if(gen == NULL)
443         {
444             X509V3err(X509V3_F_A2I_GENERAL_NAME, ERR_R_MALLOC_FAILURE);
445             return NULL;
446         }
447     }

449     switch (gen_type)
450     {
451     case GEN_URI:
452     case GEN_EMAIL:
453     case GEN_DNS:
454         is_string = 1;
455         break;
456     case GEN_RID:

```

```

458     {
459         ASN1_OBJECT *obj;
460         if(!(obj = OBJ_txt2obj(value, 0)))
461         {
462             X509V3err(X509V3_F_A2I_GENERAL_NAME, X509V3_R_BAD_OBJECT);
463             ERR_add_error_data(2, "value=", value);
464             goto err;
465         }
466         gen->d.rid = obj;
467     }
468     break;

470     case GEN_IPADD:
471     if (is_nc)
472         gen->d.ip = a2i_IPADDRESS_NC(value);
473     else
474         gen->d.ip = a2i_IPADDRESS(value);
475     if(gen->d.ip == NULL)
476     {
477         X509V3err(X509V3_F_A2I_GENERAL_NAME, X509V3_R_BAD_IP_ADDR);
478         ERR_add_error_data(2, "value=", value);
479         goto err;
480     }
481     break;

483     case GEN_DIRNAME:
484     if (!do_dirname(gen, value, ctx))
485     {
486         X509V3err(X509V3_F_A2I_GENERAL_NAME, X509V3_R_DIRNAME_ERR);
487         goto err;
488     }
489     break;

491     case GEN_OTHERNAME:
492     if (!do_othername(gen, value, ctx))
493     {
494         X509V3err(X509V3_F_A2I_GENERAL_NAME, X509V3_R_OTHERNAME_E);
495         goto err;
496     }
497     break;
498     default:
499         X509V3err(X509V3_F_A2I_GENERAL_NAME, X509V3_R_UNSUPPORTED_TYPE);
500         goto err;
501     }

503     if(is_string)
504     {
505         if(!(gen->d.ia5 = M_ASN1_IA5STRING_new()) ||
506            !ASN1_STRING_set(gen->d.ia5, (unsigned char*)value,
507                             strlen(value)))
508         {
509             X509V3err(X509V3_F_A2I_GENERAL_NAME, ERR_R_MALLOC_FAILURE);
510             goto err;
511         }
512     }

514     gen->type = gen_type;
516     return gen;

518     err:
519     if (!out)
520         GENERAL_NAME_free(gen);
521     return NULL;
522 }

```

```

524 GENERAL_NAME *v2i_GENERAL_NAME_ex(GENERAL_NAME *out,
525                                     const X509V3_EXT_METHOD *method,
526                                     X509V3_CTX *ctx, CONF_VALUE *cnf, int is_nc)
527 {
528     int type;
529
530     char *name, *value;
531
532     name = cnf->name;
533     value = cnf->value;
534
535     if(!value)
536     {
537         X509V3err(X509V3_F_V2I_GENERAL_NAME_EX, X509V3_R_MISSING_VALUE);
538         return NULL;
539     }
540
541     if(!name_cmp(name, "email"))
542         type = GEN_EMAIL;
543     else if(!name_cmp(name, "URI"))
544         type = GEN_URI;
545     else if(!name_cmp(name, "DNS"))
546         type = GEN_DNS;
547     else if(!name_cmp(name, "RID"))
548         type = GEN_RID;
549     else if(!name_cmp(name, "IP"))
550         type = GEN_IPADD;
551     else if(!name_cmp(name, "dirName"))
552         type = GEN_DIRNAME;
553     else if(!name_cmp(name, "otherName"))
554         type = GEN_OTHERNAME;
555     else
556     {
557         X509V3err(X509V3_F_V2I_GENERAL_NAME_EX, X509V3_R_UNSUPPORTED_OPTI
558         ERR_add_error_data(2, "name=", name);
559         return NULL;
560     }
561
562     return a2i_GENERAL_NAME(out, method, ctx, type, value, is_nc);
563 }
564
565 static int do_othername(GENERAL_NAME *gen, char *value, X509V3_CTX *ctx)
566 {
567     char *objtmp = NULL, *p;
568     int objlen;
569     if (!(p = strchr(value, ';')))
570         return 0;
571     if (!(gen->d.otherName = OTHERNAME_new()))
572         return 0;
573     /* Free this up because we will overwrite it.
574      * no need to free type_id because it is static
575      */
576     ASN1_TYPE_free(gen->d.otherName->value);
577     if (!(gen->d.otherName->value = ASN1_generate_v3(p + 1, ctx)))
578         return 0;
579     objlen = p - value;
580     objtmp = OPENSSL_malloc(objlen + 1);
581     strncpy(objtmp, value, objlen);
582     objtmp[objlen] = 0;
583     gen->d.otherName->type_id = OBJ_txt2obj(objtmp, 0);
584     OPENSSL_free(objtmp);
585     if (!gen->d.otherName->type_id)
586         return 0;
587     return 1;
588 }

```

```

591 static int do_dirname(GENERAL_NAME *gen, char *value, X509V3_CTX *ctx)
592 {
593     int ret;
594     STACK_OF(CONF_VALUE) *sk;
595     X509_NAME *nm;
596     if (!(nm = X509_NAME_new()))
597         return 0;
598     sk = X509V3_get_section(ctx, value);
599     if (!sk)
600     {
601         X509V3err(X509V3_F_DO_DIRNAME, X509V3_R_SECTION_NOT_FOUND);
602         ERR_add_error_data(2, "section=", value);
603         X509_NAME_free(nm);
604         return 0;
605     }
606     /* FIXME: should allow other character types... */
607     ret = X509V3_NAME_from_section(nm, sk, MBSTRING_ASC);
608     if (!ret)
609         X509_NAME_free(nm);
610     gen->d.dirn = nm;
611     X509V3_section_free(ctx, sk);
612
613     return ret;
614 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_asid.c

1

```
*****
24159 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_asid.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /*
2  * Contributed to the OpenSSL Project by the American Registry for
3  * Internet Numbers ("ARIN").
4  */
5 /* =====
6  * Copyright (c) 2006 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
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43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */

58 /*
59  * Implementation of RFC 3779 section 3.2.
60  */
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_asid.c

2

```
62 #include <stdio.h>
63 #include <string.h>
64 #include "cryptlib.h"
65 #include <openssl/conf.h>
66 #include <openssl/asn1.h>
67 #include <openssl/asn1t.h>
68 #include <openssl/x509v3.h>
69 #include <openssl/x509.h>
70 #include <openssl/bn.h>

72 #ifndef OPENSSL_NO_RFC3779

74 /*
75  * OpenSSL ASN.1 template translation of RFC 3779 3.2.3.
76  */

78 ASN1_SEQUENCE(ASRange) = {
79     ASN1_SIMPLE(ASRange, min, ASN1_INTEGER),
80     ASN1_SIMPLE(ASRange, max, ASN1_INTEGER)
81 } ASN1_SEQUENCE_END(ASRange)

83 ASN1_CHOICE(ASIdOrRange) = {
84     ASN1_SIMPLE(ASIdOrRange, u.id, ASN1_INTEGER),
85     ASN1_SIMPLE(ASIdOrRange, u.range, ASRange)
86 } ASN1_CHOICE_END(ASIdOrRange)

88 ASN1_CHOICE(ASIdentifierChoice) = {
89     ASN1_SIMPLE(ASIdentifierChoice, u.inherit, ASN1_NULL),
90     ASN1_SEQUENCE_OF(ASIdentifierChoice, u.asIdsOrRanges, ASIdOrRange)
91 } ASN1_CHOICE_END(ASIdentifierChoice)

93 ASN1_SEQUENCE(ASIdentifiers) = {
94     ASN1_EXP_OPT(ASIdentifiers, asnum, ASIdentifierChoice, 0),
95     ASN1_EXP_OPT(ASIdentifiers, rdi, ASIdentifierChoice, 1)
96 } ASN1_SEQUENCE_END(ASIdentifiers)

98 IMPLEMENT_ASN1_FUNCTIONS(ASRange)
99 IMPLEMENT_ASN1_FUNCTIONS(ASIdOrRange)
100 IMPLEMENT_ASN1_FUNCTIONS(ASIdentifierChoice)
101 IMPLEMENT_ASN1_FUNCTIONS(ASIdentifiers)

103 /*
104  * i2r method for an ASIdentifierChoice.
105  */
106 static int i2r_ASIdentifierChoice(BIO *out,
107                                   ASIdentifierChoice *choice,
108                                   int indent,
109                                   const char *msg)
110 {
111     int i;
112     char *s;
113     if (choice == NULL)
114         return 1;
115     BIO_printf(out, "%*s%s:\n", indent, "", msg);
116     switch (choice->type) {
117     case ASIdentifierChoice_inherit:
118         BIO_printf(out, "%*sinherit\n", indent + 2, "");
119         break;
120     case ASIdentifierChoice_asIdsOrRanges:
121         for (i = 0; i < sk_ASIdOrRange_num(choice->u.asIdsOrRanges); i++) {
122             ASIdOrRange *aor = sk_ASIdOrRange_value(choice->u.asIdsOrRanges, i);
123             switch (aor->type) {
124             case ASIdOrRange_id:
125                 if ((s = i2s_ASN1_INTEGER(NULL, aor->u.id)) == NULL)
126                     return 0;
127                 BIO_printf(out, "%*s%s\n", indent + 2, "", s);
```

```

128     OPENSSL_free(s);
129     break;
130 case ASIdOrRange_range:
131     if ((s = i2s_ASN1_INTEGER(NULL, aor->u.range->min)) == NULL)
132         return 0;
133     BIO_printf(out, "%s%-", indent + 2, "", s);
134     OPENSSL_free(s);
135     if ((s = i2s_ASN1_INTEGER(NULL, aor->u.range->max)) == NULL)
136         return 0;
137     BIO_printf(out, "%s\n", s);
138     OPENSSL_free(s);
139     break;
140 default:
141     return 0;
142 }
143 }
144 break;
145 default:
146     return 0;
147 }
148 return 1;
149 }

151 /*
152  * i2r method for an ASIdentifier extension.
153  */
154 static int i2r_ASIdentifiers(const X509V3_EXT_METHOD *method,
155                             void *ext,
156                             BIO *out,
157                             int indent)
158 {
159     ASIdentifiers *asid = ext;
160     return (i2r_ASIdentifierChoice(out, asid->asnum, indent,
161                                   "Autonomous System Numbers") &&
162           i2r_ASIdentifierChoice(out, asid->rds, indent,
163                                   "Routing Domain Identifiers"));
164 }

166 /*
167  * Sort comparison function for a sequence of ASIdOrRange elements.
168  */
169 static int ASIdOrRange_cmp(const ASIdOrRange * const *a_,
170                           const ASIdOrRange * const *b_)
171 {
172     const ASIdOrRange *a = *a_, *b = *b_;
173
174     OPENSSL_assert((a->type == ASIdOrRange_id && a->u.id != NULL) ||
175                   (a->type == ASIdOrRange_range && a->u.range != NULL &&
176                    a->u.range->min != NULL && a->u.range->max != NULL));
177
178     OPENSSL_assert((b->type == ASIdOrRange_id && b->u.id != NULL) ||
179                   (b->type == ASIdOrRange_range && b->u.range != NULL &&
180                    b->u.range->min != NULL && b->u.range->max != NULL));
181
182     if (a->type == ASIdOrRange_id && b->type == ASIdOrRange_id)
183         return ASN1_INTEGER_cmp(a->u.id, b->u.id);
184
185     if (a->type == ASIdOrRange_range && b->type == ASIdOrRange_range) {
186         int r = ASN1_INTEGER_cmp(a->u.range->min, b->u.range->min);
187         return r != 0 ? r : ASN1_INTEGER_cmp(a->u.range->max, b->u.range->max);
188     }
189
190     if (a->type == ASIdOrRange_id)
191         return ASN1_INTEGER_cmp(a->u.id, b->u.range->min);
192     else
193         return ASN1_INTEGER_cmp(a->u.range->min, b->u.id);

```

```

194 }

196 /*
197  * Add an inherit element.
198  */
199 int v3_asid_add_inherit(ASIdentifiers *asid, int which)
200 {
201     ASIdentifierChoice **choice;
202     if (asid == NULL)
203         return 0;
204     switch (which) {
205     case V3_ASID_ASNUM:
206         choice = &asid->asnum;
207         break;
208     case V3_ASID_RDI:
209         choice = &asid->rds;
210         break;
211     default:
212         return 0;
213     }
214     if (*choice == NULL) {
215         if ((*choice = ASIdentifierChoice_new()) == NULL)
216             return 0;
217         OPENSSL_assert((*choice)->u.inherit == NULL);
218         if (((*choice)->u.inherit = ASN1_NULL_new()) == NULL)
219             return 0;
220         (*choice)->type = ASIdentifierChoice_inherit;
221     }
222     return (*choice)->type == ASIdentifierChoice_inherit;
223 }

225 /*
226  * Add an ID or range to an ASIdentifierChoice.
227  */
228 int v3_asid_add_id_or_range(ASIdentifiers *asid,
229                             int which,
230                             ASN1_INTEGER *min,
231                             ASN1_INTEGER *max)
232 {
233     ASIdentifierChoice **choice;
234     ASIdOrRange *aor;
235     if (asid == NULL)
236         return 0;
237     switch (which) {
238     case V3_ASID_ASNUM:
239         choice = &asid->asnum;
240         break;
241     case V3_ASID_RDI:
242         choice = &asid->rds;
243         break;
244     default:
245         return 0;
246     }
247     if (*choice != NULL && (*choice)->type == ASIdentifierChoice_inherit)
248         return 0;
249     if (*choice == NULL) {
250         if ((*choice = ASIdentifierChoice_new()) == NULL)
251             return 0;
252         OPENSSL_assert((*choice)->u.asIdsOrRanges == NULL);
253         (*choice)->u.asIdsOrRanges = sk_ASIdOrRange_new(ASIdOrRange_cmp);
254         if ((*choice)->u.asIdsOrRanges == NULL)
255             return 0;
256         (*choice)->type = ASIdentifierChoice_asIdsOrRanges;
257     }
258     if ((aor = ASIdOrRange_new()) == NULL)
259         return 0;

```



```

260 if (max == NULL) {
261     aor->type = ASIdOrRange_id;
262     aor->u.id = min;
263 } else {
264     aor->type = ASIdOrRange_range;
265     if ((aor->u.range = ASRange_new()) == NULL)
266         goto err;
267     ASN1_INTEGER_free(aor->u.range->min);
268     aor->u.range->min = min;
269     ASN1_INTEGER_free(aor->u.range->max);
270     aor->u.range->max = max;
271 }
272 if (!(sk_ASIdOrRange_push((*choice)->u.asIdsOrRanges, aor)))
273     goto err;
274 return 1;

276 err:
277 ASIdOrRange_free(aor);
278 return 0;
279 }

281 /*
282  * Extract min and max values from an ASIdOrRange.
283  */
284 static void extract_min_max(ASIdOrRange *aor,
285                             ASN1_INTEGER **min,
286                             ASN1_INTEGER **max)
287 {
288     OPENSSL_assert(aor != NULL && min != NULL && max != NULL);
289     switch (aor->type) {
290     case ASIdOrRange_id:
291         *min = aor->u.id;
292         *max = aor->u.id;
293         return;
294     case ASIdOrRange_range:
295         *min = aor->u.range->min;
296         *max = aor->u.range->max;
297         return;
298     }
299 }

301 /*
302  * Check whether an ASIdentifierChoice is in canonical form.
303  */
304 static int ASIdentifierChoice_is_canonical(ASIdentifierChoice *choice)
305 {
306     ASN1_INTEGER *a_max_plus_one = NULL;
307     BIGNUM *bn = NULL;
308     int i, ret = 0;

310     /*
311      * Empty element or inheritance is canonical.
312      */
313     if (choice == NULL || choice->type == ASIdentifierChoice_inherit)
314         return 1;

316     /*
317      * If not a list, or if empty list, it's broken.
318      */
319     if (choice->type != ASIdentifierChoice_asIdsOrRanges ||
320         sk_ASIdOrRange_num(choice->u.asIdsOrRanges) == 0)
321         return 0;

323     /*
324      * It's a list, check it.
325      */

```

```

326 for (i = 0; i < sk_ASIdOrRange_num(choice->u.asIdsOrRanges) - 1; i++) {
327     ASIdOrRange *a = sk_ASIdOrRange_value(choice->u.asIdsOrRanges, i);
328     ASIdOrRange *b = sk_ASIdOrRange_value(choice->u.asIdsOrRanges, i + 1);
329     ASN1_INTEGER *a_min, *a_max, *b_min, *b_max;

331     extract_min_max(a, &a_min, &a_max);
332     extract_min_max(b, &b_min, &b_max);

334     /*
335      * Punt misordered list, overlapping start, or inverted range.
336      */
337     if (ASN1_INTEGER_cmp(a_min, b_min) >= 0 ||
338         ASN1_INTEGER_cmp(a_min, a_max) > 0 ||
339         ASN1_INTEGER_cmp(b_min, b_max) > 0)
340         goto done;

342     /*
343      * Calculate a_max + 1 to check for adjacency.
344      */
345     if ((bn == NULL && (bn = BN_new()) == NULL) ||
346         ASN1_INTEGER_to_BN(a_max, bn) == NULL ||
347         !BN_add_word(bn, 1) ||
348         (a_max_plus_one = BN_to_ASN1_INTEGER(bn, a_max_plus_one)) == NULL) {
349         X509V3err(X509V3_F_ASIDENTIFIERCHOICE_IS_CANONICAL,
350                 ERR_R_MALLOC_FAILURE);
351         goto done;
352     }
353
354     /*
355      * Punt if adjacent or overlapping.
356      */
357     if (ASN1_INTEGER_cmp(a_max_plus_one, b_min) >= 0)
358         goto done;
359 }

361 /*
362  * Check for inverted range.
363  */
364 i = sk_ASIdOrRange_num(choice->u.asIdsOrRanges) - 1;
365 {
366     ASIdOrRange *a = sk_ASIdOrRange_value(choice->u.asIdsOrRanges, i);
367     ASN1_INTEGER *a_min, *a_max;
368     if (a != NULL && a->type == ASIdOrRange_range) {
369         extract_min_max(a, &a_min, &a_max);
370         if (ASN1_INTEGER_cmp(a_min, a_max) > 0)
371             goto done;
372     }
373 }

375 ret = 1;

377 done:
378 ASN1_INTEGER_free(a_max_plus_one);
379 BN_free(bn);
380 return ret;
381 }

383 /*
384  * Check whether an ASIdentifier extension is in canonical form.
385  */
386 int v3_asid_is_canonical(ASIdentifiers *asid)
387 {
388     return (asid == NULL ||
389             (ASIdentifierChoice_is_canonical(asid->asnum) &&
390              ASIdentifierChoice_is_canonical(asid->rdi)));
391 }

```

```

393 /*
394  * Whack an ASIdentifierChoice into canonical form.
395  */
396 static int ASIdentifierChoice_canonize(ASIdentifierChoice *choice)
397 {
398     ASN1_INTEGER *a_max_plus_one = NULL;
399     BIGNUM *bn = NULL;
400     int i, ret = 0;

402     /*
403      * Nothing to do for empty element or inheritance.
404      */
405     if (choice == NULL || choice->type == ASIdentifierChoice_inherit)
406         return 1;

408     /*
409      * If not a list, or if empty list, it's broken.
410      */
411     if (choice->type != ASIdentifierChoice_asIdsOrRanges ||
412         sk_ASIdOrRange_num(choice->u.asIdsOrRanges) == 0) {
413         X509V3err(X509V3_F_ASIDENTIFIERCHOICE_CANONIZE,
414                  X509V3_R_EXTENSION_VALUE_ERROR);
415         return 0;
416     }

418     /*
419      * We have a non-empty list. Sort it.
420      */
421     sk_ASIdOrRange_sort(choice->u.asIdsOrRanges);

423     /*
424      * Now check for errors and suboptimal encoding, rejecting the
425      * former and fixing the latter.
426      */
427     for (i = 0; i < sk_ASIdOrRange_num(choice->u.asIdsOrRanges) - 1; i++) {
428         ASIdOrRange *a = sk_ASIdOrRange_value(choice->u.asIdsOrRanges, i);
429         ASIdOrRange *b = sk_ASIdOrRange_value(choice->u.asIdsOrRanges, i + 1);
430         ASN1_INTEGER *a_min, *a_max, *b_min, *b_max;

432         extract_min_max(a, &a_min, &a_max);
433         extract_min_max(b, &b_min, &b_max);

435         /*
436          * Make sure we're properly sorted (paranoia).
437          */
438         OPENSSL_assert(ASN1_INTEGER_cmp(a_min, b_min) <= 0);

440         /*
441          * Punt inverted ranges.
442          */
443         if (ASN1_INTEGER_cmp(a_min, a_max) > 0 ||
444             ASN1_INTEGER_cmp(b_min, b_max) > 0)
445             goto done;

447         /*
448          * Check for overlaps.
449          */
450         if (ASN1_INTEGER_cmp(a_max, b_min) >= 0) {
451             X509V3err(X509V3_F_ASIDENTIFIERCHOICE_CANONIZE,
452                      X509V3_R_EXTENSION_VALUE_ERROR);
453             goto done;
454         }

456         /*
457          * Calculate a_max + 1 to check for adjacency.

```

```

458     /*
459     if ((bn == NULL && (bn = BN_new()) == NULL) ||
460         ASN1_INTEGER_to_BN(a_max, bn) == NULL ||
461         !BN_add_word(bn, 1) ||
462         (a_max_plus_one = BN_to_ASN1_INTEGER(bn, a_max_plus_one)) == NULL) {
463         X509V3err(X509V3_F_ASIDENTIFIERCHOICE_CANONIZE, ERR_R_MALLOC_FAILURE);
464         goto done;
465     }

467     /*
468      * If a and b are adjacent, merge them.
469      */
470     if (ASN1_INTEGER_cmp(a_max_plus_one, b_min) == 0) {
471         ASRange *r;
472         switch (a->type) {
473             case ASIdOrRange_id:
474                 if ((r = OPENSSL_malloc(sizeof(ASRange))) == NULL) {
475                     X509V3err(X509V3_F_ASIDENTIFIERCHOICE_CANONIZE,
476                              ERR_R_MALLOC_FAILURE);
477                     goto done;
478                 }
479                 r->min = a_min;
480                 r->max = b_max;
481                 a->type = ASIdOrRange_range;
482                 a->u.range = r;
483                 break;
484             case ASIdOrRange_range:
485                 ASN1_INTEGER_free(a->u.range->max);
486                 a->u.range->max = b_max;
487                 break;
488         }
489         switch (b->type) {
490             case ASIdOrRange_id:
491                 b->u.id = NULL;
492                 break;
493             case ASIdOrRange_range:
494                 b->u.range->max = NULL;
495                 break;
496         }
497         ASIdOrRange_free(b);
498         (void) sk_ASIdOrRange_delete(choice->u.asIdsOrRanges, i + 1);
499         i--;
500         continue;
501     }

502 }

504     /*
505      * Check for final inverted range.
506      */
507     i = sk_ASIdOrRange_num(choice->u.asIdsOrRanges) - 1;
508     {
509         ASIdOrRange *a = sk_ASIdOrRange_value(choice->u.asIdsOrRanges, i);
510         ASN1_INTEGER *a_min, *a_max;
511         if (a != NULL && a->type == ASIdOrRange_range) {
512             extract_min_max(a, &a_min, &a_max);
513             if (ASN1_INTEGER_cmp(a_min, a_max) > 0)
514                 goto done;
515         }
516     }

518     OPENSSL_assert(ASIdentifierChoice_is_canonical(choice)); /* Paranoia */

520     ret = 1;

522 done:
523     ASN1_INTEGER_free(a_max_plus_one);

```

```

524 BN_free(bn);
525 return ret;
526 }

528 /*
529  * Whack an ASIdentifier extension into canonical form.
530  */
531 int v3_asid_canonize(ASIdentifiers *asid)
532 {
533     return (asid == NULL ||
534             (ASIdentifierChoice_canonize(asid->asnum) &&
535              ASIdentifierChoice_canonize(asid->rdi)));
536 }

538 /*
539  * v2i method for an ASIdentifier extension.
540  */
541 static void *v2i_ASIdentifiers(const struct v3_ext_method *method,
542                                struct v3_ext_ctx *ctx,
543                                STACK_OF(CONF_VALUE) *values)
544 {
545     ASN1_INTEGER *min = NULL, *max = NULL;
546     ASIdentifiers *asid = NULL;
547     int i;

549     if ((asid = ASIdentifiers_new()) == NULL) {
550         X509V3err(X509V3_F_V2I_ASIDENTIFIERS, ERR_R_MALLOC_FAILURE);
551         return NULL;
552     }

554     for (i = 0; i < sk_CONF_VALUE_num(values); i++) {
555         CONF_VALUE *val = sk_CONF_VALUE_value(values, i);
556         int i1, i2, i3, is_range, which;

558         /*
559          * Figure out whether this is an AS or an RDI.
560          */
561         if (!name_cmp(val->name, "AS")) {
562             which = V3_ASID_ASNUM;
563         } else if (!name_cmp(val->name, "RDI")) {
564             which = V3_ASID_RDI;
565         } else {
566             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, X509V3_R_EXTENSION_NAME_ERROR);
567             X509V3_conf_err(val);
568             goto err;
569         }

571         /*
572          * Handle inheritance.
573          */
574         if (!strcmp(val->value, "inherit")) {
575             if (v3_asid_add_inherit(asid, which))
576                 continue;
577             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, X509V3_R_INVALID_INHERITANCE);
578             X509V3_conf_err(val);
579             goto err;
580         }

582         /*
583          * Number, range, or mistake, pick it apart and figure out which.
584          */
585         i1 = strstr(val->value, "0123456789");
586         if (val->value[i1] == '\0') {
587             is_range = 0;
588         } else {
589             is_range = 1;

```

```

590         i2 = i1 + strstr(val->value + i1, " \t");
591         if (val->value[i2] != '\0') {
592             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, X509V3_R_INVALID_ASNUMBER);
593             X509V3_conf_err(val);
594             goto err;
595         }
596         i2++;
597         i2 = i2 + strstr(val->value + i2, " \t");
598         i3 = i2 + strstr(val->value + i2, "0123456789");
599         if (val->value[i3] != '\0') {
600             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, X509V3_R_INVALID_ASRANGE);
601             X509V3_conf_err(val);
602             goto err;
603         }
604     }

606     /*
607      * Syntax is ok, read and add it.
608      */
609     if (!is_range) {
610         if (!X509V3_get_value_int(val, &min)) {
611             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, ERR_R_MALLOC_FAILURE);
612             goto err;
613         }
614     } else {
615         char *s = BUF_strdup(val->value);
616         if (s == NULL) {
617             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, ERR_R_MALLOC_FAILURE);
618             goto err;
619         }
620         s[i1] = '\0';
621         min = s2i_ASN1_INTEGER(NULL, s);
622         max = s2i_ASN1_INTEGER(NULL, s + i2);
623         OPENSSL_free(s);
624         if (min == NULL || max == NULL) {
625             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, ERR_R_MALLOC_FAILURE);
626             goto err;
627         }
628         if (ASN1_INTEGER_cmp(min, max) > 0) {
629             X509V3err(X509V3_F_V2I_ASIDENTIFIERS, X509V3_R_EXTENSION_VALUE_ERROR);
630             goto err;
631         }
632     }
633     if (!v3_asid_add_id_or_range(asid, which, min, max)) {
634         X509V3err(X509V3_F_V2I_ASIDENTIFIERS, ERR_R_MALLOC_FAILURE);
635         goto err;
636     }
637     min = max = NULL;
638 }

640 /*
641  * Canonize the result, then we're done.
642  */
643 if (!v3_asid_canonize(asid))
644     goto err;
645 return asid;

647 err:
648 ASIdentifiers_free(asid);
649 ASN1_INTEGER_free(min);
650 ASN1_INTEGER_free(max);
651 return NULL;
652 }

654 /*
655  * OpenSSL dispatch.

```

```

656 */
657 const X509V3_EXT_METHOD v3_asid = {
658     NID_sbgp_autonomousSysNum, /* nid */
659     0, /* flags */
660     ASN1_ITEM_ref(ASIdentifiers), /* template */
661     0, 0, 0, 0, /* old functions, ignored */
662     0, /* i2s */
663     0, /* s2i */
664     0, /* i2v */
665     v2i_ASIdentifiers, /* v2i */
666     i2r_ASIdentifiers, /* i2r */
667     0, /* r2i */
668     NULL /* extension-specific data */
669 };

671 /*
672  * Figure out whether extension uses inheritance.
673  */
674 int v3_asid_inherits(ASIdentifiers *asid)
675 {
676     return (asid != NULL &&
677         ((asid->asnum != NULL &&
678             asid->asnum->type == ASIdentifierChoice_inherit) ||
679             (asid->rdsi != NULL &&
680                 asid->rdsi->type == ASIdentifierChoice_inherit)));
681 }

683 /*
684  * Figure out whether parent contains child.
685  */
686 static int asid_contains(ASIdOrRanges *parent, ASIdOrRanges *child)
687 {
688     ASN1_INTEGER *p_min, *p_max, *c_min, *c_max;
689     int p, c;

691     if (child == NULL || parent == child)
692         return 1;
693     if (parent == NULL)
694         return 0;

696     p = 0;
697     for (c = 0; c < sk_ASIdOrRange_num(child); c++) {
698         extract_min_max(sk_ASIdOrRange_value(child, c), &c_min, &c_max);
699         for (;;) {
700             if (p >= sk_ASIdOrRange_num(parent))
701                 return 0;
702             extract_min_max(sk_ASIdOrRange_value(parent, p), &p_min, &p_max);
703             if (ASN1_INTEGER_cmp(p_max, c_max) < 0)
704                 continue;
705             if (ASN1_INTEGER_cmp(p_min, c_min) > 0)
706                 return 0;
707             break;
708         }
709     }

711     return 1;
712 }

714 /*
715  * Test whether a is a subset of b.
716  */
717 int v3_asid_subset(ASIdentifiers *a, ASIdentifiers *b)
718 {
719     return (a == NULL ||
720         a == b ||
721         (b != NULL &&

```

```

722     !v3_asid_inherits(a) &&
723     !v3_asid_inherits(b) &&
724     asid_contains(b->asnum->u.asIdsOrRanges,
725         a->asnum->u.asIdsOrRanges) &&
726     asid_contains(b->rdsi->u.asIdsOrRanges,
727         a->rdsi->u.asIdsOrRanges));
728 }

730 /*
731  * Validation error handling via callback.
732  */
733 #define validation_err(_err_) \
734     do { \
735         if (ctx != NULL) { \
736             ctx->error = _err_; \
737             ctx->error_depth = i; \
738             ctx->current_cert = x; \
739             ret = ctx->verify_cb(0, ctx); \
740         } else { \
741             ret = 0; \
742         } \
743         if (!ret) \
744             goto done; \
745     } while (0)

747 /*
748  * Core code for RFC 3779 3.3 path validation.
749  */
750 static int v3_asid_validate_path_internal(X509_STORE_CTX *ctx,
751     STACK_OF(X509) *chain,
752     ASIdentifiers *ext)
753 {
754     ASIdOrRanges *child_as = NULL, *child_rdsi = NULL;
755     int i, ret = 1, inherit_as = 0, inherit_rdsi = 0;
756     X509 *x;

758     OPENSSL_assert(chain != NULL && sk_X509_num(chain) > 0);
759     OPENSSL_assert(ctx != NULL || ext != NULL);
760     OPENSSL_assert(ctx == NULL || ctx->verify_cb != NULL);

762     /*
763      * Figure out where to start. If we don't have an extension to
764      * check, we're done. Otherwise, check canonical form and
765      * set up for walking up the chain.
766      */
767     if (ext != NULL) {
768         i = -1;
769         x = NULL;
770     } else {
771         i = 0;
772         x = sk_X509_value(chain, i);
773         OPENSSL_assert(x != NULL);
774         if ((ext = x->rfc3779_asid) == NULL)
775             goto done;
776     }
777     if (!v3_asid_is_canonical(ext))
778         validation_err(X509_V_ERR_INVALID_EXTENSION);
779     if (ext->asnum != NULL) {
780         switch (ext->asnum->type) {
781             case ASIdentifierChoice_inherit:
782                 inherit_as = 1;
783                 break;
784             case ASIdentifierChoice_asIdsOrRanges:
785                 child_as = ext->asnum->u.asIdsOrRanges;
786                 break;
787         }

```

```

788 }
789 if (ext->rdi != NULL) {
790     switch (ext->rdi->type) {
791         case ASIdentifierChoice_inherit:
792             inherit_rdi = 1;
793             break;
794         case ASIdentifierChoice_asIdsOrRanges:
795             child_rdi = ext->rdi->u.asIdsOrRanges;
796             break;
797     }
798 }
799
800 /*
801  * Now walk up the chain. Extensions must be in canonical form, no
802  * cert may list resources that its parent doesn't list.
803  */
804 for (i++; i < sk_X509_num(chain); i++) {
805     x = sk_X509_value(chain, i);
806     OPENSSL_assert(x != NULL);
807     if (x->rfc3779_asid == NULL) {
808         if (child_as != NULL || child_rdi != NULL)
809             validation_err(X509_V_ERR_UNNESTED_RESOURCE);
810         continue;
811     }
812     if (!v3_asid_is_canonical(x->rfc3779_asid))
813         validation_err(X509_V_ERR_INVALID_EXTENSION);
814     if (x->rfc3779_asid->asnum == NULL && child_as != NULL) {
815         validation_err(X509_V_ERR_UNNESTED_RESOURCE);
816         child_as = NULL;
817         inherit_as = 0;
818     }
819     if (x->rfc3779_asid->asnum != NULL &&
820         x->rfc3779_asid->asnum->type == ASIdentifierChoice_asIdsOrRanges) {
821         if (inherit_as ||
822             asid_contains(x->rfc3779_asid->asnum->u.asIdsOrRanges, child_as)) {
823             child_as = x->rfc3779_asid->asnum->u.asIdsOrRanges;
824             inherit_as = 0;
825         } else {
826             validation_err(X509_V_ERR_UNNESTED_RESOURCE);
827         }
828     }
829     if (x->rfc3779_asid->rdi == NULL && child_rdi != NULL) {
830         validation_err(X509_V_ERR_UNNESTED_RESOURCE);
831         child_rdi = NULL;
832         inherit_rdi = 0;
833     }
834     if (x->rfc3779_asid->rdi != NULL &&
835         x->rfc3779_asid->rdi->type == ASIdentifierChoice_asIdsOrRanges) {
836         if (inherit_rdi ||
837             asid_contains(x->rfc3779_asid->rdi->u.asIdsOrRanges, child_rdi)) {
838             child_rdi = x->rfc3779_asid->rdi->u.asIdsOrRanges;
839             inherit_rdi = 0;
840         } else {
841             validation_err(X509_V_ERR_UNNESTED_RESOURCE);
842         }
843     }
844 }
845
846 /*
847  * Trust anchor can't inherit.
848  */
849 OPENSSL_assert(x != NULL);
850 if (x->rfc3779_asid != NULL) {
851     if (x->rfc3779_asid->asnum != NULL &&
852         x->rfc3779_asid->asnum->type == ASIdentifierChoice_inherit)
853         validation_err(X509_V_ERR_UNNESTED_RESOURCE);

```

```

854     if (x->rfc3779_asid->rdi != NULL &&
855         x->rfc3779_asid->rdi->type == ASIdentifierChoice_inherit)
856         validation_err(X509_V_ERR_UNNESTED_RESOURCE);
857 }
858
859 done:
860 return ret;
861 }
862
863 #undef validation_err
864
865 /*
866  * RFC 3779 3.3 path validation -- called from X509_verify_cert().
867  */
868 int v3_asid_validate_path(X509_STORE_CTX *ctx)
869 {
870     return v3_asid_validate_path_internal(ctx, ctx->chain, NULL);
871 }
872
873 /*
874  * RFC 3779 3.3 path validation of an extension.
875  * Test whether chain covers extension.
876  */
877 int v3_asid_validate_resource_set(STACK_OF(X509) *chain,
878     ASIdentifiers *ext,
879     int allow_inheritance)
880 {
881     if (ext == NULL)
882         return 1;
883     if (chain == NULL || sk_X509_num(chain) == 0)
884         return 0;
885     if (!allow_inheritance && v3_asid_inherits(ext))
886         return 0;
887     return v3_asid_validate_path_internal(NULL, chain, ext);
888 }
889
890 #endif /* OPENSSSL_NO_RFC3779 */

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_bcons.c

1

```
*****
4648 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_bcons.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_bcons.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_bcons.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/conf.h>
65 #include <openssl/x509v3.h>

67 static STACK_OF(CONF_VALUE) *i2v_BASIC_CONSTRAINTS(X509V3_EXT_METHOD *method, BA
68 static BASIC_CONSTRAINTS *v2i_BASIC_CONSTRAINTS(X509V3_EXT_METHOD *method, X509V

70 const X509V3_EXT_METHOD v3_bcons = {
71     NID_basic_constraints, 0,
72     ASN1_ITEM_ref(BASIC_CONSTRAINTS),
73     0,0,0,0,
74     0,0,
75     (X509V3_EXT_I2V)i2v_BASIC_CONSTRAINTS,
76     (X509V3_EXT_V2I)v2i_BASIC_CONSTRAINTS,
77     NULL,NULL,
78     NULL
79 };

81 ASN1_SEQUENCE(BASIC_CONSTRAINTS) = {
82     ASN1_OPT(BASIC_CONSTRAINTS, ca, ASN1_FBOOLEAN),
83     ASN1_OPT(BASIC_CONSTRAINTS, pathlen, ASN1_INTEGER)
84 } ASN1_SEQUENCE_END(BASIC_CONSTRAINTS)

86 IMPLEMENT_ASN1_FUNCTIONS(BASIC_CONSTRAINTS)

89 static STACK_OF(CONF_VALUE) *i2v_BASIC_CONSTRAINTS(X509V3_EXT_METHOD *method,
90 BASIC_CONSTRAINTS *bcons, STACK_OF(CONF_VALUE) *extlist)
91 {
92     X509V3_add_value_bool("CA", bcons->ca, &extlist);
93     X509V3_add_value_int("pathlen", bcons->pathlen, &extlist);
94     return extlist;
95 }

97 static BASIC_CONSTRAINTS *v2i_BASIC_CONSTRAINTS(X509V3_EXT_METHOD *method,
98 X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *values)
99 {
100     BASIC_CONSTRAINTS *bcons=NULL;
101     CONF_VALUE *val;
102     int i;
103     if(!bcons = BASIC_CONSTRAINTS_new()) {
104         X509V3err(X509V3_F_V2I_BASIC_CONSTRAINTS, ERR_R_MALLOC_FAILURE);
105         return NULL;
106     }
107     for(i = 0; i < sk_CONF_VALUE_num(values); i++) {
108         val = sk_CONF_VALUE_value(values, i);
109         if(!strcmp(val->name, "CA")) {
110             if(!X509V3_get_value_bool(val, &bcons->ca)) goto err;
111         } else if(!strcmp(val->name, "pathlen")) {
112             if(!X509V3_get_value_int(val, &bcons->pathlen)) goto err
113         } else {
114             X509V3err(X509V3_F_V2I_BASIC_CONSTRAINTS, X509V3_R_INVALID
115             X509V3_conf_err(val);
116             goto err;
117         }
118     }
119     return bcons;
120 err:
121     BASIC_CONSTRAINTS_free(bcons);
122     return NULL;
123 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_bitst.c

1

5025 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_bitst.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* v3_bitst.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_bitst.c

2

```
62 #include <openssl/x509v3.h>
```

```
64 static BIT_STRING_BITNAME ns_cert_type_table[] = {
65 {0, "SSL Client", "client"},
66 {1, "SSL Server", "server"},
67 {2, "S/MIME", "email"},
68 {3, "Object Signing", "objsign"},
69 {4, "Unused", "reserved"},
70 {5, "SSL CA", "sslCA"},
71 {6, "S/MIME CA", "emailCA"},
72 {7, "Object Signing CA", "objCA"},
73 {-1, NULL, NULL}
74 };
```

```
76 static BIT_STRING_BITNAME key_usage_type_table[] = {
77 {0, "Digital Signature", "digitalSignature"},
78 {1, "Non Repudiation", "nonRepudiation"},
79 {2, "Key Encipherment", "keyEncipherment"},
80 {3, "Data Encipherment", "dataEncipherment"},
81 {4, "Key Agreement", "keyAgreement"},
82 {5, "Certificate Sign", "keyCertSign"},
83 {6, "CRL Sign", "cRLSign"},
84 {7, "Encipher Only", "encipherOnly"},
85 {8, "Decipher Only", "decipherOnly"},
86 {-1, NULL, NULL}
87 };
```

```
91 const X509V3_EXT_METHOD v3_nscert = EXT_BITSTRING(NID_netscape_cert_type, ns_cert_type_table);
92 const X509V3_EXT_METHOD v3_key_usage = EXT_BITSTRING(NID_key_usage, key_usage_type_table);
```

```
94 STACK_OF(CONF_VALUE) *i2v_ASN1_BIT_STRING(X509V3_EXT_METHOD *method,
95      ASN1_BIT_STRING *bits, STACK_OF(CONF_VALUE) *ret)
96 {
97     BIT_STRING_BITNAME *bname;
98     for(bname = method->usr_data; bname->lname; bname++) {
99         if(ASN1_BIT_STRING_get_bit(bits, bname->bitnum))
100             X509V3_add_value(bname->lname, NULL, &ret);
101     }
102     return ret;
103 }
104
105 ASN1_BIT_STRING *v2i_ASN1_BIT_STRING(X509V3_EXT_METHOD *method,
106      X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
107 {
108     CONF_VALUE *val;
109     ASN1_BIT_STRING *bs;
110     int i;
111     BIT_STRING_BITNAME *bname;
112     if(!(bs = M_ASN1_BIT_STRING_new())) {
113         X509V3err(X509V3_F_V2I_ASN1_BIT_STRING, ERR_R_MALLOC_FAILURE);
114         return NULL;
115     }
116     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
117         val = sk_CONF_VALUE_value(nval, i);
118         for(bname = method->usr_data; bname->lname; bname++) {
119             if(!strcmp(bname->sname, val->name) ||
120                 !strcmp(bname->lname, val->name)) {
121                 if(!ASN1_BIT_STRING_set_bit(bs, bname->bitnum, 1))
122                     X509V3err(X509V3_F_V2I_ASN1_BIT_STRING,
123                         ERR_R_MALLOC_FAILURE);
124                 M_ASN1_BIT_STRING_free(bs);
125                 return NULL;
126             }
127         }
128     }
129     break;
```

```
128         }
129     }
130     if(!bnam->lname) {
131         X509V3err(X509V3_F_V2I_ASN1_BIT_STRING,
132                 X509V3_R_UNKNOWN_BIT_STRING_ARGUMENT);
133         X509V3_conf_err(val);
134         M_ASN1_BIT_STRING_free(bs);
135         return NULL;
136     }
137 }
138 return bs;
139 }
140
```


new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_conf.c

1

```
*****
14854 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_conf.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_conf.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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56 */
57 /*
58 /* extension creation utilities */
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_conf.c

2

```
62 #include <stdio.h>
63 #include <ctype.h>
64 #include "cryptlib.h"
65 #include <openssl/conf.h>
66 #include <openssl/x509.h>
67 #include <openssl/x509v3.h>

69 static int v3_check_critical(char **value);
70 static int v3_check_generic(char **value);
71 static X509_EXTENSION *do_ext_nconf(CONF *conf, X509V3_CTX *ctx, int ext_nid, in
72 static X509_EXTENSION *v3_generic_extension(const char *ext, char *value, int cr
73 static char *conf_lhash_get_string(void *db, char *section, char *value);
74 static STACK_OF(CONF_VALUE) *conf_lhash_get_section(void *db, char *section);
75 static X509_EXTENSION *do_ext_i2d(const X509V3_EXT_METHOD *method, int ext_nid,
76                                     int crit, void *ext_struc);
77 static unsigned char *generic_asn1(char *value, X509V3_CTX *ctx, long *ext_len);
78 /* CONF *conf: Config file */
79 /* char *name: Name */
80 /* char *value: Value */
81 X509_EXTENSION *X509V3_EXT_nconf(CONF *conf, X509V3_CTX *ctx, char *name,
82                                     char *value)
83 {
84     int crit;
85     int ext_type;
86     X509_EXTENSION *ret;
87     crit = v3_check_critical(&value);
88     if ((ext_type = v3_check_generic(&value)))
89         return v3_generic_extension(name, value, crit, ext_type, ctx);
90     ret = do_ext_nconf(conf, ctx, OBJ_sn2nid(name), crit, value);
91     if (!ret)
92     {
93         X509V3err(X509V3_F_X509V3_EXT_NCONF, X509V3_R_ERROR_IN_EXTENSION)
94         ERR_add_error_data(4, "name=", name, ", value=", value);
95     }
96     return ret;
97 }

99 /* CONF *conf: Config file */
100 /* char *value: Value */
101 X509_EXTENSION *X509V3_EXT_nconf_nid(CONF *conf, X509V3_CTX *ctx, int ext_nid,
102                                     char *value)
103 {
104     int crit;
105     int ext_type;
106     crit = v3_check_critical(&value);
107     if ((ext_type = v3_check_generic(&value)))
108         return v3_generic_extension(OBJ_nid2sn(ext_nid),
109                                     value, crit, ext_type, ctx);
110     return do_ext_nconf(conf, ctx, ext_nid, crit, value);
111 }

113 /* CONF *conf: Config file */
114 /* char *value: Value */
115 static X509_EXTENSION *do_ext_nconf(CONF *conf, X509V3_CTX *ctx, int ext_nid,
116                                     int crit, char *value)
117 {
118     const X509V3_EXT_METHOD *method;
119     X509_EXTENSION *ext;
120     STACK_OF(CONF_VALUE) *nval;
121     void *ext_struc;
122     if (ext_nid == NID_undef)
123     {
124         X509V3err(X509V3_F_DO_EXT_NCONF, X509V3_R_UNKNOWN_EXTENSION_NAME)
125         return NULL;
126     }
127     if (!(method = X509V3_EXT_get_nid(ext_nid)))
```

```

128     {
129         X509V3err(X509V3_F_DO_EXT_NCONF,X509V3_R_UNKNOWN_EXTENSION);
130         return NULL;
131     }
132     /* Now get internal extension representation based on type */
133     if (method->v2i)
134     {
135         if(*value == '@') nval = NCONF_get_section(conf, value + 1);
136         else nval = X509V3_parse_list(value);
137         if(sk_CONF_VALUE_num(nval) <= 0)
138         {
139             X509V3err(X509V3_F_DO_EXT_NCONF,X509V3_R_INVALID_EXTENSI
140             ERR_add_error_data(4, "name=", OBJ_nid2sn(ext_nid), ",se
141             return NULL;
142         }
143         ext_struct = method->v2i(method, ctx, nval);
144         if(*value != '@') sk_CONF_VALUE_pop_free(nval,
145             X509V3_conf_free);
146         if(!ext_struct) return NULL;
147     }
148     else if(method->s2i)
149     {
150         if(!(ext_struct = method->s2i(method, ctx, value))) return NULL;
151     }
152     else if(method->r2i)
153     {
154         if(!ctx->db || !ctx->db_meth)
155         {
156             X509V3err(X509V3_F_DO_EXT_NCONF,X509V3_R_NO_CONFIG_DATAB
157             return NULL;
158         }
159         if(!(ext_struct = method->r2i(method, ctx, value))) return NULL;
160     }
161     else
162     {
163         X509V3err(X509V3_F_DO_EXT_NCONF,X509V3_R_EXTENSION_SETTING_NOT_S
164         ERR_add_error_data(2, "name=", OBJ_nid2sn(ext_nid));
165         return NULL;
166     }
167
168     ext = do_ext_i2d(method, ext_nid, crit, ext_struct);
169     if(method->it) ASN1_item_free(ext_struct, ASN1_ITEM_ptr(method->it));
170     else method->ext_free(ext_struct);
171     return ext;
172 }
173
174 static X509_EXTENSION *do_ext_i2d(const X509V3_EXT_METHOD *method, int ext_nid,
175     int crit, void *ext_struct)
176 {
177     unsigned char *ext_der;
178     int ext_len;
179     ASN1_OCTET_STRING *ext_oct;
180     X509_EXTENSION *ext;
181     /* Convert internal representation to DER */
182     if (method->it)
183     {
184         ext_der = NULL;
185         ext_len = ASN1_item_i2d(ext_struct, &ext_der, ASN1_ITEM_ptr(metho
186         if (ext_len < 0) goto merr;
187     }
188     else
189     {
190         unsigned char *p;
191         ext_len = method->i2d(ext_struct, NULL);
192         if(!ext_der = OPENSSL_malloc(ext_len)) goto merr;

```

```

194         p = ext_der;
195         method->i2d(ext_struct, &p);
196     }
197     if (!(ext_oct = M_ASN1_OCTET_STRING_new())) goto merr;
198     ext_oct->data = ext_der;
199     ext_oct->length = ext_len;
200
201     ext = X509_EXTENSION_create_by_NID(NULL, ext_nid, crit, ext_oct);
202     if (!ext) goto merr;
203     M_ASN1_OCTET_STRING_free(ext_oct);
204
205     return ext;
206
207     merr:
208     X509V3err(X509V3_F_DO_EXT_I2D,ERR_R_MALLOC_FAILURE);
209     return NULL;
210 }
211
212 /* Given an internal structure, nid and critical flag create an extension */
213
214 X509_EXTENSION *X509V3_EXT_i2d(int ext_nid, int crit, void *ext_struct)
215 {
216     const X509V3_EXT_METHOD *method;
217     if (!(method = X509V3_EXT_get_nid(ext_nid))) {
218         X509V3err(X509V3_F_X509V3_EXT_I2D,X509V3_R_UNKNOWN_EXTENSION);
219         return NULL;
220     }
221     return do_ext_i2d(method, ext_nid, crit, ext_struct);
222 }
223
224 /* Check the extension string for critical flag */
225 static int v3_check_critical(char **value)
226 {
227     char *p = *value;
228     if ((strlen(p) < 9) || strncmp(p, "critical,", 9)) return 0;
229     p+=9;
230     while(isspace((unsigned char)*p)) p++;
231     *value = p;
232     return 1;
233 }
234
235 /* Check extension string for generic extension and return the type */
236 static int v3_check_generic(char **value)
237 {
238     int gen_type = 0;
239     char *p = *value;
240     if ((strlen(p) >= 4) && !strncmp(p, "DER:", 4))
241     {
242         p+=4;
243         gen_type = 1;
244     }
245     else if ((strlen(p) >= 5) && !strncmp(p, "ASN1:", 5))
246     {
247         p+=5;
248         gen_type = 2;
249     }
250     else
251         return 0;
252
253     while (isspace((unsigned char)*p)) p++;
254     *value = p;
255     return gen_type;
256 }
257
258 /* Create a generic extension: for now just handle DER type */

```

```

260 static X509_EXTENSION *v3_generic_extension(const char *ext, char *value,
261                                             int crit, int gen_type,
262                                             X509V3_CTX *ctx)
263 {
264     unsigned char *ext_der=NULL;
265     long ext_len;
266     ASN1_OBJECT *obj=NULL;
267     ASN1_OCTET_STRING *oct=NULL;
268     X509_EXTENSION *extension=NULL;
269     if (!(obj = OBJ_txt2obj(ext, 0)))
270     {
271         X509V3err(X509V3_F_V3_GENERIC_EXTENSION,X509V3_R_EXTENSION_NAME
272                 ERR_add_error_data(2, "name=", ext);
273         goto err;
274     }
275
276     if (gen_type == 1)
277         ext_der = string_to_hex(value, &ext_len);
278     else if (gen_type == 2)
279         ext_der = generic_asn1(value, ctx, &ext_len);
280
281     if (ext_der == NULL)
282     {
283         X509V3err(X509V3_F_V3_GENERIC_EXTENSION,X509V3_R_EXTENSION_VALUE
284                 ERR_add_error_data(2, "value=", value);
285         goto err;
286     }
287
288     if (!(oct = M_ASN1_OCTET_STRING_new()))
289     {
290         X509V3err(X509V3_F_V3_GENERIC_EXTENSION,ERR_R_MALLOC_FAILURE);
291         goto err;
292     }
293
294     oct->data = ext_der;
295     oct->length = ext_len;
296     ext_der = NULL;
297
298     extension = X509_EXTENSION_create_by_OBJ(NULL, obj, crit, oct);
299
300     err:
301     ASN1_OBJECT_free(obj);
302     M_ASN1_OCTET_STRING_free(oct);
303     if(ext_der) OPENSSL_free(ext_der);
304     return extension;
305
306 }
307
308 static unsigned char *generic_asn1(char *value, X509V3_CTX *ctx, long *ext_len)
309 {
310     ASN1_TYPE *typ;
311     unsigned char *ext_der = NULL;
312     typ = ASN1_generate_v3(value, ctx);
313     if (typ == NULL)
314         return NULL;
315     *ext_len = i2d_ASN1_TYPE(typ, &ext_der);
316     ASN1_TYPE_free(typ);
317     return ext_der;
318 }
319
320 /* This is the main function: add a bunch of extensions based on a config file
321 * section to an extension STACK.
322 */
323
325 int X509V3_EXT_add_nconf_sk(CONF *conf, X509V3_CTX *ctx, char *section,

```

```

326     STACK_OF(X509_EXTENSION) **sk)
327 {
328     X509_EXTENSION *ext;
329     STACK_OF(CONF_VALUE) *nval;
330     CONF_VALUE *val;
331     int i;
332     if (!(nval = NCONF_get_section(conf, section))) return 0;
333     for (i = 0; i < sk_CONF_VALUE_num(nval); i++)
334     {
335         val = sk_CONF_VALUE_value(nval, i);
336         if (!(ext = X509V3_EXT_nconf(conf, ctx, val->name, val->value)))
337             return 0;
338         if (sk) X509v3_add_ext(sk, ext, -1);
339         X509_EXTENSION_free(ext);
340     }
341     return 1;
342 }
343
344 /* Convenience functions to add extensions to a certificate, CRL and request */
345
346 int X509V3_EXT_add_nconf(CONF *conf, X509V3_CTX *ctx, char *section,
347                         X509 *cert)
348 {
349     STACK_OF(X509_EXTENSION) **sk = NULL;
350     if (cert)
351         sk = &cert->cert_info->extensions;
352     return X509V3_EXT_add_nconf_sk(conf, ctx, section, sk);
353 }
354
355 /* Same as above but for a CRL */
356
357 int X509V3_EXT_CRL_add_nconf(CONF *conf, X509V3_CTX *ctx, char *section,
358                             X509_CRL *crl)
359 {
360     STACK_OF(X509_EXTENSION) **sk = NULL;
361     if (crl)
362         sk = &crl->crl->extensions;
363     return X509V3_EXT_add_nconf_sk(conf, ctx, section, sk);
364 }
365
366 /* Add extensions to certificate request */
367
368 int X509V3_EXT_REQ_add_nconf(CONF *conf, X509V3_CTX *ctx, char *section,
369                             X509_REQ *req)
370 {
371     STACK_OF(X509_EXTENSION) *extlist = NULL, **sk = NULL;
372     int i;
373     if (req)
374         sk = &extlist;
375     i = X509V3_EXT_add_nconf_sk(conf, ctx, section, sk);
376     if (!i || !sk)
377         return i;
378     i = X509_REQ_add_extensions(req, extlist);
379     sk_X509_EXTENSION_pop_free(extlist, X509_EXTENSION_free);
380     return i;
381 }
382
383 /* Config database functions */
384
385 char * X509V3_get_string(X509V3_CTX *ctx, char *name, char *section)
386 {
387     if(!ctx->db || !ctx->db_meth || !ctx->db_meth->get_string)
388     {
389         X509V3err(X509V3_F_X509V3_GET_STRING,X509V3_R_OPERATION_NOT_DEFINED);
390         return NULL;
391     }

```

```

392     if (ctx->db_meth->get_string)
393         return ctx->db_meth->get_string(ctx->db, name, section);
394     return NULL;
395 }
396
397 STACK_OF(CONF_VALUE) * X509V3_get_section(X509V3_CTX *ctx, char *section)
398 {
399     if (!ctx->db || !ctx->db_meth || !ctx->db_meth->get_section)
400     {
401         X509V3err(X509V3_F_X509V3_GET_SECTION, X509V3_R_OPERATION_NOT_DEFINED);
402         return NULL;
403     }
404     if (ctx->db_meth->get_section)
405         return ctx->db_meth->get_section(ctx->db, section);
406     return NULL;
407 }
408
409 void X509V3_string_free(X509V3_CTX *ctx, char *str)
410 {
411     if (!str) return;
412     if (ctx->db_meth->free_string)
413         ctx->db_meth->free_string(ctx->db, str);
414 }
415
416 void X509V3_section_free(X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *section)
417 {
418     if (!section) return;
419     if (ctx->db_meth->free_section)
420         ctx->db_meth->free_section(ctx->db, section);
421 }
422
423 static char *nconf_get_string(void *db, char *section, char *value)
424 {
425     return NCONF_get_string(db, section, value);
426 }
427
428 static STACK_OF(CONF_VALUE) *nconf_get_section(void *db, char *section)
429 {
430     return NCONF_get_section(db, section);
431 }
432
433 static X509V3_CONF_METHOD nconf_method = {
434     nconf_get_string,
435     nconf_get_section,
436     NULL,
437     NULL,
438 };
439
440 void X509V3_set_nconf(X509V3_CTX *ctx, CONF *conf)
441 {
442     ctx->db_meth = &nconf_method;
443     ctx->db = conf;
444 }
445
446 void X509V3_set_ctx(X509V3_CTX *ctx, X509 *issuer, X509 *subj, X509_REQ *req,
447                    X509_CRL *crl, int flags)
448 {
449     ctx->issuer_cert = issuer;
450     ctx->subject_cert = subj;
451     ctx->crl = crl;
452     ctx->subject_req = req;
453     ctx->flags = flags;
454 }
455
456 /* Old conf compatibility functions */

```

```

458 X509_EXTENSION *X509V3_EXT_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
459                                  char *name, char *value)
460 {
461     CONF ctmp;
462     CONF_set_nconf(&ctmp, conf);
463     return X509V3_EXT_nconf(&ctmp, ctx, name, value);
464 }
465
466 /* LHASH *conf: Config file */
467 /* char *value: Value */
468 X509_EXTENSION *X509V3_EXT_conf_nid(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
469                                       int ext_nid, char *value)
470 {
471     CONF ctmp;
472     CONF_set_nconf(&ctmp, conf);
473     return X509V3_EXT_nconf_nid(&ctmp, ctx, ext_nid, value);
474 }
475
476 static char *conf_lhash_get_string(void *db, char *section, char *value)
477 {
478     return CONF_get_string(db, section, value);
479 }
480
481 static STACK_OF(CONF_VALUE) *conf_lhash_get_section(void *db, char *section)
482 {
483     return CONF_get_section(db, section);
484 }
485
486 static X509V3_CONF_METHOD conf_lhash_method = {
487     conf_lhash_get_string,
488     conf_lhash_get_section,
489     NULL,
490     NULL,
491 };
492
493 void X509V3_set_conf_lhash(X509V3_CTX *ctx, LHASH_OF(CONF_VALUE) *lhash)
494 {
495     ctx->db_meth = &conf_lhash_method;
496     ctx->db = lhash;
497 }
498
499 int X509V3_EXT_add_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
500                        char *section, X509 *cert)
501 {
502     CONF ctmp;
503     CONF_set_nconf(&ctmp, conf);
504     return X509V3_EXT_add_nconf(&ctmp, ctx, section, cert);
505 }
506
507 /* Same as above but for a CRL */
508
509 int X509V3_EXT_CRL_add_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
510                             char *section, X509_CRL *crl)
511 {
512     CONF ctmp;
513     CONF_set_nconf(&ctmp, conf);
514     return X509V3_EXT_CRL_add_nconf(&ctmp, ctx, section, crl);
515 }
516
517 /* Add extensions to certificate request */
518
519 int X509V3_EXT_REQ_add_conf(LHASH_OF(CONF_VALUE) *conf, X509V3_CTX *ctx,
520                             char *section, X509_REQ *req)
521 {
522     CONF ctmp;
523     CONF_set_nconf(&ctmp, conf);

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_conf.c

9

```
524     return X509V3_EXT_REQ_add_nconf(&ctmp, ctx, section, req);  
525 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_cpols.c

1

```
*****
13924 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_cpols.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_cpols.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999-2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  *    notice, this list of conditions and the following disclaimer.
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15  * 2. Redistributions in binary form must reproduce the above copyright
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19  *
20  * 3. All advertising materials mentioning features or use of this
21  *    software must display the following acknowledgment:
22  *    "This product includes software developed by the OpenSSL Project
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25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_cpols.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/x509v3.h>

66 #include "pcy_int.h"

68 /* Certificate policies extension support: this one is a bit complex... */

70 static int i2r_certpol(X509V3_EXT_METHOD *method, STACK_OF(POLICYINFO) *pol, BIO
71 static STACK_OF(POLICYINFO) *r2i_certpol(X509V3_EXT_METHOD *method, X509V3_CTX *
72 static void print_qualifiers(BIO *out, STACK_OF(POLICYQUALINFO) *quals, int inde
73 static void print_notice(BIO *out, USERNOTICE *notice, int indent);
74 static POLICYINFO *policy_section(X509V3_CTX *ctx,
75                                 STACK_OF(CONF_VALUE) *polstrs, int ia5org);
76 static POLICYQUALINFO *notice_section(X509V3_CTX *ctx,
77                                       STACK_OF(CONF_VALUE) *unot, int ia5org);
78 static int nref_nos(STACK_OF(ASN1_INTEGER) *nnums, STACK_OF(CONF_VALUE) *nos);

80 const X509V3_EXT_METHOD v3_cpols = {
81   NID_certificate_policies, 0, ASN1_ITEM_ref(CERTIFICATEPOLICIES),
82   0, 0, 0, 0,
83   0, 0,
84   0, 0,
85   (X509V3_EXT_I2R)i2r_certpol,
86   (X509V3_EXT_R2I)r2i_certpol,
87   NULL
88 };

90 ASN1_ITEM_TEMPLATE(CERTIFICATEPOLICIES) =
91   ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, CERTIFICATEPOLICIES, POL
92   ASN1_ITEM_TEMPLATE_END(CERTIFICATEPOLICIES)

94 IMPLEMENT_ASN1_FUNCTIONS(CERTIFICATEPOLICIES)

96 ASN1_SEQUENCE(POLICYINFO) = {
97   ASN1_SIMPLE(POLICYINFO, policyid, ASN1_OBJECT),
98   ASN1_SEQUENCE_OF_OPT(POLICYINFO, qualifiers, POLICYQUALINFO)
99 } ASN1_SEQUENCE_END(POLICYINFO)

101 IMPLEMENT_ASN1_FUNCTIONS(POLICYINFO)

103 ASN1_ADB_TEMPLATE(policydefault) = ASN1_SIMPLE(POLICYQUALINFO, d.other, ASN1_ANY

105 ASN1_ADB(POLICYQUALINFO) = {
106   ADB_ENTRY(NID_id_qt_cps, ASN1_SIMPLE(POLICYQUALINFO, d.cpsuri, ASN1_IA5S
107   ADB_ENTRY(NID_id_qt_unotice, ASN1_SIMPLE(POLICYQUALINFO, d.usernotice, U
108 } ASN1_ADB_END(POLICYQUALINFO, 0, pqualid, 0, &policydefault_tt, NULL);

110 ASN1_SEQUENCE(POLICYQUALINFO) = {
111   ASN1_SIMPLE(POLICYQUALINFO, pqualid, ASN1_OBJECT),
112   ASN1_ADB_OBJECT(POLICYQUALINFO)
113 } ASN1_SEQUENCE_END(POLICYQUALINFO)

115 IMPLEMENT_ASN1_FUNCTIONS(POLICYQUALINFO)

117 ASN1_SEQUENCE(USERNOTICE) = {
118   ASN1_OPT(USERNOTICE, noticeref, NOTICEREF),
119   ASN1_OPT(USERNOTICE, exptext, DISPLAYTEXT)
120 } ASN1_SEQUENCE_END(USERNOTICE)

122 IMPLEMENT_ASN1_FUNCTIONS(USERNOTICE)

124 ASN1_SEQUENCE(NOTICEREF) = {
125   ASN1_SIMPLE(NOTICEREF, organization, DISPLAYTEXT),
126   ASN1_SEQUENCE_OF(NOTICEREF, noticenos, ASN1_INTEGER)
127 } ASN1_SEQUENCE_END(NOTICEREF)
```

```

129 IMPLEMENT_ASN1_FUNCTIONS(NOTICEREF)

131 static STACK_OF(POLICYINFO) *r2i_certpol(X509V3_EXT_METHOD *method,
132     X509V3_CTX *ctx, char *value)
133 {
134     STACK_OF(POLICYINFO) *pols = NULL;
135     char *pstr;
136     POLICYINFO *pol;
137     ASN1_OBJECT *pobj;
138     STACK_OF(CONF_VALUE) *vals;
139     CONF_VALUE *cnf;
140     int i, ia5org;
141     pols = sk_POLICYINFO_new_null();
142     if (pols == NULL) {
143         X509V3err(X509V3_F_R2I_CERTPOL, ERR_R_MALLOC_FAILURE);
144         return NULL;
145     }
146     vals = X509V3_parse_list(value);
147     if (vals == NULL) {
148         X509V3err(X509V3_F_R2I_CERTPOL, ERR_R_X509V3_LIB);
149         goto err;
150     }
151     ia5org = 0;
152     for(i = 0; i < sk_CONF_VALUE_num(vals); i++) {
153         cnf = sk_CONF_VALUE_value(vals, i);
154         if(cnf->value || !cnf->name) {
155             X509V3err(X509V3_F_R2I_CERTPOL, X509V3_R_INVALID_POLICY_I
156             X509V3_conf_err(cnf);
157             goto err;
158         }
159         pstr = cnf->name;
160         if(!strcmp(pstr, "ia5org")) {
161             ia5org = 1;
162             continue;
163         } else if(*pstr == '@') {
164             STACK_OF(CONF_VALUE) *polsect;
165             polsect = X509V3_get_section(ctx, pstr + 1);
166             if(!polsect) {
167                 X509V3err(X509V3_F_R2I_CERTPOL, X509V3_R_INVALID_
168                 X509V3_conf_err(cnf);
169                 goto err;
170             }
171             pol = policy_section(ctx, polsect, ia5org);
172             X509V3_section_free(ctx, polsect);
173             if(!pol) goto err;
174         } else {
175             if(!(pobj = OBJ_txt2obj(cnf->name, 0))) {
176                 X509V3err(X509V3_F_R2I_CERTPOL, X509V3_R_INVALID_
177                 X509V3_conf_err(cnf);
178                 goto err;
179             }
180             pol = POLICYINFO_new();
181             pol->policyid = pobj;
182             if (!sk_POLICYINFO_push(pols, pol)){
183                 POLICYINFO_free(pol);
184                 X509V3err(X509V3_F_R2I_CERTPOL, ERR_R_MALLOC_FAILURE);
185                 goto err;
186             }
187         }
188     }
189     sk_CONF_VALUE_pop_free(vals, X509V3_conf_free);
190     return pols;
191 err:
192     sk_CONF_VALUE_pop_free(vals, X509V3_conf_free);

```

```

194     sk_POLICYINFO_pop_free(pols, POLICYINFO_free);
195     return NULL;
196 }

198 static POLICYINFO *policy_section(X509V3_CTX *ctx,
199     STACK_OF(CONF_VALUE) *polstrs, int ia5org)
200 {
201     int i;
202     CONF_VALUE *cnf;
203     POLICYINFO *pol;
204     POLICYQUALINFO *qual;
205     if(!(pol = POLICYINFO_new())) goto merr;
206     for(i = 0; i < sk_CONF_VALUE_num(polstrs); i++) {
207         cnf = sk_CONF_VALUE_value(polstrs, i);
208         if(!strcmp(cnf->name, "policyIdentifier")) {
209             ASN1_OBJECT *pobj;
210             if(!(pobj = OBJ_txt2obj(cnf->value, 0))) {
211                 X509V3err(X509V3_F_POLICY_SECTION, X509V3_R_INVALID
212                 X509V3_conf_err(cnf);
213                 goto err;
214             }
215             pol->policyid = pobj;
216         } else if(!name_cmp(cnf->name, "CPS")) {
217             if(!pol->qualifiers) pol->qualifiers =
218                 sk_POLICYQUALINFO_new_null();
219             if(!(qual = POLICYQUALINFO_new())) goto merr;
220             if(!sk_POLICYQUALINFO_push(pol->qualifiers, qual))
221                 goto merr;
222             qual->pqualid = OBJ_nid2obj(NID_id_qt_cps);
223             qual->d.cpsuri = M_ASN1_IA5STRING_new();
224             if(!ASN1_STRING_set(qual->d.cpsuri, cnf->value,
225                 strlen(cnf->value))) goto merr;
226         } else if(!name_cmp(cnf->name, "userNotice")) {
227             STACK_OF(CONF_VALUE) *unot;
228             if(*cnf->value != '@') {
229                 X509V3err(X509V3_F_POLICY_SECTION, X509V3_R_EXPECT
230                 X509V3_conf_err(cnf);
231                 goto err;
232             }
233             unot = X509V3_get_section(ctx, cnf->value + 1);
234             if(!unot) {
235                 X509V3err(X509V3_F_POLICY_SECTION, X509V3_R_INVALID
236                 X509V3_conf_err(cnf);
237                 goto err;
238             }
239             qual = notice_section(ctx, unot, ia5org);
240             X509V3_section_free(ctx, unot);
241             if(!qual) goto err;
242             if(!pol->qualifiers) pol->qualifiers =
243                 sk_POLICYQUALINFO_new_null();
244             if(!sk_POLICYQUALINFO_push(pol->qualifiers, qual))
245                 goto merr;
246         } else {
247             X509V3err(X509V3_F_POLICY_SECTION, X509V3_R_INVALID_OPTIO
248             X509V3_conf_err(cnf);
249             goto err;
250         }
251     }
252     if(!pol->policyid) {
253         X509V3err(X509V3_F_POLICY_SECTION, X509V3_R_NO_POLICY_IDENTIFIER)
254         goto err;
255     }
256 }

```

```

260     return pol;

262     merr:
263     X509V3err(X509V3_F_POLICY_SECTION,ERR_R_MALLOC_FAILURE);

265     err:
266     POLICYINFO_free(pol);
267     return NULL;
268
269 }

272 static POLICYQUALINFO *notice_section(X509V3_CTX *ctx,
273                                       STACK_OF(CONF_VALUE) *unot, int ia5org)
274 {
275     int i, ret;
276     CONF_VALUE *cnf;
277     USERNOTICE *not;
278     POLICYQUALINFO *qual;
279     if(!(qual = POLICYQUALINFO_new())) goto merr;
280     qual->pqualid = OBJ_nid2obj(NID_id_qt_unotice);
281     if(!(not = USERNOTICE_new())) goto merr;
282     qual->d.usernotice = not;
283     for(i = 0; i < sk_CONF_VALUE_num(unot); i++) {
284         cnf = sk_CONF_VALUE_value(unot, i);
285         if(!strcmp(cnf->name, "explicitText")) {
286             not->exptext = M_ASN1_VISIBLESTRING_new();
287             if(!ASN1_STRING_set(not->exptext, cnf->value,
288                                strlen(cnf->value))) goto merr;
289         } else if(!strcmp(cnf->name, "organization")) {
290             NOTICEREF *nref;
291             if(!not->noticeref) {
292                 if(!(nref = NOTICEREF_new())) goto merr;
293                 not->noticeref = nref;
294             } else nref = not->noticeref;
295             if(ia5org) nref->organization->type = V_ASN1_IA5STRING;
296             else nref->organization->type = V_ASN1_VISIBLESTRING;
297             if(!ASN1_STRING_set(nref->organization, cnf->value,
298                                strlen(cnf->value))) goto merr;
299         } else if(!strcmp(cnf->name, "noticeNumbers")) {
300             NOTICEREF *nref;
301             STACK_OF(CONF_VALUE) *nos;
302             if(!not->noticeref) {
303                 if(!(nref = NOTICEREF_new())) goto merr;
304                 not->noticeref = nref;
305             } else nref = not->noticeref;
306             nos = X509V3_parse_list(cnf->value);
307             if(!nos || !sk_CONF_VALUE_num(nos)) {
308                 X509V3err(X509V3_F_NOTICE_SECTION,X509V3_R_INVALID
309                             X509V3_conf_err(cnf));
310                 goto err;
311             }
312             ret = nref_nos(nref->noticenos, nos);
313             sk_CONF_VALUE_pop_free(nos, X509V3_conf_free);
314             if (!ret)
315                 goto err;
316         } else {
317             X509V3err(X509V3_F_NOTICE_SECTION,X509V3_R_INVALID_OPTIO
318                         X509V3_conf_err(cnf));
319             goto err;
320         }
321     }

323     if(not->noticeref &&
324        (!not->noticeref->noticenos || !not->noticeref->organization)) {
325         X509V3err(X509V3_F_NOTICE_SECTION,X509V3_R_NEED_ORGANIZA

```

```

326         goto err;
327     }

329     return qual;

331     merr:
332     X509V3err(X509V3_F_NOTICE_SECTION,ERR_R_MALLOC_FAILURE);

334     err:
335     POLICYQUALINFO_free(qual);
336     return NULL;
337 }

339 static int nref_nos(STACK_OF(ASN1_INTEGER) *nnums, STACK_OF(CONF_VALUE) *nos)
340 {
341     CONF_VALUE *cnf;
342     ASN1_INTEGER *aint;

344     int i;

346     for(i = 0; i < sk_CONF_VALUE_num(nos); i++) {
347         cnf = sk_CONF_VALUE_value(nos, i);
348         if(!(aint = s2i_ASN1_INTEGER(NULL, cnf->name))) {
349             X509V3err(X509V3_F_NREF_NOS,X509V3_R_INVALID_NUMBER);
350             goto err;
351         }
352         if(!sk_ASN1_INTEGER_push(nnums, aint)) goto merr;
353     }
354     return 1;

356     merr:
357     X509V3err(X509V3_F_NREF_NOS,ERR_R_MALLOC_FAILURE);

359     err:
360     sk_ASN1_INTEGER_pop_free(nnums, ASN1_STRING_free);
361     return 0;
362 }

365 static int i2r_certpol(X509V3_EXT_METHOD *method, STACK_OF(POLICYINFO) *pol,
366                        BIO *out, int indent)
367 {
368     int i;
369     POLICYINFO *pinfo;
370     /* First print out the policy OIDs */
371     for(i = 0; i < sk_POLICYINFO_num(pol); i++) {
372         pinfo = sk_POLICYINFO_value(pol, i);
373         BIO_printf(out, "%sPolicy: ", indent, "");
374         i2a_ASN1_OBJECT(out, pinfo->policyid);
375         BIO_puts(out, "\n");
376         if(pinfo->qualifiers)
377             print_qualifiers(out, pinfo->qualifiers, indent + 2);
378     }
379     return 1;
380 }

382 static void print_qualifiers(BIO *out, STACK_OF(POLICYQUALINFO) *quals,
383                             int indent)
384 {
385     POLICYQUALINFO *qualinfo;
386     int i;
387     for(i = 0; i < sk_POLICYQUALINFO_num(quals); i++) {
388         qualinfo = sk_POLICYQUALINFO_value(quals, i);
389         switch(OBJ_obj2nid(qualinfo->pqualid))
390         {
391             case NID_id_qt_cps:

```



```

392         BIO_printf(out, "%sCPS: %s\n", indent, "",
393                    qualinfo->d.cpsuri->data);
394         break;
395
396         case NID_id_qt_unotice:
397         BIO_printf(out, "%sUser Notice:\n", indent, "");
398         print_notice(out, qualinfo->d.usernotice, indent + 2);
399         break;
400
401         default:
402         BIO_printf(out, "%sUnknown Qualifier: ",
403                    indent + 2, "");
404
405         i2a_ASN1_OBJECT(out, qualinfo->pqualid);
406         BIO_puts(out, "\n");
407         break;
408     }
409 }
410 }
411
412 static void print_notice(BIO *out, USERNOTICE *notice, int indent)
413 {
414     int i;
415     if(notice->noticeref) {
416         NOTICEREF *ref;
417         ref = notice->noticeref;
418         BIO_printf(out, "%sOrganization: %s\n", indent, "",
419                    ref->organization->data);
420         BIO_printf(out, "%sNumber%s: ", indent, "",
421                    sk_ASN1_INTEGER_num(ref->noticenos) > 1 ? "s" : "");
422         for(i = 0; i < sk_ASN1_INTEGER_num(ref->noticenos); i++) {
423             ASN1_INTEGER *num;
424             char *tmp;
425             num = sk_ASN1_INTEGER_value(ref->noticenos, i);
426             if(i) BIO_puts(out, ", ");
427             tmp = i2s_ASN1_INTEGER(NULL, num);
428             BIO_puts(out, tmp);
429             OPENSSL_free(tmp);
430         }
431         BIO_puts(out, "\n");
432     }
433     if(notice->exptext)
434         BIO_printf(out, "%sExplicit Text: %s\n", indent, "",
435                    notice->exptext->data);
436 }
437
438 void X509_POLICY_NODE_print(BIO *out, X509_POLICY_NODE *node, int indent)
439 {
440     const X509_POLICY_DATA *dat = node->data;
441
442     BIO_printf(out, "%sPolicy: ", indent, "");
443
444     i2a_ASN1_OBJECT(out, dat->valid_policy);
445     BIO_puts(out, "\n");
446     BIO_printf(out, "%s%s\n", indent + 2, "",
447                node_data_critical(dat) ? "Critical" : "Non Critical");
448     if (dat->qualifier_set)
449         print_qualifiers(out, dat->qualifier_set, indent + 2);
450     else
451         BIO_printf(out, "%sNo Qualifiers\n", indent + 2, "");
452 }
453
454 IMPLEMENT_STACK_OF(X509_POLICY_NODE)
455 IMPLEMENT_STACK_OF(X509_POLICY_DATA)

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_crl.c

1

```
*****
15748 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_crl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_crl.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999-2008 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10 * are met:
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45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_crl.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/x509v3.h>

66 static void *v2i_crl(const X509V3_EXT_METHOD *method,
67                      X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval);
68 static int i2r_crl(const X509V3_EXT_METHOD *method, void *pcrldp, BIO *out,
69                   int indent);

71 const X509V3_EXT_METHOD v3_crl =
72 {
73     NID_crl_distribution_points, 0, ASN1_ITEM_ref(CRL_DIST_POINTS),
74     0,0,0,0,
75     0,0,
76     0,
77     v2i_crl,
78     i2r_crl,0,
79     NULL
80 };

82 const X509V3_EXT_METHOD v3_freshest_crl =
83 {
84     NID_freshest_crl, 0, ASN1_ITEM_ref(CRL_DIST_POINTS),
85     0,0,0,0,
86     0,0,
87     0,
88     v2i_crl,
89     i2r_crl,0,
90     NULL
91 };

93 static STACK_OF(GENERAL_NAME) *gnames_from Sectname(X509V3_CTX *ctx, char *sect)
94 {
95     STACK_OF(CONF_VALUE) *gnsect;
96     STACK_OF(GENERAL_NAME) *gens;
97     if (*sect == '@')
98         gnsect = X509V3_get_section(ctx, sect + 1);
99     else
100         gnsect = X509V3_parse_list(sect);
101     if (!gnsect)
102     {
103         X509V3err(X509V3_F_GNAMES_FROM_SECTNAME,
104                   X509V3_R_SECTION_NOT_FOUND);
105         return NULL;
106     }
107     gens = v2i_GENERAL_NAMES(NULL, ctx, gnsect);
108     if (*sect == '@')
109         X509V3_section_free(ctx, gnsect);
110     else
111         sk_CONF_VALUE_pop_free(gnsect, X509V3_conf_free);
112     return gens;
113 }

115 static int set_dist_point_name(DIST_POINT_NAME **pdp, X509V3_CTX *ctx,
116                             CONF_VALUE *cnf)
117 {
118     STACK_OF(GENERAL_NAME) *fnn = NULL;
119     STACK_OF(X509_NAME_ENTRY) *rnn = NULL;
120     if (!strcmp(cnf->name, "fullname", 9))
121     {
122         fnn = gnames_from_Sectname(ctx, cnf->value);
123         if (!fnn)
124             goto err;
125     }
126     else if (!strcmp(cnf->name, "relativename"))
127     {
```

```

128     int ret;
129     STACK_OF(CONF_VALUE) *dnsect;
130     X509_NAME *nm;
131     nm = X509_NAME_new();
132     if (!nm)
133         return -1;
134     dnsect = X509V3_get_section(ctx, cnf->value);
135     if (!dnsect)
136     {
137         X509V3err(X509V3_F_SET_DIST_POINT_NAME,
138                   X509V3_R_SECTION_NOT_FOUND);
139         return -1;
140     }
141     ret = X509V3_NAME_from_section(nm, dnsect, MBSTRING_ASC);
142     X509V3_section_free(ctx, dnsect);
143     rnm = nm->entries;
144     nm->entries = NULL;
145     X509_NAME_free(nm);
146     if (!ret || sk_X509_NAME_ENTRY_num(rnm) <= 0)
147         goto err;
148     /* Since its a name fragment can't have more than one
149      * RDNSSequence
150      */
151     if (sk_X509_NAME_ENTRY_value(rnm,
152                                   sk_X509_NAME_ENTRY_num(rnm) - 1)->set)
153     {
154         X509V3err(X509V3_F_SET_DIST_POINT_NAME,
155                   X509V3_R_INVALID_MULTIPLE_RDNS);
156         goto err;
157     }
158 }
159 else
160     return 0;
161
162 if (*pdp)
163 {
164     X509V3err(X509V3_F_SET_DIST_POINT_NAME,
165               X509V3_R_DISTPOINT_ALREADY_SET);
166     goto err;
167 }
168
169 *pdp = DIST_POINT_NAME_new();
170 if (!*pdp)
171     goto err;
172 if (fnm)
173 {
174     (*pdp)->type = 0;
175     (*pdp)->name.fullname = fnm;
176 }
177 else
178 {
179     (*pdp)->type = 1;
180     (*pdp)->name.relativename = rnm;
181 }
182
183 return 1;
184
185 err:
186 if (fnm)
187     sk_GENERAL_NAME_pop_free(fnm, GENERAL_NAME_free);
188 if (rnm)
189     sk_X509_NAME_ENTRY_pop_free(rnm, X509_NAME_ENTRY_free);
190 return -1;
191 }

```

```

193 static const BIT_STRING_BITNAME reason_flags[] = {

```

```

194 {0, "Unused", "unused"},
195 {1, "Key Compromise", "keyCompromise"},
196 {2, "CA Compromise", "CACompromise"},
197 {3, "Affiliation Changed", "affiliationChanged"},
198 {4, "Superseded", "superseded"},
199 {5, "Cessation Of Operation", "cessationOfOperation"},
200 {6, "Certificate Hold", "certificateHold"},
201 {7, "Privilege Withdrawn", "privilegeWithdrawn"},
202 {8, "AA Compromise", "AACompromise"},
203 {-1, NULL, NULL}
204 };
205
206 static int set_reasons(ASN1_BIT_STRING **preas, char *value)
207 {
208     STACK_OF(CONF_VALUE) *rsk = NULL;
209     const BIT_STRING_BITNAME *pbn;
210     const char *bnam;
211     int i, ret = 0;
212     rsk = X509V3_parse_list(value);
213     if (!rsk)
214         return 0;
215     if (*preas)
216         return 0;
217     for (i = 0; i < sk_CONF_VALUE_num(rsk); i++)
218     {
219         bnam = sk_CONF_VALUE_value(rsk, i)->name;
220         if (!*preas)
221         {
222             *preas = ASN1_BIT_STRING_new();
223             if (!*preas)
224                 goto err;
225         }
226         for (pbn = reason_flags; pbn->lname; pbn++)
227         {
228             if (!strcmp(pbn->sname, bnam))
229             {
230                 if (!ASN1_BIT_STRING_set_bit(*preas,
231                                               pbn->bitnum, 1))
232                     goto err;
233                 break;
234             }
235         }
236         if (!pbn->lname)
237             goto err;
238     }
239     ret = 1;
240
241 err:
242     sk_CONF_VALUE_pop_free(rsk, X509V3_conf_free);
243     return ret;
244 }
245
246 static int print_reasons(BIO *out, const char *rname,
247                          ASN1_BIT_STRING *rflags, int indent)
248 {
249     int first = 1;
250     const BIT_STRING_BITNAME *pbn;
251     BIO_printf(out, "%s%s:\n%s", indent, "", rname, indent + 2, "");
252     for (pbn = reason_flags; pbn->lname; pbn++)
253     {
254         if (ASN1_BIT_STRING_get_bit(rflags, pbn->bitnum))
255         {
256             if (first)
257                 first = 0;
258             else
259                 BIO_puts(out, ", ");

```

```

260         BIO_puts(out, pbn->lname);
261     }
262 }
263 if (first)
264     BIO_puts(out, "<EMPTY>\n");
265 else
266     BIO_puts(out, "\n");
267 return 1;
268 }

270 static DIST_POINT *crl_dp_from_section(X509V3_CTX *ctx,
271                                         STACK_OF(CONF_VALUE) *nval)
272 {
273     int i;
274     CONF_VALUE *cnf;
275     DIST_POINT *point = NULL;
276     point = DIST_POINT_new();
277     if (!point)
278         goto err;
279     for(i = 0; i < sk_CONF_VALUE_num(nval); i++)
280     {
281         int ret;
282         cnf = sk_CONF_VALUE_value(nval, i);
283         ret = set_dist_point_name(&point->distpoint, ctx, cnf);
284         if (ret > 0)
285             continue;
286         if (ret < 0)
287             goto err;
288         if (!strcmp(cnf->name, "reasons"))
289             {
290                 if (!set_reasons(&point->reasons, cnf->value))
291                     goto err;
292             }
293         else if (!strcmp(cnf->name, "CRLissuer"))
294             {
295                 point->CRLissuer =
296                     gnames_from_sectionname(ctx, cnf->value);
297                 if (!point->CRLissuer)
298                     goto err;
299             }
300     }

302     return point;
303 }

305 err:
306 if (point)
307     DIST_POINT_free(point);
308 return NULL;
309 }

311 static void *v2i_crl_dp(const X509V3_EXT_METHOD *method,
312                          X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
313 {
314     STACK_OF(DIST_POINT) *crl_dp = NULL;
315     GENERAL_NAMES *gens = NULL;
316     GENERAL_NAME *gen = NULL;
317     CONF_VALUE *cnf;
318     int i;
319     if(!(crl_dp = sk_DIST_POINT_new_null())) goto merr;
320     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
321         DIST_POINT *point;
322         cnf = sk_CONF_VALUE_value(nval, i);
323         if (!cnf->value)
324             {
325                 STACK_OF(CONF_VALUE) *dpsect;

```

```

326         dpsect = X509V3_get_section(ctx, cnf->name);
327         if (!dpsect)
328             goto err;
329         point = crl_dp_from_section(ctx, dpsect);
330         X509V3_section_free(ctx, dpsect);
331         if (!point)
332             goto err;
333         if(!sk_DIST_POINT_push(crl_dp, point))
334             {
335                 DIST_POINT_free(point);
336                 goto merr;
337             }
338     }
339     else
340     {
341         if(!(gen = v2i_GENERAL_NAME(method, ctx, cnf)))
342             goto err;
343         if(!(gens = GENERAL_NAMES_new()))
344             goto merr;
345         if(!sk_GENERAL_NAME_push(gens, gen))
346             goto merr;
347         gen = NULL;
348         if(!(point = DIST_POINT_new()))
349             goto merr;
350         if(!sk_DIST_POINT_push(crl_dp, point))
351             {
352                 DIST_POINT_free(point);
353                 goto merr;
354             }
355         if(!(point->distpoint = DIST_POINT_NAME_new()))
356             goto merr;
357         point->distpoint->name.fullname = gens;
358         point->distpoint->type = 0;
359         gens = NULL;
360     }
361 }
362 return crl_dp;

364 merr:
365 X509V3err(X509V3_F_V2I_CRL_DP,ERR_R_MALLOC_FAILURE);
366 err:
367 GENERAL_NAME_free(gen);
368 GENERAL_NAMES_free(gens);
369 sk_DIST_POINT_pop_free(crl_dp, DIST_POINT_free);
370 return NULL;
371 }

373 IMPLEMENT_STACK_OF(DIST_POINT)
374 IMPLEMENT_ASN1_SET_OF(DIST_POINT)

376 static int dpn_cb(int operation, ASN1_VALUE **pval, const ASN1_ITEM *it,
377                  void *exarg)
378 {
379     DIST_POINT_NAME *dpn = (DIST_POINT_NAME *)*pval;

381     switch(operation)
382     {
383     case ASN1_OP_NEW_POST:
384         dpn->dpname = NULL;
385         break;

387     case ASN1_OP_FREE_POST:
388         if (dpn->dpname)
389             X509_NAME_free(dpn->dpname);
390         break;
391     }

```

```

392     return 1;
393 }

396 ASN1_CHOICE_cb(DIST_POINT_NAME, dpn_cb) = {
397     ASN1_IMP_SEQUENCE_OF(DIST_POINT_NAME, name.fullname, GENERAL_NAME, 0),
398     ASN1_IMP_SET_OF(DIST_POINT_NAME, name.relativename, X509_NAME_ENTRY, 1)
399 } ASN1_CHOICE_END_cb(DIST_POINT_NAME, DIST_POINT_NAME, type)

402 IMPLEMENT_ASN1_FUNCTIONS(DIST_POINT_NAME)

404 ASN1_SEQUENCE(DIST_POINT) = {
405     ASN1_EXP_OPT(DIST_POINT, distpoint, DIST_POINT_NAME, 0),
406     ASN1_IMP_OPT(DIST_POINT, reasons, ASN1_BIT_STRING, 1),
407     ASN1_IMP_SEQUENCE_OF_OPT(DIST_POINT, CRLissuer, GENERAL_NAME, 2)
408 } ASN1_SEQUENCE_END(DIST_POINT)

410 IMPLEMENT_ASN1_FUNCTIONS(DIST_POINT)

412 ASN1_ITEM_TEMPLATE(CRL_DIST_POINTS) =
413     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, CRLDistributionPoints, D
414     ASN1_ITEM_TEMPLATE_END(CRL_DIST_POINTS)

416 IMPLEMENT_ASN1_FUNCTIONS(CRL_DIST_POINTS)

418 ASN1_SEQUENCE(ISSUING_DIST_POINT) = {
419     ASN1_EXP_OPT(ISSUING_DIST_POINT, distpoint, DIST_POINT_NAME, 0),
420     ASN1_IMP_OPT(ISSUING_DIST_POINT, onlyuser, ASN1_FBOOLEAN, 1),
421     ASN1_IMP_OPT(ISSUING_DIST_POINT, onlyCA, ASN1_FBOOLEAN, 2),
422     ASN1_IMP_OPT(ISSUING_DIST_POINT, onlysomereasons, ASN1_BIT_STRING, 3),
423     ASN1_IMP_OPT(ISSUING_DIST_POINT, indirectCRL, ASN1_FBOOLEAN, 4),
424     ASN1_IMP_OPT(ISSUING_DIST_POINT, onlyattr, ASN1_FBOOLEAN, 5)
425 } ASN1_SEQUENCE_END(ISSUING_DIST_POINT)

427 IMPLEMENT_ASN1_FUNCTIONS(ISSUING_DIST_POINT)

429 static int i2r_idp(const X509V3_EXT_METHOD *method, void *pidp, BIO *out,
430     int indent);
431 static void *v2i_idp(const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
432     STACK_OF(CONF_VALUE) *nval);

434 const X509V3_EXT_METHOD v3_idp =
435 {
436     NID_issuing_distribution_point, X509V3_EXT_MULTILINE,
437     ASN1_ITEM_ref(ISSUING_DIST_POINT),
438     0, 0, 0, 0,
439     0, 0,
440     0,
441     v2i_idp,
442     i2r_idp, 0,
443     NULL,
444 };

446 static void *v2i_idp(const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
447     STACK_OF(CONF_VALUE) *nval)
448 {
449     ISSUING_DIST_POINT *idp = NULL;
450     CONF_VALUE *cnf;
451     char *name, *val;
452     int i, ret;
453     idp = ISSUING_DIST_POINT_new();
454     if (!idp)
455         goto merr;
456     for(i = 0; i < sk_CONF_VALUE_num(nval); i++)
457     {

```

```

458         cnf = sk_CONF_VALUE_value(nval, i);
459         name = cnf->name;
460         val = cnf->value;
461         ret = set_dist_point_name(&idp->distpoint, ctx, cnf);
462         if (ret > 0)
463             continue;
464         if (ret < 0)
465             goto err;
466         if (!strcmp(name, "onlyuser"))
467         {
468             if (!X509V3_get_value_bool(cnf, &idp->onlyuser))
469                 goto err;
470         }
471         else if (!strcmp(name, "onlyCA"))
472         {
473             if (!X509V3_get_value_bool(cnf, &idp->onlyCA))
474                 goto err;
475         }
476         else if (!strcmp(name, "onlyAA"))
477         {
478             if (!X509V3_get_value_bool(cnf, &idp->onlyattr))
479                 goto err;
480         }
481         else if (!strcmp(name, "indirectCRL"))
482         {
483             if (!X509V3_get_value_bool(cnf, &idp->indirectCRL))
484                 goto err;
485         }
486         else if (!strcmp(name, "onlysomereasons"))
487         {
488             if (!set_reasons(&idp->onlysomereasons, val))
489                 goto err;
490         }
491         else
492         {
493             X509V3err(X509V3_F_V2I_IDP, X509V3_R_INVALID_NAME);
494             X509V3_conf_err(cnf);
495             goto err;
496         }
497     }
498     return idp;

500     merr:
501     X509V3err(X509V3_F_V2I_IDP, ERR_R_MALLOC_FAILURE);
502     err:
503     ISSUING_DIST_POINT_free(idp);
504     return NULL;
505 }

507 static int print_gens(BIO *out, STACK_OF(GENERAL_NAME) *gens, int indent)
508 {
509     int i;
510     for (i = 0; i < sk_GENERAL_NAME_num(gens); i++)
511     {
512         BIO_printf(out, "%*s", indent + 2, "");
513         GENERAL_NAME_print(out, sk_GENERAL_NAME_value(gens, i));
514         BIO_puts(out, "\n");
515     }
516     return 1;
517 }

519 static int print_distpoint(BIO *out, DIST_POINT_NAME *dpn, int indent)
520 {
521     if (dpn->type == 0)
522     {
523         BIO_printf(out, "%*sFull Name:\n", indent, "");

```

```

524     print_gens(out, dpn->name.fullname, indent);
525 }
526 else
527 {
528     X509_NAME ntmp;
529     ntmp.entries = dpn->name.relativename;
530     BIO_printf(out, "%*sRelative Name:\n%s",
531                indent, "", indent + 2, "");
532     X509_NAME_print_ex(out, &ntmp, 0, XN_FLAG_ONELINE);
533     BIO_puts(out, "\n");
534 }
535 return 1;
536 }

538 static int i2r_idp(const X509V3_EXT_METHOD *method, void *pidp, BIO *out,
539                   int indent)
540 {
541     ISSUING_DIST_POINT *idp = pidp;
542     if (idp->distpoint)
543         print_distpoint(out, idp->distpoint, indent);
544     if (idp->onlyuser > 0)
545         BIO_printf(out, "%*sOnly User Certificates\n", indent, "");
546     if (idp->onlyCA > 0)
547         BIO_printf(out, "%*sOnly CA Certificates\n", indent, "");
548     if (idp->indirectCRL > 0)
549         BIO_printf(out, "%*sIndirect CRL\n", indent, "");
550     if (idp->onlysomereasons)
551         print_reasons(out, "Only Some Reasons",
552                      idp->onlysomereasons, indent);
553     if (idp->onlyattr > 0)
554         BIO_printf(out, "%*sOnly Attribute Certificates\n", indent, "");
555     if (!idp->distpoint && (idp->onlyuser <= 0) && (idp->onlyCA <= 0)
556         && (idp->indirectCRL <= 0) && !idp->onlysomereasons
557         && (idp->onlyattr <= 0))
558         BIO_printf(out, "%*s<EMPTY>\n", indent, "");
559     return 1;
560 }

563 static int i2r_crl(dp(const X509V3_EXT_METHOD *method, void *pcrldp, BIO *out,
564                     int indent)
565 {
566     STACK_OF(DIST_POINT) *crl = pcrldp;
567     DIST_POINT *point;
568     int i;
569     for(i = 0; i < sk_DIST_POINT_num(crl); i++)
570     {
571         BIO_puts(out, "\n");
572         point = sk_DIST_POINT_value(crl, i);
573         if(point->distpoint)
574             print_distpoint(out, point->distpoint, indent);
575         if(point->reasons)
576             print_reasons(out, "Reasons", point->reasons,
577                          indent);
578         if(point->CRLissuer)
579         {
580             BIO_printf(out, "%*sCRL Issuer:\n", indent, "");
581             print_gens(out, point->CRLissuer, indent);
582         }
583     }
584     return 1;
585 }

587 int DIST_POINT_set_dpname(DIST_POINT_NAME *dpn, X509_NAME *iname)
588 {
589     int i;

```

```

590     STACK_OF(X509_NAME_ENTRY) *frag;
591     X509_NAME_ENTRY *ne;
592     if (!dpn || (dpn->type != 1))
593         return 1;
594     frag = dpn->name.relativename;
595     dpn->dpname = X509_NAME_dup(iname);
596     if (!dpn->dpname)
597         return 0;
598     for (i = 0; i < sk_X509_NAME_ENTRY_num(frag); i++)
599     {
600         ne = sk_X509_NAME_ENTRY_value(frag, i);
601         if (!X509_NAME_add_entry(dpn->dpname, ne, -1, i ? 0 : 1))
602         {
603             X509_NAME_free(dpn->dpname);
604             dpn->dpname = NULL;
605             return 0;
606         }
607     }
608     /* generate cached encoding of name */
609     if (i2d_X509_NAME(dpn->dpname, NULL) < 0)
610     {
611         X509_NAME_free(dpn->dpname);
612         dpn->dpname = NULL;
613         return 0;
614     }
615     return 1;
616 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_enum.c

1

```
*****
4048 Fri May 30 18:32:15 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_enum.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_enum.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
58 #include <stdio.h>
59 #include "cryptlib.h"
60 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_enum.c

2

```
63 static ENUMERATED_NAMES crl_reasons[] = {
64 {CRL_REASON_UNSPECIFIED, "Unspecified", "unspecified"},
65 {CRL_REASON_KEY_COMPROMISE, "Key Compromise", "keyCompromise"},
66 {CRL_REASON_CA_COMPROMISE, "CA Compromise", "CACompromise"},
67 {CRL_REASON_AFFILIATION_CHANGED, "Affiliation Changed", "affiliationChanged"},
68 {CRL_REASON_SUPERSEDED, "Superseded", "superseded"},
69 {CRL_REASON_CESSATION_OF_OPERATION,
70 "Cessation Of Operation", "cessationOfOperation"},
71 {CRL_REASON_CERTIFICATE_HOLD, "Certificate Hold", "certificateHold"},
72 {CRL_REASON_REMOVE_FROM_CRL, "Remove From CRL", "removeFromCRL"},
73 {CRL_REASON_PRIVILEGE_WITHDRAWN, "Privilege Withdrawn", "privilegeWithdrawn"},
74 {CRL_REASON_AA_COMPROMISE, "AA Compromise", "AACompromise"},
75 {-1, NULL, NULL}
76 };
77
78 const X509V3_EXT_METHOD v3_crl_reason = {
79 NID_crl_reason, 0, ASN1_ITEM_ref(ASN1_ENUMERATED),
80 0,0,0,0,
81 (X509V3_EXT_I2S)i2s_ASN1_ENUMERATED_TABLE,
82 0,
83 0,0,0,0,
84 crl_reasons};
85
86
87 char *i2s_ASN1_ENUMERATED_TABLE(X509V3_EXT_METHOD *method,
88 ASN1_ENUMERATED *e)
89 {
90     ENUMERATED_NAMES *enam;
91     long strval;
92     strval = ASN1_ENUMERATED_get(e);
93     for(enam = method->usr_data; enam->lname; enam++) {
94         if(strval == enam->bitnum) return BUF_strdup(enam->lname);
95     }
96     return i2s_ASN1_ENUMERATED(method, e);
97 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_extku.c

1

```
*****
4964 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_extku.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_extku.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_extku.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/conf.h>
64 #include <openssl/x509v3.h>

66 static void *v2i_EXTENDED_KEY_USAGE(const X509V3_EXT_METHOD *method,
67                                     X509V3_CTX *ctx,
68                                     STACK_OF(CONF_VALUE) *nval);
69 static STACK_OF(CONF_VALUE) *i2v_EXTENDED_KEY_USAGE(const X509V3_EXT_METHOD *met
70                                                     void *eku, STACK_OF(CONF_VALUE) *extlist);

72 const X509V3_EXT_METHOD v3_ext_ku = {
73     NID_ext_key_usage, 0,
74     ASN1_ITEM_ref(EXTENDED_KEY_USAGE),
75     0,0,0,0,
76     0,0,
77     i2v_EXTENDED_KEY_USAGE,
78     v2i_EXTENDED_KEY_USAGE,
79     0,0,
80     NULL
81 };

83 /* NB OCSP acceptable responses also is a SEQUENCE OF OBJECT */
84 const X509V3_EXT_METHOD v3_ocsp_accresp = {
85     NID_id_pkix_OCSP_acceptableResponses, 0,
86     ASN1_ITEM_ref(EXTENDED_KEY_USAGE),
87     0,0,0,0,
88     0,0,
89     i2v_EXTENDED_KEY_USAGE,
90     v2i_EXTENDED_KEY_USAGE,
91     0,0,
92     NULL
93 };

95 ASN1_ITEM_TEMPLATE(EXTENDED_KEY_USAGE) =
96     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, EXTENDED_KEY_USAGE, ASN1
97     ASN1_ITEM_TEMPLATE_END(EXTENDED_KEY_USAGE)

99 IMPLEMENT_ASN1_FUNCTIONS(EXTENDED_KEY_USAGE)

101 static STACK_OF(CONF_VALUE) *
102     i2v_EXTENDED_KEY_USAGE(const X509V3_EXT_METHOD *method, void *a,
103                           STACK_OF(CONF_VALUE) *ext_list)
104 {
105     EXTENDED_KEY_USAGE *eku = a;
106     int i;
107     ASN1_OBJECT *obj;
108     char obj_tmp[80];
109     for(i = 0; i < sk_ASN1_OBJECT_num(eku); i++) {
110         obj = sk_ASN1_OBJECT_value(eku, i);
111         i2t_ASN1_OBJECT(obj_tmp, 80, obj);
112         X509V3_add_value(NULL, obj_tmp, &ext_list);
113     }
114     return ext_list;
115 }

117 static void *v2i_EXTENDED_KEY_USAGE(const X509V3_EXT_METHOD *method,
118                                     X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
119 {
120     EXTENDED_KEY_USAGE *extku;
121     char *extval;
122     ASN1_OBJECT *objtmp;
123     CONF_VALUE *val;
124     int i;

126     if(!(extku = sk_ASN1_OBJECT_new_null())) {
127         X509V3err(X509V3_F_V2I_EXTENDED_KEY_USAGE, ERR_R_MALLOC_FAILURE);
```



```
128         return NULL;
129     }

131     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
132         val = sk_CONF_VALUE_value(nval, i);
133         if(val->value) extval = val->value;
134         else extval = val->name;
135         if(!(objtmp = OBJ_txt2obj(extval, 0))) {
136             sk_ASN1_OBJECT_pop_free(extku, ASN1_OBJECT_free);
137             X509V3err(X509V3_F_V2I_EXTENDED_KEY_USAGE, X509V3_R_INVALID
138             X509V3_conf_err(val);
139             return NULL;
140         }
141         sk_ASN1_OBJECT_push(extku, objtmp);
142     }
143     return extku;
144 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_genn.c

1

```
*****
6959 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_genn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_genn.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
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55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_genn.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/conf.h>
64 #include <openssl/x509v3.h>

66 ASN1_SEQUENCE(OTHERNAME) = {
67     ASN1_SIMPLE(OTHERNAME, type_id, ASN1_OBJECT),
68     /* Maybe have a true ANY DEFINED BY later */
69     ASN1_EXP(OTHERNAME, value, ASN1_ANY, 0)
70 } ASN1_SEQUENCE_END(OTHERNAME)

72 IMPLEMENT_ASN1_FUNCTIONS(OTHERNAME)

74 ASN1_SEQUENCE(EDIPARTYNAME) = {
75     ASN1_IMP_OPT(EDIPARTYNAME, nameAssigner, DIRECTORYSTRING, 0),
76     ASN1_IMP_OPT(EDIPARTYNAME, partyName, DIRECTORYSTRING, 1)
77 } ASN1_SEQUENCE_END(EDIPARTYNAME)

79 IMPLEMENT_ASN1_FUNCTIONS(EDIPARTYNAME)

81 ASN1_CHOICE(GENERAL_NAME) = {
82     ASN1_IMP(GENERAL_NAME, d.otherName, OTHERNAME, GEN_OTHERNAME),
83     ASN1_IMP(GENERAL_NAME, d.rfc822Name, ASN1_IA5STRING, GEN_EMAIL),
84     ASN1_IMP(GENERAL_NAME, d.dNSName, ASN1_IA5STRING, GEN_DNS),
85     /* Don't decode this */
86     ASN1_IMP(GENERAL_NAME, d.x400Address, ASN1_SEQUENCE, GEN_X400),
87     /* X509_NAME is a CHOICE type so use EXPLICIT */
88     ASN1_EXP(GENERAL_NAME, d.directoryName, X509_NAME, GEN_DIRNAME),
89     ASN1_IMP(GENERAL_NAME, d.ediPartyName, EDIPARTYNAME, GEN_EDIPARTY),
90     ASN1_IMP(GENERAL_NAME, d.uniformResourceIdentifier, ASN1_IA5STRING, GEN_URI),
91     ASN1_IMP(GENERAL_NAME, d.iPAddress, ASN1_OCTET_STRING, GEN_IPADD),
92     ASN1_IMP(GENERAL_NAME, d.registeredID, ASN1_OBJECT, GEN_RID)
93 } ASN1_CHOICE_END(GENERAL_NAME)

95 IMPLEMENT_ASN1_FUNCTIONS(GENERAL_NAME)

97 ASN1_ITEM_TEMPLATE(GENERAL_NAMES) =
98     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, GeneralNames, GENERAL_NAME)
99 ASN1_ITEM_TEMPLATE_END(GENERAL_NAMES)

101 IMPLEMENT_ASN1_FUNCTIONS(GENERAL_NAMES)

103 GENERAL_NAME *GENERAL_NAME_dup(GENERAL_NAME *a)
104 {
105     return (GENERAL_NAME *) ASN1_dup((i2d_of_void *) i2d_GENERAL_NAME,
106                                     (d2i_of_void *) d2i_GENERAL_NAME,
107                                     (char *) a);
108 }

110 /* Returns 0 if they are equal, != 0 otherwise. */
111 int GENERAL_NAME_cmp(GENERAL_NAME *a, GENERAL_NAME *b)
112 {
113     int result = -1;

115     if (!a || !b || a->type != b->type) return -1;
116     switch(a->type)
117     {
118     case GEN_X400:
119     case GEN_EDIPARTY:
120         result = ASN1_TYPE_cmp(a->d.other, b->d.other);
121         break;

123     case GEN_OTHERNAME:
124         result = OTHERNAME_cmp(a->d.otherName, b->d.otherName);
125         break;

127     case GEN_EMAIL:
```

```

128     case GEN_DNS:
129     case GEN_URI:
130         result = ASN1_STRING_cmp(a->d.ia5, b->d.ia5);
131         break;

133     case GEN_DIRNAME:
134         result = X509_NAME_cmp(a->d.dirn, b->d.dirn);
135         break;

137     case GEN_IPADD:
138         result = ASN1_OCTET_STRING_cmp(a->d.ip, b->d.ip);
139         break;

140     case GEN_RID:
141         result = OBJ_cmp(a->d.rid, b->d.rid);
142         break;
143     }
144     return result;
145 }
146

148 /* Returns 0 if they are equal, != 0 otherwise. */
149 int OTHERNAME_cmp(OTHERNAME *a, OTHERNAME *b)
150 {
151     int result = -1;

153     if (!a || !b) return -1;
154     /* Check their type first. */
155     if ((result = OBJ_cmp(a->type_id, b->type_id)) != 0)
156         return result;
157     /* Check the value. */
158     result = ASN1_TYPE_cmp(a->value, b->value);
159     return result;
160 }

162 void GENERAL_NAME_set0_value(GENERAL_NAME *a, int type, void *value)
163 {
164     switch(type)
165     {
166     case GEN_X400:
167     case GEN_EDIPARTY:
168         a->d.other = value;
169         break;

171     case GEN_OTHERNAME:
172         a->d.otherName = value;
173         break;

175     case GEN_EMAIL:
176     case GEN_DNS:
177     case GEN_URI:
178         a->d.ia5 = value;
179         break;

181     case GEN_DIRNAME:
182         a->d.dirn = value;
183         break;

185     case GEN_IPADD:
186         a->d.ip = value;
187         break;

188     case GEN_RID:
189         a->d.rid = value;
190         break;
191     }
192     a->type = type;
193 }

```

```

194     }

196 void *GENERAL_NAME_get0_value(GENERAL_NAME *a, int *ptype)
197 {
198     if (ptype)
199         *ptype = a->type;
200     switch(a->type)
201     {
202     case GEN_X400:
203     case GEN_EDIPARTY:
204         return a->d.other;

206     case GEN_OTHERNAME:
207         return a->d.otherName;

209     case GEN_EMAIL:
210     case GEN_DNS:
211     case GEN_URI:
212         return a->d.ia5;

214     case GEN_DIRNAME:
215         return a->d.dirn;

217     case GEN_IPADD:
218         return a->d.ip;

219     case GEN_RID:
220         return a->d.rid;

222     default:
223         return NULL;
224     }
225 }

228 int GENERAL_NAME_set0_othername(GENERAL_NAME *gen,
229                                 ASN1_OBJECT *oid, ASN1_TYPE *value)
230 {
231     OTHERNAME *oth;
232     oth = OTHERNAME_new();
233     if (!oth)
234         return 0;
235     oth->type_id = oid;
236     oth->value = value;
237     GENERAL_NAME_set0_value(gen, GEN_OTHERNAME, oth);
238     return 1;
239 }

241 int GENERAL_NAME_get0_otherName(GENERAL_NAME *gen,
242                                 ASN1_OBJECT **poid, ASN1_TYPE **pvalue)
243 {
244     if (gen->type != GEN_OTHERNAME)
245         return 0;
246     if (poid)
247         *poid = gen->d.otherName->type_id;
248     if (pvalue)
249         *pvalue = gen->d.otherName->value;
250     return 1;
251 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ia5.c

1

```
*****
4344 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ia5.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_ia5.c */
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53  * This product includes cryptographic software written by Eric Young
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55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ia5.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/conf.h>
64 #include <openssl/x509v3.h>

66 static char *i2s_ASN1_IA5STRING(X509V3_EXT_METHOD *method, ASN1_IA5STRING *ia5);
67 static ASN1_IA5STRING *s2i_ASN1_IA5STRING(X509V3_EXT_METHOD *method, X509V3_CTX
68 const X509V3_EXT_METHOD v3_ns_ia5_list[] = {
69 EXT_IA5STRING(NID_netscape_base_url),
70 EXT_IA5STRING(NID_netscape_revocation_url),
71 EXT_IA5STRING(NID_netscape_ca_revocation_url),
72 EXT_IA5STRING(NID_netscape_renewal_url),
73 EXT_IA5STRING(NID_netscape_ca_policy_url),
74 EXT_IA5STRING(NID_netscape_ssl_server_name),
75 EXT_IA5STRING(NID_netscape_comment),
76 EXT_END
77 };

80 static char *i2s_ASN1_IA5STRING(X509V3_EXT_METHOD *method,
81 ASN1_IA5STRING *ia5)
82 {
83     char *tmp;
84     if(!ia5 || !ia5->length) return NULL;
85     if(!(tmp = OPENSSL_malloc(ia5->length + 1))) {
86         X509V3err(X509V3_F_I2S_ASN1_IA5STRING,ERR_R_MALLOC_FAILURE);
87         return NULL;
88     }
89     memcpy(tmp, ia5->data, ia5->length);
90     tmp[ia5->length] = 0;
91     return tmp;
92 }

94 static ASN1_IA5STRING *s2i_ASN1_IA5STRING(X509V3_EXT_METHOD *method,
95 X509V3_CTX *ctx, char *str)
96 {
97     ASN1_IA5STRING *ia5;
98     if(!str) {
99         X509V3err(X509V3_F_S2I_ASN1_IA5STRING,X509V3_R_INVALID_NULL_ARGU
100         return NULL;
101     }
102     if(!(ia5 = M_ASN1_IA5STRING_new())) goto err;
103     if(!ASN1_STRING_set((ASN1_STRING *)ia5, (unsigned char*)str,
104         strlen(str))) {
105         M_ASN1_IA5STRING_free(ia5);
106         goto err;
107     }
108 #ifdef CHARSET_EBCDIC
109     ebcdic2ascii(ia5->data, ia5->data, ia5->length);
110 #endif /*CHARSET_EBCDIC*/
111     return ia5;
112 err:
113     X509V3err(X509V3_F_S2I_ASN1_IA5STRING,ERR_R_MALLOC_FAILURE);
114     return NULL;
115 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_info.c

1

```
*****
6684 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_info.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_info.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_info.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/x509v3.h>
65
66 static STACK_OF(CONF_VALUE) *i2v_AUTHORITY_INFO_ACCESS(X509V3_EXT_METHOD *method,
67     AUTHORITY_INFO_ACCESS *ainfo,
68     STACK_OF(CONF_VALUE) *ret);
69 static AUTHORITY_INFO_ACCESS *v2i_AUTHORITY_INFO_ACCESS(X509V3_EXT_METHOD *metho
70     X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval);
71
72 const X509V3_EXT_METHOD v3_info =
73 { NID_info_access, X509V3_EXT_MULTILINE, ASN1_ITEM_ref(AUTHORITY_INFO_ACCESS),
74   0,0,0,0,
75   0,0,
76   (X509V3_EXT_I2V)i2v_AUTHORITY_INFO_ACCESS,
77   (X509V3_EXT_V2I)v2i_AUTHORITY_INFO_ACCESS,
78   0,0,
79   NULL};
80
81 const X509V3_EXT_METHOD v3_sinfo =
82 { NID_sinfo_access, X509V3_EXT_MULTILINE, ASN1_ITEM_ref(AUTHORITY_INFO_ACCESS),
83   0,0,0,0,
84   0,0,
85   (X509V3_EXT_I2V)i2v_AUTHORITY_INFO_ACCESS,
86   (X509V3_EXT_V2I)v2i_AUTHORITY_INFO_ACCESS,
87   0,0,
88   NULL};
89
90 ASN1_SEQUENCE(ACCESS_DESCRIPTION) = {
91     ASN1_SIMPLE(ACCESS_DESCRIPTION, method, ASN1_OBJECT),
92     ASN1_SIMPLE(ACCESS_DESCRIPTION, location, GENERAL_NAME)
93 } ASN1_SEQUENCE_END(ACCESS_DESCRIPTION)
94
95 IMPLEMENT_ASN1_FUNCTIONS(ACCESS_DESCRIPTION)
96
97 ASN1_ITEM_TEMPLATE(AUTHORITY_INFO_ACCESS) =
98     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, GeneralNames, ACCESS_DES
99     ASN1_ITEM_TEMPLATE_END(AUTHORITY_INFO_ACCESS)
100
101 IMPLEMENT_ASN1_FUNCTIONS(AUTHORITY_INFO_ACCESS)
102
103 static STACK_OF(CONF_VALUE) *i2v_AUTHORITY_INFO_ACCESS(X509V3_EXT_METHOD *method
104     AUTHORITY_INFO_ACCESS *ainfo,
105     STACK_OF(CONF_VALUE) *ret)
106 {
107     ACCESS_DESCRIPTION *desc;
108     int i,nlen;
109     char objtmp[80], *ntmp;
110     CONF_VALUE *vtmp;
111     for(i = 0; i < sk_ACCESS_DESCRIPTION_num(ainfo); i++) {
112         desc = sk_ACCESS_DESCRIPTION_value(ainfo, i);
113         ret = i2v_GENERAL_NAME(method, desc->location, ret);
114         if(!ret) break;
115         vtmp = sk_CONF_VALUE_value(ret, i);
116         i2t_ASN1_OBJECT(objtmp, sizeof objtmp, desc->method);
117         nlen = strlen(objtmp) + strlen(vtmp->name) + 5;
118         ntmp = OPENSSL_malloc(nlen);
119         if(!ntmp) {
120             X509V3err(X509V3_F_I2V_AUTHORITY_INFO_ACCESS,
121                 ERR_R_MALLOC_FAILURE);
122             return NULL;
123         }
124         BUF_strlcpy(ntmp, objtmp, nlen);
125         BUF_strlcat(ntmp, " - ", nlen);
126         BUF_strlcat(ntmp, vtmp->name, nlen);
127         OPENSSL_free(vtmp->name);
```

```

128         vtmp->name = ntmp;
129     }
130     if(!ret) return sk_CONF_VALUE_new_null();
131     return ret;
132 }
133 }

135 static AUTHORITY_INFO_ACCESS *v2i_AUTHORITY_INFO_ACCESS(X509V3_EXT_METHOD *metho
136 X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
137 {
138     AUTHORITY_INFO_ACCESS *ainfo = NULL;
139     CONF_VALUE *cnf, ctmp;
140     ACCESS_DESCRIPTION *acc;
141     int i, objlen;
142     char *objtmp, *ptmp;
143     if(!(ainfo = sk_ACCESS_DESCRIPTION_new_null())) {
144         X509V3err(X509V3_F_V2I_AUTHORITY_INFO_ACCESS, ERR_R_MALLOC_FAILURE
145         return NULL;
146     }
147     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
148         cnf = sk_CONF_VALUE_value(nval, i);
149         if(!(acc = ACCESS_DESCRIPTION_new()))
150             || !sk_ACCESS_DESCRIPTION_push(ainfo, acc)) {
151             X509V3err(X509V3_F_V2I_AUTHORITY_INFO_ACCESS, ERR_R_MALLOC_FAILURE
152             goto err;
153         }
154         ptmp = strchr(cnf->name, ';');
155         if(!ptmp) {
156             X509V3err(X509V3_F_V2I_AUTHORITY_INFO_ACCESS, X509V3_R_INVALID_SYNTAX
157             goto err;
158         }
159         objlen = ptmp - cnf->name;
160         ctmp.name = ptmp + 1;
161         ctmp.value = cnf->value;
162         if(!v2i_GENERAL_NAME_ex(acc->location, method, ctx, &ctmp, 0))
163             goto err;
164         if(!(objtmp = OPENSSL_malloc(objlen + 1))) {
165             X509V3err(X509V3_F_V2I_AUTHORITY_INFO_ACCESS, ERR_R_MALLOC_FAILURE
166             goto err;
167         }
168         strncpy(objtmp, cnf->name, objlen);
169         objtmp[objlen] = 0;
170         acc->method = OBJ_txt2obj(objtmp, 0);
171         if(!acc->method) {
172             X509V3err(X509V3_F_V2I_AUTHORITY_INFO_ACCESS, X509V3_R_INVALID_SYNTAX
173             ERR_add_error_data(2, "value=", objtmp);
174             OPENSSL_free(objtmp);
175             goto err;
176         }
177         OPENSSL_free(objtmp);
178     }
179     return ainfo;
180 err:
181     sk_ACCESS_DESCRIPTION_pop_free(ainfo, ACCESS_DESCRIPTION_free);
182     return NULL;
183 }
184 }

186 int i2a_ACCESS_DESCRIPTION(BIO *bp, ACCESS_DESCRIPTION* a)
187 {
188     i2a_ASN1_OBJECT(bp, a->method);
189 #ifdef UNDEF
190     i2a_GENERAL_NAME(bp, a->location);
191 #endif
192     return 2;
193 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_int.c

1

```
*****
3446 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_int.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_int.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
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4  */
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55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_int.c

2

```
63 const X509V3_EXT_METHOD v3_crl_num = {
64     NID_crl_number, 0, ASN1_ITEM_ref(ASN1_INTEGER),
65     0,0,0,0,
66     (X509V3_EXT_I2S)i2s_ASN1_INTEGER,
67     0,
68     0,0,0,0, NULL};

70 const X509V3_EXT_METHOD v3_delta_crl = {
71     NID_delta_crl, 0, ASN1_ITEM_ref(ASN1_INTEGER),
72     0,0,0,0,
73     (X509V3_EXT_I2S)i2s_ASN1_INTEGER,
74     0,
75     0,0,0,0, NULL};

77 static void * s2i_asn1_int(X509V3_EXT_METHOD *meth, X509V3_CTX *ctx, char *value
78 {
79     return s2i_ASN1_INTEGER(meth, value);
80 }

82 const X509V3_EXT_METHOD v3_inhibit_anyp = {
83     NID_inhibit_any_policy, 0, ASN1_ITEM_ref(ASN1_INTEGER),
84     0,0,0,0,
85     (X509V3_EXT_I2S)i2s_ASN1_INTEGER,
86     (X509V3_EXT_S2I)s2i_asn1_int,
87     0,0,0,0, NULL};
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_lib.c

1

```
*****
9352 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_lib.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57 /*
58  * X509 v3 extension utilities */

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_lib.c

2

```
62 #include <openssl/conf.h>
63 #include <openssl/x509v3.h>

65 #include "ext_dat.h"

67 static STACK_OF(X509V3_EXT_METHOD) *ext_list = NULL;

69 static int ext_cmp(const X509V3_EXT_METHOD * const *a,
70                   const X509V3_EXT_METHOD * const *b);
71 static void ext_list_free(X509V3_EXT_METHOD *ext);

73 int X509V3_EXT_add(X509V3_EXT_METHOD *ext)
74 {
75     if(!ext_list && !(ext_list = sk_X509V3_EXT_METHOD_new(ext_cmp))) {
76         X509V3err(X509V3_F_X509V3_EXT_ADD,ERR_R_MALLOC_FAILURE);
77         return 0;
78     }
79     if(!sk_X509V3_EXT_METHOD_push(ext_list, ext)) {
80         X509V3err(X509V3_F_X509V3_EXT_ADD,ERR_R_MALLOC_FAILURE);
81         return 0;
82     }
83     return 1;
84 }

86 static int ext_cmp(const X509V3_EXT_METHOD * const *a,
87                   const X509V3_EXT_METHOD * const *b)
88 {
89     return ((*a)->ext_nid - (*b)->ext_nid);
90 }

92 DECLARE_OBJ_BSEARCH_CMP_FN(const X509V3_EXT_METHOD *, const X509V3_EXT_METHOD *,
93                             ext);
94 IMPLEMENT_OBJ_BSEARCH_CMP_FN(const X509V3_EXT_METHOD *,
95                               const X509V3_EXT_METHOD *, ext);

97 const X509V3_EXT_METHOD *X509V3_EXT_get_nid(int nid)
98 {
99     X509V3_EXT_METHOD tmp;
100     const X509V3_EXT_METHOD *t = &tmp, * const *ret;
101     int idx;
102     if(nid < 0) return NULL;
103     tmp.ext_nid = nid;
104     ret = OBJ_bsearch_ext(&t, standard_exts, STANDARD_EXTENSION_COUNT);
105     if(ret) return *ret;
106     if(!ext_list) return NULL;
107     idx = sk_X509V3_EXT_METHOD_find(ext_list, &tmp);
108     if(idx == -1) return NULL;
109     return sk_X509V3_EXT_METHOD_value(ext_list, idx);
110 }

112 const X509V3_EXT_METHOD *X509V3_EXT_get(X509_EXTENSION *ext)
113 {
114     int nid;
115     if((nid = OBJ_obj2nid(ext->object)) == NID_undef) return NULL;
116     return X509V3_EXT_get_nid(nid);
117 }

120 int X509V3_EXT_add_list(X509V3_EXT_METHOD *extlist)
121 {
122     for(;extlist->ext_nid!=-1;extlist++)
123         if(!X509V3_EXT_add(extlist)) return 0;
124     return 1;
125 }

127 int X509V3_EXT_add_alias(int nid_to, int nid_from)
```



```

128 {
129     const X509V3_EXT_METHOD *ext;
130     X509V3_EXT_METHOD *tmpext;

132     if(!(ext = X509V3_EXT_get(nid_from))) {
133         X509V3err(X509V3_F_X509V3_EXT_ADD_ALIAS,X509V3_R_EXTENSION_NOT_F
134         return 0;
135     }
136     if(!(tmpext = (X509V3_EXT_METHOD *)OPENSSL_malloc(sizeof(X509V3_EXT METH
137         X509V3err(X509V3_F_X509V3_EXT_ADD_ALIAS,ERR_R_MALLOC_FAILURE);
138         return 0;
139     }
140     *tmpext = *ext;
141     tmpext->ext_nid = nid_to;
142     tmpext->ext_flags |= X509V3_EXT_DYNAMIC;
143     return X509V3_EXT_add(tmpext);
144 }

146 void X509V3_EXT_cleanup(void)
147 {
148     sk_X509V3_EXT_METHOD_pop_free(ext_list, ext_list_free);
149     ext_list = NULL;
150 }

152 static void ext_list_free(X509V3_EXT_METHOD *ext)
153 {
154     if(ext->ext_flags & X509V3_EXT_DYNAMIC) OPENSSL_free(ext);
155 }

157 /* Legacy function: we don't need to add standard extensions
158  * any more because they are now kept in ext_dat.h.
159  */

161 int X509V3_add_standard_extensions(void)
162 {
163     return 1;
164 }

166 /* Return an extension internal structure */

168 void *X509V3_EXT_d2i(X509_EXTENSION *ext)
169 {
170     const X509V3_EXT_METHOD *method;
171     const unsigned char *p;

173     if(!(method = X509V3_EXT_get(ext))) return NULL;
174     p = ext->value->data;
175     if(method->it) return ASN1_item_d2i(NULL, &p, ext->value->length, ASN1_I
176     return method->d2i(NULL, &p, ext->value->length);
177 }

179 /* Get critical flag and decoded version of extension from a NID.
180  * The "idx" variable returns the last found extension and can
181  * be used to retrieve multiple extensions of the same NID.
182  * However multiple extensions with the same NID is usually
183  * due to a badly encoded certificate so if idx is NULL we
184  * choke if multiple extensions exist.
185  * The "crit" variable is set to the critical value.
186  * The return value is the decoded extension or NULL on
187  * error. The actual error can have several different causes,
188  * the value of *crit reflects the cause:
189  * >= 0, extension found but not decoded (reflects critical value).
190  * -1 extension not found.
191  * -2 extension occurs more than once.
192  */

```

```

194 void *X509V3_get_d2i(STACK_OF(X509_EXTENSION) *x, int nid, int *crit, int *idx)
195 {
196     int lastpos, i;
197     X509_EXTENSION *ex, *found_ex = NULL;
198     if(!x) {
199         if(idx) *idx = -1;
200         if(crit) *crit = -1;
201         return NULL;
202     }
203     if(idx) lastpos = *idx + 1;
204     else lastpos = 0;
205     if(lastpos < 0) lastpos = 0;
206     for(i = lastpos; i < sk_X509_EXTENSION_num(x); i++)
207     {
208         ex = sk_X509_EXTENSION_value(x, i);
209         if(OBJ_obj2nid(ex->object) == nid) {
210             if(idx) {
211                 *idx = i;
212                 found_ex = ex;
213                 break;
214             } else if(found_ex) {
215                 /* Found more than one */
216                 if(crit) *crit = -2;
217                 return NULL;
218             }
219             found_ex = ex;
220         }
221     }
222     if(found_ex) {
223         /* Found it */
224         if(crit) *crit = X509_EXTENSION_get_critical(found_ex);
225         return X509V3_EXT_d2i(found_ex);
226     }

228     /* Extension not found */
229     if(idx) *idx = -1;
230     if(crit) *crit = -1;
231     return NULL;
232 }

234 /* This function is a general extension append, replace and delete utility.
235  * The precise operation is governed by the 'flags' value. The 'crit' and
236  * 'value' arguments (if relevant) are the extensions internal structure.
237  */

239 int X509V3_add1_i2d(STACK_OF(X509_EXTENSION) **x, int nid, void *value,
240                     int crit, unsigned long flags)
241 {
242     int extidx = -1;
243     int errcode;
244     X509_EXTENSION *ext, *extmp;
245     unsigned long ext_op = flags & X509V3_ADD_OP_MASK;

247     /* If appending we don't care if it exists, otherwise
248      * look for existing extension.
249      */
250     if(ext_op != X509V3_ADD_APPEND)
251         extidx = X509v3_get_ext_by_NID(*x, nid, -1);

253     /* See if extension exists */
254     if(extidx >= 0) {
255         /* If keep existing, nothing to do */
256         if(ext_op == X509V3_ADD_KEEP_EXISTING)
257             return 1;
258         /* If default then its an error */
259         if(ext_op == X509V3_ADD_DEFAULT) {

```

```
260         errcode = X509V3_R_EXTENSION_EXISTS;
261         goto err;
262     }
263     /* If delete, just delete it */
264     if(ext_op == X509V3_ADD_DELETE) {
265         if(!sk_X509_EXTENSION_delete(*x, extidx)) return -1;
266         return 1;
267     }
268 } else {
269     /* If replace existing or delete, error since
270      * extension must exist
271      */
272     if((ext_op == X509V3_ADD_REPLACE_EXISTING) ||
273        (ext_op == X509V3_ADD_DELETE)) {
274         errcode = X509V3_R_EXTENSION_NOT_FOUND;
275         goto err;
276     }
277 }
278
279 /* If we get this far then we have to create an extension:
280  * could have some flags for alternative encoding schemes...
281  */
282
283 ext = X509V3_EXT_i2d(nid, crit, value);
284
285 if(!ext) {
286     X509V3err(X509V3_F_X509V3_ADD1_I2D, X509V3_R_ERROR_CREATING_EXTE
287     return 0;
288 }
289
290 /* If extension exists replace it.. */
291 if(extidx >= 0) {
292     extmp = sk_X509_EXTENSION_value(*x, extidx);
293     X509_EXTENSION_free(extmp);
294     if(!sk_X509_EXTENSION_set(*x, extidx, ext)) return -1;
295     return 1;
296 }
297
298 if(!*x && !(*x = sk_X509_EXTENSION_new_null())) return -1;
299 if(!sk_X509_EXTENSION_push(*x, ext)) return -1;
300
301 return 1;
302
303 err:
304 if(!(flags & X509V3_ADD_SILENT))
305     X509V3err(X509V3_F_X509V3_ADD1_I2D, errcode);
306 return 0;
307 }
308
309 IMPLEMENT_STACK_OF(X509V3_EXT_METHOD)
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ncons.c

1

```
*****
14031 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ncons.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_ncons.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 2003 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
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18  * distribution.
19  *
20  * 3. All advertising materials mentioning features or use of this
21  * software must display the following acknowledgment:
22  * "This product includes software developed by the OpenSSL Project
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25  * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ncons.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/conf.h>
64 #include <openssl/x509v3.h>

66 static void *v2i_NAME_CONSTRAINTS(const X509V3_EXT_METHOD *method,
67                                     X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval);
68 static int i2r_NAME_CONSTRAINTS(const X509V3_EXT_METHOD *method,
69                                   void *a, BIO *bp, int ind);
70 static int do_i2r_name_constraints(const X509V3_EXT_METHOD *method,
71                                     STACK_OF(GENERAL_SUBTREE) *trees,
72                                     BIO *bp, int ind, char *name);
73 static int print_nc_ipadd(BIO *bp, ASN1_OCTET_STRING *ip);

75 static int nc_match(GENERAL_NAME *gen, NAME_CONSTRAINTS *nc);
76 static int nc_match_single(GENERAL_NAME *sub, GENERAL_NAME *gen);
77 static int nc_dn(X509_NAME *sub, X509_NAME *nm);
78 static int nc_dns(ASN1_IA5STRING *sub, ASN1_IA5STRING *dns);
79 static int nc_email(ASN1_IA5STRING *sub, ASN1_IA5STRING *em);
80 static int nc_uri(ASN1_IA5STRING *uri, ASN1_IA5STRING *base);

82 const X509V3_EXT_METHOD v3_name_constraints = {
83     NID_name_constraints, 0,
84     ASN1_ITEM_ref(NAME_CONSTRAINTS),
85     0,0,0,0,
86     0,0,
87     0, v2i_NAME_CONSTRAINTS,
88     i2r_NAME_CONSTRAINTS,0,
89     NULL
90 };

92 ASN1_SEQUENCE(GENERAL_SUBTREE) = {
93     ASN1_SIMPLE(GENERAL_SUBTREE, base, GENERAL_NAME),
94     ASN1_IMP_OPT(GENERAL_SUBTREE, minimum, ASN1_INTEGER, 0),
95     ASN1_IMP_OPT(GENERAL_SUBTREE, maximum, ASN1_INTEGER, 1)
96 } ASN1_SEQUENCE_END(GENERAL_SUBTREE)

98 ASN1_SEQUENCE(NAME_CONSTRAINTS) = {
99     ASN1_IMP_SEQUENCE_OF_OPT(NAME_CONSTRAINTS, permittedSubtrees,
100                                GENERAL_SUBTREE, 0),
101     ASN1_IMP_SEQUENCE_OF_OPT(NAME_CONSTRAINTS, excludedSubtrees,
102                                GENERAL_SUBTREE, 1),
103 } ASN1_SEQUENCE_END(NAME_CONSTRAINTS)
104

106 IMPLEMENT_ASN1_ALLOC_FUNCTIONS(GENERAL_SUBTREE)
107 IMPLEMENT_ASN1_ALLOC_FUNCTIONS(NAME_CONSTRAINTS)

109 static void *v2i_NAME_CONSTRAINTS(const X509V3_EXT_METHOD *method,
110                                     X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
111 {
112     int i;
113     CONF_VALUE tval, *val;
114     STACK_OF(GENERAL_SUBTREE) **ptree = NULL;
115     NAME_CONSTRAINTS *ncons = NULL;
116     GENERAL_SUBTREE *sub = NULL;
117     ncons = NAME_CONSTRAINTS_new();
118     if (!ncons)
119         goto memerr;
120     for(i = 0; i < sk_CONF_VALUE_num(nval); i++)
121     {
122         val = sk_CONF_VALUE_value(nval, i);
123         if (!strcmp(val->name, "permitted", 9) && val->name[9])
124         {
125             ptree = &ncons->permittedSubtrees;
126             tval.name = val->name + 10;
127         }
```

```

128         else if (!strcmp(val->name, "excluded", 8) && val->name[8])
129         {
130             ptree = &ncons->excludedSubtrees;
131             tval.name = val->name + 9;
132         }
133     else
134     {
135         X509V3err(X509V3_F_V2I_NAME_CONSTRAINTS, X509V3_R_INVALID
136             goto err;
137     }
138     tval.value = val->value;
139     sub = GENERAL_SUBTREE_new();
140     if (!v2i_GENERAL_NAME_ex(sub->base, method, ctx, &tval, 1))
141         goto err;
142     if (!ptree)
143         *ptree = sk_GENERAL_SUBTREE_new_null();
144     if (!ptree || !sk_GENERAL_SUBTREE_push(*ptree, sub))
145         goto memerr;
146     sub = NULL;
147 }

149 return ncons;

151 memerr:
152 X509V3err(X509V3_F_V2I_NAME_CONSTRAINTS, ERR_R_MALLOC_FAILURE);
153 err:
154 if (ncons)
155     NAME_CONSTRAINTS_free(ncons);
156 if (sub)
157     GENERAL_SUBTREE_free(sub);

159 return NULL;
160 }
161
163

165 static int i2r_NAME_CONSTRAINTS(const X509V3_EXT_METHOD *method, void *a,
166     BIO *bp, int ind)
167 {
168     NAME_CONSTRAINTS *ncons = a;
169     do_i2r_name_constraints(method, ncons->permittedSubtrees,
170         bp, ind, "Permitted");
171     do_i2r_name_constraints(method, ncons->excludedSubtrees,
172         bp, ind, "Excluded");
173     return 1;
174 }

176 static int do_i2r_name_constraints(const X509V3_EXT_METHOD *method,
177     STACK_OF(GENERAL_SUBTREE) *trees,
178     BIO *bp, int ind, char *name)
179 {
180     GENERAL_SUBTREE *tree;
181     int i;
182     if (sk_GENERAL_SUBTREE_num(trees) > 0)
183         BIO_printf(bp, "%s%s:\n", ind, name);
184     for(i = 0; i < sk_GENERAL_SUBTREE_num(trees); i++)
185     {
186         tree = sk_GENERAL_SUBTREE_value(trees, i);
187         BIO_printf(bp, "%s", ind + 2, "");
188         if (tree->base->type == GEN_IPADD)
189             print_nc_ipadd(bp, tree->base->d.ip);
190         else
191             GENERAL_NAME_print(bp, tree->base);
192         BIO_puts(bp, "\n");
193     }

```

```

194     return 1;
195 }

197 static int print_nc_ipadd(BIO *bp, ASN1_OCTET_STRING *ip)
198 {
199     int i, len;
200     unsigned char *p;
201     p = ip->data;
202     len = ip->length;
203     BIO_puts(bp, "IP:");
204     if(len == 8)
205     {
206         BIO_printf(bp, "%d.%d.%d.%d/%d.%d.%d.%d",
207             p[0], p[1], p[2], p[3],
208             p[4], p[5], p[6], p[7]);
209     }
210     else if(len == 32)
211     {
212         for (i = 0; i < 16; i++)
213         {
214             BIO_printf(bp, "%X", p[i] << 8 | p[i+1]);
215             p += 2;
216             if (i == 7)
217                 BIO_puts(bp, "/");
218             else if (i != 15)
219                 BIO_puts(bp, ":");
220         }
221     }
222     else
223         BIO_printf(bp, "IP Address:<invalid>");
224     return 1;
225 }

227 /* Check a certificate conforms to a specified set of constraints.
228 * Return values:
229 * X509_V_OK: All constraints obeyed.
230 * X509_V_ERR_PERMITTED_VIOLATION: Permitted subtree violation.
231 * X509_V_ERR_EXCLUDED_VIOLATION: Excluded subtree violation.
232 * X509_V_ERR_SUBTREE_MINMAX: Min or max values present and matching type.
233 * X509_V_ERR_UNSUPPORTED_CONSTRAINT_TYPE: Unsupported constraint type.
234 * X509_V_ERR_UNSUPPORTED_CONSTRAINT_SYNTAX: bad unsupported constraint syntax.
235 * X509_V_ERR_UNSUPPORTED_NAME_SYNTAX: bad or unsupported syntax of name

237 */

239 int NAME_CONSTRAINTS_check(X509 *x, NAME_CONSTRAINTS *nc)
240 {
241     int r, i;
242     X509_NAME *nm;

244     nm = X509_get_subject_name(x);

246     if (X509_NAME_entry_count(nm) > 0)
247     {
248         GENERAL_NAME gntmp;
249         gntmp.type = GEN_DIRNAME;
250         gntmp.d.directoryName = nm;

252         r = nc_match(&gntmp, nc);

254         if (r != X509_V_OK)
255             return r;

257         gntmp.type = GEN_EMAIL;

```

```

260      /* Process any email address attributes in subject name */
262      for (i = -1;;)
263      {
264          X509_NAME_ENTRY *ne;
265          i = X509_NAME_get_index_by_NID(nm,
266                                         NID_pkcs9_emailAddress,
267                                         i);
268          if (i == -1)
269              break;
270          ne = X509_NAME_get_entry(nm, i);
271          gntmp.d.rfc822Name = X509_NAME_ENTRY_get_data(ne);
272          if (gntmp.d.rfc822Name->type != V_ASN1_IA5STRING)
273              return X509_V_ERR_UNSUPPORTED_NAME_SYNTAX;
275          r = nc_match(&gntmp, nc);
277          if (r != X509_V_OK)
278              return r;
279      }
281  }
283  for (i = 0; i < sk_GENERAL_NAME_num(x->altnames); i++)
284  {
285      GENERAL_NAME *gen = sk_GENERAL_NAME_value(x->altnames, i);
286      r = nc_match(gen, nc);
287      if (r != X509_V_OK)
288          return r;
289  }
291  return X509_V_OK;
293  }
295  static int nc_match(GENERAL_NAME *gen, NAME_CONSTRAINTS *nc)
296  {
297      GENERAL_SUBTREE *sub;
298      int i, r, match = 0;
300      /* Permitted subtrees: if any subtrees exist of matching the type
301       * at least one subtree must match.
302       */
304      for (i = 0; i < sk_GENERAL_SUBTREE_num(nc->permittedSubtrees); i++)
305      {
306          sub = sk_GENERAL_SUBTREE_value(nc->permittedSubtrees, i);
307          if (gen->type != sub->base->type)
308              continue;
309          if (sub->minimum || sub->maximum)
310              return X509_V_ERR_SUBTREE_MINMAX;
311          /* If we already have a match don't bother trying any more */
312          if (match == 2)
313              continue;
314          if (match == 0)
315              match = 1;
316          r = nc_match_single(gen, sub->base);
317          if (r == X509_V_OK)
318              match = 2;
319          else if (r != X509_V_ERR_PERMITTED_VIOLATION)
320              return r;
321      }
323      if (match == 1)
324          return X509_V_ERR_PERMITTED_VIOLATION;

```

```

326      /* Excluded subtrees: must not match any of these */
328      for (i = 0; i < sk_GENERAL_SUBTREE_num(nc->excludedSubtrees); i++)
329      {
330          sub = sk_GENERAL_SUBTREE_value(nc->excludedSubtrees, i);
331          if (gen->type != sub->base->type)
332              continue;
333          if (sub->minimum || sub->maximum)
334              return X509_V_ERR_SUBTREE_MINMAX;
336          r = nc_match_single(gen, sub->base);
337          if (r == X509_V_OK)
338              return X509_V_ERR_EXCLUDED_VIOLATION;
339          else if (r != X509_V_ERR_PERMITTED_VIOLATION)
340              return r;
342      }
344      return X509_V_OK;
346  }
348  static int nc_match_single(GENERAL_NAME *gen, GENERAL_NAME *base)
349  {
350      switch(base->type)
351      {
352          case GEN_DIRNAME:
353              return nc_dn(gen->d.directoryName, base->d.directoryName);
355          case GEN_DNS:
356              return nc_dns(gen->d.dnsName, base->d.dnsName);
358          case GEN_EMAIL:
359              return nc_email(gen->d.rfc822Name, base->d.rfc822Name);
361          case GEN_URI:
362              return nc_uri(gen->d.uniformResourceIdentifier,
363                           base->d.uniformResourceIdentifier);
365          default:
366              return X509_V_ERR_UNSUPPORTED_CONSTRAINT_TYPE;
367      }
369  }
371  /* directoryName name constraint matching.
372   * The canonical encoding of X509_NAME makes this comparison easy. It is
373   * matched if the subtree is a subset of the name.
374   */
376  static int nc_dn(X509_NAME *nm, X509_NAME *base)
377  {
378      /* Ensure canonical encodings are up to date. */
379      if (nm->modified && i2d_X509_NAME(nm, NULL) < 0)
380          return X509_V_ERR_OUT_OF_MEM;
381      if (base->modified && i2d_X509_NAME(base, NULL) < 0)
382          return X509_V_ERR_OUT_OF_MEM;
383      if (base->canon_enclen > nm->canon_enclen)
384          return X509_V_ERR_PERMITTED_VIOLATION;
385      if (memcmp(base->canon_enc, nm->canon_enc, base->canon_enclen))
386          return X509_V_ERR_PERMITTED_VIOLATION;
387      return X509_V_OK;
388  }
390  static int nc_dns(ASN1_IA5STRING *dns, ASN1_IA5STRING *base)
391  {

```

```

392 char *baseptr = (char *)base->data;
393 char *dnsptr = (char *)dns->data;
394 /* Empty matches everything */
395 if (!*baseptr)
396     return X509_V_OK;
397 /* Otherwise can add zero or more components on the left so
398  * compare RHS and if dns is longer and expect '.' as preceding
399  * character.
400  */
401 if (dns->length > base->length)
402 {
403     dnsptr += dns->length - base->length;
404     if (dnsptr[-1] != '.')
405         return X509_V_ERR_PERMITTED_VIOLATION;
406 }
407
408 if (strcasecmp(baseptr, dnsptr))
409     return X509_V_ERR_PERMITTED_VIOLATION;
410
411 return X509_V_OK;
412 }
413
414 static int nc_email(ASN1_IA5STRING *eml, ASN1_IA5STRING *base)
415 {
416     const char *baseptr = (char *)base->data;
417     const char *emlptr = (char *)eml->data;
418
419     const char *baseat = strchr(baseptr, '@');
420     const char *emlat = strchr(emlptr, '@');
421     if (!emlat)
422         return X509_V_ERR_UNSUPPORTED_NAME_SYNTAX;
423     /* Special case: initial '.' is RHS match */
424     if (!baseat && (*baseptr == '.'))
425     {
426         if (eml->length > base->length)
427         {
428             emlptr += eml->length - base->length;
429             if (!strcasecmp(baseptr, emlptr))
430                 return X509_V_OK;
431         }
432         return X509_V_ERR_PERMITTED_VIOLATION;
433     }
434
435     /* If we have anything before '@' match local part */
436
437     if (baseat)
438     {
439         if (baseat != baseptr)
440         {
441             if ((baseat - baseptr) != (emlat - emlptr))
442                 return X509_V_ERR_PERMITTED_VIOLATION;
443             /* Case sensitive match of local part */
444             if (strncmp(baseptr, emlptr, emlat - emlptr))
445                 return X509_V_ERR_PERMITTED_VIOLATION;
446         }
447         /* Position base after '@' */
448         baseptr = baseat + 1;
449     }
450     emlptr = emlat + 1;
451     /* Just have hostname left to match: case insensitive */
452     if (strcasecmp(baseptr, emlptr))
453         return X509_V_ERR_PERMITTED_VIOLATION;
454
455     return X509_V_OK;

```

```

458     }
459
460 static int nc_uri(ASN1_IA5STRING *uri, ASN1_IA5STRING *base)
461 {
462     const char *baseptr = (char *)base->data;
463     const char *hostptr = (char *)uri->data;
464     const char *p = strchr(hostptr, ':');
465     int hostlen;
466     /* Check for foo:// and skip past it */
467     if (!p || (p[1] != '/') || (p[2] != '/'))
468         return X509_V_ERR_UNSUPPORTED_NAME_SYNTAX;
469     hostptr = p + 3;
470
471     /* Determine length of hostname part of URI */
472
473     /* Look for a port indicator as end of hostname first */
474
475     p = strchr(hostptr, ':');
476     /* Otherwise look for trailing slash */
477     if (!p)
478         p = strchr(hostptr, '/');
479
480     if (!p)
481         hostlen = strlen(hostptr);
482     else
483         hostlen = p - hostptr;
484
485     if (hostlen == 0)
486         return X509_V_ERR_UNSUPPORTED_NAME_SYNTAX;
487
488     /* Special case: initial '.' is RHS match */
489     if (*baseptr == '.')
490     {
491         if (hostlen > base->length)
492         {
493             p = hostptr + hostlen - base->length;
494             if (!strncasecmp(p, baseptr, base->length))
495                 return X509_V_OK;
496         }
497         return X509_V_ERR_PERMITTED_VIOLATION;
498     }
499
500     if ((base->length != (int)hostlen) || strncasecmp(hostptr, baseptr, host
501         return X509_V_ERR_PERMITTED_VIOLATION;
502
503     return X509_V_OK;
504 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ocsp.c

1

```
*****
8387 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ocsp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_ocsp.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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20 * 3. All advertising materials mentioning features or use of this
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40 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
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43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 */

59 #ifndef OPENSSL_NO_OCSP

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_ocsp.c

2

```
62 #include "cryptlib.h"
63 #include <openssl/conf.h>
64 #include <openssl/asn1.h>
65 #include <openssl/ocsp.h>
66 #include <openssl/x509v3.h>

68 /* OCSP extensions and a couple of CRL entry extensions
69 */

71 static int i2r_ocsp_crlid(const X509V3_EXT_METHOD *method, void *nonce,
72                          BIO *out, int indent);
73 static int i2r_ocsp_acutoff(const X509V3_EXT_METHOD *method, void *nonce,
74                             BIO *out, int indent);
75 static int i2r_object(const X509V3_EXT_METHOD *method, void *obj, BIO *out,
76                      int indent);

78 static void *ocsp_nonce_new(void);
79 static int i2d_ocsp_nonce(void *a, unsigned char **pp);
80 static void *d2i_ocsp_nonce(void *a, const unsigned char **pp, long length);
81 static void ocsp_nonce_free(void *a);
82 static int i2r_ocsp_nonce(const X509V3_EXT_METHOD *method, void *nonce,
83                          BIO *out, int indent);

85 static int i2r_ocsp_nocheck(const X509V3_EXT_METHOD *method,
86                             void *nocheck, BIO *out, int indent);
87 static void *s2i_ocsp_nocheck(const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
88                               const char *str);
89 static int i2r_ocsp_serviceloc(const X509V3_EXT_METHOD *method, void *in,
90                               BIO *bp, int ind);

92 const X509V3_EXT_METHOD v3_ocsp_crlid = {
93     NID_id_pkix_OCSP_CrLiD, 0, ASN1_ITEM_ref(OCSP_CRLID),
94     0,0,0,0,
95     0,0,
96     0,0,
97     i2r_ocsp_crlid,0,
98     NULL
99 };

101 const X509V3_EXT_METHOD v3_ocsp_acutoff = {
102     NID_id_pkix_OCSP_archiveCutoff, 0, ASN1_ITEM_ref(ASN1_GENERALIZEDTIME),
103     0,0,0,0,
104     0,0,
105     0,0,
106     i2r_ocsp_acutoff,0,
107     NULL
108 };

110 const X509V3_EXT_METHOD v3_crl_invdate = {
111     NID_invalid_date, 0, ASN1_ITEM_ref(ASN1_GENERALIZEDTIME),
112     0,0,0,0,
113     0,0,
114     0,0,
115     i2r_ocsp_acutoff,0,
116     NULL
117 };

119 const X509V3_EXT_METHOD v3_crl_hold = {
120     NID_hold_instruction_code, 0, ASN1_ITEM_ref(ASN1_OBJECT),
121     0,0,0,0,
122     0,0,
123     0,0,
124     i2r_object,0,
125     NULL
126 };
```

```

128 const X509V3_EXT_METHOD v3_ocsp_nonce = {
129     NID_id_pkix_OCSP_Nonce, 0, NULL,
130     ocsp_nonce_new,
131     ocsp_nonce_free,
132     d2i_ocsp_nonce,
133     i2d_ocsp_nonce,
134     0, 0,
135     0, 0,
136     i2r_ocsp_nonce, 0,
137     NULL
138 };

140 const X509V3_EXT_METHOD v3_ocsp_nocheck = {
141     NID_id_pkix_OCSP_noCheck, 0, ASN1_ITEM_ref(ASN1_NULL),
142     0, 0, 0, 0,
143     0, s2i_ocsp_nocheck,
144     0, 0,
145     i2r_ocsp_nocheck, 0,
146     NULL
147 };

149 const X509V3_EXT_METHOD v3_ocsp_serviceloc = {
150     NID_id_pkix_OCSP_serviceLocator, 0, ASN1_ITEM_ref(OCSP_SERVICELOC),
151     0, 0, 0, 0,
152     0, 0,
153     0, 0,
154     i2r_ocsp_serviceloc, 0,
155     NULL
156 };

158 static int i2r_ocsp_crlid(const X509V3_EXT_METHOD *method, void *in, BIO *bp,
159                          int ind)
160 {
161     OCSP_CRLID *a = in;
162     if (a->crlUrl)
163     {
164         if (BIO_printf(bp, "%*scrlUrl: ", ind, "") <= 0) goto err;
165         if (!ASN1_STRING_print(bp, (ASN1_STRING *)a->crlUrl)) goto err;
166         if (BIO_write(bp, "\n", 1) <= 0) goto err;
167     }
168     if (a->crlNum)
169     {
170         if (BIO_printf(bp, "%*scrlNum: ", ind, "") <= 0) goto err;
171         if (i2a_ASN1_INTEGER(bp, a->crlNum) <= 0) goto err;
172         if (BIO_write(bp, "\n", 1) <= 0) goto err;
173     }
174     if (a->crlTime)
175     {
176         if (BIO_printf(bp, "%*scrlTime: ", ind, "") <= 0) goto err;
177         if (!ASN1_GENERALIZEDTIME_print(bp, a->crlTime)) goto err;
178         if (BIO_write(bp, "\n", 1) <= 0) goto err;
179     }
180     return 1;
181 err:
182     return 0;
183 }

185 static int i2r_ocsp_acutoff(const X509V3_EXT_METHOD *method, void *cutoff,
186                             BIO *bp, int ind)
187 {
188     if (BIO_printf(bp, "%*s", ind, "") <= 0) return 0;
189     if (!ASN1_GENERALIZEDTIME_print(bp, cutoff)) return 0;
190     return 1;
191 }

```

```

194 static int i2r_object(const X509V3_EXT_METHOD *method, void *oid, BIO *bp,
195                      int ind)
196 {
197     if (BIO_printf(bp, "%*s", ind, "") <= 0) return 0;
198     if (i2a_ASN1_OBJECT(bp, oid) <= 0) return 0;
199     return 1;
200 }

202 /* OCSP nonce. This needs special treatment because it doesn't have
203  * an ASN1 encoding at all: it just contains arbitrary data.
204  */

206 static void *ocsp_nonce_new(void)
207 {
208     return ASN1_OCTET_STRING_new();
209 }

211 static int i2d_ocsp_nonce(void *a, unsigned char **pp)
212 {
213     ASN1_OCTET_STRING *os = a;
214     if (pp) {
215         memcpy(*pp, os->data, os->length);
216         *pp += os->length;
217     }
218     return os->length;
219 }

221 static void *d2i_ocsp_nonce(void *a, const unsigned char **pp, long length)
222 {
223     ASN1_OCTET_STRING *os, **pos;
224     pos = a;
225     if (!pos || !*pos) os = ASN1_OCTET_STRING_new();
226     else os = *pos;
227     if (!ASN1_OCTET_STRING_set(os, *pp, length)) goto err;

229     *pp += length;

231     if (pos) *pos = os;
232     return os;

234 err:
235     if (os && (!pos || (*pos != os))) M_ASN1_OCTET_STRING_free(os);
236     OCSPerr(OCSP_F_D2I_OCSP_NONCE, ERR_R_MALLOC_FAILURE);
237     return NULL;
238 }

240 static void ocsp_nonce_free(void *a)
241 {
242     M_ASN1_OCTET_STRING_free(a);
243 }

245 static int i2r_ocsp_nonce(const X509V3_EXT_METHOD *method, void *nonce,
246                           BIO *out, int indent)
247 {
248     if (BIO_printf(out, "%*s", indent, "") <= 0) return 0;
249     if (i2a_ASN1_STRING(out, nonce, V_ASN1_OCTET_STRING) <= 0) return 0;
250     return 1;
251 }

253 /* Nocheck is just a single NULL. Don't print anything and always set it */

255 static int i2r_ocsp_nocheck(const X509V3_EXT_METHOD *method, void *nocheck,
256                             BIO *out, int indent)
257 {
258     return 1;
259 }

```



```
261 static void *s2i_ocsp_noccheck(const X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
262                                 const char *str)
263 {
264     return ASN1_NULL_new();
265 }
266
267 static int i2r_ocsp_serviceloc(const X509V3_EXT_METHOD *method, void *in,
268                                BIO *bp, int ind)
269 {
270     int i;
271     OCSF_SERVICELOC *a = in;
272     ACCESS_DESCRIPTION *ad;
273
274     if (BIO_printf(bp, "%sIssuer: ", ind, "") <= 0) goto err;
275     if (X509_NAME_print_ex(bp, a->issuer, 0, XN_FLAG_ONELINE) <= 0) goto err
276     for (i = 0; i < sk_ACCESS_DESCRIPTION_num(a->locator); i++)
277     {
278         ad = sk_ACCESS_DESCRIPTION_value(a->locator,i);
279         if (BIO_printf(bp, "\n%s", (2*ind), "") <= 0)
280             goto err;
281         if(i2a_ASN1_OBJECT(bp, ad->method) <= 0) goto er
282         if(BIO_puts(bp, " - ") <= 0) goto err;
283         if(GENERAL_NAME_print(bp, ad->location) <= 0) go
284     }
285     return 1;
286 err:
287     return 0;
288 }
289 #endif
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pci.c

1

```
*****
9051 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pci.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_pci.c -*- mode:C; c-file-style: "eay" -*- */
2 /* Contributed to the OpenSSL Project 2004
3  * by Richard Levitte (richard@levitte.org)
4  */
5 /* Copyright (c) 2004 Kungliga Tekniska Högskolan
6  * (Royal Institute of Technology, Stockholm, Sweden).
7  * All rights reserved.
8  */
9  * Redistribution and use in source and binary forms, with or without
10 * modification, are permitted provided that the following conditions
11 * are met:
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13 * 1. Redistributions of source code must retain the above copyright
14 * notice, this list of conditions and the following disclaimer.
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16 * 2. Redistributions in binary form must reproduce the above copyright
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20 * 3. Neither the name of the Institute nor the names of its contributors
21 * may be used to endorse or promote products derived from this software
22 * without specific prior written permission.
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26 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
27 * ARE DISCLAIMED. IN NO EVENT SHALL THE INSTITUTE OR CONTRIBUTORS BE LIABLE
28 * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
29 * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
30 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
31 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
32 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
33 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
34 * SUCH DAMAGE.
35 */

37 #include <stdio.h>
38 #include "cryptlib.h"
39 #include <openssl/conf.h>
40 #include <openssl/x509v3.h>

42 static int i2r_pci(X509V3_EXT_METHOD *method, PROXY_CERT_INFO_EXTENSION *ext,
43 BIO *out, int indent);
44 static PROXY_CERT_INFO_EXTENSION *r2i_pci(X509V3_EXT_METHOD *method,
45 X509V3_CTX *ctx, char *str);

47 const X509V3_EXT_METHOD v3_pci =
48 {
49     NID_proxyCertInfo, 0, ASN1_ITEM_ref(PROXY_CERT_INFO_EXTENSION),
50     0,0,0,0,
51     0,0,
52     NULL, NULL,
53     (X509V3_EXT_I2R)i2r_pci,
54     (X509V3_EXT_R2I)r2i_pci,
55     NULL,
56 };

57 static int i2r_pci(X509V3_EXT_METHOD *method, PROXY_CERT_INFO_EXTENSION *pci,
58 BIO *out, int indent)
59 {
60     BIO_printf(out, "%sPath Length Constraint: ", indent, "");
61     if (pci->pcPathLengthConstraint)
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pci.c

2

```
62     i2a_ASN1_INTEGER(out, pci->pcPathLengthConstraint);
63     else
64         BIO_printf(out, "infinite");
65     BIO_puts(out, "\n");
66     BIO_printf(out, "%sPolicy Language: ", indent, "");
67     i2a_ASN1_OBJECT(out, pci->proxyPolicy->policyLanguage);
68     BIO_puts(out, "\n");
69     if (pci->proxyPolicy->policy && pci->proxyPolicy->policy->data)
70         BIO_printf(out, "%sPolicy Text: %s\n", indent, "",
71                    pci->proxyPolicy->policy->data);
72     return 1;
73 }

75 static int process_pci_value(CONF_VALUE *val,
76 ASN1_OBJECT **language, ASN1_INTEGER **pathlen,
77 ASN1_OCTET_STRING **policy)
78 {
79     int free_policy = 0;

81     if (strcmp(val->name, "language") == 0)
82     {
83         if (*language)
84         {
85             X509V3err(X509V3_F_PROCESS_PCI_VALUE, X509V3_R_POLICY_LAN
86             X509V3_conf_err(val);
87             return 0;
88         }
89         if (!(*language = OBJ_txt2obj(val->value, 0)))
90         {
91             X509V3err(X509V3_F_PROCESS_PCI_VALUE, X509V3_R_INVALID_OB
92             X509V3_conf_err(val);
93             return 0;
94         }
95     }
96     else if (strcmp(val->name, "pathlen") == 0)
97     {
98         if (*pathlen)
99         {
100             X509V3err(X509V3_F_PROCESS_PCI_VALUE, X509V3_R_POLICY_PAT
101             X509V3_conf_err(val);
102             return 0;
103         }
104         if (!X509V3_get_value_int(val, pathlen))
105         {
106             X509V3err(X509V3_F_PROCESS_PCI_VALUE, X509V3_R_POLICY_PAT
107             X509V3_conf_err(val);
108             return 0;
109         }
110     }
111     else if (strcmp(val->name, "policy") == 0)
112     {
113         unsigned char *tmp_data = NULL;
114         long val_len;
115         if (!*policy)
116         {
117             *policy = ASN1_OCTET_STRING_new();
118             if (!*policy)
119             {
120                 X509V3err(X509V3_F_PROCESS_PCI_VALUE, ERR_R_MALLO
121                 X509V3_conf_err(val);
122                 return 0;
123             }
124             free_policy = 1;
125         }
126         if (strncmp(val->value, "hex:", 4) == 0)
127         {
```

```

128     unsigned char *tmp_data2 =
129         string_to_hex(val->value + 4, &val_len);

131     if (!tmp_data2)
132     {
133         X509V3err(X509V3_F_PROCESS_PCI_VALUE, X509V3_R_IL
134         X509V3_conf_err(val);
135         goto err;
136     }

138     tmp_data = OPENSSL_realloc((*policy)->data,
139     (*policy)->length + val_len + 1);
140     if (tmp_data)
141     {
142         (*policy)->data = tmp_data;
143         memcpy(&(*policy)->data[(*policy)->length],
144             tmp_data2, val_len);
145         (*policy)->length += val_len;
146         (*policy)->data[(*policy)->length] = '\0';
147     }
148     else
149     {
150         OPENSSL_free(tmp_data2);
151         /* realloc failure implies the original data spa
152         (*policy)->data = NULL;
153         (*policy)->length = 0;
154         X509V3err(X509V3_F_PROCESS_PCI_VALUE, ERR_R_MALLO
155         X509V3_conf_err(val);
156         goto err;
157     }
158     OPENSSL_free(tmp_data2);
159 }
160 else if (strcmp(val->value, "file:", 5) == 0)
161 {
162     unsigned char buf[2048];
163     int n;
164     BIO *b = BIO_new_file(val->value + 5, "r");
165     if (!b)
166     {
167         X509V3err(X509V3_F_PROCESS_PCI_VALUE, ERR_R_BIO_L
168         X509V3_conf_err(val);
169         goto err;
170     }
171     while((n = BIO_read(b, buf, sizeof(buf))) > 0
172     || (n == 0 && BIO_should_retry(b)))
173     {
174         if (!n) continue;
175
176         tmp_data = OPENSSL_realloc((*policy)->data,
177         (*policy)->length + n + 1);
178
179         if (!tmp_data)
180             break;
181
182         (*policy)->data = tmp_data;
183         memcpy(&(*policy)->data[(*policy)->length],
184             buf, n);
185         (*policy)->length += n;
186         (*policy)->data[(*policy)->length] = '\0';
187     }
188     BIO_free_all(b);
189
190     if (n < 0)
191     {
192         X509V3err(X509V3_F_PROCESS_PCI_VALUE, ERR_R_BIO_L
193         X509V3_conf_err(val);

```

```

194         goto err;
195     }
196 }
197 else if (strcmp(val->value, "text:", 5) == 0)
198 {
199     val_len = strlen(val->value + 5);
200     tmp_data = OPENSSL_realloc((*policy)->data,
201     (*policy)->length + val_len + 1);
202     if (tmp_data)
203     {
204         (*policy)->data = tmp_data;
205         memcpy(&(*policy)->data[(*policy)->length],
206             val->value + 5, val_len);
207         (*policy)->length += val_len;
208         (*policy)->data[(*policy)->length] = '\0';
209     }
210     else
211     {
212         /* realloc failure implies the original data spa
213         (*policy)->data = NULL;
214         (*policy)->length = 0;
215         X509V3err(X509V3_F_PROCESS_PCI_VALUE, ERR_R_MALLO
216         X509V3_conf_err(val);
217         goto err;
218     }
219 }
220 else
221 {
222     X509V3err(X509V3_F_PROCESS_PCI_VALUE, X509V3_R_INCORRECT
223     X509V3_conf_err(val);
224     goto err;
225 }
226 if (!tmp_data)
227 {
228     X509V3err(X509V3_F_PROCESS_PCI_VALUE, ERR_R_MALLO
229     X509V3_conf_err(val);
230     goto err;
231 }
232 }
233 return 1;
234 err:
235 if (free_policy)
236 {
237     ASN1_OCTET_STRING_free(*policy);
238     *policy = NULL;
239 }
240 return 0;
241 }

243 static PROXY_CERT_INFO_EXTENSION *r2i_pci(X509V3_EXT_METHOD *method,
244 X509V3_CTX *ctx, char *value)
245 {
246     PROXY_CERT_INFO_EXTENSION *pci = NULL;
247     STACK_OF(CONF_VALUE) *vals;
248     ASN1_OBJECT *language = NULL;
249     ASN1_INTEGER *pathlen = NULL;
250     ASN1_OCTET_STRING *policy = NULL;
251     int i, j;

253     vals = X509V3_parse_list(value);
254     for (i = 0; i < sk_CONF_VALUE_num(vals); i++)
255     {
256         CONF_VALUE *cnf = sk_CONF_VALUE_value(vals, i);
257         if (!cnf->name || (*cnf->name != '@' && !cnf->value))
258         {
259             X509V3err(X509V3_F_R2I_PCI, X509V3_R_INVALID_PROXY_POLICY

```

```

260         X509V3_conf_err(cnf);
261         goto err;
262     }
263     if (*cnf->name == '@')
264     {
265         STACK_OF(CONF_VALUE) *sect;
266         int success_p = 1;
267
268         sect = X509V3_get_section(ctx, cnf->name + 1);
269         if (!sect)
270         {
271             X509V3err(X509V3_F_R2I_PCI, X509V3_R_INVALID_SECT);
272             X509V3_conf_err(cnf);
273             goto err;
274         }
275         for (j = 0; success_p && j < sk_CONF_VALUE_num(sect); j++)
276         {
277             success_p =
278                 process_pci_value(sk_CONF_VALUE_value(sect, j),
279                                 &language, &pathlen, &policy);
280         }
281         X509V3_section_free(ctx, sect);
282         if (!success_p)
283             goto err;
284     }
285     else
286     {
287         if (!process_pci_value(cnf, &language, &pathlen, &policy))
288         {
289             X509V3_conf_err(cnf);
290             goto err;
291         }
292     }
293 }
294
295 /* Language is mandatory */
296 if (!language)
297 {
298     X509V3err(X509V3_F_R2I_PCI, X509V3_R_NO_PROXY_CERT_POLICY_LANGUAGE);
299     goto err;
300 }
301 i = OBJ_obj2nid(language);
302 if ((i == NID_Independent || i == NID_id_pp1_inheritAll) && policy)
303 {
304     X509V3err(X509V3_F_R2I_PCI, X509V3_R_POLICY_WHEN_PROXY_LANGUAGE_REQUIRED);
305     goto err;
306 }
307
308 pci = PROXY_CERT_INFO_EXTENSION_new();
309 if (!pci)
310 {
311     X509V3err(X509V3_F_R2I_PCI, ERR_R_MALLOC_FAILURE);
312     goto err;
313 }
314
315 pci->proxyPolicy->policyLanguage = language; language = NULL;
316 pci->proxyPolicy->policy = policy; policy = NULL;
317 pci->pcPathLengthConstraint = pathlen; pathlen = NULL;
318 goto end;
319
320 err:
321 if (language) { ASN1_OBJECT_free(language); language = NULL; }
322 if (pathlen) { ASN1_INTEGER_free(pathlen); pathlen = NULL; }
323 if (policy) { ASN1_OCTET_STRING_free(policy); policy = NULL; }
324 if (pci) { PROXY_CERT_INFO_EXTENSION_free(pci); pci = NULL; }
325 end:

```

```

326     sk_CONF_VALUE_pop_free(vals, X509V3_conf_free);
327     return pci;
328 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pcia.c

1

2357 Fri May 30 18:32:16 2014

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pcia.c

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* v3_pcia.c -*- mode:C; c-file-style: "eay" -*- */
2 /* Contributed to the OpenSSL Project 2004
3  * by Richard Levitte (richard@levitte.org)
4  */
5 /* Copyright (c) 2004 Kungliga Tekniska Högskolan
6  * (Royal Institute of Technology, Stockholm, Sweden).
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32 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
33 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
34 * SUCH DAMAGE.
35 */

37 #include <openssl/asn1.h>
38 #include <openssl/asn1t.h>
39 #include <openssl/x509v3.h>

41 ASN1_SEQUENCE(PROXY_POLICY) =
42 {
43     ASN1_SIMPLE(PROXY_POLICY, policyLanguage, ASN1_OBJECT),
44     ASN1_OPT(PROXY_POLICY, policy, ASN1_OCTET_STRING)
45 } ASN1_SEQUENCE_END(PROXY_POLICY)

47 IMPLEMENT_ASN1_FUNCTIONS(PROXY_POLICY)

49 ASN1_SEQUENCE(PROXY_CERT_INFO_EXTENSION) =
50 {
51     ASN1_OPT(PROXY_CERT_INFO_EXTENSION, pcPathLengthConstraint, ASN1_INTEGER),
52     ASN1_SIMPLE(PROXY_CERT_INFO_EXTENSION, proxyPolicy, PROXY_POLICY)
53 } ASN1_SEQUENCE_END(PROXY_CERT_INFO_EXTENSION)

55 IMPLEMENT_ASN1_FUNCTIONS(PROXY_CERT_INFO_EXTENSION)
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pcons.c

1

```
*****
5041 Fri May 30 18:32:16 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pcons.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_pcons.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
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55  * Hudson (tjh@cryptsoft.com).
56  *
57  */

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pcons.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/conf.h>
65 #include <openssl/x509v3.h>

67 static STACK_OF(CONF_VALUE) *
68 i2v_POLICY_CONSTRAINTS(const X509V3_EXT_METHOD *method, void *bcons,
69                        STACK_OF(CONF_VALUE) *extlist);
70 static void *v2i_POLICY_CONSTRAINTS(const X509V3_EXT_METHOD *method,
71                                     X509V3_CTX *ctx,
72                                     STACK_OF(CONF_VALUE) *values);

74 const X509V3_EXT_METHOD v3_policy_constraints = {
75     NID_policy_constraints, 0,
76     ASN1_ITEM_ref(POLICY_CONSTRAINTS),
77     0,0,0,0,
78     0,0,
79     i2v_POLICY_CONSTRAINTS,
80     v2i_POLICY_CONSTRAINTS,
81     NULL,NULL,
82     NULL
83 };

85 ASN1_SEQUENCE(POLICY_CONSTRAINTS) = {
86     ASN1_IMP_OPT(POLICY_CONSTRAINTS, requireExplicitPolicy, ASN1_INTEGER,0),
87     ASN1_IMP_OPT(POLICY_CONSTRAINTS, inhibitPolicyMapping, ASN1_INTEGER,1)
88 } ASN1_SEQUENCE_END(POLICY_CONSTRAINTS)

90 IMPLEMENT_ASN1_ALLOC_FUNCTIONS(POLICY_CONSTRAINTS)

93 static STACK_OF(CONF_VALUE) *
94 i2v_POLICY_CONSTRAINTS(const X509V3_EXT_METHOD *method, void *a,
95                        STACK_OF(CONF_VALUE) *extlist)
96 {
97     POLICY_CONSTRAINTS *pcons = a;
98     X509V3_add_value_int("Require Explicit Policy",
99                         pcons->requireExplicitPolicy, &extlist);
100     X509V3_add_value_int("Inhibit Policy Mapping",
101                         pcons->inhibitPolicyMapping, &extlist);
102     return extlist;
103 }

105 static void *v2i_POLICY_CONSTRAINTS(const X509V3_EXT_METHOD *method,
106                                     X509V3_CTX *ctx,
107                                     STACK_OF(CONF_VALUE) *values)
108 {
109     POLICY_CONSTRAINTS *pcons=NULL;
110     CONF_VALUE *val;
111     int i;
112     if(!((pcons = POLICY_CONSTRAINTS_new())) {
113         X509V3err(X509V3_F_V2I_POLICY_CONSTRAINTS, ERR_R_MALLOC_FAILURE)
114         return NULL;
115     }
116     for(i = 0; i < sk_CONF_VALUE_num(values); i++) {
117         val = sk_CONF_VALUE_value(values, i);
118         if(!strcmp(val->name, "requireExplicitPolicy")) {
119             if(!X509V3_get_value_int(val,
120                                     &pcons->requireExplicitPolicy)) goto err;
121         } else if(!strcmp(val->name, "inhibitPolicyMapping")) {
122             if(!X509V3_get_value_int(val,
123                                     &pcons->inhibitPolicyMapping)) goto err;
124         } else {
125             X509V3err(X509V3_F_V2I_POLICY_CONSTRAINTS, X509V3_R_INVA
126                     X509V3_conf_err(val);
127             goto err;
128         }
129     }
130     return pcons;
131 }
```

```
128         }
129     }
130     if (!pcons->inhibitPolicyMapping && !pcons->requireExplicitPolicy) {
131         X509V3err(X509V3_F_V2I_POLICY_CONSTRAINTS, X509V3_R_ILLEGAL_EMPTY
132             goto err;
133     }
134
135     return pcons;
136 err:
137     POLICY_CONSTRAINTS_free(pcons);
138     return NULL;
139 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pku.c

1

```
*****
4155 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pku.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_pku.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
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4  */
5 /* =====
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55  * Hudson (tjh@cryptsoft.com).
56  */
57
59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/asn1.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pku.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/x509v3.h>
64
65 static int i2r_PKEY_USAGE_PERIOD(X509V3_EXT_METHOD *method, PKEY_USAGE_PERIOD *u
66 /*
67 static PKEY_USAGE_PERIOD *v2i_PKEY_USAGE_PERIOD(X509V3_EXT_METHOD *method, X509V
68 */
69 const X509V3_EXT_METHOD v3_pkey_usage_period = {
70     NID_private_key_usage_period, 0, ASN1_ITEM_ref(PKEY_USAGE_PERIOD),
71     0,0,0,0,
72     0,0,0,0,
73     (X509V3_EXT_I2R)i2r_PKEY_USAGE_PERIOD, NULL,
74     NULL
75 };
76
77 ASN1_SEQUENCE(PKEY_USAGE_PERIOD) = {
78     ASN1_IMP_OPT(PKEY_USAGE_PERIOD, notBefore, ASN1_GENERALIZEDTIME, 0),
79     ASN1_IMP_OPT(PKEY_USAGE_PERIOD, notAfter, ASN1_GENERALIZEDTIME, 1)
80 } ASN1_SEQUENCE_END(PKEY_USAGE_PERIOD)
81
82 IMPLEMENT_ASN1_FUNCTIONS(PKEY_USAGE_PERIOD)
83
84 static int i2r_PKEY_USAGE_PERIOD(X509V3_EXT_METHOD *method,
85     PKEY_USAGE_PERIOD *usage, BIO *out, int indent)
86 {
87     BIO_printf(out, "%s", indent, "");
88     if(usage->notBefore) {
89         BIO_write(out, "Not Before: ", 12);
90         ASN1_GENERALIZEDTIME_print(out, usage->notBefore);
91         if(usage->notAfter) BIO_write(out, ", ", 2);
92     }
93     if(usage->notAfter) {
94         BIO_write(out, "Not After: ", 11);
95         ASN1_GENERALIZEDTIME_print(out, usage->notAfter);
96     }
97     return 1;
98 }
99
100 /*
101 static PKEY_USAGE_PERIOD *v2i_PKEY_USAGE_PERIOD(method, ctx, values)
102 X509V3_EXT_METHOD *method;
103 X509V3_CTX *ctx;
104 STACK_OF(CONF_VALUE) *values;
105 {
106     return NULL;
107 }
108 */
```


new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pmaps.c

1

```
*****
5477 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pmaps.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_pmaps.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
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4  */
5 /* =====
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52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_pmaps.c

2

```
62 #include <openssl/asn1t.h>
63 #include <openssl/conf.h>
64 #include <openssl/x509v3.h>
65
66 static void *v2i_POLICY_MAPPINGS(const X509V3_EXT_METHOD *method,
67                                   X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval);
68 static STACK_OF(CONF_VALUE) *
69 i2v_POLICY_MAPPINGS(const X509V3_EXT_METHOD *method, void *pmps,
70                     STACK_OF(CONF_VALUE) *extlist);
71
72 const X509V3_EXT_METHOD v3_policy_mappings = {
73     NID_policy_mappings, 0,
74     ASN1_ITEM_ref(POLICY_MAPPINGS),
75     0,0,0,0,
76     0,0,
77     i2v_POLICY_MAPPINGS,
78     v2i_POLICY_MAPPINGS,
79     0,0,
80     NULL
81 };
82
83 ASN1_SEQUENCE(POLICY_MAPPING) = {
84     ASN1_SIMPLE(POLICY_MAPPING, issuerDomainPolicy, ASN1_OBJECT),
85     ASN1_SIMPLE(POLICY_MAPPING, subjectDomainPolicy, ASN1_OBJECT)
86 } ASN1_SEQUENCE_END(POLICY_MAPPING)
87
88 ASN1_ITEM_TEMPLATE(POLICY_MAPPINGS) =
89     ASN1_EX_TEMPLATE_TYPE(ASN1_TFLG_SEQUENCE_OF, 0, POLICY_MAPPINGS,
90                           POLICY_MAPPING)
91 ASN1_ITEM_TEMPLATE_END(POLICY_MAPPINGS)
92
93 IMPLEMENT_ASN1_ALLOC_FUNCTIONS(POLICY_MAPPING)
94
95
96 static STACK_OF(CONF_VALUE) *
97 i2v_POLICY_MAPPINGS(const X509V3_EXT_METHOD *method, void *a,
98                     STACK_OF(CONF_VALUE) *ext_list)
99 {
100     POLICY_MAPPINGS *pmaps = a;
101     POLICY_MAPPING *pmap;
102     int i;
103     char obj_tmp1[80];
104     char obj_tmp2[80];
105     for(i = 0; i < sk_POLICY_MAPPING_num(pmaps); i++) {
106         pmap = sk_POLICY_MAPPING_value(pmaps, i);
107         i2t_ASN1_OBJECT(obj_tmp1, 80, pmap->issuerDomainPolicy);
108         i2t_ASN1_OBJECT(obj_tmp2, 80, pmap->subjectDomainPolicy);
109         X509V3_add_value(obj_tmp1, obj_tmp2, &ext_list);
110     }
111     return ext_list;
112 }
113
114 static void *v2i_POLICY_MAPPINGS(const X509V3_EXT_METHOD *method,
115                                   X509V3_CTX *ctx, STACK_OF(CONF_VALUE) *nval)
116 {
117     POLICY_MAPPINGS *pmaps;
118     POLICY_MAPPING *pmap;
119     ASN1_OBJECT *obj1, *obj2;
120     CONF_VALUE *val;
121     int i;
122
123     if(!(pmaps = sk_POLICY_MAPPING_new_null())) {
124         X509V3err(X509V3_F_V2I_POLICY_MAPPINGS, ERR_R_MALLOC_FAILURE);
125         return NULL;
126     }
```

```
128     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
129         val = sk_CONF_VALUE_value(nval, i);
130         if(!val->value || !val->name) {
131             sk_POLICY_MAPPING_pop_free(pmaps, POLICY_MAPPING_free);
132             X509V3err(X509V3_F_V2I_POLICY_MAPPINGS,X509V3_R_INVALID
133             X509V3_conf_err(val);
134             return NULL;
135         }
136         obj1 = OBJ_txt2obj(val->name, 0);
137         obj2 = OBJ_txt2obj(val->value, 0);
138         if(!obj1 || !obj2) {
139             sk_POLICY_MAPPING_pop_free(pmaps, POLICY_MAPPING_free);
140             X509V3err(X509V3_F_V2I_POLICY_MAPPINGS,X509V3_R_INVALID
141             X509V3_conf_err(val);
142             return NULL;
143         }
144         pmap = POLICY_MAPPING_new();
145         if (!pmap) {
146             sk_POLICY_MAPPING_pop_free(pmaps, POLICY_MAPPING_free);
147             X509V3err(X509V3_F_V2I_POLICY_MAPPINGS,ERR_R_MALLOC_FAIL
148             return NULL;
149         }
150         pmap->issuerDomainPolicy = obj1;
151         pmap->subjectDomainPolicy = obj2;
152         sk_POLICY_MAPPING_push(pmaps, pmap);
153     }
154     return pmaps;
155 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_prn.c

1

```
*****
7215 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_prn.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57 /*
58  * X509 v3 extension utilities */

60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_prn.c

2

```
62 #include <openssl/conf.h>
63 #include <openssl/x509v3.h>

65 /* Extension printing routines */

67 static int unknown_ext_print(BIO *out, X509_EXTENSION *ext, unsigned long flag,
69 /* Print out a name+value stack */

71 void X509V3_EXT_val_prn(BIO *out, STACK_OF(CONF_VALUE) *val, int indent, int ml)
72 {
73     int i;
74     CONF_VALUE *nval;
75     if(!val) return;
76     if(!ml || !sk_CONF_VALUE_num(val)) {
77         BIO_printf(out, "%*s", indent, "");
78         if(!sk_CONF_VALUE_num(val)) BIO_puts(out, "<EMPTY>\n");
79     }
80     for(i = 0; i < sk_CONF_VALUE_num(val); i++) {
81         if(ml) BIO_printf(out, "%*s", indent, "");
82         else if(i > 0) BIO_printf(out, ", ");
83         nval = sk_CONF_VALUE_value(val, i);
84         if(!nval->name) BIO_puts(out, nval->value);
85         else if(!nval->value) BIO_puts(out, nval->name);
86 #ifndef CHARSET_EBCDIC
87         else BIO_printf(out, "%s:%s", nval->name, nval->value);
88 #else
89         else {
90             int len;
91             char *tmp;
92             len = strlen(nval->value)+1;
93             tmp = OPENSSL_malloc(len);
94             if (tmp)
95             {
96                 ascii2ebcdic(tmp, nval->value, len);
97                 BIO_printf(out, "%s:%s", nval->name, tmp);
98                 OPENSSL_free(tmp);
99             }
100         }
101 #endif
102         if(ml) BIO_puts(out, "\n");
103     }
104 }

106 /* Main routine: print out a general extension */

108 int X509V3_EXT_print(BIO *out, X509_EXTENSION *ext, unsigned long flag, int inde
109 {
110     void *ext_str = NULL;
111     char *value = NULL;
112     const unsigned char *p;
113     const X509V3_EXT_METHOD *method;
114     STACK_OF(CONF_VALUE) *nval = NULL;
115     int ok = 1;

117     if(!(method = X509V3_EXT_get(ext)))
118         return unknown_ext_print(out, ext, flag, indent, 0);
119     p = ext->value->data;
120     if(method->it) ext_str = ASN1_item_d2i(NULL, &p, ext->value->length, ASN
121     else ext_str = method->d2i(NULL, &p, ext->value->length);

123     if(!ext_str) return unknown_ext_print(out, ext, flag, indent, 1);

125     if(method->i2s) {
126         if(!(value = method->i2s(method, ext_str))) {
127             ok = 0;
```

```

128         goto err;
129     }
130 #ifndef CHARSET_EBCDIC
131     BIO_printf(out, "%*s", indent, "", value);
132 #else
133     {
134         int len;
135         char *tmp;
136         len = strlen(value)+1;
137         tmp = OPENSSL_malloc(len);
138         if (tmp)
139         {
140             ascii2ebcdic(tmp, value, len);
141             BIO_printf(out, "%*s", indent, "", tmp);
142             OPENSSL_free(tmp);
143         }
144     }
145 #endif
146 } else if(method->i2v) {
147     if(!(nval = method->i2v(method, ext_str, NULL))) {
148         ok = 0;
149         goto err;
150     }
151     X509V3_EXT_val_prn(out, nval, indent,
152         method->ext_flags & X509V3_EXT_MULTILINE);
153 } else if(method->i2r) {
154     if(!method->i2r(method, ext_str, out, indent)) ok = 0;
155 } else ok = 0;
156
157 err:
158     sk_CONF_VALUE_pop_free(nval, X509V3_conf_free);
159     if(value) OPENSSL_free(value);
160     if(method->it) ASN1_item_free(ext_str, ASN1_ITEM_ptr(method->it));
161     else method->ext_free(ext_str);
162     return ok;
163 }
164
165 int X509V3_extensions_print(BIO *bp, char *title, STACK_OF(X509_EXTENSION) *exts)
166 {
167     int i, j;
168
169     if(sk_X509_EXTENSION_num(exts) <= 0) return 1;
170
171     if(title)
172     {
173         BIO_printf(bp, "%*s:\n", indent, "", title);
174         indent += 4;
175     }
176
177     for (i=0; i<sk_X509_EXTENSION_num(exts); i++)
178     {
179         ASN1_OBJECT *obj;
180         X509_EXTENSION *ex;
181         ex=sk_X509_EXTENSION_value(exts, i);
182         if (indent && BIO_printf(bp, "%*s", indent, "") <= 0) return 0;
183         obj=X509_EXTENSION_get_object(ex);
184         i2a_ASN1_OBJECT(bp,obj);
185         j=X509_EXTENSION_get_critical(ex);
186         if (BIO_printf(bp, ": %s\n", j?"critical:") <= 0)
187             return 0;
188         if(!X509V3_EXT_print(bp, ex, flag, indent + 4))
189         {
190             BIO_printf(bp, "%*s", indent + 4, "");
191             M_ASN1_OCTET_STRING_print(bp,ex->value);
192         }
193         if (BIO_write(bp, "\n", 1) <= 0) return 0;

```

```

194     }
195     return 1;
196 }
197
198 static int unknown_ext_print(BIO *out, X509_EXTENSION *ext, unsigned long flag,
199 {
200     switch(flag & X509V3_EXT_UNKNOWN_MASK) {
201
202         case X509V3_EXT_DEFAULT:
203             return 0;
204
205         case X509V3_EXT_ERROR_UNKNOWN:
206             if(supported)
207                 BIO_printf(out, "%*s<Parse Error>", indent, "");
208             else
209                 BIO_printf(out, "%*s<Not Supported>", indent, "");
210             return 1;
211
212         case X509V3_EXT_PARSE_UNKNOWN:
213             return ASN1_parse_dump(out,
214                 ext->value->data, ext->value->length, indent, -1);
215         case X509V3_EXT_DUMP_UNKNOWN:
216             return BIO_dump_indent(out, (char *)ext->value->data, ex
217
218         default:
219             return 1;
220     }
221 }
222
223
224 #ifndef OPENSSL_NO_FP_API
225 int X509V3_EXT_print_fp(FILE *fp, X509_EXTENSION *ext, int flag, int indent)
226 {
227     BIO *bio_tmp;
228     int ret;
229     if(!(bio_tmp = BIO_new_fp(fp, BIO_NOCLOSE))) return 0;
230     ret = X509V3_EXT_print(bio_tmp, ext, flag, indent);
231     BIO_free(bio_tmp);
232     return ret;
233 }
234 #endif

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_purp.c

1

```
*****
22909 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_purp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_purp.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 2001.
4  */
5 /* =====
6  * Copyright (c) 1999-2004 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10 * are met:
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19 *
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42 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/x509v3.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_purp.c

2

```
62 #include <openssl/x509_vfy.h>

64 static void x509v3_cache_extensions(X509 *x);

66 static int check_ssl_ca(const X509 *x);
67 static int check_purpose_ssl_client(const X509_PURPOSE *xp, const X509 *x, int c
68 static int check_purpose_ssl_server(const X509_PURPOSE *xp, const X509 *x, int c
69 static int check_purpose_ns_ssl_server(const X509_PURPOSE *xp, const X509 *x, in
70 static int purpose_smime(const X509 *x, int ca);
71 static int check_purpose_smime_sign(const X509_PURPOSE *xp, const X509 *x, int c
72 static int check_purpose_smime_encrypt(const X509_PURPOSE *xp, const X509 *x, in
73 static int check_purpose_crl_sign(const X509_PURPOSE *xp, const X509 *x, int ca)
74 static int check_purpose_timestamp_sign(const X509_PURPOSE *xp, const X509 *x, i
75 static int no_check(const X509_PURPOSE *xp, const X509 *x, int ca);
76 static int ocsf_helper(const X509_PURPOSE *xp, const X509 *x, int ca);

78 static int xp_cmp(const X509_PURPOSE * const *a,
79                  const X509_PURPOSE * const *b);
80 static void xtable_free(X509_PURPOSE *p);

82 static X509_PURPOSE xstandard[] = {
83     {X509_PURPOSE_SSL_CLIENT, X509_TRUST_SSL_CLIENT, 0, check_purpose_ssl_cl
84     {X509_PURPOSE_SSL_SERVER, X509_TRUST_SSL_SERVER, 0, check_purpose_ssl_se
85     {X509_PURPOSE_NS_SSL_SERVER, X509_TRUST_SSL_SERVER, 0, check_purpose_ns
86     {X509_PURPOSE_SMIME_SIGN, X509_TRUST_EMAIL, 0, check_purpose_smime_sign,
87     {X509_PURPOSE_SMIME_ENCRYPT, X509_TRUST_EMAIL, 0, check_purpose_smime_en
88     {X509_PURPOSE_CRL_SIGN, X509_TRUST_COMPAT, 0, check_purpose_crl_sign, "C
89     {X509_PURPOSE_ANY, X509_TRUST_DEFAULT, 0, no_check, "Any Purpose", "any"
90     {X509_PURPOSE_OCSP_HELPER, X509_TRUST_COMPAT, 0, ocsf_helper, "OCSP help
91     {X509_PURPOSE_TIMESTAMP_SIGN, X509_TRUST_TSA, 0, check_purpose_timestamp
92 };

94 #define X509_PURPOSE_COUNT (sizeof(xstandard)/sizeof(X509_PURPOSE))

96 IMPLEMENT_STACK_OF(X509_PURPOSE)

98 static STACK_OF(X509_PURPOSE) *xptable = NULL;

100 static int xp_cmp(const X509_PURPOSE * const *a,
101                  const X509_PURPOSE * const *b)
102 {
103     return (*a)->purpose - (*b)->purpose;
104 }

106 /* As much as I'd like to make X509_check_purpose use a "const" X509*
107  * I really can't because it does recalculate hashes and do other non-const
108  * things. */
109 int X509_check_purpose(X509 *x, int id, int ca)
110 {
111     int idx;
112     const X509_PURPOSE *pt;
113     if(!((x->ex_flags & EXFLAG_SET)) {
114         CRYPTO_w_lock(CRYPTO_LOCK_X509);
115         x509v3_cache_extensions(x);
116         CRYPTO_w_unlock(CRYPTO_LOCK_X509);
117     }
118     if(id == -1) return 1;
119     idx = X509_PURPOSE_get_by_id(id);
120     if(idx == -1) return -1;
121     pt = X509_PURPOSE_get0(idx);
122     return pt->check_purpose(pt, x, ca);
123 }

125 int X509_PURPOSE_set(int *p, int purpose)
126 {
127     if(X509_PURPOSE_get_by_id(purpose) == -1) {
```

```

128         X509V3err(X509V3_F_X509_PURPOSE_SET, X509V3_R_INVALID_PURPOSE);
129         return 0;
130     }
131     *p = purpose;
132     return 1;
133 }

135 int X509_PURPOSE_get_count(void)
136 {
137     if(!xptable) return X509_PURPOSE_COUNT;
138     return sk_X509_PURPOSE_num(xptable) + X509_PURPOSE_COUNT;
139 }

141 X509_PURPOSE * X509_PURPOSE_get0(int idx)
142 {
143     if(idx < 0) return NULL;
144     if(idx < (int)X509_PURPOSE_COUNT) return xstandard + idx;
145     return sk_X509_PURPOSE_value(xptable, idx - X509_PURPOSE_COUNT);
146 }

148 int X509_PURPOSE_get_by_sname(char *sname)
149 {
150     int i;
151     X509_PURPOSE *xptmp;
152     for(i = 0; i < X509_PURPOSE_get_count(); i++) {
153         xptmp = X509_PURPOSE_get0(i);
154         if(!strcmp(xptmp->sname, sname)) return i;
155     }
156     return -1;
157 }

159 int X509_PURPOSE_get_by_id(int purpose)
160 {
161     X509_PURPOSE tmp;
162     int idx;
163     if((purpose >= X509_PURPOSE_MIN) && (purpose <= X509_PURPOSE_MAX))
164         return purpose - X509_PURPOSE_MIN;
165     tmp.purpose = purpose;
166     if(!xptable) return -1;
167     idx = sk_X509_PURPOSE_find(xptable, &tmp);
168     if(idx == -1) return -1;
169     return idx + X509_PURPOSE_COUNT;
170 }

172 int X509_PURPOSE_add(int id, int trust, int flags,
173                     int (*ck)(const X509_PURPOSE *, const X509 *, int),
174                     char *name, char *sname, void *arg)
175 {
176     int idx;
177     X509_PURPOSE *ptmp;
178     /* This is set according to what we change: application can't set it */
179     flags &= ~X509_PURPOSE_DYNAMIC;
180     /* This will always be set for application modified trust entries */
181     flags |= X509_PURPOSE_DYNAMIC_NAME;
182     /* Get existing entry if any */
183     idx = X509_PURPOSE_get_by_id(id);
184     /* Need a new entry */
185     if(idx == -1) {
186         if(!(ptmp = OPENSSL_malloc(sizeof(X509_PURPOSE)))) {
187             X509V3err(X509V3_F_X509_PURPOSE_ADD, ERR_R_MALLOC_FAILURE);
188             return 0;
189         }
190         ptmp->flags = X509_PURPOSE_DYNAMIC;
191     } else ptmp = X509_PURPOSE_get0(idx);
193     /* OPENSSL_free existing name if dynamic */

```

```

194     if(ptmp->flags & X509_PURPOSE_DYNAMIC_NAME) {
195         OPENSSL_free(ptmp->name);
196         OPENSSL_free(ptmp->sname);
197     }
198     /* dup supplied name */
199     ptmp->name = BUF_strdup(name);
200     ptmp->sname = BUF_strdup(sname);
201     if(!ptmp->name || !ptmp->sname) {
202         X509V3err(X509V3_F_X509_PURPOSE_ADD, ERR_R_MALLOC_FAILURE);
203         return 0;
204     }
205     /* Keep the dynamic flag of existing entry */
206     ptmp->flags &= X509_PURPOSE_DYNAMIC;
207     /* Set all other flags */
208     ptmp->flags |= flags;

210     ptmp->purpose = id;
211     ptmp->trust = trust;
212     ptmp->check_purpose = ck;
213     ptmp->usr_data = arg;

215     /* If its a new entry manage the dynamic table */
216     if(idx == -1) {
217         if(!xptable && !(xptable = sk_X509_PURPOSE_new(xp_cmp))) {
218             X509V3err(X509V3_F_X509_PURPOSE_ADD, ERR_R_MALLOC_FAILURE);
219             return 0;
220         }
221         if (!sk_X509_PURPOSE_push(xptable, ptmp)) {
222             X509V3err(X509V3_F_X509_PURPOSE_ADD, ERR_R_MALLOC_FAILURE);
223             return 0;
224         }
225     }
226     return 1;
227 }

229 static void xptable_free(X509_PURPOSE *p)
230 {
231     if(!p) return;
232     if (p->flags & X509_PURPOSE_DYNAMIC)
233     {
234         if (p->flags & X509_PURPOSE_DYNAMIC_NAME) {
235             OPENSSL_free(p->name);
236             OPENSSL_free(p->sname);
237         }
238         OPENSSL_free(p);
239     }
240 }

242 void X509_PURPOSE_cleanup(void)
243 {
244     unsigned int i;
245     sk_X509_PURPOSE_pop_free(xptable, xptable_free);
246     for(i = 0; i < X509_PURPOSE_COUNT; i++) xptable_free(xstandard + i);
247     xptable = NULL;
248 }

250 int X509_PURPOSE_get_id(X509_PURPOSE *xp)
251 {
252     return xp->purpose;
253 }

255 char *X509_PURPOSE_get0_name(X509_PURPOSE *xp)
256 {
257     return xp->name;
258 }

```

```

260 char *X509_PURPOSE_get0_sname(X509_PURPOSE *xp)
261 {
262     return xp->sname;
263 }

265 int X509_PURPOSE_get_trust(X509_PURPOSE *xp)
266 {
267     return xp->trust;
268 }

270 static int nid_cmp(const int *a, const int *b)
271 {
272     return *a - *b;
273 }

275 DECLARE_OBJ_BSEARCH_CMP_FN(int, int, nid);
276 IMPLEMENT_OBJ_BSEARCH_CMP_FN(int, int, nid);

278 int X509_supported_extension(X509_EXTENSION *ex)
279 {
280     /* This table is a list of the NIDs of supported extensions:
281      * that is those which are used by the verify process. If
282      * an extension is critical and doesn't appear in this list
283      * then the verify process will normally reject the certificate.
284      * The list must be kept in numerical order because it will be
285      * searched using bsearch.
286      */

288     static const int supported_nids[] = {
289         NID_netscape_cert_type, /* 71 */
290         NID_key_usage, /* 83 */
291         NID_subject_alt_name, /* 85 */
292         NID_basic_constraints, /* 87 */
293         NID_certificate_policies, /* 89 */
294         NID_ext_key_usage, /* 126 */
295 #ifndef OPENSSL_NO_RFC3779
296         NID_sbgp_ipAddrBlock, /* 290 */
297         NID_sbgp_autonomousSysNum, /* 291 */
298 #endif
299         NID_policy_constraints, /* 401 */
300         NID_proxyCertInfo, /* 663 */
301         NID_name_constraints, /* 666 */
302         NID_policy_mappings, /* 747 */
303         NID_inhibit_any_policy /* 748 */
304     };

306     int ex_nid = OBJ_obj2nid(X509_EXTENSION_get_object(ex));

308     if (ex_nid == NID_undef)
309         return 0;

311     if (OBJ_bsearch_nid(&ex_nid, supported_nids,
312         sizeof(supported_nids)/sizeof(int)))
313         return 1;
314     return 0;
315 }

317 static void setup_dp(X509 *x, DIST_POINT *dp)
318 {
319     X509_NAME *iname = NULL;
320     int i;
321     if (dp->reasons)
322     {
323         if (dp->reasons->length > 0)
324             dp->dp_reasons = dp->reasons->data[0];
325         if (dp->reasons->length > 1)

```

```

326         dp->dp_reasons |= (dp->reasons->data[1] << 8);
327         dp->dp_reasons &= CRLDP_ALL_REASONS;
328     }
329     else
330         dp->dp_reasons = CRLDP_ALL_REASONS;
331     if (!dp->distpoint || (dp->distpoint->type != 1))
332         return;
333     for (i = 0; i < sk_GENERAL_NAME_num(dp->CRLissuer); i++)
334     {
335         GENERAL_NAME *gen = sk_GENERAL_NAME_value(dp->CRLissuer, i);
336         if (gen->type == GEN_DIRNAME)
337         {
338             iname = gen->d.directoryName;
339             break;
340         }
341     }
342     if (!iname)
343         iname = X509_get_issuer_name(x);

345     DIST_POINT_set_dpname(dp->distpoint, iname);
347 }

349 static void setup_crl_dp(X509 *x)
350 {
351     int i;
352     x->crl_dp = X509_get_ext_d2i(x, NID_crl_distribution_points, NULL, NULL);
353     for (i = 0; i < sk_DIST_POINT_num(x->crl_dp); i++)
354         setup_dp(x, sk_DIST_POINT_value(x->crl_dp, i));
355 }

357 static void x509v3_cache_extensions(X509 *x)
358 {
359     BASIC_CONSTRAINTS *bs;
360     PROXY_CERT_INFO_EXTENSION *pci;
361     ASN1_BIT_STRING *usage;
362     ASN1_BIT_STRING *ns;
363     EXTENDED_KEY_USAGE *extusage;
364     X509_EXTENSION *ex;

365     int i;
366     if (x->ex_flags & EXFLAG_SET) return;
367 #ifndef OPENSSL_NO_SHA
368     X509_digest(x, EVP_sha1(), x->sha1_hash, NULL);
369 #endif

371     /* Does subject name match issuer ? */
372     if (!X509_NAME_cmp(X509_get_subject_name(x), X509_get_issuer_name(x)))
373         x->ex_flags |= EXFLAG_SI;
374     /* V1 should mean no extensions ... */
375     if (!X509_get_version(x)) x->ex_flags |= EXFLAG_V1;
376     /* Handle basic constraints */
377     if ((bs=X509_get_ext_d2i(x, NID_basic_constraints, NULL, NULL))) {
378         if (bs->ca) x->ex_flags |= EXFLAG_CA;
379         if (bs->pathlen) {
380             if ((bs->pathlen->type == V_ASN1_NEG_INTEGER)
381                 || !bs->ca) {
382                 x->ex_flags |= EXFLAG_INVALID;
383                 x->ex_pathlen = 0;
384             } else x->ex_pathlen = ASN1_INTEGER_get(bs->pathlen);
385         } else x->ex_pathlen = -1;
386         BASIC_CONSTRAINTS_free(bs);
387         x->ex_flags |= EXFLAG_BCONS;
388     }

389     /* Handle proxy certificates */
390     if ((pci=X509_get_ext_d2i(x, NID_proxyCertInfo, NULL, NULL))) {
391         if (x->ex_flags & EXFLAG_CA

```

```

392         || X509_get_ext_by_NID(x, NID_subject_alt_name, 0) >= 0
393         || X509_get_ext_by_NID(x, NID_issuer_alt_name, 0) >= 0) {
394             x->ex_flags |= EXFLAG_INVALID;
395         }
396         if (pci->pcPathLengthConstraint) {
397             x->ex_pcpathlen =
398                 ASN1_INTEGER_get(pci->pcPathLengthConstraint);
399         } else x->ex_pcpathlen = -1;
400         PROXY_CERT_INFO_EXTENSION_free(pci);
401         x->ex_flags |= EXFLAG_PROXY;
402     }
403     /* Handle key usage */
404     if((usage=X509_get_ext_d2i(x, NID_key_usage, NULL, NULL))) {
405         if(usage->length > 0) {
406             x->ex_kusage = usage->data[0];
407             if(usage->length > 1)
408                 x->ex_kusage |= usage->data[1] << 8;
409         } else x->ex_kusage = 0;
410         x->ex_flags |= EXFLAG_KUSAGE;
411         ASN1_BIT_STRING_free(usage);
412     }
413     x->ex_xkusage = 0;
414     if((extusage=X509_get_ext_d2i(x, NID_ext_key_usage, NULL, NULL))) {
415         x->ex_flags |= EXFLAG_XKUSAGE;
416         for(i = 0; i < sk_ASN1_OBJECT_num(extusage); i++) {
417             switch(OBJ_obj2nid(sk_ASN1_OBJECT_value(extusage,i))) {
418                 case NID_server_auth:
419                     x->ex_xkusage |= XKU_SSL_SERVER;
420                     break;
421
422                 case NID_client_auth:
423                     x->ex_xkusage |= XKU_SSL_CLIENT;
424                     break;
425
426                 case NID_email_protect:
427                     x->ex_xkusage |= XKU_SMIME;
428                     break;
429
430                 case NID_code_sign:
431                     x->ex_xkusage |= XKU_CODE_SIGN;
432                     break;
433
434                 case NID_ms_sgc:
435                 case NID_ns_sgc:
436                     x->ex_xkusage |= XKU_SGC;
437                     break;
438
439                 case NID_ocsp_sign:
440                     x->ex_xkusage |= XKU_OCSP_SIGN;
441                     break;
442
443                 case NID_time_stamp:
444                     x->ex_xkusage |= XKU_TIMESTAMP;
445                     break;
446
447                 case NID_dvcs:
448                     x->ex_xkusage |= XKU_DVCS;
449                     break;
450             }
451         }
452         sk_ASN1_OBJECT_pop_free(extusage, ASN1_OBJECT_free);
453     }
454
455     if((ns=X509_get_ext_d2i(x, NID_netscape_cert_type, NULL, NULL))) {
456         if(ns->length > 0) x->ex_nscert = ns->data[0];
457         else x->ex_nscert = 0;

```

```

458         x->ex_flags |= EXFLAG_NSCERT;
459         ASN1_BIT_STRING_free(ns);
460     }
461     x->skid = X509_get_ext_d2i(x, NID_subject_key_identifier, NULL, NULL);
462     x->akid = X509_get_ext_d2i(x, NID_authority_key_identifier, NULL, NULL);
463     x->altname = X509_get_ext_d2i(x, NID_subject_alt_name, NULL, NULL);
464     x->nc = X509_get_ext_d2i(x, NID_name_constraints, &i, NULL);
465     if (!x->nc && (i != -1))
466         x->ex_flags |= EXFLAG_INVALID;
467     setup_crlp(x);
468
469 #ifndef OPENSSL_NO_RFC3779
470     x->rfc3779_addr = X509_get_ext_d2i(x, NID_sbgp_ipAddrBlock, NULL, NULL);
471     x->rfc3779_asid = X509_get_ext_d2i(x, NID_sbgp_autonomousSysNum,
472                                     NULL, NULL);
473 #endif
474     for (i = 0; i < X509_get_ext_count(x); i++)
475     {
476         ex = X509_get_ext(x, i);
477         if (OBJ_obj2nid(X509_EXTENSION_get_object(ex))
478             == NID_freshest_crl)
479             x->ex_flags |= EXFLAG_FRESHEST;
480         if (!X509_EXTENSION_get_critical(ex))
481             continue;
482         if (!X509_supported_extension(ex))
483         {
484             x->ex_flags |= EXFLAG_CRITICAL;
485             break;
486         }
487     }
488     x->ex_flags |= EXFLAG_SET;
489 }
490
491 /* CA checks common to all purposes
492  * return codes:
493  * 0 not a CA
494  * 1 is a CA
495  * 2 basicConstraints absent so "maybe" a CA
496  * 3 basicConstraints absent but self signed V1.
497  * 4 basicConstraints absent but keyUsage present and keyCertSign asserted.
498  */
499
500 #define V1_ROOT (EXFLAG_V1|EXFLAG_SS)
501 #define ku_reject(x, usage) \
502     (((x)->ex_flags & EXFLAG_KUSAGE) && !((x)->ex_kusage & (usage)))
503 #define xku_reject(x, usage) \
504     (((x)->ex_flags & EXFLAG_XKUSAGE) && !((x)->ex_xkusage & (usage)))
505 #define ns_reject(x, usage) \
506     (((x)->ex_flags & EXFLAG_NSCERT) && !((x)->ex_nscert & (usage)))
507
508 static int check_ca(const X509 *x)
509 {
510     /* keyUsage if present should allow cert signing */
511     if(ku_reject(x, KU_KEY_CERT_SIGN)) return 0;
512     if(x->ex_flags & EXFLAG_BCONS) {
513         if(x->ex_flags & EXFLAG_CA) return 1;
514         /* If basicConstraints says not a CA then say so */
515         else return 0;
516     } else {
517         /* we support V1 roots for... uh, I don't really know why. */
518         if((x->ex_flags & V1_ROOT) == V1_ROOT) return 3;
519         /* If key usage present it must have certSign so tolerate it */
520         else if (x->ex_flags & EXFLAG_KUSAGE) return 4;
521         /* Older certificates could have Netscape-specific CA types */
522         else if (x->ex_flags & EXFLAG_NSCERT
523                 && x->ex_nscert & NS_ANY_CA) return 5;

```



```

524         /* can this still be regarded a CA certificate? I doubt it */
525         return 0;
526     }
527 }

529 int X509_check_ca(X509 *x)
530 {
531     if(!(x->ex_flags & EXFLAG_SET)) {
532         CRYPTO_w_lock(CRYPTO_LOCK_X509);
533         x509v3_cache_extensions(x);
534         CRYPTO_w_unlock(CRYPTO_LOCK_X509);
535     }

537     return check_ca(x);
538 }

540 /* Check SSL CA: common checks for SSL client and server */
541 static int check_ssl_ca(const X509 *x)
542 {
543     int ca_ret;
544     ca_ret = check_ca(x);
545     if(!ca_ret) return 0;
546     /* check nsCertType if present */
547     if(ca_ret != 5 || x->ex_nscert & NS_SSL_CA) return ca_ret;
548     else return 0;
549 }

552 static int check_purpose_ssl_client(const X509_PURPOSE *xp, const X509 *x, int c
553 {
554     if(xku_reject(x, XKU_SSL_CLIENT)) return 0;
555     if(ca) return check_ssl_ca(x);
556     /* We need to do digital signatures with it */
557     if(ku_reject(x, KU_DIGITAL_SIGNATURE)) return 0;
558     /* nsCertType if present should allow SSL client use */
559     if(ns_reject(x, NS_SSL_CLIENT)) return 0;
560     return 1;
561 }

563 static int check_purpose_ssl_server(const X509_PURPOSE *xp, const X509 *x, int c
564 {
565     if(xku_reject(x, XKU_SSL_SERVER|XKU_SGC)) return 0;
566     if(ca) return check_ssl_ca(x);

568     if(ns_reject(x, NS_SSL_SERVER)) return 0;
569     /* Now as for keyUsage: we'll at least need to sign OR encipher */
570     if(ku_reject(x, KU_DIGITAL_SIGNATURE|KU_KEY_ENCIPHERMENT)) return 0;
571
572     return 1;

574 }

576 static int check_purpose_ns_ssl_server(const X509_PURPOSE *xp, const X509 *x, in
577 {
578     int ret;
579     ret = check_purpose_ssl_server(xp, x, ca);
580     if(!ret || ca) return ret;
581     /* We need to encipher or Netscape complains */
582     if(ku_reject(x, KU_KEY_ENCIPHERMENT)) return 0;
583     return ret;
584 }

586 /* common S/MIME checks */
587 static int purpose_smime(const X509 *x, int ca)
588 {
589     if(xku_reject(x, XKU_SMIME)) return 0;

```

```

590     if(ca) {
591         int ca_ret;
592         ca_ret = check_ca(x);
593         if(!ca_ret) return 0;
594         /* check nsCertType if present */
595         if(ca_ret != 5 || x->ex_nscert & NS_SMIME_CA) return ca_ret;
596         else return 0;
597     }
598     if(x->ex_flags & EXFLAG_NSCERT) {
599         if(x->ex_nscert & NS_SMIME) return 1;
600         /* Workaround for some buggy certificates */
601         if(x->ex_nscert & NS_SSL_CLIENT) return 2;
602         return 0;
603     }
604     return 1;
605 }

607 static int check_purpose_smime_sign(const X509_PURPOSE *xp, const X509 *x, int c
608 {
609     int ret;
610     ret = purpose_smime(x, ca);
611     if(!ret || ca) return ret;
612     if(ku_reject(x, KU_DIGITAL_SIGNATURE|KU_NON_REPUDIATION)) return 0;
613     return ret;
614 }

616 static int check_purpose_smime_encrypt(const X509_PURPOSE *xp, const X509 *x, in
617 {
618     int ret;
619     ret = purpose_smime(x, ca);
620     if(!ret || ca) return ret;
621     if(ku_reject(x, KU_KEY_ENCIPHERMENT)) return 0;
622     return ret;
623 }

625 static int check_purpose_crl_sign(const X509_PURPOSE *xp, const X509 *x, int ca)
626 {
627     if(ca) {
628         int ca_ret;
629         if((ca_ret = check_ca(x)) != 2) return ca_ret;
630         else return 0;
631     }
632     if(ku_reject(x, KU_CRL_SIGN)) return 0;
633     return 1;
634 }

636 /* OCSP helper: this is *not* a full OCSP check. It just checks that
637  * each CA is valid. Additional checks must be made on the chain.
638  */

640 static int ocsp_helper(const X509_PURPOSE *xp, const X509 *x, int ca)
641 {
642     /* Must be a valid CA. Should we really support the "I don't know"
643      value (2)? */
644     if(ca) return check_ca(x);
645     /* leaf certificate is checked in OCSP_verify() */
646     return 1;
647 }

649 static int check_purpose_timestamp_sign(const X509_PURPOSE *xp, const X509 *x,
650 int ca)
651 {
652     int i_ext;

654     /* If ca is true we must return if this is a valid CA certificate. */
655     if (ca) return check_ca(x);

```

```

657 /*
658  * Check the optional key usage field:
659  * if Key Usage is present, it must be one of digitalSignature
660  * and/or nonRepudiation (other values are not consistent and shall
661  * be rejected).
662  */
663 if ((x->ex_flags & EXFLAG_KUSAGE)
664     && ((x->ex_kusage & ~(KU_NON_REPUDIATION | KU_DIGITAL_SIGNATURE)) ||
665         !(x->ex_kusage & (KU_NON_REPUDIATION | KU_DIGITAL_SIGNATURE))))
666     return 0;

668 /* Only time stamp key usage is permitted and it's required. */
669 if (!(x->ex_flags & EXFLAG_XKUSAGE) || x->ex_xkusage != XKU_TIMESTAMP)
670     return 0;

672 /* Extended Key Usage MUST be critical */
673 i_ext = X509_get_ext_by_NID((X509 *) x, NID_ext_key_usage, 0);
674 if (i_ext >= 0)
675 {
676     X509_EXTENSION *ext = X509_get_ext((X509 *) x, i_ext);
677     if (!X509_EXTENSION_get_critical(ext))
678         return 0;
679 }

681 return 1;
682 }

684 static int no_check(const X509_PURPOSE *xp, const X509 *x, int ca)
685 {
686     return 1;
687 }

689 /* Various checks to see if one certificate issued the second.
690  * This can be used to prune a set of possible issuer certificates
691  * which have been looked up using some simple method such as by
692  * subject name.
693  * These are:
694  * 1. Check issuer_name(subject) == subject_name(issuer)
695  * 2. If akid(subject) exists check it matches issuer
696  * 3. If key_usage(issuer) exists check it supports certificate signing
697  * returns 0 for OK, positive for reason for mismatch, reasons match
698  * codes for X509_verify_cert()
699 */

701 int X509_check_issued(X509 *issuer, X509 *subject)
702 {
703     if(X509_NAME_cmp(X509_get_subject_name(issuer),
704                     X509_get_issuer_name(subject)))
705         return X509_V_ERR_SUBJECT_ISSUER_MISMATCH;
706     x509v3_cache_extensions(issuer);
707     x509v3_cache_extensions(subject);

709     if(subject->akid)
710     {
711         int ret = X509_check_akid(issuer, subject->akid);
712         if (ret != X509_V_OK)
713             return ret;
714     }

716     if(subject->ex_flags & EXFLAG_PROXY)
717     {
718         if(ku_reject(issuer, KU_DIGITAL_SIGNATURE))
719             return X509_V_ERR_KEYUSAGE_NO_DIGITAL_SIGNATURE;
720     }
721     else if(ku_reject(issuer, KU_KEY_CERT_SIGN))

```

```

722         return X509_V_ERR_KEYUSAGE_NO_CERTSIGN;
723     return X509_V_OK;
724 }

726 int X509_check_akid(X509 *issuer, AUTHORITY_KEYID *akid)
727 {
729     if(!akid)
730         return X509_V_OK;

732     /* Check key ids (if present) */
733     if(akid->keyid && issuer->skid &&
734        ASN1_OCTET_STRING_cmp(akid->keyid, issuer->skid))
735         return X509_V_ERR_AKID_SKID_MISMATCH;
736     /* Check serial number */
737     if(akid->serial &&
738        ASN1_INTEGER_cmp(X509_get_serialNumber(issuer), akid->serial))
739         return X509_V_ERR_AKID_ISSUER_SERIAL_MISMATCH;
740     /* Check issuer name */
741     if(akid->issuer)
742     {
743         /* Ugh, for some peculiar reason AKID includes
744          * SEQUENCE OF GeneralName. So look for a DirName.
745          * There may be more than one but we only take any
746          * notice of the first.
747          */
748         GENERAL_NAMES *gens;
749         GENERAL_NAME *gen;
750         X509_NAME *nm = NULL;
751         int i;
752         gens = akid->issuer;
753         for(i = 0; i < sk_GENERAL_NAME_num(gens); i++)
754         {
755             gen = sk_GENERAL_NAME_value(gens, i);
756             if(gen->type == GEN_DIRNAME)
757             {
758                 nm = gen->d.dirn;
759                 break;
760             }
761         }
762         if(nm && X509_NAME_cmp(nm, X509_get_issuer_name(issuer)))
763             return X509_V_ERR_AKID_ISSUER_SERIAL_MISMATCH;
764     }
765     return X509_V_OK;
766 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_skey.c

1

```
*****
4742 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_skey.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_skey.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
6  * Copyright (c) 1999 The OpenSSL Project. All rights reserved.
7  *
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9  * modification, are permitted provided that the following conditions
10  * are met:
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48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57
60 #include <stdio.h>
61 #include "cryptlib.h"
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_skey.c

2

```
62 #include <openssl/x509v3.h>
63
64 static ASN1_OCTET_STRING *s2i_skey_id(X509V3_EXT_METHOD *method, X509V3_CTX *ctx
65 const X509V3_EXT_METHOD v3_skey_id = {
66 NID_subject_key_identifier, 0, ASN1_ITEM_ref(ASN1_OCTET_STRING),
67 0,0,0,0,
68 (X509V3_EXT_I2S)i2s_ASN1_OCTET_STRING,
69 (X509V3_EXT_S2I)s2i_skey_id,
70 0,0,0,0,
71 NULL};
72
73 char *i2s_ASN1_OCTET_STRING(X509V3_EXT_METHOD *method,
74 ASN1_OCTET_STRING *oct)
75 {
76     return hex_to_string(oct->data, oct->length);
77 }
78
79 ASN1_OCTET_STRING *s2i_ASN1_OCTET_STRING(X509V3_EXT_METHOD *method,
80 X509V3_CTX *ctx, char *str)
81 {
82     ASN1_OCTET_STRING *oct;
83     long length;
84
85     if(!(oct = M_ASN1_OCTET_STRING_new())) {
86         X509V3err(X509V3_F_S2I_ASN1_OCTET_STRING, ERR_R_MALLOC_FAILURE);
87         return NULL;
88     }
89
90     if(!(oct->data = string_to_hex(str, &length))) {
91         M_ASN1_OCTET_STRING_free(oct);
92         return NULL;
93     }
94
95     oct->length = length;
96
97     return oct;
98 }
99
101 static ASN1_OCTET_STRING *s2i_skey_id(X509V3_EXT_METHOD *method,
102 X509V3_CTX *ctx, char *str)
103 {
104     ASN1_OCTET_STRING *oct;
105     ASN1_BIT_STRING *pk;
106     unsigned char pkey_dig[EVP_MAX_MD_SIZE];
107     unsigned int diglen;
108
109     if(strcmp(str, "hash")) return s2i_ASN1_OCTET_STRING(method, ctx, str);
110
111     if(!(oct = M_ASN1_OCTET_STRING_new())) {
112         X509V3err(X509V3_F_S2I_SKEY_ID, ERR_R_MALLOC_FAILURE);
113         return NULL;
114     }
115
116     if(ctx && (ctx->flags == CTX_TEST)) return oct;
117
118     if(!ctx || (!ctx->subject_req && !ctx->subject_cert)) {
119         X509V3err(X509V3_F_S2I_SKEY_ID, X509V3_R_NO_PUBLIC_KEY);
120         goto err;
121     }
122
123     if(ctx->subject_req)
124         pk = ctx->subject_req->req_info->pubkey->public_key;
125     else pk = ctx->subject_cert->cert_info->key->public_key;
126
127     if(!pk) {
```

```
128         X509V3err(X509V3_F_S2I_SKEY_ID,X509V3_R_NO_PUBLIC_KEY);
129         goto err;
130     }
131
132     if (!EVP_Digest(pk->data, pk->length, pkey_dig, &diglen, EVP_sha1(), NUL
133         goto err;
134
135     if(!M_ASN1_OCTET_STRING_set(oct, pkey_dig, diglen)) {
136         X509V3err(X509V3_F_S2I_SKEY_ID,ERR_R_MALLOC_FAILURE);
137         goto err;
138     }
139
140     return oct;
141
142     err:
143     M_ASN1_OCTET_STRING_free(oct);
144     return NULL;
145 }
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_sxnet.c

1

```
*****
7836 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_sxnet.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

1 /* v3_sxnet.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project 1999.
4  */
5 /* =====
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45 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50 * OF THE POSSIBILITY OF SUCH DAMAGE.
51 * =====
52 *
53 * This product includes cryptographic software written by Eric Young
54 * (eay@cryptsoft.com). This product includes software written by Tim
55 * Hudson (tjh@cryptsoft.com).
56 *
57 */

59 #include <stdio.h>
60 #include "cryptlib.h"
61 #include <openssl/conf.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_sxnet.c

2

```
62 #include <openssl/asn1.h>
63 #include <openssl/asn1t.h>
64 #include <openssl/x509v3.h>

66 /* Support for Thawte strong extranet extension */

68 #define SXNET_TEST

70 static int sxnet_i2r(X509V3_EXT_METHOD *method, SXNET *sx, BIO *out, int indent)
71 #ifdef SXNET_TEST
72 static SXNET * sxnet_v2i(X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
73                          STACK_OF(CONF_VALUE) *nval);
74 #endif
75 const X509V3_EXT_METHOD v3_sxnet = {
76     NID_sxnet, X509V3_EXT_MULTILINE, ASN1_ITEM_ref(SXNET),
77     0,0,0,0,
78     0,0,
79     0,
80     #ifdef SXNET_TEST
81     (X509V3_EXT_V2I)sxnet_v2i,
82     #else
83     0,
84     #endif
85     (X509V3_EXT_I2R)sxnet_i2r,
86     0,
87     NULL
88 };

90 ASN1_SEQUENCE(SXNETID) = {
91     ASN1_SIMPLE(SXNETID, zone, ASN1_INTEGER),
92     ASN1_SIMPLE(SXNETID, user, ASN1_OCTET_STRING)
93 } ASN1_SEQUENCE_END(SXNETID)

95 IMPLEMENT_ASN1_FUNCTIONS(SXNETID)

97 ASN1_SEQUENCE(SXNET) = {
98     ASN1_SIMPLE(SXNET, version, ASN1_INTEGER),
99     ASN1_SEQUENCE_OF(SXNET, ids, SXNETID)
100 } ASN1_SEQUENCE_END(SXNET)

102 IMPLEMENT_ASN1_FUNCTIONS(SXNET)

104 static int sxnet_i2r(X509V3_EXT_METHOD *method, SXNET *sx, BIO *out,
105                     int indent)
106 {
107     long v;
108     char *tmp;
109     SXNETID *id;
110     int i;
111     v = ASN1_INTEGER_get(sx->version);
112     BIO_printf(out, "%sVersion: %ld (0x%lX)", indent, "", v + 1, v);
113     for(i = 0; i < sk_SXNETID_num(sx->ids); i++) {
114         id = sk_SXNETID_value(sx->ids, i);
115         tmp = i2s_ASN1_INTEGER(NULL, id->zone);
116         BIO_printf(out, "\n%sZone: %s, User: ", indent, "", tmp);
117         OPENSSL_free(tmp);
118         M_ASN1_OCTET_STRING_print(out, id->user);
119     }
120     return 1;
121 }

123 #ifdef SXNET_TEST

125 /* NBB: this is used for testing only. It should *not* be used for anything
126  * else because it will just take static IDs from the configuration file and
127  * they should really be separate values for each user.
```

```

128 */
129
131 static SXNET * sxnet_v2i(X509V3_EXT_METHOD *method, X509V3_CTX *ctx,
132     STACK_OF(CONF_VALUE) *nval)
133 {
134     CONF_VALUE *cnf;
135     SXNET *sx = NULL;
136     int i;
137     for(i = 0; i < sk_CONF_VALUE_num(nval); i++) {
138         cnf = sk_CONF_VALUE_value(nval, i);
139         if(!SXNET_add_id_asc(&sx, cnf->name, cnf->value, -1))
140             return NULL;
141     }
142     return sx;
143 }
144
146 #endif
147
148 /* Strong Extranet utility functions */
149
150 /* Add an id given the zone as an ASCII number */
151
152 int SXNET_add_id_asc(SXNET **psx, char *zone, char *user,
153     int userlen)
154 {
155     ASN1_INTEGER *izone = NULL;
156     if(!((izone = s2i_ASN1_INTEGER(NULL, zone))) {
157         X509V3err(X509V3_F_SXNET_ADD_ID_ASC, X509V3_R_ERROR_CONVERTING_ZONE);
158         return 0;
159     }
160     return SXNET_add_id_INTEGER(psx, izone, user, userlen);
161 }
162
163 /* Add an id given the zone as an unsigned long */
164
165 int SXNET_add_id_ulong(SXNET **psx, unsigned long lzone, char *user,
166     int userlen)
167 {
168     ASN1_INTEGER *izone = NULL;
169     if(!((izone = M_ASN1_INTEGER_new()) || !ASN1_INTEGER_set(izone, lzone)) {
170         X509V3err(X509V3_F_SXNET_ADD_ID_ULONG, ERR_R_MALLOC_FAILURE);
171         M_ASN1_INTEGER_free(izone);
172         return 0;
173     }
174     return SXNET_add_id_INTEGER(psx, izone, user, userlen);
175 }
176
177 /* Add an id given the zone as an ASN1_INTEGER.
178  * Note this version uses the passed integer and doesn't make a copy so don't
179  * free it up afterwards.
180  */
181
182 int SXNET_add_id_INTEGER(SXNET **psx, ASN1_INTEGER *zone, char *user,
183     int userlen)
184 {
185     SXNET *sx = NULL;
186     SXNETID *id = NULL;
187     if(!psx || !zone || !user) {
188         X509V3err(X509V3_F_SXNET_ADD_ID_INTEGER, X509V3_R_INVALID_NULL_ARG);
189         return 0;
190     }
191     if(userlen == -1) userlen = strlen(user);
192     if(userlen > 64) {

```

```

194         X509V3err(X509V3_F_SXNET_ADD_ID_INTEGER, X509V3_R_USER_TOO_LONG);
195         return 0;
196     }
197     if(!*psx) {
198         if(!(sx = SXNET_new())) goto err;
199         if(!ASN1_INTEGER_set(sx->version, 0)) goto err;
200         *psx = sx;
201     } else sx = *psx;
202     if(SXNET_get_id_INTEGER(sx, zone)) {
203         X509V3err(X509V3_F_SXNET_ADD_ID_INTEGER, X509V3_R_DUPLICATE_ZONE);
204         return 0;
205     }
206
207     if(!(id = SXNETID_new())) goto err;
208     if(userlen == -1) userlen = strlen(user);
209
210     if(!M_ASN1_OCTET_STRING_set(id->user, user, userlen)) goto err;
211     if(!sk_SXNETID_push(sx->ids, id)) goto err;
212     id->zone = zone;
213     return 1;
214
215 err:
216     X509V3err(X509V3_F_SXNET_ADD_ID_INTEGER, ERR_R_MALLOC_FAILURE);
217     SXNETID_free(id);
218     SXNET_free(sx);
219     *psx = NULL;
220     return 0;
221 }
222
223 ASN1_OCTET_STRING *SXNET_get_id_asc(SXNET *sx, char *zone)
224 {
225     ASN1_INTEGER *izone = NULL;
226     ASN1_OCTET_STRING *oct;
227     if(!((izone = s2i_ASN1_INTEGER(NULL, zone))) {
228         X509V3err(X509V3_F_SXNET_GET_ID_ASC, X509V3_R_ERROR_CONVERTING_ZONE);
229         return NULL;
230     }
231     oct = SXNET_get_id_INTEGER(sx, izone);
232     M_ASN1_INTEGER_free(izone);
233     return oct;
234 }
235
236 ASN1_OCTET_STRING *SXNET_get_id_ulong(SXNET *sx, unsigned long lzone)
237 {
238     ASN1_INTEGER *izone = NULL;
239     ASN1_OCTET_STRING *oct;
240     if(!((izone = M_ASN1_INTEGER_new()) || !ASN1_INTEGER_set(izone, lzone)) {
241         X509V3err(X509V3_F_SXNET_GET_ID_ULONG, ERR_R_MALLOC_FAILURE);
242         M_ASN1_INTEGER_free(izone);
243         return NULL;
244     }
245     oct = SXNET_get_id_INTEGER(sx, izone);
246     M_ASN1_INTEGER_free(izone);
247     return oct;
248 }
249
250 ASN1_OCTET_STRING *SXNET_get_id_INTEGER(SXNET *sx, ASN1_INTEGER *zone)
251 {
252     SXNETID *id;
253     int i;
254     for(i = 0; i < sk_SXNETID_num(sx->ids); i++) {
255         id = sk_SXNETID_value(sx->ids, i);
256         if(!M_ASN1_INTEGER_cmp(id->zone, zone)) return id->user;
257     }
258     return NULL;
259 }

```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_sxnet.c

5

```
261 IMPLEMENT_STACK_OF(SXNETID)
262 IMPLEMENT_ASN1_SET_OF(SXNETID)
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_utl.c

1

```
*****
21060 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_utl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* v3_utl.c */
2 /* Written by Dr Stephen N Henson (steve@openssl.org) for the OpenSSL
3  * project.
4  */
5 /* =====
6  * Copyright (c) 1999-2003 The OpenSSL Project. All rights reserved.
7  *
8  * Redistribution and use in source and binary forms, with or without
9  * modification, are permitted provided that the following conditions
10  * are met:
11  *
12  * 1. Redistributions of source code must retain the above copyright
13  * notice, this list of conditions and the following disclaimer.
14  *
15  * 2. Redistributions in binary form must reproduce the above copyright
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19  *
20  * 3. All advertising materials mentioning features or use of this
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24  *
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38  *
39  * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
40  * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
41  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
42  * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
43  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
44  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
45  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
46  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
47  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
48  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
49  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
50  * OF THE POSSIBILITY OF SUCH DAMAGE.
51  * =====
52  *
53  * This product includes cryptographic software written by Eric Young
54  * (eay@cryptsoft.com). This product includes software written by Tim
55  * Hudson (tjh@cryptsoft.com).
56  */
57 /*
58 /* X509 v3 extension utilities */

61 #include <stdio.h>
```

new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3_utl.c

2

```
62 #include <ctype.h>
63 #include "cryptlib.h"
64 #include <openssl/conf.h>
65 #include <openssl/x509v3.h>
66 #include <openssl/bn.h>

68 static char *strip_spaces(char *name);
69 static int sk_strcmp(const char * const *a, const char * const *b);
70 static STACK_OF(OPENSSL_STRING) *get_email(X509_NAME *name, GENERAL_NAMES *gens);
71 static void str_free(OPENSSL_STRING str);
72 static int append_ia5(STACK_OF(OPENSSL_STRING) **sk, ASN1_IA5STRING *email);

74 static int ipv4_from_asc(unsigned char *v4, const char *in);
75 static int ipv6_from_asc(unsigned char *v6, const char *in);
76 static int ipv6_cb(const char *elem, int len, void *usr);
77 static int ipv6_hex(unsigned char *out, const char *in, int inlen);

79 /* Add a CONF_VALUE name value pair to stack */

81 int X509V3_add_value(const char *name, const char *value,
82                     STACK_OF(CONF_VALUE) **extlist)
83 {
84     CONF_VALUE *vtmp = NULL;
85     char *tname = NULL, *tvalue = NULL;
86     if(name && !(tname = BUF_strdup(name))) goto err;
87     if(value && !(tvalue = BUF_strdup(value))) goto err;
88     if(!(vtmp = (CONF_VALUE *)OPENSSL_malloc(sizeof(CONF_VALUE)))) goto err;
89     if(!*extlist && !(*extlist = sk_CONF_VALUE_new_null())) goto err;
90     vtmp->section = NULL;
91     vtmp->name = tname;
92     vtmp->value = tvalue;
93     if(!sk_CONF_VALUE_push(*extlist, vtmp)) goto err;
94     return 1;
95 err:
96     X509V3err(X509V3_F_X509V3_ADD_VALUE, ERR_R_MALLOC_FAILURE);
97     if(vtmp) OPENSSL_free(vtmp);
98     if(tname) OPENSSL_free(tname);
99     if(tvalue) OPENSSL_free(tvalue);
100     return 0;
101 }

103 int X509V3_add_value_uchar(const char *name, const unsigned char *value,
104                           STACK_OF(CONF_VALUE) **extlist)
105 {
106     return X509V3_add_value(name, (const char *)value, extlist);
107 }

109 /* Free function for STACK_OF(CONF_VALUE) */

111 void X509V3_conf_free(CONF_VALUE *conf)
112 {
113     if(!conf) return;
114     if(conf->name) OPENSSL_free(conf->name);
115     if(conf->value) OPENSSL_free(conf->value);
116     if(conf->section) OPENSSL_free(conf->section);
117     OPENSSL_free(conf);
118 }

120 int X509V3_add_value_bool(const char *name, int asn1_bool,
121                           STACK_OF(CONF_VALUE) **extlist)
122 {
123     if(asn1_bool) return X509V3_add_value(name, "TRUE", extlist);
124     return X509V3_add_value(name, "FALSE", extlist);
125 }

127 int X509V3_add_value_bool_nf(char *name, int asn1_bool,
```



```

128             STACK_OF(CONF_VALUE) **extlist)
129 {
130     if(asn1_bool) return X509V3_add_value(name, "TRUE", extlist);
131     return 1;
132 }

135 char *i2s_ASN1_ENUMERATED(X509V3_EXT_METHOD *method, ASN1_ENUMERATED *a)
136 {
137     BIGNUM *bntmp = NULL;
138     char *strtmp = NULL;
139     if(!a) return NULL;
140     if(!(bntmp = ASN1_ENUMERATED_to_BN(a, NULL)) ||
141        !(strtmp = BN_bn2dec(bntmp)) )
142         X509V3err(X509V3_F_I2S_ASN1_ENUMERATED,ERR_R_MALLOC_FAILURE);
143     BN_free(bntmp);
144     return strtmp;
145 }

147 char *i2s_ASN1_INTEGER(X509V3_EXT_METHOD *method, ASN1_INTEGER *a)
148 {
149     BIGNUM *bntmp = NULL;
150     char *strtmp = NULL;
151     if(!a) return NULL;
152     if(!(bntmp = ASN1_INTEGER_to_BN(a, NULL)) ||
153        !(strtmp = BN_bn2dec(bntmp)) )
154         X509V3err(X509V3_F_I2S_ASN1_INTEGER,ERR_R_MALLOC_FAILURE);
155     BN_free(bntmp);
156     return strtmp;
157 }

159 ASN1_INTEGER *s2i_ASN1_INTEGER(X509V3_EXT_METHOD *method, char *value)
160 {
161     BIGNUM *bn = NULL;
162     ASN1_INTEGER *aint;
163     int isneg, ishex;
164     int ret;
165     if (!value) {
166         X509V3err(X509V3_F_S2I_ASN1_INTEGER,X509V3_R_INVALID_NULL_VALUE)
167         return 0;
168     }
169     bn = BN_new();
170     if (value[0] == '-' ) {
171         value++;
172         isneg = 1;
173     } else isneg = 0;

175     if (value[0] == '0' && ((value[1] == 'x') || (value[1] == 'X'))) {
176         value += 2;
177         ishex = 1;
178     } else ishex = 0;

180     if (ishex) ret = BN_hex2bn(&bn, value);
181     else ret = BN_dec2bn(&bn, value);

183     if (!ret || value[ret]) {
184         BN_free(bn);
185         X509V3err(X509V3_F_S2I_ASN1_INTEGER,X509V3_R_BN_DEC2BN_ERROR);
186         return 0;
187     }

189     if (isneg && BN_is_zero(bn)) isneg = 0;

191     aint = BN_to_ASN1_INTEGER(bn, NULL);
192     BN_free(bn);
193     if (!aint) {

```

```

194         X509V3err(X509V3_F_S2I_ASN1_INTEGER,X509V3_R_BN_TO_ASN1_INTEGER)
195         return 0;
196     }
197     if (isneg) aint->type |= V_ASN1_NEG;
198     return aint;
199 }

201 int X509V3_add_value_int(const char *name, ASN1_INTEGER *aint,
202                          STACK_OF(CONF_VALUE) **extlist)
203 {
204     char *strtmp;
205     int ret;
206     if(!aint) return 1;
207     if(!(strtmp = i2s_ASN1_INTEGER(NULL, aint))) return 0;
208     ret = X509V3_add_value(name, strtmp, extlist);
209     OPENSSL_free(strtmp);
210     return ret;
211 }

213 int X509V3_get_value_bool(CONF_VALUE *value, int *asn1_bool)
214 {
215     char *btmp;
216     if(!(btmp = value->value)) goto err;
217     if(!strcmp(btmp, "TRUE") || !strcmp(btmp, "true")
218        || !strcmp(btmp, "Y") || !strcmp(btmp, "y")
219        || !strcmp(btmp, "YES") || !strcmp(btmp, "yes")) {
220         *asn1_bool = 0xff;
221         return 1;
222     } else if(!strcmp(btmp, "FALSE") || !strcmp(btmp, "false")
223               || !strcmp(btmp, "N") || !strcmp(btmp, "n")
224               || !strcmp(btmp, "NO") || !strcmp(btmp, "no")) {
225         *asn1_bool = 0;
226         return 1;
227     }
228     err:
229     X509V3err(X509V3_F_X509V3_GET_VALUE_BOOL,X509V3_R_INVALID_BOOLEAN_STRING)
230     X509V3_conf_err(value);
231     return 0;
232 }

234 int X509V3_get_value_int(CONF_VALUE *value, ASN1_INTEGER **aint)
235 {
236     ASN1_INTEGER *itmp;
237     if(!(itmp = s2i_ASN1_INTEGER(NULL, value->value))) {
238         X509V3_conf_err(value);
239         return 0;
240     }
241     *aint = itmp;
242     return 1;
243 }

245 #define HDR_NAME      1
246 #define HDR_VALUE     2

248 /*#define DEBUG*/

250 STACK_OF(CONF_VALUE) *X509V3_parse_list(const char *line)
251 {
252     char *p, *q, c;
253     char *ntmp, *vtmp;
254     STACK_OF(CONF_VALUE) *values = NULL;
255     char *linebuf;
256     int state;
257     /* We are going to modify the line so copy it first */
258     linebuf = BUF_strdup(line);
259     state = HDR_NAME;

```

```

260     ntmp = NULL;
261     /* Go through all characters */
262     for(p = linebuf, q = linebuf; (c = *p) && (c!='\r') && (c!='\n'); p++) {

264         switch(state) {
265             case HDR_NAME:
266                 if(c == ':') {
267                     state = HDR_VALUE;
268                     *p = 0;
269                     ntmp = strip_spaces(q);
270                     if(!ntmp) {
271                         X509V3err(X509V3_F_X509V3_PARSE_LIST, X5
272                             goto err;
273                     }
274                     q = p + 1;
275                 } else if(c == ',') {
276                     *p = 0;
277                     ntmp = strip_spaces(q);
278                     q = p + 1;
279 #if 0
280                     printf("%s\n", ntmp);
281 #endif
282                     if(!ntmp) {
283                         X509V3err(X509V3_F_X509V3_PARSE_LIST, X5
284                             goto err;
285                     }
286                     X509V3_add_value(ntmp, NULL, &values);
287                 }
288                 break ;

290             case HDR_VALUE:
291                 if(c == ',') {
292                     state = HDR_NAME;
293                     *p = 0;
294                     vtmp = strip_spaces(q);
295 #if 0
296                     printf("%s\n", ntmp);
297 #endif
298                     if(!vtmp) {
299                         X509V3err(X509V3_F_X509V3_PARSE_LIST, X5
300                             goto err;
301                     }
302                     X509V3_add_value(ntmp, vtmp, &values);
303                     ntmp = NULL;
304                     q = p + 1;
305                 }

307             }
308         }

310     if(state == HDR_VALUE) {
311         vtmp = strip_spaces(q);
312 #if 0
313         printf("%s=%s\n", ntmp, vtmp);
314 #endif
315         if(!vtmp) {
316             X509V3err(X509V3_F_X509V3_PARSE_LIST, X509V3_R_INVALID_N
317                 goto err;
318         }
319         X509V3_add_value(ntmp, vtmp, &values);
320     } else {
321         ntmp = strip_spaces(q);
322 #if 0
323         printf("%s\n", ntmp);
324 #endif
325         if(!ntmp) {

```

```

326             X509V3err(X509V3_F_X509V3_PARSE_LIST, X509V3_R_INVALID_N
327                 goto err;
328         }
329         X509V3_add_value(ntmp, NULL, &values);
330     }
331     OPENSSL_free(linebuf);
332     return values;

334 err:
335     OPENSSL_free(linebuf);
336     sk_CONF_VALUE_pop_free(values, X509V3_conf_free);
337     return NULL;

339 }

341 /* Delete leading and trailing spaces from a string */
342 static char *strip_spaces(char *name)
343 {
344     char *p, *q;
345     /* Skip over leading spaces */
346     p = name;
347     while(*p && isspace((unsigned char)*p)) p++;
348     if(!*p) return NULL;
349     q = p + strlen(p) - 1;
350     while((q != p) && isspace((unsigned char)*q)) q--;
351     if(p != q) q[1] = 0;
352     if(!*p) return NULL;
353     return p;
354 }

356 /* hex string utilities */

358 /* Given a buffer of length 'len' return a OPENSSL_malloc'ed string with its
359  * hex representation
360  * @@@ (Contents of buffer are always kept in ASCII, also on EBCDIC machines)
361  */

363 char *hex_to_string(const unsigned char *buffer, long len)
364 {
365     char *tmp, *q;
366     const unsigned char *p;
367     int i;
368     static const char hexdig[] = "0123456789ABCDEF";
369     if(!buffer || !len) return NULL;
370     if(!(tmp = OPENSSL_malloc(len * 3 + 1))) {
371         X509V3err(X509V3_F_HEX_TO_STRING, ERR_R_MALLOC_FAILURE);
372         return NULL;
373     }
374     q = tmp;
375     for(i = 0, p = buffer; i < len; i++, p++) {
376         *q++ = hexdig[(p >> 4) & 0xf];
377         *q++ = hexdig[p & 0xf];
378         *q++ = ':';
379     }
380     q[-1] = 0;
381 #ifdef CHARSET_EBCDIC
382     ebcidic2ascii(tmp, tmp, q - tmp - 1);
383 #endif

385     return tmp;
386 }

388 /* Give a string of hex digits convert to
389  * a buffer
390  */

```

```

392 unsigned char *string_to_hex(const char *str, long *len)
393 {
394     unsigned char *hexbuf, *q;
395     unsigned char ch, cl, *p;
396     if(!str) {
397         X509V3err(X509V3_F_STRING_TO_HEX, X509V3_R_INVALID_NULL_ARGUMENT)
398         return NULL;
399     }
400     if(!(hexbuf = OPENSSL_malloc(strlen(str) >> 1))) goto err;
401     for(p = (unsigned char *)str, q = hexbuf; *p;) {
402         ch = *p++;
403 #ifdef CHARSET_EBCDIC
404         ch = os_toebcdic[ch];
405 #endif
406         if(ch == ':') continue;
407         cl = *p++;
408 #ifdef CHARSET_EBCDIC
409         cl = os_toebcdic[cl];
410 #endif
411         if(!cl) {
412             X509V3err(X509V3_F_STRING_TO_HEX, X509V3_R_ODD_NUMBER_OF_
413             OPENSSL_free(hexbuf);
414             return NULL;
415         }
416         if(isupper(ch)) ch = tolower(ch);
417         if(isupper(cl)) cl = tolower(cl);
418
419         if((ch >= '0') && (ch <= '9')) ch -= '0';
420         else if ((ch >= 'a') && (ch <= 'f')) ch -= 'a' - 10;
421         else goto badhex;
422
423         if((cl >= '0') && (cl <= '9')) cl -= '0';
424         else if ((cl >= 'a') && (cl <= 'f')) cl -= 'a' - 10;
425         else goto badhex;
426
427         *q++ = (ch << 4) | cl;
428     }
429
430     if(len) *len = q - hexbuf;
431
432     return hexbuf;
433
434 err:
435     if(hexbuf) OPENSSL_free(hexbuf);
436     X509V3err(X509V3_F_STRING_TO_HEX, ERR_R_MALLOC_FAILURE);
437     return NULL;
438
439 badhex:
440     OPENSSL_free(hexbuf);
441     X509V3err(X509V3_F_STRING_TO_HEX, X509V3_R_ILLEGAL_HEX_DIGIT);
442     return NULL;
443 }
444
445 /* V2I name comparison function: returns zero if 'name' matches
446  * cmp or cmp.*
447  */
448
449 int name_cmp(const char *name, const char *cmp)
450 {
451     int len, ret;
452     char c;
453     len = strlen(cmp);
454     if((ret = strncmp(name, cmp, len)) return ret;
455     c = name[len];
456     if(!c || (c == '.')) return 0;

```

```

458     return 1;
459 }
460
461 static int sk_strcmp(const char * const *a, const char * const *b)
462 {
463     return strcmp(*a, *b);
464 }
465
466 STACK_OF(OPENSSL_STRING) *X509_get1_email(X509 *x)
467 {
468     GENERAL_NAMES *gens;
469     STACK_OF(OPENSSL_STRING) *ret;
470
471     gens = X509_get_ext_d2i(x, NID_subject_alt_name, NULL, NULL);
472     ret = get_email(X509_get_subject_name(x), gens);
473     sk_GENERAL_NAME_pop_free(gens, GENERAL_NAME_free);
474     return ret;
475 }
476
477 STACK_OF(OPENSSL_STRING) *X509_get1_ocsp(X509 *x)
478 {
479     AUTHORITY_INFO_ACCESS *info;
480     STACK_OF(OPENSSL_STRING) *ret = NULL;
481     int i;
482
483     info = X509_get_ext_d2i(x, NID_info_access, NULL, NULL);
484     if (!info)
485         return NULL;
486     for (i = 0; i < sk_ACCESS_DESCRIPTION_num(info); i++)
487     {
488         ACCESS_DESCRIPTION *ad = sk_ACCESS_DESCRIPTION_value(info, i);
489         if (OBJ_obj2nid(ad->method) == NID_ad_OCSP)
490         {
491             if (ad->location->type == GEN_URI)
492             {
493                 if (!append_ia5(&ret, ad->location->d.uniformRes
494                     break;
495             }
496         }
497     }
498     AUTHORITY_INFO_ACCESS_free(info);
499     return ret;
500 }
501
502 STACK_OF(OPENSSL_STRING) *X509_REQ_get1_email(X509_REQ *x)
503 {
504     GENERAL_NAMES *gens;
505     STACK_OF(X509_EXTENSION) *exts;
506     STACK_OF(OPENSSL_STRING) *ret;
507
508     exts = X509_REQ_get_extensions(x);
509     gens = X509V3_get_d2i(exts, NID_subject_alt_name, NULL, NULL);
510     ret = get_email(X509_REQ_get_subject_name(x), gens);
511     sk_GENERAL_NAME_pop_free(gens, GENERAL_NAME_free);
512     sk_X509_EXTENSION_pop_free(exts, X509_EXTENSION_free);
513     return ret;
514 }
515
516 static STACK_OF(OPENSSL_STRING) *get_email(X509_NAME *name, GENERAL_NAMES *gens)
517 {
518     STACK_OF(OPENSSL_STRING) *ret = NULL;
519     X509_NAME_ENTRY *ne;
520     ASN1_IA5STRING *email;
521     GENERAL_NAME *gen;
522     int i;

```

```

524 /* Now add any email address(es) to STACK */
525 i = -1;
526 /* First supplied X509_NAME */
527 while((i = X509_NAME_get_index_by_NID(name,
528 NID_pkcs9_emailAddress, i)) >= 0) {
529     ne = X509_NAME_get_entry(name, i);
530     email = X509_NAME_ENTRY_get_data(ne);
531     if(!append_ia5(&ret, email)) return NULL;
532 }
533 for(i = 0; i < sk_GENERAL_NAME_num(gens); i++)
534 {
535     gen = sk_GENERAL_NAME_value(gens, i);
536     if(gen->type != GEN_EMAIL) continue;
537     if(!append_ia5(&ret, gen->d.ia5)) return NULL;
538 }
539 return ret;
540 }

542 static void str_free(OPENSSL_STRING str)
543 {
544     OPENSSL_free(str);
545 }

547 static int append_ia5(STACK_OF(OPENSSL_STRING) **sk, ASN1_IA5STRING *email)
548 {
549     char *emtmp;
550     /* First some sanity checks */
551     if(email->type != V_ASN1_IA5STRING) return 1;
552     if(!email->data || !email->length) return 1;
553     if(!*sk) *sk = sk_OPENSSL_STRING_new(sk_strcmp);
554     if(!*sk) return 0;
555     /* Don't add duplicates */
556     if(sk_OPENSSL_STRING_find(*sk, (char *)email->data) != -1) return 1;
557     emtmp = BUF_strdup((char *)email->data);
558     if(!emtmp || !sk_OPENSSL_STRING_push(*sk, emtmp)) {
559         X509_email_free(*sk);
560         *sk = NULL;
561         return 0;
562     }
563     return 1;
564 }

566 void X509_email_free(STACK_OF(OPENSSL_STRING) *sk)
567 {
568     sk_OPENSSL_STRING_pop_free(sk, str_free);
569 }

571 /* Convert IP addresses both IPv4 and IPv6 into an
572  * OCTET STRING compatible with RFC3280.
573  */

575 ASN1_OCTET_STRING *a2i_IPADDRESS(const char *ipasc)
576 {
577     unsigned char ipout[16];
578     ASN1_OCTET_STRING *ret;
579     int iplen;

581     /* If string contains a ':' assume IPv6 */

583     iplen = a2i_ipadd(ipout, ipasc);

585     if (!iplen)
586         return NULL;

588     ret = ASN1_OCTET_STRING_new();
589     if (!ret)

```

```

590         return NULL;
591     if (!ASN1_OCTET_STRING_set(ret, ipout, iplen))
592     {
593         ASN1_OCTET_STRING_free(ret);
594         return NULL;
595     }
596     return ret;
597 }

599 ASN1_OCTET_STRING *a2i_IPADDRESS_NC(const char *ipasc)
600 {
601     ASN1_OCTET_STRING *ret = NULL;
602     unsigned char ipout[32];
603     char *iptmp = NULL, *p;
604     int iplen1, iplen2;
605     p = strchr(ipasc, '/');
606     if (!p)
607         return NULL;
608     iptmp = BUF_strdup(ipasc);
609     if (!iptmp)
610         return NULL;
611     p = iptmp + (p - ipasc);
612     *p++ = 0;

614     iplen1 = a2i_ipadd(ipout, iptmp);

616     if (!iplen1)
617         goto err;

619     iplen2 = a2i_ipadd(ipout + iplen1, p);

621     OPENSSL_free(iptmp);
622     iptmp = NULL;

624     if (!iplen2 || (iplen1 != iplen2))
625         goto err;

627     ret = ASN1_OCTET_STRING_new();
628     if (!ret)
629         goto err;
630     if (!ASN1_OCTET_STRING_set(ret, ipout, iplen1 + iplen2))
631         goto err;

633     return ret;

635 err:
636     if (iptmp)
637         OPENSSL_free(iptmp);
638     if (ret)
639         ASN1_OCTET_STRING_free(ret);
640     return NULL;
641 }
642 }

644 int a2i_ipadd(unsigned char *ipout, const char *ipasc)
645 {
646     /* If string contains a ':' assume IPv6 */

648     if (strchr(ipasc, ':'))
649     {
650         if (!ip6_from_asc(ipout, ipasc))
651             return 0;
652         return 16;
653     }
654     else
655     {

```

```

656         if (!ipv4_from_asc(ipout, ipasc))
657             return 0;
658         return 4;
659     }
660 }

662 static int ipv4_from_asc(unsigned char *v4, const char *in)
663 {
664     int a0, a1, a2, a3;
665     if (sscanf(in, "%d.%d.%d.%d", &a0, &a1, &a2, &a3) != 4)
666         return 0;
667     if ((a0 < 0) || (a0 > 255) || (a1 < 0) || (a1 > 255)
668         || (a2 < 0) || (a2 > 255) || (a3 < 0) || (a3 > 255))
669         return 0;
670     v4[0] = a0;
671     v4[1] = a1;
672     v4[2] = a2;
673     v4[3] = a3;
674     return 1;
675 }

677 typedef struct {
678     /* Temporary store for IPV6 output */
679     unsigned char tmp[16];
680     /* Total number of bytes in tmp */
681     int total;
682     /* The position of a zero (corresponding to '::') */
683     int zero_pos;
684     /* Number of zeroes */
685     int zero_cnt;
686 } IPV6_STAT;

689 static int ipv6_from_asc(unsigned char *v6, const char *in)
690 {
691     IPV6_STAT v6stat;
692     v6stat.total = 0;
693     v6stat.zero_pos = -1;
694     v6stat.zero_cnt = 0;
695     /* Treat the IPV6 representation as a list of values
696      * separated by ':'. The presence of a '::' will parse
697      * as one, two or three zero length elements.
698      */
699     if (!CONF_parse_list(in, ':', 0, ipv6_cb, &v6stat))
700         return 0;

702     /* Now for some sanity checks */

704     if (v6stat.zero_pos == -1)
705     {
706         /* If no '::' must have exactly 16 bytes */
707         if (v6stat.total != 16)
708             return 0;
709     }
710     else
711     {
712         /* If '::' must have less than 16 bytes */
713         if (v6stat.total == 16)
714             return 0;
715         /* More than three zeroes is an error */
716         if (v6stat.zero_cnt > 3)
717             return 0;
718         /* Can only have three zeroes if nothing else present */
719         else if (v6stat.zero_cnt == 3)
720         {
721             if (v6stat.total > 0)

```

```

722         return 0;
723     }
724     /* Can only have two zeroes if at start or end */
725     else if (v6stat.zero_cnt == 2)
726     {
727         if ((v6stat.zero_pos != 0)
728             && (v6stat.zero_pos != v6stat.total))
729             return 0;
730     }
731     else
732     /* Can only have one zero if *not* start or end */
733     {
734         if ((v6stat.zero_pos == 0)
735             || (v6stat.zero_pos == v6stat.total))
736             return 0;
737     }
738 }

740 /* Format result */

742 if (v6stat.zero_pos >= 0)
743 {
744     /* Copy initial part */
745     memcpy(v6, v6stat.tmp, v6stat.zero_pos);
746     /* Zero middle */
747     memset(v6 + v6stat.zero_pos, 0, 16 - v6stat.total);
748     /* Copy final part */
749     if (v6stat.total != v6stat.zero_pos)
750         memcpy(v6 + v6stat.zero_pos + 16 - v6stat.total,
751             v6stat.tmp + v6stat.zero_pos,
752             v6stat.total - v6stat.zero_pos);
753 }
754 else
755     memcpy(v6, v6stat.tmp, 16);

757 return 1;
758 }

760 static int ipv6_cb(const char *elem, int len, void *usr)
761 {
762     IPV6_STAT *s = usr;
763     /* Error if 16 bytes written */
764     if (s->total == 16)
765         return 0;
766     if (len == 0)
767     {
768         /* Zero length element, corresponds to '::' */
769         if (s->zero_pos == -1)
770             s->zero_pos = s->total;
771         /* If we've already got a :: its an error */
772         else if (s->zero_pos != s->total)
773             return 0;
774         s->zero_cnt++;
775     }
776     else
777     {
778         /* If more than 4 characters could be final a.b.c.d form */
779         if (len > 4)
780         {
781             /* Need at least 4 bytes left */
782             if (s->total > 12)
783                 return 0;
784             /* Must be end of string */
785             if (elem[len])
786                 return 0;
787             if (!ipv4_from_asc(s->tmp + s->total, elem))

```

```

788         return 0;
789         s->total += 4;
790     }
791     else
792     {
793         if (!ipv6_hex(s->tmp + s->total, elem, len))
794             return 0;
795         s->total += 2;
796     }
797 }
798 return 1;
799 }

801 /* Convert a string of up to 4 hex digits into the corresponding
802  * IPv6 form.
803  */
805 static int ipv6_hex(unsigned char *out, const char *in, int inlen)
806 {
807     unsigned char c;
808     unsigned int num = 0;
809     if (inlen > 4)
810         return 0;
811     while(inlen--)
812     {
813         c = *in++;
814         num <= 4;
815         if ((c >= '0') && (c <= '9'))
816             num |= c - '0';
817         else if ((c >= 'A') && (c <= 'F'))
818             num |= c - 'A' + 10;
819         else if ((c >= 'a') && (c <= 'f'))
820             num |= c - 'a' + 10;
821         else
822             return 0;
823     }
824     out[0] = num >> 8;
825     out[1] = num & 0xff;
826     return 1;
827 }

830 int X509V3_NAME_from_section(X509_NAME *nm, STACK_OF(CONF_VALUE)*dn_sk,
831                             unsigned long ctype)
832 {
833     CONF_VALUE *v;
834     int i, mval;
835     char *p, *type;
836     if (!nm)
837         return 0;
839     for (i = 0; i < sk_CONF_VALUE_num(dn_sk); i++)
840     {
841         v = sk_CONF_VALUE_value(dn_sk, i);
842         type = v->name;
843         /* Skip past any leading X. X: X, etc to allow for
844          * multiple instances
845          */
846         for(p = type; *p; p++)
847             #ifndef CHARSET_EBCDIC
848                 if ((*p == ':') || (*p == ',') || (*p == '.'))
849             #else
850                 if ((*p == os_toascii[':']) || (*p == os_toascii[',']) ||
851                     (*p == os_toascii['.']))
852             {
853                 p++;

```

```

854         if(*p) type = p;
855         break;
856     }
857     #ifndef CHARSET_EBCDIC
858         if (*type == '+')
859     #else
860         if (*type == os_toascii['+'])
861     #endif
862     {
863         mval = -1;
864         type++;
865     }
866     else
867         mval = 0;
868     if (!X509_NAME_add_entry_by_txt(nm, type, ctype,
869                                     (unsigned char *) v->value, -1, -1, mval))
870         return 0;
872 }
873 return 1;
874 }

```

```

*****
12172 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_crypto/x509v3/v3err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* crypto/x509v3/v3err.c */
2 /*
3  * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
4  *
5  * Redistribution and use in source and binary forms, with or without
6  * modification, are permitted provided that the following conditions
7  * are met:
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40  * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41  * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42  * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43  * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45  * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46  * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47  * OF THE POSSIBILITY OF SUCH DAMAGE.
48  *
49  * This product includes cryptographic software written by Eric Young
50  * (eay@cryptsoft.com). This product includes software written by Tim
51  * Hudson (tjh@cryptsoft.com).
52  *
53  *
54  */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57  * made to it will be overwritten when the script next updates this file,
58  * only reason strings will be preserved.
59  */
60
61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/x509v3.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_X509V3,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_X509V3,0,reason)
70
71 static ERR_STRING_DATA X509V3_str_functs[]=
72 {
73 {ERR_FUNC(X509V3_F_A2I_GENERAL_NAME), "A2I_GENERAL_NAME"},
74 {ERR_FUNC(X509V3_F_ASIDENTIFIERCHOICE_CANONIZE), "ASIDENTIFIERCHOICE_CANONIZE"},
75 {ERR_FUNC(X509V3_F_ASIDENTIFIERCHOICE_IS_CANONICAL), "ASIDENTIFIERCHOICE_IS_C"},
76 {ERR_FUNC(X509V3_F_COPY_EMAIL), "COPY_EMAIL"},
77 {ERR_FUNC(X509V3_F_COPY_ISSUER), "COPY_ISSUER"},
78 {ERR_FUNC(X509V3_F_DO_DIRNAME), "DO_DIRNAME"},
79 {ERR_FUNC(X509V3_F_DO_EXT_CONF), "DO_EXT_CONF"},
80 {ERR_FUNC(X509V3_F_DO_EXT_I2D), "DO_EXT_I2D"},
81 {ERR_FUNC(X509V3_F_DO_EXT_NCONF), "DO_EXT_NCONF"},
82 {ERR_FUNC(X509V3_F_DO_I2V_NAME_CONSTRAINTS), "DO_I2V_NAME_CONSTRAINTS"},
83 {ERR_FUNC(X509V3_F_GNAMES_FROM_SECTNAME), "GNAMES_FROM_SECTNAME"},
84 {ERR_FUNC(X509V3_F_HEX_TO_STRING), "hex_to_string"},
85 {ERR_FUNC(X509V3_F_I2S_ASN1_ENUMERATED), "i2s_ASN1_ENUMERATED"},
86 {ERR_FUNC(X509V3_F_I2S_ASN1_IA5STRING), "I2S_ASN1_IA5STRING"},
87 {ERR_FUNC(X509V3_F_I2S_ASN1_INTEGER), "i2s_ASN1_INTEGER"},
88 {ERR_FUNC(X509V3_F_I2V_AUTHORITY_INFO_ACCESS), "I2V_AUTHORITY_INFO_ACCESS"},
89 {ERR_FUNC(X509V3_F_NOTICE_SECTION), "NOTICE_SECTION"},
90 {ERR_FUNC(X509V3_F_NREF_NOS), "NREF_NOS"},
91 {ERR_FUNC(X509V3_F_POLICY_SECTION), "POLICY_SECTION"},
92 {ERR_FUNC(X509V3_F_PROCESS_PCI_VALUE), "PROCESS_PCI_VALUE"},
93 {ERR_FUNC(X509V3_F_R2I_CERTPOL), "R2I_CERTPOL"},
94 {ERR_FUNC(X509V3_F_R2I_PCI), "R2I_PCI"},
95 {ERR_FUNC(X509V3_F_S2I_ASN1_IA5STRING), "S2I_ASN1_IA5STRING"},
96 {ERR_FUNC(X509V3_F_S2I_ASN1_INTEGER), "s2i_ASN1_INTEGER"},
97 {ERR_FUNC(X509V3_F_S2I_ASN1_OCTET_STRING), "s2i_ASN1_OCTET_STRING"},
98 {ERR_FUNC(X509V3_F_S2I_ASN1_KEY_ID), "S2I_ASN1_KEY_ID"},
99 {ERR_FUNC(X509V3_F_S2I_SKEY_ID), "S2I_SKEY_ID"},
100 {ERR_FUNC(X509V3_F_SET_DIST_POINT_NAME), "SET_DIST_POINT_NAME"},
101 {ERR_FUNC(X509V3_F_STRING_TO_HEX), "string_to_hex"},
102 {ERR_FUNC(X509V3_F_SXNET_ADD_ID_ASC), "SXNET_add_id_asc"},
103 {ERR_FUNC(X509V3_F_SXNET_ADD_ID_INTEGER), "SXNET_add_id_INTEGER"},
104 {ERR_FUNC(X509V3_F_SXNET_ADD_ID_ULONG), "SXNET_add_id_ulong"},
105 {ERR_FUNC(X509V3_F_SXNET_GET_ID_ASC), "SXNET_get_id_asc"},
106 {ERR_FUNC(X509V3_F_SXNET_GET_ID_ULONG), "SXNET_get_id_ulong"},
107 {ERR_FUNC(X509V3_F_V2I_ASIDENTIFIERS), "V2I_ASIDENTIFIERS"},
108 {ERR_FUNC(X509V3_F_V2I_ASN1_BIT_STRING), "v2i_ASN1_BIT_STRING"},
109 {ERR_FUNC(X509V3_F_V2I_AUTHORITY_INFO_ACCESS), "V2I_AUTHORITY_INFO_ACCESS"},
110 {ERR_FUNC(X509V3_F_V2I_AUTHORITY_KEYID), "V2I_AUTHORITY_KEYID"},
111 {ERR_FUNC(X509V3_F_V2I_BASIC_CONSTRAINTS), "V2I_BASIC_CONSTRAINTS"},
112 {ERR_FUNC(X509V3_F_V2I_CRLD), "V2I_CRLD"},
113 {ERR_FUNC(X509V3_F_V2I_EXTENDED_KEY_USAGE), "V2I_EXTENDED_KEY_USAGE"},
114 {ERR_FUNC(X509V3_F_V2I_GENERAL_NAMES), "v2i_GENERAL_NAMES"},
115 {ERR_FUNC(X509V3_F_V2I_GENERAL_NAME_EX), "v2i_GENERAL_NAME_ex"},
116 {ERR_FUNC(X509V3_F_V2I_IDP), "V2I_IDP"},
117 {ERR_FUNC(X509V3_F_V2I_IPADDRBLOCKS), "V2I_IPADDRBLOCKS"},
118 {ERR_FUNC(X509V3_F_V2I_ISSUER_ALT), "V2I_ISSUER_ALT"},
119 {ERR_FUNC(X509V3_F_V2I_NAME_CONSTRAINTS), "V2I_NAME_CONSTRAINTS"},
120 {ERR_FUNC(X509V3_F_V2I_POLICY_CONSTRAINTS), "V2I_POLICY_CONSTRAINTS"},
121 {ERR_FUNC(X509V3_F_V2I_POLICY_MAPPINGS), "V2I_POLICY_MAPPINGS"},
122 {ERR_FUNC(X509V3_F_V2I_SUBJECT_ALT), "V2I_SUBJECT_ALT"},
123 {ERR_FUNC(X509V3_F_V3_ADDR_VALIDATE_PATH_INTERNAL), "V3_ADDR_VALIDATE_PATH_I"},
124 {ERR_FUNC(X509V3_F_V3_GENERIC_EXTENSION), "V3_GENERIC_EXTENSION"},
125 {ERR_FUNC(X509V3_F_X509V3_ADD1_I2D), "X509V3_add1_i2d"},
126 {ERR_FUNC(X509V3_F_X509V3_ADD_VALUE), "X509V3_add_value"},
127 {ERR_FUNC(X509V3_F_X509V3_EXT_ADD), "X509V3_EXT_add"},

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128 {ERR_FUNC(X509V3_F_X509V3_EXT_ADD_ALIAS), "X509V3_EXT_add_alias"},
129 {ERR_FUNC(X509V3_F_X509V3_EXT_CONF), "X509V3_EXT_conf"},
130 {ERR_FUNC(X509V3_F_X509V3_EXT_I2D), "X509V3_EXT_i2d"},
131 {ERR_FUNC(X509V3_F_X509V3_EXT_NCONF), "X509V3_EXT_nconf"},
132 {ERR_FUNC(X509V3_F_X509V3_GET_SECTION), "X509V3_get_section"},
133 {ERR_FUNC(X509V3_F_X509V3_GET_STRING), "X509V3_get_string"},
134 {ERR_FUNC(X509V3_F_X509V3_GET_VALUE_BOOL), "X509V3_get_value_bool"},
135 {ERR_FUNC(X509V3_F_X509V3_PARSE_LIST), "X509V3_parse_list"},
136 {ERR_FUNC(X509V3_F_X509_PURPOSE_ADD), "X509_PURPOSE_add"},
137 {ERR_FUNC(X509V3_F_X509_PURPOSE_SET), "X509_PURPOSE_set"},
138 {0, NULL}};
139 };

141 static ERR_STRING_DATA X509V3_str_reasons[]=
142 {
143 {ERR_REASON(X509V3_R_BAD_IP_ADDRESS), "bad ip address"},
144 {ERR_REASON(X509V3_R_BAD_OBJECT), "bad object"},
145 {ERR_REASON(X509V3_R_BN_DEC2BN_ERROR), "bn dec2bn error"},
146 {ERR_REASON(X509V3_R_BN_TO_ASN1_INTEGER_ERROR), "bn to asn1 integer error"},
147 {ERR_REASON(X509V3_R_DIRNAME_ERROR), "dirname error"},
148 {ERR_REASON(X509V3_R_DISTPOINT_ALREADY_SET), "distpoint already set"},
149 {ERR_REASON(X509V3_R_DUPLICATE_ZONE_ID), "duplicate zone id"},
150 {ERR_REASON(X509V3_R_ERROR_CONVERTING_ZONE), "error converting zone"},
151 {ERR_REASON(X509V3_R_ERROR_CREATING_EXTENSION), "error creating extension"},
152 {ERR_REASON(X509V3_R_ERROR_IN_EXTENSION), "error in extension"},
153 {ERR_REASON(X509V3_R_EXPECTED_A_SECTION_NAME), "expected a section name"},
154 {ERR_REASON(X509V3_R_EXTENSION_EXISTS), "extension exists"},
155 {ERR_REASON(X509V3_R_EXTENSION_NAME_ERROR), "extension name error"},
156 {ERR_REASON(X509V3_R_EXTENSION_NOT_FOUND), "extension not found"},
157 {ERR_REASON(X509V3_R_EXTENSION_SETTING_NOT_SUPPORTED), "extension setting not sup"},
158 {ERR_REASON(X509V3_R_EXTENSION_VALUE_ERROR), "extension value error"},
159 {ERR_REASON(X509V3_R_ILLEGAL_EMPTY_EXTENSION), "illegal empty extension"},
160 {ERR_REASON(X509V3_R_ILLEGAL_HEX_DIGIT), "illegal hex digit"},
161 {ERR_REASON(X509V3_R_INCORRECT_POLICY_SYNTAX_TAG), "incorrect policy syntax tag"},
162 {ERR_REASON(X509V3_R_INVALID_MULTIPLE_RDNS), "invalid multiple rdns"},
163 {ERR_REASON(X509V3_R_INVALID_ASNUMBER), "invalid asnumber"},
164 {ERR_REASON(X509V3_R_INVALID_ASRANGE), "invalid asrange"},
165 {ERR_REASON(X509V3_R_INVALID_BOOLEAN_STRING), "invalid boolean string"},
166 {ERR_REASON(X509V3_R_INVALID_EXTENSION_STRING), "invalid extension string"},
167 {ERR_REASON(X509V3_R_INVALID_INHERITANCE), "invalid inheritance"},
168 {ERR_REASON(X509V3_R_INVALID_IPADDRESS), "invalid ipaddress"},
169 {ERR_REASON(X509V3_R_INVALID_NAME), "invalid name"},
170 {ERR_REASON(X509V3_R_INVALID_NULL_ARGUMENT), "invalid null argument"},
171 {ERR_REASON(X509V3_R_INVALID_NULL_NAME), "invalid null name"},
172 {ERR_REASON(X509V3_R_INVALID_NULL_VALUE), "invalid null value"},
173 {ERR_REASON(X509V3_R_INVALID_NUMBER), "invalid number"},
174 {ERR_REASON(X509V3_R_INVALID_NUMBERS), "invalid numbers"},
175 {ERR_REASON(X509V3_R_INVALID_OBJECT_IDENTIFIER), "invalid object identifier"},
176 {ERR_REASON(X509V3_R_INVALID_OPTION), "invalid option"},
177 {ERR_REASON(X509V3_R_INVALID_POLICY_IDENTIFIER), "invalid policy identifier"},
178 {ERR_REASON(X509V3_R_INVALID_PROXY_POLICY_SETTING), "invalid proxy policy setting"},
179 {ERR_REASON(X509V3_R_INVALID_PURPOSE), "invalid purpose"},
180 {ERR_REASON(X509V3_R_INVALID_SAFI), "invalid safi"},
181 {ERR_REASON(X509V3_R_INVALID_SECTION), "invalid section"},
182 {ERR_REASON(X509V3_R_INVALID_SYNTAX), "invalid syntax"},
183 {ERR_REASON(X509V3_R_ISSUER_DECODE_ERROR), "issuer decode error"},
184 {ERR_REASON(X509V3_R_MISSING_VALUE), "missing value"},
185 {ERR_REASON(X509V3_R_NEED_ORGANIZATION_AND_NUMBERS), "need organization and numbe"},
186 {ERR_REASON(X509V3_R_NO_CONFIG_DATABASE), "no config database"},
187 {ERR_REASON(X509V3_R_NO_ISSUER_CERTIFICATE), "no issuer certificate"},
188 {ERR_REASON(X509V3_R_NO_ISSUER_DETAILS), "no issuer details"},
189 {ERR_REASON(X509V3_R_NO_POLICY_IDENTIFIER), "no policy identifier"},
190 {ERR_REASON(X509V3_R_NO_PROXY_CERT_POLICY_LANGUAGE_DEFINED), "no proxy cert polic"},
191 {ERR_REASON(X509V3_R_NO_PUBLIC_KEY), "no public key"},
192 {ERR_REASON(X509V3_R_NO_SUBJECT_DETAILS), "no subject details"},
193 {ERR_REASON(X509V3_R_ODD_NUMBER_OF_DIGITS), "odd number of digits"},

```

```

194 {ERR_REASON(X509V3_R_OPERATION_NOT_DEFINED), "operation not defined"},
195 {ERR_REASON(X509V3_R_OTHERNAME_ERROR), "othername error"},
196 {ERR_REASON(X509V3_R_POLICY_LANGUAGE_ALREADY_DEFINED), "policy language already d"},
197 {ERR_REASON(X509V3_R_POLICY_PATH_LENGTH), "policy path length"},
198 {ERR_REASON(X509V3_R_POLICY_PATH_LENGTH_ALREADY_DEFINED), "policy path length alr"},
199 {ERR_REASON(X509V3_R_POLICY_SYNTAX_NOT_CURRENTLY_SUPPORTED), "policy syntax not c"},
200 {ERR_REASON(X509V3_R_POLICY_WHEN_PROXY_LANGUAGE_REQUIRES_NO_POLICY), "policy when"},
201 {ERR_REASON(X509V3_R_SECTION_NOT_FOUND), "section not found"},
202 {ERR_REASON(X509V3_R_UNABLE_TO_GET_ISSUER_DETAILS), "unable to get issuer details"},
203 {ERR_REASON(X509V3_R_UNABLE_TO_GET_ISSUER_KEYID), "unable to get issuer keyid"},
204 {ERR_REASON(X509V3_R_UNKNOWN_BIT_STRING_ARGUMENT), "unknown bit string argument"},
205 {ERR_REASON(X509V3_R_UNKNOWN_EXTENSION), "unknown extension"},
206 {ERR_REASON(X509V3_R_UNKNOWN_EXTENSION_NAME), "unknown extension name"},
207 {ERR_REASON(X509V3_R_UNKNOWN_OPTION), "unknown option"},
208 {ERR_REASON(X509V3_R_UNSUPPORTED_OPTION), "unsupported option"},
209 {ERR_REASON(X509V3_R_UNSUPPORTED_TYPE), "unsupported type"},
210 {ERR_REASON(X509V3_R_USER_TOO_LONG), "user too long"},
211 {0, NULL}};
212 };

214 #endif

216 void ERR_load_X509V3_strings(void)
217 {
218 #ifndef OPENSSL_NO_ERR
219
220     if (ERR_func_error_string(X509V3_str_funcs[0].error) == NULL)
221     {
222         ERR_load_strings(0, X509V3_str_funcs);
223         ERR_load_strings(0, X509V3_str_reasons);
224     }
225 #endif
226 }

```


new/usr/src/lib/openssl/libsunw_ssl/Makefile

1

```
*****
1588 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_ssl/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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23 # Use is subject to license terms.
24 #
25 #
```

```
27 include $(SRC)/lib/Makefile.lib
```

```
29 SUBDIRS = .WAIT $(MACH) $(BUILD64) $(MACH64)
```

```
31 # conditional assignments
32 all := TARGET= all
33 install := TARGET= install
34 clean := TARGET= clean
35 clobber := TARGET= clobber
36 lint := TARGET= lint
37 _msg := TARGET= _msg
```

```
39 sparc_HDRS=
40 sparcv9_HDRS=
41 i386_HDRS=
42 HDRS= $(MACH)_HDRS
43 ROOTHDRDIR= $(ROOT)/usr/include
44 ROOTHDRS= $(HDRS:%=$(ROOTHDRDIR)/%)
45 CHECKHDRS= $(HDRS:%.h=%.check)
```

```
47 .KEEP_STATE:
```

```
49 all install clean clobber lint: $(SUBDIRS)
```

```
51 _msg: $(MACH) $(MACH64)
```

```
54 $(ROOTHDRDIR)/%: %
55 $(INS.file)
```

```
57 $(ROOTHDRDIR):
58 $(INS.dir)
```

```
60 check: $(CHECKHDRS)
```

new/usr/src/lib/openssl/libsunw_ssl/Makefile

2

```
62 $(MACH) $(MACH64): FRC
63 @cd $@; pwd; $(MAKE) $(TARGET)
```

```
65 FRC:
```

new/usr/src/lib/openssl/libsunw_ssl/Makefile.com

1

```
*****
2896 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_ssl/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

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```

```
26 LIBRARY=      libsunw_ssl.a
27 VERS=         .1
```

```
29 OBJECTS=      bio_ssl.o \
30                d1_both.o \
31                d1_clnt.o \
32                d1_enc.o \
33                d1_lib.o \
34                d1_meth.o \
35                d1_pkt.o \
36                d1_srtp.o \
37                d1_svr.o \
38                kssl.o \
39                s23_clnt.o \
40                s23_lib.o \
41                s23_meth.o \
42                s23_pkt.o \
43                s23_svr.o \
44                s2_clnt.o \
45                s2_enc.o \
46                s2_lib.o \
47                s2_meth.o \
48                s2_pkt.o \
49                s2_svr.o \
50                s3_both.o \
51                s3_cbc.o \
52                s3_clnt.o \
53                s3_enc.o \
54                s3_lib.o \
55                s3_meth.o \
56                s3_pkt.o \
57                s3_svr.o \
58                ssl_algs.o \
59                ssl_asn1.o \
60                ssl_cert.o \
61                ssl_ciph.o \
```

new/usr/src/lib/openssl/libsunw_ssl/Makefile.com

2

```
62                ssl_err.o \
63                ssl_err2.o \
64                ssl_lib.o \
65                ssl_rsa.o \
66                ssl_sess.o \
67                ssl_stat.o \
68                ssl_txt.o \
69                t1_clnt.o \
70                t1_enc.o \
71                t1_lib.o \
72                t1_meth.o \
73                t1_reneg.o \
74                t1_svr.o \
75                tls_srp.o
```

```
77 # include library definitions
78 include $(SRC)/lib/Makefile.lib
```

```
80 CLOBBERFILES += $(LIBLINKS)
```

```
82 LIBS =         $(DYNLIB)
```

```
84 LDLIBS += -lc -lsunw_crypto
```

```
86 LINTFLAGS =     -uxn
87 LINTFLAGS64 =   $(LINTFLAGS) -m64
88 LINTOUT=        lint.out
89 LINTSRC =       $(LINTLIB:%.ln=%)
90 ROOTLINTDIR =   $(ROOTLIBDIR)
91 ROOTLINT =      $(LINTSRC:%=$(ROOTLINTDIR)/%)
```

```
93 CPPFLAGS +=     -I. \
94                -I$(SRC)/lib/openssl/include
```

```
96 CPPFLAGS +=     -D_REENTRANT
97 CPPFLAGS +=     -DOPENSSL_THREADS
98 CPPFLAGS +=     -DSSL_DLFCN
99 CPPFLAGS +=     -DHAVE_DLFCN_H
100 CPPFLAGS +=     -DSOLARIS_OPENSSL
101 CPPFLAGS +=     -DNO_WINDOWS_BRAINDEATH
102 CPPFLAGS +=     -DOPENSSL_BN_ASM_GF2m
103 CPPFLAGS +=     -DSHA1_ASM
104 CPPFLAGS +=     -DSHA256_ASM
105 CPPFLAGS +=     -DSHA512_ASM
106 CPPFLAGS +=     -DMD5_ASM
107 CPPFLAGS +=     -DAES_ASM
108 CPPFLAGS +=     -DVPAES_ASM
109 CPPFLAGS +=     -DGHASH_ASM
110 CPPFLAGS +=     -DVPAES_ASM
111 CPPFLAGS +=     -DOPENSSL_BN_ASM_MONT
```

```
113 CFLAGS +=       $(CCVERBOSE)
```

```
115 CERRWARN +=     -erroff=E_END_OF_LOOP_CODE_NOT_REACHED
116 CERRWARN +=     -erroff=E_CONST_PROMOTED_UNSIGNED_LONG
117 CERRWARN +=     -erroff=E_INIT_DOES_NOT_FIT
```

```
119 $(LINTLIB) :=    LINTFLAGS = -nvx -I.
120 $(LINTLIB) :=    LINTFLAGS64 = -nvx -m64 -I..
```

```
122 .KEEP_STATE:
```

```
124 all : $(LIBS)
```

```
126 lint : lintcheck
```

new/usr/src/lib/openssl/libsunw_ssl/Makefile.com

3

```
128 # include library targets
129 include $(SRC)/lib/Makefile.targ

131 pics/%.o:      ../%.c
132      $(COMPILE.c) -o $@ $<

134 $(ROOTLINTDIR)/%: ../%
135      $(INS.file)
```

new/usr/src/lib/openssl/libsunw_ssl/amd64/Makefile

1

1265 Fri May 30 18:32:17 2014

new/usr/src/lib/openssl/libsunw_ssl/amd64/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
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25 include ../Makefile.com
26 include ${SRC}/lib/Makefile.lib.64

28 .KEEP_STATE:

30 CPPFLAGS += -DL_ENDIAN
31 CPPFLAGS += -DOPENSSL_IA32_SSE2
32 CPPFLAGS += -DOPENSSL_BN_ASM_MONT5
33 CPPFLAGS += -DBSAES_ASM

35 all: ${ROOTLIBDIR64} ${LIBS} ${LIBLINKS}

37 ${LIBLINKS}: FRC
38 $(RM) $@; $(SYMLINK) $(DYNLIB) $@

40 ${ROOTLIBDIR64}:
41 $(INS.dir)

43 install: all ${ROOTLIBS64} ${ROOTLINKS64}

45 FRC:
```

```

*****
14285 Fri May 30 18:32:17 2014
new/usr/src/lib/openssl/libsunw_ssl/bio_ssl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* ssl/bio_ssl.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
10 * the following conditions are aheared to. The following conditions
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <stdlib.h>
61 #include <string.h>

```

```

62 #include <errno.h>
63 #include <openssl/opensslconf.h>
64 #include <openssl/crypto.h>
65 #include <openssl/bio.h>
66 #include <openssl/err.h>
67 #include <openssl/ssl.h>
68
69 static int ssl_write(BIO *h, const char *buf, int num);
70 static int ssl_read(BIO *h, char *buf, int size);
71 static int ssl_puts(BIO *h, const char *str);
72 static long ssl_ctrl(BIO *h, int cmd, long arg1, void *arg2);
73 static int ssl_new(BIO *h);
74 static int ssl_free(BIO *data);
75 static long ssl_callback_ctrl(BIO *h, int cmd, bio_info_cb *fp);
76 typedef struct bio_ssl_st
77 {
78     SSL *ssl; /* The ssl handle :- ) */
79     /* re-negotiate every time the total number of bytes is this size */
80     int num_renegotiates;
81     unsigned long renegotiate_count;
82     unsigned long byte_count;
83     unsigned long renegotiate_timeout;
84     unsigned long last_time;
85 } BIO_SSL;
86
87 static BIO_METHOD methods_sslp=
88 {
89     BIO_TYPE_SSL,"ssl",
90     ssl_write,
91     ssl_read,
92     ssl_puts,
93     NULL, /* ssl_gets, */
94     ssl_ctrl,
95     ssl_new,
96     ssl_free,
97     ssl_callback_ctrl,
98 };
99
100 BIO_METHOD *BIO_f_ssl(void)
101 {
102     return(&methods_sslp);
103 }
104
105 static int ssl_new(BIO *bi)
106 {
107     BIO_SSL *bs;
108
109     bs=(BIO_SSL *)OPENSSL_malloc(sizeof(BIO_SSL));
110     if (bs == NULL)
111     {
112         BIOerr(BIO_F_SSL_NEW,ERR_R_MALLOC_FAILURE);
113         return(0);
114     }
115     memset(bs,0,sizeof(BIO_SSL));
116     bi->init=0;
117     bi->ptr=(char *)bs;
118     bi->flags=0;
119     return(1);
120 }
121
122 static int ssl_free(BIO *a)
123 {
124     BIO_SSL *bs;
125
126     if (a == NULL) return(0);
127     bs=(BIO_SSL *)a->ptr;

```

```

128     if (bs->ssl != NULL) SSL_shutdown(bs->ssl);
129     if (a->shutdown)
130     {
131         if (a->init && (bs->ssl != NULL))
132             SSL_free(bs->ssl);
133         a->init=0;
134         a->flags=0;
135     }
136     if (a->ptr != NULL)
137         OPENSSL_free(a->ptr);
138     return(1);
139 }
140
141 static int ssl_read(BIO *b, char *out, int outl)
142 {
143     int ret=1;
144     BIO_SSL *sb;
145     SSL *ssl;
146     int retry_reason=0;
147     int r=0;
148
149     if (out == NULL) return(0);
150     sb=(BIO_SSL *)b->ptr;
151     ssl=sb->ssl;
152
153     BIO_clear_retry_flags(b);
154
155     #if 0
156     if (!SSL_is_init_finished(ssl))
157     {
158         /* ret=SSL_do_handshake(ssl); */
159         if (ret > 0)
160         {
161             outflags=(BIO_FLAGS_READ|BIO_FLAGS_SHOULD_RETRY);
162             ret= -1;
163             goto end;
164         }
165     }
166     #endif
167     /* if (ret > 0) */
168     /* ret=SSL_read(ssl,out,outl); */
169
170     switch (SSL_get_error(ssl,ret))
171     {
172     case SSL_ERROR_NONE:
173         if (ret <= 0) break;
174         if (sb->renegotiate_count > 0)
175         {
176             sb->byte_count+=ret;
177             if (sb->byte_count > sb->renegotiate_count)
178             {
179                 sb->byte_count=0;
180                 sb->num_renegotiates++;
181                 SSL_renegotiate(ssl);
182                 r=1;
183             }
184         }
185         if ((sb->renegotiate_timeout > 0) && (!r))
186         {
187             unsigned long tm;
188
189             tm=(unsigned long)time(NULL);
190             if (tm > sb->last_time+sb->renegotiate_timeout)
191             {
192                 sb->last_time=tm;

```

```

194         sb->num_renegotiates++;
195         SSL_renegotiate(ssl);
196     }
197 }
198
199     break;
200 case SSL_ERROR_WANT_READ:
201     BIO_set_retry_read(b);
202     break;
203 case SSL_ERROR_WANT_WRITE:
204     BIO_set_retry_write(b);
205     break;
206 case SSL_ERROR_WANT_X509_LOOKUP:
207     BIO_set_retry_special(b);
208     retry_reason=BIO_RR_SSL_X509_LOOKUP;
209     break;
210 case SSL_ERROR_WANT_ACCEPT:
211     BIO_set_retry_special(b);
212     retry_reason=BIO_RR_ACCEPT;
213     break;
214 case SSL_ERROR_WANT_CONNECT:
215     BIO_set_retry_special(b);
216     retry_reason=BIO_RR_CONNECT;
217     break;
218 case SSL_ERROR_SYSCALL:
219 case SSL_ERROR_SSL:
220 case SSL_ERROR_ZERO_RETURN:
221     default:
222         break;
223 }
224
225     b->retry_reason=retry_reason;
226     return(ret);
227 }
228
229 static int ssl_write(BIO *b, const char *out, int outl)
230 {
231     int ret,r=0;
232     int retry_reason=0;
233     SSL *ssl;
234     BIO_SSL *bs;
235
236     if (out == NULL) return(0);
237     bs=(BIO_SSL *)b->ptr;
238     ssl=bs->ssl;
239
240     BIO_clear_retry_flags(b);
241
242     /* ret=SSL_do_handshake(ssl); */
243     if (ret > 0) /*
244     ret=SSL_write(ssl,out,outl); */
245
246     switch (SSL_get_error(ssl,ret))
247     {
248     case SSL_ERROR_NONE:
249         if (ret <= 0) break;
250         if (bs->renegotiate_count > 0)
251         {
252             bs->byte_count+=ret;
253             if (bs->byte_count > bs->renegotiate_count)
254             {
255                 bs->byte_count=0;
256                 bs->num_renegotiates++;
257                 SSL_renegotiate(ssl);
258                 r=1;
259             }

```

```

260     }
261     if ((bs->renegotiate_timeout > 0) && (!r))
262     {
263         unsigned long tm;
264
265         tm=(unsigned long)time(NULL);
266         if (tm > bs->last_time+bs->renegotiate_timeout)
267         {
268             bs->last_time=tm;
269             bs->num_renegotiates++;
270             SSL_renegotiate(ssl);
271         }
272     }
273     break;
274 case SSL_ERROR_WANT_WRITE:
275     BIO_set_retry_write(b);
276     break;
277 case SSL_ERROR_WANT_READ:
278     BIO_set_retry_read(b);
279     break;
280 case SSL_ERROR_WANT_X509_LOOKUP:
281     BIO_set_retry_special(b);
282     retry_reason=BIO_RR_SSL_X509_LOOKUP;
283     break;
284 case SSL_ERROR_WANT_CONNECT:
285     BIO_set_retry_special(b);
286     retry_reason=BIO_RR_CONNECT;
287 case SSL_ERROR_SYSCALL:
288 case SSL_ERROR_SSL:
289 default:
290     break;
291 }
292
293 b->retry_reason=retry_reason;
294 return(ret);
295 }
296
297 static long ssl_ctrl(BIO *b, int cmd, long num, void *ptr)
298 {
299     SSL **sslp,*ssl;
300     BIO_SSL *bs;
301     BIO *dbio,*bio;
302     long ret=1;
303
304     bs=(BIO_SSL *)b->ptr;
305     ssl=bs->ssl;
306     if ((ssl == NULL) && (cmd != BIO_C_SET_SSL))
307         return(0);
308     switch (cmd)
309     {
310 case BIO_CTRL_RESET:
311     SSL_shutdown(ssl);
312
313     if (ssl->handshake_func == ssl->method->ssl_connect)
314         SSL_set_connect_state(ssl);
315     else if (ssl->handshake_func == ssl->method->ssl_accept)
316         SSL_set_accept_state(ssl);
317
318     SSL_clear(ssl);
319
320     if (b->next_bio != NULL)
321         ret=BIO_ctrl(b->next_bio,cmd,num,ptr);
322     else if (ssl->rbio != NULL)
323         ret=BIO_ctrl(ssl->rbio,cmd,num,ptr);
324     else
325         ret=1;

```

```

326     break;
327 case BIO_CTRL_INFO:
328     ret=0;
329     break;
330 case BIO_C_SSL_MODE:
331     if (num) /* client mode */
332         SSL_set_connect_state(ssl);
333     else
334         SSL_set_accept_state(ssl);
335     break;
336 case BIO_C_SET_SSL_RENEGOTIATE_TIMEOUT:
337     ret=bs->renegotiate_timeout;
338     if (num < 60) num=5;
339     bs->renegotiate_timeout=(unsigned long)num;
340     bs->last_time=(unsigned long)time(NULL);
341     break;
342 case BIO_C_SET_SSL_RENEGOTIATE_BYTES:
343     ret=bs->renegotiate_count;
344     if ((long)num >=512)
345         bs->renegotiate_count=(unsigned long)num;
346     break;
347 case BIO_C_GET_SSL_NUM_RENEGOTIATES:
348     ret=bs->num_renegotiates;
349     break;
350 case BIO_C_SET_SSL:
351     if (ssl != NULL)
352     {
353         ssl_free(b);
354         if (!ssl_new(b))
355             return 0;
356     }
357     b->shutdown=(int)num;
358     ssl=(SSL *)ptr;
359     ((BIO_SSL *)b->ptr)->ssl=ssl;
360     bio=SSL_get_rbio(ssl);
361     if (bio != NULL)
362     {
363         if (b->next_bio != NULL)
364             BIO_push(bio,b->next_bio);
365         b->next_bio=bio;
366         CRYPTO_add(&bio->references,1,CRYPTO_LOCK_BIO);
367     }
368     b->init=1;
369     break;
370 case BIO_C_GET_SSL:
371     if (ptr != NULL)
372     {
373         sslp=(SSL **)ptr;
374         *sslp=ssl;
375     }
376     else
377         ret=0;
378     break;
379 case BIO_CTRL_GET_CLOSE:
380     ret=b->shutdown;
381     break;
382 case BIO_CTRL_SET_CLOSE:
383     b->shutdown=(int)num;
384     break;
385 case BIO_CTRL_WPENDING:
386     ret=BIO_ctrl(ssl->wbio,cmd,num,ptr);
387     break;
388 case BIO_CTRL_PENDING:
389     ret=SSL_pending(ssl);
390     if (ret == 0)
391         ret=BIO_pending(ssl->rbio);

```

```

392         break;
393     case BIO_CTRL_FLUSH:
394         BIO_clear_retry_flags(b);
395         ret=BIO_ctrl(ssl->wbio,cmd,num,ptr);
396         BIO_copy_next_retry(b);
397         break;
398     case BIO_CTRL_PUSH:
399         if ((b->next_bio != NULL) && (b->next_bio != ssl->rbio))
400             {
401                 SSL_set_bio(ssl,b->next_bio,b->next_bio);
402                 CRYPTO_add(&b->next_bio->references,1,CRYPTO_LOCK_BIO);
403             }
404         break;
405     case BIO_CTRL_POP:
406         /* Only detach if we are the BIO explicitly being popped */
407         if (b == ptr)
408             {
409                 /* Shouldn't happen in practice because the
410                  * rbio and wbio are the same when pushed.
411                  */
412                 if (ssl->rbio != ssl->wbio)
413                     BIO_free_all(ssl->wbio);
414                 if (b->next_bio != NULL)
415                     CRYPTO_add(&b->next_bio->references,-1,CRYPTO_LO
416                 ssl->wbio=NULL;
417                 ssl->rbio=NULL;
418             }
419         break;
420     case BIO_C_DO_STATE_MACHINE:
421         BIO_clear_retry_flags(b);
422
423         b->retry_reason=0;
424         ret=(int)SSL_do_handshake(ssl);
425
426         switch (SSL_get_error(ssl,(int)ret))
427             {
428             case SSL_ERROR_WANT_READ:
429                 BIO_set_flags(b,
430                     BIO_FLAGS_READ|BIO_FLAGS_SHOULD_RETRY);
431                 break;
432             case SSL_ERROR_WANT_WRITE:
433                 BIO_set_flags(b,
434                     BIO_FLAGS_WRITE|BIO_FLAGS_SHOULD_RETRY);
435                 break;
436             case SSL_ERROR_WANT_CONNECT:
437                 BIO_set_flags(b,
438                     BIO_FLAGS_IO_SPECIAL|BIO_FLAGS_SHOULD_RETRY);
439                 b->retry_reason=b->next_bio->retry_reason;
440                 break;
441             default:
442                 break;
443             }
444         break;
445     case BIO_CTRL_DUP:
446         dbio=(BIO *)ptr;
447         if (((BIO_SSL *)dbio->ptr)->ssl != NULL)
448             SSL_free(((BIO_SSL *)dbio->ptr)->ssl);
449         ((BIO_SSL *)dbio->ptr)->ssl=SSL_dup(ssl);
450         ((BIO_SSL *)dbio->ptr)->renegotiate_count=
451             ((BIO_SSL *)b->ptr)->renegotiate_count;
452         ((BIO_SSL *)dbio->ptr)->byte_count=
453             ((BIO_SSL *)b->ptr)->byte_count;
454         ((BIO_SSL *)dbio->ptr)->renegotiate_timeout=
455             ((BIO_SSL *)b->ptr)->renegotiate_timeout;
456         ((BIO_SSL *)dbio->ptr)->last_time=
457             ((BIO_SSL *)b->ptr)->last_time;

```

```

458         ret=((BIO_SSL *)dbio->ptr)->ssl != NULL);
459         break;
460     case BIO_C_GET_FD:
461         ret=BIO_ctrl(ssl->rbio,cmd,num,ptr);
462         break;
463     case BIO_CTRL_SET_CALLBACK:
464         {
465             #if 0 /* FIXME: Should this be used? -- Richard Levitte */
466                 SSLerr(SSL_F_SSL_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
467                 ret = -1;
468             #else
469                 ret=0;
470             #endif
471         }
472         break;
473     case BIO_CTRL_GET_CALLBACK:
474         {
475             void (**fptr)(const SSL *xssl,int type,int val);
476
477             fptr=(void (**)(const SSL *xssl,int type,int val))ptr;
478             *fptr=SSL_get_info_callback(ssl);
479         }
480         break;
481     default:
482         ret=BIO_ctrl(ssl->rbio,cmd,num,ptr);
483         break;
484     }
485     return(ret);
486 }
487
488 static long ssl_callback_ctrl(BIO *b, int cmd, bio_info_cb *fp)
489 {
490     SSL *ssl;
491     BIO_SSL *bs;
492     long ret=1;
493
494     bs=(BIO_SSL *)b->ptr;
495     ssl=bs->ssl;
496     switch (cmd)
497     {
498     case BIO_CTRL_SET_CALLBACK:
499         {
500             /* FIXME: setting this via a completely different prototype
501              * seems like a crap idea */
502             SSL_set_info_callback(ssl,(void (*)(const SSL *,int,int))fp);
503         }
504         break;
505     default:
506         ret=BIO_callback_ctrl(ssl->rbio,cmd,fp);
507         break;
508     }
509     return(ret);
510 }
511
512 static int ssl_puts(BIO *bp, const char *str)
513 {
514     int n,ret;
515
516     n=strlen(str);
517     ret=BIO_write(bp,str,n);
518     return(ret);
519 }
520
521 BIO *BIO_new_buffer_ssl_connect(SSL_CTX *ctx)
522 {
523     #ifndef OPENSSL_NO_SOCKET

```



```

524     BIO *ret=NULL, *buf=NULL, *ssl=NULL;

526     if ((buf=BIO_new(BIO_f_buffer())) == NULL)
527         return(NULL);
528     if ((ssl=BIO_new_ssl_connect(ctx)) == NULL)
529         goto err;
530     if ((ret=BIO_push(buf,ssl)) == NULL)
531         goto err;
532     return(ret);
533 err:
534     if (buf != NULL) BIO_free(buf);
535     if (ssl != NULL) BIO_free(ssl);
536 #endif
537     return(NULL);
538 }

540 BIO *BIO_new_ssl_connect(SSL_CTX *ctx)
541 {
542 #ifndef OPENSSL_NO_SOCK
543     BIO *ret=NULL, *con=NULL, *ssl=NULL;

545     if ((con=BIO_new(BIO_s_connect())) == NULL)
546         return(NULL);
547     if ((ssl=BIO_new_ssl(ctx,1)) == NULL)
548         goto err;
549     if ((ret=BIO_push(ssl,con)) == NULL)
550         goto err;
551     return(ret);
552 err:
553     if (con != NULL) BIO_free(con);
554 #endif
555     return(NULL);
556 }

558 BIO *BIO_new_ssl(SSL_CTX *ctx, int client)
559 {
560     BIO *ret;
561     SSL *ssl;

563     if ((ret=BIO_new(BIO_f_ssl())) == NULL)
564         return(NULL);
565     if ((ssl=SSL_new(ctx)) == NULL)
566     {
567         BIO_free(ret);
568         return(NULL);
569     }
570     if (client)
571         SSL_set_connect_state(ssl);
572     else
573         SSL_set_accept_state(ssl);
574
575     BIO_set_ssl(ret,ssl,BIO_CLOSE);
576     return(ret);
577 }

579 int BIO_ssl_copy_session_id(BIO *t, BIO *f)
580 {
581     t=BIO_find_type(t,BIO_TYPE_SSL);
582     f=BIO_find_type(f,BIO_TYPE_SSL);
583     if ((t == NULL) || (f == NULL))
584         return(0);
585     if (
586         (((BIO_SSL *)t->ptr)->ssl == NULL) ||
587         (((BIO_SSL *)f->ptr)->ssl == NULL))
588         return(0);
589     SSL_copy_session_id(((BIO_SSL *)t->ptr)->ssl,((BIO_SSL *)f->ptr)->ssl);
590     return(1);

```

```

590     }

592 void BIO_ssl_shutdown(BIO *b)
593 {
594     SSL *s;

596     while (b != NULL)
597     {
598         if (b->method->type == BIO_TYPE_SSL)
599         {
600             s=((BIO_SSL *)b->ptr)->ssl;
601             SSL_shutdown(s);
602             break;
603         }
604         b=b->next_bio;
605     }
606 }

```

new/usr/src/lib/openssl/libsunw_ssl/d1_both.c

1

```
*****
44715 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_both.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/d1_both.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * Copyright (c) 1998-2005 The OpenSSL Project. All rights reserved.
8  *
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10 * modification, are permitted provided that the following conditions
11 * are met:
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
49 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
50 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 *
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */
59 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
60  * All rights reserved.
61  */
```

new/usr/src/lib/openssl/libsunw_ssl/d1_both.c

2

```
62 * This package is an SSL implementation written
63 * by Eric Young (eay@cryptsoft.com).
64 * The implementation was written so as to conform with Netscapes SSL.
65 *
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69 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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109 *
110 * The licence and distribution terms for any publically available version or
111 * derivative of this code cannot be changed. i.e. this code cannot simply be
112 * copied and put under another distribution licence
113 * [including the GNU Public Licence.]
114 */
115
116 #include <limits.h>
117 #include <string.h>
118 #include <stdio.h>
119 #include "ssl_locl.h"
120 #include <openssl/buffer.h>
121 #include <openssl/rand.h>
122 #include <openssl/objects.h>
123 #include <openssl/evp.h>
124 #include <openssl/x509.h>
125
126 #define RSMBLY_BITMASK_SIZE(msg_len) (((msg_len) + 7) / 8)
```

```

128 #define RSMBLY_BITMASK(bitmask, start, end) { \
129     if ((end) - (start) <= 8) { \
130         long ii; \
131         for (ii = (start); ii < (end); ii++) bitmask[((i
132     } else { \
133         long ii; \
134         bitmask[((start) >> 3)] |= bitmask_start_values[
135         for (ii = (((start) >> 3) + 1); ii < (((end) -
136         bitmask[(((end) - 1) >> 3)] |= bitmask_end_value
137     } }

139 #define RSMBLY_BITMASK_IS_COMPLETE(bitmask, msg_len, is_complete) { \
140     long ii; \
141     OPENSSL_assert((msg_len) > 0); \
142     is_complete = 1; \
143     if (bitmask[(((msg_len) - 1) >> 3)] != bitmask_end_value
144     if (is_complete) for (ii = (((msg_len) - 1) >> 3) - 1; i
145         if (bitmask[ii] != 0xff) { is_complete = 0; brea

147 #if 0
148 #define RSMBLY_BITMASK_PRINT(bitmask, msg_len) { \
149     long ii; \
150     printf("bitmask: "); for (ii = 0; ii < (msg_len); ii++)
151     printf("%d ", (bitmask[ii >> 3] & (1 <= (ii & 7)))) >> (i
152     printf("\n"); }
153 #endif

155 static unsigned char bitmask_start_values[] = {0xff, 0xfe, 0xfc, 0xf8, 0xf0, 0xe
156 static unsigned char bitmask_end_values[] = {0xff, 0x01, 0x03, 0x07, 0x0f, 0x1

158 /* XDTLS: figure out the right values */
159 static unsigned int g_probable_mtu[] = {1500 - 28, 512 - 28, 256 - 28};

161 static unsigned int dtls1_guess_mtu(unsigned int curr_mtu);
162 static void dtls1_fix_message_header(SSL *s, unsigned long frag_off,
163     unsigned long frag_len);
164 static unsigned char *dtls1_write_message_header(SSL *s,
165     unsigned char *p);
166 static void dtls1_set_message_header_int(SSL *s, unsigned char mt,
167     unsigned long len, unsigned short seq_num, unsigned long frag_off,
168     unsigned long frag_len);
169 static long dtls1_get_message_fragment(SSL *s, int st1, int stn,
170     long max, int *ok);

172 static hm_fragment *
173 dtls1_hm_fragment_new(unsigned long frag_len, int reassembly)
174 {
175     hm_fragment *frag = NULL;
176     unsigned char *buf = NULL;
177     unsigned char *bitmask = NULL;

179     frag = (hm_fragment *)OPENSSL_malloc(sizeof(hm_fragment));
180     if (frag == NULL)
181         return NULL;

183     if (frag_len)
184     {
185         buf = (unsigned char *)OPENSSL_malloc(frag_len);
186         if (buf == NULL)
187         {
188             OPENSSL_free(frag);
189             return NULL;
190         }
191     }

193     /* zero length fragment gets zero frag->fragment */

```

```

194     frag->fragment = buf;

196     /* Initialize reassembly bitmask if necessary */
197     if (reassembly)
198     {
199         bitmask = (unsigned char *)OPENSSL_malloc(RSMBLY_BITMASK_SIZE(fr
200         if (bitmask == NULL)
201         {
202             if (buf != NULL) OPENSSL_free(buf);
203             OPENSSL_free(frag);
204             return NULL;
205         }
206         memset(bitmask, 0, RSMBLY_BITMASK_SIZE(frag_len));
207     }

209     frag->reassembly = bitmask;
210     return frag;
211 }

214 static void
215 dtls1_hm_fragment_free(hm_fragment *frag)
216 {
217     if (frag->msg_header.is_ccs)
218     {
219         EVP_CIPHER_CTX_free(frag->msg_header.saved_retransmit_state.enc
220         EVP_MD_CTX_destroy(frag->msg_header.saved_retransmit_state.write
221     }
222     if (frag->fragment) OPENSSL_free(frag->fragment);
223     if (frag->reassembly) OPENSSL_free(frag->reassembly);
224     OPENSSL_free(frag);
225 }

228 /* send s->init_buf in records of type 'type' (SSL3_RT_HANDSHAKE or SSL3_RT_CHAN
229 int dtls1_do_write(SSL *s, int type)
230 {
231     int ret;
232     int curr_mtu;
233     unsigned int len, frag_off, mac_size, blocksize;

235     /* AHA! Figure out the MTU, and stick to the right size */
236     if (s->d1->mtu < dtls1_min_mtu() && !(SSL_get_options(s) & SSL_OP_NO_QUE
237     {
238         s->d1->mtu =
239             BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_QUERY_MTU, 0, N

241     /* I've seen the kernel return bogus numbers when it doesn't kno
242     * (initial write), so just make sure we have a reasonable numbe
243     if (s->d1->mtu < dtls1_min_mtu())
244     {
245         s->d1->mtu = 0;
246         s->d1->mtu = dtls1_guess_mtu(s->d1->mtu);
247         BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SET_MTU,
248             s->d1->mtu, NULL);
249     }
250 }

251 #if 0
252     mtu = s->d1->mtu;

254     fprintf(stderr, "using MTU = %d\n", mtu);

256     mtu -= (DTLS1_HM_HEADER_LENGTH + DTLS1_RT_HEADER_LENGTH);

258     curr_mtu = mtu - BIO_wpending(SSL_get_wbio(s));

```

```

260     if ( curr_mtu > 0)
261         mtu = curr_mtu;
262     else if ( ( ret = BIO_flush(SSL_get_wbio(s))) <= 0)
263         return ret;

265     if ( BIO_wpending(SSL_get_wbio(s)) + s->init_num >= mtu)
266     {
267         ret = BIO_flush(SSL_get_wbio(s));
268         if ( ret <= 0)
269             return ret;
270         mtu = s->d1->mtu - (DTLS1_HM_HEADER_LENGTH + DTLS1_RT_HEADER_LEN
271     }
272 #endif

274     OPENSSL_assert(s->d1->mtu >= dtls1_min_mtu()); /* should have something

276     if ( s->init_off == 0 && type == SSL3_RT_HANDSHAKE)
277         OPENSSL_assert(s->init_num ==
278             (int)s->d1->w_msg_hdr.msg_len + DTLS1_HM_HEADER_LENGTH);

280     if (s->write_hash)
281         mac_size = EVP_MD_CTX_size(s->write_hash);
282     else
283         mac_size = 0;

285     if (s->enc_write_ctx &&
286         (EVP_CIPHER_mode( s->enc_write_ctx->cipher) & EVP_CIPH_CBC_MODE)
287         blocksize = 2 * EVP_CIPHER_block_size(s->enc_write_ctx->cipher);
288     else
289         blocksize = 0;

291     frag_off = 0;
292     while( s->init_num)
293     {
294         curr_mtu = s->d1->mtu - BIO_wpending(SSL_get_wbio(s)) -
295             DTLS1_RT_HEADER_LENGTH - mac_size - blocksize;

297         if ( curr_mtu <= DTLS1_HM_HEADER_LENGTH)
298         {
299             /* grr.. we could get an error if MTU picked was wrong */
300             ret = BIO_flush(SSL_get_wbio(s));
301             if ( ret <= 0)
302                 return ret;
303             curr_mtu = s->d1->mtu - DTLS1_RT_HEADER_LENGTH -
304                 mac_size - blocksize;
305         }

307         if ( s->init_num > curr_mtu)
308             len = curr_mtu;
309         else
310             len = s->init_num;

313     /* XDTLS: this function is too long.  split out the CCS part */
314     if ( type == SSL3_RT_HANDSHAKE)
315     {
316         if ( s->init_off != 0)
317         {
318             OPENSSL_assert(s->init_off > DTLS1_HM_HEADER_LEN
319             s->init_off -= DTLS1_HM_HEADER_LENGTH;
320             s->init_num += DTLS1_HM_HEADER_LENGTH;

322             if ( s->init_num > curr_mtu)
323                 len = curr_mtu;
324             else
325                 len = s->init_num;

```

```

326     }

328     dtls1_fix_message_header(s, frag_off,
329         len - DTLS1_HM_HEADER_LENGTH);

331     dtls1_write_message_header(s, (unsigned char *)&s->init_
333     OPENSSL_assert(len >= DTLS1_HM_HEADER_LENGTH);
334     }

336     ret=dtls1_write_bytes(s,type,&s->init_buf->data[s->init_off],
337         len);
338     if (ret < 0)
339     {
340         /* might need to update MTU here, but we don't know
341         * which previous packet caused the failure -- so can't
342         * really retransmit anything.  continue as if everythin
343         * is fine and wait for an alert to handle the
344         * retransmit
345         */
346         if ( BIO_ctrl(SSL_get_wbio(s),
347             BIO_CTRL_DGRAM_MTU_EXCEEDED, 0, NULL) > 0 )
348             s->d1->mtu = BIO_ctrl(SSL_get_wbio(s),
349                 BIO_CTRL_DGRAM_QUERY_MTU, 0, NULL);
350     }
351     else
352         return(-1);
353 }
354 else
355 {
356     /* bad if this assert fails, only part of the handshake
357     * message got sent.  but why would this happen? */
358     OPENSSL_assert(len == (unsigned int)ret);

360     if (type == SSL3_RT_HANDSHAKE && ! s->d1->retransmitting
361     {
362         /* should not be done for 'Hello Request's, but
363         * we'll ignore the result anyway */
364         unsigned char *p = (unsigned char *)&s->init_buf
365         const struct hm_header_st *msg_hdr = &s->d1->w_m
366         int xlen;

368         if (frag_off == 0 && s->version != DTLS1_BAD_VER
369         {
370             /* reconstruct message header is if it
371             * is being sent in single fragment */
372             *p++ = msg_hdr->type;
373             l2n3(msg_hdr->msg_len,p);
374             s2n (msg_hdr->seq,p);
375             l2n3(0,p);
376             l2n3(msg_hdr->msg_len,p);
377             p -= DTLS1_HM_HEADER_LENGTH;
378             xlen = ret;
379         }
380     }
381     else
382     {
383         p += DTLS1_HM_HEADER_LENGTH;
384         xlen = ret - DTLS1_HM_HEADER_LENGTH;
385     }

386     ssl3_finish_mac(s, p, xlen);
387 }

389     if (ret == s->init_num)
390     {
391         if (s->msg_callback)

```

```

392         s->msg_callback(1, s->version, type, s->
393             (size_t)(s->init_off + s->init_n
394             s->msg_callback_arg));
396         s->init_off = 0; /* done writing this message */
397         s->init_num = 0;
399         return(1);
400     }
401     s->init_off+=ret;
402     s->init_num-=ret;
403     frag_off += (ret -= DTLS1_HM_HEADER_LENGTH);
404 }
405 }
406 return(0);
407 }

410 /* Obtain handshake message of message type 'mt' (any if mt == -1),
411 * maximum acceptable body length 'max'.
412 * Read an entire handshake message. Handshake messages arrive in
413 * fragments.
414 */
415 long dtls1_get_message(SSL *s, int st1, int stn, int mt, long max, int *ok)
416 {
417     int i, al;
418     struct hm_header_st *msg_hdr;
419     unsigned char *p;
420     unsigned long msg_len;

422     /* s3->tmp is used to store messages that are unexpected, caused
423     * by the absence of an optional handshake message */
424     if (s->s3->tmp.reuse_message)
425     {
426         s->s3->tmp.reuse_message=0;
427         if ((mt >= 0) && (s->s3->tmp.message_type != mt))
428         {
429             al=SSL_AD_UNEXPECTED_MESSAGE;
430             SSLerr(SSL_F_DTLS1_GET_MESSAGE, SSL_R_UNEXPECTED_MESSAGE)
431             goto f_err;
432         }
433         *ok=1;
434         s->init_msg = s->init_buf->data + DTLS1_HM_HEADER_LENGTH;
435         s->init_num = (int)s->s3->tmp.message_size;
436         return s->init_num;
437     }

439     msg_hdr = &s->d1->r_msg_hdr;
440     memset(msg_hdr, 0x00, sizeof(struct hm_header_st));

442 again:
443     i = dtls1_get_message_fragment(s, st1, stn, max, ok);
444     if (i == DTLS1_HM_BAD_FRAGMENT ||
445         i == DTLS1_HM_FRAGMENT_RETRY) /* bad fragment received */
446         goto again;
447     else if (i <= 0 && !*ok)
448         return i;

450     p = (unsigned char *)s->init_buf->data;
451     msg_len = msg_hdr->msg_len;

453     /* reconstruct message header */
454     *(p++) = msg_hdr->type;
455     l2n3(msg_len,p);
456     s2n(msg_hdr->seq,p);
457     l2n3(0,p);

```

```

458     l2n3(msg_len,p);
459     if (s->version != DTLS1_BAD_VER) {
460         p -= DTLS1_HM_HEADER_LENGTH;
461         msg_len += DTLS1_HM_HEADER_LENGTH;
462     }

464     ssl3_finish_mac(s, p, msg_len);
465     if (s->msg_callback)
466         s->msg_callback(0, s->version, SSL3_RT_HANDSHAKE,
467             p, msg_len,
468             s, s->msg_callback_arg);

470     memset(msg_hdr, 0x00, sizeof(struct hm_header_st));

472     /* Don't change sequence numbers while listening */
473     if (!s->d1->listen)
474         s->d1->handshake_read_seq++;

476     s->init_msg = s->init_buf->data + DTLS1_HM_HEADER_LENGTH;
477     return s->init_num;

479 f_err:
480     ssl3_send_alert(s,SSL3_AL_FATAL,al);
481     *ok = 0;
482     return -1;
483 }

486 static int dtls1_preprocess_fragment(SSL *s,struct hm_header_st *msg_hdr,int max
487 {
488     size_t frag_off,frag_len,msg_len;

490     msg_len = msg_hdr->msg_len;
491     frag_off = msg_hdr->frag_off;
492     frag_len = msg_hdr->frag_len;

494     /* sanity checking */
495     if ( (frag_off+frag_len) > msg_len)
496     {
497         SSLerr(SSL_F_DTLS1_PREPROCESS_FRAGMENT,SSL_R_EXCESSIVE_MESSAGE_S
498         return SSL_AD_ILLEGAL_PARAMETER;
499     }

501     if ( (frag_off+frag_len) > (unsigned long)max)
502     {
503         SSLerr(SSL_F_DTLS1_PREPROCESS_FRAGMENT,SSL_R_EXCESSIVE_MESSAGE_S
504         return SSL_AD_ILLEGAL_PARAMETER;
505     }

507     if ( s->d1->r_msg_hdr.frag_off == 0) /* first fragment */
508     {
509         /* msg_len is limited to 2^24, but is effectively checked
510         * against max above */
511         if (!BUF_MEM_grow_clean(s->init_buf,msg_len+DTLS1_HM_HEADER LENG
512         {
513             SSLerr(SSL_F_DTLS1_PREPROCESS_FRAGMENT,ERR_R_BUF_LIB);
514             return SSL_AD_INTERNAL_ERROR;
515         }

517         s->s3->tmp.message_size = msg_len;
518         s->d1->r_msg_hdr.msg_len = msg_len;
519         s->s3->tmp.message_type = msg_hdr->type;
520         s->d1->r_msg_hdr.type = msg_hdr->type;
521         s->d1->r_msg_hdr.seq = msg_hdr->seq;
522     }
523     else if (msg_len != s->d1->r_msg_hdr.msg_len)

```

```

524     {
525         /* They must be playing with us! BTW, failure to enforce
526          * upper limit would open possibility for buffer overrun. */
527         SSLerr(SSL_F_DTLS1_PREPROCESS_FRAGMENT, SSL_R_EXCESSIVE_MESSAGE_S
528         return SSL_AD_ILLEGAL_PARAMETER;
529     }

531     return 0; /* no error */
532 }

535 static int
536 dtls1_retrieve_buffered_fragment(SSL *s, long max, int *ok)
537 {
538     /* (0) check whether the desired fragment is available
539     * if so:
540     * (1) copy over the fragment to s->init_buf->data[]
541     * (2) update s->init_num
542     */
543     pitem *item;
544     hm_fragment *frag;
545     int al;

547     *ok = 0;
548     item = pqueue_peek(s->d1->buffered_messages);
549     if (item == NULL)
550         return 0;

552     frag = (hm_fragment *)item->data;
553
554     /* Don't return if reassembly still in progress */
555     if (frag->reassembly != NULL)
556         return 0;

558     if (s->d1->handshake_read_seq == frag->msg_header.seq)
559     {
560         unsigned long frag_len = frag->msg_header.frag_len;
561         pqueue_pop(s->d1->buffered_messages);

563         al=dtls1_preprocess_fragment(s,&frag->msg_header,max);

565         if (al==0) /* no alert */
566         {
567             unsigned char *p = (unsigned char *)s->init_buf->data+DT
568             memcpy(&p[frag->msg_header.frag_off],
569             frag->fragment,frag->msg_header.frag_len);
570         }

572         dtls1_hm_fragment_free(frag);
573         pitem_free(item);

575         if (al==0)
576         {
577             *ok = 1;
578             return frag_len;
579         }

581         ssl3_send_alert(s,SSL3_AL_FATAL,al);
582         s->init_num = 0;
583         *ok = 0;
584         return -1;
585     }
586     else
587         return 0;
588 }

```

```

591 static int
592 dtls1_reassemble_fragment(SSL *s, struct hm_header_st* msg_hdr, int *ok)
593 {
594     hm_fragment *frag = NULL;
595     pitem *item = NULL;
596     int i = -1, is_complete;
597     unsigned char seq64be[8];
598     unsigned long frag_len = msg_hdr->frag_len, max_len;

600     if ((msg_hdr->frag_off+frag_len) > msg_hdr->msg_len)
601         goto err;

603     /* Determine maximum allowed message size. Depends on (user set)
604     * maximum certificate length, but 16k is minimum.
605     */
606     if (DTLS1_HM_HEADER_LENGTH + SSL3_RT_MAX_ENCRYPTED_LENGTH < s->max_cert
607         max_len = s->max_cert_list;
608     else
609         max_len = DTLS1_HM_HEADER_LENGTH + SSL3_RT_MAX_ENCRYPTED_LENGTH;

611     if ((msg_hdr->frag_off+frag_len) > max_len)
612         goto err;

614     /* Try to find item in queue */
615     memset(seq64be,0,sizeof(seq64be));
616     seq64be[6] = (unsigned char) (msg_hdr->seq>>8);
617     seq64be[7] = (unsigned char) msg_hdr->seq;
618     item = pqueue_find(s->d1->buffered_messages, seq64be);

620     if (item == NULL)
621     {
622         frag = dtls1_hm_fragment_new(msg_hdr->msg_len, 1);
623         if (frag == NULL)
624             goto err;
625         memcpy(&(frag->msg_header), msg_hdr, sizeof(*msg_hdr));
626         frag->msg_header.frag_len = frag->msg_header.msg_len;
627         frag->msg_header.frag_off = 0;
628     }
629     else
630         frag = (hm_fragment*) item->data;

632     /* If message is already reassembled, this must be a
633     * retransmit and can be dropped.
634     */
635     if (frag->reassembly == NULL)
636     {
637         unsigned char devnull [256];

639         while (frag_len)
640         {
641             i = s->method->ssl_read_bytes(s,SSL3_RT_HANDSHAKE,
642             devnull,
643             frag_len>sizeof(devnull)?sizeof(devnull):frag_le
644             if (i<=0) goto err;
645             frag_len -= i;
646         }
647         return DTLS1_HM_FRAGMENT_RETRY;
648     }

650     /* read the body of the fragment (header has already been read */
651     i = s->method->ssl_read_bytes(s,SSL3_RT_HANDSHAKE,
652     frag->fragment + msg_hdr->frag_off,frag_len,0);
653     if (i<=0 || (unsigned long)i!=frag_len)
654         goto err;

```

```

656     RSBLY_BITMASK_MARK(frag->reassembly, (long)msg_hdr->frag_off,
657                        (long)(msg_hdr->frag_off + frag_len));
659     RSBLY_BITMASK_IS_COMPLETE(frag->reassembly, (long)msg_hdr->msg_len,
660                              is_complete);
662     if (is_complete)
663     {
664         OPENSSL_free(frag->reassembly);
665         frag->reassembly = NULL;
666     }
668     if (item == NULL)
669     {
670         memset(seq64be, 0, sizeof(seq64be));
671         seq64be[6] = (unsigned char)(msg_hdr->seq>>8);
672         seq64be[7] = (unsigned char)(msg_hdr->seq);
674         item = pitem_new(seq64be, frag);
675         if (item == NULL)
676         {
677             goto err;
678             i = -1;
679         }
681         pqueue_insert(s->d1->buffered_messages, item);
682     }
684     return DTLS1_HM_FRAGMENT_RETRY;
686 err:
687     if (frag != NULL) dtls1_hm_fragment_free(frag);
688     if (item != NULL) OPENSSL_free(item);
689     *ok = 0;
690     return i;
691 }
694 static int
695 dtls1_process_out_of_seq_message(SSL *s, struct hm_header_st* msg_hdr, int *ok)
696 {
697     int i=-1;
698     hm_fragment *frag = NULL;
699     pitem *item = NULL;
700     unsigned char seq64be[8];
701     unsigned long frag_len = msg_hdr->frag_len;
703     if ((msg_hdr->frag_off+frag_len) > msg_hdr->msg_len)
704         goto err;
706     /* Try to find item in queue, to prevent duplicate entries */
707     memset(seq64be, 0, sizeof(seq64be));
708     seq64be[6] = (unsigned char) (msg_hdr->seq>>8);
709     seq64be[7] = (unsigned char) msg_hdr->seq;
710     item = pqueue_find(s->d1->buffered_messages, seq64be);
712     /* If we already have an entry and this one is a fragment,
713      * don't discard it and rather try to reassemble it.
714      */
715     if (item != NULL && frag_len < msg_hdr->msg_len)
716         item = NULL;
718     /* Discard the message if sequence number was already there, is
719      * too far in the future, already in the queue or if we received
720      * a FINISHED before the SERVER_HELLO, which then must be a stale
721      * retransmit.

```

```

722     */
723     if (msg_hdr->seq <= s->d1->handshake_read_seq ||
724         msg_hdr->seq > s->d1->handshake_read_seq + 10 || item != NULL ||
725         (s->d1->handshake_read_seq == 0 && msg_hdr->type == SSL3_MT_FINI
726         {
727         unsigned char devnull [256];
729         while (frag_len)
730         {
731             i = s->method->ssl_read_bytes(s, SSL3_RT_HANDSHAKE,
732             devnull,
733             frag_len>sizeof(devnull)?sizeof(devnull):frag_le
734             if (i<=0) goto err;
735             frag_len -= i;
736         }
737     }
738     else
739     {
740         if (frag_len && frag_len < msg_hdr->msg_len)
741             return dtls1_reassemble_fragment(s, msg_hdr, ok);
743         frag = dtls1_hm_fragment_new(frag_len, 0);
744         if (frag == NULL)
745             goto err;
747         memcpy(&(frag->msg_header), msg_hdr, sizeof(*msg_hdr));
749         if (frag_len)
750         {
751             /* read the body of the fragment (header has already bee
752             i = s->method->ssl_read_bytes(s, SSL3_RT_HANDSHAKE,
753             frag->fragment, frag_len, 0);
754             if (i<=0 || (unsigned long)i!=frag_len)
755                 goto err;
756         }
758         memset(seq64be, 0, sizeof(seq64be));
759         seq64be[6] = (unsigned char)(msg_hdr->seq>>8);
760         seq64be[7] = (unsigned char)(msg_hdr->seq);
762         item = pitem_new(seq64be, frag);
763         if (item == NULL)
764             goto err;
766         pqueue_insert(s->d1->buffered_messages, item);
767     }
769     return DTLS1_HM_FRAGMENT_RETRY;
771 err:
772     if (frag != NULL) dtls1_hm_fragment_free(frag);
773     if (item != NULL) OPENSSL_free(item);
774     *ok = 0;
775     return i;
776 }
779 static long
780 dtls1_get_message_fragment(SSL *s, int st1, int stn, long max, int *ok)
781 {
782     unsigned char wire[DTLS1_HM_HEADER_LENGTH];
783     unsigned long len, frag_off, frag_len;
784     int i, al;
785     struct hm_header_st msg_hdr;
787     /* see if we have the required fragment already */

```

```

788     if ((frag_len = dtls1_retrieve_buffered_fragment(s,max,ok)) || *ok)
789     {
790         if (*ok)         s->init_num = frag_len;
791         return frag_len;
792     }

794     /* read handshake message header */
795     i=s->method->ssl_read_bytes(s,SSL3_RT_HANDSHAKE,wire,
796         DTLS1_HM_HEADER_LENGTH, 0);
797     if (i <= 0) /* nbio, or an error */
798     {
799         s->rwstate=SSL_READING;
800         *ok = 0;
801         return i;
802     }
803     /* Handshake fails if message header is incomplete */
804     if (i != DTLS1_HM_HEADER_LENGTH)
805     {
806         al=SSL_AD_UNEXPECTED_MESSAGE;
807         SSLerr(SSL_F_DTLS1_GET_MESSAGE_FRAGMENT,SSL_R_UNEXPECTED_MESSAGE
808             goto f_err;
809     }

811     /* parse the message fragment header */
812     dtls1_get_message_header(wire, &msg_hdr);

814     /*
815      * if this is a future (or stale) message it gets buffered
816      * (or dropped)--no further processing at this time
817      * While listening, we accept seq 1 (ClientHello with cookie)
818      * although we're still expecting seq 0 (ClientHello)
819      */
820     if (msg_hdr.seq != s->d1->handshake_read_seq && !(s->d1->listen && msg_h
821         return dtls1_process_out_of_seq_message(s, &msg_hdr, ok);

823     len = msg_hdr.msg_len;
824     frag_off = msg_hdr.frag_off;
825     frag_len = msg_hdr.frag_len;

827     if (frag_len && frag_len < len)
828         return dtls1_reassemble_fragment(s, &msg_hdr, ok);

830     if (!s->server && s->d1->r_msg_hdr.frag_off == 0 &&
831         wire[0] == SSL3_MT_HELLO_REQUEST)
832     {
833         /* The server may always send 'Hello Request' messages --
834          * we are doing a handshake anyway now, so ignore them
835          * if their format is correct. Does not count for
836          * 'Finished' MAC. */
837         if (wire[1] == 0 && wire[2] == 0 && wire[3] == 0)
838         {
839             if (s->msg_callback)
840                 s->msg_callback(0, s->version, SSL3_RT_HANDSHAKE
841                     wire, DTLS1_HM_HEADER_LENGTH, s,
842                     s->msg_callback_arg);
843
844             s->init_num = 0;
845             return dtls1_get_message_fragment(s, st1, stn,
846                 max, ok);
847         }
848         else /* Incorrectly formatted Hello request */
849         {
850             al=SSL_AD_UNEXPECTED_MESSAGE;
851             SSLerr(SSL_F_DTLS1_GET_MESSAGE_FRAGMENT,SSL_R_UNEXPECTED
852                 goto f_err;
853         }

```

```

854     }

856     if ((al=dtls1_preprocess_fragment(s,&msg_hdr,max)))
857         goto f_err;

859     /* XDTLS: resurrect this when restart is in place */
860     s->state=stn;

862     if ( frag_len > 0)
863     {
864         unsigned char *p=(unsigned char *)s->init_buf->data+DTLS1_HM_HEA
865
866         i=s->method->ssl_read_bytes(s,SSL3_RT_HANDSHAKE,
867             &p[frag_off],frag_len,0);
868         /* XDTLS: fix this--message fragments cannot span multiple pack
869         if (i <= 0)
870         {
871             s->rwstate=SSL_READING;
872             *ok = 0;
873             return i;
874         }
875     }
876     else
877         i = 0;

879     /* XDTLS: an incorrectly formatted fragment should cause the
880      * handshake to fail */
881     if (i != (int)frag_len)
882     {
883         al=SSL3_AD_ILLEGAL_PARAMETER;
884         SSLerr(SSL_F_DTLS1_GET_MESSAGE_FRAGMENT,SSL3_AD_ILLEGAL_PARAMETE
885             goto f_err;
886     }

888     *ok = 1;

890     /* Note that s->init_num is *not* used as current offset in
891      * s->init_buf->data, but as a counter summing up fragments'
892      * lengths: as soon as they sum up to handshake packet
893      * length, we assume we have got all the fragments. */
894     s->init_num = frag_len;
895     return frag_len;

897 f_err:
898     ssl3_send_alert(s,SSL3_AL_FATAL,al);
899     s->init_num = 0;

901     *ok=0;
902     return(-1);
903 }

905 int dtls1_send_finished(SSL *s, int a, int b, const char *sender, int slen)
906 {
907     unsigned char *p,*d;
908     int i;
909     unsigned long l;

911     if (s->state == a)
912     {
913         d=(unsigned char *)s->init_buf->data;
914         p = &(d[DTLS1_HM_HEADER_LENGTH]);

916         i=s->method->ssl3_enc->final_finish_mac(s,
917             sender,slen,s->s3->tmp.finish_md);
918         s->s3->tmp.finish_md_len = i;
919         memcpy(p, s->s3->tmp.finish_md, i);

```



```

920         p+=i;
921         l=i;

923         /* Copy the finished so we can use it for
924          * renegotiation checks
925          */
926         if(s->type == SSL_ST_CONNECT)
927         {
928             OPENSSL_assert(i <= EVP_MAX_MD_SIZE);
929             memcpy(s->s3->previous_client_finished,
930                  s->s3->tmp.finish_md, i);
931             s->s3->previous_client_finished_len=i;
932         }
933         else
934         {
935             OPENSSL_assert(i <= EVP_MAX_MD_SIZE);
936             memcpy(s->s3->previous_server_finished,
937                  s->s3->tmp.finish_md, i);
938             s->s3->previous_server_finished_len=i;
939         }

941 #ifdef OPENSSL_SYS_WIN16
942         /* MSVC 1.5 does not clear the top bytes of the word unless
943          * I do this.
944          */
945         l&=0xffff;
946 #endif

948         d = dtls1_set_message_header(s, d, SSL3_MT_FINISHED, l, 0, l);
949         s->init_num=(int)l+DTLS1_HM_HEADER_LENGTH;
950         s->init_off=0;

952         /* buffer the message to handle re-xmits */
953         dtls1_buffer_message(s, 0);

955         s->state=b;
956     }

958     /* SSL3_ST_SEND_XXXXXX_HELLO_B */
959     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
960 }

962 /* for these 2 messages, we need to
963  * ssl->enc_read_ctx          re-init
964  * ssl->s3->read_sequence      zero
965  * ssl->s3->read_mac_secret    re-init
966  * ssl->session->read_sym_enc  assign
967  * ssl->session->read_compression assign
968  * ssl->session->read_hash     assign
969  */
970 int dtls1_send_change_cipher_spec(SSL *s, int a, int b)
971 {
972     unsigned char *p;

974     if (s->state == a)
975     {
976         p=(unsigned char *)s->init_buf->data;
977         *p+=SSL3_MT_CCS;
978         s->d1->handshake_write_seq = s->d1->next_handshake_write_seq;
979         s->init_num=DTLS1_CCS_HEADER_LENGTH;

981         if (s->version == DTLS1_BAD_VER) {
982             s->d1->next_handshake_write_seq++;
983             s2n(s->d1->handshake_write_seq,p);
984             s->init_num+=2;
985         }

```

```

987         s->init_off=0;

989         dtls1_set_message_header_int(s, SSL3_MT_CCS, 0,
990                                     s->d1->handshake_write_seq, 0, 0);

992         /* buffer the message to handle re-xmits */
993         dtls1_buffer_message(s, 1);

995         s->state=b;
996     }

998     /* SSL3_ST_CW_CHANGE_B */
999     return(dtls1_do_write(s,SSL3_RT_CHANGE_CIPHER_SPEC));
1000 }

1002 static int dtls1_add_cert_to_buf(BUF_MEM *buf, unsigned long *l, X509 *x)
1003 {
1004     int n;
1005     unsigned char *p;

1007     n=i2d_X509(x,NULL);
1008     if (!BUF_MEM_grow_clean(buf,(int)(n+(*l)+3)))
1009     {
1010         SSLerr(SSL_F_DTLS1_ADD_CERT_TO_BUF,ERR_R_BUF_LIB);
1011         return 0;
1012     }
1013     p=(unsigned char *)&(buf->data[*l]);
1014     l2n3(n,p);
1015     i2d_X509(x,&p);
1016     *l+=n+3;

1018     return 1;
1019 }
1020 unsigned long dtls1_output_cert_chain(SSL *s, X509 *x)
1021 {
1022     unsigned char *p;
1023     int i;
1024     unsigned long l= 3 + DTLS1_HM_HEADER_LENGTH;
1025     BUF_MEM *buf;

1027     /* TLSv1 sends a chain with nothing in it, instead of an alert */
1028     buf=s->init_buf;
1029     if (!BUF_MEM_grow_clean(buf,10))
1030     {
1031         SSLerr(SSL_F_DTLS1_OUTPUT_CERT_CHAIN,ERR_R_BUF_LIB);
1032         return(0);
1033     }
1034     if (x != NULL)
1035     {
1036         X509_STORE_CTX xs_ctx;

1038         if (!X509_STORE_CTX_init(&xs_ctx,s->ctx->cert_store,x,NULL))
1039         {
1040             SSLerr(SSL_F_DTLS1_OUTPUT_CERT_CHAIN,ERR_R_X509_LIB);
1041             return(0);
1042         }

1044         X509_verify_cert(&xs_ctx);
1045         /* Don't leave errors in the queue */
1046         ERR_clear_error();
1047         for (i=0; i < sk_X509_num(xs_ctx.chain); i++)
1048         {
1049             x = sk_X509_value(xs_ctx.chain, i);

1051             if (!dtls1_add_cert_to_buf(buf, &l, x))

```

```

1052         {
1053             X509_STORE_CTX_cleanup(&xs_ctx);
1054             return 0;
1055         }
1056     }
1057     X509_STORE_CTX_cleanup(&xs_ctx);
1058 }
1059 /* Thawte special :-) */
1060 for (i=0; i<sk_X509_num(s->ctx->extra_certs); i++)
1061 {
1062     x=sk_X509_value(s->ctx->extra_certs,i);
1063     if (!dtls1_add_cert_to_buf(buf, &l, x))
1064         return 0;
1065 }
1067 l-= (3 + DTLS1_HM_HEADER_LENGTH);
1069 p=(unsigned char *)&(buf->data[DTLS1_HM_HEADER_LENGTH]);
1070 l2n3(l,p);
1071 l+=3;
1072 p=(unsigned char *)&(buf->data[0]);
1073 p = dtls1_set_message_header(s, p, SSL3_MT_CERTIFICATE, l, 0, l);
1075 l+=DTLS1_HM_HEADER_LENGTH;
1076 return(l);
1077 }
1079 int dtls1_read_failed(SSL *s, int code)
1080 {
1081     if (code > 0)
1082     {
1083         fprintf(stderr, "invalid state reached %s:%d", __FILE__, __LINE);
1084         return 1;
1085     }
1087     if (!dtls1_is_timer_expired(s))
1088     {
1089         /* not a timeout, none of our business,
1090          let higher layers handle this. in fact it's probably an error
1091         return code;
1092     }
1094 #ifndef OPENSSL_NO_HEARTBEATS
1095     if (!SSL_in_init(s) && !s->tlsext_hb_pending) /* done, no need to send
1096 #else
1097     if (!SSL_in_init(s)) /* done, no need to send a retransmit */
1098 #endif
1099     {
1100         BIO_set_flags(SSL_get_rbio(s), BIO_FLAGS_READ);
1101         return code;
1102     }
1104 #if 0 /* for now, each alert contains only one record number */
1105     item = pqueue_peek(state->rcvd_records);
1106     if (item)
1107     {
1108         /* send an alert immediately for all the missing records */
1109     }
1110     else
1111 #endif
1113 #if 0 /* no more alert sending, just retransmit the last set of messages */
1114     if (state->timeout.read_timeouts >= DTLS1_TMO_READ_COUNT)
1115         ssl3_send_alert(s, SSL3_AL_WARNING,
1116             DTLS1_AD_MISSING_HANDSHAKE_MESSAGE);
1117 #endif

```

```

1119     return dtls1_handle_timeout(s);
1120 }
1122 int
1123 dtls1_get_queue_priority(unsigned short seq, int is_ccs)
1124 {
1125     /* The index of the retransmission queue actually is the message sequenc
1126     * since the queue only contains messages of a single handshake. However
1127     * ChangeCipherSpec has no message sequence number and so using only the
1128     * will result in the CCS and Finished having the same index. To prevent
1129     * the sequence number is multiplied by 2. In case of a CCS 1 is subtrac
1130     * This does not only differ CCS and Finished, it also maintains the ord
1131     * index (important for priority queues) and fits in the unsigned short
1132     */
1133     return seq * 2 - is_ccs;
1134 }
1136 int
1137 dtls1_retransmit_buffered_messages(SSL *s)
1138 {
1139     pqueue sent = s->d1->sent_messages;
1140     piterator iter;
1141     pitem *item;
1142     hm_fragment *frag;
1143     int found = 0;
1145     iter = pqueue_iterator(sent);
1147     for (item = pqueue_next(&iter); item != NULL; item = pqueue_next(&iter))
1148     {
1149         frag = (hm_fragment *)item->data;
1150         if (dtls1_retransmit_message(s,
1151             (unsigned short)dtls1_get_queue_priority(frag->m
1152             0, &found) <= 0 && found)
1153         {
1154             fprintf(stderr, "dtls1_retransmit_message() failed\n");
1155             return -1;
1156         }
1157     }
1159     return 1;
1160 }
1162 int
1163 dtls1_buffer_message(SSL *s, int is_ccs)
1164 {
1165     pitem *item;
1166     hm_fragment *frag;
1167     unsigned char seq64be[8];
1169     /* this function is called immediately after a message has
1170     * been serialized */
1171     OPENSSL_assert(s->init_off == 0);
1173     frag = dtls1_hm_fragment_new(s->init_num, 0);
1175     memcpy(frag->fragment, s->init_buf->data, s->init_num);
1177     if (is_ccs)
1178     {
1179         OPENSSL_assert(s->d1->w_msg_hdr.msg_len +
1180             ((s->version==DTLS1_VERSION)?DTLS1_CCS_HEADER_LEN
1181             )
1182     }
1183     else
1184     {

```

```

1184         OPENSSL_assert(s->d1->w_msg_hdr.msg_len +
1185             DTLS1_HM_HEADER_LENGTH == (unsigned int)s->init_num);
1186     }

1188     frag->msg_header.msg_len = s->d1->w_msg_hdr.msg_len;
1189     frag->msg_header.seq = s->d1->w_msg_hdr.seq;
1190     frag->msg_header.type = s->d1->w_msg_hdr.type;
1191     frag->msg_header.frag_off = 0;
1192     frag->msg_header.frag_len = s->d1->w_msg_hdr.msg_len;
1193     frag->msg_header.is_ccs = is_ccs;

1195     /* save current state */
1196     frag->msg_header.saved_retransmit_state.enc_write_ctx = s->enc_write_ctx;
1197     frag->msg_header.saved_retransmit_state.write_hash = s->write_hash;
1198     frag->msg_header.saved_retransmit_state.compress = s->compress;
1199     frag->msg_header.saved_retransmit_state.session = s->session;
1200     frag->msg_header.saved_retransmit_state.epoch = s->d1->w_epoch;

1202     memset(seq64be, 0, sizeof(seq64be));
1203     seq64be[6] = (unsigned char)(dtls1_get_queue_priority(frag->msg_header.s
1204     seq64be[7] = (unsigned char)(dtls1_get_queue_priority(frag->msg_header.s

1208     item = pitem_new(seq64be, frag);
1209     if ( item == NULL)
1210     {
1211         dtls1_hm_fragment_free(frag);
1212         return 0;
1213     }

1215 #if 0
1216     fprintf( stderr, "buffered message: \ttype = %xx\n", msg_buf->type);
1217     fprintf( stderr, "\t\t\t\t\tlen = %d\n", msg_buf->len);
1218     fprintf( stderr, "\t\t\t\t\tseq_num = %d\n", msg_buf->seq_num);
1219 #endif

1221     pqueue_insert(s->d1->sent_messages, item);
1222     return 1;
1223 }

1225 int
1226 dtls1_retransmit_message(SSL *s, unsigned short seq, unsigned long frag_off,
1227     int *found)
1228 {
1229     int ret;
1230     /* XDTLS: for now assuming that read/writes are blocking */
1231     pitem *item;
1232     hm_fragment *frag;
1233     unsigned long header_length;
1234     unsigned char seq64be[8];
1235     struct dtls1_retransmit_state saved_state;
1236     unsigned char save_write_sequence[8];

1238     /*
1239     OPENSSL_assert(s->init_num == 0);
1240     OPENSSL_assert(s->init_off == 0);
1241     */

1243     /* XDTLS: the requested message ought to be found, otherwise error */
1244     memset(seq64be, 0, sizeof(seq64be));
1245     seq64be[6] = (unsigned char)(seq>>8);
1246     seq64be[7] = (unsigned char)seq;

1248     item = pqueue_find(s->d1->sent_messages, seq64be);
1249     if ( item == NULL)

```

```

1250     {
1251         fprintf(stderr, "retransmit: message %d non-existent\n", seq);
1252         *found = 0;
1253         return 0;
1254     }

1256     *found = 1;
1257     frag = (hm_fragment *)item->data;

1259     if ( frag->msg_header.is_ccs)
1260         header_length = DTLS1_CCS_HEADER_LENGTH;
1261     else
1262         header_length = DTLS1_HM_HEADER_LENGTH;

1264     memcpy(s->init_buf->data, frag->fragment,
1265         frag->msg_header.msg_len + header_length);
1266     s->init_num = frag->msg_header.msg_len + header_length;

1268     dtls1_set_message_header_int(s, frag->msg_header.type,
1269         frag->msg_header.msg_len, frag->msg_header.seq, 0,
1270         frag->msg_header.frag_len);

1272     /* save current state */
1273     saved_state.enc_write_ctx = s->enc_write_ctx;
1274     saved_state.write_hash = s->write_hash;
1275     saved_state.compress = s->compress;
1276     saved_state.session = s->session;
1277     saved_state.epoch = s->d1->w_epoch;
1278     saved_state.epoch = s->d1->w_epoch;

1279     s->d1->retransmitting = 1;

1282     /* restore state in which the message was originally sent */
1283     s->enc_write_ctx = frag->msg_header.saved_retransmit_state.enc_write_ctx;
1284     s->write_hash = frag->msg_header.saved_retransmit_state.write_hash;
1285     s->compress = frag->msg_header.saved_retransmit_state.compress;
1286     s->session = frag->msg_header.saved_retransmit_state.session;
1287     s->d1->w_epoch = frag->msg_header.saved_retransmit_state.epoch;

1289     if (frag->msg_header.saved_retransmit_state.epoch == saved_state.epoch -
1290     {
1291         memcpy(save_write_sequence, s->s3->write_sequence, sizeof(s->s3-
1292         memcpy(s->s3->write_sequence, s->d1->last_write_sequence, sizeof
1293     }

1295     ret = dtls1_do_write(s, frag->msg_header.is_ccs ?
1296         SSL3_RT_CHANGE_CIPHER_SPEC : SS

1297     /* restore current state */
1298     s->enc_write_ctx = saved_state.enc_write_ctx;
1299     s->write_hash = saved_state.write_hash;
1300     s->compress = saved_state.compress;
1301     s->session = saved_state.session;
1302     s->d1->w_epoch = saved_state.epoch;

1304     if (frag->msg_header.saved_retransmit_state.epoch == saved_state.epoch -
1305     {
1306         memcpy(s->d1->last_write_sequence, s->s3->write_sequence, sizeof
1307         memcpy(s->s3->write_sequence, save_write_sequence, sizeof(s->s3-
1308     }

1311     s->d1->retransmitting = 0;

1313     (void)BIO_flush(SSL_get_wbio(s));
1314     return ret;
1315 }

```

```

1317 /* call this function when the buffered messages are no longer needed */
1318 void
1319 dtls1_clear_record_buffer(SSL *s)
1320 {
1321     pitem *item;
1322
1323     for(item = pqueue_pop(s->d1->sent_messages);
1324         item != NULL; item = pqueue_pop(s->d1->sent_messages))
1325     {
1326         dtls1_hm_fragment_free((hm_fragment *)item->data);
1327         pitem_free(item);
1328     }
1329 }
1330
1332 unsigned char *
1333 dtls1_set_message_header(SSL *s, unsigned char *p, unsigned char mt,
1334                          unsigned long len, unsigned long frag_off, unsigned long
1335                          {
1336          /* Don't change sequence numbers while listening */
1337          if (frag_off == 0 && !s->d1->listen)
1338          {
1339              s->d1->handshake_write_seq = s->d1->next_handshake_write_seq;
1340              s->d1->next_handshake_write_seq++;
1341          }
1342
1343          dtls1_set_message_header_int(s, mt, len, s->d1->handshake_write_seq,
1344                                      frag_off, frag_len);
1345
1346          return p += DTLS1_HM_HEADER_LENGTH;
1347      }
1348
1350 /* don't actually do the writing, wait till the MTU has been retrieved */
1351 static void
1352 dtls1_set_message_header_int(SSL *s, unsigned char mt,
1353                             unsigned long len, unsigned short seq_num, unsigned
1354                             unsigned long frag_len)
1355 {
1356     struct hm_header_st *msg_hdr = &s->d1->w_msg_hdr;
1357
1358     msg_hdr->type = mt;
1359     msg_hdr->msg_len = len;
1360     msg_hdr->seq = seq_num;
1361     msg_hdr->frag_off = frag_off;
1362     msg_hdr->frag_len = frag_len;
1363 }
1364
1366 static void
1367 dtls1_fix_message_header(SSL *s, unsigned long frag_off,
1368                          unsigned long frag_len)
1369 {
1370     struct hm_header_st *msg_hdr = &s->d1->w_msg_hdr;
1371
1372     msg_hdr->frag_off = frag_off;
1373     msg_hdr->frag_len = frag_len;
1374 }
1375
1377 static unsigned char *
1378 dtls1_write_message_header(SSL *s, unsigned char *p)
1379 {
1380     struct hm_header_st *msg_hdr = &s->d1->w_msg_hdr;
1381
1382     *p++ = msg_hdr->type;
1383     l2n3(msg_hdr->msg_len, p);

```

```

1383     s2n(msg_hdr->seq, p);
1384     l2n3(msg_hdr->frag_off, p);
1385     l2n3(msg_hdr->frag_len, p);
1386
1387     return p;
1388 }
1389
1390 unsigned int
1391 dtls1_min_mtu(void)
1392 {
1393     return (g_probable_mtu[(sizeof(g_probable_mtu) /
1394                             sizeof(g_probable_mtu[0])) - 1]);
1395 }
1396
1397 static unsigned int
1398 dtls1_guess_mtu(unsigned int curr_mtu)
1399 {
1400     unsigned int i;
1401
1402     if (curr_mtu == 0)
1403         return g_probable_mtu[0];
1404
1405     for (i = 0; i < sizeof(g_probable_mtu)/sizeof(g_probable_mtu[0]); i++)
1406         if (curr_mtu > g_probable_mtu[i])
1407             return g_probable_mtu[i];
1408
1409     return curr_mtu;
1410 }
1411
1412 void
1413 dtls1_get_message_header(unsigned char *data, struct hm_header_st *msg_hdr)
1414 {
1415     memset(msg_hdr, 0x00, sizeof(struct hm_header_st));
1416     msg_hdr->type = *(data++);
1417     n2l3(data, msg_hdr->msg_len);
1418
1419     n2s(data, msg_hdr->seq);
1420     n2l3(data, msg_hdr->frag_off);
1421     n2l3(data, msg_hdr->frag_len);
1422 }
1423
1424 void
1425 dtls1_get_ccs_header(unsigned char *data, struct ccs_header_st *ccs_hdr)
1426 {
1427     memset(ccs_hdr, 0x00, sizeof(struct ccs_header_st));
1428
1429     ccs_hdr->type = *(data++);
1430 }
1431
1432 int dtls1_shutdown(SSL *s)
1433 {
1434     int ret;
1435     #ifndef OPENSSL_NO_SCTP
1436     if (BIO_dgram_is_sctp(SSL_get_wbio(s)) &&
1437         !(s->shutdown & SSL_SENT_SHUTDOWN))
1438     {
1439         ret = BIO_dgram_sctp_wait_for_dry(SSL_get_wbio(s));
1440         if (ret < 0) return -1;
1441     }
1442     if (ret == 0)
1443         BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_SAVE_SHUTD
1444                );
1445     #endif
1446     ret = ssl3_shutdown(s);
1447     #ifndef OPENSSL_NO_SCTP

```

```

1448     BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_SAVE_SHUTDOWN, 0, NULL);
1449 #endif
1450     return ret;
1451 }

1453 #ifndef OPENSSSL_NO_HEARTBEATS
1454 int
1455 dtls1_process_heartbeat(SSL *s)
1456 {
1457     unsigned char *p = &s->s3->rrec.data[0], *pl;
1458     unsigned short hbtype;
1459     unsigned int payload;
1460     unsigned int padding = 16; /* Use minimum padding */

1462     if (s->msg_callback)
1463         s->msg_callback(0, s->version, TLS1_RT_HEARTBEAT,
1464             &s->s3->rrec.data[0], s->s3->rrec.length,
1465             s, s->msg_callback_arg);

1467     /* Read type and payload length first */
1468     if (1 + 2 + 16 > s->s3->rrec.length)
1469         return 0; /* silently discard */
1470     hbtype = *p++;
1471     n2s(p, payload);
1472     if (1 + 2 + payload + 16 > s->s3->rrec.length)
1473         return 0; /* silently discard per RFC 6520 sec. 4 */
1474     pl = p;

1476     if (hbtype == TLS1_HB_REQUEST)
1477     {
1478         unsigned char *buffer, *bp;
1479         unsigned int write_length = 1 /* heartbeat type */ +
1480             2 /* heartbeat length */ +
1481             payload + padding;

1484         int r;

1486         if (write_length > SSL3_RT_MAX_PLAIN_LENGTH)
1487             return 0;

1489         /* Allocate memory for the response, size is 1 byte
1490          * message type, plus 2 bytes payload length, plus
1491          * payload, plus padding
1492          */
1493         buffer = OPENSSSL_malloc(write_length);
1494         bp = buffer;

1496         /* Enter response type, length and copy payload */
1497         *bp++ = TLS1_HB_RESPONSE;
1498         s2n(payload, bp);
1499         memcpy(bp, pl, payload);
1500         bp += payload;
1501         /* Random padding */
1502         RAND_pseudo_bytes(bp, padding);

1504         r = dtls1_write_bytes(s, TLS1_RT_HEARTBEAT, buffer, write_length);

1506         if (r >= 0 && s->msg_callback)
1507             s->msg_callback(1, s->version, TLS1_RT_HEARTBEAT,
1508                 buffer, write_length,
1509                 s, s->msg_callback_arg);

1511         OPENSSSL_free(buffer);

1513         if (r < 0)
1514             return r;
1515     }

```

```

1514     else if (hbtype == TLS1_HB_RESPONSE)
1515     {
1516         unsigned int seq;

1518         /* We only send sequence numbers (2 bytes unsigned int),
1519          * and 16 random bytes, so we just try to read the
1520          * sequence number */
1521         n2s(pl, seq);

1523         if (payload == 18 && seq == s->tlsext_hb_seq)
1524         {
1525             dtls1_stop_timer(s);
1526             s->tlsext_hb_seq++;
1527             s->tlsext_hb_pending = 0;
1528         }
1529     }

1531     return 0;
1532 }

1534 int
1535 dtls1_heartbeat(SSL *s)
1536 {
1537     unsigned char *buf, *p;
1538     int ret;
1539     unsigned int payload = 18; /* Sequence number + random bytes */
1540     unsigned int padding = 16; /* Use minimum padding */

1542     /* Only send if peer supports and accepts HB requests... */
1543     if (!(s->tlsext_heartbeat & SSL_TLSEXT_HB_ENABLED) ||
1544         s->tlsext_heartbeat & SSL_TLSEXT_HB_DONT_SEND_REQUESTS)
1545     {
1546         SSLerr(SSL_F_DTLS1_HEARTBEAT, SSL_R_TLS_HEARTBEAT_PEER_DOESNT_ACC
1547             return -1;
1548     }

1550     /* ...and there is none in flight yet... */
1551     if (s->tlsext_hb_pending)
1552     {
1553         SSLerr(SSL_F_DTLS1_HEARTBEAT, SSL_R_TLS_HEARTBEAT_PENDING);
1554         return -1;
1555     }

1557     /* ...and no handshake in progress. */
1558     if (SSL_in_init(s) || s->in_handshake)
1559     {
1560         SSLerr(SSL_F_DTLS1_HEARTBEAT, SSL_R_UNEXPECTED_MESSAGE);
1561         return -1;
1562     }

1564     /* Check if padding is too long, payload and padding
1565      * must not exceed 2^14 - 3 = 16381 bytes in total.
1566      */
1567     OPENSSSL_assert(payload + padding <= 16381);

1569     /* Create HeartBeat message, we just use a sequence number
1570      * as payload to distinguish different messages and add
1571      * some random stuff.
1572      * - Message Type, 1 byte
1573      * - Payload Length, 2 bytes (unsigned int)
1574      * - Payload, the sequence number (2 bytes uint)
1575      * - Payload, random bytes (16 bytes uint)
1576      * - Padding
1577      */
1578     buf = OPENSSSL_malloc(1 + 2 + payload + padding);
1579     p = buf;

```

```
1580     /* Message Type */
1581     *p++ = TLS1_HB_REQUEST;
1582     /* Payload length (18 bytes here) */
1583     s2n(payload, p);
1584     /* Sequence number */
1585     s2n(s->tlsext_hb_seq, p);
1586     /* 16 random bytes */
1587     RAND_pseudo_bytes(p, 16);
1588     p += 16;
1589     /* Random padding */
1590     RAND_pseudo_bytes(p, padding);
1591
1592     ret = dtls1_write_bytes(s, TLS1_RT_HEARTBEAT, buf, 3 + payload + padding
1593 if (ret >= 0)
1594     {
1595         if (s->msg_callback)
1596             s->msg_callback(1, s->version, TLS1_RT_HEARTBEAT,
1597                             buf, 3 + payload + padding,
1598                             s, s->msg_callback_arg);
1599
1600         dtls1_start_timer(s);
1601         s->tlsext_hb_pending = 1;
1602     }
1603
1604     OPENSSL_free(buf);
1605
1606     return ret;
1607 }
1608 #endif
```

new/usr/src/lib/openssl/libsunw_ssl/d1_clnt.c

1

```
*****
44718 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_clnt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/d1_clnt.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * Copyright (c) 1999-2007 The OpenSSL Project. All rights reserved.
8  *
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10 * modification, are permitted provided that the following conditions
11 * are met:
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
49 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
50 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 *
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 */
58 /*
59 * Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
60 * All rights reserved.
61 */
```

new/usr/src/lib/openssl/libsunw_ssl/d1_clnt.c

2

```
62 * This package is an SSL implementation written
63 * by Eric Young (eay@cryptsoft.com).
64 * The implementation was written so as to conform with Netscapes SSL.
65 *
66 * This library is free for commercial and non-commercial use as long as
67 * the following conditions are aheared to. The following conditions
68 * apply to all code found in this distribution, be it the RC4, RSA,
69 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
70 * included with this distribution is covered by the same copyright terms
71 * except that the holder is Tim Hudson (tjh@cryptsoft.com).
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74 * the code are not to be removed.
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76 * as the author of the parts of the library used.
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78 * in documentation (online or textual) provided with the package.
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104 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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106 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
107 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
108 * SUCH DAMAGE.
109 *
110 * The licence and distribution terms for any publically available version or
111 * derivative of this code cannot be changed. i.e. this code cannot simply be
112 * copied and put under another distribution licence
113 * [including the GNU Public Licence.]
114 */
115
116 #include <stdio.h>
117 #include "ssl_locl.h"
118 #ifndef OPENSSL_NO_KRB5
119 #include "kssl_lcl.h"
120 #endif
121 #include <openssl/buffer.h>
122 #include <openssl/rand.h>
123 #include <openssl/objects.h>
124 #include <openssl/evp.h>
125 #include <openssl/md5.h>
126 #include <openssl/bn.h>
127 #ifndef OPENSSL_NO_DH
```

```
new/usr/src/lib/openssl/libsunw_ssl/d1 clnt.c
```

```

194         state=s->state;
195
196         switch(s->state)
197         {
198         case SSL_ST_RENEGOTIATE:
199             s->renegotiate=1;
200             s->state=SSL_ST_CONNECT;
201             s->ctx->stats.sess_connect_renegotiate++;
202             /* break */
203         case SSL_ST_BEFORE:
204         case SSL_ST_CONNECT:
205         case SSL_ST_BEFORE|SSL_ST_CONNECT:
206         case SSL_ST_OK|SSL_ST_CONNECT:
207
208             s->server=0;
209             if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_START,1);
210
211             if ((s->version & 0xff00 ) != (DTLS1_VERSION & 0xff00) &
212                 (s->version & 0xff00 ) != (DTLS1_BAD_VER & 0xff00))
213             {
214                 SSLerr(SSL_F_DTLS1_CONNECT, ERR_R_INTERNAL_ERROR);
215                 ret = -1;
216                 goto end;
217             }
218
219             /* s->version=SSL3_VERSION; */
220             s->type=SSL_ST_CONNECT;
221
222             if (s->init_buf == NULL)
223             {
224                 if ((buf=BUF_MEM_new()) == NULL)
225                 {
226                     ret= -1;
227                     goto end;
228                 }
229                 if (!BUF_MEM_grow(buf,SSL3_RT_MAX_PLAIN_LENGTH))
230                 {
231                     ret= -1;
232                     goto end;
233                 }
234                 s->init_buf=buf;
235                 buf=NULL;
236             }
237
238             if (!ssl3_setup_buffers(s)) { ret= -1; goto end; }
239
240             /* setup buffering BIO */
241             if (!ssl_init_wbio_buffer(s,0)) { ret= -1; goto end; }
242
243             /* don't push the buffering BIO quite yet */
244
245             s->state=SSL3_ST_CW_CLNT_HELLO_A;
246             s->ctx->stats.sess_connect++;
247             s->init_num=0;
248             /* mark client_random uninitialized */
249             memset(s->s3->client_random,0,sizeof(s->s3->client_random));
250             s->d1->send_cookie = 0;
251             s->hit = 0;
252             break;
253
254 #ifndef OPENSSL_NO_SCTP
255         case DTLS1_SCTP_ST_CR_READ SOCK:
256
257             if (BIO_dgram_sctp_msg_waiting(SSL_get_rbio(s)))
258             {
259                 s->s3->in_read_app_data=2;

```



```

260         s->rwstate=SSL_READING;
261         BIO_clear_retry_flags(SSL_get_rbio(s));
262         BIO_set_retry_read(SSL_get_rbio(s));
263         ret = -1;
264         goto end;
265     }
266     s->state=s->s3->tmp.next_state;
267     break;
268
269     case DTLS1_SCTP_ST_CW_WRITE_SOCKET:
270         /* read app data until dry event */
271
272         ret = BIO_dgram_sctp_wait_for_dry(SSL_get_wbio(s));
273         if (ret < 0) goto end;
274
275         if (ret == 0)
276         {
277             s->s3->in_read_app_data=2;
278             s->rwstate=SSL_READING;
279             BIO_clear_retry_flags(SSL_get_rbio(s));
280             BIO_set_retry_read(SSL_get_rbio(s));
281             ret = -1;
282             goto end;
283         }
284
285         s->state=s->d1->next_state;
286         break;
287
288 #endif
289
290     case SSL3_ST_CW_CLNT_HELLO_A:
291     case SSL3_ST_CW_CLNT_HELLO_B:
292
293         s->shutdown=0;
294
295         /* every DTLS ClientHello resets Finished MAC */
296         ssl3_init_finished_mac(s);
297
298         dtls1_start_timer(s);
299         ret=dtls1_client_hello(s);
300         if (ret <= 0) goto end;
301
302         if (s->d1->send_cookie)
303         {
304             s->state=SSL3_ST_CW_FLUSH;
305             s->s3->tmp.next_state=SSL3_ST_CR_SRVR_HELLO_A;
306         }
307         else
308             s->state=SSL3_ST_CR_SRVR_HELLO_A;
309
310         s->init_num=0;
311
312 #ifndef OPENSSL_NO_SCTP
313         /* Disable buffering for SCTP */
314         if (!BIO_dgram_is_sctp(SSL_get_wbio(s)))
315         {
316             /* turn on buffering for the next lot of output
317             if (s->bbio != s->wbio)
318                 s->wbio=BIO_push(s->bbio,s->wbio);
319         }
320 #endif
321
322 #endif
323
324         break;

```

```

326     case SSL3_ST_CR_SRVR_HELLO_A:
327     case SSL3_ST_CR_SRVR_HELLO_B:
328         ret=ssl3_get_server_hello(s);
329         if (ret <= 0) goto end;
330         else
331         {
332             if (s->hit)
333             {
334 #ifndef OPENSSL_NO_SCTP
335                 /* Add new shared key for SCTP-Auth,
336                 * will be ignored if no SCTP used.
337                 */
338                 snprintf((char*) labelbuffer, sizeof(DTLS1_SCTP_AUTH_LABEL);
339
340                 SSL_export_keying_material(s, sctpauthke,
341                 sizeof(sctpauthkey),
342                 sizeof(labelb
343
344                 BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM,
345                 sizeof(sctpauthkey), sc
346 #endif
347
348                 s->state=SSL3_ST_CR_FINISHED_A;
349             }
350         }
351         else
352             s->state=DTLS1_ST_CR_HELLO_VERIFY_REQUEST
353         }
354         s->init_num=0;
355         break;
356
357     case DTLS1_ST_CR_HELLO_VERIFY_REQUEST_A:
358     case DTLS1_ST_CR_HELLO_VERIFY_REQUEST_B:
359
360         ret = dtls1_get_hello_verify(s);
361         if (ret <= 0)
362             goto end;
363         dtls1_stop_timer(s);
364         if (s->d1->send_cookie) /* start again, with a cookie */
365             s->state=SSL3_ST_CW_CLNT_HELLO_A;
366         else
367             s->state = SSL3_ST_CR_CERT_A;
368         s->init_num = 0;
369         break;
370
371     case SSL3_ST_CR_CERT_A:
372     case SSL3_ST_CR_CERT_B:
373 #ifndef OPENSSL_NO_TLSEXT
374         ret=ssl3_check_finished(s);
375         if (ret <= 0) goto end;
376         if (ret == 2)
377         {
378             s->hit = 1;
379             if (s->tlsext_ticket_expected)
380                 s->state=SSL3_ST_CR_SESSION_TICKET_A;
381             else
382                 s->state=SSL3_ST_CR_FINISHED_A;
383             s->init_num=0;
384             break;
385         }
386 #endif
387
388         /* Check if it is anon DH or PSK */
389         if (!(s->s3->tmp.new_cipher->algorithm_auth & SSL_aNULL)
390             !(s->s3->tmp.new_cipher->algorithm_mkey & SSL_kPSK))
391         {
392             ret=ssl3_get_server_certificate(s);

```

```

392         if (ret <= 0) goto end;
393 #ifndef OPENSSL_NO_TLSEXT
394         if (s->tlsext_status_expected)
395             s->state=SSL3_ST_CR_CERT_STATUS_A;
396         else
397             s->state=SSL3_ST_CR_KEY_EXCH_A;
398     }
399     else
400     {
401         skip = 1;
402         s->state=SSL3_ST_CR_KEY_EXCH_A;
403     }
404 #else
405     }
406     else
407         skip=1;
409     s->state=SSL3_ST_CR_KEY_EXCH_A;
410 #endif
411     s->init_num=0;
412     break;
414 case SSL3_ST_CR_KEY_EXCH_A:
415 case SSL3_ST_CR_KEY_EXCH_B:
416     ret=ssl3_get_key_exchange(s);
417     if (ret <= 0) goto end;
418     s->state=SSL3_ST_CR_CERT_REQ_A;
419     s->init_num=0;
421     /* at this point we check that we have the
422     * required stuff from the server */
423     if (!ssl3_check_cert_and_algorithm(s))
424     {
425         ret= -1;
426         goto end;
427     }
428     break;
430 case SSL3_ST_CR_CERT_REQ_A:
431 case SSL3_ST_CR_CERT_REQ_B:
432     ret=ssl3_get_certificate_request(s);
433     if (ret <= 0) goto end;
434     s->state=SSL3_ST_CR_SRVR_DONE_A;
435     s->init_num=0;
436     break;
438 case SSL3_ST_CR_SRVR_DONE_A:
439 case SSL3_ST_CR_SRVR_DONE_B:
440     ret=ssl3_get_server_done(s);
441     if (ret <= 0) goto end;
442     dtls1_stop_timer(s);
443     if (s->s3->tmp.cert_req)
444         s->s3->tmp.next_state=SSL3_ST_CW_CERT_A;
445     else
446         s->s3->tmp.next_state=SSL3_ST_CW_KEY_EXCH_A;
447     s->init_num=0;
449 #ifndef OPENSSL_NO_SCTP
450     if (BIO_dgram_is_sctp(SSL_get_wbio(s)) &&
451         state == SSL_ST_RENEGOTIATE)
452         s->state=DTLS1_SCTP_ST_CR_READ SOCK;
453     else
454 #endif
455     s->state=s->s3->tmp.next_state;
456     break;

```

```

458 case SSL3_ST_CW_CERT_A:
459 case SSL3_ST_CW_CERT_B:
460 case SSL3_ST_CW_CERT_C:
461 case SSL3_ST_CW_CERT_D:
462     dtls1_start_timer(s);
463     ret=dtls1_send_client_certificate(s);
464     if (ret <= 0) goto end;
465     s->state=SSL3_ST_CW_KEY_EXCH_A;
466     s->init_num=0;
467     break;
469 case SSL3_ST_CW_KEY_EXCH_A:
470 case SSL3_ST_CW_KEY_EXCH_B:
471     dtls1_start_timer(s);
472     ret=dtls1_send_client_key_exchange(s);
473     if (ret <= 0) goto end;
475 #ifndef OPENSSL_NO_SCTP
476     /* Add new shared key for SCTP-Auth,
477     * will be ignored if no SCTP used.
478     */
479     snprintf((char*) labelbuffer, sizeof(DTLS1_SCTP_AUTH_LABEL),
480              DTLS1_SCTP_AUTH_LABEL);
482     SSL_export_keying_material(s, sctpauthkey,
483                               sizeof(sctpauthkey), labelbuf,
484                               sizeof(labelbuffer), NULL, 0,
486     BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_ADD_AUTH_K,
487                sizeof(sctpauthkey), sctpauthkey);
488 #endif
490     /* EAY EAY EAY need to check for DH fix cert
491     * sent back */
492     /* For TLS, cert_req is set to 2, so a cert chain
493     * of nothing is sent, but no verify packet is sent */
494     if (s->s3->tmp.cert_req == 1)
495     {
496         s->state=SSL3_ST_CW_CERT_VRFY_A;
497     }
498     else
499     {
500 #ifndef OPENSSL_NO_SCTP
501         if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
502         {
503             s->d1->next_state=SSL3_ST_CW_CHANGE_A;
504             s->state=DTLS1_SCTP_ST_CW_WRITE SOCK;
505         }
506         else
507 #endif
508             s->state=SSL3_ST_CW_CHANGE_A;
509     }
510     s->s3->change_cipher_spec=0;
512     s->init_num=0;
513     break;
515 case SSL3_ST_CW_CERT_VRFY_A:
516 case SSL3_ST_CW_CERT_VRFY_B:
517     dtls1_start_timer(s);
518     ret=dtls1_send_client_verify(s);
519     if (ret <= 0) goto end;
520 #ifndef OPENSSL_NO_SCTP
521     if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
522     {
523         s->d1->next_state=SSL3_ST_CW_CHANGE_A;

```

```

524         s->state=DTLS1_SCTP_ST_CW_WRITE SOCK;
525     }
526     else
527 #endif
528         s->state=SSL3_ST_CW_CHANGE_A;
529     s->init_num=0;
530     s->s3->change_cipher_spec=0;
531     break;

533     case SSL3_ST_CW_CHANGE_A:
534     case SSL3_ST_CW_CHANGE_B:
535         if (!s->hit)
536             dtls1_start_timer(s);
537         ret=dtls1_send_change_cipher_spec(s,
538             SSL3_ST_CW_CHANGE_A, SSL3_ST_CW_CHANGE_B);
539         if (ret <= 0) goto end;

541         s->state=SSL3_ST_CW_FINISHED_A;
542         s->init_num=0;

544         s->session->cipher=s->s3->tmp.new_cipher;
545 #ifdef OPENSSL_NO_COMP
546         s->session->compress_meth=0;
547 #else
548         if (s->s3->tmp.new_compression == NULL)
549             s->session->compress_meth=0;
550         else
551             s->session->compress_meth=
552                 s->s3->tmp.new_compression->id;
553 #endif

554         if (!s->method->ssl3_enc->setup_key_block(s))
555         {
556             ret= -1;
557             goto end;
558         }

560         if (!s->method->ssl3_enc->change_cipher_state(s,
561             SSL3_CHANGE_CIPHER_CLIENT_WRITE))
562         {
563             ret= -1;
564             goto end;
565         }

566 #ifndef OPENSSL_NO_SCTP
567         if (s->hit)
568         {
569             /* Change to new shared key of SCTP-Auth
570              * will be ignored if no SCTP used.
571              */
572             BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM,
573                 BIO_CTRL_DGRAM_SCTP_AUTH, NULL);
574         }
575 #endif

577         dtls1_reset_seq_numbers(s, SSL3_CC_WRITE);
578         break;

580     case SSL3_ST_CW_FINISHED_A:
581     case SSL3_ST_CW_FINISHED_B:
582         if (!s->hit)
583             dtls1_start_timer(s);
584         ret=dtls1_send_finished(s,
585             SSL3_ST_CW_FINISHED_A, SSL3_ST_CW_FINISHED_B,
586             s->method->ssl3_enc->client_finished_label,
587             s->method->ssl3_enc->client_finished_label_len);
588         if (ret <= 0) goto end;
589         s->state=SSL3_ST_CW_FLUSH;

```

```

591         /* clear flags */
592         s->s3->flags&= ~SSL3_FLAGS_POP_BUFFER;
593         if (s->hit)
594         {
595             s->s3->tmp.next_state=SSL_ST_OK;
596 #ifndef OPENSSL_NO_SCTP
597             if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
598             {
599                 s->d1->next_state = s->s3->tmp.n
600                 s->s3->tmp.next_state=DTLS1_SCTP
601             }
602 #endif
603             if (s->s3->flags & SSL3_FLAGS_DELAY_CLIENT_FINIS
604             {
605                 s->state=SSL_ST_OK;
606 #ifndef OPENSSL_NO_SCTP
607                 if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
608                 {
609                     s->d1->next_state = SSL
610                     s->state=DTLS1_SCTP_ST_C
611                 }
612 #endif
613                 s->s3->flags|=SSL3_FLAGS_POP_BUFFER;
614                 s->s3->delay_buf_pop_ret=0;
615             }
616         }
617     else
618     {
619 #ifndef OPENSSL_NO_SCTP
620         /* Change to new shared key of SCTP-Auth,
621          * will be ignored if no SCTP used.
622          */
623         BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_NE
624 #endif

626 #ifndef OPENSSL_NO_TLSEXT
627         /* Allow NewSessionTicket if ticket expected */
628         if (s->tlsext_ticket_expected)
629             s->s3->tmp.next_state=SSL3_ST_CR_SESSION
630         else
631 #endif
632             s->s3->tmp.next_state=SSL3_ST_CR_FINISHED_A;
633     }
634     s->init_num=0;
635     break;

638 #ifndef OPENSSL_NO_TLSEXT
639     case SSL3_ST_CR_SESSION_TICKET_A:
640     case SSL3_ST_CR_SESSION_TICKET_B:
641         ret=ssl3_get_new_session_ticket(s);
642         if (ret <= 0) goto end;
643         s->state=SSL3_ST_CR_FINISHED_A;
644         s->init_num=0;
645         break;

647     case SSL3_ST_CR_CERT_STATUS_A:
648     case SSL3_ST_CR_CERT_STATUS_B:
649         ret=ssl3_get_cert_status(s);
650         if (ret <= 0) goto end;
651         s->state=SSL3_ST_CR_KEY_EXCH_A;
652         s->init_num=0;
653         break;
654 #endif

```

```

656         case SSL3_ST_CR_FINISHED_A:
657         case SSL3_ST_CR_FINISHED_B:
658             s->d1->change_cipher_spec_ok = 1;
659             ret=ssl3_get_finished(s,SSL3_ST_CR_FINISHED_A,
660                                 SSL3_ST_CR_FINISHED_B);
661             if (ret <= 0) goto end;
662             dtls1_stop_timer(s);

664             if (s->hit)
665                 s->state=SSL3_ST_CW_CHANGE_A;
666             else
667                 s->state=SSL_ST_OK;

669 #ifndef OPENSSL_NO_SCTP
670             if (BIO_dgram_is_sctp(SSL_get_wbio(s)) &&
671                 state == SSL_ST_RENEGOTIATE)
672             {
673                 s->d1->next_state=s->state;
674                 s->state=DTLS1_SCTP_ST_CW_WRITE_SOCKET;
675             }
676 #endif

678             s->init_num=0;
679             break;

681         case SSL3_ST_CW_FLUSH:
682             s->rwstate=SSL_WRITING;
683             if (BIO_flush(s->wbio) <= 0)
684             {
685                 /* If the write error was fatal, stop trying */
686                 if (!BIO_should_retry(s->wbio))
687                 {
688                     s->rwstate=SSL_NOTHING;
689                     s->state=s->s3->tmp.next_state;
690                 }
691             }
692             ret= -1;
693             goto end;
694         }
695         s->rwstate=SSL_NOTHING;
696         s->state=s->s3->tmp.next_state;
697         break;

699         case SSL_ST_OK:
700             /* clean a few things up */
701             ssl3_cleanup_key_block(s);

703 #if 0
704             if (s->init_buf != NULL)
705             {
706                 BUF_MEM_free(s->init_buf);
707                 s->init_buf=NULL;
708             }
709 #endif

711             /* If we are not 'joining' the last two packets,
712              * remove the buffering now */
713             if (!(s->s3->flags & SSL3_FLAGS_POP_BUFFER))
714                 ssl_free_wbio_buffer(s);
715             /* else do it later in ssl3_write */

717             s->init_num=0;
718             s->renegotiate=0;
719             s->new_session=0;

721             ssl_update_cache(s,SSL_SESS_CACHE_CLIENT);

```

```

722             if (s->hit) s->ctx->stats.sess_hit++;

724             ret=1;
725             /* s->server=0; */
726             s->handshake_func=dtls1_connect;
727             s->ctx->stats.sess_connect_good++;

729             if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_DONE,1);

731             /* done with handshaking */
732             s->d1->handshake_read_seq = 0;
733             s->d1->next_handshake_write_seq = 0;
734             goto end;
735             /* break; */

736         default:
737             SSLerr(SSL_F_DTLS1_CONNECT,SSL_R_UNKNOWN_STATE);
738             ret= -1;
739             goto end;
740             /* break; */
741         }
742     }

744     /* did we do anything */
745     if (!s->s3->tmp.reuse_message && !skip)
746     {
747         if (s->debug)
748         {
749             if ((ret=BIO_flush(s->wbio)) <= 0)
750                 goto end;
751         }

753         if ((cb != NULL) && (s->state != state))
754         {
755             new_state=s->state;
756             s->state=state;
757             cb(s,SSL_CB_CONNECT_LOOP,1);
758             s->state=new_state;
759         }
760     }
761     skip=0;
762 }

763 end:
764     s->in_handshake--;
765
766 #ifndef OPENSSL_NO_SCTP
767     /* Notify SCTP BIO socket to leave handshake
768      * mode and allow stream identifier other
769      * than 0. Will be ignored if no SCTP is used.
770      */
771     BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_SET_IN_HANDSHAKE, s->in_ha
772 #endif

774     if (buf != NULL)
775         BUF_MEM_free(buf);
776     if (cb != NULL)
777         cb(s,SSL_CB_CONNECT_EXIT,ret);
778     return(ret);
779 }

781 int dtls1_client_hello(SSL *s)
782 {
783     unsigned char *buf;
784     unsigned char *p,*d;
785     unsigned int i,j;
786     unsigned long l;
787     SSL_COMP *comp;

```

```

789     buf=(unsigned char *)s->init_buf->data;
790     if (s->state == SSL3_ST_CW_CLNT_HELLO_A)
791     {
792         SSL_SESSION *sess = s->session;
793         if ((s->session == NULL) ||
794             (s->session->ssl_version != s->version) ||
795 #ifdef OPENSSL_NO_TLSEXT
796             !sess->session_id_length ||
797 #else
798             (!sess->session_id_length && !sess->tlsext_tick) ||
799 #endif
800             (s->session->not_resumable))
801         {
802             if (!ssl_get_new_session(s,0))
803                 goto err;
804         }
805         /* else use the pre-loaded session */
806
807         p=s->s3->client_random;
808
809         /* if client_random is initialized, reuse it, we are
810          * required to use same upon reply to HelloVerify */
811         for (i=0;p[i]!='\0' && i<sizeof(s->s3->client_random);i++)
812             ;
813         if (i==sizeof(s->s3->client_random))
814             ssl_fill_hello_random(s, 0, p,
815                                 sizeof(s->s3->client_random));
816
817         /* Do the message type and length last */
818         d=p= &(buf[DTLS1_HM_HEADER_LENGTH]);
819
820         *(p++)=s->version>>8;
821         *(p++)=s->version&0xff;
822         s->client_version=s->version;
823
824         /* Random stuff */
825         memcpy(p,s->s3->client_random,SSL3_RANDOM_SIZE);
826         p+=SSL3_RANDOM_SIZE;
827
828         /* Session ID */
829         if (s->new_session)
830             i=0;
831         else
832             i=s->session->session_id_length;
833         *(p++)=i;
834         if (i != 0)
835         {
836             if (i > sizeof s->session->session_id)
837             {
838                 SSLerr(SSL_F_DTLS1_CLIENT_HELLO, ERR_R_INTERNAL_
839                     goto err;
840             }
841             memcpy(p,s->session->session_id,i);
842             p+=i;
843         }
844
845         /* cookie stuff */
846         if (s->d1->cookie_len > sizeof(s->d1->cookie))
847         {
848             SSLerr(SSL_F_DTLS1_CLIENT_HELLO, ERR_R_INTERNAL_ERROR);
849             goto err;
850         }
851         *(p++) = s->d1->cookie_len;
852         memcpy(p, s->d1->cookie, s->d1->cookie_len);
853         p += s->d1->cookie_len;

```

```

855         /* Ciphers supported */
856         i=ssl_cipher_list_to_bytes(s,SSL_get_ciphers(s),&(p[2]),0);
857         if (i == 0)
858         {
859             SSLerr(SSL_F_DTLS1_CLIENT_HELLO,SSL_R_NO_CIPHERS_AVAILAB
860                 goto err;
861         }
862         s2n(i,p);
863         p+=i;
864
865         /* COMPRESSION */
866         if (s->ctx->comp_methods == NULL)
867             j=0;
868         else
869             j=sk_SSL_COMP_num(s->ctx->comp_methods);
870         *(p++)=1+j;
871         for (i=0; i<j; i++)
872         {
873             comp=sk_SSL_COMP_value(s->ctx->comp_methods,i);
874             *(p++)=comp->id;
875         }
876         *(p++)=0; /* Add the NULL method */
877
878 #ifndef OPENSSL_NO_TLSEXT
879         if ((p = ssl_add_clienthello_tlsext(s, p, buf+SSL3_RT_MAX_PLAIN_
880             {
881                 SSLerr(SSL_F_DTLS1_CLIENT_HELLO,ERR_R_INTERNAL_ERROR);
882                 goto err;
883             }
884 #endif
885
886         l=(p-d);
887         d=buf;
888
889         d = dtls1_set_message_header(s, d, SSL3_MT_CLIENT_HELLO, l, 0, l
890
891         s->state=SSL3_ST_CW_CLNT_HELLO_B;
892         /* number of bytes to write */
893         s->init_num=p-buf;
894         s->init_off=0;
895
896         /* buffer the message to handle re-xmits */
897         dtls1_buffer_message(s, 0);
898     }
899
900     /* SSL3_ST_CW_CLNT_HELLO_B */
901     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
902 err:
903     return(-1);
904 }
905
906 static int dtls1_get_hello_verify(SSL *s)
907 {
908     int n, al, ok = 0;
909     unsigned char *data;
910     unsigned int cookie_len;
911
912     n=s->method->ssl_get_message(s,
913         DTLS1_ST_CR_HELLO_VERIFY_REQUEST_A,
914         DTLS1_ST_CR_HELLO_VERIFY_REQUEST_B,
915         -1,
916         s->max_cert_list,
917         &ok);
918
919     if (!ok) return((int)n);

```

```

921     if (s->s3->tmp.message_type != DTLS1_MT_HELLO_VERIFY_REQUEST)
922     {
923         s->d1->send_cookie = 0;
924         s->s3->tmp.reuse_message=1;
925         return(1);
926     }

928     data = (unsigned char *)s->init_msg;

930     if ((data[0] != (s->version>>8)) || (data[1] != (s->version&0xff)))
931     {
932         SSLerr(SSL_F_DTLS1_GET_HELLO_VERIFY,SSL_R_WRONG_SSL_VERSION);
933         s->version=(s->version&0xff00)|data[1];
934         al = SSL_AD_PROTOCOL_VERSION;
935         goto f_err;
936     }
937     data+=2;

939     cookie_len = *(data++);
940     if ( cookie_len > sizeof(s->d1->cookie))
941     {
942         al=SSL_AD_ILLEGAL_PARAMETER;
943         goto f_err;
944     }

946     memcpy(s->d1->cookie, data, cookie_len);
947     s->d1->cookie_len = cookie_len;

949     s->d1->send_cookie = 1;
950     return 1;

952 f_err:
953     ssl3_send_alert(s, SSL3_AL_FATAL, al);
954     return -1;
955 }

957 int dtls1_send_client_key_exchange(SSL *s)
958 {
959     unsigned char *p,*d;
960     int n;
961     unsigned long alg_k;
962 #ifndef OPENSSL_NO_RSA
963     unsigned char *q;
964     EVP_PKEY *pkey=NULL;
965 #endif
966 #ifndef OPENSSL_NO_KRB5
967     KSSL_ERR kssl_err;
968 #endif /* OPENSSL_NO_KRB5 */
969 #ifndef OPENSSL_NO_ECDH
970     EC_KEY *clnt_ecdh = NULL;
971     const EC_POINT *srvr_ecpoint = NULL;
972     EVP_PKEY *srvr_pub_pkey = NULL;
973     unsigned char *encodedPoint = NULL;
974     int encoded_pt_len = 0;
975     BN_CTX *bn_ctx = NULL;
976 #endif

978     if (s->state == SSL3_ST_CW_KEY_EXCH_A)
979     {
980         d=(unsigned char *)s->init_buf->data;
981         p= &(d[DTLS1_HM_HEADER_LENGTH]);
982
983         alg_k=s->s3->tmp.new_cipher->algorithm_mkey;

985         /* Fool emacs indentation */

```

```

986         if (0) {}
987 #ifndef OPENSSL_NO_RSA
988         else if (alg_k & SSL_kRSA)
989         {
990             RSA *rsa;
991             unsigned char tmp_buf[SSL_MAX_MASTER_KEY_LENGTH];

993             if (s->session->sess_cert->peer_rsa_tmp != NULL)
994                 rsa=s->session->sess_cert->peer_rsa_tmp;
995             else
996             {
997                 pkey=X509_get_pubkey(s->session->sess_cert->peer
998                 if ((pkey == NULL) ||
999                     (pkey->type != EVP_PKEY_RSA) ||
1000                     (pkey->pkey.rsa == NULL))
1001                 {
1002                     SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHA
1003                     goto err;
1004                 }
1005                 rsa=pkey->pkey.rsa;
1006                 EVP_PKEY_free(pkey);
1007             }

1009             tmp_buf[0]=s->client_version>>8;
1010             tmp_buf[1]=s->client_version&0xff;
1011             if (RAND_bytes(&(tmp_buf[2]),sizeof tmp_buf-2) <= 0)
1012                 goto err;

1014             s->session->master_key_length=sizeof tmp_buf;

1016             q=p;
1017             /* Fix buf for TLS and [incidentally] DTLS */
1018             if (s->version > SSL3_VERSION)
1019                 p+=2;
1020             n=RSA_public_encrypt(sizeof tmp_buf,
1021                                 tmp_buf,p,rsa,RSA_PKCS1_PADDING);
1022 #ifdef PKCS1_CHECK
1023             if (s->options & SSL_OP_PKCS1_CHECK_1) p[1]++;
1024             if (s->options & SSL_OP_PKCS1_CHECK_2) tmp_buf[0]=0x70;
1025 #endif
1026             if (n <= 0)
1027             {
1028                 SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,SSL
1029                 goto err;
1030             }

1032             /* Fix buf for TLS and [incidentally] DTLS */
1033             if (s->version > SSL3_VERSION)
1034             {
1035                 s2n(n,q);
1036                 n+=2;
1037             }

1039             s->session->master_key_length=
1040             s->method->ssl3_enc->generate_master_secret(s,
1041             s->session->master_key,
1042             tmp_buf,sizeof tmp_buf);
1043             OPENSSL_cleanse(tmp_buf,sizeof tmp_buf);
1044         }
1045 #endif
1046 #ifndef OPENSSL_NO_KRB5
1047         else if (alg_k & SSL_kKRB5)
1048         {
1049             krb5_error_code krb5rc;
1050             KSSL_CTX *kssl_ctx = s->kssl_ctx;
1051             /* krb5_data krb5_ap_req; */

```

```

1052         krb5_data      *enc_ticket;
1053         krb5_data      authenticator, *authp = NULL;
1054         EVP_CIPHER_CTX ciph_ctx;
1055         const EVP_CIPHER *enc = NULL;
1056         unsigned char   iv[EVP_MAX_IV_LENGTH];
1057         unsigned char   tmp_buf[SSL_MAX_MASTER_KEY_LENGTH];
1058         unsigned char   epms[SSL_MAX_MASTER_KEY_LENGTH
1059                             + EVP_MAX_IV_LENGTH];
1060         int              padl, outl = sizeof(epms);

1062         EVP_CIPHER_CTX_init(&ciph_ctx);

1064 #ifdef KSSL_DEBUG
1065         printf("ssl3_send_client_key_exchange(%lx & %lx)\n",
1066                alg_k, SSL_KKRB5);
1067 #endif /* KSSL_DEBUG */

1069         authp = NULL;
1070 #ifdef KRB5SENDAUTH
1071         if (KRB5SENDAUTH) authp = &authenticator;
1072 #endif /* KRB5SENDAUTH */

1074         krb5rc = kssl_cget_tkt(kssl_ctx, &enc_ticket, authp,
1075                                &kssl_err);
1076         enc = kssl_map_enc(kssl_ctx->enc_type);
1077         if (enc == NULL)
1078             goto err;
1079 #ifdef KSSL_DEBUG
1080         {
1081             printf("kssl_cget_tkt rtn %d\n", krb5rc);
1082             if (krb5rc && kssl_err.text)
1083                 printf("kssl_cget_tkt kssl_err=%s\n", kssl_err.text);
1084         }
1085 #endif /* KSSL_DEBUG */

1087         if (krb5rc)
1088         {
1089             ssl3_send_alert(s, SSL3_AL_FATAL,
1090                            SSL_AD_HANDSHAKE_FAILURE);
1091             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1092                   kssl_err.reason);
1093             goto err;
1094         }

1096         /* 20010406 VRS - Earlier versions used KRB5_AP_REQ
1097         ** in place of RFC 2712 KerberosWrapper, as in:
1098         **
1099         ** Send ticket (copy to *p, set n = length)
1100         ** n = krb5_ap_req.length;
1101         ** memcpy(p, krb5_ap_req.data, krb5_ap_req.length);
1102         ** if (krb5_ap_req.data)
1103         **     kssl_krb5_free_data_contents(NULL, &krb5_ap_req);
1104         **
1105         ** Now using real RFC 2712 KerberosWrapper
1106         ** (Thanks to Simon Wilkinson <sxw@sxw.org.uk>)
1107         ** Note: 2712 "opaque" types are here replaced
1108         ** with a 2-byte length followed by the value.
1109         ** Example:
1110         ** KerberosWrapper= xx xx asn1ticket 0 0 xx xx encpms
1111         ** where "xx xx" = length bytes. Shown here with
1112         ** optional authenticator omitted.
1113         */

1115         /* KerberosWrapper.Ticket */
1116         s2n(enc_ticket->length, p);
1117         memcpy(p, enc_ticket->data, enc_ticket->length);

```

```

1118         p+= enc_ticket->length;
1119         n = enc_ticket->length + 2;

1121         /* KerberosWrapper.Authenticator */
1122         if (authp && authp->length)
1123         {
1124             s2n(authp->length, p);
1125             memcpy(p, authp->data, authp->length);
1126             p+= authp->length;
1127             n+= authp->length + 2;

1128             free(authp->data);
1129             authp->data = NULL;
1130             authp->length = 0;
1131         }
1132         else
1133         {
1134             s2n(0, p); /* null authenticator length */
1135             n+=2;
1136         }

1137         if (RAND_bytes(tmp_buf, sizeof tmp_buf) <= 0)
1138             goto err;

1140         /* 20010420 VRS. Tried it this way; failed.
1141         ** EVP_EncryptInit_ex(&ciph_ctx, enc, NULL, NULL);
1142         ** EVP_CIPHER_CTX_set_key_length(&ciph_ctx,
1143         **                               kssl_ctx->length);
1144         ** EVP_EncryptInit_ex(&ciph_ctx, NULL, key, iv);
1145         */

1149         memset(iv, 0, sizeof iv); /* per RFC 1510 */
1150         EVP_EncryptInit_ex(&ciph_ctx, enc, NULL,
1151                            kssl_ctx->key, iv);
1152         EVP_EncryptUpdate(&ciph_ctx, epms, &outl, tmp_buf,
1153                           sizeof tmp_buf);
1154         EVP_EncryptFinal_ex(&ciph_ctx, (epms[outl]), &padl);
1155         outl += padl;
1156         if (outl > (int)sizeof epms)
1157         {
1158             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE, ERR
1159                   );
1160             goto err;
1161         }

1163         EVP_CIPHER_CTX_cleanup(&ciph_ctx);

1164         /* KerberosWrapper.EncryptedPreMasterSecret */
1165         s2n(outl, p);
1166         memcpy(p, epms, outl);
1167         p+=outl;
1168         n+=outl + 2;

1169         s->session->master_key_length=
1170             s->method->ssl3_enc->generate_master_secret(s,
1171                                                         s->session->master_key,
1172                                                         tmp_buf, sizeof tmp_buf);

1174         OPENSSL_cleanse(tmp_buf, sizeof tmp_buf);
1175         OPENSSL_cleanse(epms, outl);
1176     }
1177 #endif
1178 #ifndef OPENSSL_NO_DH
1179         else if (alg_k & (SSL_KEDH|SSL_KDHR|SSL_KDHD))
1180         {
1181             DH *dh_srvr, *dh_clnt;

1183             if (s->session->sess_cert->peer_dh_tmp != NULL)

```

```

1184         dh_srvr=s->session->sess_cert->peer_dh_tmp;
1185     else
1186     {
1187         /* we get them from the cert */
1188         ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_HANDSHAKE
1189             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,SSL_
1190                 goto err;
1191             }
1192
1193         /* generate a new random key */
1194         if ((dh_clnt=DHparams_dup(dh_srvr)) == NULL)
1195         {
1196             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,ERR_
1197                 goto err;
1198             }
1199         if (!DH_generate_key(dh_clnt))
1200         {
1201             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,ERR_
1202                 goto err;
1203             }
1204
1205         /* use the 'p' output buffer for the DH key, but
1206            * make sure to clear it out afterwards */
1207
1208         n=DH_compute_key(p,dh_srvr->pub_key,dh_clnt);
1209
1210         if (n <= 0)
1211         {
1212             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,ERR_
1213                 goto err;
1214             }
1215
1216         /* generate master key from the result */
1217         s->session->master_key_length=
1218             s->method->ssl3_enc->generate_master_secret(s,
1219                 s->session->master_key,p,n);
1220
1221         /* clean up */
1222         memset(p,0,n);
1223
1224         /* send off the data */
1225         n=BN_num_bytes(dh_clnt->pub_key);
1226         s2n(n,p);
1227         BN_bn2bin(dh_clnt->pub_key,p);
1228         n+=2;
1229
1230         DH_free(dh_clnt);
1231
1232         /* perhaps clean things up a bit EAY EAY EAY EAY*/
1233     }
1234 #endif
1235 #ifndef OPENSSL_NO_ECDH
1236     else if (alg_k & (SSL_kECDH|SSL_kECDHr|SSL_kECDHe))
1237     {
1238         const EC_GROUP *srvr_group = NULL;
1239         EC_KEY *tkey;
1240         int ecdh_clnt_cert = 0;
1241         int field_size = 0;
1242
1243         /* Did we send out the client's
1244            * ECDH share for use in premaster
1245            * computation as part of client certificate?
1246            * If so, set ecdh_clnt_cert to 1.
1247            */
1248         if ((alg_k & (SSL_kECDHr|SSL_kECDHe)) && (s->cert != NUL
1249             {
1250                 /* XXX: For now, we do not support client

```

```

1250         * authentication using ECDH certificates.
1251         * To add such support, one needs to add
1252         * code that checks for appropriate
1253         * conditions and sets ecdh_clnt_cert to 1.
1254         * For example, the cert have an ECC
1255         * key on the same curve as the server's
1256         * and the key should be authorized for
1257         * key agreement.
1258         *
1259         * One also needs to add code in ssl3_connect
1260         * to skip sending the certificate verify
1261         * message.
1262         *
1263         * if ((s->cert->key->privatekey != NULL) &&
1264             (s->cert->key->privatekey->type ==
1265              EVP_PKEY_EC) && ...)
1266         * ecdh_clnt_cert = 1;
1267         */
1268     }
1269
1270     if (s->session->sess_cert->peer_ecdh_tmp != NULL)
1271     {
1272         tkey = s->session->sess_cert->peer_ecdh_tmp;
1273     }
1274     else
1275     {
1276         /* Get the Server Public Key from Cert */
1277         srvr_pub_pkey = X509_get_pubkey(s->session-> \
1278             sess_cert->peer_pkeys[SSL_PKEY_ECC].x509);
1279         if ((srvr_pub_pkey == NULL) ||
1280             (srvr_pub_pkey->type != EVP_PKEY_EC) ||
1281             (srvr_pub_pkey->pkey.ec == NULL))
1282         {
1283             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHA
1284                 ERR_R_INTERNAL_ERROR);
1285             goto err;
1286         }
1287
1288         tkey = srvr_pub_pkey->pkey.ec;
1289     }
1290
1291     srvr_group = EC_KEY_get0_group(tkey);
1292     srvr_ecpoint = EC_KEY_get0_public_key(tkey);
1293
1294     if ((srvr_group == NULL) || (srvr_ecpoint == NULL))
1295     {
1296         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1297             ERR_R_INTERNAL_ERROR);
1298         goto err;
1299     }
1300
1301     if ((clnt_ecdh=EC_KEY_new()) == NULL)
1302     {
1303         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,ERR_
1304             goto err;
1305         }
1306
1307     if (!EC_KEY_set_group(clnt_ecdh, srvr_group))
1308     {
1309         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,ERR_
1310             goto err;
1311         }
1312
1313     if (ecdh_clnt_cert)
1314     {
1315         /* Reuse key info from our certificate
1316            * We only need our private key to perform

```



```

1316         * the ECDH computation.
1317         */
1318         const BIGNUM *priv_key;
1319         tkey = s->cert->key->privatekey->pkey.ec;
1320         priv_key = EC_KEY_get0_private_key(tkey);
1321         if (priv_key == NULL)
1322         {
1323             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHA
1324                 goto err;
1325         }
1326         if (!EC_KEY_set_private_key(clnt_ecdh, priv_key)
1327         {
1328             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHA
1329                 goto err;
1330         }
1331     }
1332     else
1333     {
1334         /* Generate a new ECDH key pair */
1335         if (!(EC_KEY_generate_key(clnt_ecdh)))
1336         {
1337             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHA
1338                 goto err;
1339         }
1340     }
1341
1342     /* use the 'p' output buffer for the ECDH key, but
1343     * make sure to clear it out afterwards
1344     */
1345
1346     field_size = EC_GROUP_get_degree(srvr_group);
1347     if (field_size <= 0)
1348     {
1349         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1350             ERR_R_ECDH_LIB);
1351         goto err;
1352     }
1353     n=ECDH_compute_key(p, (field_size+7)/8, srvr_ecpoint, cl
1354     if (n <= 0)
1355     {
1356         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1357             ERR_R_ECDH_LIB);
1358         goto err;
1359     }
1360
1361     /* generate master key from the result */
1362     s->session->master_key_length = s->method->ssl3_enc \
1363     -> generate_master_secret(s,
1364     s->session->master_key,
1365     p, n);
1366
1367     memset(p, 0, n); /* clean up */
1368
1369     if (ecdh_clnt_cert)
1370     {
1371         /* Send empty client key exch message */
1372         n = 0;
1373     }
1374     else
1375     {
1376         /* First check the size of encoding and
1377         * allocate memory accordingly.
1378         */
1379         encoded_pt_len =
1380             EC_POINT_point2oct(srvr_group,
1381                 EC_KEY_get0_public_key(clnt_ecdh),

```

```

1382         POINT_CONVERSION_UNCOMPRESSED,
1383         NULL, 0, NULL);
1384
1385         encodedPoint = (unsigned char *)
1386             OPENSSL_malloc(encoded_pt_len *
1387                 sizeof(unsigned char));
1388         bn_ctx = BN_CTX_new();
1389         if ((encodedPoint == NULL) ||
1390             (bn_ctx == NULL))
1391         {
1392             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHA
1393                 goto err;
1394         }
1395
1396         /* Encode the public key */
1397         n = EC_POINT_point2oct(srvr_group,
1398             EC_KEY_get0_public_key(clnt_ecdh),
1399             POINT_CONVERSION_UNCOMPRESSED,
1400             encodedPoint, encoded_pt_len, bn_ctx);
1401
1402         *p = n; /* length of encoded point */
1403         /* Encoded point will be copied here */
1404         p += 1;
1405         /* copy the point */
1406         memcpy((unsigned char *)p, encodedPoint, n);
1407         /* increment n to account for length field */
1408         n += 1;
1409     }
1410
1411     /* Free allocated memory */
1412     BN_CTX_free(bn_ctx);
1413     if (encodedPoint != NULL) OPENSSL_free(encodedPoint);
1414     if (clnt_ecdh != NULL)
1415         EC_KEY_free(clnt_ecdh);
1416     EVP_PKEY_free(srvr_pub_pkey);
1417 }
1418 #endif /* !OPENSSL_NO_ECDH */
1419
1420 #ifndef OPENSSL_NO_PSK
1421     else if (alg_k & SSL_kPSK)
1422     {
1423         char identity[PSK_MAX_IDENTITY_LEN];
1424         unsigned char *t = NULL;
1425         unsigned char psk_or_pre_ms[PSK_MAX_PSK_LEN*2+4];
1426         unsigned int pre_ms_len = 0, psk_len = 0;
1427         int psk_err = 1;
1428
1429         n = 0;
1430         if (s->psk_client_callback == NULL)
1431         {
1432             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1433                 SSL_R_PSK_NO_CLIENT_CB);
1434             goto err;
1435         }
1436
1437         psk_len = s->psk_client_callback(s, s->ctx->psk_identity
1438             identity, PSK_MAX_IDENTITY_LEN,
1439             psk_or_pre_ms, sizeof(psk_or_pre_ms));
1440         if (psk_len > PSK_MAX_PSK_LEN)
1441         {
1442             SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1443                 ERR_R_INTERNAL_ERROR);
1444             goto psk_err;
1445         }
1446         else if (psk_len == 0)
1447         {

```

```

1448         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1449                SSL_R_PSK_IDENTITY_NOT_FOUND);
1450         goto psk_err;
1451     }

1453     /* create PSK pre_master_secret */
1454     pre_ms_len = 2+psk_len+2+psk_len;
1455     t = psk_or_pre_ms;
1456     memmove(psk_or_pre_ms+psk_len+4, psk_or_pre_ms, psk_len)
1457     s2n(psk_len, t);
1458     memset(t, 0, psk_len);
1459     t+=psk_len;
1460     s2n(psk_len, t);

1462     if (s->session->psk_identity_hint != NULL)
1463         OPENSSL_free(s->session->psk_identity_hint);
1464     s->session->psk_identity_hint = BUF_strdup(s->ctx->psk_i
1465     if (s->ctx->psk_identity_hint != NULL &&
1466         s->session->psk_identity_hint == NULL)
1467     {
1468         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1469                ERR_R_MALLOC_FAILURE);
1470         goto psk_err;
1471     }

1473     if (s->session->psk_identity != NULL)
1474         OPENSSL_free(s->session->psk_identity);
1475     s->session->psk_identity = BUF_strdup(identity);
1476     if (s->session->psk_identity == NULL)
1477     {
1478         SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE,
1479                ERR_R_MALLOC_FAILURE);
1480         goto psk_err;
1481     }

1483     s->session->master_key_length =
1484     s->method->ssl3_enc->generate_master_secret(s,
1485         s->session->master_key,
1486         psk_or_pre_ms, pre_ms_len);
1487     n = strlen(identity);
1488     s2n(n, p);
1489     memcpy(p, identity, n);
1490     n+=2;
1491     psk_err = 0;
1492 psk_err:
1493     OPENSSL_cleanse(identity, PSK_MAX_IDENTITY_LEN);
1494     OPENSSL_cleanse(psk_or_pre_ms, sizeof(psk_or_pre_ms));
1495     if (psk_err != 0)
1496     {
1497         ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_HANDSHAKE
1498         goto err;
1499     }
1500 }
1501 #endif
1502 else
1503 {
1504     ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_HANDSHAKE_FAILURE
1505     SSLerr(SSL_F_DTLS1_SEND_CLIENT_KEY_EXCHANGE, ERR_R_INTER
1506     goto err;
1507 }
1508
1509 d = dtls1_set_message_header(s, d,
1510     SSL3_MT_CLIENT_KEY_EXCHANGE, n, 0, n);
1511 /*
1512 *(d++)=SSL3_MT_CLIENT_KEY_EXCHANGE;
1513 l2n3(n,d);

```

```

1514         l2n(s->d1->handshake_write_seq,d);
1515         s->d1->handshake_write_seq++;
1516         */
1517
1518         s->state=SSL3_ST_CW_KEY_EXCH_B;
1519         /* number of bytes to write */
1520         s->init_num=n+DTLS1_HM_HEADER_LENGTH;
1521         s->init_off=0;

1523         /* buffer the message to handle re-xmits */
1524         dtls1_buffer_message(s, 0);
1525     }
1526
1527     /* SSL3_ST_CW_KEY_EXCH_B */
1528     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
1529 err:
1530 #ifndef OPENSSL_NO_ECDH
1531     BN_CTX_free(bn_ctx);
1532     if (encodedPoint != NULL) OPENSSL_free(encodedPoint);
1533     if (clnt_ecdh != NULL)
1534         EC_KEY_free(clnt_ecdh);
1535     EVP_PKEY_free(srvr_pub_pkey);
1536 #endif
1537     return(-1);
1538 }

1540 int dtls1_send_client_verify(SSL *s)
1541 {
1542     unsigned char *p,*d;
1543     unsigned char data[MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH];
1544     EVP_PKEY *pkey;
1545     #ifndef OPENSSL_NO_RSA
1546     unsigned u=0;
1547     #endif
1548     unsigned long n;
1549     #if !defined(OPENSSL_NO_DSA) || !defined(OPENSSL_NO_ECDSA)
1550     int j;
1551     #endif

1553     if (s->state == SSL3_ST_CW_CERT_VRFY_A)
1554     {
1555         d=(unsigned char *)s->init_buf->data;
1556         p= &(d[DTLS1_HM_HEADER_LENGTH]);
1557         pkey=s->cert->key->privatekey;

1559         s->method->ssl3_enc->cert_verify_mac(s,
1560             NID_sha1,
1561             &(data[MD5_DIGEST_LENGTH]));

1563     #ifndef OPENSSL_NO_RSA
1564         if (pkey->type == EVP_PKEY_RSA)
1565         {
1566             s->method->ssl3_enc->cert_verify_mac(s,
1567                 NID_md5,
1568                 &(data[0]));
1569             if (RSA_sign(NID_md5_sha1, data,
1570                 MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH,
1571                 &(p[2]), &u, pkey->pkey.rsa) <= 0 )
1572             {
1573                 SSLerr(SSL_F_DTLS1_SEND_CLIENT_VERIFY,ERR_R_RSA
1574                 goto err;
1575             }
1576             s2n(u,p);
1577             n=u+2;
1578         }
1579     else

```

```

1580 #endif
1581 #ifndef OPENSSL_NO_DSA
1582     if (pkey->type == EVP_PKEY_DSA)
1583     {
1584         if (!DSA_sign(pkey->save_type,
1585             &(data[MD5_DIGEST_LENGTH]),
1586             SHA_DIGEST_LENGTH,&(p[2]),
1587             (unsigned int *)&j,pkey->pkey.dsa))
1588         {
1589             SSLerr(SSL_F_DTLS1_SEND_CLIENT_VERIFY,ERR_R_DSA);
1590             goto err;
1591         }
1592         s2n(j,p);
1593         n=j+2;
1594     }
1595     else
1596 #endif
1597 #ifndef OPENSSL_NO_ECDSA
1598     if (pkey->type == EVP_PKEY_EC)
1599     {
1600         if (!ECDSA_sign(pkey->save_type,
1601             &(data[MD5_DIGEST_LENGTH]),
1602             SHA_DIGEST_LENGTH,&(p[2]),
1603             (unsigned int *)&j,pkey->pkey.ec))
1604         {
1605             SSLerr(SSL_F_DTLS1_SEND_CLIENT_VERIFY,
1606                 ERR_R_ECDSA_LIB);
1607             goto err;
1608         }
1609         s2n(j,p);
1610         n=j+2;
1611     }
1612     else
1613 #endif
1614     {
1615         SSLerr(SSL_F_DTLS1_SEND_CLIENT_VERIFY,ERR_R_INTERNAL_ERR);
1616         goto err;
1617     }
1618
1619     d = dtls1_set_message_header(s, d,
1620         SSL3_MT_CERTIFICATE_VERIFY, n, 0, n);
1621
1622     s->init_num=(int)n+DTLS1_HM_HEADER_LENGTH;
1623     s->init_off=0;
1624
1625     /* buffer the message to handle re-xmits */
1626     dtls1_buffer_message(s, 0);
1627
1628     s->state = SSL3_ST_CW_CERT_VRFY_B;
1629 }
1630
1631 /* s->state = SSL3_ST_CW_CERT_VRFY_B */
1632 return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
1633 err:
1634     return(-1);
1635 }
1636
1637 int dtls1_send_client_certificate(SSL *s)
1638 {
1639     X509 *x509=NULL;
1640     EVP_PKEY *pkey=NULL;
1641     int i;
1642     unsigned long l;
1643
1644     if (s->state == SSL3_ST_CW_CERT_A)
1645     {

```

```

1646         if ((s->cert == NULL) ||
1647             (s->cert->key->x509 == NULL) ||
1648             (s->cert->key->privatekey == NULL))
1649             s->state=SSL3_ST_CW_CERT_B;
1650         else
1651             s->state=SSL3_ST_CW_CERT_C;
1652     }
1653
1654     /* We need to get a client cert */
1655     if (s->state == SSL3_ST_CW_CERT_B)
1656     {
1657         /* If we get an error, we need to
1658          * ssl->rwstate=SSL_X509_LOOKUP; return(-1);
1659          * We then get retied later */
1660         i=0;
1661         i = ssl_do_client_cert_cb(s, &x509, &pkey);
1662         if (i < 0)
1663         {
1664             s->rwstate=SSL_X509_LOOKUP;
1665             return(-1);
1666         }
1667         s->rwstate=SSL_NOTHING;
1668         if ((i == 1) && (pkey != NULL) && (x509 != NULL))
1669         {
1670             s->state=SSL3_ST_CW_CERT_B;
1671             if (!SSL_use_certificate(s,x509) ||
1672                 !SSL_use_PrivateKey(s,pkey))
1673                 i=0;
1674         }
1675         else if (i == 1)
1676         {
1677             i=0;
1678             SSLerr(SSL_F_DTLS1_SEND_CLIENT_CERTIFICATE,SSL_R_BAD_DAT);
1679         }
1680
1681         if (x509 != NULL) X509_free(x509);
1682         if (pkey != NULL) EVP_PKEY_free(pkey);
1683         if (i == 0)
1684         {
1685             if (s->version == SSL3_VERSION)
1686             {
1687                 s->s3->tmp.cert_req=0;
1688                 ssl3_send_alert(s,SSL3_AL_WARNING,SSL_AD_NO_CERT);
1689                 return(1);
1690             }
1691             else
1692             {
1693                 s->s3->tmp.cert_req=2;
1694             }
1695         }
1696     }
1697
1698     /* Ok, we have a cert */
1699     s->state=SSL3_ST_CW_CERT_C;
1700 }
1701
1702 if (s->state == SSL3_ST_CW_CERT_C)
1703 {
1704     s->state=SSL3_ST_CW_CERT_D;
1705     l=dtls1_output_cert_chain(s,
1706         (s->s3->tmp.cert_req == 2)?NULL:s->cert->key->x509);
1707     s->init_num=(int)l;
1708     s->init_off=0;
1709
1710     /* set header called by dtls1_output_cert_chain() */
1711     /* buffer the message to handle re-xmits */

```

```
1712         dtls1_buffer_message(s, 0);
1713     }
1714     /* SSL3_ST_CW_CERT_D */
1715     return(dtls1_do_write(s, SSL3_RT_HANDSHAKE));
1716 }
```

new/usr/src/lib/openssl/libsunw_ssl/d1_enc.c

1

```
*****
9369 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/d1_enc.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * =====
8  * Copyright (c) 1998-2005 The OpenSSL Project. All rights reserved.
9  *
10 * Redistribution and use in source and binary forms, with or without
11 * modification, are permitted provided that the following conditions
12 * are met:
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48 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
49 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
50 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
51 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
52 * OF THE POSSIBILITY OF SUCH DAMAGE.
53 *
54 * =====
55 * This product includes cryptographic software written by Eric Young
56 * (eay@cryptsoft.com). This product includes software written by Tim
57 * Hudson (tjh@cryptsoft.com).
58 */
59 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
60  * All rights reserved.
61  */
```

new/usr/src/lib/openssl/libsunw_ssl/d1_enc.c

2

```
62 * This package is an SSL implementation written
63 * by Eric Young (eay@cryptsoft.com).
64 * The implementation was written so as to conform with Netscapes SSL.
65 *
66 * This library is free for commercial and non-commercial use as long as
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68 * apply to all code found in this distribution, be it the RC4, RSA,
69 * lhash, DES, etc., code; not just the SSL code. The SSL documentation
70 * included with this distribution is covered by the same copyright terms
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74 * the code are not to be removed.
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78 * in documentation (online or textual) provided with the package.
79 *
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112 * SUCH DAMAGE.
113 *
114 * The licence and distribution terms for any publically available version or
115 * derivative of this code cannot be changed. i.e. this code cannot simply be
116 * copied and put under another distribution licence
117 * [including the GNU Public Licence.]
118 */
119
120 #include <stdio.h>
121 #include "ssl_locl.h"
122 #ifndef OPENSSL_NO_COMP
123 #include <openssl/comp.h>
124 #endif
125 #include <openssl/evp.h>
126 #include <openssl/hmac.h>
127 #include <openssl/md5.h>
128 #include <openssl/rand.h>
129 #ifndef KSSL_DEBUG
130 #include <openssl/des.h>
131 #endif
```

```

129 /* dtls1_enc encrypts/decrypts the record in |s->wrec| / |s->rrec|, respectively
130 *
131 * Returns:
132 * 0: (in non-constant time) if the record is publically invalid (i.e. too
133 *    short etc).
134 * 1: if the record's padding is valid / the encryption was successful.
135 * -1: if the record's padding/AEAD-authenticator is invalid or, if sending,
136 *    an internal error occurred. */
137 int dtls1_enc(SSL *s, int send)
138 {
139     SSL3_RECORD *rec;
140     EVP_CIPHER_CTX *ds;
141     unsigned long l;
142     int bs,i,j,k,mac_size=0;
143     const EVP_CIPHER *enc;

145     if (send)
146     {
147         if (EVP_MD_CTX_md(s->write_hash))
148         {
149             mac_size=EVP_MD_CTX_size(s->write_hash);
150             if (mac_size < 0)
151                 return -1;
152         }
153         ds=s->enc_write_ctx;
154         rec= &(s->s3->wrec);
155         if (s->enc_write_ctx == NULL)
156             enc=NULL;
157         else
158         {
159             enc=EVP_CIPHER_CTX_cipher(s->enc_write_ctx);
160             if ( rec->data != rec->input)
161                 /* we can't write into the input stream */
162                 fprintf(stderr, "%s:%d: rec->data != rec->input\
163                     _FILE_, _LINE_);
164             else if ( EVP_CIPHER_block_size(ds->cipher) > 1)
165             {
166                 if (RAND_bytes(rec->input, EVP_CIPHER_block_size
167                     return -1;
168             }
169         }
170     }
171     else
172     {
173         if (EVP_MD_CTX_md(s->read_hash))
174         {
175             mac_size=EVP_MD_CTX_size(s->read_hash);
176             OPENSSL_assert(mac_size >= 0);
177         }
178         ds=s->enc_read_ctx;
179         rec= &(s->s3->rrec);
180         if (s->enc_read_ctx == NULL)
181             enc=NULL;
182         else
183             enc=EVP_CIPHER_CTX_cipher(s->enc_read_ctx);
184     }

186 #ifdef KSSL_DEBUG
187     printf("dtls1_enc(%d)\n", send);
188 #endif /* KSSL_DEBUG */

190     if ((s->session == NULL) || (ds == NULL) ||
191         (enc == NULL))
192     {
193         memmove(rec->data, rec->input, rec->length);

```

```

194         rec->input=rec->data;
195     }
196     else
197     {
198         l=rec->length;
199         bs=EVP_CIPHER_block_size(ds->cipher);

201         if ((bs != 1) && send)
202         {
203             i=bs-((int)l%bs);

205             /* Add weird padding of upto 256 bytes */

207             /* we need to add 'i' padding bytes of value j */
208             j=i-1;
209             if (s->options & SSL_OP_TLS_BLOCK_PADDING_BUG)
210             {
211                 if (s->s3->flags & TLS1_FLAGS_TLS_PADDING_BUG)
212                     j++;
213             }
214             for (k=(int)l; k<(int)(l+i); k++)
215                 rec->input[k]=j;
216             l+=i;
217             rec->length+=i;
218         }

220 #ifdef KSSL_DEBUG
221     {
222         unsigned long ui;
223         printf("EVP_Cipher(ds=%p, rec->data=%p, rec->input=%p, l=%ld) ==>\n
224             ds, rec->data, rec->input, l);
225         printf("\tEVP_CIPHER_CTX: %d buf_len, %d key_len [%d %d], %d iv_
226             ds->buf_len, ds->cipher->key_len,
227             DES_KEY_SZ, DES_SCHEDULE_SZ,
228             ds->cipher->iv_len);
229         printf("\t\tIV: ");
230         for (i=0; i<ds->cipher->iv_len; i++) printf("%02X", ds->iv[i]);
231         printf("\n");
232         printf("\tretc->input=");
233         for (ui=0; ui<l; ui++) printf(" %02x", rec->input[ui]);
234         printf("\n");
235     }
236 #endif /* KSSL_DEBUG */

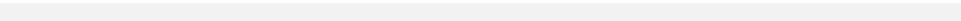
238     if (!send)
239     {
240         if (l == 0 || l%bs != 0)
241             return 0;
242     }

243     EVP_Cipher(ds, rec->data, rec->input, l);

246 #ifdef KSSL_DEBUG
247     {
248         unsigned long i;
249         printf("\tretc->data=");
250         for (i=0; i<l; i++)
251             printf(" %02x", rec->data[i]); printf("\n");
252     }
253 #endif /* KSSL_DEBUG */

255     if ((bs != 1) && !send)
256         return tls1_cbc_remove_padding(s, rec, bs, mac_size);
257     }
258     return(1);
259 }

```



```

*****
12630 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/d1_lib.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * Copyright (c) 1999-2005 The OpenSSL Project. All rights reserved.
8  *
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10 * modification, are permitted provided that the following conditions
11 * are met:
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48 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
49 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
50 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 *
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 */
58
59 #include <stdio.h>
60 #define USE_SOCKETS

```

```

62 #include <openssl/objects.h>
63 #include "ssl_locl.h"

65 #if defined(OPENSSL_SYS_WIN32) || defined(OPENSSL_SYS_VMS)
66 #include <sys/timeb.h>
67 #endif

69 static void get_current_time(struct timeval *t);
70 const char dtls1_version_str[]="DTLSv1" OPENSSL_VERSION_PTEXT;
71 int dtls1_listen(SSL *s, struct sockaddr *client);

73 SSL3_ENC_METHOD DTLSv1_enc_data={
74     dtls1_enc,
75     tls1_mac,
76     tls1_setup_key_block,
77     tls1_generate_master_secret,
78     tls1_change_cipher_state,
79     tls1_final_finish_mac,
80     TLS1_FINISH_MAC_LENGTH,
81     tls1_cert_verify_mac,
82     TLS_MD_CLIENT_FINISH_CONST, TLS_MD_CLIENT_FINISH_CONST_SIZE,
83     TLS_MD_SERVER_FINISH_CONST, TLS_MD_SERVER_FINISH_CONST_SIZE,
84     tls1_alert_code,
85     tls1_export_keying_material,
86 };

88 long dtls1_default_timeout(void)
89 {
90     /* 2 hours, the 24 hours mentioned in the DTLSv1 spec
91      * is way too long for http, the cache would over fill */
92     return(60*60*2);
93 }

95 int dtls1_new(SSL *s)
96 {
97     DTLS1_STATE *d1;

99     if (!ssl3_new(s)) return(0);
100     if ((d1=OPENSSL_malloc(sizeof *d1)) == NULL) return (0);
101     memset(d1,0, sizeof *d1);

103     /* d1->handshake_epoch=0; */

105     d1->unprocessed_rcds.q=pqueue_new();
106     d1->processed_rcds.q=pqueue_new();
107     d1->buffered_messages = pqueue_new();
108     d1->sent_messages=pqueue_new();
109     d1->buffered_app_data.q=pqueue_new();

111     if ( s->server)
112     {
113         d1->cookie_len = sizeof(s->d1->cookie);
114     }

116     if( ! d1->unprocessed_rcds.q || ! d1->processed_rcds.q
117     || ! d1->buffered_messages || ! d1->sent_messages || ! d1->buffered_app_
118     {
119         if ( d1->unprocessed_rcds.q) pqueue_free(d1->unprocessed_rcds.q);
120         if ( d1->processed_rcds.q) pqueue_free(d1->processed_rcds.q);
121         if ( d1->buffered_messages) pqueue_free(d1->buffered_messages);
122         if ( d1->sent_messages) pqueue_free(d1->sent_messages);
123         if ( d1->buffered_app_data.q) pqueue_free(d1->buffered_app_data.
124         OPENSSL_free(d1);
125         return (0);
126     }

```



```

128     s->d1=d1;
129     s->method->ssl_clear(s);
130     return(1);
131 }

133 static void dtls1_clear_queues(SSL *s)
134 {
135     pitem *item = NULL;
136     hm_fragment *frag = NULL;
137     DTLS1_RECORD_DATA *rdata;

139     while( (item = pqueue_pop(s->d1->unprocessed_rcds.q)) != NULL)
140     {
141         rdata = (DTLS1_RECORD_DATA *) item->data;
142         if (rdata->rbuf.buf)
143         {
144             OPENSSL_free(rdata->rbuf.buf);
145         }
146         OPENSSL_free(item->data);
147         pitem_free(item);
148     }

150     while( (item = pqueue_pop(s->d1->processed_rcds.q)) != NULL)
151     {
152         rdata = (DTLS1_RECORD_DATA *) item->data;
153         if (rdata->rbuf.buf)
154         {
155             OPENSSL_free(rdata->rbuf.buf);
156         }
157         OPENSSL_free(item->data);
158         pitem_free(item);
159     }

161     while( (item = pqueue_pop(s->d1->buffered_messages)) != NULL)
162     {
163         frag = (hm_fragment *)item->data;
164         OPENSSL_free(frag->fragment);
165         OPENSSL_free(frag);
166         pitem_free(item);
167     }

169     while ( (item = pqueue_pop(s->d1->sent_messages)) != NULL)
170     {
171         frag = (hm_fragment *)item->data;
172         OPENSSL_free(frag->fragment);
173         OPENSSL_free(frag);
174         pitem_free(item);
175     }

177     while ( (item = pqueue_pop(s->d1->buffered_app_data.q)) != NULL)
178     {
179         frag = (hm_fragment *)item->data;
180         OPENSSL_free(frag->fragment);
181         OPENSSL_free(frag);
182         pitem_free(item);
183     }
184 }

186 void dtls1_free(SSL *s)
187 {
188     ssl3_free(s);

190     dtls1_clear_queues(s);

192     pqueue_free(s->d1->unprocessed_rcds.q);
193     pqueue_free(s->d1->processed_rcds.q);

```

```

194     pqueue_free(s->d1->buffered_messages);
195     pqueue_free(s->d1->sent_messages);
196     pqueue_free(s->d1->buffered_app_data.q);

198     OPENSSL_free(s->d1);
199     s->d1 = NULL;
200 }

202 void dtls1_clear(SSL *s)
203 {
204     pqueue unprocessed_rcds;
205     pqueue processed_rcds;
206     pqueue buffered_messages;
207     pqueue sent_messages;
208     pqueue buffered_app_data;
209     unsigned int mtu;

211     if (s->d1)
212     {
213         unprocessed_rcds = s->d1->unprocessed_rcds.q;
214         processed_rcds = s->d1->processed_rcds.q;
215         buffered_messages = s->d1->buffered_messages;
216         sent_messages = s->d1->sent_messages;
217         buffered_app_data = s->d1->buffered_app_data.q;
218         mtu = s->d1->mtu;

220         dtls1_clear_queues(s);

222         memset(s->d1, 0, sizeof(*(s->d1)));

224         if (s->server)
225         {
226             s->d1->cookie_len = sizeof(s->d1->cookie);
227         }

229         if (SSL_get_options(s) & SSL_OP_NO_QUERY_MTU)
230         {
231             s->d1->mtu = mtu;
232         }

234         s->d1->unprocessed_rcds.q = unprocessed_rcds;
235         s->d1->processed_rcds.q = processed_rcds;
236         s->d1->buffered_messages = buffered_messages;
237         s->d1->sent_messages = sent_messages;
238         s->d1->buffered_app_data.q = buffered_app_data;
239     }

241     ssl3_clear(s);
242     if (s->options & SSL_OP_CISCO_ANYCONNECT)
243         s->version=DTLS1_BAD_VER;
244     else
245         s->version=DTLS1_VERSION;
246 }

248 long dtls1_ctrl(SSL *s, int cmd, long larg, void *parg)
249 {
250     int ret=0;

252     switch (cmd)
253     {
254     case DTLS_CTRL_GET_TIMEOUT:
255         if (dtls1_get_timeout(s, (struct timeval*) parg) != NULL)
256         {
257             ret = 1;
258         }
259         break;

```

```

260     case DTLS_CTRL_HANDLE_TIMEOUT:
261         ret = dtls1_handle_timeout(s);
262         break;
263     case DTLS_CTRL_LISTEN:
264         ret = dtls1_listen(s, parg);
265         break;
266
267     default:
268         ret = ssl3_ctrl(s, cmd, larg, parg);
269         break;
270     }
271     return(ret);
272 }
273
274 /*
275  * As it's impossible to use stream ciphers in "datagram" mode, this
276  * simple filter is designed to disengage them in DTLS. Unfortunately
277  * there is no universal way to identify stream SSL_CIPHER, so we have
278  * to explicitly list their SSL_* codes. Currently RC4 is the only one
279  * available, but if new ones emerge, they will have to be added...
280  */
281 const SSL_CIPHER *dtls1_get_cipher(unsigned int u)
282 {
283     const SSL_CIPHER *ciph = ssl3_get_cipher(u);
284
285     if (ciph != NULL)
286     {
287         if (ciph->algorithm_enc == SSL_RC4)
288             return NULL;
289     }
290
291     return ciph;
292 }
293
294 void dtls1_start_timer(SSL *s)
295 {
296     #ifndef OPENSSL_NO_SCTP
297     /* Disable timer for SCTP */
298     if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
299     {
300         memset(&(s->d1->next_timeout), 0, sizeof(struct timeval));
301         return;
302     }
303     #endif
304
305     /* If timer is not set, initialize duration with 1 second */
306     if (s->d1->next_timeout.tv_sec == 0 && s->d1->next_timeout.tv_usec == 0)
307     {
308         s->d1->timeout_duration = 1;
309     }
310
311     /* Set timeout to current time */
312     get_current_time(&(s->d1->next_timeout));
313
314     /* Add duration to current time */
315     s->d1->next_timeout.tv_sec += s->d1->timeout_duration;
316     BIO_ctrl(SSL_get_rbio(s), BIO_CTRL_DGRAM_SET_NEXT_TIMEOUT, 0, &(s->d1->n
317
318
319 struct timeval* dtls1_get_timeout(SSL *s, struct timeval* timeleft)
320 {
321     struct timeval timenow;
322
323     /* If no timeout is set, just return NULL */
324     if (s->d1->next_timeout.tv_sec == 0 && s->d1->next_timeout.tv_usec == 0)
325     {

```

```

326         return NULL;
327     }
328
329     /* Get current time */
330     get_current_time(&timenow);
331
332     /* If timer already expired, set remaining time to 0 */
333     if (s->d1->next_timeout.tv_sec < timenow.tv_sec ||
334         (s->d1->next_timeout.tv_sec == timenow.tv_sec &&
335          s->d1->next_timeout.tv_usec <= timenow.tv_usec))
336     {
337         memset(timeleft, 0, sizeof(struct timeval));
338         return timeleft;
339     }
340
341     /* Calculate time left until timer expires */
342     memcpy(timeleft, &(s->d1->next_timeout), sizeof(struct timeval));
343     timeleft->tv_sec -= timenow.tv_sec;
344     timeleft->tv_usec -= timenow.tv_usec;
345     if (timeleft->tv_usec < 0)
346     {
347         timeleft->tv_sec--;
348         timeleft->tv_usec += 1000000;
349     }
350
351     /* If remaining time is less than 15 ms, set it to 0
352     * to prevent issues because of small divergences with
353     * socket timeouts.
354     */
355     if (timeleft->tv_sec == 0 && timeleft->tv_usec < 15000)
356     {
357         memset(timeleft, 0, sizeof(struct timeval));
358     }
359
360     return timeleft;
361 }
362
363 int dtls1_is_timer_expired(SSL *s)
364 {
365     struct timeval timeleft;
366
367     /* Get time left until timeout, return false if no timer running */
368     if (dtls1_get_timeout(s, &timeleft) == NULL)
369     {
370         return 0;
371     }
372
373     /* Return false if timer is not expired yet */
374     if (timeleft.tv_sec > 0 || timeleft.tv_usec > 0)
375     {
376         return 0;
377     }
378
379     /* Timer expired, so return true */
380     return 1;
381 }
382
383 void dtls1_double_timeout(SSL *s)
384 {
385     s->d1->timeout_duration *= 2;
386     if (s->d1->timeout_duration > 60)
387         s->d1->timeout_duration = 60;
388     dtls1_start_timer(s);
389 }

```

```

392 void dtls1_stop_timer(SSL *s)
393 {
394     /* Reset everything */
395     memset(&(s->d1->timeout), 0, sizeof(struct dtls1_timeout_st));
396     memset(&(s->d1->next_timeout), 0, sizeof(struct timeval));
397     s->d1->timeout_duration = 1;
398     BIO_ctrl(SSL_get_rbio(s), BIO_CTRL_DGRAM_SET_NEXT_TIMEOUT, 0, &(s->d1->n
399     /* Clear retransmission buffer */
400     dtls1_clear_record_buffer(s);
401 }

403 int dtls1_check_timeout_num(SSL *s)
404 {
405     s->d1->timeout.num_alerts++;

407     /* Reduce MTU after 2 unsuccessful retransmissions */
408     if (s->d1->timeout.num_alerts > 2)
409     {
410         s->d1->mtu = BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_GET_FALLBA
411     }

413     if (s->d1->timeout.num_alerts > DTLS1_TMO_ALERT_COUNT)
414     {
415         /* fail the connection, enough alerts have been sent */
416         SSLerr(SSL_F_DTLS1_CHECK_TIMEOUT_NUM, SSL_R_READ_TIMEOUT_EXPIRED)
417         return -1;
418     }

420     return 0;
421 }

423 int dtls1_handle_timeout(SSL *s)
424 {
425     /* if no timer is expired, don't do anything */
426     if (!dtls1_is_timer_expired(s))
427     {
428         return 0;
429     }

431     dtls1_double_timeout(s);

433     if (dtls1_check_timeout_num(s) < 0)
434         return -1;

436     s->d1->timeout.read_timeouts++;
437     if (s->d1->timeout.read_timeouts > DTLS1_TMO_READ_COUNT)
438     {
439         s->d1->timeout.read_timeouts = 1;
440     }

442 #ifndef OPENSSL_NO_HEARTBEATS
443     if (s->tlsext_hb_pending)
444     {
445         s->tlsext_hb_pending = 0;
446         return dtls1_heartbeat(s);
447     }
448 #endif

450     dtls1_start_timer(s);
451     return dtls1_retransmit_buffered_messages(s);
452 }

454 static void get_current_time(struct timeval *t)
455 {
456 #ifdef OPENSSL_SYS_WIN32
457     struct _timeb tb;

```

```

458     _ftime(&tb);
459     t->tv_sec = (long)tb.time;
460     t->tv_usec = (long)tb.millitm * 1000;
461 #elif defined(OPENSSL_SYS_VMS)
462     struct timeb tb;
463     ftime(&tb);
464     t->tv_sec = (long)tb.time;
465     t->tv_usec = (long)tb.millitm * 1000;
466 #else
467     gettimeofday(t, NULL);
468 #endif
469 }

471 int dtls1_listen(SSL *s, struct sockaddr *client)
472 {
473     int ret;

475     SSL_set_options(s, SSL_OP_COOKIE_EXCHANGE);
476     s->d1->listen = 1;

478     ret = SSL_accept(s);
479     if (ret <= 0) return ret;
480
481     (void) BIO_dgram_get_peer(SSL_get_rbio(s), client);
482     return 1;
483 }

```

new/usr/src/lib/openssl/libsunw_ssl/d1_meth.c

1

```
*****
3132 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_meth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/d1_meth.h */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /* =====
7  * Copyright (c) 1999-2005 The OpenSSL Project. All rights reserved.
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51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 * =====
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */

60 #include <stdio.h>
61 #include <openssl/objects.h>
```

new/usr/src/lib/openssl/libsunw_ssl/d1_meth.c

2

```
62 #include "ssl_locl.h"

64 static const SSL_METHOD *dtls1_get_method(int ver);
65 static const SSL_METHOD *dtls1_get_method(int ver)
66 {
67     if (ver == DTLS1_VERSION)
68         return(DTLSv1_method());
69     else
70         return(NULL);
71 }

73 IMPLEMENT_dtls1_meth_func(DTLSv1_method,
74                             dtls1_accept,
75                             dtls1_connect,
76                             dtls1_get_method)
```

new/usr/src/lib/openssl/libsunw_ssl/d1_pkt.c

1

```
*****
52612 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_pkt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/d1_pkt.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
7  * Copyright (c) 1998-2005 The OpenSSL Project. All rights reserved.
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10 * modification, are permitted provided that the following conditions
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16 * 2. Redistributions in binary form must reproduce the above copyright
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21 * 3. All advertising materials mentioning features or use of this
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55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */
59 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
60  * All rights reserved.
61  */
```

new/usr/src/lib/openssl/libsunw_ssl/d1_pkt.c

2

```
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63 * by Eric Young (eay@cryptsoft.com).
64 * The implementation was written so as to conform with Netscapes SSL.
65 *
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111 * derivative of this code cannot be changed. i.e. this code cannot simply be
112 * copied and put under another distribution licence
113 * [including the GNU Public Licence.]
114 */
115
116 #include <stdio.h>
117 #include <errno.h>
118 #define USE_SOCKETS
119 #include "ssl_loc1.h"
120 #include <openssl/evp.h>
121 #include <openssl/buffer.h>
122 #include <openssl/pqueue.h>
123 #include <openssl/rand.h>
124
125 /* mod 128 saturating subtract of two 64-bit values in big-endian order */
126 static int satsub64be(const unsigned char *v1,const unsigned char *v2)
127 {
128     int ret,sat,brw,i;
```

```

129     if (sizeof(long) == 8) do
130     {
131         const union { long one; char little; } is_endian = {1};
132         long l;

133         if (is_endian.little)                break;
134         /* not reached on little-endians */
135         /* following test is redundant, because input is
136          * always aligned, but I take no chances... */
137         if (((size_t)v1|(size_t)v2)&0x7)      break;

138
139         l = *((long *)v1);
140         l -= *((long *)v2);
141         if (l>128)                return 128;
142         else if (l<-128)          return -128;
143         else                      return (int)l;
144     } while (0);

145
146     ret = (int)v1[7]-(int)v2[7];
147     sat = 0;
148     brw = ret>>8; /* brw is either 0 or -1 */
149     if (ret & 0x80)
150     {
151         for (i=6;i>=0;i--)
152         {
153             brw += (int)v1[i]-(int)v2[i];
154             sat |= ~brw;
155             brw >>= 8;
156         }
157     }
158     else
159     {
160         for (i=6;i>=0;i--)
161         {
162             brw += (int)v1[i]-(int)v2[i];
163             sat |= brw;
164             brw >>= 8;
165         }
166     }
167     brw <= 8; /* brw is either 0 or -256 */

168
169     if (sat&0xff) return brw | 0x80;
170     else         return brw + (ret&0xFF);
171 }

172 static int have_handshake_fragment(SSL *s, int type, unsigned char *buf,
173 int len, int peek);
174 static int dtls1_record_replay_check(SSL *s, DTLS1_BITMAP *bitmap);
175 static void dtls1_record_bitmap_update(SSL *s, DTLS1_BITMAP *bitmap);
176 static DTLS1_BITMAP *dtls1_get_bitmap(SSL *s, SSL3_RECORD *rr,
177 unsigned int *is_next_epoch);
178 #if 0
179 static int dtls1_record_needs_buffering(SSL *s, SSL3_RECORD *rr,
180 unsigned short *priority, unsigned long *offset);
181 #endif
182 static int dtls1_buffer_record(SSL *s, record_pqueue *q,
183 unsigned char *priority);
184 static int dtls1_process_record(SSL *s);

185 /* copy buffered record into SSL structure */
186 static int
187 dtls1_copy_record(SSL *s, pitem *item)
188 {
189     DTLS1_RECORD_DATA *rdata;

190     rdata = (DTLS1_RECORD_DATA *)item->data;

191     if (s->s3->rbuf.buf != NULL)
192         OPENSSL_free(s->s3->rbuf.buf);
193 
```

```

194     s->packet = rdata->packet;
195     s->packet_length = rdata->packet_length;
196     memcpy(&(s->s3->rbuf), &(rdata->rbuf), sizeof(SSL3_BUFFER));
197     memcpy(&(s->s3->rrec), &(rdata->rrec), sizeof(SSL3_RECORD));
198
199     /* Set proper sequence number for mac calculation */
200     memcpy(&(s->s3->read_sequence[2]), &(rdata->packet[5]), 6);
201
202     return(1);
203 }

204
205 static int
206 dtls1_buffer_record(SSL *s, record_pqueue *queue, unsigned char *priority)
207 {
208     DTLS1_RECORD_DATA *rdata;
209     pitem *item;

210
211     /* Limit the size of the queue to prevent DOS attacks */
212     if (pqueue_size(queue->q) >= 100)
213         return 0;

214
215     rdata = OPENSSL_malloc(sizeof(DTLS1_RECORD_DATA));
216     item = pitem_new(priority, rdata);
217     if (rdata == NULL || item == NULL)
218     {
219         if (rdata != NULL) OPENSSL_free(rdata);
220         if (item != NULL) pitem_free(item);
221
222         SSLerr(SSL_F_DTLS1_BUFFER_RECORD, ERR_R_INTERNAL_ERROR);
223         return(0);
224     }

225
226     rdata->packet = s->packet;
227     rdata->packet_length = s->packet_length;
228     memcpy(&(rdata->rbuf), &(s->s3->rbuf), sizeof(SSL3_BUFFER));
229     memcpy(&(rdata->rrec), &(s->s3->rrec), sizeof(SSL3_RECORD));

230
231     item->data = rdata;

232
233 #ifndef OPENSSL_NO_SCTP
234     /* Store bio_dgram_sctp_rcvinfo struct */
235     if (BIO_dgram_is_sctp(SSL_get_rbio(s)) &&
236         (s->state == SSL3_ST_SR_FINISHED_A || s->state == SSL3_ST_CR_FINISHE
237         BIO_ctrl(SSL_get_rbio(s), BIO_CTRL_DGRAM_SCTP_GET_RCVINFO, sizeof
238     )
239 #endif

240
241     /* insert should not fail, since duplicates are dropped */
242     if (pqueue_insert(queue->q, item) == NULL)
243     {
244         OPENSSL_free(rdata);
245         pitem_free(item);
246         return(0);
247     }

248
249     s->packet = NULL;
250     s->packet_length = 0;
251     memset(&(s->s3->rbuf), 0, sizeof(SSL3_BUFFER));
252     memset(&(s->s3->rrec), 0, sizeof(SSL3_RECORD));

253
254     if (!ssl3_setup_buffers(s))
255     {
256         SSLerr(SSL_F_DTLS1_BUFFER_RECORD, ERR_R_INTERNAL_ERROR);
257         OPENSSL_free(rdata);
258         pitem_free(item);
259 
```

```

260         return(0);
261     }
262
263     return(1);
264 }

```

```

267 static int
268 dtls1_retrieve_buffered_record(SSL *s, record_pqueue *queue)
269 {
270     pitem *item;

```

```

272     item = pqueue_pop(queue->q);
273     if (item)
274     {
275         dtls1_copy_record(s, item);

```

```

277         OPENSSL_free(item->data);
278         pitem_free(item);

```

```

280         return(1);
281     }

```

```

283     return(0);
284 }

```

```

287 /* retrieve a buffered record that belongs to the new epoch, i.e., not processed
288 * yet */
289 #define dtls1_get_unprocessed_record(s) \
290     dtls1_retrieve_buffered_record((s), \
291     &((s)->d1->unprocessed_rcds))

```

```

293 /* retrieve a buffered record that belongs to the current epoch, ie, processed */
294 #define dtls1_get_processed_record(s) \
295     dtls1_retrieve_buffered_record((s), \
296     &((s)->d1->processed_rcds))

```

```

298 static int
299 dtls1_process_buffered_records(SSL *s)
300 {
301     pitem *item;
302
303     item = pqueue_peek(s->d1->unprocessed_rcds.q);
304     if (item)
305     {
306         /* Check if epoch is current. */
307         if (s->d1->unprocessed_rcds.epoch != s->d1->r_epoch)
308             return(1); /* Nothing to do. */
309
310         /* Process all the records. */
311         while (pqueue_peek(s->d1->unprocessed_rcds.q))
312         {
313             dtls1_get_unprocessed_record(s);
314             if ( ! dtls1_process_record(s))
315                 return(0);
316             dtls1_buffer_record(s, &(s->d1->processed_rcds),
317                 s->s3->rrec.seq_num);
318         }
319     }

```

```

321     /* sync epoch numbers once all the unprocessed records
322     * have been processed */
323     s->d1->processed_rcds.epoch = s->d1->r_epoch;
324     s->d1->unprocessed_rcds.epoch = s->d1->r_epoch + 1;

```

```

326     return(1);
327 }

```

```

330 #if 0

```

```

332 static int
333 dtls1_get_buffered_record(SSL *s)
334 {
335     pitem *item;
336     PQ_64BIT priority =
337         (((PQ_64BIT)s->d1->handshake_read_seq) << 32) |
338         ((PQ_64BIT)s->d1->r_msg_hdr.frag_off);
339
340     if ( ! SSL_in_init(s)) /* if we're not (re)negotiating,
341                             nothing buffered */
342         return 0;

```

```

345     item = pqueue_peek(s->d1->rcvd_records);
346     if (item && item->priority == priority)
347     {
348         /* Check if we've received the record of interest. It must be
349          * a handshake record, since data records as passed up without
350          * buffering */
351         DTLS1_RECORD_DATA *rdata;
352         item = pqueue_pop(s->d1->rcvd_records);
353         rdata = (DTLS1_RECORD_DATA *)item->data;
354
355         if (s->s3->rbuf.buf != NULL)
356             OPENSSL_free(s->s3->rbuf.buf);
357
358         s->packet = rdata->packet;
359         s->packet_length = rdata->packet_length;
360         memcpy(&(s->s3->rbuf), &(rdata->rbuf), sizeof(SSL3_BUFFER));
361         memcpy(&(s->s3->rrec), &(rdata->rrec), sizeof(SSL3_RECORD));
362
363         OPENSSL_free(item->data);
364         pitem_free(item);
365
366         /* s->d1->next_expected_seq_num++; */
367         return(1);
368     }
369
370     return 0;
371 }

```

```

373 #endif

```

```

375 static int
376 dtls1_process_record(SSL *s)
377 {
378     int i,al;
379     int enc_err;
380     SSL_SESSION *sess;
381     SSL3_RECORD *rr;
382     unsigned int mac_size, orig_len;
383     unsigned char md[EVP_MAX_MD_SIZE];

```

```

385     rr = &(s->s3->rrec);
386     sess = s->session;

```

```

388     /* At this point, s->packet_length == SSL3_RT_HEADER_LENGTH + rr->length,
389     * and we have that many bytes in s->packet
390     */
391     rr->input = &(s->packet[DTLS1_RT_HEADER_LENGTH]);

```

```

393 /* ok, we can now read from 's->packet' data into 'rr'
394 * rr->input points at rr->length bytes, which
395 * need to be copied into rr->data by either
396 * the decryption or by the decompression
397 * When the data is 'copied' into the rr->data buffer,
398 * rr->input will be pointed at the new buffer */

400 /* We now have - encrypted [ MAC [ compressed [ plain ] ] ]
401 * rr->length bytes of encrypted compressed stuff. */

403 /* check is not needed I believe */
404 if (rr->length > SSL3_RT_MAX_ENCRYPTED_LENGTH)
405 {
406     al=SSL_AD_RECORD_OVERFLOW;
407     SSLerr(SSL_F_DTLS1_PROCESS_RECORD,SSL_R_ENCRYPTED_LENGTH_TOO_LONG
408     goto f_err;
409 }

411 /* decrypt in place in 'rr->input' */
412 rr->data=rr->input;

414 enc_err = s->method->ssl3_enc->enc(s,0);
415 /* enc_err is:
416 * 0: (in non-constant time) if the record is publically invalid.
417 * 1: if the padding is valid
418 * -1: if the padding is invalid */
419 if (enc_err == 0)
420 {
421     /* For DTLS we simply ignore bad packets. */
422     rr->length = 0;
423     s->packet_length = 0;
424     goto err;
425 }

427 #ifdef TLS_DEBUG
428 printf("dec %d\n",rr->length);
429 { unsigned int z; for (z=0; z<rr->length; z++) printf("%02X%c",rr->data[z],((z+1
430 printf("\n"));
431 #endif

433 /* r->length is now the compressed data plus mac */
434 if ((sess != NULL) &&
435     (s->enc_read_ctx != NULL) &&
436     (EVP_MD_CTX_md(s->read_hash) != NULL))
437 {
438     /* s->read_hash != NULL => mac_size != -1 */
439     unsigned char *mac = NULL;
440     unsigned char mac_tmp[EVP_MAX_MD_SIZE];
441     mac_size=EVP_MD_CTX_size(s->read_hash);
442     OPENSSL_assert(mac_size <= EVP_MAX_MD_SIZE);

444 /* kludge: *_cbc_remove_padding passes padding length in rr->type
445 orig_len = rr->length+((unsigned int)rr->type>>8);

447 /* orig_len is the length of the record before any padding was
448 * removed. This is public information, as is the MAC in use,
449 * therefore we can safely process the record in a different
450 * amount of time if it's too short to possibly contain a MAC.
451 */
452 if (orig_len < mac_size ||
453     /* CBC records must have a padding length byte too. */
454     (EVP_CIPHER_CTX_mode(s->enc_read_ctx) == EVP_CIPH_CBC_MODE &
455      orig_len < mac_size+1))
456 {
457     al=SSL_AD_DECODE_ERROR;

```

```

458     SSLerr(SSL_F_DTLS1_PROCESS_RECORD,SSL_R_LENGTH_TOO_SHORT
459     goto f_err;
460 }

462 if (EVP_CIPHER_CTX_mode(s->enc_read_ctx) == EVP_CIPH_CBC_MODE)
463 {
464     /* We update the length so that the TLS header bytes
465     * can be constructed correctly but we need to extract
466     * the MAC in constant time from within the record,
467     * without leaking the contents of the padding bytes.
468     */
469     mac = mac_tmp;
470     ssl3_cbc_copy_mac(mac_tmp, rr, mac_size, orig_len);
471     rr->length -= mac_size;
472 }
473 else
474 {
475     /* In this case there's no padding, so |orig_len|
476     * equals |rec->length| and we checked that there's
477     * enough bytes for |mac_size| above. */
478     rr->length -= mac_size;
479     mac = &rr->data[rr->length];
480 }

482 i=s->method->ssl3_enc->mac(s,md,0 /* not send */);
483 if (i < 0 || mac == NULL || CRYPTO_memcmp(md, mac, (size_t)mac_s
484     enc_err = -1;
485 if (rr->length > SSL3_RT_MAX_COMPRESSED_LENGTH+mac_size)
486     enc_err = -1;
487 }

489 if (enc_err < 0)
490 {
491     /* decryption failed, silently discard message */
492     rr->length = 0;
493     s->packet_length = 0;
494     goto err;
495 }

497 /* r->length is now just compressed */
498 if (s->expand != NULL)
499 {
500     if (rr->length > SSL3_RT_MAX_COMPRESSED_LENGTH)
501     {
502         al=SSL_AD_RECORD_OVERFLOW;
503         SSLerr(SSL_F_DTLS1_PROCESS_RECORD,SSL_R_COMPRESSED_LENGTH_T
504         goto f_err;
505     }
506     if (!ssl3_do_uncompress(s))
507     {
508         al=SSL_AD_DECOMPRESSION_FAILURE;
509         SSLerr(SSL_F_DTLS1_PROCESS_RECORD,SSL_R_BAD_DECOMPRESSION
510         goto f_err;
511     }
512 }

514 if (rr->length > SSL3_RT_MAX_PLAIN_LENGTH)
515 {
516     al=SSL_AD_RECORD_OVERFLOW;
517     SSLerr(SSL_F_DTLS1_PROCESS_RECORD,SSL_R_DATA_LENGTH_TOO_LONG);
518     goto f_err;
519 }

521 rr->off=0;
522 /* So at this point the following is true
523 * ssl->s3->rrec.type is the type of record

```



```

524     * ssl->s3->rrec.length == number of bytes in record
525     * ssl->s3->rrec.off  == offset to first valid byte
526     * ssl->s3->rrec.data  == where to take bytes from, increment
527     *                      after use :-).
528     */

530     /* we have pulled in a full packet so zero things */
531     s->packet_length=0;
532     dtls1_record_bitmap_update(s, &(s->d1->bitmap));/* Mark receipt of recor
533     return(1);

535 f_err:
536     ssl3_send_alert(s,SSL3_AL_FATAL,al);
537 err:
538     return(0);
539 }

542 /* Call this to get a new input record.
543  * It will return <= 0 if more data is needed, normally due to an error
544  * or non-blocking IO.
545  * When it finishes, one packet has been decoded and can be found in
546  * ssl->s3->rrec.type      - is the type of record
547  * ssl->s3->rrec.data,      - data
548  * ssl->s3->rrec.length,    - number of bytes
549  */
550 /* used only by dtls1_read_bytes */
551 int dtls1_get_record(SSL *s)
552 {
553     int ssl_major,ssl_minor;
554     int i,n;
555     SSL3_RECORD *rr;
556     unsigned char *p = NULL;
557     unsigned short version;
558     DTLS1_BITMAP *bitmap;
559     unsigned int is_next_epoch;

561     rr= &(s->s3->rrec);

563     /* The epoch may have changed. If so, process all the
564     * pending records. This is a non-blocking operation. */
565     dtls1_process_buffered_records(s);

567     /* if we're renegotiating, then there may be buffered records */
568     if (dtls1_get_processed_record(s))
569         return 1;

571     /* get something from the wire */
572 again:
573     /* check if we have the header */
574     if ( (s->rstate != SSL_ST_READ_BODY) ||
575          (s->packet_length < DTLS1_RT_HEADER_LENGTH))
576     {
577         n=ssl3_read_n(s, DTLS1_RT_HEADER_LENGTH, s->s3->rbuf.len, 0);
578         /* read timeout is handled by dtls1_read_bytes */
579         if (n <= 0) return(n); /* error or non-blocking */

581         /* this packet contained a partial record, dump it */
582         if (s->packet_length != DTLS1_RT_HEADER_LENGTH)
583         {
584             s->packet_length = 0;
585             goto again;
586         }

588         s->rstate=SSL_ST_READ_BODY;

```

```

590         p=s->packet;

592         /* Pull apart the header into the DTLS1_RECORD */
593         rr->type= *(p++);
594         ssl_major= *(p++);
595         ssl_minor= *(p++);
596         version=(ssl_major<<8)|ssl_minor;

598         /* sequence number is 64 bits, with top 2 bytes = epoch */
599         n2s(p,rr->epoch);

601         memcpy(&(s->s3->read_sequence[2]), p, 6);
602         p+=6;

604         n2s(p,rr->length);

606         /* Lets check version */
607         if (!s->first_packet)
608         {
609             if (version != s->version)
610             {
611                 /* unexpected version, silently discard */
612                 rr->length = 0;
613                 s->packet_length = 0;
614                 goto again;
615             }
616         }

618         if ((version & 0xff00) != (s->version & 0xff00))
619         {
620             /* wrong version, silently discard record */
621             rr->length = 0;
622             s->packet_length = 0;
623             goto again;
624         }

626         if (rr->length > SSL3_RT_MAX_ENCRYPTED_LENGTH)
627         {
628             /* record too long, silently discard it */
629             rr->length = 0;
630             s->packet_length = 0;
631             goto again;
632         }

634         /* now s->rstate == SSL_ST_READ_BODY */
635     }

637     /* s->rstate == SSL_ST_READ_BODY, get and decode the data */

639     if (rr->length > s->packet_length-DTLS1_RT_HEADER_LENGTH)
640     {
641         /* now s->packet_length == DTLS1_RT_HEADER_LENGTH */
642         i=rr->length;
643         n=ssl3_read_n(s,i,i,1);
644         if (n <= 0) return(n); /* error or non-blocking io */

646         /* this packet contained a partial record, dump it */
647         if ( n != i)
648         {
649             rr->length = 0;
650             s->packet_length = 0;
651             goto again;
652         }

654         /* now n == rr->length,
655         * and s->packet_length == DTLS1_RT_HEADER_LENGTH + rr->length */

```

```

656     }
657     s->rstate=SSL_ST_READ_HEADER; /* set state for later operations */

659     /* match epochs.  NULL means the packet is dropped on the floor */
660     bitmap = dtls1_get_bitmap(s, rr, &is_next_epoch);
661     if ( bitmap == NULL)
662     {
663         rr->length = 0;
664         s->packet_length = 0; /* dump this record */
665         goto again; /* get another record */
666     }

668 #ifndef OPENSLL_NO_SCTP
669     /* Only do replay check if no SCTP bio */
670     if (!BIO_dgram_is_sctp(SSL_get_rbio(s)))
671     {
672 #endif
673         /* Check whether this is a repeat, or aged record.
674          * Don't check if we're listening and this message is
675          * a ClientHello. They can look as if they're replayed,
676          * since they arrive from different connections and
677          * would be dropped unnecessarily.
678          */
679         if (!(s->d1->listen && rr->type == SSL3_RT_HANDSHAKE &&
680             *p == SSL3_MT_CLIENT_HELLO) &&
681             !dtls1_record_replay_check(s, bitmap))
682         {
683             rr->length = 0;
684             s->packet_length=0; /* dump this record */
685             goto again; /* get another record */
686         }
687 #ifndef OPENSLL_NO_SCTP
688     }
689 #endif

691     /* just read a 0 length packet */
692     if (rr->length == 0) goto again;

694     /* If this record is from the next epoch (either HM or ALERT),
695      * and a handshake is currently in progress, buffer it since it
696      * cannot be processed at this time. However, do not buffer
697      * anything while listening.
698      */
699     if (is_next_epoch)
700     {
701         if ((SSL_in_init(s) || s->in_handshake) && !s->d1->listen)
702         {
703             dtls1_buffer_record(s, &(s->d1->unprocessed_rcds), rr->s
704         }
705         rr->length = 0;
706         s->packet_length = 0;
707         goto again;
708     }

710     if (!dtls1_process_record(s))
711     {
712         rr->length = 0;
713         s->packet_length = 0; /* dump this record */
714         goto again; /* get another record */
715     }

717     return(1);

719 }

721 /* Return up to 'len' payload bytes received in 'type' records.

```

```

722 * 'type' is one of the following:
723 *
724 * - SSL3_RT_HANDSHAKE (when ssl3_get_message calls us)
725 * - SSL3_RT_APPLICATION_DATA (when ssl3_read calls us)
726 * - 0 (during a shutdown, no data has to be returned)
727 *
728 * If we don't have stored data to work from, read a SSL/TLS record first
729 * (possibly multiple records if we still don't have anything to return).
730 *
731 * This function must handle any surprises the peer may have for us, such as
732 * Alert records (e.g. close_notify), ChangeCipherSpec records (not really
733 * a surprise, but handled as if it were), or renegotiation requests.
734 * Also if record payloads contain fragments too small to process, we store
735 * them until there is enough for the respective protocol (the record protocol
736 * may use arbitrary fragmentation and even interleaving):
737 *   Change cipher spec protocol
738 *       just 1 byte needed, no need for keeping anything stored
739 *   Alert protocol
740 *       2 bytes needed (AlertLevel, AlertDescription)
741 *   Handshake protocol
742 *       4 bytes needed (HandshakeType, uint24 length) -- we just have
743 *       to detect unexpected Client Hello and Hello Request messages
744 *       here, anything else is handled by higher layers
745 *   Application data protocol
746 *       none of our business
747 */
748 int dtls1_read_bytes(SSL *s, int type, unsigned char *buf, int len, int peek)
749 {
750     int al,i,j,ret;
751     unsigned int n;
752     SSL3_RECORD *rr;
753     void (*cb)(const SSL *ssl,int type2,int val)=NULL;

755     if (s->s3->rbuf.buf == NULL) /* Not initialized yet */
756         if (!ssl3_setup_buffers(s))
757             return(-1);

759     /* XXX: check what the second '&& type' is about */
760     if ((type && (type != SSL3_RT_APPLICATION_DATA) &&
761         (type != SSL3_RT_HANDSHAKE) && type) ||
762         (peek && (type != SSL3_RT_APPLICATION_DATA)))
763     {
764         SSLerr(SSL_F_DTLS1_READ_BYTES, ERR_R_INTERNAL_ERROR);
765         return -1;
766     }

768     /* check whether there's a handshake message (client hello?) waiting */
769     if ( (ret = have_handshake_fragment(s, type, buf, len, peek)))
770         return ret;

772     /* Now s->d1->handshake_fragment_len == 0 if type == SSL3_RT_HANDSHAKE.

774 #ifndef OPENSLL_NO_SCTP
775     /* Continue handshake if it had to be interrupted to read
776      * app data with SCTP.
777      */
778     if ((!s->in_handshake && SSL_in_init(s)) ||
779         (BIO_dgram_is_sctp(SSL_get_rbio(s)) &&
780          (s->state == DTLS1_SCTP_ST_SR_READ_SOCKET || s->state == DTLS1_SCTP_S
781           s->s3->in_read_app_data != 2)))
782     #else
783     if (!s->in_handshake && SSL_in_init(s))
784 #endif
785     {
786         /* type == SSL3_RT_APPLICATION_DATA */
787         i=s->handshake_func(s);

```

```

788         if (i < 0) return(i);
789         if (i == 0)
790             {
791                 SSLerr(SSL_F_DTLS1_READ_BYTES, SSL_R_SSL_HANDSHAKE_FAILURE
792                     return(-1);
793             }
794     }

796 start:
797     s->rwstate=SSL_NOTHING;

799     /* s->s3->rrec.type      - is the type of record
800      * s->s3->rrec.data,      - data
801      * s->s3->rrec.off,        - offset into 'data' for next read
802      * s->s3->rrec.length,    - number of bytes. */
803     rr = &(s->s3->rrec);

805     /* We are not handshaking and have no data yet,
806      * so process data buffered during the last handshake
807      * in advance, if any.
808      */
809     if (s->state == SSL_ST_OK && rr->length == 0)
810     {
811         pitem *item;
812         item = pqueue_pop(s->d1->buffered_app_data.q);
813         if (item)
814             {
815 #ifndef OPENSSSL_NO_SCTP
816                 /* Restore bio_dgram_sctp_rcvinfo struct */
817                 if (BIO_dgram_is_sctp(SSL_get_rbio(s)))
818                 {
819                     DTLS1_RECORD_DATA *rdata = (DTLS1_RECORD_DATA *)
820                         BIO_ctrl(SSL_get_rbio(s), BIO_CTRL_DGRAM_SCTP_SE
821                             }
822 #endif

824                     dtls1_copy_record(s, item);

826                     OPENSSSL_free(item->data);
827                     pitem_free(item);
828                 }
829             }

831     /* Check for timeout */
832     if (dtls1_handle_timeout(s) > 0)
833         goto start;

835     /* get new packet if necessary */
836     if ((rr->length == 0) || (s->rstate == SSL_ST_READ_BODY))
837     {
838         ret=dtls1_get_record(s);
839         if (ret <= 0)
840         {
841             ret = dtls1_read_failed(s, ret);
842             /* anything other than a timeout is an error */
843             if (ret <= 0)
844                 return(ret);
845             else
846                 goto start;
847         }
848     }

850     if (s->d1->listen && rr->type != SSL3_RT_HANDSHAKE)
851     {
852         rr->length = 0;
853         goto start;

```

```

854     }

856     /* we now have a packet which can be read and processed */

858     if (s->s3->change_cipher_spec /* set when we receive ChangeCipherSpec,
859                                     * reset by ssl3_get_finished */
860         && (rr->type != SSL3_RT_HANDSHAKE))
861     {
862         /* We now have application data between CCS and Finished.
863          * Most likely the packets were reordered on their way, so
864          * buffer the application data for later processing rather
865          * than dropping the connection.
866          */
867         dtls1_buffer_record(s, &(s->d1->buffered_app_data), rr->seq_num)
868         rr->length = 0;
869         goto start;
870     }

872     /* If the other end has shut down, throw anything we read away
873      * (even in 'peek' mode) */
874     if (s->shutdown & SSL_RECEIVED_SHUTDOWN)
875     {
876         rr->length=0;
877         s->rwstate=SSL_NOTHING;
878         return(0);
879     }

882     if (type == rr->type) /* SSL3_RT_APPLICATION_DATA or SSL3_RT_HANDSHAKE */
883     {
884         /* make sure that we are not getting application data when we
885          * are doing a handshake for the first time */
886         if (SSL_in_init(s) && (type == SSL3_RT_APPLICATION_DATA) &&
887             (s->enc_read_ctx == NULL))
888         {
889             al=SSL_AD_UNEXPECTED_MESSAGE;
890             SSLerr(SSL_F_DTLS1_READ_BYTES, SSL_R_APP_DATA_IN_HANDSHAK
891                 goto f_err;
892         }

894         if (len <= 0) return(len);

896         if ((unsigned int)len > rr->length)
897             n = rr->length;
898         else
899             n = (unsigned int)len;

901         memcpy(buf, &(rr->data[rr->off]), n);
902         if (!peek)
903         {
904             rr->length-=n;
905             rr->off+=n;
906             if (rr->length == 0)
907             {
908                 s->rstate=SSL_ST_READ_HEADER;
909                 rr->off=0;
910             }
911         }

913 #ifndef OPENSSSL_NO_SCTP
914         /* We were about to renegotiate but had to read
915          * belated application data first, so retry.
916          */
917         if (BIO_dgram_is_sctp(SSL_get_rbio(s)) &&
918             rr->type == SSL3_RT_APPLICATION_DATA &&
919             (s->state == DTLS1_SCTP_ST_SR_READ_SOCKET || s->state

```

```

920     {
921         s->rwstate=SSL_READING;
922         BIO_clear_retry_flags(SSL_get_rbio(s));
923         BIO_set_retry_read(SSL_get_rbio(s));
924     }

926     /* We might had to delay a close_notify alert because
927     * of reordered app data. If there was an alert and ther
928     * is no message to read anymore, finally set shutdown.
929     */
930     if (BIO_dgram_is_sctp(SSL_get_rbio(s)) &&
931         s->d1->shutdown_received && !BIO_dgram_sctp_msg_wait
932         {
933             s->shutdown |= SSL_RECEIVED_SHUTDOWN;
934             return(0);
935         }
936 #endif
937     return(n);
938 }

941 /* If we get here, then type != rr->type; if we have a handshake
942 * message, then it was unexpected (Hello Request or Client Hello). */

944 /* In case of record types for which we have 'fragment' storage,
945 * fill that so that we can process the data at a fixed place.
946 */
947 {
948     unsigned int k, dest_maxlen = 0;
949     unsigned char *dest = NULL;
950     unsigned int *dest_len = NULL;

952     if (rr->type == SSL3_RT_HANDSHAKE)
953     {
954         dest_maxlen = sizeof s->d1->handshake_fragment;
955         dest = s->d1->handshake_fragment;
956         dest_len = &s->d1->handshake_fragment_len;
957     }
958     else if (rr->type == SSL3_RT_ALERT)
959     {
960         dest_maxlen = sizeof(s->d1->alert_fragment);
961         dest = s->d1->alert_fragment;
962         dest_len = &s->d1->alert_fragment_len;
963     }
964 #ifndef OPENSSL_NO_HEARTBEATS
965     else if (rr->type == TLS1_RT_HEARTBEAT)
966     {
967         dtls1_process_heartbeat(s);

969         /* Exit and notify application to read again */
970         rr->length = 0;
971         s->rwstate=SSL_READING;
972         BIO_clear_retry_flags(SSL_get_rbio(s));
973         BIO_set_retry_read(SSL_get_rbio(s));
974         return(-1);
975     }
976 #endif

977     /* else it's a CCS message, or application data or wrong */
978     else if (rr->type != SSL3_RT_CHANGE_CIPHER_SPEC)
979     {
980         /* Application data while renegotiating
981         * is allowed. Try again reading.
982         */
983         if (rr->type == SSL3_RT_APPLICATION_DATA)
984         {
985             BIO *bio;

```

```

986         s->s3->in_read_app_data=2;
987         bio=SSL_get_rbio(s);
988         s->rwstate=SSL_READING;
989         BIO_clear_retry_flags(bio);
990         BIO_set_retry_read(bio);
991         return(-1);
992     }

994     /* Not certain if this is the right error handling */
995     al=SSL_AD_UNEXPECTED_MESSAGE;
996     SSLerr(SSL_F_DTLS1_READ_BYTES,SSL_R_UNEXPECTED_RECORD);
997     goto f_err;
998 }

1000     if (dest_maxlen > 0)
1001     {
1002         /* XDTLS: In a pathological case, the Client Hello
1003         * may be fragmented--don't always expect dest_maxlen bytes */
1004         if ( rr->length < dest_maxlen)
1005         {
1006             #ifdef DTLS1_AD_MISSING_HANDSHAKE_MESSAGE
1007                 /*
1008                 * for normal alerts rr->length is 2, while
1009                 * dest_maxlen is 7 if we were to handle this
1010                 * non-existing alert...
1011                 */
1012                 FIX ME
1013             #endif

1014             s->rstate=SSL_ST_READ_HEADER;
1015             rr->length = 0;
1016             goto start;
1017         }

1019         /* now move 'n' bytes: */
1020         for ( k = 0; k < dest_maxlen; k++)
1021         {
1022             dest[k] = rr->data[rr->off++];
1023             rr->length--;
1024         }
1025         *dest_len = dest_maxlen;
1026     }
1027 }

1029 /* s->d1->handshake_fragment_len == 12 iff rr->type == SSL3_RT_HANDSHA
1030 * s->d1->alert_fragment_len == 7 iff rr->type == SSL3_RT_ALERT.
1031 * (Possibly rr is 'empty' now, i.e. rr->length may be 0.) */

1033 /* If we are a client, check for an incoming 'Hello Request': */
1034 if ((!s->server) &&
1035     (s->d1->handshake_fragment_len >= DTLS1_HM_HEADER_LENGTH) &&
1036     (s->d1->handshake_fragment[0] == SSL3_MT_HELLO_REQUEST) &&
1037     (s->session != NULL) && (s->session->cipher != NULL))
1038 {
1039     s->d1->handshake_fragment_len = 0;

1041     if ((s->d1->handshake_fragment[1] != 0) ||
1042         (s->d1->handshake_fragment[2] != 0) ||
1043         (s->d1->handshake_fragment[3] != 0))
1044     {
1045         al=SSL_AD_DECODE_ERROR;
1046         SSLerr(SSL_F_DTLS1_READ_BYTES,SSL_R_BAD_HELLO_REQUEST);
1047         goto err;
1048     }

1050     /* no need to check sequence number on HELLO REQUEST messages */

```

```

1052     if (s->msg_callback)
1053         s->msg_callback(0, s->version, SSL3_RT_HANDSHAKE,
1054             s->d1->handshake_fragment, 4, s, s->msg_callback);
1055
1056     if (SSL_is_init_finished(s) &&
1057         !(s->s3->flags & SSL3_FLAGS_NO_RENEGOTIATE_CIPHERS) &&
1058         !s->s3->renegotiate)
1059     {
1060         s->d1->handshake_read_seq++;
1061         s->new_session = 1;
1062         ssl3_renegotiate(s);
1063         if (ssl3_renegotiate_check(s))
1064         {
1065             i=s->handshake_func(s);
1066             if (i < 0) return(i);
1067             if (i == 0)
1068             {
1069                 SSLerr(SSL_F_DTLS1_READ_BYTES, SSL_R_SSL
1070                     return(-1);
1071             }
1072         }
1073
1074         if (!(s->mode & SSL_MODE_AUTO_RETRY))
1075         {
1076             if (s->s3->rbuf.left == 0) /* no read-ah
1077                 {
1078                     BIO *bio;
1079                     /* In the case where we try to r
1080                      * but we trigger an SSL handsha
1081                      * the retry option set. Otherw
1082                      * cause nasty problems in the b
1083                     s->rwstate=SSL_READING;
1084                     bio=SSL_get_rbio(s);
1085                     BIO_clear_retry_flags(bio);
1086                     BIO_set_retry_read(bio);
1087                     return(-1);
1088                 }
1089             }
1090
1091             /* we either finished a handshake or ignored the request,
1092              * now try again to obtain the (application) data we were asked
1093              goto start;
1094             }
1095
1096     if (s->d1->alert_fragment_len >= DTLS1_AL_HEADER_LENGTH)
1097     {
1098         int alert_level = s->d1->alert_fragment[0];
1099         int alert_descr = s->d1->alert_fragment[1];
1100
1101         s->d1->alert_fragment_len = 0;
1102
1103         if (s->msg_callback)
1104             s->msg_callback(0, s->version, SSL3_RT_ALERT,
1105                 s->d1->alert_fragment, 2, s, s->msg_callback_arg);
1106
1107         if (s->info_callback != NULL)
1108             cb=s->info_callback;
1109         else if (s->ctx->info_callback != NULL)
1110             cb=s->ctx->info_callback;
1111
1112         if (cb != NULL)
1113         {
1114             j = (alert_level << 8) | alert_descr;
1115             cb(s, SSL_CB_READ_ALERT, j);
1116         }

```

```

1118     if (alert_level == 1) /* warning */
1119     {
1120         s->s3->warn_alert = alert_descr;
1121         if (alert_descr == SSL_AD_CLOSE_NOTIFY)
1122         {
1123             #ifndef OPENSSL_NO_SCTP
1124                 /* With SCTP and streams the socket may deliver
1125                  * after a close_notify alert. We have to check
1126                  * first so that nothing gets discarded.
1127                  */
1128                 if (BIO_dgram_is_sctp(SSL_get_rbio(s)) &&
1129                     BIO_dgram_sctp_msg_waiting(SSL_get_rbio(
1130                         {
1131                             s->d1->shutdown_received = 1;
1132                             s->rwstate=SSL_READING;
1133                             BIO_clear_retry_flags(SSL_get_rbio(s));
1134                             BIO_set_retry_read(SSL_get_rbio(s));
1135                             return -1;
1136                         }
1137             #endif
1138
1139             s->shutdown |= SSL_RECEIVED_SHUTDOWN;
1140             return(0);
1141         }
1142     }
1143     /* XXX: this is a possible improvement in the future */
1144     /* now check if it's a missing record */
1145     if (alert_descr == DTLS1_AD_MISSING_HANDSHAKE_MESSAGE)
1146     {
1147         unsigned short seq;
1148         unsigned int frag_off;
1149         unsigned char *p = &(s->d1->alert_fragment[2]);
1150
1151         n2s(p, seq);
1152         n2l3(p, frag_off);
1153
1154         dtls1_retransmit_message(s,
1155
1156             if ( ! found && SSL_in_init(s))
1157             {
1158                 /* fprintf( stderr,"in init = %d\n", SSL
1159                  * requested a message not yet sent,
1160                  send an alert ourselves */
1161                 ssl3_send_alert(s, SSL3_AL_WARNING,
1162                     DTLS1_AD_MISSING_HANDSHAKE_MESSA
1163             }
1164         }
1165     #endif
1166
1167     else if (alert_level == 2) /* fatal */
1168     {
1169         char tmp[16];
1170
1171         s->rwstate=SSL_NOTHING;
1172         s->s3->fatal_alert = alert_descr;
1173         SSLerr(SSL_F_DTLS1_READ_BYTES, SSL_AD_REASON_OFFSET + al
1174             BIO_snprintf(tmp, sizeof tmp, "%d", alert_descr);
1175             ERR_add_error_data(2, "SSL alert number ", tmp);
1176             s->shutdown|=SSL_RECEIVED_SHUTDOWN;
1177             SSL_CTX_remove_session(s->ctx, s->session);
1178             return(0);
1179         }
1180     else
1181     {
1182         al=SSL_AD_ILLEGAL_PARAMETER;
1183         SSLerr(SSL_F_DTLS1_READ_BYTES, SSL_R_UNKNOWN_ALERT_TYPE);

```

```

1184         goto f_err;
1185     }

1187     goto start;
1188 }

1190 if (s->shutdown & SSL_SENT_SHUTDOWN) /* but we have not received a shutd
1191 {
1192     s->rwstate=SSL_NOTHING;
1193     rr->length=0;
1194     return(0);
1195 }

1197 if (rr->type == SSL3_RT_CHANGE_CIPHER_SPEC)
1198 {
1199     struct ccs_header_st ccs_hdr;
1200     unsigned int ccs_hdr_len = DTLS1_CCS_HEADER_LENGTH;

1202     dtls1_get_ccs_header(rr->data, &ccs_hdr);

1204     if (s->version == DTLS1_BAD_VER)
1205         ccs_hdr_len = 3;

1207     /* 'Change Cipher Spec' is just a single byte, so we know
1208     * exactly what the record payload has to look like */
1209     /* XDTLS: check that epoch is consistent */
1210     if (
1211         (rr->length != ccs_hdr_len) ||
1212         (rr->off != 0) || (rr->data[0] != SSL3_MT_CCS))
1213     {
1214         i=SSL_AD_ILLEGAL_PARAMETER;
1215         SSLerr(SSL_F_DTLS1_READ_BYTES, SSL_R_BAD_CHANGE_CIPHER_SP
1216             goto err;
1217     }

1218     rr->length=0;

1220     if (s->msg_callback)
1221         s->msg_callback(0, s->version, SSL3_RT_CHANGE_CIPHER_SPE
1222             rr->data, 1, s, s->msg_callback_arg);

1224     /* We can't process a CCS now, because previous handshake
1225     * messages are still missing, so just drop it.
1226     */
1227     if (!s->d1->change_cipher_spec_ok)
1228     {
1229         goto start;
1230     }

1232     s->d1->change_cipher_spec_ok = 0;

1234     s->s3->change_cipher_spec=1;
1235     if (!ssl3_do_change_cipher_spec(s))
1236         goto err;

1238     /* do this whenever CCS is processed */
1239     dtls1_reset_seq_numbers(s, SSL3_CC_READ);

1241     if (s->version == DTLS1_BAD_VER)
1242         s->d1->handshake_read_seq++;

1244 #ifndef OPENSSL_NO_SCTP
1245     /* Remember that a CCS has been received,
1246     * so that an old key of SCTP-Auth can be
1247     * deleted when a CCS is sent. Will be ignored
1248     * if no SCTP is used
1249     */

```

```

1250         BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_AUTH_CCS_RCVD, 1,
1251 #endif

1253         goto start;
1254     }

1256     /* Unexpected handshake message (Client Hello, or protocol violation) */
1257     if ((s->d1->handshake_fragment_len >= DTLS1_HM_HEADER_LENGTH) &&
1258         !s->in_handshake)
1259     {
1260         struct hm_header_st msg_hdr;
1261
1262         /* this may just be a stale retransmit */
1263         dtls1_get_message_header(rr->data, &msg_hdr);
1264         if (rr->epoch != s->d1->r_epoch)
1265         {
1266             rr->length = 0;
1267             goto start;
1268         }

1270         /* If we are server, we may have a repeated FINISHED of the
1271         * client here, then retransmit our CCS and FINISHED.
1272         */
1273         if (msg_hdr.type == SSL3_MT_FINISHED)
1274         {
1275             if (dtls1_check_timeout_num(s) < 0)
1276                 return -1;

1278             dtls1_retransmit_buffered_messages(s);
1279             rr->length = 0;
1280             goto start;
1281         }

1283         if (((s->state&SSL_ST_MASK) == SSL_ST_OK) &&
1284             !(s->s3->flags & SSL3_FLAGS_NO_RENEGOTIATE_CIPHERS))
1285         {
1286             #if 0 /* worked only because C operator preferences are not as expected (and
1287             * because this is not really needed for clients except for detecting
1288             * protocol violations): */
1289                 s->state=SSL_ST_BEFORE|(s->server)
1290                     ?SSL_ST_ACCEPT
1291                     :SSL_ST_CONNECT;
1292             #else
1293                 s->state = s->server ? SSL_ST_ACCEPT : SSL_ST_CONNECT;
1294             #endif

1295             s->renegotiate=1;
1296             s->new_session=1;
1297         }
1298         i=s->handshake_func(s);
1299         if (i < 0) return(i);
1300         if (i == 0)
1301         {
1302             SSLerr(SSL_F_DTLS1_READ_BYTES, SSL_R_SSL_HANDSHAKE_FAILURE
1303                 return(-1);
1304         }

1306         if (!(s->mode & SSL_MODE_AUTO_RETRY))
1307         {
1308             if (s->s3->rbuf.left == 0) /* no read-ahead left? */
1309             {
1310                 BIO *bio;
1311                 /* In the case where we try to read application
1312                 * but we trigger an SSL handshake, we return -1
1313                 * the retry option set. Otherwise renegotiatio
1314                 * cause nasty problems in the blocking world */
1315                 s->rwstate=SSL_READING;

```

```

1316         bio=SSL_get_rbio(s);
1317         BIO_clear_retry_flags(bio);
1318         BIO_set_retry_read(bio);
1319         return(-1);
1320     }
1321     }
1322     goto start;
1323 }

1325 switch (rr->type)
1326 {
1327     default:
1328 #ifndef OPENSAL_NO_TLS
1329     /* TLS just ignores unknown message types */
1330     if (s->version == TLS1_VERSION)
1331     {
1332         rr->length = 0;
1333         goto start;
1334     }
1335 #endif
1336     al=SSL_AD_UNEXPECTED_MESSAGE;
1337     SSLerr(SSL_F_DTLS1_READ_BYTES,SSL_R_UNEXPECTED_RECORD);
1338     goto f_err;
1339 case SSL3_RT_CHANGE_CIPHER_SPEC:
1340 case SSL3_RT_ALERT:
1341 case SSL3_RT_HANDSHAKE:
1342     /* we already handled all of these, with the possible exception
1343      * of SSL3_RT_HANDSHAKE when s->in_handshake is set, but that
1344      * should not happen when type != rr->type */
1345     al=SSL_AD_UNEXPECTED_MESSAGE;
1346     SSLerr(SSL_F_DTLS1_READ_BYTES,ERR_R_INTERNAL_ERROR);
1347     goto f_err;
1348 case SSL3_RT_APPLICATION_DATA:
1349     /* At this point, we were expecting handshake data,
1350      * but have application data. If the library was
1351      * running inside ssl3_read() (i.e. in_read_app_data
1352      * is set) and it makes sense to read application data
1353      * at this point (session renegotiation not yet started),
1354      * we will indulge it.
1355      */
1356     if (s->s3->in_read_app_data &&
1357         (s->s3->total_renegotiations != 0) &&
1358         ((
1359             (s->state & SSL_ST_CONNECT) &&
1360             (s->state >= SSL3_ST_CW_CLNT_HELLO_A) &&
1361             (s->state <= SSL3_ST_CR_SRVR_HELLO_A)
1362         ) || (
1363             (s->state & SSL_ST_ACCEPT) &&
1364             (s->state <= SSL3_ST_SW_HELLO_REQ_A) &&
1365             (s->state >= SSL3_ST_SR_CLNT_HELLO_A)
1366         )))
1367     {
1368         s->s3->in_read_app_data=2;
1369         return(-1);
1370     }
1371     else
1372     {
1373         al=SSL_AD_UNEXPECTED_MESSAGE;
1374         SSLerr(SSL_F_DTLS1_READ_BYTES,SSL_R_UNEXPECTED_RECORD);
1375         goto f_err;
1376     }
1377 }
1378 /* not reached */
1381 f_err:

```

```

1382     ssl3_send_alert(s,SSL3_AL_FATAL,al);
1383 err:
1384     return(-1);
1385 }

1387 int
1388 dtls1_write_app_data_bytes(SSL *s, int type, const void *buf_, int len)
1389 {
1390     int i;

1392 #ifndef OPENSAL_NO_SCTP
1393     /* Check if we have to continue an interrupted handshake
1394      * for reading belated app data with SCTP.
1395      */
1396     if ((SSL_in_init(s) && !s->in_handshake) ||
1397         (BIO_dgram_is_sctp(SSL_get_wbio(s)) &&
1398          (s->state == DTLS1_SCTP_ST_SR_READ SOCK || s->state == DTLS
1399 #else
1400         if (SSL_in_init(s) && !s->in_handshake)
1401 #endif
1402         {
1403             i=s->handshake_func(s);
1404             if (i < 0) return(i);
1405             if (i == 0)
1406             {
1407                 SSLerr(SSL_F_DTLS1_WRITE_APP_DATA_BYTES,SSL_R_SSL_HANDSH
1408                 return -1;
1409             }
1410         }

1412     if (len > SSL3_RT_MAX_PLAIN_LENGTH)
1413     {
1414         SSLerr(SSL_F_DTLS1_WRITE_APP_DATA_BYTES,SSL_R_DTLS_MESSA
1415         return -1;
1416     }

1418     i = dtls1_write_bytes(s, type, buf_, len);
1419     return i;
1420 }

1423     /* this only happens when a client hello is received and a handshake
1424      * is started. */
1425 static int
1426 have_handshake_fragment(SSL *s, int type, unsigned char *buf,
1427     int len, int peek)
1428 {
1429     if ((type == SSL3_RT_HANDSHAKE) && (s->d1->handshake_fragment_len > 0))
1430     /* (partially) satisfy request from storage */
1431     {
1432         unsigned char *src = s->d1->handshake_fragment;
1433         unsigned char *dst = buf;
1434         unsigned int k,n;

1436         /* peek == 0 */
1437         n = 0;
1438         while ((len > 0) && (s->d1->handshake_fragment_len > 0))
1439         {
1440             *dst++ = *src++;
1441             len--; s->d1->handshake_fragment_len--;
1442             n++;
1443         }
1444         /* move any remaining fragment bytes: */
1445         for (k = 0; k < s->d1->handshake_fragment_len; k++)
1446             s->d1->handshake_fragment[k] = *src++;
1447     }

```

```

1448         return n;
1449     }
1450     return 0;
1451 }
1452
1457 /* Call this to write data in records of type 'type'
1458  * It will return <= 0 if not all data has been sent or non-blocking IO.
1459  */
1460 int dtls1_write_bytes(SSL *s, int type, const void *buf, int len)
1461 {
1462     int i;
1463
1464     OPENSSL_assert(len <= SSL3_RT_MAX_PLAIN_LENGTH);
1465     s->rwstate=SSL_NOTHING;
1466     i=do_dtls1_write(s, type, buf, len, 0);
1467     return i;
1468 }
1469
1470 int do_dtls1_write(SSL *s, int type, const unsigned char *buf, unsigned int len,
1471 {
1472     unsigned char *p,*pseq;
1473     int i,mac_size,clear=0;
1474     int prefix_len = 0;
1475     SSL3_RECORD *wr;
1476     SSL3_BUFFER *wb;
1477     SSL_SESSION *sess;
1478     int bs;
1479
1480     /* first check if there is a SSL3_BUFFER still being written
1481      * out. This will happen with non blocking IO */
1482     if (s->s3->wbuf.left != 0)
1483     {
1484         OPENSSL_assert(0); /* XDTLS: want to see if we ever get here */
1485         return(ssl3_write_pending(s,type,buf,len));
1486     }
1487
1488     /* If we have an alert to send, lets send it */
1489     if (s->s3->alert_dispatch)
1490     {
1491         i=s->method->ssl_dispatch_alert(s);
1492         if (i <= 0)
1493             return(i);
1494         /* if it went, fall through and send more stuff */
1495     }
1496
1497     if (len == 0 && !create_empty_fragment)
1498         return 0;
1499
1500     wr= &(s->s3->wrec);
1501     wb= &(s->s3->wbuf);
1502     sess=s->session;
1503
1504     if ( (sess == NULL) ||
1505         (s->enc_write_ctx == NULL) ||
1506         (EVP_MD_CTX_md(s->write_hash) == NULL))
1507         clear=1;
1508
1509     if (clear)
1510         mac_size=0;
1511     else
1512     {
1513         mac_size=EVP_MD_CTX_size(s->write_hash);

```

```

1514         if (mac_size < 0)
1515             goto err;
1516     }
1517
1518     /* DTLS implements explicit IV, so no need for empty fragments */
1519 #if 0
1520     /* 'create_empty_fragment' is true only when this function calls itself
1521     if (!clear && !create_empty_fragment && !s->s3->empty_fragment_done
1522         && SSL_version(s) != DTLS1_VERSION && SSL_version(s) != DTLS1_BAD_VE
1523     {
1524         /* countermeasure against known-IV weakness in CBC ciphersuites
1525         * (see http://www.openssl.org/~bodo/tls-cbc.txt)
1526         */
1527
1528         if (s->s3->need_empty_fragments && type == SSL3_RT_APPLICATION_D
1529         {
1530             /* recursive function call with 'create_empty_fragment'
1531             * this prepares and buffers the data for an empty fragm
1532             * (these 'prefix_len' bytes are sent out later
1533             * together with the actual payload) */
1534             prefix_len = s->method->do_ssl_write(s, type, buf, 0, 1)
1535             if (prefix_len <= 0)
1536                 goto err;
1537
1538             if (s->s3->wbuf.len < (size_t)prefix_len + SSL3_RT_MAX_P
1539             {
1540                 /* insufficient space */
1541                 SSLerr(SSL_F_DO_DTLS1_WRITE, ERR_R_INTERNAL_ERRO
1542                 goto err;
1543             }
1544
1545             s->s3->empty_fragment_done = 1;
1546         }
1547     }
1548 #endif
1549     p = wb->buf + prefix_len;
1550
1551     /* write the header */
1552
1553     *(p++)=type&0xff;
1554     wr->type=type;
1555
1556     *(p++)=(s->version>>8);
1557     *(p++)=s->version&0xff;
1558
1559     /* field where we are to write out packet epoch, seq num and len */
1560     pseq=p;
1561     p+=10;
1562
1563     /* lets setup the record stuff. */
1564
1565     /* Make space for the explicit IV in case of CBC.
1566     * (this is a bit of a boundary violation, but what the heck).
1567     */
1568     if ( s->enc_write_ctx &&
1569         (EVP_CIPHER_mode( s->enc_write_ctx->cipher ) & EVP_CIPH_CBC_MODE
1570         bs = EVP_CIPHER_block_size(s->enc_write_ctx->cipher);
1571     else
1572         bs = 0;
1573
1574     wr->data=p + bs; /* make room for IV in case of CBC */
1575     wr->length=(int)len;
1576     wr->input=(unsigned char *)buf;
1577
1578     /* we now 'read' from wr->input, wr->length bytes into
1579     * wr->data */

```



```

1581     /* first we compress */
1582     if (s->compress != NULL)
1583     {
1584         if (!ssl3_do_compress(s))
1585         {
1586             SSLerr(SSL_F_DO_DTLS1_WRITE, SSL_R_COMPRESSION_FAILURE);
1587             goto err;
1588         }
1589     }
1590     else
1591     {
1592         memcpy(wr->data, wr->input, wr->length);
1593         wr->input = wr->data;
1594     }

1596     /* we should still have the output to wr->data and the input
1597     * from wr->input. Length should be wr->length.
1598     * wr->data still points in the wb->buf */

1600     if (mac_size != 0)
1601     {
1602         if (s->method->ssl3_enc->mac(s, &(p[wr->length + bs]), 1) < 0)
1603             goto err;
1604         wr->length += mac_size;
1605     }

1607     /* this is true regardless of mac size */
1608     wr->input = p;
1609     wr->data = p;

1612     /* ssl3_enc can only have an error on read */
1613     if (bs) /* bs != 0 in case of CBC */
1614     {
1615         RAND_pseudo_bytes(p, bs);
1616         /* master IV and last CBC residue stand for
1617         * the rest of randomness */
1618         wr->length += bs;
1619     }

1621     s->method->ssl3_enc->enc(s, 1);

1623     /* record length after mac and block padding */
1624     /* if (type == SSL3_RT_APPLICATION_DATA ||
1625     (type == SSL3_RT_ALERT && ! SSL_in_init(s))) */
1626
1627     /* there's only one epoch between handshake and app data */
1628
1629     s2n(s->d1->w_epoch, pseq);

1631     /* XDTLS: ?? */
1632     /* else
1633     s2n(s->d1->handshake_epoch, pseq); */

1635     memcpy(pseq, &(s->s3->write_sequence[2]), 6);
1636     pseq += 6;
1637     s2n(wr->length, pseq);

1639     /* we should now have
1640     * wr->data pointing to the encrypted data, which is
1641     * wr->length long */
1642     wr->type = type; /* not needed but helps for debugging */
1643     wr->length += DTLS1_RT_HEADER_LENGTH;

1645 #if 0 /* this is now done at the message layer */

```

```

1646     /* buffer the record, making it easy to handle retransmits */
1647     if (type == SSL3_RT_HANDSHAKE || type == SSL3_RT_CHANGE_CIPHER_SPEC)
1648         dtls1_buffer_record(s, wr->data, wr->length,
1649             *((PQ_64BIT *)&(s->s3->write_sequence[0])));
1650 #endif

1652     ssl3_record_sequence_update(&(s->s3->write_sequence[0]));

1654     if (create_empty_fragment)
1655     {
1656         /* we are in a recursive call;
1657         * just return the length, don't write out anything here
1658         */
1659         return wr->length;
1660     }

1662     /* now let's set up wb */
1663     wb->left = prefix_len + wr->length;
1664     wb->offset = 0;

1666     /* memorize arguments so that ssl3_write_pending can detect bad write re
1667     s->s3->wpend_tot = len;
1668     s->s3->wpend_buf = buf;
1669     s->s3->wpend_type = type;
1670     s->s3->wpend_ret = len;

1672     /* we now just need to write the buffer */
1673     return ssl3_write_pending(s, type, buf, len);
1674 err:
1675     return -1;
1676 }

1680 static int dtls1_record_replay_check(SSL *s, DTLS1_BITMAP *bitmap)
1681 {
1682     int cmp;
1683     unsigned int shift;
1684     const unsigned char *seq = s->s3->read_sequence;

1686     cmp = satsub64be(seq, bitmap->max_seq_num);
1687     if (cmp > 0)
1688     {
1689         memcpy(s->s3->rrec.seq_num, seq, 8);
1690         return 1; /* this record in new */
1691     }
1692     shift = -cmp;
1693     if (shift >= sizeof(bitmap->map)*8)
1694         return 0; /* stale, outside the window */
1695     else if (bitmap->map & (1UL << shift))
1696         return 0; /* record previously received */

1698     memcpy(s->s3->rrec.seq_num, seq, 8);
1699     return 1;
1700 }

1703 static void dtls1_record_bitmap_update(SSL *s, DTLS1_BITMAP *bitmap)
1704 {
1705     int cmp;
1706     unsigned int shift;
1707     const unsigned char *seq = s->s3->read_sequence;

1709     cmp = satsub64be(seq, bitmap->max_seq_num);
1710     if (cmp > 0)
1711     {

```

```

1712         shift = cmp;
1713         if (shift < sizeof(bitmap->map)*8)
1714             bitmap->map <= shift, bitmap->map |= 1UL;
1715         else
1716             bitmap->map = 1UL;
1717         memcpy(bitmap->max_seq_num, seq, 8);
1718     }
1719     else
1720     {
1721         shift = -cmp;
1722         if (shift < sizeof(bitmap->map)*8)
1723             bitmap->map |= 1UL<<shift;
1724     }
}

1727 int dtls1_dispatch_alert(SSL *s)
1728 {
1729     int i, j;
1730     void (*cb)(const SSL *ssl, int type, int val)=NULL;
1731     unsigned char buf[DTLS1_AL_HEADER_LENGTH];
1732     unsigned char *ptr = &buf[0];

1734     s->s3->alert_dispatch=0;

1736     memset(buf, 0x00, sizeof(buf));
1737     *ptr++ = s->s3->send_alert[0];
1738     *ptr++ = s->s3->send_alert[1];

1740 #ifdef DTLS1_AD_MISSING_HANDSHAKE_MESSAGE
1741     if (s->s3->send_alert[1] == DTLS1_AD_MISSING_HANDSHAKE_MESSAGE)
1742     {
1743         s2n(s->d1->handshake_read_seq, ptr);
1744     #if 0
1745         if (s->d1->r_msg_hdr.frag_off == 0) /* waiting for a new msg */
1746         else
1747             s2n(s->d1->r_msg_hdr.seq, ptr); /* partial msg read */
1748     #endif
1749 #endif

1751     #if 0
1752         fprintf(stderr, "s->d1->handshake_read_seq = %d, s->d1->r_msg_hdr
1753 #endif
1754         l2n3(s->d1->r_msg_hdr.frag_off, ptr);
1755     }
1756 #endif

1758     i = do_dtls1_write(s, SSL3_RT_ALERT, &buf[0], sizeof(buf), 0);
1759     if (i <= 0)
1760     {
1761         s->s3->alert_dispatch=1;
1762         /* fprintf( stderr, "not done with alert\n" ); */
1763     }
1764     else
1765     {
1766         if (s->s3->send_alert[0] == SSL3_AL_FATAL
1767 #ifdef DTLS1_AD_MISSING_HANDSHAKE_MESSAGE
1768             || s->s3->send_alert[1] == DTLS1_AD_MISSING_HANDSHAKE_MESSAG
1769 #endif
1770         )
1771             (void)BIO_flush(s->wbio);

1773         if (s->msg_callback)
1774             s->msg_callback(1, s->version, SSL3_RT_ALERT, s->s3->sen
1775                             2, s, s->msg_callback_arg);

1777         if (s->info_callback != NULL)

```

```

1778         cb=s->info_callback;
1779         else if (s->ctx->info_callback != NULL)
1780             cb=s->ctx->info_callback;

1782         if (cb != NULL)
1783         {
1784             j=(s->s3->send_alert[0]<<8)|s->s3->send_alert[1];
1785             cb(s, SSL_CB_WRITE_ALERT, j);
1786         }
1787     }
1788     return(i);
1789 }

1792 static DTLS1_BITMAP *
1793 dtls1_get_bitmap(SSL *s, SSL3_RECORD *rr, unsigned int *is_next_epoch)
1794 {
1795     *is_next_epoch = 0;

1798     /* In current epoch, accept HM, CCS, DATA, & ALERT */
1799     if (rr->epoch == s->d1->r_epoch)
1800         return &s->d1->bitmap;

1802     /* Only HM and ALERT messages can be from the next epoch */
1803     else if (rr->epoch == (unsigned long)(s->d1->r_epoch + 1) &&
1804             (rr->type == SSL3_RT_HANDSHAKE ||
1805              rr->type == SSL3_RT_ALERT))
1806     {
1807         *is_next_epoch = 1;
1808         return &s->d1->next_bitmap;
1809     }

1811     return NULL;
1812 }

1814 #if 0
1815 static int
1816 dtls1_record_needs_buffering(SSL *s, SSL3_RECORD *rr, unsigned short *priority,
1817                             unsigned long *offset)
1818 {
1820     /* alerts are passed up immediately */
1821     if ( rr->type == SSL3_RT_APPLICATION_DATA ||
1822          rr->type == SSL3_RT_ALERT)
1823         return 0;

1825     /* Only need to buffer if a handshake is underway.
1826      * (this implies that Hello Request and Client Hello are passed up
1827      * immediately) */
1828     if ( SSL_init(s)
1829     {
1830         unsigned char *data = rr->data;
1831         /* need to extract the HM/CCS sequence number here */
1832         if ( rr->type == SSL3_RT_HANDSHAKE ||
1833              rr->type == SSL3_RT_CHANGE_CIPHER_SPEC)
1834         {
1835             unsigned short seq_num;
1836             struct hm_header_st msg_hdr;
1837             struct ccs_header_st ccs_hdr;

1839             if ( rr->type == SSL3_RT_HANDSHAKE)
1840             {
1841                 dtls1_get_message_header(data, &msg_hdr);
1842                 seq_num = msg_hdr.seq;
1843                 *offset = msg_hdr.frag_off;

```

```

1844     }
1845     else
1846     {
1847         dtls1_get_ccs_header(data, &ccs_hdr);
1848         seq_num = ccs_hdr.seq;
1849         *offset = 0;
1850     }
1851
1852     /* this is either a record we're waiting for, or a
1853      * retransmit of something we happened to previously
1854      * receive (higher layers will drop the repeat silently
1855      if ( seq_num < s->d1->handshake_read_seq)
1856         return 0;
1857     if (rr->type == SSL3_RT_HANDSHAKE &&
1858         seq_num == s->d1->handshake_read_seq &&
1859         msg_hdr.frag_off < s->d1->r_msg_hdr.frag_off)
1860         return 0;
1861     else if ( seq_num == s->d1->handshake_read_seq &&
1862              (rr->type == SSL3_RT_CHANGE_CIPHER_SPEC ||
1863               msg_hdr.frag_off == s->d1->r_msg_hdr.frag_off))
1864         return 0;
1865     else
1866     {
1867         *priority = seq_num;
1868         return 1;
1869     }
1870 }
1871 else /* unknown record type */
1872     return 0;
1873 }
1874
1875 return 0;
1876 }
1877 #endif
1878
1879 void
1880 dtls1_reset_seq_numbers(SSL *s, int rw)
1881 {
1882     unsigned char *seq;
1883     unsigned int seq_bytes = sizeof(s->s3->read_sequence);
1884
1885     if ( rw & SSL3_CC_READ)
1886     {
1887         seq = s->s3->read_sequence;
1888         s->d1->r_epoch++;
1889         memcpy(&(s->d1->bitmap), &(s->d1->next_bitmap), sizeof(DTLS1_BITMAP));
1890         memset(&(s->d1->next_bitmap), 0x00, sizeof(DTLS1_BITMAP));
1891     }
1892     else
1893     {
1894         seq = s->s3->write_sequence;
1895         memcpy(s->d1->last_write_sequence, seq, sizeof(s->s3->write_sequence));
1896         s->d1->w_epoch++;
1897     }
1898
1899     memset(seq, 0x00, seq_bytes);
1900 }

```

```

*****
13410 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_srtp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/t1_lib.c */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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```

```

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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /*
112  * DTLS code by Eric Rescorla <ekr@rtfm.com>
113  *
114  * Copyright (C) 2006, Network Resonance, Inc.
115  * Copyright (C) 2011, RTFM, Inc.
116 */
117
118 #include <stdio.h>
119 #include <openssl/objects.h>
120 #include "ssl_locl.h"
121
122 #ifndef OPENSSL_NO_SRTP
123
124 #include <openssl/srtp.h>
125
126 static SRTP_PROTECTION_PROFILE srtp_known_profiles[]=

```

```

128     {
129     {
130     "SRTP_AES128_CM_SHA1_80",
131     SRTP_AES128_CM_SHA1_80,
132     },
133     {
134     "SRTP_AES128_CM_SHA1_32",
135     SRTP_AES128_CM_SHA1_32,
136     },
137     #if 0
138     {
139     "SRTP_NULL_SHA1_80",
140     SRTP_NULL_SHA1_80,
141     },
142     {
143     "SRTP_NULL_SHA1_32",
144     SRTP_NULL_SHA1_32,
145     },
146     #endif
147     {0}
148     };

150 static int find_profile_by_name(char *profile_name,
151                               SRTP_PROTECTION_PROFILE **pptr,unsigned len)
152     {
153     SRTP_PROTECTION_PROFILE *p;

155     p=srtp_known_profiles;
156     while(p->name)
157     {
158         if((len == strlen(p->name)) && !strcmp(p->name,profile_name,
159         len))
160         {
161             *pptr=p;
162             return 0;
163         }

165         p++;
166     }

168     return 1;
169 }

171 static int find_profile_by_num(unsigned profile_num,
172                               SRTP_PROTECTION_PROFILE **pptr)
173     {
174     SRTP_PROTECTION_PROFILE *p;

176     p=srtp_known_profiles;
177     while(p->name)
178     {
179         if(p->id == profile_num)
180         {
181             *pptr=p;
182             return 0;
183         }
184         p++;
185     }

187     return 1;
188 }

190 static int ssl_ctx_make_profiles(const char *profiles_string,STACK_OF(SRTP_PROTE
191 {
192     STACK_OF(SRTP_PROTECTION_PROFILE) *profiles;

```

```

194     char *col;
195     char *ptr=(char *)profiles_string;
196
197     SRTP_PROTECTION_PROFILE *p;

199     if(!(profiles=sk_SRTP_PROTECTION_PROFILE_new_null()))
200     {
201         SSLerr(SSL_F_SSL_CTX_MAKE_PROFILES, SSL_R_SRTP_COULD_NOT_ALLOCAT
202         return 1;
203     }
204
205     do
206     {
207         col=strchr(ptr,':');

209         if(!find_profile_by_name(ptr,&p,
210         col ? col-ptr : (int)strlen(ptr)))
211         {
212             sk_SRTP_PROTECTION_PROFILE_push(profiles,p);
213         }
214         else
215         {
216             SSLerr(SSL_F_SSL_CTX_MAKE_PROFILES,SSL_R_SRTP_UNKNOWN_PR
217             return 1;
218         }

220         if(col) ptr=col+1;
221     } while (col);

223     *out=profiles;
224
225     return 0;
226 }

227 int SSL_set_tlsext_use_srtp(SSL_CTX *ctx,const char *profiles)
228 {
229     return ssl_ctx_make_profiles(profiles,&ctx->srtp_profiles);
230 }
231

233 int SSL_set_tlsext_use_srtp(SSL *s,const char *profiles)
234 {
235     return ssl_ctx_make_profiles(profiles,&s->srtp_profiles);
236 }

239 STACK_OF(SRTP_PROTECTION_PROFILE) *SSL_get_srtp_profiles(SSL *s)
240 {
241     if(s != NULL)
242     {
243         if(s->srtp_profiles != NULL)
244         {
245             return s->srtp_profiles;
246         }
247         else if((s->ctx != NULL) &&
248         (s->ctx->srtp_profiles != NULL))
249         {
250             return s->ctx->srtp_profiles;
251         }
252     }

254     return NULL;
255 }

257 SRTP_PROTECTION_PROFILE *SSL_get_selected_srtp_profile(SSL *s)
258 {
259     return s->srtp_profile;

```

```

260     }

262 /* Note: this function returns 0 length if there are no
263    profiles specified */
264 int ssl_add_clienthello_use_srtp_ext(SSL *s, unsigned char *p, int *len, int max
265 {
266     int ct=0;
267     int i;
268     STACK_OF(SRTP_PROTECTION_PROFILE) *cInt=0;
269     SRTP_PROTECTION_PROFILE *prof;
270
271     cInt=SSL_get_srtp_profiles(s);
272     ct=sk_SRTP_PROTECTION_PROFILE_num(cInt); /* -1 if cInt == 0 */

274     if(p)
275     {
276         if(ct==0)
277         {
278             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_USE_SRTP_EXT,SSL_R_EMPTY
279             return 1;
280         }

282         if((2 + ct*2 + 1) > maxlen)
283         {
284             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_USE_SRTP_EXT,SSL_R_SRTP
285             return 1;
286         }

288         /* Add the length */
289         s2n(ct * 2, p);
290         for(i=0;i<ct;i++)
291         {
292             prof=sk_SRTP_PROTECTION_PROFILE_value(cInt,i);
293             s2n(prof->id,p);
294         }

296         /* Add an empty use_mki value */
297         *p++ = 0;
298     }

300     *len=2 + ct*2 + 1;
301     return 0;
302 }

303

306 int ssl_parse_clienthello_use_srtp_ext(SSL *s, unsigned char *d, int len,int *al
307 {
308     SRTP_PROTECTION_PROFILE *cprof,*sprof;
309     STACK_OF(SRTP_PROTECTION_PROFILE) *cInt=0,*srvr;
310     int ct;
311     int mki_len;
312     int i,j;
313     int id;
314     int ret;

316     /* Length value + the MKI length */
317     if(len < 3)
318     {
319         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_P
320         *al=SSL_AD_DECODE_ERROR;
321         return 1;
322     }

324     /* Pull off the length of the cipher suite list */
325     n2s(d, ct);

```

```

326     len -= 2;
327
328     /* Check that it is even */
329     if(ct%2)
330     {
331         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_P
332         *al=SSL_AD_DECODE_ERROR;
333         return 1;
334     }
335
336     /* Check that lengths are consistent */
337     if(len < (ct + 1))
338     {
339         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_P
340         *al=SSL_AD_DECODE_ERROR;
341         return 1;
342     }

344     cInt=sk_SRTP_PROTECTION_PROFILE_new_null();
345
347     while(ct)
348     {
349         n2s(d,id);
350         ct-=2;
351         len-=2;

353         if(!find_profile_by_num(id,&cprof))
354         {
355             sk_SRTP_PROTECTION_PROFILE_push(cInt,cprof);
356         }
357         else
358         {
359             /* Ignore */
360         }
361     }

363     /* Now extract the MKI value as a sanity check, but discard it for now */
364     mki_len = *d;
365     d++; len--;

367     if (mki_len != len)
368     {
369         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_M
370         *al=SSL_AD_DECODE_ERROR;
371         return 1;
372     }

374     srvr=SSL_get_srtp_profiles(s);

376     /* Pick our most preferred profile. If no profiles have been
377        configured then the outer loop doesn't run
378        (sk_SRTP_PROTECTION_PROFILE_num() = -1)
379        and so we just return without doing anything */
380     for(i=0;i<sk_SRTP_PROTECTION_PROFILE_num(srvr);i++)
381     {
382         sprof=sk_SRTP_PROTECTION_PROFILE_value(srvr,i);

384         for(j=0;j<sk_SRTP_PROTECTION_PROFILE_num(cInt);j++)
385         {
386             cprof=sk_SRTP_PROTECTION_PROFILE_value(cInt,j);

388             if(cprof->id==sprof->id)
389             {
390                 s->srtp_profile=sprof;
391                 *al=0;

```

```

392         ret=0;
393         goto done;
394     }
395 }
396
398     ret=0;
399
400 done:
401     if(cInt) sk_SRTP_PROTECTION_PROFILE_free(cInt);
402
403     return ret;
404 }
405
406 int ssl_add_serverhello_use_srtp_ext(SSL *s, unsigned char *p, int *len, int max
407 {
408     if(p)
409     {
410         if(maxlen < 5)
411         {
412             SSLerr(SSL_F_SSL_ADD_SERVERHELLO_USE_SRTP_EXT,SSL_R_SRTP
413                 return 1;
414         }
415
416         if(s->srtp_profile==0)
417         {
418             SSLerr(SSL_F_SSL_ADD_SERVERHELLO_USE_SRTP_EXT,SSL_R_USE_
419                 return 1;
420         }
421         s2n(2, p);
422         s2n(s->srtp_profile->id,p);
423         *p++ = 0;
424     }
425     *len=5;
426
427     return 0;
428 }
429
431 int ssl_parse_serverhello_use_srtp_ext(SSL *s, unsigned char *d, int len,int *al
432 {
433     unsigned id;
434     int i;
435     int ct;
436
437     STACK_OF(SRTP_PROTECTION_PROFILE) *cInt;
438     SRTP_PROTECTION_PROFILE *prof;
439
440     if(len!=5)
441     {
442         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_P
443             *al=SSL_AD_DECODE_ERROR;
444             return 1;
445         }
446
447     n2s(d, ct);
448     if(ct!=2)
449     {
450         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_P
451             *al=SSL_AD_DECODE_ERROR;
452             return 1;
453         }
454
455     n2s(d,id);
456     if (*d) /* Must be no MKI, since we never offer one */
457     {

```

```

458         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_M
459             *al=SSL_AD_ILLEGAL_PARAMETER;
460             return 1;
461         }
462
463     cInt=SSL_get_srtp_profiles(s);
464
465     /* Throw an error if the server gave us an unsolicited extension */
466     if (cInt == NULL)
467     {
468         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_USE_SRTP_EXT,SSL_R_NO_SRTP_PR
469             *al=SSL_AD_DECODE_ERROR;
470             return 1;
471         }
472
473     /* Check to see if the server gave us something we support
474        (and presumably offered)
475     */
476     for(i=0;i<sk_SRTP_PROTECTION_PROFILE_num(cInt);i++)
477     {
478         prof=sk_SRTP_PROTECTION_PROFILE_value(cInt,i);
479
480         if(prof->id == id)
481         {
482             s->srtp_profile=prof;
483             *al=0;
484             return 0;
485         }
486     }
487
488     SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_USE_SRTP_EXT,SSL_R_BAD_SRTP_PROTECTIO
489     *al=SSL_AD_DECODE_ERROR;
490     return 1;
491 }
492
494 #endif

```

new/usr/src/lib/openssl/libsunw_ssl/d1_srvr.c

1

```
*****
45087 Fri May 30 18:32:18 2014
new/usr/src/lib/openssl/libsunw_ssl/d1_srvr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/d1_srvr.c */
2 /*
3  * DTLS implementation written by Nagendra Modadugu
4  * (nagendra@cs.stanford.edu) for the OpenSSL project 2005.
5  */
6 /*
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52 *
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 */
58 /*
59 * Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
60 * All rights reserved.
61 */
```

new/usr/src/lib/openssl/libsunw_ssl/d1_srvr.c

2

```
62 * This package is an SSL implementation written
63 * by Eric Young (eay@cryptsoft.com).
64 * The implementation was written so as to conform with Netscapes SSL.
65 *
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111 * derivative of this code cannot be changed. i.e. this code cannot simply be
112 * copied and put under another distribution licence
113 * [including the GNU Public Licence.]
114 */
115
116 #include <stdio.h>
117 #include "ssl_locl.h"
118 #include <openssl/buffer.h>
119 #include <openssl/rand.h>
120 #include <openssl/objects.h>
121 #include <openssl/evp.h>
122 #include <openssl/x509.h>
123 #include <openssl/md5.h>
124 #include <openssl/bn.h>
125 #ifndef OPENSSL_NO_DH
126 #include <openssl/dh.h>
127 #endif
```



```

129 static const SSL_METHOD *dtls1_get_server_method(int ver);
130 static int dtls1_send_hello_verify_request(SSL *s);

132 static const SSL_METHOD *dtls1_get_server_method(int ver)
133 {
134     if (ver == DTLS1_VERSION)
135         return(DTLSh1_server_method());
136     else
137         return(NULL);
138 }

140 IMPLEMENT_dtls1_meth_func(DTLSh1_server_method,
141 dtls1_accept,
142 ssl_undefined_function,
143 dtls1_get_server_method)

145 int dtls1_accept(SSL *s)
146 {
147     BUF_MEM *buf;
148     unsigned long Time=(unsigned long)time(NULL);
149     void (*cb)(const SSL *ssl,int type,int val)=NULL;
150     unsigned long alg_k;
151     int ret= -1;
152     int new_state,state,skip=0;
153     int listen;
154 #ifndef OPENSLL_NO_SCTP
155     unsigned char sctpauthkey[64];
156     char labelbuffer[sizeof(DTLS1_SCTP_AUTH_LABEL)];
157 #endif

159     RAND_add(&Time,sizeof(Time),0);
160     ERR_clear_error();
161     clear_sys_error();

163     if (s->info_callback != NULL)
164         cb=s->info_callback;
165     else if (s->ctx->info_callback != NULL)
166         cb=s->ctx->info_callback;
167
168     listen = s->d1->listen;

170     /* init things to blank */
171     s->in_handshake++;
172     if (!SSL_in_init(s) || SSL_in_before(s)) SSL_clear(s);

174     s->d1->listen = listen;
175 #ifndef OPENSLL_NO_SCTP
176     /* Notify SCTP BIO socket to enter handshake
177      * mode and prevent stream identifier other
178      * than 0. Will be ignored if no SCTP is used.
179      */
180     BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_SET_IN_HANDSHAKE, s->in_ha
181 #endif

183     if (s->cert == NULL)
184     {
185         SSLerr(SSL_F_DTLS1_ACCEPT,SSL_R_NO_CERTIFICATE_SET);
186         return(-1);
187     }

189 #ifndef OPENSLL_NO_HEARTBEATS
190     /* If we're awaiting a HeartbeatResponse, pretend we
191      * already got and don't await it anymore, because
192      * Heartbeats don't make sense during handshakes anyway.
193      */

```

```

194     if (s->tlsext_hb_pending)
195     {
196         dtls1_stop_timer(s);
197         s->tlsext_hb_pending = 0;
198         s->tlsext_hb_seq++;
199     }
200 #endif

202     for (;;)
203     {
204         state=s->state;

206         switch (s->state)
207         {
208             case SSL_ST_RENEGOTIATE:
209                 s->renegotiate=1;
210                 /* s->state=SSL_ST_ACCEPT; */

212             case SSL_ST_BEFORE:
213             case SSL_ST_ACCEPT:
214             case SSL_ST_BEFORE|SSL_ST_ACCEPT:
215             case SSL_ST_OK|SSL_ST_ACCEPT:

217                 s->server=1;
218                 if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_START,1);

220                 if ((s->version & 0xff00) != (DTLS1_VERSION & 0xff00))
221                 {
222                     SSLerr(SSL_F_DTLS1_ACCEPT, ERR_R_INTERNAL_ERROR)
223                     return -1;
224                 }
225                 s->type=SSL_ST_ACCEPT;

227                 if (s->init_buf == NULL)
228                 {
229                     if ((buf=BUF_MEM_new()) == NULL)
230                     {
231                         ret= -1;
232                         goto end;
233                     }
234                     if (!BUF_MEM_grow(buf,SSL3_RT_MAX_PLAIN_LENGTH))
235                     {
236                         ret= -1;
237                         goto end;
238                     }
239                     s->init_buf=buf;
240                 }

242                 if (!ssl3_setup_buffers(s))
243                 {
244                     ret= -1;
245                     goto end;
246                 }

248                 s->init_num=0;

250                 if (s->state != SSL_ST_RENEGOTIATE)
251                 {
252                     /* Ok, we now need to push on a buffering BIO so
253                      * the output is sent in a way that TCP likes :-
254                      * ...but not with SCTP :-)
255                      */
256 #ifndef OPENSLL_NO_SCTP
257                     if (!BIO_dgram_is_sctp(SSL_get_wbio(s)))
258 #endif
259                     if (!ssl_init_wbio_buffer(s,1)) { ret= -

```

```

261         ssl3_init_finished_mac(s);
262         s->state=SSL3_ST_SR_CLNT_HELLO_A;
263         s->ctx->stats.sess_accept++;
264     }
265     else
266     {
267         /* s->state == SSL_ST_RENEGOTIATE,
268          * we will just send a HelloRequest */
269         s->ctx->stats.sess_accept_renegotiate++;
270         s->state=SSL3_ST_SW_HELLO_REQ_A;
271     }
272
273     break;
274
275 case SSL3_ST_SW_HELLO_REQ_A:
276 case SSL3_ST_SW_HELLO_REQ_B:
277
278     s->shutdown=0;
279     dtls1_clear_record_buffer(s);
280     dtls1_start_timer(s);
281     ret=dtls1_send_hello_request(s);
282     if (ret <= 0) goto end;
283     s->s3->tmp.next_state=SSL3_ST_SR_CLNT_HELLO_A;
284     s->state=SSL3_ST_SW_FLUSH;
285     s->init_num=0;
286
287     ssl3_init_finished_mac(s);
288     break;
289
290 case SSL3_ST_SW_HELLO_REQ_C:
291     s->state=SSL_ST_OK;
292     break;
293
294 case SSL3_ST_SR_CLNT_HELLO_A:
295 case SSL3_ST_SR_CLNT_HELLO_B:
296 case SSL3_ST_SR_CLNT_HELLO_C:
297
298     s->shutdown=0;
299     ret=ssl3_get_client_hello(s);
300     if (ret <= 0) goto end;
301     dtls1_stop_timer(s);
302
303     if (ret == 1 && (SSL_get_options(s) & SSL_OP_COOKIE_EXCH
304                    s->state = DTLS1_ST_SW_HELLO_VERIFY_REQUEST_A;
305     else
306         s->state = SSL3_ST_SW_SRVR_HELLO_A;
307
308     s->init_num=0;
309
310     /* Reflect ClientHello sequence to remain stateless while
311      * (listen)
312      {
313          memcpy(s->s3->write_sequence, s->s3->read_sequence,
314               sizeof(s->s3->write_sequence));
315      }
316
317     /* If we're just listening, stop here */
318     if (listen && s->state == SSL3_ST_SW_SRVR_HELLO_A)
319     {
320         ret = 2;
321         s->d1->listen = 0;
322         /* Set expected sequence numbers
323          * to continue the handshake.
324          */
325         s->d1->handshake_read_seq = 2;
326         s->d1->handshake_write_seq = 1;

```

```

326         s->d1->next_handshake_write_seq = 1;
327         goto end;
328     }
329
330     break;
331
332 case DTLS1_ST_SW_HELLO_VERIFY_REQUEST_A:
333 case DTLS1_ST_SW_HELLO_VERIFY_REQUEST_B:
334
335     ret = dtls1_send_hello_verify_request(s);
336     if (ret <= 0) goto end;
337     s->state=SSL3_ST_SW_FLUSH;
338     s->s3->tmp.next_state=SSL3_ST_SR_CLNT_HELLO_A;
339
340     /* HelloVerifyRequest resets Finished MAC */
341     if (s->version != DTLS1_BAD_VER)
342         ssl3_init_finished_mac(s);
343     break;
344
345 #ifndef OPENSSL_NO_SCTP
346 case DTLS1_SCTP_ST_SR_READ_SOCKET:
347
348     if (BIO_dgram_sctp_msg_waiting(SSL_get_rbio(s)))
349     {
350         s->s3->in_read_app_data=2;
351         s->rwstate=SSL_READING;
352         BIO_clear_retry_flags(SSL_get_rbio(s));
353         BIO_set_retry_read(SSL_get_rbio(s));
354         ret = -1;
355         goto end;
356     }
357
358     s->state=SSL3_ST_SR_FINISHED_A;
359     break;
360
361 case DTLS1_SCTP_ST_SW_WRITE_SOCKET:
362     ret = BIO_dgram_sctp_wait_for_dry(SSL_get_wbio(s));
363     if (ret < 0) goto end;
364
365     if (ret == 0)
366     {
367         if (s->d1->next_state != SSL_ST_OK)
368         {
369             s->s3->in_read_app_data=2;
370             s->rwstate=SSL_READING;
371             BIO_clear_retry_flags(SSL_get_rbio(s));
372             BIO_set_retry_read(SSL_get_rbio(s));
373             ret = -1;
374             goto end;
375         }
376     }
377
378     s->state=s->d1->next_state;
379     break;
380 #endif
381
382 case SSL3_ST_SW_SRVR_HELLO_A:
383 case SSL3_ST_SW_SRVR_HELLO_B:
384     s->renegotiate = 2;
385     dtls1_start_timer(s);
386     ret=dtls1_send_server_hello(s);
387     if (ret <= 0) goto end;
388
389     if (s->hit)
390     {
391 #ifndef OPENSSL_NO_SCTP

```

```

392          /* Add new shared key for SCTP-Auth,
393           * will be ignored if no SCTP used.
394           */
395          snprintf((char*) labelbuffer, sizeof(DTLS1_SCTP_
396                  DTLS1_SCTP_AUTH_LABEL);

398          SSL_export_keying_material(s, sctpauthkey,
399                                  sizeof(sctpauthkey),
400                                  sizeof(labelbuffer),
401
402          BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_AD
403                  sizeof(sctpauthkey), sctpauthkey);
404 #endif
405 #ifndef OPENSSL_NO_TLSEXT
406         if (s->tlsext_ticket_expected)
407             s->state=SSL3_ST_SW_SESSION_TICKET_A;
408         else
409             s->state=SSL3_ST_SW_CHANGE_A;
410 #else
411         s->state=SSL3_ST_SW_CHANGE_A;
412 #endif
413     }
414     else
415         s->state=SSL3_ST_SW_CERT_A;
416     s->init_num=0;
417     break;

419     case SSL3_ST_SW_CERT_A:
420     case SSL3_ST_SW_CERT_B:
421         /* Check if it is anon DH or normal PSK */
422         if (!(s->s3->tmp.new_cipher->algorithm_auth & SSL_aNULL)
423             && !(s->s3->tmp.new_cipher->algorithm_mkey & SSL
424                 {
425                 dtls1_start_timer(s);
426                 ret=dtls1_send_server_certificate(s);
427                 if (ret <= 0) goto end;
428 #ifndef OPENSSL_NO_TLSEXT
429                 if (s->tlsext_status_expected)
430                     s->state=SSL3_ST_SW_CERT_STATUS_A;
431                 else
432                     s->state=SSL3_ST_SW_KEY_EXCH_A;
433                 }
434             else
435             {
436                 skip = 1;
437                 s->state=SSL3_ST_SW_KEY_EXCH_A;
438             }
439 #else
440             }
441         else
442             skip=1;

444         s->state=SSL3_ST_SW_KEY_EXCH_A;
445 #endif
446         s->init_num=0;
447         break;

449     case SSL3_ST_SW_KEY_EXCH_A:
450     case SSL3_ST_SW_KEY_EXCH_B:
451         alg_k = s->s3->tmp.new_cipher->algorithm_mkey;

453         /* clear this, it may get reset by
454          * send_server_key_exchange */
455         if ((s->options & SSL_OP_EPHEMERAL_RSA)
456 #ifndef OPENSSL_NO_KRB5
457             && !(alg_k & SSL_kKRB5)

```

```

458 #endif /* OPENSSL_NO_KRB5 */
459         )
460         /* option SSL_OP_EPHEMERAL_RSA sends temporary R
461          * even when forbidden by protocol specs
462          * (handshake may fail as clients are not requir
463          * be able to handle this) */
464         s->s3->tmp.use_rsa_tmp=1;
465     else
466         s->s3->tmp.use_rsa_tmp=0;

468     /* only send if a DH key exchange or
469     * RSA but we have a sign only certificate */
470     if (s->s3->tmp.use_rsa_tmp
471         /* PSK: send ServerKeyExchange if PSK identity
472          * hint if provided */
473         #ifndef OPENSSL_NO_PSK
474         || ((alg_k & SSL_kPSK) && s->ctx->psk_identity_hint)
475         #endif
476         || (alg_k & (SSL_kEDH|SSL_kDHR|SSL_kDHD))
477         || (alg_k & SSL_kECDH)
478         || (alg_k & SSL_kRSA)
479         && (s->cert->pkeys[SSL_PKEY_RSA_ENC].privatekey
480             || (SSL_C_IS_EXPORT(s->s3->tmp.new_cipher)
481                 && EVP_PKEY_size(s->cert->pkeys[SSL_PKEY
482                     )
483                 )
484             )
485         )
486     {
487         dtls1_start_timer(s);
488         ret=dtls1_send_server_key_exchange(s);
489         if (ret <= 0) goto end;
490     }
491     else
492         skip=1;

494     s->state=SSL3_ST_SW_CERT_REQ_A;
495     s->init_num=0;
496     break;

498     case SSL3_ST_SW_CERT_REQ_A:
499     case SSL3_ST_SW_CERT_REQ_B:
500         if (/* don't request cert unless asked for it: */
501             !(s->verify_mode & SSL_VERIFY_PEER) ||
502             /* if SSL_VERIFY_CLIENT_ONCE is set,
503              * don't request cert during re-negotiation: */
504             ((s->session->peer != NULL) &&
505              (s->verify_mode & SSL_VERIFY_CLIENT_ONCE)) ||
506             /* never request cert in anonymous ciphersuites
507              * (see section "Certificate request" in SSL 3 d
508              * and in RFC 2246): */
509             ((s->s3->tmp.new_cipher->algorithm_auth & SSL_aN
510              /* ... except when the application insists on v
511               * (against the specs, but s3_clnt.c accepts th
512              !(s->verify_mode & SSL_VERIFY_FAIL_IF_NO_PEER_C
513              /* never request cert in Kerberos ciphersuites
514              (s->s3->tmp.new_cipher->algorithm_auth & SSL_aKR
515              /* With normal PSK Certificates and
516              * Certificate Requests are omitted */
517              || (s->s3->tmp.new_cipher->algorithm_mkey & SSL_
518              {
519              /* no cert request */
520              skip=1;
521              s->s3->tmp.cert_request=0;
522              s->state=SSL3_ST_SW_SRVR_DONE_A;
523 #ifndef OPENSSL_NO_SCTP

```

```

524         if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
525         {
526             s->d1->next_state = SSL3_ST_SW_SRVR_DONE;
527             s->state = DTLS1_SCTP_ST_SW_WRITE_SOCKET;
528         }
529 #endif
530     }
531     else
532     {
533         s->s3->tmp.cert_request=1;
534         dtls1_start_timer(s);
535         ret=dtls1_send_certificate_request(s);
536         if (ret <= 0) goto end;
537 #ifndef NETSCAPE_HANG_BUG
538         s->state=SSL3_ST_SW_SRVR_DONE_A;
539 #endif
540 #ifndef OPENSSL_NO_SCTP
541         if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
542         {
543             s->d1->next_state = SSL3_ST_SW_SRVR_DONE;
544             s->state = DTLS1_SCTP_ST_SW_WRITE_SOCKET;
545         }
546 #endif
547         s->state=SSL3_ST_SW_FLUSH;
548         s->s3->tmp.next_state=SSL3_ST_SR_CERT_A;
549 #ifndef OPENSSL_NO_SCTP
550         if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
551         {
552             s->d1->next_state = s->s3->tmp.next_state;
553             s->s3->tmp.next_state=DTLS1_SCTP_ST_SW_W
554         }
555 #endif
556 #endif
557         s->init_num=0;
558     }
559     break;
561 case SSL3_ST_SW_SRVR_DONE_A:
562 case SSL3_ST_SW_SRVR_DONE_B:
563     dtls1_start_timer(s);
564     ret=dtls1_send_server_done(s);
565     if (ret <= 0) goto end;
566     s->s3->tmp.next_state=SSL3_ST_SR_CERT_A;
567     s->state=SSL3_ST_SW_FLUSH;
568     s->init_num=0;
569     break;
571 case SSL3_ST_SW_FLUSH:
572     s->rwstate=SSL_WRITING;
573     if (BIO_flush(s->wbio) <= 0)
574     {
575         /* If the write error was fatal, stop trying */
576         if (!BIO_should_retry(s->wbio))
577         {
578             s->rwstate=SSL_NOTHING;
579             s->state=s->s3->tmp.next_state;
580         }
581         ret= -1;
582         goto end;
583     }
584     s->rwstate=SSL_NOTHING;
585     s->state=s->s3->tmp.next_state;
586     break;
589 case SSL3_ST_SR_CERT_A:

```

```

590 case SSL3_ST_SR_CERT_B:
591     /* Check for second client hello (MS SGC) */
592     ret = ssl3_check_client_hello(s);
593     if (ret <= 0)
594         goto end;
595     if (ret == 2)
596     {
597         dtls1_stop_timer(s);
598         s->state = SSL3_ST_SR_CLNT_HELLO_C;
599     }
600     else {
601         /* could be sent for a DH cert, even if we
602          * have not asked for it :- ) */
603         ret=ssl3_get_client_certificate(s);
604         if (ret <= 0) goto end;
605         s->init_num=0;
606         s->state=SSL3_ST_SR_KEY_EXCH_A;
607     }
608     break;
610 case SSL3_ST_SR_KEY_EXCH_A:
611 case SSL3_ST_SR_KEY_EXCH_B:
612     ret=ssl3_get_client_key_exchange(s);
613     if (ret <= 0) goto end;
614 #ifndef OPENSSL_NO_SCTP
615     /* Add new shared key for SCTP-Auth,
616      * will be ignored if no SCTP used.
617      */
618     snprintf((char *) labelbuffer, sizeof(DTLS1_SCTP_AUTH_LABEL),
619              DTLS1_SCTP_AUTH_LABEL);
621     SSL_export_keying_material(s, sctpauthkey,
622                               sizeof(sctpauthkey), labelbuf
623                               sizeof(labelbuffer), NULL, 0,
625     BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_ADD_AUTH_K
626              sizeof(sctpauthkey), sctpauthkey);
627 #endif
629 s->state=SSL3_ST_SR_CERT_VRFY_A;
630 s->init_num=0;
632 if (ret == 2)
633 {
634     /* For the ECDH ciphersuites when
635      * the client sends its ECDH pub key in
636      * a certificate, the CertificateVerify
637      * message is not sent.
638      */
639     s->state=SSL3_ST_SR_FINISHED_A;
640     s->init_num = 0;
641 }
642 else
643 {
644     s->state=SSL3_ST_SR_CERT_VRFY_A;
645     s->init_num=0;
647     /* We need to get hashes here so if there is
648      * a client cert, it can be verified */
649     s->method->ssl3_enc->cert_verify_mac(s,
650                                         NID_md5,
651                                         &(s->s3->tmp.cert_verify_md[0]));
652     s->method->ssl3_enc->cert_verify_mac(s,
653                                         NID_sha1,
654                                         &(s->s3->tmp.cert_verify_md[MD5_DIGEST_L
655                                         ]));

```

```

656             break;

658             case SSL3_ST_SR_CERT_VRFY_A:
659             case SSL3_ST_SR_CERT_VRFY_B:

661                 s->d1->change_cipher_spec_ok = 1;
662                 /* we should decide if we expected this one */
663                 ret=ssl3_get_cert_verify(s);
664                 if (ret <= 0) goto end;
665 #ifndef OPENSSL_NO_SCTP
666                 if (BIO_dgram_is_sctp(SSL_get_wbio(s)) &&
667                     state == SSL_ST_RENEGOTIATE)
668                     s->state=DTLS1_SCTP_ST_SR_READ SOCK;
669                 else
670 #endif
671                     s->state=SSL3_ST_SR_FINISHED_A;
672                 s->init_num=0;
673                 break;

675             case SSL3_ST_SR_FINISHED_A:
676             case SSL3_ST_SR_FINISHED_B:
677                 s->d1->change_cipher_spec_ok = 1;
678                 ret=ssl3_get_finished(s,SSL3_ST_SR_FINISHED_A,
679                                     SSL3_ST_SR_FINISHED_B);
680                 if (ret <= 0) goto end;
681                 dtls1_stop_timer(s);
682                 if (s->hit)
683                     s->state=SSL_ST_OK;
684 #ifndef OPENSSL_NO_TLSEXT
685                 else if (s->tlsext_ticket_expected)
686                     s->state=SSL3_ST_SW_SESSION_TICKET_A;
687 #endif
688                 else
689                     s->state=SSL3_ST_SW_CHANGE_A;
690                 s->init_num=0;
691                 break;

693 #ifndef OPENSSL_NO_TLSEXT
694             case SSL3_ST_SW_SESSION_TICKET_A:
695             case SSL3_ST_SW_SESSION_TICKET_B:
696                 ret=dtls1_send_newsession_ticket(s);
697                 if (ret <= 0) goto end;
698                 s->state=SSL3_ST_SW_CHANGE_A;
699                 s->init_num=0;
700                 break;

702             case SSL3_ST_SW_CERT_STATUS_A:
703             case SSL3_ST_SW_CERT_STATUS_B:
704                 ret=ssl3_send_cert_status(s);
705                 if (ret <= 0) goto end;
706                 s->state=SSL3_ST_SW_KEY_EXCH_A;
707                 s->init_num=0;
708                 break;

710 #endif

712             case SSL3_ST_SW_CHANGE_A:
713             case SSL3_ST_SW_CHANGE_B:

715                 s->session->cipher=s->s3->tmp.new_cipher;
716                 if (!s->method->ssl3_enc->setup_key_block(s))
717                     { ret= -1; goto end; }

719                 ret=dtls1_send_change_cipher_spec(s,
720                                     SSL3_ST_SW_CHANGE_A,SSL3_ST_SW_CHANGE_B);

```

```

722             if (ret <= 0) goto end;

724 #ifndef OPENSSL_NO_SCTP
725             if (!s->hit)
726             {
727                 /* Change to new shared key of SCTP-Auth,
728                 * will be ignored if no SCTP used.
729                 */
730                 BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_NE
731             }
732 #endif

734             s->state=SSL3_ST_SW_FINISHED_A;
735             s->init_num=0;

737             if (!s->method->ssl3_enc->change_cipher_state(s,
738                 SSL3_CHANGE_CIPHER_SERVER_WRITE))
739             {
740                 ret= -1;
741                 goto end;
742             }

744             dtls1_reset_seq_numbers(s, SSL3_CC_WRITE);
745             break;

747             case SSL3_ST_SW_FINISHED_A:
748             case SSL3_ST_SW_FINISHED_B:
749                 ret=dtls1_send_finished(s,
750                                     SSL3_ST_SW_FINISHED_A,SSL3_ST_SW_FINISHED_B,
751                                     s->method->ssl3_enc->server_finished_label,
752                                     s->method->ssl3_enc->server_finished_label_len);
753                 if (ret <= 0) goto end;
754                 s->state=SSL3_ST_SW_FLUSH;
755                 if (s->hit)
756                 {
757                     s->s3->tmp.next_state=SSL3_ST_SR_FINISHED_A;

759 #ifndef OPENSSL_NO_SCTP
760                     /* Change to new shared key of SCTP-Auth,
761                     * will be ignored if no SCTP used.
762                     */
763                     BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_NE
764                 #endif
765                 }
766             else
767             {
768                 s->s3->tmp.next_state=SSL_ST_OK;

769 #ifndef OPENSSL_NO_SCTP
770                 if (BIO_dgram_is_sctp(SSL_get_wbio(s)))
771                 {
772                     s->d1->next_state = s->s3->tmp.next_stat
773                     s->s3->tmp.next_state=DTLS1_SCTP_ST_SW_W
774                 }
775                 #endif
776             }
777             s->init_num=0;
778             break;

780             case SSL_ST_OK:
781                 /* clean a few things up */
782                 ssl3_cleanup_key_block(s);

784             #if 0
785                 BUF_MEM_free(s->init_buf);
786                 s->init_buf=NULL;
787             #endif

```

```

789         /* remove buffering on output */
790         ssl_free_wbio_buffer(s);

792         s->init_num=0;

794         if (s->renegotiate == 2) /* skipped if we just sent a He
795         {
796             s->renegotiate=0;
797             s->new_session=0;
798
799             ssl_update_cache(s,SSL_SESS_CACHE_SERVER);
800
801             s->ctx->stats.ssess_accept_good++;
802             /* s->server=1; */
803             s->handshake_func=dtls1_accept;

805             if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_DONE,1);
806         }

807         ret = 1;
808
809         /* done handshaking, next message is client hello */
810         s->d1->handshake_read_seq = 0;
811         /* next message is server hello */
812         s->d1->handshake_write_seq = 0;
813         s->d1->next_handshake_write_seq = 0;
814         goto end;
815         /* break; */
816
817     default:
818         SSLerr(SSL_F_DTLS1_ACCEPT,SSL_R_UNKNOWN_STATE);
819         ret= -1;
820         goto end;
821         /* break; */
822     }

823     if (!s->s3->tmp.reuse_message && !skip)
824     {
825         if (s->debug)
826         {
827             if ((ret=BIO_flush(s->wbio)) <= 0)
828                 goto end;
829         }

830         if ((cb != NULL) && (s->state != state))
831         {
832             new_state=s->state;
833             s->state=state;
834             cb(s,SSL_CB_ACCEPT_LOOP,1);
835             s->state=new_state;
836         }

837         skip=0;
838     }

839     end:
840     /* BIO_flush(s->wbio); */

841     s->in_handshake--;
842 #ifndef OPENSSL_NO_SCTP
843     /* Notify SCTP BIO socket to leave handshake
844     * mode and prevent stream identifier other
845     * than 0. Will be ignored if no SCTP is used.
846     */
847     BIO_ctrl(SSL_get_wbio(s), BIO_CTRL_DGRAM_SCTP_SET_IN_HANDSHAKE,

```

```

854 #endif

855     if (cb != NULL)
856         cb(s,SSL_CB_ACCEPT_EXIT,ret);
857     return(ret);
858 }

859 int dtls1_send_hello_request(SSL *s)
860 {
861     unsigned char *p;

862     if (s->state == SSL3_ST_SW_HELLO_REQ_A)
863     {
864         p=(unsigned char *)s->init_buf->data;
865         p = dtls1_set_message_header(s, p, SSL3_MT_HELLO_REQUEST, 0, 0,

866         s->state=SSL3_ST_SW_HELLO_REQ_B;
867         /* number of bytes to write */
868         s->init_num=DTLS1_HM_HEADER_LENGTH;
869         s->init_off=0;

870         /* no need to buffer this message, since there are no retransmit
871         * requests for it */
872     }

873     /* SSL3_ST_SW_HELLO_REQ_B */
874     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
875 }

876 int dtls1_send_hello_verify_request(SSL *s)
877 {
878     unsigned int msg_len;
879     unsigned char *msg, *buf, *p;

880     if (s->state == DTLS1_ST_SW_HELLO_VERIFY_REQUEST_A)
881     {
882         buf = (unsigned char *)s->init_buf->data;

883         msg = p = &(buf[DTLS1_HM_HEADER_LENGTH]);
884         *(p++) = s->version >> 8;
885         *(p++) = s->version & 0xFF;

886         if (s->ctx->app_gen_cookie_cb == NULL ||
887             s->ctx->app_gen_cookie_cb(s, s->d1->cookie,
888                                     &(s->d1->cookie_len)) == 0)
889         {
890             SSLerr(SSL_F_DTLS1_SEND_HELLO_VERIFY_REQUEST,ERR_R_INTERNAL_ERROR);
891             return 0;
892         }

893         *(p++) = (unsigned char) s->d1->cookie_len;
894         memcpy(p, s->d1->cookie, s->d1->cookie_len);
895         p += s->d1->cookie_len;
896         msg_len = p - msg;

897         dtls1_set_message_header(s, buf,
898                                 DTLS1_MT_HELLO_VERIFY_REQUEST, msg_len, 0, msg_len);

899         s->state=DTLS1_ST_SW_HELLO_VERIFY_REQUEST_B;
900         /* number of bytes to write */
901         s->init_num=p-buf;
902         s->init_off=0;
903     }

904     /* s->state = DTLS1_ST_SW_HELLO_VERIFY_REQUEST_B */
905     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));

```

```

920     }

922 int dtls1_send_server_hello(SSL *s)
923 {
924     unsigned char *buf;
925     unsigned char *p,*d;
926     int i;
927     unsigned int sl;
928     unsigned long l;

930     if (s->state == SSL3_ST_SW_SRVR_HELLO_A)
931     {
932         buf=(unsigned char *)s->init_buf->data;
933         p=s->s3->server_random;
934         ssl_fill_hello_random(s, 1, p, SSL3_RANDOM_SIZE);
935         /* Do the message type and length last */
936         d=p+ &(buf[DTLS1_HM_HEADER_LENGTH]);

938         *(p++)=s->version>>8;
939         *(p++)=s->version&0xff;

941         /* Random stuff */
942         memcpy(p,s->s3->server_random,SSL3_RANDOM_SIZE);
943         p+=SSL3_RANDOM_SIZE;

945         /* now in theory we have 3 options to sending back the
946          * session id. If it is a re-use, we send back the
947          * old session-id, if it is a new session, we send
948          * back the new session-id or we send back a 0 length
949          * session-id if we want it to be single use.
950          * Currently I will not implement the '0' length session-id
951          * 12-Jan-98 - I'll now support the '0' length stuff.
952          */
953         if (!(s->ctx->session_cache_mode & SSL_SESS_CACHE_SERVER))
954             s->session->session_id_length=0;

956         sl=s->session->session_id_length;
957         if (sl > sizeof s->session->session_id)
958         {
959             SSLerr(SSL_F_DTLS1_SEND_SERVER_HELLO, ERR_R_INTERNAL_ERR);
960             return -1;
961         }
962         *(p++)=sl;
963         memcpy(p,s->session->session_id,sl);
964         p+=sl;

966         /* put the cipher */
967         if (s->s3->tmp.new_cipher == NULL)
968             return -1;
969         i=ssl3_put_cipher_by_char(s->s3->tmp.new_cipher,p);
970         p+=i;

972         /* put the compression method */
973 #ifdef OPENSSL_NO_COMP
974         *(p++)=0;
975 #else
976         if (s->s3->tmp.new_compression == NULL)
977             *(p++)=0;
978         else
979             *(p++)=s->s3->tmp.new_compression->id;
980 #endif

982 #ifndef OPENSSL_NO_TLSEXT
983         if ((p = ssl_add_serverhello_tlsext(s, p, buf+SSL3_RT_MAX_PLAIN_
984         {
985             SSLerr(SSL_F_DTLS1_SEND_SERVER_HELLO,ERR_R_INTERNAL_ERR)

```

```

986             return -1;
987         }
988 #endif

990         /* do the header */
991         l=(p-d);
992         d=buf;

994         d = dtls1_set_message_header(s, d, SSL3_MT_SERVER_HELLO, l, 0, l

996         s->state=SSL3_ST_SW_SRVR_HELLO_B;
997         /* number of bytes to write */
998         s->init_num=p-buf;
999         s->init_off=0;

1001         /* buffer the message to handle re-xmits */
1002         dtls1_buffer_message(s, 0);
1003     }

1005     /* SSL3_ST_SW_SRVR_HELLO_B */
1006     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
1007 }

1009 int dtls1_send_server_done(SSL *s)
1010 {
1011     unsigned char *p;

1013     if (s->state == SSL3_ST_SW_SRVR_DONE_A)
1014     {
1015         p=(unsigned char *)s->init_buf->data;

1017         /* do the header */
1018         p = dtls1_set_message_header(s, p, SSL3_MT_SERVER_DONE, 0, 0, 0)

1020         s->state=SSL3_ST_SW_SRVR_DONE_B;
1021         /* number of bytes to write */
1022         s->init_num=DTLS1_HM_HEADER_LENGTH;
1023         s->init_off=0;

1025         /* buffer the message to handle re-xmits */
1026         dtls1_buffer_message(s, 0);
1027     }

1029     /* SSL3_ST_SW_SRVR_DONE_B */
1030     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
1031 }

1033 int dtls1_send_server_key_exchange(SSL *s)
1034 {
1035 #ifndef OPENSSL_NO_RSA
1036     unsigned char *q;
1037     int j,num;
1038     RSA *rsa;
1039     unsigned char md_buf[MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH];
1040     unsigned int u;
1041 #endif
1042 #ifndef OPENSSL_NO_DH
1043     DH *dh=NULL,*dhp;
1044 #endif
1045 #ifndef OPENSSL_NO_ECDH
1046     EC_KEY *ecdh=NULL, *ecdhp;
1047     unsigned char *encodedPoint = NULL;
1048     int encodedlen = 0;
1049     int curve_id = 0;
1050     BN_CTX *bn_ctx = NULL;
1051 #endif

```

```

1052     EVP_PKEY *pkey;
1053     unsigned char *p,*d;
1054     int al,i;
1055     unsigned long type;
1056     int n;
1057     CERT *cert;
1058     BIGNUM *r[4];
1059     int nr[4],kn;
1060     BUF_MEM *buf;
1061     EVP_MD_CTX md_ctx;

1063     EVP_MD_CTX_init(&md_ctx);
1064     if (s->state == SSL3_ST_SW_KEY_EXCH_A)
1065     {
1066         type=s->s3->tmp.new_cipher->algorithm_mkey;
1067         cert=s->cert;

1069         buf=s->init_buf;

1071         r[0]=r[1]=r[2]=r[3]=NULL;
1072         n=0;
1073 #ifndef OPENSSL_NO_RSA
1074         if (type & SSL_kRSA)
1075         {
1076             rsa=cert->rsa_tmp;
1077             if ((rsa == NULL) && (s->cert->rsa_tmp_cb != NULL))
1078             {
1079                 rsa=s->cert->rsa_tmp_cb(s,
1080                     SSL_C_IS_EXPORT(s->s3->tmp.new_cipher),
1081                     SSL_C_EXPORT_PKEYLENGTH(s->s3->tmp.new_cip
1082             if(rsa == NULL)
1083             {
1084                 al=SSL_AD_HANDSHAKE_FAILURE;
1085                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHA
1086                     goto f_err;
1087             }
1088             RSA_up_ref(rsa);
1089             cert->rsa_tmp=rsa;
1090         }
1091         if (rsa == NULL)
1092         {
1093             al=SSL_AD_HANDSHAKE_FAILURE;
1094             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,SSL_
1095                 goto f_err;
1096         }
1097         r[0]=rsa->n;
1098         r[1]=rsa->e;
1099         s->s3->tmp.use_rsa_tmp=1;
1100     }
1101     else
1102 #endif
1103 #ifndef OPENSSL_NO_DH
1104         if (type & SSL_kEDH)
1105         {
1106             dhp=cert->dh_tmp;
1107             if ((dhp == NULL) && (s->cert->dh_tmp_cb != NULL))
1108             {
1109                 dhp=s->cert->dh_tmp_cb(s,
1110                     SSL_C_IS_EXPORT(s->s3->tmp.new_cipher),
1111                     SSL_C_EXPORT_PKEYLENGTH(s->s3->tmp.new_cip
1112             if (dhp == NULL)
1113             {
1114                 al=SSL_AD_HANDSHAKE_FAILURE;
1115                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,SSL_
1116                     goto f_err;
1117             }

```

```

1118         if (s->s3->tmp.dh != NULL)
1119         {
1120             DH_free(dh);
1121             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, ERR
1122                 goto err;
1123         }

1125         if ((dh=DHparams_dup(dhp)) == NULL)
1126         {
1127             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,ERR_
1128                 goto err;
1129         }

1131         s->s3->tmp.dh=dh;
1132         if ((dhp->pub_key == NULL ||
1133             dhp->priv_key == NULL ||
1134             (s->options & SSL_OP_SINGLE_DH_USE)))
1135         {
1136             if(!DH_generate_key(dh))
1137             {
1138                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,
1139                     ERR_R_DH_LIB);
1140                 goto err;
1141             }
1142         }
1143         else
1144         {
1145             dh->pub_key=BN_dup(dhp->pub_key);
1146             dh->priv_key=BN_dup(dhp->priv_key);
1147             if ((dh->pub_key == NULL) ||
1148                 (dh->priv_key == NULL))
1149             {
1150                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHA
1151                     goto err;
1152             }
1153         }
1154         r[0]=dh->p;
1155         r[1]=dh->q;
1156         r[2]=dh->pub_key;
1157     }
1158     else
1159 #endif
1160 #ifndef OPENSSL_NO_ECDH
1161         if (type & SSL_kEECDH)
1162         {
1163             const EC_GROUP *group;

1165             ecdhp=cert->ecdh_tmp;
1166             if ((ecdh == NULL) && (s->cert->ecdh_tmp_cb != NULL))
1167             {
1168                 ecdhp=s->cert->ecdh_tmp_cb(s,
1169                     SSL_C_IS_EXPORT(s->s3->tmp.new_cipher),
1170                     SSL_C_EXPORT_PKEYLENGTH(s->s3->tmp.new_cip
1171             }
1172             if (ecdh == NULL)
1173             {
1174                 al=SSL_AD_HANDSHAKE_FAILURE;
1175                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,SSL_
1176                     goto f_err;
1177             }

1179             if (s->s3->tmp.ecdh != NULL)
1180             {
1181                 EC_KEY_free(s->s3->tmp.ecdh);
1182                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, ERR
1183                     goto err;

```



```

1184         }
1186         /* Duplicate the ECDH structure. */
1187         if (ecdhp == NULL)
1188         {
1189             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, ERR_
1190             goto err;
1191         }
1192         if ((ecdhp = EC_KEY_dup(ecdhp)) == NULL)
1193         {
1194             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, ERR_
1195             goto err;
1196         }
1198         s->s3->tmp.ecdh=ecdhp;
1199         if ((EC_KEY_get0_public_key(ecdhp) == NULL) ||
1200             (EC_KEY_get0_private_key(ecdhp) == NULL) ||
1201             (s->options & SSL_OP_SINGLE_ECDH_USE))
1202         {
1203             if (!EC_KEY_generate_key(ecdhp))
1204             {
1205                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,
1206                 goto err;
1207             }
1208         }
1210         if (((group = EC_KEY_get0_group(ecdhp)) == NULL) ||
1211             (EC_KEY_get0_public_key(ecdhp) == NULL) ||
1212             (EC_KEY_get0_private_key(ecdhp) == NULL))
1213         {
1214             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, ERR_
1215             goto err;
1216         }
1218         if (SSL_C_IS_EXPORT(s->s3->tmp.new_cipher) &&
1219             (EC_GROUP_get_degree(group) > 163))
1220         {
1221             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, SSL_
1222             goto err;
1223         }
1225         /* XXX: For now, we only support ephemeral ECDH
1226         * keys over named (not generic) curves. For
1227         * supported named curves, curve_id is non-zero.
1228         */
1229         if ((curve_id =
1230             tls1_ec_nid2curve_id(EC_GROUP_get_curve_name(group))
1231             == 0)
1232         {
1233             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, SSL_
1234             goto err;
1235         }
1237         /* Encode the public key.
1238         * First check the size of encoding and
1239         * allocate memory accordingly.
1240         */
1241         encodedlen = EC_POINT_point2oct(group,
1242             EC_KEY_get0_public_key(ecdhp),
1243             POINT_CONVERSION_UNCOMPRESSED,
1244             NULL, 0, NULL);
1246         encodedPoint = (unsigned char *)
1247             OPENSSL_malloc(encodedlen*sizeof(unsigned char));
1248         bn_ctx = BN_CTX_new();
1249         if ((encodedPoint == NULL) || (bn_ctx == NULL))

```

```

1250         {
1251             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, ERR_
1252             goto err;
1253         }
1255         encodedlen = EC_POINT_point2oct(group,
1256             EC_KEY_get0_public_key(ecdhp),
1257             POINT_CONVERSION_UNCOMPRESSED,
1258             encodedPoint, encodedlen, bn_ctx);
1260         if (encodedlen == 0)
1261         {
1262             SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, ERR_
1263             goto err;
1264         }
1265         BN_CTX_free(bn_ctx); bn_ctx=NULL;
1267         /* XXX: For now, we only support named (not
1268         * generic) curves in ECDH ephemeral key exchanges.
1269         * In this situation, we need four additional bytes
1270         * to encode the entire ServerECDHParams
1271         * structure.
1272         */
1273         n = 4 + encodedlen;
1275         /* We'll generate the serverKeyExchange message
1276         * explicitly so we can set these to NULLs
1277         */
1278         r[0]=NULL;
1279         r[1]=NULL;
1280         r[2]=NULL;
1281         r[3]=NULL;
1282         }
1283         else
1284         {
1285             #endif /* !OPENSSL_NO_ECDH */
1286             #ifndef OPENSSL_NO_PSK
1287             if (type & SSL_kPSK)
1288             {
1289                 /* reserve size for record length and PSK identi
1290                 n+=2+strlen(s->ctx->psk_identity_hint);
1291             }
1292             else
1293             {
1294                 #endif /* !OPENSSL_NO_PSK */
1295                 {
1296                     al=SSL_AD_HANDSHAKE_FAILURE;
1297                     SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE, SSL_R_UNKNOW
1298                     goto f_err;
1299                 }
1300                 for (i=0; r[i] != NULL; i++)
1301                 {
1302                     nr[i]=BN_num_bytes(r[i]);
1303                     n+=2+nr[i];
1304                 }
1306                 if (!(s->s3->tmp.new_cipher->algorithm_auth & SSL_aNULL)
1307                     && !(s->s3->tmp.new_cipher->algorithm_mkey & SSL_kPSK))
1308                 {
1309                     if ((pkey=ssl_get_sign_pkey(s, s->s3->tmp.new_cipher, NUL
1310                     == NULL)
1311                     {
1312                         al=SSL_AD_DECODE_ERROR;
1313                         goto f_err;
1314                     }
1315                     kn=EVP_PKEY_size(pkey);

```

```

1316         }
1317     else
1318     {
1319         pkey=NULL;
1320         kn=0;
1321     }
1322
1323     if (!BUF_MEM_grow_clean(buf,n+DTLS1_HM_HEADER_LENGTH+kn))
1324     {
1325         SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,ERR_LIB_BUF)
1326         goto err;
1327     }
1328     d=(unsigned char *)s->init_buf->data;
1329     p= &(d[DTLS1_HM_HEADER_LENGTH]);
1330
1331     for (i=0; r[i] != NULL; i++)
1332     {
1333         s2n(nr[i],p);
1334         BN_bn2bin(r[i],p);
1335         p+=nr[i];
1336     }
1337
1338 #ifndef OPENSSL_NO_ECDH
1339     if (type & SSL_KEECDH)
1340     {
1341         /* XXX: For now, we only support named (not generic) cur
1342          * In this situation, the serverKeyExchange message has:
1343          * [1 byte CurveType], [2 byte CurveName]
1344          * [1 byte length of encoded point], followed by
1345          * the actual encoded point itself
1346          */
1347         *p = NAMED_CURVE_TYPE;
1348         p += 1;
1349         *p = 0;
1350         p += 1;
1351         *p = curve_id;
1352         p += 1;
1353         *p = encodedlen;
1354         p += 1;
1355         memcpy((unsigned char*)p,
1356              (unsigned char *)encodedPoint,
1357              encodedlen);
1358         OPENSSL_free(encodedPoint);
1359         p += encodedlen;
1360     }
1361 #endif
1362
1363 #ifndef OPENSSL_NO_PSK
1364     if (type & SSL_KPSK)
1365     {
1366         /* copy PSK identity hint */
1367         s2n(strlen(s->ctx->psk_identity_hint), p);
1368         strncpy((char *)p, s->ctx->psk_identity_hint, strlen(s->
1369         p+=strlen(s->ctx->psk_identity_hint);
1370     }
1371 #endif
1372
1373     /* not anonymous */
1374     if (pkey != NULL)
1375     {
1376         /* n is the length of the params, they start at
1377          * &(d[DTLS1_HM_HEADER_LENGTH]) and p points to the spac
1378          * at the end. */
1379 #ifndef OPENSSL_NO_RSA
1380         if (pkey->type == EVP_PKEY_RSA)
1381         {

```

```

1382             q=md_buf;
1383             j=0;
1384             for (num=2; num > 0; num--)
1385             {
1386                 EVP_DigestInit_ex(&md_ctx,(num == 2)
1387                 ?s->ctx->md5:s->ctx->sha1, NULL)
1388                 EVP_DigestUpdate(&md_ctx,&(s->s3->client
1389                 EVP_DigestUpdate(&md_ctx,&(s->s3->server
1390                 EVP_DigestUpdate(&md_ctx,&(d[DTLS1_HM_HE
1391                 EVP_DigestFinal_ex(&md_ctx,q,
1392                 (unsigned int *)&i);
1393                 q+=i;
1394                 j+=i;
1395             }
1396             if (RSA_sign(NID_md5_sha1, md_buf, j,
1397                 &(p[2]), &u, pkey->pkey.rsa) <= 0)
1398             {
1399                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHA
1400                 goto err;
1401             }
1402             s2n(u,p);
1403             n+=u+2;
1404         }
1405     else
1406     #endif
1407     #if !defined(OPENSSL_NO_DSA)
1408         if (pkey->type == EVP_PKEY_DSA)
1409         {
1410             /* lets do DSS */
1411             EVP_SignInit_ex(&md_ctx,EVP_dss1(), NULL);
1412             EVP_SignUpdate(&md_ctx,&(s->s3->client_random[0]
1413             EVP_SignUpdate(&md_ctx,&(s->s3->server_random[0]
1414             EVP_SignUpdate(&md_ctx,&(d[DTLS1_HM_HEADER LENGT
1415             if (!EVP_SignFinal(&md_ctx,&(p[2]),
1416                 (unsigned int *)&i,pkey))
1417             {
1418                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHA
1419                 goto err;
1420             }
1421             s2n(i,p);
1422             n+=i+2;
1423         }
1424     else
1425     #endif
1426     #if !defined(OPENSSL_NO_ECDSA)
1427         if (pkey->type == EVP_PKEY_EC)
1428         {
1429             /* let's do ECDSA */
1430             EVP_SignInit_ex(&md_ctx,EVP_ecdsa(), NULL);
1431             EVP_SignUpdate(&md_ctx,&(s->s3->client_random[0]
1432             EVP_SignUpdate(&md_ctx,&(s->s3->server_random[0]
1433             EVP_SignUpdate(&md_ctx,&(d[DTLS1_HM_HEADER LENGT
1434             if (!EVP_SignFinal(&md_ctx,&(p[2]),
1435                 (unsigned int *)&i,pkey))
1436             {
1437                 SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHA
1438                 goto err;
1439             }
1440             s2n(i,p);
1441             n+=i+2;
1442         }
1443     else
1444     #endif
1445     {
1446         /* Is this error check actually needed? */
1447         al=SSL_AD_HANDSHAKE_FAILURE;

```

```

1448         SSLerr(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE,SSL_
1449             goto f_err;
1450     }
1451 }

1453     d = dtls1_set_message_header(s, d,
1454         SSL3_MT_SERVER_KEY_EXCHANGE, n, 0, n);

1456     /* we should now have things packed up, so lets send
1457      * it off */
1458     s->init_num=n+DTLS1_HM_HEADER_LENGTH;
1459     s->init_off=0;

1461     /* buffer the message to handle re-xmits */
1462     dtls1_buffer_message(s, 0);
1463 }

1465     s->state = SSL3_ST_SW_KEY_EXCH_B;
1466     EVP_MD_CTX_cleanup(&md_ctx);
1467     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
1468 f_err:
1469     ssl3_send_alert(s,SSL3_AL_FATAL,al);
1470 err:
1471 #ifndef OPENSSL_NO_ECDH
1472     if (encodedPoint != NULL) OPENSSL_free(encodedPoint);
1473     BN_CTX_free(bn_ctx);
1474 #endif
1475     EVP_MD_CTX_cleanup(&md_ctx);
1476     return(-1);
1477 }

1479 int dtls1_send_certificate_request(SSL *s)
1480 {
1481     unsigned char *p,*d;
1482     int i,j,nl,off,n;
1483     STACK_OF(X509_NAME) *sk=NULL;
1484     X509_NAME *name;
1485     BUF_MEM *buf;
1486     unsigned int msg_len;

1488     if (s->state == SSL3_ST_SW_CERT_REQ_A)
1489     {
1490         buf=s->init_buf;

1492         d=p=(unsigned char *)&(buf->data[DTLS1_HM_HEADER_LENGTH]);

1494         /* get the list of acceptable cert types */
1495         p++;
1496         n=ssl3_get_req_cert_type(s,p);
1497         d[0]=n;
1498         p+=n;
1499         n++;

1501         off=n;
1502         p+=2;
1503         n+=2;

1505         sk=SSL_get_client_CA_list(s);
1506         nl=0;
1507         if (sk != NULL)
1508         {
1509             for (i=0; i<sk_X509_NAME_num(sk); i++)
1510             {
1511                 name=sk_X509_NAME_value(sk,i);
1512                 j=i2d_X509_NAME(name,NULL);
1513                 if (!BUF_MEM_grow_clean(buf,DTLS1_HM_HEADER LENG

```

```

1514     {
1515         SSLerr(SSL_F_DTLS1_SEND_CERTIFICATE_REQUEST,SSL_
1516             goto err;
1517     }
1518     p=(unsigned char *)&(buf->data[DTLS1_HM_HEADER_LENGTH+off]);
1519     if (!(s->options & SSL_OP_NETSCAPE_CA_DN_BUG))
1520     {
1521         s2n(j,p);
1522         i2d_X509_NAME(name,&p);
1523         n+=2+j;
1524         nl+=2+j;
1525     }
1526     else
1527     {
1528         d=p;
1529         i2d_X509_NAME(name,&p);
1530         j-=2; s2n(j,d); j+=2;
1531         n+=j;
1532         nl+=j;
1533     }
1534 }
1535 }
1536 /* else no CA names */
1537 p=(unsigned char *)&(buf->data[DTLS1_HM_HEADER_LENGTH+off]);
1538 s2n(nl,p);

1540     d=(unsigned char *)buf->data;
1541     *(d++)=SSL3_MT_CERTIFICATE_REQUEST;
1542     l2n3(n,d);
1543     s2n(s->d1->handshake_write_seq,d);
1544     s->d1->handshake_write_seq++;

1546     /* we should now have things packed up, so lets send
1547      * it off */

1549     s->init_num=n+DTLS1_HM_HEADER_LENGTH;
1550     s->init_off=0;
1551 #ifdef NETSCAPE_HANG_BUG
1552     /* XXX: what to do about this? */
1553     p=(unsigned char *)s->init_buf->data + s->init_num;

1555     /* do the header */
1556     *(p++)=SSL3_MT_SERVER_DONE;
1557     *(p++)=0;
1558     *(p++)=0;
1559     *(p++)=0;
1560     s->init_num += 4;
1561 #endif

1563     /* XDTLS: set message header ? */
1564     msg_len = s->init_num - DTLS1_HM_HEADER_LENGTH;
1565     dtls1_set_message_header(s, (void *)s->init_buf->data,
1566         SSL3_MT_CERTIFICATE_REQUEST, msg_len, 0, msg_len);

1568     /* buffer the message to handle re-xmits */
1569     dtls1_buffer_message(s, 0);

1571     s->state = SSL3_ST_SW_CERT_REQ_B;
1572 }

1574     /* SSL3_ST_SW_CERT_REQ_B */
1575     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
1576 err:
1577     return(-1);
1578 }

```

```

1580 int dtls1_send_server_certificate(SSL *s)
1581 {
1582     unsigned long l;
1583     X509 *x;

1585     if (s->state == SSL3_ST_SW_CERT_A)
1586     {
1587         x=ssl_get_server_send_cert(s);
1588         if (x == NULL)
1589         {
1590             /* VRS: allow null cert if auth == KRB5 */
1591             if ((s->s3->tmp.new_cipher->algorithm_mkey != SSL_KRB5)
1592                 (s->s3->tmp.new_cipher->algorithm_auth != SSL_AKRB5)
1593             )
1594             {
1595                 SSLerr(SSL_F_DTLS1_SEND_SERVER_CERTIFICATE,ERR_R
1596                     return(0);
1597             }
1598         }

1599         l=dtls1_output_cert_chain(s,x);
1600         s->state=SSL3_ST_SW_CERT_B;
1601         s->init_num=(int)l;
1602         s->init_off=0;

1604         /* buffer the message to handle re-xmits */
1605         dtls1_buffer_message(s, 0);
1606     }

1608     /* SSL3_ST_SW_CERT_B */
1609     return(dtls1_do_write(s,SSL3_RT_HANDSHAKE));
1610 }

1612 #ifndef OPENSSL_NO_TLSEXT
1613 int dtls1_send_newsession_ticket(SSL *s)
1614 {
1615     if (s->state == SSL3_ST_SW_SESSION_TICKET_A)
1616     {
1617         unsigned char *p, *senc, *macstart;
1618         int len, slen;
1619         unsigned int hlen, msg_len;
1620         EVP_CIPHER_CTX ctx;
1621         HMAC_CTX hctx;
1622         SSL_CTX *tctx = s->initial_ctx;
1623         unsigned char iv[EVP_MAX_IV_LENGTH];
1624         unsigned char key_name[16];

1626         /* get session encoding length */
1627         slen = i2d_SSL_SESSION(s->session, NULL);
1628         /* Some length values are 16 bits, so forget it if session is
1629            * too long
1630            */
1631         if (slen > 0xFF00)
1632             return -1;
1633         /* Grow buffer if need be: the length calculation is as
1634            * follows 12 (DTLS handshake message header) +
1635            * 4 (ticket lifetime hint) + 2 (ticket length) +
1636            * 16 (key name) + max_iv_len (iv length) +
1637            * session length + max_enc_block_size (max encrypted session
1638            * length) + max_md_size (HMAC).
1639            */
1640         if (!BUF_MEM_grow(s->init_buf,
1641             DTLS1_HM_HEADER_LENGTH + 22 + EVP_MAX_IV_LENGTH +
1642             EVP_MAX_BLOCK_LENGTH + EVP_MAX_MD_SIZE + slen))
1643             return -1;
1644         senc = OPENSSL_malloc(slen);
1645         if (!senc)

```

```

1646         return -1;
1647         p = senc;
1648         i2d_SSL_SESSION(s->session, &p);

1650         p=(unsigned char *)&(s->init_buf->data[DTLS1_HM_HEADER_LENGTH]);
1651         EVP_CIPHER_CTX_init(&ctx);
1652         HMAC_CTX_init(&hctx);
1653         /* Initialize HMAC and cipher contexts. If callback present
1654            * it does all the work otherwise use generated values
1655            * from parent ctx.
1656            */
1657         if (tctx->tlsext_ticket_key_cb)
1658         {
1659             if (tctx->tlsext_ticket_key_cb(s, key_name, iv, &ctx,
1660                 &hctx, 1) < 0)
1661             {
1662                 OPENSSL_free(senc);
1663                 return -1;
1664             }
1665         }
1666         else
1667         {
1668             RAND_pseudo_bytes(iv, 16);
1669             EVP_EncryptInit_ex(&ctx, EVP_aes_128_cbc(), NULL,
1670                 tctx->tlsext_tick_aes_key, iv);
1671             HMAC_Init_ex(&hctx, tctx->tlsext_tick_hmac_key, 16,
1672                 tlsext_tick_md(), NULL);
1673             memcpy(key_name, tctx->tlsext_tick_key_name, 16);
1674         }
1675         l2n(s->session->tlsext_tick_lifetime_hint, p);
1676         /* Skip ticket length for now */
1677         p += 2;
1678         /* Output key name */
1679         macstart = p;
1680         memcpy(p, key_name, 16);
1681         p += 16;
1682         /* output IV */
1683         memcpy(p, iv, EVP_CIPHER_CTX_iv_length(&ctx));
1684         p += EVP_CIPHER_CTX_iv_length(&ctx);
1685         /* Encrypt session data */
1686         EVP_EncryptUpdate(&ctx, p, &len, senc, slen);
1687         p += len;
1688         EVP_EncryptFinal(&ctx, p, &len);
1689         p += len;
1690         EVP_CIPHER_CTX_cleanup(&ctx);

1692         HMAC_Update(&hctx, macstart, p - macstart);
1693         HMAC_Final(&hctx, p, &hlen);
1694         HMAC_CTX_cleanup(&hctx);

1696         p += hlen;
1697         /* Now write out lengths: p points to end of data written */
1698         /* Total length */
1699         len = p - (unsigned char *)&(s->init_buf->data);
1700         /* Ticket length */
1701         p=(unsigned char *)&(s->init_buf->data[DTLS1_HM_HEADER_LENGTH])
1702         s2n(len - DTLS1_HM_HEADER_LENGTH - 6, p);

1704         /* number of bytes to write */
1705         s->init_num= len;
1706         s->state=SSL3_ST_SW_SESSION_TICKET_B;
1707         s->init_off=0;
1708         OPENSSL_free(senc);

1710         /* XDTLS: set message header ? */
1711         msg_len = s->init_num - DTLS1_HM_HEADER_LENGTH;

```

```
1712         dtls1_set_message_header(s, (void *)s->init_buf->data,  
1713                                SSL3_MT_NEWSESSION_TICKET, msg_len, 0, msg_len);  
  
1715         /* buffer the message to handle re-xmits */  
1716         dtls1_buffer_message(s, 0);  
1717     }  
  
1719     /* SSL3_ST_SW_SESSION_TICKET_B */  
1720     return(dtls1_do_write(s, SSL3_RT_HANDSHAKE));  
1721 }  
1722 #endif
```

new/usr/src/lib/openssl/libsunw_ssl/i386/Makefile

1

1289 Fri May 30 18:32:19 2014

new/usr/src/lib/openssl/libsunw_ssl/i386/Makefile

4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
23 # Use is subject to license terms.
24 #
```

```
26 include ../Makefile.com
```

```
28 CPPFLAGS += -DL_ENDIAN
29 CPPFLAGS += -DOPENSSL_NO_INLINE_ASM
30 CPPFLAGS += -DOPENSSL_BN_ASM_PART_WORDS
31 CPPFLAGS += -DOPENSSL_IA32_SSE2
32 CPPFLAGS += -DRMD160_ASM
33 CPPFLAGS += -DAES_ASM
```

```
35 .KEEP_STATE:
```

```
37 all: $(ROOTLIBDIR) $(LIBS) $(LIBLINKS)
```

```
39 $(LIBLINKS): FRC
40 $(RM) $@; $(SYMLINK) $(DYNLIB) $@
```

```
42 $(ROOTLIBDIR):
43 $(INS.dir)
```

```
45 install: all $(ROOTLIBS) $(ROOTLINKS)
```

```
47 FRC:
```

new/usr/src/lib/openssl/libsunw_ssl/kssl.c

1

```
*****
69597 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/kssl.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/kssl.c  *- mode: C; c-file-style: "eay"  *- */
2 /* Written by Vern Staats <staatsvr@asc.hpc.mil> for the OpenSSL project 2000.
3 */
4 /* =====
5 * Copyright (c) 2000 The OpenSSL Project. All rights reserved.
6 *
7 * Redistribution and use in source and binary forms, with or without
8 * modification, are permitted provided that the following conditions
9 * are met:
10 *
11 * 1. Redistributions of source code must retain the above copyright
12 * notice, this list of conditions and the following disclaimer.
13 *
14 * 2. Redistributions in binary form must reproduce the above copyright
15 * notice, this list of conditions and the following disclaimer in
16 * the documentation and/or other materials provided with the
17 * distribution.
18 *
19 * 3. All advertising materials mentioning features or use of this
20 * software must display the following acknowledgment:
21 * "This product includes software developed by the OpenSSL Project
22 * for use in the OpenSSL Toolkit. (http://www.OpenSSL.org/)"
23 *
24 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
25 * endorse or promote products derived from this software without
26 * prior written permission. For written permission, please contact
27 * licensing@OpenSSL.org.
28 *
29 * 5. Products derived from this software may not be called "OpenSSL"
30 * nor may "OpenSSL" appear in their names without prior written
31 * permission of the OpenSSL Project.
32 *
33 * 6. Redistributions of any form whatsoever must retain the following
34 * acknowledgment:
35 * "This product includes software developed by the OpenSSL Project
36 * for use in the OpenSSL Toolkit (http://www.OpenSSL.org/)"
37 *
38 * THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY
39 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
40 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
41 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
42 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
43 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
44 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
45 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
46 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
47 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
48 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
49 * OF THE POSSIBILITY OF SUCH DAMAGE.
50 * =====
51 *
52 * This product includes cryptographic software written by Eric Young
53 * (eay@cryptsoft.com). This product includes software written by Tim
54 * Hudson (tjh@cryptsoft.com).
55 *
56 */

59 /* ssl/kssl.c  -- Routines to support (& debug) Kerberos5 auth for openssl
60 **
61 ** 19990701 VRS Started.
```

new/usr/src/lib/openssl/libsunw_ssl/kssl.c

2

```
62 ** 200011?? Jeffrey Altman, Richard Levitte
63 ** Generalized for Heimdal, Newer MIT, & Win32.
64 ** Integrated into main OpenSSL 0.9.7 snapshots.
65 ** 20010413 Simon Wilkinson, VRS
66 ** Real RFC2712 KerberosWrapper replaces AP_REQ.
67 */

69 #include <openssl/opensslconf.h>

71 #include <string.h>

73 #define KRB5_PRIVATE 1

75 #include <openssl/ssl.h>
76 #include <openssl/evp.h>
77 #include <openssl/objects.h>
78 #include <openssl/krb5_asn.h>
79 #include "kssl_lcl.h"

81 #ifndef OPENSSL_NO_KRB5

83 #ifndef ENOMEM
84 #define ENOMEM KRB5KRB_ERR_GENERIC
85 #endif

87 /*
88 * When OpenSSL is built on Windows, we do not want to require that
89 * the Kerberos DLLs be available in order for the OpenSSL DLLs to
90 * work. Therefore, all Kerberos routines are loaded at run time
91 * and we do not link to a .LIB file.
92 */

94 #if defined(OPENSSL_SYS_WINDOWS) || defined(OPENSSL_SYS_WIN32)
95 /*
96 * The purpose of the following pre-processor statements is to provide
97 * compatibility with different releases of MIT Kerberos for Windows.
98 * All versions up to 1.2 used macros. But macros do not allow for
99 * a binary compatible interface for DLLs. Therefore, all macros are
100 * being replaced by function calls. The following code will allow
101 * an OpenSSL DLL built on Windows to work whether or not the macro
102 * or function form of the routines are utilized.
103 */
104 #ifdef krb5_cc_get_principal
105 #define NO_DEF_KRB5_CCACHE
106 #undef krb5_cc_get_principal
107 #endif
108 #define krb5_cc_get_principal kssl_krb5_cc_get_principal

110 #define krb5_free_data_contents kssl_krb5_free_data_contents
111 #define krb5_free_context kssl_krb5_free_context
112 #define krb5_auth_con_free kssl_krb5_auth_con_free
113 #define krb5_free_principal kssl_krb5_free_principal
114 #define krb5_mk_req_extended kssl_krb5_mk_req_extended
115 #define krb5_get_credentials kssl_krb5_get_credentials
116 #define krb5_cc_default kssl_krb5_cc_default
117 #define krb5_sname_to_principal kssl_krb5_sname_to_principal
118 #define krb5_init_context kssl_krb5_init_context
119 #define krb5_free_ticket kssl_krb5_free_ticket
120 #define krb5_rd_req kssl_krb5_rd_req
121 #define krb5_kt_default kssl_krb5_kt_default
122 #define krb5_kt_resolve kssl_krb5_kt_resolve
123 /* macros in mit 1.2.2 and earlier; functions in mit 1.2.3 and greater */
124 #ifndef krb5_kt_close
125 #define krb5_kt_close kssl_krb5_kt_close
126 #endif /* krb5_kt_close */
127 #ifndef krb5_kt_get_entry
```

```

128 #define krb5_kt_get_entry      kssl_krb5_kt_get_entry
129 #endif /* krb5_kt_get_entry */
130 #define krb5_auth_con_init      kssl_krb5_auth_con_init

132 #define krb5_principal_compare kssl_krb5_principal_compare
133 #define krb5_decrypt_tkt_part kssl_krb5_decrypt_tkt_part
134 #define krb5_timeofday        kssl_krb5_timeofday
135 #define krb5_rc_default        kssl_krb5_rc_default

137 #ifdef krb5_rc_initialize
138 #undef krb5_rc_initialize
139 #endif
140 #define krb5_rc_initialize      kssl_krb5_rc_initialize

142 #ifdef krb5_rc_get_lifespan
143 #undef krb5_rc_get_lifespan
144 #endif
145 #define krb5_rc_get_lifespan    kssl_krb5_rc_get_lifespan

147 #ifdef krb5_rc_destroy
148 #undef krb5_rc_destroy
149 #endif
150 #define krb5_rc_destroy         kssl_krb5_rc_destroy

152 #define valid_cksumtype         kssl_valid_cksumtype
153 #define krb5_checksum_size     kssl_krb5_checksum_size
154 #define krb5_kt_free_entry     kssl_krb5_kt_free_entry
155 #define krb5_auth_con_setrcache kssl_krb5_auth_con_setrcache
156 #define krb5_auth_con_getrcache kssl_krb5_auth_con_getrcache
157 #define krb5_get_server_rcache kssl_krb5_get_server_rcache

159 /* Prototypes for built in stubs */
160 void kssl_krb5_free_data_contents(krb5_context, krb5_data *);
161 void kssl_krb5_free_principal(krb5_context, krb5_principal *);
162 krb5_error_code kssl_krb5_kt_resolve(krb5_context,
163                                     krb5_const char *,
164                                     krb5_keytab *);
165 krb5_error_code kssl_krb5_kt_default(krb5_context,
166                                     krb5_keytab *);
167 krb5_error_code kssl_krb5_free_ticket(krb5_context, krb5_ticket *);
168 krb5_error_code kssl_krb5_rd_req(krb5_context, krb5_auth_context *,
169                                 krb5_const krb5_data *,
170                                 krb5_const_principal, krb5_keytab,
171                                 krb5_flags *, krb5_ticket **);

173 krb5_boolean kssl_krb5_principal_compare(krb5_context, krb5_const_principal,
174                                           krb5_const_principal);
175 krb5_error_code kssl_krb5_mk_req_extended(krb5_context,
176                                           krb5_auth_context *,
177                                           krb5_const krb5_flags,
178                                           krb5_data *,
179                                           krb5_creds *,
180                                           krb5_data *);
181 krb5_error_code kssl_krb5_init_context(krb5_context *);
182 void kssl_krb5_free_context(krb5_context);
183 krb5_error_code kssl_krb5_cc_default(krb5_context, krb5_ccache *);
184 krb5_error_code kssl_krb5_sname_to_principal(krb5_context,
185                                               krb5_const char *,
186                                               krb5_const char *,
187                                               krb5_int32,
188                                               krb5_principal *);
189 krb5_error_code kssl_krb5_get_credentials(krb5_context,
190                                           krb5_const krb5_flags,
191                                           krb5_ccache,
192                                           krb5_creds *,
193                                           krb5_creds * *);

```

```

194 krb5_error_code kssl_krb5_auth_con_init(krb5_context,
195                                           krb5_auth_context *);
196 krb5_error_code kssl_krb5_cc_get_principal(krb5_context context,
197                                             krb5_ccache cache,
198                                             krb5_principal *principal);
199 krb5_error_code kssl_krb5_auth_con_free(krb5_context, krb5_auth_context);
200 size_t kssl_krb5_checksum_size(krb5_context context, krb5_cksumtype ctype);
201 krb5_boolean kssl_valid_cksumtype(krb5_cksumtype ctype);
202 krb5_error_code krb5_kt_free_entry(krb5_context, krb5_keytab_entry FAR *);
203 krb5_error_code kssl_krb5_auth_con_setrcache(krb5_context,
204                                              krb5_auth_context,
205                                              krb5_rcache);
206 krb5_error_code kssl_krb5_get_server_rcache(krb5_context,
207                                             krb5_const krb5_data *,
208                                             krb5_rcache *);
209 krb5_error_code kssl_krb5_auth_con_getrcache(krb5_context,
210                                              krb5_auth_context,
211                                              krb5_rcache *);

213 /* Function pointers (almost all Kerberos functions are stdcall) */
214 static void (_stdcall *p_krb5_free_data_contents)(krb5_context, krb5_data *)
215           =NULL;
216 static void (_stdcall *p_krb5_free_principal)(krb5_context, krb5_principal *)
217           =NULL;
218 static krb5_error_code(_stdcall *p_krb5_kt_resolve)
219           (krb5_context, krb5_const char *, krb5_keytab *) =NULL;
220 static krb5_error_code (_stdcall *p_krb5_kt_default)(krb5_context,
221                                                     krb5_keytab *) =NULL;
222 static krb5_error_code (_stdcall *p_krb5_free_ticket)(krb5_context,
223                                                       krb5_ticket *) =NULL;
224 static krb5_error_code (_stdcall *p_krb5_rd_req)(krb5_context,
225                                                  krb5_auth_context *,
226                                                  krb5_const krb5_data *,
227                                                  krb5_const_principal,
228                                                  krb5_keytab, krb5_flags *,
229                                                  krb5_ticket **) =NULL;
230 static krb5_error_code (_stdcall *p_krb5_mk_req_extended)
231           (krb5_context, krb5_auth_context *,
232           krb5_const krb5_flags, krb5_data *, krb5_creds *,
233           krb5_data *) =NULL;
234 static krb5_error_code (_stdcall *p_krb5_init_context)(krb5_context *) =NULL;
235 static void (_stdcall *p_krb5_free_context)(krb5_context) =NULL;
236 static krb5_error_code (_stdcall *p_krb5_cc_default)(krb5_context,
237                                                     krb5_ccache *) =NULL;
238 static krb5_error_code (_stdcall *p_krb5_sname_to_principal)
239           (krb5_context, krb5_const char *, krb5_const char *,
240           krb5_int32, krb5_principal *) =NULL;
241 static krb5_error_code (_stdcall *p_krb5_get_credentials)
242           (krb5_context, krb5_const krb5_flags, krb5_ccache,
243           krb5_creds *, krb5_creds **) =NULL;
244 static krb5_error_code (_stdcall *p_krb5_auth_con_init)
245           (krb5_context, krb5_auth_context *) =NULL;
246 static krb5_error_code (_stdcall *p_krb5_cc_get_principal)
247           (krb5_context context, krb5_ccache cache,
248           krb5_principal *principal) =NULL;
249 static krb5_error_code (_stdcall *p_krb5_auth_con_free)
250           (krb5_context, krb5_auth_context) =NULL;
251 static krb5_error_code (_stdcall *p_krb5_decrypt_tkt_part)
252           (krb5_context, krb5_const krb5_keyblock *,
253           krb5_ticket *) =NULL;
254 static krb5_error_code (_stdcall *p_krb5_timeofday)
255           (krb5_context context, krb5_int32 *timeret) =NULL;
256 static krb5_error_code (_stdcall *p_krb5_rc_default)
257           (krb5_context context, krb5_rcache *rc) =NULL;
258 static krb5_error_code (_stdcall *p_krb5_rc_initialize)
259           (krb5_context context, krb5_rcache rc,

```



```

260         krb5_deltat lifespan)=NULL;
261 static krb5_error_code (_stdcall *p_krb5_rc_get_lifespan)
262     (krb5_context context, krb5_rcache rc,
263      krb5_deltat *lifespan)=NULL;
264 static krb5_error_code (_stdcall *p_krb5_rc_destroy)
265     (krb5_context context, krb5_rcache rc)=NULL;
266 static krb5_boolean (_stdcall *p_krb5_principal_compare)
267     (krb5_context, krb5_const_principal, krb5_const_principal)=
268 static size_t (_stdcall *p_krb5_checksum_size)(krb5_context context,krb5_cksumty
269 static krb5_boolean (_stdcall *p_valid_cksumtype)(krb5_cksumtype ctype)=NULL;
270 static krb5_error_code (_stdcall *p_krb5_kt_free_entry)
271     (krb5_context,krb5_keytab_entry *)=NULL;
272 static krb5_error_code (_stdcall * p_krb5_auth_con_setrcache)(krb5_context,
273     krb5_auth_context,
274     krb5_rcache *)=NULL;
275 static krb5_error_code (_stdcall * p_krb5_get_server_rcache)(krb5_context,
276     krb5_const krb5_da
277     krb5_rcache *)=NUL
278 static krb5_error_code (* p_krb5_auth_con_getrcache)(krb5_context,
279     krb5_auth_context,
280     krb5_rcache *)=NULL;
281 static krb5_error_code (_stdcall * p_krb5_kt_close)(krb5_context context,
282     krb5_keytab keytab)=NULL;
283 static krb5_error_code (_stdcall * p_krb5_kt_get_entry)(krb5_context context,
284     krb5_keytab keytab,
285     krb5_const_principal principal, krb5_kvno vno,
286     krb5_enctype enctype, krb5_keytab_entry *entry)=NULL;
287 static int krb5_loaded = 0; /* only attempt to initialize func ptrs once */

289 /* Function to Load the Kerberos 5 DLL and initialize function pointers */
290 void
291 load_krb5_dll(void)
292 {
293     HANDLE hKRB5_32;
294
295     krb5_loaded++;
296     hKRB5_32 = LoadLibrary(TEXT("KRB5_32"));
297     if (!hKRB5_32)
298         return;

300     (FARPROC) p_krb5_free_data_contents =
301         GetProcAddress( hKRB5_32, "krb5_free_data_contents" );
302     (FARPROC) p_krb5_free_context =
303         GetProcAddress( hKRB5_32, "krb5_free_context" );
304     (FARPROC) p_krb5_auth_con_free =
305         GetProcAddress( hKRB5_32, "krb5_auth_con_free" );
306     (FARPROC) p_krb5_free_principal =
307         GetProcAddress( hKRB5_32, "krb5_free_principal" );
308     (FARPROC) p_krb5_mk_req_extended =
309         GetProcAddress( hKRB5_32, "krb5_mk_req_extended" );
310     (FARPROC) p_krb5_get_credentials =
311         GetProcAddress( hKRB5_32, "krb5_get_credentials" );
312     (FARPROC) p_krb5_cc_get_principal =
313         GetProcAddress( hKRB5_32, "krb5_cc_get_principal" );
314     (FARPROC) p_krb5_cc_default =
315         GetProcAddress( hKRB5_32, "krb5_cc_default" );
316     (FARPROC) p_krb5_sname_to_principal =
317         GetProcAddress( hKRB5_32, "krb5_sname_to_principal" );
318     (FARPROC) p_krb5_init_context =
319         GetProcAddress( hKRB5_32, "krb5_init_context" );
320     (FARPROC) p_krb5_free_ticket =
321         GetProcAddress( hKRB5_32, "krb5_free_ticket" );
322     (FARPROC) p_krb5_rd_req =
323         GetProcAddress( hKRB5_32, "krb5_rd_req" );
324     (FARPROC) p_krb5_principal_compare =
325         GetProcAddress( hKRB5_32, "krb5_principal_compare" );

```

```

326     (FARPROC) p_krb5_decrypt_tkt_part =
327         GetProcAddress( hKRB5_32, "krb5_decrypt_tkt_part" );
328     (FARPROC) p_krb5_timeofday =
329         GetProcAddress( hKRB5_32, "krb5_timeofday" );
330     (FARPROC) p_krb5_rc_default =
331         GetProcAddress( hKRB5_32, "krb5_rc_default" );
332     (FARPROC) p_krb5_rc_initialize =
333         GetProcAddress( hKRB5_32, "krb5_rc_initialize" );
334     (FARPROC) p_krb5_rc_get_lifespan =
335         GetProcAddress( hKRB5_32, "krb5_rc_get_lifespan" );
336     (FARPROC) p_krb5_rc_destroy =
337         GetProcAddress( hKRB5_32, "krb5_rc_destroy" );
338     (FARPROC) p_krb5_kt_default =
339         GetProcAddress( hKRB5_32, "krb5_kt_default" );
340     (FARPROC) p_krb5_kt_resolve =
341         GetProcAddress( hKRB5_32, "krb5_kt_resolve" );
342     (FARPROC) p_krb5_auth_con_init =
343         GetProcAddress( hKRB5_32, "krb5_auth_con_init" );
344     (FARPROC) p_valid_cksumtype =
345         GetProcAddress( hKRB5_32, "valid_cksumtype" );
346     (FARPROC) p_krb5_checksum_size =
347         GetProcAddress( hKRB5_32, "krb5_checksum_size" );
348     (FARPROC) p_krb5_kt_free_entry =
349         GetProcAddress( hKRB5_32, "krb5_kt_free_entry" );
350     (FARPROC) p_krb5_auth_con_setrcache =
351         GetProcAddress( hKRB5_32, "krb5_auth_con_setrcache" );
352     (FARPROC) p_krb5_get_server_rcache =
353         GetProcAddress( hKRB5_32, "krb5_get_server_rcache" );
354     (FARPROC) p_krb5_auth_con_getrcache =
355         GetProcAddress( hKRB5_32, "krb5_auth_con_getrcache" );
356     (FARPROC) p_krb5_kt_close =
357         GetProcAddress( hKRB5_32, "krb5_kt_close" );
358     (FARPROC) p_krb5_kt_get_entry =
359         GetProcAddress( hKRB5_32, "krb5_kt_get_entry" );
360 }

362 /* Stubs for each function to be dynamically loaded */
363 void
364 kssl_krb5_free_data_contents(krb5_context C0, krb5_data * data)
365 {
366     if (!krb5_loaded)
367         load_krb5_dll();

369     if ( p_krb5_free_data_contents )
370         p_krb5_free_data_contents(C0,data);
371 }

373 krb5_error_code
374 kssl_krb5_mk_req_extended (krb5_context C0,
375     krb5_auth_context * pAC0,
376     krb5_const krb5_flags F,
377     krb5_data * pD1,
378     krb5_creds * pC,
379     krb5_data * pD2)
380 {
381     if (!krb5_loaded)
382         load_krb5_dll();

384     if ( p_krb5_mk_req_extended )
385         return(p_krb5_mk_req_extended(C0,pAC0,F,pD1,pC,pD2));
386     else
387         return KRB5KRB_ERR_GENERIC;
388 }

389 krb5_error_code
390 kssl_krb5_auth_con_init(krb5_context C0,
391     krb5_auth_context * pAC0)

```

```

392     {
393         if (!krb5_loaded)
394             load_krb5_dll();
395
396         if ( p_krb5_auth_con_init )
397             return(p_krb5_auth_con_init(CO,pACO));
398         else
399             return KRB5KRB_ERR_GENERIC;
400     }
401 krb5_error_code
402 kssl_krb5_auth_con_free (krb5_context CO,
403                          krb5_auth_context ACO)
404     {
405         if (!krb5_loaded)
406             load_krb5_dll();
407
408         if ( p_krb5_auth_con_free )
409             return(p_krb5_auth_con_free(CO,ACO));
410         else
411             return KRB5KRB_ERR_GENERIC;
412     }
413 krb5_error_code
414 kssl_krb5_get_credentials(krb5_context CO,
415                           krb5_const krb5_flags F,
416                           krb5_ccache CC,
417                           krb5_creds * pCR,
418                           krb5_creds ** ppCR)
419     {
420         if (!krb5_loaded)
421             load_krb5_dll();
422
423         if ( p_krb5_get_credentials )
424             return(p_krb5_get_credentials(CO,F,CC,pCR,ppCR));
425         else
426             return KRB5KRB_ERR_GENERIC;
427     }
428 krb5_error_code
429 kssl_krb5_sname_to_principal(krb5_context CO,
430                              krb5_const char * pC1,
431                              krb5_const char * pC2,
432                              krb5_int32 I,
433                              krb5_principal * pPR)
434     {
435         if (!krb5_loaded)
436             load_krb5_dll();
437
438         if ( p_krb5_sname_to_principal )
439             return(p_krb5_sname_to_principal(CO,pC1,pC2,I,pPR));
440         else
441             return KRB5KRB_ERR_GENERIC;
442     }
443
444 krb5_error_code
445 kssl_krb5_cc_default(krb5_context CO,
446                      krb5_ccache * pCC)
447     {
448         if (!krb5_loaded)
449             load_krb5_dll();
450
451         if ( p_krb5_cc_default )
452             return(p_krb5_cc_default(CO,pCC));
453         else
454             return KRB5KRB_ERR_GENERIC;
455     }
456
457 krb5_error_code

```

```

458 kssl_krb5_init_context(krb5_context * pCO)
459     {
460         if (!krb5_loaded)
461             load_krb5_dll();
462
463         if ( p_krb5_init_context )
464             return(p_krb5_init_context(pCO));
465         else
466             return KRB5KRB_ERR_GENERIC;
467     }
468
469 void
470 kssl_krb5_free_context(krb5_context CO)
471     {
472         if (!krb5_loaded)
473             load_krb5_dll();
474
475         if ( p_krb5_free_context )
476             p_krb5_free_context(CO);
477     }
478
479 void
480 kssl_krb5_free_principal(krb5_context c, krb5_principal p)
481     {
482         if (!krb5_loaded)
483             load_krb5_dll();
484
485         if ( p_krb5_free_principal )
486             p_krb5_free_principal(c,p);
487     }
488
489 krb5_error_code
490 kssl_krb5_kt_resolve(krb5_context con,
491                      krb5_const char * sz,
492                      krb5_keytab * kt)
493     {
494         if (!krb5_loaded)
495             load_krb5_dll();
496
497         if ( p_krb5_kt_resolve )
498             return(p_krb5_kt_resolve(con,sz,kt));
499         else
500             return KRB5KRB_ERR_GENERIC;
501     }
502
503 krb5_error_code
504 kssl_krb5_kt_default(krb5_context con,
505                      krb5_keytab * kt)
506     {
507         if (!krb5_loaded)
508             load_krb5_dll();
509
510         if ( p_krb5_kt_default )
511             return(p_krb5_kt_default(con,kt));
512         else
513             return KRB5KRB_ERR_GENERIC;
514     }
515
516 krb5_error_code
517 kssl_krb5_free_ticket(krb5_context con,
518                       krb5_ticket * kt)
519     {
520         if (!krb5_loaded)
521             load_krb5_dll();
522
523         if ( p_krb5_free_ticket )

```

```

524         return(p_krb5_free_ticket(con,kt));
525     else
526         return KRB5KRB_ERR_GENERIC;
527 }

529 krb5_error_code
530 kssl_krb5_rd_req(krb5_context con, krb5_auth_context * pacon,
531                 krb5_const krb5_data * data,
532                 krb5_const_principal princ, krb5_keytab keytab,
533                 krb5_flags * flags, krb5_ticket ** pptkt)
534 {
535     if (!krb5_loaded)
536         load_krb5_dll();

538     if ( p_krb5_rd_req )
539         return(p_krb5_rd_req(con,pacon,data,princ,keytab,flags,pptkt));
540     else
541         return KRB5KRB_ERR_GENERIC;
542 }

544 krb5_boolean
545 krb5_principal_compare(krb5_context con, krb5_const_principal princ1,
546                       krb5_const_principal princ2)
547 {
548     if (!krb5_loaded)
549         load_krb5_dll();

551     if ( p_krb5_principal_compare )
552         return(p_krb5_principal_compare(con,princ1,princ2));
553     else
554         return KRB5KRB_ERR_GENERIC;
555 }

557 krb5_error_code
558 krb5_decrypt_tkt_part(krb5_context con, krb5_const krb5_keyblock *keys,
559                      krb5_ticket *ticket)
560 {
561     if (!krb5_loaded)
562         load_krb5_dll();

564     if ( p_krb5_decrypt_tkt_part )
565         return(p_krb5_decrypt_tkt_part(con,keys,ticket));
566     else
567         return KRB5KRB_ERR_GENERIC;
568 }

570 krb5_error_code
571 krb5_timeofday(krb5_context con, krb5_int32 *timeret)
572 {
573     if (!krb5_loaded)
574         load_krb5_dll();

576     if ( p_krb5_timeofday )
577         return(p_krb5_timeofday(con,timeret));
578     else
579         return KRB5KRB_ERR_GENERIC;
580 }

582 krb5_error_code
583 krb5_rc_default(krb5_context con, krb5_rcache *rc)
584 {
585     if (!krb5_loaded)
586         load_krb5_dll();

588     if ( p_krb5_rc_default )
589         return(p_krb5_rc_default(con,rc));

```

```

590     else
591         return KRB5KRB_ERR_GENERIC;
592 }

594 krb5_error_code
595 krb5_rc_initialize(krb5_context con, krb5_rcache rc, krb5_deltat lifespan)
596 {
597     if (!krb5_loaded)
598         load_krb5_dll();

600     if ( p_krb5_rc_initialize )
601         return(p_krb5_rc_initialize(con, rc, lifespan));
602     else
603         return KRB5KRB_ERR_GENERIC;
604 }

606 krb5_error_code
607 krb5_rc_get_lifespan(krb5_context con, krb5_rcache rc, krb5_deltat *lifespanp)
608 {
609     if (!krb5_loaded)
610         load_krb5_dll();

612     if ( p_krb5_rc_get_lifespan )
613         return(p_krb5_rc_get_lifespan(con, rc, lifespanp));
614     else
615         return KRB5KRB_ERR_GENERIC;
616 }

618 krb5_error_code
619 krb5_rc_destroy(krb5_context con, krb5_rcache rc)
620 {
621     if (!krb5_loaded)
622         load_krb5_dll();

624     if ( p_krb5_rc_destroy )
625         return(p_krb5_rc_destroy(con, rc));
626     else
627         return KRB5KRB_ERR_GENERIC;
628 }

630 size_t
631 krb5_checksum_size(krb5_context context,krb5_cksumtype ctype)
632 {
633     if (!krb5_loaded)
634         load_krb5_dll();

636     if ( p_krb5_checksum_size )
637         return(p_krb5_checksum_size(context, ctype));
638     else
639         return KRB5KRB_ERR_GENERIC;
640 }

642 krb5_boolean
643 valid_cksumtype(krb5_cksumtype ctype)
644 {
645     if (!krb5_loaded)
646         load_krb5_dll();

648     if ( p_valid_cksumtype )
649         return(p_valid_cksumtype(ctype));
650     else
651         return KRB5KRB_ERR_GENERIC;
652 }

654 krb5_error_code
655 krb5_kt_free_entry(krb5_context con,krb5_keytab_entry * entry)

```

```

656     {
657         if (!krb5_loaded)
658             load_krb5_dll();
659
660         if ( p_krb5_kt_free_entry )
661             return(p_krb5_kt_free_entry(con,entry));
662         else
663             return KRB5KRB_ERR_GENERIC;
664     }
665
666 /* Structure definitions */
667 #ifndef NO_DEF_KRB5_CCACHE
668 #ifndef krb5_x
669 #define krb5_x(ptr,args) ((ptr)?((*ptr)) args):(abort(),1))
670 #define krb5_xc(ptr,args) ((ptr)?((*ptr)) args):(abort(),(char*)0))
671 #endif
672
673 typedef krb5_pointer    krb5_cc_cursor; /* cursor for sequential lookup */
674
675 typedef struct _krb5_ccache
676 {
677     krb5_magic magic;
678     struct _krb5_cc_ops FAR *ops;
679     krb5_pointer data;
680 } *krb5_ccache;
681
682 typedef struct _krb5_cc_ops
683 {
684     krb5_magic magic;
685     char *prefix;
686     char * (KRB5_CALLCONV *get_name)
687         (krb5_context, krb5_ccache);
688     krb5_error_code (KRB5_CALLCONV *resolve)
689         (krb5_context, krb5_ccache *, const char *);
690     krb5_error_code (KRB5_CALLCONV *gen_new)
691         (krb5_context, krb5_ccache *);
692     krb5_error_code (KRB5_CALLCONV *init)
693         (krb5_context, krb5_ccache, krb5_principal);
694     krb5_error_code (KRB5_CALLCONV *destroy)
695         (krb5_context, krb5_ccache);
696     krb5_error_code (KRB5_CALLCONV *close)
697         (krb5_context, krb5_ccache);
698     krb5_error_code (KRB5_CALLCONV *store)
699         (krb5_context, krb5_ccache, krb5_creds *);
700     krb5_error_code (KRB5_CALLCONV *retrieve)
701         (krb5_context, krb5_ccache,
702          krb5_flags, krb5_creds *, krb5_creds *);
703     krb5_error_code (KRB5_CALLCONV *get Princ)
704         (krb5_context, krb5_ccache, krb5_principal *);
705     krb5_error_code (KRB5_CALLCONV *get first)
706         (krb5_context, krb5_ccache, krb5_cc_cursor *);
707     krb5_error_code (KRB5_CALLCONV *get next)
708         (krb5_context, krb5_ccache,
709          krb5_cc_cursor *, krb5_creds *);
710     krb5_error_code (KRB5_CALLCONV *end get)
711         (krb5_context, krb5_ccache, krb5_cc_cursor *);
712     krb5_error_code (KRB5_CALLCONV *remove_cred)
713         (krb5_context, krb5_ccache,
714          krb5_flags, krb5_creds *);
715     krb5_error_code (KRB5_CALLCONV *set_flags)
716         (krb5_context, krb5_ccache, krb5_flags);
717 } krb5_cc_ops;
718 #endif /* NO_DEF_KRB5_CCACHE */
719
720 krb5_error_code
721 kssl_krb5_cc_get_principal

```

```

722     (krb5_context context, krb5_ccache cache,
723      krb5_principal *principal)
724     {
725         if ( p_krb5_cc_get_principal )
726             return(p_krb5_cc_get_principal(context,cache,principal));
727         else
728             return(krb5_x
729                    ((cache)->ops->get Princ,(context, cache, principal)));
730     }
731
732 krb5_error_code
733 kssl_krb5_auth_con_setrcache(krb5_context con, krb5_auth_context acon,
734                              krb5_rcache rcache)
735     {
736         if ( p_krb5_auth_con_setrcache )
737             return(p_krb5_auth_con_setrcache(con,acon,rcache));
738         else
739             return KRB5KRB_ERR_GENERIC;
740     }
741
742 krb5_error_code
743 kssl_krb5_get_server_rcache(krb5_context con, krb5_const krb5_data * data,
744                             krb5_rcache * rcache)
745     {
746         if ( p_krb5_get_server_rcache )
747             return(p_krb5_get_server_rcache(con,data,rcache));
748         else
749             return KRB5KRB_ERR_GENERIC;
750     }
751
752 krb5_error_code
753 kssl_krb5_auth_con_getrcache(krb5_context con, krb5_auth_context acon,
754                              krb5_rcache * prcache)
755     {
756         if ( p_krb5_auth_con_getrcache )
757             return(p_krb5_auth_con_getrcache(con,acon, prcache));
758         else
759             return KRB5KRB_ERR_GENERIC;
760     }
761
762 krb5_error_code
763 kssl_krb5_kt_close(krb5_context context, krb5_keytab keytab)
764     {
765         if ( p_krb5_kt_close )
766             return(p_krb5_kt_close(context,keytab));
767         else
768             return KRB5KRB_ERR_GENERIC;
769     }
770
771 krb5_error_code
772 kssl_krb5_kt_get_entry(krb5_context context, krb5_keytab keytab,
773                        krb5_const_principal principal, krb5_kvno vno,
774                        krb5_etype enctype, krb5_keytab_entry *entry)
775     {
776         if ( p_krb5_kt_get_entry )
777             return(p_krb5_kt_get_entry(context,keytab,principal,vno,enctype,
778                                         entry));
779         else
780             return KRB5KRB_ERR_GENERIC;
781     }
782 #endif /* OPENSLL_SYS_WINDOWS || OPENSLL_SYS_WIN32 */
783
784 /* memory allocation functions for non-temporary storage
785  * (e.g. stuff that gets saved into the kssl context) */
786 static void* kssl_calloc(size_t nmemb, size_t size)
787 {

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788 void* p;
789
790 p=OPENSSL_malloc(nmemb*size);
791 if (p){
792     memset(p, 0, nmemb*size);
793 }
794 return p;
795 }

797 #define kssl_malloc(size) OPENSSL_malloc((size))
798 #define kssl_realloc(ptr, size) OPENSSL_realloc(ptr, size)
799 #define kssl_free(ptr) OPENSSL_free((ptr))

802 char
803 *kstring(char *string)
804 {
805     static char *null = "[NULL]";

807     return ((string == NULL)? null: string);
808 }

810 /*
811 ** Given KRB5 enctype (basically DES or 3DES),
812 ** return closest match openssl EVP encryption algorithm.
813 ** Return NULL for unknown or problematic (krb5_dk_encrypt) encatypes.
814 ** Assume ENCTYPE_RAW (krb5_raw_encrypt) are OK.
815 */
816 const EVP_CIPHER *
817 kssl_map_enc(krb5_enctype enctype)
818 {
819     switch (enctype)
820     {
821     case ENCTYPE_DES_HMAC_SHA1: /* EVP_des_cbc(); */
822     case ENCTYPE_DES_CBC_CRC:
823     case ENCTYPE_DES_CBC_MD4:
824     case ENCTYPE_DES_CBC_MD5:
825     case ENCTYPE_DES_CBC_RAW:
826         return EVP_des_cbc();
827     case ENCTYPE_DES3_CBC_SHA1: /* EVP_des_ede3_cbc(); */
828     case ENCTYPE_DES3_CBC_SHA:
829     case ENCTYPE_DES3_CBC_RAW:
830         return EVP_des_ede3_cbc();
831     default:
832         return NULL;
833     }
834 }
835

838 /*
839 ** Return true:1 if p "looks like" the start of the real authenticator
840 ** described in kssl_skip_confound() below. The ASN.1 pattern is
841 ** "62 xx 30 yy" (APPLICATION-2, SEQUENCE), where xx-yy =~ 2, and
842 ** xx and yy are possibly multi-byte length fields.
843 */
844 static int
845 kssl_test_confound(unsigned char *p)
846 {
847     int len = 2;
848     int xx = 0, yy = 0;

849     if (*p++ != 0x62) return 0;
850     if (*p > 0x82) return 0;
851     switch(*p) {
852     case 0x82: p++; xx = (*p++ < 8); xx += *p++; break;
853     case 0x81: p++; xx = *p++; break;
854     case 0x80: return 0;

```

```

854         default: xx = *p++; break;
855     }
856     if (*p++ != 0x30) return 0;
857     if (*p > 0x82) return 0;
858     switch(*p) {
859     case 0x82: p++; len+=2; yy = (*p++ < 8); yy += *p++; break;
860     case 0x81: p++; len++; yy = *p++; break;
861     case 0x80: return 0;
862     default: yy = *p++; break;
863     }

865     return (xx - len == yy)? 1: 0;
866 }

868 /*
869 ** Allocate, fill, and return cksumlens array of checksum lengths.
870 ** This array holds just the unique elements from the krb5_cksumarray[].
871 ** array[n] == 0 signals end of data.
872 **
873 ** The krb5_cksumarray[] was an internal variable that has since been
874 ** replaced by a more general method for storing the data. It should
875 ** not be used. Instead we use real API calls and make a guess for
876 ** what the highest assigned CKSUMTYPE constant is. As of 1.2.2
877 ** it is 0x000c (CKSUMTYPE_HMAC_SHA1_DES3). So we will use 0x0010.
878 */
879 static size_t *populate_cksumlens(void)
880 {
881     int i, j, n;
882     static size_t *cklens = NULL;

883 #ifdef KRB5_MIT_OLD11
884     n = krb5_max_cksum;
885 #else
886     n = 0x0010;
887 #endif /* KRB5_MIT_OLD11 */
888
889 #ifdef KRB5CHECKAUTH
890     if (!cklens && !(cklens = (size_t *) calloc(sizeof(int),n+1))) return N
891
892     for (i=0; i < n; i++) {
893         if (!valid_cksumtype(i)) continue; /* array has holes */
894         for (j=0; j < n; j++) {
895             if (cklens[j] == 0) {
896                 cklens[j] = krb5_checksum_size(NULL,i);
897                 break; /* krb5 elem was new: add */
898             }
899             if (cklens[j] == krb5_checksum_size(NULL,i)) {
900                 break; /* ignore duplicate elements */
901             }
902         }
903     }
904 #endif /* KRB5CHECKAUTH */

906     return cklens;
907 }

909 /*
910 ** Return pointer to start of real authenticator within authenticator, or
911 ** return NULL on error.
912 ** Decrypted authenticator looks like this:
913 ** [0 or 8 byte confounder] [4-24 byte checksum] [real authent'r]
914 ** This hackery wouldn't be necessary if MIT KRB5 1.0.6 had the
915 ** krb5_auth_con_getcksumtype() function advertised in its krb5.h.
916 */
917 unsigned char *
918 kssl_skip_confound(krb5_enctype etype, unsigned char *a)
919 {
920     int i, conlen;
921     size_t clen;

```

```

920     static size_t    *cksumlens = NULL;
921     unsigned char    *test_auth;

923     conlen = (etype)? 8: 0;

925     if (!cksumlens && !(cksumlens = populate_cksumlens())) return NULL;
926     for (i=0; (cklen = cksumlens[i]) != 0; i++)
927     {
928         test_auth = a + conlen + cklen;
929         if (kssl_test_confound(test_auth)) return test_auth;
930     }

932     return NULL;
933 }

936 /*      Set kssl_err error info when reason text is a simple string
937 **      kssl_err = struct { int reason; char text[KSSL_ERR_MAX+1]; }
938 */
939 void
940 kssl_err_set(KSSL_ERR *kssl_err, int reason, char *text)
941 {
942     if (kssl_err == NULL) return;

944     kssl_err->reason = reason;
945     BIO_snprintf(kssl_err->text, KSSL_ERR_MAX, "%s", text);
946     return;
947 }

950 /*      Display contents of krb5_data struct, for debugging
951 */
952 void
953 print_krb5_data(char *label, krb5_data *kdata)
954 {
955     int i;

957     printf("%s[%d] ", label, kdata->length);
958     for (i=0; i < (int)kdata->length; i++)
959     {
960         if (0 && isprint((int) kdata->data[i]))
961             printf(" %c ", kdata->data[i]);
962         else
963             printf(" %02x ", (unsigned char) kdata->data[i]);
964     }
965     printf("\n");
966 }

969 /*      Display contents of krb5_authdata struct, for debugging
970 */
971 void
972 print_krb5_authdata(char *label, krb5_authdata **adata)
973 {
974     if (adata == NULL)
975     {
976         printf("%s, authdata==0\n", label);
977         return;
978     }
979     printf("%s [%p]\n", label, (void *)adata);
980     #if 0
981     {
982         int i;
983         printf("%s[at%d:%d] ", label, adata->ad_type, adata->length);
984         for (i=0; i < adata->length; i++)
985             {

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```

986         printf((isprint(adata->contents[i]))? "%c ": "%02x",
987                adata->contents[i]);
988     }
989     printf("\n");
990 }
991 #endif
992 }

995 /*      Display contents of krb5_keyblock struct, for debugging
996 */
997 void
998 print_krb5_keyblock(char *label, krb5_keyblock *keyblk)
999 {
1000     int i;

1002     if (keyblk == NULL)
1003     {
1004         printf("%s, keyblk==0\n", label);
1005         return;
1006     }
1007     #ifdef KRB5_HEIMDAL
1008     printf("%s\n\t[et%d:%d]: ", label, keyblk->keytype,
1009            keyblk->keyvalue->length);
1010     for (i=0; i < (int)keyblk->keyvalue->length; i++)
1011     {
1012         printf("%02x", (unsigned char *) (keyblk->keyvalue->contents)[i]);
1013     }
1014     printf("\n");
1015     #else
1016     printf("%s\n\t[et%d:%d]: ", label, keyblk->enctype, keyblk->length);
1017     for (i=0; i < (int)keyblk->length; i++)
1018     {
1019         printf("%02x", keyblk->contents[i]);
1020     }
1021     printf("\n");
1022     #endif
1023 }

1026 /*      Display contents of krb5_principal_data struct, for debugging
1027 **      (krb5_principal is typedef'd == krb5_principal_data *)
1028 */
1029 static void
1030 print_krb5 Princ(char *label, krb5_principal_data *princ)
1031 {
1032     int i, ui, uj;

1034     printf("%s principal Realm: ", label);
1035     if (princ == NULL) return;
1036     for (ui=0; ui < (int)princ->realm.length; ui++) putchar(princ->realm.da
1037     printf(" (nametype %d) has %d strings:\n", princ->type, princ->length);
1038     for (i=0; i < (int)princ->length; i++)
1039     {
1040         printf("\t%d [%d]: ", i, princ->data[i].length);
1041         for (uj=0; uj < (int)princ->data[i].length; uj++) {
1042             putchar(princ->data[i].data[uj]);
1043         }
1044         printf("\n");
1045     }
1046     return;
1047 }

1050 /*      Given krb5 service (typically "kssl") and hostname in kssl_ctx,
1051 **      Return encrypted Kerberos ticket for service @ hostname.

```

```

1052 **      If authenp is non-NULL, also return encrypted authenticator,
1053 **      whose data should be freed by caller.
1054 **      (Originally was: Create Kerberos AP_REQ message for SSL Client.)
1055 **
1056 **      19990628      VRS      Started; Returns Kerberos AP_REQ message.
1057 **      20010409      VRS      Modified for RFC2712; Returns enc tkt.
1058 **      20010606      VRS      May also return optional authenticator.
1059 */
1060 krb5_error_code
1061 kssl_cget_tkt( /* UPDATE */ KSSL_CTX *kssl_ctx,
1062               /* OUT */ krb5_data **enc_ticketp,
1063               /* UPDATE */ krb5_data *authenp,
1064               /* OUT */ KSSL_ERR *kssl_err)
1065 {
1066     krb5_error_code      krb5rc = KRB5KRB_ERR_GENERIC;
1067     krb5_context          krb5context = NULL;
1068     krb5_auth_context     krb5auth_context = NULL;
1069     krb5_ccache           krb5ccdef = NULL;
1070     krb5_creds            krb5creds = NULL;
1071     krb5_app_req          krb5_app_req;
1072
1073     kssl_err_set(kssl_err, 0, "");
1074     memset((char *)&krb5creds, 0, sizeof(krb5creds));
1075
1076     if (!kssl_ctx)
1077     {
1078         kssl_err_set(kssl_err, SSL_R_KRB5_S_INIT,
1079                     "No kssl_ctx defined.\n");
1080         goto err;
1081     }
1082     else if (!kssl_ctx->service_host)
1083     {
1084         kssl_err_set(kssl_err, SSL_R_KRB5_S_INIT,
1085                     "kssl_ctx service_host undefined.\n");
1086         goto err;
1087     }
1088
1089     if ((krb5rc = krb5_init_context(&krb5context)) != 0)
1090     {
1091         BIO_snprintf(kssl_err->text, KSSL_ERR_MAX,
1092                     "krb5_init_context() fails: %d\n", krb5rc);
1093         kssl_err->reason = SSL_R_KRB5_C_INIT;
1094         goto err;
1095     }
1096
1097     if ((krb5rc = krb5_sname_to_principal(krb5context,
1098     kssl_ctx->service_host,
1099     (kssl_ctx->service_name)? kssl_ctx->service_name: KRB5SVC,
1100     KRB5_NT_SRV_HST, &krb5creds.server)) != 0)
1101     {
1102         BIO_snprintf(kssl_err->text, KSSL_ERR_MAX,
1103                     "krb5_sname_to_principal() fails for %s/%s\n",
1104                     kssl_ctx->service_host,
1105                     (kssl_ctx->service_name)? kssl_ctx->service_name:
1106                     KRB5SVC);
1107         kssl_err->reason = SSL_R_KRB5_C_INIT;
1108         goto err;
1109     }
1110
1111     if ((krb5rc = krb5_cc_default(krb5context, &krb5ccdef)) != 0)
1112     {
1113         kssl_err_set(kssl_err, SSL_R_KRB5_C_CC_PRINC,
1114                     "krb5_cc_default fails.\n");
1115         goto err;
1116     }

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```

1118     if ((krb5rc = krb5_cc_get_principal(krb5context, krb5ccdef,
1119     &krb5creds.client)) != 0)
1120     {
1121         kssl_err_set(kssl_err, SSL_R_KRB5_C_CC_PRINC,
1122                     "krb5_cc_get_principal() fails.\n");
1123         goto err;
1124     }
1125
1126     if ((krb5rc = krb5_get_credentials(krb5context, 0, krb5ccdef,
1127     &krb5creds, &krb5credsp)) != 0)
1128     {
1129         kssl_err_set(kssl_err, SSL_R_KRB5_C_GET_CRED,
1130                     "krb5_get_credentials() fails.\n");
1131         goto err;
1132     }
1133
1134     *enc_ticketp = &krb5credsp->ticket;
1135     #ifdef KRB5_HEIMDAL
1136     kssl_ctx->enctype = krb5credsp->session.keytype;
1137     #else
1138     kssl_ctx->enctype = krb5credsp->keyblock.enctype;
1139     #endif
1140
1141     krb5rc = KRB5KRB_ERR_GENERIC;
1142     /* caller should free data of krb5_app_req */
1143     /* 20010406 VRS deleted for real KerberosWrapper
1144     ** 20010605 VRS reinstated to offer Authenticator to KerberosWrapper
1145     */
1146     krb5_app_req.length = 0;
1147     if (authenp)
1148     {
1149         krb5_data      krb5in_data;
1150         const unsigned char *p;
1151         long            arlen;
1152         KRB5_APREQBODY *ap_req;
1153
1154         authenp->length = 0;
1155         krb5in_data.data = NULL;
1156         krb5in_data.length = 0;
1157         if ((krb5rc = krb5_mk_req_extended(krb5context,
1158         &krb5auth_context, 0, &krb5in_data, krb5credsp,
1159         &krb5_app_req)) != 0)
1160         {
1161             kssl_err_set(kssl_err, SSL_R_KRB5_C_MK_REQ,
1162                         "krb5_mk_req_extended() fails.\n");
1163             goto err;
1164         }
1165
1166         arlen = krb5_app_req.length;
1167         p = (unsigned char *)krb5_app_req.data;
1168         ap_req = (KRB5_APREQBODY *) d2i_KRB5_APREQ(NULL, &p, arlen);
1169         if (ap_req)
1170         {
1171             authenp->length = i2d_KRB5_ENCDATA(
1172                 ap_req->authenticator, NULL);
1173             if (authenp->length &&
1174                 (authenp->data = malloc(authenp->length)))
1175             {
1176                 unsigned char *adp = (unsigned char *)authenp->
1177                 authenp->length = i2d_KRB5_ENCDATA(
1178                     ap_req->authenticator, &adp);
1179             }
1180         }
1181
1182         if (ap_req) KRB5_APREQ_free((KRB5_APREQ *) ap_req);
1183         if (krb5_app_req.length)

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1184         kssl_krb5_free_data_contents(krb5context, &krb5_app_req);
1185     }
1186 #ifdef KRB5_HEIMDAL
1187     if (kssl_ctx_setkey(kssl_ctx, &krb5credsp->session))
1188     {
1189         kssl_err_set(kssl_err, SSL_R_KRB5_C_INIT,
1190             "kssl_ctx_setkey() fails.\n");
1191     }
1192 #else
1193     if (kssl_ctx_setkey(kssl_ctx, &krb5credsp->keyblock))
1194     {
1195         kssl_err_set(kssl_err, SSL_R_KRB5_C_INIT,
1196             "kssl_ctx_setkey() fails.\n");
1197     }
1198 #endif
1199     else    krb5rc = 0;

1201 err:
1202 #ifdef KSSL_DEBUG
1203     kssl_ctx_show(kssl_ctx);
1204 #endif /* KSSL_DEBUG */

1206     if (krb5creds.client)    krb5_free_principal(krb5context,
1207         krb5creds.client);
1208     if (krb5creds.server)    krb5_free_principal(krb5context,
1209         krb5creds.server);
1210     if (krb5auth_context)    krb5_auth_con_free(krb5context,
1211         krb5auth_context);
1212     if (krb5context)         krb5_free_context(krb5context);
1213     return (krb5rc);
1214 }

1217 /* Given d2i_-decoded asn1ticket, allocate and return a new krb5_ticket.
1218 ** Return Kerberos error code and kssl_err struct on error.
1219 ** Allocates krb5_ticket and krb5_principal; caller should free these.
1220 **
1221 **      20010410      VRS      Implemented krb5_decode_ticket() as
1222 **                      old_krb5_decode_ticket(). Missing from MIT1.0.6.
1223 **      20010615      VRS      Re-cast as openssl/asn1 d2i_*() functions.
1224 **                      Re-used some of the old krb5_decode_ticket()
1225 **                      code here. This tkt should alloc/free just
1226 **                      like the real thing.
1227 */
1228 static krb5_error_code
1229 kssl_TKT2tkt( /* IN      */ krb5_context    krb5context,
1230 /* IN      */ KRB5_TKTBODY *asn1ticket,
1231 /* OUT     */ krb5_ticket    **krb5ticket,
1232 /* OUT     */ KSSL_ERR *kssl_err )
1233 {
1234     krb5_error_code    krb5rc = KRB5KRB_ERR_GENERIC;
1235     krb5_ticket        *new5ticket = NULL;
1236     ASN1_GENERALSTRING *gstr_svc, *gstr_host;

1238     *krb5ticket = NULL;

1240     if (asn1ticket == NULL || asn1ticket->realm == NULL ||
1241         asn1ticket->sname == NULL ||
1242         sk_ASN1_GENERALSTRING_num(asn1ticket->sname->namestring) < 2)
1243     {
1244         BIO_snprintf(kssl_err->text, KSSL_ERR_MAX,
1245             "Null field in asn1ticket.\n");
1246         kssl_err->reason = SSL_R_KRB5_S_RD_REQ;
1247         return KRB5KRB_ERR_GENERIC;
1248     }

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1250     if ((new5ticket = (krb5_ticket *) calloc(1, sizeof(krb5_ticket))) == NULL)
1251     {
1252         BIO_snprintf(kssl_err->text, KSSL_ERR_MAX,
1253             "Unable to allocate new krb5_ticket.\n");
1254         kssl_err->reason = SSL_R_KRB5_S_RD_REQ;
1255         return ENOMEM; /* or KRB5KRB_ERR_GENERIC; */
1256     }

1258     gstr_svc = sk_ASN1_GENERALSTRING_value(asn1ticket->sname->namestring, 0)
1259     gstr_host = sk_ASN1_GENERALSTRING_value(asn1ticket->sname->namestring, 1)

1261     if ((krb5rc = kssl_build_principal_2(krb5context,
1262         &new5ticket->server,
1263         asn1ticket->realm->length, (char *)asn1ticket->realm->da
1264         gstr_svc->length, (char *)gstr_svc->data,
1265         gstr_host->length, (char *)gstr_host->data)) != 0)
1266     {
1267         free(new5ticket);
1268         BIO_snprintf(kssl_err->text, KSSL_ERR_MAX,
1269             "Error building ticket server principal.\n");
1270         kssl_err->reason = SSL_R_KRB5_S_RD_REQ;
1271         return krb5rc; /* or KRB5KRB_ERR_GENERIC; */
1272     }

1274     krb5 Princ_type(krb5context, new5ticket->server) =
1275         asn1ticket->sname->nametype->data[0];
1276     new5ticket->enc_part.etype = asn1ticket->encdata->etype->data[0];
1277     new5ticket->enc_part.kvno = asn1ticket->encdata->kvno->data[0];
1278     new5ticket->enc_part.ciphertext.length =
1279         asn1ticket->encdata->cipher->length;
1280     if ((new5ticket->enc_part.ciphertext.data =
1281         calloc(1, asn1ticket->encdata->cipher->length)) == NULL)
1282     {
1283         free(new5ticket);
1284         BIO_snprintf(kssl_err->text, KSSL_ERR_MAX,
1285             "Error allocating cipher in krb5ticket.\n");
1286         kssl_err->reason = SSL_R_KRB5_S_RD_REQ;
1287         return KRB5KRB_ERR_GENERIC;
1288     }
1289     else
1290     {
1291         memcpy(new5ticket->enc_part.ciphertext.data,
1292             asn1ticket->encdata->cipher->data,
1293             asn1ticket->encdata->cipher->length);
1294     }

1296     *krb5ticket = new5ticket;
1297     return 0;
1298 }

1301 /* Given krb5 service name in KSSL_CTX *kssl_ctx (typically "kssl"),
1302 ** and krb5 AP_REQ message & message length,
1303 ** Return Kerberos session key and client principle
1304 ** to SSL Server in KSSL_CTX *kssl_ctx.
1305 **
1306 **      19990702      VRS      Started.
1307 */
1308 krb5_error_code
1309 kssl_sget_tkt( /* UPDATE */ KSSL_CTX *kssl_ctx, /* IN */ krb5_data *indata,
1310 /* IN */ krb5_data *tktdata, /* OUT */ KSSL_ERR *kssl_err )
1311 {
1312     /* OUT */ KSSL_ERR *kssl_err )
1313 {
1314     krb5_error_code    krb5rc = KRB5KRB_ERR_GENERIC;
1315     static krb5_context    krb5context = NULL;

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1316 static krb5_auth_context    krb5auth_context = NULL;
1317 krb5_ticket                 *krb5ticket = NULL;
1318 KRB5_TKTBODY                *asn1ticket = NULL;
1319 const unsigned char          *p;
1320 krb5_keytab                  krb5keytab = NULL;
1321 krb5_keytab_entry            kt_entry;
1322 krb5_principal               krb5server;
1323 krb5_rcache                   rcache = NULL;

1325 kssl_err_set(ksl_err, 0, "");

1327 if (!ksl_ctx)
1328 {
1329     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1330                 "No kssl_ctx defined.\n");
1331     goto err;
1332 }

1334 #ifdef KSSL_DEBUG
1335     printf("in kssl_sget_tkt(%s)\n", kstring(ksl_ctx->service_name));
1336 #endif

1338 if (!krb5context && (krb5rc = krb5_init_context(&krb5context)))
1339 {
1340     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1341                 "krb5_init_context() fails.\n");
1342     goto err;
1343 }
1344 if (krb5auth_context && (krb5rc = krb5_auth_con_free(krb5context, krb5auth_context)))
1345 {
1346     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1347                 "krb5_auth_con_free() fails.\n");
1348     goto err;
1349 }
1350 else krb5auth_context = NULL;
1351 if (!krb5auth_context && (krb5rc = krb5_auth_con_init(krb5context, &krb5auth_context)))
1352 {
1353     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1354                 "krb5_auth_con_init() fails.\n");
1355     goto err;
1356 }
1357 }

1360 if ((krb5rc = krb5_auth_con_getrcache(krb5context, krb5auth_context,
1361 &rcache)))
1362 {
1363     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1364                 "krb5_auth_con_getrcache() fails.\n");
1365     goto err;
1366 }
1367 }
1368 if ((krb5rc = krb5_sname_to_principal(krb5context, NULL,
1369 (ksl_ctx->service_name)? kssl_ctx->service_name: KRB5SVC,
1370 KRB5_NT_SRV_HST, &krb5server)) != 0)
1371 {
1372     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1373                 "krb5_sname_to_principal() fails.\n");
1374     goto err;
1375 }
1376 }

1378 if (rcache == NULL)
1379 {
1380     if ((krb5rc = krb5_get_server_rcache(krb5context,
1381     krb5 Princ Component(krb5context, krb5server, 0),

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1382     &rcache)))
1383     {
1384         kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1385                     "krb5_get_server_rcache() fails.\n");
1386         goto err;
1387     }
1388 }

1390 if ((krb5rc = krb5_auth_con_setrcache(krb5context, krb5auth_context, rca
1391 {
1392     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1393                 "krb5_auth_con_setrcache() fails.\n");
1394     goto err;
1395 }

1398 /*      kssl_ctx->keytab_file == NULL ==> use Kerberos default
1399 */
1400 if (ksl_ctx->keytab_file)
1401 {
1402     krb5rc = krb5_kt_resolve(krb5context, kssl_ctx->keytab_file,
1403 &krb5keytab);
1404 if (krb5rc)
1405 {
1406     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1407                 "krb5_kt_resolve() fails.\n");
1408     goto err;
1409 }
1410 }
1411 else
1412 {
1413     krb5rc = krb5_kt_default(krb5context, &krb5keytab);
1414 if (krb5rc)
1415 {
1416     kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
1417                 "krb5_kt_default() fails.\n");
1418     goto err;
1419 }
1420 }

1422 /*      Actual Kerberos5 krb5_recvauth() has initial conversation here
1423 **      0      check KRB5_SENDAUTH_BADAUTHVERS
1424 **      unless KRB5_RECVAUTH_SKIP_VERSION
1425 **      0      check KRB5_SENDAUTH_BADAPPLVERS
1426 **      send "0" msg if all OK
1427 */

1429 /*      20010411 was using AP_REQ instead of true KerberosWrapper
1430 **
1431 **      if ((krb5rc = krb5_rd_req(krb5context, &krb5auth_context,
1432 &krb5in_data, krb5server, krb5keytab,
1433 &ap_option, &krb5ticket)) != 0) { Error }
1434 */

1436 p = (unsigned char *)indata->data;
1437 if ((asn1ticket = (KRB5_TKTBODY *) d2i_KRB5_TICKET(NULL, &p,
1438 (long) indata->length)) == NULL)
1439 {
1440     BIO_snprintf(ksl_err->text, KSSL_ERR_MAX,
1441                 "d2i_KRB5_TICKET() ASN.1 decode failure.\n");
1442     kssl_err->reason = SSL_R_KRB5_S_RD_REQ;
1443     goto err;
1444 }
1445 }

1446 /* Was:  krb5rc = krb5_decode_ticket(krb5in_data, &krb5ticket)) != 0) */
1447 if ((krb5rc = kssl_TKT2tkt(krb5context, asn1ticket, &krb5ticket,

```

```
1512     krb5rc = KRB5_NO_TKT_SUPPLIED;
1513     if (!krb5ticket || !krb5ticket->enc_part2 ||
```

```

1514         !krb5ticket->enc_part2->client ||
1515         !krb5ticket->enc_part2->client->data ||
1516         !krb5ticket->enc_part2->session)
1517     {
1518         kssl_err_set(kssl_err, SSL_R_KRB5_S_BAD_TICKET,
1519                     "bad ticket from krb5_rd_req.\n");
1520     }
1521     else if (kssl_ctx_setprinc(kssl_ctx, KSSL_CLIENT,
1522                               &krb5ticket->enc_part2->client->realm,
1523                               krb5ticket->enc_part2->client->data,
1524                               krb5ticket->enc_part2->client->length))
1525     {
1526         kssl_err_set(kssl_err, SSL_R_KRB5_S_BAD_TICKET,
1527                     "kssl_ctx_setprinc() fails.\n");
1528     }
1529     else if (kssl_ctx_setkey(kssl_ctx, krb5ticket->enc_part2->session))
1530     {
1531         kssl_err_set(kssl_err, SSL_R_KRB5_S_BAD_TICKET,
1532                     "kssl_ctx_setkey() fails.\n");
1533     }
1534     else if (krb5ticket->enc_part2->flags & TKT_FLG_INVALID)
1535     {
1536         krb5rc = KRB5KRB_AP_ERR_TKT_INVALID;
1537         kssl_err_set(kssl_err, SSL_R_KRB5_S_BAD_TICKET,
1538                     "invalid ticket from krb5_rd_req.\n");
1539     }
1540     else
1541         krb5rc = 0;
1542
1543     kssl_ctx->enttype = krb5ticket->enc_part.enttype;
1544     ttimes->authtime = krb5ticket->enc_part2->times.authtime;
1545     ttimes->starttime = krb5ticket->enc_part2->times.starttime;
1546     ttimes->endtime = krb5ticket->enc_part2->times.endtime;
1547     ttimes->renew_till = krb5ticket->enc_part2->times.renew_till;
1548
1549     err:
1550     #ifdef KSSL_DEBUG
1551         kssl_ctx_show(kssl_ctx);
1552     #endif
1553     /* KSSL_DEBUG */
1554
1555     if (asn1ticket)
1556         KRB5_TICKET_free((KRB5_TICKET *) asn1ticket);
1557     if (krb5keytab)
1558         krb5_kt_close(krb5context, krb5keytab);
1559     if (krb5ticket)
1560         krb5_free_ticket(krb5context, krb5ticket);
1561     if (krb5server)
1562         krb5_free_principal(krb5context, krb5server);
1563     return (krb5rc);
1564 }
1565
1566 /* Allocate & return a new kssl_ctx struct.
1567 */
1568 KSSL_CTX
1569 kssl_ctx_new(void)
1570 {
1571     return ((KSSL_CTX *) kssl_calloc(1, sizeof(KSSL_CTX)));
1572 }
1573
1574 /* Frees a kssl_ctx struct and any allocated memory it holds.
1575 */
1576 Returns NULL.
1577 */
1578 KSSL_CTX
1579 kssl_ctx_free(KSSL_CTX *kssl_ctx)
1580 {
1581     if (kssl_ctx == NULL)
1582         return kssl_ctx;
1583
1584     if (kssl_ctx->key)
1585         OPENSSL_cleanse(kssl_ctx->key,
1586                         kssl_ctx->length);
1587 }

```

```

1580     if (kssl_ctx->key)      kssl_free(kssl_ctx->key);
1581     if (kssl_ctx->client_princ) kssl_free(kssl_ctx->client_princ);
1582     if (kssl_ctx->service_host) kssl_free(kssl_ctx->service_host);
1583     if (kssl_ctx->service_name) kssl_free(kssl_ctx->service_name);
1584     if (kssl_ctx->keytab_file)  kssl_free(kssl_ctx->keytab_file);

1586     kssl_free(kssl_ctx);
1587     return (KSSL_CTX *) NULL;
1588 }

1591 /*      Given an array of (krb5_data *) entity (and optional realm),
1592 **      set the plain (char *) client_princ or service_host member
1593 **      of the kssl_ctx struct.
1594 */
1595 krb5_error_code
1596 kssl_ctx_setprinc(KSSL_CTX *kssl_ctx, int which,
1597                  krb5_data *realm, krb5_data *entity, int nentities)
1598 {
1599     char    **princ;
1600     int      length;
1601     int i;

1603     if (kssl_ctx == NULL || entity == NULL) return KSSL_CTX_ERR;

1605     switch (which)
1606     {
1607     case KSSL_CLIENT:      princ = &kssl_ctx->client_princ;      break;
1608     case KSSL_SERVER:     princ = &kssl_ctx->service_host;      break;
1609     default:              return KSSL_CTX_ERR;                  break;
1610     }
1611     if (*princ) kssl_free(*princ);

1613     /* Add up all the entity->lengths */
1614     length = 0;
1615     for (i=0; i < nentities; i++)
1616     {
1617         length += entity[i].length;
1618     }
1619     /* Add in space for the '/' character(s) (if any) */
1620     length += nentities-1;
1621     /* Space for the ('@'+realm+NULL | NULL) */
1622     length += ((realm)? realm->length + 2: 1);

1624     if ((*princ = kssl_calloc(1, length)) == NULL)
1625         return KSSL_CTX_ERR;
1626     else
1627     {
1628         for (i = 0; i < nentities; i++)
1629         {
1630             strncat(*princ, entity[i].data, entity[i].length);
1631             if (i < nentities-1)
1632             {
1633                 strcat(*princ, "/");
1634             }
1635         }
1636         if (realm)
1637         {
1638             strcat(*princ, "@");
1639             (void) strncat(*princ, realm->data, realm->length);
1640         }
1641     }

1643     return KSSL_CTX_OK;
1644 }

```

```

1647 /*      Set one of the plain (char *) string members of the kssl_ctx struct.
1648 **      Default values should be:
1649 **      which == KSSL_SERVICE => "khost" (KRB5SVC)
1650 **      which == KSSL_KEYTAB  => "/etc/krb5.keytab" (KRB5KEYTAB)
1651 */
1652 krb5_error_code
1653 kssl_ctx_setstring(KSSL_CTX *kssl_ctx, int which, char *text)
1654 {
1655     char    **string;

1657     if (!kssl_ctx) return KSSL_CTX_ERR;

1659     switch (which)
1660     {
1661     case KSSL_SERVICE:      string = &kssl_ctx->service_name;      break;
1662     case KSSL_SERVER:      string = &kssl_ctx->service_host;      break;
1663     case KSSL_CLIENT:      string = &kssl_ctx->client_princ;      break;
1664     case KSSL_KEYTAB:      string = &kssl_ctx->keytab_file;      break;
1665     default:              return KSSL_CTX_ERR;                  break;
1666     }
1667     if (*string) kssl_free(*string);

1669     if (!text)
1670     {
1671         *string = '\0';
1672         return KSSL_CTX_OK;
1673     }

1675     if ((*string = kssl_calloc(1, strlen(text) + 1)) == NULL)
1676         return KSSL_CTX_ERR;
1677     else
1678         strcpy(*string, text);

1680     return KSSL_CTX_OK;
1681 }

1684 /*      Copy the Kerberos session key from a (krb5_keyblock *) to a kssl_ctx
1685 **      struct. Clear kssl_ctx->key if Kerberos session key is NULL.
1686 */
1687 krb5_error_code
1688 kssl_ctx_setkey(KSSL_CTX *kssl_ctx, krb5_keyblock *session)
1689 {
1690     int      length;
1691     krb5_enctype enctype;
1692     krb5_octet FAR *contents = NULL;

1694     if (!kssl_ctx) return KSSL_CTX_ERR;

1696     if (kssl_ctx->key)
1697     {
1698         OPENSSL_cleanse(kssl_ctx->key, kssl_ctx->length);
1699         kssl_free(kssl_ctx->key);
1700     }

1702     if (session)
1703     {
1705 #ifdef KRB5_HEIMDAL
1706         length = session->keyvalue->length;
1707         enctype = session->keytype;
1708         contents = session->keyvalue->contents;
1709 #else
1710         length = session->length;
1711         enctype = session->enctype;

```

```

1772     int
1773     kssl_keytab_is_available(KSSL_CTX *ksssl_ctx)
1774 {
1775     krb5_context          krb5context = NULL;
1776     krb5_keytab            krb5keytab = NULL;
1777     krb5_keytab_entry      entry;

```

```

1778     krb5_principal      princ = NULL;
1779     krb5_error_code      krb5rc = KRB5KRB_ERR_GENERIC;
1780     int rc = 0;

1782     if ((krb5rc = krb5_init_context(&krb5context)))
1783         return(0);

1785     /* kssl_ctx->keytab_file == NULL ==> use Kerberos default
1786     */
1787     if (kssl_ctx->keytab_file)
1788     {
1789         krb5rc = krb5_kt_resolve(krb5context, kssl_ctx->keytab_file,
1790                                 &krb5keytab);
1791         if (krb5rc)
1792             goto exit;
1793     }
1794     else
1795     {
1796         krb5rc = krb5_kt_default(krb5context, &krb5keytab);
1797         if (krb5rc)
1798             goto exit;
1799     }

1801     /* the host key we are looking for */
1802     krb5rc = krb5_sname_to_principal(krb5context, NULL,
1803                                     kssl_ctx->service_name ? kssl_ctx->service_
1804                                     KRB5_NT_SRV_HST, &princ);

1806     if (krb5rc)
1807         goto exit;

1809     krb5rc = krb5_kt_get_entry(krb5context, krb5keytab,
1810                               princ,
1811                               0 /* IGNORE_VNO */,
1812                               0 /* IGNORE_ENCTYPE */,
1813                               &entry);
1814     if ( krb5rc == KRB5_KT_NOTFOUND ) {
1815         rc = 1;
1816         goto exit;
1817     } else if ( krb5rc )
1818         goto exit;
1819
1820     krb5_kt_free_entry(krb5context, &entry);
1821     rc = 1;

1823     exit:
1824     if (krb5keytab)      krb5_kt_close(krb5context, krb5keytab);
1825     if (princ)           krb5_free_principal(krb5context, princ);
1826     if (krb5context)     krb5_free_context(krb5context);
1827     return(rc);
1828 }

1830 int
1831 kssl_tgt_is_available(KSSL_CTX *ksssl_ctx)
1832 {
1833     krb5_error_code      krb5rc = KRB5KRB_ERR_GENERIC;
1834     krb5_context          krb5context = NULL;
1835     krb5_ccache           krb5ccdef = NULL;
1836     krb5_creds            krb5creds, *krb5credsp = NULL;
1837     int                   rc = 0;

1839     memset((char *)&krb5creds, 0, sizeof(krb5creds));

1841     if (!ksssl_ctx)
1842         return(0);

```

```

1844     if (!kssl_ctx->service_host)
1845         return(0);

1847     if ((krb5rc = krb5_init_context(&krb5context)) != 0)
1848         goto err;

1850     if ((krb5rc = krb5_sname_to_principal(krb5context,
1851     kssl_ctx->service_host,
1852     (kssl_ctx->service_name)? kssl_ctx
1853     KRB5_NT_SRV_HST, &krb5creds.server
1854         goto err;

1856     if ((krb5rc = krb5_cc_default(krb5context, &krb5ccdef)) != 0)
1857         goto err;

1859     if ((krb5rc = krb5_cc_get_principal(krb5context, krb5ccdef,
1860     &krb5creds.client)) != 0)
1861         goto err;

1863     if ((krb5rc = krb5_get_credentials(krb5context, 0, krb5ccdef,
1864     &krb5creds, &krb5credsp)) != 0)
1865         goto err;

1867     rc = 1;

1869     err:
1870 #ifdef KSSL_DEBUG
1871     kssl_ctx_show(kssl_ctx);
1872 #endif /* KSSL_DEBUG */

1874     if (krb5creds.client)    krb5_free_principal(krb5context, krb5creds.clie
1875     if (krb5creds.server)    krb5_free_principal(krb5context, krb5creds.serve
1876     if (krb5context)         krb5_free_context(krb5context);
1877     return(rc);
1878 }

1880 #if !defined(OPENSSL_SYS_WINDOWS) && !defined(OPENSSL_SYS_WIN32)
1881 void kssl_krb5_free_data_contents(krb5_context context, krb5_data *data)
1882 {
1883 #ifdef KRB5_HEIMDAL
1884     data->length = 0;
1885     if (data->data)
1886         free(data->data);
1887 #elif defined(KRB5_MIT_OLD11)
1888     if (data->data) {
1889         krb5_xfree(data->data);
1890         data->data = 0;
1891     }
1892 #else
1893     krb5_free_data_contents(NULL, data);
1894 #endif
1895 }
1896 #endif /* !OPENSSL_SYS_WINDOWS && !OPENSSL_SYS_WIN32 */

1899 /* Given pointers to KerberosTime and struct tm structs, convert the
1900 ** KerberosTime string to struct tm. Note that KerberosTime is a
1901 ** ASN1_GENERALIZEDTIME value, constrained to GMT with no fractional
1902 ** seconds as defined in RFC 1510.
1903 ** Return pointer to the (partially) filled in struct tm on success,
1904 ** return NULL on failure.
1905 */
1906 static struct tm *k_gmtime(ASN1_GENERALIZEDTIME *gtime, struct tm *k_tm)
1907 {
1908     char        c, *p;

```

```

1910     if (!k_tm) return NULL;
1911     if (gtime == NULL || gtime->length < 14) return NULL;
1912     if (gtime->data == NULL) return NULL;

1914     p = (char *)&gtime->data[14];

1916     c = *p; *p = '\0'; p += 2; k_tm->tm_sec = atoi(p); *(p+2) = c;
1917     c = *p; *p = '\0'; p += 2; k_tm->tm_min = atoi(p); *(p+2) = c;
1918     c = *p; *p = '\0'; p += 2; k_tm->tm_hour = atoi(p); *(p+2) = c;
1919     c = *p; *p = '\0'; p += 2; k_tm->tm_mday = atoi(p); *(p+2) = c;
1920     c = *p; *p = '\0'; p += 2; k_tm->tm_mon = atoi(p)-1; *(p+2) = c;
1921     c = *p; *p = '\0'; p += 4; k_tm->tm_year = atoi(p)-1900; *(p+4) = c;

1923     return k_tm;
1924 }

1927 /* Helper function for kssl_validate_times().
1928 ** We need context->clockskew, but krb5_context is an opaque struct.
1929 ** So we try to sneak the clockskew out through the replay cache.
1930 ** If that fails just return a likely default (300 seconds).
1931 */
1932 static krb5_deltat get_rc_clockskew(krb5_context context)
1933 {
1934     krb5_rcache rc;
1935     krb5_deltat clockskew;

1937     if (krb5_rc_default(context, &rc) return KSSL_CLOCKSKEW;
1938     if (krb5_rc_initialize(context, rc, 0)) return KSSL_CLOCKSKEW;
1939     if (krb5_rc_get_lifespan(context, rc, &clockskew)) {
1940         clockskew = KSSL_CLOCKSKEW;
1941     }
1942     (void) krb5_rc_destroy(context, rc);
1943     return clockskew;
1944 }

1947 /* kssl_validate_times() combines (and more importantly exposes)
1948 ** the MIT KRB5 internal function krb5_validate_times() and the
1949 ** in_clock_skew() macro. The authenticator client time is checked
1950 ** to be within clockskew secs of the current time and the current
1951 ** time is checked to be within the ticket start and expire times.
1952 ** Either check may be omitted by supplying a NULL value.
1953 ** Returns 0 for valid times, SSL_R_KRB5* error codes otherwise.
1954 ** See Also: (Kerberos source)/krb5/lib/krb5/krb/valid_times.c
1955 ** 20010420 VRS
1956 */
1957 krb5_error_code kssl_validate_times(krb5_timestamp atime,
1958     krb5_ticket_times *ttimes)
1959 {
1960     krb5_deltat skew;
1961     krb5_timestamp start, now;
1962     krb5_error_code rc;
1963     krb5_context context;

1965     if ((rc = krb5_init_context(&context)) return SSL_R_KRB5_S_BAD_TICKET;
1966     skew = get_rc_clockskew(context);
1967     if ((rc = krb5_timeofday(context, &now)) return SSL_R_KRB5_S_BAD_TICKET;
1968     krb5_free_context(context);

1970     if (atime && labs(atime - now) >= skew) return SSL_R_KRB5_S_TKT_SKEW;

1972     if (! ttimes) return 0;

1974     start = (ttimes->starttime != 0)? ttimes->starttime: ttimes->authtime;
1975     if (start - now > skew) return SSL_R_KRB5_S_TKT_NYV;

```

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new/usr/src/lib/openssl/libsunw_ssl/kssl.c
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32

```

2042         krb5rc = KRB5KRB_ERR_GENERIC;
2043         goto err;
2044     }
2045
2046     p = (unsigned char *)authntp->data;
2047     if ((dec_authent = d2i_KRB5_ENCDATA(NULL, &p,
2048         (long) authntp->length)) == NULL)
2049     {
2050         kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
2051             "Error decoding authenticator.\n");
2052         krb5rc = KRB5KRB_AP_ERR_BAD_INTEGRITY;
2053         goto err;
2054     }
2055
2056     enctype = dec_authent->etype->data[0]; /* should = kssl_ctx->enctype */
2057     #if !defined(KRB5_MIT_OLD11)
2058     switch (enctype) {
2059     case ENCTYPE_DES3_CBC_SHA1: /* EVP_des_ede3_cbc(); */
2060     case ENCTYPE_DES3_CBC_SHA:
2061     case ENCTYPE_DES3_CBC_RAW:
2062         krb5rc = 0; /* Skip, can't handle derived keys */
2063         goto err;
2064     }
2065     #endif
2066     enc = kssl_map_enc(enctype);
2067     memset(iv, 0, sizeof iv); /* per RFC 1510 */
2068
2069     if (enc == NULL)
2070     {
2071         /* Disable kssl_check_authent for ENCTYPE_DES3_CBC_SHA1.
2072          * This enctype indicates the authenticator was encrypted
2073          * using key-usage derived keys which openssl cannot decrypt.
2074          */
2075         goto err;
2076     }
2077
2078     if (!EVP_CipherInit(&ciph_ctx, enc, kssl_ctx->key, iv, 0))
2079     {
2080         kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
2081             "EVP_CipherInit error decrypting authenticator.\n");
2082         krb5rc = KRB5KRB_AP_ERR_BAD_INTEGRITY;
2083         goto err;
2084     }
2085     outl = dec_authent->cipher->length;
2086     if (!EVP_Cipher(&ciph_ctx, unenc_authent, dec_authent->cipher->data, outl))
2087     {
2088         kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
2089             "EVP_Cipher error decrypting authenticator.\n");
2090         krb5rc = KRB5KRB_AP_ERR_BAD_INTEGRITY;
2091         goto err;
2092     }
2093     EVP_CIPHER_CTX_cleanup(&ciph_ctx);
2094
2095     #ifdef KSSL_DEBUG
2096     {
2097         int padl;
2098         printf("ksl_check_authent: decrypted authenticator[%d] =\n", outl);
2099         for (padl=0; padl < outl; padl++) printf("%02x ", unenc_authent[padl]);
2100         printf("\n");
2101     }
2102     #endif /* KSSL_DEBUG */
2103
2104     if ((p = kssl_skip_confound(enctype, unenc_authent)) == NULL)
2105     {
2106         kssl_err_set(ksl_err, SSL_R_KRB5_S_INIT,
2107             "confounded by authenticator.\n");
2108     }

```

```

2108         krb5src = KRB5KRB_AP_ERR_BAD_INTEGRITY;
2109         goto err;
2110     }
2111     outl -= p - unenc_authent;

2113     if ((auth = (KRB5_AUTHENTBODY *) d2i_KRB5_AUTHENT(NULL, &p,
2114         (long) outl)) == NULL)
2115     {
2116         kssl_err_set(kssl_err, SSL_R_KRB5_S_INIT,
2117             "Error decoding authenticator body.\n");
2118         krb5src = KRB5KRB_AP_ERR_BAD_INTEGRITY;
2119         goto err;
2120     }

2122     memset(&tm_time, 0, sizeof(struct tm));
2123     if (k_gmtime(auth->ctime, &tm_time) &&
2124         ((tr = mktime(&tm_time)) != (time_t)(-1)))
2125     {
2126         now = time(&now);
2127         tm_l = localtime(&now);          tl = mktime(tm_l);
2128         tm_g = gmtime(&now);            tg = mktime(tm_g);
2129         tz_offset = tg - tl;

2131         *atimep = (krb5_timestamp)(tr - tz_offset);
2132     }

2134 #ifdef KSSL_DEBUG
2135     printf("kssl_check_authent: returns %d for client time ", *atimep);
2136     if (auth && auth->ctime && auth->ctime->length && auth->ctime->data)
2137         printf("%.s\n", auth->ctime->length, auth->ctime->data);
2138     else
2139         printf("NULL\n");
2140 #endif /* KSSL_DEBUG */

2141 err:
2142     if (auth)                KRB5_AUTHENT_free((KRB5_AUTHENT *) auth);
2143     if (dec_authent)         KRB5_ENCDATA_free(dec_authent);
2144     if (unenc_authent)       free(unenc_authent);
2145     EVP_CIPHER_CTX_cleanup(&ciph_ctx);
2146     return krb5src;
2147 }

2150 /* Replaces krb5_build_principal_ext(), with varargs length == 2 (svc, host),
2151 ** because I don't know how to stub varargs.
2152 ** Returns krb5_error_code == ENOMEM on alloc error, otherwise
2153 ** passes back newly constructed principal, which should be freed by caller.
2154 */
2155 krb5_error_code kssl_build_principal_2(
2156     /* UPDATE */      krb5_context context,
2157     /* OUT */         krb5_principal *princ,
2158     /* IN */          int rlen, const char *realm,
2159     /* IN */          int slen, const char *svc,
2160     /* IN */          int hlen, const char *host)
2161 {
2162     krb5_data          *p_data = NULL;
2163     krb5_principal     new_p = NULL;
2164     char               *new_r = NULL;

2166     if ((p_data = (krb5_data *) calloc(2, sizeof(krb5_data))) == NULL ||
2167         (new_p = (krb5_principal) calloc(1, sizeof(krb5_principal_data)))
2168         == NULL) goto err;
2169     new_p->length = 2;
2170     new_p->data = p_data;

2172     if ((new_r = calloc(1, rlen + 1)) == NULL) goto err;
2173     memcpy(new_r, realm, rlen);

```

```

2174     krb5_princ_set_realm_length(context, new_p, rlen);
2175     krb5_princ_set_realm_data(context, new_p, new_r);

2177     if ((new_p->data[0].data = calloc(1, slen + 1)) == NULL) goto err;
2178     memcpy(new_p->data[0].data, svc, slen);
2179     new_p->data[0].length = slen;

2181     if ((new_p->data[1].data = calloc(1, hlen + 1)) == NULL) goto err;
2182     memcpy(new_p->data[1].data, host, hlen);
2183     new_p->data[1].length = hlen;

2184     krb5_princ_type(context, new_p) = KRB5_NT_UNKNOWN;
2185     *princ = new_p;
2186     return 0;

2189 err:
2190     if (new_p && new_p[0].data) free(new_p[0].data);
2191     if (new_p && new_p[1].data) free(new_p[1].data);
2192     if (new_p) free(new_p);
2193     if (new_r) free(new_r);
2194     return ENOMEM;
2195 }

2197 void SSL_set0_kssl_ctx(SSL *s, KSSL_CTX *kctx)
2198 {
2199     s->kssl_ctx = kctx;
2200 }

2202 KSSL_CTX * SSL_get0_kssl_ctx(SSL *s)
2203 {
2204     return s->kssl_ctx;
2205 }

2207 char *kssl_ctx_get0_client_princ(KSSL_CTX *kctx)
2208 {
2209     if (kctx)
2210         return kctx->client_princ;
2211     return NULL;
2212 }

2214 #else /* !OPENSSL_NO_KRB5 */

2216 #if defined(PEDANTIC) || defined(OPENSSL_SYS_VMS)
2217 static void *dummy=&dummy;
2218 #endif

2220 #endif /* !OPENSSL_NO_KRB5 */

```

```
*****
15597 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/mapfile-vers
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 $mapfile_version 2
```

```
3 SYMBOL_VERSION SUNWprivate_1.1 {
4     global:
5         sunw_BIO_f_ssl;
6         sunw_BIO_new_buffer_ssl_connect;
7         sunw_BIO_new_ssl;
8         sunw_BIO_new_ssl_connect;
9         sunw_BIO_ssl_copy_session_id;
10        sunw_BIO_ssl_shutdown;
11        sunw_d2i_SSL_SESSION;
12        sunw_do_dtls1_write;
13        sunw_dtls1_accept;
14        sunw_dtls1_buffer_message;
15        sunw_dtls1_check_timeout_num;
16        sunw_dtls1_clear;
17        sunw_dtls1_clear_record_buffer;
18        sunw_dtls1_client_hello;
19        sunw_dtls1_connect;
20        sunw_dtls1_ctrl;
21        sunw_dtls1_default_timeout;
22        sunw_dtls1_dispatch_alert;
23        sunw_dtls1_do_write;
24        sunw_dtls1_double_timeout;
25        sunw_dtls1_enc;
26        sunw_dtls1_free;
27        sunw_dtls1_get_ccs_header;
28        sunw_dtls1_get_cipher;
29        sunw_dtls1_get_message;
30        sunw_dtls1_get_message_header;
31        sunw_dtls1_get_queue_priority;
32        sunw_dtls1_get_record;
33        sunw_dtls1_get_timeout;
34        sunw_dtls1_handle_timeout;
35        sunw_dtls1_heartbeat;
36        sunw_dtls1_is_timer_expired;
37        sunw_dtls1_listen;
38        sunw_dtls1_min_mtu;
39        sunw_dtls1_new;
40        sunw_dtls1_output_cert_chain;
41        sunw_dtls1_process_heartbeat;
42        sunw_dtls1_read_bytes;
43        sunw_dtls1_read_failed;
44        sunw_dtls1_reset_seq_numbers;
45        sunw_dtls1_retransmit_buffered_messages;
46        sunw_dtls1_retransmit_message;
47        sunw_dtls1_send_certificate_request;
48        sunw_dtls1_send_change_cipher_spec;
49        sunw_dtls1_send_client_certificate;
50        sunw_dtls1_send_client_key_exchange;
51        sunw_dtls1_send_client_verify;
52        sunw_dtls1_send_finished;
53        sunw_dtls1_send_hello_request;
54        sunw_dtls1_send_newsession_ticket;
55        sunw_dtls1_send_server_certificate;
56        sunw_dtls1_send_server_done;
57        sunw_dtls1_send_server_hello;
58        sunw_dtls1_send_server_key_exchange;
59        sunw_dtls1_set_message_header;
60        sunw_dtls1_shutdown;
61        sunw_dtls1_start_timer;
```

```
62        sunw_dtls1_stop_timer;
63        sunw_dtls1_version_str;
64        sunw_dtls1_write_app_data_bytes;
65        sunw_dtls1_write_bytes;
66        sunw_DTLSv1_client_method;
67        sunw_DTLSv1_enc_data;
68        sunw_DTLSv1_method;
69        sunw_DTLSv1_server_method;
70        sunw_ERR_load_SSL_strings;
71        sunw_i2d_SSL_SESSION;
72        sunw_n_ssl3_mac;
73        sunw_OBJ_bsearch_ssl_cipher_id;
74        sunw_PEM_read_bio_SSL_SESSION;
75        sunw_PEM_read_SSL_SESSION;
76        sunw_PEM_write_bio_SSL_SESSION;
77        sunw_PEM_write_SSL_SESSION;
78        sunw_SRP_Calc_A_param;
79        sunw_SRP_generate_client_master_secret;
80        sunw_SRP_generate_server_master_secret;
81        sunw_SSL_accept;
82        sunw_SSL_add_client_CA;
83        sunw_ssl_add_clienthello_renegotiate_ext;
84        sunw_ssl_add_clienthello_tlsext;
85        sunw_ssl_add_clienthello_use_srtp_ext;
86        sunw_SSL_add_dir_cert_subjects_to_stack;
87        sunw_SSL_add_file_cert_subjects_to_stack;
88        sunw_ssl_add_serverhello_renegotiate_ext;
89        sunw_ssl_add_serverhello_tlsext;
90        sunw_ssl_add_serverhello_use_srtp_ext;
91        sunw_SSL_alert_desc_string;
92        sunw_SSL_alert_desc_string_long;
93        sunw_SSL_alert_type_string;
94        sunw_SSL_alert_type_string_long;
95        sunw_ssl_bad_method;
96        sunw_ssl_bytes_to_cipher_list;
97        sunw_SSL_cache_hit;
98        sunw_SSL_callback_ctrl;
99        sunw_ssl_cert_dup;
100       sunw_ssl_cert_free;
101       sunw_ssl_cert_inst;
102       sunw_ssl_cert_new;
103       sunw_ssl_cert_type;
104       sunw_ssl_check_clienthello_tlsext_early;
105       sunw_ssl_check_clienthello_tlsext_late;
106       sunw_SSL_check_private_key;
107       sunw_ssl_check_serverhello_tlsext;
108       sunw_SSL_CIPHER_description;
109       sunw_SSL_CIPHER_get_bits;
110       sunw_ssl_cipher_get_evpc;
111       sunw_SSL_CIPHER_get_id;
112       sunw_SSL_CIPHER_get_name;
113       sunw_SSL_CIPHER_get_version;
114       sunw_ssl_cipher_id_cmp;
115       sunw_ssl_cipher_list_to_bytes;
116       sunw_ssl_cipher_ptr_id_cmp;
117       sunw_SSL_clear;
118       sunw_ssl_clear_bad_session;
119       sunw_ssl_clear_cipher_ctx;
120       sunw_ssl_clear_hash_ctx;
121       sunw_SSL_COMP_add_compression_method;
122       sunw_SSL_COMP_get_compression_methods;
123       sunw_SSL_COMP_get_name;
124       sunw_SSL_connect;
125       sunw_SSL_copy_session_id;
126       sunw_ssl_create_cipher_list;
127       sunw_SSL_ctrl;
```



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128 sunw_SSL_CTX_add_client_CA;
129 sunw_SSL_CTX_add_session;
130 sunw_SSL_CTX_callback_ctrl;
131 sunw_SSL_CTX_check_private_key;
132 sunw_SSL_CTX_ctrl;
133 sunw_SSL_CTX_flush_sessions;
134 sunw_SSL_CTX_free;
135 sunw_SSL_CTX_get_cert_store;
136 sunw_SSL_CTX_get_client_CA_list;
137 sunw_SSL_CTX_get_client_cert_cb;
138 sunw_SSL_CTX_get_ex_data;
139 sunw_SSL_CTX_get_ex_new_index;
140 sunw_SSL_CTX_get_info_callback;
141 sunw_SSL_CTX_get_quiet_shutdown;
142 sunw_SSL_CTX_get_timeout;
143 sunw_SSL_CTX_get_verify_callback;
144 sunw_SSL_CTX_get_verify_depth;
145 sunw_SSL_CTX_get_verify_mode;
146 sunw_SSL_CTX_load_verify_locations;
147 sunw_SSL_CTX_new;
148 sunw_SSL_CTX_remove_session;
149 sunw_SSL_CTX_sess_get_get_cb;
150 sunw_SSL_CTX_sess_get_new_cb;
151 sunw_SSL_CTX_sess_get_remove_cb;
152 sunw_SSL_CTX_sess_set_get_cb;
153 sunw_SSL_CTX_sess_set_new_cb;
154 sunw_SSL_CTX_sess_set_remove_cb;
155 sunw_SSL_CTX_sessions;
156 sunw_SSL_CTX_set_cert_store;
157 sunw_SSL_CTX_set_cert_verify_callback;
158 sunw_SSL_CTX_set_cipher_list;
159 sunw_SSL_CTX_set_client_CA_list;
160 sunw_SSL_CTX_set_client_cert_cb;
161 sunw_SSL_CTX_set_client_cert_engine;
162 sunw_SSL_CTX_set_cookie_generate_cb;
163 sunw_SSL_CTX_set_cookie_verify_cb;
164 sunw_SSL_CTX_set_default_passwd_cb;
165 sunw_SSL_CTX_set_default_passwd_cb_userdata;
166 sunw_SSL_CTX_set_default_verify_paths;
167 sunw_SSL_CTX_set_ex_data;
168 sunw_SSL_CTX_set_generate_session_id;
169 sunw_SSL_CTX_set_info_callback;
170 sunw_SSL_CTX_set_msg_callback;
171 sunw_SSL_CTX_set_next_proto_select_cb;
172 sunw_SSL_CTX_set_next_protos_advertised_cb;
173 sunw_SSL_CTX_set_psk_client_callback;
174 sunw_SSL_CTX_set_psk_server_callback;
175 sunw_SSL_CTX_set_purpose;
176 sunw_SSL_CTX_set_quiet_shutdown;
177 sunw_SSL_CTX_set_session_id_context;
178 sunw_SSL_CTX_set_srp_cb_arg;
179 sunw_SSL_CTX_set_srp_client_pwd_callback;
180 sunw_SSL_CTX_set_srp_password;
181 sunw_SSL_CTX_set_srp_strength;
182 sunw_SSL_CTX_set_srp_username;
183 sunw_SSL_CTX_set_srp_username_callback;
184 sunw_SSL_CTX_set_srp_verify_param_callback;
185 sunw_SSL_CTX_set_ssl_version;
186 sunw_SSL_CTX_set_timeout;
187 sunw_SSL_CTX_set_tlsext_use_srtp;
188 sunw_SSL_CTX_set_tmp_dh_callback;
189 sunw_SSL_CTX_set_tmp_rsa_callback;
190 sunw_SSL_CTX_set_trust;
191 sunw_SSL_CTX_set_verify;
192 sunw_SSL_CTX_set_verify_depth;
193 sunw_SSL_CTX_set1_param;

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194 sunw_SSL_CTX_SRP_CTX_free;
195 sunw_SSL_CTX_SRP_CTX_init;
196 sunw_SSL_CTX_use_certificate;
197 sunw_SSL_CTX_use_certificate_ASN1;
198 sunw_SSL_CTX_use_certificate_chain_file;
199 sunw_SSL_CTX_use_certificate_file;
200 sunw_SSL_CTX_use_PrivateKey;
201 sunw_SSL_CTX_use_PrivateKey_ASN1;
202 sunw_SSL_CTX_use_PrivateKey_file;
203 sunw_SSL_CTX_use_psk_identity_hint;
204 sunw_SSL_CTX_use_RSAPrivateKey;
205 sunw_SSL_CTX_use_RSAPrivateKey_ASN1;
206 sunw_SSL_CTX_use_RSAPrivateKey_file;
207 sunw_ssl_do_client_cert_cb;
208 sunw_SSL_do_handshake;
209 sunw_SSL_dup;
210 sunw_SSL_dup_CA_list;
211 sunw_SSL_export_keying_material;
212 sunw_ssl_fill_hello_random;
213 sunw_SSL_free;
214 sunw_ssl_free_wbio_buffer;
215 sunw_ssl_get_algorithm2;
216 sunw_SSL_get_certificate;
217 sunw_SSL_get_cipher_list;
218 sunw_SSL_get_ciphers;
219 sunw_ssl_get_ciphers_by_id;
220 sunw_SSL_get_client_CA_list;
221 sunw_SSL_get_current_cipher;
222 sunw_SSL_get_current_compression;
223 sunw_SSL_get_current_expansion;
224 sunw_SSL_get_default_timeout;
225 sunw_SSL_get_error;
226 sunw_SSL_get_ex_data;
227 sunw_SSL_get_ex_data_X509_STORE_CTX_idx;
228 sunw_SSL_get_ex_new_index;
229 sunw_SSL_get_fd;
230 sunw_SSL_get_finished;
231 sunw_ssl_get_handshake_digest;
232 sunw_SSL_get_info_callback;
233 sunw_ssl_get_new_session;
234 sunw_SSL_get_peer_cert_chain;
235 sunw_SSL_get_peer_certificate;
236 sunw_SSL_get_peer_finished;
237 sunw_ssl_get_prev_session;
238 sunw_SSL_get_privatekey;
239 sunw_SSL_get_psk_identity;
240 sunw_SSL_get_psk_identity_hint;
241 sunw_SSL_get_quiet_shutdown;
242 sunw_SSL_get_rbio;
243 sunw_SSL_get_read_ahead;
244 sunw_SSL_get_rfd;
245 sunw_SSL_get_selected_srtp_profile;
246 sunw_ssl_get_server_send_cert;
247 sunw_ssl_get_server_send_pkey;
248 sunw_SSL_get_servername;
249 sunw_SSL_get_servername_type;
250 sunw_SSL_get_session;
251 sunw_SSL_get_shared_ciphers;
252 sunw_SSL_get_shutdown;
253 sunw_ssl_get_sign_pkey;
254 sunw_SSL_get_srp_g;
255 sunw_SSL_get_srp_N;
256 sunw_SSL_get_srp_userinfo;
257 sunw_SSL_get_srp_username;
258 sunw_SSL_get_srtp_profiles;
259 sunw_SSL_get_SSL_CTX;

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260 sunw_SSL_get_ssl_method;
261 sunw_SSL_get_verify_callback;
262 sunw_SSL_get_verify_depth;
263 sunw_SSL_get_verify_mode;
264 sunw_SSL_get_verify_result;
265 sunw_SSL_get_version;
266 sunw_SSL_get_wbio;
267 sunw_SSL_get_wfd;
268 sunw_SSL_get0_next_proto_negotiated;
269 sunw_SSL_get1_session;
270 sunw_SSL_has_matching_session_id;
271 sunw_ssl_init_wbio_buffer;
272 sunw_SSL_library_init;
273 sunw_ssl_load_ciphers;
274 sunw_SSL_load_client_CA_file;
275 sunw_SSL_load_error_strings;
276 sunw_SSL_new;
277 sunw_ssl_ok;
278 sunw_ssl_parse_clienthello_renegotiate_ext;
279 sunw_ssl_parse_clienthello_tlsext;
280 sunw_ssl_parse_clienthello_use_srtp_ext;
281 sunw_ssl_parse_serverhello_renegotiate_ext;
282 sunw_ssl_parse_serverhello_tlsext;
283 sunw_ssl_parse_serverhello_use_srtp_ext;
284 sunw_SSL_peek;
285 sunw_SSL_pending;
286 sunw_ssl_prepare_clienthello_tlsext;
287 sunw_ssl_prepare_serverhello_tlsext;
288 sunw_SSL_read;
289 sunw_SSL_renegotiate;
290 sunw_SSL_renegotiate_abbreviated;
291 sunw_SSL_renegotiate_pending;
292 sunw_ssl_replace_hash;
293 sunw_SSL_rstate_string;
294 sunw_SSL_rstate_string_long;
295 sunw_SSL_select_next_proto;
296 sunw_ssl_sess_cert_free;
297 sunw_ssl_sess_cert_new;
298 sunw_SSL_SESSION_free;
299 sunw_SSL_SESSION_get_compress_id;
300 sunw_SSL_SESSION_get_ex_data;
301 sunw_SSL_SESSION_get_ex_new_index;
302 sunw_SSL_SESSION_get_id;
303 sunw_SSL_SESSION_get_time;
304 sunw_SSL_SESSION_get_timeout;
305 sunw_SSL_SESSION_get0_peer;
306 sunw_SSL_SESSION_new;
307 sunw_SSL_SESSION_print;
308 sunw_SSL_SESSION_print_fp;
309 sunw_SSL_SESSION_set_ex_data;
310 sunw_SSL_SESSION_set_time;
311 sunw_SSL_SESSION_set_timeout;
312 sunw_SSL_SESSION_set1_id_context;
313 sunw_SSL_set_accept_state;
314 sunw_SSL_set_bio;
315 sunw_ssl_set_cert_masks;
316 sunw_SSL_set_cipher_list;
317 sunw_SSL_set_client_CA_list;
318 sunw_SSL_set_connect_state;
319 sunw_SSL_set_debug;
320 sunw_SSL_set_ex_data;
321 sunw_SSL_set_fd;
322 sunw_SSL_set_generate_session_id;
323 sunw_SSL_set_info_callback;
324 sunw_SSL_set_msg_callback;
325 sunw_ssl_set_peer_cert_type;

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326 sunw_SSL_set_psk_client_callback;
327 sunw_SSL_set_psk_server_callback;
328 sunw_SSL_set_purpose;
329 sunw_SSL_set_quiet_shutdown;
330 sunw_SSL_set_read_ahead;
331 sunw_SSL_set_rfd;
332 sunw_SSL_set_session;
333 sunw_SSL_set_session_id_context;
334 sunw_SSL_set_session_secret_cb;
335 sunw_SSL_set_session_ticket_ext;
336 sunw_SSL_set_session_ticket_ext_cb;
337 sunw_SSL_set_shutdown;
338 sunw_SSL_set_srp_server_param;
339 sunw_SSL_set_srp_server_param_pw;
340 sunw_SSL_set_SSL_CTX;
341 sunw_SSL_set_ssl_method;
342 sunw_SSL_set_state;
343 sunw_SSL_set_tlsext_use_srtp;
344 sunw_SSL_set_tmp_dh_callback;
345 sunw_SSL_set_tmp_rsa_callback;
346 sunw_SSL_set_trust;
347 sunw_SSL_set_verify;
348 sunw_SSL_set_verify_depth;
349 sunw_SSL_set_verify_result;
350 sunw_SSL_set_wfd;
351 sunw_SSL_set1_param;
352 sunw_SSL_shutdown;
353 sunw_SSL_SRP_CTX_free;
354 sunw_SSL_SRP_CTX_init;
355 sunw_SSL_srp_server_param_with_username;
356 sunw_SSL_state;
357 sunw_SSL_state_string;
358 sunw_SSL_state_string_long;
359 sunw_ssl_undefined_const_function;
360 sunw_ssl_undefined_function;
361 sunw_ssl_undefined_void_function;
362 sunw_ssl_update_cache;
363 sunw_SSL_use_certificate;
364 sunw_SSL_use_certificate_ASN1;
365 sunw_SSL_use_certificate_file;
366 sunw_SSL_use_PrivateKey;
367 sunw_SSL_use_PrivateKey_ASN1;
368 sunw_SSL_use_PrivateKey_file;
369 sunw_SSL_use_psk_identity_hint;
370 sunw_SSL_use_RSAPrivateKey;
371 sunw_SSL_use_RSAPrivateKey_ASN1;
372 sunw_SSL_use_RSAPrivateKey_file;
373 sunw_ssl_verify_alarm_type;
374 sunw_ssl_verify_cert_chain;
375 sunw_SSL_version;
376 sunw_SSL_version_str;
377 sunw_SSL_want;
378 sunw_SSL_write;
379 sunw_ssl2_accept;
380 sunw_ssl2_callback_ctrl;
381 sunw_ssl2_ciphers;
382 sunw_ssl2_clear;
383 sunw_ssl2_connect;
384 sunw_ssl2_ctrl;
385 sunw_ssl2_ctx_callback_ctrl;
386 sunw_ssl2_ctx_ctrl;
387 sunw_ssl2_default_timeout;
388 sunw_ssl2_do_write;
389 sunw_ssl2_enc;
390 sunw_ssl2_enc_init;
391 sunw_ssl2_free;

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392 sunw_ssl2_generate_key_material;
393 sunw_ssl2_get_cipher;
394 sunw_ssl2_get_cipher_by_char;
395 sunw_ssl2_mac;
396 sunw_ssl2_new;
397 sunw_ssl2_num_ciphers;
398 sunw_ssl2_part_read;
399 sunw_ssl2_peek;
400 sunw_ssl2_pending;
401 sunw_ssl2_put_cipher_by_char;
402 sunw_ssl2_read;
403 sunw_ssl2_return_error;
404 sunw_ssl2_set_certificate;
405 sunw_ssl2_shutdown;
406 sunw_ssl2_version_str;
407 sunw_ssl2_write;
408 sunw_ssl2_write_error;
409 sunw_ssl23_accept;
410 sunw_ssl23_connect;
411 sunw_ssl23_default_timeout;
412 sunw_ssl23_get_cipher;
413 sunw_ssl23_get_cipher_by_char;
414 sunw_ssl23_get_client_hello;
415 sunw_ssl23_num_ciphers;
416 sunw_ssl23_peek;
417 sunw_ssl23_put_cipher_by_char;
418 sunw_ssl23_read;
419 sunw_ssl23_read_bytes;
420 sunw_ssl23_write;
421 sunw_ssl23_write_bytes;
422 sunw_ssl3_accept;
423 sunw_ssl3_alert_code;
424 sunw_ssl3_callback_ctrl;
425 sunw_ssl3_cbc_copy_mac;
426 sunw_ssl3_cbc_digest_record;
427 sunw_ssl3_cbc_record_digest_supported;
428 sunw_ssl3_cbc_remove_padding;
429 sunw_ssl3_cert_verify_mac;
430 sunw_ssl3_change_cipher_state;
431 sunw_ssl3_check_cert_and_algorithm;
432 sunw_ssl3_check_client_hello;
433 sunw_ssl3_check_finished;
434 sunw_ssl3_choose_cipher;
435 sunw_ssl3_ciphers;
436 sunw_ssl3_cleanup_key_block;
437 sunw_ssl3_clear;
438 sunw_ssl3_client_hello;
439 sunw_ssl3_comp_find;
440 sunw_ssl3_connect;
441 sunw_ssl3_ctrl;
442 sunw_ssl3_ctx_callback_ctrl;
443 sunw_ssl3_ctx_ctrl;
444 sunw_ssl3_default_timeout;
445 sunw_ssl3_digest_cached_records;
446 sunw_ssl3_dispatch_alert;
447 sunw_ssl3_do_change_cipher_spec;
448 sunw_ssl3_do_compress;
449 sunw_ssl3_do_uncompress;
450 sunw_ssl3_do_write;
451 sunw_ssl3_enc;
452 sunw_ssl3_final_finish_mac;
453 sunw_ssl3_finish_mac;
454 sunw_ssl3_free;
455 sunw_ssl3_free_digest_list;
456 sunw_ssl3_generate_master_secret;
457 sunw_ssl3_get_cert_status;
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458 sunw_ssl3_get_cert_verify;
459 sunw_ssl3_get_certificate_request;
460 sunw_ssl3_get_cipher;
461 sunw_ssl3_get_cipher_by_char;
462 sunw_ssl3_get_client_certificate;
463 sunw_ssl3_get_client_hello;
464 sunw_ssl3_get_client_key_exchange;
465 sunw_ssl3_get_finished;
466 sunw_ssl3_get_key_exchange;
467 sunw_ssl3_get_message;
468 sunw_ssl3_get_new_session_ticket;
469 sunw_ssl3_get_next_proto;
470 sunw_ssl3_get_req_cert_type;
471 sunw_ssl3_get_server_certificate;
472 sunw_ssl3_get_server_done;
473 sunw_ssl3_get_server_hello;
474 sunw_ssl3_init_finished_mac;
475 sunw_ssl3_new;
476 sunw_ssl3_num_ciphers;
477 sunw_ssl3_output_cert_chain;
478 sunw_ssl3_peek;
479 sunw_ssl3_pending;
480 sunw_ssl3_put_cipher_by_char;
481 sunw_ssl3_read;
482 sunw_ssl3_read_bytes;
483 sunw_ssl3_read_n;
484 sunw_ssl3_record_sequence_update;
485 sunw_ssl3_release_read_buffer;
486 sunw_ssl3_release_write_buffer;
487 sunw_ssl3_renegotiate;
488 sunw_ssl3_renegotiate_check;
489 sunw_ssl3_send_alert;
490 sunw_ssl3_send_cert_status;
491 sunw_ssl3_send_certificate_request;
492 sunw_ssl3_send_change_cipher_spec;
493 sunw_ssl3_send_client_certificate;
494 sunw_ssl3_send_client_key_exchange;
495 sunw_ssl3_send_client_verify;
496 sunw_ssl3_send_finished;
497 sunw_ssl3_send_hello_request;
498 sunw_ssl3_send_newsession_ticket;
499 sunw_ssl3_send_next_proto;
500 sunw_ssl3_send_server_certificate;
501 sunw_ssl3_send_server_done;
502 sunw_ssl3_send_server_hello;
503 sunw_ssl3_send_server_key_exchange;
504 sunw_ssl3_setup_buffers;
505 sunw_ssl3_setup_key_block;
506 sunw_ssl3_setup_read_buffer;
507 sunw_ssl3_setup_write_buffer;
508 sunw_ssl3_shutdown;
509 sunw_ssl3_undef_enc_method;
510 sunw_ssl3_version_str;
511 sunw_ssl3_write;
512 sunw_ssl3_write_bytes;
513 sunw_ssl3_write_pending;
514 sunw_SSLv2_client_method;
515 sunw_SSLv2_method;
516 sunw_SSLv2_server_method;
517 sunw_SSLv23_client_method;
518 sunw_SSLv23_method;
519 sunw_SSLv23_server_method;
520 sunw_SSLv3_client_method;
521 sunw_SSLv3_enc_data;
522 sunw_SSLv3_method;
523 sunw_SSLv3_server_method;
```

```
524     sunw_tls1_alert_code;
525     sunw_tls1_cbc_remove_padding;
526     sunw_tls1_cert_verify_mac;
527     sunw_tls1_change_cipher_state;
528     sunw_tls1_clear;
529     sunw_tls1_default_timeout;
530     sunw_tls1_enc;
531     sunw_tls1_export_keying_material;
532     sunw_tls1_final_finish_mac;
533     sunw_tls1_free;
534     sunw_tls1_generate_master_secret;
535     sunw_tls1_heartbeat;
536     sunw_tls1_mac;
537     sunw_tls1_new;
538     sunw_tls1_process_heartbeat;
539     sunw_tls1_process_sigalgs;
540     sunw_tls1_process_ticket;
541     sunw_tls1_setup_key_block;
542     sunw_tls1_version_str;
543     sunw_tls12_get_hash;
544     sunw_tls12_get_req_sig_algs;
545     sunw_tls12_get_sigandhash;
546     sunw_tls12_get_sigid;
547     sunw_TLSv1_1_client_method;
548     sunw_TLSv1_1_method;
549     sunw_TLSv1_1_server_method;
550     sunw_TLSv1_2_client_method;
551     sunw_TLSv1_2_method;
552     sunw_TLSv1_2_server_method;
553     sunw_TLSv1_client_method;
554     sunw_TLSv1_enc_data;
555     sunw_TLSv1_method;
556     sunw_TLSv1_server_method;
557     local:
558     *;
559 };
```

new/usr/src/lib/openssl/libsunw_ssl/s23_clnt.c

1

```
*****
21954 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/s23_clnt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s23_clnt.c */
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3  * All rights reserved.
4  *
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6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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60 *
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```

new/usr/src/lib/openssl/libsunw_ssl/s23_clnt.c

2

```
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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include "ssl_locl.h"
114 #include <openssl/buffer.h>
115 #include <openssl/rand.h>
116 #include <openssl/objects.h>
117 #include <openssl/evp.h>
118
119 static const SSL_METHOD *ssl23_get_client_method(int ver);
120 static int ssl23_client_hello(SSL *s);
121 static int ssl23_get_server_hello(SSL *s);
122 static const SSL_METHOD *ssl23_get_client_method(int ver)
123 {
124     #ifndef OPENSSL_NO_SSL2
125     if (ver == SSL2_VERSION)
126         return(SSLv2_client_method());
127     #endif
```

```

128     if (ver == SSL3_VERSION)
129         return(SSLv3_client_method());
130     else if (ver == TLS1_VERSION)
131         return(TLSv1_client_method());
132     else if (ver == TLS1_1_VERSION)
133         return(TLSv1_1_client_method());
134     else if (ver == TLS1_2_VERSION)
135         return(TLSv1_2_client_method());
136     else
137         return(NULL);
138 }

140 IMPLEMENT_ssl23_meth_func(SSLv23_client_method,
141     ssl_undefined_function,
142     ssl23_connect,
143     ssl23_get_client_method)

145 int ssl23_connect(SSL *s)
146 {
147     BUF_MEM *buf=NULL;
148     unsigned long Time=(unsigned long)time(NULL);
149     void (*cb)(const SSL *ssl,int type,int val)=NULL;
150     int ret= -1;
151     int new_state,state;

153     RAND_add(&Time,sizeof(Time),0);
154     ERR_clear_error();
155     clear_sys_error();

157     if (s->info_callback != NULL)
158         cb=s->info_callback;
159     else if (s->ctx->info_callback != NULL)
160         cb=s->ctx->info_callback;

161     s->in_handshake++;
162     if (!SSL_in_init(s) || SSL_in_before(s)) SSL_clear(s);

165     for (;;)
166     {
167         state=s->state;

169         switch(s->state)
170         {
171             case SSL_ST_BEFORE:
172             case SSL_ST_CONNECT:
173             case SSL_ST_BEFORE|SSL_ST_CONNECT:
174             case SSL_ST_OK|SSL_ST_CONNECT:

176                 if (s->session != NULL)
177                 {
178                     SSLerr(SSL_F_SSL23_CONNECT,SSL_R_SSL23_DOING_SES
179                         ret= -1;
180                         goto end;
181                 }
182                 s->server=0;
183                 if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_START,1);

185                 /* s->version=TLS1_VERSION; */
186                 s->type=SSL_ST_CONNECT;

188                 if (s->init_buf == NULL)
189                 {
190                     if ((buf=BUF_MEM_new()) == NULL)
191                     {
192                         ret= -1;
193                         goto end;

```

```

194     }
195     if (!BUF_MEM_grow(buf,SSL3_RT_MAX_PLAIN_LENGTH))
196     {
197         ret= -1;
198         goto end;
199     }
200     s->init_buf=buf;
201     buf=NULL;
202 }

204     if (!ssl3_setup_buffers(s)) { ret= -1; goto end; }

206     ssl3_init_finished_mac(s);

208     s->state=SSL23_ST_CW_CLNT_HELLO_A;
209     s->ctx->stats.sess_connect++;
210     s->init_num=0;
211     break;

213     case SSL23_ST_CW_CLNT_HELLO_A:
214     case SSL23_ST_CW_CLNT_HELLO_B:

216         s->shutdown=0;
217         ret=ssl23_client_hello(s);
218         if (ret <= 0) goto end;
219         s->state=SSL23_ST_CR_SRVR_HELLO_A;
220         s->init_num=0;

222         break;

224     case SSL23_ST_CR_SRVR_HELLO_A:
225     case SSL23_ST_CR_SRVR_HELLO_B:
226         ret=ssl23_get_server_hello(s);
227         if (ret >= 0) cb=NULL;
228         goto end;
229         /* break; */

231     default:
232         SSLerr(SSL_F_SSL23_CONNECT,SSL_R_UNKNOWN_STATE);
233         ret= -1;
234         goto end;
235         /* break; */
236     }

238     if (s->debug) { (void)BIO_flush(s->wbio); }

240     if ((cb != NULL) && (s->state != state))
241     {
242         new_state=s->state;
243         s->state=state;
244         cb(s,SSL_CB_CONNECT_LOOP,1);
245         s->state=new_state;
246     }
247 }

248 end:
249     s->in_handshake--;
250     if (buf != NULL)
251         BUF_MEM_free(buf);
252     if (cb != NULL)
253         cb(s,SSL_CB_CONNECT_EXIT,ret);
254     return(ret);
255 }

257 static int ssl23_no_ssl2_ciphers(SSL *s)
258 {
259     SSL_CIPHER *cipher;

```

```

260     STACK_OF(SSL_CIPHER) *ciphers;
261     int i;
262     ciphers = SSL_get_ciphers(s);
263     for (i = 0; i < sk_SSL_CIPHER_num(ciphers); i++)
264     {
265         cipher = sk_SSL_CIPHER_value(ciphers, i);
266         if (cipher->algorithm_ssl == SSL_SSLV2)
267             return 0;
268     }
269     return 1;
270 }

272 /* Fill a ClientRandom or ServerRandom field of length len. Returns <= 0
273  * on failure, 1 on success. */
274 int ssl_fill_hello_random(SSL *s, int server, unsigned char *result, int len)
275 {
276     int send_time = 0;

278     if (len < 4)
279         return 0;
280     if (server)
281         send_time = (s->mode & SSL_MODE_SEND_SERVERHELLO_TIME) != 0;
282     else
283         send_time = (s->mode & SSL_MODE_SEND_CLIENTHELLO_TIME) != 0;
284     if (send_time)
285     {
286         unsigned long Time = (unsigned long)time(NULL);
287         unsigned char *p = result;
288         l2n(Time, p);
289         return RAND_pseudo_bytes(p, len-4);
290     }
291     else
292         return RAND_pseudo_bytes(result, len);
293 }

295 static int ssl23_client_hello(SSL *s)
296 {
297     unsigned char *buf;
298     unsigned char *p, *d;
299     int i, ch, len;
300     unsigned long l;
301     int ssl2_compat;
302     int version = 0, version_major, version_minor;
303 #ifndef OPENSSL_NO_COMP
304     int j;
305     SSL_COMP *comp;
306 #endif
307     int ret;
308     unsigned long mask, options = s->options;

310     ssl2_compat = (options & SSL_OP_NO_SSLV2) ? 0 : 1;

312     if (ssl2_compat && ssl23_no_ssl2_ciphers(s))
313         ssl2_compat = 0;

315     /*
316      * SSL_OP_NO_X disables all protocols above X *if* there are
317      * some protocols below X enabled. This is required in order
318      * to maintain "version capability" vector contiguous. So
319      * that if application wants to disable TLS1.0 in favour of
320      * TLS1>=1, it would be insufficient to pass SSL_NO_TLSv1, the
321      * answer is SSL_OP_NO_TLSv1|SSL_OP_NO_SSLv3|SSL_OP_NO_SSLv2.
322      */
323     mask = SSL_OP_NO_TLSv1_1|SSL_OP_NO_TLSv1
324 #if !defined(OPENSSL_NO_SSL3)
325     |SSL_OP_NO_SSLv3

```

```

326 #endif
327 #if !defined(OPENSSL_NO_SSL2)
328     |(ssl2_compat?SSL_OP_NO_SSLv2:0)
329 #endif
330     ;
331 #if !defined(OPENSSL_NO_TLS1_2_CLIENT)
332     version = TLS1_2_VERSION;

334     if ((options & SSL_OP_NO_TLSv1_2) && (options & mask) != mask)
335         version = TLS1_1_VERSION;
336 #else
337     version = TLS1_1_VERSION;
338 #endif
339     mask &= ~SSL_OP_NO_TLSv1_1;
340     if ((options & SSL_OP_NO_TLSv1_1) && (options & mask) != mask)
341         version = TLS1_VERSION;
342     mask &= ~SSL_OP_NO_TLSv1;
343 #if !defined(OPENSSL_NO_SSL3)
344     if ((options & SSL_OP_NO_TLSv1) && (options & mask) != mask)
345         version = SSL3_VERSION;
346     mask &= ~SSL_OP_NO_SSLv3;
347 #endif
348 #if !defined(OPENSSL_NO_SSL2)
349     if ((options & SSL_OP_NO_SSLv3) && (options & mask) != mask)
350         version = SSL2_VERSION;
351 #endif

353 #ifndef OPENSSL_NO_TLSEXT
354     if (version != SSL2_VERSION)
355     {
356         /* have to disable SSL 2.0 compatibility if we need TLS extensio

358         if (s->tlsext_hostname != NULL)
359             ssl2_compat = 0;
360         if (s->tlsext_status_type != -1)
361             ssl2_compat = 0;
362 #ifdef TLSEXT_TYPE_opaque_prf_input
363         if (s->ctx->tlsext_opaque_prf_input_callback != 0 || s->tlsext_o
364             ssl2_compat = 0;
365 #endif
366     }
367 #endif

369     buf=(unsigned char *)s->init_buf->data;
370     if (s->state == SSL23_ST_CW_CLNT_HELLO_A)
371     {
372         #if 0
373             /* don't reuse session-id's */
374             if (!ssl_get_new_session(s,0))
375             {
376                 return(-1);
377             }
378         #endif

380         p=s->s3->client_random;
381         if (ssl_fill_hello_random(s, 0, p, SSL3_RANDOM_SIZE) <= 0)
382             return -1;

384         if (version == TLS1_2_VERSION)
385         {
386             version_major = TLS1_2_VERSION_MAJOR;
387             version_minor = TLS1_2_VERSION_MINOR;
388         }
389         else if (version == TLS1_1_VERSION)
390         {
391             version_major = TLS1_1_VERSION_MAJOR;

```

```

392         version_minor = TLS1_1_VERSION_MINOR;
393     }
394     else if (version == TLS1_VERSION)
395     {
396         version_major = TLS1_VERSION_MAJOR;
397         version_minor = TLS1_VERSION_MINOR;
398     }
399 #ifndef OPENSSSL_FIPS
400     else if (FIPS_mode())
401     {
402         SSLerr(SSL_F_SSL23_CLIENT_HELLO,
403              SSL_R_ONLY_TLS_ALLOWED_IN_FIPS_MODE);
404         return -1;
405     }
406 #endif
407     else if (version == SSL3_VERSION)
408     {
409         version_major = SSL3_VERSION_MAJOR;
410         version_minor = SSL3_VERSION_MINOR;
411     }
412     else if (version == SSL2_VERSION)
413     {
414         version_major = SSL2_VERSION_MAJOR;
415         version_minor = SSL2_VERSION_MINOR;
416     }
417     else
418     {
419         SSLerr(SSL_F_SSL23_CLIENT_HELLO, SSL_R_NO_PROTOCOLS_AVAIL);
420         return(-1);
421     }
422
423     s->client_version = version;
424
425     if (ssl2_compat)
426     {
427         /* create SSL 2.0 compatible Client Hello */
428
429         /* two byte record header will be written last */
430         d = &(buf[2]);
431         p = d + 9; /* leave space for message type, version, ind
432
433         *(d++) = SSL2_MT_CLIENT_HELLO;
434         *(d++) = version_major;
435         *(d++) = version_minor;
436
437         /* Ciphers supported */
438         i=ssl_cipher_list_to_bytes(s,SSL_get_ciphers(s),p,0);
439         if (i == 0)
440         {
441             /* no ciphers */
442             SSLerr(SSL_F_SSL23_CLIENT_HELLO,SSL_R_NO_CIPHERS);
443             return -1;
444         }
445         s2n(i,d);
446         p+=i;
447
448         /* put in the session-id length (zero since there is no
449 #if 0
450         s->session->session_id_length=0;
451 #endif
452         s2n(0,d);
453
454         if (s->options & SSL_OP_NETSCAPE_CHALLENGE_BUG)
455             ch_len=SSL2_CHALLENGE_LENGTH;
456         else
457             ch_len=SSL2_MAX_CHALLENGE_LENGTH;

```

```

459         /* write out sslv2 challenge */
460         /* Note that ch_len must be <= SSL3_RANDOM_SIZE (32),
461         because it is one of SSL2_MAX_CHALLENGE_LENGTH (32)
462         or SSL2_MAX_CHALLENGE_LENGTH (16), but leave the
463         check in for futurproofing */
464         if (SSL3_RANDOM_SIZE < ch_len)
465             i=SSL3_RANDOM_SIZE;
466         else
467             i=ch_len;
468         s2n(i,d);
469         memset(&(s->s3->client_random[0]),0,SSL3_RANDOM_SIZE);
470         if (RAND_pseudo_bytes(&(s->s3->client_random[SSL3_RANDOM_SIZE-i]),i))
471             return -1;
472
473         memcpy(p,&(s->s3->client_random[SSL3_RANDOM_SIZE-i]),i);
474         p+=i;
475
476         i= p- &(buf[2]);
477         buf[0]=((i>8)&0xff)|0x80;
478         buf[1]=(i&0xff);
479
480         /* number of bytes to write */
481         s->init_num=i+2;
482         s->init_off=0;
483
484         ssl3_finish_mac(s,&(buf[2]),i);
485     }
486     else
487     {
488         /* create Client Hello in SSL 3.0/TLS 1.0 format */
489
490         /* do the record header (5 bytes) and handshake message
491         d = p = &(buf[9]);
492
493         *(p++) = version_major;
494         *(p++) = version_minor;
495
496         /* Random stuff */
497         memcpy(p, s->s3->client_random, SSL3_RANDOM_SIZE);
498         p += SSL3_RANDOM_SIZE;
499
500         /* Session ID (zero since there is no reuse) */
501         *(p++) = 0;
502
503         /* Ciphers supported (using SSL 3.0/TLS 1.0 format) */
504         i=ssl_cipher_list_to_bytes(s,SSL_get_ciphers(s),&(p[2]),
505         if (i == 0)
506         {
507             SSLerr(SSL_F_SSL23_CLIENT_HELLO,SSL_R_NO_CIPHERS);
508             return -1;
509         }
510 #ifndef OPENSSSL_MAX_TLS1_2_CIPHER_LENGTH
511         /* Some servers hang if client hello > 256 bytes
512         * as hack workaround chop number of supported ciphers
513         * to keep it well below this if we use TLS v1.2
514         */
515         if (TLS1_get_version(s) >= TLS1_2_VERSION
516             && i > OPENSSSL_MAX_TLS1_2_CIPHER_LENGTH)
517             i = OPENSSSL_MAX_TLS1_2_CIPHER_LENGTH & ~1;
518 #endif
519         s2n(i,p);
520         p+=i;
521
522         /* COMPRESSION */
523 #ifndef OPENSSSL_NO_COMP

```



```

524         *(p++)=1;
525     #else
526         if ((s->options & SSL_OP_NO_COMPRESSION)
527             || !s->ctx->comp_methods)
528             j=0;
529         else
530             j=sk_SSL_COMP_num(s->ctx->comp_methods);
531         *(p++)=1+j;
532         for (i=0; i<j; i++)
533             {
534                 comp=sk_SSL_COMP_value(s->ctx->comp_methods,i);
535                 *(p++)=comp->id;
536             }
537     #endif
538         *(p++)=0; /* Add the NULL method */

540 #ifndef OPENSSL_NO_TLSEXT
541     /* TLS extensions*/
542     if (ssl_prepare_clienthello_tlsext(s) <= 0)
543     {
544         SSLerr(SSL_F_SSL23_CLIENT_HELLO,SSL_R_CLIENTHELL
545         return -1;
546     }
547     if ((p = ssl_add_clienthello_tlsext(s, p, buf+SSL3_RT_MA
548     {
549         SSLerr(SSL_F_SSL23_CLIENT_HELLO,ERR_R_INTERNAL_E
550         return -1;
551     }
552 #endif
553
554     l = p-d;

556     /* fill in 4-byte handshake header */
557     d=&(buf[5]);
558     *(d++)=SSL3_MT_CLIENT_HELLO;
559     l2n3(l,d);

561     l += 4;

563     if (l > SSL3_RT_MAX_PLAIN_LENGTH)
564     {
565         SSLerr(SSL_F_SSL23_CLIENT_HELLO,ERR_R_INTERNAL_E
566         return -1;
567     }

568     /* fill in 5-byte record header */
569     d=buf;
570     *(d++) = SSL3_RT_HANDSHAKE;
571     *(d++) = version_major;
572     /* Some servers hang if we use long client hellos
573     * and a record number > TLS 1.0.
574     */
575     if (TLS1_get_client_version(s) > TLS1_VERSION)
576         *(d++) = 1;
577     else
578         *(d++) = version_minor;
579     s2n((int)l,d);

582     /* number of bytes to write */
583     s->init_num=p-buf;
584     s->init_off=0;

586     ssl3_finish_mac(s,&(buf[5]), s->init_num - 5);
587 }

589     s->state=SSL3_ST_CW_CLNT_HELLO_B;

```

```

590         s->init_off=0;
591     }

593     /* SSL3_ST_CW_CLNT_HELLO_B */
594     ret = ssl23_write_bytes(s);

596     if ((ret >= 2) && s->msg_callback)
597     {
598         /* Client Hello has been sent; tell msg_callback */

600         if (ssl2_compat)
601             s->msg_callback(1, SSL2_VERSION, 0, s->init_buf->data+2,
602         else
603             s->msg_callback(1, version, SSL3_RT_HANDSHAKE, s->init_b
604         }

606     return ret;
607 }

609 static int ssl23_get_server_hello(SSL *s)
610 {
611     char buf[8];
612     unsigned char *p;
613     int i;
614     int n;

616     n=ssl23_read_bytes(s,7);

618     if (n != 7) return(n);
619     p=s->packet;

621     memcpy(buf,p,n);

623     if ((p[0] & 0x80) && (p[2] == SSL2_MT_SERVER_HELLO) &&
624         {p[5] == 0x00} && (p[6] == 0x02))
625     {
626         #ifndef OPENSSL_NO_SSL2
627         SSLerr(SSL_F_SSL23_GET_SERVER_HELLO,SSL_R_UNSUPPORTED_PROTOCOL);
628         goto err;
629     #else
630         /* we are talking sslv2 */
631         /* we need to clean up the SSLv3 setup and put in the
632         * sslv2 stuff. */
633         int ch_len;

635         if (s->options & SSL_OP_NO_SSLv2)
636         {
637             SSLerr(SSL_F_SSL23_GET_SERVER_HELLO,SSL_R_UNSUPPORTED_PR
638             goto err;
639         }
640         if (s->s2 == NULL)
641         {
642             if (!ssl2_new(s))
643                 goto err;
644         }
645         else
646             ssl2_clear(s);

648         if (s->options & SSL_OP_NETSCAPE_CHALLENGE_BUG)
649             ch_len=SSL2_CHALLENGE_LENGTH;
650         else
651             ch_len=SSL2_MAX_CHALLENGE_LENGTH;

653         /* write out sslv2 challenge */
654         /* Note that ch_len must be <= SSL3_RANDOM_SIZE (32), because
655         it is one of SSL2_MAX_CHALLENGE_LENGTH (32) or

```

```

656         SSL2_MAX_CHALLENGE_LENGTH (16), but leave the check in for
657         futurproofing */
658         i=(SSL3_RANDOM_SIZE < ch_len)
659         ?SSL3_RANDOM_SIZE:ch_len;
660         s->s2->challenge_length=i;
661         memcpy(s->s2->challenge,
662             &(s->s3->client_random[SSL3_RANDOM_SIZE-i]),i);
664         if (s->s3 != NULL) ssl3_free(s);
666         if (!BUF_MEM_grow_clean(s->init_buf,
667             SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER))
668         {
669             SSLerr(SSL_F_SSL23_GET_SERVER_HELLO,ERR_R_BUF_LIB);
670             goto err;
671         }
673         s->state=SSL2_ST_GET_SERVER_HELLO_A;
674         if (!(s->client_version == SSL2_VERSION))
675             /* use special padding (SSL 3.0 draft/RFC 2246, App. E.2
676             s->s2->ssl2_rollback=1;
678         /* setup the 7 bytes we have read so we get them from
679         * the sslv2 buffer */
680         s->rstate=SSL_ST_READ_HEADER;
681         s->packet_length=n;
682         s->packet= &(s->s2->rbuf[0]);
683         memcpy(s->packet,buf,n);
684         s->s2->rbuf_left=n;
685         s->s2->rbuf_offs=0;
687         /* we have already written one */
688         s->s2->write_sequence=1;
690         s->method=SSLv2_client_method();
691         s->handshake_func=s->method->ssl_connect;
692     #endif
693     }
694     else if ((p[1] == SSL3_VERSION_MAJOR &&
695         p[2] <= TLS1_2_VERSION_MINOR &&
696         ((p[0] == SSL3_RT_HANDSHAKE && p[5] == SSL3_MT_SERVER_HELLO) ||
697         (p[0] == SSL3_RT_ALERT && p[3] == 0 && p[4] == 2)))
698     {
699         /* we have sslv3 or tls1 (server hello or alert) */
701         if ((p[2] == SSL3_VERSION_MINOR) &&
702             !(s->options & SSL_OP_NO_SSLv3))
703         {
704             #ifdef OPENSSL_FIPS
705                 if(FIPS_mode())
706                 {
707                     SSLerr(SSL_F_SSL23_GET_SERVER_HELLO,
708                         SSL_R_ONLY_TLS_ALLOWED_IN_FIPS_MODE);
709                     goto err;
710                 }
711             #endif
712             s->version=SSL3_VERSION;
713             s->method=SSLv3_client_method();
714         }
715         else if ((p[2] == TLS1_VERSION_MINOR) &&
716             !(s->options & SSL_OP_NO_TLSv1))
717         {
718             s->version=TLS1_VERSION;
719             s->method=TLSv1_client_method();
720         }
721         else if ((p[2] == TLS1_1_VERSION_MINOR) &&

```

```

722             !(s->options & SSL_OP_NO_TLSv1_1))
723         {
724             s->version=TLS1_1_VERSION;
725             s->method=TLSv1_1_client_method();
726         }
727         else if ((p[2] == TLS1_2_VERSION_MINOR) &&
728             !(s->options & SSL_OP_NO_TLSv1_2))
729         {
730             s->version=TLS1_2_VERSION;
731             s->method=TLSv1_2_client_method();
732         }
733         else
734         {
735             SSLerr(SSL_F_SSL23_GET_SERVER_HELLO,SSL_R_UNSUPPORTED_PR
736             goto err;
737         }
739         if (p[0] == SSL3_RT_ALERT && p[5] != SSL3_AL_WARNING)
740         {
741             /* fatal alert */
743             void (*cb)(const SSL *ssl,int type,int val)=NULL;
744             int j;
746             if (s->info_callback != NULL)
747                 cb=s->info_callback;
748             else if (s->ctx->info_callback != NULL)
749                 cb=s->ctx->info_callback;
750             i=p[5];
751             if (cb != NULL)
752             {
753                 j=(i<8)?p[6];
754                 cb(s,SSL_CB_READ_ALERT,j);
755             }
756             if (s->msg_callback)
757                 s->msg_callback(0, s->version, SSL3_RT_ALERT, p+
758             s->rwstate=SSL_NOTHING;
759             SSLerr(SSL_F_SSL23_GET_SERVER_HELLO,SSL_AD_REASON_OFFSET
760             goto err;
761         }
762         if (!ssl_init_wbio_buffer(s,1)) goto err;
763         /* we are in this state */
764         s->state=SSL3_ST_CR_SRVR_HELLO_A;
766         /* put the 7 bytes we have read into the input buffer
767         * for SSLv3 */
768         s->rstate=SSL_ST_READ_HEADER;
769         s->packet_length=n;
771         if (s->s3->rbuf.buf == NULL)
772             if (!ssl3_setup_read_buffer(s))
773                 goto err;
774         s->packet= &(s->s3->rbuf.buf[0]);
775         memcpy(s->packet,buf,n);
776         s->s3->rbuf_left=n;
777         s->s3->rbuf.offset=0;
778         s->handshake_func=s->method->ssl_connect;
779     }
780     else
781     {
782         SSLerr(SSL_F_SSL23_GET_SERVER_HELLO,SSL_R_UNKNOWN_PROTOCOL);
783     }

```

```
788         goto err;
789     }
790     s->init_num=0;

792     /* Since, if we are sending a ssl23 client hello, we are not
793      * reusing a session-id */
794     if (!ssl_get_new_session(s,0))
795         goto err;

797     return(SSL_connect(s));
798 err:
799     return(-1);
800 }
```

```

*****
5378 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/s23_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1  /* ssl/s23_lib.c */
2  /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3   * All rights reserved.
4   *
5   * This package is an SSL implementation written
6   * by Eric Young (eay@cryptsoft.com).
7   * The implementation was written so as to conform with Netscapes SSL.
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11  * apply to all code found in this distribution, be it the RC4, RSA,
12  * lhash, DES, etc., code; not just the SSL code. The SSL documentation
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16  * Copyright remains Eric Young's, and as such any Copyright notices in
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18  * If this package is used in a product, Eric Young should be given attribution
19  * as the author of the parts of the library used.
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21  * in documentation (online or textual) provided with the package.
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29  * notice, this list of conditions and the following disclaimer in the
30  * documentation and/or other materials provided with the distribution.
31  * 3. All advertising materials mentioning features or use of this software
32  * must display the following acknowledgement:
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34  * Eric Young (eay@cryptsoft.com)"
35  * The word 'cryptographic' can be left out if the rouines from the library
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38  * the apps directory (application code) you must include an acknowledgement:
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48  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
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50  * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51  * SUCH DAMAGE.
52  *
53  * The licence and distribution terms for any publically available version or
54  * derivative of this code cannot be changed. i.e. this code cannot simply be
55  * copied and put under another distribution licence
56  * [including the GNU Public Licence.]
57  */
58
59 #include <stdio.h>
60 #include <openssl/objects.h>
61 #include "ssl_locl.h"

```

```

63 long ssl23_default_timeout(void)
64 {
65     return(300);
66 }
67
68 int ssl23_num_ciphers(void)
69 {
70     return(ssl3_num_ciphers()
71 #ifndef OPENSSL_NO_SSL2
72         + ssl2_num_ciphers()
73 #endif
74     );
75 }
76
77 const SSL_CIPHER *ssl23_get_cipher(unsigned int u)
78 {
79     unsigned int uu=ssl3_num_ciphers();
80
81     if (u < uu)
82         return(ssl3_get_cipher(u));
83     else
84 #ifndef OPENSSL_NO_SSL2
85         return(ssl2_get_cipher(u-uu));
86 #else
87         return(NULL);
88 #endif
89 }
90
91 /* This function needs to check if the ciphers required are actually
92  * available */
93 const SSL_CIPHER *ssl23_get_cipher_by_char(const unsigned char *p)
94 {
95     const SSL_CIPHER *cp;
96
97     cp=ssl3_get_cipher_by_char(p);
98 #ifndef OPENSSL_NO_SSL2
99     if (cp == NULL)
100         cp=ssl2_get_cipher_by_char(p);
101 #endif
102     return(cp);
103 }
104
105 int ssl23_put_cipher_by_char(const SSL_CIPHER *c, unsigned char *p)
106 {
107     long l;
108
109     /* We can write SSLv2 and SSLv3 ciphers */
110     if (p != NULL)
111     {
112         l=c->id;
113         p[0]=((unsigned char)(l>>16L))&0xFF;
114         p[1]=((unsigned char)(l>> 8L))&0xFF;
115         p[2]=((unsigned char)(l    ))&0xFF;
116     }
117     return(3);
118 }
119
120 int ssl23_read(SSL *s, void *buf, int len)
121 {
122     int n;
123
124     clear_sys_error();
125     if (SSL_in_init(s) && (!s->in_handshake))
126     {
127         n=s->handshake_func(s);

```

```
128         if (n < 0) return(n);
129         if (n == 0)
130             {
131                 SSLerr(SSL_F_SSL23_READ, SSL_R_SSL_HANDSHAKE_FAILURE);
132                 return(-1);
133             }
134         return(SSL_read(s,buf,len));
135     }
136     else
137     {
138         ssl_undefined_function(s);
139         return(-1);
140     }
141 }

143 int ssl23_peek(SSL *s, void *buf, int len)
144 {
145     int n;

147     clear_sys_error();
148     if (SSL_in_init(s) && (!s->in_handshake))
149     {
150         n=s->handshake_func(s);
151         if (n < 0) return(n);
152         if (n == 0)
153             {
154                 SSLerr(SSL_F_SSL23_PEEK, SSL_R_SSL_HANDSHAKE_FAILURE);
155                 return(-1);
156             }
157         return(SSL_peek(s,buf,len));
158     }
159     else
160     {
161         ssl_undefined_function(s);
162         return(-1);
163     }
164 }

166 int ssl23_write(SSL *s, const void *buf, int len)
167 {
168     int n;

170     clear_sys_error();
171     if (SSL_in_init(s) && (!s->in_handshake))
172     {
173         n=s->handshake_func(s);
174         if (n < 0) return(n);
175         if (n == 0)
176             {
177                 SSLerr(SSL_F_SSL23_WRITE, SSL_R_SSL_HANDSHAKE_FAILURE);
178                 return(-1);
179             }
180         return(SSL_write(s,buf,len));
181     }
182     else
183     {
184         ssl_undefined_function(s);
185         return(-1);
186     }
187 }
```

```

*****
3875 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/s23_meth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s23_meth.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/objects.h>
61 #include "ssl_locl.h"

```

```

63 static const SSL_METHOD *ssl23_get_method(int ver);
64 static const SSL_METHOD *ssl23_get_method(int ver)
65 {
66 #ifndef OPENSSL_NO_SSL2
67     if (ver == SSL2_VERSION)
68         return(SSLv2_method());
69     else
70 #endif
71 #ifndef OPENSSL_NO_SSL3
72     if (ver == SSL3_VERSION)
73         return(SSLv3_method());
74     else
75 #endif
76 #ifndef OPENSSL_NO_TLS1
77     if (ver == TLS1_VERSION)
78         return(TLSv1_method());
79     else if (ver == TLS1_1_VERSION)
80         return(TLSv1_1_method());
81     else if (ver == TLS1_2_VERSION)
82         return(TLSv1_2_method());
83     else
84 #endif
85         return(NULL);
86 }
87
88 IMPLEMENT_ssl23_meth_func(SSLv23_method,
89                             ssl23_accept,
90                             ssl23_connect,
91                             ssl23_get_method)

```

```

*****
4187 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/s23_pkt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s23_pkt.c */
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50 * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51 * SUCH DAMAGE.
52 *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <errno.h>
61 #define USE_SOCKETS

```

```

62 #include "ssl_locl.h"
63 #include <openssl/evp.h>
64 #include <openssl/buffer.h>
65
66 int ssl23_write_bytes(SSL *s)
67 {
68     int i,num,tot;
69     char *buf;
70
71     buf=s->init_buf->data;
72     tot=s->init_off;
73     num=s->init_num;
74     for (;;)
75     {
76         s->rwstate=SSL_WRITING;
77         i=BIO_write(s->wbio,&(buf[tot]),num);
78         if (i <= 0)
79         {
80             s->init_off=tot;
81             s->init_num=num;
82             return(i);
83         }
84         s->rwstate=SSL_NOTHING;
85         if (i == num) return(tot+i);
86
87         num-=i;
88         tot+=i;
89     }
90 }
91
92 /* return regularly only when we have read (at least) 'n' bytes */
93 int ssl23_read_bytes(SSL *s, int n)
94 {
95     unsigned char *p;
96     int j;
97
98     if (s->packet_length < (unsigned int)n)
99     {
100         p=s->packet;
101
102         for (;;)
103         {
104             s->rwstate=SSL_READING;
105             j=BIO_read(s->rbio,(char *)&(p[s->packet_length]),
106                     n-s->packet_length);
107             if (j <= 0)
108                 return(j);
109             s->rwstate=SSL_NOTHING;
110             s->packet_length+=j;
111             if (s->packet_length >= (unsigned int)n)
112                 return(s->packet_length);
113         }
114     }
115     return(n);
116 }

```

new/usr/src/lib/openssl/libsunw_ssl/s23_srvr.c

1

```
*****
18370 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/s23_srvr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s23_srvr.c */
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5  * This package is an SSL implementation written
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```

new/usr/src/lib/openssl/libsunw_ssl/s23_srvr.c

2

```
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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include "ssl_locl.h"
114 #include <openssl/buffer.h>
115 #include <openssl/rand.h>
116 #include <openssl/objects.h>
117 #include <openssl/evp.h>
118 #ifdef OPENSSL_FIPS
119 #include <openssl/fips.h>
120 #endif
121
122 static const SSL_METHOD *ssl23_get_server_method(int ver);
123 int ssl23_get_client_hello(SSL *s);
124 static const SSL_METHOD *ssl23_get_server_method(int ver)
125 {
126 #ifndef OPENSSL_NO_SSL2
127     if (ver == SSL2_VERSION)
```



```

128         return(SSLv2_server_method());
129 #endif
130     if (ver == SSL3_VERSION)
131         return(SSLv3_server_method());
132     else if (ver == TLS1_VERSION)
133         return(TLSv1_server_method());
134     else if (ver == TLS1_1_VERSION)
135         return(TLSv1_1_server_method());
136     else if (ver == TLS1_2_VERSION)
137         return(TLSv1_2_server_method());
138     else
139         return(NULL);
140 }

142 IMPLEMENT_ssl23_meth_func(SSLv23_server_method,
143                             ssl23_accept,
144                             ssl_undefined_function,
145                             ssl23_get_server_method)

147 int ssl23_accept(SSL *s)
148 {
149     BUF_MEM *buf;
150     unsigned long Time=(unsigned long)time(NULL);
151     void (*cb)(const SSL *ssl,int type,int val)=NULL;
152     int ret= -1;
153     int new_state,state;

155     RAND_add(&Time,sizeof(Time),0);
156     ERR_clear_error();
157     clear_sys_error();

159     if (s->info_callback != NULL)
160         cb=s->info_callback;
161     else if (s->ctx->info_callback != NULL)
162         cb=s->ctx->info_callback;

163     s->in_handshake++;
164     if (!SSL_in_init(s) || SSL_in_before(s)) SSL_clear(s);

165     for (;;)
166     {
167         state=s->state;

168         switch(s->state)
169         {
170             case SSL_ST_BEFORE:
171             case SSL_ST_ACCEPT:
172             case SSL_ST_BEFORE|SSL_ST_ACCEPT:
173             case SSL_ST_OK|SSL_ST_ACCEPT:

174                 s->server=1;
175                 if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_START,1);

176                 /* s->version=SSL3_VERSION; */
177                 s->type=SSL_ST_ACCEPT;

178                 if (s->init_buf == NULL)
179                 {
180                     if ((buf=BUF_MEM_new()) == NULL)
181                     {
182                         ret= -1;
183                         goto end;
184                     }
185                     if (!BUF_MEM_grow(buf,SSL3_RT_MAX_PLAIN_LENGTH))
186                     {
187                         ret= -1;
188                     }
189                 }
190             }
191         }
192     }
193 }

```

```

194         goto end;
195     }
196     s->init_buf=buf;
197 }

199     ssl3_init_finished_mac(s);

201     s->state=SSL23_ST_SR_CLNT_HELLO_A;
202     s->ctx->stats.sess_accept++;
203     s->init_num=0;
204     break;

206 case SSL23_ST_SR_CLNT_HELLO_A:
207 case SSL23_ST_SR_CLNT_HELLO_B:

209     s->shutdown=0;
210     ret=ssl23_get_client_hello(s);
211     if (ret >= 0) cb=NULL;
212     goto end;
213     /* break; */

215 default:
216     SSLerr(SSL_F_SSL23_ACCEPT,SSL_R_UNKNOWN_STATE);
217     ret= -1;
218     goto end;
219     /* break; */
220 }

222 if ((cb != NULL) && (s->state != state))
223 {
224     new_state=s->state;
225     s->state=state;
226     cb(s,SSL_CB_ACCEPT_LOOP,1);
227     s->state=new_state;
228 }
229 }
230 end:
231 s->in_handshake--;
232 if (cb != NULL)
233     cb(s,SSL_CB_ACCEPT_EXIT,ret);
234 return(ret);
235 }

238 int ssl23_get_client_hello(SSL *s)
239 {
240     char buf_space[11]; /* Request this many bytes in initial read.
241                          * We can detect SSL 3.0/TLS 1.0 Client Hellos
242                          * ('type == 3') correctly only when the following
243                          * is in a single record, which is not guaranteed by
244                          * the protocol specification:
245                          * Byte Content
246                          * 0      type          \
247                          * 1/2   version       > record header
248                          * 3/4   length        /
249                          * 5      msg_type     \
250                          * 6-8   length        > Client Hello message
251                          * 9/10  client_version /
252                          */
253     char *buf= &(buf_space[0]);
254     unsigned char *p,*d,*d_len,*dd;
255     unsigned int i;
256     unsigned int csl,sil,cl;
257     int n=0,j;
258     int type=0;
259     int v[2];

```

```

261     if (s->state == SSL23_ST_SR_CLNT_HELLO_A)
262     {
263         /* read the initial header */
264         v[0]=v[1]=0;
265
266         if (!ssl3_setup_buffers(s)) goto err;
267
268         n=ssl23_read_bytes(s, sizeof buf_space);
269         if (n != sizeof buf_space) return(n); /* n == -1 || n == 0 */
270
271         p=s->packet;
272
273         memcpy(buf,p,n);
274
275         if ((p[0] & 0x80) && (p[2] == SSL2_MT_CLIENT_HELLO))
276         {
277             /*
278              * SSLv2 header
279              */
280             if ((p[3] == 0x00) && (p[4] == 0x02))
281             {
282                 v[0]=p[3]; v[1]=p[4];
283                 /* SSLv2 */
284                 if (!(s->options & SSL_OP_NO_SSLv2))
285                     type=1;
286             }
287             else if (p[3] == SSL3_VERSION_MAJOR)
288             {
289                 v[0]=p[3]; v[1]=p[4];
290                 /* SSLv3/TLSv1 */
291                 if (p[4] >= TLS1_VERSION_MINOR)
292                 {
293                     if (p[4] >= TLS1_2_VERSION_MINOR &&
294                         !(s->options & SSL_OP_NO_TLSv1_2))
295                     {
296                         s->version=TLS1_2_VERSION;
297                         s->state=SSL23_ST_SR_CLNT_HELLO_
298                         s->version=TLS1_1_VERSION;
299                         /* type=2; */ /* done later to s
300                         s->state=SSL23_ST_SR_CLNT_HELLO_
301                         else if (p[4] >= TLS1_1_VERSION_MINOR &&
302                             !(s->options & SSL_OP_NO_TLSv1_1))
303                         {
304                             s->version=TLS1_1_VERSION;
305                             /* type=2; */ /* done later to s
306                             s->state=SSL23_ST_SR_CLNT_HELLO_
307                             else if (!(s->options & SSL_OP_NO_TLSv1)
308                             {
309                                 s->version=TLS1_VERSION;
310                                 /* type=2; */ /* done later to s
311                                 s->state=SSL23_ST_SR_CLNT_HELLO_
312                             else if (!(s->options & SSL_OP_NO_SSLv3)
313                             {
314                                 s->version=SSL3_VERSION;
315                                 /* type=2; */
316                                 s->state=SSL23_ST_SR_CLNT_HELLO_
317                             else if (!(s->options & SSL_OP_NO_SSLv2)
318                             {
319                                 type=1;
320                             }
321                         }
322                     }
323                     else if (!(s->options & SSL_OP_NO_SSLv3))
324                     {
325                         s->version=SSL3_VERSION;

```

```

326         /* type=2; */
327         s->state=SSL23_ST_SR_CLNT_HELLO_B;
328     }
329     else if (!(s->options & SSL_OP_NO_SSLv2))
330         type=1;
331
332     }
333
334     else if ((p[0] == SSL3_RT_HANDSHAKE) &&
335             (p[1] == SSL3_VERSION_MAJOR) &&
336             (p[5] == SSL3_MT_CLIENT_HELLO) &&
337             ((p[3] == 0 && p[4] < 5 /* silly record length? */
338              || (p[9] >= p[1])))
339     {
340         /*
341          * SSLv3 or tls1 header
342          */
343
344         v[0]=p[1]; /* major version (= SSL3_VERSION_MAJOR) */
345         /* We must look at client version inside the Client Hell
346          * to get the correct minor version.
347          * However if we have only a pathologically small fragme
348          * Client Hello message, this would be difficult, and we
349          * to read more records to find out.
350          * No known SSL 3.0 client fragments ClientHello like th
351          * so we simply assume TLS 1.0 to avoid protocol
352          * attacks. */
353         if (p[3] == 0 && p[4] < 6)
354         {
355             #if 0
356             SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO, SSL_R_RECORD
357             goto err;
358             #else
359             v[1] = TLS1_VERSION_MINOR;
360             #endif
361         }
362         /* if major version number > 3 set minor to a value
363          * which will use the highest version 3 we support.
364          * If TLS 2.0 ever appears we will need to revise
365          * this....
366          */
367         else if (p[9] > SSL3_VERSION_MAJOR)
368             v[1]=0xff;
369         else
370             v[1]=p[10]; /* minor version according to client
371             if (v[1] >= TLS1_VERSION_MINOR)
372             {
373                 if (v[1] >= TLS1_2_VERSION_MINOR &&
374                     !(s->options & SSL_OP_NO_TLSv1_2))
375                 {
376                     s->version=TLS1_2_VERSION;
377                     type=3;
378                 }
379                 else if (v[1] >= TLS1_1_VERSION_MINOR &&
380                     !(s->options & SSL_OP_NO_TLSv1_1))
381                 {
382                     s->version=TLS1_1_VERSION;
383                     type=3;
384                 }
385                 else if (!(s->options & SSL_OP_NO_TLSv1))
386                 {
387                     s->version=TLS1_VERSION;
388                     type=3;
389                 }
390                 else if (!(s->options & SSL_OP_NO_SSLv3))
391                 {

```

```

392         s->version=SSL3_VERSION;
393         type=3;
394     }
395     else
396     {
397         /* client requests SSL 3.0 */
398         if (!(s->options & SSL_OP_NO_SSLv3))
399         {
400             s->version=SSL3_VERSION;
401             type=3;
402         }
403         else if (!(s->options & SSL_OP_NO_TLSv1))
404         {
405             /* we won't be able to use TLS of course
406              * but this will send an appropriate ale
407              s->version=TLS1_VERSION;
408              type=3;
409          }
410      }
411  }
412  else if ((strcmp("GET ", (char *)p,4) == 0) ||
413           (strcmp("POST ", (char *)p,5) == 0) ||
414           (strcmp("HEAD ", (char *)p,5) == 0) ||
415           (strcmp("PUT ", (char *)p,4) == 0))
416  {
417      SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO,SSL_R_HTTP_REQUEST);
418      goto err;
419  }
420  else if (strcmp("CONNECT", (char *)p,7) == 0)
421  {
422      SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO,SSL_R_HTTPS_PROXY_RE
423      goto err;
424  }
425  }
426  }
427
428 #ifdef OPENSSL_FIPS
429     if (FIPS_mode() && (s->version < TLS1_VERSION))
430     {
431         SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO,
432               SSL_R_ONLY_TLS_ALLOWED_IN_FIPS_MODE);
433         goto err;
434     }
435 #endif
436
437     if (s->state == SSL23_ST_SR_CLNT_HELLO_B)
438     {
439         /* we have SSLv3/TLSv1 in an SSLv2 header
440          * (other cases skip this state) */
441
442         type=2;
443         p=s->packet;
444         v[0] = p[3]; /* == SSL3_VERSION_MAJOR */
445         v[1] = p[4];
446
447         n=((p[0]&0x7f)<<8)|p[1];
448         if (n > (1024*4))
449         {
450             SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO,SSL_R_RECORD_TOO_LAR
451             goto err;
452         }
453
454         j=ssl23_read_bytes(s,n+2);
455         if (j <= 0) return(j);
456
457         ssl3_finish_mac(s, s->packet+2, s->packet_length-2);

```

```

458     if (s->msg_callback)
459         s->msg_callback(0, SSL2_VERSION, 0, s->packet+2, s->pack
460
461     p=s->packet;
462     p+=5;
463     n2s(p,csl);
464     n2s(p,sil);
465     n2s(p,cl);
466     d=(unsigned char *)s->init_buf->data;
467     if ((csl+sil+cl+11) != s->packet_length) /* We can't have TLS ex
468                                             * Client Hello, can we
469                                             * '>' otherwise */
470     {
471         SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO,SSL_R_RECORD_LENGTH_
472         goto err;
473     }
474
475     /* record header: msg_type ... */
476     *(d++) = SSL3_MT_CLIENT_HELLO;
477     /* ... and length (actual value will be written later) */
478     d_len = d;
479     d += 3;
480
481     /* client_version */
482     *(d++) = SSL3_VERSION_MAJOR; /* == v[0] */
483     *(d++) = v[1];
484
485     /* lets populate the random area */
486     /* get the challenge_length */
487     i=(cl > SSL3_RANDOM_SIZE)?SSL3_RANDOM_SIZE:cl;
488     memset(d,0,SSL3_RANDOM_SIZE);
489     memcpy(&(d[SSL3_RANDOM_SIZE-i]),&(p[csl+sil]),i);
490     d+=SSL3_RANDOM_SIZE;
491
492     /* no session-id reuse */
493     *(d++)=0;
494
495     /* ciphers */
496     j=0;
497     dd=d;
498     d+=2;
499     for (i=0; i<csl; i+=3)
500     {
501         if (p[i] != 0) continue;
502         *(d++)=p[i+1];
503         *(d++)=p[i+2];
504         j+=2;
505     }
506     s2n(j,dd);
507
508     /* COMPRESSION */
509     *(d++)=1;
510     *(d++)=0;
511
512     #if 0
513     /* copy any remaining data with may be extensions */
514     p = p+csl+sil+cl;
515     while (p < s->packet+s->packet_length)
516     {
517         *(d++)=(p++);
518     }
519 #endif
520
521     i = (d-(unsigned char *)s->init_buf->data) - 4;
522     l2n3((long)i, d_len);

```

```

524         /* get the data reused from the init_buf */
525         s->s3->tmp.reuse_message=1;
526         s->s3->tmp.message_type=SSL3_MT_CLIENT_HELLO;
527         s->s3->tmp.message_size=i;
528     }

530     /* imaginary new state (for program structure): */
531     /* s->state = SSL23_SR_CLNT_HELLO_C */

533     if (type == 1)
534     {
535 #ifdef OPENSSL_NO_SSL2
536         SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO, SSL_R_UNSUPPORTED_PROTOCOL);
537         goto err;
538 #else
539         /* we are talking sslv2 */
540         /* we need to clean up the SSLv3/TLSv1 setup and put in the
541          * sslv2 stuff. */

543         if (s->s2 == NULL)
544         {
545             if (!ssl2_new(s))
546                 goto err;
547         }
548         else
549             ssl2_clear(s);

551         if (s->s3 != NULL) ssl3_free(s);

553         if (!BUF_MEM_grow_clean(s->init_buf,
554             SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER))
555         {
556             goto err;
557         }

559         s->state=SSL2_ST_GET_CLIENT_HELLO_A;
560         if (s->options & SSL_OP_NO_TLSv1 && s->options & SSL_OP_NO_SSLv3)
561             s->s2->ssl2_rollback=0;
562         else
563             /* reject SSL 2.0 session if client supports SSL 3.0 or
564              * (SSL 3.0 draft/RFC 2246, App. E.2) */
565             s->s2->ssl2_rollback=1;

567         /* setup the n bytes we have read so we get them from
568          * the sslv2 buffer */
569         s->rstate=SSL_ST_READ_HEADER;
570         s->packet_length=n;
571         s->packet= &(s->s2->rbuf[0]);
572         memcpy(s->packet, buf, n);
573         s->s2->rbuf_left=n;
574         s->s2->rbuf_offs=0;

576         s->method=SSLv2_server_method();
577         s->handshake_func=s->method->ssl_accept;
578 #endif
579     }

581     if ((type == 2) || (type == 3))
582     {
583         /* we have SSLv3/TLSv1 (type 2: SSL2 style, type 3: SSL3/TLS sty

585         if (!ssl_init_wbio_buffer(s,1)) goto err;

587         /* we are in this state */
588         s->state=SSL3_ST_SR_CLNT_HELLO_A;

```

```

590         if (type == 3)
591         {
592             /* put the 'n' bytes we have read into the input buffer
593              * for SSLv3 */
594             s->rstate=SSL_ST_READ_HEADER;
595             s->packet_length=n;
596             if (s->s3->rbuf.buf == NULL)
597                 if (!ssl3_setup_read_buffer(s))
598                     goto err;

600             s->packet= &(s->s3->rbuf.buf[0]);
601             memcpy(s->packet, buf, n);
602             s->s3->rbuf.left=n;
603             s->s3->rbuf.offset=0;
604         }
605         else
606         {
607             s->packet_length=0;
608             s->s3->rbuf.left=0;
609             s->s3->rbuf.offset=0;
610         }

611         if (s->version == TLS1_2_VERSION)
612             s->method = TLSv1_2_server_method();
613         else if (s->version == TLS1_1_VERSION)
614             s->method = TLSv1_1_server_method();
615         else if (s->version == TLS1_VERSION)
616             s->method = TLSv1_server_method();
617         else
618             s->method = SSLv3_server_method();

619 #if 0 /* ssl3_get_client_hello does this */
620         s->client_version=(v[0]<<8)|v[1];
621 #endif
622         s->handshake_func=s->method->ssl_accept;
623     }

624     if ((type < 1) || (type > 3))
625     {
626         /* bad, very bad */
627         SSLerr(SSL_F_SSL23_GET_CLIENT_HELLO, SSL_R_UNKNOWN_PROTOCOL);
628         goto err;
629     }

630     s->init_num=0;

633     if (buf != buf_space) OPENSSL_free(buf);
634     return(SSL_accept(s));
635 err:
636     if (buf != buf_space) OPENSSL_free(buf);
637     return(-1);
638 }

```

```

*****
30851 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/s2_clnt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s2_clnt.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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```

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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include "ssl_locl.h"
113 #ifndef OPENSSL_NO_SSL2
114 #include <stdio.h>
115 #include <openssl/rand.h>
116 #include <openssl/buffer.h>
117 #include <openssl/objects.h>
118 #include <openssl/evp.h>
119
120 static const SSL_METHOD *ssl2_get_client_method(int ver);
121 static int get_server_finished(SSL *s);
122 static int get_server_verify(SSL *s);
123 static int get_server_hello(SSL *s);
124 static int client_hello(SSL *s);
125 static int client_master_key(SSL *s);
126 static int client_finished(SSL *s);
127 static int client_certificate(SSL *s);

```

```

128 static int ssl_rsa_public_encrypt(SESS_CERT *sc, int len, unsigned char *from,
129 unsigned char *to, int padding);
130 #define BREAK break

132 static const SSL_METHOD *ssl2_get_client_method(int ver)
133 {
134     if (ver == SSL2_VERSION)
135         return(SSLv2_client_method());
136     else
137         return(NULL);
138 }

140 IMPLEMENT_ssl2_meth_func(SSLv2_client_method,
141 ssl_undefined_function,
142 ssl2_connect,
143 ssl2_get_client_method)

145 int ssl2_connect(SSL *s)
146 {
147     unsigned long l=(unsigned long)time(NULL);
148     BUF_MEM *buf=NULL;
149     int ret= -1;
150     void (*cb)(const SSL *ssl,int type,int val)=NULL;
151     int new_state,state;

153     RAND_add(&l,sizeof(l),0);
154     ERR_clear_error();
155     clear_sys_error();

157     if (s->info_callback != NULL)
158         cb=s->info_callback;
159     else if (s->ctx->info_callback != NULL)
160         cb=s->ctx->info_callback;

162     /* init things to blank */
163     s->in_handshake++;
164     if (!SSL_in_init(s) || SSL_in_before(s)) SSL_clear(s);

166     for (;;)
167     {
168         state=s->state;

170         switch (s->state)
171         {
172             case SSL_ST_BEFORE:
173             case SSL_ST_CONNECT:
174             case SSL_ST_BEFORE|SSL_ST_CONNECT:
175             case SSL_ST_OK|SSL_ST_CONNECT:

177                 s->server=0;
178                 if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_START,1);

180                 s->version=SSL2_VERSION;
181                 s->type=SSL_ST_CONNECT;

183                 buf=s->init_buf;
184                 if ((buf == NULL) && ((buf=BUF_MEM_new()) == NULL))
185                 {
186                     ret= -1;
187                     goto end;
188                 }
189                 if (!BUF_MEM_grow(buf,
190 SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER))
191                 {
192                     if (buf == s->init_buf)
193                         buf=NULL;

```

```

194                 ret= -1;
195                 goto end;
196             }
197             s->init_buf=buf;
198             buf=NULL;
199             s->init_num=0;
200             s->state=SSL2_ST_SEND_CLIENT_HELLO_A;
201             s->ctx->stats.sess_connect++;
202             s->handshake_func=ssl2_connect;
203             BREAK;

205         case SSL2_ST_SEND_CLIENT_HELLO_A:
206         case SSL2_ST_SEND_CLIENT_HELLO_B:
207             s->shutdown=0;
208             ret=client_hello(s);
209             if (ret <= 0) goto end;
210             s->init_num=0;
211             s->state=SSL2_ST_GET_SERVER_HELLO_A;
212             BREAK;

213         case SSL2_ST_GET_SERVER_HELLO_A:
214         case SSL2_ST_GET_SERVER_HELLO_B:
215             ret=get_server_hello(s);
216             if (ret <= 0) goto end;
217             s->init_num=0;
218             if (!s->hit) /* new session */
219             {
220                 s->state=SSL2_ST_SEND_CLIENT_MASTER_KEY_A;
221                 BREAK;
222             }
223             else
224             {
225                 s->state=SSL2_ST_CLIENT_START_ENCRYPTION;
226                 break;
227             }

228         case SSL2_ST_SEND_CLIENT_MASTER_KEY_A:
229         case SSL2_ST_SEND_CLIENT_MASTER_KEY_B:
230             ret=client_master_key(s);
231             if (ret <= 0) goto end;
232             s->init_num=0;
233             s->state=SSL2_ST_CLIENT_START_ENCRYPTION;
234             break;

235         case SSL2_ST_CLIENT_START_ENCRYPTION:
236             /* Ok, we now have all the stuff needed to
237              * start encrypting, so lets fire it up :- */
238             if (!ssl2_enc_init(s,1))
239             {
240                 ret= -1;
241                 goto end;
242             }
243             s->s2->clear_text=0;
244             s->state=SSL2_ST_SEND_CLIENT_FINISHED_A;
245             break;

246         case SSL2_ST_SEND_CLIENT_FINISHED_A:
247         case SSL2_ST_SEND_CLIENT_FINISHED_B:
248             ret=client_finished(s);
249             if (ret <= 0) goto end;
250             s->init_num=0;
251             s->state=SSL2_ST_GET_SERVER_VERIFY_A;
252             break;

253         case SSL2_ST_GET_SERVER_VERIFY_A:
254         case SSL2_ST_GET_SERVER_VERIFY_B:

```

```

260         ret=get_server_verify(s);
261         if (ret <= 0) goto end;
262         s->init_num=0;
263         s->state=SSL2_ST_GET_SERVER_FINISHED_A;
264         break;

266     case SSL2_ST_GET_SERVER_FINISHED_A:
267     case SSL2_ST_GET_SERVER_FINISHED_B:
268         ret=get_server_finished(s);
269         if (ret <= 0) goto end;
270         break;

272     case SSL2_ST_SEND_CLIENT_CERTIFICATE_A:
273     case SSL2_ST_SEND_CLIENT_CERTIFICATE_B:
274     case SSL2_ST_SEND_CLIENT_CERTIFICATE_C:
275     case SSL2_ST_SEND_CLIENT_CERTIFICATE_D:
276     case SSL2_ST_X509_GET_CLIENT_CERTIFICATE:
277         ret=client_certificate(s);
278         if (ret <= 0) goto end;
279         s->init_num=0;
280         s->state=SSL2_ST_GET_SERVER_FINISHED_A;
281         break;

283     case SSL_ST_OK:
284         if (s->init_buf != NULL)
285             {
286                 BUF_MEM_free(s->init_buf);
287                 s->init_buf=NULL;
288             }
289         s->init_num=0;
290         /* ERR_clear_error(); */

292         /* If we want to cache session-ids in the client
293          * and we successfully add the session-id to the
294          * cache, and there is a callback, then pass it out.
295          * 26/11/96 - eay - only add if not a re-used session.
296          */

298         ssl_update_cache(s,SSL_SESS_CACHE_CLIENT);
299         if (s->hit) s->ctx->stats.sess_hit++;

301         ret=1;
302         /* s->server=0; */
303         s->ctx->stats.sess_connect_good++;

305         if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_DONE,1);

307         goto end;
308         /* break; */
309     default:
310         SSLerr(SSL_F_SSL2_CONNECT,SSL_R_UNKNOWN_STATE);
311         return(-1);
312         /* break; */
313     }

315     if ((cb != NULL) && (s->state != state))
316     {
317         new_state=s->state;
318         s->state=state;
319         cb(s,SSL_CB_CONNECT_LOOP,1);
320         s->state=new_state;
321     }
322 }
323 end:
324     s->in_handshake--;
325     if (buf != NULL)

```

```

326         BUF_MEM_free(buf);
327     if (cb != NULL)
328         cb(s,SSL_CB_CONNECT_EXIT,ret);
329     return(ret);
330 }

332 static int get_server_hello(SSL *s)
333 {
334     unsigned char *buf;
335     unsigned char *p;
336     int i,j;
337     unsigned long len;
338     STACK_OF(SSL_CIPHER) *sk=NULL,*cl,*prio,*allow;

340     buf=(unsigned char *)s->init_buf->data;
341     p=buf;
342     if (s->state == SSL2_ST_GET_SERVER_HELLO_A)
343     {
344         i=ssl2_read(s,(char *)&(buf[s->init_num]),11-s->init_num);
345         if (i < (11-s->init_num))
346             return(ssl2_part_read(s,SSL_F_GET_SERVER_HELLO,i));
347         s->init_num = 11;

349         if (*(p++) != SSL2_MT_SERVER_HELLO)
350             {
351                 if (p[-1] != SSL2_MT_ERROR)
352                     {
353                         ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
354                         SSLerr(SSL_F_GET_SERVER_HELLO,
355                             SSL_R_READ_WRONG_PACKET_TYPE);
356                     }
357                 else
358                     SSLerr(SSL_F_GET_SERVER_HELLO,
359                         SSL_R_PEER_ERROR);
360                 return(-1);
361             }
362         #if 0
363             s->hit=(*(p++))?1:0;
364             /* Some [PPC?] compilers fail to increment p in above
365              * statement, e.g. one provided with Rhapsody 5.5, but
366              * most recent example XL C 11.1 for AIX, even without
367              * optimization flag... */
368         #else
369             s->hit=(*p)?1:0; p++;
370         #endif

371         s->s2->tmp.cert_type= *(p++);
372         n2s(p,i);
373         if (i < s->version) s->version=i;
374         n2s(p,i); s->s2->tmp.cert_length=i;
375         n2s(p,i); s->s2->tmp.csl=i;
376         n2s(p,i); s->s2->tmp.conn_id_length=i;
377         s->state=SSL2_ST_GET_SERVER_HELLO_B;
378     }

380     /* SSL2_ST_GET_SERVER_HELLO_B */
381     len = 11 + (unsigned long)s->s2->tmp.cert_length + (unsigned long)s->s2->
382         if (len > SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER)
383         {
384             SSLerr(SSL_F_GET_SERVER_HELLO,SSL_R_MESSAGE_TOO_LONG);
385             return -1;
386         }
387     j = (int)len - s->init_num;
388     i = ssl2_read(s,(char *)&(buf[s->init_num]),j);
389     if (i != j) return(ssl2_part_read(s,SSL_F_GET_SERVER_HELLO,i));
390     if (s->msg_callback)
391         s->msg_callback(0, s->version, 0, buf, (size_t)len, s, s->msg_ca

```

```

393      /* things are looking good */
395      p = buf + 11;
396      if (s->hit)
397      {
398          if (s->s2->tmp.cert_length != 0)
399          {
400              SSLerr(SSL_F_GET_SERVER_HELLO, SSL_R_REUSE_CERT_LENGTH_NO
401                  return(-1);
402          }
403          if (s->s2->tmp.cert_type != 0)
404          {
405              if (!(s->options &
406                  SSL_OP_SSLREF2_REUSE_CERT_TYPE_BUG))
407              {
408                  SSLerr(SSL_F_GET_SERVER_HELLO, SSL_R_REUSE_CERT_T
409                      return(-1);
410              }
411          }
412          if (s->s2->tmp.csl != 0)
413          {
414              SSLerr(SSL_F_GET_SERVER_HELLO, SSL_R_REUSE_CIPHER_LIST_NO
415                  return(-1);
416          }
417      }
418      else
419      {
420          #ifdef undef
421              /* very bad */
422              memset(s->session->session_id, 0,
423                  SSL_MAX_SSL_SESSION_ID_LENGTH_IN_BYTES);
424              s->session->session_id_length = 0;
425              */
426          #endif
427
428          /* we need to do this in case we were trying to reuse a
429             * client session but others are already reusing it.
430             * If this was a new 'blank' session ID, the session-id
431             * length will still be 0 */
432          if (s->session->session_id_length > 0)
433          {
434              if (!ssl_get_new_session(s, 0))
435              {
436                  ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
437                  return(-1);
438              }
439          }
440
441          if (ssl2_set_certificate(s, s->s2->tmp.cert_type,
442              s->s2->tmp.cert_length, p) <= 0)
443          {
444              ssl2_return_error(s, SSL2_PE_BAD_CERTIFICATE);
445              return(-1);
446          }
447          p += s->s2->tmp.cert_length;
448
449          if (s->s2->tmp.csl == 0)
450          {
451              ssl2_return_error(s, SSL2_PE_NO_CIPHER);
452              SSLerr(SSL_F_GET_SERVER_HELLO, SSL_R_NO_CIPHER_LIST);
453              return(-1);
454          }
455
456          /* We have just received a list of ciphers back from the
457             * server. We need to get the ones that match, then select

```

```

458      * the one we want the most :-). */
459
460      /* load the ciphers */
461      sk = ssl_bytes_to_cipher_list(s, p, s->s2->tmp.csl,
462                                  &s->session->ciphers);
463      p += s->s2->tmp.csl;
464      if (sk == NULL)
465      {
466          ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
467          SSLerr(SSL_F_GET_SERVER_HELLO, ERR_R_MALLOC_FAILURE);
468          return(-1);
469      }
470
471      (void)sk_SSL_CIPHER_set_cmp_func(sk, ssl_cipher_ptr_id_cmp);
472
473      /* get the array of ciphers we will accept */
474      cl = SSL_get_ciphers(s);
475      (void)sk_SSL_CIPHER_set_cmp_func(cl, ssl_cipher_ptr_id_cmp);
476
477      /*
478       * If server preference flag set, choose the first
479       * (highest priority) cipher the server sends, otherwise
480       * client preference has priority.
481       */
482      if (s->options & SSL_OP_CIPHER_SERVER_PREFERENCE)
483      {
484          prio = sk;
485          allow = cl;
486      }
487      else
488      {
489          prio = cl;
490          allow = sk;
491      }
492
493      /* In theory we could have ciphers sent back that we
494       * don't want to use but that does not matter since we
495       * will check against the list we originally sent and
496       * for performance reasons we should not bother to match
497       * the two lists up just to check. */
498      for (i = 0; i < sk_SSL_CIPHER_num(prio); i++)
499      {
500          if (sk_SSL_CIPHER_find(allow,
501                                sk_SSL_CIPHER_value(prio, i)) >= 0)
502              break;
503      }
504
505      if (i >= sk_SSL_CIPHER_num(prio))
506      {
507          ssl2_return_error(s, SSL2_PE_NO_CIPHER);
508          SSLerr(SSL_F_GET_SERVER_HELLO, SSL_R_NO_CIPHER_MATCH);
509          return(-1);
510      }
511      s->session->cipher = sk_SSL_CIPHER_value(prio, i);
512
513      if (s->session->peer != NULL) /* can't happen */
514      {
515          ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
516          SSLerr(SSL_F_GET_SERVER_HELLO, ERR_R_INTERNAL_ERROR);
517          return(-1);
518      }
519
520      s->session->peer = s->session->sess_cert->peer_key->x509;
521      /* peer_key->x509 has been set by ssl2_set_certificate. */
522      CRYPTO_add(&s->session->peer->references, 1, CRYPTO_LOCK_X509);
523      }

```



```

525     if (s->session->sess_cert == NULL
526 || s->session->peer != s->session->sess_cert->peer_key->x509)
527     /* can't happen */
528     {
529         ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
530         SSLerr(SSL_F_GET_SERVER_HELLO, ERR_R_INTERNAL_ERROR);
531         return(-1);
532     }
533
534     s->s2->conn_id_length=s->s2->tmp.conn_id_length;
535     if (s->s2->conn_id_length > sizeof s->s2->conn_id)
536     {
537         ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
538         SSLerr(SSL_F_GET_SERVER_HELLO, SSL_R_SSL2_CONNECTION_ID_TOO_LONG
539         return -1;
540     }
541     memcpy(s->s2->conn_id,p,s->s2->tmp.conn_id_length);
542     return(1);
543 }
544
545 static int client_hello(SSL *s)
546 {
547     unsigned char *buf;
548     unsigned char *p,*d;
549     /* CIPHER **cipher;*/
550     int i,n,j;
551
552     buf=(unsigned char *)s->init_buf->data;
553     if (s->state == SSL2_ST_SEND_CLIENT_HELLO_A)
554     {
555         if ((s->session == NULL) ||
556             (s->session->ssl_version != s->version))
557         {
558             if (!ssl_get_new_session(s,0))
559             {
560                 ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
561                 return(-1);
562             }
563         }
564         /* else use the pre-loaded session */
565
566         p=buf;
567         d=p+9;
568         *(p++)=SSL2_MT_CLIENT_HELLO;
569         s2n(SSL2_VERSION,p);
570         n=j=0;
571
572         n=ssl_cipher_list_to_bytes(s,SSL_get_ciphers(s),d,0);
573         d+=n;
574
575         if (n == 0)
576         {
577             SSLerr(SSL_F_CLIENT_HELLO,SSL_R_NO_CIPHERS_AVAILABLE);
578             return(-1);
579         }
580
581         s2n(n,p);
582         /* cipher spec num bytes */
583
584         if ((s->session->session_id_length > 0) &&
585             (s->session->session_id_length <=
586              SSL2_MAX_SSL_SESSION_ID_LENGTH))
587         {
588             i=s->session->session_id_length;
589             s2n(i,p);
590             /* session id length */
591             memcpy(d,s->session->session_id,(unsigned int)i);

```

```

590         d+=i;
591     }
592     else
593     {
594         s2n(0,p);
595     }
596
597     s->s2->challenge_length=SSL2_CHALLENGE_LENGTH;
598     s2n(SSL2_CHALLENGE_LENGTH,p);
599     /* challenge length */
600     /* challenge id data */
601     if (RAND_pseudo_bytes(s->s2->challenge,SSL2_CHALLENGE_LENGTH) <=
602         return -1;
603     memcpy(d,s->s2->challenge,SSL2_CHALLENGE_LENGTH);
604     d+=SSL2_CHALLENGE_LENGTH;
605
606     s->state=SSL2_ST_SEND_CLIENT_HELLO_B;
607     s->init_num=d-buf;
608     s->init_off=0;
609     /* SSL2_ST_SEND_CLIENT_HELLO_B */
610     return(ssl2_do_write(s));
611 }
612
613 static int client_master_key(SSL *s)
614 {
615     unsigned char *buf;
616     unsigned char *p,*d;
617     int clear,enc,karg,i;
618     SSL_SESSION *sess;
619     const EVP_CIPHER *c;
620     const EVP_MD *md;
621
622     buf=(unsigned char *)s->init_buf->data;
623     if (s->state == SSL2_ST_SEND_CLIENT_MASTER_KEY_A)
624     {
625         if (!ssl_cipher_get_evp(s->session,&c,&md,NULL,NULL,NULL))
626         {
627             ssl2_return_error(s,SSL2_PE_NO_CIPHER);
628             SSLerr(SSL_F_CLIENT_MASTER_KEY,SSL_R_PROBLEMS_MAPPING_CI
629             return(-1);
630         }
631         sess=s->session;
632         p=buf;
633         d=p+10;
634         *(p++)=SSL2_MT_CLIENT_MASTER_KEY;
635         /* type */
636
637         i=ssl_put_cipher_by_char(s,sess->cipher,p);
638         p+=i;
639
640         /* make key_arg data */
641         i=EVP_CIPHER_iv_length(c);
642         sess->key_arg_length=i;
643         if (i > SSL_MAX_KEY_ARG_LENGTH)
644         {
645             ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
646             SSLerr(SSL_F_CLIENT_MASTER_KEY, ERR_R_INTERNAL_ERROR);
647             return -1;
648         }
649         if (i > 0)
650             if (RAND_pseudo_bytes(sess->key_arg,i) <= 0)
651                 return -1;
652
653         /* make a master key */
654         i=EVP_CIPHER_key_length(c);
655         sess->master_key_length=i;

```

```

656         if (i > 0)
657         {
658             if (i > (int)sizeof(sess->master_key))
659             {
660                 ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
661                 SSLerr(SSL_F_CLIENT_MASTER_KEY, ERR_R_INTERNAL_E
662                 return -1;
663             }
664             if (RAND_bytes(sess->master_key,i) <= 0)
665             {
666                 ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
667                 return(-1);
668             }
669         }

671         if (sess->cipher->algorithm2 & SSL2_CF_8_BYTE_ENC)
672             enc=8;
673         else if (SSL_C_IS_EXPORT(sess->cipher))
674             enc=5;
675         else
676             enc=i;

678         if ((int)i < enc)
679         {
680             ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
681             SSLerr(SSL_F_CLIENT_MASTER_KEY,SSL_R_CIPHER_TABLE_SRC_ER
682             return(-1);
683         }
684         clear=i-enc;
685         s2n(clear,p);
686         memcpy(d,sess->master_key,(unsigned int)clear);
687         d+=clear;

689         enc=ssl_rsa_public_encrypt(sess->sess_cert,enc,
690         &(sess->master_key[clear]),d,
691         (s->s2->ssl2_rollback)?RSA_SSLV23_PADDING:RSA_PKCS1_PADD
692         if (enc <= 0)
693         {
694             ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
695             SSLerr(SSL_F_CLIENT_MASTER_KEY,SSL_R_PUBLIC_KEY_ENCRYPT_
696             return(-1);
697         }
698 #ifdef PKCS1_CHECK
699         if (s->options & SSL_OP_PKCS1_CHECK_1) d[1]++;
700         if (s->options & SSL_OP_PKCS1_CHECK_2)
701             sess->master_key[clear]++;
702 #endif

703         s2n(enc,p);
704         d+=enc;
705         karg=sess->key_arg_length;
706         s2n(karg,p); /* key arg size */
707         if (karg > (int)sizeof(sess->key_arg))
708         {
709             ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
710             SSLerr(SSL_F_CLIENT_MASTER_KEY, ERR_R_INTERNAL_ERROR);
711             return -1;
712         }
713         memcpy(d,sess->key_arg,(unsigned int)karg);
714         d+=karg;

716         s->state=SSL2_ST_SEND_CLIENT_MASTER_KEY_B;
717         s->init_num=d-buf;
718         s->init_off=0;
719     }

721     /* SSL2_ST_SEND_CLIENT_MASTER_KEY_B */

```

```

722         return(ssl2_do_write(s));
723     }

725 static int client_finished(SSL *s)
726 {
727     unsigned char *p;

729     if (s->state == SSL2_ST_SEND_CLIENT_FINISHED_A)
730     {
731         p=(unsigned char *)s->init_buf->data;
732         *(p++)=SSL2_MT_CLIENT_FINISHED;
733         if (s->s2->conn_id_length > sizeof s->s2->conn_id)
734         {
735             SSLerr(SSL_F_CLIENT_FINISHED, ERR_R_INTERNAL_ERROR);
736             return -1;
737         }
738         memcpy(p,s->s2->conn_id,(unsigned int)s->s2->conn_id_length);

740         s->state=SSL2_ST_SEND_CLIENT_FINISHED_B;
741         s->init_num=s->s2->conn_id_length+1;
742         s->init_off=0;
743     }
744     return(ssl2_do_write(s));
745 }

747 /* read the data and then respond */
748 static int client_certificate(SSL *s)
749 {
750     unsigned char *buf;
751     unsigned char *p,*d;
752     int i;
753     unsigned int n;
754     int cert_ch_len;
755     unsigned char *cert_ch;

757     buf=(unsigned char *)s->init_buf->data;

759     /* We have a cert associated with the SSL, so attach it to
760     * the session if it does not have one */

762     if (s->state == SSL2_ST_SEND_CLIENT_CERTIFICATE_A)
763     {
764         i=ssl2_read(s,(char *)&(buf[s->init_num]),
765         SSL2_MAX_CERT_CHALLENGE_LENGTH+2-s->init_num);
766         if (i<(SSL2_MIN_CERT_CHALLENGE_LENGTH+2-s->init_num))
767             return(ssl2_part_read(s,SSL_F_CLIENT_CERTIFICATE,i));
768         s->init_num += i;
769         if (s->msg_callback)
770             s->msg_callback(0, s->version, 0, buf, (size_t)s->init_n

772         /* type=buf[0]; */
773         /* type eq x509 */
774         if (buf[1] != SSL2_AT_MD5_WITH_RSA_ENCRYPTION)
775         {
776             ssl2_return_error(s,SSL2_PE_UNSUPPORTED_CERTIFICATE_TYPE
777             SSLerr(SSL_F_CLIENT_CERTIFICATE,SSL_R_BAD_AUTHENTICATION
778             return(-1);
779         }

781         if ((s->cert == NULL) ||
782             (s->cert->key->x509 == NULL) ||
783             (s->cert->key->privatekey == NULL))
784         {
785             s->state=SSL2_ST_X509_GET_CLIENT_CERTIFICATE;
786         }
787     }
else

```

```
851     if (s->state == SSL2_ST_SEND_CLIENT_CERTIFICATE_B)
852     {
853         return(ssl2_do_write(s));
```

```

917         ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
918         SSLerr(SSL_F_GET_SERVER_VERIFY,
919             SSL_R_READ_WRONG_PACKET_TYPE);

```

```

920     }
921     else
922     {
923         SSLerr(SSL_F_GET_SERVER_VERIFY,SSL_R_PEER_ERROR)
924         /* try to read the error message */
925         i=ssl2_read(s,(char *)&(p[s->init_num]),3-s->ini
926         return ssl2_part_read(s,SSL_F_GET_SERVER_VERIFY,
927         }
928         return(-1);
929     }
930 }
931
932 p=(unsigned char *)s->init_buf->data;
933 len = 1 + s->s2->challenge_length;
934 n = len - s->init_num;
935 i = ssl2_read(s,(char *)&(p[s->init_num]),n);
936 if (i < n)
937     return(ssl2_part_read(s,SSL_F_GET_SERVER_VERIFY,i));
938 if (s->msg_callback)
939     s->msg_callback(0, s->version, 0, p, len, s, s->msg_callback_arg
940 p += 1;
941
942 if (CRYPTO_memcmp(p,s->s2->challenge,s->s2->challenge_length) != 0)
943 {
944     ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
945     SSLerr(SSL_F_GET_SERVER_VERIFY,SSL_R_CHALLENGE_IS_DIFFERENT);
946     return(-1);
947 }
948 return(1);
949 }
950
951 static int get_server_finished(SSL *s)
952 {
953     unsigned char *buf;
954     unsigned char *p;
955     int i, n, len;
956
957     buf=(unsigned char *)s->init_buf->data;
958     p=buf;
959     if (s->state == SSL2_ST_GET_SERVER_FINISHED_A)
960     {
961         i=ssl2_read(s,(char *)&(buf[s->init_num]),1-s->init_num);
962         if (i < (1-s->init_num))
963             return(ssl2_part_read(s,SSL_F_GET_SERVER_FINISHED,i));
964         s->init_num += i;
965
966         if (*p == SSL2_MT_REQUEST_CERTIFICATE)
967         {
968             s->state=SSL2_ST_SEND_CLIENT_CERTIFICATE_A;
969             return(1);
970         }
971         else if (*p != SSL2_MT_SERVER_FINISHED)
972         {
973             if (p[0] != SSL2_MT_ERROR)
974             {
975                 ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
976                 SSLerr(SSL_F_GET_SERVER_FINISHED,SSL_R_READ_WRON
977             }
978             else
979             {
980                 SSLerr(SSL_F_GET_SERVER_FINISHED,SSL_R_PEER_ERRO
981                 /* try to read the error message */
982                 i=ssl2_read(s,(char *)&(p[s->init_num]),3-s->ini
983                 return ssl2_part_read(s,SSL_F_GET_SERVER_VERIFY,
984             }
985             return(-1);

```

```

986     }
987     s->state=SSL2_ST_GET_SERVER_FINISHED_B;
988 }
989
990 len = 1 + SSL2_SSL_SESSION_ID_LENGTH;
991 n = len - s->init_num;
992 i = ssl2_read(s,(char *)&(buf[s->init_num]), n);
993 if (i < n) /* XXX could be shorter than SSL2_SSL_SESSION_ID_LENGTH, that
994     return(ssl2_part_read(s,SSL_F_GET_SERVER_FINISHED,i));
995 s->init_num += i;
996 if (s->msg_callback)
997     s->msg_callback(0, s->version, 0, buf, (size_t)s->init_num, s, s
998
999 if (!s->hit) /* new session */
1000 {
1001     /* new session-id */
1002     /* Make sure we were not trying to re-use an old SSL_SESSION
1003     /* or bad things can happen */
1004     /* ZZZZZZZZZZZZ */
1005     s->session->session_id_length=SSL2_SSL_SESSION_ID_LENGTH;
1006     memcpy(s->session->session_id,p+1,SSL2_SSL_SESSION_ID_LENGTH);
1007 }
1008 else
1009 {
1010     if (!(s->options & SSL_OP_MICROSOFT_SESS_ID_BUG))
1011     {
1012         if ((s->session->session_id_length > sizeof s->session->
1013             || (0 != memcmp(buf + 1, s->session->session_id,
1014                 (unsigned int)s->session->session_id
1015             {
1016                 ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
1017                 SSLerr(SSL_F_GET_SERVER_FINISHED,SSL_R_SSL_SESSI
1018                 return(-1);
1019             }
1020         }
1021     }
1022     s->state = SSL2_ST_OK;
1023     return(1);
1024 }
1025
1026 /* loads in the certificate from the server */
1027 int ssl2_set_certificate(SSL *s, int type, int len, const unsigned char *data)
1028 {
1029     STACK_OF(X509) *sk=NULL;
1030     EVP_PKEY *pkey=NULL;
1031     SESS_CERT *sc=NULL;
1032     int i;
1033     X509 *x509=NULL;
1034     int ret=0;
1035
1036     x509=d2i_X509(NULL,&data,(long)len);
1037     if (x509 == NULL)
1038     {
1039         SSLerr(SSL_F_SSL2_SET_CERTIFICATE,ERR_R_X509_LIB);
1040         goto err;
1041     }
1042
1043     if ((sk=sk_X509_new_null()) == NULL || !sk_X509_push(sk,x509))
1044     {
1045         SSLerr(SSL_F_SSL2_SET_CERTIFICATE,ERR_R_MALLOC_FAILURE);
1046         goto err;
1047     }
1048
1049     i=ssl_verify_cert_chain(s,sk);
1050
1051     if ((s->verify_mode != SSL_VERIFY_NONE) && (i <= 0))

```

```

1052         {
1053             SSLerr(SSL_F_SSL2_SET_CERTIFICATE, SSL_R_CERTIFICATE_VERIFY_FAIL
1054             goto err;
1055         }
1056     ERR_clear_error(); /* but we keep s->verify_result */
1057     s->session->verify_result = s->verify_result;

1059     /* server's cert for this session */
1060     sc=ssl_sess_cert_new();
1061     if (sc == NULL)
1062     {
1063         ret= -1;
1064         goto err;
1065     }
1066     if (s->session->sess_cert) ssl_sess_cert_free(s->session->sess_cert);
1067     s->session->sess_cert=sc;

1069     sc->peer_pkeys[SSL_PKEY_RSA_ENC].x509=x509;
1070     sc->peer_key= &(sc->peer_pkeys[SSL_PKEY_RSA_ENC]);

1072     pkey=X509_get_pubkey(x509);
1073     x509=NULL;
1074     if (pkey == NULL)
1075     {
1076         SSLerr(SSL_F_SSL2_SET_CERTIFICATE, SSL_R_UNABLE_TO_EXTRACT_PUBLIC
1077         goto err;
1078     }
1079     if (pkey->type != EVP_PKEY_RSA)
1080     {
1081         SSLerr(SSL_F_SSL2_SET_CERTIFICATE, SSL_R_PUBLIC_KEY_NOT_RSA);
1082         goto err;
1083     }

1085     if (!ssl_set_peer_cert_type(sc, SSL2_CT_X509_CERTIFICATE))
1086         goto err;
1087     ret=1;
1088 err:
1089     sk_X509_free(sk);
1090     X509_free(x509);
1091     EVP_PKEY_free(pkey);
1092     return(ret);
1093 }

1095 static int ssl_rsa_public_encrypt(SESS_CERT *sc, int len, unsigned char *from,
1096 unsigned char *to, int padding)
1097 {
1098     EVP_PKEY *pkey=NULL;
1099     int i= -1;

1101     if ((sc == NULL) || (sc->peer_key->x509 == NULL) ||
1102         ((pkey=X509_get_pubkey(sc->peer_key->x509)) == NULL))
1103     {
1104         SSLerr(SSL_F_SSL_RSA_PUBLIC_ENCRYPT, SSL_R_NO_PUBLICKEY);
1105         return(-1);
1106     }
1107     if (pkey->type != EVP_PKEY_RSA)
1108     {
1109         SSLerr(SSL_F_SSL_RSA_PUBLIC_ENCRYPT, SSL_R_PUBLIC_KEY_IS_NOT_RSA)
1110         goto end;
1111     }

1113     /* we have the public key */
1114     i=RSA_public_encrypt(len, from, to, pkey->pkey.rsa, padding);
1115     if (i < 0)
1116         SSLerr(SSL_F_SSL_RSA_PUBLIC_ENCRYPT, ERR_R_RSA_LIB);
1117 end:

```

```

1118     EVP_PKEY_free(pkey);
1119     return(i);
1120 }
1121 #else /* !OPENSSL_NO_SSL2 */

1123 # if PEDANTIC
1124 static void *dummy=&dummy;
1125 # endif

1127 #endif

```

```

*****
6263 Fri May 30 18:32:19 2014
new/usr/src/lib/openssl/libsunw_ssl/s2_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s2_enc.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include "ssl_locl.h"
60 #ifndef OPENSSL_NO_SSL2
61 #include <stdio.h>

```

```

63 int ssl2_enc_init(SSL *s, int client)
64 {
65     /* Max number of bytes needed */
66     EVP_CIPHER_CTX *rs, *ws;
67     const EVP_CIPHER *c;
68     const EVP_MD *md;
69     int num;
70
71     if (!ssl_cipher_get_evp(s->session, &c, &md, NULL, NULL, NULL))
72     {
73         ssl2_return_error(s, SSL2_PE_NO_CIPHER);
74         SSLerr(SSL_F_SSL2_ENC_INIT, SSL_R_PROBLEMS_MAPPING_CIPHER_FUNCTION,
75              return(0);
76     }
77     ssl_replace_hash(&s->read_hash, md);
78     ssl_replace_hash(&s->write_hash, md);
79
80     if ((s->enc_read_ctx == NULL) &&
81         ((s->enc_read_ctx = (EVP_CIPHER_CTX *)
82          OPENSSL_malloc(sizeof(EVP_CIPHER_CTX))) == NULL))
83         goto err;
84
85     /* make sure it's intialized in case the malloc for enc_write_ctx fails
86      * and we exit with an error */
87     rs = s->enc_read_ctx;
88     EVP_CIPHER_CTX_init(rs);
89
90     if ((s->enc_write_ctx == NULL) &&
91         ((s->enc_write_ctx = (EVP_CIPHER_CTX *)
92          OPENSSL_malloc(sizeof(EVP_CIPHER_CTX))) == NULL))
93         goto err;
94
95     ws = s->enc_write_ctx;
96     EVP_CIPHER_CTX_init(ws);
97
98     num = c->key_len;
99     s->s2->key_material_length = num * 2;
100    OPENSSL_assert(s->s2->key_material_length <= sizeof s->s2->key_material)
101
102    if (ssl2_generate_key_material(s) <= 0)
103        return 0;
104
105    OPENSSL_assert(c->iv_len <= (int)sizeof(s->session->key_arg));
106    EVP_EncryptInit_ex(ws, c, NULL, &(s->s2->key_material[(client)?num:0]),
107                      s->session->key_arg);
108    EVP_DecryptInit_ex(rs, c, NULL, &(s->s2->key_material[(client)?0:num]),
109                      s->session->key_arg);
110    s->s2->read_key = &(s->s2->key_material[(client)?0:num]);
111    s->s2->write_key = &(s->s2->key_material[(client)?num:0]);
112    return(1);
113 err:
114    SSLerr(SSL_F_SSL2_ENC_INIT, ERR_R_MALLOC_FAILURE);
115    return(0);
116 }
117
118 /* read/writes from s->s2->mac_data using length for encrypt and
119  * decrypt. It sets s->s2->padding and s->[rw]length
120  * if we are encrypting */
121 void ssl2_enc(SSL *s, int send)
122 {
123     EVP_CIPHER_CTX *ds;
124     unsigned long l;
125     int bs;
126
127     if (send)

```

```

128         {
129             ds=s->enc_write_ctx;
130             l=s->s2->wlength;
131         }
132     else
133     {
134         ds=s->enc_read_ctx;
135         l=s->s2->rlength;
136     }

138     /* check for NULL cipher */
139     if (ds == NULL) return;

142     bs=ds->cipher->block_size;
143     /* This should be using (bs-1) and bs instead of 7 and 8, but
144      * what the hell. */
145     if (bs == 8)
146         l=(l+7)/8*8;

148     EVP_Cipher(ds, s->s2->mac_data, s->s2->mac_data, l);
149 }

151 void ssl2_mac(SSL *s, unsigned char *md, int send)
152 {
153     EVP_MD_CTX c;
154     unsigned char sequence[4], *p, *sec, *act;
155     unsigned long seq;
156     unsigned int len;

158     if (send)
159     {
160         seq=s->s2->write_sequence;
161         sec=s->s2->write_key;
162         len=s->s2->wact_data_length;
163         act=s->s2->wact_data;
164     }
165     else
166     {
167         seq=s->s2->read_sequence;
168         sec=s->s2->read_key;
169         len=s->s2->ract_data_length;
170         act=s->s2->ract_data;
171     }

173     p= &(sequence[0]);
174     l2n(seq, p);

176     /* There has to be a MAC algorithm. */
177     EVP_MD_CTX_init(&c);
178     EVP_MD_CTX_copy(&c, s->read_hash);
179     EVP_DigestUpdate(&c, sec,
180                     EVP_CIPHER_CTX_key_length(s->enc_read_ctx));
181     EVP_DigestUpdate(&c, act, len);
182     /* the above line also does the pad data */
183     EVP_DigestUpdate(&c, sequence, 4);
184     EVP_DigestFinal_ex(&c, md, NULL);
185     EVP_MD_CTX_cleanup(&c);
186 }
187 #else /* !OPENSSL_NO_SSL2 */

189 # if PEDANTIC
190 static void *dummy=&dummy;
191 # endif

193 #endif

```

```

*****
13424 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s2_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s2_lib.c */
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```

```

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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include "ssl_locl.h"
113 #ifndef OPENSSL_NO_SSL2
114 #include <stdio.h>
115 #include <openssl/objects.h>
116 #include <openssl/evp.h>
117 #include <openssl/md5.h>
118
119 const char ssl2_version_str[]="SSLv2" OPENSSL_VERSION_PTEXT;
120
121 #define SSL2_NUM_CIPHERS (sizeof(ssl2_ciphers)/sizeof(SSL_CIPHER))
122
123 /* list of available SSLv2 ciphers (sorted by id) */
124 OPENSSL_GLOBAL const SSL_CIPHER ssl2_ciphers[]={
125 #if 0
126 /* NULL_WITH_MD5 v3 */
127 {

```



```

128     1,
129     SSL2_TXT_NULL_WITH_MD5,
130     SSL2_CK_NULL_WITH_MD5,
131     SSL_kRSA,
132     SSL_aRSA,
133     SSL_eNULL,
134     SSL_MD5,
135     SSL_SSLV2,
136     SSL_EXPORT|SSL_EXP40|SSL_STRONG_NONE,
137     0,
138     0,
139     0,
140     },
141 #endif

143 /* RC4_128_WITH_MD5 */
144 {
145     1,
146     SSL2_TXT_RC4_128_WITH_MD5,
147     SSL2_CK_RC4_128_WITH_MD5,
148     SSL_kRSA,
149     SSL_aRSA,
150     SSL_RC4,
151     SSL_MD5,
152     SSL_SSLV2,
153     SSL_NOT_EXP|SSL_MEDIUM,
154     0,
155     128,
156     128,
157     },

159 /* RC4_128_EXPORT40_WITH_MD5 */
160 {
161     1,
162     SSL2_TXT_RC4_128_EXPORT40_WITH_MD5,
163     SSL2_CK_RC4_128_EXPORT40_WITH_MD5,
164     SSL_kRSA,
165     SSL_aRSA,
166     SSL_RC4,
167     SSL_MD5,
168     SSL_SSLV2,
169     SSL_EXPORT|SSL_EXP40,
170     SSL2_CF_5_BYTE_ENC,
171     40,
172     128,
173     },

175 /* RC2_128_CBC_WITH_MD5 */
176 {
177     1,
178     SSL2_TXT_RC2_128_CBC_WITH_MD5,
179     SSL2_CK_RC2_128_CBC_WITH_MD5,
180     SSL_kRSA,
181     SSL_aRSA,
182     SSL_RC2,
183     SSL_MD5,
184     SSL_SSLV2,
185     SSL_NOT_EXP|SSL_MEDIUM,
186     0,
187     128,
188     128,
189     },

191 /* RC2_128_CBC_EXPORT40_WITH_MD5 */
192 {
193     1,

```

```

194     SSL2_TXT_RC2_128_CBC_EXPORT40_WITH_MD5,
195     SSL2_CK_RC2_128_CBC_EXPORT40_WITH_MD5,
196     SSL_kRSA,
197     SSL_aRSA,
198     SSL_RC2,
199     SSL_MD5,
200     SSL_SSLV2,
201     SSL_EXPORT|SSL_EXP40,
202     SSL2_CF_5_BYTE_ENC,
203     40,
204     128,
205     },

207 #ifndef OPENSSL_NO_IDEA
208 /* IDEA_128_CBC_WITH_MD5 */
209 {
210     1,
211     SSL2_TXT_IDEA_128_CBC_WITH_MD5,
212     SSL2_CK_IDEA_128_CBC_WITH_MD5,
213     SSL_kRSA,
214     SSL_aRSA,
215     SSL_IDEA,
216     SSL_MD5,
217     SSL_SSLV2,
218     SSL_NOT_EXP|SSL_MEDIUM,
219     0,
220     128,
221     128,
222     },
223 #endif

225 /* DES_64_CBC_WITH_MD5 */
226 {
227     1,
228     SSL2_TXT_DES_64_CBC_WITH_MD5,
229     SSL2_CK_DES_64_CBC_WITH_MD5,
230     SSL_kRSA,
231     SSL_aRSA,
232     SSL_DES,
233     SSL_MD5,
234     SSL_SSLV2,
235     SSL_NOT_EXP|SSL_LOW,
236     0,
237     56,
238     56,
239     },

241 /* DES_192_EDE3_CBC_WITH_MD5 */
242 {
243     1,
244     SSL2_TXT_DES_192_EDE3_CBC_WITH_MD5,
245     SSL2_CK_DES_192_EDE3_CBC_WITH_MD5,
246     SSL_kRSA,
247     SSL_aRSA,
248     SSL_3DES,
249     SSL_MD5,
250     SSL_SSLV2,
251     SSL_NOT_EXP|SSL_HIGH,
252     0,
253     168,
254     168,
255     },

257 #if 0
258 /* RC4_64_WITH_MD5 */
259 {

```

```

260     1,
261     SSL2_TXT_RC4_64_WITH_MD5,
262     SSL2_CK_RC4_64_WITH_MD5,
263     SSL_kRSA,
264     SSL_aRSA,
265     SSL_RC4,
266     SSL_MD5,
267     SSL_SSLV2,
268     SSL_NOT_EXP|SSL_LOW,
269     SSL2_CF_8_BYTE_ENC,
270     64,
271     64,
272     },
273 #endif

275 #if 0
276 /* NULL SSLeay (testing) */
277 {
278     0,
279     SSL2_TXT_NULL,
280     SSL2_CK_NULL,
281     0,
282     0,
283     0,
284     0,
285     SSL_SSLV2,
286     SSL_STRONG_NONE,
287     0,
288     0,
289     0,
290     },
291 #endif

293 /* end of list :-) */
294 };

296 long ssl2_default_timeout(void)
297 {
298     return(300);
299 }

301 int ssl2_num_ciphers(void)
302 {
303     return(SSL2_NUM_CIPHERS);
304 }

306 const SSL_CIPHER *ssl2_get_cipher(unsigned int u)
307 {
308     if (u < SSL2_NUM_CIPHERS)
309         return(&(ssl2_ciphers[SSL2_NUM_CIPHERS-1-u]));
310     else
311         return(NULL);
312 }

314 int ssl2_pending(const SSL *s)
315 {
316     return SSL_in_init(s) ? 0 : s->s2->ract_data_length;
317 }

319 int ssl2_new(SSL *s)
320 {
321     SSL2_STATE *s2;

323     if ((s2=OPENSSL_malloc(sizeof *s2)) == NULL) goto err;
324     memset(s2,0,sizeof *s2);

```

```

326 #if SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER + 3 > SSL2_MAX_RECORD_LENGTH_2_BYTE_HEA
327 # error "assertion failed"
328 #endif

330     if ((s2->rbuf=OPENSSL_malloc(
331         SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER+2)) == NULL) goto err;
332     /* wbuf needs one byte more because when using two-byte headers,
333        * we leave the first byte unused in do_ssl_write (s2_pkt.c) */
334     if ((s2->wbuf=OPENSSL_malloc(
335         SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER+3)) == NULL) goto err;
336     s->s2=s2;

338     ssl2_clear(s);
339     return(1);
340 err:
341     if (s2 != NULL)
342     {
343         if (s2->wbuf != NULL) OPENSSL_free(s2->wbuf);
344         if (s2->rbuf != NULL) OPENSSL_free(s2->rbuf);
345         OPENSSL_free(s2);
346     }
347     return(0);
348 }

350 void ssl2_free(SSL *s)
351 {
352     SSL2_STATE *s2;

354     if(s == NULL)
355         return;

357     s2=s->s2;
358     if (s2->rbuf != NULL) OPENSSL_free(s2->rbuf);
359     if (s2->wbuf != NULL) OPENSSL_free(s2->wbuf);
360     OPENSSL_cleanse(s2,sizeof *s2);
361     OPENSSL_free(s2);
362     s->s2=NULL;
363 }

365 void ssl2_clear(SSL *s)
366 {
367     SSL2_STATE *s2;
368     unsigned char *rbuf,*wbuf;

370     s2=s->s2;

372     rbuf=s2->rbuf;
373     wbuf=s2->wbuf;

375     memset(s2,0,sizeof *s2);

377     s2->rbuf=rbuf;
378     s2->wbuf=wbuf;
379     s2->clear_text=1;
380     s->packet=s2->rbuf;
381     s->version=SSL2_VERSION;
382     s->packet_length=0;
383 }

385 long ssl2_ctrl(SSL *s, int cmd, long larg, void *parg)
386 {
387     int ret=0;

389     switch(cmd)
390     {
391     case SSL_CTRL_GET_SESSION_REUSED:

```

```

392         ret=s->hit;
393         break;
394     default:
395         break;
396     }
397     return(ret);
398 }

400 long ssl2_callback_ctrl(SSL *s, int cmd, void (*fp)(void))
401 {
402     return(0);
403 }

405 long ssl2_ctx_ctrl(SSL_CTX *ctx, int cmd, long larg, void *parg)
406 {
407     return(0);
408 }

410 long ssl2_ctx_callback_ctrl(SSL_CTX *ctx, int cmd, void (*fp)(void))
411 {
412     return(0);
413 }

415 /* This function needs to check if the ciphers required are actually
416    * available */
417 const SSL_CIPHER *ssl2_get_cipher_by_char(const unsigned char *p)
418 {
419     SSL_CIPHER c;
420     const SSL_CIPHER *cp;
421     unsigned long id;

423     id=0x02000000L|((unsigned long)p[0]<<16L)|
424         ((unsigned long)p[1]<<8L)|((unsigned long)p[2];
425     c.id=id;
426     cp = OBJ_bsearch_ssl_cipher_id(&c, ssl2_ciphers, SSL2_NUM_CIPHERS);
427     if ((cp == NULL) || (cp->valid == 0))
428         return NULL;
429     else
430         return cp;
431 }

433 int ssl2_put_cipher_by_char(const SSL_CIPHER *c, unsigned char *p)
434 {
435     long l;

437     if (p != NULL)
438     {
439         l=c->id;
440         if ((l & 0xff000000) != 0x02000000) return(0);
441         p[0]=((unsigned char)(l>>16L))&0xFF;
442         p[1]=((unsigned char)(l>> 8L))&0xFF;
443         p[2]=((unsigned char)(l    ))&0xFF;
444     }
445     return(3);
446 }

448 int ssl2_generate_key_material(SSL *s)
449 {
450     unsigned int i;
451     EVP_MD_CTX ctx;
452     unsigned char *km;
453     unsigned char c='0';
454     const EVP_MD *md5;
455     int md_size;

457     md5 = EVP_md5();

```

```

459 #ifdef CHARSET_EBCDIC
460     c = os_toascii['0']; /* Must be an ASCII '0', not EBCDIC '0',
461                          see SSLv2 docu */
462 #endif
463     EVP_MD_CTX_init(&ctx);
464     km=s->s2->key_material;

466     if (s->session->master_key_length < 0 ||
467         s->session->master_key_length > (int)sizeof(s->session->
468         {
469             SSLerr(SSL_F_SSL2_GENERATE_KEY_MATERIAL, ERR_R_INTERNAL_ERROR);
470             return 0;
471         }
472     md_size = EVP_MD_size(md5);
473     if (md_size < 0)
474         return 0;
475     for (i=0; i<s->s2->key_material_length; i += md_size)
476     {
477         if (((km - s->s2->key_material) + md_size) >
478             (int)sizeof(s->s2->key_material))
479         {
480             /* EVP_DigestFinal_ex() below would write beyond buffer
481             SSLerr(SSL_F_SSL2_GENERATE_KEY_MATERIAL, ERR_R_INTERNAL
482             return 0;
483         }

485     EVP_DigestInit_ex(&ctx, md5, NULL);

487     OPENSSL_assert(s->session->master_key_length >= 0
488         && s->session->master_key_length
489         < (int)sizeof(s->session->master_key));
490     EVP_DigestUpdate(&ctx, s->session->master_key, s->session->master_
491     EVP_DigestUpdate(&ctx, &c, 1);
492     c++;
493     EVP_DigestUpdate(&ctx, s->s2->challenge, s->s2->challenge_length);
494     EVP_DigestUpdate(&ctx, s->s2->conn_id, s->s2->conn_id_length);
495     EVP_DigestFinal_ex(&ctx, km, NULL);
496     km += md_size;
497 }

499     EVP_MD_CTX_cleanup(&ctx);
500     return 1;
501 }

503 void ssl2_return_error(SSL *s, int err)
504 {
505     if (!s->error)
506     {
507         s->error=3;
508         s->error_code=err;

510         ssl2_write_error(s);
511     }
512 }

515 void ssl2_write_error(SSL *s)
516 {
517     unsigned char buf[3];
518     int i,error;

520     buf[0]=SSL2_MT_ERROR;
521     buf[1]=(s->error_code>>8)&0xff;
522     buf[2]=(s->error_code)&0xff;

```

```
524 /*      state=s->rwstate; */
526      error=s->error; /* number of bytes left to write */
527      s->error=0;
528      OPENSSL_assert(error >= 0 && error <= (int)sizeof(buf));
529      i=ssl2_write(s,&(buf[3-error]),error);
531 /*      if (i == error) s->rwstate=state; */
533      if (i < 0)
534          s->error=error;
535      else
536          {
537              s->error=error-i;
539              if (s->error == 0)
540                  if (s->msg_callback)
541                      s->msg_callback(1, s->version, 0, buf, 3, s, s->
542                  }
543          }
545 int ssl2_shutdown(SSL *s)
546 {
547     s->shutdown=(SSL_SENT_SHUTDOWN|SSL_RECEIVED_SHUTDOWN);
548     return(1);
549 }
550 #else /* !OPENSSL_NO_SSL2 */
552 # if PEDANTIC
553 static void *dummy=&dummy;
554 # endif
556 #endif
```

```

*****
3650 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s2_meth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s2_meth.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include "ssl_locl.h"
60 #ifndef OPENSSL_NO_SSL2
61 #include <stdio.h>

```

```

62 #include <openssl/objects.h>
64 static const SSL_METHOD *ssl2_get_method(int ver);
65 static const SSL_METHOD *ssl2_get_method(int ver)
66 {
67     if (ver == SSL2_VERSION)
68         return(SSLv2_method());
69     else
70         return(NULL);
71 }
73 IMPLEMENT_ssl2_meth_func(SSLv2_method,
74                          ssl2_accept,
75                          ssl2_connect,
76                          ssl2_get_method)
78 #else /* !OPENSSL_NO_SSL2 */
80 # if PEDANTIC
81 static void *dummy=&dummy;
82 # endif
84 #endif

```

```

*****
20201 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s2_pkt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s2_pkt.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
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58 /* =====
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60 *
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```

```

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105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include "ssl_locl.h"
113 #ifndef OPENSSL_NO_SSL2
114 #include <stdio.h>
115 #include <errno.h>
116 #define USE_SOCKETS
117
118 static int read_n(SSL *s, unsigned int n, unsigned int max, unsigned int extend);
119 static int n_do_ssl_write(SSL *s, const unsigned char *buf, unsigned int len);
120 static int write_pending(SSL *s, const unsigned char *buf, unsigned int len);
121 static int ssl_mt_error(int n);
122
123
124 /* SSL 2.0 implementation for SSL_read/SSL_peek -
125  * This routine will return 0 to len bytes, decrypted etc if required.
126  */
127 static int ssl2_read_internal(SSL *s, void *buf, int len, int peek)

```

```
new/usr/src/lib/openssl/libsunw_ssl/s2_pkt.c
```

```

194         if (n <= 0) return(n); /* error or non-blocking */
195     }
196     /* part read stuff */

198     s->rstate=SSL_ST_READ_BODY;
199     p=s->packet;
200     /* Do header */
201     /*s->s2->padding=0;*/
202     s->s2->escape=0;
203     s->s2->rlength=(((unsigned int)p[0])<8)|((unsigned int)p[1]);
204     if ((p[0] & TWO_BYTE_BIT)) /* Two byte header? */
205     {
206         s->s2->three_byte_header=0;
207         s->s2->rlength&=TWO_BYTE_MASK;
208     }
209     else
210     {
211         s->s2->three_byte_header=1;
212         s->s2->rlength&=THREE_BYTE_MASK;

214         /* security >s2->escape */
215         s->s2->escape=((p[0] & SEC_ESC_BIT))?1:0;
216     }
217 }

219 if (s->rstate == SSL_ST_READ_BODY)
220 {
221     n=s->s2->rlength+2+s->s2->three_byte_header;
222     if (n > (int)s->packet_length)
223     {
224         n=s->packet_length;
225         i=read_n(s,(unsigned int)n,(unsigned int)n,1);
226         if (i <= 0) return(i); /* ERROR */
227     }

229     p= &(s->packet[2]);
230     s->rstate=SSL_ST_READ_HEADER;
231     if (s->s2->three_byte_header)
232         s->s2->padding= *(p++);
233     else
234         s->s2->padding=0;

235     /* Data portion */
236     if (s->s2->clear_text)
237     {
238         mac_size = 0;
239         s->s2->mac_data=p;
240         s->s2->ract_data=p;
241         if (s->s2->padding)
242         {
243             SSLerr(SSL_F_SSL2_READ_INTERNAL,SSL_R_ILLEGAL_PA
244             return(-1);
245         }
246     }
247     else
248     {
249         mac_size=EVP_MD_CTX_size(s->read_hash);
250         if (mac_size < 0)
251             return -1;
252         OPENSSL_assert(mac_size <= MAX_MAC_SIZE);
253         s->s2->mac_data=p;
254         s->s2->ract_data= &p[mac_size];
255         if (s->s2->padding + mac_size > s->s2->rlength)
256         {
257             SSLerr(SSL_F_SSL2_READ_INTERNAL,SSL_R_ILLEGAL_PA
258             return(-1);
259         }
260     }
261 }

```

```

260         }
262         s->s2->ract_data_length=s->s2->rlength;
263         /* added a check for length > max_size in case
264          * encryption was not turned on yet due to an error */
265         if ((!s->s2->clear_text) &&
266             (s->s2->rlength >= (unsigned int)mac_size))
267         {
268             ssl2_enc(s,0);
269             s->s2->ract_data_length=mac_size;
270             ssl2_mac(s,mac,0);
271             s->s2->ract_data_length=s->s2->padding;
272             if (CRYPTO_memcmp(mac,s->s2->mac_data,mac_size) !=
273                 (s->s2->rlength% EVP_CIPHER_CTX_block_size(s->enc
274                 {
275                     SSLerr(SSL_F_SSL2_READ_INTERNAL,SSL_R_BAD_MAC_DE
276                     return(-1);
277                 }
278             }
279             INC32(s->s2->read_sequence); /* expect next number */
280             /* s->s2->ract_data is now available for processing */
282             /* Possibly the packet that we just read had 0 actual data bytes
283              * (SSLay/OpenSSL itself never sends such packets; see ssl2_wri
284              * In this case, returning 0 would be interpreted by the caller
285              * as indicating EOF, so it's not a good idea. Instead, we just
286              * continue reading; thus ssl2_read_internal may have to process
287              * multiple packets before it can return.
288              *
289              * [Note that using select() for blocking sockets *never* guaran
290              * that the next SSL_read will not block -- the available
291              * data may contain incomplete packets, and except for SSL 2,
292              * renegotiation can confuse things even more.] */
294             goto ssl2_read_again; /* This should really be
295              * "return ssl2_read(s,buf,len)",
296              * but that would allow for
297              * denial-of-service attacks if a
298              * C compiler is used that does not
299              * recognize end-recursion. */
300         }
301     else
302     {
303         SSLerr(SSL_F_SSL2_READ_INTERNAL,SSL_R_BAD_STATE);
304         return(-1);
305     }
306 }
308 int ssl2_read(SSL *s, void *buf, int len)
309 {
310     return ssl2_read_internal(s, buf, len, 0);
311 }
313 int ssl2_peek(SSL *s, void *buf, int len)
314 {
315     return ssl2_read_internal(s, buf, len, 1);
316 }
318 static int read_n(SSL *s, unsigned int n, unsigned int max,
319                  unsigned int extend)
320 {
321     int i,off,newb;
323     /* if there is stuff still in the buffer from a previous read,
324      * and there is more than we want, take some. */
325     if (s->s2->rbuf_left >= (int)n)

```

```

326     {
327         if (extend)
328             s->packet_length+=n;
329         else
330         {
331             s->packet= &(s->s2->rbuf[s->s2->rbuf_offs]);
332             s->packet_length=n;
333         }
334         s->s2->rbuf_left-=n;
335         s->s2->rbuf_offs+=n;
336         return(n);
337     }
339     if (!s->read_ahead) max=n;
340     if (max > (unsigned int)(SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER+2))
341         max=SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER+2;
342
344     /* Else we want more than we have.
345      * First, if there is some left or we want to extend */
346     off=0;
347     if ((s->s2->rbuf_left != 0) || ((s->packet_length != 0) && extend))
348     {
349         newb=s->s2->rbuf_left;
350         if (extend)
351         {
352             off=s->packet_length;
353             if (s->packet != s->s2->rbuf)
354                 memcpy(s->s2->rbuf,s->packet,
355                        (unsigned int)newb+off);
356         }
357         else if (s->s2->rbuf_offs != 0)
358         {
359             memcpy(s->s2->rbuf,&(s->s2->rbuf[s->s2->rbuf_offs]),
360                    (unsigned int)newb);
361             s->s2->rbuf_offs=0;
362         }
363         s->s2->rbuf_left=0;
364     }
365     else
366         newb=0;
368     /* off is the offset to start writing too.
369      * r->s2->rbuf_offs is the 'unread data', now 0.
370      * newb is the number of new bytes so far
371      */
372     s->packet=s->s2->rbuf;
373     while (newb < (int)n)
374     {
375         clear_sys_error();
376         if (s->rbio != NULL)
377         {
378             s->rystate=SSL_READING;
379             i=BIO_read(s->rbio,(char *)&(s->s2->rbuf[off+newb]),
380                       max-newb);
381         }
382         else
383         {
384             SSLerr(SSL_F_READ_N,SSL_R_READ_BIO_NOT_SET);
385             i= -1;
386         }
387     }
388     #ifdef PKT_DEBUG
389     if (s->debug & 0x01) sleep(1);
390     #endif
391     if (i <= 0)
392     {

```



```

392         s->s2->rbuf_left+=newb;
393         return(i);
394     }
395     newb+=i;
396 }
397
398 /* record unread data */
399 if (newb > (int)n)
400 {
401     s->s2->rbuf_offs=n+off;
402     s->s2->rbuf_left=newb-n;
403 }
404 else
405 {
406     s->s2->rbuf_offs=0;
407     s->s2->rbuf_left=0;
408 }
409 if (extend)
410     s->packet_length+=n;
411 else
412     s->packet_length=n;
413 s->rwstate=SSL_NOTHING;
414 return(n);
415 }
416
417 int ssl2_write(SSL *s, const void *_buf, int len)
418 {
419     const unsigned char *buf=_buf;
420     unsigned int n,tot;
421     int i;
422
423     if (SSL_in_init(s) && !s->in_handshake)
424     {
425         i=s->handshake_func(s);
426         if (i < 0) return(i);
427         if (i == 0)
428         {
429             SSLerr(SSL_F_SSL2_WRITE, SSL_R_SSL_HANDSHAKE_FAILURE);
430             return(-1);
431         }
432     }
433
434     if (s->error)
435     {
436         ssl2_write_error(s);
437         if (s->error)
438             return(-1);
439     }
440
441     clear_sys_error();
442     s->rwstate=SSL_NOTHING;
443     if (len <= 0) return(len);
444
445     tot=s->s2->wnum;
446     s->s2->wnum=0;
447
448     n=(len-tot);
449     for (;;)
450     {
451         i=n_do_ssl_write(s,&(buf[tot]),n);
452         if (i <= 0)
453         {
454             s->s2->wnum=tot;
455             return(i);
456         }
457         if ((i == (int)n) ||

```

```

458         (s->mode & SSL_MODE_ENABLE_PARTIAL_WRITE))
459     {
460         return(tot+i);
461     }
462
463     n-=i;
464     tot+=i;
465 }
466
467 static int write_pending(SSL *s, const unsigned char *buf, unsigned int len)
468 {
469     int i;
470
471     /* s->s2->wpend_len != 0 MUST be true. */
472
473     /* check that they have given us the same buffer to
474      * write */
475     if ((s->s2->wpend_tot > (int)len) ||
476         ((s->s2->wpend_buf != buf) &&
477          !(s->mode & SSL_MODE_ACCEPT_MOVING_WRITE_BUFFER)))
478     {
479         SSLerr(SSL_F_WRITE_PENDING, SSL_R_BAD_WRITE_RETRY);
480         return(-1);
481     }
482
483     for (;;)
484     {
485         clear_sys_error();
486         if (s->wbio != NULL)
487         {
488             s->rwstate=SSL_WRITING;
489             i=BIO_write(s->wbio,
490                        (char *)&(s->s2->write_ptr[s->s2->wpend_off]),
491                        (unsigned int)s->s2->wpend_len);
492         }
493         else
494         {
495             SSLerr(SSL_F_WRITE_PENDING, SSL_R_WRITE_BIO_NOT_SET);
496             i= -1;
497         }
498     }
499 #ifdef PKT_DEBUG
500     if (s->debug & 0x01) sleep(1);
501 #endif
502     if (i == s->s2->wpend_len)
503     {
504         s->s2->wpend_len=0;
505         s->rwstate=SSL_NOTHING;
506         return(s->s2->wpend_ret);
507     }
508     else if (i <= 0)
509     {
510         return(i);
511         s->s2->wpend_off+=i;
512         s->s2->wpend_len-=i;
513     }
514 }
515
516 static int n_do_ssl_write(SSL *s, const unsigned char *buf, unsigned int len)
517 {
518     unsigned int j,k,olen,p,bs;
519     int mac_size;
520     register unsigned char *pp;
521
522     olen=len;
523
524     /* first check if there is data from an encryption waiting to

```

```

524     * be sent - it must be sent because the other end is waiting.
525     * This will happen with non-blocking IO. We print it and then
526     * return.
527     */
528     if (s->s2->wpend_len != 0) return(write_pending(s,buf,len));

530     /* set mac_size to mac size */
531     if (s->s2->clear_text)
532         mac_size=0;
533     else
534     {
535         mac_size=EVP_MD_CTX_size(s->write_hash);
536         if (mac_size < 0)
537             return -1;
538     }

540     /* lets set the pad p */
541     if (s->s2->clear_text)
542     {
543         if (len > SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER)
544             len=SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER;
545         p=0;
546         s->s2->three_byte_header=0;
547         /* len=len; */
548     }
549     else
550     {
551         bs=EVP_CIPHER_CTX_block_size(s->enc_read_ctx);
552         j=len+mac_size;
553         /* Two-byte headers allow for a larger record length than
554          * three-byte headers, but we can't use them if we need
555          * padding or if we have to set the escape bit. */
556         if ((j > SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER) &&
557             (!s->s2->escape))
558         {
559             if (j > SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER)
560                 j=SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER;
561             /* set k to the max number of bytes with 2
562              * byte header */
563             k=j-(j%bs);
564             /* how many data bytes? */
565             len=k-mac_size;
566             s->s2->three_byte_header=0;
567             p=0;
568         }
569         else if ((bs <= 1) && (!s->s2->escape))
570         {
571             /* j <= SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER, thus
572              * j < SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER */
573             s->s2->three_byte_header=0;
574             p=0;
575         }
576         else /* we may have to use a 3 byte header */
577         {
578             /* If s->s2->escape is not set, then
579              * j <= SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER, and thus
580              * j < SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER. */
581             p=(j%bs);
582             p=(p == 0)?0:(bs-p);
583             if (s->s2->escape)
584             {
585                 s->s2->three_byte_header=1;
586                 if (j > SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER)
587                     j=SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER;
588             }
589             else

```

```

590         s->s2->three_byte_header=(p == 0)?0:1;
591     }
592 }

594 /* Now
595  * j <= SSL2_MAX_RECORD_LENGTH_2_BYTE_HEADER
596  * holds, and if s->s2->three_byte_header is set, then even
597  * j <= SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER.
598  */

600 /* mac_size is the number of MAC bytes
601  * len is the number of data bytes we are going to send
602  * p is the number of padding bytes
603  * (if it is a two-byte header, then p == 0) */

605 s->s2->wlength=len;
606 s->s2->padding=p;
607 s->s2->mac_data= &(s->s2->wbuf[3]);
608 s->s2->wact_data= &(s->s2->wbuf[3+mac_size]);
609 /* we copy the data into s->s2->wbuf */
610 memcpy(s->s2->wact_data,buf,len);
611 if (p)
612     memset(&(s->s2->wact_data[len]),0,p); /* arbitrary padding */

614 if (!s->s2->clear_text)
615 {
616     s->s2->wact_data_length=len+p;
617     ssl2_mac(s,s->s2->mac_data,1);
618     s->s2->wlength+=p+mac_size;
619     ssl2_enc(s,1);
620 }

622 /* package up the header */
623 s->s2->wpend_len=s->s2->wlength;
624 if (s->s2->three_byte_header) /* 3 byte header */
625 {
626     pp=s->s2->mac_data;
627     pp-=3;
628     pp[0]=(s->s2->wlength>>8)&(THREE_BYTE_MASK>>8);
629     if (s->s2->escape) pp[0]|=SEC_ESC_BIT;
630     pp[1]=s->s2->wlength&0xff;
631     pp[2]=s->s2->padding;
632     s->s2->wpend_len+=3;
633 }
634 else
635 {
636     pp=s->s2->mac_data;
637     pp-=2;
638     pp[0]=((s->s2->wlength>>8)&(TWO_BYTE_MASK>>8))|TWO_BYTE_BIT;
639     pp[1]=s->s2->wlength&0xff;
640     s->s2->wpend_len+=2;
641 }
642 s->s2->write_ptr=pp;
643
644 INC32(s->s2->write_sequence); /* expect next number */

646 /* lets try to actually write the data */
647 s->s2->wpend_tot=olen;
648 s->s2->wpend_buf=buf;

650 s->s2->wpend_ret=len;

652 s->s2->wpend_off=0;
653 return(write_pending(s,buf,olen));
654 }

```

```

656 int ssl2_part_read(SSL *s, unsigned long f, int i)
657 {
658     unsigned char *p;
659     int j;

661     if (i < 0)
662     {
663         /* ssl2_return_error(s); */
664         /* for non-blocking io,
665          * this is not necessarily fatal */
666         return(i);
667     }
668     else
669     {
670         s->init_num+=i;

672         /* Check for error. While there are recoverable errors,
673          * this function is not called when those must be expected;
674          * any error detected here is fatal. */
675         if (s->init_num >= 3)
676         {
677             p=(unsigned char *)s->init_buf->data;
678             if (p[0] == SSL2_MT_ERROR)
679             {
680                 j=(p[1]<<8)|p[2];
681                 SSLerr((int)f,ssl_mt_error(j));
682                 s->init_num -= 3;
683                 if (s->init_num > 0)
684                     memmove(p, p+3, s->init_num);
685             }
686         }

688         /* If it's not an error message, we have some error anyway --
689          * the message was shorter than expected. This too is treated
690          * as fatal (at least if SSL_get_error is asked for its opinion)
691         return(0);
692     }
693 }

695 int ssl2_do_write(SSL *s)
696 {
697     int ret;

699     ret=ssl2_write(s,&s->init_buf->data[s->init_off],s->init_num);
700     if (ret == s->init_num)
701     {
702         if (s->msg_callback)
703             s->msg_callback(1, s->version, 0, s->init_buf->data, (si
704         return(1);
705     }
706     if (ret < 0)
707         return(-1);
708     s->init_off+=ret;
709     s->init_num-=ret;
710     return(0);
711 }

713 static int ssl_mt_error(int n)
714 {
715     int ret;

717     switch (n)
718     {
719     case SSL2_PE_NO_CIPHER:
720         ret=SSL_R_PEER_ERROR_NO_CIPHER;
721         break;

```

```

722     case SSL2_PE_NO_CERTIFICATE:
723         ret=SSL_R_PEER_ERROR_NO_CERTIFICATE;
724         break;
725     case SSL2_PE_BAD_CERTIFICATE:
726         ret=SSL_R_PEER_ERROR_CERTIFICATE;
727         break;
728     case SSL2_PE_UNSUPPORTED_CERTIFICATE_TYPE:
729         ret=SSL_R_PEER_ERROR_UNSUPPORTED_CERTIFICATE_TYPE;
730         break;
731     default:
732         ret=SSL_R_UNKNOWN_REMOTE_ERROR_TYPE;
733         break;
734     }
735     return(ret);
736 }
737 #else /* !OPENSSL_NO_SSL2 */

739 # if PEDANTIC
740 static void *dummy=&dummy;
741 # endif

743 #endif

```

```

*****
32266 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s2_srvr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* ssl/s2_srvr.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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57 */
58 /* =====
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60 *
61 * Redistribution and use in source and binary forms, with or without

```

```

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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include "ssl_locl.h"
113 #ifndef OPENSSL_NO_SSL2
114 #include <stdio.h>
115 #include <openssl/bio.h>
116 #include <openssl/rand.h>
117 #include <openssl/objects.h>
118 #include <openssl/evp.h>
119
120 static const SSL_METHOD *ssl2_get_server_method(int ver);
121 static int get_client_master_key(SSL *s);
122 static int get_client_hello(SSL *s);
123 static int server_hello(SSL *s);
124 static int get_client_finished(SSL *s);
125 static int server_verify(SSL *s);
126 static int server_finish(SSL *s);
127 static int request_certificate(SSL *s);

```

```

128 static int ssl_rsa_private_decrypt(CERT *c, int len, unsigned char *from,
129 unsigned char *to, int padding);
130 #define BREAK break

132 static const SSL_METHOD *ssl2_get_server_method(int ver)
133 {
134     if (ver == SSL2_VERSION)
135         return(SSLv2_server_method());
136     else
137         return(NULL);
138 }

140 IMPLEMENT_ssl2_meth_func(SSLv2_server_method,
141 ssl2_accept,
142 ssl_undefined_function,
143 ssl2_get_server_method)

145 int ssl2_accept(SSL *s)
146 {
147     unsigned long l=(unsigned long)time(NULL);
148     BUF_MEM *buf=NULL;
149     int ret= -1;
150     long num1;
151     void (*cb)(const SSL *ssl,int type,int val)=NULL;
152     int new_state,state;

154     RAND_add(&l,sizeof(l),0);
155     ERR_clear_error();
156     clear_sys_error();

158     if (s->info_callback != NULL)
159         cb=s->info_callback;
160     else if (s->ctx->info_callback != NULL)
161         cb=s->ctx->info_callback;

163     /* init things to blank */
164     s->in_handshake++;
165     if (!SSL_in_init(s) || SSL_in_before(s)) SSL_clear(s);

167     if (s->cert == NULL)
168     {
169         SSLerr(SSL_F_SSL2_ACCEPT,SSL_R_NO_CERTIFICATE_SET);
170         return(-1);
171     }

173     clear_sys_error();
174     for (;;)
175     {
176         state=s->state;

178         switch (s->state)
179         {
180             case SSL_ST_BEFORE:
181             case SSL_ST_ACCEPT:
182             case SSL_ST_BEFORE|SSL_ST_ACCEPT:
183             case SSL_ST_OK|SSL_ST_ACCEPT:

185                 s->server=1;
186                 if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_START,1);

188                 s->version=SSL2_VERSION;
189                 s->type=SSL_ST_ACCEPT;

191                 buf=s->init_buf;
192                 if ((buf == NULL) && ((buf=BUF_MEM_new()) == NULL))
193                     { ret= -1; goto end; }

```

```

194         if (!BUF_MEM_grow(buf,(int)
195             SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER))
196             { ret= -1; goto end; }
197         s->init_buf=buf;
198         s->init_num=0;
199         s->ctx->stats.sess_accept++;
200         s->handshake_func=ssl2_accept;
201         s->state=SSL2_ST_GET_CLIENT_HELLO_A;
202         BREAK;

204     case SSL2_ST_GET_CLIENT_HELLO_A:
205     case SSL2_ST_GET_CLIENT_HELLO_B:
206     case SSL2_ST_GET_CLIENT_HELLO_C:
207         s->shutdown=0;
208         ret=get_client_hello(s);
209         if (ret <= 0) goto end;
210         s->init_num=0;
211         s->state=SSL2_ST_SEND_SERVER_HELLO_A;
212         BREAK;

214     case SSL2_ST_SEND_SERVER_HELLO_A:
215     case SSL2_ST_SEND_SERVER_HELLO_B:
216         ret=server_hello(s);
217         if (ret <= 0) goto end;
218         s->init_num=0;
219         if (!s->hit)
220         {
221             s->state=SSL2_ST_GET_CLIENT_MASTER_KEY_A;
222             BREAK;
223         }
224         else
225         {
226             s->state=SSL2_ST_SERVER_START_ENCRYPTION;
227             BREAK;
228         }
229     case SSL2_ST_GET_CLIENT_MASTER_KEY_A:
230     case SSL2_ST_GET_CLIENT_MASTER_KEY_B:
231         ret=get_client_master_key(s);
232         if (ret <= 0) goto end;
233         s->init_num=0;
234         s->state=SSL2_ST_SERVER_START_ENCRYPTION;
235         BREAK;

237     case SSL2_ST_SERVER_START_ENCRYPTION:
238         /* Ok we now have sent all the stuff needed to
239          * start encrypting, the next packet back will
240          * be encrypted. */
241         if (!ssl2_enc_init(s,0))
242             { ret= -1; goto end; }
243         s->s2->clear_text=0;
244         s->state=SSL2_ST_SEND_SERVER_VERIFY_A;
245         BREAK;

247     case SSL2_ST_SEND_SERVER_VERIFY_A:
248     case SSL2_ST_SEND_SERVER_VERIFY_B:
249         ret=server_verify(s);
250         if (ret <= 0) goto end;
251         s->init_num=0;
252         if (s->hit)
253         {
254             /* If we are in here, we have been
255              * buffering the output, so we need to
256              * flush it and remove buffering from
257              * future traffic */
258             s->state=SSL2_ST_SEND_SERVER_VERIFY_C;
259             BREAK;

```

```

260     }
261     else
262     {
263         s->state=SSL2_ST_GET_CLIENT_FINISHED_A;
264         break;
265     }
266
267 case SSL2_ST_SEND_SERVER_VERIFY_C:
268     /* get the number of bytes to write */
269     num1=BIO_ctrl(s->wbio,BIO_CTRL_INFO,0,NULL);
270     if (num1 > 0)
271     {
272         s->rwstate=SSL_WRITING;
273         num1=BIO_flush(s->wbio);
274         if (num1 <= 0) { ret= -1; goto end; }
275         s->rwstate=SSL_NOTHING;
276     }
277
278     /* flushed and now remove buffering */
279     s->wbio=BIO_pop(s->wbio);
280
281     s->state=SSL2_ST_GET_CLIENT_FINISHED_A;
282     BREAK;
283
284 case SSL2_ST_GET_CLIENT_FINISHED_A:
285 case SSL2_ST_GET_CLIENT_FINISHED_B:
286     ret=get_client_finished(s);
287     if (ret <= 0)
288         goto end;
289     s->init_num=0;
290     s->state=SSL2_ST_SEND_REQUEST_CERTIFICATE_A;
291     BREAK;
292
293 case SSL2_ST_SEND_REQUEST_CERTIFICATE_A:
294 case SSL2_ST_SEND_REQUEST_CERTIFICATE_B:
295 case SSL2_ST_SEND_REQUEST_CERTIFICATE_C:
296 case SSL2_ST_SEND_REQUEST_CERTIFICATE_D:
297     /* don't do a 'request certificate' if we
298      * don't want to, or we already have one, and
299      * we only want to do it once. */
300     if (!(s->verify_mode & SSL_VERIFY_PEER) ||
301         ((s->session->peer != NULL) &&
302          (s->verify_mode & SSL_VERIFY_CLIENT_ONCE)))
303     {
304         s->state=SSL2_ST_SEND_SERVER_FINISHED_A;
305         break;
306     }
307     else
308     {
309         ret=request_certificate(s);
310         if (ret <= 0) goto end;
311         s->init_num=0;
312         s->state=SSL2_ST_SEND_SERVER_FINISHED_A;
313     }
314     BREAK;
315
316 case SSL2_ST_SEND_SERVER_FINISHED_A:
317 case SSL2_ST_SEND_SERVER_FINISHED_B:
318     ret=server_finish(s);
319     if (ret <= 0) goto end;
320     s->init_num=0;
321     s->state=SSL_ST_OK;
322     break;
323
324 case SSL_ST_OK:
325     BUF_MEM_free(s->init_buf);

```

```

326     ssl_free_wbio_buffer(s);
327     s->init_buf=NULL;
328     s->init_num=0;
329     /* ERR_clear_error(); */
330
331     ssl_update_cache(s,SSL_SESS_CACHE_SERVER);
332
333     s->ctx->stats.sess_accept_good++;
334     /* s->server=1; */
335     ret=1;
336
337     if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_DONE,1);
338
339     goto end;
340     /* BREAK; */
341
342 default:
343     SSLerr(SSL_F_SSL2_ACCEPT,SSL_R_UNKNOWN_STATE);
344     ret= -1;
345     goto end;
346     /* BREAK; */
347 }
348
349 if ((cb != NULL) && (s->state != state))
350 {
351     new_state=s->state;
352     s->state=state;
353     cb(s,SSL_CB_ACCEPT_LOOP,1);
354     s->state=new_state;
355 }
356 }
357 end:
358     s->in_handshake--;
359     if (cb != NULL)
360         cb(s,SSL_CB_ACCEPT_EXIT,ret);
361     return(ret);
362 }
363
364 static int get_client_master_key(SSL *s)
365 {
366     int is_export,i,n,keya,ek;
367     unsigned long len;
368     unsigned char *p;
369     const SSL_CIPHER *cp;
370     const EVP_CIPHER *c;
371     const EVP_MD *md;
372
373     p=(unsigned char *)s->init_buf->data;
374     if (s->state == SSL2_ST_GET_CLIENT_MASTER_KEY_A)
375     {
376         i=ssl2_read(s,(char *)&(p[s->init_num]),10-s->init_num);
377
378         if (i < (10-s->init_num))
379             return(ssl2_part_read(s,SSL_F_GET_CLIENT_MASTER_KEY,i));
380         s->init_num = 10;
381
382         if (*(p++) != SSL2_MT_CLIENT_MASTER_KEY)
383         {
384             if (p[-1] != SSL2_MT_ERROR)
385             {
386                 ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
387                 SSLerr(SSL_F_GET_CLIENT_MASTER_KEY,SSL_R_READ_WR
388                     );
389             }
390             else
391                 SSLerr(SSL_F_GET_CLIENT_MASTER_KEY,SSL_R_PEER_E
392                     );
393             return(-1);

```

```

392     }
394     cp=ssl2_get_cipher_by_char(p);
395     if (cp == NULL)
396     {
397         ssl2_return_error(s,SSL2_PE_NO_CIPHER);
398         SSLerr(SSL_F_GET_CLIENT_MASTER_KEY, SSL_R_NO_CIPHER_MATC
399         return(-1);
400     }
401     s->session->cipher= cp;
403     p+=3;
404     n2s(p,i); s->s2->tmp.clear=i;
405     n2s(p,i); s->s2->tmp.enc=i;
406     n2s(p,i);
407     if(i > SSL_MAX_KEY_ARG_LENGTH)
408     {
409         ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
410         SSLerr(SSL_F_GET_CLIENT_MASTER_KEY, SSL_R_KEY_ARG_TOO_LO
411         return -1;
412     }
413     s->session->key_arg_length=i;
414     s->state=SSL2_ST_GET_CLIENT_MASTER_KEY_B;
415 }
417 /* SSL2_ST_GET_CLIENT_MASTER_KEY_B */
418 p=(unsigned char *)s->init_buf->data;
419 if (s->init_buf->length < SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER)
420 {
421     ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
422     SSLerr(SSL_F_GET_CLIENT_MASTER_KEY, ERR_R_INTERNAL_ERROR);
423     return -1;
424 }
425 keya=s->session->key_arg_length;
426 len = 10 + (unsigned long)s->s2->tmp.clear + (unsigned long)s->s2->tmp.e
427 if (len > SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER)
428 {
429     ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
430     SSLerr(SSL_F_GET_CLIENT_MASTER_KEY,SSL_R_MESSAGE_TOO_LONG);
431     return -1;
432 }
433 n = (int)len - s->init_num;
434 i = ssl2_read(s,(char *)&(p[s->init_num]),n);
435 if (i != n) return(ssl2_part_read(s,SSL_F_GET_CLIENT_MASTER_KEY,i));
436 if (s->msg_callback)
437     s->msg_callback(0, s->version, 0, p, (size_t)len, s, s->msg_call
438     p += 10;
440 memcpy(s->session->key_arg,&(p[s->s2->tmp.clear+s->s2->tmp.enc]),
441     (unsigned int)keya);
443 if (s->cert->pkeys[SSL_PKEY_RSA_ENC].privatekey == NULL)
444 {
445     ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
446     SSLerr(SSL_F_GET_CLIENT_MASTER_KEY,SSL_R_NO_PRIVATEKEY);
447     return(-1);
448 }
449 i=ssl_rsa_private_decrypt(s->cert,s->s2->tmp.enc,
450     &(p[s->s2->tmp.clear]),&(p[s->s2->tmp.clear]),
451     (s->s2->ssl2_rollback)?RSA_SSLV23_PADDING:RSA_PKCS1_PADDING);
453 is_export=SSL_C_IS_EXPORT(s->session->cipher);
454
455 if (!ssl_cipher_get_evp(s->session,&c,&md,NULL,NULL))
456 {
457     ssl2_return_error(s,SSL2_PE_NO_CIPHER);

```

```

458     SSLerr(SSL_F_GET_CLIENT_MASTER_KEY,SSL_R_PROBLEMS_MAPPING_CIPHER
459     return(0);
460 }
462 if (s->session->cipher->algorithm2 & SSL2_CF_8_BYTE_ENC)
463 {
464     is_export=1;
465     ek=8;
466 }
467 else
468     ek=5;
470 /* bad decrypt */
471 #if 1
472 /* If a bad decrypt, continue with protocol but with a
473  * random master secret (Bleichenbacher attack) */
474 if ((i < 0) ||
475     ((!is_export && (i != EVP_CIPHER_key_length(c)))
476     || (is_export && ((i != ek) || (s->s2->tmp.clear+(unsigned int)i
477     (unsigned int)EVP_CIPHER_key_length(c)))))
478 {
479     ERR_clear_error();
480     if (is_export)
481         i=ek;
482     else
483         i=EVP_CIPHER_key_length(c);
484     if (RAND_pseudo_bytes(p,i) <= 0)
485         return 0;
486 }
487 #else
488 if (i < 0)
489 {
490     error=1;
491     SSLerr(SSL_F_GET_CLIENT_MASTER_KEY,SSL_R_BAD_RSA_DECRYPT);
492 }
493 /* incorrect number of key bytes for non export cipher */
494 else if ((!is_export && (i != EVP_CIPHER_key_length(c)))
495     || (is_export && ((i != ek) || (s->s2->tmp.clear+i !=
496     EVP_CIPHER_key_length(c)))))
497 {
498     error=1;
499     SSLerr(SSL_F_GET_CLIENT_MASTER_KEY,SSL_R_WRONG_NUMBER_OF_KEY_BIT
500 }
501 if (error)
502 {
503     ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
504     return(-1);
505 }
506 #endif
508 if (is_export) i+=s->s2->tmp.clear;
510 if (i > SSL_MAX_MASTER_KEY_LENGTH)
511 {
512     ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
513     SSLerr(SSL_F_GET_CLIENT_MASTER_KEY, ERR_R_INTERNAL_ERROR);
514     return -1;
515 }
516 s->session->master_key_length=i;
517 memcpy(s->session->master_key,p,(unsigned int)i);
518 return(1);
519 }
521 static int get_client_hello(SSL *s)
522 {
523     int i,n;

```

```

524     unsigned long len;
525     unsigned char *p;
526     STACK_OF(SSL_CIPHER) *cs; /* a stack of SSL_CIPHERS */
527     STACK_OF(SSL_CIPHER) *cl; /* the ones we want to use */
528     STACK_OF(SSL_CIPHER) *prio, *allow;
529     int z;

531     /* This is a bit of a hack to check for the correct packet
532      * type the first time round. */
533     if (s->state == SSL2_ST_GET_CLIENT_HELLO_A)
534     {
535         s->first_packet=1;
536         s->state=SSL2_ST_GET_CLIENT_HELLO_B;
537     }

539     p=(unsigned char *)s->init_buf->data;
540     if (s->state == SSL2_ST_GET_CLIENT_HELLO_B)
541     {
542         i=ssl2_read(s, (char *)&(p[s->init_num]), 9-s->init_num);
543         if (i < (9-s->init_num))
544             return(ssl2_part_read(s, SSL_F_GET_CLIENT_HELLO, i));
545         s->init_num = 9;
546         if (*(p++) != SSL2_MT_CLIENT_HELLO)
547         {
548             if (p[-1] != SSL2_MT_ERROR)
549             {
550                 ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
551                 SSLerr(SSL_F_GET_CLIENT_HELLO, SSL_R_READ_WRONG_P
552                     );
553             }
554             else
555                 SSLerr(SSL_F_GET_CLIENT_HELLO, SSL_R_PEER_ERROR);
556             return(-1);
557         }
558         n2s(p, i);
559         if (i < s->version) s->version=i;
560         n2s(p, i); s->s2->tmp.cipher_spec_length=i;
561         n2s(p, i); s->s2->tmp.session_id_length=i;
562         n2s(p, i); s->s2->challenge_length=i;
563         if ( (i < SSL2_MIN_CHALLENGE_LENGTH) ||
564             (i > SSL2_MAX_CHALLENGE_LENGTH) )
565         {
566             ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
567             SSLerr(SSL_F_GET_CLIENT_HELLO, SSL_R_INVALID_CHALLENGE_LE
568                 );
569             return(-1);
570         }
571         s->state=SSL2_ST_GET_CLIENT_HELLO_C;
572     }

573     /* SSL2_ST_GET_CLIENT_HELLO_C */
574     p=(unsigned char *)s->init_buf->data;
575     len = 9 + (unsigned long)s->s2->tmp.cipher_spec_length + (unsigned long)
576     if (len > SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER)
577     {
578         ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
579         SSLerr(SSL_F_GET_CLIENT_HELLO, SSL_R_MESSAGE_TOO_LONG);
580         return -1;
581     }
582     n = (int)len - s->init_num;
583     i = ssl2_read(s, (char *)&(p[s->init_num]), n);
584     if (i != n) return(ssl2_part_read(s, SSL_F_GET_CLIENT_HELLO, i));
585     if (s->msg_callback)
586         s->msg_callback(0, s->version, 0, p, (size_t)len, s, s->msg_call
587     p += 9;

589     /* get session-id before cipher stuff so we can get out session

```

```

590     * structure if it is cached */
591     /* session-id */
592     if ((s->s2->tmp.session_id_length != 0) &&
593         (s->s2->tmp.session_id_length != SSL2_SSL_SESSION_ID_LENGTH))
594     {
595         ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
596         SSLerr(SSL_F_GET_CLIENT_HELLO, SSL_R_BAD_SSL_SESSION_ID_LENGTH);
597         return(-1);
598     }

600     if (s->s2->tmp.session_id_length == 0)
601     {
602         if (!ssl_get_new_session(s, 1))
603         {
604             ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
605             return(-1);
606         }
607     }
608     else
609     {
610         i=ssl_get_prev_session(s, &(p[s->s2->tmp.cipher_spec_length]),
611             s->s2->tmp.session_id_length, NULL);
612         if (i == 1)
613             /* previous session */
614             s->hit=1;
615         else if (i == -1)
616             ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
617             return(-1);
618         else
619         {
620             if (s->cert == NULL)
621             {
622                 ssl2_return_error(s, SSL2_PE_NO_CERTIFICATE);
623                 SSLerr(SSL_F_GET_CLIENT_HELLO, SSL_R_NO_CERTIFICA
624                     );
625                 return(-1);
626             }
627             if (!ssl_get_new_session(s, 1))
628             {
629                 ssl2_return_error(s, SSL2_PE_UNDEFINED_ERROR);
630                 return(-1);
631             }
632         }
633     }

634     }

635     if (!s->hit)
636     {
637         cs=ssl_bytes_to_cipher_list(s, p, s->s2->tmp.cipher_spec_length,
638             &s->session->ciphers);
639         if (cs == NULL) goto mem_err;

641         cl=SSL_get_ciphers(s);

643         if (s->options & SSL_OP_CIPHER_SERVER_PREFERENCE)
644         {
645             prio=sk_SSL_CIPHER_dup(cl);
646             if (prio == NULL) goto mem_err;
647             allow = cs;
648         }
649         else
650         {
651             prio = cs;
652             allow = cl;
653         }
654     }

```



```

656         }
657         for (z=0; z<sk_SSL_CIPHER_num(prio); z++)
658             {
659                 if (sk_SSL_CIPHER_find(allow,sk_SSL_CIPHER_value(prio,z)
660                     {
661                         (void)sk_SSL_CIPHER_delete(prio,z);
662                         z--;
663                     }
664             }
665         if (s->options & SSL_OP_CIPHER_SERVER_PREFERENCE)
666             {
667                 sk_SSL_CIPHER_free(s->session->ciphers);
668                 s->session->ciphers = prio;
669             }
670         /* s->session->ciphers should now have a list of
671            * ciphers that are on both the client and server.
672            * This list is ordered by the order the client sent
673            * the ciphers or in the order of the server's preference
674            * if SSL_OP_CIPHER_SERVER_PREFERENCE was set.
675            */
676         p+=s->s2->tmp.cipher_spec_length;
677         /* done cipher selection */
678
679         /* session id extracted already */
680         p+=s->s2->tmp.session_id_length;
681
682         /* challenge */
683         if (s->s2->challenge_length > sizeof s->s2->challenge)
684             {
685                 ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
686                 SSLerr(SSL_F_GET_CLIENT_HELLO, ERR_R_INTERNAL_ERROR);
687                 return -1;
688             }
689         memcpy(s->s2->challenge,p,(unsigned int)s->s2->challenge_length);
690         return(1);
691     mem_err:
692     SSLerr(SSL_F_GET_CLIENT_HELLO,ERR_R_MALLOC_FAILURE);
693     return(0);
694 }
695
696 static int server_hello(SSL *s)
697 {
698     unsigned char *p,*d;
699     int n,hit;
700
701     p=(unsigned char *)s->init_buf->data;
702     if (s->state == SSL2_ST_SEND_SERVER_HELLO_A)
703         {
704             d=p+11;
705             *(p++)=SSL2_MT_SERVER_HELLO;          /* type */
706             hit=s->hit;
707             *(p++)=(unsigned char)hit;
708         }
709     #if 1
710         if (!hit)
711             {
712                 if (s->session->sess_cert != NULL)
713                     /* This can't really happen because get_client_h
714                      * has called ssl_get_new_session, which does no
715                      * sess_cert. */
716                     ssl_sess_cert_free(s->session->sess_cert);
717                 s->session->sess_cert = ssl_sess_cert_new();
718                 if (s->session->sess_cert == NULL)
719                     {
720                         SSLerr(SSL_F_SERVER_HELLO, ERR_R_MALLOC_FAILURE)
721                         return(-1);

```

```

722         }
723     }
724     /* If 'hit' is set, then s->sess_cert may be non-NULL or NULL,
725     * depending on whether it survived in the internal cache
726     * or was retrieved from an external cache.
727     * If it is NULL, we cannot put any useful data in it anyway,
728     * so we don't touch it.
729     */
730
731     #else /* That's what used to be done when cert_st and sess_cert_st were
732            * the same. */
733         if (!hit)
734             {
735                 /* else add cert to session */
736                 CRYPTO_add(&s->cert->references,1,CRYPTO_LOCK_SSL_CERT);
737                 if (s->session->sess_cert != NULL)
738                     ssl_cert_free(s->session->sess_cert);
739                 s->session->sess_cert=s->cert;
740             }
741         else /* We have a session id-cache hit, if the
742            * session-id has no certificate listed against
743            * the 'cert' structure, grab the 'old' one
744            * listed against the SSL connection */
745             {
746                 if (s->session->sess_cert == NULL)
747                     {
748                         CRYPTO_add(&s->cert->references,1,
749                             CRYPTO_LOCK_SSL_CERT);
750                         s->session->sess_cert=s->cert;
751                     }
752             }
753     #endif
754
755     if (s->cert == NULL)
756         {
757             ssl2_return_error(s,SSL2_PE_NO_CERTIFICATE);
758             SSLerr(SSL_F_SERVER_HELLO,SSL_R_NO_CERTIFICATE_SPECIFIED
759                 return(-1);
760         }
761
762     if (hit)
763         {
764             *(p++)=0;          /* no certificate type */
765             s2n(s->version,p);  /* version */
766             s2n(0,p);          /* cert len */
767             s2n(0,p);          /* ciphers len */
768         }
769     else
770         {
771             /* EAY EAY */
772             /* put certificate type */
773             *(p++)=SSL2_CT_X509_CERTIFICATE;
774             s2n(s->version,p);  /* version */
775             n=i2d_X509(s->cert->pkeys[SSL_PKEY_RSA_ENC].x509,NULL);
776             s2n(n,p);          /* certificate length */
777             i2d_X509(s->cert->pkeys[SSL_PKEY_RSA_ENC].x509,&d);
778             n=0;
779
780             /* lets send out the ciphers we like in the
781             * preferred order */
782             n=ssl_cipher_list_to_bytes(s,s->session->ciphers,d,0);
783             d+=n;
784             s2n(n,p);          /* add cipher length */
785         }
786
787     /* make and send conn_id */
788     s2n(SSL2_CONNECTION_ID_LENGTH,p);          /* add conn_id length */

```

```

788     s->s2->conn_id_length=SSL2_CONNECTION_ID_LENGTH;
789     if (RAND_pseudo_bytes(s->s2->conn_id,(int)s->s2->conn_id_length)
790         return -1;
791     memcpy(d,s->s2->conn_id,SSL2_CONNECTION_ID_LENGTH);
792     d+=SSL2_CONNECTION_ID_LENGTH;

794     s->state=SSL2_ST_SEND_SERVER_HELLO_B;
795     s->init_num=d-(unsigned char *)s->init_buf->data;
796     s->init_off=0;
797 }
798 /* SSL2_ST_SEND_SERVER_HELLO_B */
799 /* If we are using TCP/IP, the performance is bad if we do 2
800  * writes without a read between them. This occurs when
801  * Session-id reuse is used, so I will put in a buffering module
802  */
803 if (s->hit)
804 {
805     if (!ssl_init_wbio_buffer(s,1)) return(-1);
806 }
807
808 return(ssl2_do_write(s));
809 }

811 static int get_client_finished(SSL *s)
812 {
813     unsigned char *p;
814     int i, n;
815     unsigned long len;

817     p=(unsigned char *)s->init_buf->data;
818     if (s->state == SSL2_ST_GET_CLIENT_FINISHED_A)
819     {
820         i=ssl2_read(s,(char *)&(p[s->init_num]),1-s->init_num);
821         if (i < 1-s->init_num)
822             return(ssl2_part_read(s,SSL_F_GET_CLIENT_FINISHED,i));
823         s->init_num += i;

825         if (*p != SSL2_MT_CLIENT_FINISHED)
826         {
827             if (*p != SSL2_MT_ERROR)
828             {
829                 ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
830                 SSLerr(SSL_F_GET_CLIENT_FINISHED,SSL_R_READ_WRON
831             }
832             else
833             {
834                 SSLerr(SSL_F_GET_CLIENT_FINISHED,SSL_R_PEER_ERRO
835                 /* try to read the error message */
836                 i=ssl2_read(s,(char *)&(p[s->init_num]),3-s->ini
837                 return ssl2_part_read(s,SSL_F_GET_SERVER_VERIFY,
838             }
839             return(-1);
840         }
841         s->state=SSL2_ST_GET_CLIENT_FINISHED_B;
842     }

844     /* SSL2_ST_GET_CLIENT_FINISHED_B */
845     if (s->s2->conn_id_length > sizeof s->s2->conn_id)
846     {
847         ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
848         SSLerr(SSL_F_GET_CLIENT_FINISHED, ERR_R_INTERNAL_ERROR);
849         return -1;
850     }
851     len = 1 + (unsigned long)s->s2->conn_id_length;
852     n = (int)len - s->init_num;
853     i = ssl2_read(s,(char *)&(p[s->init_num]),n);

```

```

854     if (i < n)
855     {
856         return(ssl2_part_read(s,SSL_F_GET_CLIENT_FINISHED,i));
857     }
858     if (s->msg_callback)
859         s->msg_callback(0, s->version, 0, p, len, s, s->msg_callback_arg
860     p += 1;
861     if (memcmp(p,s->s2->conn_id,s->s2->conn_id_length) != 0)
862     {
863         ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
864         SSLerr(SSL_F_GET_CLIENT_FINISHED,SSL_R_CONNECTION_ID_IS_DIFFEREN
865         return(-1);
866     }
867     return(1);
868 }

870 static int server_verify(SSL *s)
871 {
872     unsigned char *p;

874     if (s->state == SSL2_ST_SEND_SERVER_VERIFY_A)
875     {
876         p=(unsigned char *)s->init_buf->data;
877         *(p++)=SSL2_MT_SERVER_VERIFY;
878         if (s->s2->challenge_length > sizeof s->s2->challenge)
879         {
880             SSLerr(SSL_F_SERVER_VERIFY, ERR_R_INTERNAL_ERROR);
881             return -1;
882         }
883         memcpy(p,s->s2->challenge,(unsigned int)s->s2->challenge_length)
884         /* p+=s->s2->challenge_length; */

886         s->state=SSL2_ST_SEND_SERVER_VERIFY_B;
887         s->init_num=s->s2->challenge_length+1;
888         s->init_off=0;
889     }
890     return(ssl2_do_write(s));
891 }

893 static int server_finish(SSL *s)
894 {
895     unsigned char *p;

897     if (s->state == SSL2_ST_SEND_SERVER_FINISHED_A)
898     {
899         p=(unsigned char *)s->init_buf->data;
900         *(p++)=SSL2_MT_SERVER_FINISHED;

902         if (s->session->session_id_length > sizeof s->session->session_i
903         {
904             SSLerr(SSL_F_SERVER_FINISH, ERR_R_INTERNAL_ERROR);
905             return -1;
906         }
907         memcpy(p,s->session->session_id,(unsigned int)s->session->sessi
908         /* p+=s->session->session_id_length; */

910         s->state=SSL2_ST_SEND_SERVER_FINISHED_B;
911         s->init_num=s->session->session_id_length+1;
912         s->init_off=0;
913     }

915     /* SSL2_ST_SEND_SERVER_FINISHED_B */
916     return(ssl2_do_write(s));
917 }

919 /* send the request and check the response */

```

```

920 static int request_certificate(SSL *s)
921 {
922     const unsigned char *cp;
923     unsigned char *p,*p2,*buf2;
924     unsigned char *ccd;
925     int i,j,ctype,ret= -1;
926     unsigned long len;
927     X509 *x509=NULL;
928     STACK_OF(X509) *sk=NULL;

930     ccd=s->s2->tmp.ccl;
931     if (s->state == SSL2_ST_SEND_REQUEST_CERTIFICATE_A)
932     {
933         p=(unsigned char *)s->init_buf->data;
934         *(p++)=SSL2_MT_REQUEST_CERTIFICATE;
935         *(p++)=SSL2_AT_MD5_WITH_RSA_ENCRYPTION;
936         if (RAND_pseudo_bytes(ccd,SSL2_MIN_CERT_CHALLENGE_LENGTH) <= 0)
937             return -1;
938         memcpy(p,ccd,SSL2_MIN_CERT_CHALLENGE_LENGTH);

940         s->state=SSL2_ST_SEND_REQUEST_CERTIFICATE_B;
941         s->init_num=SSL2_MIN_CERT_CHALLENGE_LENGTH+2;
942         s->init_off=0;
943     }

945     if (s->state == SSL2_ST_SEND_REQUEST_CERTIFICATE_B)
946     {
947         i=ssl2_do_write(s);
948         if (i <= 0)
949         {
950             ret=i;
951             goto end;
952         }

954         s->init_num=0;
955         s->state=SSL2_ST_SEND_REQUEST_CERTIFICATE_C;
956     }

958     if (s->state == SSL2_ST_SEND_REQUEST_CERTIFICATE_C)
959     {
960         p=(unsigned char *)s->init_buf->data;
961         i=ssl2_read(s,(char *)&(p[s->init_num]),6-s->init_num); /* try t
962         if (i < 3-s->init_num) /* ... but don't call ssl2_part_read now
963             * (probably NO-CERTIFICATE-ERROR) */
964         {
965             ret=ssl2_part_read(s,SSL_F_REQUEST_CERTIFICATE,i);
966             goto end;
967         }
968         s->init_num += i;

970         if ((s->init_num >= 3) && (p[0] == SSL2_MT_ERROR))
971         {
972             n2s(p,i);
973             if (i != SSL2_PE_NO_CERTIFICATE)
974             {
975                 /* not the error message we expected -- let ssl2
976                 s->init_num -= 3;
977                 ret = ssl2_part_read(s,SSL_F_REQUEST_CERTIFICATE
978                 goto end;
979             }

981             if (s->msg_callback)
982                 s->msg_callback(0, s->version, 0, p, 3, s, s->ms

984             /* this is the one place where we can recover from an SS

```

```

986         if (s->verify_mode & SSL_VERIFY_FAIL_IF_NO_PEER_CERT)
987         {
988             ssl2_return_error(s,SSL2_PE_BAD_CERTIFICATE);
989             SSLerr(SSL_F_REQUEST_CERTIFICATE,SSL_R_PEER_DID_
990             goto end;
991         }

992         ret=1;
993         goto end;
994     }

995     if ((*p++) != SSL2_MT_CLIENT_CERTIFICATE) || (s->init_num < 6))
996     {
997         ssl2_return_error(s,SSL2_PE_UNDEFINED_ERROR);
998         SSLerr(SSL_F_REQUEST_CERTIFICATE,SSL_R_SHORT_READ);
999         goto end;
1000     }

1001     if (s->init_num != 6)
1002     {
1003         SSLerr(SSL_F_REQUEST_CERTIFICATE, ERR_R_INTERNAL_ERROR);
1004         goto end;
1005     }

1006     /* ok we have a response */
1007     /* certificate type, there is only one right now. */
1008     ctype= *(p++);
1009     if (ctype != SSL2_AT_MD5_WITH_RSA_ENCRYPTION)
1010     {
1011         ssl2_return_error(s,SSL2_PE_UNSUPPORTED_CERTIFICATE_TYPE
1012         SSLerr(SSL_F_REQUEST_CERTIFICATE,SSL_R_BAD_RESPONSE_ARGU
1013         goto end;
1014     }

1015     n2s(p,i); s->s2->tmp.clen=i;
1016     n2s(p,i); s->s2->tmp.rlen=i;
1017     s->state=SSL2_ST_SEND_REQUEST_CERTIFICATE_D;
1018 }

1019

1021 /* SSL2_ST_SEND_REQUEST_CERTIFICATE_D */
1022 p=(unsigned char *)s->init_buf->data;
1023 len = 6 + (unsigned long)s->s2->tmp.clen + (unsigned long)s->s2->tmp.rle
1024 if (len > SSL2_MAX_RECORD_LENGTH_3_BYTE_HEADER)
1025 {
1026     SSLerr(SSL_F_REQUEST_CERTIFICATE,SSL_R_MESSAGE_TOO_LONG);
1027     goto end;
1028 }

1029 j = (int)len - s->init_num;
1030 i = ssl2_read(s,(char *)&(p[s->init_num]),j);
1031 if (i < j)
1032 {
1033     ret=ssl2_part_read(s,SSL_F_REQUEST_CERTIFICATE,i);
1034     goto end;
1035 }

1036 if (s->msg_callback)
1037     s->msg_callback(0, s->version, 0, p, len, s, s->msg_callback_arg
1038     p += 6;

1040     cp = p;
1041     x509=(X509 *)d2i_X509(NULL,&cp,(long)s->s2->tmp.clen);
1042     if (x509 == NULL)
1043     {
1044         SSLerr(SSL_F_REQUEST_CERTIFICATE,ERR_R_X509_LIB);
1045         goto msg_end;
1046     }

1048     if (((sk=sk_X509_new_null()) == NULL) || (!sk_X509_push(sk,x509)))
1049     {
1050         SSLerr(SSL_F_REQUEST_CERTIFICATE,ERR_R_MALLOC_FAILURE);
1051         goto msg_end;

```

```

1052     }
1054     i=ssl_verify_cert_chain(s,sk);
1056     if (i > 0)      /* we like the packet, now check the chksum */
1057     {
1058         EVP_MD_CTX ctx;
1059         EVP_PKEY *pkey=NULL;
1061         EVP_MD_CTX_init(&ctx);
1062         if (!EVP_VerifyInit_ex(&ctx,s->ctx->rsa_md5, NULL)
1063             || !EVP_VerifyUpdate(&ctx,s->s2->key_material,
1064                                 s->s2->key_material_length)
1065             || !EVP_VerifyUpdate(&ctx,ccd,
1066                                 SSL2_MIN_CERT_CHALLENGE_LENGTH))
1067             goto msg_end;
1069         i=i2d_X509(s->cert->pkeys[SSL_PKEY_RSA_ENC].x509,NULL);
1070         buf2=OPENSSL_malloc((unsigned int)i);
1071         if (buf2 == NULL)
1072         {
1073             SSLerr(SSL_F_REQUEST_CERTIFICATE,ERR_R_MALLOC_FAILURE);
1074             goto msg_end;
1075         }
1076         p2=buf2;
1077         i=i2d_X509(s->cert->pkeys[SSL_PKEY_RSA_ENC].x509,&p2);
1078         if (!EVP_VerifyUpdate(&ctx,buf2,(unsigned int)i))
1079         {
1080             OPENSSL_free(buf2);
1081             goto msg_end;
1082         }
1083         OPENSSL_free(buf2);
1085         pkey=X509_get_pubkey(x509);
1086         if (pkey == NULL) goto end;
1087         i=EVP_VerifyFinal(&ctx,cp,s->s2->tmp.rlen,pkey);
1088         EVP_PKEY_free(pkey);
1089         EVP_MD_CTX_cleanup(&ctx);
1091         if (i > 0)
1092         {
1093             if (s->session->peer != NULL)
1094                 X509_free(s->session->peer);
1095             s->session->peer=x509;
1096             CRYPTO_add(&x509->references,1,CRYPTO_LOCK_X509);
1097             s->session->verify_result = s->verify_result;
1098             ret=1;
1099             goto end;
1100         }
1101         else
1102         {
1103             SSLerr(SSL_F_REQUEST_CERTIFICATE,SSL_R_BAD_CHECKSUM);
1104             goto msg_end;
1105         }
1106     }
1107     else
1108     {
1109 msg_end:
1110         ssl2_return_error(s,SSL2_PE_BAD_CERTIFICATE);
1111     }
1112 end:
1113     sk_X509_free(sk);
1114     X509_free(x509);
1115     return(ret);
1116 }

```

```

1118 static int ssl_rsa_private_decrypt(CERT *c, int len, unsigned char *from,
1119                                   unsigned char *to, int padding)
1120 {
1121     RSA *rsa;
1122     int i;
1124     if ((c == NULL) || (c->pkeys[SSL_PKEY_RSA_ENC].privatekey == NULL))
1125     {
1126         SSLerr(SSL_F_SSL_RSA_PRIVATE_DECRYPT,SSL_R_NO_PRIVATEKEY);
1127         return(-1);
1128     }
1129     if (c->pkeys[SSL_PKEY_RSA_ENC].privatekey->type != EVP_PKEY_RSA)
1130     {
1131         SSLerr(SSL_F_SSL_RSA_PRIVATE_DECRYPT,SSL_R_PUBLIC_KEY_IS_NOT_RSA);
1132         return(-1);
1133     }
1134     rsa=c->pkeys[SSL_PKEY_RSA_ENC].privatekey->pkey.rsa;
1136     /* we have the public key */
1137     i=RSA_private_decrypt(len,from,to,rsa,padding);
1138     if (i < 0)
1139         SSLerr(SSL_F_SSL_RSA_PRIVATE_DECRYPT,ERR_R_RSA_LIB);
1140     return(i);
1141 }
1142 #else /* !OPENSSL_NO_SSL2 */
1144 # if PEDANTIC
1145 static void *dummy=&dummy;
1146 # endif
1148 #endif

```

```

*****
24114 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_both.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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8  *
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57 */
58 /* =====
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60 *
61 * Redistribution and use in source and binary forms, with or without

```

```

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104 * =====
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108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 * ECC cipher suite support in OpenSSL originally developed by
114 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
115 */
116
117 #include <limits.h>
118 #include <string.h>
119 #include <stdio.h>
120 #include "ssl_locl.h"
121 #include <openssl/buffer.h>
122 #include <openssl/rand.h>
123 #include <openssl/objects.h>
124 #include <openssl/evp.h>
125 #include <openssl/x509.h>
126
127 /* send s->init_buf in records of type 'type' (SSL3_RT_HANDSHAKE or SSL3_RT_CHAN

```

```

128 int ssl3_do_write(SSL *s, int type)
129 {
130     int ret;

132     ret=ssl3_write_bytes(s,type,&s->init_buf->data[s->init_off],
133                          s->init_num);
134     if (ret < 0) return(-1);
135     if (type == SSL3_RT_HANDSHAKE)
136         /* should not be done for 'Hello Request's, but in that case
137          * we'll ignore the result anyway */
138         ssl3_finish_mac(s,(unsigned char *)&s->init_buf->data[s->init_of
139     if (ret == s->init_num)
140     {
141         if (s->msg_callback)
142             s->msg_callback(1, s->version, type, s->init_buf->data,
143                             return(1);
144     }
145     s->init_off+=ret;
146     s->init_num-=ret;
147     return(0);
148 }
149

151 int ssl3_send_finished(SSL *s, int a, int b, const char *sender, int slen)
152 {
153     unsigned char *p,*d;
154     int i;
155     unsigned long l;

157     if (s->state == a)
158     {
159         d=(unsigned char *)s->init_buf->data;
160         p= &d[4];

162         i=s->method->ssl3_enc->final_finish_mac(s,
163         sender,slen,s->s3->tmp.finish_md);
164         if (i == 0)
165             return 0;
166         s->s3->tmp.finish_md_len = i;
167         memcpy(p, s->s3->tmp.finish_md, i);
168         p+=i;
169         l=i;

171         /* Copy the finished so we can use it for
172          renegotiation checks */
173         if(s->type == SSL_ST_CONNECT)
174         {
175             OPENSSL_assert(i <= EVP_MAX_MD_SIZE);
176             memcpy(s->s3->previous_client_finished,
177                  s->s3->tmp.finish_md, i);
178             s->s3->previous_client_finished_len=i;
179         }
180         else
181         {
182             OPENSSL_assert(i <= EVP_MAX_MD_SIZE);
183             memcpy(s->s3->previous_server_finished,
184                  s->s3->tmp.finish_md, i);
185             s->s3->previous_server_finished_len=i;
186         }

188 #ifdef OPENSSL_SYS_WIN16
189     /* MSVC 1.5 does not clear the top bytes of the word unless
190      * I do this.
191      */
192     l&=0xffff;
193 #endif

```

```

195         *(d++)=SSL3_MT_FINISHED;
196         l2n3(l,d);
197         s->init_num=(int)l+4;
198         s->init_off=0;

200         s->state=b;
201     }

203     /* SSL3_ST_SEND_XXXXXX_HELLO_B */
204     return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
205 }

207 #ifndef OPENSSL_NO_NEXTPROTONEG
208 /* ssl3_take_mac calculates the Finished MAC for the handshakes messages seen to
209 static void ssl3_take_mac(SSL *s)
210 {
211     const char *sender;
212     int slen;
213     /* If no new cipher setup return immediately: other functions will
214      * set the appropriate error.
215     */
216     if (s->s3->tmp.new_cipher == NULL)
217         return;
218     if (s->state & SSL_ST_CONNECT)
219     {
220         sender=s->method->ssl3_enc->server_finished_label;
221         slen=s->method->ssl3_enc->server_finished_label_len;
222     }
223     else
224     {
225         sender=s->method->ssl3_enc->client_finished_label;
226         slen=s->method->ssl3_enc->client_finished_label_len;
227     }

229     s->s3->tmp.peer_finish_md_len = s->method->ssl3_enc->final_finish_mac(s,
230     sender,slen,s->s3->tmp.peer_finish_md);
231 }
232 #endif

234 int ssl3_get_finished(SSL *s, int a, int b)
235 {
236     int al,i,ok;
237     long n;
238     unsigned char *p;

240 #ifdef OPENSSL_NO_NEXTPROTONEG
241     /* the mac has already been generated when we received the
242      * change cipher spec message and is in s->s3->tmp.peer_finish_md.
243     */
244 #endif

246     n=s->method->ssl_get_message(s,
247     a,
248     b,
249     SSL3_MT_FINISHED,
250     64, /* should actually be 36+4 :- ) */
251     &ok);

253     if (!ok) return((int)n);

255     /* If this occurs, we have missed a message */
256     if (!s->s3->change_cipher_spec)
257     {
258         al=SSL_AD_UNEXPECTED_MESSAGE;
259         SSLerr(SSL_F_SSL3_GET_FINISHED,SSL_R_GOT_A_FIN_BEFORE_A_CCS);

```

```

260         goto f_err;
261     }
262     s->s3->change_cipher_spec=0;

264     p = (unsigned char *)s->init_msg;
265     i = s->s3->tmp.peer_finish_md_len;

267     if (i != n)
268     {
269         al=SSL_AD_DECODE_ERROR;
270         SSLerr(SSL_F_SSL3_GET_FINISHED,SSL_R_BAD_DIGEST_LENGTH);
271         goto f_err;
272     }

274     if (CRYPTO_memcmp(p, s->s3->tmp.peer_finish_md, i) != 0)
275     {
276         al=SSL_AD_DECRYPT_ERROR;
277         SSLerr(SSL_F_SSL3_GET_FINISHED,SSL_R_DIGEST_CHECK_FAILED);
278         goto f_err;
279     }

281     /* Copy the finished so we can use it for
282     renegotiation checks */
283     if(s->type == SSL_ST_ACCEPT)
284     {
285         OPENSSL_assert(i <= EVP_MAX_MD_SIZE);
286         memcpy(s->s3->previous_client_finished,
287             s->s3->tmp.peer_finish_md, i);
288         s->s3->previous_client_finished_len=i;
289     }
290     else
291     {
292         OPENSSL_assert(i <= EVP_MAX_MD_SIZE);
293         memcpy(s->s3->previous_server_finished,
294             s->s3->tmp.peer_finish_md, i);
295         s->s3->previous_server_finished_len=i;
296     }

298     return(1);
299 f_err:
300     ssl3_send_alert(s,SSL3_AL_FATAL,al);
301     return(0);
302 }

304 /* for these 2 messages, we need to
305  * ssl->enc_read_ctx          re-init
306  * ssl->s3->read_sequence      zero
307  * ssl->s3->read_mac_secret    re-init
308  * ssl->session->read_sym_enc  assign
309  * ssl->session->read_compression assign
310  * ssl->session->read_hash      assign
311  */
312 int ssl3_send_change_cipher_spec(SSL *s, int a, int b)
313 {
314     unsigned char *p;

316     if (s->state == a)
317     {
318         p=(unsigned char *)s->init_buf->data;
319         *p=SSL3_MT_CCS;
320         s->init_num=1;
321         s->init_off=0;

323         s->state=b;
324     }

```

```

326     /* SSL3_ST_CW_CHANGE_B */
327     return(ssl3_do_write(s,SSL3_RT_CHANGE_CIPHER_SPEC));
328 }

330 static int ssl3_add_cert_to_buf(BUF_MEM *buf, unsigned long *l, X509 *x)
331 {
332     int n;
333     unsigned char *p;

335     n=i2d_X509(x,NULL);
336     if (!BUF_MEM_grow_clean(buf,(int)(n+(*l)+3)))
337     {
338         SSLerr(SSL_F_SSL3_ADD_CERT_TO_BUF,ERR_R_BUF_LIB);
339         return(-1);
340     }
341     p=(unsigned char *)&(buf->data[*l]);
342     l2n3(n,p);
343     i2d_X509(x,&p);
344     *l+=n+3;

346     return(0);
347 }

349 unsigned long ssl3_output_cert_chain(SSL *s, X509 *x)
350 {
351     unsigned char *p;
352     int i;
353     unsigned long l=7;
354     BUF_MEM *buf;
355     int no_chain;

357     if ((s->mode & SSL_MODE_NO_AUTO_CHAIN) || s->ctx->extra_certs)
358         no_chain = 1;
359     else
360         no_chain = 0;

362     /* TLSv1 sends a chain with nothing in it, instead of an alert */
363     buf=s->init_buf;
364     if (!BUF_MEM_grow_clean(buf,10))
365     {
366         SSLerr(SSL_F_SSL3_OUTPUT_CERT_CHAIN,ERR_R_BUF_LIB);
367         return(0);
368     }

369     if (x != NULL)
370     {
371         if (no_chain)
372         {
373             if (ssl3_add_cert_to_buf(buf, &l, x))
374                 return(0);
375         }
376         else
377         {
378             X509_STORE_CTX xs_ctx;

380             if (!X509_STORE_CTX_init(&xs_ctx,s->ctx->cert_store,x,NU
381             {
382                 SSLerr(SSL_F_SSL3_OUTPUT_CERT_CHAIN,ERR_R_X509_L
383                 return(0);
384             }
385             X509_verify_cert(&xs_ctx);
386             /* Don't leave errors in the queue */
387             ERR_clear_error();
388             for (i=0; i < sk_X509_num(xs_ctx.chain); i++)
389             {
390                 x = sk_X509_value(xs_ctx.chain, i);

```

```

392         if (ssl3_add_cert_to_buf(buf, &l, x))
393             {
394                 X509_STORE_CTX_cleanup(&xs_ctx);
395                 return 0;
396             }
397     }
398     X509_STORE_CTX_cleanup(&xs_ctx);
399 }
400
401 /* Thawte special :-) */
402 for (i=0; i<sk_X509_num(s->ctx->extra_certs); i++)
403 {
404     x=sk_X509_value(s->ctx->extra_certs,i);
405     if (ssl3_add_cert_to_buf(buf, &l, x))
406         return(0);
407 }
408
409 l-=7;
410 p=(unsigned char *)&(buf->data[4]);
411 l2n3(l,p);
412 l+=3;
413 p=(unsigned char *)&(buf->data[0]);
414 *(p++)=SSL3_MT_CERTIFICATE;
415 l2n3(l,p);
416 l+=4;
417 return(l);
418 }
419
420 /* Obtain handshake message of message type 'mt' (any if mt == -1),
421  * maximum acceptable body length 'max'.
422  * The first four bytes (msg_type and length) are read in state 'st1',
423  * the body is read in state 'stn'.
424  */
425 long ssl3_get_message(SSL *s, int st1, int stn, int mt, long max, int *ok)
426 {
427     unsigned char *p;
428     unsigned long l;
429     long n;
430     int i,al;
431
432     if (s->s3->tmp.reuse_message)
433     {
434         s->s3->tmp.reuse_message=0;
435         if ((mt >= 0) && (s->s3->tmp.message_type != mt))
436         {
437             al=SSL_AD_UNEXPECTED_MESSAGE;
438             SSLerr(SSL_F_SSL3_GET_MESSAGE, SSL_R_UNEXPECTED_MESSAGE);
439             goto f_err;
440         }
441         *ok=1;
442         s->init_msg = s->init_buf->data + 4;
443         s->init_num = (int)s->s3->tmp.message_size;
444         return s->init_num;
445     }
446
447     p=(unsigned char *)s->init_buf->data;
448
449     if (s->state == st1) /* s->init_num < 4 */
450     {
451         int skip_message;
452
453         do
454         {
455             while (s->init_num < 4)
456             {
457                 i=s->method->ssl_read_bytes(s, SSL3_RT_HANDSHAKE,

```

```

458         &p[s->init_num],4 - s->init_num, 0);
459         if (i <= 0)
460         {
461             s->rwstate=SSL_READING;
462             *ok = 0;
463             return i;
464         }
465         s->init_num+=i;
466     }
467
468     skip_message = 0;
469     if (!s->server)
470     {
471         if (p[0] == SSL3_MT_HELLO_REQUEST)
472             /* The server may always send 'Hello Req
473              * we are doing a handshake anyway now,
474              * if their format is correct. Does not
475              * 'Finished' MAC. */
476             if (p[1] == 0 && p[2] == 0 && p[3] == 0)
477             {
478                 s->init_num = 0;
479                 skip_message = 1;
480
481                 if (s->msg_callback)
482                     s->msg_callback(0, s->ve
483             }
484         }
485     }
486     while (skip_message);
487
488     /* s->init_num == 4 */
489
490     if ((mt >= 0) && (*p != mt))
491     {
492         al=SSL_AD_UNEXPECTED_MESSAGE;
493         SSLerr(SSL_F_SSL3_GET_MESSAGE, SSL_R_UNEXPECTED_MESSAGE);
494         goto f_err;
495     }
496     if ((mt < 0) && (*p == SSL3_MT_CLIENT_HELLO) &&
497         (st1 == SSL3_ST_SR_CERT_A) &&
498         (stn == SSL3_ST_SR_CERT_B))
499     {
500         /* At this point we have got an MS SGC second client
501          * hello (maybe we should always allow the client to
502          * start a new handshake?). We need to restart the mac.
503          * Don't increment {num,total}_renegotiations because
504          * we have not completed the handshake. */
505         ssl3_init_finished_mac(s);
506     }
507
508     s->s3->tmp.message_type= *(p++);
509
510     n2l3(p,l);
511     if (l > (unsigned long)max)
512     {
513         al=SSL_AD_ILLEGAL_PARAMETER;
514         SSLerr(SSL_F_SSL3_GET_MESSAGE, SSL_R_EXCESSIVE_MESSAGE_SI
515         goto f_err;
516     }
517     if (l > (INT_MAX-4)) /* BUF_MEM_grow takes an 'int' parameter */
518     {
519         al=SSL_AD_ILLEGAL_PARAMETER;
520         SSLerr(SSL_F_SSL3_GET_MESSAGE, SSL_R_EXCESSIVE_MESSAGE_SI
521         goto f_err;
522     }
523     if (l && !BUF_MEM_grow_clean(s->init_buf, (int)l+4))
524     {
525         SSLerr(SSL_F_SSL3_GET_MESSAGE, ERR_R_BUF_LIB);

```



```

524         goto err;
525     }
526     s->s3->tmp.message_size=l;
527     s->state=stn;

529     s->init_msg = s->init_buf->data + 4;
530     s->init_num = 0;
531 }

533 /* next state (stn) */
534 p = s->init_msg;
535 n = s->s3->tmp.message_size - s->init_num;
536 while (n > 0)
537 {
538     i=s->method->ssl_read_bytes(s,SSL3_RT_HANDSHAKE,&p[s->init_num],
539     if (i <= 0)
540     {
541         s->rwstate=SSL_READING;
542         *ok = 0;
543         return i;
544     }
545     s->init_num += i;
546     n -= i;
547 }

549 #ifndef OPENSSL_NO_NEXTPROTONEG
550 /* If receiving Finished, record MAC of prior handshake messages for
551  * Finished verification. */
552 if (*s->init_buf->data == SSL3_MT_FINISHED)
553     ssl3_take_mac(s);
554 #endif

556 /* Feed this message into MAC computation. */
557 ssl3_finish_mac(s, (unsigned char *)s->init_buf->data, s->init_num + 4);
558 if (s->msg_callback)
559     s->msg_callback(0, s->version, SSL3_RT_HANDSHAKE, s->init_buf->d
560     *ok=1;
561     return s->init_num;
562 f_err:
563     ssl3_send_alert(s,SSL3_AL_FATAL,al);
564 err:
565     *ok=0;
566     return(-1);
567 }

569 int ssl_cert_type(X509 *x, EVP_PKEY *pkey)
570 {
571     EVP_PKEY *pk;
572     int ret= -1,i;

574     if (pkey == NULL)
575         pk=X509_get_pubkey(x);
576     else
577         pk=pkey;
578     if (pk == NULL) goto err;

580     i=pk->type;
581     if (i == EVP_PKEY_RSA)
582     {
583         ret=SSL_PKEY_RSA_ENC;
584     }
585     else if (i == EVP_PKEY_DSA)
586     {
587         ret=SSL_PKEY_DSA_SIGN;
588     }
589 #ifndef OPENSSL_NO_EC

```

```

590     else if (i == EVP_PKEY_EC)
591     {
592         ret = SSL_PKEY_ECC;
593     }
594 #endif
595     else if (i == NID_id_GostR3410_94 || i == NID_id_GostR3410_94_cc)
596     {
597         ret = SSL_PKEY_GOST94;
598     }
599     else if (i == NID_id_GostR3410_2001 || i == NID_id_GostR3410_2001_cc)
600     {
601         ret = SSL_PKEY_GOST01;
602     }
603 err:
604     if(!pkey) EVP_PKEY_free(pk);
605     return(ret);
606 }

608 int ssl_verify_alarm_type(long type)
609 {
610     int al;

612     switch(type)
613     {
614         case X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT:
615         case X509_V_ERR_UNABLE_TO_GET_CRL:
616         case X509_V_ERR_UNABLE_TO_GET_CRL_ISSUER:
617             al=SSL_AD_UNKNOWN_CA;
618             break;
619         case X509_V_ERR_UNABLE_TO_DECRYPT_CERT_SIGNATURE:
620         case X509_V_ERR_UNABLE_TO_DECRYPT_CRL_SIGNATURE:
621         case X509_V_ERR_UNABLE_TO_DECODE_ISSUER_PUBLIC_KEY:
622         case X509_V_ERR_ERROR_IN_CERT_NOT_BEFORE_FIELD:
623         case X509_V_ERR_ERROR_IN_CERT_NOT_AFTER_FIELD:
624         case X509_V_ERR_ERROR_IN_CRL_LAST_UPDATE_FIELD:
625         case X509_V_ERR_ERROR_IN_CRL_NEXT_UPDATE_FIELD:
626         case X509_V_ERR_CERT_NOT_YET_VALID:
627         case X509_V_ERR_CRL_NOT_YET_VALID:
628         case X509_V_ERR_CERT_UNTRUSTED:
629         case X509_V_ERR_CERT_REJECTED:
630             al=SSL_AD_BAD_CERTIFICATE;
631             break;
632         case X509_V_ERR_CERT_SIGNATURE_FAILURE:
633         case X509_V_ERR_CRL_SIGNATURE_FAILURE:
634             al=SSL_AD_DECRYPT_ERROR;
635             break;
636         case X509_V_ERR_CERT_HAS_EXPIRED:
637         case X509_V_ERR_CRL_HAS_EXPIRED:
638             al=SSL_AD_CERTIFICATE_EXPIRED;
639             break;
640         case X509_V_ERR_CERT_REVOKED:
641             al=SSL_AD_CERTIFICATE_REVOKED;
642             break;
643         case X509_V_ERR_OUT_OF_MEM:
644             al=SSL_AD_INTERNAL_ERROR;
645             break;
646         case X509_V_ERR_DEPTH_ZERO_SELF_SIGNED_CERT:
647         case X509_V_ERR_SELF_SIGNED_CERT_IN_CHAIN:
648         case X509_V_ERR_UNABLE_TO_GET_ISSUER_CERT_LOCALLY:
649         case X509_V_ERR_UNABLE_TO_VERIFY_LEAF_SIGNATURE:
650         case X509_V_ERR_CERT_CHAIN_TOO_LONG:
651         case X509_V_ERR_PATH_LENGTH_EXCEEDED:
652         case X509_V_ERR_INVALID_CA:
653             al=SSL_AD_UNKNOWN_CA;
654             break;
655         case X509_V_ERR_APPLICATION_VERIFICATION:

```

```

656         al=SSL_AD_HANDSHAKE_FAILURE;
657         break;
658     case X509_V_ERR_INVALID_PURPOSE:
659         al=SSL_AD_UNSUPPORTED_CERTIFICATE;
660         break;
661     default:
662         al=SSL_AD_CERTIFICATE_UNKNOWN;
663         break;
664     }
665     return(al);
666 }

668 #ifndef OPENSLL_NO_BUF_FREELISTS
669 /* On some platforms, malloc() performance is bad enough that you can't just
670 * free() and malloc() buffers all the time, so we need to use freelists from
671 * unused buffers. Currently, each freelist holds memory chunks of only a
672 * given size (list->chunklen); other sized chunks are freed and malloced.
673 * This doesn't help much if you're using many different SSL option settings
674 * with a given context. (The options affecting buffer size are
675 * max_send_fragment, read buffer vs write buffer,
676 * SSL_OP_MICROSOFT_BIG_WRITE_BUFFER, SSL_OP_NO_COMPRESSION, and
677 * SSL_OP_DONT_INSERT_EMPTY_FRAGMENTS.) Using a separate freelist for every
678 * possible size is not an option, since max_send_fragment can take on many
679 * different values.
680 *
681 * If you are on a platform with a slow malloc(), and you're using SSL
682 * connections with many different settings for these options, and you need to
683 * use the SSL_MOD_RELEASE_BUFFERS feature, you have a few options:
684 * - Link against a faster malloc implementation.
685 * - Use a separate SSL_CTX for each option set.
686 * - Improve this code.
687 */
688 static void *
689 freelist_extract(SSL_CTX *ctx, int for_read, int sz)
690 {
691     SSL3_BUF_FREELIST *list;
692     SSL3_BUF_FREELIST_ENTRY *ent = NULL;
693     void *result = NULL;

695     CRYPTO_w_lock(CRYPTO_LOCK_SSL_CTX);
696     list = for_read ? ctx->rbuf_freelist : ctx->wbuf_freelist;
697     if (list != NULL && sz == (int)list->chunklen)
698         ent = list->head;
699     if (ent != NULL)
700     {
701         list->head = ent->next;
702         result = ent;
703         if (--list->len == 0)
704             list->chunklen = 0;
705     }
706     CRYPTO_w_unlock(CRYPTO_LOCK_SSL_CTX);
707     if (!result)
708         result = OPENSSL_malloc(sz);
709     return result;
710 }

712 static void
713 freelist_insert(SSL_CTX *ctx, int for_read, size_t sz, void *mem)
714 {
715     SSL3_BUF_FREELIST *list;
716     SSL3_BUF_FREELIST_ENTRY *ent;

718     CRYPTO_w_lock(CRYPTO_LOCK_SSL_CTX);
719     list = for_read ? ctx->rbuf_freelist : ctx->wbuf_freelist;
720     if (list != NULL &&
721         (sz == list->chunklen || list->chunklen == 0) &&

```

```

722     list->len < ctx->freelist_max_len &&
723     sz >= sizeof(*ent))
724     {
725         list->chunklen = sz;
726         ent = mem;
727         ent->next = list->head;
728         list->head = ent;
729         ++list->len;
730         mem = NULL;
731     }

733     CRYPTO_w_unlock(CRYPTO_LOCK_SSL_CTX);
734     if (mem)
735         OPENSSL_free(mem);
736 }
737 #else
738 #define freelist_extract(c,fr,sz) OPENSSL_malloc(sz)
739 #define freelist_insert(c,fr,sz,m) OPENSSL_free(m)
740 #endif

742 int ssl3_setup_read_buffer(SSL *s)
743 {
744     unsigned char *p;
745     size_t len, align=0, headerlen;
746
747     if (SSL_version(s) == DTLS1_VERSION || SSL_version(s) == DTLS1_BAD_VER)
748         headerlen = DTLS1_RT_HEADER_LENGTH;
749     else
750         headerlen = SSL3_RT_HEADER_LENGTH;

752 #if defined(SSL3_ALIGN_PAYLOAD) && SSL3_ALIGN_PAYLOAD!=0
753     align = (-SSL3_RT_HEADER_LENGTH)&(SSL3_ALIGN_PAYLOAD-1);
754 #endif

756     if (s->s3->rbuf.buf == NULL)
757     {
758         len = SSL3_RT_MAX_PLAIN_LENGTH
759             + SSL3_RT_MAX_ENCRYPTED_OVERHEAD
760             + headerlen + align;
761         if (s->options & SSL_OP_MICROSOFT_BIG_SSLV3_BUFFER)
762         {
763             s->s3->init_extra = 1;
764             len += SSL3_RT_MAX_EXTRA;
765         }
766 #ifndef OPENSLL_NO_COMP
767         if (!(s->options & SSL_OP_NO_COMPRESSION))
768             len += SSL3_RT_MAX_COMPRESSED_OVERHEAD;
769 #endif
770         if ((p=freelist_extract(s->ctx, 1, len)) == NULL)
771             goto err;
772         s->s3->rbuf.buf = p;
773         s->s3->rbuf.len = len;
774     }

776     s->packet= &(s->s3->rbuf.buf[0]);
777     return 1;

779 err:
780     SSLerr(SSL_F_SSL3_SETUP_READ_BUFFER, ERR_R_MALLOC_FAILURE);
781     return 0;
782 }

784 int ssl3_setup_write_buffer(SSL *s)
785 {
786     unsigned char *p;
787     size_t len, align=0, headerlen;

```

```

789     if (SSL_version(s) == DTLS1_VERSION || SSL_version(s) == DTLS1_BAD_VER)
790         headerlen = DTLS1_RT_HEADER_LENGTH + 1;
791     else
792         headerlen = SSL3_RT_HEADER_LENGTH;

794 #if defined(SSL3_ALIGN_PAYLOAD) && SSL3_ALIGN_PAYLOAD!=0
795     align = (-SSL3_RT_HEADER_LENGTH)&(SSL3_ALIGN_PAYLOAD-1);
796 #endif

798     if (s->s3->wbuf.buf == NULL)
799     {
800         len = s->max_send_fragment
801             + SSL3_RT_SEND_MAX_ENCRYPTED_OVERHEAD
802             + headerlen + align;
803 #ifndef OPENSSSL_NO_COMP
804         if (!(s->options & SSL_OP_NO_COMPRESSION))
805             len += SSL3_RT_MAX_COMPRESSED_OVERHEAD;
806 #endif
807         if (!(s->options & SSL_OP_DONT_INSERT_EMPTY_FRAGMENTS))
808             len += headerlen + align
809                 + SSL3_RT_SEND_MAX_ENCRYPTED_OVERHEAD;

811         if ((p=freelist_extract(s->ctx, 0, len)) == NULL)
812             goto err;
813         s->s3->wbuf.buf = p;
814         s->s3->wbuf.len = len;
815     }

817     return 1;

819 err:
820     SSLerr(SSL_F_SSL3_SETUP_WRITE_BUFFER, ERR_R_MALLOC_FAILURE);
821     return 0;
822 }

825 int ssl3_setup_buffers(SSL *s)
826 {
827     if (!ssl3_setup_read_buffer(s))
828         return 0;
829     if (!ssl3_setup_write_buffer(s))
830         return 0;
831     return 1;
832 }

834 int ssl3_release_write_buffer(SSL *s)
835 {
836     if (s->s3->wbuf.buf != NULL)
837     {
838         freelist_insert(s->ctx, 0, s->s3->wbuf.len, s->s3->wbuf.buf);
839         s->s3->wbuf.buf = NULL;
840     }
841     return 1;
842 }

844 int ssl3_release_read_buffer(SSL *s)
845 {
846     if (s->s3->rbuf.buf != NULL)
847     {
848         freelist_insert(s->ctx, 1, s->s3->rbuf.len, s->s3->rbuf.buf);
849         s->s3->rbuf.buf = NULL;
850     }
851     return 1;
852 }

```

```

*****
28214 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_cbc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s3_cbc.c */
2 /* =====
3 * Copyright (c) 2012 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
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48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */

56 #include "ssl_locl.h"

58 #include <openssl/md5.h>
59 #include <openssl/sha.h>

61 /* MAX_HASH_BIT_COUNT_BYTES is the maximum number of bytes in the hash's length

```

```

62 * field. (SHA-384/512 have 128-bit length.) */
63 #define MAX_HASH_BIT_COUNT_BYTES 16

65 /* MAX_HASH_BLOCK_SIZE is the maximum hash block size that we'll support.
66 * Currently SHA-384/512 has a 128-byte block size and that's the largest
67 * supported by TLS.) */
68 #define MAX_HASH_BLOCK_SIZE 128

70 /* Some utility functions are needed:
71 *
72 * These macros return the given value with the MSB copied to all the other
73 * bits. They use the fact that arithmetic shift shifts-in the sign bit.
74 * However, this is not ensured by the C standard so you may need to replace
75 * them with something else on odd CPUs. */
76 #define DUPLICATE_MSB_TO_ALL(x) ( (unsigned)( (int)(x) >> (sizeof(int)*8-1) ) )
77 #define DUPLICATE_MSB_TO_ALL_8(x) ((unsigned char)(DUPLICATE_MSB_TO_ALL(x)))

79 /* constant_time_lt returns 0xff if a<b and 0x00 otherwise. */
80 static unsigned constant_time_lt(unsigned a, unsigned b)
81 {
82     a -= b;
83     return DUPLICATE_MSB_TO_ALL(a);
84 }

86 /* constant_time_ge returns 0xff if a>=b and 0x00 otherwise. */
87 static unsigned constant_time_ge(unsigned a, unsigned b)
88 {
89     a -= b;
90     return DUPLICATE_MSB_TO_ALL(~a);
91 }

93 /* constant_time_eq_8 returns 0xff if a==b and 0x00 otherwise. */
94 static unsigned char constant_time_eq_8(unsigned a, unsigned b)
95 {
96     unsigned c = a ^ b;
97     c--;
98     return DUPLICATE_MSB_TO_ALL_8(c);
99 }

101 /* ssl3_cbc_remove_padding removes padding from the decrypted, SSLv3, CBC
102 * record in |rec| by updating |rec->length| in constant time.
103 *
104 * block_size: the block size of the cipher used to encrypt the record.
105 * returns:
106 * 0: (in non-constant time) if the record is publicly invalid.
107 * 1: if the padding was valid
108 * -1: otherwise. */
109 int ssl3_cbc_remove_padding(const SSL* s,
110                             SSL3_RECORD* rec,
111                             unsigned block_size,
112                             unsigned mac_size)
113 {
114     unsigned padding_length, good;
115     const unsigned overhead = 1 /* padding length byte */ + mac_size;

117     /* These lengths are all public so we can test them in non-constant
118     * time. */
119     if (overhead > rec->length)
120         return 0;

122     padding_length = rec->data[rec->length-1];
123     good = constant_time_ge(rec->length, padding_length+overhead);
124     /* SSLv3 requires that the padding is minimal. */
125     good &= constant_time_ge(block_size, padding_length+1);
126     padding_length = good & (padding_length+1);
127     rec->length -= padding_length;

```

```

128     rec->type |= padding_length<8; /* kludge: pass padding length */
129     return (int)((good & 1) | (~good & -1));
130 }

132 /* tls1_cbc_remove_padding removes the CBC padding from the decrypted, TLS, CBC
133 * record in |rec| in constant time and returns 1 if the padding is valid and
134 * -1 otherwise. It also removes any explicit IV from the start of the record
135 * without leaking any timing about whether there was enough space after the
136 * padding was removed.
137 *
138 * block_size: the block size of the cipher used to encrypt the record.
139 * returns:
140 *   0: (in non-constant time) if the record is publicly invalid.
141 *   1: if the padding was valid
142 *  -1: otherwise. */
143 int tls1_cbc_remove_padding(const SSL* s,
144                             SSL3_RECORD *rec,
145                             unsigned block_size,
146                             unsigned mac_size)
147 {
148     unsigned padding_length, good, to_check, i;
149     const unsigned overhead = 1 /* padding length byte */ + mac_size;
150     /* Check if version requires explicit IV */
151     if (s->version >= TLS1_1_VERSION || s->version == DTLS1_BAD_VER)
152     {
153         /* These lengths are all public so we can test them in
154          * non-constant time.
155          */
156         if (overhead + block_size > rec->length)
157             return 0;
158         /* We can now safely skip explicit IV */
159         rec->data += block_size;
160         rec->input += block_size;
161         rec->length -= block_size;
162     }
163     else if (overhead > rec->length)
164         return 0;

166     padding_length = rec->data[rec->length-1];

168     /* NB: if compression is in operation the first packet may not be of
169      * even length so the padding bug check cannot be performed. This bug
170      * workaround has been around since SSLseay so hopefully it is either
171      * fixed now or no buggy implementation supports compression [steve]
172      */
173     if ( (s->options&SSL_OP_TLS_BLOCK_PADDING_BUG) && !s->expand)
174     {
175         /* First packet is even in size, so check */
176         if ((memcmp(s->s3->read_sequence, "\0\0\0\0\0\0\0\0", 8) == 0) &&
177             !(padding_length & 1))
178         {
179             s->s3->flags|=TLS1_FLAGS_TLS_PADDING_BUG;
180         }
181         if ((s->s3->flags & TLS1_FLAGS_TLS_PADDING_BUG) &&
182             padding_length > 0)
183         {
184             padding_length--;
185         }
186     }

188     if (EVP_CIPHER_flags(s->enc_read_ctx->cipher)&EVP_CIPHER_FLAG_AEAD_CIPHER)
189     {
190         /* padding is already verified */
191         rec->length -= padding_length + 1;
192         return 1;
193     }

```

```

195     good = constant_time_ge(rec->length, overhead+padding_length);
196     /* The padding consists of a length byte at the end of the record and
197      * then that many bytes of padding, all with the same value as the
198      * length byte. Thus, with the length byte included, there are i+1
199      * bytes of padding.
200      *
201      * We can't check just |padding_length+1| bytes because that leaks
202      * decrypted information. Therefore we always have to check the maximum
203      * amount of padding possible. (Again, the length of the record is
204      * public information so we can use it.) */
205     to_check = 255; /* maximum amount of padding. */
206     if (to_check > rec->length-1)
207         to_check = rec->length-1;

209     for (i = 0; i < to_check; i++)
210     {
211         unsigned char mask = constant_time_ge(padding_length, i);
212         unsigned char b = rec->data[rec->length-1-i];
213         /* The final |padding_length+1| bytes should all have the value
214          * |padding_length|. Therefore the XOR should be zero. */
215         good &= ~(mask&(padding_length ^ b));
216     }

218     /* If any of the final |padding_length+1| bytes had the wrong value,
219      * one or more of the lower eight bits of |good| will be cleared. We
220      * AND the bottom 8 bits together and duplicate the result to all the
221      * bits. */
222     good &= good >> 4;
223     good &= good >> 2;
224     good &= good >> 1;
225     good <= sizeof(good)*8-1;
226     good = DUPLICATE_MSB_TO_ALL(good);

228     padding_length = good & (padding_length+1);
229     rec->length -= padding_length;
230     rec->type |= padding_length<8; /* kludge: pass padding length */

232     return (int)((good & 1) | (~good & -1));
233 }

235 /* ssl3_cbc_copy_mac copies |md_size| bytes from the end of |rec| to |out| in
236 * constant time (independent of the concrete value of rec->length, which may
237 * vary within a 256-byte window).
238 *
239 * ssl3_cbc_remove_padding or tls1_cbc_remove_padding must be called prior to
240 * this function.
241 *
242 * On entry:
243 *   rec->orig_len >= md_size
244 *   md_size <= EVP_MAX_MD_SIZE
245 *
246 * If CBC_MAC_ROTATE_IN_PLACE is defined then the rotation is performed with
247 * variable accesses in a 64-byte-aligned buffer. Assuming that this fits into
248 * a single or pair of cache-lines, then the variable memory accesses don't
249 * actually affect the timing. CPUs with smaller cache-lines [if any] are
250 * not multi-core and are not considered vulnerable to cache-timing attacks.
251 */
252 #define CBC_MAC_ROTATE_IN_PLACE

254 void ssl3_cbc_copy_mac(unsigned char* out,
255                        const SSL3_RECORD *rec,
256                        unsigned md_size, unsigned orig_len)
257 {
258     #if defined(CBC_MAC_ROTATE_IN_PLACE)
259         unsigned char rotated_mac_buf[64+EVP_MAX_MD_SIZE];

```

```

260 unsigned char *rotated_mac;
261 #else
262 unsigned char rotated_mac[EVP_MAX_MD_SIZE];
263 #endif

265 /* mac_end is the index of |rec->data| just after the end of the MAC. */
266 unsigned mac_end = rec->length;
267 unsigned mac_start = mac_end - md_size;
268 /* scan_start contains the number of bytes that we can ignore because
269  * the MAC's position can only vary by 255 bytes. */
270 unsigned scan_start = 0;
271 unsigned i, j;
272 unsigned div_spoiler;
273 unsigned rotate_offset;

275 OPENSSL_assert(orig_len >= md_size);
276 OPENSSL_assert(md_size <= EVP_MAX_MD_SIZE);

278 #if defined(CBC_MAC_ROTATE_IN_PLACE)
279 rotated_mac = rotated_mac_buf + ((0 - (size_t)rotated_mac_buf)&63);
280 #endif

282 /* This information is public so it's safe to branch based on it. */
283 if (orig_len > md_size + 255 + 1)
284     scan_start = orig_len - (md_size + 255 + 1);
285 /* div_spoiler contains a multiple of md_size that is used to cause the
286  * modulo operation to be constant time. Without this, the time varies
287  * based on the amount of padding when running on Intel chips at least.
288  *
289  * The aim of right-shifting md_size is so that the compiler doesn't
290  * figure out that it can remove div_spoiler as that would require it
291  * to prove that md_size is always even, which I hope is beyond it. */
292 div_spoiler = md_size >> 1;
293 div_spoiler <= (sizeof(div_spoiler)-1)*8;
294 rotate_offset = (div_spoiler + mac_start - scan_start) % md_size;

296 memset(rotated_mac, 0, md_size);
297 for (i = scan_start, j = 0; i < orig_len; i++)
298 {
299     unsigned char mac_started = constant_time_ge(i, mac_start);
300     unsigned char mac_ended = constant_time_ge(i, mac_end);
301     unsigned char b = rec->data[i];
302     rotated_mac[j++] |= b & mac_started & ~mac_ended;
303     j &= constant_time_lt(j, md_size);
304 }

306 /* Now rotate the MAC */
307 #if defined(CBC_MAC_ROTATE_IN_PLACE)
308 j = 0;
309 for (i = 0; i < md_size; i++)
310 {
311     /* in case cache-line is 32 bytes, touch second line */
312     ((volatile unsigned char *)rotated_mac)[rotate_offset^32];
313     out[j++] = rotated_mac[rotate_offset++];
314     rotate_offset &= constant_time_lt(rotate_offset, md_size);
315 }
316 #else
317 memset(out, 0, md_size);
318 rotate_offset = md_size - rotate_offset;
319 rotate_offset &= constant_time_lt(rotate_offset, md_size);
320 for (i = 0; i < md_size; i++)
321 {
322     for (j = 0; j < md_size; j++)
323         out[j] |= rotated_mac[i] & constant_time_eq_8(j, rotate_offset);
324     rotate_offset++;
325     rotate_offset &= constant_time_lt(rotate_offset, md_size);

```

```

326     }
327 #endif
328 }

330 /* u32toLE serialises an unsigned, 32-bit number (n) as four bytes at (p) in
331  * little-endian order. The value of p is advanced by four. */
332 #define u32toLE(n, p) \
333     (*(p++)=(unsigned char)(n), \
334     *(p++)=(unsigned char)(n>>8), \
335     *(p++)=(unsigned char)(n>>16), \
336     *(p++)=(unsigned char)(n>>24))

338 /* These functions serialize the state of a hash and thus perform the standard
339  * "final" operation without adding the padding and length that such a function
340  * typically does. */
341 static void tls1_md5_final_raw(void* ctx, unsigned char *md_out)
342 {
343     MD5_CTX *md5 = ctx;
344     u32toLE(md5->A, md_out);
345     u32toLE(md5->B, md_out);
346     u32toLE(md5->C, md_out);
347     u32toLE(md5->D, md_out);
348 }

350 static void tls1_sha1_final_raw(void* ctx, unsigned char *md_out)
351 {
352     SHA_CTX *sha1 = ctx;
353     l2n(sha1->h0, md_out);
354     l2n(sha1->h1, md_out);
355     l2n(sha1->h2, md_out);
356     l2n(sha1->h3, md_out);
357     l2n(sha1->h4, md_out);
358 }
359 #define LARGEST_DIGEST_CTX SHA_CTX

361 #ifndef OPENSSL_NO_SHA256
362 static void tls1_sha256_final_raw(void* ctx, unsigned char *md_out)
363 {
364     SHA256_CTX *sha256 = ctx;
365     unsigned i;

367     for (i = 0; i < 8; i++)
368     {
369         l2n(sha256->h[i], md_out);
370     }
371 }
372 #undef LARGEST_DIGEST_CTX
373 #define LARGEST_DIGEST_CTX SHA256_CTX
374 #endif

376 #ifndef OPENSSL_NO_SHA512
377 static void tls1_sha512_final_raw(void* ctx, unsigned char *md_out)
378 {
379     SHA512_CTX *sha512 = ctx;
380     unsigned i;

382     for (i = 0; i < 8; i++)
383     {
384         l2n8(sha512->h[i], md_out);
385     }
386 }
387 #undef LARGEST_DIGEST_CTX
388 #define LARGEST_DIGEST_CTX SHA512_CTX
389 #endif

391 /* ssl3_cbc_record_digest_supported returns 1 iff |ctx| uses a hash function

```

```

392 * which ssl3_cbc_digest_record supports. */
393 char ssl3_cbc_record_digest_supported(const EVP_MD_CTX *ctx)
394 {
395 #ifdef OPENSSL_FIPS
396     if (FIPS_mode())
397         return 0;
398 #endif
399     switch (EVP_MD_CTX_type(ctx))
400     {
401         case NID_md5:
402         case NID_sha1:
403 #ifndef OPENSSL_NO_SHA256
404         case NID_sha224:
405         case NID_sha256:
406 #endif
407 #ifndef OPENSSL_NO_SHA512
408         case NID_sha384:
409         case NID_sha512:
410 #endif
411         return 1;
412     default:
413         return 0;
414     }
415 }

417 /* ssl3_cbc_digest_record computes the MAC of a decrypted, padded SSLv3/TLS
418 * record.
419 *
420 * ctx: the EVP_MD_CTX from which we take the hash function.
421 * ssl3_cbc_record_digest_supported must return true for this EVP_MD_CTX.
422 * md_out: the digest output. At most EVP_MAX_MD_SIZE bytes will be written.
423 * md_out_size: if non-NULL, the number of output bytes is written here.
424 * header: the 13-byte, TLS record header.
425 * data: the record data itself, less any preceeding explicit IV.
426 * data_plus_mac_size: the secret, reported length of the data and MAC
427 *     once the padding has been removed.
428 * data_plus_mac_plus_padding_size: the public length of the whole
429 *     record, including padding.
430 * is_sslv3: non-zero if we are to use SSLv3. Otherwise, TLS.
431 *
432 * On entry: by virtue of having been through one of the remove_padding
433 * functions, above, we know that data_plus_mac_size is large enough to contain
434 * a padding byte and MAC. (If the padding was invalid, it might contain the
435 * padding too.) */
436 void ssl3_cbc_digest_record(
437     const EVP_MD_CTX *ctx,
438     unsigned char *md_out,
439     size_t *md_out_size,
440     const unsigned char header[13],
441     const unsigned char *data,
442     size_t data_plus_mac_size,
443     size_t data_plus_mac_plus_padding_size,
444     const unsigned char *mac_secret,
445     unsigned int mac_secret_length,
446     char is_sslv3)
447 {
448     union { double align;
449             unsigned char c[sizeof(LARGEST_DIGEST_CTX)]; } md_state;
450     void (*md_final_raw)(void *ctx, unsigned char *md_out);
451     void (*md_transform)(void *ctx, const unsigned char *block);
452     unsigned md_size, md_block_size = 64;
453     unsigned sslv3_pad_length = 40, header_length, variance_blocks,
454             len, max_mac_bytes, num_blocks,
455             num_starting_blocks, k, mac_end_offset, c, index_a, index_b;
456     unsigned int bits; /* at most 18 bits */
457     unsigned char length_bytes[MAX_HASH_BIT_COUNT_BYTES];

```

```

458     /* hmac_pad is the masked HMAC key. */
459     unsigned char hmac_pad[MAX_HASH_BLOCK_SIZE];
460     unsigned char first_block[MAX_HASH_BLOCK_SIZE];
461     unsigned char mac_out[EVP_MAX_MD_SIZE];
462     unsigned i, j, md_out_size_u;
463     EVP_MD_CTX md_ctx;
464     /* mdLengthSize is the number of bytes in the length field that terminat
465     * the hash. */
466     unsigned md_length_size = 8;
467     char length_is_big_endian = 1;

469     /* This is a, hopefully redundant, check that allows us to forget about
470     * many possible overflows later in this function. */
471     OPENSSL_assert(data_plus_mac_plus_padding_size < 1024*1024);

473     switch (EVP_MD_CTX_type(ctx))
474     {
475     case NID_md5:
476         MD5_Init((MD5_CTX*)md_state.c);
477         md_final_raw = tls1_md5_final_raw;
478         md_transform = (void*)(void *ctx, const unsigned char *
479             md_size = 16;
480             sslv3_pad_length = 48;
481             length_is_big_endian = 0;
482             break;
483     case NID_sha1:
484         SHA1_Init((SHA_CTX*)md_state.c);
485         md_final_raw = tls1_sha1_final_raw;
486         md_transform = (void*)(void *ctx, const unsigned char *
487             md_size = 20;
488             break;
489 #ifndef OPENSSL_NO_SHA256
490     case NID_sha224:
491         SHA224_Init((SHA256_CTX*)md_state.c);
492         md_final_raw = tls1_sha256_final_raw;
493         md_transform = (void*)(void *ctx, const unsigned char *
494             md_size = 224/8;
495             break;
496     case NID_sha256:
497         SHA256_Init((SHA256_CTX*)md_state.c);
498         md_final_raw = tls1_sha256_final_raw;
499         md_transform = (void*)(void *ctx, const unsigned char *
500             md_size = 32;
501             break;
502 #endif
503 #ifndef OPENSSL_NO_SHA512
504     case NID_sha384:
505         SHA384_Init((SHA512_CTX*)md_state.c);
506         md_final_raw = tls1_sha512_final_raw;
507         md_transform = (void*)(void *ctx, const unsigned char *
508             md_size = 384/8;
509             md_block_size = 128;
510             md_length_size = 16;
511             break;
512     case NID_sha512:
513         SHA512_Init((SHA512_CTX*)md_state.c);
514         md_final_raw = tls1_sha512_final_raw;
515         md_transform = (void*)(void *ctx, const unsigned char *
516             md_size = 64;
517             md_block_size = 128;
518             md_length_size = 16;
519             break;
520 #endif
521     default:
522         /* ssl3_cbc_record_digest_supported should have been
523         * called first to check that the hash function is

```

```

524     * supported. */
525     OPENSSL_assert(0);
526     if (md_out_size)
527         *md_out_size = -1;
528     return;
529 }

531 OPENSSL_assert(md_length_size <= MAX_HASH_BIT_COUNT_BYTES);
532 OPENSSL_assert(md_block_size <= MAX_HASH_BLOCK_SIZE);
533 OPENSSL_assert(md_size <= EVP_MAX_MD_SIZE);

535 header_length = 13;
536 if (is_sslv3)
537 {
538     header_length =
539         mac_secret_length +
540         sslv3_pad_length +
541         8 /* sequence number */ +
542         1 /* record type */ +
543         2 /* record length */;
544 }

546 /* variance_blocks is the number of blocks of the hash that we have to
547 * calculate in constant time because they could be altered by the
548 * padding value.
549 *
550 * In SSLv3, the padding must be minimal so the end of the plaintext
551 * varies by, at most, 15+20 = 35 bytes. (We conservatively assume that
552 * the MAC size varies from 0..20 bytes.) In case the 9 bytes of hash
553 * termination (0x80 + 64-bit length) don't fit in the final block, we
554 * say that the final two blocks can vary based on the padding.
555 *
556 * TLSv1 has MACs up to 48 bytes long (SHA-384) and the padding is not
557 * required to be minimal. Therefore we say that the final six blocks
558 * can vary based on the padding.
559 *
560 * Later in the function, if the message is short and there obviously
561 * cannot be this many blocks then variance_blocks can be reduced. */
562 variance_blocks = is_sslv3 ? 2 : 6;
563 /* From now on we're dealing with the MAC, which conceptually has 13
564 * bytes of 'header' before the start of the data (TLS) or 71/75 bytes
565 * (SSLv3) */
566 len = data_plus_mac_plus_padding_size + header_length;
567 /* max_mac_bytes contains the maximum bytes of bytes in the MAC, includi
568 * |header|, assuming that there's no padding. */
569 max_mac_bytes = len - md_size - 1;
570 /* num_blocks is the maximum number of hash blocks. */
571 num_blocks = (max_mac_bytes + 1 + md_length_size + md_block_size - 1) /
572 /* In order to calculate the MAC in constant time we have to handle
573 * the final blocks specially because the padding value could cause the
574 * end to appear somewhere in the final [variance_blocks] blocks and we
575 * can't leak where. However, [num_starting_blocks] worth of data can
576 * be hashed right away because no padding value can affect whether
577 * they are plaintext. */
578 num_starting_blocks = 0;
579 /* k is the starting byte offset into the conceptual header||data where
580 * we start processing. */
581 k = 0;
582 /* mac_end_offset is the index just past the end of the data to be
583 * MACed. */
584 mac_end_offset = data_plus_mac_size + header_length - md_size;
585 /* c is the index of the 0x80 byte in the final hash block that
586 * contains application data. */
587 c = mac_end_offset % md_block_size;
588 /* index_a is the hash block number that contains the 0x80 terminating
589 * value. */

```

```

590     index_a = mac_end_offset / md_block_size;
591     /* index_b is the hash block number that contains the 64-bit hash
592     * length, in bits. */
593     index_b = (mac_end_offset + md_length_size) / md_block_size;
594     /* bits is the hash-length in bits. It includes the additional hash
595     * block for the masked HMAC key, or whole of |header| in the case of
596     * SSLv3. */

598     /* For SSLv3, if we're going to have any starting blocks then we need
599     * at least two because the header is larger than a single block. */
600     if (num_blocks > variance_blocks + (is_sslv3 ? 1 : 0))
601     {
602         num_starting_blocks = num_blocks - variance_blocks;
603         k = md_block_size * num_starting_blocks;
604     }

606     bits = 8 * mac_end_offset;
607     if (!is_sslv3)
608     {
609         /* Compute the initial HMAC block. For SSLv3, the padding and
610         * secret bytes are included in |header| because they take more
611         * than a single block. */
612         bits += 8 * md_block_size;
613         memset(hmac_pad, 0, md_block_size);
614         OPENSSL_assert(mac_secret_length <= sizeof(hmac_pad));
615         memcpy(hmac_pad, mac_secret, mac_secret_length);
616         for (i = 0; i < md_block_size; i++)
617             hmac_pad[i] ^= 0x36;

619         md_transform(md_state.c, hmac_pad);
620     }

622     if (length_is_big_endian)
623     {
624         memset(length_bytes, 0, md_length_size - 4);
625         length_bytes[md_length_size - 4] = (unsigned char)(bits >> 24);
626         length_bytes[md_length_size - 3] = (unsigned char)(bits >> 16);
627         length_bytes[md_length_size - 2] = (unsigned char)(bits >> 8);
628         length_bytes[md_length_size - 1] = (unsigned char)bits;
629     }
630     else
631     {
632         memset(length_bytes, 0, md_length_size);
633         length_bytes[md_length_size - 5] = (unsigned char)(bits >> 24);
634         length_bytes[md_length_size - 6] = (unsigned char)(bits >> 16);
635         length_bytes[md_length_size - 7] = (unsigned char)(bits >> 8);
636         length_bytes[md_length_size - 8] = (unsigned char)bits;
637     }

639     if (k > 0)
640     {
641         if (is_sslv3)
642         {
643             /* The SSLv3 header is larger than a single block.
644             * overhang is the number of bytes beyond a single
645             * block that the header consumes: either 7 bytes
646             * (SHA1) or 11 bytes (MD5). */
647             unsigned overhang = header_length - md_block_size;
648             md_transform(md_state.c, header);
649             memcpy(first_block, header + md_block_size, overhang);
650             memcpy(first_block + overhang, data, md_block_size - overh
651             md_transform(md_state.c, first_block);
652             for (i = 1; i < k / md_block_size - 1; i++)
653                 md_transform(md_state.c, data + md_block_size * i
654         }
655     }

```



```

656     {
657         /* k is a multiple of md_block_size. */
658         memcpy(first_block, header, 13);
659         memcpy(first_block+13, data, md_block_size-13);
660         md_transform(md_state.c, first_block);
661         for (i = 1; i < k/md_block_size; i++)
662             md_transform(md_state.c, data + md_block_size*i);
663     }
664 }

666 memset(mac_out, 0, sizeof(mac_out));

668 /* We now process the final hash blocks. For each block, we construct
669  * it in constant time. If the |i|=index_a| then we'll include the 0x80
670  * bytes and zero pad etc. For each block we selectively copy it, in
671  * constant time, to |mac_out|. */
672 for (i = num_starting_blocks; i <= num_starting_blocks+variance_blocks;
673      {
674     unsigned char block[MAX_HASH_BLOCK_SIZE];
675     unsigned char is_block_a = constant_time_eq_8(i, index_a);
676     unsigned char is_block_b = constant_time_eq_8(i, index_b);
677     for (j = 0; j < md_block_size; j++)
678     {
679         unsigned char b = 0, is_past_c, is_past_cp1;
680         if (k < header_length)
681             b = header[k];
682         else if (k < data_plus_mac_plus_padding_size + header_le
683                 b = data[k-header_length];
684         k++;

686         is_past_c = is_block_a & constant_time_ge(j, c);
687         is_past_cp1 = is_block_a & constant_time_ge(j, c+1);
688         /* If this is the block containing the end of the
689          * application data, and we are at the offset for the
690          * 0x80 value, then overwrite b with 0x80. */
691         b = (b&~is_past_c) | (0x80&is_past_c);
692         /* If this the the block containing the end of the
693          * application data and we're past the 0x80 value then
694          * just write zero. */
695         b = b&~is_past_cp1;
696         /* If this is index_b (the final block), but not
697          * index_a (the end of the data), then the 64-bit
698          * length didn't fit into index_a and we're having to
699          * add an extra block of zeros. */
700         b &= ~is_block_b | is_block_a;

702         /* The final bytes of one of the blocks contains the
703          * length. */
704         if (j >= md_block_size - md_length_size)
705         {
706             /* If this is index_b, write a length byte. */
707             b = (b&~is_block_b) | (is_block_b&length_bytes[j]
708                                     );
709             block[j] = b;
710         }

712         md_transform(md_state.c, block);
713         md_final_raw(md_state.c, block);
714         /* If this is index_b, copy the hash value to |mac_out|. */
715         for (j = 0; j < md_size; j++)
716             mac_out[j] |= block[j]&is_block_b;
717     }

719     EVP_MD_CTX_init(&md_ctx);
720     EVP_DigestInit_ex(&md_ctx, ctx->digest, NULL /* engine */);
721     if (is_sslv3)

```

```

722     {
723         /* We repurpose |hmac_pad| to contain the SSLv3 pad2 block. */
724         memset(hmac_pad, 0x5c, sslv3_pad_length);

726         EVP_DigestUpdate(&md_ctx, mac_secret, mac_secret_length);
727         EVP_DigestUpdate(&md_ctx, hmac_pad, sslv3_pad_length);
728         EVP_DigestUpdate(&md_ctx, mac_out, md_size);
729     }
730     else
731     {
732         /* Complete the HMAC in the standard manner. */
733         for (i = 0; i < md_block_size; i++)
734             hmac_pad[i] ^= 0x6a;

736         EVP_DigestUpdate(&md_ctx, hmac_pad, md_block_size);
737         EVP_DigestUpdate(&md_ctx, mac_out, md_size);
738     }
739     EVP_DigestFinal(&md_ctx, md_out, &md_out_size_u);
740     if (md_out_size)
741         *md_out_size = md_out_size_u;
742     EVP_MD_CTX_cleanup(&md_ctx);
743 }

745 #ifdef OPENSSL_FIPS

747 /* Due to the need to use EVP in FIPS mode we can't reimplement digests but
748  * we can ensure the number of blocks processed is equal for all cases
749  * by digesting additional data.
750  */

752 void tls_fips_digest_extra(
753     const EVP_CIPHER_CTX *cipher_ctx, EVP_MD_CTX *mac_ctx,
754     const unsigned char *data, size_t data_len, size_t orig_len)
755 {
756     size_t block_size, digest_pad, blocks_data, blocks_orig;
757     if (EVP_CIPHER_CTX_mode(cipher_ctx) != EVP_CIPH_CBC_MODE)
758         return;
759     block_size = EVP_MD_CTX_block_size(mac_ctx);
760     /* We are in FIPS mode if we get this far so we know we have only SHA*
761      * digests and TLS to deal with.
762      * Minimum digest padding length is 17 for SHA384/SHA512 and 9
763      * otherwise.
764      * Additional header is 13 bytes. To get the number of digest blocks
765      * processed round up the amount of data plus padding to the nearest
766      * block length. Block length is 128 for SHA384/SHA512 and 64 otherwise.
767      * So we have:
768      * blocks = (payload_len + digest_pad + 13 + block_size - 1)/block_size
769      * equivalently:
770      * blocks = (payload_len + digest_pad + 12)/block_size + 1
771      * HMAC adds a constant overhead.
772      * We're ultimately only interested in differences so this becomes
773      * blocks = (payload_len + 29)/128
774      * for SHA384/SHA512 and
775      * blocks = (payload_len + 21)/64
776      * otherwise.
777      */
778     digest_pad = block_size == 64 ? 21 : 29;
779     blocks_orig = (orig_len + digest_pad)/block_size;
780     blocks_data = (data_len + digest_pad)/block_size;
781     /* MAC enough blocks to make up the difference between the original
782      * and actual lengths plus one extra block to ensure this is never a
783      * no op. The "data" pointer should always have enough space to
784      * perform this operation as it is large enough for a maximum
785      * length TLS buffer.
786      */
787     EVP_DigestSignUpdate(mac_ctx, data,

```

new/usr/src/lib/openssl/libsunw_ssl/s3_cbc.c

13

```
788                                     (blocks_orig - blocks_data + 1) * block_size);  
789     }  
790 #endif
```

```

*****
85361 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_clnt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s3_clnt.c */
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4  *
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55 * copied and put under another distribution licence
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60 *
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```

```

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148 * OTHERWISE.
149 */

151 #include <stdio.h>
152 #include "ssl_locl.h"
153 #include "kssl_lcl.h"
154 #include <openssl/buffer.h>
155 #include <openssl/rand.h>
156 #include <openssl/objects.h>
157 #include <openssl/evp.h>
158 #include <openssl/md5.h>
159 #ifdef OPENSSL_FIPS
160 #include <openssl/fips.h>
161 #endif
162 #ifndef OPENSSL_NO_DH
163 #include <openssl/dh.h>
164 #endif
165 #include <openssl/bn.h>
166 #ifndef OPENSSL_NO_ENGINE
167 #include <openssl/engine.h>
168 #endif

170 static const SSL_METHOD *ssl3_get_client_method(int ver);
171 static int ca_dn_cmp(const X509_NAME * const *a, const X509_NAME * const *b);

173 static const SSL_METHOD *ssl3_get_client_method(int ver)
174 {
175     if (ver == SSL3_VERSION)
176         return(SSLv3_client_method());
177     else
178         return(NULL);
179 }

181 IMPLEMENT_ssl3_meth_func(SSLv3_client_method,
182                          ssl_undefined_function,
183                          ssl3_connect,
184                          ssl3_get_client_method)

186 int ssl3_connect(SSL *s)
187 {
188     BUF_MEM *buf=NULL;
189     unsigned long Time=(unsigned long)time(NULL);
190     void (*cb)(const SSL *ssl,int type,int val)=NULL;
191     int ret= -1;
192     int new_state,state,skip=0;

```

```

194     RAND_add(&Time,sizeof(Time),0);
195     ERR_clear_error();
196     clear_sys_error();

198     if (s->info_callback != NULL)
199         cb=s->info_callback;
200     else if (s->ctx->info_callback != NULL)
201         cb=s->ctx->info_callback;
202
203     s->in_handshake++;
204     if (!SSL_in_init(s) || SSL_in_before(s)) SSL_clear(s);

206 #ifndef OPENSSL_NO_HEARTBEATS
207     /* If we're awaiting a HeartbeatResponse, pretend we
208      * already got and don't await it anymore, because
209      * Heartbeats don't make sense during handshakes anyway.
210      */
211     if (s->tlsext_hb_pending)
212     {
213         s->tlsext_hb_pending = 0;
214         s->tlsext_hb_seq++;
215     }
216 #endif

218     for (;;)
219     {
220         state=s->state;

222         switch(s->state)
223         {
224             case SSL_ST_RENEGOTIATE:
225                 s->renegotiate=1;
226                 s->state=SSL_ST_CONNECT;
227                 s->ctx->stats.sess_connect_renegotiate++;
228                 /* break */
229             case SSL_ST_BEFORE:
230             case SSL_ST_CONNECT:
231             case SSL_ST_BEFORE|SSL_ST_CONNECT:
232             case SSL_ST_OK|SSL_ST_CONNECT:

234                 s->server=0;
235                 if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_START,1);

237                 if ((s->version & 0xff00) != 0x0300)
238                 {
239                     SSLerr(SSL_F_SSL3_CONNECT, ERR_R_INTERNAL_ERROR)
240                     ret = -1;
241                     goto end;
242                 }

244                 /* s->version=SSL3_VERSION; */
245                 s->type=SSL_ST_CONNECT;

247                 if (s->init_buf == NULL)
248                 {
249                     if ((buf=BUF_MEM_new()) == NULL)
250                     {
251                         ret= -1;
252                         goto end;
253                     }
254                     if (!BUF_MEM_grow(buf,SSL3_RT_MAX_PLAIN_LENGTH))
255                     {
256                         ret= -1;
257                         goto end;
258                     }
259                     s->init_buf=buf;

```

```

260         buf=NULL;
261     }

263     if (!ssl3_setup_buffers(s)) { ret= -1; goto end; }

265     /* setup buffering BIO */
266     if (!ssl_init_wbio_buffer(s,0)) { ret= -1; goto end; }

268     /* don't push the buffering BIO quite yet */

270     ssl3_init_finished_mac(s);

272     s->state=SSL3_ST_CW_CLNT_HELLO_A;
273     s->ctx->stats.sess_connect++;
274     s->init_num=0;
275     break;

277     case SSL3_ST_CW_CLNT_HELLO_A:
278     case SSL3_ST_CW_CLNT_HELLO_B:

280         s->shutdown=0;
281         ret=ssl3_client_hello(s);
282         if (ret <= 0) goto end;
283         s->state=SSL3_ST_CR_SRVR_HELLO_A;
284         s->init_num=0;

286         /* turn on buffering for the next lot of output */
287         if (s->wbio != s->wbio)
288             s->wbio=BIO_push(s->wbio, s->wbio);

290         break;

292     case SSL3_ST_CR_SRVR_HELLO_A:
293     case SSL3_ST_CR_SRVR_HELLO_B:
294         ret=ssl3_get_server_hello(s);
295         if (ret <= 0) goto end;

297         if (s->hit)
298         {
299             s->state=SSL3_ST_CR_FINISHED_A;
300 #ifndef OPENSSL_NO_TLSEXT
301             if (s->tlsext_ticket_expected)
302             {
303                 /* receive renewed session ticket */
304                 s->state=SSL3_ST_CR_SESSION_TICKET_A;
305             }
306 #endif
307         }
308         else
309             s->state=SSL3_ST_CR_CERT_A;
310         s->init_num=0;
311         break;

313     case SSL3_ST_CR_CERT_A:
314     case SSL3_ST_CR_CERT_B:
315 #ifndef OPENSSL_NO_TLSEXT
316         ret=ssl3_check_finished(s);
317         if (ret <= 0) goto end;
318         if (ret == 2)
319         {
320             s->hit = 1;
321             if (s->tlsext_ticket_expected)
322                 s->state=SSL3_ST_CR_SESSION_TICKET_A;
323             else
324                 s->state=SSL3_ST_CR_FINISHED_A;
325             s->init_num=0;

```

```

326         break;
327     }

328 #endif

329     /* Check if it is anon DH/ECDH */
330     /* or PSK */
331     if (!(s->s3->tmp.new_cipher->algorithm_auth & SSL_aNULL)
332         !(s->s3->tmp.new_cipher->algorithm_mkey & SSL_kPSK))
333     {
334         ret=ssl3_get_server_certificate(s);
335         if (ret <= 0) goto end;
336 #ifndef OPENSSL_NO_TLSEXT
337         if (s->tlsext_status_expected)
338             s->state=SSL3_ST_CR_CERT_STATUS_A;
339         else
340             s->state=SSL3_ST_CR_KEY_EXCH_A;
341     }
342     else
343     {
344         skip = 1;
345         s->state=SSL3_ST_CR_KEY_EXCH_A;
346     }
347 #else
348     }
349     else
350         skip=1;

352     s->state=SSL3_ST_CR_KEY_EXCH_A;
353 #endif
354     s->init_num=0;
355     break;

357     case SSL3_ST_CR_KEY_EXCH_A:
358     case SSL3_ST_CR_KEY_EXCH_B:
359         ret=ssl3_get_key_exchange(s);
360         if (ret <= 0) goto end;
361         s->state=SSL3_ST_CR_CERT_REQ_A;
362         s->init_num=0;

364         /* at this point we check that we have the
365          * required stuff from the server */
366         if (!ssl3_check_cert_and_algorithm(s))
367         {
368             ret= -1;
369             goto end;
370         }
371         break;

373     case SSL3_ST_CR_CERT_REQ_A:
374     case SSL3_ST_CR_CERT_REQ_B:
375         ret=ssl3_get_certificate_request(s);
376         if (ret <= 0) goto end;
377         s->state=SSL3_ST_CR_SRVR_DONE_A;
378         s->init_num=0;
379         break;

381     case SSL3_ST_CR_SRVR_DONE_A:
382     case SSL3_ST_CR_SRVR_DONE_B:
383         ret=ssl3_get_server_done(s);
384         if (ret <= 0) goto end;
385 #ifndef OPENSSL_NO_SRP
386         if (s->s3->tmp.new_cipher->algorithm_mkey & SSL_kSRP)
387         {
388             if ((ret = SRP_Calc_A_param(s))<=0)
389             {
390                 SSLerr(SSL_F_SSL3_CONNECT, SSL_R_SRP_A_CA
391                     ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_I

```

```

392             goto end;
393         }
394     }
395 #endif
396     if (s->s3->tmp.cert_req)
397         s->state=SSL3_ST_CW_CERT_A;
398     else
399         s->state=SSL3_ST_CW_KEY_EXCH_A;
400     s->init_num=0;
401
402     break;
403
404 case SSL3_ST_CW_CERT_A:
405 case SSL3_ST_CW_CERT_B:
406 case SSL3_ST_CW_CERT_C:
407 case SSL3_ST_CW_CERT_D:
408     ret=ssl3_send_client_certificate(s);
409     if (ret <= 0) goto end;
410     s->state=SSL3_ST_CW_KEY_EXCH_A;
411     s->init_num=0;
412     break;
413
414 case SSL3_ST_CW_KEY_EXCH_A:
415 case SSL3_ST_CW_KEY_EXCH_B:
416     ret=ssl3_send_client_key_exchange(s);
417     if (ret <= 0) goto end;
418     /* EAY EAY EAY need to check for DH fix cert
419      * sent back */
420     /* For TLS, cert_req is set to 2, so a cert chain
421      * of nothing is sent, but no verify packet is sent */
422     /* XXX: For now, we do not support client
423      * authentication in ECDH cipher suites with
424      * ECDH (rather than ECDSA) certificates.
425      * We need to skip the certificate verify
426      * message when client's ECDH public key is sent
427      * inside the client certificate.
428      */
429     if (s->s3->tmp.cert_req == 1)
430     {
431         s->state=SSL3_ST_CW_CERT_VRFY_A;
432     }
433     else
434     {
435         s->state=SSL3_ST_CW_CHANGE_A;
436         s->s3->change_cipher_spec=0;
437     }
438     if (s->s3->flags & TLS1_FLAGS_SKIP_CERT_VERIFY)
439     {
440         s->state=SSL3_ST_CW_CHANGE_A;
441         s->s3->change_cipher_spec=0;
442     }
443
444     s->init_num=0;
445     break;
446
447 case SSL3_ST_CW_CERT_VRFY_A:
448 case SSL3_ST_CW_CERT_VRFY_B:
449     ret=ssl3_send_client_verify(s);
450     if (ret <= 0) goto end;
451     s->state=SSL3_ST_CW_CHANGE_A;
452     s->init_num=0;
453     s->s3->change_cipher_spec=0;
454     break;
455
456 case SSL3_ST_CW_CHANGE_A:
457 case SSL3_ST_CW_CHANGE_B:

```

```

458     ret=ssl3_send_change_cipher_spec(s,
459         SSL3_ST_CW_CHANGE_A,SSL3_ST_CW_CHANGE_B);
460     if (ret <= 0) goto end;
461
462 #if defined(OPENSSL_NO_TLSEXT) || defined(OPENSSL_NO_NEXTPROTONEG)
463     s->state=SSL3_ST_CW_FINISHED_A;
464 #else
465     if (s->s3->next_proto_neg_seen)
466         s->state=SSL3_ST_CW_NEXT_PROTO_A;
467     else
468         s->state=SSL3_ST_CW_FINISHED_A;
469 #endif
470     s->init_num=0;
471
472     s->session->cipher=s->s3->tmp.new_cipher;
473 #ifdef OPENSSL_NO_COMP
474     s->session->compress_meth=0;
475 #else
476     if (s->s3->tmp.new_compression == NULL)
477         s->session->compress_meth=0;
478     else
479         s->session->compress_meth=
480             s->s3->tmp.new_compression->id;
481 #endif
482     if (!s->method->ssl3_enc->setup_key_block(s))
483     {
484         ret= -1;
485         goto end;
486     }
487
488     if (!s->method->ssl3_enc->change_cipher_state(s,
489         SSL3_CHANGE_CIPHER_CLIENT_WRITE))
490     {
491         ret= -1;
492         goto end;
493     }
494
495     break;
496
497 #if !defined(OPENSSL_NO_TLSEXT) && !defined(OPENSSL_NO_NEXTPROTONEG)
498     case SSL3_ST_CW_NEXT_PROTO_A:
499     case SSL3_ST_CW_NEXT_PROTO_B:
500         ret=ssl3_send_next_proto(s);
501         if (ret <= 0) goto end;
502         s->state=SSL3_ST_CW_FINISHED_A;
503         break;
504 #endif
505
506 case SSL3_ST_CW_FINISHED_A:
507 case SSL3_ST_CW_FINISHED_B:
508     ret=ssl3_send_finished(s,
509         SSL3_ST_CW_FINISHED_A,SSL3_ST_CW_FINISHED_B,
510         s->method->ssl3_enc->client_finished_label,
511         s->method->ssl3_enc->client_finished_label_len);
512     if (ret <= 0) goto end;
513     s->state=SSL3_ST_CW_FLUSH;
514
515     /* clear flags */
516     s->s3->flags&= ~SSL3_FLAGS_POP_BUFFER;
517     if (s->hit)
518     {
519         s->s3->tmp.next_state=SSL_ST_OK;
520         if (s->s3->flags & SSL3_FLAGS_DELAY_CLIENT_FINIS
521             {
522                 s->state=SSL_ST_OK;
523                 s->s3->flags|=SSL3_FLAGS_POP_BUFFER;

```

```

524         s->s3->delay_buf_pop_ret=0;
525     }
526 }
527 else
528 {
529 #ifndef OPENSSL_NO_TLSEXT
530     /* Allow NewSessionTicket if ticket expected */
531     if (s->tlsext_ticket_expected)
532         s->s3->tmp.next_state=SSL3_ST_CR_SESSION
533     else
534 #endif
535         s->s3->tmp.next_state=SSL3_ST_CR_FINISHED_A;
536 }
537 s->init_num=0;
538 break;
539
541 #ifndef OPENSSL_NO_TLSEXT
542 case SSL3_ST_CR_SESSION_TICKET_A:
543 case SSL3_ST_CR_SESSION_TICKET_B:
544     ret=ssl3_get_new_session_ticket(s);
545     if (ret <= 0) goto end;
546     s->state=SSL3_ST_CR_FINISHED_A;
547     s->init_num=0;
548     break;
549
550 case SSL3_ST_CR_CERT_STATUS_A:
551 case SSL3_ST_CR_CERT_STATUS_B:
552     ret=ssl3_get_cert_status(s);
553     if (ret <= 0) goto end;
554     s->state=SSL3_ST_CR_KEY_EXCH_A;
555     s->init_num=0;
556     break;
557 #endif
558
559 case SSL3_ST_CR_FINISHED_A:
560 case SSL3_ST_CR_FINISHED_B:
561
562     ret=ssl3_get_finished(s, SSL3_ST_CR_FINISHED_A,
563         SSL3_ST_CR_FINISHED_B);
564     if (ret <= 0) goto end;
565
566     if (s->hit)
567         s->state=SSL3_ST_CW_CHANGE_A;
568     else
569         s->state=SSL_ST_OK;
570     s->init_num=0;
571     break;
572
573 case SSL3_ST_CW_FLUSH:
574     s->rwstate=SSL_WRITING;
575     if (BIO_flush(s->wbio) <= 0)
576     {
577         ret= -1;
578         goto end;
579     }
580     s->rwstate=SSL_NOTHING;
581     s->state=s->s3->tmp.next_state;
582     break;
583
584 case SSL_ST_OK:
585     /* clean a few things up */
586     ssl3_cleanup_key_block(s);
587
588     if (s->init_buf != NULL)
589     {

```

```

590         BUF_MEM_free(s->init_buf);
591         s->init_buf=NULL;
592     }
593
594     /* If we are not 'joining' the last two packets,
595     * remove the buffering now */
596     if (!(s->s3->flags & SSL3_FLAGS_POP_BUFFER))
597         ssl_free_wbio_buffer(s);
598     /* else do it later in ssl3_write */
599
600     s->init_num=0;
601     s->renegotiate=0;
602     s->new_session=0;
603
604     ssl_update_cache(s, SSL_SESS_CACHE_CLIENT);
605     if (s->hit) s->ctx->stats.sess_hit++;
606
607     ret=1;
608     /* s->server=0; */
609     s->handshake_func=ssl3_connect;
610     s->ctx->stats.sess_connect_good++;
611
612     if (cb != NULL) cb(s, SSL_CB_HANDSHAKE_DONE, 1);
613
614     goto end;
615     /* break; */
616
617 default:
618     SSLerr(SSL_F_SSL3_CONNECT, SSL_R_UNKNOWN_STATE);
619     ret= -1;
620     goto end;
621     /* break; */
622 }
623
624 /* did we do anything */
625 if (!s->s3->tmp.reuse_message && !skip)
626 {
627     if (s->debug)
628     {
629         if ((ret=BIO_flush(s->wbio)) <= 0)
630             goto end;
631     }
632
633     if ((cb != NULL) && (s->state != state))
634     {
635         new_state=s->state;
636         s->state=state;
637         cb(s, SSL_CB_CONNECT_LOOP, 1);
638         s->state=new_state;
639     }
640
641     skip=0;
642 }
643 end:
644 s->in_handshake--;
645 if (buf != NULL)
646     BUF_MEM_free(buf);
647 if (cb != NULL)
648     cb(s, SSL_CB_CONNECT_EXIT, ret);
649 return(ret);
650 }
651
653 int ssl3_client_hello(SSL *s)
654 {
655     unsigned char *buf;

```

```

656     unsigned char *p,*d;
657     int i;
658     unsigned long l;
659 #ifndef OPENSSL_NO_COMP
660     int j;
661     SSL_COMP *comp;
662 #endif

664     buf=(unsigned char *)s->init_buf->data;
665     if (s->state == SSL3_ST_CW_CLNT_HELLO_A)
666     {
667         SSL_SESSION *sess = s->session;
668         if ((sess == NULL) ||
669             (sess->ssl_version != s->version) ||
670 #ifdef OPENSSL_NO_TLSEXT
671             !sess->session_id_length ||
672 #else
673             (!sess->session_id_length && !sess->tlsext_tick) ||
674 #endif
675             (sess->not_resumable))
676         {
677             if (!ssl_get_new_session(s,0))
678                 goto err;
679         }
680         /* else use the pre-loaded session */

682         p=s->s3->client_random;

684         if (ssl_fill_hello_random(s, 0, p, SSL3_RANDOM_SIZE) <= 0)
685             goto err;

687         /* Do the message type and length last */
688         d=p+ &(buf[4]);

690         /* version indicates the negotiated version: for example from
691          * an SSLv2/v3 compatible client hello). The client_version
692          * field is the maximum version we permit and it is also
693          * used in RSA encrypted premaster secrets. Some servers can
694          * choke if we initially report a higher version then
695          * renegotiate to a lower one in the premaster secret. This
696          * didn't happen with TLS 1.0 as most servers supported it
697          * but it can with TLS 1.1 or later if the server only supports
698          * 1.0.
699          *
700          * Possible scenario with previous logic:
701          * 1. Client hello indicates TLS 1.2
702          * 2. Server hello says TLS 1.0
703          * 3. RSA encrypted premaster secret uses 1.2.
704          * 4. Handhaked proceeds using TLS 1.0.
705          * 5. Server sends hello request to renegotiate.
706          * 6. Client hello indicates TLS v1.0 as we now
707          *    know that is maximum server supports.
708          * 7. Server chokes on RSA encrypted premaster secret
709          *    containing version 1.0.
710          *
711          * For interoperability it should be OK to always use the
712          * maximum version we support in client hello and then rely
713          * on the checking of version to ensure the servers isn't
714          * being inconsistent: for example initially negotiating with
715          * TLS 1.0 and renegotiating with TLS 1.2. We do this by using
716          * client_version in client hello and not resetting it to
717          * the negotiated version.
718          */
719 #if 0
720         *(p++)=s->version>>8;
721         *(p++)=s->version&0xff;

```

```

722         s->client_version=s->version;
723 #else
724         *(p++)=s->client_version>>8;
725         *(p++)=s->client_version&0xff;
726 #endif

728         /* Random stuff */
729         memcpy(p,s->s3->client_random,SSL3_RANDOM_SIZE);
730         p+=SSL3_RANDOM_SIZE;

732         /* Session ID */
733         if (s->new_session)
734             i=0;
735         else
736             i=s->session->session_id_length;
737         *(p++)=i;
738         if (i != 0)
739         {
740             if (i > (int)sizeof(s->session->session_id))
741             {
742                 SSLerr(SSL_F_SSL3_CLIENT_HELLO, ERR_R_INTERNAL_E);
743                 goto err;
744             }
745             memcpy(p,s->session->session_id,i);
746             p+=i;
747         }

748         /* Ciphers supported */
749         i=ssl_cipher_list_to_bytes(s,SSL_get_ciphers(s),&(p[2]),0);
750         if (i == 0)
751         {
752             SSLerr(SSL_F_SSL3_CLIENT_HELLO,SSL_R_NO_CIPHERS_AVAILABLE);
753             goto err;
754         }
755 #ifdef OPENSSL_MAX_TLS1_2_CIPHER_LENGTH
756         /* Some servers hang if client hello > 256 bytes
757          * as hack workaround chop number of supported ciphers
758          * to keep it well below this if we use TLS v1.2
759          */
760         if (TLS1_get_version(s) >= TLS1_2_VERSION
761             && i > OPENSSL_MAX_TLS1_2_CIPHER_LENGTH)
762             i = OPENSSL_MAX_TLS1_2_CIPHER_LENGTH & ~1;
763 #endif
764         s2n(i,p);
765         p+=i;

768         /* COMPRESSION */
769 #ifndef OPENSSL_NO_COMP
770         *(p++)=1;
771 #else

773         if ((s->options & SSL_OP_NO_COMPRESSION)
774             || !s->ctx->comp_methods)
775             j=0;
776         else
777             j=sk_SSL_COMP_num(s->ctx->comp_methods);
778         *(p++)=1+j;
779         for (i=0; i<j; i++)
780         {
781             comp=sk_SSL_COMP_value(s->ctx->comp_methods,i);
782             *(p++)=comp->id;
783         }
784 #endif
785         *(p++)=0; /* Add the NULL method */

787 #ifndef OPENSSL_NO_TLSEXT

```



```

788     /* TLS extensions */
789     if (ssl_prepare_clienthello_tlsext(s) <= 0)
790     {
791         SSLerr(SSL_F_SSL3_CLIENT_HELLO, SSL_R_CLIENTHELLO_TLSEXT)
792         goto err;
793     }
794     if ((p = ssl_add_clienthello_tlsext(s, p, buf+SSL3_RT_MAX_PLAIN
795     {
796         SSLerr(SSL_F_SSL3_CLIENT_HELLO, ERR_R_INTERNAL_ERROR);
797         goto err;
798     }
799 #endif
800     l=(p-d);
801     d=buf;
802     *(d++)=SSL3_MT_CLIENT_HELLO;
803     l2n3(l,d);
804
806     s->state=SSL3_ST_CW_CLNT_HELLO_B;
807     /* number of bytes to write */
808     s->init_num=p-buf;
809     s->init_off=0;
810 }
812 /* SSL3_ST_CW_CLNT_HELLO_B */
813 return(ssl3_do_write(s, SSL3_RT_HANDSHAKE));
814 err:
815     return(-1);
816 }
818 int ssl3_get_server_hello(SSL *s)
819 {
820     STACK_OF(SSL_CIPHER) *sk;
821     const SSL_CIPHER *c;
822     unsigned char *p,*d;
823     int i,al,ok;
824     unsigned int j;
825     long n;
826 #ifndef OPENSSL_NO_COMP
827     SSL_COMP *comp;
828 #endif
830     n=s->method->ssl_get_message(s,
831     SSL3_ST_CR_SRVR_HELLO_A,
832     SSL3_ST_CR_SRVR_HELLO_B,
833     -1,
834     20000, /* ?? */
835     &ok);
837     if (!ok) return((int)n);
839     if (SSL_version(s) == DTLS1_VERSION || SSL_version(s) == DTLS1_BAD_VER)
840     {
841         if (s->s3->tmp.message_type == DTLS1_MT_HELLO_VERIFY_REQUEST)
842         {
843             if (s->d1->send_cookie == 0)
844             {
845                 s->s3->tmp.reuse_message = 1;
846                 return 1;
847             }
848             else /* already sent a cookie */
849             {
850                 al=SSL_AD_UNEXPECTED_MESSAGE;
851                 SSLerr(SSL_F_SSL3_GET_SERVER_HELLO, SSL_R_BAD_MES
852                 goto f_err;
853             }
854         }
855     }

```

```

854     }
855     }
856     if (s->s3->tmp.message_type != SSL3_MT_SERVER_HELLO)
857     {
858         al=SSL_AD_UNEXPECTED_MESSAGE;
859         SSLerr(SSL_F_SSL3_GET_SERVER_HELLO, SSL_R_BAD_MESSAGE_TYPE);
860         goto f_err;
861     }
862
864     d=p=(unsigned char *)s->init_msg;
866     if ((p[0] != (s->version>>8)) || (p[1] != (s->version&0xff)))
867     {
868         SSLerr(SSL_F_SSL3_GET_SERVER_HELLO, SSL_R_WRONG_SSL_VERSION);
869         s->version=(s->version&0xff00)|p[1];
870         al=SSL_AD_PROTOCOL_VERSION;
871         goto f_err;
872     }
873     p+=2;
875     /* load the server hello data */
876     /* load the server random */
877     memcpy(s->s3->server_random,p,SSL3_RANDOM_SIZE);
878     p+=SSL3_RANDOM_SIZE;
880     /* get the session-id */
881     j= *(p++);
883     if ((j > sizeof s->session->session_id) || (j > SSL3_SESSION_ID_SIZE))
884     {
885         al=SSL_AD_ILLEGAL_PARAMETER;
886         SSLerr(SSL_F_SSL3_GET_SERVER_HELLO, SSL_R_SSL3_SESSION_ID_TOO_LON
887         goto f_err;
888     }
890 #ifndef OPENSSL_NO_TLSEXT
891     /* check if we want to resume the session based on external pre-shared s
892     if (s->version >= TLS1_VERSION && s->tls_session_secret_cb)
893     {
894         SSL_CIPHER *pref_cipher=NULL;
895         s->session->master_key_length=sizeof(s->session->master_key);
896         if (s->tls_session_secret_cb(s, s->session->master_key,
897         &s->session->master_key_length,
898         NULL, &pref_cipher,
899         s->tls_session_secret_cb_arg))
900         {
901             s->session->cipher = pref_cipher ?
902             pref_cipher : ssl_get_cipher_by_char(s, p+j);
903         }
904     }
905 #endif /* OPENSSL_NO_TLSEXT */
907     if (j != 0 && j == s->session->session_id_length
908     && memcmp(p,s->session->session_id,j) == 0)
909     {
910         if (s->sid_ctx_length != s->session->sid_ctx_length
911         || memcmp(s->session->sid_ctx,s->sid_ctx,s->sid_ctx_length))
912         {
913             /* actually a client application bug */
914             al=SSL_AD_ILLEGAL_PARAMETER;
915             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO, SSL_R_ATTEMPT_TO_REUSE_SESSIO
916             goto f_err;
917         }
918         s->hit=1;
919     }

```

```

920     else /* a miss or crap from the other end */
921     {
922         /* If we were trying for session-id reuse, make a new
923          * SSL_SESSION so we don't stuff up other people */
924         s->hit=0;
925         if (s->session->session_id_length > 0)
926         {
927             if (!ssl_get_new_session(s,0))
928             {
929                 al=SSL_AD_INTERNAL_ERROR;
930                 goto f_err;
931             }
932             s->session->session_id_length=j;
933             memcpy(s->session->session_id,p,j); /* j could be 0 */
934         }
935         p+=j;
936         c=ssl_get_cipher_by_char(s,p);
937         if (c == NULL)
938         {
939             /* unknown cipher */
940             al=SSL_AD_ILLEGAL_PARAMETER;
941             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_UNKNOWN_CIPHER_RETURNED);
942             goto f_err;
943         }
944         /* TLS v1.2 only ciphersuites require v1.2 or later */
945         if ((c->algorithm_ssl & SSL_TLSV1_2) &&
946             (TLS1_get_version(s) < TLS1_2_VERSION))
947         {
948             al=SSL_AD_ILLEGAL_PARAMETER;
949             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_WRONG_CIPHER_RETURNED);
950             goto f_err;
951         }
952         p+=ssl_put_cipher_by_char(s,NULL,NULL);
953
954         sk=ssl_get_ciphers_by_id(s);
955         i=sk_SSL_CIPHER_find(sk,c);
956         if (i < 0)
957         {
958             /* we did not say we would use this cipher */
959             al=SSL_AD_ILLEGAL_PARAMETER;
960             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_WRONG_CIPHER_RETURNED);
961             goto f_err;
962         }
963
964         /* Depending on the session caching (internal/external), the cipher
965          and/or cipher_id values may not be set. Make sure that
966          cipher_id is set and use it for comparison. */
967         if (s->session->cipher)
968             s->session->cipher_id = s->session->cipher->id;
969         if (s->hit && (s->session->cipher_id != c->id))
970         {
971             /* Workaround is now obsolete */
972             #if 0
973                 if (!(s->options &
974                     SSL_OP_NETSCAPE_REUSE_CIPHER_CHANGE_BUG))
975                 #endif
976                 {
977                     al=SSL_AD_ILLEGAL_PARAMETER;
978                     SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_OLD_SESSION_CIPHER_USED);
979                     goto f_err;
980                 }
981             }
982             s->s3->tmp.new_cipher=c;
983             /* Don't digest cached records if TLS v1.2: we may need them for
984              * client authentication.

```

```

986         */
987         if (TLS1_get_version(s) < TLS1_2_VERSION && !ssl3_digest_cached_records(s))
988         {
989             al = SSL_AD_INTERNAL_ERROR;
990             goto f_err;
991         }
992         /* lets get the compression algorithm */
993         /* COMPRESSION */
994         #ifdef OPENSSL_NO_COMP
995         if (*(p++) != 0)
996         {
997             al=SSL_AD_ILLEGAL_PARAMETER;
998             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_UNSUPPORTED_COMPRESSION);
999             goto f_err;
1000         }
1001         /* If compression is disabled we'd better not try to resume a session
1002          * using compression.
1003          */
1004         if (s->session->compress_meth != 0)
1005         {
1006             al=SSL_AD_INTERNAL_ERROR;
1007             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_INCONSISTENT_COMPRESSION);
1008             goto f_err;
1009         }
1010     #else
1011         j= *(p++);
1012         if (s->hit && j != s->session->compress_meth)
1013         {
1014             al=SSL_AD_ILLEGAL_PARAMETER;
1015             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_OLD_SESSION_COMPRESSION_MISMATCH);
1016             goto f_err;
1017         }
1018         if (j == 0)
1019             comp=NULL;
1020         else if (s->options & SSL_OP_NO_COMPRESSION)
1021         {
1022             al=SSL_AD_ILLEGAL_PARAMETER;
1023             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_COMPRESSION_DISABLED);
1024             goto f_err;
1025         }
1026         else
1027             comp=ssl3_comp_find(s->ctx->comp_methods,j);
1028
1029         if ((j != 0) && (comp == NULL))
1030         {
1031             al=SSL_AD_ILLEGAL_PARAMETER;
1032             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_UNSUPPORTED_COMPRESSION);
1033             goto f_err;
1034         }
1035         else
1036         {
1037             s->s3->tmp.new_compression=comp;
1038         }
1039     #endif
1040
1041     #ifndef OPENSSL_NO_TLSEXT
1042         /* TLS extensions */
1043         if (s->version >= SSL3_VERSION)
1044         {
1045             if (!ssl_parse_serverhello_tlsext(s,&p,d,n, &al))
1046             {
1047                 /* 'al' set by ssl_parse_serverhello_tlsext */
1048                 SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_PARSE_TLSEXT);
1049                 goto f_err;
1050             }
1051             if (ssl_check_serverhello_tlsext(s) <= 0)

```

```

1052         {
1053             SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_SERVERHELLO_TLS
1054                 goto err;
1055         }
1056     }
1057 #endif

1059     if (p != (d+n))
1060     {
1061         /* wrong packet length */
1062         al=SSL_AD_DECODE_ERROR;
1063         SSLerr(SSL_F_SSL3_GET_SERVER_HELLO,SSL_R_BAD_PACKET_LENGTH);
1064         goto f_err;
1065     }

1067     return(1);
1068 f_err:
1069     ssl3_send_alert(s,SSL3_AL_FATAL,al);
1070 err:
1071     return(-1);
1072 }

1074 int ssl3_get_server_certificate(SSL *s)
1075 {
1076     int al,i,ok,ret= -1;
1077     unsigned long n,nc,llen,l;
1078     X509 *x=NULL;
1079     const unsigned char *q,*p;
1080     unsigned char *d;
1081     STACK_OF(X509) *sk=NULL;
1082     SESS_CERT *sc;
1083     EVP_PKEY *pkey=NULL;
1084     int need_cert = 1; /* VRS: 0=> will allow null cert if auth == KRB5 */

1086     n=s->method->ssl_get_message(s,
1087         SSL3_ST_CR_CERT_A,
1088         SSL3_ST_CR_CERT_B,
1089         -1,
1090         s->max_cert_list,
1091         &ok);

1093     if (!ok) return((int)n);

1095     if ((s->s3->tmp.message_type == SSL3_MT_SERVER_KEY_EXCHANGE) ||
1096         ((s->s3->tmp.new_cipher->algorithm_auth & SSL_aKRB5) &&
1097          (s->s3->tmp.message_type == SSL3_MT_SERVER_DONE)))
1098     {
1099         s->s3->tmp.reuse_message=1;
1100         return(1);
1101     }

1103     if (s->s3->tmp.message_type != SSL3_MT_CERTIFICATE)
1104     {
1105         al=SSL_AD_UNEXPECTED_MESSAGE;
1106         SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,SSL_R_BAD_MESSAGE_TYPE)
1107         goto f_err;
1108     }
1109     p=d=(unsigned char *)s->init_msg;

1111     if ((sk=sk_X509_new_null()) == NULL)
1112     {
1113         SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,ERR_R_MALLOC_FAILURE);
1114         goto err;
1115     }

1117     n2l3(p,llen);

```

```

1118     if (llen+3 != n)
1119     {
1120         al=SSL_AD_DECODE_ERROR;
1121         SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,SSL_R_LENGTH_MISMATCH);
1122         goto f_err;
1123     }
1124     for (nc=0; nc<llen; )
1125     {
1126         n2l3(p,l);
1127         if ((l+nc+3) > llen)
1128         {
1129             al=SSL_AD_DECODE_ERROR;
1130             SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,SSL_R_CERT LENG
1131             goto f_err;
1132         }

1134         q=p;
1135         x=d2i_X509(NULL,&q,l);
1136         if (x == NULL)
1137         {
1138             al=SSL_AD_BAD_CERTIFICATE;
1139             SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,ERR_R_ASN1_LIB)
1140             goto f_err;
1141         }
1142         if (q != (p+l))
1143         {
1144             al=SSL_AD_DECODE_ERROR;
1145             SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,SSL_R_CERT LENG
1146             goto f_err;
1147         }
1148         if (!sk_X509_push(sk,x))
1149         {
1150             SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,ERR_R_MALLOC_FA
1151             goto err;
1152         }
1153         x=NULL;
1154         nc+=l+3;
1155         p=q;
1156     }

1158     i=ssl_verify_cert_chain(s,sk);
1159     if ((s->verify_mode != SSL_VERIFY_NONE) && (i <= 0))
1160 #ifndef OPENSSSL_NO_KRB5
1161         && !((s->s3->tmp.new_cipher->algorithm_mkey & SSL_kKRB5) &&
1162             (s->s3->tmp.new_cipher->algorithm_auth & SSL_aKRB5))
1163 #endif /* OPENSSSL_NO_KRB5 */
1164     {
1165         al=ssl_verify_alarm_type(s->verify_result);
1166         SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,SSL_R_CERTIFICATE_VERIF
1167         goto f_err;
1168     }
1169     ERR_clear_error(); /* but we keep s->verify_result */

1172     sc=ssl_sess_cert_new();
1173     if (sc == NULL) goto err;

1175     if (s->session->sess_cert) ssl_sess_cert_free(s->session->sess_cert);
1176     s->session->sess_cert=sc;

1178     sc->cert_chain=sk;
1179     /* Inconsistency alert: cert_chain does include the peer's
1180      * certificate, which we don't include in s3_srvr.c */
1181     x=sk_X509_value(sk,0);
1182     sk=NULL;
1183     /* VRS 19990621: possible memory leak; sk=null ==> !sk_pop_free() @end*/

```

```

1185     pkey=X509_get_pubkey(x);

1187     /* VRS: allow null cert if auth == KRB5 */
1188     need_cert = ((s->s3->tmp.new_cipher->algorithm_mkey & SSL_kKRB5) &&
1189                 (s->s3->tmp.new_cipher->algorithm_auth & SSL_aKRB5))
1190                ? 0 : 1;

1192 #ifdef KSSL_DEBUG
1193     printf("pkey,x = %p, %p\n", pkey,x);
1194     printf("ssl_cert_type(x,pkey) = %d\n", ssl_cert_type(x,pkey));
1195     printf("cipher, alg, nc = %s, %lx, %lx, %d\n", s->s3->tmp.new_cipher->na
1196            s->s3->tmp.new_cipher->algorithm_mkey, s->s3->tmp.new_cipher->al
1197 #endif /* KSSL_DEBUG */

1199     if (need_cert && ((pkey == NULL) || EVP_PKEY_missing_parameters(pkey)))
1200     {
1201         x=NULL;
1202         al=SSL3_AL_FATAL;
1203         SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,
1204               SSL_R_UNABLE_TO_FIND_PUBLIC_KEY_PARAMETERS);
1205         goto f_err;
1206     }

1208     i=ssl_cert_type(x,pkey);
1209     if (need_cert && i < 0)
1210     {
1211         x=NULL;
1212         al=SSL3_AL_FATAL;
1213         SSLerr(SSL_F_SSL3_GET_SERVER_CERTIFICATE,
1214               SSL_R_UNKNOWN_CERTIFICATE_TYPE);
1215         goto f_err;
1216     }

1218     if (need_cert)
1219     {
1220         sc->peer_cert_type=i;
1221         CRYPTO_add(&x->references,1,CRYPTO_LOCK_X509);
1222         /* Why would the following ever happen?
1223          * We just created sc a couple of lines ago. */
1224         if (sc->peer_pkeys[i].x509 != NULL)
1225             X509_free(sc->peer_pkeys[i].x509);
1226         sc->peer_pkeys[i].x509=x;
1227         sc->peer_key= &(sc->peer_pkeys[i]);

1229         if (s->session->peer != NULL)
1230             X509_free(s->session->peer);
1231         CRYPTO_add(&x->references,1,CRYPTO_LOCK_X509);
1232         s->session->peer=x;
1233     }
1234     else
1235     {
1236         sc->peer_cert_type=i;
1237         sc->peer_key= NULL;

1239         if (s->session->peer != NULL)
1240             X509_free(s->session->peer);
1241         s->session->peer=NULL;
1242     }
1243     s->session->verify_result = s->verify_result;

1245     x=NULL;
1246     ret=1;

1248     if (0)
1249     {

```

```

1250 f_err:
1251     ssl3_send_alert(s,SSL3_AL_FATAL,al);
1252 }
1253 err:
1254     EVP_PKEY_free(pkey);
1255     X509_free(x);
1256     sk_X509_pop_free(sk,X509_free);
1257     return(ret);
1258 }

1260 int ssl3_get_key_exchange(SSL *s)
1261 {
1262     #ifndef OPENSSL_NO_RSA
1263         unsigned char *q,md_buf[EVP_MAX_MD_SIZE*2];
1264     #endif
1265     EVP_MD_CTX md_ctx;
1266     unsigned char *param,*p;
1267     int al,i,j,param_len,ok;
1268     long n,alg_k,alg_a;
1269     EVP_PKEY *pkey=NULL;
1270     const EVP_MD *md = NULL;
1271     #ifndef OPENSSL_NO_RSA
1272         RSA *rsa=NULL;
1273     #endif
1274     #ifndef OPENSSL_NO_DH
1275         DH *dh=NULL;
1276     #endif
1277     #ifndef OPENSSL_NO_ECDH
1278         EC_KEY *ecdh = NULL;
1279         BN_CTX *bn_ctx = NULL;
1280         EC_POINT *srvr_ecpoint = NULL;
1281         int curve_nid = 0;
1282         int encoded_pt_len = 0;
1283     #endif

1285     /* use same message size as in ssl3_get_certificate_request()
1286      * as ServerKeyExchange message may be skipped */
1287     n=s->method->ssl_get_message(s,
1288                                SSL3_ST_CR_KEY_EXCH_A,
1289                                SSL3_ST_CR_KEY_EXCH_B,
1290                                -1,
1291                                s->max_cert_list,
1292                                &ok);
1293     if (!ok) return((int)n);

1295     if (s->s3->tmp.message_type != SSL3_MT_SERVER_KEY_EXCHANGE)
1296     {
1297         #ifndef OPENSSL_NO_PSK
1298             /* In plain PSK ciphersuite, ServerKeyExchange can be
1299              * omitted if no identity hint is sent. Set
1300              * session->sess_cert anyway to avoid problems
1301              * later.*/
1302             if (s->s3->tmp.new_cipher->algorithm_mkey & SSL_kPSK)
1303             {
1304                 s->session->sess_cert=ssl_sess_cert_new();
1305                 if (s->ctx->psk_identity_hint)
1306                     OPENSSL_free(s->ctx->psk_identity_hint);
1307                 s->ctx->psk_identity_hint = NULL;
1308             }
1309         #endif

1310         s->s3->tmp.reuse_message=1;
1311         return(1);
1312     }

1314     param=p=(unsigned char *)s->init_msg;
1315     if (s->session->sess_cert != NULL)

```

```

1316     {
1317 #ifndef OPENSSSL_NO_RSA
1318     if (s->session->sess_cert->peer_rsa_tmp != NULL)
1319     {
1320         RSA_free(s->session->sess_cert->peer_rsa_tmp);
1321         s->session->sess_cert->peer_rsa_tmp=NULL;
1322     }
1323 #endif
1324 #ifndef OPENSSSL_NO_DH
1325     if (s->session->sess_cert->peer_dh_tmp)
1326     {
1327         DH_free(s->session->sess_cert->peer_dh_tmp);
1328         s->session->sess_cert->peer_dh_tmp=NULL;
1329     }
1330 #endif
1331 #ifndef OPENSSSL_NO_ECDH
1332     if (s->session->sess_cert->peer_ecdh_tmp)
1333     {
1334         EC_KEY_free(s->session->sess_cert->peer_ecdh_tmp);
1335         s->session->sess_cert->peer_ecdh_tmp=NULL;
1336     }
1337 #endif
1338     }
1339     else
1340     {
1341         s->session->sess_cert=ssl_sess_cert_new();
1342     }
1343
1344     param_len=0;
1345     alg_k=s->s3->tmp.new_cipher->algorithm_mkey;
1346     alg_a=s->s3->tmp.new_cipher->algorithm_auth;
1347     EVP_MD_CTX_init(&md_ctx);
1348
1349 #ifndef OPENSSSL_NO_PSK
1350     if (alg_k & SSL_kPSK)
1351     {
1352         char tmp_id_hint[PSK_MAX_IDENTITY_LEN+1];
1353
1354         al=SSL_AD_HANDSHAKE_FAILURE;
1355         n2s(p,i);
1356         param_len=i+2;
1357         /* Store PSK identity hint for later use, hint is used
1358          * in ssl3_send_client_key_exchange. Assume that the
1359          * maximum length of a PSK identity hint can be as
1360          * long as the maximum length of a PSK identity. */
1361         if (i > PSK_MAX_IDENTITY_LEN)
1362         {
1363             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,
1364                   SSL_R_DATA_LENGTH_TOO_LONG);
1365             goto f_err;
1366         }
1367         if (param_len > n)
1368         {
1369             al=SSL_AD_DECODE_ERROR;
1370             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,
1371                   SSL_R_BAD_PSK_IDENTITY_HINT_LENGTH);
1372             goto f_err;
1373         }
1374         /* If received PSK identity hint contains NULL
1375          * characters, the hint is truncated from the first
1376          * NULL. p may not be ending with NULL, so create a
1377          * NULL-terminated string. */
1378         memcpy(tmp_id_hint, p, i);
1379         memset(tmp_id_hint+i, 0, PSK_MAX_IDENTITY_LEN+1-i);
1380         if (s->ctx->psk_identity_hint != NULL)
1381             OPENSSSL_free(s->ctx->psk_identity_hint);

```

```

1382         s->ctx->psk_identity_hint = BUF_strdup(tmp_id_hint);
1383         if (s->ctx->psk_identity_hint == NULL)
1384         {
1385             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, ERR_R_MALLOC_FAILURE);
1386             goto f_err;
1387         }
1388
1389         p+=i;
1390         n-=param_len;
1391     }
1392     else
1393 #endif /* !OPENSSSL_NO_PSK */
1394 #ifndef OPENSSSL_NO_SRP
1395     if (alg_k & SSL_kSRP)
1396     {
1397         n2s(p,i);
1398         param_len=i+2;
1399         if (param_len > n)
1400         {
1401             al=SSL_AD_DECODE_ERROR;
1402             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_SRP_N_LENGT);
1403             goto f_err;
1404         }
1405         if (!(s->srp_ctx.N=BN_bin2bn(p,i,NULL)))
1406         {
1407             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1408             goto err;
1409         }
1410         p+=i;
1411
1412         n2s(p,i);
1413         param_len+=i+2;
1414         if (param_len > n)
1415         {
1416             al=SSL_AD_DECODE_ERROR;
1417             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_SRP_G_LENGT);
1418             goto f_err;
1419         }
1420         if (!(s->srp_ctx.g=BN_bin2bn(p,i,NULL)))
1421         {
1422             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1423             goto err;
1424         }
1425         p+=i;
1426
1427         i = (unsigned int)(p[0]);
1428         p++;
1429         param_len+=i+1;
1430         if (param_len > n)
1431         {
1432             al=SSL_AD_DECODE_ERROR;
1433             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_SRP_S_LENGT);
1434             goto f_err;
1435         }
1436         if (!(s->srp_ctx.s=BN_bin2bn(p,i,NULL)))
1437         {
1438             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1439             goto err;
1440         }
1441         p+=i;
1442
1443         n2s(p,i);
1444         param_len+=i+2;
1445         if (param_len > n)
1446         {
1447             al=SSL_AD_DECODE_ERROR;

```

```

1448         SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_SRP_B_LENGET
1449         goto f_err;
1450     }
1451     if (!(s->srp_ctx.B=BN_bin2bn(p,i,NULL)))
1452     {
1453         SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1454         goto err;
1455     }
1456     p+=i;
1457     n-=param_len;

1459 /* We must check if there is a certificate */
1460 #ifndef OPENSSL_NO_RSA
1461     if (alg_a & SSL_aRSA)
1462         pkey=X509_get_pubkey(s->session->sess_cert->peer_pkeys[S
1463 #else
1464     if (0)
1465         ;
1466 #endif
1467 #ifndef OPENSSL_NO_DSA
1468     else if (alg_a & SSL_aDSS)
1469         pkey=X509_get_pubkey(s->session->sess_cert->peer_pkeys[S
1470 #endif
1471     }
1472     else
1473 #endif /* !OPENSSL_NO_SRP */
1474 #ifndef OPENSSL_NO_RSA
1475     if (alg_k & SSL_kRSA)
1476     {
1477         if ((rsa=RSA_new()) == NULL)
1478         {
1479             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_MALLOC_FAILURE)
1480             goto err;
1481         }
1482         n2s(p,i);
1483         param_len=i+2;
1484         if (param_len > n)
1485         {
1486             al=SSL_AD_DECODE_ERROR;
1487             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_RSA_MODULUS
1488             goto f_err;
1489         }
1490         if (!(rsa->n=BN_bin2bn(p,i,rsa->n)))
1491         {
1492             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1493             goto err;
1494         }
1495         p+=i;

1497         n2s(p,i);
1498         param_len+=i+2;
1499         if (param_len > n)
1500         {
1501             al=SSL_AD_DECODE_ERROR;
1502             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_RSA_E_LENGET
1503             goto f_err;
1504         }
1505         if (!(rsa->e=BN_bin2bn(p,i,rsa->e)))
1506         {
1507             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1508             goto err;
1509         }
1510         p+=i;
1511         n-=param_len;

1513         /* this should be because we are using an export cipher */

```

```

1514         if (alg_a & SSL_aRSA)
1515             pkey=X509_get_pubkey(s->session->sess_cert->peer_pkeys[S
1516         else
1517         {
1518             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_INTERNAL_ERROR)
1519             goto err;
1520         }
1521         s->session->sess_cert->peer_rsa_tmp=rsa;
1522         rsa=NULL;
1523     }
1524 #else /* OPENSSL_NO_RSA */
1525     if (0)
1526         ;
1527 #endif
1528 #ifndef OPENSSL_NO_DH
1529     else if (alg_k & SSL_kEDH)
1530     {
1531         if ((dh=DH_new()) == NULL)
1532         {
1533             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_DH_LIB);
1534             goto err;
1535         }
1536         n2s(p,i);
1537         param_len=i+2;
1538         if (param_len > n)
1539         {
1540             al=SSL_AD_DECODE_ERROR;
1541             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_DH_P_LENGTH
1542             goto f_err;
1543         }
1544         if (!(dh->p=BN_bin2bn(p,i,NULL)))
1545         {
1546             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1547             goto err;
1548         }
1549         p+=i;

1551         n2s(p,i);
1552         param_len+=i+2;
1553         if (param_len > n)
1554         {
1555             al=SSL_AD_DECODE_ERROR;
1556             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_DH_G_LENGTH
1557             goto f_err;
1558         }
1559         if (!(dh->g=BN_bin2bn(p,i,NULL)))
1560         {
1561             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1562             goto err;
1563         }
1564         p+=i;

1566         n2s(p,i);
1567         param_len+=i+2;
1568         if (param_len > n)
1569         {
1570             al=SSL_AD_DECODE_ERROR;
1571             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_DH_PUB_KEY_
1572             goto f_err;
1573         }
1574         if (!(dh->pub_key=BN_bin2bn(p,i,NULL)))
1575         {
1576             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_BN_LIB);
1577             goto err;
1578         }
1579         p+=i;

```

```

1580         n=param_len;

1582 #ifndef OPENSSSL_NO_RSA
1583     if (alg_a & SSL_aRSA)
1584         pkey=X509_get_pubkey(s->session->sess_cert->peer_pkeys[S
1585 #else
1586     if (0)
1587         ;
1588 #endif
1589 #ifndef OPENSSSL_NO_DSA
1590     else if (alg_a & SSL_aDSS)
1591         pkey=X509_get_pubkey(s->session->sess_cert->peer_pkeys[S
1592 #endif
1593     /* else anonymous DH, so no certificate or pkey. */

1595     s->session->sess_cert->peer_dh_tmp=dh;
1596     dh=NULL;
1597 }
1598 else if ((alg_k & SSL_kDhR) || (alg_k & SSL_kDhD))
1599 {
1600     al=SSL_AD_ILLEGAL_PARAMETER;
1601     SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_TRIED_TO_USE_UNSUPPORTED
1602     goto f_err;
1603 }
1604 #endif /* !OPENSSSL_NO_DH */

1606 #ifndef OPENSSSL_NO_ECDH
1607     else if (alg_k & SSL_kEECDH)
1608     {
1609         EC_GROUP *ngroup;
1610         const EC_GROUP *group;

1612         if ((ecdh=EC_KEY_new()) == NULL)
1613         {
1614             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_MALLOC_FAILURE)
1615             goto err;
1616         }

1618         /* Extract elliptic curve parameters and the
1619          * server's ephemeral ECDH public key.
1620          * Keep accumulating lengths of various components in
1621          * param_len and make sure it never exceeds n.
1622          */

1624         /* XXX: For now we only support named (not generic) curves
1625          * and the ECParameters in this case is just three bytes.
1626          */
1627         param_len=3;
1628         if ((param_len > n) ||
1629             (*p != NAMED_CURVE_TYPE) ||
1630             ((curve_nid = tls1_ec_curve_id2nid(*(p + 2))) == 0))
1631         {
1632             al=SSL_AD_INTERNAL_ERROR;
1633             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_UNABLE_TO_FIND
1634             goto f_err;
1635         }

1637         ngroup = EC_GROUP_new_by_curve_name(curve_nid);
1638         if (ngroup == NULL)
1639         {
1640             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_EC_LIB);
1641             goto err;
1642         }
1643         if (EC_KEY_set_group(ecdh, ngroup) == 0)
1644         {
1645             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_EC_LIB);

```

```

1646         goto err;
1647     }
1648     EC_GROUP_free(ngroup);

1650     group = EC_KEY_get0_group(ecdh);

1652     if (SSL_C_IS_EXPORT(s->s3->tmp.new_cipher) &&
1653         (EC_GROUP_get_degree(group) > 163))
1654     {
1655         al=SSL_AD_EXPORT_RESTRICTION;
1656         SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_ECGROUP_TOO_LAR
1657         goto f_err;
1658     }

1660     p+=3;

1662     /* Next, get the encoded ECPoint */
1663     if (((srvr_ecpoint = EC_POINT_new(group)) == NULL) ||
1664         ((bn_ctx = BN_CTX_new()) == NULL))
1665     {
1666         SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,ERR_R_MALLOC_FAILURE)
1667         goto err;
1668     }

1670     encoded_pt_len = *p; /* length of encoded point */
1671     p+=1;
1672     param_len += (1 + encoded_pt_len);
1673     if ((param_len > n) ||
1674         (EC_POINT_oct2point(group, srvr_ecpoint,
1675             p, encoded_pt_len, bn_ctx) == 0))
1676     {
1677         al=SSL_AD_DECODE_ERROR;
1678         SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_BAD_ECPOINT);
1679         goto f_err;
1680     }

1682     n=param_len;
1683     p+=encoded_pt_len;

1685     /* The ECC/TLS specification does not mention
1686     * the use of DSA to sign ECParameters in the server
1687     * key exchange message. We do support RSA and ECDSA.
1688     */
1689     if (0) ;
1690 #ifndef OPENSSSL_NO_RSA
1691     else if (alg_a & SSL_aRSA)
1692         pkey=X509_get_pubkey(s->session->sess_cert->peer_pkeys[S
1693 #endif
1694 #ifndef OPENSSSL_NO_ECDSA
1695     else if (alg_a & SSL_aECDSA)
1696         pkey=X509_get_pubkey(s->session->sess_cert->peer_pkeys[S
1697 #endif
1698     /* else anonymous ECDH, so no certificate or pkey. */
1699     EC_KEY_set_public_key(ecdh, srvr_ecpoint);
1700     s->session->sess_cert->peer_ecdh_tmp=ecdh;
1701     ecdh=NULL;
1702     BN_CTX_free(bn_ctx);
1703     bn_ctx = NULL;
1704     EC_POINT_free(srvr_ecpoint);
1705     srvr_ecpoint = NULL;
1706 }
1707 else if (alg_k)
1708 {
1709     al=SSL_AD_UNEXPECTED_MESSAGE;
1710     SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE,SSL_R_UNEXPECTED_MESSAGE);
1711     goto f_err;

```

```

1712     }
1713 #endif /* !OPENSSL_NO_ECDH */

1716     /* p points to the next byte, there are 'n' bytes left */

1718     /* if it was signed, check the signature */
1719     if (pkey != NULL)
1720     {
1721         if (TLS1_get_version(s) >= TLS1_2_VERSION)
1722         {
1723             int sigalg = tls12_get_sigid(pkey);
1724             /* Should never happen */
1725             if (sigalg == -1)
1726             {
1727                 SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, ERR_R_INTERNAL_ERROR);
1728                 goto err;
1729             }
1730             /* Check key type is consistent with signature */
1731             if (sigalg != (int)p[1])
1732             {
1733                 SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, SSL_R_WRONG_SIGNATURE);
1734                 al=SSL_AD_DECODE_ERROR;
1735                 goto f_err;
1736             }
1737             md = tls12_get_hash(p[0]);
1738             if (md == NULL)
1739             {
1740                 SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, SSL_R_UNKNOWN_ERROR);
1741                 al=SSL_AD_DECODE_ERROR;
1742                 goto f_err;
1743             }
1744 #ifdef SSL_DEBUG
1745             fprintf(stderr, "USING TLSv1.2 HASH %s\n", EVP_MD_name(md));
1746 #endif
1747             p += 2;
1748             n -= 2;
1749         }
1750         else
1751             md = EVP_sha1();
1752
1753         n2s(p, i);
1754         n -= 2;
1755         j=EVP_PKEY_size(pkey);

1757         if ((i != n) || (n > j) || (n <= 0))
1758         {
1759             /* wrong packet length */
1760             al=SSL_AD_DECODE_ERROR;
1761             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, SSL_R_WRONG_SIGNATURE);
1762             goto f_err;
1763         }

1765 #ifndef OPENSSL_NO_RSA
1766         if (pkey->type == EVP_PKEY_RSA && TLS1_get_version(s) < TLS1_2_VERSION)
1767         {
1768             int num;

1770             j=0;
1771             q=md_buf;
1772             for (num=2; num > 0; num--)
1773             {
1774                 EVP_MD_CTX_set_flags(&md_ctx,
1775                     EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
1776                 EVP_DigestInit_ex(&md_ctx, (num == 2)
1777                     ? s->ctx->md5 : s->ctx->sha1, NULL);

```

```

1778                 EVP_DigestUpdate(&md_ctx, &(s->s3->client_random[
1779                     EVP_DigestUpdate(&md_ctx, &(s->s3->server_random[
1780                     EVP_DigestUpdate(&md_ctx, param, param_len);
1781                     EVP_DigestFinal_ex(&md_ctx, q, (unsigned int *)&i)
1782                     q+=i;
1783                     j+=i;
1784                 }
1785                 i=RSA_verify(NID_md5_sha1, md_buf, j, p, n,
1786                     pkey->pkey.rsa);
1787                 if (i < 0)
1788                 {
1789                     al=SSL_AD_DECRYPT_ERROR;
1790                     SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, SSL_R_BAD_RSA);
1791                     goto f_err;
1792                 }
1793                 if (i == 0)
1794                 {
1795                     /* bad signature */
1796                     al=SSL_AD_DECRYPT_ERROR;
1797                     SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, SSL_R_BAD_SIGNATURE);
1798                     goto f_err;
1799                 }
1800             }
1801         }
1802 #endif
1803         else
1804         {
1805             EVP_VerifyInit_ex(&md_ctx, md, NULL);
1806             EVP_VerifyUpdate(&md_ctx, &(s->s3->client_random[0]), SSL3
1807             EVP_VerifyUpdate(&md_ctx, &(s->s3->server_random[0]), SSL3
1808             EVP_VerifyUpdate(&md_ctx, param, param_len);
1809             if (EVP_VerifyFinal(&md_ctx, p, (int)n, pkey) <= 0)
1810             {
1811                 /* bad signature */
1812                 al=SSL_AD_DECRYPT_ERROR;
1813                 SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, SSL_R_BAD_SIGNATURE);
1814                 goto f_err;
1815             }
1816         }
1817     }
1818     else
1819     {
1820         if (!(alg_a & SSL_aNULL) && !(alg_k & SSL_kPSK))
1821             /* aNULL or kPSK do not need public keys */
1822             {
1823                 SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, ERR_R_INTERNAL_ERROR);
1824                 goto err;
1825             }
1826         /* still data left over */
1827         if (n != 0)
1828         {
1829             al=SSL_AD_DECODE_ERROR;
1830             SSLerr(SSL_F_SSL3_GET_KEY_EXCHANGE, SSL_R_EXTRA_DATA_IN_MESSAGE);
1831             goto f_err;
1832         }
1833     }
1834     EVP_PKEY_free(pkey);
1835     EVP_MD_CTX_cleanup(&md_ctx);
1836     return(1);
1837 f_err:
1838     ssl3_send_alert(s, SSL3_AL_FATAL, al);
1839 err:
1840     EVP_PKEY_free(pkey);
1841 #ifndef OPENSSL_NO_RSA
1842     if (rsa != NULL)
1843         RSA_free(rsa);
1844 #endif

```



```

1844 #ifndef OPENSSSL_NO_DH
1845     if (dh != NULL)
1846         DH_free(dh);
1847 #endif
1848 #ifndef OPENSSSL_NO_ECDH
1849     BN_CTX_free(bn_ctx);
1850     EC_POINT_free(srvr_ecpoint);
1851     if (ecdh != NULL)
1852         EC_KEY_free(ecdh);
1853 #endif
1854     EVP_MD_CTX_cleanup(&md_ctx);
1855     return(-1);
1856 }

1858 int ssl3_get_certificate_request(SSL *s)
1859 {
1860     int ok, ret=0;
1861     unsigned long n, nc, l;
1862     unsigned int llen, ctype_num, i;
1863     X509_NAME *xn=NULL;
1864     const unsigned char *p,*q;
1865     unsigned char *d;
1866     STACK_OF(X509_NAME) *ca_sk=NULL;

1868     n=s->method->ssl_get_message(s,
1869     SSL3_ST_CR_CERT_REQ_A,
1870     SSL3_ST_CR_CERT_REQ_B,
1871     -1,
1872     s->max_cert_list,
1873     &ok);

1875     if (!ok) return((int)n);

1877     s->s3->tmp.cert_req=0;

1879     if (s->s3->tmp.message_type == SSL3_MT_SERVER_DONE)
1880     {
1881         s->s3->tmp.reuse_message=1;
1882         /* If we get here we don't need any cached handshake records
1883          * as we wont be doing client auth.
1884          */
1885         if (s->s3->handshake_buffer)
1886         {
1887             if (!ssl3_digest_cached_records(s))
1888                 goto err;
1889         }
1890         return(1);
1891     }

1893     if (s->s3->tmp.message_type != SSL3_MT_CERTIFICATE_REQUEST)
1894     {
1895         ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_UNEXPECTED_MESSAGE);
1896         SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST, SSL_R_WRONG_MESSAGE_TY
1897         goto err;
1898     }

1900     /* TLS does not like anon-DH with client cert */
1901     if (s->version > SSL3_VERSION)
1902     {
1903         if (s->s3->tmp.new_cipher->algorithm_auth & SSL_aNULL)
1904         {
1905             ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_UNEXPECTED_MESSAG
1906             SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST, SSL_R_TLS_CLIE
1907             goto err;
1908         }
1909     }

```

```

1911     p=d+(unsigned char *)s->init_msg;

1913     if ((ca_sk=sk_X509_NAME_new(ca_dn_cmp)) == NULL)
1914     {
1915         SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST, ERR_R_MALLOC_FAILURE);
1916         goto err;
1917     }

1919     /* get the certificate types */
1920     ctype_num= *(p++);
1921     if (ctype_num > SSL3_CT_NUMBER)
1922         ctype_num=SSL3_CT_NUMBER;
1923     for (i=0; i<ctype_num; i++)
1924         s->s3->tmp.ctype[i]= p[i];
1925     p+=ctype_num;
1926     if (TLS1_get_version(s) >= TLS1_2_VERSION)
1927     {
1928         n2s(p, llen);
1929         /* Check we have enough room for signature algorithms and
1930          * following length value.
1931          */
1932         if (((unsigned long)(p - d + llen + 2) > n)
1933         {
1934             ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_DECODE_ERROR);
1935             SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST, SSL_R_DATA_LEN
1936             goto err;
1937         }
1938         if ((llen & 1) || !tls1_process_sigalgs(s, p, llen))
1939         {
1940             ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_DECODE_ERROR);
1941             SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST, SSL_R_SIGNATUR
1942             goto err;
1943         }
1944         p += llen;
1945     }

1947     /* get the CA RDNs */
1948     n2s(p, llen);
1949     #if 0
1950     {
1951         FILE *out;
1952         out=fopen("/tmp/vsign.der", "w");
1953         fwrite(p, 1, llen, out);
1954         fclose(out);
1955     }
1956     #endif

1958     if (((unsigned long)(p - d + llen) != n)
1959     {
1960         ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_DECODE_ERROR);
1961         SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST, SSL_R_LENGTH_MISMATCH)
1962         goto err;
1963     }

1965     for (nc=0; nc<llen; )
1966     {
1967         n2s(p, l);
1968         if ((l+nc+2) > llen)
1969         {
1970             if ((s->options & SSL_OP_NETSCAPE_CA_DN_BUG))
1971                 goto cont; /* netscape bugs */
1972             ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_DECODE_ERROR);
1973             SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST, SSL_R_CA_DN_TO
1974             goto err;
1975         }

```

```

1977         q=p;
1979         if ((xn=d2i_X509_NAME(NULL,&q,l)) == NULL)
1980             {
1981                 /* If netscape tolerance is on, ignore errors */
1982                 if (s->options & SSL_OP_NETSCAPE_CA_DN_BUG)
1983                     goto cont;
1984                 else
1985                     {
1986                         ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_DECODE_ER
1987                         SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST,ERR_R_
1988                         goto err;
1989                     }
1990             }
1992         if (q != (p+l))
1993             {
1994                 ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_DECODE_ERROR);
1995                 SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST,SSL_R_CA_DN_LE
1996                 goto err;
1997             }
1998         if (!sk_X509_NAME_push(ca_sk,xn))
1999             {
2000                 SSLerr(SSL_F_SSL3_GET_CERTIFICATE_REQUEST,ERR_R_MALLOC_F
2001                 goto err;
2002             }
2004         p+=l;
2005         nc+=l+2;
2006     }
2008     if (0)
2009     {
2010         cont:
2011         ERR_clear_error();
2012     }
2014     /* we should setup a certificate to return.... */
2015     s->s3->tmp.cert_req=1;
2016     s->s3->tmp.ctype_num=ctype_num;
2017     if (s->s3->tmp.ca_names != NULL)
2018         sk_X509_NAME_pop_free(s->s3->tmp.ca_names,X509_NAME_free);
2019     s->s3->tmp.ca_names=ca_sk;
2020     ca_sk=NULL;
2022     ret=1;
2023 err:
2024     if (ca_sk != NULL) sk_X509_NAME_pop_free(ca_sk,X509_NAME_free);
2025     return(ret);
2026 }
2028 static int ca_dn_cmp(const X509_NAME * const *a, const X509_NAME * const *b)
2029 {
2030     return(X509_NAME_cmp(*a,*b));
2031 }
2032 #ifndef OPENSSL_NO_TLSEXT
2033 int ssl3_get_new_session_ticket(SSL *s)
2034 {
2035     int ok,al,ret=0, ticklen;
2036     long n;
2037     const unsigned char *p;
2038     unsigned char *d;
2040     n=s->method->ssl_get_message(s,
2041     SSL3_ST_CR_SESSION_TICKET_A,

```

```

2042         SSL3_ST_CR_SESSION_TICKET_B,
2043         -1,
2044         16384,
2045         &ok);
2047     if (!ok)
2048         return((int)n);
2050     if (s->s3->tmp.message_type == SSL3_MT_FINISHED)
2051     {
2052         s->s3->tmp.reuse_message=1;
2053         return(1);
2054     }
2055     if (s->s3->tmp.message_type != SSL3_MT_NEWSESSION_TICKET)
2056     {
2057         al=SSL_AD_UNEXPECTED_MESSAGE;
2058         SSLerr(SSL_F_SSL3_GET_NEW_SESSION_TICKET,SSL_R_BAD_MESSAGE_TYPE)
2059         goto f_err;
2060     }
2061     if (n < 6)
2062     {
2063         /* need at least ticket_lifetime_hint + ticket length */
2064         al = SSL_AD_DECODE_ERROR;
2065         SSLerr(SSL_F_SSL3_GET_NEW_SESSION_TICKET,SSL_R_LENGTH_MISMATCH);
2066         goto f_err;
2067     }
2069     p=d=(unsigned char *)s->init_msg;
2070     n2l(p, s->session->tlsext_tick_lifetime_hint);
2071     n2s(p, ticklen);
2072     /* ticket_lifetime_hint + ticket_length + ticket */
2073     if (ticklen + 6 != n)
2074     {
2075         al = SSL_AD_DECODE_ERROR;
2076         SSLerr(SSL_F_SSL3_GET_NEW_SESSION_TICKET,SSL_R_LENGTH_MISMATCH);
2077         goto f_err;
2078     }
2079     if (s->session->tlsext_tick)
2080     {
2081         OPENSSL_free(s->session->tlsext_tick);
2082         s->session->tlsext_ticklen = 0;
2083     }
2084     s->session->tlsext_tick = OPENSSL_malloc(ticklen);
2085     if (!s->session->tlsext_tick)
2086     {
2087         SSLerr(SSL_F_SSL3_GET_NEW_SESSION_TICKET,ERR_R_MALLOC_FAILURE);
2088         goto err;
2089     }
2090     memcpy(s->session->tlsext_tick, p, ticklen);
2091     s->session->tlsext_ticklen = ticklen;
2092     /* There are two ways to detect a resumed ticket session.
2093     * One is to set an appropriate session ID and then the server
2094     * must return a match in ServerHello. This allows the normal
2095     * client session ID matching to work and we know much
2096     * earlier that the ticket has been accepted.
2097     *
2098     * The other way is to set zero length session ID when the
2099     * ticket is presented and rely on the handshake to determine
2100     * session resumption.
2101     *
2102     * We choose the former approach because this fits in with
2103     * assumptions elsewhere in OpenSSL. The session ID is set
2104     * to the SHA256 (or SHA1 is SHA256 is disabled) hash of the
2105     * ticket.
2106     */
2107     EVP_Digest(p, ticklen,

```

```

2108         s->session->session_id, &s->session->session_id_length,
2109 #ifndef OPENSSSL_NO_SHA256
2110         EVP_sha256(), NULL);
2111 #else
2112         EVP_sha1(), NULL);
2113 #endif
2114     ret=1;
2115     return(ret);
2116 f_err:
2117     ssl3_send_alert(s,SSL3_AL_FATAL,al);
2118 err:
2119     return(-1);
2120 }

2122 int ssl3_get_cert_status(SSL *s)
2123 {
2124     int ok, al;
2125     unsigned long resplen,n;
2126     const unsigned char *p;

2128     n=s->method->ssl_get_message(s,
2129     SSL3_ST_CR_CERT_STATUS_A,
2130     SSL3_ST_CR_CERT_STATUS_B,
2131     SSL3_MT_CERTIFICATE_STATUS,
2132     16384,
2133     &ok);

2135     if (!ok) return((int)n);
2136     if (n < 4)
2137     {
2138         /* need at least status type + length */
2139         al = SSL_AD_DECODE_ERROR;
2140         SSLerr(SSL_F_SSL3_GET_CERT_STATUS,SSL_R_LENGTH_MISMATCH);
2141         goto f_err;
2142     }
2143     p = (unsigned char *)s->init_msg;
2144     if (*p++ != TLSEXT_STATUSTYPE_ocsp)
2145     {
2146         al = SSL_AD_DECODE_ERROR;
2147         SSLerr(SSL_F_SSL3_GET_CERT_STATUS,SSL_R_UNSUPPORTED_STATUS_TYPE)
2148         goto f_err;
2149     }
2150     n2l3(p, resplen);
2151     if (resplen + 4 != n)
2152     {
2153         al = SSL_AD_DECODE_ERROR;
2154         SSLerr(SSL_F_SSL3_GET_CERT_STATUS,SSL_R_LENGTH_MISMATCH);
2155         goto f_err;
2156     }
2157     if (s->tlsext_ocsp_resp)
2158         OPENSSL_free(s->tlsext_ocsp_resp);
2159     s->tlsext_ocsp_resp = BUF_memdup(p, resplen);
2160     if (!s->tlsext_ocsp_resp)
2161     {
2162         al = SSL_AD_INTERNAL_ERROR;
2163         SSLerr(SSL_F_SSL3_GET_CERT_STATUS,ERR_R_MALLOC_FAILURE);
2164         goto f_err;
2165     }
2166     s->tlsext_ocsp_resplen = resplen;
2167     if (s->ctx->tlsext_status_cb)
2168     {
2169         int ret;
2170         ret = s->ctx->tlsext_status_cb(s, s->ctx->tlsext_status_arg);
2171         if (ret == 0)
2172         {
2173             al = SSL_AD_BAD_CERTIFICATE_STATUS_RESPONSE;

```

```

2174         SSLerr(SSL_F_SSL3_GET_CERT_STATUS,SSL_R_INVALID_STATUS_R
2175         goto f_err;
2176     }
2177     if (ret < 0)
2178     {
2179         al = SSL_AD_INTERNAL_ERROR;
2180         SSLerr(SSL_F_SSL3_GET_CERT_STATUS,ERR_R_MALLOC_FAILURE);
2181         goto f_err;
2182     }
2183     }
2184     return 1;
2185 f_err:
2186     ssl3_send_alert(s,SSL3_AL_FATAL,al);
2187     return(-1);
2188 }
2189 #endif

2191 int ssl3_get_server_done(SSL *s)
2192 {
2193     int ok,ret=0;
2194     long n;

2196     n=s->method->ssl_get_message(s,
2197     SSL3_ST_CR_SRVR_DONE_A,
2198     SSL3_ST_CR_SRVR_DONE_B,
2199     SSL3_MT_SERVER_DONE,
2200     30, /* should be very small, like 0 :) */
2201     &ok);

2203     if (!ok) return((int)n);
2204     if (n > 0)
2205     {
2206         /* should contain no data */
2207         ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_DECODE_ERROR);
2208         SSLerr(SSL_F_SSL3_GET_SERVER_DONE,SSL_R_LENGTH_MISMATCH);
2209         return -1;
2210     }
2211     ret=1;
2212     return(ret);
2213 }

2216 int ssl3_send_client_key_exchange(SSL *s)
2217 {
2218     unsigned char *p,*d;
2219     int n;
2220     unsigned long alg_k;
2221 #ifndef OPENSSSL_NO_RSA
2222     unsigned char *q;
2223     EVP_PKEY *pkey=NULL;
2224 #endif
2225 #ifndef OPENSSSL_NO_KRB5
2226     KSSL_ERR kssl_err;
2227 #endif /* OPENSSSL_NO_KRB5 */
2228 #ifndef OPENSSSL_NO_ECDH
2229     EC_KEY *clnt_ecdh = NULL;
2230     const EC_POINT *srvr_ecpoint = NULL;
2231     EVP_PKEY *srvr_pub_pkey = NULL;
2232     unsigned char *encodedPoint = NULL;
2233     int encoded_pt_len = 0;
2234     BN_CTX *bn_ctx = NULL;
2235 #endif

2237     if (s->state == SSL3_ST_CW_KEY_EXCH_A)
2238     {
2239         d=(unsigned char *)s->init_buf->data;

```

```

2240         p= &(d[4]);
2242         alg_k=s->s3->tmp.new_cipher->algorithm_mkey;

2244         /* Fool emacs indentation */
2245         if (0) {}
2246 #ifndef OPENSSSL_NO_RSA
2247         else if (alg_k & SSL_kRSA)
2248         {
2249             RSA *rsa;
2250             unsigned char tmp_buf[SSL_MAX_MASTER_KEY_LENGTH];

2252             if (s->session->sess_cert->peer_rsa_tmp != NULL)
2253                 rsa=s->session->sess_cert->peer_rsa_tmp;
2254             else
2255             {
2256                 pkey=X509_get_pubkey(s->session->sess_cert->peer
2257                 if ((pkey == NULL) ||
2258                     (pkey->type != EVP_PKEY_RSA) ||
2259                     (pkey->pkey.rsa == NULL))
2260                 {
2261                     SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2262                     goto err;
2263                 }
2264                 rsa=pkey->pkey.rsa;
2265                 EVP_PKEY_free(pkey);
2266             }

2267             tmp_buf[0]=s->client_version>>8;
2268             tmp_buf[1]=s->client_version&0xff;
2269             if (RAND_bytes(&(tmp_buf[2]),sizeof tmp_buf-2) <= 0)
2270                 goto err;
2271             goto err;

2273             s->session->master_key_length=sizeof tmp_buf;

2275             q=p;
2276             /* Fix buf for TLS and beyond */
2277             if (s->version > SSL3_VERSION)
2278                 p+=2;
2279             n=RSA_public_encrypt(sizeof tmp_buf,
2280                                 tmp_buf,p,rsa,RSA_PKCS1_PADDING);
2281 #ifdef PKCS1_CHECK
2282             if (s->options & SSL_OP_PKCS1_CHECK_1) p[1]++;
2283             if (s->options & SSL_OP_PKCS1_CHECK_2) tmp_buf[0]=0x70;
2284 #endif
2285             if (n <= 0)
2286             {
2287                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,SSL_R
2288                 goto err;
2289             }

2291             /* Fix buf for TLS and beyond */
2292             if (s->version > SSL3_VERSION)
2293             {
2294                 s2n(n,q);
2295                 n+=2;
2296             }

2298             s->session->master_key_length=
2299             s->method->ssl3_enc->generate_master_secret(s,
2300             s->session->master_key,
2301             tmp_buf,sizeof tmp_buf);
2302             OPENSSSL_cleanse(tmp_buf,sizeof tmp_buf);
2303         }
2304 #endif
2305 #ifndef OPENSSSL_NO_KRB5

```

```

2306         else if (alg_k & SSL_kKRB5)
2307         {
2308             krb5_error_code krb5rc;
2309             KSSL_CTX *kssl_ctx = s->kssl_ctx;
2310             /* krb5_data krb5_ap_req; */
2311             krb5_data *enc_ticket;
2312             krb5_data authenticator, *authp = NULL;
2313             EVP_CIPHER_CTX ciph_ctx;
2314             const EVP_CIPHER *enc = NULL;
2315             unsigned char iv[EVP_MAX_IV_LENGTH];
2316             unsigned char tmp_buf[SSL_MAX_MASTER_KEY_LENGTH];
2317             unsigned char epms[SSL_MAX_MASTER_KEY_LENGTH
2318                             + EVP_MAX_IV_LENGTH];
2319             int padl, outl = sizeof(epms);

2321             EVP_CIPHER_CTX_init(&ciph_ctx);

2323 #ifdef KSSL_DEBUG
2324             printf("ssl3_send_client_key_exchange(%lx & %lx)\n",
2325                 alg_k, SSL_kKRB5);
2326 #endif /* KSSL_DEBUG */

2328             authp = NULL;
2329 #ifdef KRB5SENDAUTH
2330             if (KRB5SENDAUTH) authp = &authenticator;
2331 #endif /* KRB5SENDAUTH */

2333             krb5rc = kssl_cget_tkt(kssl_ctx, &enc_ticket, authp,
2334                                   &kssl_err);
2335             enc = kssl_map_enc(kssl_ctx->enc_type);
2336             if (enc == NULL)
2337                 goto err;
2338 #ifdef KSSL_DEBUG
2339             {
2340                 printf("kssl_cget_tkt rtn %d\n", krb5rc);
2341                 if (krb5rc && kssl_err.text)
2342                     printf("kssl_cget_tkt kssl_err=%s\n", kssl_err.text);
2343             }
2344 #endif /* KSSL_DEBUG */

2346             if (krb5rc)
2347             {
2348                 ssl3_send_alert(s,SSL3_AL_FATAL,
2349                                SSL_AD_HANDSHAKE_FAILURE);
2350                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2351                        kssl_err.reason);
2352                 goto err;
2353             }

2355             /* 20010406 VRS - Earlier versions used KRB5_AP_REQ
2356             ** in place of RFC 2712 KerberosWrapper, as in:
2357             **
2358             ** Send ticket (copy to *p, set n = length)
2359             ** n = krb5_ap_req.length;
2360             ** memcpy(p, krb5_ap_req.data, krb5_ap_req.length);
2361             ** if (krb5_ap_req.data)
2362             **     kssl_krb5_free_data_contents(NULL,&krb5_ap_req);
2363             **
2364             ** Now using real RFC 2712 KerberosWrapper
2365             ** (Thanks to Simon Wilkinson <sxw@sxw.org.uk>)
2366             ** Note: 2712 "opaque" types are here replaced
2367             ** with a 2-byte length followed by the value.
2368             ** Example:
2369             ** KerberosWrapper= xx xx asn1ticket 0 0 xx xx encpms
2370             ** Where "xx xx" = length bytes. Shown here with
2371             ** optional authenticator omitted.

```

```

2372      */
2373
2374      /* KerberosWrapper.Ticket */
2375      s2n(enc_ticket->length,p);
2376      memcpy(p, enc_ticket->data, enc_ticket->length);
2377      p+= enc_ticket->length;
2378      n = enc_ticket->length + 2;
2379
2380      /* KerberosWrapper.Authenticator */
2381      if (authp && authp->length)
2382      {
2383          s2n(authp->length,p);
2384          memcpy(p, authp->data, authp->length);
2385          p+= authp->length;
2386          n+= authp->length + 2;
2387
2388          free(authp->data);
2389          authp->data = NULL;
2390          authp->length = 0;
2391      }
2392      else
2393      {
2394          s2n(0,p); /* null authenticator length */
2395          n+=2;
2396      }
2397
2398      tmp_buf[0]=s->client_version>>8;
2399      tmp_buf[1]=s->client_version&0xff;
2400      if (RAND_bytes(&(tmp_buf[2]),sizeof tmp_buf-2) <= 0)
2401          goto err;
2402
2403      /* 20010420 VRS. Tried it this way; failed.
2404      ** EVP_EncryptInit_ex(&ciph_ctx,enc, NULL,NULL);
2405      ** EVP_CIPHER_CTX_set_key_length(&ciph_ctx,
2406      ** kssl_ctx->length);
2407      ** EVP_EncryptInit_ex(&ciph_ctx,NULL, key,iv);
2408      */
2409
2410      memset(iv, 0, sizeof iv); /* per RFC 1510 */
2411      EVP_EncryptInit_ex(&ciph_ctx,enc, NULL,
2412          kssl_ctx->key,iv);
2413      EVP_EncryptUpdate(&ciph_ctx,epms,&outl,tmp_buf,
2414          sizeof tmp_buf);
2415      EVP_EncryptFinal_ex(&ciph_ctx,&(epms[outl]),&padl);
2416      outl += padl;
2417      if (outl > (int)sizeof epms)
2418      {
2419          SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE, ERR_
2420              goto err;
2421          }
2422      EVP_CIPHER_CTX_cleanup(&ciph_ctx);
2423
2424      /* KerberosWrapper.EncryptedPreMasterSecret */
2425      s2n(outl,p);
2426      memcpy(p, epms, outl);
2427      p+=outl;
2428      n+=outl + 2;
2429
2430      s->session->master_key_length=
2431          s->method->ssl3_enc->generate_master_secret(s,
2432              s->session->master_key,
2433              tmp_buf, sizeof tmp_buf);
2434
2435      OPENSSL_cleanse(tmp_buf, sizeof tmp_buf);
2436      OPENSSL_cleanse(epms, outl);
2437      }

```

```

2438 #endif
2439 #ifndef OPENSSL_NO_DH
2440     else if (alg_k & (SSL_kEDH|SSL_kDHr|SSL_kDHd))
2441     {
2442         DH *dh_srvr,*dh_clnt;
2443
2444         if (s->session->sess_cert == NULL)
2445         {
2446             ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_UNEXPECTE
2447                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,SSL_R
2448                     goto err;
2449             }
2450
2451         if (s->session->sess_cert->peer_dh_tmp != NULL)
2452             dh_srvr=s->session->sess_cert->peer_dh_tmp;
2453         else
2454         {
2455             /* we get them from the cert */
2456             ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_HANDSHAKE
2457                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,SSL_R
2458                     goto err;
2459             }
2460
2461         /* generate a new random key */
2462         if ((dh_clnt=DHparams_dup(dh_srvr)) == NULL)
2463         {
2464             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,ERR_R
2465                 goto err;
2466             }
2467         if (!DH_generate_key(dh_clnt))
2468         {
2469             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,ERR_R
2470                 DH_free(dh_clnt);
2471                 goto err;
2472             }
2473
2474         /* use the 'p' output buffer for the DH key, but
2475          * make sure to clear it out afterwards */
2476
2477         n=DH_compute_key(p,dh_srvr->pub_key,dh_clnt);
2478
2479         if (n <= 0)
2480         {
2481             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,ERR_R
2482                 DH_free(dh_clnt);
2483                 goto err;
2484             }
2485
2486         /* generate master key from the result */
2487         s->session->master_key_length=
2488             s->method->ssl3_enc->generate_master_secret(s,
2489                 s->session->master_key,p,n);
2490
2491         /* clean up */
2492         memset(p,0,n);
2493
2494         /* send off the data */
2495         n=BN_num_bytes(dh_clnt->pub_key);
2496         s2n(n,p);
2497         BN_bn2bin(dh_clnt->pub_key,p);
2498         n+=2;
2499
2500         DH_free(dh_clnt);
2501
2502         /* perhaps clean things up a bit EAY EAY EAY EAY*/
2503     }
2504 #endif

```

```

2505 #ifndef OPENSSL_NO_ECDH
2506     else if (alg_k & (SSL_kECDH|SSL_kECDHr|SSL_kECDHe))
2507     {
2508         const EC_GROUP *srvr_group = NULL;
2509         EC_KEY *tkey;
2510         int ecdh_clnt_cert = 0;
2511         int field_size = 0;
2512
2513         /* Did we send out the client's
2514          * ECDH share for use in premaster
2515          * computation as part of client certificate?
2516          * If so, set ecdh_clnt_cert to 1.
2517          */
2518         if ((alg_k & (SSL_kECDHr|SSL_kECDHe)) && (s->cert != NUL
2519         {
2520             /* XXX: For now, we do not support client
2521              * authentication using ECDH certificates.
2522              * To add such support, one needs to add
2523              * code that checks for appropriate
2524              * conditions and sets ecdh_clnt_cert to 1.
2525              * For example, the cert have an ECC
2526              * key on the same curve as the server's
2527              * and the key should be authorized for
2528              * key agreement.
2529              *
2530              * One also needs to add code in ssl3_connect
2531              * to skip sending the certificate verify
2532              * message.
2533              *
2534              * if ((s->cert->key->privatekey != NULL) &&
2535              *      (s->cert->key->privatekey->type ==
2536              *       EVP_PKEY_EC) && ...)
2537              * ecdh_clnt_cert = 1;
2538              */
2539         }
2540
2541         if (s->session->sess_cert->peer_ecdh_tmp != NULL)
2542         {
2543             tkey = s->session->sess_cert->peer_ecdh_tmp;
2544         }
2545         else
2546         {
2547             /* Get the Server Public Key from Cert */
2548             srvr_pub_pkey = X509_get_pubkey(s->session-> \
2549             sess_cert->peer_pkeys[SSL_PKEY_ECC].x509);
2550             if ((srvr_pub_pkey == NULL) ||
2551                 (srvr_pub_pkey->type != EVP_PKEY_EC) ||
2552                 (srvr_pub_pkey->pkey.ec == NULL))
2553             {
2554                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2555                     ERR_R_INTERNAL_ERROR);
2556                 goto err;
2557             }
2558
2559             tkey = srvr_pub_pkey->pkey.ec;
2560         }
2561
2562         srvr_group = EC_KEY_get0_group(tkey);
2563         srvr_ecpoint = EC_KEY_get0_public_key(tkey);
2564
2565         if ((srvr_group == NULL) || (srvr_ecpoint == NULL))
2566         {
2567             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2568                 ERR_R_INTERNAL_ERROR);
2569             goto err;

```

```

2570         }
2571
2572         if ((clnt_ecdh=EC_KEY_new()) == NULL)
2573         {
2574             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,ERR_R
2575             goto err;
2576         }
2577
2578         if (!EC_KEY_set_group(clnt_ecdh, srvr_group))
2579         {
2580             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,ERR_R
2581             goto err;
2582         }
2583         if (ecdh_clnt_cert)
2584         {
2585             /* Reuse key info from our certificate
2586              * We only need our private key to perform
2587              * the ECDH computation.
2588              */
2589             const BIGNUM *priv_key;
2590             tkey = s->cert->key->privatekey->pkey.ec;
2591             priv_key = EC_KEY_get0_private_key(tkey);
2592             if (priv_key == NULL)
2593             {
2594                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2595                 goto err;
2596             }
2597             if (!EC_KEY_set_private_key(clnt_ecdh, priv_key)
2598             {
2599                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2600                 goto err;
2601             }
2602         }
2603         else
2604         {
2605             /* Generate a new ECDH key pair */
2606             if (!EC_KEY_generate_key(clnt_ecdh))
2607             {
2608                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2609                 goto err;
2610             }
2611         }
2612
2613         /* use the 'p' output buffer for the ECDH key, but
2614          * make sure to clear it out afterwards
2615          */
2616
2617         field_size = EC_GROUP_get_degree(srvr_group);
2618         if (field_size <= 0)
2619         {
2620             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2621                 ERR_R_ECDH_LIB);
2622             goto err;
2623         }
2624         n=ECDH_compute_key(p, (field_size+7)/8, srvr_ecpoint, cl
2625         if (n <= 0)
2626         {
2627             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2628                 ERR_R_ECDH_LIB);
2629             goto err;
2630         }
2631
2632         /* generate master key from the result */
2633         s->session->master_key_length = s->method->ssl3_enc \
2634         -> generate_master_secret(s,
2635         s->session->master_key,

```

```

2636         p, n);
2638         memset(p, 0, n); /* clean up */
2640         if (ecdh_clnt_cert)
2641         {
2642             /* Send empty client key exch message */
2643             n = 0;
2644         }
2645         else
2646         {
2647             /* First check the size of encoding and
2648              * allocate memory accordingly.
2649              */
2650             encoded_pt_len =
2651                 EC_POINT_point2oct(srvr_group,
2652                 EC_KEY_get0_public_key(clnt_ecdh),
2653                 POINT_CONVERSION_UNCOMPRESSED,
2654                 NULL, 0, NULL);
2656             encodedPoint = (unsigned char *)
2657                 OPENSSL_malloc(encoded_pt_len *
2658                 sizeof(unsigned char));
2659             bn_ctx = BN_CTX_new();
2660             if ((encodedPoint == NULL) ||
2661                 (bn_ctx == NULL))
2662             {
2663                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2664                     goto err;
2665             }
2667             /* Encode the public key */
2668             n = EC_POINT_point2oct(srvr_group,
2669             EC_KEY_get0_public_key(clnt_ecdh),
2670             POINT_CONVERSION_UNCOMPRESSED,
2671             encodedPoint, encoded_pt_len, bn_ctx);
2673             *p = n; /* length of encoded point */
2674             /* Encoded point will be copied here */
2675             p += 1;
2676             /* copy the point */
2677             memcpy((unsigned char *)p, encodedPoint, n);
2678             /* increment n to account for length field */
2679             n += 1;
2680         }
2682         /* Free allocated memory */
2683         BN_CTX_free(bn_ctx);
2684         if (encodedPoint != NULL) OPENSSL_free(encodedPoint);
2685         if (clnt_ecdh != NULL)
2686             EC_KEY_free(clnt_ecdh);
2687         EVP_PKEY_free(srvr_pub_pkey);
2688     }
2689 #endif /* !OPENSSL_NO_ECDH */
2690     else if (alg_k & SSL_KGOST)
2691     {
2692         /* GOST key exchange message creation */
2693         EVP_PKEY_CTX *pkey_ctx;
2694         X509 *peer_cert;
2695         size_t msglen;
2696         unsigned int md_len;
2697         int keytype;
2698         unsigned char premaster_secret[32], shared_ukm[32], tmp[2]
2699         EVP_MD_CTX *ukm_hash;
2700         EVP_PKEY *pub_key;

```

```

2702         /* Get server certificate PKEY and create ctx from it */
2703         peer_cert=s->session->sess_cert->peer_pkeys[(keytype=SSL
2704         if (!peer_cert)
2705             peer_cert=s->session->sess_cert->peer_pkeys[(key
2706         if (!peer_cert)
2707             {
2708                 SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2709                 goto err;
2710             }
2711         pkey_ctx=EVP_PKEY_CTX_new(pub_key=X509_get_pubkey(peer_c
2712         /* If we have send a certificate, and certificate key
2714         * parameters match those of server certificate, use
2715         * certificate key for key exchange
2716         */
2718         /* Otherwise, generate ephemeral key pair */
2719
2720         EVP_PKEY_encrypt_init(pkey_ctx);
2721         /* Generate session key */
2722         RAND_bytes(premaster_secret,32);
2723         /* If we have client certificate, use its secret as peer
2724         if (s->s3->tmp.cert_req && s->cert->key->privatekey) {
2725             if (EVP_PKEY_derive_set_peer(pkey_ctx,s->cert->k
2726                 /* If there was an error - just ignore i
2727                 * would be used
2728                 */
2729                 ERR_clear_error();
2730             }
2731         }
2732         /* Compute shared IV and store it in algorithm-specific
2733         * context data */
2734         ukm_hash = EVP_MD_CTX_create();
2735         EVP_DigestInit(ukm_hash,EVP_get_digestbyname(NID_id_GostR
2736         EVP_DigestUpdate(ukm_hash,s->s3->client_random,SSL3_RAND
2737         EVP_DigestUpdate(ukm_hash,s->s3->server_random,SSL3_RAND
2738         EVP_DigestFinal_ex(ukm_hash, shared_ukm, &md_len);
2739         EVP_MD_CTX_destroy(ukm_hash);
2740         if (EVP_PKEY_CTX_ctrl(pkey_ctx,-1,EVP_PKEY_OP_ENCRYPT,EV
2741             8,shared_ukm)<0) {
2742             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHAN
2743             SSL_R_LIBRARY_BUG);
2744             goto err;
2745         }
2746         /* Make GOST keytransport blob message */
2747         /*Encapsulate it into sequence */
2748         *(p++)=V_ASN1_SEQUENCE | V_ASN1_CONSTRUCTED;
2749         msglen=255;
2750         if (EVP_PKEY_encrypt(pkey_ctx,tmp,&msglen,premaster_secr
2751             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2752             SSL_R_LIBRARY_BUG);
2753             goto err;
2754         }
2755         if (msglen >= 0x80)
2756         {
2757             *(p++)=0x81;
2758             *(p++)= msglen & 0xff;
2759             n=msglen+3;
2760         }
2761         else
2762         {
2763             *(p++)= msglen & 0xff;
2764             n=msglen+2;
2765         }
2766         memcpy(p, tmp, msglen);
2767         /* Check if pubkey from client certificate was used */

```

```

2768         if (EVP_PKEY_CTX_ctrl(pkey_ctx, -1, -1, EVP_PKEY_CTRL_PE
2769             {
2770                 /* Set flag "skip certificate verify" */
2771                 s->s3->flags |= TLS1_FLAGS_SKIP_CERT_VERIFY;
2772             }
2773         EVP_PKEY_CTX_free(pkey_ctx);
2774         s->session->master_key_length=
2775         s->method->ssl3_enc->generate_master_secret(s,
2776             s->session->master_key,premaster_secret,
2777         EVP_PKEY_free(pub_key);
2778     }
2779 #ifndef OPENSSL_NO_SRP
2780     else if (alg_k & SSL_kSRP)
2781     {
2782         if (s->srp_ctx.A != NULL)
2783         {
2784             /* send off the data */
2785             n=BN_num_bytes(s->srp_ctx.A);
2786             s2n(n,p);
2787             BN_bn2bin(s->srp_ctx.A,p);
2788             n+=2;
2789         }
2790     }
2791     else
2792     {
2793         SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,ERR_R
2794         goto err;
2795     }
2796     if (s->session->srp_username != NULL)
2797         OPENSSL_free(s->session->srp_username);
2798     s->session->srp_username = BUF_strdup(s->srp_ctx.login);
2799     if (s->session->srp_username == NULL)
2800     {
2801         SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2802             ERR_R_MALLOC_FAILURE);
2803         goto err;
2804     }
2805     if ((s->session->master_key_length = SRP_generate_client
2806     {
2807         SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,ERR_R
2808         goto err;
2809     }
2810     }
2811 }
2812 #endif
2813 #ifndef OPENSSL_NO_PSK
2814     else if (alg_k & SSL_kPSK)
2815     {
2816         char identity[PSK_MAX_IDENTITY_LEN];
2817         unsigned char *t = NULL;
2818         unsigned char psk_or_pre_ms[PSK_MAX_PSK_LEN*2+4];
2819         unsigned int pre_ms_len = 0, psk_len = 0;
2820         int psk_err = 1;
2821
2822         n = 0;
2823         if (s->psk_client_callback == NULL)
2824         {
2825             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2826                 SSL_R_PSK_NO_CLIENT_CB);
2827             goto err;
2828         }
2829         psk_len = s->psk_client_callback(s, s->ctx->psk_identity
2830             identity, PSK_MAX_IDENTITY_LEN,
2831             psk_or_pre_ms, sizeof(psk_or_pre_ms));
2832         if (psk_len > PSK_MAX_PSK_LEN)

```

```

2834         {
2835             SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2836                 ERR_R_INTERNAL_ERROR);
2837             goto psk_err;
2838         }
2839     }
2840     else if (psk_len == 0)
2841     {
2842         SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2843             SSL_R_PSK_IDENTITY_NOT_FOUND);
2844         goto psk_err;
2845     }
2846     /* create PSK pre_master_secret */
2847     pre_ms_len = 2+psk_len+2+psk_len;
2848     t = psk_or_pre_ms;
2849     memmove(psk_or_pre_ms+psk_len+4, psk_or_pre_ms, psk_len)
2850     s2n(psk_len, t);
2851     memset(t, 0, psk_len);
2852     t+=psk_len;
2853     s2n(psk_len, t);
2854
2855     if (s->session->psk_identity_hint != NULL)
2856         OPENSSL_free(s->session->psk_identity_hint);
2857     s->session->psk_identity_hint = BUF_strdup(s->ctx->psk_i
2858     if (s->ctx->psk_identity_hint != NULL &&
2859         s->session->psk_identity_hint == NULL)
2860     {
2861         SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2862             ERR_R_MALLOC_FAILURE);
2863         goto psk_err;
2864     }
2865     if (s->session->psk_identity != NULL)
2866         OPENSSL_free(s->session->psk_identity);
2867     s->session->psk_identity = BUF_strdup(identity);
2868     if (s->session->psk_identity == NULL)
2869     {
2870         SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,
2871             ERR_R_MALLOC_FAILURE);
2872         goto psk_err;
2873     }
2874
2875     s->session->master_key_length =
2876     s->method->ssl3_enc->generate_master_secret(s,
2877         s->session->master_key,
2878         psk_or_pre_ms, pre_ms_len);
2879     n = strlen(identity);
2880     s2n(n, p);
2881     memcpy(p, identity, n);
2882     n+=2;
2883     psk_err = 0;
2884 psk_err:
2885     OPENSSL_cleanse(identity, PSK_MAX_IDENTITY_LEN);
2886     OPENSSL_cleanse(psk_or_pre_ms, sizeof(psk_or_pre_ms));
2887     if (psk_err != 0)
2888     {
2889         ssl3_send_alert(s, SSL3_AL_FATAL, SSL_AD_HANDSHA
2890         goto err;
2891     }
2892 }
2893 #endif
2894
2895     else
2896     {
2897         ssl3_send_alert(s, SSL3_AL_FATAL,
2898             SSL_AD_HANDSHAKE_FAILURE);
2899         SSLerr(SSL_F_SSL3_SEND_CLIENT_KEY_EXCHANGE,

```



```

2900         ERR_R_INTERNAL_ERROR);
2901         goto err;
2902     }
2903
2904     *(d++)=SSL3_MT_CLIENT_KEY_EXCHANGE;
2905     l2n3(n,d);
2906
2907     s->state=SSL3_ST_CW_KEY_EXCH_B;
2908     /* number of bytes to write */
2909     s->init_num=n+4;
2910     s->init_off=0;
2911 }
2912
2913 /* SSL3_ST_CW_KEY_EXCH_B */
2914 return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
2915 err:
2916 #ifndef OPENSSL_NO_ECDH
2917     BN_CTX_free(bn_ctx);
2918     if (encodedPoint != NULL) OPENSSL_free(encodedPoint);
2919     if (clnt_ecdh != NULL)
2920         EC_KEY_free(clnt_ecdh);
2921     EVP_PKEY_free(srvr_pub_pkey);
2922 #endif
2923 return(-1);
2924 }
2925
2926 int ssl3_send_client_verify(SSL *s)
2927 {
2928     unsigned char *p,*d;
2929     unsigned char data[MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH];
2930     EVP_PKEY *pkey;
2931     EVP_PKEY_CTX *pctx=NULL;
2932     EVP_MD_CTX mctx;
2933     unsigned u=0;
2934     unsigned long n;
2935     int j;
2936
2937     EVP_MD_CTX_init(&mctx);
2938
2939     if (s->state == SSL3_ST_CW_CERT_VRFY_A)
2940     {
2941         d=(unsigned char *)s->init_buf->data;
2942         p= &d[4];
2943         pkey=s->cert->key->privatekey;
2944         /* Create context from key and test if sha1 is allowed as digest */
2945         pctx = EVP_PKEY_CTX_new(pkey,NULL);
2946         EVP_PKEY_sign_init(pctx);
2947         if (EVP_PKEY_CTX_set_signature_md(pctx, EVP_sha1())>0)
2948         {
2949             if (TLS1_get_version(s) < TLS1_2_VERSION)
2950                 s->method->ssl3_enc->cert_verify_mac(s,
2951                     NID_sha1,
2952                     &(data[MD5_DIGEST_LENGTH]));
2953         }
2954         else
2955         {
2956             ERR_clear_error();
2957         }
2958         /* For TLS v1.2 send signature algorithm and signature
2959          * using agreed digest and cached handshake records.
2960          */
2961         if (TLS1_get_version(s) >= TLS1_2_VERSION)
2962         {
2963             long hdatalen = 0;
2964             void *hdata;
2965             const EVP_MD *md = s->cert->key->digest;

```

```

2966         hdatalen = BIO_get_mem_data(s->s3->handshake_buffer,
2967                                     &hdata);
2968         if (hdatalen <= 0 || !tls12_get_sigandhash(p, pkey, md))
2969         {
2970             SSLerr(SSL_F_SSL3_SEND_CLIENT_VERIFY,
2971                     ERR_R_INTERNAL_ERROR);
2972             goto err;
2973         }
2974         p += 2;
2975 #ifdef SSL_DEBUG
2976         fprintf(stderr, "Using TLS 1.2 with client alg %s\n",
2977                 EVP_MD_name(md));
2978 #endif
2979         if (!EVP_SignInit_ex(&mctx, md, NULL)
2980             || !EVP_SignUpdate(&mctx, hdata, hdatalen)
2981             || !EVP_SignFinal(&mctx, p + 2, &u, pkey))
2982         {
2983             SSLerr(SSL_F_SSL3_SEND_CLIENT_VERIFY,
2984                     ERR_R_EVP_LIB);
2985             goto err;
2986         }
2987         s2n(u,p);
2988         n = u + 4;
2989         if (!ssl3_digest_cached_records(s))
2990             goto err;
2991     }
2992     else
2993     #ifndef OPENSSL_NO_RSA
2994         if (pkey->type == EVP_PKEY_RSA)
2995         {
2996             s->method->ssl3_enc->cert_verify_mac(s,
2997                 NID_md5,
2998                 &(data[0]));
2999             if (RSA_sign(NID_md5_sha1, data,
3000                 MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH,
3001                 &(p[2]), &u, pkey->pkey.rsa) <= 0 )
3002             {
3003                 SSLerr(SSL_F_SSL3_SEND_CLIENT_VERIFY,ERR_R_RSA_L
3004                     goto err;
3005             }
3006             s2n(u,p);
3007             n=u+2;
3008         }
3009     else
3010     #endif
3011     #ifndef OPENSSL_NO_DSA
3012         if (pkey->type == EVP_PKEY_DSA)
3013         {
3014             if (!DSA_sign(pkey->save_type,
3015                 &(data[MD5_DIGEST_LENGTH]),
3016                 SHA_DIGEST_LENGTH,&(p[2]),
3017                 (unsigned int *)&j,pkey->pkey.dsa))
3018             {
3019                 SSLerr(SSL_F_SSL3_SEND_CLIENT_VERIFY,ERR_R_DSA_L
3020                     goto err;
3021             }
3022             s2n(j,p);
3023             n=j+2;
3024         }
3025     else
3026     #endif
3027     #ifndef OPENSSL_NO_ECDSA
3028         if (pkey->type == EVP_PKEY_EC)
3029         {
3030             if (!ECDSA_sign(pkey->save_type,
3031                 &(data[MD5_DIGEST_LENGTH]),

```

```

3032         SHA_DIGEST_LENGTH,&(p[2]),
3033         (unsigned int *)&j,pkey->pkey.ec))
3034     {
3035         SSLerr(SSL_F_SSL3_SEND_CLIENT_VERIFY,
3036             ERR_R_ECDSA_LIB);
3037         goto err;
3038     }
3039     s2n(j,p);
3040     n=j+2;
3041 }
3042 else
3043 #endif
3044 if (pkey->type == NID_id_Gostr3410_94 || pkey->type == NID_id_Go
3045 {
3046     unsigned char signbuf[64];
3047     int i;
3048     size_t sigsize=64;
3049     s->method->ssl3_enc->cert_verify_mac(s,
3050         NID_id_Gostr3411_94,
3051         data);
3052     if (EVP_PKEY_sign(pctx, signbuf, &sigsize, data, 32) <= 0) {
3053         SSLerr(SSL_F_SSL3_SEND_CLIENT_VERIFY,
3054             ERR_R_INTERNAL_ERROR);
3055         goto err;
3056     }
3057     for (i=63,j=0; i>=0; j++, i--) {
3058         p[2+j]=signbuf[i];
3059     }
3060     s2n(j,p);
3061     n=j+2;
3062 }
3063 else
3064 {
3065     SSLerr(SSL_F_SSL3_SEND_CLIENT_VERIFY,ERR_R_INTERNAL_ERRO
3066     goto err;
3067 }
3068 *(d++)=SSL3_MT_CERTIFICATE_VERIFY;
3069 l2n3(n,d);

3071 s->state=SSL3_ST_CW_CERT_VRFY_B;
3072 s->init_num=(int)n+4;
3073 s->init_off=0;
3074 }
3075 EVP_MD_CTX_cleanup(&mctx);
3076 EVP_PKEY_CTX_free(pctx);
3077 return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
3078 err:
3079 EVP_MD_CTX_cleanup(&mctx);
3080 EVP_PKEY_CTX_free(pctx);
3081 return(-1);
3082 }

3084 int ssl3_send_client_certificate(SSL *s)
3085 {
3086     X509 *x509=NULL;
3087     EVP_PKEY *pkey=NULL;
3088     int i;
3089     unsigned long l;

3091     if (s->state == SSL3_ST_CW_CERT_A)
3092     {
3093         if ((s->cert == NULL) ||
3094             (s->cert->key->x509 == NULL) ||
3095             (s->cert->key->privatekey == NULL))
3096             s->state=SSL3_ST_CW_CERT_B;
3097     else

```

```

3098         s->state=SSL3_ST_CW_CERT_C;
3099     }

3101     /* We need to get a client cert */
3102     if (s->state == SSL3_ST_CW_CERT_B)
3103     {
3104         /* If we get an error, we need to
3105          * ssl->rwstate=SSL_X509_LOOKUP; return(-1);
3106          * We then get retied later */
3107         i=0;
3108         i = ssl_do_client_cert_cb(s, &x509, &pkey);
3109         if (i < 0)
3110         {
3111             s->rwstate=SSL_X509_LOOKUP;
3112             return(-1);
3113         }
3114         s->rwstate=SSL_NOTHING;
3115         if ((i == 1) && (pkey != NULL) && (x509 != NULL))
3116         {
3117             s->state=SSL3_ST_CW_CERT_B;
3118             if (!SSL_use_certificate(s,x509) ||
3119                 !SSL_use_PrivateKey(s,pkey))
3120                 i=0;
3121         }
3122     else if (i == 1)
3123     {
3124         i=0;
3125         SSLerr(SSL_F_SSL3_SEND_CLIENT_CERTIFICATE,SSL_R_BAD_DATA
3126     }

3128     if (x509 != NULL) X509_free(x509);
3129     if (pkey != NULL) EVP_PKEY_free(pkey);
3130     if (i == 0)
3131     {
3132         if (s->version == SSL3_VERSION)
3133         {
3134             s->s3->tmp.cert_req=0;
3135             ssl3_send_alert(s,SSL3_AL_WARNING,SSL_AD_NO_CERT
3136             return(1);
3137         }
3138     else
3139     {
3140         s->s3->tmp.cert_req=2;
3141     }
3142 }

3144     /* Ok, we have a cert */
3145     s->state=SSL3_ST_CW_CERT_C;
3146 }

3148     if (s->state == SSL3_ST_CW_CERT_C)
3149     {
3150         s->state=SSL3_ST_CW_CERT_D;
3151         l=ssl3_output_cert_chain(s,
3152             (s->s3->tmp.cert_req == 2)?NULL:s->cert->key->x509);
3153         s->init_num=(int)l;
3154         s->init_off=0;
3155     }
3156     /* SSL3_ST_CW_CERT_D */
3157     return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
3158 }

3160 #define has_bits(i,m) (((i)&(m)) == (m))

3162 int ssl3_check_cert_and_algorithm(SSL *s)
3163 {

```

```

3164     int i,idx;
3165     long alg_k,alg_a;
3166     EVP_PKEY *pkey=NULL;
3167     SESS_CERT *sc;
3168 #ifndef OPENSSSL_NO_RSA
3169     RSA *rsa;
3170 #endif
3171 #ifndef OPENSSSL_NO_DH
3172     DH *dh;
3173 #endif

3175     alg_k=s->s3->tmp.new_cipher->algorithm_mkey;
3176     alg_a=s->s3->tmp.new_cipher->algorithm_auth;

3178     /* we don't have a certificate */
3179     if ((alg_a & (SSL_ADH|SSL_ANULL|SSL_AKRB5)) || (alg_k & SSL_KPSK))
3180         return(1);

3182     sc=s->session->sess_cert;
3183     if (sc == NULL)
3184     {
3185         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,ERR_R_INTERNAL_ERROR)
3186         goto err;
3187     }

3189 #ifndef OPENSSSL_NO_RSA
3190     rsa=s->session->sess_cert->peer_rsa_tmp;
3191 #endif
3192 #ifndef OPENSSSL_NO_DH
3193     dh=s->session->sess_cert->peer_dh_tmp;
3194 #endif

3196     /* This is the passed certificate */

3198     idx=sc->peer_cert_type;
3199 #ifndef OPENSSSL_NO_ECDH
3200     if (idx == SSL_PKEY_ECC)
3201     {
3202         if (ssl_check_srvr_ecc_cert_and_alg(sc->peer_pkeys[idx].x509,
3203                                             s) == 0)
3204         { /* check failed */
3205             SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_BAD_ECC
3206                   goto f_err;
3207         }
3208     }
3209     else
3210     {
3211         return 1;
3212     }
3213 #endif
3214     pkey=X509_get_pubkey(sc->peer_pkeys[idx].x509);
3215     i=X509_certificate_type(sc->peer_pkeys[idx].x509,pkey);
3216     EVP_PKEY_free(pkey);

3218     /* Check that we have a certificate if we require one */
3219     if ((alg_a & SSL_aRSA) && !has_bits(i,EVP_PK_RSA|EVP_PKT_SIGN))
3220     {
3221         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_MISSING_RSA_SIG
3222         goto f_err;
3223     }
3224 #ifndef OPENSSSL_NO_DSA
3225     else if ((alg_a & SSL_aDSS) && !has_bits(i,EVP_PK_DSA|EVP_PKT_SIGN))
3226     {
3227         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_MISSING_DSA_SIG
3228         goto f_err;
3229     }

```

```

3230     }
3231 #endif
3232 #ifndef OPENSSSL_NO_RSA
3233     if ((alg_k & SSL_kRSA) &&
3234         !(has_bits(i,EVP_PK_RSA|EVP_PKT_ENC) || (rsa != NULL)))
3235     {
3236         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_MISSING_RSA_ENC
3237         goto f_err;
3238     }
3239 #endif
3240 #ifndef OPENSSSL_NO_DH
3241     if ((alg_k & SSL_kEDH) &&
3242         !(has_bits(i,EVP_PK_DH|EVP_PKT_EXCH) || (dh != NULL)))
3243     {
3244         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_MISSING_DH_KEY)
3245         goto f_err;
3246     }
3247     else if ((alg_k & SSL_kDhR) && !has_bits(i,EVP_PK_DH|EVP_PKS_RSA))
3248     {
3249         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_MISSING_DH_RSA
3250         goto f_err;
3251     }
3252 #ifndef OPENSSSL_NO_DSA
3253     else if ((alg_k & SSL_kDHd) && !has_bits(i,EVP_PK_DH|EVP_PKS_DSA))
3254     {
3255         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_MISSING_DH_DSA
3256         goto f_err;
3257     }
3258 #endif
3259 #endif

3261     if (SSL_C_IS_EXPORT(s->s3->tmp.new_cipher) && !has_bits(i,EVP_PKT_EXP))
3262     {
3263 #ifndef OPENSSSL_NO_RSA
3264         if (alg_k & SSL_kRSA)
3265         {
3266             if (rsa == NULL
3267                 || RSA_size(rsa)*8 > SSL_C_EXPORT_PKEYLENGTH(s->s3->
3268                 {
3269                     SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R
3270                     goto f_err;
3271                 }
3272             }
3273         }
3274 #endif
3275 #ifndef OPENSSSL_NO_DH
3276         if (alg_k & (SSL_kEDH|SSL_kDhR|SSL_kDHd))
3277         {
3278             if (dh == NULL
3279                 || DH_size(dh)*8 > SSL_C_EXPORT_PKEYLENGTH(s->s3
3280             {
3281                 SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R
3282                 goto f_err;
3283             }
3284         }
3285     }
3286 #endif
3287     {
3288         SSLerr(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM,SSL_R_UNKNOWN
3289         goto f_err;
3290     }
3291 }
3292 return(1);
3293 f_err:
3294     ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_HANDSHAKE_FAILURE);
3295 err:

```

```

3296     return(0);
3297 }

3299 #if !defined(OPENSSL_NO_TLSEXT) && !defined(OPENSSL_NO_NEXTPROTONEG)
3300 int ssl3_send_next_proto(SSL *s)
3301 {
3302     unsigned int len, padding_len;
3303     unsigned char *d;

3305     if (s->state == SSL3_ST_CW_NEXT_PROTO_A)
3306     {
3307         len = s->next_proto_negotiated_len;
3308         padding_len = 32 - ((len + 2) % 32);
3309         d = (unsigned char *)s->init_buf->data;
3310         d[4] = len;
3311         memcpy(d + 5, s->next_proto_negotiated, len);
3312         d[5 + len] = padding_len;
3313         memset(d + 6 + len, 0, padding_len);
3314         *(d++) = SSL3_MT_NEXT_PROTO;
3315         l2n3(2 + len + padding_len, d);
3316         s->state = SSL3_ST_CW_NEXT_PROTO_B;
3317         s->init_num = 4 + 2 + len + padding_len;
3318         s->init_off = 0;
3319     }

3321     return ssl3_do_write(s, SSL3_RT_HANDSHAKE);
3322 }
3323 #endif /* !OPENSSL_NO_TLSEXT && !OPENSSL_NO_NEXTPROTONEG */

3325 /* Check to see if handshake is full or resumed. Usually this is just a
3326  * case of checking to see if a cache hit has occurred. In the case of
3327  * session tickets we have to check the next message to be sure.
3328  */

3330 #ifndef OPENSSL_NO_TLSEXT
3331 int ssl3_check_finished(SSL *s)
3332 {
3333     int ok;
3334     long n;
3335     /* If we have no ticket it cannot be a resumed session. */
3336     if (!s->session->tlsext_tick)
3337         return 1;
3338     /* this function is called when we really expect a Certificate
3339      * message, so permit appropriate message length */
3340     n = s->method->ssl_get_message(s,
3341         SSL3_ST_CR_CERT_A,
3342         SSL3_ST_CR_CERT_B,
3343         -1,
3344         s->max_cert_list,
3345         &ok);
3346     if (!ok) return((int)n);
3347     s->s3->tmp.reuse_message = 1;
3348     if ((s->s3->tmp.message_type == SSL3_MT_FINISHED)
3349         || (s->s3->tmp.message_type == SSL3_MT_NEWSESSION_TICKET))
3350         return 2;

3352     return 1;
3353 }
3354 #endif

3356 int ssl_do_client_cert_cb(SSL *s, X509 **px509, EVP_PKEY **ppkey)
3357 {
3358     int i = 0;
3359 #ifndef OPENSSL_NO_ENGINE
3360     if (s->ctx->client_cert_engine)
3361     {

```

```

3362         i = ENGINE_load_ssl_client_cert(s->ctx->client_cert_engine, s,
3363             SSL_get_client_CA_list(s),
3364             px509, ppkey, NULL, NULL, NULL);
3365         if (i != 0)
3366             return i;
3367     }
3368 #endif
3369     if (s->ctx->client_cert_cb)
3370         i = s->ctx->client_cert_cb(s, px509, ppkey);
3371     return i;
3372 }

```

```
*****
```

```
26594 Fri May 30 18:32:20 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_enc.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
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8  *
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57 */
58 /* =====
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60 *
61 * Redistribution and use in source and binary forms, with or without
```

```
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135 * OTHERWISE.
136 */

138 #include <stdio.h>
139 #include "ssl_locl.h"
140 #include <openssl/evp.h>
141 #include <openssl/md5.h>

143 static unsigned char ssl3_pad_1[48]={
144     0x36,0x36,0x36,0x36,0x36,0x36,0x36,0x36,
145     0x36,0x36,0x36,0x36,0x36,0x36,0x36,0x36,
146     0x36,0x36,0x36,0x36,0x36,0x36,0x36,0x36,
147     0x36,0x36,0x36,0x36,0x36,0x36,0x36,0x36,
148     0x36,0x36,0x36,0x36,0x36,0x36,0x36,0x36,
149     0x36,0x36,0x36,0x36,0x36,0x36,0x36,0x36 };

151 static unsigned char ssl3_pad_2[48]={
152     0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,
153     0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,
154     0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,
155     0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,
156     0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,
157     0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c,0x5c };
158 static int ssl3_handshake_mac(SSL *s, int md_nid,
159     const char *sender, int len, unsigned char *p);
160 static int ssl3_generate_key_block(SSL *s, unsigned char *km, int num)
161 {
162     EVP_MD_CTX m5;
163     EVP_MD_CTX s1;
164     unsigned char buf[16],smd[SHA_DIGEST_LENGTH];
165     unsigned char c='A';
166     unsigned int i,j,k;

168 #ifdef CHARSET_EBCDIC
169     c = os_toascii[c]; /* 'A' in ASCII */
170 #endif
171     k=0;
172     EVP_MD_CTX_init(&m5);
173     EVP_MD_CTX_set_flags(&m5, EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
174     EVP_MD_CTX_init(&s1);
175     for (i=0; (int)i<num; i+=MD5_DIGEST_LENGTH)
176     {
177         k++;
178         if (k > sizeof buf)
179         {
180             /* bug: 'buf' is too small for this ciphersuite */
181             SSLerr(SSL_F_SSL3_GENERATE_KEY_BLOCK, ERR_R_INTERNAL_ERR);
182             return 0;
183         }
184
185         for (j=0; j<k; j++)
186             buf[j]=c;
187         c++;
188         EVP_DigestInit_ex(&s1,EVP_sha1(), NULL);
189         EVP_DigestUpdate(&s1,buf,k);
190         EVP_DigestUpdate(&s1,s->session->master_key,
191             s->session->master_key_length);
192         EVP_DigestUpdate(&s1,s->s3->server_random,SSL3_RANDOM_SIZE);
193         EVP_DigestUpdate(&s1,s->s3->client_random,SSL3_RANDOM_SIZE);

```

```

194     EVP_DigestFinal_ex(&s1,smd,NULL);

196     EVP_DigestInit_ex(&m5,EVP_md5(), NULL);
197     EVP_DigestUpdate(&m5,s->session->master_key,
198         s->session->master_key_length);
199     EVP_DigestUpdate(&m5,smd,SHA_DIGEST_LENGTH);
200     if ((int)(i+MD5_DIGEST_LENGTH) > num)
201     {
202         EVP_DigestFinal_ex(&m5,smd,NULL);
203         memcpy(km,smd,(num-i));
204     }
205     else
206         EVP_DigestFinal_ex(&m5,km,NULL);

208     km+=MD5_DIGEST_LENGTH;
209 }
210 OPENSSL_cleanse(smd,SHA_DIGEST_LENGTH);
211 EVP_MD_CTX_cleanup(&m5);
212 EVP_MD_CTX_cleanup(&s1);
213 return 1;
214 }

216 int ssl3_change_cipher_state(SSL *s, int which)
217 {
218     unsigned char *p,*mac_secret;
219     unsigned char exp_key[EVP_MAX_KEY_LENGTH];
220     unsigned char exp_iv[EVP_MAX_IV_LENGTH];
221     unsigned char *ms,*key,*iv,*er1,*er2;
222     EVP_CIPHER_CTX *dd;
223     const EVP_CIPHER *c;
224 #ifndef OPENSSL_NO_COMP
225     COMP_METHOD *comp;
226 #endif
227     const EVP_MD *m;
228     EVP_MD_CTX md;
229     int is_exp,n,i,j,k,cl;
230     int reuse_dd = 0;

232     is_exp=SSL_C_IS_EXPORT(s->s3->tmp.new_cipher);
233     c=s->s3->tmp.new_sym_enc;
234     m=s->s3->tmp.new_hash;
235     /* m == NULL will lead to a crash later */
236     OPENSSL_assert(m);
237 #ifndef OPENSSL_NO_COMP
238     if (s->s3->tmp.new_compression == NULL)
239         comp=NULL;
240     else
241         comp=s->s3->tmp.new_compression->method;
242 #endif

244     if (which & SSL3_CC_READ)
245     {
246         if (s->enc_read_ctx != NULL)
247             reuse_dd = 1;
248         else if ((s->enc_read_ctx=OPENSSL_malloc(sizeof(EVP_CIPHER_CTX)))
249             goto err;
250         else
251             /* make sure it's initialized in case we exit later with
252              EVP_CIPHER_CTX_init(s->enc_read_ctx);
253              dd= s->enc_read_ctx;

255     ssl_replace_hash(&s->read_hash,m);
256 #ifndef OPENSSL_NO_COMP
257     /* COMPRESS */
258     if (s->expand != NULL)
259         {

```

```

260         COMP_CTX_free(s->expand);
261         s->expand=NULL;
262     }
263     if (comp != NULL)
264     {
265         s->expand=COMP_CTX_new(comp);
266         if (s->expand == NULL)
267         {
268             SSLerr(SSL_F_SSL3_CHANGE_CIPHER_STATE, SSL_R_COMP
269             goto err2;
270         }
271         if (s->s3->rrec.comp == NULL)
272             s->s3->rrec.comp=(unsigned char *)
273             OPENSSL_malloc(SSL3_RT_MAX_PLAIN_LENGTH)
274         if (s->s3->rrec.comp == NULL)
275             goto err;
276     }
277 #endif
278     memset(&(s->s3->read_sequence[0]),0,8);
279     mac_secret= &(s->s3->read_mac_secret[0]);
280 }
281 else
282 {
283     if (s->enc_write_ctx != NULL)
284         reuse_dd = 1;
285     else if ((s->enc_write_ctx=OPENSSL_malloc(sizeof(EVP_CIPHER_CTX)
286         goto err;
287     else
288         /* make sure it's initialized in case we exit later with
289         EVP_CIPHER_CTX_init(s->enc_write_ctx);
290     dd= s->enc_write_ctx;
291     ssl_replace_hash(&s->write_hash,m);
292 #ifndef OPENSSL_NO_COMP
293     /* COMPRESS */
294     if (s->compress != NULL)
295     {
296         COMP_CTX_free(s->compress);
297         s->compress=NULL;
298     }
299     if (comp != NULL)
300     {
301         s->compress=COMP_CTX_new(comp);
302         if (s->compress == NULL)
303         {
304             SSLerr(SSL_F_SSL3_CHANGE_CIPHER_STATE, SSL_R_COMP
305             goto err2;
306         }
307     }
308 #endif
309     memset(&(s->s3->write_sequence[0]),0,8);
310     mac_secret= &(s->s3->write_mac_secret[0]);
311 }
312
313 if (reuse_dd)
314     EVP_CIPHER_CTX_cleanup(dd);
315
316 p=s->s3->tmp.key_block;
317 i=EVP_MD_size(m);
318 if (i < 0)
319     goto err2;
320 cl=EVP_CIPHER_key_length(c);
321 j=is_exp ? (cl < SSL_C_EXPORT_KEYLENGTH(s->s3->tmp.new_cipher) ?
322     cl : SSL_C_EXPORT_KEYLENGTH(s->s3->tmp.new_cipher)) : cl;
323 /* Was j=(is_exp)?5:EVP_CIPHER_key_length(c); */
324 k=EVP_CIPHER_iv_length(c);
325 if (which == SSL3_CHANGE_CIPHER_CLIENT_WRITE) ||

```

```

326         (which == SSL3_CHANGE_CIPHER_SERVER_READ))
327     {
328         ms= &(p[ 0]); n=i+i;
329         key= &(p[ n]); n+=j+j;
330         iv= &(p[ n]); n+=k+k;
331         er1= &(s->s3->client_random[0]);
332         er2= &(s->s3->server_random[0]);
333     }
334     else
335     {
336         n=i;
337         ms= &(p[ n]); n+=i+j;
338         key= &(p[ n]); n+=j+k;
339         iv= &(p[ n]); n+=k;
340         er1= &(s->s3->server_random[0]);
341         er2= &(s->s3->client_random[0]);
342     }
343
344     if (n > s->s3->tmp.key_block_length)
345     {
346         SSLerr(SSL_F_SSL3_CHANGE_CIPHER_STATE, ERR_R_INTERNAL_ERROR);
347         goto err2;
348     }
349
350     EVP_MD_CTX_init(&md);
351     memcpy(mac_secret,ms,i);
352     if (is_exp)
353     {
354         /* In here I set both the read and write key/iv to the
355         * same value since only the correct one will be used :-).
356         */
357         EVP_DigestInit_ex(&md,EVP_md5(), NULL);
358         EVP_DigestUpdate(&md,key,j);
359         EVP_DigestUpdate(&md,er1,SSL3_RANDOM_SIZE);
360         EVP_DigestUpdate(&md,er2,SSL3_RANDOM_SIZE);
361         EVP_DigestFinal_ex(&md,&(exp_key[0]),NULL);
362         key= &(exp_key[0]);
363
364         if (k > 0)
365         {
366             EVP_DigestInit_ex(&md,EVP_md5(), NULL);
367             EVP_DigestUpdate(&md,er1,SSL3_RANDOM_SIZE);
368             EVP_DigestUpdate(&md,er2,SSL3_RANDOM_SIZE);
369             EVP_DigestFinal_ex(&md,&(exp_iv[0]),NULL);
370             iv= &(exp_iv[0]);
371         }
372     }
373
374     s->session->key_arg_length=0;
375
376     EVP_CipherInit_ex(dd,c,NULL,key,iv,(which & SSL3_CC_WRITE));
377
378     OPENSSL_cleanse(&(exp_key[0]),sizeof(exp_key));
379     OPENSSL_cleanse(&(exp_iv[0]),sizeof(exp_iv));
380     EVP_MD_CTX_cleanup(&md);
381     return(1);
382 err:
383     SSLerr(SSL_F_SSL3_CHANGE_CIPHER_STATE, ERR_R_MALLOC_FAILURE);
384 err2:
385     return(0);
386 }
387
388 int ssl3_setup_key_block(SSL *s)
389 {
390     unsigned char *p;
391     const EVP_CIPHER *c;

```

```

392     const EVP_MD *hash;
393     int num;
394     int ret = 0;
395     SSL_COMP *comp;

397     if (s->s3->tmp.key_block_length != 0)
398         return(1);

400     if (!ssl_cipher_get_evp(s->session,&c,&hash,NULL,&comp))
401     {
402         SSLerr(SSL_F_SSL3_SETUP_KEY_BLOCK,SSL_R_CIPHER_OR_HASH_UNAVAILAB
403         return(0);
404     }

406     s->s3->tmp.new_sym_enc=c;
407     s->s3->tmp.new_hash=hash;
408 #ifdef OPENSSL_NO_COMP
409     s->s3->tmp.new_compression=NULL;
410 #else
411     s->s3->tmp.new_compression=comp;
412 #endif

414     num=EVP_MD_size(hash);
415     if (num < 0)
416         return 0;

418     num=EVP_CIPHER_key_length(c)+num+EVP_CIPHER_iv_length(c);
419     num*=2;

421     ssl3_cleanup_key_block(s);

423     if ((p=OPENSSL_malloc(num)) == NULL)
424         goto err;

426     s->s3->tmp.key_block_length=num;
427     s->s3->tmp.key_block=p;

429     ret = ssl3_generate_key_block(s,p,num);

431     if (!(s->options & SSL_OP_DONT_INSERT_EMPTY_FRAGMENTS))
432     {
433         /* enable vulnerability countermeasure for CBC ciphers with
434         * known-IV problem (http://www.openssl.org/~bodo/tls-cbc.txt)
435         */
436         s->s3->need_empty_fragments = 1;

438         if (s->session->cipher != NULL)
439         {
440             if (s->session->cipher->algorithm_enc == SSL_eNULL)
441                 s->s3->need_empty_fragments = 0;

443 #ifndef OPENSSL_NO_RC4
444             if (s->session->cipher->algorithm_enc == SSL_RC4)
445                 s->s3->need_empty_fragments = 0;
446 #endif
447         }
448     }

450     return ret;
451 err:
452     SSLerr(SSL_F_SSL3_SETUP_KEY_BLOCK,ERR_R_MALLOC_FAILURE);
453     return(0);
454 }
455
457 void ssl3_cleanup_key_block(SSL *s)

```

```

458     {
459         if (s->s3->tmp.key_block != NULL)
460         {
461             OPENSSL_cleanse(s->s3->tmp.key_block,
462             s->s3->tmp.key_block_length);
463             OPENSSL_free(s->s3->tmp.key_block);
464             s->s3->tmp.key_block=NULL;
465         }
466         s->s3->tmp.key_block_length=0;
467     }

469 /* ssl3_enc encrypts/decrypts the record in |s->wrec| / |s->rrec|, respectively.
470 *
471 * Returns:
472 * 0: (in non-constant time) if the record is publically invalid (i.e. too
473 * short etc).
474 * 1: if the record's padding is valid / the encryption was successful.
475 * -1: if the record's padding is invalid or, if sending, an internal error
476 * occurred.
477 */
478 int ssl3_enc(SSL *s, int send)
479 {
480     SSL3_RECORD *rec;
481     EVP_CIPHER_CTX *ds;
482     unsigned long l;
483     int bs,i,mac_size=0;
484     const EVP_CIPHER *enc;

486     if (send)
487     {
488         ds=s->enc_write_ctx;
489         rec= &(s->s3->wrec);
490         if (s->enc_write_ctx == NULL)
491             enc=NULL;
492         else
493             enc=EVP_CIPHER_CTX_cipher(s->enc_write_ctx);
494     }
495     else
496     {
497         ds=s->enc_read_ctx;
498         rec= &(s->s3->rrec);
499         if (s->enc_read_ctx == NULL)
500             enc=NULL;
501         else
502             enc=EVP_CIPHER_CTX_cipher(s->enc_read_ctx);
503     }

505     if ((s->session == NULL) || (ds == NULL) ||
506         (enc == NULL))
507     {
508         memmove(rec->data,rec->input,rec->length);
509         rec->input=rec->data;
510     }
511     else
512     {
513         l=rec->length;
514         bs=EVP_CIPHER_block_size(ds->cipher);

516         /* COMPRESS */

518         if ((bs != 1) && send)
519         {
520             i=bs-((int)l%bs);

522             /* we need to add 'i-1' padding bytes */
523             l+=i;

```



```

524         /* the last of these zero bytes will be overwritten
525         * with the padding length. */
526         memset(&rec->input[rec->length], 0, i);
527         rec->length+=i;
528         rec->input[l-1]=(i-1);
529     }
530
531     if (!send)
532     {
533         if (l == 0 || l%bs != 0)
534             return 0;
535         /* otherwise, rec->length >= bs */
536     }
537
538     EVP_Cipher(ds, rec->data, rec->input, l);
539
540     if (EVP_MD_CTX_md(s->read_hash) != NULL)
541         mac_size = EVP_MD_CTX_size(s->read_hash);
542     if ((bs != 1) && !send)
543         return ssl3_cbc_remove_padding(s, rec, bs, mac_size);
544     }
545     return(1);
546 }
547
548 void ssl3_init_finished_mac(SSL *s)
549 {
550     if (s->s3->handshake_buffer) BIO_free(s->s3->handshake_buffer);
551     if (s->s3->handshake_dgst) ssl3_free_digest_list(s);
552     s->s3->handshake_buffer=BIO_new(BIO_s_mem());
553     (void)BIO_set_close(s->s3->handshake_buffer, BIO_CLOSE);
554 }
555
556 void ssl3_free_digest_list(SSL *s)
557 {
558     int i;
559     if (!s->s3->handshake_dgst) return;
560     for (i=0; i<SSL_MAX_DIGEST; i++)
561     {
562         if (s->s3->handshake_dgst[i])
563             EVP_MD_CTX_destroy(s->s3->handshake_dgst[i]);
564     }
565     OPENSSL_free(s->s3->handshake_dgst);
566     s->s3->handshake_dgst=NULL;
567 }
568
569 void ssl3_finish_mac(SSL *s, const unsigned char *buf, int len)
570 {
571     if (s->s3->handshake_buffer && !(s->s3->flags & TLS1_FLAGS_KEEP_HANDSHAK
572     {
573         BIO_write (s->s3->handshake_buffer, (void *)buf, len);
574     }
575     else
576     {
577         int i;
578         for (i=0; i< SSL_MAX_DIGEST; i++)
579         {
580             if (s->s3->handshake_dgst[i] != NULL)
581                 EVP_DigestUpdate(s->s3->handshake_dgst[i], buf, len);
582         }
583     }
584 }
585
586 int ssl3_digest_cached_records(SSL *s)
587 {

```

```

590     int i;
591     long mask;
592     const EVP_MD *md;
593     long hdatalen;
594     void *hdata;
595
596     /* Allocate handshake_dgst array */
597     ssl3_free_digest_list(s);
598     s->s3->handshake_dgst = OPENSSL_malloc(SSL_MAX_DIGEST * sizeof(EVP_MD_CTX
599     memset(s->s3->handshake_dgst, 0, SSL_MAX_DIGEST * sizeof(EVP_MD_CTX *));
600     hdatalen = BIO_get_mem_data(s->s3->handshake_buffer, &hdata);
601     if (hdatalen <= 0)
602     {
603         SSLerr(SSL_F_SSL3_DIGEST_CACHED_RECORDS, SSL_R_BAD_HANDSHAKE_LEN
604         return 0;
605     }
606
607     /* Loop through bitso of algorithm2 field and create MD_CTX-es */
608     for (i=0; ssl_get_handshake_digest(i, &mask, &md); i++)
609     {
610         if ((mask & ssl_get_algorithm2(s)) && md)
611         {
612             s->s3->handshake_dgst[i]=EVP_MD_CTX_create();
613 #ifdef OPENSSL_FIPS
614             if (EVP_MD_nid(md) == NID_md5)
615                 EVP_MD_CTX_set_flags(s->s3->handshake_dgst[i],
616                                     EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
617 #endif
618             EVP_DigestInit_ex(s->s3->handshake_dgst[i], md, NULL);
619             EVP_DigestUpdate(s->s3->handshake_dgst[i], hdata, hdatalen
620         }
621         else
622         {
623             s->s3->handshake_dgst[i]=NULL;
624         }
625     }
626     if (!(s->s3->flags & TLS1_FLAGS_KEEP_HANDSHAKE))
627     {
628         /* Free handshake_buffer BIO */
629         BIO_free(s->s3->handshake_buffer);
630         s->s3->handshake_buffer = NULL;
631     }
632
633     return 1;
634 }
635
636 int ssl3_cert_verify_mac(SSL *s, int md_nid, unsigned char *p)
637 {
638     return(ssl3_handshake_mac(s, md_nid, NULL, 0, p));
639 }
640
641 int ssl3_final_finish_mac(SSL *s,
642                          const char *sender, int len, unsigned char *p)
643 {
644     int ret;
645     ret=ssl3_handshake_mac(s, NID_md5, sender, len, p);
646     p+=ret;
647     ret+=ssl3_handshake_mac(s, NID_sha1, sender, len, p);
648     return(ret);
649 }
650
651 static int ssl3_handshake_mac(SSL *s, int md_nid,
652                               const char *sender, int len, unsigned char *p)
653 {
654     unsigned int ret;
655     int npad, n;

```

```

656     unsigned int i;
657     unsigned char md_buf[EVP_MAX_MD_SIZE];
658     EVP_MD_CTX ctx,*d=NULL;

660     if (s->s3->handshake_buffer)
661         if (!ssl3_digest_cached_records(s))
662             return 0;

664     /* Search for digest of specified type in the handshake_dgst
665      * array*/
666     for (i=0;i<SSL_MAX_DIGEST;i++)
667     {
668         if (s->s3->handshake_dgst[i]&&EVP_MD_CTX_type(s->s3->handshake
669             {
670                 d=s->s3->handshake_dgst[i];
671                 break;
672             }
673     }
674     if (!d) {
675         SSLerr(SSL_F_SSL3_HANDSHAKE_MAC,SSL_R_NO_REQUIRED_DIGEST);
676         return 0;
677     }
678     EVP_MD_CTX_init(&ctx);
679     EVP_MD_CTX_set_flags(&ctx, EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
680     EVP_MD_CTX_copy_ex(&ctx,d);
681     n=EVP_MD_CTX_size(&ctx);
682     if (n < 0)
683         return 0;

685     npad=(48/n)*n;
686     if (sender != NULL)
687         EVP_DigestUpdate(&ctx,sender,len);
688     EVP_DigestUpdate(&ctx,s->session->master_key,
689         s->session->master_key_length);
690     EVP_DigestUpdate(&ctx,ssl3_pad_1,npad);
691     EVP_DigestFinal_ex(&ctx,md_buf,&i);

693     EVP_DigestInit_ex(&ctx,EVP_MD_CTX_md(&ctx), NULL);
694     EVP_DigestUpdate(&ctx,s->session->master_key,
695         s->session->master_key_length);
696     EVP_DigestUpdate(&ctx,ssl3_pad_2,npad);
697     EVP_DigestUpdate(&ctx,md_buf,i);
698     EVP_DigestFinal_ex(&ctx,p,&ret);

700     EVP_MD_CTX_cleanup(&ctx);

702     return((int)ret);
703 }

705 int n_ssl3_mac(SSL *ssl, unsigned char *md, int send)
706 {
707     SSL3_RECORD *rec;
708     unsigned char *mac_sec,*seq;
709     EVP_MD_CTX md_ctx;
710     const EVP_MD_CTX *hash;
711     unsigned char *p,rec_char;
712     size_t md_size, orig_len;
713     int npad;
714     int t;

716     if (send)
717     {
718         rec= &(ssl->s3->wrec);
719         mac_sec= &(ssl->s3->write_mac_secret[0]);
720         seq= &(ssl->s3->write_sequence[0]);
721         hash=ssl->write_hash;

```

```

722     }
723     else
724     {
725         rec= &(ssl->s3->rrec);
726         mac_sec= &(ssl->s3->read_mac_secret[0]);
727         seq= &(ssl->s3->read_sequence[0]);
728         hash=ssl->read_hash;
729     }

731     t=EVP_MD_CTX_size(hash);
732     if (t < 0)
733         return -1;
734     md_size=t;
735     npad=(48/md_size)*md_size;

737     /* kludge: ssl3_cbc_remove_padding passes padding length in rec->type */
738     orig_len = rec->length+md_size+((unsigned int)rec->type>>8);
739     rec->type &= 0xff;

741     if (!send &&
742         EVP_CIPHER_CTX_mode(ssl->enc_read_ctx) == EVP_CIPH_CBC_MODE &&
743         ssl3_cbc_record_digest_supported(hash))
744     {
745         /* This is a CBC-encrypted record. We must avoid leaking any
746          * timing-side channel information about how many blocks of
747          * data we are hashing because that gives an attacker a
748          * timing-oracle. */

750         /* npad is, at most, 48 bytes and that's with MD5:
751          * 16 + 48 + 8 (sequence bytes) + 1 + 2 = 75.
752          *
753          * With SHA-1 (the largest hash speced for SSLv3) the hash size
754          * goes up 4, but npad goes down by 8, resulting in a smaller
755          * total size. */
756         unsigned char header[75];
757         unsigned j = 0;
758         memcpy(header+j, mac_sec, md_size);
759         j += md_size;
760         memcpy(header+j, ssl3_pad_1, npad);
761         j += npad;
762         memcpy(header+j, seq, 8);
763         j += 8;
764         header[j++] = rec->type;
765         header[j++] = rec->length >> 8;
766         header[j++] = rec->length & 0xff;

768         ssl3_cbc_digest_record(
769             hash,
770             md, &md_size,
771             header, rec->input,
772             rec->length + md_size, orig_len,
773             mac_sec, md_size,
774             1 /* is SSLv3 */);
775     }
776     else
777     {
778         unsigned int md_size_u;
779         /* Chop the digest off the end :- */
780         EVP_MD_CTX_init(&md_ctx);

782         EVP_MD_CTX_copy_ex(&md_ctx,hash);
783         EVP_DigestUpdate(&md_ctx,mac_sec,md_size);
784         EVP_DigestUpdate(&md_ctx,ssl3_pad_1,npad);
785         EVP_DigestUpdate(&md_ctx,seq,8);
786         rec_char=rec->type;
787         EVP_DigestUpdate(&md_ctx,&rec_char,1);

```

```

788         p=md;
789         s2n(rec->length,p);
790         EVP_DigestUpdate(&md_ctx,md,2);
791         EVP_DigestUpdate(&md_ctx,rec->input,rec->length);
792         EVP_DigestFinal_ex(&md_ctx,md,NULL);

794         EVP_MD_CTX_copy_ex(&md_ctx,hash);
795         EVP_DigestUpdate(&md_ctx,mac_sec,md_size);
796         EVP_DigestUpdate(&md_ctx,ssl3_pad_2,npad);
797         EVP_DigestUpdate(&md_ctx,md,md_size);
798         EVP_DigestFinal_ex(&md_ctx,md,&md_size_u);
799         md_size = md_size_u;

801     EVP_MD_CTX_cleanup(&md_ctx);
802 }

804     ssl3_record_sequence_update(seq);
805     return(md_size);
806 }

808 void ssl3_record_sequence_update(unsigned char *seq)
809 {
810     int i;

812     for (i=7; i>=0; i--)
813     {
814         ++seq[i];
815         if (seq[i] != 0) break;
816     }
817 }

819 int ssl3_generate_master_secret(SSL *s, unsigned char *out, unsigned char *p,
820                                int len)
821 {
822     static const unsigned char *salt[3]={
823 #ifndef CHARSET_EBCDIC
824         (const unsigned char *) "A",
825         (const unsigned char *) "BB",
826         (const unsigned char *) "CCC",
827 #else
828         (const unsigned char *) "\x41",
829         (const unsigned char *) "\x42\x42",
830         (const unsigned char *) "\x43\x43\x43",
831 #endif
832     };
833     unsigned char buf[EVP_MAX_MD_SIZE];
834     EVP_MD_CTX ctx;
835     int i,ret=0;
836     unsigned int n;

838     EVP_MD_CTX_init(&ctx);
839     for (i=0; i<3; i++)
840     {
841         EVP_DigestInit_ex(&ctx,s->ctx->sha1, NULL);
842         EVP_DigestUpdate(&ctx,salt[i],strlen((const char *)salt[i]));
843         EVP_DigestUpdate(&ctx,p,len);
844         EVP_DigestUpdate(&ctx,&(s->s3->client_random[0]),
845                         SSL3_RANDOM_SIZE);
846         EVP_DigestUpdate(&ctx,&(s->s3->server_random[0]),
847                         SSL3_RANDOM_SIZE);
848         EVP_DigestFinal_ex(&ctx,buf,&n);

850         EVP_DigestInit_ex(&ctx,s->ctx->md5, NULL);
851         EVP_DigestUpdate(&ctx,p,len);
852         EVP_DigestUpdate(&ctx,buf,n);
853         EVP_DigestFinal_ex(&ctx,out,&n);

```

```

854         out+=n;
855         ret+=n;
856     }
857     EVP_MD_CTX_cleanup(&ctx);
858     return(ret);
859 }

861 int ssl3_alert_code(int code)
862 {
863     switch (code)
864     {
865         case SSL_AD_CLOSE_NOTIFY: return(SSL3_AD_CLOSE_NOTIFY);
866         case SSL_AD_UNEXPECTED_MESSAGE: return(SSL3_AD_UNEXPECTED_MESSAGE);
867         case SSL_AD_BAD_RECORD_MAC: return(SSL3_AD_BAD_RECORD_MAC);
868         case SSL_AD_DECRYPTION_FAILED: return(SSL3_AD_BAD_RECORD_MAC);
869         case SSL_AD_RECORD_OVERFLOW: return(SSL3_AD_BAD_RECORD_MAC);
870         case SSL_AD_DECOMPRESSION_FAILURE: return(SSL3_AD_DECOMPRESSION_FAILURE);
871         case SSL_AD_HANDSHAKE_FAILURE: return(SSL3_AD_HANDSHAKE_FAILURE);
872         case SSL_AD_NO_CERTIFICATE: return(SSL3_AD_NO_CERTIFICATE);
873         case SSL_AD_BAD_CERTIFICATE: return(SSL3_AD_BAD_CERTIFICATE);
874         case SSL_AD_UNSUPPORTED_CERTIFICATE: return(SSL3_AD_UNSUPPORTED_CERTIFICATE);
875         case SSL_AD_CERTIFICATE_REVOKED: return(SSL3_AD_CERTIFICATE_REVOKED);
876         case SSL_AD_CERTIFICATE_EXPIRED: return(SSL3_AD_CERTIFICATE_EXPIRED);
877         case SSL_AD_CERTIFICATE_UNKNOWN: return(SSL3_AD_CERTIFICATE_UNKNOWN);
878         case SSL_AD_ILLEGAL_PARAMETER: return(SSL3_AD_ILLEGAL_PARAMETER);
879         case SSL_AD_UNKNOWN_CA: return(SSL3_AD_BAD_CERTIFICATE);
880         case SSL_AD_ACCESS_DENIED: return(SSL3_AD_HANDSHAKE_FAILURE);
881         case SSL_AD_DECODE_ERROR: return(SSL3_AD_HANDSHAKE_FAILURE);
882         case SSL_AD_DECRYPT_ERROR: return(SSL3_AD_HANDSHAKE_FAILURE);
883         case SSL_AD_EXPORT_RESTRICTION: return(SSL3_AD_HANDSHAKE_FAILURE);
884         case SSL_AD_PROTOCOL_VERSION: return(SSL3_AD_HANDSHAKE_FAILURE);
885         case SSL_AD_INSUFFICIENT_SECURITY: return(SSL3_AD_HANDSHAKE_FAILURE);
886         case SSL_AD_INTERNAL_ERROR: return(SSL3_AD_HANDSHAKE_FAILURE);
887         case SSL_AD_USER_CANCELLED: return(SSL3_AD_HANDSHAKE_FAILURE);
888         case SSL_AD_NO_RENEGOTIATION: return(-1); /* Don't send it :-) */
889         case SSL_AD_UNSUPPORTED_EXTENSION: return(SSL3_AD_HANDSHAKE_FAILURE);
890         case SSL_AD_CERTIFICATE_UNOBTAINABLE: return(SSL3_AD_HANDSHAKE_FAILURE);
891         case SSL_AD_UNRECOGNIZED_NAME: return(SSL3_AD_HANDSHAKE_FAILURE);
892         case SSL_AD_BAD_CERTIFICATE_STATUS_RESPONSE: return(SSL3_AD_HANDSHAKE_FAILURE);
893         case SSL_AD_BAD_CERTIFICATE_HASH_VALUE: return(SSL3_AD_HANDSHAKE_FAILURE);
894         case SSL_AD_UNKNOWN_PSK_IDENTITY: return(TLS1_AD_UNKNOWN_PSK_IDENTITY);
895         default: return(-1);
896     }
897 }

```

```

*****
83291 Fri May 30 18:32:21 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
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```

```

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147 * OTHER ENTITY BASED ON INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR
148 * OTHERWISE.
149 */

151 #include <stdio.h>
152 #include <openssl/objects.h>
153 #include "ssl_locl.h"
154 #include "kssl_lcl.h"
155 #ifndef OPENSSL_NO_TLSEXT
156 #ifndef OPENSSL_NO_EC
157 #include <ec_lcl.h>
158 #endif /* OPENSSL_NO_EC */
159 #endif /* OPENSSL_NO_TLSEXT */
160 #include <openssl/md5.h>
161 #ifndef OPENSSL_NO_DH
162 #include <openssl/dh.h>
163 #endif

165 const char ssl3_version_str[]="SSLv3" OPENSSL_VERSION_PTEXT;

167 #define SSL3_NUM_CIPHERS      (sizeof(ssl3_ciphers)/sizeof(SSL_CIPHER))

169 /* list of available SSLv3 ciphers (sorted by id) */
170 OPENSSL_GLOBAL SSL_CIPHER ssl3_ciphers[]={

172 /* The RSA ciphers */
173 /* Cipher 01 */
174 {
175     1,
176     SSL3_TXT_RSA_NULL_MD5,
177     SSL3_CK_RSA_NULL_MD5,
178     SSL_kRSA,
179     SSL_aRSA,
180     SSL_eNULL,
181     SSL_MD5,
182     SSL_SSLV3,
183     SSL_NOT_EXP|SSL_STRONG_NONE,
184     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
185     0,
186     0,
187 },

189 /* Cipher 02 */
190 {
191     1,
192     SSL3_TXT_RSA_NULL_SHA,
193     SSL3_CK_RSA_NULL_SHA,

```

```

194     SSL_kRSA,
195     SSL_aRSA,
196     SSL_eNULL,
197     SSL_SHA1,
198     SSL_SSLV3,
199     SSL_NOT_EXP|SSL_STRONG_NONE|SSL_FIPS,
200     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
201     0,
202     0,
203 },

205 /* Cipher 03 */
206 {
207     1,
208     SSL3_TXT_RSA_RC4_40_MD5,
209     SSL3_CK_RSA_RC4_40_MD5,
210     SSL_kRSA,
211     SSL_aRSA,
212     SSL_RC4,
213     SSL_MD5,
214     SSL_SSLV3,
215     SSL_EXPORT|SSL_EXP40,
216     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
217     40,
218     128,
219 },

221 /* Cipher 04 */
222 {
223     1,
224     SSL3_TXT_RSA_RC4_128_MD5,
225     SSL3_CK_RSA_RC4_128_MD5,
226     SSL_kRSA,
227     SSL_aRSA,
228     SSL_RC4,
229     SSL_MD5,
230     SSL_SSLV3,
231     SSL_NOT_EXP|SSL_MEDIUM,
232     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
233     128,
234     128,
235 },

237 /* Cipher 05 */
238 {
239     1,
240     SSL3_TXT_RSA_RC4_128_SHA,
241     SSL3_CK_RSA_RC4_128_SHA,
242     SSL_kRSA,
243     SSL_aRSA,
244     SSL_RC4,
245     SSL_SHA1,
246     SSL_SSLV3,
247     SSL_NOT_EXP|SSL_MEDIUM,
248     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
249     128,
250     128,
251 },

253 /* Cipher 06 */
254 {
255     1,
256     SSL3_TXT_RSA_RC2_40_MD5,
257     SSL3_CK_RSA_RC2_40_MD5,
258     SSL_kRSA,
259     SSL_aRSA,

```

```

260     SSL_RC2,
261     SSL_MD5,
262     SSL_SSLV3,
263     SSL_EXPORT|SSL_EXP40,
264     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
265     40,
266     128,
267     },

269 /* Cipher 07 */
270 #ifndef OPENSSSL_NO_IDEA
271 {
272     1,
273     SSL3_TXT_RSA_IDEA_128_SHA,
274     SSL3_CK_RSA_IDEA_128_SHA,
275     SSL_kRSA,
276     SSL_aRSA,
277     SSL_IDEA,
278     SSL_SHA1,
279     SSL_SSLV3,
280     SSL_NOT_EXP|SSL_MEDIUM,
281     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
282     128,
283     128,
284     },
285 #endif

287 /* Cipher 08 */
288 {
289     1,
290     SSL3_TXT_RSA_DES_40_CBC_SHA,
291     SSL3_CK_RSA_DES_40_CBC_SHA,
292     SSL_kRSA,
293     SSL_aRSA,
294     SSL_DES,
295     SSL_SHA1,
296     SSL_SSLV3,
297     SSL_EXPORT|SSL_EXP40,
298     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
299     40,
300     56,
301     },

303 /* Cipher 09 */
304 {
305     1,
306     SSL3_TXT_RSA_DES_64_CBC_SHA,
307     SSL3_CK_RSA_DES_64_CBC_SHA,
308     SSL_kRSA,
309     SSL_aRSA,
310     SSL_DES,
311     SSL_SHA1,
312     SSL_SSLV3,
313     SSL_NOT_EXP|SSL_LOW,
314     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
315     56,
316     56,
317     },

319 /* Cipher 0A */
320 {
321     1,
322     SSL3_TXT_RSA_DES_192_CBC3_SHA,
323     SSL3_CK_RSA_DES_192_CBC3_SHA,
324     SSL_kRSA,
325     SSL_aRSA,

```

```

326     SSL_3DES,
327     SSL_SHA1,
328     SSL_SSLV3,
329     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
330     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
331     168,
332     168,
333     },

335 /* The DH ciphers */
336 /* Cipher 0B */
337 {
338     0,
339     SSL3_TXT_DH_DSS_DES_40_CBC_SHA,
340     SSL3_CK_DH_DSS_DES_40_CBC_SHA,
341     SSL_kDhD,
342     SSL_aDH,
343     SSL_DES,
344     SSL_SHA1,
345     SSL_SSLV3,
346     SSL_EXPORT|SSL_EXP40,
347     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
348     40,
349     56,
350     },

352 /* Cipher 0C */
353 {
354     0, /* not implemented (non-ephemeral DH) */
355     SSL3_TXT_DH_DSS_DES_64_CBC_SHA,
356     SSL3_CK_DH_DSS_DES_64_CBC_SHA,
357     SSL_kDhD,
358     SSL_aDH,
359     SSL_DES,
360     SSL_SHA1,
361     SSL_SSLV3,
362     SSL_NOT_EXP|SSL_LOW,
363     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
364     56,
365     56,
366     },

368 /* Cipher 0D */
369 {
370     0, /* not implemented (non-ephemeral DH) */
371     SSL3_TXT_DH_DSS_DES_192_CBC3_SHA,
372     SSL3_CK_DH_DSS_DES_192_CBC3_SHA,
373     SSL_kDhD,
374     SSL_aDH,
375     SSL_3DES,
376     SSL_SHA1,
377     SSL_SSLV3,
378     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
379     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
380     168,
381     168,
382     },

384 /* Cipher 0E */
385 {
386     0, /* not implemented (non-ephemeral DH) */
387     SSL3_TXT_DH_RSA_DES_40_CBC_SHA,
388     SSL3_CK_DH_RSA_DES_40_CBC_SHA,
389     SSL_kDhR,
390     SSL_aDH,
391     SSL_DES,

```

```

392     SSL_SHA1,
393     SSL_SSLV3,
394     SSL_EXPORT|SSL_EXP40,
395     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
396     40,
397     56,
398     },

400 /* Cipher 0F */
401 {
402     0, /* not implemented (non-ephemeral DH) */
403     SSL3_TXT_DH_RSA_DES_64_CBC_SHA,
404     SSL3_CK_DH_RSA_DES_64_CBC_SHA,
405     SSL_kDHr,
406     SSL_aDH,
407     SSL_DES,
408     SSL_SHA1,
409     SSL_SSLV3,
410     SSL_NOT_EXP|SSL_LOW,
411     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
412     56,
413     56,
414     },

416 /* Cipher 10 */
417 {
418     0, /* not implemented (non-ephemeral DH) */
419     SSL3_TXT_DH_RSA_DES_192_CBC3_SHA,
420     SSL3_CK_DH_RSA_DES_192_CBC3_SHA,
421     SSL_kDHr,
422     SSL_aDH,
423     SSL_3DES,
424     SSL_SHA1,
425     SSL_SSLV3,
426     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
427     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
428     168,
429     168,
430     },

432 /* The Ephemeral DH ciphers */
433 /* Cipher 11 */
434 {
435     1,
436     SSL3_TXT_EDH_DSS_DES_40_CBC_SHA,
437     SSL3_CK_EDH_DSS_DES_40_CBC_SHA,
438     SSL_kEDH,
439     SSL_aDSS,
440     SSL_DES,
441     SSL_SHA1,
442     SSL_SSLV3,
443     SSL_EXPORT|SSL_EXP40,
444     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
445     40,
446     56,
447     },

449 /* Cipher 12 */
450 {
451     1,
452     SSL3_TXT_EDH_DSS_DES_64_CBC_SHA,
453     SSL3_CK_EDH_DSS_DES_64_CBC_SHA,
454     SSL_kEDH,
455     SSL_aDSS,
456     SSL_DES,
457     SSL_SHA1,

```

```

458     SSL_SSLV3,
459     SSL_NOT_EXP|SSL_LOW,
460     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
461     56,
462     56,
463     },

465 /* Cipher 13 */
466 {
467     1,
468     SSL3_TXT_EDH_DSS_DES_192_CBC3_SHA,
469     SSL3_CK_EDH_DSS_DES_192_CBC3_SHA,
470     SSL_kEDH,
471     SSL_aDSS,
472     SSL_3DES,
473     SSL_SHA1,
474     SSL_SSLV3,
475     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
476     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
477     168,
478     168,
479     },

481 /* Cipher 14 */
482 {
483     1,
484     SSL3_TXT_EDH_RSA_DES_40_CBC_SHA,
485     SSL3_CK_EDH_RSA_DES_40_CBC_SHA,
486     SSL_kEDH,
487     SSL_aRSA,
488     SSL_DES,
489     SSL_SHA1,
490     SSL_SSLV3,
491     SSL_EXPORT|SSL_EXP40,
492     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
493     40,
494     56,
495     },

497 /* Cipher 15 */
498 {
499     1,
500     SSL3_TXT_EDH_RSA_DES_64_CBC_SHA,
501     SSL3_CK_EDH_RSA_DES_64_CBC_SHA,
502     SSL_kEDH,
503     SSL_aRSA,
504     SSL_DES,
505     SSL_SHA1,
506     SSL_SSLV3,
507     SSL_NOT_EXP|SSL_LOW,
508     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
509     56,
510     56,
511     },

513 /* Cipher 16 */
514 {
515     1,
516     SSL3_TXT_EDH_RSA_DES_192_CBC3_SHA,
517     SSL3_CK_EDH_RSA_DES_192_CBC3_SHA,
518     SSL_kEDH,
519     SSL_aRSA,
520     SSL_3DES,
521     SSL_SHA1,
522     SSL_SSLV3,
523     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,

```

```

524     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
525     168,
526     168,
527     },

529 /* Cipher 17 */
530 {
531     1,
532     SSL3_TXT_ADH_RC4_40_MD5,
533     SSL3_CK_ADH_RC4_40_MD5,
534     SSL_kEDH,
535     SSL_aNULL,
536     SSL_RC4,
537     SSL_MD5,
538     SSL_SSLV3,
539     SSL_EXPORT|SSL_EXP40,
540     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
541     40,
542     128,
543     },

545 /* Cipher 18 */
546 {
547     1,
548     SSL3_TXT_ADH_RC4_128_MD5,
549     SSL3_CK_ADH_RC4_128_MD5,
550     SSL_kEDH,
551     SSL_aNULL,
552     SSL_RC4,
553     SSL_MD5,
554     SSL_SSLV3,
555     SSL_NOT_EXP|SSL_MEDIUM,
556     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
557     128,
558     128,
559     },

561 /* Cipher 19 */
562 {
563     1,
564     SSL3_TXT_ADH_DES_40_CBC_SHA,
565     SSL3_CK_ADH_DES_40_CBC_SHA,
566     SSL_kEDH,
567     SSL_aNULL,
568     SSL_DES,
569     SSL_SHA1,
570     SSL_SSLV3,
571     SSL_EXPORT|SSL_EXP40,
572     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
573     40,
574     128,
575     },

577 /* Cipher 1A */
578 {
579     1,
580     SSL3_TXT_ADH_DES_64_CBC_SHA,
581     SSL3_CK_ADH_DES_64_CBC_SHA,
582     SSL_kEDH,
583     SSL_aNULL,
584     SSL_DES,
585     SSL_SHA1,
586     SSL_SSLV3,
587     SSL_NOT_EXP|SSL_LOW,
588     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
589     56,

```

```

590     56,
591     },

593 /* Cipher 1B */
594 {
595     1,
596     SSL3_TXT_ADH_DES_192_CBC_SHA,
597     SSL3_CK_ADH_DES_192_CBC_SHA,
598     SSL_kEDH,
599     SSL_aNULL,
600     SSL_3DES,
601     SSL_SHA1,
602     SSL_SSLV3,
603     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
604     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
605     168,
606     168,
607     },

609 /* Fortezza ciphersuite from SSL 3.0 spec */
610 #if 0
611 /* Cipher 1C */
612 {
613     0,
614     SSL3_TXT_FZA_DMS_NULL_SHA,
615     SSL3_CK_FZA_DMS_NULL_SHA,
616     SSL_kFZA,
617     SSL_aFZA,
618     SSL_eNULL,
619     SSL_SHA1,
620     SSL_SSLV3,
621     SSL_NOT_EXP|SSL_STRONG_NONE,
622     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
623     0,
624     0,
625     },

627 /* Cipher 1D */
628 {
629     0,
630     SSL3_TXT_FZA_DMS_FZA_SHA,
631     SSL3_CK_FZA_DMS_FZA_SHA,
632     SSL_kFZA,
633     SSL_aFZA,
634     SSL_eFZA,
635     SSL_SHA1,
636     SSL_SSLV3,
637     SSL_NOT_EXP|SSL_STRONG_NONE,
638     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
639     0,
640     0,
641     },

643 /* Cipher 1E */
644 {
645     0,
646     SSL3_TXT_FZA_DMS_RC4_SHA,
647     SSL3_CK_FZA_DMS_RC4_SHA,
648     SSL_kFZA,
649     SSL_aFZA,
650     SSL_RC4,
651     SSL_SHA1,
652     SSL_SSLV3,
653     SSL_NOT_EXP|SSL_MEDIUM,
654     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
655     128,

```



```

656     128,
657 },
658 #endif

660 #ifndef OPENSSSL_NO_KRB5
661 /* The Kerberos ciphers*/
662 /* Cipher 1E */
663 {
664     1,
665     SSL3_TXT_KRB5_DES_64_CBC_SHA,
666     SSL3_CK_KRB5_DES_64_CBC_SHA,
667     SSL_kKRB5,
668     SSL_aKRB5,
669     SSL_DES,
670     SSL_SHA1,
671     SSL_SSLV3,
672     SSL_NOT_EXP|SSL_LOW,
673     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
674     56,
675     56,
676 },

678 /* Cipher 1F */
679 {
680     1,
681     SSL3_TXT_KRB5_DES_192_CBC3_SHA,
682     SSL3_CK_KRB5_DES_192_CBC3_SHA,
683     SSL_kKRB5,
684     SSL_aKRB5,
685     SSL_3DES,
686     SSL_SHA1,
687     SSL_SSLV3,
688     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
689     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
690     168,
691     168,
692 },

694 /* Cipher 20 */
695 {
696     1,
697     SSL3_TXT_KRB5_RC4_128_SHA,
698     SSL3_CK_KRB5_RC4_128_SHA,
699     SSL_kKRB5,
700     SSL_aKRB5,
701     SSL_RC4,
702     SSL_SHA1,
703     SSL_SSLV3,
704     SSL_NOT_EXP|SSL_MEDIUM,
705     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
706     128,
707     128,
708 },

710 /* Cipher 21 */
711 {
712     1,
713     SSL3_TXT_KRB5_IDEA_128_CBC_SHA,
714     SSL3_CK_KRB5_IDEA_128_CBC_SHA,
715     SSL_kKRB5,
716     SSL_aKRB5,
717     SSL_IDEA,
718     SSL_SHA1,
719     SSL_SSLV3,
720     SSL_NOT_EXP|SSL_MEDIUM,
721     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,

```

```

722     128,
723     128,
724 },

726 /* Cipher 22 */
727 {
728     1,
729     SSL3_TXT_KRB5_DES_64_CBC_MD5,
730     SSL3_CK_KRB5_DES_64_CBC_MD5,
731     SSL_kKRB5,
732     SSL_aKRB5,
733     SSL_DES,
734     SSL_MD5,
735     SSL_SSLV3,
736     SSL_NOT_EXP|SSL_LOW,
737     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
738     56,
739     56,
740 },

742 /* Cipher 23 */
743 {
744     1,
745     SSL3_TXT_KRB5_DES_192_CBC3_MD5,
746     SSL3_CK_KRB5_DES_192_CBC3_MD5,
747     SSL_kKRB5,
748     SSL_aKRB5,
749     SSL_3DES,
750     SSL_MD5,
751     SSL_SSLV3,
752     SSL_NOT_EXP|SSL_HIGH,
753     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
754     168,
755     168,
756 },

758 /* Cipher 24 */
759 {
760     1,
761     SSL3_TXT_KRB5_RC4_128_MD5,
762     SSL3_CK_KRB5_RC4_128_MD5,
763     SSL_kKRB5,
764     SSL_aKRB5,
765     SSL_RC4,
766     SSL_MD5,
767     SSL_SSLV3,
768     SSL_NOT_EXP|SSL_MEDIUM,
769     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
770     128,
771     128,
772 },

774 /* Cipher 25 */
775 {
776     1,
777     SSL3_TXT_KRB5_IDEA_128_CBC_MD5,
778     SSL3_CK_KRB5_IDEA_128_CBC_MD5,
779     SSL_kKRB5,
780     SSL_aKRB5,
781     SSL_IDEA,
782     SSL_MD5,
783     SSL_SSLV3,
784     SSL_NOT_EXP|SSL_MEDIUM,
785     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
786     128,
787     128,

```

```

788     },
790 /* Cipher 26 */
791 {
792     1,
793     SSL3_TXT_KRB5_DES_40_CBC_SHA,
794     SSL3_CK_KRB5_DES_40_CBC_SHA,
795     SSL_kKRB5,
796     SSL_aKRB5,
797     SSL_DES,
798     SSL_SHA1,
799     SSL_SSLV3,
800     SSL_EXPORT|SSL_EXP40,
801     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
802     40,
803     56,
804 },
806 /* Cipher 27 */
807 {
808     1,
809     SSL3_TXT_KRB5_RC2_40_CBC_SHA,
810     SSL3_CK_KRB5_RC2_40_CBC_SHA,
811     SSL_kKRB5,
812     SSL_aKRB5,
813     SSL_RC2,
814     SSL_SHA1,
815     SSL_SSLV3,
816     SSL_EXPORT|SSL_EXP40,
817     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
818     40,
819     128,
820 },
822 /* Cipher 28 */
823 {
824     1,
825     SSL3_TXT_KRB5_RC4_40_SHA,
826     SSL3_CK_KRB5_RC4_40_SHA,
827     SSL_kKRB5,
828     SSL_aKRB5,
829     SSL_RC4,
830     SSL_SHA1,
831     SSL_SSLV3,
832     SSL_EXPORT|SSL_EXP40,
833     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
834     40,
835     128,
836 },
838 /* Cipher 29 */
839 {
840     1,
841     SSL3_TXT_KRB5_DES_40_CBC_MD5,
842     SSL3_CK_KRB5_DES_40_CBC_MD5,
843     SSL_kKRB5,
844     SSL_aKRB5,
845     SSL_DES,
846     SSL_MD5,
847     SSL_SSLV3,
848     SSL_EXPORT|SSL_EXP40,
849     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
850     40,
851     56,
852 },

```

```

854 /* Cipher 2A */
855 {
856     1,
857     SSL3_TXT_KRB5_RC2_40_CBC_MD5,
858     SSL3_CK_KRB5_RC2_40_CBC_MD5,
859     SSL_kKRB5,
860     SSL_aKRB5,
861     SSL_RC2,
862     SSL_MD5,
863     SSL_SSLV3,
864     SSL_EXPORT|SSL_EXP40,
865     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
866     40,
867     128,
868 },
870 /* Cipher 2B */
871 {
872     1,
873     SSL3_TXT_KRB5_RC4_40_MD5,
874     SSL3_CK_KRB5_RC4_40_MD5,
875     SSL_kKRB5,
876     SSL_aKRB5,
877     SSL_RC4,
878     SSL_MD5,
879     SSL_SSLV3,
880     SSL_EXPORT|SSL_EXP40,
881     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
882     40,
883     128,
884 },
885 #endif /* OPENSAL_NO_KRB5 */
887 /* New AES ciphersuites */
888 /* Cipher 2F */
889 {
890     1,
891     TLS1_TXT_RSA_WITH_AES_128_SHA,
892     TLS1_CK_RSA_WITH_AES_128_SHA,
893     SSL_kRSA,
894     SSL_aRSA,
895     SSL_AES128,
896     SSL_SHA1,
897     SSL_TLSV1,
898     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
899     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
900     128,
901     128,
902 },
903 /* Cipher 30 */
904 {
905     0,
906     TLS1_TXT_DH_DSS_WITH_AES_128_SHA,
907     TLS1_CK_DH_DSS_WITH_AES_128_SHA,
908     SSL_kDHD,
909     SSL_aDH,
910     SSL_AES128,
911     SSL_SHA1,
912     SSL_TLSV1,
913     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
914     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
915     128,
916     128,
917 },
918 /* Cipher 31 */
919 {

```

```

920     0,
921     TLS1_TXT_DH_RSA_WITH_AES_128_SHA,
922     TLS1_CK_DH_RSA_WITH_AES_128_SHA,
923     SSL_kDHR,
924     SSL_aDH,
925     SSL_AES128,
926     SSL_SHA1,
927     SSL_TLSV1,
928     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
929     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
930     128,
931     128,
932     },
933 /* Cipher 32 */
934 {
935     1,
936     TLS1_TXT_DHE_DSS_WITH_AES_128_SHA,
937     TLS1_CK_DHE_DSS_WITH_AES_128_SHA,
938     SSL_kEDH,
939     SSL_aDSS,
940     SSL_AES128,
941     SSL_SHA1,
942     SSL_TLSV1,
943     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
944     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
945     128,
946     128,
947     },
948 /* Cipher 33 */
949 {
950     1,
951     TLS1_TXT_DHE_RSA_WITH_AES_128_SHA,
952     TLS1_CK_DHE_RSA_WITH_AES_128_SHA,
953     SSL_kEDH,
954     SSL_aRSA,
955     SSL_AES128,
956     SSL_SHA1,
957     SSL_TLSV1,
958     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
959     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
960     128,
961     128,
962     },
963 /* Cipher 34 */
964 {
965     1,
966     TLS1_TXT_ADH_WITH_AES_128_SHA,
967     TLS1_CK_ADH_WITH_AES_128_SHA,
968     SSL_kEDH,
969     SSL_aNULL,
970     SSL_AES128,
971     SSL_SHA1,
972     SSL_TLSV1,
973     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
974     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
975     128,
976     128,
977     },
978
979 /* Cipher 35 */
980 {
981     1,
982     TLS1_TXT_RSA_WITH_AES_256_SHA,
983     TLS1_CK_RSA_WITH_AES_256_SHA,
984     SSL_kRSA,
985     SSL_aRSA,

```

```

986     SSL_AES256,
987     SSL_SHA1,
988     SSL_TLSV1,
989     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
990     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
991     256,
992     256,
993     },
994 /* Cipher 36 */
995 {
996     0,
997     TLS1_TXT_DH_DSS_WITH_AES_256_SHA,
998     TLS1_CK_DH_DSS_WITH_AES_256_SHA,
999     SSL_kDHd,
1000     SSL_aDH,
1001     SSL_AES256,
1002     SSL_SHA1,
1003     SSL_TLSV1,
1004     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1005     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1006     256,
1007     256,
1008     },
1009
1010 /* Cipher 37 */
1011 {
1012     0, /* not implemented (non-ephemeral DH) */
1013     TLS1_TXT_DH_RSA_WITH_AES_256_SHA,
1014     TLS1_CK_DH_RSA_WITH_AES_256_SHA,
1015     SSL_kDHR,
1016     SSL_aDH,
1017     SSL_AES256,
1018     SSL_SHA1,
1019     SSL_TLSV1,
1020     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1021     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1022     256,
1023     256,
1024     },
1025
1026 /* Cipher 38 */
1027 {
1028     1,
1029     TLS1_TXT_DHE_DSS_WITH_AES_256_SHA,
1030     TLS1_CK_DHE_DSS_WITH_AES_256_SHA,
1031     SSL_kEDH,
1032     SSL_aDSS,
1033     SSL_AES256,
1034     SSL_SHA1,
1035     SSL_TLSV1,
1036     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1037     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1038     256,
1039     256,
1040     },
1041
1042 /* Cipher 39 */
1043 {
1044     1,
1045     TLS1_TXT_DHE_RSA_WITH_AES_256_SHA,
1046     TLS1_CK_DHE_RSA_WITH_AES_256_SHA,
1047     SSL_kEDH,
1048     SSL_aRSA,
1049     SSL_AES256,
1050     SSL_SHA1,
1051     SSL_TLSV1,

```

```

1052     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1053     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1054     256,
1055     256,
1056     },

1058     /* Cipher 3A */
1059     {
1060     1,
1061     TLS1_TXT_ADH_WITH_AES_256_SHA,
1062     TLS1_CK_ADH_WITH_AES_256_SHA,
1063     SSL_kEDH,
1064     SSL_aNULL,
1065     SSL_AES256,
1066     SSL_SHA1,
1067     SSL_TLSV1,
1068     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1069     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1070     256,
1071     256,
1072     },

1074     /* TLS v1.2 ciphersuites */
1075     /* Cipher 3B */
1076     {
1077     1,
1078     TLS1_TXT_RSA_WITH_NULL_SHA256,
1079     TLS1_CK_RSA_WITH_NULL_SHA256,
1080     SSL_kRSA,
1081     SSL_aRSA,
1082     SSL_eNULL,
1083     SSL_SHA256,
1084     SSL_TLSV1_2,
1085     SSL_NOT_EXP|SSL_STRONG_NONE|SSL_FIPS,
1086     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1087     0,
1088     0,
1089     },

1091     /* Cipher 3C */
1092     {
1093     1,
1094     TLS1_TXT_RSA_WITH_AES_128_SHA256,
1095     TLS1_CK_RSA_WITH_AES_128_SHA256,
1096     SSL_kRSA,
1097     SSL_aRSA,
1098     SSL_AES128,
1099     SSL_SHA256,
1100     SSL_TLSV1_2,
1101     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1102     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1103     128,
1104     128,
1105     },

1107     /* Cipher 3D */
1108     {
1109     1,
1110     TLS1_TXT_RSA_WITH_AES_256_SHA256,
1111     TLS1_CK_RSA_WITH_AES_256_SHA256,
1112     SSL_kRSA,
1113     SSL_aRSA,
1114     SSL_AES256,
1115     SSL_SHA256,
1116     SSL_TLSV1_2,
1117     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,

```

```

1118     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1119     256,
1120     256,
1121     },

1123     /* Cipher 3E */
1124     {
1125     0, /* not implemented (non-ephemeral DH) */
1126     TLS1_TXT_DH_DSS_WITH_AES_128_SHA256,
1127     TLS1_CK_DH_DSS_WITH_AES_128_SHA256,
1128     SSL_kDHd,
1129     SSL_aDH,
1130     SSL_AES128,
1131     SSL_SHA256,
1132     SSL_TLSV1_2,
1133     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1134     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1135     128,
1136     128,
1137     },

1139     /* Cipher 3F */
1140     {
1141     0, /* not implemented (non-ephemeral DH) */
1142     TLS1_TXT_DH_RSA_WITH_AES_128_SHA256,
1143     TLS1_CK_DH_RSA_WITH_AES_128_SHA256,
1144     SSL_kDHR,
1145     SSL_aDH,
1146     SSL_AES128,
1147     SSL_SHA256,
1148     SSL_TLSV1_2,
1149     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1150     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1151     128,
1152     128,
1153     },

1155     /* Cipher 40 */
1156     {
1157     1,
1158     TLS1_TXT_DHE_DSS_WITH_AES_128_SHA256,
1159     TLS1_CK_DHE_DSS_WITH_AES_128_SHA256,
1160     SSL_kEDH,
1161     SSL_aDSS,
1162     SSL_AES128,
1163     SSL_SHA256,
1164     SSL_TLSV1_2,
1165     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1166     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1167     128,
1168     128,
1169     },

1171 #ifndef OPENSSSL_NO_CAMELLIA
1172     /* Camellia ciphersuites from RFC4132 (128-bit portion) */

1174     /* Cipher 41 */
1175     {
1176     1,
1177     TLS1_TXT_RSA_WITH_CAMELLIA_128_CBC_SHA,
1178     TLS1_CK_RSA_WITH_CAMELLIA_128_CBC_SHA,
1179     SSL_kRSA,
1180     SSL_aRSA,
1181     SSL_CAMELLIA128,
1182     SSL_SHA1,
1183     SSL_TLSV1,

```

```

1184     SSL_NOT_EXP|SSL_HIGH,
1185     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1186     128,
1187     128,
1188     },
1189
1190     /* Cipher 42 */
1191     {
1192     0, /* not implemented (non-ephemeral DH) */
1193     TLS1_TXT_DH_DSS_WITH_CAMELLIA_128_CBC_SHA,
1194     TLS1_CK_DH_DSS_WITH_CAMELLIA_128_CBC_SHA,
1195     SSL_kDHd,
1196     SSL_aDH,
1197     SSL_CAMELLIA128,
1198     SSL_SHA1,
1199     SSL_TLSV1,
1200     SSL_NOT_EXP|SSL_HIGH,
1201     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1202     128,
1203     128,
1204     },
1205
1206     /* Cipher 43 */
1207     {
1208     0, /* not implemented (non-ephemeral DH) */
1209     TLS1_TXT_DH_RSA_WITH_CAMELLIA_128_CBC_SHA,
1210     TLS1_CK_DH_RSA_WITH_CAMELLIA_128_CBC_SHA,
1211     SSL_kDhR,
1212     SSL_aDH,
1213     SSL_CAMELLIA128,
1214     SSL_SHA1,
1215     SSL_TLSV1,
1216     SSL_NOT_EXP|SSL_HIGH,
1217     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1218     128,
1219     128,
1220     },
1221
1222     /* Cipher 44 */
1223     {
1224     1,
1225     TLS1_TXT_DHE_DSS_WITH_CAMELLIA_128_CBC_SHA,
1226     TLS1_CK_DHE_DSS_WITH_CAMELLIA_128_CBC_SHA,
1227     SSL_kEDH,
1228     SSL_aDSS,
1229     SSL_CAMELLIA128,
1230     SSL_SHA1,
1231     SSL_TLSV1,
1232     SSL_NOT_EXP|SSL_HIGH,
1233     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1234     128,
1235     128,
1236     },
1237
1238     /* Cipher 45 */
1239     {
1240     1,
1241     TLS1_TXT_DHE_RSA_WITH_CAMELLIA_128_CBC_SHA,
1242     TLS1_CK_DHE_RSA_WITH_CAMELLIA_128_CBC_SHA,
1243     SSL_kEDH,
1244     SSL_aRSA,
1245     SSL_CAMELLIA128,
1246     SSL_SHA1,
1247     SSL_TLSV1,
1248     SSL_NOT_EXP|SSL_HIGH,
1249     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,

```

```

1250     128,
1251     128,
1252     },
1253
1254     /* Cipher 46 */
1255     {
1256     1,
1257     TLS1_TXT_ADH_WITH_CAMELLIA_128_CBC_SHA,
1258     TLS1_CK_ADH_WITH_CAMELLIA_128_CBC_SHA,
1259     SSL_kEDH,
1260     SSL_aNULL,
1261     SSL_CAMELLIA128,
1262     SSL_SHA1,
1263     SSL_TLSV1,
1264     SSL_NOT_EXP|SSL_HIGH,
1265     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1266     128,
1267     128,
1268     },
1269     #endif /* OPENSSSL_NO_CAMELLIA */
1270
1271     #if TLS1_ALLOW_EXPERIMENTAL_CIPHERSUITES
1272     /* New TLS Export CipherSuites from expired ID */
1273     #if 0
1274     /* Cipher 60 */
1275     {
1276     1,
1277     TLS1_TXT_RSA_EXPORT1024_WITH_RC4_56_MD5,
1278     TLS1_CK_RSA_EXPORT1024_WITH_RC4_56_MD5,
1279     SSL_kRSA,
1280     SSL_aRSA,
1281     SSL_RC4,
1282     SSL_MD5,
1283     SSL_TLSV1,
1284     SSL_EXPORT|SSL_EXP56,
1285     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1286     56,
1287     128,
1288     },
1289
1290     /* Cipher 61 */
1291     {
1292     1,
1293     TLS1_TXT_RSA_EXPORT1024_WITH_RC2_CBC_56_MD5,
1294     TLS1_CK_RSA_EXPORT1024_WITH_RC2_CBC_56_MD5,
1295     SSL_kRSA,
1296     SSL_aRSA,
1297     SSL_RC2,
1298     SSL_MD5,
1299     SSL_TLSV1,
1300     SSL_EXPORT|SSL_EXP56,
1301     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1302     56,
1303     128,
1304     },
1305     #endif
1306
1307     /* Cipher 62 */
1308     {
1309     1,
1310     TLS1_TXT_RSA_EXPORT1024_WITH_DES_CBC_SHA,
1311     TLS1_CK_RSA_EXPORT1024_WITH_DES_CBC_SHA,
1312     SSL_kRSA,
1313     SSL_aRSA,
1314     SSL_DES,
1315     SSL_SHA1,

```

```

1316     SSL_TLSV1,
1317     SSL_EXPORT|SSL_EXP56,
1318     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1319     56,
1320     56,
1321     },
1322
1323     /* Cipher 63 */
1324     {
1325     1,
1326     TLS1_TXT_DHE_DSS_EXPORT1024_WITH_DES_CBC_SHA,
1327     TLS1_CK_DHE_DSS_EXPORT1024_WITH_DES_CBC_SHA,
1328     SSL_KEDH,
1329     SSL_aDSS,
1330     SSL_DES,
1331     SSL_SHA1,
1332     SSL_TLSV1,
1333     SSL_EXPORT|SSL_EXP56,
1334     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1335     56,
1336     56,
1337     },
1338
1339     /* Cipher 64 */
1340     {
1341     1,
1342     TLS1_TXT_RSA_EXPORT1024_WITH_RC4_56_SHA,
1343     TLS1_CK_RSA_EXPORT1024_WITH_RC4_56_SHA,
1344     SSL_kRSA,
1345     SSL_aRSA,
1346     SSL_RC4,
1347     SSL_SHA1,
1348     SSL_TLSV1,
1349     SSL_EXPORT|SSL_EXP56,
1350     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1351     56,
1352     128,
1353     },
1354
1355     /* Cipher 65 */
1356     {
1357     1,
1358     TLS1_TXT_DHE_DSS_EXPORT1024_WITH_RC4_56_SHA,
1359     TLS1_CK_DHE_DSS_EXPORT1024_WITH_RC4_56_SHA,
1360     SSL_kEDH,
1361     SSL_aDSS,
1362     SSL_RC4,
1363     SSL_SHA1,
1364     SSL_TLSV1,
1365     SSL_EXPORT|SSL_EXP56,
1366     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1367     56,
1368     128,
1369     },
1370
1371     /* Cipher 66 */
1372     {
1373     1,
1374     TLS1_TXT_DHE_DSS_WITH_RC4_128_SHA,
1375     TLS1_CK_DHE_DSS_WITH_RC4_128_SHA,
1376     SSL_kEDH,
1377     SSL_aDSS,
1378     SSL_RC4,
1379     SSL_SHA1,
1380     SSL_TLSV1,
1381     SSL_NOT_EXP|SSL_MEDIUM,

```

```

1382     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1383     128,
1384     128,
1385     },
1386 #endif
1387
1388     /* TLS v1.2 ciphersuites */
1389     /* Cipher 67 */
1390     {
1391     1,
1392     TLS1_TXT_DHE_RSA_WITH_AES_128_SHA256,
1393     TLS1_CK_DHE_RSA_WITH_AES_128_SHA256,
1394     SSL_kEDH,
1395     SSL_aRSA,
1396     SSL_AES128,
1397     SSL_SHA256,
1398     SSL_TLSV1_2,
1399     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1400     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1401     128,
1402     128,
1403     },
1404
1405     /* Cipher 68 */
1406     {
1407     0, /* not implemented (non-ephemeral DH) */
1408     TLS1_TXT_DH_DSS_WITH_AES_256_SHA256,
1409     TLS1_CK_DH_DSS_WITH_AES_256_SHA256,
1410     SSL_kDHd,
1411     SSL_aDH,
1412     SSL_AES256,
1413     SSL_SHA256,
1414     SSL_TLSV1_2,
1415     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1416     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1417     256,
1418     256,
1419     },
1420
1421     /* Cipher 69 */
1422     {
1423     0, /* not implemented (non-ephemeral DH) */
1424     TLS1_TXT_DH_RSA_WITH_AES_256_SHA256,
1425     TLS1_CK_DH_RSA_WITH_AES_256_SHA256,
1426     SSL_kDhr,
1427     SSL_aDH,
1428     SSL_AES256,
1429     SSL_SHA256,
1430     SSL_TLSV1_2,
1431     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1432     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1433     256,
1434     256,
1435     },
1436
1437     /* Cipher 6A */
1438     {
1439     1,
1440     TLS1_TXT_DHE_DSS_WITH_AES_256_SHA256,
1441     TLS1_CK_DHE_DSS_WITH_AES_256_SHA256,
1442     SSL_kEDH,
1443     SSL_aDSS,
1444     SSL_AES256,
1445     SSL_SHA256,
1446     SSL_TLSV1_2,
1447     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,

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```

1448     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1449     256,
1450     256,
1451     },
1452
1453     /* Cipher 6B */
1454     {
1455     1,
1456     TLS1_TXT_DHE_RSA_WITH_AES_256_SHA256,
1457     TLS1_CK_DHE_RSA_WITH_AES_256_SHA256,
1458     SSL_kEDH,
1459     SSL_aRSA,
1460     SSL_AES256,
1461     SSL_SHA256,
1462     SSL_TLSV1_2,
1463     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1464     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1465     256,
1466     256,
1467     },
1468
1469     /* Cipher 6C */
1470     {
1471     1,
1472     TLS1_TXT_ADH_WITH_AES_128_SHA256,
1473     TLS1_CK_ADH_WITH_AES_128_SHA256,
1474     SSL_kEDH,
1475     SSL_aNULL,
1476     SSL_AES128,
1477     SSL_SHA256,
1478     SSL_TLSV1_2,
1479     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1480     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1481     128,
1482     128,
1483     },
1484
1485     /* Cipher 6D */
1486     {
1487     1,
1488     TLS1_TXT_ADH_WITH_AES_256_SHA256,
1489     TLS1_CK_ADH_WITH_AES_256_SHA256,
1490     SSL_kEDH,
1491     SSL_aNULL,
1492     SSL_AES256,
1493     SSL_SHA256,
1494     SSL_TLSV1_2,
1495     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1496     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1497     256,
1498     256,
1499     },
1500
1501     /* GOST Ciphersuites */
1502     {
1503     1,
1504     "GOST94-GOST89-GOST89",
1505     0x3000080,
1506     SSL_kGOST,
1507     SSL_aGOST94,
1508     SSL_eGOST2814789CNT,
1509     SSL_GOST89MAC,
1510     SSL_TLSV1,
1511     SSL_NOT_EXP|SSL_HIGH,
1512     SSL_HANDSHAKE_MAC_GOST94|TLS1_PRF_GOST94|TLS1_STREAM_MAC,
1513

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```

1514     256,
1515     256,
1516     },
1517     {
1518     1,
1519     "GOST2001-GOST89-GOST89",
1520     0x3000081,
1521     SSL_kGOST,
1522     SSL_aGOST01,
1523     SSL_eGOST2814789CNT,
1524     SSL_GOST89MAC,
1525     SSL_TLSV1,
1526     SSL_NOT_EXP|SSL_HIGH,
1527     SSL_HANDSHAKE_MAC_GOST94|TLS1_PRF_GOST94|TLS1_STREAM_MAC,
1528     256,
1529     256,
1530     },
1531     {
1532     1,
1533     "GOST94-NUL-GOST94",
1534     0x3000082,
1535     SSL_kGOST,
1536     SSL_aGOST94,
1537     SSL_eNULL,
1538     SSL_GOST94,
1539     SSL_TLSV1,
1540     SSL_NOT_EXP|SSL_STRONG_NONE,
1541     SSL_HANDSHAKE_MAC_GOST94|TLS1_PRF_GOST94,
1542     0,
1543     0,
1544     },
1545     {
1546     1,
1547     "GOST2001-NUL-GOST94",
1548     0x3000083,
1549     SSL_kGOST,
1550     SSL_aGOST01,
1551     SSL_eNULL,
1552     SSL_GOST94,
1553     SSL_TLSV1,
1554     SSL_NOT_EXP|SSL_STRONG_NONE,
1555     SSL_HANDSHAKE_MAC_GOST94|TLS1_PRF_GOST94,
1556     0,
1557     0,
1558     },
1559
1560 #ifndef OPENSSL_NO_CAMELLIA
1561     /* Camellia ciphersuites from RFC4132 (256-bit portion) */
1562
1563     /* Cipher 84 */
1564     {
1565     1,
1566     TLS1_TXT_RSA_WITH_CAMELLIA_256_CBC_SHA,
1567     TLS1_CK_RSA_WITH_CAMELLIA_256_CBC_SHA,
1568     SSL_kRSA,
1569     SSL_aRSA,
1570     SSL_CAMELLIA256,
1571     SSL_SHA1,
1572     SSL_TLSV1,
1573     SSL_NOT_EXP|SSL_HIGH,
1574     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1575     256,
1576     256,
1577     },
1578     /* Cipher 85 */
1579     {

```

```

1580     0, /* not implemented (non-ephemeral DH) */
1581     TLS1_TXT_DH_DSS_WITH_CAMELLIA_256_CBC_SHA,
1582     TLS1_CK_DH_DSS_WITH_CAMELLIA_256_CBC_SHA,
1583     SSL_kDHd,
1584     SSL_aDH,
1585     SSL_CAMELLIA256,
1586     SSL_SHA1,
1587     SSL_TLSV1,
1588     SSL_NOT_EXP|SSL_HIGH,
1589     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1590     256,
1591     256,
1592     },
1593
1594     /* Cipher 86 */
1595     {
1596     0, /* not implemented (non-ephemeral DH) */
1597     TLS1_TXT_DH_RSA_WITH_CAMELLIA_256_CBC_SHA,
1598     TLS1_CK_DH_RSA_WITH_CAMELLIA_256_CBC_SHA,
1599     SSL_kDHR,
1600     SSL_aDH,
1601     SSL_CAMELLIA256,
1602     SSL_SHA1,
1603     SSL_TLSV1,
1604     SSL_NOT_EXP|SSL_HIGH,
1605     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1606     256,
1607     256,
1608     },
1609
1610     /* Cipher 87 */
1611     {
1612     1,
1613     TLS1_TXT_DHE_DSS_WITH_CAMELLIA_256_CBC_SHA,
1614     TLS1_CK_DHE_DSS_WITH_CAMELLIA_256_CBC_SHA,
1615     SSL_kEDH,
1616     SSL_aDSS,
1617     SSL_CAMELLIA256,
1618     SSL_SHA1,
1619     SSL_TLSV1,
1620     SSL_NOT_EXP|SSL_HIGH,
1621     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1622     256,
1623     256,
1624     },
1625
1626     /* Cipher 88 */
1627     {
1628     1,
1629     TLS1_TXT_DHE_RSA_WITH_CAMELLIA_256_CBC_SHA,
1630     TLS1_CK_DHE_RSA_WITH_CAMELLIA_256_CBC_SHA,
1631     SSL_kEDH,
1632     SSL_aRSA,
1633     SSL_CAMELLIA256,
1634     SSL_SHA1,
1635     SSL_TLSV1,
1636     SSL_NOT_EXP|SSL_HIGH,
1637     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1638     256,
1639     256,
1640     },
1641
1642     /* Cipher 89 */
1643     {
1644     1,
1645     TLS1_TXT_ADH_WITH_CAMELLIA_256_CBC_SHA,

```

```

1646     TLS1_CK_ADH_WITH_CAMELLIA_256_CBC_SHA,
1647     SSL_kEDH,
1648     SSL_aNULL,
1649     SSL_CAMELLIA256,
1650     SSL_SHA1,
1651     SSL_TLSV1,
1652     SSL_NOT_EXP|SSL_HIGH,
1653     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1654     256,
1655     256,
1656     },
1657 #endif /* OPENSSSL_NO_CAMELLIA */
1658
1659 #ifndef OPENSSSL_NO_PSK
1660     /* Cipher 8A */
1661     {
1662     1,
1663     TLS1_TXT_PSK_WITH_RC4_128_SHA,
1664     TLS1_CK_PSK_WITH_RC4_128_SHA,
1665     SSL_kPSK,
1666     SSL_aPSK,
1667     SSL_RC4,
1668     SSL_SHA1,
1669     SSL_TLSV1,
1670     SSL_NOT_EXP|SSL_MEDIUM,
1671     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1672     128,
1673     128,
1674     },
1675
1676     /* Cipher 8B */
1677     {
1678     1,
1679     TLS1_TXT_PSK_WITH_3DES_EDE_CBC_SHA,
1680     TLS1_CK_PSK_WITH_3DES_EDE_CBC_SHA,
1681     SSL_kPSK,
1682     SSL_aPSK,
1683     SSL_3DES,
1684     SSL_SHA1,
1685     SSL_TLSV1,
1686     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1687     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1688     168,
1689     168,
1690     },
1691
1692     /* Cipher 8C */
1693     {
1694     1,
1695     TLS1_TXT_PSK_WITH_AES_128_CBC_SHA,
1696     TLS1_CK_PSK_WITH_AES_128_CBC_SHA,
1697     SSL_kPSK,
1698     SSL_aPSK,
1699     SSL_AES128,
1700     SSL_SHA1,
1701     SSL_TLSV1,
1702     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1703     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1704     128,
1705     128,
1706     },
1707
1708     /* Cipher 8D */
1709     {
1710     1,
1711     TLS1_TXT_PSK_WITH_AES_256_CBC_SHA,

```



```

1712     TLS1_CK_PSK_WITH_AES_256_CBC_SHA,
1713     SSL_kPSK,
1714     SSL_aPSK,
1715     SSL_AES256,
1716     SSL_SHA1,
1717     SSL_TLSV1,
1718     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1719     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1720     256,
1721     256,
1722     },
1723 #endif /* OPENSSSL_NO_PSK */

1725 #ifndef OPENSSSL_NO_SEED
1726 /* SEED ciphersuites from RFC4162 */

1728 /* Cipher 96 */
1729 {
1730     1,
1731     TLS1_TXT_RSA_WITH_SEED_SHA,
1732     TLS1_CK_RSA_WITH_SEED_SHA,
1733     SSL_kRSA,
1734     SSL_aRSA,
1735     SSL_SEED,
1736     SSL_SHA1,
1737     SSL_TLSV1,
1738     SSL_NOT_EXP|SSL_MEDIUM,
1739     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1740     128,
1741     128,
1742     },

1744 /* Cipher 97 */
1745 {
1746     0, /* not implemented (non-ephemeral DH) */
1747     TLS1_TXT_DH_DSS_WITH_SEED_SHA,
1748     TLS1_CK_DH_DSS_WITH_SEED_SHA,
1749     SSL_kDHd,
1750     SSL_aDH,
1751     SSL_SEED,
1752     SSL_SHA1,
1753     SSL_TLSV1,
1754     SSL_NOT_EXP|SSL_MEDIUM,
1755     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1756     128,
1757     128,
1758     },

1760 /* Cipher 98 */
1761 {
1762     0, /* not implemented (non-ephemeral DH) */
1763     TLS1_TXT_DH_RSA_WITH_SEED_SHA,
1764     TLS1_CK_DH_RSA_WITH_SEED_SHA,
1765     SSL_kDhr,
1766     SSL_aDH,
1767     SSL_SEED,
1768     SSL_SHA1,
1769     SSL_TLSV1,
1770     SSL_NOT_EXP|SSL_MEDIUM,
1771     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1772     128,
1773     128,
1774     },

1776 /* Cipher 99 */
1777 {

```

```

1778     1,
1779     TLS1_TXT_DHE_DSS_WITH_SEED_SHA,
1780     TLS1_CK_DHE_DSS_WITH_SEED_SHA,
1781     SSL_kEDH,
1782     SSL_aDSS,
1783     SSL_SEED,
1784     SSL_SHA1,
1785     SSL_TLSV1,
1786     SSL_NOT_EXP|SSL_MEDIUM,
1787     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1788     128,
1789     128,
1790     },

1792 /* Cipher 9A */
1793 {
1794     1,
1795     TLS1_TXT_DHE_RSA_WITH_SEED_SHA,
1796     TLS1_CK_DHE_RSA_WITH_SEED_SHA,
1797     SSL_kEDH,
1798     SSL_aRSA,
1799     SSL_SEED,
1800     SSL_SHA1,
1801     SSL_TLSV1,
1802     SSL_NOT_EXP|SSL_MEDIUM,
1803     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1804     128,
1805     128,
1806     },

1808 /* Cipher 9B */
1809 {
1810     1,
1811     TLS1_TXT_ADH_WITH_SEED_SHA,
1812     TLS1_CK_ADH_WITH_SEED_SHA,
1813     SSL_kEDH,
1814     SSL_aNULL,
1815     SSL_SEED,
1816     SSL_SHA1,
1817     SSL_TLSV1,
1818     SSL_NOT_EXP|SSL_MEDIUM,
1819     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
1820     128,
1821     128,
1822     },

1824 #endif /* OPENSSSL_NO_SEED */

1826 /* GCM ciphersuites from RFC5288 */

1828 /* Cipher 9C */
1829 {
1830     1,
1831     TLS1_TXT_RSA_WITH_AES_128_GCM_SHA256,
1832     TLS1_CK_RSA_WITH_AES_128_GCM_SHA256,
1833     SSL_kRSA,
1834     SSL_aRSA,
1835     SSL_AES128GCM,
1836     SSL_AEAD,
1837     SSL_TLSV1_2,
1838     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1839     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
1840     128,
1841     128,
1842     },

```

```

1844     /* Cipher 9D */
1845     {
1846     1,
1847     TLS1_TXT_RSA_WITH_AES_256_GCM_SHA384,
1848     TLS1_CK_RSA_WITH_AES_256_GCM_SHA384,
1849     SSL_kRSA,
1850     SSL_aRSA,
1851     SSL_AES256GCM,
1852     SSL_AEAD,
1853     SSL_TLSV1_2,
1854     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1855     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
1856     256,
1857     256,
1858     },
1859
1860     /* Cipher 9E */
1861     {
1862     1,
1863     TLS1_TXT_DHE_RSA_WITH_AES_128_GCM_SHA256,
1864     TLS1_CK_DHE_RSA_WITH_AES_128_GCM_SHA256,
1865     SSL_kEDH,
1866     SSL_aRSA,
1867     SSL_AES128GCM,
1868     SSL_AEAD,
1869     SSL_TLSV1_2,
1870     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1871     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
1872     128,
1873     128,
1874     },
1875
1876     /* Cipher 9F */
1877     {
1878     1,
1879     TLS1_TXT_DHE_RSA_WITH_AES_256_GCM_SHA384,
1880     TLS1_CK_DHE_RSA_WITH_AES_256_GCM_SHA384,
1881     SSL_kEDH,
1882     SSL_aRSA,
1883     SSL_AES256GCM,
1884     SSL_AEAD,
1885     SSL_TLSV1_2,
1886     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1887     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
1888     256,
1889     256,
1890     },
1891
1892     /* Cipher A0 */
1893     {
1894     0,
1895     TLS1_TXT_DH_RSA_WITH_AES_128_GCM_SHA256,
1896     TLS1_CK_DH_RSA_WITH_AES_128_GCM_SHA256,
1897     SSL_kDHr,
1898     SSL_aDH,
1899     SSL_AES128GCM,
1900     SSL_AEAD,
1901     SSL_TLSV1_2,
1902     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1903     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
1904     128,
1905     128,
1906     },
1907
1908     /* Cipher A1 */
1909     {

```

```

1910     0,
1911     TLS1_TXT_DH_RSA_WITH_AES_256_GCM_SHA384,
1912     TLS1_CK_DH_RSA_WITH_AES_256_GCM_SHA384,
1913     SSL_kDHr,
1914     SSL_aDH,
1915     SSL_AES256GCM,
1916     SSL_AEAD,
1917     SSL_TLSV1_2,
1918     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1919     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
1920     256,
1921     256,
1922     },
1923
1924     /* Cipher A2 */
1925     {
1926     1,
1927     TLS1_TXT_DHE_DSS_WITH_AES_128_GCM_SHA256,
1928     TLS1_CK_DHE_DSS_WITH_AES_128_GCM_SHA256,
1929     SSL_kEDH,
1930     SSL_aDSS,
1931     SSL_AES128GCM,
1932     SSL_AEAD,
1933     SSL_TLSV1_2,
1934     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1935     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
1936     128,
1937     128,
1938     },
1939
1940     /* Cipher A3 */
1941     {
1942     1,
1943     TLS1_TXT_DHE_DSS_WITH_AES_256_GCM_SHA384,
1944     TLS1_CK_DHE_DSS_WITH_AES_256_GCM_SHA384,
1945     SSL_kEDH,
1946     SSL_aDSS,
1947     SSL_AES256GCM,
1948     SSL_AEAD,
1949     SSL_TLSV1_2,
1950     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1951     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
1952     256,
1953     256,
1954     },
1955
1956     /* Cipher A4 */
1957     {
1958     0,
1959     TLS1_TXT_DH_DSS_WITH_AES_128_GCM_SHA256,
1960     TLS1_CK_DH_DSS_WITH_AES_128_GCM_SHA256,
1961     SSL_kDHd,
1962     SSL_aDH,
1963     SSL_AES128GCM,
1964     SSL_AEAD,
1965     SSL_TLSV1_2,
1966     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1967     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
1968     128,
1969     128,
1970     },
1971
1972     /* Cipher A5 */
1973     {
1974     0,
1975     TLS1_TXT_DH_DSS_WITH_AES_256_GCM_SHA384,

```

```

1976     TLS1_CK_DH_DSS_WITH_AES_256_GCM_SHA384,
1977     SSL_kDHd,
1978     SSL_aDH,
1979     SSL_AES256GCM,
1980     SSL_AEAD,
1981     SSL_TLSV1_2,
1982     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1983     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
1984     256,
1985     256,
1986     },

1988     /* Cipher A6 */
1989     {
1990     1,
1991     TLS1_TXT_ADH_WITH_AES_128_GCM_SHA256,
1992     TLS1_CK_ADH_WITH_AES_128_GCM_SHA256,
1993     SSL_kEDH,
1994     SSL_aNULL,
1995     SSL_AES128GCM,
1996     SSL_AEAD,
1997     SSL_TLSV1_2,
1998     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
1999     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
2000     128,
2001     128,
2002     },

2004     /* Cipher A7 */
2005     {
2006     1,
2007     TLS1_TXT_ADH_WITH_AES_256_GCM_SHA384,
2008     TLS1_CK_ADH_WITH_AES_256_GCM_SHA384,
2009     SSL_kEDH,
2010     SSL_aNULL,
2011     SSL_AES256GCM,
2012     SSL_AEAD,
2013     SSL_TLSV1_2,
2014     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2015     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
2016     256,
2017     256,
2018     },

2020 #ifndef OPENSSL_NO_ECDH
2021     /* Cipher C001 */
2022     {
2023     1,
2024     TLS1_TXT_ECDH_ECDSA_WITH_NULL_SHA,
2025     TLS1_CK_ECDH_ECDSA_WITH_NULL_SHA,
2026     SSL_kECDH,
2027     SSL_aECDH,
2028     SSL_eNULL,
2029     SSL_SHA1,
2030     SSL_TLSV1,
2031     SSL_NOT_EXP|SSL_STRONG_NONE|SSL_FIPS,
2032     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2033     0,
2034     0,
2035     },

2037     /* Cipher C002 */
2038     {
2039     1,
2040     TLS1_TXT_ECDH_ECDSA_WITH_RC4_128_SHA,
2041     TLS1_CK_ECDH_ECDSA_WITH_RC4_128_SHA,

```

```

2042     SSL_kECDH,
2043     SSL_aECDH,
2044     SSL_RC4,
2045     SSL_SHA1,
2046     SSL_TLSV1,
2047     SSL_NOT_EXP|SSL_MEDIUM,
2048     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2049     128,
2050     128,
2051     },

2053     /* Cipher C003 */
2054     {
2055     1,
2056     TLS1_TXT_ECDH_ECDSA_WITH_DES_192_CBC3_SHA,
2057     TLS1_CK_ECDH_ECDSA_WITH_DES_192_CBC3_SHA,
2058     SSL_kECDH,
2059     SSL_aECDH,
2060     SSL_3DES,
2061     SSL_SHA1,
2062     SSL_TLSV1,
2063     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2064     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2065     168,
2066     168,
2067     },

2069     /* Cipher C004 */
2070     {
2071     1,
2072     TLS1_TXT_ECDH_ECDSA_WITH_AES_128_CBC_SHA,
2073     TLS1_CK_ECDH_ECDSA_WITH_AES_128_CBC_SHA,
2074     SSL_kECDH,
2075     SSL_aECDH,
2076     SSL_AES128,
2077     SSL_SHA1,
2078     SSL_TLSV1,
2079     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2080     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2081     128,
2082     128,
2083     },

2085     /* Cipher C005 */
2086     {
2087     1,
2088     TLS1_TXT_ECDH_ECDSA_WITH_AES_256_CBC_SHA,
2089     TLS1_CK_ECDH_ECDSA_WITH_AES_256_CBC_SHA,
2090     SSL_kECDH,
2091     SSL_aECDH,
2092     SSL_AES256,
2093     SSL_SHA1,
2094     SSL_TLSV1,
2095     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2096     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2097     256,
2098     256,
2099     },

2101     /* Cipher C006 */
2102     {
2103     1,
2104     TLS1_TXT_ECDHE_ECDSA_WITH_NULL_SHA,
2105     TLS1_CK_ECDHE_ECDSA_WITH_NULL_SHA,
2106     SSL_kECDH,
2107     SSL_aECDSA,

```

```

2108     SSL_eNULL,
2109     SSL_SHA1,
2110     SSL_TLSV1,
2111     SSL_NOT_EXP|SSL_STRONG_NONE|SSL_FIPS,
2112     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2113     0,
2114     0,
2115     },

2117     /* Cipher C007 */
2118     {
2119     1,
2120     TLS1_TXT_ECDHE_ECDSA_WITH_RC4_128_SHA,
2121     TLS1_CK_ECDHE_ECDSA_WITH_RC4_128_SHA,
2122     SSL_kEECDH,
2123     SSL_aECDSA,
2124     SSL_RC4,
2125     SSL_SHA1,
2126     SSL_TLSV1,
2127     SSL_NOT_EXP|SSL_MEDIUM,
2128     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2129     128,
2130     128,
2131     },

2133     /* Cipher C008 */
2134     {
2135     1,
2136     TLS1_TXT_ECDHE_ECDSA_WITH_DES_192_CBC3_SHA,
2137     TLS1_CK_ECDHE_ECDSA_WITH_DES_192_CBC3_SHA,
2138     SSL_kEECDH,
2139     SSL_aECDSA,
2140     SSL_3DES,
2141     SSL_SHA1,
2142     SSL_TLSV1,
2143     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2144     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2145     168,
2146     168,
2147     },

2149     /* Cipher C009 */
2150     {
2151     1,
2152     TLS1_TXT_ECDHE_ECDSA_WITH_AES_128_CBC_SHA,
2153     TLS1_CK_ECDHE_ECDSA_WITH_AES_128_CBC_SHA,
2154     SSL_kEECDH,
2155     SSL_aECDSA,
2156     SSL_AES128,
2157     SSL_SHA1,
2158     SSL_TLSV1,
2159     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2160     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2161     128,
2162     128,
2163     },

2165     /* Cipher C00A */
2166     {
2167     1,
2168     TLS1_TXT_ECDHE_ECDSA_WITH_AES_256_CBC_SHA,
2169     TLS1_CK_ECDHE_ECDSA_WITH_AES_256_CBC_SHA,
2170     SSL_kEECDH,
2171     SSL_aECDSA,
2172     SSL_AES256,
2173     SSL_SHA1,

```

```

2174     SSL_TLSV1,
2175     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2176     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2177     256,
2178     256,
2179     },

2181     /* Cipher C00B */
2182     {
2183     1,
2184     TLS1_TXT_ECDH_RSA_WITH_NULL_SHA,
2185     TLS1_CK_ECDH_RSA_WITH_NULL_SHA,
2186     SSL_kECDHr,
2187     SSL_aECDH,
2188     SSL_eNULL,
2189     SSL_SHA1,
2190     SSL_TLSV1,
2191     SSL_NOT_EXP|SSL_STRONG_NONE|SSL_FIPS,
2192     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2193     0,
2194     0,
2195     },

2197     /* Cipher C00C */
2198     {
2199     1,
2200     TLS1_TXT_ECDH_RSA_WITH_RC4_128_SHA,
2201     TLS1_CK_ECDH_RSA_WITH_RC4_128_SHA,
2202     SSL_kECDHr,
2203     SSL_aECDH,
2204     SSL_RC4,
2205     SSL_SHA1,
2206     SSL_TLSV1,
2207     SSL_NOT_EXP|SSL_MEDIUM,
2208     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2209     128,
2210     128,
2211     },

2213     /* Cipher C00D */
2214     {
2215     1,
2216     TLS1_TXT_ECDH_RSA_WITH_DES_192_CBC3_SHA,
2217     TLS1_CK_ECDH_RSA_WITH_DES_192_CBC3_SHA,
2218     SSL_kECDHr,
2219     SSL_aECDH,
2220     SSL_3DES,
2221     SSL_SHA1,
2222     SSL_TLSV1,
2223     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2224     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2225     168,
2226     168,
2227     },

2229     /* Cipher C00E */
2230     {
2231     1,
2232     TLS1_TXT_ECDH_RSA_WITH_AES_128_CBC_SHA,
2233     TLS1_CK_ECDH_RSA_WITH_AES_128_CBC_SHA,
2234     SSL_kECDHr,
2235     SSL_aECDH,
2236     SSL_AES128,
2237     SSL_SHA1,
2238     SSL_TLSV1,
2239     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,

```

```

2240     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2241     128,
2242     128,
2243     },
2244
2245     /* Cipher C00F */
2246     {
2247     1,
2248     TLS1_TXT_ECDH_RSA_WITH_AES_256_CBC_SHA,
2249     TLS1_CK_ECDH_RSA_WITH_AES_256_CBC_SHA,
2250     SSL_kECDHr,
2251     SSL_aECDH,
2252     SSL_AES256,
2253     SSL_SHA1,
2254     SSL_TLSV1,
2255     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2256     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2257     256,
2258     256,
2259     },
2260
2261     /* Cipher C010 */
2262     {
2263     1,
2264     TLS1_TXT_ECDH_RSA_WITH_NULL_SHA,
2265     TLS1_CK_ECDH_RSA_WITH_NULL_SHA,
2266     SSL_kEECDH,
2267     SSL_aRSA,
2268     SSL_eNULL,
2269     SSL_SHA1,
2270     SSL_TLSV1,
2271     SSL_NOT_EXP|SSL_STRONG_NONE|SSL_FIPS,
2272     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2273     0,
2274     0,
2275     },
2276
2277     /* Cipher C011 */
2278     {
2279     1,
2280     TLS1_TXT_ECDH_RSA_WITH_RC4_128_SHA,
2281     TLS1_CK_ECDH_RSA_WITH_RC4_128_SHA,
2282     SSL_kEECDH,
2283     SSL_aRSA,
2284     SSL_RC4,
2285     SSL_SHA1,
2286     SSL_TLSV1,
2287     SSL_NOT_EXP|SSL_MEDIUM,
2288     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2289     128,
2290     128,
2291     },
2292
2293     /* Cipher C012 */
2294     {
2295     1,
2296     TLS1_TXT_ECDH_RSA_WITH_DES_192_CBC3_SHA,
2297     TLS1_CK_ECDH_RSA_WITH_DES_192_CBC3_SHA,
2298     SSL_kEECDH,
2299     SSL_aRSA,
2300     SSL_3DES,
2301     SSL_SHA1,
2302     SSL_TLSV1,
2303     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2304     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2305     168,

```

```

2306     168,
2307     },
2308
2309     /* Cipher C013 */
2310     {
2311     1,
2312     TLS1_TXT_ECDH_RSA_WITH_AES_128_CBC_SHA,
2313     TLS1_CK_ECDH_RSA_WITH_AES_128_CBC_SHA,
2314     SSL_kEECDH,
2315     SSL_aRSA,
2316     SSL_AES128,
2317     SSL_SHA1,
2318     SSL_TLSV1,
2319     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2320     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2321     128,
2322     128,
2323     },
2324
2325     /* Cipher C014 */
2326     {
2327     1,
2328     TLS1_TXT_ECDH_RSA_WITH_AES_256_CBC_SHA,
2329     TLS1_CK_ECDH_RSA_WITH_AES_256_CBC_SHA,
2330     SSL_kEECDH,
2331     SSL_aRSA,
2332     SSL_AES256,
2333     SSL_SHA1,
2334     SSL_TLSV1,
2335     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2336     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2337     256,
2338     256,
2339     },
2340
2341     /* Cipher C015 */
2342     {
2343     1,
2344     TLS1_TXT_ECDH_anon_WITH_NULL_SHA,
2345     TLS1_CK_ECDH_anon_WITH_NULL_SHA,
2346     SSL_kEECDH,
2347     SSL_aNULL,
2348     SSL_eNULL,
2349     SSL_SHA1,
2350     SSL_TLSV1,
2351     SSL_NOT_EXP|SSL_STRONG_NONE|SSL_FIPS,
2352     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2353     0,
2354     0,
2355     },
2356
2357     /* Cipher C016 */
2358     {
2359     1,
2360     TLS1_TXT_ECDH_anon_WITH_RC4_128_SHA,
2361     TLS1_CK_ECDH_anon_WITH_RC4_128_SHA,
2362     SSL_kEECDH,
2363     SSL_aNULL,
2364     SSL_RC4,
2365     SSL_SHA1,
2366     SSL_TLSV1,
2367     SSL_NOT_EXP|SSL_MEDIUM,
2368     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2369     128,
2370     128,
2371     },

```

```

2373     /* Cipher C017 */
2374     {
2375     1,
2376     TLS1_TXT_ECDH_anon_WITH_DES_192_CBC_SHA,
2377     TLS1_CK_ECDH_anon_WITH_DES_192_CBC_SHA,
2378     SSL_kEECDH,
2379     SSL_aNULL,
2380     SSL_3DES,
2381     SSL_SHA1,
2382     SSL_TLSV1,
2383     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2384     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2385     168,
2386     168,
2387     },
2389     /* Cipher C018 */
2390     {
2391     1,
2392     TLS1_TXT_ECDH_anon_WITH_AES_128_CBC_SHA,
2393     TLS1_CK_ECDH_anon_WITH_AES_128_CBC_SHA,
2394     SSL_kEECDH,
2395     SSL_aNULL,
2396     SSL_AES128,
2397     SSL_SHA1,
2398     SSL_TLSV1,
2399     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2400     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2401     128,
2402     128,
2403     },
2405     /* Cipher C019 */
2406     {
2407     1,
2408     TLS1_TXT_ECDH_anon_WITH_AES_256_CBC_SHA,
2409     TLS1_CK_ECDH_anon_WITH_AES_256_CBC_SHA,
2410     SSL_kEECDH,
2411     SSL_aNULL,
2412     SSL_AES256,
2413     SSL_SHA1,
2414     SSL_TLSV1,
2415     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2416     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2417     256,
2418     256,
2419     },
2420 #endif /* OPENSSSL_NO_ECDH */
2422 #ifndef OPENSSSL_NO_SRP
2423     /* Cipher C01A */
2424     {
2425     1,
2426     TLS1_TXT_SRP_SHA_WITH_3DES_EDE_CBC_SHA,
2427     TLS1_CK_SRP_SHA_WITH_3DES_EDE_CBC_SHA,
2428     SSL_kSRP,
2429     SSL_aNULL,
2430     SSL_3DES,
2431     SSL_SHA1,
2432     SSL_TLSV1,
2433     SSL_NOT_EXP|SSL_HIGH,
2434     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2435     168,
2436     168,
2437     },

```

```

2439     /* Cipher C01B */
2440     {
2441     1,
2442     TLS1_TXT_SRP_SHA_RSA_WITH_3DES_EDE_CBC_SHA,
2443     TLS1_CK_SRP_SHA_RSA_WITH_3DES_EDE_CBC_SHA,
2444     SSL_kSRP,
2445     SSL_aRSA,
2446     SSL_3DES,
2447     SSL_SHA1,
2448     SSL_TLSV1,
2449     SSL_NOT_EXP|SSL_HIGH,
2450     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2451     168,
2452     168,
2453     },
2455     /* Cipher C01C */
2456     {
2457     1,
2458     TLS1_TXT_SRP_SHA_DSS_WITH_3DES_EDE_CBC_SHA,
2459     TLS1_CK_SRP_SHA_DSS_WITH_3DES_EDE_CBC_SHA,
2460     SSL_kSRP,
2461     SSL_aDSS,
2462     SSL_3DES,
2463     SSL_SHA1,
2464     SSL_TLSV1,
2465     SSL_NOT_EXP|SSL_HIGH,
2466     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2467     168,
2468     168,
2469     },
2471     /* Cipher C01D */
2472     {
2473     1,
2474     TLS1_TXT_SRP_SHA_WITH_AES_128_CBC_SHA,
2475     TLS1_CK_SRP_SHA_WITH_AES_128_CBC_SHA,
2476     SSL_kSRP,
2477     SSL_aNULL,
2478     SSL_AES128,
2479     SSL_SHA1,
2480     SSL_TLSV1,
2481     SSL_NOT_EXP|SSL_HIGH,
2482     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2483     128,
2484     128,
2485     },
2487     /* Cipher C01E */
2488     {
2489     1,
2490     TLS1_TXT_SRP_SHA_RSA_WITH_AES_128_CBC_SHA,
2491     TLS1_CK_SRP_SHA_RSA_WITH_AES_128_CBC_SHA,
2492     SSL_kSRP,
2493     SSL_aRSA,
2494     SSL_AES128,
2495     SSL_SHA1,
2496     SSL_TLSV1,
2497     SSL_NOT_EXP|SSL_HIGH,
2498     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2499     128,
2500     128,
2501     },
2503     /* Cipher C01F */

```

```

2504     {
2505     1,
2506     TLS1_TXT_SRP_SHA_DSS_WITH_AES_128_CBC_SHA,
2507     TLS1_CK_SRP_SHA_DSS_WITH_AES_128_CBC_SHA,
2508     SSL_kSRP,
2509     SSL_aDSS,
2510     SSL_AES128,
2511     SSL_SHA1,
2512     SSL_TLSV1,
2513     SSL_NOT_EXP|SSL_HIGH,
2514     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2515     128,
2516     128,
2517     },
2518
2519     /* Cipher C020 */
2520     {
2521     1,
2522     TLS1_TXT_SRP_SHA_WITH_AES_256_CBC_SHA,
2523     TLS1_CK_SRP_SHA_WITH_AES_256_CBC_SHA,
2524     SSL_kSRP,
2525     SSL_aNULL,
2526     SSL_AES256,
2527     SSL_SHA1,
2528     SSL_TLSV1,
2529     SSL_NOT_EXP|SSL_HIGH,
2530     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2531     256,
2532     256,
2533     },
2534
2535     /* Cipher C021 */
2536     {
2537     1,
2538     TLS1_TXT_SRP_SHA_RSA_WITH_AES_256_CBC_SHA,
2539     TLS1_CK_SRP_SHA_RSA_WITH_AES_256_CBC_SHA,
2540     SSL_kSRP,
2541     SSL_aRSA,
2542     SSL_AES256,
2543     SSL_SHA1,
2544     SSL_TLSV1,
2545     SSL_NOT_EXP|SSL_HIGH,
2546     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2547     256,
2548     256,
2549     },
2550
2551     /* Cipher C022 */
2552     {
2553     1,
2554     TLS1_TXT_SRP_SHA_DSS_WITH_AES_256_CBC_SHA,
2555     TLS1_CK_SRP_SHA_DSS_WITH_AES_256_CBC_SHA,
2556     SSL_kSRP,
2557     SSL_aDSS,
2558     SSL_AES256,
2559     SSL_SHA1,
2560     SSL_TLSV1,
2561     SSL_NOT_EXP|SSL_HIGH,
2562     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2563     256,
2564     256,
2565     },
2566 #endif /* OPENSSSL_NO_SRP */
2567 #ifndef OPENSSSL_NO_ECDH
2568
2569     /* HMAC based TLS v1.2 ciphersuites from RFC5289 */

```

```

2571     /* Cipher C023 */
2572     {
2573     1,
2574     TLS1_TXT_ECDHE_ECDSA_WITH_AES_128_SHA256,
2575     TLS1_CK_ECDHE_ECDSA_WITH_AES_128_SHA256,
2576     SSL_kEECDH,
2577     SSL_aECDH,
2578     SSL_AES128,
2579     SSL_SHA256,
2580     SSL_TLSV1_2,
2581     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2582     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
2583     128,
2584     128,
2585     },
2586
2587     /* Cipher C024 */
2588     {
2589     1,
2590     TLS1_TXT_ECDHE_ECDSA_WITH_AES_256_SHA384,
2591     TLS1_CK_ECDHE_ECDSA_WITH_AES_256_SHA384,
2592     SSL_kEECDH,
2593     SSL_aECDH,
2594     SSL_AES256,
2595     SSL_SHA384,
2596     SSL_TLSV1_2,
2597     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2598     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
2599     256,
2600     256,
2601     },
2602
2603     /* Cipher C025 */
2604     {
2605     1,
2606     TLS1_TXT_ECDH_ECDSA_WITH_AES_128_SHA256,
2607     TLS1_CK_ECDH_ECDSA_WITH_AES_128_SHA256,
2608     SSL_kECDH,
2609     SSL_aECDH,
2610     SSL_AES128,
2611     SSL_SHA256,
2612     SSL_TLSV1_2,
2613     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2614     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
2615     128,
2616     128,
2617     },
2618
2619     /* Cipher C026 */
2620     {
2621     1,
2622     TLS1_TXT_ECDH_ECDSA_WITH_AES_256_SHA384,
2623     TLS1_CK_ECDH_ECDSA_WITH_AES_256_SHA384,
2624     SSL_kECDH,
2625     SSL_aECDH,
2626     SSL_AES256,
2627     SSL_SHA384,
2628     SSL_TLSV1_2,
2629     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2630     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
2631     256,
2632     256,
2633     },
2634
2635     /* Cipher C027 */

```

```

2636     {
2637     1,
2638     TLS1_TXT_ECDHE_RSA_WITH_AES_128_SHA256,
2639     TLS1 CK_ECDHE_RSA_WITH_AES_128_SHA256,
2640     SSL_kEECDH,
2641     SSL_aRSA,
2642     SSL_AES128,
2643     SSL_SHA256,
2644     SSL_TL SV1_2,
2645     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2646     SSL_HANDSHAKE_MAC_SHA256|TLS1_PR F_SHA256,
2647     128,
2648     128,
2649     },

2651     /* Cipher C028 */
2652     {
2653     1,
2654     TLS1_TXT_ECDHE_RSA_WITH_AES_256_SHA384,
2655     TLS1 CK_ECDHE_RSA_WITH_AES_256_SHA384,
2656     SSL_kEECDH,
2657     SSL_aRSA,
2658     SSL_AES256,
2659     SSL_SHA384,
2660     SSL_TL SV1_2,
2661     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2662     SSL_HANDSHAKE_MAC_SHA384|TLS1_PR F_SHA384,
2663     256,
2664     256,
2665     },

2667     /* Cipher C029 */
2668     {
2669     1,
2670     TLS1_TXT_ECDH_RSA_WITH_AES_128_SHA256,
2671     TLS1 CK_ECDH_RSA_WITH_AES_128_SHA256,
2672     SSL_kECDHr,
2673     SSL_aECDH,
2674     SSL_AES128,
2675     SSL_SHA256,
2676     SSL_TL SV1_2,
2677     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2678     SSL_HANDSHAKE_MAC_SHA256|TLS1_PR F_SHA256,
2679     128,
2680     128,
2681     },

2683     /* Cipher C02A */
2684     {
2685     1,
2686     TLS1_TXT_ECDH_RSA_WITH_AES_256_SHA384,
2687     TLS1 CK_ECDH_RSA_WITH_AES_256_SHA384,
2688     SSL_kECDHr,
2689     SSL_aECDH,
2690     SSL_AES256,
2691     SSL_SHA384,
2692     SSL_TL SV1_2,
2693     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2694     SSL_HANDSHAKE_MAC_SHA384|TLS1_PR F_SHA384,
2695     256,
2696     256,
2697     },

2699     /* GCM based TLS v1.2 ciphersuites from RFC5289 */
2701     /* Cipher C02B */

```

```

2702     {
2703     1,
2704     TLS1_TXT_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256,
2705     TLS1 CK_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256,
2706     SSL_kEECDH,
2707     SSL_aECDSA,
2708     SSL_AES128GCM,
2709     SSL_AEAD,
2710     SSL_TL SV1_2,
2711     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2712     SSL_HANDSHAKE_MAC_SHA256|TLS1_PR F_SHA256,
2713     128,
2714     128,
2715     },

2717     /* Cipher C02C */
2718     {
2719     1,
2720     TLS1_TXT_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384,
2721     TLS1 CK_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384,
2722     SSL_kEECDH,
2723     SSL_aECDSA,
2724     SSL_AES256GCM,
2725     SSL_AEAD,
2726     SSL_TL SV1_2,
2727     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2728     SSL_HANDSHAKE_MAC_SHA384|TLS1_PR F_SHA384,
2729     256,
2730     256,
2731     },

2733     /* Cipher C02D */
2734     {
2735     1,
2736     TLS1_TXT_ECDH_ECDSA_WITH_AES_128_GCM_SHA256,
2737     TLS1 CK_ECDH_ECDSA_WITH_AES_128_GCM_SHA256,
2738     SSL_kECDHe,
2739     SSL_aECDH,
2740     SSL_AES128GCM,
2741     SSL_AEAD,
2742     SSL_TL SV1_2,
2743     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2744     SSL_HANDSHAKE_MAC_SHA256|TLS1_PR F_SHA256,
2745     128,
2746     128,
2747     },

2749     /* Cipher C02E */
2750     {
2751     1,
2752     TLS1_TXT_ECDH_ECDSA_WITH_AES_256_GCM_SHA384,
2753     TLS1 CK_ECDH_ECDSA_WITH_AES_256_GCM_SHA384,
2754     SSL_kECDHe,
2755     SSL_aECDH,
2756     SSL_AES256GCM,
2757     SSL_AEAD,
2758     SSL_TL SV1_2,
2759     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2760     SSL_HANDSHAKE_MAC_SHA384|TLS1_PR F_SHA384,
2761     256,
2762     256,
2763     },

2765     /* Cipher C02F */
2766     {
2767     1,

```



```

2768     TLS1_TXT_ECDHE_RSA_WITH_AES_128_GCM_SHA256,
2769     TLS1_CK_ECDHE_RSA_WITH_AES_128_GCM_SHA256,
2770     SSL_kECDH,
2771     SSL_aRSA,
2772     SSL_AES128GCM,
2773     SSL_AEAD,
2774     SSL_TLSV1_2,
2775     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2776     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
2777     128,
2778     128,
2779     },

2781     /* Cipher C030 */
2782     {
2783     1,
2784     TLS1_TXT_ECDHE_RSA_WITH_AES_256_GCM_SHA384,
2785     TLS1_CK_ECDHE_RSA_WITH_AES_256_GCM_SHA384,
2786     SSL_kECDH,
2787     SSL_aRSA,
2788     SSL_AES256GCM,
2789     SSL_AEAD,
2790     SSL_TLSV1_2,
2791     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2792     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
2793     256,
2794     256,
2795     },

2797     /* Cipher C031 */
2798     {
2799     1,
2800     TLS1_TXT_ECDH_RSA_WITH_AES_128_GCM_SHA256,
2801     TLS1_CK_ECDH_RSA_WITH_AES_128_GCM_SHA256,
2802     SSL_kECDHr,
2803     SSL_aECDH,
2804     SSL_AES128GCM,
2805     SSL_AEAD,
2806     SSL_TLSV1_2,
2807     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2808     SSL_HANDSHAKE_MAC_SHA256|TLS1_PRF_SHA256,
2809     128,
2810     128,
2811     },

2813     /* Cipher C032 */
2814     {
2815     1,
2816     TLS1_TXT_ECDH_RSA_WITH_AES_256_GCM_SHA384,
2817     TLS1_CK_ECDH_RSA_WITH_AES_256_GCM_SHA384,
2818     SSL_kECDHr,
2819     SSL_aECDH,
2820     SSL_AES256GCM,
2821     SSL_AEAD,
2822     SSL_TLSV1_2,
2823     SSL_NOT_EXP|SSL_HIGH|SSL_FIPS,
2824     SSL_HANDSHAKE_MAC_SHA384|TLS1_PRF_SHA384,
2825     256,
2826     256,
2827     },

2829 #endif /* OPENSSSL_NO_ECDH */

2832 #ifdef TEMP_GOST_TLS
2833 /* Cipher FF00 */

```

```

2834     {
2835     1,
2836     "GOST-MD5",
2837     0x0300ff00,
2838     SSL_kRSA,
2839     SSL_aRSA,
2840     SSL_eGOST2814789CNT,
2841     SSL_MD5,
2842     SSL_TLSV1,
2843     SSL_NOT_EXP|SSL_HIGH,
2844     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2845     256,
2846     256,
2847     },
2848     {
2849     1,
2850     "GOST-GOST94",
2851     0x0300ff01,
2852     SSL_kRSA,
2853     SSL_aRSA,
2854     SSL_eGOST2814789CNT,
2855     SSL_GOST94,
2856     SSL_TLSV1,
2857     SSL_NOT_EXP|SSL_HIGH,
2858     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2859     256,
2860     256,
2861     },
2862     {
2863     1,
2864     "GOST-GOST89MAC",
2865     0x0300ff02,
2866     SSL_kRSA,
2867     SSL_aRSA,
2868     SSL_eGOST2814789CNT,
2869     SSL_GOST89MAC,
2870     SSL_TLSV1,
2871     SSL_NOT_EXP|SSL_HIGH,
2872     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF,
2873     256,
2874     256,
2875     },
2876     {
2877     1,
2878     "GOST-GOST89STREAM",
2879     0x0300ff03,
2880     SSL_kRSA,
2881     SSL_aRSA,
2882     SSL_eGOST2814789CNT,
2883     SSL_GOST89MAC,
2884     SSL_TLSV1,
2885     SSL_NOT_EXP|SSL_HIGH,
2886     SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF|TLS1_STREAM_MAC,
2887     256,
2888     256,
2889     },
2890 #endif

2892 /* end of list */
2893 };

2895 SSL3_ENC_METHOD SSLv3_enc_data={
2896     ssl3_enc,
2897     n_ssl3_mac,
2898     ssl3_setup_key_block,
2899     ssl3_generate_master_secret,

```

```

2900     ssl3_change_cipher_state,
2901     ssl3_final_finish_mac,
2902     MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH,
2903     ssl3_cert_verify_mac,
2904     SSL3_MD_CLIENT_FINISHED_CONST,4,
2905     SSL3_MD_SERVER_FINISHED_CONST,4,
2906     ssl3_alert_code,
2907     (int (*)(SSL *, unsigned char *, size_t, const char *,
2908             size_t, const unsigned char *, size_t,
2909             int use_context))ssl_undefined_function,
2910     };
2911
2912 long ssl3_default_timeout(void)
2913 {
2914     /* 2 hours, the 24 hours mentioned in the SSLv3 spec
2915      * is way too long for http, the cache would over fill */
2916     return(60*60*2);
2917 }
2918
2919 int ssl3_num_ciphers(void)
2920 {
2921     return(SSL3_NUM_CIPHERS);
2922 }
2923
2924 const SSL_CIPHER *ssl3_get_cipher(unsigned int u)
2925 {
2926     if (u < SSL3_NUM_CIPHERS)
2927         return(&(ssl3_ciphers[SSL3_NUM_CIPHERS-1-u]));
2928     else
2929         return(NULL);
2930 }
2931
2932 int ssl3_pending(const SSL *s)
2933 {
2934     if (s->rstate == SSL_ST_READ_BODY)
2935         return 0;
2936
2937     return (s->s3->rrec.type == SSL3_RT_APPLICATION_DATA) ? s->s3->rrec.leng
2938 }
2939
2940 int ssl3_new(SSL *s)
2941 {
2942     SSL3_STATE *s3;
2943
2944     if ((s3=OPENSSL_malloc(sizeof *s3)) == NULL) goto err;
2945     memset(s3,0,sizeof *s3);
2946     memset(s3->rrec.seq_num,0,sizeof(s3->rrec.seq_num));
2947     memset(s3->wrec.seq_num,0,sizeof(s3->wrec.seq_num));
2948
2949     s->s3=s3;
2950
2951 #ifndef OPENSSL_NO_SRP
2952     SSL_SRP_CTX_init(s);
2953 #endif
2954     s->method->ssl_clear(s);
2955     return(1);
2956 err:
2957     return(0);
2958 }
2959
2960 void ssl3_free(SSL *s)
2961 {
2962     if(s == NULL)
2963         return;
2964
2965 #ifdef TLSEXT_TYPE_opaque_prf_input

```

```

2966     if (s->s3->client_opaque_prf_input != NULL)
2967         OPENSSL_free(s->s3->client_opaque_prf_input);
2968     if (s->s3->server_opaque_prf_input != NULL)
2969         OPENSSL_free(s->s3->server_opaque_prf_input);
2970 #endif
2971
2972     ssl3_cleanup_key_block(s);
2973     if (s->s3->rbuf.buf != NULL)
2974         ssl3_release_read_buffer(s);
2975     if (s->s3->wbuf.buf != NULL)
2976         ssl3_release_write_buffer(s);
2977     if (s->s3->rrec.comp != NULL)
2978         OPENSSL_free(s->s3->rrec.comp);
2979 #ifndef OPENSSL_NO_DH
2980     if (s->s3->tmp.dh != NULL)
2981         DH_free(s->s3->tmp.dh);
2982 #endif
2983 #ifndef OPENSSL_NO_ECDH
2984     if (s->s3->tmp.ecdh != NULL)
2985         EC_KEY_free(s->s3->tmp.ecdh);
2986 #endif
2987
2988     if (s->s3->tmp.ca_names != NULL)
2989         sk_X509_NAME_pop_free(s->s3->tmp.ca_names,X509_NAME_free);
2990     if (s->s3->handshake_buffer) {
2991         BIO_free(s->s3->handshake_buffer);
2992     }
2993     if (s->s3->handshake_dgst) ssl3_free_digest_list(s);
2994 #ifndef OPENSSL_NO_SRP
2995     SSL_SRP_CTX_free(s);
2996 #endif
2997     OPENSSL_cleanse(s->s3,sizeof *s->s3);
2998     OPENSSL_free(s->s3);
2999     s->s3=NULL;
3000 }
3001
3002 void ssl3_clear(SSL *s)
3003 {
3004     unsigned char *rp,*wp;
3005     size_t rlen, wlen;
3006     int init_extra;
3007
3008 #ifdef TLSEXT_TYPE_opaque_prf_input
3009     if (s->s3->client_opaque_prf_input != NULL)
3010         OPENSSL_free(s->s3->client_opaque_prf_input);
3011     s->s3->client_opaque_prf_input = NULL;
3012     if (s->s3->server_opaque_prf_input != NULL)
3013         OPENSSL_free(s->s3->server_opaque_prf_input);
3014     s->s3->server_opaque_prf_input = NULL;
3015 #endif
3016
3017     ssl3_cleanup_key_block(s);
3018     if (s->s3->tmp.ca_names != NULL)
3019         sk_X509_NAME_pop_free(s->s3->tmp.ca_names,X509_NAME_free);
3020
3021     if (s->s3->rrec.comp != NULL)
3022     {
3023         OPENSSL_free(s->s3->rrec.comp);
3024         s->s3->rrec.comp=NULL;
3025     }
3026 #ifndef OPENSSL_NO_DH
3027     if (s->s3->tmp.dh != NULL)
3028     {
3029         DH_free(s->s3->tmp.dh);
3030         s->s3->tmp.dh = NULL;
3031     }

```

```

3032 #endif
3033 #ifndef OPENSSL_NO_ECDH
3034     if (s->s3->tmp.ecdh != NULL)
3035     {
3036         EC_KEY_free(s->s3->tmp.ecdh);
3037         s->s3->tmp.ecdh = NULL;
3038     }
3039 #endif
3040 #ifndef OPENSSL_NO_TLSEXT
3041 #ifndef OPENSSL_NO_EC
3042     s->s3->is_probably_safari = 0;
3043 #endif /* !OPENSSL_NO_EC */
3044 #endif /* !OPENSSL_NO_TLSEXT */

3046     rp = s->s3->rbuf.buf;
3047     wp = s->s3->wbuf.buf;
3048     rlen = s->s3->rbuf.len;
3049     wlen = s->s3->wbuf.len;
3050     init_extra = s->s3->init_extra;
3051     if (s->s3->handshake_buffer) {
3052         BIO_free(s->s3->handshake_buffer);
3053         s->s3->handshake_buffer = NULL;
3054     }
3055     if (s->s3->handshake_dgst) {
3056         ssl3_free_digest_list(s);
3057     }
3058     memset(s->s3, 0, sizeof *s->s3);
3059     s->s3->rbuf.buf = rp;
3060     s->s3->wbuf.buf = wp;
3061     s->s3->rbuf.len = rlen;
3062     s->s3->wbuf.len = wlen;
3063     s->s3->init_extra = init_extra;

3065     ssl_free_wbio_buffer(s);

3067     s->packet_length=0;
3068     s->s3->renegotiate=0;
3069     s->s3->total_renegotiations=0;
3070     s->s3->num_renegotiations=0;
3071     s->s3->in_read_app_data=0;
3072     s->version=SSL3_VERSION;

3074 #if !defined(OPENSSL_NO_TLSEXT) && !defined(OPENSSL_NO_NEXTPROTONEG)
3075     if (s->next_proto_negotiated)
3076     {
3077         OPENSSL_free(s->next_proto_negotiated);
3078         s->next_proto_negotiated = NULL;
3079         s->next_proto_negotiated_len = 0;
3080     }
3081 #endif
3082 }

3084 #ifndef OPENSSL_NO_SRP
3085 static char * MS_CALLBACK srp_password_from_info_cb(SSL *s, void *arg)
3086 {
3087     return BUF_strdup(s->srp_ctx.info);
3088 }
3089 #endif

3091 long ssl3_ctrl(SSL *s, int cmd, long larg, void *parg)
3092 {
3093     int ret=0;

3095 #if !defined(OPENSSL_NO_DSA) || !defined(OPENSSL_NO_RSA)
3096     if (
3097 #ifndef OPENSSL_NO_RSA

```

```

3098         cmd == SSL_CTRL_SET_TMP_RSA ||
3099         cmd == SSL_CTRL_SET_TMP_RSA_CB ||
3100 #endif
3101 #ifndef OPENSSL_NO_DSA
3102         cmd == SSL_CTRL_SET_TMP_DH ||
3103         cmd == SSL_CTRL_SET_TMP_DH_CB ||
3104 #endif
3105         0)
3106     {
3107         if (!ssl_cert_inst(&s->cert))
3108         {
3109             SSLerr(SSL_F_SSL3_CTRL, ERR_R_MALLOC_FAILURE);
3110             return(0);
3111         }
3112     }
3113 #endif

3115     switch (cmd)
3116     {
3117     case SSL_CTRL_GET_SESSION_REUSED:
3118         ret=s->hit;
3119         break;
3120     case SSL_CTRL_GET_CLIENT_CERT_REQUEST:
3121         break;
3122     case SSL_CTRL_GET_NUM_RENEGOTIATIONS:
3123         ret=s->s3->num_renegotiations;
3124         break;
3125     case SSL_CTRL_CLEAR_NUM_RENEGOTIATIONS:
3126         ret=s->s3->num_renegotiations;
3127         s->s3->num_renegotiations=0;
3128         break;
3129     case SSL_CTRL_GET_TOTAL_RENEGOTIATIONS:
3130         ret=s->s3->total_renegotiations;
3131         break;
3132     case SSL_CTRL_GET_FLAGS:
3133         ret=(int)(s->s3->flags);
3134         break;
3135 #ifndef OPENSSL_NO_RSA
3136     case SSL_CTRL_NEED_TMP_RSA:
3137         if ((s->cert != NULL) && (s->cert->rsa_tmp == NULL) &&
3138             ((s->cert->pkeys[SSL_PKEY_RSA_ENC].privatekey == NULL) ||
3139              (EVP_PKEY_size(s->cert->pkeys[SSL_PKEY_RSA_ENC].privatekey)
3140               ret = 1;
3141         break;
3142     case SSL_CTRL_SET_TMP_RSA:
3143         {
3144             RSA *rsa = (RSA *)parg;
3145             if (rsa == NULL)
3146             {
3147                 SSLerr(SSL_F_SSL3_CTRL, ERR_R_PASSED_NULL_PARAM);
3148                 return(ret);
3149             }
3150             if ((rsa = RSAPrivateKey_dup(rsa)) == NULL)
3151             {
3152                 SSLerr(SSL_F_SSL3_CTRL, ERR_R_RSA_LIB);
3153                 return(ret);
3154             }
3155             if (s->cert->rsa_tmp != NULL)
3156                 RSA_free(s->cert->rsa_tmp);
3157             s->cert->rsa_tmp = rsa;
3158             ret = 1;
3159         }
3160         break;
3161     case SSL_CTRL_SET_TMP_RSA_CB:
3162         {
3163             SSLerr(SSL_F_SSL3_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);

```

```

3164         return(ret);
3165     }
3166     break;
3167 #endif
3168 #ifndef OPENSSSL_NO_DH
3169     case SSL_CTRL_SET_TMP_DH:
3170     {
3171         DH *dh = (DH *)parg;
3172         if (dh == NULL)
3173         {
3174             SSLerr(SSL_F_SSL3_CTRL, ERR_R_PASSED_NULL_PARAME
3175                 return(ret);
3176         }
3177         if ((dh = DHparams_dup(dh)) == NULL)
3178         {
3179             SSLerr(SSL_F_SSL3_CTRL, ERR_R_DH_LIB);
3180             return(ret);
3181         }
3182         if (!(s->options & SSL_OP_SINGLE_DH_USE))
3183         {
3184             if (!DH_generate_key(dh))
3185             {
3186                 DH_free(dh);
3187                 SSLerr(SSL_F_SSL3_CTRL, ERR_R_DH_LIB);
3188                 return(ret);
3189             }
3190         }
3191         if (s->cert->dh_tmp != NULL)
3192             DH_free(s->cert->dh_tmp);
3193         s->cert->dh_tmp = dh;
3194         ret = 1;
3195     }
3196     break;
3197     case SSL_CTRL_SET_TMP_DH_CB:
3198     {
3199         SSLerr(SSL_F_SSL3_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
3200         return(ret);
3201     }
3202     break;
3203 #endif
3204 #ifndef OPENSSSL_NO_ECDH
3205     case SSL_CTRL_SET_TMP_ECDH:
3206     {
3207         EC_KEY *ecdh = NULL;
3208
3209         if (parg == NULL)
3210         {
3211             SSLerr(SSL_F_SSL3_CTRL, ERR_R_PASSED_NULL_PARAMETER);
3212             return(ret);
3213         }
3214         if (!EC_KEY_up_ref((EC_KEY *)parg))
3215         {
3216             SSLerr(SSL_F_SSL3_CTRL, ERR_R_ECDH_LIB);
3217             return(ret);
3218         }
3219         ecdh = (EC_KEY *)parg;
3220         if (!(s->options & SSL_OP_SINGLE_ECDH_USE))
3221         {
3222             if (!EC_KEY_generate_key(ecdh))
3223             {
3224                 EC_KEY_free(ecdh);
3225                 SSLerr(SSL_F_SSL3_CTRL, ERR_R_ECDH_LIB);
3226                 return(ret);
3227             }
3228         }
3229         if (s->cert->ecdh_tmp != NULL)

```

```

3230         EC_KEY_free(s->cert->ecdh_tmp);
3231         s->cert->ecdh_tmp = ecdh;
3232         ret = 1;
3233     }
3234     break;
3235     case SSL_CTRL_SET_TMP_ECDH_CB:
3236     {
3237         SSLerr(SSL_F_SSL3_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
3238         return(ret);
3239     }
3240     break;
3241 #endif /* !OPENSSSL_NO_ECDH */
3242 #ifndef OPENSSSL_NO_TLSEXT
3243     case SSL_CTRL_SET_TLSEXT_HOSTNAME:
3244         if (larg == TLSEXT_NAMETYPE_host_name)
3245         {
3246             if (s->tlsext_hostname != NULL)
3247                 OPENSSL_free(s->tlsext_hostname);
3248             s->tlsext_hostname = NULL;
3249
3250             ret = 1;
3251             if (parg == NULL)
3252                 break;
3253             if (strlen((char *)parg) > TLSEXT_MAXLEN_host_name)
3254             {
3255                 SSLerr(SSL_F_SSL3_CTRL, SSL_R_SSL3_EXT_INVALID_S
3256                     return 0;
3257             }
3258             if ((s->tlsext_hostname = BUF_strdup((char *)parg)) == N
3259             {
3260                 SSLerr(SSL_F_SSL3_CTRL, ERR_R_INTERNAL_ERROR);
3261                 return 0;
3262             }
3263         }
3264         else
3265         {
3266             SSLerr(SSL_F_SSL3_CTRL, SSL_R_SSL3_EXT_INVALID_SERVERNAM
3267                 return 0;
3268         }
3269         break;
3270     case SSL_CTRL_SET_TLSEXT_DEBUG_ARG:
3271         s->tlsext_debug_arg = parg;
3272         ret = 1;
3273         break;
3274
3275 #ifdef TLSEXT_TYPE_opaque_prf_input
3276     case SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT:
3277         if (larg > 12288) /* actual internal limit is 2^16 for the compl
3278             * (including the cert chain and everything) */
3279         {
3280             SSLerr(SSL_F_SSL3_CTRL, SSL_R_OPAQUE_PRF_INPUT_TOO_LONG)
3281             break;
3282         }
3283         if (s->tlsext_opaque_prf_input != NULL)
3284             OPENSSL_free(s->tlsext_opaque_prf_input);
3285         if ((size_t)larg == 0)
3286             s->tlsext_opaque_prf_input = OPENSSL_malloc(1); /* dummy
3287         else
3288             s->tlsext_opaque_prf_input = BUF_memdup(parg, (size_t)la
3289         if (s->tlsext_opaque_prf_input != NULL)
3290         {
3291             s->tlsext_opaque_prf_input_len = (size_t)larg;
3292             ret = 1;
3293         }
3294         else
3295             s->tlsext_opaque_prf_input_len = 0;

```

```

3296         break;
3297 #endif

3299     case SSL_CTRL_SET_TLSEXT_STATUS_REQ_TYPE:
3300         s->tlsext_status_type=larg;
3301         ret = 1;
3302         break;

3304     case SSL_CTRL_GET_TLSEXT_STATUS_REQ_EXTS:
3305         *(STACK_OF(X509_EXTENSION) **)parg = s->tlsext_ocsp_exts;
3306         ret = 1;
3307         break;

3309     case SSL_CTRL_SET_TLSEXT_STATUS_REQ_EXTS:
3310         s->tlsext_ocsp_exts = parg;
3311         ret = 1;
3312         break;

3314     case SSL_CTRL_GET_TLSEXT_STATUS_REQ_IDS:
3315         *(STACK_OF(OCSP_RESPID) **)parg = s->tlsext_ocsp_ids;
3316         ret = 1;
3317         break;

3319     case SSL_CTRL_SET_TLSEXT_STATUS_REQ_IDS:
3320         s->tlsext_ocsp_ids = parg;
3321         ret = 1;
3322         break;

3324     case SSL_CTRL_GET_TLSEXT_STATUS_REQ_OCSP_RESP:
3325         *(unsigned char **)parg = s->tlsext_ocsp_resp;
3326         return s->tlsext_ocsp_resplen;
3327
3328     case SSL_CTRL_SET_TLSEXT_STATUS_REQ_OCSP_RESP:
3329         if (s->tlsext_ocsp_resp)
3330             OPENSSL_free(s->tlsext_ocsp_resp);
3331         s->tlsext_ocsp_resp = parg;
3332         s->tlsext_ocsp_resplen = larg;
3333         ret = 1;
3334         break;

3336 #ifndef OPENSSL_NO_HEARTBEATS
3337     case SSL_CTRL_TLSEXT_SEND_HEARTBEAT:
3338         if (SSL_version(s) == DTLS1_VERSION || SSL_version(s) == DTLS1_B
3339             ret = dtls1_heartbeat(s);
3340         else
3341             ret = tls1_heartbeat(s);
3342         break;

3344     case SSL_CTRL_GET_TLSEXT_SEND_HEARTBEAT_PENDING:
3345         ret = s->tlsext_hb_pending;
3346         break;

3348     case SSL_CTRL_SET_TLSEXT_SEND_HEARTBEAT_NO_REQUESTS:
3349         if (larg)
3350             s->tlsext_heartbeat |= SSL_TLSEXT_HB_DONT_RECV_REQUESTS;
3351         else
3352             s->tlsext_heartbeat &= ~SSL_TLSEXT_HB_DONT_RECV_REQUESTS;
3353         ret = 1;
3354         break;
3355 #endif

3357 #endif /* !OPENSSL_NO_TLSEXT */
3358     default:
3359         break;
3360 }
3361 return(ret);

```

```

3362     }

3364     long ssl3_callback_ctrl(SSL *s, int cmd, void (*fp)(void))
3365     {
3366         int ret=0;

3368         #if !defined(OPENSSL_NO_DSA) || !defined(OPENSSL_NO_RSA)
3369             if (
3370                 #ifndef OPENSSL_NO_RSA
3371                     cmd == SSL_CTRL_SET_TMP_RSA_CB ||
3372                 #endif
3373                 #ifndef OPENSSL_NO_DSA
3374                     cmd == SSL_CTRL_SET_TMP_DH_CB ||
3375                 #endif
3376                     0)
3377             {
3378                 if (!ssl_cert_inst(&s->cert))
3379                 {
3380                     SSLerr(SSL_F_SSL3_CALLBACK_CTRL, ERR_R_MALLOC_FAILURE);
3381                     return(0);
3382                 }
3383             }
3384         #endif

3386         switch (cmd)
3387         {
3388             #ifndef OPENSSL_NO_RSA
3389             case SSL_CTRL_SET_TMP_RSA_CB:
3390                 {
3391                     s->cert->rsa_tmp_cb = (RSA (*)(SSL *, int, int))fp;
3392                 }
3393                 break;
3394             #endif
3395             #ifndef OPENSSL_NO_DH
3396             case SSL_CTRL_SET_TMP_DH_CB:
3397                 {
3398                     s->cert->dh_tmp_cb = (DH (*)(SSL *, int, int))fp;
3399                 }
3400                 break;
3401             #endif
3402             #ifndef OPENSSL_NO_ECDH
3403             case SSL_CTRL_SET_TMP_ECDH_CB:
3404                 {
3405                     s->cert->ecdh_tmp_cb = (EC_KEY (*)(SSL *, int, int))fp;
3406                 }
3407                 break;
3408             #endif
3409             #ifndef OPENSSL_NO_TLSEXT
3410             case SSL_CTRL_SET_TLSEXT_DEBUG_CB:
3411                 s->tlsext_debug_cb=(void (*)(SSL *,int ,int,
3412                     unsigned char *, int, void *))fp;
3413                 break;
3414             #endif
3415             default:
3416                 break;
3417             }
3418         return(ret);
3419     }

3421     long ssl3_ctx_ctrl(SSL_CTX *ctx, int cmd, long larg, void *parg)
3422     {
3423         CERT *cert;

3425         cert=ctx->cert;

3427         switch (cmd)

```

```

3428     {
3429 #ifndef OPENSSSL_NO_RSA
3430     case SSL_CTRL_NEED_TMP_RSA:
3431         if (
3432             (cert->rsa_tmp == NULL) &&
3433             ((cert->pkeys[SSL_PKEY_RSA_ENC].privatekey == NULL) ||
3434              (EVP_PKEY_size(cert->pkeys[SSL_PKEY_RSA_ENC].privatekey
3435                           )
3436               )
3437             )
3438             return(1);
3439         else
3440             return(0);
3441         /* break; */
3442     case SSL_CTRL_SET_TMP_RSA:
3443     {
3444         RSA *rsa;
3445         int i;
3446
3447         rsa=(RSA *)parg;
3448         i=1;
3449         if (rsa == NULL)
3450             i=0;
3451         else
3452             {
3453                 if ((rsa=RSAPrivateKey_dup(rsa)) == NULL)
3454                     i=0;
3455             }
3456         if (!i)
3457             {
3458                 SSLerr(SSL_F_SSL3_CTX_CTRL,ERR_R_RSA_LIB);
3459                 return(0);
3460             }
3461         else
3462             {
3463                 if (cert->rsa_tmp != NULL)
3464                     RSA_free(cert->rsa_tmp);
3465                 cert->rsa_tmp=rsa;
3466                 return(1);
3467             }
3468         /* break; */
3469     case SSL_CTRL_SET_TMP_RSA_CB:
3470     {
3471         SSLerr(SSL_F_SSL3_CTX_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
3472         return(0);
3473     }
3474     break;
3475 #endif
3476 #ifndef OPENSSSL_NO_DH
3477 case SSL_CTRL_SET_TMP_DH:
3478     {
3479         DH *new=NULL,*dh;
3480
3481         dh=(DH *)parg;
3482         if ((new=DHparams_dup(dh)) == NULL)
3483             {
3484                 SSLerr(SSL_F_SSL3_CTX_CTRL,ERR_R_DH_LIB);
3485                 return 0;
3486             }
3487         if (!(ctx->options & SSL_OP_SINGLE_DH_USE))
3488             {
3489                 if (!DH_generate_key(new))
3490                     {
3491                         SSLerr(SSL_F_SSL3_CTX_CTRL,ERR_R_DH_LIB);
3492                         DH_free(new);
3493                         return 0;
3494                     }
3495             }
3496     }

```

```

3494         if (cert->dh_tmp != NULL)
3495             DH_free(cert->dh_tmp);
3496         cert->dh_tmp=new;
3497         return 1;
3498     }
3499     /*break; */
3500 case SSL_CTRL_SET_TMP_DH_CB:
3501     {
3502         SSLerr(SSL_F_SSL3_CTX_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
3503         return(0);
3504     }
3505     break;
3506 #endif
3507 #ifndef OPENSSSL_NO_ECDH
3508 case SSL_CTRL_SET_TMP_ECDH:
3509     {
3510         EC_KEY *ecdh = NULL;
3511
3512         if (parg == NULL)
3513             {
3514                 SSLerr(SSL_F_SSL3_CTX_CTRL,ERR_R_ECDH_LIB);
3515                 return 0;
3516             }
3517         ecdh = EC_KEY_dup((EC_KEY *)parg);
3518         if (ecdh == NULL)
3519             {
3520                 SSLerr(SSL_F_SSL3_CTX_CTRL,ERR_R_EC_LIB);
3521                 return 0;
3522             }
3523         if (!(ctx->options & SSL_OP_SINGLE_ECDH_USE))
3524             {
3525                 if (!EC_KEY_generate_key(ecdh))
3526                     {
3527                         EC_KEY_free(ecdh);
3528                         SSLerr(SSL_F_SSL3_CTX_CTRL,ERR_R_ECDH_LIB);
3529                         return 0;
3530                     }
3531             }
3532
3533         if (cert->ecdh_tmp != NULL)
3534             {
3535                 EC_KEY_free(cert->ecdh_tmp);
3536             }
3537         cert->ecdh_tmp = ecdh;
3538         return 1;
3539     }
3540     /* break; */
3541 case SSL_CTRL_SET_TMP_ECDH_CB:
3542     {
3543         SSLerr(SSL_F_SSL3_CTX_CTRL, ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
3544         return(0);
3545     }
3546     break;
3547 #endif /* !OPENSSSL_NO_ECDH */
3548 #ifndef OPENSSSL_NO_TLSEXT
3549 case SSL_CTRL_SET_TLSEXT_SERVERNAME_ARG:
3550     {
3551         ctx->tlsext_servername_arg=parg;
3552         break;
3553     }
3554 case SSL_CTRL_SET_TLSEXT_TICKET_KEYS:
3555 case SSL_CTRL_GET_TLSEXT_TICKET_KEYS:
3556     {
3557         unsigned char *keys = parg;
3558         if (!keys)
3559             return 48;
3560         if (larg != 48)
3561             {

```

```

3560         SSLerr(SSL_F_SSL3_CTX_CTRL, SSL_R_INVALID_TICKET_KEYS_LE
3561         return 0;
3562     }
3563     if (cmd == SSL_CTRL_SET_TLSEXT_TICKET_KEYS)
3564     {
3565         memcpy(ctx->tlsext_tick_key_name, keys, 16);
3566         memcpy(ctx->tlsext_tick_hmac_key, keys + 16, 16);
3567         memcpy(ctx->tlsext_tick_aes_key, keys + 32, 16);
3568     }
3569     else
3570     {
3571         memcpy(keys, ctx->tlsext_tick_key_name, 16);
3572         memcpy(keys + 16, ctx->tlsext_tick_hmac_key, 16);
3573         memcpy(keys + 32, ctx->tlsext_tick_aes_key, 16);
3574     }
3575     return 1;
3576 }

3578 #ifdef TLSEXT_TYPE_opaque_prf_input
3579     case SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT_CB_ARG:
3580         ctx->tlsext_opaque_prf_input_callback_arg = parg;
3581         return 1;
3582 #endif

3584     case SSL_CTRL_SET_TLSEXT_STATUS_REQ_CB_ARG:
3585         ctx->tlsext_status_arg=parg;
3586         return 1;
3587         break;

3589 #ifndef OPENSSSL_NO_SRP
3590     case SSL_CTRL_SET_TLS_EXT_SRP_USERNAME:
3591         ctx->srp_ctx.srp_mask|=SSL_kSRP;
3592         if (ctx->srp_ctx.login != NULL)
3593             OPENSSL_free(ctx->srp_ctx.login);
3594         ctx->srp_ctx.login = NULL;
3595         if (parg == NULL)
3596             break;
3597         if (strlen((const char *)parg) > 255 || strlen((const char *)par
3598         {
3599             SSLerr(SSL_F_SSL3_CTX_CTRL, SSL_R_INVALID_SRP_USERNAME);
3600             return 0;
3601         }
3602         if ((ctx->srp_ctx.login = BUF_strdup((char *)parg)) == NULL)
3603         {
3604             SSLerr(SSL_F_SSL3_CTX_CTRL, ERR_R_INTERNAL_ERROR);
3605             return 0;
3606         }
3607         break;
3608     case SSL_CTRL_SET_TLS_EXT_SRP_PASSWORD:
3609         ctx->srp_ctx.SRP_give_srp_client_pwd_callback=srp_password_from_
3610         ctx->srp_ctx.info=parg;
3611         break;
3612     case SSL_CTRL_SET_SRP_ARG:
3613         ctx->srp_ctx.srp_mask|=SSL_kSRP;
3614         ctx->srp_ctx.SRP_cb_arg=parg;
3615         break;

3617     case SSL_CTRL_SET_TLS_EXT_SRP_STRENGTH:
3618         ctx->srp_ctx.strength=larg;
3619         break;
3620 #endif
3621 #endif /* !OPENSSSL_NO_TLSEXT */

3623 /* A Thawte special :- */
3624 case SSL_CTRL_EXTRA_CHAIN_CERT:
3625     if (ctx->extra_certs == NULL)

```

```

3626     {
3627         if ((ctx->extra_certs=sk_X509_new_null()) == NULL)
3628             return(0);
3629     }
3630     sk_X509_push(ctx->extra_certs,(X509 *)parg);
3631     break;

3633     case SSL_CTRL_GET_EXTRA_CHAIN_CERTS:
3634         *(STACK_OF(X509) **)parg = ctx->extra_certs;
3635         break;

3637     case SSL_CTRL_CLEAR_EXTRA_CHAIN_CERTS:
3638         if (ctx->extra_certs)
3639         {
3640             sk_X509_pop_free(ctx->extra_certs, X509_free);
3641             ctx->extra_certs = NULL;
3642         }
3643         break;

3645     default:
3646         return(0);
3647     }
3648     return(1);
3649 }

3651 long ssl3_ctx_callback_ctrl(SSL_CTX *ctx, int cmd, void (*fp)(void))
3652 {
3653     CERT *cert;

3655     cert=ctx->cert;

3657     switch (cmd)
3658     {
3659 #ifndef OPENSSSL_NO_RSA
3660     case SSL_CTRL_SET_TMP_RSA_CB:
3661     {
3662         cert->rsa_tmp_cb = (RSA (*)(SSL *, int, int))fp;
3663     }
3664     break;
3665 #endif
3666 #ifndef OPENSSSL_NO_DH
3667     case SSL_CTRL_SET_TMP_DH_CB:
3668     {
3669         cert->dh_tmp_cb = (DH (*)(SSL *, int, int))fp;
3670     }
3671     break;
3672 #endif
3673 #ifndef OPENSSSL_NO_ECDH
3674     case SSL_CTRL_SET_TMP_ECDH_CB:
3675     {
3676         cert->ecdh_tmp_cb = (EC_KEY (*)(SSL *, int, int))fp;
3677     }
3678     break;
3679 #endif
3680 #ifndef OPENSSSL_NO_TLSEXT
3681     case SSL_CTRL_SET_TLSEXT_SERVERNAME_CB:
3682         ctx->tlsext_servername_callback=(int (*)(SSL *,int *,void *))fp;
3683         break;

3685 #ifdef TLSEXT_TYPE_opaque_prf_input
3686     case SSL_CTRL_SET_TLSEXT_OPAQUE_PRF_INPUT_CB:
3687         ctx->tlsext_opaque_prf_input_callback = (int (*)(SSL *,void *, s
3688         break;
3689 #endif

3691     case SSL_CTRL_SET_TLSEXT_STATUS_REQ_CB:

```

```

3692         ctx->tlsext_status_cb=(int (*)(SSL *,void *))fp;
3693         break;

3695     case SSL_CTRL_SET_TLSEXT_TICKET_KEY_CB:
3696         ctx->tlsext_ticket_key_cb=(int (*)(SSL *,unsigned char *,
3697         unsigned char *,
3698         EVP_CIPHER_CTX *,
3699         HMAC_CTX *, int))fp;
3700         break;

3702 #ifndef OPENSSL_NO_SRP
3703     case SSL_CTRL_SET_SRP_VERIFY_PARAM_CB:
3704         ctx->srp_ctx.srp_mask|=SSL_kSRP;
3705         ctx->srp_ctx.SRP_verify_param_callback=(int (*)(SSL *,void *))fp;
3706         break;
3707     case SSL_CTRL_SET_TLS_EXT_SRP_USERNAME_CB:
3708         ctx->srp_ctx.srp_mask|=SSL_kSRP;
3709         ctx->srp_ctx.TLS_ext_srp_username_callback=(int (*)(SSL *,int *,
3710         break;
3711     case SSL_CTRL_SET_SRP_GIVE_CLIENT_PWD_CB:
3712         ctx->srp_ctx.srp_mask|=SSL_kSRP;
3713         ctx->srp_ctx.SRP_give_srp_client_pwd_callback=(char (*)(SSL *,v
3714         break;
3715 #endif
3716 #endif
3717     default:
3718         return(0);
3719     }
3720     return(1);
3721 }

3723 /* This function needs to check if the ciphers required are actually
3724  * available */
3725 const SSL_CIPHER *ssl3_get_cipher_by_char(const unsigned char *p)
3726 {
3727     SSL_CIPHER c;
3728     const SSL_CIPHER *cp;
3729     unsigned long id;

3731     id=0x03000000L|((unsigned long)p[0]<<8L)|((unsigned long)p[1];
3732     c.id=id;
3733     cp = OBJ_bsearch_ssl_cipher_id(&c, ssl3_ciphers, SSL3_NUM_CIPHERS);
3734 #ifdef DEBUG_PRINT_UNKNOWN_CIPHERSUITES
3735     if (cp == NULL) fprintf(stderr, "Unknown cipher ID %x\n", (p[0] << 8) | p[1]);
3736 #endif
3737     if (cp == NULL || cp->valid == 0)
3738         return NULL;
3739     else
3740         return cp;
3741 }

3743 int ssl3_put_cipher_by_char(const SSL_CIPHER *c, unsigned char *p)
3744 {
3745     long l;

3747     if (p != NULL)
3748     {
3749         l=c->id;
3750         if ((l & 0xff000000) != 0x03000000) return(0);
3751         p[0]=((unsigned char)(l>> 8L))&0xFF;
3752         p[1]=((unsigned char)(l
3753         ))&0xFF;
3754     }
3755     return(2);
3756 }

3757 SSL_CIPHER *ssl3_choose_cipher(SSL *s, STACK_OF(SSL_CIPHER) *clnt,

```

```

3758         STACK_OF(SSL_CIPHER) *srvr)
3759     {
3760         SSL_CIPHER *c,*ret=NULL;
3761         STACK_OF(SSL_CIPHER) *prio, *allow;
3762         int i,ii,ok;
3763         #if !defined(OPENSSL_NO_TLSEXT) && !defined(OPENSSL_NO_EC)
3764         unsigned int j;
3765         int ec_ok, ec_nid;
3766         unsigned char ec_search1 = 0, ec_search2 = 0;
3767         #endif
3768         CERT *cert;
3769         unsigned long alg_k,alg_a,mask_k,mask_a,emask_k,emask_a;

3771         /* Let's see which ciphers we can support */
3772         cert=s->cert;

3774         #if 0
3775         /* Do not set the compare functions, because this may lead to a
3776          * reordering by "id". We want to keep the original ordering.
3777          * We may pay a price in performance during sk_SSL_CIPHER_find(),
3778          * but would have to pay with the price of sk_SSL_CIPHER_dup().
3779          */
3780         sk_SSL_CIPHER_set_cmp_func(srvr, ssl_cipher_ptr_id_cmp);
3781         sk_SSL_CIPHER_set_cmp_func(clnt, ssl_cipher_ptr_id_cmp);
3782         #endif

3784         #ifdef CIPHER_DEBUG
3785         printf("Server has %d from %p:\n", sk_SSL_CIPHER_num(srvr), (void *)srvr)
3786         for(i=0 ; i < sk_SSL_CIPHER_num(srvr) ; ++i)
3787         {
3788             c=sk_SSL_CIPHER_value(srvr,i);
3789             printf("%p:%s\n", (void *)c,c->name);
3790         }
3791         printf("Client sent %d from %p:\n", sk_SSL_CIPHER_num(clnt), (void *)clnt)
3792         for(i=0 ; i < sk_SSL_CIPHER_num(clnt) ; ++i)
3793         {
3794             c=sk_SSL_CIPHER_value(clnt,i);
3795             printf("%p:%s\n", (void *)c,c->name);
3796         }
3797         #endif

3799         if (s->options & SSL_OP_CIPHER_SERVER_PREFERENCE)
3800         {
3801             prio = srvr;
3802             allow = clnt;
3803         }
3804         else
3805         {
3806             prio = clnt;
3807             allow = srvr;
3808         }

3810         for (i=0; i<sk_SSL_CIPHER_num(prio); i++)
3811         {
3812             c=sk_SSL_CIPHER_value(prio,i);

3814             /* Skip TLS v1.2 only ciphersuites if lower than v1.2 */
3815             if ((c->algorithm_ssl & SSL_TLSV1_2) &&
3816                 (TLS1_get_version(s) < TLS1_2_VERSION))
3817                 continue;

3819             ssl_set_cert_masks(cert,c);
3820             mask_k = cert->mask_k;
3821             mask_a = cert->mask_a;
3822             emask_k = cert->export_mask_k;
3823             emask_a = cert->export_mask_a;

```



```

3824 #ifndef OPENSSSL_NO_SRP
3825     mask_k=cert->mask_k | s->srp_ctx.srp_Mask;
3826     emask_k=cert->export_mask_k | s->srp_ctx.srp_Mask;
3827 #endif
3828
3829 #ifdef KSSL_DEBUG
3830     /* printf("ssl3_choose_cipher %d alg= %lx\n", i,c->algorithms); */
3831 #endif /* KSSL_DEBUG */
3832
3833     alg_k=c->algorithm_mkey;
3834     alg_a=c->algorithm_auth;
3835
3836 #ifndef OPENSSSL_NO_KRB5
3837     if (alg_k & SSL_kKRB5)
3838     {
3839         if ( !kssl_keytab_is_available(s->kssl_ctx) )
3840             continue;
3841     }
3842 #endif /* OPENSSSL_NO_KRB5 */
3843 #ifndef OPENSSSL_NO_PSK
3844     /* with PSK there must be server callback set */
3845     if ((alg_k & SSL_kPSK) && s->psk_server_callback == NULL)
3846         continue;
3847 #endif /* OPENSSSL_NO_PSK */
3848
3849     if (SSL_C_IS_EXPORT(c))
3850     {
3851         ok = (alg_k & emask_k) && (alg_a & emask_a);
3852 #ifdef CIPHER_DEBUG
3853         printf("%d:[%08lx:%08lx:%08lx:%08lx]p:%s (export)\n",ok,
3854             (void *)c,c->name);
3855 #endif
3856     }
3857     else
3858     {
3859         ok = (alg_k & mask_k) && (alg_a & mask_a);
3860 #ifdef CIPHER_DEBUG
3861         printf("%d:[%08lx:%08lx:%08lx:%08lx]p:%s\n",ok,alg_k,alg_a,
3862             c->name);
3863 #endif
3864     }
3865
3866 #ifndef OPENSSSL_NO_TLSEXT
3867 #ifndef OPENSSSL_NO_EC
3868     if (
3869         /* if we are considering an ECC cipher suite that uses o
3870         (alg_a & SSL_aECDSA || alg_a & SSL_aECDH)
3871         /* and we have an ECC certificate */
3872         && (s->cert->pkeys[SSL_PKEY_ECC].x509 != NULL)
3873         /* and the client specified a Supported Point Formats ex
3874         && ((s->session->tlsext_ecpointformatlist_length > 0) &&
3875         /* and our certificate's point is compressed */
3876         && (
3877             (s->cert->pkeys[SSL_PKEY_ECC].x509->cert_info !=
3878             && (s->cert->pkeys[SSL_PKEY_ECC].x509->cert_info
3879             && (s->cert->pkeys[SSL_PKEY_ECC].x509->cert_info
3880             && (s->cert->pkeys[SSL_PKEY_ECC].x509->cert_info
3881             && (
3882                 (*(s->cert->pkeys[SSL_PKEY_ECC].x509->ce
3883                 || (*(s->cert->pkeys[SSL_PKEY_ECC].x509-
3884                 )
3885             )
3886         )
3887     {
3888         ec_ok = 0;
3889         /* if our certificate's curve is over a field type that

```

```

3890     * then do not allow this cipher suite to be negotiated
3891     if (
3892         (s->cert->pkeys[SSL_PKEY_ECC].privatekey->pkey.e
3893         && (s->cert->pkeys[SSL_PKEY_ECC].privatekey->pke
3894         && (s->cert->pkeys[SSL_PKEY_ECC].privatekey->pke
3895         && (EC_METHOD_get_field_type(s->cert->pkeys[SSL_
3896         )
3897     {
3898         for (j = 0; j < s->session->tlsext_ecpointformat
3899         {
3900             if (s->session->tlsext_ecpointformatlist
3901             {
3902                 ec_ok = 1;
3903                 break;
3904             }
3905         }
3906     }
3907     else if (EC_METHOD_get_field_type(s->cert->pkeys[SSL_PKE
3908     {
3909         for (j = 0; j < s->session->tlsext_ecpointformat
3910         {
3911             if (s->session->tlsext_ecpointformatlist
3912             {
3913                 ec_ok = 1;
3914                 break;
3915             }
3916         }
3917     }
3918     ok = ok && ec_ok;
3919 }
3920
3921 if (
3922     /* if we are considering an ECC cipher suite that uses o
3923     (alg_a & SSL_aECDSA || alg_a & SSL_aECDH)
3924     /* and we have an ECC certificate */
3925     && (s->cert->pkeys[SSL_PKEY_ECC].x509 != NULL)
3926     /* and the client specified an EllipticCurves extension
3927     && ((s->session->tlsext_ellipticcurvelist_length > 0) &&
3928     )
3929     {
3930         ec_ok = 0;
3931         if (
3932             (s->cert->pkeys[SSL_PKEY_ECC].privatekey->pkey.e
3933             && (s->cert->pkeys[SSL_PKEY_ECC].privatekey->pke
3934             )
3935         {
3936             ec_nid = EC_GROUP_get_curve_name(s->cert->pkeys[
3937             if ((ec_nid == 0)
3938             && (s->cert->pkeys[SSL_PKEY_ECC].private
3939             )
3940             {
3941                 if (EC_METHOD_get_field_type(s->cert->pk
3942                 {
3943                     ec_search1 = 0xFF;
3944                     ec_search2 = 0x01;
3945                 }
3946             }
3947             else if (EC_METHOD_get_field_type(s->cer
3948             {
3949                 ec_search1 = 0xFF;
3950                 ec_search2 = 0x02;
3951             }
3952         }
3953     }
3954     else
3955     {
3956         ec_search1 = 0x00;
3957         ec_search2 = tls1_ec_nid2curve_id(ec_nid)
3958     }

```

```

3956         if ((ec_search1 != 0) || (ec_search2 != 0))
3957         {
3958             for (j = 0; j < s->session->tlsext_ellip
3959             {
3960                 if ((s->session->tlsext_elliptic
3961                 {
3962                     ec_ok = 1;
3963                     break;
3964                 }
3965             }
3966         }
3967     }
3968     ok = ok && ec_ok;
3969 }
3970 if (
3971     /* if we are considering an ECC cipher suite that uses a
3972     (alg_k & SSL_KEECDH)
3973     /* and we have an ephemeral EC key */
3974     && (s->cert->ecdh_tmp != NULL)
3975     /* and the client specified an EllipticCurves extension
3976     && ((s->session->tlsext_ellipticcurvelist_length > 0) &&
3977 )
3978 {
3979     ec_ok = 0;
3980     if (s->cert->ecdh_tmp->group != NULL)
3981     {
3982         ec_nid = EC_GROUP_get_curve_name(s->cert->ecdh_t
3983         if ((ec_nid == 0)
3984             && (s->cert->ecdh_tmp->group->meth != NU
3985         )
3986         {
3987             if (EC_METHOD_get_field_type(s->cert->ec
3988             {
3989                 ec_search1 = 0xFF;
3990                 ec_search2 = 0x01;
3991             }
3992             else if (EC_METHOD_get_field_type(s->cer
3993             {
3994                 ec_search1 = 0xFF;
3995                 ec_search2 = 0x02;
3996             }
3997         }
3998     }
3999     else
4000     {
4001         ec_search1 = 0x00;
4002         ec_search2 = tls1_ec_nid2curve_id(ec_nid
4003     }
4004     if ((ec_search1 != 0) || (ec_search2 != 0))
4005     {
4006         for (j = 0; j < s->session->tlsext_ellip
4007         {
4008             if ((s->session->tlsext_elliptic
4009             {
4010                 ec_ok = 1;
4011                 break;
4012             }
4013         }
4014     }
4015     ok = ok && ec_ok;
4016 }
4017 #endif /* OPENSSL_NO_EC */
4018 #endif /* OPENSSL_NO_TLSEXT */
4019
4020 if (!ok) continue;
4021 ii=sk_SSL_CIPHER_find(allow,c);

```

```

4022         if (ii >= 0)
4023         {
4024             #if !defined(OPENSSL_NO_EC) && !defined(OPENSSL_NO_TLSEXT)
4025             if ((alg_k & SSL_KEECDH) && (alg_a & SSL_aECDSA) && s->s
4026             {
4027                 if (!ret) ret=sk_SSL_CIPHER_value(allow,ii);
4028                 continue;
4029             }
4030             #endif
4031             ret=sk_SSL_CIPHER_value(allow,ii);
4032             break;
4033         }
4034     }
4035     return(ret);
4036 }
4037
4038 int ssl3_get_req_cert_type(SSL *s, unsigned char *p)
4039 {
4040     int ret=0;
4041     unsigned long alg_k;
4042
4043     alg_k = s->s3->tmp.new_cipher->algorithm_mkey;
4044
4045     #ifndef OPENSSL_NO_GOST
4046     if (s->version >= TLS1_VERSION)
4047     {
4048         if (alg_k & SSL_kGOST)
4049         {
4050             p[ret++]=TLS_CT_GOST94_SIGN;
4051             p[ret++]=TLS_CT_GOST01_SIGN;
4052             return(ret);
4053         }
4054     }
4055     #endif
4056
4057     #ifndef OPENSSL_NO_DH
4058     if (alg_k & (SSL_kDHR|SSL_kEDH))
4059     {
4060         # if !defined(OPENSSL_NO_RSA)
4061         p[ret++]=SSL3_CT_RSA_FIXED_DH;
4062         # endif
4063         # if !defined(OPENSSL_NO_DSA)
4064         p[ret++]=SSL3_CT_DSS_FIXED_DH;
4065         # endif
4066     }
4067     if ((s->version == SSL3_VERSION) &&
4068         (alg_k & (SSL_kEDH|SSL_kDHD|SSL_kDHR)))
4069     {
4070         # if !defined(OPENSSL_NO_RSA)
4071         p[ret++]=SSL3_CT_RSA_EPHEMERAL_DH;
4072         # endif
4073         # if !defined(OPENSSL_NO_DSA)
4074         p[ret++]=SSL3_CT_DSS_EPHEMERAL_DH;
4075         # endif
4076     }
4077     #endif /* !OPENSSL_NO_DH */
4078     #ifndef OPENSSL_NO_RSA
4079     p[ret++]=SSL3_CT_RSA_SIGN;
4080     #endif
4081     #ifndef OPENSSL_NO_DSA
4082     p[ret++]=SSL3_CT_DSS_SIGN;
4083     #endif
4084     #ifndef OPENSSL_NO_ECDH
4085     if ((alg_k & (SSL_kECDHR|SSL_kECDHe)) && (s->version >= TLS1_VERSION))
4086     {
4087         p[ret++]=TLS_CT_RSA_FIXED_ECDH;

```

```

4088         p[ret++]=TLS_CT_ECDSA_FIXED_ECDH;
4089     }
4090 #endif

4092 #ifndef OPENSSSL_NO_ECDSA
4093     /* ECDSA certs can be used with RSA cipher suites as well
4094      * so we don't need to check for SSL_kECDH or SSL_kEECDH
4095      */
4096     if (s->version >= TLS1_VERSION)
4097     {
4098         p[ret++]=TLS_CT_ECDSA_SIGN;
4099     }
4100 #endif
4101     return(ret);
4102 }

4104 int ssl3_shutdown(SSL *s)
4105 {
4106     int ret;

4108     /* Don't do anything much if we have not done the handshake or
4109      * we don't want to send messages :- */
4110     if ((s->quiet_shutdown) || (s->state == SSL_ST_BEFORE))
4111     {
4112         s->shutdown=(SSL_SENT_SHUTDOWN|SSL_RECEIVED_SHUTDOWN);
4113         return(1);
4114     }

4116     if (!(s->shutdown & SSL_SENT_SHUTDOWN))
4117     {
4118         s->shutdown|=SSL_SENT_SHUTDOWN;
4119         #if 1
4120         ssl3_send_alert(s,SSL3_AL_WARNING,SSL_AD_CLOSE_NOTIFY);
4121         #endif
4122         /* our shutdown alert has been sent now, and if it still needs
4123          * to be written, s->s3->alert_dispatch will be true */
4124         if (s->s3->alert_dispatch)
4125             return(-1); /* return WANT_WRITE */
4126     }
4127     else if (s->s3->alert_dispatch)
4128     {
4129         /* resend it if not sent */
4130         #if 1
4131         ret=s->method->ssl_dispatch_alert(s);
4132         if(ret == -1)
4133         {
4134             /* we only get to return -1 here the 2nd/Nth
4135              * invocation, we must have already signalled
4136              * return 0 upon a previous invocation,
4137              * return WANT_WRITE */
4138             return(ret);
4139         }
4140         #endif
4141     }
4142     else if (!(s->shutdown & SSL_RECEIVED_SHUTDOWN))
4143     {
4144         /* If we are waiting for a close from our peer, we are closed */
4145         s->method->ssl_read_bytes(s,0,NULL,0,0);
4146         if(!(s->shutdown & SSL_RECEIVED_SHUTDOWN))
4147         {
4148             return(-1); /* return WANT_READ */
4149         }
4150     }

4152     if ((s->shutdown == (SSL_SENT_SHUTDOWN|SSL_RECEIVED_SHUTDOWN)) &&
4153         !s->s3->alert_dispatch)

```

```

4154         return(1);
4155     else
4156         return(0);
4157     }

4159 int ssl3_write(SSL *s, const void *buf, int len)
4160 {
4161     int ret,n;

4163     #if 0
4164     if (s->shutdown & SSL_SEND_SHUTDOWN)
4165     {
4166         s->rwstate=SSL_NOTHING;
4167         return(0);
4168     }
4169     #endif
4170     clear_sys_error();
4171     if (s->s3->renegotiate) ssl3_renegotiate_check(s);

4173     /* This is an experimental flag that sends the
4174      * last handshake message in the same packet as the first
4175      * use data - used to see if it helps the TCP protocol during
4176      * session-id reuse */
4177     /* The second test is because the buffer may have been removed */
4178     if ((s->s3->flags & SSL3_FLAGS_POP_BUFFER) && (s->wbio == s->bbio))
4179     {
4180         /* First time through, we write into the buffer */
4181         if (s->s3->delay_buf_pop_ret == 0)
4182         {
4183             ret=ssl3_write_bytes(s,SSL3_RT_APPLICATION_DATA,
4184                                buf, len);
4185             if (ret <= 0) return(ret);

4187             s->s3->delay_buf_pop_ret=ret;
4188         }

4190         s->rwstate=SSL_WRITING;
4191         n=BIO_flush(s->wbio);
4192         if (n <= 0) return(n);
4193         s->rwstate=SSL_NOTHING;

4195         /* We have flushed the buffer, so remove it */
4196         ssl_free_wbio_buffer(s);
4197         s->s3->flags&= ~SSL3_FLAGS_POP_BUFFER;

4199         ret=s->s3->delay_buf_pop_ret;
4200         s->s3->delay_buf_pop_ret=0;
4201     }
4202     else
4203     {
4204         ret=s->method->ssl_write_bytes(s,SSL3_RT_APPLICATION_DATA,
4205                                     buf, len);
4206         if (ret <= 0) return(ret);
4207     }

4209     return(ret);
4210 }

4212 static int ssl3_read_internal(SSL *s, void *buf, int len, int peek)
4213 {
4214     int ret;

4215     clear_sys_error();
4216     if (s->s3->renegotiate) ssl3_renegotiate_check(s);
4217     s->s3->in_read_app_data=1;
4218     ret=s->method->ssl_read_bytes(s,SSL3_RT_APPLICATION_DATA,buf, len, peek);

```

```

4220     if ((ret == -1) && (s->s3->in_read_app_data == 2))
4221     {
4222         /* ssl3_read_bytes decided to call s->handshake_func, which
4223            * called ssl3_read_bytes to read handshake data.
4224            * However, ssl3_read_bytes actually found application data
4225            * and thinks that application data makes sense here; so disable
4226            * handshake processing and try to read application data again.
4227            s->in_handshake++;
4228            ret=s->method->ssl_read_bytes(s, SSL3_RT_APPLICATION_DATA, buf, len
4229            s->in_handshake--;
4230            }
4231     else
4232         s->s3->in_read_app_data=0;

4234     return(ret);
4235 }

4237 int ssl3_read(SSL *s, void *buf, int len)
4238 {
4239     return ssl3_read_internal(s, buf, len, 0);
4240 }

4242 int ssl3_peek(SSL *s, void *buf, int len)
4243 {
4244     return ssl3_read_internal(s, buf, len, 1);
4245 }

4247 int ssl3_renegotiate(SSL *s)
4248 {
4249     if (s->handshake_func == NULL)
4250         return(1);

4252     if (s->s3->flags & SSL3_FLAGS_NO_RENEGOTIATE_CIPHERS)
4253         return(0);

4255     s->s3->renegotiate=1;
4256     return(1);
4257 }

4259 int ssl3_renegotiate_check(SSL *s)
4260 {
4261     int ret=0;

4263     if (s->s3->renegotiate)
4264     {
4265         if ( (s->s3->rbuf.left == 0) &&
4266             (s->s3->wbuf.left == 0) &&
4267             !SSL_in_init(s))
4268         {
4269             /*
4270             if we are the server, and we have sent a 'RENEGOTIATE' message, we
4271             need to go to SSL_ST_ACCEPT.
4272             */
4273             /* SSL_ST_ACCEPT */
4274             s->state=SSL_ST_RENEGOTIATE;
4275             s->s3->renegotiate=0;
4276             s->s3->num_renegotiations++;
4277             s->s3->total_renegotiations++;
4278             ret=1;
4279         }
4280     }
4281     return(ret);
4282 }
4283 /* If we are using TLS v1.2 or later and default SHA1+MD5 algorithms switch
4284 * to new SHA256 PRF and handshake macs
4285 */

```

```

4286 long ssl_get_algorithm2(SSL *s)
4287 {
4288     long alg2 = s->s3->tmp.new_cipher->algorithm2;
4289     if (s->method->version == TLS1_2_VERSION &&
4290         alg2 == (SSL_HANDSHAKE_MAC_DEFAULT|TLS1_PRF))
4291         return SSL_HANDSHAKE_MAC_SHA256 | TLS1_PRF_SHA256;
4292     return alg2;
4293 }
4294

```

```

*****
3541 Fri May 30 18:32:21 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_meth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s3_meth.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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28 * 2. Redistributions in binary form must reproduce the above copyright
29 * notice, this list of conditions and the following disclaimer in the
30 * documentation and/or other materials provided with the distribution.
31 * 3. All advertising materials mentioning features or use of this software
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/objects.h>
61 #include "ssl_locl.h"

```

```

63 static const SSL_METHOD *ssl3_get_method(int ver);
64 static const SSL_METHOD *ssl3_get_method(int ver)
65 {
66     if (ver == SSL3_VERSION)
67         return(SSLv3_method());
68     else
69         return(NULL);
70 }
71
72 IMPLEMENT_ssl3_meth_func(SSLv3_method,
73                          ssl3_accept,
74                          ssl3_connect,
75                          ssl3_get_method)

```

```

*****
43254 Fri May 30 18:32:21 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_pkt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s3_pkt.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
9  * This library is free for commercial and non-commercial use as long as
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11 * apply to all code found in this distribution, be it the RC4, RSA,
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33 * "This product includes cryptographic software written by
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38 * the apps directory (application code) you must include an acknowledgement:
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105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111
112 #include <stdio.h>
113 #include <errno.h>
114 #define USE_SOCKETS
115 #include "ssl_locl.h"
116 #include <openssl/evp.h>
117 #include <openssl/buffer.h>
118 #include <openssl/rand.h>
119
120 static int do_ssl3_write(SSL *s, int type, const unsigned char *buf,
121                        unsigned int len, int create_empty_fragment);
122 static int ssl3_get_record(SSL *s);
123
124 int ssl3_read_n(SSL *s, int n, int max, int extend)
125 {
126     /* If extend == 0, obtain new n-byte packet; if extend == 1, increase
127      * packet by another n bytes.

```

```

128     * The packet will be in the sub-array of s->s3->rbuf.buf specified
129     * by s->packet and s->packet_length.
130     * (If s->read_ahead is set, 'max' bytes may be stored in rbuf
131     * [plus s->packet_length bytes if extend == 1].)
132     */
133     int i, len, left;
134     long align=0;
135     unsigned char *pkt;
136     SSL3_BUFFER *rb;

138     if (n <= 0) return n;

140     rb = &(s->s3->rbuf);
141     if (rb->buf == NULL)
142         if (!ssl3_setup_read_buffer(s))
143             return -1;

145     left = rb->left;
146 #if defined(SSL3_ALIGN_PAYLOAD) && SSL3_ALIGN_PAYLOAD!=0
147     align = (long)rb->buf + SSL3_RT_HEADER_LENGTH;
148     align = (-align)&(SSL3_ALIGN_PAYLOAD-1);
149 #endif

151     if (!extend)
152     {
153         /* start with empty packet ... */
154         if (left == 0)
155             rb->offset = align;
156         else if (align != 0 && left >= SSL3_RT_HEADER_LENGTH)
157         {
158             /* check if next packet length is large
159              * enough to justify payload alignment... */
160             pkt = rb->buf + rb->offset;
161             if (pkt[0] == SSL3_RT_APPLICATION_DATA
162                 && (pkt[3]<8|pkt[4]) >= 128)
163             {
164                 /* Note that even if packet is corrupted
165                  * and its length field is insane, we can
166                  * only be led to wrong decision about
167                  * whether memmove will occur or not.
168                  * Header values has no effect on memmove
169                  * arguments and therefore no buffer
170                  * overrun can be triggered. */
171                 memmove (rb->buf+align,pkt,left);
172                 rb->offset = align;
173             }
174         }
175         s->packet = rb->buf + rb->offset;
176         s->packet_length = 0;
177         /* ... now we can act as if 'extend' was set */
178     }

180     /* For DTLS/UDP reads should not span multiple packets
181     * because the read operation returns the whole packet
182     * at once (as long as it fits into the buffer). */
183     if (SSL_version(s) == DTLS1_VERSION || SSL_version(s) == DTLS1_BAD_VER)
184     {
185         if (left > 0 && n > left)
186             n = left;
187     }

189     /* if there is enough in the buffer from a previous read, take some */
190     if (left >= n)
191     {
192         s->packet_length+=n;
193         rb->left=left-n;

```

```

194         rb->offset+=n;
195         return(n);
196     }

198     /* else we need to read more data */

200     len = s->packet_length;
201     pkt = rb->buf+align;
202     /* Move any available bytes to front of buffer:
203     * 'len' bytes already pointed to by 'packet',
204     * 'left' extra ones at the end */
205     if (s->packet != pkt) /* len > 0 */
206     {
207         memmove(pkt, s->packet, len+left);
208         s->packet = pkt;
209         rb->offset = len + align;
210     }

212     if (n > (int)(rb->len - rb->offset)) /* does not happen */
213     {
214         SSLerr(SSL_F_SSL3_READ_N,ERR_R_INTERNAL_ERROR);
215         return -1;
216     }

218     if (!s->read_ahead)
219         /* ignore max parameter */
220         max = n;
221     else
222     {
223         if (max < n)
224             max = n;
225         if (max > (int)(rb->len - rb->offset))
226             max = rb->len - rb->offset;
227     }

229     while (left < n)
230     {
231         /* Now we have len+left bytes at the front of s->s3->rbuf.buf
232         * and need to read in more until we have len+n (up to
233         * len+max if possible) */

235         clear_sys_error();
236         if (s->rbio != NULL)
237         {
238             s->rwstate=SSL_READING;
239             i=BIO_read(s->rbio,pkt+len+left, max-left);
240         }
241         else
242         {
243             SSLerr(SSL_F_SSL3_READ_N,SSL_R_READ_BIO_NOT_SET);
244             i = -1;
245         }

247         if (i <= 0)
248         {
249             rb->left = left;
250             if (s->mode & SSL_MODE_RELEASE_BUFFERS &&
251                 SSL_version(s) != DTLS1_VERSION && SSL_version(s) !=
252                 if (len+left == 0)
253                     ssl3_release_read_buffer(s);
254             return(i);
255         }
256         left+=i;
257     }
258     /* reads should *never* span multiple packets for DTLS because
259     * the underlying transport protocol is message oriented as oppo
260     * to byte oriented as in the TLS case. */

```

```

260         if (SSL_version(s) == DTLS1_VERSION || SSL_version(s) == DTLS1_B
261             {
262                 if (n > left)
263                     n = left; /* makes the while condition false */
264             }
265     }

267     /* done reading, now the book-keeping */
268     rb->offset += n;
269     rb->left = left - n;
270     s->packet_length += n;
271     s->rwstate=SSL_NOTHING;
272     return(n);
273 }

275 /* Call this to get a new input record.
276 * It will return <= 0 if more data is needed, normally due to an error
277 * or non-blocking IO.
278 * When it finishes, one packet has been decoded and can be found in
279 * ssl->s3->rrec.type - is the type of record
280 * ssl->s3->rrec.data, - data
281 * ssl->s3->rrec.length, - number of bytes
282 */
283 /* used only by ssl3_read_bytes */
284 static int ssl3_get_record(SSL *s)
285 {
286     int ssl_major,ssl_minor,al;
287     int enc_err,n,i,ret= -1;
288     SSL3_RECORD *rr;
289     SSL_SESSION *sess;
290     unsigned char *p;
291     unsigned char md[EVP_MAX_MD_SIZE];
292     short version;
293     unsigned mac_size, orig_len;
294     size_t extra;

296     rr= &(s->s3->rrec);
297     sess=s->session;

299     if (s->options & SSL_OP_MICROSOFT_BIG_SSLV3_BUFFER)
300         extra=SSL3_RT_MAX_EXTRA;
301     else
302         extra=0;
303     if (extra && !s->s3->init_extra)
304     {
305         /* An application error: SLS_OP_MICROSOFT_BIG_SSLV3_BUFFER
306          * set after ssl3_setup_buffers() was done */
307         SSLerr(SSL_F_SSL3_GET_RECORD, ERR_R_INTERNAL_ERROR);
308         return -1;
309     }

311 again:
312     /* check if we have the header */
313     if ( (s->rwstate != SSL_ST_READ_BODY) ||
314          (s->packet_length < SSL3_RT_HEADER_LENGTH))
315     {
316         n=ssl3_read_n(s, SSL3_RT_HEADER_LENGTH, s->s3->rbuf.len, 0);
317         if (n <= 0) return(n); /* error or non-blocking */
318         s->rwstate=SSL_ST_READ_BODY;
319     }

320     p=s->packet;

322     /* Pull apart the header into the SSL3_RECORD */
323     rr->type= *(p++);
324     ssl_major= *(p++);
325     ssl_minor= *(p++);

```

```

326     version=(ssl_major<<8)|ssl_minor;
327     n2s(p,rr->length);
328     #if 0
329     fprintf(stderr, "Record type=%d, Length=%d\n", rr->type, rr->length);
330     #endif

332     /* Lets check version */
333     if (!s->first_packet)
334     {
335         if (version != s->version)
336         {
337             SSLerr(SSL_F_SSL3_GET_RECORD,SSL_R_WRONG_VERSION
338                 if ((s->version & 0xFF00) == (version & 0xFF00))
339                     /* Send back error using their minor ver
340                     s->version = (unsigned short)version;
341                     al=SSL_AD_PROTOCOL_VERSION;
342                     goto f_err;
343                 }
344         }

346         if ((version>>8) != SSL3_VERSION_MAJOR)
347         {
348             SSLerr(SSL_F_SSL3_GET_RECORD,SSL_R_WRONG_VERSION_NUMBER)
349             goto err;
350         }

352         if (rr->length > s->s3->rbuf.len - SSL3_RT_HEADER_LENGTH)
353         {
354             al=SSL_AD_RECORD_OVERFLOW;
355             SSLerr(SSL_F_SSL3_GET_RECORD,SSL_R_PACKET_LENGTH_TOO_LONG
356             goto f_err;
357         }

359         /* now s->rwstate == SSL_ST_READ_BODY */
360     }

362     /* s->rwstate == SSL_ST_READ_BODY, get and decode the data */

364     if (rr->length > s->packet_length-SSL3_RT_HEADER_LENGTH)
365     {
366         /* now s->packet_length == SSL3_RT_HEADER_LENGTH */
367         i=rr->length;
368         n=ssl3_read_n(s,i,i,1);
369         if (n <= 0) return(n); /* error or non-blocking io */
370         /* now n == rr->length,
371          * and s->packet_length == SSL3_RT_HEADER_LENGTH + rr->length */
372     }

374     s->rwstate=SSL_ST_READ_HEADER; /* set state for later operations */

376     /* At this point, s->packet_length == SSL3_RT_HEADER_LENGTH + rr->length,
377      * and we have that many bytes in s->packet
378      */
379     rr->input= &(s->packet[SSL3_RT_HEADER_LENGTH]);

381     /* ok, we can now read from 's->packet' data into 'rr'
382      * rr->input points at rr->length bytes, which
383      * need to be copied into rr->data by either
384      * the decryption or by the decompression
385      * When the data is 'copied' into the rr->data buffer,
386      * rr->input will be pointed at the new buffer */

388     /* We now have - encrypted [ MAC [ compressed [ plain ] ] ]
389      * rr->length bytes of encrypted compressed stuff. */

391     /* check is not needed I believe */

```



```

392     if (rr->length > SSL3_RT_MAX_ENCRYPTED_LENGTH+extra)
393     {
394         al=SSL_AD_RECORD_OVERFLOW;
395         SSLerr(SSL_F_SSL3_GET_RECORD, SSL_R_ENCRYPTED_LENGTH_TOO_LONG);
396         goto f_err;
397     }
398
399     /* decrypt in place in 'rr->input' */
400     rr->data=rr->input;
401
402     enc_err = s->method->ssl3_enc->enc(s,0);
403     /* enc_err is:
404      * 0: (in non-constant time) if the record is publically invalid.
405      * 1: if the padding is valid
406      * -1: if the padding is invalid */
407     if (enc_err == 0)
408     {
409         al=SSL_AD_DECRYPTION_FAILED;
410         SSLerr(SSL_F_SSL3_GET_RECORD, SSL_R_BLOCK_CIPHER_PAD_IS_WRONG);
411         goto f_err;
412     }
413
414 #ifdef TLS_DEBUG
415 printf("dec %d\n",rr->length);
416 { unsigned int z; for (z=0; z<rr->length; z++) printf("%02X%c",rr->data[z],((z+1
417 printf("\n");
418 #endif
419
420     /* r->length is now the compressed data plus mac */
421     if ((sess != NULL) &&
422         (s->enc_read_ctx != NULL) &&
423         (EVP_MD_CTX_md(s->read_hash) != NULL))
424     {
425         /* s->read_hash != NULL => mac_size != -1 */
426         unsigned char *mac = NULL;
427         unsigned char mac_tmp[EVP_MAX_MD_SIZE];
428         mac_size=EVP_MD_CTX_size(s->read_hash);
429         OPENSSL_assert(mac_size <= EVP_MAX_MD_SIZE);
430
431         /* kludge: *_cbc_remove_padding passes padding length in rr->typ
432         orig_len = rr->length+((unsigned int)rr->type>>8);
433
434         /* orig_len is the length of the record before any padding was
435         * removed. This is public information, as is the MAC in use,
436         * therefore we can safely process the record in a different
437         * amount of time if it's too short to possibly contain a MAC.
438         */
439         if (orig_len < mac_size ||
440             /* CBC records must have a padding length byte too. */
441             (EVP_CIPHER_CTX_mode(s->enc_read_ctx) == EVP_CIPH_CBC_MODE &
442              orig_len < mac_size+1))
443         {
444             al=SSL_AD_DECODE_ERROR;
445             SSLerr(SSL_F_SSL3_GET_RECORD, SSL_R_LENGTH_TOO_SHORT);
446             goto f_err;
447         }
448
449         if (EVP_CIPHER_CTX_mode(s->enc_read_ctx) == EVP_CIPH_CBC_MODE)
450         {
451             /* We update the length so that the TLS header bytes
452             * can be constructed correctly but we need to extract
453             * the MAC in constant time from within the record,
454             * without leaking the contents of the padding bytes.
455             */
456             mac = mac_tmp;
457             ssl3_cbc_copy_mac(mac_tmp, rr, mac_size, orig_len);

```

```

458         rr->length -= mac_size;
459     }
460     else
461     {
462         /* In this case there's no padding, so |orig_len|
463         * equals |rec->length| and we checked that there's
464         * enough bytes for |mac_size| above. */
465         rr->length -= mac_size;
466         mac = &rr->data[rr->length];
467     }
468
469     i=s->method->ssl3_enc->mac(s,md,0 /* not send */);
470     if (i < 0 || mac == NULL || CRYPTO_memcmp(md, mac, (size_t)mac_s
471         enc_err = -1;
472     if (rr->length > SSL3_RT_MAX_COMPRESSED_LENGTH+extra+mac_size)
473         enc_err = -1;
474     }
475
476     if (enc_err < 0)
477     {
478         /* A separate 'decryption_failed' alert was introduced with TLS
479         * SSL 3.0 only has 'bad_record_mac'. But unless a decryption
480         * failure is directly visible from the ciphertext anyway,
481         * we should not reveal which kind of error occurred -- this
482         * might become visible to an attacker (e.g. via a logfile) */
483         al=SSL_AD_BAD_RECORD_MAC;
484         SSLerr(SSL_F_SSL3_GET_RECORD, SSL_R_DECRYPTION_FAILED_OR_BAD_RECO
485         goto f_err;
486     }
487
488     /* r->length is now just compressed */
489     if (s->expand != NULL)
490     {
491         if (rr->length > SSL3_RT_MAX_COMPRESSED_LENGTH+extra)
492         {
493             al=SSL_AD_RECORD_OVERFLOW;
494             SSLerr(SSL_F_SSL3_GET_RECORD, SSL_R_COMPRESSED_LENGTH_TOO
495             goto f_err;
496         }
497         if (!ssl3_do_uncompress(s))
498         {
499             al=SSL_AD_DECOMPRESSION_FAILURE;
500             SSLerr(SSL_F_SSL3_GET_RECORD, SSL_R_BAD_DECOMPRESSION);
501             goto f_err;
502         }
503     }
504
505     if (rr->length > SSL3_RT_MAX_PLAIN_LENGTH+extra)
506     {
507         al=SSL_AD_RECORD_OVERFLOW;
508         SSLerr(SSL_F_SSL3_GET_RECORD, SSL_R_DATA_LENGTH_TOO_LONG);
509         goto f_err;
510     }
511
512     rr->off=0;
513     /* So at this point the following is true
514     * ssl->s3->rrec.type is the type of record
515     * ssl->s3->rrec.length == number of bytes in record
516     * ssl->s3->rrec.off == offset to first valid byte
517     * ssl->s3->rrec.data == where to take bytes from, increment
518     * after use :-).
519     */
520
521     /* we have pulled in a full packet so zero things */
522     s->packet_length=0;

```

```

524      /* just read a 0 length packet */
525      if (rr->length == 0) goto again;

527 #if 0
528 fprintf(stderr, "Ultimate Record type=%d, Length=%d\n", rr->type, rr->length);
529 #endif

531      return(1);

533 f_err:
534      ssl3_send_alert(s,SSL3_AL_FATAL,al);
535 err:
536      return(ret);
537 }

539 int ssl3_do_uncompress(SSL *ssl)
540 {
541 #ifndef OPENSSL_NO_COMP
542     int i;
543     SSL3_RECORD *rr;

545     rr= &(ssl->s3->rrec);
546     i=COMP_expand_block(ssl->expand,rr->comp,
547         SSL3_RT_MAX_PLAIN_LENGTH,rr->data,(int)rr->length);
548     if (i < 0)
549         return(0);
550     else
551         rr->length=i;
552     rr->data=rr->comp;
553 #endif
554     return(1);
555 }

557 int ssl3_do_compress(SSL *ssl)
558 {
559 #ifndef OPENSSL_NO_COMP
560     int i;
561     SSL3_RECORD *wr;

563     wr= &(ssl->s3->wrec);
564     i=COMP_compress_block(ssl->compress,wr->data,
565         SSL3_RT_MAX_COMPRESSED_LENGTH,
566         wr->input,(int)wr->length);
567     if (i < 0)
568         return(0);
569     else
570         wr->length=i;

572     wr->input=wr->data;
573 #endif
574     return(1);
575 }

577 /* Call this to write data in records of type 'type'
578  * It will return <= 0 if not all data has been sent or non-blocking IO.
579  */
580 int ssl3_write_bytes(SSL *s, int type, const void *buf_, int len)
581 {
582     const unsigned char *buf=buf_;
583     unsigned int tot,n,nw;
584     int i;

586     s->rwstate=SSL_NOTHING;
587     tot=s->s3->wnum;
588     s->s3->wnum=0;

```

```

590     if (SSL_in_init(s) && !s->in_handshake)
591     {
592         i=s->handshake_func(s);
593         if (i < 0) return(i);
594         if (i == 0)
595         {
596             SSLerr(SSL_F_SSL3_WRITE_BYTES,SSL_R_SSL_HANDSHAKE_FAILURE);
597             return -1;
598         }
599     }

601     n=(len-tot);
602     for (;;)
603     {
604         if (n > s->max_send_fragment)
605             nw=s->max_send_fragment;
606         else
607             nw=n;

609         i=do_ssl3_write(s, type, &(buf[tot]), nw, 0);
610         if (i <= 0)
611         {
612             s->s3->wnum=tot;
613             return i;
614         }

616         if ((i == (int)n) ||
617             (type == SSL3_RT_APPLICATION_DATA &&
618              (s->mode & SSL_MODE_ENABLE_PARTIAL_WRITE)))
619         {
620             /* next chunk of data should get another prepended empty
621              * in ciphersuites with known-IV weakness: */
622             s->s3->empty_fragment_done = 0;

623             return tot+i;
624         }
625     }

627     n-=i;
628     tot+=i;
629 }
630 }

632 static int do_ssl3_write(SSL *s, int type, const unsigned char *buf,
633                          unsigned int len, int create_empty_fragment)
634 {
635     unsigned char *p,*plen;
636     int i,mac_size,clear=0;
637     int prefix_len=0;
638     int eivlen;
639     long align=0;
640     SSL3_RECORD *wr;
641     SSL3_BUFFER *wb=&(s->s3->wbuff);
642     SSL_SESSION *sess;

644     if (wb->buf == NULL)
645         if (!ssl3_setup_write_buffer(s))
646             return -1;

648     /* first check if there is a SSL3_BUFFER still being written
649      * out. This will happen with non blocking IO */
650     if (wb->left != 0)
651         return(ssl3_write_pending(s,type,buf,len));

653     /* If we have an alert to send, lets send it */
654     if (s->s3->alert_dispatch)
655     {

```

```

656         i=s->method->ssl_dispatch_alert(s);
657         if (i <= 0)
658             return(i);
659         /* if it went, fall through and send more stuff */
660     }

662     if (len == 0 && !create_empty_fragment)
663         return 0;

665     wr= &(s->s3->wrec);
666     sess=s->session;

668     if ( (sess == NULL) ||
669         (s->enc_write_ctx == NULL) ||
670         (EVP_MD_CTX_md(s->write_hash) == NULL))
671     {
672     #if 1
673         clear=s->enc_write_ctx?0:1;    /* must be AEAD cipher */
674     #else
675         clear=1;
676     #endif
677         mac_size=0;
678     }
679     else
680     {
681         mac_size=EVP_MD_CTX_size(s->write_hash);
682         if (mac_size < 0)
683             goto err;
684     }

686     /* 'create_empty_fragment' is true only when this function calls itself
687     if (!clear && !create_empty_fragment && !s->s3->empty_fragment_done)
688     {
689         /* countermeasure against known-IV weakness in CBC ciphersuites
690         * (see http://www.openssl.org/~bodo/tls-cbc.txt) */

692         if (s->s3->need_empty_fragments && type == SSL3_RT_APPLICATION_D
693         {
694             /* recursive function call with 'create_empty_fragment'
695             * this prepares and buffers the data for an empty fragm
696             * (these 'prefix_len' bytes are sent out later
697             * together with the actual payload) */
698             prefix_len = do_ssl3_write(s, type, buf, 0, 1);
699             if (prefix_len <= 0)
700                 goto err;

702             if (prefix_len >
703                 (SSL3_RT_HEADER_LENGTH + SSL3_RT_SEND_MAX_ENCRYPTED_OVERHEAD))
704             {
705                 /* insufficient space */
706                 SSLerr(SSL_F_DO_SSL3_WRITE, ERR_R_INTERNAL_ERROR)
707                 goto err;
708             }
709         }

710         s->s3->empty_fragment_done = 1;
711     }

712     if (create_empty_fragment)
713     {
714     #if defined(SSL3_ALIGN_PAYLOAD) && SSL3_ALIGN_PAYLOAD!=0
715         /* extra fragment would be couple of cipher blocks,
716         * which would be multiple of SSL3_ALIGN_PAYLOAD, so
717         * if we want to align the real payload, then we can
718         * just pretend we simply have two headers. */
719         align = (long)wb->buf + 2*SSL3_RT_HEADER_LENGTH;

```

```

722         align = (-align)&(SSL3_ALIGN_PAYLOAD-1);
723     #endif
724     p = wb->buf + align;
725     wb->offset = align;
726 }
727 else if (prefix_len)
728 {
729     p = wb->buf + wb->offset + prefix_len;
730 }
731 else
732 {
733     #if defined(SSL3_ALIGN_PAYLOAD) && SSL3_ALIGN_PAYLOAD!=0
734         align = (long)wb->buf + SSL3_RT_HEADER_LENGTH;
735         align = (-align)&(SSL3_ALIGN_PAYLOAD-1);
736     #endif
737     p = wb->buf + align;
738     wb->offset = align;
739 }

741     /* write the header */

743     *(p++)=type&0xff;
744     wr->type=type;

746     *(p++)=(s->version>>8);
747     /* Some servers hang if iniatial client hello is larger than 256
748     * bytes and record version number > TLS 1.0
749     */
750     if (s->state == SSL3_ST_CW_CLNT_HELLO_B
751         && !s->renegotiate
752         && TLS1_get_version(s) > TLS1_VERSION)
753         *(p++) = 0x1;
754     else
755         *(p++)=s->version&0xff;

757     /* field where we are to write out packet length */
758     plen=p;
759     p+=2;
760     /* Explicit IV length, block ciphers and TLS version 1.1 or later */
761     if (s->enc_write_ctx && s->version >= TLS1_1_VERSION)
762     {
763         int mode = EVP_CIPHER_CTX_mode(s->enc_write_ctx);
764         if (mode == EVP_CIPH_CBC_MODE)
765         {
766             eivlen = EVP_CIPHER_CTX_iv_length(s->enc_write_ctx);
767             if (eivlen <= 1)
768                 eivlen = 0;
769         }
770         /* Need explicit part of IV for GCM mode */
771         else if (mode == EVP_CIPH_GCM_MODE)
772             eivlen = EVP_GCM_TLS_EXPLICIT_IV_LEN;
773         else
774             eivlen = 0;
775     }
776     else
777         eivlen = 0;

779     /* lets setup the record stuff. */
780     wr->data=p + eivlen;
781     wr->length=(int)len;
782     wr->input=(unsigned char *)buf;

784     /* we now 'read' from wr->input, wr->length bytes into
785     * wr->data */

787     /* first we compress */

```

```

788     if (s->compress != NULL)
789     {
790         if (!ssl3_do_compress(s))
791         {
792             SSLerr(SSL_F_DO_SSL3_WRITE, SSL_R_COMPRESSION_FAILURE);
793             goto err;
794         }
795     }
796     else
797     {
798         memcpy(wr->data, wr->input, wr->length);
799         wr->input = wr->data;
800     }

802     /* we should still have the output to wr->data and the input
803     * from wr->input. Length should be wr->length.
804     * wr->data still points in the wb->buf */

806     if (mac_size != 0)
807     {
808         if (s->method->ssl3_enc->mac(s, &(p[wr->length + eivlen]), 1) < 0)
809             goto err;
810         wr->length += mac_size;
811     }

813     wr->input = p;
814     wr->data = p;

816     if (eivlen)
817     {
818         /* if (RAND_pseudo_bytes(p, eivlen) <= 0)
819            goto err; */
820         wr->length += eivlen;
821     }

823     /* ssl3_enc can only have an error on read */
824     s->method->ssl3_enc->enc(s, 1);

826     /* record length after mac and block padding */
827     s2n(wr->length, plen);

829     /* we should now have
830     * wr->data pointing to the encrypted data, which is
831     * wr->length long */
832     wr->type = type; /* not needed but helps for debugging */
833     wr->length += SSL3_RT_HEADER_LENGTH;

835     if (create_empty_fragment)
836     {
837         /* we are in a recursive call;
838         * just return the length, don't write out anything here
839         */
840         return wr->length;
841     }

843     /* now let's set up wb */
844     wb->left = prefix_len + wr->length;

846     /* memorize arguments so that ssl3_write_pending can detect bad write re
847     s->s3->wpend_tot = len;
848     s->s3->wpend_buf = buf;
849     s->s3->wpend_type = type;
850     s->s3->wpend_ret = len;

852     /* we now just need to write the buffer */
853     return ssl3_write_pending(s, type, buf, len);

```

```

854 err:
855     return -1;
856 }

858 /* if s->s3->wbuf.left != 0, we need to call this */
859 int ssl3_write_pending(SSL *s, int type, const unsigned char *buf,
860                       unsigned int len)
861 {
862     int i;
863     SSL3_BUFFER *wb = &(s->s3->wbuf);

865     /* XXXX */
866     if ((s->s3->wpend_tot > (int)len)
867         || ((s->s3->wpend_buf != buf) &&
868             !(s->mode & SSL_MODE_ACCEPT_MOVING_WRITE_BUFFER))
869         || (s->s3->wpend_type != type))
870     {
871         SSLerr(SSL_F_SSL3_WRITE_PENDING, SSL_R_BAD_WRITE_RETRY);
872         return(-1);
873     }

875     for (;;)
876     {
877         clear_sys_error();
878         if (s->wbio != NULL)
879         {
880             s->rwstate = SSL_WRITING;
881             i = BIO_write(s->wbio,
882                          (char *)&(wb->buf[wb->offset]),
883                          (unsigned int)wb->left);
884         }
885         else
886         {
887             SSLerr(SSL_F_SSL3_WRITE_PENDING, SSL_R_BIO_NOT_SET);
888             i = -1;
889         }
890         if (i == wb->left)
891         {
892             wb->left = 0;
893             wb->offset += i;
894             if (s->mode & SSL_MODE_RELEASE_BUFFERS &&
895                 SSL_version(s) != DTLS1_VERSION && SSL_version(s) !=
896                 ssl3_release_write_buffer(s);
897             s->rwstate = SSL_NOTHING;
898             return(s->s3->wpend_ret);
899         }
900         else if (i <= 0) {
901             if (s->version == DTLS1_VERSION ||
902                 s->version == DTLS1_BAD_VER) {
903                 /* For DTLS, just drop it. That's kind of the wh
904                 point in using a datagram service */
905                 wb->left = 0;
906             }
907             return(i);
908         }
909         wb->offset += i;
910         wb->left -= i;
911     }
912 }

914 /* Return up to 'len' payload bytes received in 'type' records.
915 * 'type' is one of the following:
916 *
917 * - SSL3_RT_HANDSHAKE (when ssl3_get_message calls us)
918 * - SSL3_RT_APPLICATION_DATA (when ssl3_read calls us)
919 * - 0 (during a shutdown, no data has to be returned)

```

```

920 *
921 * If we don't have stored data to work from, read a SSL/TLS record first
922 * (possibly multiple records if we still don't have anything to return).
923 *
924 * This function must handle any surprises the peer may have for us, such as
925 * Alert records (e.g. close_notify), ChangeCipherSpec records (not really
926 * a surprise, but handled as if it were), or renegotiation requests.
927 * Also if record payloads contain fragments too small to process, we store
928 * them until there is enough for the respective protocol (the record protocol
929 * may use arbitrary fragmentation and even interleaving):
930 *   Change cipher spec protocol
931 *       just 1 byte needed, no need for keeping anything stored
932 *   Alert protocol
933 *       2 bytes needed (AlertLevel, AlertDescription)
934 *   Handshake protocol
935 *       4 bytes needed (HandshakeType, uint24 length) -- we just have
936 *       to detect unexpected Client Hello and Hello Request messages
937 *       here, anything else is handled by higher layers
938 *   Application data protocol
939 *       none of our business
940 */
941 int ssl3_read_bytes(SSL *s, int type, unsigned char *buf, int len, int peek)
942 {
943     int al,i,j,ret;
944     unsigned int n;
945     SSL3_RECORD *rr;
946     void (*cb)(const SSL *ssl,int type2,int val)=NULL;
947
948     if (s->s3->rbuf.buf == NULL) /* Not initialized yet */
949         if (!ssl3_setup_read_buffer(s))
950             return(-1);
951
952     if ((type && (type != SSL3_RT_APPLICATION_DATA) && (type != SSL3_RT_HANDSHAKE) && (type != SSL3_RT_ALERT)))
953         if ((type && (type != SSL3_RT_APPLICATION_DATA)))
954         {
955             SSLerr(SSL_F_SSL3_READ_BYTES, ERR_R_INTERNAL_ERROR);
956             return -1;
957         }
958
959     if ((type == SSL3_RT_HANDSHAKE) && (s->s3->handshake_fragment_len > 0))
960         /* (partially) satisfy request from storage */
961         {
962             unsigned char *src = s->s3->handshake_fragment;
963             unsigned char *dst = buf;
964             unsigned int k;
965
966             /* peek == 0 */
967             n = 0;
968             while ((len > 0) && (s->s3->handshake_fragment_len > 0))
969             {
970                 *dst++ = *src++;
971                 len--; s->s3->handshake_fragment_len--;
972                 n++;
973             }
974             /* move any remaining fragment bytes: */
975             for (k = 0; k < s->s3->handshake_fragment_len; k++)
976                 s->s3->handshake_fragment[k] = *src++;
977             return n;
978         }
979
980     /* Now s->s3->handshake_fragment_len == 0 if type == SSL3_RT_HANDSHAKE.
981
982     if (!s->in_handshake && SSL_in_init(s))
983     {
984         /* type == SSL3_RT_APPLICATION_DATA */
985         i=s->handshake_func(s);

```

```

986         if (i < 0) return(i);
987         if (i == 0)
988         {
989             SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_SSL_HANDSHAKE_FAILURE);
990             return(-1);
991         }
992     }
993 start:
994     s->rwstate=SSL_NOTHING;
995
996     /* s->s3->rrec.type      - is the type of record
997     * s->s3->rrec.data,      - data
998     * s->s3->rrec.off,       - offset into 'data' for next read
999     * s->s3->rrec.length,    - number of bytes. */
1000    rr = &(s->s3->rrec);
1001
1002    /* get new packet if necessary */
1003    if ((rr->length == 0) || (s->rwstate == SSL_ST_READ_BODY))
1004    {
1005        ret=ssl3_get_record(s);
1006        if (ret <= 0) return(ret);
1007    }
1008
1009    /* we now have a packet which can be read and processed */
1010
1011    if (s->s3->change_cipher_spec /* set when we receive ChangeCipherSpec,
1012                                * reset by ssl3_get_finished */
1013        && (rr->type != SSL3_RT_HANDSHAKE))
1014    {
1015        al=SSL_AD_UNEXPECTED_MESSAGE;
1016        SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_DATA_BETWEEN_CCS_AND_FINISHED);
1017        goto f_err;
1018    }
1019
1020    /* If the other end has shut down, throw anything we read away
1021     * (even in 'peek' mode) */
1022    if (s->shutdown & SSL_RECEIVED_SHUTDOWN)
1023    {
1024        rr->length=0;
1025        s->rwstate=SSL_NOTHING;
1026        return(0);
1027    }
1028
1029    if (type == rr->type) /* SSL3_RT_APPLICATION_DATA or SSL3_RT_HANDSHAKE */
1030    {
1031        /* make sure that we are not getting application data when we
1032         * are doing a handshake for the first time */
1033        if (SSL_in_init(s) && (type == SSL3_RT_APPLICATION_DATA) &&
1034            (s->enc_read_ctx == NULL))
1035        {
1036            al=SSL_AD_UNEXPECTED_MESSAGE;
1037            SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_APP_DATA_IN_HANDSHAKE);
1038            goto f_err;
1039        }
1040    }
1041
1042    if (len <= 0) return(len);
1043
1044    if ((unsigned int)len > rr->length)
1045        n = rr->length;
1046    else
1047        n = (unsigned int)len;
1048
1049    memcpy(buf,&(rr->data[rr->off]),n);
1050    if (!peek)
1051    {

```

```

1052         rr->length-=n;
1053         rr->off+=n;
1054         if (rr->length == 0)
1055         {
1056             s->rstate=SSL_ST_READ_HEADER;
1057             rr->off=0;
1058             if (s->mode & SSL_MODE_RELEASE_BUFFERS)
1059                 ssl3_release_read_buffer(s);
1060         }
1061     }
1062     return(n);
1063 }

1066 /* If we get here, then type != rr->type; if we have a handshake
1067  * message, then it was unexpected (Hello Request or Client Hello). */

1069 /* In case of record types for which we have 'fragment' storage,
1070  * fill that so that we can process the data at a fixed place.
1071  */
1072 {
1073     unsigned int dest_maxlen = 0;
1074     unsigned char *dest = NULL;
1075     unsigned int *dest_len = NULL;

1077     if (rr->type == SSL3_RT_HANDSHAKE)
1078     {
1079         dest_maxlen = sizeof s->s3->handshake_fragment;
1080         dest = s->s3->handshake_fragment;
1081         dest_len = &s->s3->handshake_fragment_len;
1082     }
1083     else if (rr->type == SSL3_RT_ALERT)
1084     {
1085         dest_maxlen = sizeof s->s3->alert_fragment;
1086         dest = s->s3->alert_fragment;
1087         dest_len = &s->s3->alert_fragment_len;
1088     }
1089 #ifndef OPENSSL_NO_HEARTBEATS
1090     else if (rr->type == TLS1_RT_HEARTBEAT)
1091     {
1092         tls1_process_heartbeat(s);

1094         /* Exit and notify application to read again */
1095         rr->length = 0;
1096         s->rwstate=SSL_READING;
1097         BIO_clear_retry_flags(SSL_get_rbio(s));
1098         BIO_set_retry_read(SSL_get_rbio(s));
1099         return(-1);
1100     }
1101 #endif

1103     if (dest_maxlen > 0)
1104     {
1105         n = dest_maxlen - *dest_len; /* available space in 'dest'
1106         if (rr->length < n)
1107             n = rr->length; /* available bytes */

1109         /* now move 'n' bytes: */
1110         while (n-- > 0)
1111         {
1112             dest[( *dest_len )++] = rr->data[rr->off++];
1113             rr->length--;
1114         }

1116         if (*dest_len < dest_maxlen)
1117             goto start; /* fragment was too small */

```

```

1118     }
1119 }

1121 /* s->s3->handshake_fragment_len == 4 iff rr->type == SSL3_RT_HANDSHAK
1122  * s->s3->alert_fragment_len == 2 iff rr->type == SSL3_RT_ALERT.
1123  * (Possibly rr is 'empty' now, i.e. rr->length may be 0.) */

1125 /* If we are a client, check for an incoming 'Hello Request': */
1126 if (!(s->server) &&
1127     (s->s3->handshake_fragment_len >= 4) &&
1128     (s->s3->handshake_fragment[0] == SSL3_MT_HELLO_REQUEST) &&
1129     (s->session != NULL) && (s->session->cipher != NULL))
1130 {
1131     s->s3->handshake_fragment_len = 0;

1133     if ((s->s3->handshake_fragment[1] != 0) ||
1134         (s->s3->handshake_fragment[2] != 0) ||
1135         (s->s3->handshake_fragment[3] != 0))
1136     {
1137         al=SSL_AD_DECODE_ERROR;
1138         SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_BAD_HELLO_REQUEST);
1139         goto f_err;
1140     }

1142     if (s->msg_callback)
1143         s->msg_callback(0, s->version, SSL3_RT_HANDSHAKE, s->s3-

1145     if (SSL_is_init_finished(s) &&
1146         !(s->s3->flags & SSL3_FLAGS_NO_RENEGOTIATE_CIPHERS) &&
1147         !s->s3->renegotiate)
1148     {
1149         ssl3_renegotiate(s);
1150         if (ssl3_renegotiate_check(s))
1151         {
1152             i=s->handshake_func(s);
1153             if (i < 0) return(i);
1154             if (i == 0)
1155             {
1156                 SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_SSL_H
1157                 return(-1);
1158             }

1160             if (!(s->mode & SSL_MODE_AUTO_RETRY))
1161             {
1162                 if (s->s3->rbuf.left == 0) /* no read-ah
1163                 {
1164                     BIO *bio;
1165                     /* In the case where we try to r
1166                     * but we trigger an SSL handsha
1167                     * the retry option set. Otherw
1168                     * cause nasty problems in the b
1169                     s->rwstate=SSL_READING;
1170                     bio=SSL_get_rbio(s);
1171                     BIO_clear_retry_flags(bio);
1172                     BIO_set_retry_read(bio);
1173                     return(-1);
1174                 }
1175             }
1176         }
1177     }

1178     /* we either finished a handshake or ignored the request,
1179     * now try again to obtain the (application) data we were asked
1180     goto start;
1181 }

1182 /* If we are a server and get a client hello when renegotiation isn't
1183  * allowed send back a no renegotiation alert and carry on.

```

```

1184     * WARNING: experimental code, needs reviewing (steve)
1185     */
1186     if (s->server &&
1187         SSL_is_init_finished(s) &&
1188         !s->s3->send_connection_binding &&
1189         (s->version > SSL3_VERSION) &&
1190         (s->s3->handshake_fragment_len >= 4) &&
1191         (s->s3->handshake_fragment[0] == SSL3_MT_CLIENT_HELLO) &&
1192         (s->session != NULL) && (s->session->cipher != NULL) &&
1193         !(s->ctx->options & SSL_OP_ALLOW_UNSAFE_LEGACY_RENEGOTIATION))
1194     {
1195         /*s->s3->handshake_fragment_len = 0;*/
1196         rr->length = 0;
1197         ssl3_send_alert(s, SSL3_AL_WARNING, SSL_AD_NO_RENEGOTIATION);
1198         goto start;
1199     }
1200
1201     if (s->s3->alert_fragment_len >= 2)
1202     {
1203         int alert_level = s->s3->alert_fragment[0];
1204         int alert_descr = s->s3->alert_fragment[1];
1205
1206         s->s3->alert_fragment_len = 0;
1207
1208         if (s->msg_callback)
1209             s->msg_callback(0, s->version, SSL3_RT_ALERT, s->s3->ale
1210
1211         if (s->info_callback != NULL)
1212             cb=s->info_callback;
1213         else if (s->ctx->info_callback != NULL)
1214             cb=s->ctx->info_callback;
1215
1216         if (cb != NULL)
1217         {
1218             j = (alert_level << 8) | alert_descr;
1219             cb(s, SSL_CB_READ_ALERT, j);
1220         }
1221
1222         if (alert_level == 1) /* warning */
1223         {
1224             s->s3->warn_alert = alert_descr;
1225             if (alert_descr == SSL_AD_CLOSE_NOTIFY)
1226             {
1227                 s->shutdown |= SSL_RECEIVED_SHUTDOWN;
1228                 return(0);
1229             }
1230             /* This is a warning but we receive it if we requested
1231              * renegotiation and the peer denied it. Terminate with
1232              * a fatal alert because if application tried to
1233              * renegotiatie it presumably had a good reason and
1234              * expects it to succeed.
1235              *
1236              * In future we might have a renegotiation where we
1237              * don't care if the peer refused it where we carry on.
1238              */
1239             else if (alert_descr == SSL_AD_NO_RENEGOTIATION)
1240             {
1241                 al = SSL_AD_HANDSHAKE_FAILURE;
1242                 SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_NO_RENEGOTIAT
1243                 goto f_err;
1244             }
1245 #ifdef SSL_AD_MISSING_SRP_USERNAME
1246             else if (alert_descr == SSL_AD_MISSING_SRP_USERNAME)
1247                 return(0);
1248 #endif
1249         }

```

```

1250     else if (alert_level == 2) /* fatal */
1251     {
1252         char tmp[16];
1253
1254         s->rwstate=SSL_NOTHING;
1255         s->s3->fatal_alert = alert_descr;
1256         SSLerr(SSL_F_SSL3_READ_BYTES, SSL_AD_REASON_OFFSET + ale
1257         BIO_snprintf(tmp, sizeof tmp, "%d", alert_descr);
1258         ERR_add_error_data(2, "SSL alert number ", tmp);
1259         s->shutdown|=SSL_RECEIVED_SHUTDOWN;
1260         SSL_CTX_remove_session(s->ctx, s->session);
1261         return(0);
1262     }
1263     else
1264     {
1265         al=SSL_AD_ILLEGAL_PARAMETER;
1266         SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_UNKNOWN_ALERT_TYPE);
1267         goto f_err;
1268     }
1269
1270     goto start;
1271 }
1272
1273 if (s->shutdown & SSL_SENT_SHUTDOWN) /* but we have not received a shutd
1274 {
1275     s->rwstate=SSL_NOTHING;
1276     rr->length=0;
1277     return(0);
1278 }
1279
1280 if (rr->type == SSL3_RT_CHANGE_CIPHER_SPEC)
1281 {
1282     /* 'Change Cipher Spec' is just a single byte, so we know
1283      * exactly what the record payload has to look like */
1284     if (
1285         (rr->length != 1) || (rr->off != 0) ||
1286         (rr->data[0] != SSL3_MT_CCS))
1287     {
1288         al=SSL_AD_ILLEGAL_PARAMETER;
1289         SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_BAD_CHANGE_CIPHER_SPE
1290         goto f_err;
1291     }
1292
1293     /* Check we have a cipher to change to */
1294     if (s->s3->tmp.new_cipher == NULL)
1295     {
1296         al=SSL_AD_UNEXPECTED_MESSAGE;
1297         SSLerr(SSL_F_SSL3_READ_BYTES, SSL_R_CCS_RECEIVED_EARLY);
1298         goto f_err;
1299     }
1300
1301     rr->length=0;
1302
1303     if (s->msg_callback)
1304         s->msg_callback(0, s->version, SSL3_RT_CHANGE_CIPHER_SPE
1305
1306     s->s3->change_cipher_spec=1;
1307     if (!ssl3_do_change_cipher_spec(s))
1308         goto err;
1309     else
1310         goto start;
1311 }
1312
1313 /* Unexpected handshake message (Client Hello, or protocol violation) */
1314 if ((s->s3->handshake_fragment_len >= 4) && !s->in_handshake)
1315 {
1316     if (((s->state&SSL_ST_MASK) == SSL_ST_OK) &&

```

```

1316         !((s->s3->flags & SSL3_FLAGS_NO_RENEGOTIATE_CIPHERS))
1317         {
1318 #if 0 /* worked only because C operator preferences are not as expected (and
1319      * because this is not really needed for clients except for detecting
1320      * protocol violations): */
1321         s->state=SSL_ST_BEFORE|(s->server)
1322         ?SSL_ST_ACCEPT
1323         :SSL_ST_CONNECT;
1324 #else
1325         s->state = s->server ? SSL_ST_ACCEPT : SSL_ST_CONNECT;
1326 #endif
1327         s->renegotiate=1;
1328         s->new_session=1;
1329     }
1330     i=s->handshake_func(s);
1331     if (i < 0) return(i);
1332     if (i == 0)
1333     {
1334         SSLerr(SSL_F_SSL3_READ_BYTES,SSL_R_SSL_HANDSHAKE_FAILURE
1335         return(-1);
1336     }

1338     if (!(s->mode & SSL_MODE_AUTO_RETRY))
1339     {
1340         if (s->s3->rbuf.left == 0) /* no read-ahead left? */
1341         {
1342             BIO *bio;
1343             /* In the case where we try to read application
1344             * but we trigger an SSL handshake, we return -1
1345             * the retry option set. Otherwise renegotiatio
1346             * cause nasty problems in the blocking world */
1347             s->rwstate=SSL_READING;
1348             bio=SSL_get_rbio(s);
1349             BIO_clear_retry_flags(bio);
1350             BIO_set_retry_read(bio);
1351             return(-1);
1352         }
1353     }
1354     goto start;
1355 }

1357 switch (rr->type)
1358 {
1359     default:
1360 #ifndef OPENSSL_NO_TLS
1361     /* TLS up to v1.1 just ignores unknown message types:
1362     * TLS v1.2 give an unexpected message alert.
1363     */
1364     if (s->version >= TLS1_VERSION && s->version <= TLS1_1_VERSION)
1365     {
1366         rr->length = 0;
1367         goto start;
1368     }
1369 #endif
1370     al=SSL_AD_UNEXPECTED_MESSAGE;
1371     SSLerr(SSL_F_SSL3_READ_BYTES,SSL_R_UNEXPECTED_RECORD);
1372     goto f_err;
1373 case SSL3_RT_CHANGE_CIPHER_SPEC:
1374 case SSL3_RT_ALERT:
1375 case SSL3_RT_HANDSHAKE:
1376     /* we already handled all of these, with the possible exception
1377     * of SSL3_RT_HANDSHAKE when s->in_handshake is set, but that
1378     * should not happen when type != rr->type */
1379     al=SSL_AD_UNEXPECTED_MESSAGE;
1380     SSLerr(SSL_F_SSL3_READ_BYTES,ERR_R_INTERNAL_ERROR);
1381     goto f_err;

```

```

1382     case SSL3_RT_APPLICATION_DATA:
1383         /* At this point, we were expecting handshake data,
1384         * but have application data. If the library was
1385         * running inside ssl3_read() (i.e. in_read_app_data
1386         * is set) and it makes sense to read application data
1387         * at this point (session renegotiation not yet started),
1388         * we will indulge it.
1389         */
1390         if (s->s3->in_read_app_data &&
1391             (s->s3->total_renegotiations != 0) &&
1392             ((
1393                 (s->state & SSL_ST_CONNECT) &&
1394                 (s->state >= SSL3_ST_CW_CLNT_HELLO_A) &&
1395                 (s->state <= SSL3_ST_CR_SRVR_HELLO_A)
1396             ) || (
1397                 (s->state & SSL_ST_ACCEPT) &&
1398                 (s->state <= SSL3_ST_SW_HELLO_REQ_A) &&
1399                 (s->state >= SSL3_ST_SR_CLNT_HELLO_A)
1400             )))
1401         {
1402             s->s3->in_read_app_data=2;
1403             return(-1);
1404         }
1405     else
1406     {
1407         al=SSL_AD_UNEXPECTED_MESSAGE;
1408         SSLerr(SSL_F_SSL3_READ_BYTES,SSL_R_UNEXPECTED_RECORD);
1409         goto f_err;
1410     }
1411 }
1412 /* not reached */
1413

1415 f_err:
1416     ssl3_send_alert(s,SSL3_AL_FATAL,al);
1417 err:
1418     return(-1);
1419 }

1421 int ssl3_do_change_cipher_spec(SSL *s)
1422 {
1423     int i;
1424     const char *sender;
1425     int slen;

1427     if (s->state & SSL_ST_ACCEPT)
1428         i=SSL3_CHANGE_CIPHER_SERVER_READ;
1429     else
1430         i=SSL3_CHANGE_CIPHER_CLIENT_READ;

1432     if (s->s3->tmp.key_block == NULL)
1433     {
1434         if (s->session == NULL)
1435         {
1436             /* might happen if dtls1_read_bytes() calls this */
1437             SSLerr(SSL_F_SSL3_DO_CHANGE_CIPHER_SPEC,SSL_R_CCES_RECEIV
1438             return (0);
1439         }

1441         s->session->cipher=s->s3->tmp.new_cipher;
1442         if (!s->method->ssl3_enc->setup_key_block(s)) return(0);
1443     }

1445     if (!s->method->ssl3_enc->change_cipher_state(s,i))
1446         return(0);

```



```

1448 /* we have to record the message digest at
1449  * this point so we can get it before we read
1450  * the finished message */
1451 if (s->state & SSL_ST_CONNECT)
1452 {
1453     sender=s->method->ssl3_enc->server_finished_label;
1454     slen=s->method->ssl3_enc->server_finished_label_len;
1455 }
1456 else
1457 {
1458     sender=s->method->ssl3_enc->client_finished_label;
1459     slen=s->method->ssl3_enc->client_finished_label_len;
1460 }
1462 i = s->method->ssl3_enc->final_finish_mac(s,
1463     sender,slen,s->s3->tmp.peer_finish_md);
1464 if (i == 0)
1465 {
1466     SSLerr(SSL_F_SSL3_DO_CHANGE_CIPHER_SPEC, ERR_R_INTERNAL_ERROR);
1467     return 0;
1468 }
1469 s->s3->tmp.peer_finish_md_len = i;
1471 return(1);
1472 }

1474 int ssl3_send_alert(SSL *s, int level, int desc)
1475 {
1476     /* Map tls/ssl alert value to correct one */
1477     desc=s->method->ssl3_enc->alert_value(desc);
1478     if (s->version == SSL3_VERSION && desc == SSL_AD_PROTOCOL_VERSION)
1479         desc = SSL_AD_HANDSHAKE_FAILURE; /* SSL 3.0 does not have protoc
1480     if (desc < 0) return -1;
1481     /* If a fatal one, remove from cache */
1482     if ((level == 2) && (s->session != NULL))
1483         SSL_CTX_remove_session(s->ctx,s->session);
1485     s->s3->alert_dispatch=1;
1486     s->s3->send_alert[0]=level;
1487     s->s3->send_alert[1]=desc;
1488     if (s->s3->wbuf.left == 0) /* data still being written out? */
1489         return s->method->ssl_dispatch_alert(s);
1490     /* else data is still being written out, we will get written
1491     * some time in the future */
1492     return -1;
1493 }

1495 int ssl3_dispatch_alert(SSL *s)
1496 {
1497     int i,j;
1498     void (*cb)(const SSL *ssl,int type,int val)=NULL;
1500     s->s3->alert_dispatch=0;
1501     i = do_ssl3_write(s, SSL3_RT_ALERT, &s->s3->send_alert[0], 2, 0);
1502     if (i <= 0)
1503     {
1504         s->s3->alert_dispatch=1;
1505     }
1506     else
1507     {
1508         /* Alert sent to BIO. If it is important, flush it now.
1509         * If the message does not get sent due to non-blocking IO,
1510         * we will not worry too much. */
1511         if (s->s3->send_alert[0] == SSL3_AL_FATAL)
1512             (void)BIO_flush(s->wbio);

```

```

1514     if (s->msg_callback)
1515         s->msg_callback(1, s->version, SSL3_RT_ALERT, s->s3->sen
1517     if (s->info_callback != NULL)
1518         cb=s->info_callback;
1519     else if (s->ctx->info_callback != NULL)
1520         cb=s->ctx->info_callback;
1522     if (cb != NULL)
1523     {
1524         j=(s->s3->send_alert[0]<<8)|s->s3->send_alert[1];
1525         cb(s,SSL_CB_WRITE_ALERT,j);
1526     }
1527 }
1528 return(i);
1529 }

```

```

*****
91471 Fri May 30 18:32:21 2014
new/usr/src/lib/openssl/libsunw_ssl/s3_srvr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/s3_srvr.c  -*- mode:C; c-file-style: "eay"  -*- */
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4  *
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```

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148 * OTHERWISE.
149 */

151 #define REUSE_CIPHER_BUG
152 #define NETSCAPE_HANG_BUG

154 #include <stdio.h>
155 #include "ssl_locl.h"
156 #include "kssl_lcl.h"
157 #include <openssl/buffer.h>
158 #include <openssl/rand.h>
159 #include <openssl/objects.h>
160 #include <openssl/evp.h>
161 #include <openssl/hmac.h>
162 #include <openssl/x509.h>
163 #ifndef OPENSSL_NO_DH
164 #include <openssl/dh.h>
165 #endif
166 #include <openssl/bn.h>
167 #ifndef OPENSSL_NO_KRB5
168 #include <openssl/krb5_asn.h>
169 #endif
170 #include <openssl/md5.h>

172 static const SSL_METHOD *ssl3_get_server_method(int ver);

174 static const SSL_METHOD *ssl3_get_server_method(int ver)
175 {
176     if (ver == SSL3_VERSION)
177         return(SSLv3_server_method());
178     else
179         return(NULL);
180 }

182 #ifndef OPENSSL_NO_SRP
183 static int ssl_check_srp_ext_ClientHello(SSL *s, int *al)
184 {
185     int ret = SSL_ERROR_NONE;

187     *al = SSL_AD_UNRECOGNIZED_NAME;

189     if ((s->s3->tmp.new_cipher->algorithm_mkey & SSL_KSRP) &&
190         (s->srp_ctx.TLS_ext_srp_username_callback != NULL))
191     {
192         if(s->srp_ctx.login == NULL)
193             {

```

```

194         /* RFC 5054 says SHOULD reject,
195         we do so if there is no srp login name */
196         ret = SSL3_AD_FATAL;
197         *al = SSL_AD_UNKNOWN_PSK_IDENTITY;
198     }
199     else
200     {
201         ret = SSL_srp_server_param_with_username(s,al);
202     }
203 }
204 return ret;
205 }
206 #endif

208 IMPLEMENT_ssl3_meth_func(SSLv3_server_method,
209                          ssl3_accept,
210                          ssl_undefined_function,
211                          ssl3_get_server_method)

213 int ssl3_accept(SSL *s)
214 {
215     BUF_MEM *buf;
216     unsigned long alg_k,Time=(unsigned long)time(NULL);
217     void (*cb)(const SSL *ssl,int type,int val)=NULL;
218     int ret= -1;
219     int new_state,state,skip=0;

221     RAND_add(&Time,sizeof(Time),0);
222     ERR_clear_error();
223     clear_sys_error();

225     if (s->info_callback != NULL)
226         cb=s->info_callback;
227     else if (s->ctx->info_callback != NULL)
228         cb=s->ctx->info_callback;

230     /* init things to blank */
231     s->in_handshake++;
232     if (!SSL_in_init(s) || SSL_in_before(s)) SSL_clear(s);

234     if (s->cert == NULL)
235     {
236         SSLerr(SSL_F_SSL3_ACCEPT,SSL_R_NO_CERTIFICATE_SET);
237         return(-1);
238     }

240 #ifndef OPENSSL_NO_HEARTBEATS
241     /* If we're awaiting a HeartbeatResponse, pretend we
242     * already got and don't await it anymore, because
243     * Heartbeats don't make sense during handshakes anyway.
244     */
245     if (s->tlsext_hb_pending)
246     {
247         s->tlsext_hb_pending = 0;
248         s->tlsext_hb_seq++;
249     }
250 #endif

252     for (;;)
253     {
254         state=s->state;

256         switch (s->state)
257         {
258             case SSL_ST_RENEGOTIATE:
259                 s->renewed=1;

```

```

260      /* s->state=SSL_ST_ACCEPT; */
262      case SSL_ST_BEFORE:
263      case SSL_ST_ACCEPT:
264      case SSL_ST_BEFORE|SSL_ST_ACCEPT:
265      case SSL_ST_OK|SSL_ST_ACCEPT:
267          s->server=1;
268          if (cb != NULL) cb(s, SSL_CB_HANDSHAKE_START,1);
270          if ((s->version>>8) != 3)
271          {
272              SSLerr(SSL_F_SSL3_ACCEPT, ERR_R_INTERNAL_ERROR);
273              return -1;
274          }
275          s->type=SSL_ST_ACCEPT;
277          if (s->init_buf == NULL)
278          {
279              if ((buf=BUF_MEM_new()) == NULL)
280              {
281                  ret= -1;
282                  goto end;
283              }
284              if (!BUF_MEM_grow(buf, SSL3_RT_MAX_PLAIN_LENGTH))
285              {
286                  ret= -1;
287                  goto end;
288              }
289              s->init_buf=buf;
290          }
292          if (!ssl3_setup_buffers(s))
293          {
294              ret= -1;
295              goto end;
296          }
298          s->init_num=0;
299          s->s3->flags &= ~SSL3_FLAGS_SGC_RESTART_DONE;
301          if (s->state != SSL_ST_RENEGOTIATE)
302          {
303              /* Ok, we now need to push on a buffering BIO so
304               * the output is sent in a way that TCP likes :-
305               */
306              if (!ssl_init_wbio_buffer(s,1)) { ret= -1; goto
307              }
308              ssl3_init_finished_mac(s);
309              s->state=SSL3_ST_SR_CLNT_HELLO_A;
310              s->ctx->stats.sess_accept++;
311          }
312          else if (s->s3->send_connection_binding &&
313                  !(s->options & SSL_OP_ALLOW_UNSAFE_LEGACY_RENEGO)
314          {
315              /* Server attempting to renegotiate with
316               * client that doesn't support secure
317               * renegotiation.
318               */
319              SSLerr(SSL_F_SSL3_ACCEPT, SSL_R_UNSAFE_LEGACY_RE
320              ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_HANDSHAKE
321              ret = -1;
322              goto end;
323          }
324          else
325          {

```

```

326      /* s->state == SSL_ST_RENEGOTIATE,
327       * we will just send a HelloRequest */
328      s->ctx->stats.sess_accept_renegotiate++;
329      s->state=SSL3_ST_SW_HELLO_REQ_A;
330      }
331      break;
333      case SSL3_ST_SW_HELLO_REQ_A:
334      case SSL3_ST_SW_HELLO_REQ_B:
336          s->shutdown=0;
337          ret=ssl3_send_hello_request(s);
338          if (ret <= 0) goto end;
339          s->s3->tmp.next_state=SSL3_ST_SW_HELLO_REQ_C;
340          s->state=SSL3_ST_SW_FLUSH;
341          s->init_num=0;
343          ssl3_init_finished_mac(s);
344          break;
346      case SSL3_ST_SW_HELLO_REQ_C:
347          s->state=SSL_ST_OK;
348          break;
350      case SSL3_ST_SR_CLNT_HELLO_A:
351      case SSL3_ST_SR_CLNT_HELLO_B:
352      case SSL3_ST_SR_CLNT_HELLO_C:
354          s->shutdown=0;
355          if (s->rwstate != SSL_X509_LOOKUP)
356          {
357              ret=ssl3_get_client_hello(s);
358              if (ret <= 0) goto end;
359          }
360          #ifndef OPENSSL_NO_SRP
361          {
362              int al;
363              if ((ret = ssl_check_srp_ext_ClientHello(s,&al)) < 0)
364              {
365                  /* callback indicates firther work to be
366                   * s->rwstate=SSL_X509_LOOKUP;
367                   * goto end;
368              }
369              if (ret != SSL_ERROR_NONE)
370              {
371                  ssl3_send_alert(s,SSL3_AL_FATAL,al);
372                  /* This is not really an error but the only mean
373                   * for a client to detect whether srp is support
374                   * if (al != TLS1_AD_UNKNOWN_PSK_IDENTITY)
375                     SSLerr(SSL_F_SSL3_ACCEPT,SSL_R_CLIENTHEL
376                     ret = SSL_TLSEXT_ERR_ALERT_FATAL;
377                     ret= -1;
378                     goto end;
379              }
380          }
381          #endif
383          s->renegotiate = 2;
384          s->state=SSL3_ST_SW_SRVR_HELLO_A;
385          s->init_num=0;
386          break;
388      case SSL3_ST_SW_SRVR_HELLO_A:
389      case SSL3_ST_SW_SRVR_HELLO_B:
390          ret=ssl3_send_server_hello(s);
391          if (ret <= 0) goto end;

```

```

392 #ifndef OPENSSL_NO_TLSEXT
393     if (s->hit)
394     {
395         if (s->tlsext_ticket_expected)
396             s->state=SSL3_ST_SW_SESSION_TICKET_A;
397         else
398             s->state=SSL3_ST_SW_CHANGE_A;
399     }
400 #else
401     if (s->hit)
402         s->state=SSL3_ST_SW_CHANGE_A;
403 #endif
404     else
405         s->state=SSL3_ST_SW_CERT_A;
406     s->init_num=0;
407     break;
408
409     case SSL3_ST_SW_CERT_A:
410     case SSL3_ST_SW_CERT_B:
411         /* Check if it is anon DH or anon ECDH, */
412         /* normal PSK or KRB5 or SRP */
413         if (!(s->s3->tmp.new_cipher->algorithm_auth & SSL_aNULL)
414             && !(s->s3->tmp.new_cipher->algorithm_mkey & SSL
415             && !(s->s3->tmp.new_cipher->algorithm_auth & SSL
416             {
417                 ret=ssl3_send_server_certificate(s);
418                 if (ret <= 0) goto end;
419 #ifndef OPENSSL_NO_TLSEXT
420                 if (s->tlsext_status_expected)
421                     s->state=SSL3_ST_SW_CERT_STATUS_A;
422                 else
423                     s->state=SSL3_ST_SW_KEY_EXCH_A;
424             }
425             else
426             {
427                 skip = 1;
428                 s->state=SSL3_ST_SW_KEY_EXCH_A;
429             }
430 #else
431             }
432             else
433                 skip=1;
434
435             s->state=SSL3_ST_SW_KEY_EXCH_A;
436 #endif
437             s->init_num=0;
438             break;
439
440             case SSL3_ST_SW_KEY_EXCH_A:
441             case SSL3_ST_SW_KEY_EXCH_B:
442                 alg_k = s->s3->tmp.new_cipher->algorithm_mkey;
443
444                 /* clear this, it may get reset by
445                 * send_server_key_exchange */
446                 if ((s->options & SSL_OP_EPHEMERAL_RSA)
447 #ifndef OPENSSL_NO_KRB5
448                     && !(alg_k & SSL_kKRB5)
449 #endif /* OPENSSL_NO_KRB5 */
450                 )
451                     /* option SSL_OP_EPHEMERAL_RSA sends temporary R
452                     * even when forbidden by protocol specs
453                     * (handshake may fail as clients are not requir
454                     * be able to handle this) */
455                     s->s3->tmp.use_rsa_tmp=1;
456             else
457                 s->s3->tmp.use_rsa_tmp=0;

```

```

460         /* only send if a DH key exchange, fortaleza or
461         * RSA but we have a sign only certificate
462         *
463         * PSK: may send PSK identity hints
464         *
465         * For ECC ciphersuites, we send a serverKeyExchange
466         * message only if the cipher suite is either
467         * ECDH-anon or ECDHE. In other cases, the
468         * server certificate contains the server's
469         * public key for key exchange.
470         */
471         if (s->s3->tmp.use_rsa_tmp
472             /* PSK: send ServerKeyExchange if PSK identity
473             * hint if provided */
474 #ifndef OPENSSL_NO_PSK
475             || ((alg_k & SSL_kPSK) && s->ctx->psk_identity_hint)
476 #endif
477 #ifndef OPENSSL_NO_SRP
478             /* SRP: send ServerKeyExchange */
479             || (alg_k & SSL_kSRP)
480 #endif
481             || (alg_k & (SSL_kDh || SSL_kDh || SSL_kEDH))
482             || (alg_k & SSL_kECDH)
483             || (alg_k & SSL_kRSA)
484             && (s->cert->pkeys[SSL_PKEY_RSA_ENC].privatekey
485                 || (SSL_C_IS_EXPORT(s->s3->tmp.new_cipher)
486                     && EVP_PKEY_size(s->cert->pkeys[SSL_PKEY
487                     )
488                 )
489             )
490             {
491                 ret=ssl3_send_server_key_exchange(s);
492                 if (ret <= 0) goto end;
493             }
494         else
495             skip=1;
496
497         s->state=SSL3_ST_SW_CERT_REQ_A;
498         s->init_num=0;
499         break;
500
501     case SSL3_ST_SW_CERT_REQ_A:
502     case SSL3_ST_SW_CERT_REQ_B:
503         if (/* don't request cert unless asked for it: */
504             !(s->verify_mode & SSL_VERIFY_PEER) ||
505             /* if SSL_VERIFY_CLIENT_ONCE is set,
506             * don't request cert during re-negotiation: */
507             ((s->session->peer != NULL) &&
508              (s->verify_mode & SSL_VERIFY_CLIENT_ONCE)) ||
509             /* never request cert in anonymous ciphersuites
510             * (see section "Certificate request" in SSL 3 d
511             * and in RFC 2246): */
512             ((s->s3->tmp.new_cipher->algorithm_auth & SSL_aN
513              /* ... except when the application insists on v
514              * (against the specs, but s3_clnt.c accepts th
515              !(s->verify_mode & SSL_VERIFY_FAIL_IF_NO_PEER_C
516              /* never request cert in Kerberos ciphersuites
517              (s->s3->tmp.new_cipher->algorithm_auth & SSL_aKR
518              /* With normal PSK Certificates and
519              * Certificate Requests are omitted */
520              || (s->s3->tmp.new_cipher->algorithm_mkey & SSL_
521              {
522                 /* no cert request */
523

```

```

524         skip=1;
525         s->s3->tmp.cert_request=0;
526         s->state=SSL3_ST_SW_SRVR_DONE_A;
527         if (s->s3->handshake_buffer)
528             if (!ssl3_digest_cached_records(s))
529                 return -1;
530     }
531     else
532     {
533         s->s3->tmp.cert_request=1;
534         ret=ssl3_send_certificate_request(s);
535         if (ret <= 0) goto end;
536 #ifndef NETSCAPE_HANG_BUG
537         s->state=SSL3_ST_SW_SRVR_DONE_A;
538 #else
539         s->state=SSL3_ST_SW_FLUSH;
540         s->s3->tmp.next_state=SSL3_ST_SR_CERT_A;
541 #endif
542         s->init_num=0;
543     }
544     break;

546 case SSL3_ST_SW_SRVR_DONE_A:
547 case SSL3_ST_SW_SRVR_DONE_B:
548     ret=ssl3_send_server_done(s);
549     if (ret <= 0) goto end;
550     s->s3->tmp.next_state=SSL3_ST_SR_CERT_A;
551     s->state=SSL3_ST_SW_FLUSH;
552     s->init_num=0;
553     break;

554 case SSL3_ST_SW_FLUSH:
555     /* This code originally checked to see if
556      * any data was pending using BIO_CTRL_INFO
557      * and then flushed. This caused problems
558      * as documented in PR#1939. The proposed
559      * fix doesn't completely resolve this issue
560      * as buggy implementations of BIO_CTRL_PENDING
561      * still exist. So instead we just flush
562      * unconditionally.
563      */
564     s->rwstate=SSL_WRITING;
565     if (BIO_flush(s->wbio) <= 0)
566     {
567         ret= -1;
568         goto end;
569     }
570     s->rwstate=SSL_NOTHING;

571     s->state=s->s3->tmp.next_state;
572     break;

573 case SSL3_ST_SR_CERT_A:
574 case SSL3_ST_SR_CERT_B:
575     /* Check for second client hello (MS SGC) */
576     ret = ssl3_check_client_hello(s);
577     if (ret <= 0)
578         goto end;
579     if (ret == 2)
580         s->state = SSL3_ST_SR_CLNT_HELLO_C;
581     else {
582         if (s->s3->tmp.cert_request)
583         {
584             ret=ssl3_get_client_certificate(s);

```

```

590         if (ret <= 0) goto end;
591     }
592     s->init_num=0;
593     s->state=SSL3_ST_SR_KEY_EXCH_A;
594 }
595 break;

597 case SSL3_ST_SR_KEY_EXCH_A:
598 case SSL3_ST_SR_KEY_EXCH_B:
599     ret=ssl3_get_client_key_exchange(s);
600     if (ret <= 0)
601         goto end;
602     if (ret == 2)
603     {
604         /* For the ECDH ciphersuites when
605          * the client sends its ECDH pub key in
606          * a certificate, the CertificateVerify
607          * message is not sent.
608          * Also for GOST ciphersuites when
609          * the client uses its key from the certificate
610          * for key exchange.
611          */
612 #if defined(OPENSSL_NO_TLSEXT) || defined(OPENSSL_NO_NEXTPROTONEG)
613         s->state=SSL3_ST_SR_FINISHED_A;
614 #else
615         if (s->s3->next_proto_neg_seen)
616             s->state=SSL3_ST_SR_NEXT_PROTO_A;
617         else
618             s->state=SSL3_ST_SR_FINISHED_A;
619 #endif
620         s->init_num = 0;
621     }
622     else if (TLS1_get_version(s) >= TLS1_2_VERSION)
623     {
624         s->state=SSL3_ST_SR_CERT_VRFY_A;
625         s->init_num=0;
626         if (!s->session->peer)
627             break;
628         /* For TLS v1.2 freeze the handshake buffer
629          * at this point and digest cached records.
630          */
631         if (!s->s3->handshake_buffer)
632         {
633             SSLerr(SSL_F_SSL3_ACCEPT,ERR_R_INTERNAL
634                 return -1;
635         }
636         s->s3->flags |= TLS1_FLAGS_KEEP_HANDSHAKE;
637         if (!ssl3_digest_cached_records(s))
638             return -1;
639     }
640     else
641     {
642         int offset=0;
643         int dgst_num;

644         s->state=SSL3_ST_SR_CERT_VRFY_A;
645         s->init_num=0;

646         /* We need to get hashes here so if there is
647          * a client cert, it can be verified
648          * FIXME - digest processing for CertificateVeri
649          * should be generalized. But it is next step
650          */
651         if (s->s3->handshake_buffer)
652             if (!ssl3_digest_cached_records(s))
653                 return -1;

```

```

656         for (dgst_num=0; dgst_num<SSL_MAX_DIGEST;dgst_num++)
657             if (s->s3->handshake_dgst[dgst_num])
658                 {
659                     int dgst_size;
660
661                     s->method->ssl3_enc->cert_verify
662                     dgst_size=EVP_MD_CTX_size(s->s3-
663                     if (dgst_size < 0)
664                         {
665                             ret = -1;
666                             goto end;
667                         }
668                     offset+=dgst_size;
669                 }
670             }
671         break;
672
673     case SSL3_ST_SR_CERT_VRFY_A:
674     case SSL3_ST_SR_CERT_VRFY_B:
675
676         /* we should decide if we expected this one */
677         ret=ssl3_get_cert_verify(s);
678         if (ret <= 0) goto end;
679
680 #if defined(OPENSSL_NO_TLSEXT) || defined(OPENSSL_NO_NEXTPROTONEG)
681     s->state=SSL3_ST_SR_FINISHED_A;
682 #else
683     if (s->s3->next_proto_neg_seen)
684         s->state=SSL3_ST_SR_NEXT_PROTO_A;
685     else
686         s->state=SSL3_ST_SR_FINISHED_A;
687 #endif
688     s->init_num=0;
689     break;
690
691 #if !defined(OPENSSL_NO_TLSEXT) && !defined(OPENSSL_NO_NEXTPROTONEG)
692     case SSL3_ST_SR_NEXT_PROTO_A:
693     case SSL3_ST_SR_NEXT_PROTO_B:
694         ret=ssl3_get_next_proto(s);
695         if (ret <= 0) goto end;
696         s->init_num = 0;
697         s->state=SSL3_ST_SR_FINISHED_A;
698         break;
699 #endif
700
701     case SSL3_ST_SR_FINISHED_A:
702     case SSL3_ST_SR_FINISHED_B:
703         ret=ssl3_get_finished(s,SSL3_ST_SR_FINISHED_A,
704         SSL3_ST_SR_FINISHED_B);
705         if (ret <= 0) goto end;
706         if (s->hit)
707             s->state=SSL_ST_OK;
708 #ifndef OPENSSL_NO_TLSEXT
709     else if (s->tlsext_ticket_expected)
710         s->state=SSL3_ST_SW_SESSION_TICKET_A;
711 #endif
712     else
713         s->state=SSL3_ST_SW_CHANGE_A;
714     s->init_num=0;
715     break;
716
717 #ifndef OPENSSL_NO_TLSEXT
718     case SSL3_ST_SW_SESSION_TICKET_A:
719     case SSL3_ST_SW_SESSION_TICKET_B:
720         ret=ssl3_send_newsession_ticket(s);
721         if (ret <= 0) goto end;

```

```

722         s->state=SSL3_ST_SW_CHANGE_A;
723         s->init_num=0;
724         break;
725
726     case SSL3_ST_SW_CERT_STATUS_A:
727     case SSL3_ST_SW_CERT_STATUS_B:
728         ret=ssl3_send_cert_status(s);
729         if (ret <= 0) goto end;
730         s->state=SSL3_ST_SW_KEY_EXCH_A;
731         s->init_num=0;
732         break;
733
734 #endif
735
736     case SSL3_ST_SW_CHANGE_A:
737     case SSL3_ST_SW_CHANGE_B:
738
739         s->session->cipher=s->s3->tmp.new_cipher;
740         if (!s->method->ssl3_enc->setup_key_block(s))
741             { ret= -1; goto end; }
742
743         ret=ssl3_send_change_cipher_spec(s,
744         SSL3_ST_SW_CHANGE_A,SSL3_ST_SW_CHANGE_B);
745
746         if (ret <= 0) goto end;
747         s->state=SSL3_ST_SW_FINISHED_A;
748         s->init_num=0;
749
750         if (!s->method->ssl3_enc->change_cipher_state(s,
751         SSL3_CHANGE_CIPHER_SERVER_WRITE))
752             {
753                 ret= -1;
754                 goto end;
755             }
756
757         break;
758
759     case SSL3_ST_SW_FINISHED_A:
760     case SSL3_ST_SW_FINISHED_B:
761         ret=ssl3_send_finished(s,
762         SSL3_ST_SW_FINISHED_A,SSL3_ST_SW_FINISHED_B,
763         s->method->ssl3_enc->server_finished_label,
764         s->method->ssl3_enc->server_finished_label_len);
765         if (ret <= 0) goto end;
766         s->state=SSL3_ST_SW_FLUSH;
767         if (s->hit)
768             {
769 #if defined(OPENSSL_NO_TLSEXT) || defined(OPENSSL_NO_NEXTPROTONEG)
770                 s->s3->tmp.next_state=SSL3_ST_SR_FINISHED_A;
771 #else
772                 if (s->s3->next_proto_neg_seen)
773                     s->s3->tmp.next_state=SSL3_ST_SR_NEXT_PR
774                 else
775                     s->s3->tmp.next_state=SSL3_ST_SR_FINISHE
776 #endif
777             }
778         else
779             s->s3->tmp.next_state=SSL_ST_OK;
780         s->init_num=0;
781         break;
782
783     case SSL_ST_OK:
784         /* clean a few things up */
785         ssl3_cleanup_key_block(s);
786
787         BUF_MEM_free(s->init_buf);

```

```

888         s->init_buf=NULL;
890
891         /* remove buffering on output */
892         ssl_free_wbio_buffer(s);
893
894         s->init_num=0;
895
896         if (s->renegotiate == 2) /* skipped if we just sent a He
897             {
898                 s->renegotiate=0;
899                 s->new_session=0;
900
901                 ssl_update_cache(s, SSL_SESS_CACHE_SERVER);
902
903                 s->ctx->stats.sess_accept_good++;
904                 /* s->server=1; */
905                 s->handshake_func=ssl3_accept;
906
907                 if (cb != NULL) cb(s,SSL_CB_HANDSHAKE_DONE,1);
908             }
909
910         ret = 1;
911         goto end;
912         /* break; */
913
914     default:
915         SSLerr(SSL_F_SSL3_ACCEPT,SSL_R_UNKNOWN_STATE);
916         ret= -1;
917         goto end;
918         /* break; */
919     }
920
921     if (!s->s3->tmp.reuse_message && !skip)
922     {
923         if (s->debug)
924         {
925             if ((ret=BIO_flush(s->wbio)) <= 0)
926                 goto end;
927         }
928
929         if ((cb != NULL) && (s->state != state))
930         {
931             new_state=s->state;
932             s->state=state;
933             cb(s,SSL_CB_ACCEPT_LOOP,1);
934             s->state=new_state;
935         }
936     }
937     skip=0;
938 }
939
940 end:
941     /* BIO_flush(s->wbio); */
942
943     s->in_handshake--;
944     if (cb != NULL)
945         cb(s,SSL_CB_ACCEPT_EXIT,ret);
946     return(ret);
947 }
948
949 int ssl3_send_hello_request(SSL *s)
950 {
951     unsigned char *p;
952
953     if (s->state == SSL3_ST_SW_HELLO_REQ_A)
954     {

```

```

854         p=(unsigned char *)s->init_buf->data;
855         *(p++)=SSL3_MT_HELLO_REQUEST;
856         *(p++)=0;
857         *(p++)=0;
858         *(p++)=0;
859
860         s->state=SSL3_ST_SW_HELLO_REQ_B;
861         /* number of bytes to write */
862         s->init_num=4;
863         s->init_off=0;
864     }
865
866     /* SSL3_ST_SW_HELLO_REQ_B */
867     return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
868 }
869
870 int ssl3_check_client_hello(SSL *s)
871 {
872     int ok;
873     long n;
874
875     /* this function is called when we really expect a Certificate message,
876        * so permit appropriate message length */
877     n=s->method->ssl_get_message(s,
878         SSL3_ST_SR_CERT_A,
879         SSL3_ST_SR_CERT_B,
880         -1,
881         s->max_cert_list,
882         &ok);
883     if (!ok) return((int)n);
884     s->s3->tmp.reuse_message = 1;
885     if (s->s3->tmp.message_type == SSL3_MT_CLIENT_HELLO)
886     {
887         /* We only allow the client to restart the handshake once per
888            * negotiation. */
889         if (s->s3->flags & SSL3_FLAGS_SGC_RESTART_DONE)
890         {
891             SSLerr(SSL_F_SSL3_CHECK_CLIENT_HELLO, SSL_R_MULTIPLE_SGC);
892             return -1;
893         }
894         /* Throw away what we have done so far in the current handshake,
895            * which will now be aborted. (A full SSL_clear would be too muc
896            #ifndef OPENSSL_NO_DH
897             if (s->s3->tmp.dh != NULL)
898             {
899                 DH_free(s->s3->tmp.dh);
900                 s->s3->tmp.dh = NULL;
901             }
902         #endif
903         #ifndef OPENSSL_NO_ECDH
904             if (s->s3->tmp.ecdh != NULL)
905             {
906                 EC_KEY_free(s->s3->tmp.ecdh);
907                 s->s3->tmp.ecdh = NULL;
908             }
909         #endif
910         s->s3->flags |= SSL3_FLAGS_SGC_RESTART_DONE;
911         return 2;
912     }
913     return 1;
914 }
915
916 int ssl3_get_client_hello(SSL *s)
917 {
918     int i,j,ok,al,ret= -1;
919     unsigned int cookie_len;

```



```

920     long n;
921     unsigned long id;
922     unsigned char *p,*d,*q;
923     SSL_CIPHER *c;
924 #ifndef OPENSSL_NO_COMP
925     SSL_COMP *comp=NULL;
926 #endif
927     STACK_OF(SSL_CIPHER) *ciphers=NULL;

929     /* We do this so that we will respond with our native type.
930      * If we are TLSv1 and we get SSLv3, we will respond with TLSv1,
931      * This down switching should be handled by a different method.
932      * If we are SSLv3, we will respond with SSLv3, even if prompted with
933      * TLSv1.
934      */
935     if (s->state == SSL3_ST_SR_CLNT_HELLO_A
936         )
937     {
938         s->state=SSL3_ST_SR_CLNT_HELLO_B;
939     }
940     s->first_packet=1;
941     n=s->method->ssl_get_message(s,
942         SSL3_ST_SR_CLNT_HELLO_B,
943         SSL3_ST_SR_CLNT_HELLO_C,
944         SSL3_MT_CLIENT_HELLO,
945         SSL3_RT_MAX_PLAIN_LENGTH,
946         &ok);

948     if (!ok) return((int)n);
949     s->first_packet=0;
950     d=p=(unsigned char *)s->init_msg;

952     /* use version from inside client hello, not from record header
953      * (may differ: see RFC 2246, Appendix E, second paragraph) */
954     s->client_version=((int)p[0]<8)|(int)p[1];
955     p+=2;

957     if ((s->version == DTLS1_VERSION && s->client_version > s->version) ||
958         (s->version != DTLS1_VERSION && s->client_version < s->version))
959     {
960         SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_WRONG_VERSION_NUMBER);
961         if ((s->client_version>>8) == SSL3_VERSION_MAJOR &&
962             !s->enc_write_ctx && !s->write_hash)
963         {
964             /* similar to ssl3_get_record, send alert using remote v
965              s->version = s->client_version;
966             }
967             al = SSL_AD_PROTOCOL_VERSION;
968             goto f_err;
969         }

971     /* If we require cookies and this ClientHello doesn't
972      * contain one, just return since we do not want to
973      * allocate any memory yet. So check cookie length...
974      */
975     if (SSL_get_options(s) & SSL_OP_COOKIE_EXCHANGE)
976     {
977         unsigned int session_length, cookie_length;
978
979         session_length = *(p + SSL3_RANDOM_SIZE);
980         cookie_length = *(p + SSL3_RANDOM_SIZE + session_length + 1);

982         if (cookie_length == 0)
983             return 1;
984     }

```

```

986     /* load the client random */
987     memcpy(s->s3->client_random,p,SSL3_RANDOM_SIZE);
988     p+=SSL3_RANDOM_SIZE;

990     /* get the session-id */
991     j= *(p++);

993     s->hit=0;
994     /* Versions before 0.9.7 always allow clients to resume sessions in rene
995      * 0.9.7 and later allow this by default, but optionally ignore resumpti
996      * with flag SSL_OP_NO_SESSION_RESUMPTION_ON_RENEGOTIATION (it's a new f
997      * than a change to default behavior so that applications relying on thi
998      * won't even compile against older library versions).
999      *
1000     * 1.0.1 and later also have a function SSL_renegotiate_abbreviated() to
1001     * renegotiate but not a new session (s->new_session remains unset): f
1002     * this essentially just means that the SSL_OP_NO_SESSION_RESUMPTION_ON_
1003     * setting will be ignored.
1004     */
1005     if ((s->new_session && (s->options & SSL_OP_NO_SESSION_RESUMPTION_ON_REN
1006         )
1007         {
1008             if (!ssl_get_new_session(s,1))
1009                 goto err;
1010         }
1011     else
1012     {
1013         i=ssl_get_prev_session(s, p, j, d + n);
1014         if (i == 1)
1015             /* previous session */
1016             s->hit=1;
1017         else if (i == -1)
1018             goto err;
1019         else /* i == 0 */
1020         {
1021             if (!ssl_get_new_session(s,1))
1022                 goto err;
1023         }
1024     }

1026     p+=j;

1028     if (s->version == DTLS1_VERSION || s->version == DTLS1_BAD_VER)
1029     {
1030         /* cookie stuff */
1031         cookie_len = *(p++);

1033         /*
1034          * The ClientHello may contain a cookie even if the
1035          * HelloVerify message has not been sent--make sure that it
1036          * does not cause an overflow.
1037          */
1038         if ( cookie_len > sizeof(s->d1->rcvd_cookie))
1039         {
1040             /* too much data */
1041             al = SSL_AD_DECODE_ERROR;
1042             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_COOKIE_MISMATCH);
1043             goto f_err;
1044         }

1046         /* verify the cookie if appropriate option is set. */
1047         if ((SSL_get_options(s) & SSL_OP_COOKIE_EXCHANGE) &&
1048             cookie_len > 0)
1049         {
1050             memcpy(s->d1->rcvd_cookie, p, cookie_len);

```

```

1052         if ( s->ctx->app_verify_cookie_cb != NULL)
1053         {
1054             if ( s->ctx->app_verify_cookie_cb(s, s->d1->rcvd
1055                 cookie_len) == 0)
1056             {
1057                 al=SSL_AD_HANDSHAKE_FAILURE;
1058                 SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO,
1059                     SSL_R_COOKIE_MISMATCH);
1060                 goto f_err;
1061             }
1062             /* else cookie verification succeeded */
1063         }
1064         else if ( memcmp(s->d1->rcvd_cookie, s->d1->cookie,
1065             s->d1->cookie_len) != 0) /* de
1066         {
1067             al=SSL_AD_HANDSHAKE_FAILURE;
1068             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO,
1069                 SSL_R_COOKIE_MISMATCH);
1070             goto f_err;
1071         }
1073         ret = 2;
1074     }
1076     p += cookie_len;
1077 }
1079 n2s(p,i);
1080 if ((i == 0) && (j != 0))
1081 {
1082     /* we need a cipher if we are not resuming a session */
1083     al=SSL_AD_ILLEGAL_PARAMETER;
1084     SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_NO_CIPHERS_SPECIFIED);
1085     goto f_err;
1086 }
1087 if ((p+i) >= (d+n))
1088 {
1089     /* not enough data */
1090     al=SSL_AD_DECODE_ERROR;
1091     SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_LENGTH_MISMATCH);
1092     goto f_err;
1093 }
1094 if ((i > 0) && (ssl_bytes_to_cipher_list(s,p,i,&(ciphers))
1095     == NULL))
1096 {
1097     goto err;
1098 }
1099 p+=i;
1101 /* If it is a hit, check that the cipher is in the list */
1102 if ((s->hit) && (i > 0))
1103 {
1104     j=0;
1105     id=s->session->cipher->id;
1107 #ifdef CIPHER_DEBUG
1108     printf("client sent %d ciphers\n",sk_num(ciphers));
1109 #endif
1110     for (i=0; i<sk_SSL_CIPHER_num(ciphers); i++)
1111     {
1112         c=sk_SSL_CIPHER_value(ciphers,i);
1113 #ifdef CIPHER_DEBUG
1114         printf("client [%2d of %2d]:%s\n",
1115             i,sk_num(ciphers),SSL_CIPHER_get_name(c));
1116 #endif
1117         if (c->id == id)

```

```

1118         {
1119             j=1;
1120             break;
1121         }
1122     }
1123     /* Disabled because it can be used in a ciphersuite downgrade
1124     * attack: CVE-2010-4180.
1125     */
1126     #if 0
1127         if (j == 0 && (s->options & SSL_OP_NETSCAPE_REUSE_CIPHER_CHANGE_
1128             /* Special case as client bug workaround: the previously
1129             * not be in the current list, the client instead might
1130             * continue using a cipher that before wasn't chosen due
1131             * preferences. We'll have to reject the connection if
1132             * enabled, though. */
1133             c = sk_SSL_CIPHER_value(ciphers, 0);
1134             if (sk_SSL_CIPHER_find(SSL_get_ciphers(s), c) >= 0)
1135             {
1136                 s->session->cipher = c;
1137                 j = 1;
1138             }
1139         }
1140     #endif
1141     if (j == 0)
1142     {
1143         /* we need to have the cipher in the cipher
1144         * list if we are asked to reuse it */
1145         al=SSL_AD_ILLEGAL_PARAMETER;
1146         SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_REQUIRED_CIPHER
1147             goto f_err;
1148     }
1149 }
1150 }
1152 /* compression */
1153 i= *(p++);
1154 if ((p+i) > (d+n))
1155 {
1156     /* not enough data */
1157     al=SSL_AD_DECODE_ERROR;
1158     SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_LENGTH_MISMATCH);
1159     goto f_err;
1160 }
1161 q=p;
1162 for (j=0; j<i; j++)
1163 {
1164     if (p[j] == 0) break;
1165 }
1167 p+=i;
1168 if (j >= i)
1169 {
1170     /* no compress */
1171     al=SSL_AD_DECODE_ERROR;
1172     SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_NO_COMPRESSION_SPECIFIE
1173     goto f_err;
1174 }
1176 #ifndef OPENSSL_NO_TLSEXT
1177 /* TLS extensions*/
1178 if (s->version >= SSL3_VERSION)
1179 {
1180     if (!ssl_parse_clienthello_tlsext(s,&p,d,n, &al))
1181     {
1182         /* 'al' set by ssl_parse_clienthello_tlsext */
1183         SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_PARSE_TLSEXT);

```

```

1184         goto f_err;
1185     }
1186 }
1187 if (ssl_check_clienthello_tlsext_early(s) <= 0) {
1188     SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO,SSL_R_CLIENTHELLO_TLSEXT)
1189     goto err;
1190 }

1192 /* Check if we want to use external pre-shared secret for this
1193  * handshake for not reused session only. We need to generate
1194  * server_random before calling tls_session_secret_cb in order to allow
1195  * SessionTicket processing to use it in key derivation. */
1196 {
1197     unsigned char *pos;
1198     pos=s->s3->server_random;
1199     if (ssl_fill_hello_random(s, 1, pos, SSL3_RANDOM_SIZE) <= 0)
1200     {
1201         al=SSL_AD_INTERNAL_ERROR;
1202         goto f_err;
1203     }
1204 }

1206 if (!s->hit && s->version >= TLS1_VERSION && s->tls_session_secret_cb)
1207 {
1208     SSL_CIPHER *pref_cipher=NULL;

1210     s->session->master_key_length=sizeof(s->session->master_key);
1211     if(s->tls_session_secret_cb(s, s->session->master_key, &s->sessi
1212     ciphers, &pref_cipher, s->tls_session_secret_cb_arg))
1213     {
1214         s->hit=1;
1215         s->session->ciphers=ciphers;
1216         s->session->verify_result=X509_V_OK;

1218         ciphers=NULL;

1220         /* check if some cipher was preferred by call back */
1221         pref_cipher=pref_cipher ? pref_cipher : ssl_choose_ciph
1222         if (pref_cipher == NULL)
1223         {
1224             al=SSL_AD_HANDSHAKE_FAILURE;
1225             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO,SSL_R_NO_SHAR
1226             goto f_err;
1227         }

1229         s->session->cipher=pref_cipher;

1231         if (s->cipher_list)
1232             sk_SSL_CIPHER_free(s->cipher_list);

1234         if (s->cipher_list_by_id)
1235             sk_SSL_CIPHER_free(s->cipher_list_by_id);

1237         s->cipher_list = sk_SSL_CIPHER_dup(s->session->ciphers);
1238         s->cipher_list_by_id = sk_SSL_CIPHER_dup(s->session->cip
1239     }
1240 }
1241 #endif

1243 /* Worst case, we will use the NULL compression, but if we have other
1244  * options, we will now look for them. We have i-1 compression
1245  * algorithms from the client, starting at q. */
1246 s->s3->tmp.new_compression=NULL;
1247 #ifndef OPENSSL_NO_COMP
1248 /* This only happens if we have a cache hit */
1249 if (s->session->compress_meth != 0)

```

```

1250     {
1251         int m, comp_id = s->session->compress_meth;
1252         /* Perform sanity checks on resumed compression algorithm */
1253         /* Can't disable compression */
1254         if (s->options & SSL_OP_NO_COMPRESSION)
1255         {
1256             al=SSL_AD_INTERNAL_ERROR;
1257             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO,SSL_R_INCONSISTENT_CO
1258             goto f_err;
1259         }
1260         /* Look for resumed compression method */
1261         for (m = 0; m < sk_SSL_COMP_num(s->ctx->comp_methods); m++)
1262         {
1263             comp=sk_SSL_COMP_value(s->ctx->comp_methods,m);
1264             if (comp_id == comp->id)
1265             {
1266                 s->s3->tmp.new_compression=comp;
1267                 break;
1268             }
1269         }
1270         if (s->s3->tmp.new_compression == NULL)
1271         {
1272             al=SSL_AD_INTERNAL_ERROR;
1273             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO,SSL_R_INVALID_COMPRES
1274             goto f_err;
1275         }
1276         /* Look for resumed method in compression list */
1277         for (m = 0; m < i; m++)
1278         {
1279             if (q[m] == comp_id)
1280                 break;
1281         }
1282         if (m >= i)
1283         {
1284             al=SSL_AD_ILLEGAL_PARAMETER;
1285             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO,SSL_R_REQUIRED_COMPRE
1286             goto f_err;
1287         }
1288     }
1289 else if (s->hit)
1290     comp = NULL;
1291 else if (!(s->options & SSL_OP_NO_COMPRESSION) && s->ctx->comp_methods)
1292     /* See if we have a match */
1293     {
1294         int m,nn,o,v,done=0;

1295         nn=sk_SSL_COMP_num(s->ctx->comp_methods);
1296         for (m=0; m<nn; m++)
1297         {
1298             comp=sk_SSL_COMP_value(s->ctx->comp_methods,m);
1299             v=comp->id;
1300             for (o=0; o<i; o++)
1301             {
1302                 if (v == q[o])
1303                 {
1304                     done=1;
1305                     break;
1306                 }
1307             }
1308             if (done) break;
1309         }
1310         if (done)
1311             s->s3->tmp.new_compression=comp;
1312         else
1313             comp=NULL;
1314     }
1315 #else

```

```

1316     /* If compression is disabled we'd better not try to resume a session
1317     * using compression.
1318     */
1319     if (s->session->compress_meth != 0)
1320     {
1321         al=SSL_AD_INTERNAL_ERROR;
1322         SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_INCONSISTENT_COMPRESSIO
1323         goto f_err;
1324     }
1325 #endif

1327     /* Given s->session->ciphers and SSL_get_ciphers, we must
1328     * pick a cipher */

1330     if (!s->hit)
1331     {
1332         #ifdef OPENSSL_NO_COMP
1333             s->session->compress_meth=0;
1334         #else
1335             s->session->compress_meth=(comp == NULL)?0:comp->id;
1336         #endif

1337         if (s->session->ciphers != NULL)
1338             sk_SSL_CIPHER_free(s->session->ciphers);
1339         s->session->ciphers=ciphers;
1340         if (ciphers == NULL)
1341         {
1342             al=SSL_AD_ILLEGAL_PARAMETER;
1343             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_NO_CIPHERS_PASS
1344             goto f_err;
1345         }
1346         ciphers=NULL;
1347         c=ssl3_choose_cipher(s, s->session->ciphers,
1348                             SSL_get_ciphers(s));

1350         if (c == NULL)
1351         {
1352             al=SSL_AD_HANDSHAKE_FAILURE;
1353             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_NO_SHARED_CIPHE
1354             goto f_err;
1355         }
1356         s->s3->tmp.new_cipher=c;
1357     }
1358     else
1359     {
1360         /* Session-id reuse */
1361         #ifdef REUSE_CIPHER_BUG
1362             STACK_OF(SSL_CIPHER) *sk;
1363             SSL_CIPHER *nc=NULL;
1364             SSL_CIPHER *ec=NULL;

1366             if (s->options & SSL_OP_NETSCAPE_DEMO_CIPHER_CHANGE_BUG)
1367             {
1368                 sk=s->session->ciphers;
1369                 for (i=0; i<sk_SSL_CIPHER_num(sk); i++)
1370                 {
1371                     c=sk_SSL_CIPHER_value(sk,i);
1372                     if (c->algorithm_enc & SSL_eNULL)
1373                         nc=c;
1374                     if (SSL_C_IS_EXPORT(c))
1375                         ec=c;
1376                 }
1377                 if (nc != NULL)
1378                     s->s3->tmp.new_cipher=nc;
1379                 else if (ec != NULL)
1380                     s->s3->tmp.new_cipher=ec;
1381                 else

```

```

1382         s->s3->tmp.new_cipher=s->session->cipher;
1383     }
1384     else
1385 #endif
1386         s->s3->tmp.new_cipher=s->session->cipher;
1387     }

1389     if (TLS1_get_version(s) < TLS1_2_VERSION || !(s->verify_mode & SSL_VERIFY
1390     {
1391         if (!ssl3_digest_cached_records(s))
1392         {
1393             al = SSL_AD_INTERNAL_ERROR;
1394             goto f_err;
1395         }
1396     }
1397

1398     /* we now have the following setup.
1399     * client_random
1400     * cipher_list           - our preferred list of ciphers
1401     * ciphers               - the clients preferred list of ciphers
1402     * compression           - basically ignored right now
1403     * ssl version is set    - sslv3
1404     * s->session             - The ssl session has been setup.
1405     * s->hit                 - session reuse flag
1406     * s->tmp.new_cipher      - the new cipher to use.
1407     */

1409     /* Handles TLS extensions that we couldn't check earlier */
1410     if (s->version >= SSL3_VERSION)
1411     {
1412         if (ssl_check_clienthello_tlsext_late(s) <= 0)
1413         {
1414             SSLerr(SSL_F_SSL3_GET_CLIENT_HELLO, SSL_R_CLIENTHELLO_TL
1415             goto err;
1416         }
1417     }

1419     if (ret < 0) ret=1;
1420     if (0)
1421     {
1422         f_err:
1423             ssl3_send_alert(s, SSL3_AL_FATAL, al);
1424         }
1425     err:
1426         if (ciphers != NULL) sk_SSL_CIPHER_free(ciphers);
1427         return(ret);
1428     }

1430     int ssl3_send_server_hello(SSL *s)
1431     {
1432         unsigned char *buf;
1433         unsigned char *p,*d;
1434         int i,sl;
1435         unsigned long l;

1437         if (s->state == SSL3_ST_SW_SRVR_HELLO_A)
1438         {
1439             buf=(unsigned char *)s->init_buf->data;
1440             #ifdef OPENSSL_NO_TLSEXT
1441             p=s->s3->server_random;
1442             if (ssl_fill_hello_random(s, 1, p, SSL3_RANDOM_SIZE) <= 0)
1443                 return -1;
1444             #endif

1445             /* Do the message type and length last */
1446             d=p+ &(buf[4]);

```

```

1448      *(p++)=s->version>>8;
1449      *(p++)=s->version&0xff;

1451      /* Random stuff */
1452      memcpy(p,s->s3->server_random,SSL3_RANDOM_SIZE);
1453      p+=SSL3_RANDOM_SIZE;

1455      /* There are several cases for the session ID to send
1456      * back in the server hello:
1457      * - For session reuse from the session cache,
1458      *   we send back the old session ID.
1459      * - If stateless session reuse (using a session ticket)
1460      *   is successful, we send back the client's "session ID"
1461      *   (which doesn't actually identify the session).
1462      * - If it is a new session, we send back the new
1463      *   session ID.
1464      * - However, if we want the new session to be single-use,
1465      *   we send back a 0-length session ID.
1466      * s->hit is non-zero in either case of session reuse,
1467      * so the following won't overwrite an ID that we're supposed
1468      * to send back.
1469      */
1470      if (!(s->ctx->session_cache_mode & SSL_SESS_CACHE_SERVER)
1471          && !s->hit)
1472          s->session->session_id_length=0;

1474      sl=s->session->session_id_length;
1475      if (sl > (int)sizeof(s->session->session_id))
1476          {
1477              SSLerr(SSL_F_SSL3_SEND_SERVER_HELLO, ERR_R_INTERNAL_ERROR);
1478              return -1;
1479          }
1480      *(p++)=sl;
1481      memcpy(p,s->session->session_id,sl);
1482      p+=sl;

1484      /* put the cipher */
1485      i=ssl3_put_cipher_by_char(s->s3->tmp.new_cipher,p);
1486      p+=i;

1488      /* put the compression method */
1489      #ifdef OPENSSL_NO_COMP
1490          *(p++)=0;
1491      #else
1492          if (s->s3->tmp.new_compression == NULL)
1493              *(p++)=0;
1494          else
1495              *(p++)=s->s3->tmp.new_compression->id;
1496      #endif
1497      #ifndef OPENSSL_NO_TLSEXT
1498          if (ssl_prepare_serverhello_tlsext(s) <= 0)
1499          {
1500              SSLerr(SSL_F_SSL3_SEND_SERVER_HELLO,SSL_R_SERVERHELLO_TL
1501              return -1;
1502          }
1503          if ((p = ssl_add_serverhello_tlsext(s, p, buf+SSL3_RT_MAX_PLAIN_
1504          {
1505              SSLerr(SSL_F_SSL3_SEND_SERVER_HELLO,ERR_R_INTERNAL_ERROR
1506              return -1;
1507          }
1508      #endif

1509      /* do the header */
1510      l=(p-d);
1511      d=buf;
1512      *(d++)=SSL3_MT_SERVER_HELLO;
1513      l2n3(l,d);

```

```

1515      s->state=SSL3_ST_SW_SRVR_HELLO_B;
1516      /* number of bytes to write */
1517      s->init_num=p-buf;
1518      s->init_off=0;
1519      }

1521      /* SSL3_ST_SW_SRVR_HELLO_B */
1522      return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
1523      }

1525      int ssl3_send_server_done(SSL *s)
1526      {
1527          unsigned char *p;

1529          if (s->state == SSL3_ST_SW_SRVR_DONE_A)
1530          {
1531              p=(unsigned char *)s->init_buf->data;

1533              /* do the header */
1534              *(p++)=SSL3_MT_SERVER_DONE;
1535              *(p++)=0;
1536              *(p++)=0;
1537              *(p++)=0;

1539              s->state=SSL3_ST_SW_SRVR_DONE_B;
1540              /* number of bytes to write */
1541              s->init_num=4;
1542              s->init_off=0;
1543              }

1545              /* SSL3_ST_SW_SRVR_DONE_B */
1546              return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
1547              }

1549      int ssl3_send_server_key_exchange(SSL *s)
1550      {
1551      #ifndef OPENSSL_NO_RSA
1552          unsigned char *q;
1553          int j,num;
1554          RSA *rsa;
1555          unsigned char md_buf[MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH];
1556          unsigned int u;
1557      #endif
1558      #ifndef OPENSSL_NO_DH
1559          DH *dh=NULL,*dhp;
1560      #endif
1561      #ifndef OPENSSL_NO_ECDH
1562          EC_KEY *ecdh=NULL,*ecdhp;
1563          unsigned char *encodedPoint = NULL;
1564          int encodedlen = 0;
1565          int curve_id = 0;
1566          BN_CTX *bn_ctx = NULL;
1567      #endif
1568          EVP_PKEY *pkey;
1569          const EVP_MD *md = NULL;
1570          unsigned char *p,*d;
1571          int al,i;
1572          unsigned long type;
1573          int n;
1574          CERT *cert;
1575          BIGNUM *r[4];
1576          int nr[4],kn;
1577          BUF_MEM *buf;
1578          EVP_MD_CTX md_ctx;

```

```

1580     EVP_MD_CTX_init(&md_ctx);
1581     if (s->state == SSL3_ST_SW_KEY_EXCH_A)
1582     {
1583         type=s->s3->tmp.new_cipher->algorithm_mkey;
1584         cert=s->cert;

1586         buf=s->init_buf;

1588         r[0]=r[1]=r[2]=r[3]=NULL;
1589         n=0;
1590 #ifndef OPENSSL_NO_RSA
1591         if (type & SSL_kRSA)
1592         {
1593             rsa=cert->rsa_tmp;
1594             if ((rsa == NULL) && (s->cert->rsa_tmp_cb != NULL))
1595             {
1596                 rsa=s->cert->rsa_tmp_cb(s,
1597                     SSL_C_IS_EXPORT(s->s3->tmp.new_cipher),
1598                     SSL_C_EXPORT_PKEYLENGTH(s->s3->tmp.new_cip
1599             if (rsa == NULL)
1600             {
1601                 al=SSL_AD_HANDSHAKE_FAILURE;
1602                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHAN
1603                     goto f_err;
1604             }
1605             RSA_up_ref(rsa);
1606             cert->rsa_tmp=rsa;
1607         }
1608         if (rsa == NULL)
1609         {
1610             al=SSL_AD_HANDSHAKE_FAILURE;
1611             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,SSL_R
1612                 goto f_err;
1613         }
1614         r[0]=rsa->n;
1615         r[1]=rsa->e;
1616         s->s3->tmp.use_rsa_tmp=1;
1617     }
1618     else
1619 #endif
1620 #ifndef OPENSSL_NO_DH
1621     if (type & SSL_kEDH)
1622     {
1623         dhp=cert->dh_tmp;
1624         if ((dhp == NULL) && (s->cert->dh_tmp_cb != NULL))
1625         {
1626             dhp=s->cert->dh_tmp_cb(s,
1627                 SSL_C_IS_EXPORT(s->s3->tmp.new_cipher),
1628                 SSL_C_EXPORT_PKEYLENGTH(s->s3->tmp.new_cip
1629         if (dhp == NULL)
1630         {
1631             al=SSL_AD_HANDSHAKE_FAILURE;
1632             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,SSL_R
1633                 goto f_err;
1634         }
1635         if (s->s3->tmp.dh != NULL)
1636         {
1637             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, ERR_
1638                 goto err;
1639         }

1641         if ((dh=DHparams_dup(dhp)) == NULL)
1642         {
1643             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,ERR_R
1644                 goto err;
1645         }

```

```

1647         s->s3->tmp.dh=dh;
1648         if ((dhp->pub_key == NULL ||
1649             dhp->priv_key == NULL ||
1650             (s->options & SSL_OP_SINGLE_DH_USE)))
1651         {
1652             if (!DH_generate_key(dh))
1653             {
1654                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,
1655                     ERR_R_DH_LIB);
1656                 goto err;
1657             }
1658         }
1659     else
1660     {
1661         dh->pub_key=BN_dup(dhp->pub_key);
1662         dh->priv_key=BN_dup(dhp->priv_key);
1663         if ((dh->pub_key == NULL) ||
1664             (dh->priv_key == NULL))
1665         {
1666             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHAN
1667                 goto err;
1668         }
1669     }
1670     r[0]=dh->p;
1671     r[1]=dh->q;
1672     r[2]=dh->pub_key;
1673 }
1674     else
1675 #endif
1676 #ifndef OPENSSL_NO_ECDH
1677     if (type & SSL_kECDH)
1678     {
1679         const EC_GROUP *group;

1681         ecdhp=cert->ecdh_tmp;
1682         if ((ecdh == NULL) && (s->cert->ecdh_tmp_cb != NULL))
1683         {
1684             ecdhp=s->cert->ecdh_tmp_cb(s,
1685                 SSL_C_IS_EXPORT(s->s3->tmp.new_cipher),
1686                 SSL_C_EXPORT_PKEYLENGTH(s->s3->tmp.new_cip
1687         if (ecdh == NULL)
1688         {
1689             al=SSL_AD_HANDSHAKE_FAILURE;
1690             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,SSL_R
1691                 goto f_err;
1692         }
1693         if (s->s3->tmp.ecdh != NULL)
1694         {
1695             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, ERR_
1696                 goto err;
1697         }

1699         /* Duplicate the ECDH structure. */
1700         if (ecdh == NULL)
1701         {
1702             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,ERR_R
1703                 goto err;
1704         }
1705         if ((ecdh = EC_KEY_dup(ecdhp)) == NULL)
1706         {
1707             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,ERR_R
1708                 goto err;
1709         }
1710         goto err;
1711     }

```

```

1713         s->s3->tmp.ecdh=ecdh;
1714         if ((EC_KEY_get0_public_key(ecdh) == NULL) ||
1715             (EC_KEY_get0_private_key(ecdh) == NULL) ||
1716             (s->options & SSL_OP_SINGLE_ECDH_USE))
1717             {
1718                 if (!EC_KEY_generate_key(ecdh))
1719                 {
1720                     SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, E
1721                         goto err;
1722                 }
1723             }

1725         if (((group = EC_KEY_get0_group(ecdh)) == NULL) ||
1726             (EC_KEY_get0_public_key(ecdh) == NULL) ||
1727             (EC_KEY_get0_private_key(ecdh) == NULL))
1728             {
1729                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, ERR_R
1730                     goto err;
1731             }

1733         if (SSL_C_IS_EXPORT(s->s3->tmp.new_cipher) &&
1734             (EC_GROUP_get_degree(group) > 163))
1735             {
1736                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, SSL_R
1737                     goto err;
1738             }

1740         /* XXX: For now, we only support ephemeral ECDH
1741            * keys over named (not generic) curves. For
1742            * supported named curves, curve_id is non-zero.
1743            */
1744         if ((curve_id =
1745             tls1_ec_nid2curve_id(EC_GROUP_get_curve_name(group))
1746             == 0)
1747             {
1748                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, SSL_R
1749                     goto err;
1750             }

1752         /* Encode the public key.
1753            * First check the size of encoding and
1754            * allocate memory accordingly.
1755            */
1756         encodedlen = EC_POINT_point2oct(group,
1757             EC_KEY_get0_public_key(ecdh),
1758             POINT_CONVERSION_UNCOMPRESSED,
1759             NULL, 0, NULL);

1761         encodedPoint = (unsigned char *)
1762             OPENSSL_malloc(encodedlen*sizeof(unsigned char));
1763         bn_ctx = BN_CTX_new();
1764         if ((encodedPoint == NULL) || (bn_ctx == NULL))
1765             {
1766                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, ERR_R
1767                     goto err;
1768             }

1771         encodedlen = EC_POINT_point2oct(group,
1772             EC_KEY_get0_public_key(ecdh),
1773             POINT_CONVERSION_UNCOMPRESSED,
1774             encodedPoint, encodedlen, bn_ctx);

1776         if (encodedlen == 0)
1777             {

```

```

1778             SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, ERR_R
1779                 goto err;
1780             }

1782         BN_CTX_free(bn_ctx); bn_ctx=NULL;

1784         /* XXX: For now, we only support named (not
1785            * generic) curves in ECDH ephemeral key exchanges.
1786            * In this situation, we need four additional bytes
1787            * to encode the entire ServerECDHParams
1788            * structure.
1789            */
1790         n = 4 + encodedlen;

1792         /* We'll generate the serverKeyExchange message
1793            * explicitly so we can set these to NULLs
1794            */
1795         r[0]=NULL;
1796         r[1]=NULL;
1797         r[2]=NULL;
1798         r[3]=NULL;
1799     }
1800     else
1801         #endif /* !OPENSSL_NO_ECDH */
1802         #ifndef OPENSSL_NO_PSK
1803             if (type & SSL_kPSK)
1804             {
1805                 /* reserve size for record length and PSK identi
1806                 n+=2+strlen(s->ctx->psk_identity_hint);
1807             }
1808         else
1809             #endif /* !OPENSSL_NO_PSK */
1810             #ifndef OPENSSL_NO_SRP
1811                 if (type & SSL_kSRP)
1812                 {
1813                     if ((s->srp_ctx.N == NULL) ||
1814                         (s->srp_ctx.g == NULL) ||
1815                         (s->srp_ctx.s == NULL) ||
1816                         (s->srp_ctx.B == NULL))
1817                     {
1818                         SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, SSL_R
1819                             goto err;
1820                     }

1821                     r[0]=s->srp_ctx.N;
1822                     r[1]=s->srp_ctx.g;
1823                     r[2]=s->srp_ctx.s;
1824                     r[3]=s->srp_ctx.B;
1825                 }
1826             else
1827                 #endif
1828                 {
1829                     al=SSL_AD_HANDSHAKE_FAILURE;
1830                     SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, SSL_R_UNKNOWN
1831                         goto f_err;
1832                 }
1833             for (i=0; i < 4 && r[i] != NULL; i++)
1834             {
1835                 nr[i]=BN_num_bytes(r[i]);
1836             #ifndef OPENSSL_NO_SRP
1837                 if ((i == 2) && (type & SSL_kSRP))
1838                     n+=1+nr[i];
1839             else
1840                 #endif
1841                 n+=2+nr[i];
1842             }

```

```

1844     if (!(s->s3->tmp.new_cipher->algorithm_auth & SSL_aNULL)
1845         && !(s->s3->tmp.new_cipher->algorithm_mkey & SSL_kPSK))
1846     {
1847         if ((pkey=ssl_get_sign_pkey(s, s->s3->tmp.new_cipher, &md)
1848             == NULL)
1849             {
1850                 al=SSL_AD_DECODE_ERROR;
1851                 goto f_err;
1852             }
1853         kn=EVP_PKEY_size(pkey);
1854     }
1855     else
1856     {
1857         pkey=NULL;
1858         kn=0;
1859     }
1861     if (!BUF_MEM_grow_clean(buf, n+4+kn))
1862     {
1863         SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE, ERR_LIB_BUF);
1864         goto err;
1865     }
1866     d=(unsigned char *)s->init_buf->data;
1867     p=&(d[4]);
1869     for (i=0; i < 4 && r[i] != NULL; i++)
1870     {
1871 #ifndef OPENSSSL_NO_SRP
1872         if ((i == 2) && (type & SSL_kSRP))
1873         {
1874             *p = nr[i];
1875             p++;
1876         }
1877     }
1878 #endif
1879     s2n(nr[i], p);
1880     BN_bn2bin(r[i], p);
1881     p+=nr[i];
1882 }
1884 #ifndef OPENSSSL_NO_ECDH
1885     if (type & SSL_kECDH)
1886     {
1887         /* XXX: For now, we only support named (not generic) cur
1888          * In this situation, the serverKeyExchange message has:
1889          * [1 byte CurveType], [2 byte CurveName]
1890          * [1 byte length of encoded point], followed by
1891          * the actual encoded point itself
1892          */
1893         *p = NAMED_CURVE_TYPE;
1894         p += 1;
1895         *p = 0;
1896         p += 1;
1897         *p = curve_id;
1898         p += 1;
1899         *p = encodedlen;
1900         p += 1;
1901         memcpy((unsigned char*)p,
1902              (unsigned char *)encodedPoint,
1903              encodedlen);
1904         OPENSSL_free(encodedPoint);
1905         encodedPoint = NULL;
1906         p += encodedlen;
1907     }
1908 #endif

```

```

1910 #ifndef OPENSSSL_NO_PSK
1911     if (type & SSL_kPSK)
1912     {
1913         /* copy PSK identity hint */
1914         s2n(strlen(s->ctx->psk_identity_hint), p);
1915         strncpy((char *)p, s->ctx->psk_identity_hint, strlen(s->
1916             p+=strlen(s->ctx->psk_identity_hint);
1917     }
1918 #endif
1920     /* not anonymous */
1921     if (pkey != NULL)
1922     {
1923         /* n is the length of the params, they start at &(d[4])
1924          * and p points to the space at the end. */
1925 #ifndef OPENSSSL_NO_RSA
1926         if (pkey->type == EVP_PKEY_RSA
1927             && TLS1_get_version(s) < TLS1_2_VERSION)
1928         {
1929             q=md_buf;
1930             j=0;
1931             for (num=2; num > 0; num--)
1932             {
1933                 EVP_MD_CTX_set_flags(&md_ctx,
1934                     EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
1935                 EVP_DigestInit_ex(&md_ctx, (num == 2)
1936                     ?s->ctx->md5:s->ctx->sha1, NULL)
1937                 EVP_DigestUpdate(&md_ctx, &(s->s3->client
1938                     EVP_DigestUpdate(&md_ctx, &(s->s3->server
1939                     EVP_DigestUpdate(&md_ctx, &(d[4]), n);
1940                     EVP_DigestFinal_ex(&md_ctx, q,
1941                         (unsigned int *)&i);
1942                 q+=i;
1943                 j+=i;
1944             }
1945             if (RSA_sign(NID_md5_sha1, md_buf, j,
1946                 &(p[2]), &u, pkey->pkey.rsa) <= 0)
1947             {
1948                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHAN
1949                     goto err;
1950             }
1951             s2n(u, p);
1952             n+=u+2;
1953         }
1954     }
1955 #endif
1956     else
1957     {
1958         if (md)
1959         {
1960             /* For TLS1.2 and later send signature
1961              * algorithm */
1962             if (TLS1_get_version(s) >= TLS1_2_VERSION)
1963             {
1964                 if (!tls12_get_sigandhash(p, pkey, md))
1965                 {
1966                     /* Should never happen */
1967                     al=SSL_AD_INTERNAL_ERROR;
1968                     SSLerr(SSL_F_SSL3_SEND_SERVER_KEY
1969                         goto f_err;
1970                 }
1971                 p+=2;
1972             }
1973             fprintf(stderr, "Using hash %s\n",
1974                 EVP_MD_name(md));
1975             EVP_SignInit_ex(&md_ctx, md, NULL);

```



```

1976         EVP_SignUpdate(&md_ctx,&(s->s3->client_random[0]
1977         EVP_SignUpdate(&md_ctx,&(s->s3->server_random[0]
1978         EVP_SignUpdate(&md_ctx,&(d[4]),n);
1979         if (!EVP_SignFinal(&md_ctx,&(p[2]),
1980             (unsigned int *)&i,pkey))
1981             {
1982                 SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHAN
1983                 goto err;
1984             }
1985         s2n(i,p);
1986         n+=i+2;
1987         if (TLS1_get_version(s) >= TLS1_2_VERSION)
1988             n+= 2;
1989     }
1990     else
1991     {
1992         /* Is this error check actually needed? */
1993         al=SSL_AD_HANDSHAKE_FAILURE;
1994         SSLerr(SSL_F_SSL3_SEND_SERVER_KEY_EXCHANGE,SSL_R
1995         goto f_err;
1996     }
1997 }

1999     *(d++)=SSL3_MT_SERVER_KEY_EXCHANGE;
2000     l2n3(n,d);

2002     /* we should now have things packed up, so lets send
2003     * it off */
2004     s->init_num=n+4;
2005     s->init_off=0;
2006 }

2008     s->state = SSL3_ST_SW_KEY_EXCH_B;
2009     EVP_MD_CTX_cleanup(&md_ctx);
2010     return(ssl3_do_write(s,SSL3_RT_HANDSHAKE));
2011 f_err:
2012     ssl3_send_alert(s,SSL3_AL_FATAL,al);
2013 err:
2014 #ifndef OPENSSL_NO_ECDH
2015     if (encodedPoint != NULL) OPENSSL_free(encodedPoint);
2016     BN_CTX_free(bn_ctx);
2017 #endif
2018     EVP_MD_CTX_cleanup(&md_ctx);
2019     return(-1);
2020 }

2022 int ssl3_send_certificate_request(SSL *s)
2023 {
2024     unsigned char *p,*d;
2025     int i,j,nl,off,n;
2026     STACK_OF(X509_NAME) *sk=NULL;
2027     X509_NAME *name;
2028     BUF_MEM *buf;

2030     if (s->state == SSL3_ST_SW_CERT_REQ_A)
2031     {
2032         buf=s->init_buf;

2034         d=p=(unsigned char *)&(buf->data[4]);

2036         /* get the list of acceptable cert types */
2037         p++;
2038         n=ssl3_get_req_cert_type(s,p);
2039         d[0]=n;
2040         p+=n;
2041         n++;

```

```

2043         if (TLS1_get_version(s) >= TLS1_2_VERSION)
2044         {
2045             nl = tls12_get_req_sig_algs(s, p + 2);
2046             s2n(nl, p);
2047             p += nl + 2;
2048             n += nl + 2;
2049         }

2051         off=n;
2052         p+=2;
2053         n+=2;

2055         sk=SSL_get_client_CA_list(s);
2056         nl=0;
2057         if (sk != NULL)
2058         {
2059             for (i=0; i<sk_X509_NAME_num(sk); i++)
2060             {
2061                 name=sk_X509_NAME_value(sk,i);
2062                 j=i2d_X509_NAME(name,NULL);
2063                 if (!BUF_MEM_grow_clean(buf,4+n+j+2))
2064                     {
2065                         SSLerr(SSL_F_SSL3_SEND_CERTIFICATE_REQUE
2066                         goto err;
2067                     }
2068                 p=(unsigned char *)&(buf->data[4+n]);
2069                 if (!{s->options & SSL_OP_NETSCAPE_CA_DN_BUG})
2070                 {
2071                     s2n(j,p);
2072                     i2d_X509_NAME(name,&p);
2073                     n+=2+j;
2074                     nl+=2+j;
2075                 }
2076             }
2077         }
2078         else
2079         {
2080             d=p;
2081             i2d_X509_NAME(name,&p);
2082             j-=2; s2n(j,d); j+=2;
2083             n+=j;
2084             nl+=j;
2085         }
2086     }
2087     /* else no CA names */
2088     p=(unsigned char *)&(buf->data[4+off]);
2089     s2n(nl,p);

2090     d=(unsigned char *)buf->data;
2091     *(d++)=SSL3_MT_CERTIFICATE_REQUEST;
2092     l2n3(n,d);

2094     /* we should now have things packed up, so lets send
2095     * it off */

2097     s->init_num=n+4;
2098     s->init_off=0;
2099 #ifdef NETSCAPE_HANG_BUG
2100     p=(unsigned char *)s->init_buf->data + s->init_num;

2102     /* do the header */
2103     *(p++)=SSL3_MT_SERVER_DONE;
2104     *(p++)=0;
2105     *(p++)=0;
2106     *(p++)=0;
2107     s->init_num += 4;

```

```

2108 #endif
2110         s->state = SSL3_ST_SW_CERT_REQ_B;
2111     }
2113     /* SSL3_ST_SW_CERT_REQ_B */
2114     return(ssl3_do_write(s, SSL3_RT_HANDSHAKE));
2115 err:
2116     return(-1);
2117 }
2119 int ssl3_get_client_key_exchange(SSL *s)
2120 {
2121     int i,al,ok;
2122     long n;
2123     unsigned long alg_k;
2124     unsigned char *p;
2125 #ifndef OPENSSL_NO_RSA
2126     RSA *rsa=NULL;
2127     EVP_PKEY *pkey=NULL;
2128 #endif
2129 #ifndef OPENSSL_NO_DH
2130     BIGNUM *pub=NULL;
2131     DH *dh_srvr;
2132 #endif
2133 #ifndef OPENSSL_NO_KRB5
2134     KSSL_ERR kssl_err;
2135 #endif /* OPENSSL_NO_KRB5 */
2137 #ifndef OPENSSL_NO_ECDH
2138     EC_KEY *srvr_ecdh = NULL;
2139     EVP_PKEY *clnt_pub_pkey = NULL;
2140     EC_POINT *clnt_ecpoint = NULL;
2141     BN_CTX *bn_ctx = NULL;
2142 #endif
2144     n=s->method->ssl_get_message(s,
2145     SSL3_ST_SR_KEY_EXCH_A,
2146     SSL3_ST_SR_KEY_EXCH_B,
2147     SSL3_MT_CLIENT_KEY_EXCHANGE,
2148     2048, /* ??? */
2149     &ok);
2151     if (!ok) return((int)n);
2152     p=(unsigned char *)s->init_msg;
2154     alg_k=s->s3->tmp.new_cipher->algorithm_mkey;
2156 #ifndef OPENSSL_NO_RSA
2157     if (alg_k & SSL_KRSA)
2158     {
2159         /* FIX THIS UP EAY EAY EAY EAY */
2160         if (s->s3->tmp.use_rsa_tmp)
2161         {
2162             if ((s->cert != NULL) && (s->cert->rsa_tmp != NULL))
2163                 rsa=s->cert->rsa_tmp;
2164             /* Don't do a callback because rsa_tmp should
2165              * be sent already */
2166             if (rsa == NULL)
2167             {
2168                 al=SSL_AD_HANDSHAKE_FAILURE;
2169                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2170                 goto f_err;
2172             }
2173         }

```

```

2174     else
2175     {
2176         pkey=s->cert->pkeys[SSL_PKEY_RSA_ENC].privatekey;
2177         if ( (pkey == NULL) ||
2178             (pkey->type != EVP_PKEY_RSA) ||
2179             (pkey->pkey.rsa == NULL))
2180         {
2181             al=SSL_AD_HANDSHAKE_FAILURE;
2182             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2183             goto f_err;
2184         }
2185         rsa=pkey->pkey.rsa;
2186     }
2188     /* TLS and [incidentally] DTLS{0xFEFF} */
2189     if (s->version > SSL3_VERSION && s->version != DTLS1_BAD_VER)
2190     {
2191         n2s(p,i);
2192         if (n != i+2)
2193         {
2194             if (!(s->options & SSL_OP_TLS_D5_BUG))
2195             {
2196                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANG
2197                 goto err;
2198             }
2199             else
2200                 p-=2;
2201         }
2202         else
2203             n=i;
2204     }
2206     i=RSA_private_decrypt((int)n,p,p,rsa,RSA_PKCS1_PADDING);
2208     al = -1;
2209     if (i != SSL_MAX_MASTER_KEY_LENGTH)
2210     {
2211         al=SSL_AD_DECODE_ERROR;
2212         /* SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_BAD_R
2213     }
2216     if ((al == -1) && !((p[0] == (s->client_version>>8)) && (p[1] ==
2217     {
2218         /* The premaster secret must contain the same version nu
2219         * ClientHello to detect version rollback attacks (stran
2220         * protocol does not offer such protection for DH cipher
2221         * However, buggy clients exist that send the negotiated
2222         * version instead if the server does not support the re
2223         * protocol version.
2224         * If SSL_OP_TLS_ROLLBACK_BUG is set, tolerate such clie
2225         if (!((s->options & SSL_OP_TLS_ROLLBACK_BUG) &&
2226             (p[0] == (s->version>>8)) && (p[1] == (s->versio
2227         {
2228             al=SSL_AD_DECODE_ERROR;
2229             /* SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL
2231         /* The Klima-Pokorny-Rosa extension of Bleichenb
2232         * (http://eprint.iacr.org/2003/052/) exploits t
2233         * number check as a "bad version oracle" -- an
2234         * reveal that the plaintext corresponding to so
2235         * made up by the adversary is properly formatte
2236         * that the version number is wrong. To avoid s
2237         * we should treat this just like any other decr
2238         }
2239     }

```

```

2241         if (al != -1)
2242             {
2243                 /* Some decryption failure -- use random value instead a
2244                  * against Bleichenbacher's attack on PKCS #1 v1.5 RSA p
2245                  * (see RFC 2246, section 7.4.7.1). */
2246                 ERR_clear_error();
2247                 i = SSL_MAX_MASTER_KEY_LENGTH;
2248                 p[0] = s->client_version >> 8;
2249                 p[1] = s->client_version & 0xff;
2250                 if (RAND_pseudo_bytes(p+2, i-2) <= 0) /* should be RAND_
2251                    goto err;
2252             }
2253
2254         s->session->master_key_length=
2255             s->method->ssl3_enc->generate_master_secret(s,
2256                 s->session->master_key,
2257                 p,i);
2258         OPENSSL_cleanse(p,i);
2259     }
2260     else
2261 #endif
2262 #ifndef OPENSSL_NO_DH
2263     if (alg_k & (SSL_kEDH|SSL_kDhR|SSL_kDHd))
2264     {
2265         n2s(p,i);
2266         if (n != i+2)
2267             {
2268                 if (!(s->options & SSL_OP_SSLEAY_080_CLIENT_DH_BUG))
2269                     {
2270                         SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2271                             goto err;
2272                     }
2273                 else
2274                 {
2275                     p-=2;
2276                     i=(int)n;
2277                 }
2278             }
2279
2280         if (n == 0L) /* the parameters are in the cert */
2281         {
2282             al=SSL_AD_HANDSHAKE_FAILURE;
2283             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_UNABLE_T
2284                 goto f_err;
2285         }
2286         else
2287         {
2288             if (s->s3->tmp.dh == NULL)
2289             {
2290                 al=SSL_AD_HANDSHAKE_FAILURE;
2291                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2292                     goto f_err;
2293             }
2294             else
2295                 dh_srvr=s->s3->tmp.dh;
2296         }
2297
2298         pub=BN_bin2bn(p,i,NULL);
2299         if (pub == NULL)
2300         {
2301             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_BN_LIB);
2302             goto err;
2303         }
2304
2305         i=DH_compute_key(p,pub,dh_srvr);

```

```

2307         if (i <= 0)
2308             {
2309                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,ERR_R_DH_LIB);
2310                 BN_clear_free(pub);
2311                 goto err;
2312             }
2313
2314         DH_free(s->s3->tmp.dh);
2315         s->s3->tmp.dh=NULL;
2316
2317         BN_clear_free(pub);
2318         pub=NULL;
2319         s->session->master_key_length=
2320             s->method->ssl3_enc->generate_master_secret(s,
2321                 s->session->master_key,p,i);
2322         OPENSSL_cleanse(p,i);
2323     }
2324     else
2325 #endif
2326 #ifndef OPENSSL_NO_KRB5
2327     if (alg_k & SSL_kKRB5)
2328     {
2329         krb5_error_code      krb5rc;
2330         krb5_data            enc_ticket;
2331         krb5_data            authenticator;
2332         krb5_data            enc_pms;
2333         KSSL_CTX             *kssl_ctx = s->kssl_ctx;
2334         EVP_CIPHER_CTX       ciph_ctx;
2335         const EVP_CIPHER     *enc = NULL;
2336         unsigned char        iv[EVP_MAX_IV_LENGTH];
2337         unsigned char        pms[SSL_MAX_MASTER_KEY_LENGTH
2338                               + EVP_MAX_BLOCK_LENGTH];
2339         int                  padl, outl;
2340         krb5_timestamp       authtime = 0;
2341         krb5_ticket_times    ttimes;
2342
2343         EVP_CIPHER_CTX_init(&ciph_ctx);
2344
2345         if (!kssl_ctx) kssl_ctx = kssl_ctx_new();
2346
2347         n2s(p,i);
2348         enc_ticket.length = i;
2349
2350         if (n < (long)(enc_ticket.length + 6))
2351             {
2352                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2353                     SSL_R_DATA_LENGTH_TOO_LONG);
2354                 goto err;
2355             }
2356
2357         enc_ticket.data = (char *)p;
2358         p+=enc_ticket.length;
2359
2360         n2s(p,i);
2361         authenticator.length = i;
2362
2363         if (n < (long)(enc_ticket.length + authenticator.length + 6))
2364             {
2365                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2366                     SSL_R_DATA_LENGTH_TOO_LONG);
2367                 goto err;
2368             }
2369
2370         authenticator.data = (char *)p;
2371         p+=authenticator.length;

```

```

2373         n2s(p,i);
2374         enc_pms.length = i;
2375         enc_pms.data = (char *)p;
2376         p+=enc_pms.length;

2378         /* Note that the length is checked again below,
2379         ** after decryption
2380         */
2381         if(enc_pms.length > sizeof pms)
2382         {
2383             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2384                   SSL_R_DATA_LENGTH_TOO_LONG);
2385             goto err;
2386         }

2388         if (n != (long)(enc_ticket.length + authenticator.length +
2389                        enc_pms.length + 6))
2390         {
2391             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2392                   SSL_R_DATA_LENGTH_TOO_LONG);
2393             goto err;
2394         }

2396         if ((krb5rc = kssl_sget_tkt(kssl_ctx, &enc_ticket, &ttimes,
2397                                    &kssl_err)) != 0)
2398         {
2399             #ifdef KSSL_DEBUG
2400                 printf("kssl_sget_tkt rtn %d [%d]\n",
2401                       krb5rc, kssl_err.reason);
2402                 if (kssl_err.text)
2403                     printf("kssl_err text= %s\n", kssl_err.text);
2404             #endif /* KSSL_DEBUG */
2405             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2406                   kssl_err.reason);
2407             goto err;
2408         }

2410         /* Note: no authenticator is not considered an error,
2411         ** but will return authtime == 0.
2412         */
2413         if ((krb5rc = kssl_check_authent(kssl_ctx, &authenticator,
2414                                          &authtime, &kssl_err)) != 0)
2415         {
2416             #ifdef KSSL_DEBUG
2417                 printf("kssl_check_authent rtn %d [%d]\n",
2418                       krb5rc, kssl_err.reason);
2419                 if (kssl_err.text)
2420                     printf("kssl_err text= %s\n", kssl_err.text);
2421             #endif /* KSSL_DEBUG */
2422             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2423                   kssl_err.reason);
2424             goto err;
2425         }

2427         if ((krb5rc = kssl_validate_times(authtime, &ttimes)) != 0)
2428         {
2429             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE, krb5rc);
2430             goto err;
2431         }

2433         #ifdef KSSL_DEBUG
2434             kssl_ctx_show(kssl_ctx);
2435         #endif /* KSSL_DEBUG */

2437         enc = kssl_map_enc(kssl_ctx->enctype);

```

```

2438         if (enc == NULL)
2439             goto err;

2441         memset(iv, 0, sizeof iv); /* per RFC 1510 */

2443         if (!EVP_DecryptInit_ex(&ciph_ctx, enc, NULL, kssl_ctx->key, iv))
2444         {
2445             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2446                   SSL_R_DECRYPTION_FAILED);
2447             goto err;
2448         }
2449         if (!EVP_DecryptUpdate(&ciph_ctx, pms, &outl,
2450                                (unsigned char *)enc_pms.data, enc_pms.l
2451                                ))
2452         {
2453             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2454                   SSL_R_DECRYPTION_FAILED);
2455             goto err;
2456         }
2457         if (outl > SSL_MAX_MASTER_KEY_LENGTH)
2458         {
2459             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2460                   SSL_R_DATA_LENGTH_TOO_LONG);
2461             goto err;
2462         }
2463         if (!EVP_DecryptFinal_ex(&ciph_ctx, &(pms[outl]), &padl))
2464         {
2465             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2466                   SSL_R_DECRYPTION_FAILED);
2467             goto err;
2468         }
2469         outl += padl;
2470         if (outl > SSL_MAX_MASTER_KEY_LENGTH)
2471         {
2472             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2473                   SSL_R_DATA_LENGTH_TOO_LONG);
2474             goto err;
2475         }
2476         if (!((pms[0] == (s->client_version>>8)) && (pms[1] == (s->clien
2477         {
2478             /* The premaster secret must contain the same version number
2479             * ClientHello to detect version rollback attacks (strangely
2480             * protocol does not offer such protection for DH ciphersuit
2481             * However, buggy clients exist that send random bytes inste
2482             * the protocol version.
2483             * If SSL_OP_TLS_ROLLBACK_BUG is set, tolerate such clients.
2484             * (Perhaps we should have a separate BUG value for the Kerb
2485             */
2486             if (!(s->options & SSL_OP_TLS_ROLLBACK_BUG))
2487             {
2488                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2489                       SSL_AD_DECODE_ERROR);
2490                 goto err;
2491             }
2492         }

2493         EVP_CIPHER_CTX_cleanup(&ciph_ctx);

2495         s->session->master_key_length=
2496             s->method->ssl3_enc->generate_master_secret(s,
2497             s->session->master_key, pms, outl);

2499         if (kssl_ctx->client_princ)
2500         {
2501             size_t len = strlen(kssl_ctx->client_princ);
2502             if ( len < SSL_MAX_KRB5_PRINCIPAL_LENGTH )
2503                 {

```

```

2504         s->session->krb5_client_princ_len = len;
2505         memcpy(s->session->krb5_client_princ, kssl_ctx->c
2506             }
2507
2510     /* Was doing kssl_ctx_free() here,
2511     ** but it caused problems for apache.
2512     ** kssl_ctx = kssl_ctx_free(kssl_ctx);
2513     ** if (s->kssl_ctx) s->kssl_ctx = NULL;
2514     */
2515     }
2516     else
2517 #endif /* OPENSSSL_NO_KRB5 */
2518
2519 #ifndef OPENSSSL_NO_ECDH
2520     if (alg_k & (SSL_kEECDH|SSL_kECDHr|SSL_kECDHe))
2521     {
2522         int ret = 1;
2523         int field_size = 0;
2524         const EC_KEY *tkey;
2525         const EC_GROUP *group;
2526         const BIGNUM *priv_key;
2527
2528         /* initialize structures for server's ECDH key pair */
2529         if ((srvr_ecdh = EC_KEY_new()) == NULL)
2530         {
2531             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2532                 ERR_R_MALLOC_FAILURE);
2533             goto err;
2534         }
2535
2536         /* Let's get server private key and group information */
2537         if (alg_k & (SSL_kECDHr|SSL_kECDHe))
2538         {
2539             /* use the certificate */
2540             tkey = s->cert->pkeys[SSL_PKEY_ECC].privatekey->pkey.ec;
2541         }
2542         else
2543         {
2544             /* use the ephemeral values we saved when
2545             * generating the ServerKeyExchange msg.
2546             */
2547             tkey = s->s3->tmp.ecdh;
2548         }
2549
2550         group = EC_KEY_get0_group(tkey);
2551         priv_key = EC_KEY_get0_private_key(tkey);
2552
2553         if (!EC_KEY_set_group(srvr_ecdh, group) ||
2554             !EC_KEY_set_private_key(srvr_ecdh, priv_key))
2555         {
2556             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2557                 ERR_R_EC_LIB);
2558             goto err;
2559         }
2560
2561         /* Let's get client's public key */
2562         if ((clnt_ecpoint = EC_POINT_new(group)) == NULL)
2563         {
2564             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2565                 ERR_R_MALLOC_FAILURE);
2566             goto err;
2567         }
2568
2569         if (n == 0L)

```

```

2570     {
2571         /* Client Publickey was in Client Certificate */
2572
2573         if (alg_k & SSL_kEECDH)
2574         {
2575             al=SSL_AD_HANDSHAKE_FAILURE;
2576             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE, SSL_R
2577                 goto f_err;
2578         }
2579         if (((clnt_pub_pkey=X509_get_pubkey(s->session->peer))
2580             == NULL) ||
2581             (clnt_pub_pkey->type != EVP_PKEY_EC))
2582         {
2583             /* XXX: For now, we do not support client
2584             * authentication using ECDH certificates
2585             * so this branch (n == 0L) of the code is
2586             * never executed. When that support is
2587             * added, we ought to ensure the key
2588             * received in the certificate is
2589             * authorized for key agreement.
2590             * ECDH_compute_key implicitly checks that
2591             * the two ECDH shares are for the same
2592             * group.
2593             */
2594             al=SSL_AD_HANDSHAKE_FAILURE;
2595             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2596                 SSL_R_UNABLE_TO_DECODE_ECDH_CERTS);
2597             goto f_err;
2598         }
2599
2600         if (EC_POINT_copy(clnt_ecpoint,
2601             EC_KEY_get0_public_key(clnt_pub_pkey->pkey.ec)) == 0
2602         {
2603             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2604                 ERR_R_EC_LIB);
2605             goto err;
2606         }
2607         ret = 2; /* Skip certificate verify processing */
2608     }
2609     else
2610     {
2611         /* Get client's public key from encoded point
2612         * in the ClientKeyExchange message.
2613         */
2614         if ((bn_ctx = BN_CTX_new()) == NULL)
2615         {
2616             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2617                 ERR_R_MALLOC_FAILURE);
2618             goto err;
2619         }
2620
2621         /* Get encoded point length */
2622         i = *p;
2623         p += 1;
2624         if (n != 1 + i)
2625         {
2626             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2627                 ERR_R_EC_LIB);
2628             goto err;
2629         }
2630         if (EC_POINT_oct2point(group,
2631             clnt_ecpoint, p, i, bn_ctx) == 0)
2632         {
2633             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2634                 ERR_R_EC_LIB);
2635             goto err;

```

```

2636         }
2637         /* p is pointing to somewhere in the buffer
2638          * currently, so set it to the start
2639          */
2640         p=(unsigned char *)s->init_buf->data;
2641     }

2643     /* Compute the shared pre-master secret */
2644     field_size = EC_GROUP_get_degree(group);
2645     if (field_size <= 0)
2646     {
2647         SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2648             ERR_R_ECDH_LIB);
2649         goto err;
2650     }
2651     i = ECDH_compute_key(p, (field_size+7)/8, clnt_ecpoint, srvr_ecd
2652     if (i <= 0)
2653     {
2654         SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2655             ERR_R_ECDH_LIB);
2656         goto err;
2657     }

2659     EVP_PKEY_free(clnt_pub_pkey);
2660     EC_POINT_free(clnt_ecpoint);
2661     EC_KEY_free(srvr_ecdh);
2662     BN_CTX_free(bn_ctx);
2663     EC_KEY_free(s->s3->tmp.ecdh);
2664     s->s3->tmp.ecdh = NULL;

2666     /* Compute the master secret */
2667     s->session->master_key_length = s->method->ssl3_enc-> \
2668         generate_master_secret(s, s->session->master_key, p, i);

2669     OPENSSL_cleanse(p, i);
2670     return (ret);
2671 }
2672
2673 else
2674 #endif
2675 #ifndef OPENSSL_NO_PSK
2676     if (alg_k & SSL_kPSK)
2677     {
2678         unsigned char *t = NULL;
2679         unsigned char psk_or_pre_ms[PSK_MAX_PSK_LEN*2+4];
2680         unsigned int pre_ms_len = 0, psk_len = 0;
2681         int psk_err = 1;
2682         char tmp_id[PSK_MAX_IDENTITY_LEN+1];

2684         al=SSL_AD_HANDSHAKE_FAILURE;

2686         n2s(p,i);
2687         if (n != i+2)
2688         {
2689             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2690                 SSL_R_LENGTH_MISMATCH);
2691             goto psk_err;
2692         }
2693         if (i > PSK_MAX_IDENTITY_LEN)
2694         {
2695             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2696                 SSL_R_DATA_LENGTH_TOO_LONG);
2697             goto psk_err;
2698         }
2699         if (s->psk_server_callback == NULL)
2700         {
2701             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,

```

```

2702             SSL_R_PSK_NO_SERVER_CB);
2703             goto psk_err;
2704         }

2706         /* Create guaranteed NULL-terminated identity
2707          * string for the callback */
2708         memcpy(tmp_id, p, i);
2709         memset(tmp_id+i, 0, PSK_MAX_IDENTITY_LEN+1-i);
2710         psk_len = s->psk_server_callback(s, tmp_id,
2711             psk_or_pre_ms, sizeof(psk_or_pre_ms));
2712         OPENSSL_cleanse(tmp_id, PSK_MAX_IDENTITY_LEN+1);

2714         if (psk_len > PSK_MAX_PSK_LEN)
2715         {
2716             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2717                 ERR_R_INTERNAL_ERROR);
2718             goto psk_err;
2719         }
2720         else if (psk_len == 0)
2721         {
2722             /* PSK related to the given identity not found */
2723             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2724                 SSL_R_PSK_IDENTITY_NOT_FOUND);
2725             al=SSL_AD_UNKNOWN_PSK_IDENTITY;
2726             goto psk_err;
2727         }

2729         /* create PSK pre_master_secret */
2730         pre_ms_len=2+psk_len+2+psk_len;
2731         t = psk_or_pre_ms;
2732         memmove(psk_or_pre_ms+psk_len+4, psk_or_pre_ms, psk_len)
2733         s2n(psk_len, t);
2734         memset(t, 0, psk_len);
2735         t+=psk_len;
2736         s2n(psk_len, t);

2738         if (s->session->psk_identity != NULL)
2739             OPENSSL_free(s->session->psk_identity);
2740         s->session->psk_identity = BUF_strdup((char *)p);
2741         if (s->session->psk_identity == NULL)
2742         {
2743             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2744                 ERR_R_MALLOC_FAILURE);
2745             goto psk_err;
2746         }

2748         if (s->session->psk_identity_hint != NULL)
2749             OPENSSL_free(s->session->psk_identity_hint);
2750         s->session->psk_identity_hint = BUF_strdup(s->ctx->psk_i
2751         if (s->ctx->psk_identity_hint != NULL &&
2752             s->session->psk_identity_hint == NULL)
2753         {
2754             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2755                 ERR_R_MALLOC_FAILURE);
2756             goto psk_err;
2757         }

2759         s->session->master_key_length=
2760             s->method->ssl3_enc->generate_master_secret(s,
2761                 s->session->master_key, psk_or_pre_ms, p
2762         psk_err = 0;
2763     psk_err:
2764         OPENSSL_cleanse(psk_or_pre_ms, sizeof(psk_or_pre_ms));
2765         if (psk_err != 0)
2766             goto f_err;
2767     }

```

```

2768         else
2769     #endif
2770     #ifndef OPENSSL_NO_SRP
2771         if (alg_k & SSL_kSRP)
2772         {
2773             int param_len;
2774
2775             n2s(p,i);
2776             param_len=i+2;
2777             if (param_len > n)
2778             {
2779                 al=SSL_AD_DECODE_ERROR;
2780                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2781                     goto f_err;
2782             }
2783             if (!(s->srp_ctx.A=BN_bin2bn(p,i,NULL)))
2784             {
2785                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,ERR_R_
2786                     goto err;
2787             }
2788             if (s->session->srp_username != NULL)
2789                 OPENSSL_free(s->session->srp_username);
2790             s->session->srp_username = BUF_strdup(s->srp_ctx.login);
2791             if (s->session->srp_username == NULL)
2792             {
2793                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2794                     ERR_R_MALLOC_FAILURE);
2795                 goto err;
2796             }
2797
2798             if ((s->session->master_key_length = SRP_generate_server
2799                 {
2800                     SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,ERR_R_
2801                         goto err;
2802                 }
2803
2804             p+=i;
2805         }
2806     else
2807     #endif /* OPENSSL_NO_SRP */
2808     if (alg_k & SSL_kGOST)
2809     {
2810         int ret = 0;
2811         EVP_PKEY_CTX *pkey_ctx;
2812         EVP_PKEY *client_pub_pkey = NULL, *pk = NULL;
2813         unsigned char premaster_secret[32], *start;
2814         size_t outlen=32, inlen;
2815         unsigned long alg_a;
2816
2817         /* Get our certificate private key*/
2818         alg_a = s->s3->tmp.new_cipher->algorithm_auth;
2819         if (alg_a & SSL_aGOST94)
2820             pk = s->cert->pkeys[SSL_PKEY_GOST94].privatekey;
2821         else if (alg_a & SSL_aGOST01)
2822             pk = s->cert->pkeys[SSL_PKEY_GOST01].privatekey;
2823
2824         pkey_ctx = EVP_PKEY_CTX_new(pk,NULL);
2825         EVP_PKEY_decrypt_init(pkey_ctx);
2826         /* If client certificate is present and is of the same t
2827          * use it for key exchange. Don't mind errors from
2828          * EVP_PKEY_derive_set_peer, because it is completely va
2829          * a client certificate for authorization only. */
2830         client_pub_pkey = X509_get_pubkey(s->session->peer);
2831         if (client_pub_pkey)
2832         {
2833             if (EVP_PKEY_derive_set_peer(pkey_ctx, client_pu

```

```

2834             ERR_clear_error();
2835         }
2836         /* Decrypt session key */
2837         if ((*p!= ( V_ASN1_SEQUENCE| V_ASN1_CONSTRUCTED)))
2838         {
2839             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2840                 goto gerr;
2841         }
2842         if (p[1] == 0x81)
2843         {
2844             start = p+3;
2845             inlen = p[2];
2846         }
2847         else if (p[1] < 0x80)
2848         {
2849             start = p+2;
2850             inlen = p[1];
2851         }
2852         else
2853         {
2854             SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2855                 goto gerr;
2856         }
2857         if (EVP_PKEY_decrypt(pkey_ctx,premaster_secret,&outlen,s
2858
2859             {
2860                 SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,SSL_R_
2861                     goto gerr;
2862             }
2863         /* Generate master secret */
2864         s->session->master_key_length=
2865             s->method->ssl3_enc->generate_master_secret(s,
2866                 s->session->master_key,premaster_secret,
2867         /* Check if pubkey from client certificate was used */
2868         if (EVP_PKEY_CTX_ctrl(pkey_ctx, -1, -1, EVP_PKEY_CTRL_PE
2869             ret = 2;
2870         else
2871             ret = 1;
2872
2873         gerr:
2874         EVP_PKEY_free(client_pub_pkey);
2875         EVP_PKEY_CTX_free(pkey_ctx);
2876         if (ret)
2877             return ret;
2878         else
2879             goto err;
2880     }
2881     {
2882         al=SSL_AD_HANDSHAKE_FAILURE;
2883         SSLerr(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE,
2884             SSL_R_UNKNOWN_CIPHER_TYPE);
2885         goto f_err;
2886     }
2887
2888     return(1);
2889 f_err:
2890     ssl3_send_alert(s,SSL3_AL_FATAL,al);
2891     #if !defined(OPENSSL_NO_DH) || !defined(OPENSSL_NO_RSA) || !defined(OPENSSL_NO_E
2892     err:
2893     #endif
2894     #ifndef OPENSSL_NO_ECDH
2895         EVP_PKEY_free(clnt_pub_pkey);
2896         EC_POINT_free(clnt_ecpoint);
2897         if (srvr_ecdh != NULL)
2898             EC_KEY_free(srvr_ecdh);
2899         BN_CTX_free(bn_ctx);

```

```

2900 #endif
2901     return(-1);
2902 }

2904 int ssl3_get_cert_verify(SSL *s)
2905 {
2906     EVP_PKEY *pkey=NULL;
2907     unsigned char *p;
2908     int al,ok,ret=0;
2909     long n;
2910     int type=0,i,j;
2911     X509 *peer;
2912     const EVP_MD *md = NULL;
2913     EVP_MD_CTX mctx;
2914     EVP_MD_CTX_init(&mctx);

2916     n=s->method->ssl_get_message(s,
2917         SSL3_ST_SR_CERT_VRFY_A,
2918         SSL3_ST_SR_CERT_VRFY_B,
2919         -1,
2920         516, /* Enough for 4096 bit RSA key with TLS v1.2 */
2921         &ok);

2923     if (!ok) return((int)n);

2925     if (s->session->peer != NULL)
2926     {
2927         peer=s->session->peer;
2928         pkey=X509_get_pubkey(peer);
2929         type=X509_certificate_type(peer,pkey);
2930     }
2931     else
2932     {
2933         peer=NULL;
2934         pkey=NULL;
2935     }

2937     if (s->s3->tmp.message_type != SSL3_MT_CERTIFICATE_VERIFY)
2938     {
2939         s->s3->tmp.reuse_message=1;
2940         if ((peer != NULL) && (type & EVP_PKT_SIGN))
2941         {
2942             al=SSL_AD_UNEXPECTED_MESSAGE;
2943             SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_MISSING_VERIFY_M
2944                 goto f_err;
2945         }
2946         ret=1;
2947         goto end;
2948     }

2950     if (peer == NULL)
2951     {
2952         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_NO_CLIENT_CERT_RECEIVED)
2953         al=SSL_AD_UNEXPECTED_MESSAGE;
2954         goto f_err;
2955     }

2957     if (!(type & EVP_PKT_SIGN))
2958     {
2959         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_SIGNATURE_FOR_NON_SIGNIN
2960         al=SSL_AD_ILLEGAL_PARAMETER;
2961         goto f_err;
2962     }

2964     if (s->s3->change_cipher_spec)
2965     {

```

```

2966         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_CCS_RECEIVED_EARLY);
2967         al=SSL_AD_UNEXPECTED_MESSAGE;
2968         goto f_err;
2969     }

2971     /* we now have a signature that we need to verify */
2972     p=(unsigned char *)s->init_msg;
2973     /* Check for broken implementations of GOST ciphersuites */
2974     /* If key is GOST and n is exactly 64, it is bare
2975     * signature without length field */
2976     if (n==64 && (pkey->type==NID_id_GostR3410_94 ||
2977         pkey->type == NID_id_GostR3410_2001) )
2978     {
2979         i=64;
2980     }
2981     else
2982     {
2983         if (TLS1_get_version(s) >= TLS1_2_VERSION)
2984         {
2985             int sigalg = tls12_get_sigid(pkey);
2986             /* Should never happen */
2987             if (sigalg == -1)
2988             {
2989                 SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,ERR_R_INTERNAL
2990                 al=SSL_AD_INTERNAL_ERROR;
2991                 goto f_err;
2992             }
2993             /* Check key type is consistent with signature */
2994             if (sigalg != (int)p[1])
2995             {
2996                 SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_WRONG_SI
2997                 al=SSL_AD_DECODE_ERROR;
2998                 goto f_err;
2999             }
3000             md = tls12_get_hash(p[0]);
3001             if (md == NULL)
3002             {
3003                 SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_UNKNOWN_
3004                 al=SSL_AD_DECODE_ERROR;
3005                 goto f_err;
3006             }
3007             #ifdef SSL_DEBUG
3008             fprintf(stderr, "USING TLSv1.2 HASH %s\n", EVP_MD_name(md));
3009             #endif

3010             p += 2;
3011             n -= 2;
3012         }
3013         n2s(p,i);
3014         n-=2;
3015         if (i > n)
3016         {
3017             SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_LENGTH_MISMATCH)
3018             al=SSL_AD_DECODE_ERROR;
3019             goto f_err;
3020         }
3021     }
3022     j=EVP_PKEY_size(pkey);
3023     if ((i > j) || (n > j) || (n <= 0))
3024     {
3025         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,SSL_R_WRONG_SIGNATURE_SIZE);
3026         al=SSL_AD_DECODE_ERROR;
3027         goto f_err;
3028     }

3030     if (TLS1_get_version(s) >= TLS1_2_VERSION)
3031     {

```



```

3032     long hdataalen = 0;
3033     void *hdata;
3034     hdataalen = BIO_get_mem_data(s->s3->handshake_buffer, &hdata);
3035     if (hdataalen <= 0)
3036     {
3037         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY, ERR_R_INTERNAL_ERROR)
3038         al=SSL_AD_INTERNAL_ERROR;
3039         goto f_err;
3040     }
3041 #ifdef SSL_DEBUG
3042     fprintf(stderr, "Using TLS 1.2 with client verify alg %s\n",
3043             EVP_MD_name(md));
3044 #endif
3045     if (!EVP_VerifyInit_ex(&mctx, md, NULL)
3046         || !EVP_VerifyUpdate(&mctx, hdata, hdataalen))
3047     {
3048         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY, ERR_R_EVP_LIB);
3049         al=SSL_AD_INTERNAL_ERROR;
3050         goto f_err;
3051     }
3052
3053     if (EVP_VerifyFinal(&mctx, p, i, pkey) <= 0)
3054     {
3055         al=SSL_AD_DECRYPT_ERROR;
3056         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY, SSL_R_BAD_SIGNATURE);
3057         goto f_err;
3058     }
3059 }
3060 else
3061 #ifndef OPENSAL_NO_RSA
3062 if (pkey->type == EVP_PKEY_RSA)
3063 {
3064     i=RSA_verify(NID_md5_sha1, s->s3->tmp.cert_verify_md,
3065                 MD5_DIGEST_LENGTH+SHA_DIGEST_LENGTH, p, i,
3066                 pkey->pkey.rsa);
3067     if (i < 0)
3068     {
3069         al=SSL_AD_DECRYPT_ERROR;
3070         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY, SSL_R_BAD_RSA_DECRYPT)
3071         goto f_err;
3072     }
3073     if (i == 0)
3074     {
3075         al=SSL_AD_DECRYPT_ERROR;
3076         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY, SSL_R_BAD_RSA_SIGNATUR
3077         goto f_err;
3078     }
3079 }
3080 else
3081 #endif
3082 #ifndef OPENSAL_NO_DSA
3083 if (pkey->type == EVP_PKEY_DSA)
3084 {
3085     j=DSA_verify(pkey->save_type,
3086                 &(s->s3->tmp.cert_verify_md[MD5_DIGEST_LENGTH]),
3087                 SHA_DIGEST_LENGTH, p, i, pkey->pkey.dsa);
3088     if (j <= 0)
3089     {
3090         /* bad signature */
3091         al=SSL_AD_DECRYPT_ERROR;
3092         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY, SSL_R_BAD_DSA_SIGNATUR
3093         goto f_err;
3094     }
3095 }
3096 else
3097 #endif

```

```

3098 #ifndef OPENSAL_NO_ECDSA
3099 if (pkey->type == EVP_PKEY_EC)
3100 {
3101     j=ECDSA_verify(pkey->save_type,
3102                   &(s->s3->tmp.cert_verify_md[MD5_DIGEST_LENGTH]),
3103                   SHA_DIGEST_LENGTH, p, i, pkey->pkey.ec);
3104     if (j <= 0)
3105     {
3106         /* bad signature */
3107         al=SSL_AD_DECRYPT_ERROR;
3108         SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,
3109               SSL_R_BAD_ECDSA_SIGNATURE);
3110         goto f_err;
3111     }
3112 }
3113 else
3114 #endif
3115 if (pkey->type == NID_id_GostR3410_94 || pkey->type == NID_id_GostR3410_
3116     {
3117         unsigned char signature[64];
3118         int idx;
3119         EVP_PKEY_CTX *pctx = EVP_PKEY_CTX_new(pkey, NULL);
3120         EVP_PKEY_verify_init(pctx);
3121         if (i!=64) {
3122             fprintf(stderr, "GOST signature length is %d", i);
3123         }
3124         for (idx=0; idx<64; idx++) {
3125             signature[63-idx]=p[idx];
3126         }
3127         j=EVP_PKEY_verify(pctx, signature, 64, s->s3->tmp.cert_veri
3128         EVP_PKEY_CTX_free(pctx);
3129         if (j<=0)
3130         {
3131             al=SSL_AD_DECRYPT_ERROR;
3132             SSLerr(SSL_F_SSL3_GET_CERT_VERIFY,
3133                   SSL_R_BAD_ECDSA_SIGNATURE);
3134             goto f_err;
3135         }
3136     }
3137 else
3138 {
3139     SSLerr(SSL_F_SSL3_GET_CERT_VERIFY, ERR_R_INTERNAL_ERROR);
3140     al=SSL_AD_UNSUPPORTED_CERTIFICATE;
3141     goto f_err;
3142 }
3143
3144 ret=1;
3145 if (0)
3146 {
3147     f_err:
3148         ssl3_send_alert(s, SSL3_AL_FATAL, al);
3149     }
3150 end:
3151 if (s->s3->handshake_buffer)
3152 {
3153     BIO_free(s->s3->handshake_buffer);
3154     s->s3->handshake_buffer = NULL;
3155     s->s3->flags &= ~TLS1_FLAGS_KEEP_HANDSHAKE;
3156 }
3157 EVP_MD_CTX_cleanup(&mctx);
3158 EVP_PKEY_free(pkey);
3159 return(ret);
3160 }
3161
3162 int ssl3_get_client_certificate(SSL *s)
3163 {

```

```

3164     int i,ok,al,ret= -1;
3165     X509 *x=NULL;
3166     unsigned long l,nc,llen,n;
3167     const unsigned char *p,*q;
3168     unsigned char *d;
3169     STACK_OF(X509) *sk=NULL;

3171     n=s->method->ssl_get_message(s,
3172     SSL3_ST_SR_CERT_A,
3173     SSL3_ST_SR_CERT_B,
3174     -1,
3175     s->max_cert_list,
3176     &ok);

3178     if (!ok) return((int)n);

3180     if (s->s3->tmp.message_type == SSL3_MT_CLIENT_KEY_EXCHANGE)
3181     {
3182         if ( (s->verify_mode & SSL_VERIFY_PEER) &&
3183             (s->verify_mode & SSL_VERIFY_FAIL_IF_NO_PEER_CERT))
3184         {
3185             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_PEER_DID_
3186             al=SSL_AD_HANDSHAKE_FAILURE;
3187             goto f_err;
3188         }
3189         /* If tls asked for a client cert, the client must return a 0 li
3190         if ((s->version > SSL3_VERSION) && s->s3->tmp.cert_request)
3191         {
3192             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_TLS_PEER_
3193             al=SSL_AD_UNEXPECTED_MESSAGE;
3194             goto f_err;
3195         }
3196         s->s3->tmp.reuse_message=1;
3197         return(1);
3198     }

3200     if (s->s3->tmp.message_type != SSL3_MT_CERTIFICATE)
3201     {
3202         al=SSL_AD_UNEXPECTED_MESSAGE;
3203         SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_WRONG_MESSAGE_TYP
3204         goto f_err;
3205     }
3206     p=d=(unsigned char *)s->init_msg;

3208     if ((sk=sk_X509_new_null()) == NULL)
3209     {
3210         SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,ERR_R_MALLOC_FAILURE);
3211         goto err;
3212     }

3214     n2l3(p,llen);
3215     if (llen+3 != n)
3216     {
3217         al=SSL_AD_DECODE_ERROR;
3218         SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_LENGTH_MISMATCH);
3219         goto f_err;
3220     }
3221     for (nc=0; nc<llen; )
3222     {
3223         n2l3(p,l);
3224         if ((l+nc+3) > llen)
3225         {
3226             al=SSL_AD_DECODE_ERROR;
3227             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_CERT LENG
3228             goto f_err;
3229         }

```

```

3231         q=p;
3232         x=d2i_X509(NULL,&p,l);
3233         if (x == NULL)
3234         {
3235             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,ERR_R_ASN1_LIB)
3236             goto err;
3237         }
3238         if (p != (q+l))
3239         {
3240             al=SSL_AD_DECODE_ERROR;
3241             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_CERT LENG
3242             goto f_err;
3243         }
3244         if (!sk_X509_push(sk,x))
3245         {
3246             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,ERR_R_MALLOC_FA
3247             goto err;
3248         }
3249         x=NULL;
3250         nc+=l+3;
3251     }

3253     if (sk_X509_num(sk) <= 0)
3254     {
3255         /* TLS does not mind 0 certs returned */
3256         if (s->version == SSL3_VERSION)
3257         {
3258             al=SSL_AD_HANDSHAKE_FAILURE;
3259             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_NO_CERTIF
3260             goto f_err;
3261         }
3262         /* Fail for TLS only if we required a certificate */
3263         else if ((s->verify_mode & SSL_VERIFY_PEER) &&
3264             (s->verify_mode & SSL_VERIFY_FAIL_IF_NO_PEER_CERT))
3265         {
3266             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_PEER_DID_
3267             al=SSL_AD_HANDSHAKE_FAILURE;
3268             goto f_err;
3269         }
3270         /* No client certificate so digest cached records */
3271         if (s->s3->handshake_buffer && !ssl3_digest_cached_records(s))
3272         {
3273             al=SSL_AD_INTERNAL_ERROR;
3274             goto f_err;
3275         }
3276     }
3277     else
3278     {
3279         i=ssl_verify_cert_chain(s,sk);
3280         if (i <= 0)
3281         {
3282             al=ssl_verify_alarm_type(s->verify_result);
3283             SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE,SSL_R_NO_CERTIF
3284             goto f_err;
3285         }
3286     }

3288     if (s->session->peer != NULL) /* This should not be needed */
3289         X509_free(s->session->peer);
3290     s->session->peer=sk_X509_shift(sk);
3291     s->session->verify_result = s->verify_result;

3293     /* With the current implementation, sess_cert will always be NULL
3294     * when we arrive here. */
3295     if (s->session->sess_cert == NULL)

```

```

3296     {
3297         s->session->sess_cert = ssl_sess_cert_new();
3298         if (s->session->sess_cert == NULL)
3299             {
3300                 SSLerr(SSL_F_SSL3_GET_CLIENT_CERTIFICATE, ERR_R_MALLOC_F
3301                 goto err;
3302             }
3303     }
3304     if (s->session->sess_cert->cert_chain != NULL)
3305         sk_X509_pop_free(s->session->sess_cert->cert_chain, X509_free);
3306     s->session->sess_cert->cert_chain=sk;
3307     /* Inconsistency alert: cert_chain does *not* include the
3308        * peer's own certificate, while we do include it in s3_clnt.c */
3309
3310     sk=NULL;
3311
3312     ret=1;
3313     if (0)
3314     {
3315         f_err:
3316             ssl3_send_alert(s, SSL3_AL_FATAL, al);
3317     }
3318     err:
3319     if (x != NULL) X509_free(x);
3320     if (sk != NULL) sk_X509_pop_free(sk, X509_free);
3321     return(ret);
3322 }
3323
3324 int ssl3_send_server_certificate(SSL *s)
3325 {
3326     unsigned long l;
3327     X509 *x;
3328
3329     if (s->state == SSL3_ST_SW_CERT_A)
3330     {
3331         x=ssl_get_server_send_cert(s);
3332         if (x == NULL)
3333             {
3334                 /* VRS: allow null cert if auth == KRB5 */
3335                 if ((s->s3->tmp.new_cipher->algorithm_auth != SSL_aKRB5)
3336                     (s->s3->tmp.new_cipher->algorithm_mkey & SSL_kKRB5))
3337                 {
3338                     SSLerr(SSL_F_SSL3_SEND_SERVER_CERTIFICATE, ERR_R_
3339                     return(0);
3340                 }
3341             }
3342
3343             l=ssl3_output_cert_chain(s,x);
3344             s->state=SSL3_ST_SW_CERT_B;
3345             s->init_num=(int)l;
3346             s->init_off=0;
3347         }
3348
3349         /* SSL3_ST_SW_CERT_B */
3350         return(ssl3_do_write(s, SSL3_RT_HANDSHAKE));
3351     }
3352
3353 #ifndef OPENSSL_NO_TLSEXT
3354 /* send a new session ticket (not necessarily for a new session) */
3355 int ssl3_send_newsession_ticket(SSL *s)
3356 {
3357     if (s->state == SSL3_ST_SW_SESSION_TICKET_A)
3358     {
3359         unsigned char *p, *senc, *macstart;
3360         const unsigned char *const_p;
3361         int len, slen_full, slen;

```

```

3362     SSL_SESSION *sess;
3363     unsigned int hlen;
3364     EVP_CIPHER_CTX ctx;
3365     HMAC_CTX hctx;
3366     SSL_CTX *tctx = s->initial_ctx;
3367     unsigned char iv[EVP_MAX_IV_LENGTH];
3368     unsigned char key_name[16];
3369
3370     /* get session encoding length */
3371     slen_full = i2d_SSL_SESSION(s->session, NULL);
3372     /* Some length values are 16 bits, so forget it if session is
3373        * too long
3374        */
3375     if (slen_full > 0xFF00)
3376         return -1;
3377     senc = OPENSSL_malloc(slen_full);
3378     if (!senc)
3379         return -1;
3380     p = senc;
3381     i2d_SSL_SESSION(s->session, &p);
3382
3383     /* create a fresh copy (not shared with other threads) to clean
3384        const_p = senc;
3385     sess = d2i_SSL_SESSION(NULL, &const_p, slen_full);
3386     if (sess == NULL)
3387     {
3388         OPENSSL_free(senc);
3389         return -1;
3390     }
3391     sess->session_id_length = 0; /* ID is irrelevant for the ticket
3392
3393     slen = i2d_SSL_SESSION(sess, NULL);
3394     if (slen > slen_full) /* shouldn't ever happen */
3395     {
3396         OPENSSL_free(senc);
3397         return -1;
3398     }
3399     p = senc;
3400     i2d_SSL_SESSION(sess, &p);
3401     SSL_SESSION_free(sess);
3402
3403     /* Grow buffer if need be: the length calculation is as
3404        * follows 1 (size of message name) + 3 (message length
3405        * bytes) + 4 (ticket lifetime hint) + 2 (ticket length) +
3406        * 16 (key name) + max_iv_len (iv length) +
3407        * session_length + max_enc_block_size (max encrypted session
3408        * length) + max_md_size (HMAC).
3409        */
3410     if (!BUF_MEM_grow(s->init_buf,
3411         26 + EVP_MAX_IV_LENGTH + EVP_MAX_BLOCK_LENGTH +
3412         EVP_MAX_MD_SIZE + slen))
3413         return -1;
3414
3415     p=(unsigned char *)s->init_buf->data;
3416     /* do the header */
3417     *(p++)=SSL3_MT_NEWSESSION_TICKET;
3418     /* Skip message length for now */
3419     p += 3;
3420     EVP_CIPHER_CTX_init(&ctx);
3421     HMAC_CTX_init(&hctx);
3422     /* Initialize HMAC and cipher contexts. If callback present
3423        * it does all the work otherwise use generated values
3424        * from parent ctx.
3425        */
3426     if (tctx->tlsext_ticket_key_cb)
3427         {

```

```

3428         if (tctx->tlsext_ticket_key_cb(s, key_name, iv, &ctx,
3429                                         &hctx, 1) < 0)
3430         {
3431             OPENSSL_free(senc);
3432             return -1;
3433         }
3434     else
3435     {
3436         RAND_pseudo_bytes(iv, 16);
3437         EVP_EncryptInit_ex(&ctx, EVP_aes_128_cbc(), NULL,
3438                             tctx->tlsext_tick_aes_key, iv);
3439         HMAC_Init_ex(&hctx, tctx->tlsext_tick_hmac_key, 16,
3440                     tlsext_tick_md(), NULL);
3441         memcpy(key_name, tctx->tlsext_tick_key_name, 16);
3442     }
3443
3444     /* Ticket lifetime hint (advisory only):
3445     * We leave this unspecified for resumed session (for simplicity
3446     * and guess that tickets for new sessions will live as long
3447     * as their sessions. */
3448     l2n(s->hit ? 0 : s->session->timeout, p);
3449
3450     /* Skip ticket length for now */
3451     p += 2;
3452     /* Output key name */
3453     macstart = p;
3454     memcpy(p, key_name, 16);
3455     p += 16;
3456     /* output IV */
3457     memcpy(p, iv, EVP_CIPHER_CTX_iv_length(&ctx));
3458     p += EVP_CIPHER_CTX_iv_length(&ctx);
3459     /* Encrypt session data */
3460     EVP_EncryptUpdate(&ctx, p, &len, senc, slen);
3461     p += len;
3462     EVP_EncryptFinal(&ctx, p, &len);
3463     p += len;
3464     EVP_CIPHER_CTX_cleanup(&ctx);
3465
3466     HMAC_Update(&hctx, macstart, p - macstart);
3467     HMAC_Final(&hctx, p, &hlen);
3468     HMAC_CTX_cleanup(&hctx);
3469
3470     p += hlen;
3471     /* Now write out lengths: p points to end of data written */
3472     /* Total length */
3473     len = p - (unsigned char *)s->init_buf->data;
3474     p=(unsigned char *)s->init_buf->data + 1;
3475     l2n3(len - 4, p); /* Message length */
3476     p += 4;
3477     s2n(len - 10, p); /* Ticket length */
3478
3479     /* number of bytes to write */
3480     s->init_num = len;
3481     s->state=SSL3_ST_SW_SESSION_TICKET_B;
3482     s->init_off=0;
3483     OPENSSL_free(senc);
3484     }
3485
3486     /* SSL3_ST_SW_SESSION_TICKET_B */
3487     return(ssl3_do_write(s, SSL3_RT_HANDSHAKE));
3488 }
3489
3490 int ssl3_send_cert_status(SSL *s)
3491 {
3492     if (s->state == SSL3_ST_SW_CERT_STATUS_A)

```

```

3494     {
3495         unsigned char *p;
3496         /* Grow buffer if need be: the length calculation is as
3497         * follows 1 (message type) + 3 (message length) +
3498         * 1 (ocsp response type) + 3 (ocsp response length)
3499         * + (ocsp response)
3500         */
3501         if (!BUF_MEM_grow(s->init_buf, 8 + s->tlsext_ocsp_resplen))
3502             return -1;
3503
3504         p=(unsigned char *)s->init_buf->data;
3505
3506         /* do the header */
3507         *(p++)=SSL3_MT_CERTIFICATE_STATUS;
3508         /* message length */
3509         l2n3(s->tlsext_ocsp_resplen + 4, p);
3510         /* status type */
3511         *(p++)= s->tlsext_status_type;
3512         /* length of OCSF response */
3513         l2n3(s->tlsext_ocsp_resplen, p);
3514         /* actual response */
3515         memcpy(p, s->tlsext_ocsp_resp, s->tlsext_ocsp_resplen);
3516         /* number of bytes to write */
3517         s->init_num = 8 + s->tlsext_ocsp_resplen;
3518         s->state=SSL3_ST_SW_CERT_STATUS_B;
3519         s->init_off = 0;
3520     }
3521
3522     /* SSL3_ST_SW_CERT_STATUS_B */
3523     return(ssl3_do_write(s, SSL3_RT_HANDSHAKE));
3524 }
3525
3526 # ifndef OPENSSL_NO_NEXTPROTONEG
3527 /* ssl3_get_next_proto reads a Next Protocol Negotiation handshake message. It
3528 * sets the next_proto member in s if found */
3529 int ssl3_get_next_proto(SSL *s)
3530 {
3531     int ok;
3532     int proto_len, padding_len;
3533     long n;
3534     const unsigned char *p;
3535
3536     /* Clients cannot send a NextProtocol message if we didn't see the
3537     * extension in their ClientHello */
3538     if (!s->s3->next_proto_neg_seen)
3539     {
3540         SSLerr(SSL_F_SSL3_GET_NEXT_PROTO, SSL_R_GOT_NEXT_PROTO_WITHOUT_EX
3541             return -1;
3542     }
3543
3544     n=s->method->ssl_get_message(s,
3545                                 SSL3_ST_SR_NEXT_PROTO_A,
3546                                 SSL3_ST_SR_NEXT_PROTO_B,
3547                                 SSL3_MT_NEXT_PROTO,
3548                                 514, /* See the payload format below */
3549                                 &ok);
3550
3551     if (!ok)
3552         return((int)n);
3553
3554     /* s->state doesn't reflect whether ChangeCipherSpec has been received
3555     * in this handshake, but s->s3->change_cipher_spec does (will be reset
3556     * by ssl3_get_finished). */
3557     if (!s->s3->change_cipher_spec)
3558     {
3559         SSLerr(SSL_F_SSL3_GET_NEXT_PROTO, SSL_R_GOT_NEXT_PROTO_BEFORE_A_C

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```
3560         return -1;
3561     }
3563     if (n < 2)
3564         return 0; /* The body must be > 1 bytes long */
3566     p=(unsigned char *)s->init_msg;
3568     /* The payload looks like:
3569     *  uint8 proto_len;
3570     *  uint8 proto[proto_len];
3571     *  uint8 padding_len;
3572     *  uint8 padding[padding_len];
3573     */
3574     proto_len = p[0];
3575     if (proto_len + 2 > s->init_num)
3576         return 0;
3577     padding_len = p[proto_len + 1];
3578     if (proto_len + padding_len + 2 != s->init_num)
3579         return 0;
3581     s->next_proto_negotiated = OPENSSL_malloc(proto_len);
3582     if (!s->next_proto_negotiated)
3583     {
3584         SSLerr(SSL_F_SSL3_GET_NEXT_PROTO,ERR_R_MALLOC_FAILURE);
3585         return 0;
3586     }
3587     memcpy(s->next_proto_negotiated, p + 1, proto_len);
3588     s->next_proto_negotiated_len = proto_len;
3590     return 1;
3591 }
3592 # endif
3593 #endif
```

```

*****
5719 Fri May 30 18:32:21 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_algs.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* ssl/ssl_algs.c */
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
59 #include <stdio.h>
60 #include <openssl/objects.h>
61 #include <openssl/lhash.h>

```

```

62 #include "ssl_locl.h"
63
64 int SSL_library_init(void)
65 {
66
67 #ifndef OPENSSL_NO_DES
68     EVP_add_cipher(EVP_des_cbc());
69     EVP_add_cipher(EVP_des_ede3_cbc());
70 #endif
71 #ifndef OPENSSL_NO_IDEA
72     EVP_add_cipher(EVP_idea_cbc());
73 #endif
74 #ifndef OPENSSL_NO_RC4
75     EVP_add_cipher(EVP_rc4());
76     #if !defined(OPENSSL_NO_MD5) && (defined(__x86_64) || defined(__x86_64__))
77     EVP_add_cipher(EVP_rc4_hmac_md5());
78 #endif
79 #endif
80 #ifndef OPENSSL_NO_RC2
81     EVP_add_cipher(EVP_rc2_cbc());
82     /* Not actually used for SSL/TLS but this makes PKCS#12 work
83      * if an application only calls SSL_library_init().
84      */
85     EVP_add_cipher(EVP_rc2_40_cbc());
86 #endif
87 #ifndef OPENSSL_NO_AES
88     EVP_add_cipher(EVP_aes_128_cbc());
89     EVP_add_cipher(EVP_aes_192_cbc());
90     EVP_add_cipher(EVP_aes_256_cbc());
91     EVP_add_cipher(EVP_aes_128_gcm());
92     EVP_add_cipher(EVP_aes_256_gcm());
93     #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_SHA1)
94     EVP_add_cipher(EVP_aes_128_cbc_hmac_sha1());
95     EVP_add_cipher(EVP_aes_256_cbc_hmac_sha1());
96 #endif
97 #endif
98 #ifndef OPENSSL_NO_CAMELLIA
99     EVP_add_cipher(EVP_camellia_128_cbc());
100     EVP_add_cipher(EVP_camellia_256_cbc());
101 #endif
102
103 #ifndef OPENSSL_NO_SEED
104     EVP_add_cipher(EVP_seed_cbc());
105 #endif
106
107 #ifndef OPENSSL_NO_MD5
108     EVP_add_digest(EVP_md5());
109     EVP_add_digest_alias(SN_md5, "ssl2-md5");
110     EVP_add_digest_alias(SN_md5, "ssl3-md5");
111 #endif
112 #ifndef OPENSSL_NO_SHA
113     EVP_add_digest(EVP_sha1()); /* RSA with sha1 */
114     EVP_add_digest_alias(SN_sha1, "ssl3-sha1");
115     EVP_add_digest_alias(SN_sha1WithRSAEncryption, SN_sha1WithRSA);
116 #endif
117 #ifndef OPENSSL_NO_SHA256
118     EVP_add_digest(EVP_sha224());
119     EVP_add_digest(EVP_sha256());
120 #endif
121 #ifndef OPENSSL_NO_SHA512
122     EVP_add_digest(EVP_sha384());
123     EVP_add_digest(EVP_sha512());
124 #endif
125
126 #if !defined(OPENSSL_NO_SHA) && !defined(OPENSSL_NO_DSA)
127     EVP_add_digest(EVP_dss1()); /* DSA with sha1 */

```

```
128     EVP_add_digest_alias(SN_dsaWithSHA1, SN_dsaWithSHA1_2);
129     EVP_add_digest_alias(SN_dsaWithSHA1, "DSS1");
130     EVP_add_digest_alias(SN_dsaWithSHA1, "dss1");
131 #endif
132 #ifndef OPENSSL_NO_ECDSA
133     EVP_add_digest(EVP_ecdsa());
134 #endif
135     /* If you want support for phased out ciphers, add the following */
136 #if 0
137     EVP_add_digest(EVP_sha());
138     EVP_add_digest(EVP_dss());
139 #endif
140 #ifndef OPENSSL_NO_COMP
141     /* This will initialise the built-in compression algorithms.
142        The value returned is a STACK_OF(SSL_COMP), but that can
143        be discarded safely */
144     (void)SSL_COMP_get_compression_methods();
145 #endif
146     /* initialize cipher/digest methods table */
147     ssl_load_ciphers();
148     return(1);
149 }
```

new/usr/src/lib/openssl/libsunw_ssl/ssl_asn1.c

1

```
*****
20002 Fri May 30 18:32:21 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_asn1.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/ssl_asn1.c */
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7  * The implementation was written so as to conform with Netscapes SSL.
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58 /* =====
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new/usr/src/lib/openssl/libsunw_ssl/ssl_asn1.c

2

```
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82 * OTHERWISE.
83 */
84
85 #include <stdio.h>
86 #include <stdlib.h>
87 #include "ssl_locl.h"
88 #include <openssl/asn1_mac.h>
89 #include <openssl/objects.h>
90 #include <openssl/x509.h>
91
92 typedef struct ssl_session_asn1_st
93 {
94     ASN1_INTEGER version;
95     ASN1_INTEGER ssl_version;
96     ASN1_OCTET_STRING cipher;
97     ASN1_OCTET_STRING comp_id;
98     ASN1_OCTET_STRING master_key;
99     ASN1_OCTET_STRING session_id;
100     ASN1_OCTET_STRING session_id_context;
101     ASN1_OCTET_STRING key_arg;
102 #ifndef OPENSSL_NO_KRB5
103     ASN1_OCTET_STRING krb5_princ;
104 #endif /* OPENSSL_NO_KRB5 */
105     ASN1_INTEGER time;
106     ASN1_INTEGER timeout;
107     ASN1_INTEGER verify_result;
108 #ifndef OPENSSL_NO_TLSEXT
109     ASN1_OCTET_STRING tlsext_hostname;
110     ASN1_INTEGER tlsext_tick_lifetime;
111     ASN1_OCTET_STRING tlsext_tick;
112 #endif /* OPENSSL_NO_TLSEXT */
113 #ifndef OPENSSL_NO_PSK
114     ASN1_OCTET_STRING psk_identity_hint;
115     ASN1_OCTET_STRING psk_identity;
116 #endif /* OPENSSL_NO_PSK */
117 #ifndef OPENSSL_NO_SRP
118     ASN1_OCTET_STRING srp_username;
119 #endif /* OPENSSL_NO_SRP */
120 } SSL_SESSION_ASN1;
121
122 int i2d_SSL_SESSION(SSL_SESSION *in, unsigned char **pp)
123 {
124     #define LSIZE2 (sizeof(long)*2)
125     int v1=0,v2=0,v3=0,v4=0,v5=0,v7=0,v8=0;
126     unsigned char buf[4],ibuf1[LSIZE2],ibuf2[LSIZE2];
127     unsigned char ibuf3[LSIZE2],ibuf4[LSIZE2],ibuf5[LSIZE2];
```



```

128 #ifndef OPENSSSL_NO_TLSEXT
129     int v6=0,v9=0,v10=0;
130     unsigned char ibuf6[LSIZE2];
131 #endif
132 #ifndef OPENSSSL_NO_COMP
133     unsigned char cbuf;
134     int v11=0;
135 #endif
136 #ifndef OPENSSSL_NO_SRP
137     int v12=0;
138 #endif
139     long l;
140     SSL_SESSION_ASN1 a;
141     M_ASN1_I2D_vars(in);

143     if ((in == NULL) || ((in->cipher == NULL) && (in->cipher_id == 0)))
144         return(0);

146     /* Note that I cheat in the following 2 assignments. I know
147      * that if the ASN1_INTEGER passed to ASN1_INTEGER_set
148      * is > sizeof(long)+1, the buffer will not be re-OPENSSL_malloc()'ed.
149      * This is a bit evil but makes things simple, no dynamic allocation
150      * to clean up :-)) */
151     a.version.length=LSIZE2;
152     a.version.type=V_ASN1_INTEGER;
153     a.version.data=ibuf1;
154     ASN1_INTEGER_set(&(a.version), SSL_SESSION_ASN1_VERSION);

156     a.ssl_version.length=LSIZE2;
157     a.ssl_version.type=V_ASN1_INTEGER;
158     a.ssl_version.data=ibuf2;
159     ASN1_INTEGER_set(&(a.ssl_version), in->ssl_version);

161     a.cipher.type=V_ASN1_OCTET_STRING;
162     a.cipher.data=buf;

164     if (in->cipher == NULL)
165         l=in->cipher_id;
166     else
167         l=in->cipher->id;
168     if (in->ssl_version == SSL2_VERSION)
169     {
170         a.cipher.length=3;
171         buf[0]=((unsigned char)(l>>16L))&0xff;
172         buf[1]=((unsigned char)(l>> 8L))&0xff;
173         buf[2]=((unsigned char)(l ))&0xff;
174     }
175     else
176     {
177         a.cipher.length=2;
178         buf[0]=((unsigned char)(l>>8L))&0xff;
179         buf[1]=((unsigned char)(l ))&0xff;
180     }

182 #ifndef OPENSSSL_NO_COMP
183     if (in->compress_meth)
184     {
185         cbuf = (unsigned char)in->compress_meth;
186         a.comp_id.length = 1;
187         a.comp_id.type = V_ASN1_OCTET_STRING;
188         a.comp_id.data = &cbuf;
189     }
190 #endif

192     a.master_key.length=in->master_key_length;
193     a.master_key.type=V_ASN1_OCTET_STRING;

```

```

194     a.master_key.data=in->master_key;

196     a.session_id.length=in->session_id_length;
197     a.session_id.type=V_ASN1_OCTET_STRING;
198     a.session_id.data=in->session_id;

200     a.session_id_context.length=in->sid_ctx_length;
201     a.session_id_context.type=V_ASN1_OCTET_STRING;
202     a.session_id_context.data=in->sid_ctx;

204     a.key_arg.length=in->key_arg_length;
205     a.key_arg.type=V_ASN1_OCTET_STRING;
206     a.key_arg.data=in->key_arg;

208 #ifndef OPENSSSL_NO_KRB5
209     if (in->krb5_client_princ_len)
210     {
211         a.krb5_princ.length=in->krb5_client_princ_len;
212         a.krb5_princ.type=V_ASN1_OCTET_STRING;
213         a.krb5_princ.data=in->krb5_client_princ;
214     }
215 #endif /* OPENSSSL_NO_KRB5 */

217     if (in->time != 0L)
218     {
219         a.time.length=LSIZE2;
220         a.time.type=V_ASN1_INTEGER;
221         a.time.data=ibuf3;
222         ASN1_INTEGER_set(&(a.time), in->time);
223     }

225     if (in->timeout != 0L)
226     {
227         a.timeout.length=LSIZE2;
228         a.timeout.type=V_ASN1_INTEGER;
229         a.timeout.data=ibuf4;
230         ASN1_INTEGER_set(&(a.timeout), in->timeout);
231     }

233     if (in->verify_result != X509_V_OK)
234     {
235         a.verify_result.length=LSIZE2;
236         a.verify_result.type=V_ASN1_INTEGER;
237         a.verify_result.data=ibuf5;
238         ASN1_INTEGER_set(&a.verify_result, in->verify_result);
239     }

241 #ifndef OPENSSSL_NO_TLSEXT
242     if (in->tlsext_hostname)
243     {
244         a.tlsext_hostname.length=strlen(in->tlsext_hostname);
245         a.tlsext_hostname.type=V_ASN1_OCTET_STRING;
246         a.tlsext_hostname.data=(unsigned char *)in->tlsext_hostname;
247     }
248     if (in->tlsext_tick)
249     {
250         a.tlsext_tick.length= in->tlsext_ticklen;
251         a.tlsext_tick.type=V_ASN1_OCTET_STRING;
252         a.tlsext_tick.data=(unsigned char *)in->tlsext_tick;
253     }
254     if (in->tlsext_tick_lifetime_hint > 0)
255     {
256         a.tlsext_tick_lifetime.length=LSIZE2;
257         a.tlsext_tick_lifetime.type=V_ASN1_INTEGER;
258         a.tlsext_tick_lifetime.data=ibuf6;
259         ASN1_INTEGER_set(&a.tlsext_tick_lifetime, in->tlsext_tick_lifetime);

```

```

260     }
261 #endif /* OPENSSSL_NO_TLS_EXT */
262 #ifndef OPENSSSL_NO_PSK
263     if (in->psk_identity_hint)
264     {
265         a.psk_identity_hint.length=strlen(in->psk_identity_hint);
266         a.psk_identity_hint.type=V_ASN1_OCTET_STRING;
267         a.psk_identity_hint.data=(unsigned char *) (in->psk_identity_hint)
268     }
269     if (in->psk_identity)
270     {
271         a.psk_identity.length=strlen(in->psk_identity);
272         a.psk_identity.type=V_ASN1_OCTET_STRING;
273         a.psk_identity.data=(unsigned char *) (in->psk_identity);
274     }
275 #endif /* OPENSSSL_NO_PSK */
276 #ifndef OPENSSSL_NO_SRP
277     if (in->srp_username)
278     {
279         a.srp_username.length=strlen(in->srp_username);
280         a.srp_username.type=V_ASN1_OCTET_STRING;
281         a.srp_username.data=(unsigned char *) (in->srp_username);
282     }
283 #endif /* OPENSSSL_NO_SRP */
284
285     M_ASN1_I2D_len(&(a.version), i2d_ASN1_INTEGER);
286     M_ASN1_I2D_len(&(a.ssl_version), i2d_ASN1_INTEGER);
287     M_ASN1_I2D_len(&(a.cipher), i2d_ASN1_OCTET_STRING);
288     M_ASN1_I2D_len(&(a.session_id), i2d_ASN1_OCTET_STRING);
289     M_ASN1_I2D_len(&(a.master_key), i2d_ASN1_OCTET_STRING);
290 #ifndef OPENSSSL_NO_KRB5
291     if (in->krb5_client_princ_len)
292         M_ASN1_I2D_len(&(a.krb5_princ), i2d_ASN1_OCTET_STRING);
293 #endif /* OPENSSSL_NO_KRB5 */
294     if (in->key_arg.length > 0)
295         M_ASN1_I2D_len_EXP_opt(&(a.key_arg), i2d_ASN1_OCTET_STRING);
296     if (in->time != 0L)
297         M_ASN1_I2D_len_EXP_opt(&(a.time), i2d_ASN1_INTEGER, 1, v1);
298     if (in->timeout != 0L)
299         M_ASN1_I2D_len_EXP_opt(&(a.timeout), i2d_ASN1_INTEGER, 2, v2);
300     if (in->peer != NULL)
301         M_ASN1_I2D_len_EXP_opt(in->peer, i2d_X509, 3, v3);
302     M_ASN1_I2D_len_EXP_opt(&a.session_id_context, i2d_ASN1_OCTET_STRING, 4, v4)
303     if (in->verify_result != X509_V_OK)
304         M_ASN1_I2D_len_EXP_opt(&(a.verify_result), i2d_ASN1_INTEGER, 5, v5)
305
306 #ifndef OPENSSSL_NO_TLS_EXT
307     if (in->tlsext_tick_lifetime_hint > 0)
308         M_ASN1_I2D_len_EXP_opt(&a.tlsext_tick_lifetime, i2d_ASN1_INTEGER
309     if (in->tlsext_tick)
310         M_ASN1_I2D_len_EXP_opt(&(a.tlsext_tick), i2d_ASN1_OCTET_STRING, 1
311     if (in->tlsext_hostname)
312         M_ASN1_I2D_len_EXP_opt(&(a.tlsext_hostname), i2d_ASN1_OCTET_STRI
313 #ifndef OPENSSSL_NO_COMP
314     if (in->compress_meth)
315         M_ASN1_I2D_len_EXP_opt(&(a.comp_id), i2d_ASN1_OCTET_STRING, 11, v1
316 #endif
317 #endif /* OPENSSSL_NO_TLS_EXT */
318 #ifndef OPENSSSL_NO_PSK
319     if (in->psk_identity_hint)
320         M_ASN1_I2D_len_EXP_opt(&(a.psk_identity_hint), i2d_ASN1_OCTET_ST
321     if (in->psk_identity)
322         M_ASN1_I2D_len_EXP_opt(&(a.psk_identity), i2d_ASN1_OCTET_STRING,
323 #endif /* OPENSSSL_NO_PSK */
324 #ifndef OPENSSSL_NO_SRP
325     if (in->srp_username)

```

```

326         M_ASN1_I2D_len_EXP_opt(&(a.srp_username), i2d_ASN1_OCTET_STRING,
327 #endif /* OPENSSSL_NO_SRP */
328
329     M_ASN1_I2D_seq_total();
330
331     M_ASN1_I2D_put(&(a.version), i2d_ASN1_INTEGER);
332     M_ASN1_I2D_put(&(a.ssl_version), i2d_ASN1_INTEGER);
333     M_ASN1_I2D_put(&(a.cipher), i2d_ASN1_OCTET_STRING);
334     M_ASN1_I2D_put(&(a.session_id), i2d_ASN1_OCTET_STRING);
335     M_ASN1_I2D_put(&(a.master_key), i2d_ASN1_OCTET_STRING);
336 #ifndef OPENSSSL_NO_KRB5
337     if (in->krb5_client_princ_len)
338         M_ASN1_I2D_put(&(a.krb5_princ), i2d_ASN1_OCTET_STRING);
339 #endif /* OPENSSSL_NO_KRB5 */
340     if (in->key_arg.length > 0)
341         M_ASN1_I2D_put_IMP_opt(&(a.key_arg), i2d_ASN1_OCTET_STRING, 0);
342     if (in->time != 0L)
343         M_ASN1_I2D_put_EXP_opt(&(a.time), i2d_ASN1_INTEGER, 1, v1);
344     if (in->timeout != 0L)
345         M_ASN1_I2D_put_EXP_opt(&(a.timeout), i2d_ASN1_INTEGER, 2, v2);
346     if (in->peer != NULL)
347         M_ASN1_I2D_put_EXP_opt(in->peer, i2d_X509, 3, v3);
348     M_ASN1_I2D_put_EXP_opt(&a.session_id_context, i2d_ASN1_OCTET_STRING, 4,
349         v4);
350     if (in->verify_result != X509_V_OK)
351         M_ASN1_I2D_put_EXP_opt(&a.verify_result, i2d_ASN1_INTEGER, 5, v5);
352 #ifndef OPENSSSL_NO_TLS_EXT
353     if (in->tlsext_hostname)
354         M_ASN1_I2D_put_EXP_opt(&(a.tlsext_hostname), i2d_ASN1_OCTET_STRI
355 #endif /* OPENSSSL_NO_TLS_EXT */
356 #ifndef OPENSSSL_NO_PSK
357     if (in->psk_identity_hint)
358         M_ASN1_I2D_put_EXP_opt(&(a.psk_identity_hint), i2d_ASN1_OCTET_ST
359     if (in->psk_identity)
360         M_ASN1_I2D_put_EXP_opt(&(a.psk_identity), i2d_ASN1_OCTET_STRING,
361 #endif /* OPENSSSL_NO_PSK */
362 #ifndef OPENSSSL_NO_TLS_EXT
363     if (in->tlsext_tick_lifetime_hint > 0)
364         M_ASN1_I2D_put_EXP_opt(&a.tlsext_tick_lifetime, i2d_ASN1_INTEGER
365     if (in->tlsext_tick)
366         M_ASN1_I2D_put_EXP_opt(&(a.tlsext_tick), i2d_ASN1_OCTET_STRING, 1
367 #endif /* OPENSSSL_NO_TLS_EXT */
368 #ifndef OPENSSSL_NO_COMP
369     if (in->compress_meth)
370         M_ASN1_I2D_put_EXP_opt(&(a.comp_id), i2d_ASN1_OCTET_STRING, 11, v1
371 #endif
372 #ifndef OPENSSSL_NO_SRP
373     if (in->srp_username)
374         M_ASN1_I2D_put_EXP_opt(&(a.srp_username), i2d_ASN1_OCTET_STRING,
375 #endif /* OPENSSSL_NO_SRP */
376     M_ASN1_I2D_finish();
377 }
378
379 SSL_SESSION *d2i_SSL_SESSION(SSL_SESSION **a, const unsigned char **pp,
380                             long length)
381 {
382     int ssl_version=0, i;
383     long id;
384     ASN1_INTEGER ai,*aip;
385     ASN1_OCTET_STRING os,*osp;
386     M_ASN1_D2I_vars(a, SSL_SESSION *, SSL_SESSION_new);
387
388     aip= &ai;
389     osp= &os;
390
391     M_ASN1_D2I_Init();

```

```

392     M_ASN1_D2I_start_sequence();

394     ai.data=NULL; ai.length=0;
395     M_ASN1_D2I_get_x(ASN1_INTEGER,aip,d2i_ASN1_INTEGER);
396     if (ai.data != NULL) { OPENSSL_free(ai.data); ai.data=NULL; ai.length=0;

398     /* we don't care about the version right now :- */
399     M_ASN1_D2I_get_x(ASN1_INTEGER,aip,d2i_ASN1_INTEGER);
400     ssl_version=(int)ASN1_INTEGER_get(aip);
401     ret->ssl_version=ssl_version;
402     if (ai.data != NULL) { OPENSSL_free(ai.data); ai.data=NULL; ai.length=0;

404     os.data=NULL; os.length=0;
405     M_ASN1_D2I_get_x(ASN1_OCTET_STRING,osp,d2i_ASN1_OCTET_STRING);
406     if (ssl_version == SSL2_VERSION)
407     {
408         if (os.length != 3)
409         {
410             c.error=SSL_R_CIPHER_CODE_WRONG_LENGTH;
411             goto err;
412         }
413         id=0x20000000L|
414             ((unsigned long)os.data[0]<<16L)|
415             ((unsigned long)os.data[1]<< 8L)|
416             (unsigned long)os.data[2];
417     }
418     else if ((ssl_version>>8) >= SSL3_VERSION_MAJOR)
419     {
420         if (os.length != 2)
421         {
422             c.error=SSL_R_CIPHER_CODE_WRONG_LENGTH;
423             goto err;
424         }
425         id=0x30000000L|
426             ((unsigned long)os.data[0]<<8L)|
427             (unsigned long)os.data[1];
428     }
429     else
430     {
431         c.error=SSL_R_UNKNOWN_SSL_VERSION;
432         goto err;
433     }
434
435     ret->cipher=NULL;
436     ret->cipher_id=id;

438     M_ASN1_D2I_get_x(ASN1_OCTET_STRING,osp,d2i_ASN1_OCTET_STRING);
439     if ((ssl_version>>8) >= SSL3_VERSION_MAJOR)
440         i=SSL3_MAX_SSL_SESSION_ID_LENGTH;
441     else /* if (ssl_version>>8 == SSL2_VERSION_MAJOR) */
442         i=SSL2_MAX_SSL_SESSION_ID_LENGTH;

444     if (os.length > i)
445         os.length = i;
446     if (os.length > (int)sizeof(ret->session_id)) /* can't happen */
447         os.length = sizeof(ret->session_id);

449     ret->session_id_length=os.length;
450     OPENSSL_assert(os.length <= (int)sizeof(ret->session_id));
451     memcpy(ret->session_id,os.data,os.length);

453     M_ASN1_D2I_get_x(ASN1_OCTET_STRING,osp,d2i_ASN1_OCTET_STRING);
454     if (os.length > SSL_MAX_MASTER_KEY_LENGTH)
455         ret->master_key_length=SSL_MAX_MASTER_KEY_LENGTH;
456     else
457         ret->master_key_length=os.length;

```

```

458     memcpy(ret->master_key,os.data,ret->master_key_length);

460     os.length=0;

462 #ifndef OPENSSL_NO_KRB5
463     os.length=0;
464     M_ASN1_D2I_get_opt(osp,d2i_ASN1_OCTET_STRING,V_ASN1_OCTET_STRING);
465     if (os.data)
466     {
467         if (os.length > SSL_MAX_KRB5_PRINCIPAL_LENGTH)
468             ret->krb5_client_princ_len=0;
469         else
470             ret->krb5_client_princ_len=os.length;
471         memcpy(ret->krb5_client_princ,os.data,ret->krb5_client_princ_len);
472         OPENSSL_free(os.data);
473         os.data = NULL;
474         os.length = 0;
475     }
476     else
477         ret->krb5_client_princ_len=0;
478 #endif /* OPENSSL_NO_KRB5 */

480     M_ASN1_D2I_get_IMP_opt(osp,d2i_ASN1_OCTET_STRING,0,V_ASN1_OCTET_STRING);
481     if (os.length > SSL_MAX_KEY_ARG_LENGTH)
482         ret->key_arg_length=SSL_MAX_KEY_ARG_LENGTH;
483     else
484         ret->key_arg_length=os.length;
485     memcpy(ret->key_arg,os.data,ret->key_arg_length);
486     if (os.data != NULL) OPENSSL_free(os.data);

488     ai.length=0;
489     M_ASN1_D2I_get_EXP_opt(aip,d2i_ASN1_INTEGER,1);
490     if (ai.data != NULL)
491     {
492         ret->time=ASN1_INTEGER_get(aip);
493         OPENSSL_free(ai.data); ai.data=NULL; ai.length=0;
494     }
495     else
496         ret->time=(unsigned long)time(NULL);

498     ai.length=0;
499     M_ASN1_D2I_get_EXP_opt(aip,d2i_ASN1_INTEGER,2);
500     if (ai.data != NULL)
501     {
502         ret->timeout=ASN1_INTEGER_get(aip);
503         OPENSSL_free(ai.data); ai.data=NULL; ai.length=0;
504     }
505     else
506         ret->timeout=3;

508     if (ret->peer != NULL)
509     {
510         X509_free(ret->peer);
511         ret->peer=NULL;
512     }
513     M_ASN1_D2I_get_EXP_opt(ret->peer,d2i_X509,3);

515     os.length=0;
516     os.data=NULL;
517     M_ASN1_D2I_get_EXP_opt(osp,d2i_ASN1_OCTET_STRING,4);

519     if(os.data != NULL)
520     {
521         if (os.length > SSL_MAX_SID_CTX_LENGTH)
522         {
523             c.error=SSL_R_BAD_LENGTH;

```

```

524         goto err;
525     }
526     else
527     {
528         ret->sid_ctx_length=os.length;
529         memcpy(ret->sid_ctx,os.data,os.length);
530     }
531     OPENSSL_free(os.data); os.data=NULL; os.length=0;
532 }
533 else
534     ret->sid_ctx_length=0;

536 ai.length=0;
537 M_ASN1_D2I_get_EXP_opt(aip,d2i_ASN1_INTEGER,5);
538 if (ai.data != NULL)
539 {
540     ret->verify_result=ASN1_INTEGER_get(aip);
541     OPENSSL_free(ai.data); ai.data=NULL; ai.length=0;
542 }
543 else
544     ret->verify_result=X509_V_OK;

546 #ifndef OPENSSL_NO_TLSEXT
547     os.length=0;
548     os.data=NULL;
549     M_ASN1_D2I_get_EXP_opt(osp,d2i_ASN1_OCTET_STRING,6);
550     if (os.data)
551     {
552         ret->tlsext_hostname = BUF_strdup((char *)os.data, os.length);
553         OPENSSL_free(os.data);
554         os.data = NULL;
555         os.length = 0;
556     }
557     else
558         ret->tlsext_hostname=NULL;
559 #endif /* OPENSSL_NO_TLSEXT */

561 #ifndef OPENSSL_NO_PSK
562     os.length=0;
563     os.data=NULL;
564     M_ASN1_D2I_get_EXP_opt(osp,d2i_ASN1_OCTET_STRING,7);
565     if (os.data)
566     {
567         ret->psk_identity_hint = BUF_strdup((char *)os.data, os.length);
568         OPENSSL_free(os.data);
569         os.data = NULL;
570         os.length = 0;
571     }
572     else
573         ret->psk_identity_hint=NULL;

575     os.length=0;
576     os.data=NULL;
577     M_ASN1_D2I_get_EXP_opt(osp,d2i_ASN1_OCTET_STRING,8);
578     if (os.data)
579     {
580         ret->psk_identity = BUF_strdup((char *)os.data, os.length);
581         OPENSSL_free(os.data);
582         os.data = NULL;
583         os.length = 0;
584     }
585     else
586         ret->psk_identity=NULL;
587 #endif /* OPENSSL_NO_PSK */

589 #ifndef OPENSSL_NO_TLSEXT

```

```

590     ai.length=0;
591     M_ASN1_D2I_get_EXP_opt(aip,d2i_ASN1_INTEGER,9);
592     if (ai.data != NULL)
593     {
594         ret->tlsext_tick_lifetime_hint=ASN1_INTEGER_get(aip);
595         OPENSSL_free(ai.data); ai.data=NULL; ai.length=0;
596     }
597     else if (ret->tlsext_ticklen && ret->session_id_length)
598         ret->tlsext_tick_lifetime_hint = -1;
599     else
600         ret->tlsext_tick_lifetime_hint=0;
601     os.length=0;
602     os.data=NULL;
603     M_ASN1_D2I_get_EXP_opt(osp,d2i_ASN1_OCTET_STRING,10);
604     if (os.data)
605     {
606         ret->tlsext_tick = os.data;
607         ret->tlsext_ticklen = os.length;
608         os.data = NULL;
609         os.length = 0;
610     }
611     else
612         ret->tlsext_tick=NULL;
613 #endif /* OPENSSL_NO_TLSEXT */
614 #ifndef OPENSSL_NO_COMP
615     os.length=0;
616     os.data=NULL;
617     M_ASN1_D2I_get_EXP_opt(osp,d2i_ASN1_OCTET_STRING,11);
618     if (os.data)
619     {
620         ret->compress_meth = os.data[0];
621         OPENSSL_free(os.data);
622         os.data = NULL;
623     }
624 #endif

626 #ifndef OPENSSL_NO_SRP
627     os.length=0;
628     os.data=NULL;
629     M_ASN1_D2I_get_EXP_opt(osp,d2i_ASN1_OCTET_STRING,12);
630     if (os.data)
631     {
632         ret->srp_username = BUF_strdup((char *)os.data, os.length);
633         OPENSSL_free(os.data);
634         os.data = NULL;
635         os.length = 0;
636     }
637     else
638         ret->srp_username=NULL;
639 #endif /* OPENSSL_NO_SRP */

641     M_ASN1_D2I_Finish(a,SSL_SESSION_free,SSL_F_D2I_SSL_SESSION);
642 }

```

```

*****
22087 Fri May 30 18:32:22 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_cert.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*! \file ssl/ssl_cert.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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57 */
58 /* =====
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60 *
61 * Redistribution and use in source and binary forms, with or without

```

```

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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 /* =====
112 * Copyright 2002 Sun Microsystems, Inc. ALL RIGHTS RESERVED.
113 * ECC cipher suite support in OpenSSL originally developed by
114 * SUN MICROSYSTEMS, INC., and contributed to the OpenSSL project.
115 */
117 #include <stdio.h>
118
119 #include "e_os.h"
120 #ifndef NO_SYS_TYPES_H
121 #include <sys/types.h>
122 #endif
123
124 #include "o_dir.h"
125 #include <openssl/objects.h>
126 #include <openssl/bio.h>
127 #include <openssl/pem.h>

```

```

128 #include <openssl/x509v3.h>
129 #ifndef OPENSSL_NO_DH
130 #include <openssl/dh.h>
131 #endif
132 #include <openssl/bn.h>
133 #include "ssl_locl.h"

135 int SSL_get_ex_data_X509_STORE_CTX_idx(void)
136 {
137     static volatile int ssl_x509_store_ctx_idx= -1;
138     int got_write_lock = 0;

140     CRYPTO_r_lock(CRYPTO_LOCK_SSL_CTX);

142     if (ssl_x509_store_ctx_idx < 0)
143     {
144         CRYPTO_r_unlock(CRYPTO_LOCK_SSL_CTX);
145         CRYPTO_w_lock(CRYPTO_LOCK_SSL_CTX);
146         got_write_lock = 1;
147         if (ssl_x509_store_ctx_idx < 0)
148         {
149             ssl_x509_store_ctx_idx=X509_STORE_CTX_get_ex_new_index(
150                 0,"SSL for verify callback",NULL,NULL,NULL);
151         }
152     }
153 }

155 if (got_write_lock)
156     CRYPTO_w_unlock(CRYPTO_LOCK_SSL_CTX);
157 else
158     CRYPTO_r_unlock(CRYPTO_LOCK_SSL_CTX);
159 return ssl_x509_store_ctx_idx;
160 }
161 }

163 static void ssl_cert_set_default_md(CERT *cert)
164 {
165     /* Set digest values to defaults */
166 #ifndef OPENSSL_NO_DSA
167     cert->pkeys[SSL_PKEY_DSA_SIGN].digest = EVP_sha1();
168 #endif
169 #ifndef OPENSSL_NO_RSA
170     cert->pkeys[SSL_PKEY_RSA_SIGN].digest = EVP_sha1();
171     cert->pkeys[SSL_PKEY_RSA_ENC].digest = EVP_sha1();
172 #endif
173 #ifndef OPENSSL_NO_ECDSA
174     cert->pkeys[SSL_PKEY_ECC].digest = EVP_sha1();
175 #endif
176 }

178 CERT *ssl_cert_new(void)
179 {
180     CERT *ret;

182     ret=(CERT *)OPENSSL_malloc(sizeof(CERT));
183     if (ret == NULL)
184     {
185         SSLerr(SSL_F_SSL_CERT_NEW,ERR_R_MALLOC_FAILURE);
186         return(NULL);
187     }
188     memset(ret,0,sizeof(CERT));

190     ret->key= &(ret->pkeys[SSL_PKEY_RSA_ENC]);
191     ret->references=1;
192     ssl_cert_set_default_md(ret);
193     return(ret);

```

```

194     }

196 CERT *ssl_cert_dup(CERT *cert)
197 {
198     CERT *ret;
199     int i;

201     ret = (CERT *)OPENSSL_malloc(sizeof(CERT));
202     if (ret == NULL)
203     {
204         SSLerr(SSL_F_SSL_CERT_DUP, ERR_R_MALLOC_FAILURE);
205         return(NULL);
206     }

208     memset(ret, 0, sizeof(CERT));

210     ret->key = &ret->pkeys[cert->key - &cert->pkeys[0]];
211     /* or ret->key = ret->pkeys + (cert->key - cert->pkeys),
212      * if you find that more readable */

214     ret->valid = cert->valid;
215     ret->mask_k = cert->mask_k;
216     ret->mask_a = cert->mask_a;
217     ret->export_mask_k = cert->export_mask_k;
218     ret->export_mask_a = cert->export_mask_a;

220 #ifndef OPENSSL_NO_RSA
221     if (cert->rsa_tmp != NULL)
222     {
223         RSA_up_ref(cert->rsa_tmp);
224         ret->rsa_tmp = cert->rsa_tmp;
225     }
226     ret->rsa_tmp_cb = cert->rsa_tmp_cb;
227 #endif

229 #ifndef OPENSSL_NO_DH
230     if (cert->dh_tmp != NULL)
231     {
232         ret->dh_tmp = DHparams_dup(cert->dh_tmp);
233         if (ret->dh_tmp == NULL)
234         {
235             SSLerr(SSL_F_SSL_CERT_DUP, ERR_R_DH_LIB);
236             goto err;
237         }
238         if (cert->dh_tmp->priv_key)
239         {
240             BIGNUM *b = BN_dup(cert->dh_tmp->priv_key);
241             if (!b)
242             {
243                 SSLerr(SSL_F_SSL_CERT_DUP, ERR_R_BN_LIB);
244                 goto err;
245             }
246             ret->dh_tmp->priv_key = b;
247         }
248         if (cert->dh_tmp->pub_key)
249         {
250             BIGNUM *b = BN_dup(cert->dh_tmp->pub_key);
251             if (!b)
252             {
253                 SSLerr(SSL_F_SSL_CERT_DUP, ERR_R_BN_LIB);
254                 goto err;
255             }
256             ret->dh_tmp->pub_key = b;
257         }
258     }
259     ret->dh_tmp_cb = cert->dh_tmp_cb;

```

```

260 #endif

262 #ifndef OPENSSL_NO_ECDH
263     if (cert->ecdh_tmp)
264     {
265         ret->ecdh_tmp = EC_KEY_dup(cert->ecdh_tmp);
266         if (ret->ecdh_tmp == NULL)
267         {
268             SSLerr(SSL_F_SSL_CERT_DUP, ERR_R_EC_LIB);
269             goto err;
270         }
271     }
272     ret->ecdh_tmp_cb = cert->ecdh_tmp_cb;
273 #endif

275     for (i = 0; i < SSL_PKEY_NUM; i++)
276     {
277         if (cert->pkeys[i].x509 != NULL)
278         {
279             ret->pkeys[i].x509 = cert->pkeys[i].x509;
280             CRYPTO_add(&ret->pkeys[i].x509->references, 1,
281                 CRYPTO_LOCK_X509);
282         }
283         if (cert->pkeys[i].privatekey != NULL)
284         {
285             ret->pkeys[i].privatekey = cert->pkeys[i].privatekey;
286             CRYPTO_add(&ret->pkeys[i].privatekey->references, 1,
287                 CRYPTO_LOCK_EVP_PKEY);
288         }

290         switch(i)
291         {
292             /* If there was anything special to do for
293              * certain types of keys, we'd do it here.
294              * (Nothing at the moment, I think.) */

296             case SSL_PKEY_RSA_ENC:
297             case SSL_PKEY_RSA_SIGN:
298                 /* We have an RSA key. */
299                 break;

301             case SSL_PKEY_DSA_SIGN:
302                 /* We have a DSA key. */
303                 break;

305             case SSL_PKEY_DH_RSA:
306             case SSL_PKEY_DH_DSA:
307                 /* We have a DH key. */
308                 break;

310             case SSL_PKEY_ECC:
311                 /* We have an ECC key */
312                 break;

314             default:
315                 /* Can't happen. */
316                 SSLerr(SSL_F_SSL_CERT_DUP, SSL_R_LIBRARY_BUG);
317         }
318     }

320     /* ret->extra_certs *should* exist, but currently the own certificate
321      * chain is held inside SSL_CTX */

324     ret->references=1;
325     /* Set digests to defaults. NB: we don't copy existing values as they

```

```

326         * will be set during handshake.
327         */
328         ssl_cert_set_default_md(ret);

330     return(ret);
331
332     #if !defined(OPENSSL_NO_DH) || !defined(OPENSSL_NO_ECDH)
333     err:
334     #endif
335     #ifndef OPENSSL_NO_RSA
336         if (ret->rsa_tmp != NULL)
337             RSA_free(ret->rsa_tmp);
338     #endif
339     #ifndef OPENSSL_NO_DH
340         if (ret->dh_tmp != NULL)
341             DH_free(ret->dh_tmp);
342     #endif
343     #ifndef OPENSSL_NO_ECDH
344         if (ret->ecdh_tmp != NULL)
345             EC_KEY_free(ret->ecdh_tmp);
346     #endif

348     for (i = 0; i < SSL_PKEY_NUM; i++)
349     {
350         if (ret->pkeys[i].x509 != NULL)
351             X509_free(ret->pkeys[i].x509);
352         if (ret->pkeys[i].privatekey != NULL)
353             EVP_PKEY_free(ret->pkeys[i].privatekey);
354     }

356     return NULL;
357 }

360 void ssl_cert_free(CERT *c)
361 {
362     int i;

364     if(c == NULL)
365         return;

367     i=CRYPTO_add(&c->references, -1, CRYPTO_LOCK_SSL_CERT);
368     #ifdef REF_PRINT
369     REF_PRINT("CERT", c);
370     #endif
371     if (i > 0) return;
372     #ifdef REF_CHECK
373     if (i < 0)
374     {
375         fprintf(stderr, "ssl_cert_free, bad reference count\n");
376         abort(); /* ok */
377     }
378     #endif

380     #ifndef OPENSSL_NO_RSA
381     if (c->rsa_tmp) RSA_free(c->rsa_tmp);
382     #endif
383     #ifndef OPENSSL_NO_DH
384     if (c->dh_tmp) DH_free(c->dh_tmp);
385     #endif
386     #ifndef OPENSSL_NO_ECDH
387     if (c->ecdh_tmp) EC_KEY_free(c->ecdh_tmp);
388     #endif

390     for (i=0; i<SSL_PKEY_NUM; i++)
391     {

```

```

392         if (c->pkeys[i].x509 != NULL)
393             X509_free(c->pkeys[i].x509);
394         if (c->pkeys[i].privatekey != NULL)
395             EVP_PKEY_free(c->pkeys[i].privatekey);
396 #if 0
397         if (c->pkeys[i].publickey != NULL)
398             EVP_PKEY_free(c->pkeys[i].publickey);
399 #endif
400     }
401     OPENSSL_free(c);
402 }

404 int ssl_cert_inst(CERT **o)
405 {
406     /* Create a CERT if there isn't already one
407     * (which cannot really happen, as it is initially created in
408     * SSL_CTX_new; but the earlier code usually allows for that one
409     * being non-existent, so we follow that behaviour, as it might
410     * turn out that there actually is a reason for it -- but I'm
411     * not sure that *all* of the existing code could cope with
412     * s->cert being NULL, otherwise we could do without the
413     * initialization in SSL_CTX_new).
414     */
415     if (o == NULL)
416     {
417         SSLerr(SSL_F_SSL_CERT_INST, ERR_R_PASSED_NULL_PARAMETER);
418         return(0);
419     }
420     if (*o == NULL)
421     {
422         if ((*o = ssl_cert_new()) == NULL)
423         {
424             SSLerr(SSL_F_SSL_CERT_INST, ERR_R_MALLOC_FAILURE);
425             return(0);
426         }
427     }
428     return(1);
429 }

433 SESS_CERT *ssl_sess_cert_new(void)
434 {
435     SESS_CERT *ret;

437     ret = OPENSSL_malloc(sizeof *ret);
438     if (ret == NULL)
439     {
440         SSLerr(SSL_F_SSL_SESS_CERT_NEW, ERR_R_MALLOC_FAILURE);
441         return NULL;
442     }

444     memset(ret, 0, sizeof *ret);
445     ret->peer_key = &(ret->peer_pkeys[SSL_PKEY_RSA_ENC]);
446     ret->references = 1;

448     return ret;
449 }

451 void ssl_sess_cert_free(SESS_CERT *sc)
452 {
453     int i;

455     if (sc == NULL)
456         return;

```

```

458     i = CRYPTO_add(&sc->references, -1, CRYPTO_LOCK_SSL_SESS_CERT);
459 #ifdef REF_PRINT
460     REF_PRINT("SESS_CERT", sc);
461 #endif
462     if (i > 0)
463         return;
464 #ifdef REF_CHECK
465     if (i < 0)
466     {
467         fprintf(stderr, "ssl_sess_cert_free, bad reference count\n");
468         abort(); /* ok */
469     }
470 #endif

472     /* i == 0 */
473     if (sc->cert_chain != NULL)
474         sk_X509_pop_free(sc->cert_chain, X509_free);
475     for (i = 0; i < SSL_PKEY_NUM; i++)
476     {
477         if (sc->peer_pkeys[i].x509 != NULL)
478             X509_free(sc->peer_pkeys[i].x509);
479 #if 0 /* We don't have the peer's private key. These lines are just
480      * here as a reminder that we're still using a not-quite-appropriate
481      * data structure. */
482         if (sc->peer_pkeys[i].privatekey != NULL)
483             EVP_PKEY_free(sc->peer_pkeys[i].privatekey);
484 #endif
485     }

487 #ifndef OPENSSL_NO_RSA
488     if (sc->peer_rsa_tmp != NULL)
489         RSA_free(sc->peer_rsa_tmp);
490 #endif
491 #ifndef OPENSSL_NO_DH
492     if (sc->peer_dh_tmp != NULL)
493         DH_free(sc->peer_dh_tmp);
494 #endif
495 #ifndef OPENSSL_NO_ECDH
496     if (sc->peer_ecdh_tmp != NULL)
497         EC_KEY_free(sc->peer_ecdh_tmp);
498 #endif

500     OPENSSL_free(sc);
501 }

503 int ssl_set_peer_cert_type(SESS_CERT *sc, int type)
504 {
505     sc->peer_cert_type = type;
506     return(1);
507 }

509 int ssl_verify_cert_chain(SSL *s, STACK_OF(X509) *sk)
510 {
511     X509 *x;
512     int i;
513     X509_STORE_CTX ctx;

515     if ((sk == NULL) || (sk_X509_num(sk) == 0))
516         return(0);

518     x = sk_X509_value(sk, 0);
519     if (!X509_STORE_CTX_init(&ctx, s->ctx->cert_store, x, sk))
520     {
521         SSLerr(SSL_F_SSL_VERIFY_CERT_CHAIN, ERR_R_X509_LIB);
522         return(0);
523     }

```



```

524 #if 0
525     if (SSL_get_verify_depth(s) >= 0)
526         X509_STORE_CTX_set_depth(&ctx, SSL_get_verify_depth(s));
527 #endif
528     X509_STORE_CTX_set_ex_data(&ctx, SSL_get_ex_data_X509_STORE_CTX_idx(), s);

530     /* We need to inherit the verify parameters. These can be determined by
531      * the context: if its a server it will verify SSL client certificates
532      * or vice versa.
533      */

535     X509_STORE_CTX_set_default(&ctx,
536                               s->server ? "ssl_client" : "ssl_server");
537     /* Anything non-default in "param" should overwrite anything in the
538      * ctx.
539      */
540     X509_VERIFY_PARAM_set1(X509_STORE_CTX_get0_param(&ctx), s->param);

542     if (s->verify_callback)
543         X509_STORE_CTX_set_verify_cb(&ctx, s->verify_callback);

545     if (s->ctx->app_verify_callback != NULL)
546 #if 1 /* new with OpenSSL 0.9.7 */
547         i=s->ctx->app_verify_callback(&ctx, s->ctx->app_verify_arg);
548 #else
549         i=s->ctx->app_verify_callback(&ctx); /* should pass app_verify_a
550 #endif
551     else
552     {
553 #ifndef OPENSSL_NO_X509_VERIFY
554         i=X509_verify_cert(&ctx);
555 #else
556         i=0;
557         ctx.error=X509_V_ERR_APPLICATION_VERIFICATION;
558         SSLerr(SSL_F_SSL_VERIFY_CERT_CHAIN, SSL_R_NO_VERIFY_CALLBACK);
559 #endif
560     }

562     s->verify_result=ctx.error;
563     X509_STORE_CTX_cleanup(&ctx);

565     return(i);
566 }

568 static void set_client_CA_list(STACK_OF(X509_NAME) **ca_list, STACK_OF(X509_NAME)
569 {
570     if (*ca_list != NULL)
571         sk_X509_NAME_pop_free(*ca_list, X509_NAME_free);

573     *ca_list=name_list;
574 }

576 STACK_OF(X509_NAME) *SSL_dup_CA_list(STACK_OF(X509_NAME) *sk)
577 {
578     int i;
579     STACK_OF(X509_NAME) *ret;
580     X509_NAME *name;

582     ret=sk_X509_NAME_new_null();
583     for (i=0; i<sk_X509_NAME_num(sk); i++)
584     {
585         name=X509_NAME_dup(sk_X509_NAME_value(sk,i));
586         if ((name == NULL) || !sk_X509_NAME_push(ret,name))
587         {
588             sk_X509_NAME_pop_free(ret, X509_NAME_free);
589             return(NULL);

```

```

590     }
591     }
592     return(ret);
593 }

595 void SSL_set_client_CA_list(SSL *s, STACK_OF(X509_NAME) *name_list)
596 {
597     set_client_CA_list(&(s->client_CA), name_list);
598 }

600 void SSL_CTX_set_client_CA_list(SSL_CTX *ctx, STACK_OF(X509_NAME) *name_list)
601 {
602     set_client_CA_list(&(ctx->client_CA), name_list);
603 }

605 STACK_OF(X509_NAME) *SSL_CTX_get_client_CA_list(const SSL_CTX *ctx)
606 {
607     return(ctx->client_CA);
608 }

610 STACK_OF(X509_NAME) *SSL_get_client_CA_list(const SSL *s)
611 {
612     if (s->type == SSL_ST_CONNECT)
613     { /* we are in the client */
614         if (((s->version>>8) == SSL3_VERSION_MAJOR) &&
615             (s->s3 != NULL))
616             return(s->s3->tmp.ca_names);
617         else
618             return(NULL);
619     }
620     else
621     {
622         if (s->client_CA != NULL)
623             return(s->client_CA);
624         else
625             return(s->ctx->client_CA);
626     }
627 }

629 static int add_client_CA(STACK_OF(X509_NAME) **sk, X509 *x)
630 {
631     X509_NAME *name;

633     if (x == NULL) return(0);
634     if ((*sk == NULL) && ((*sk=sk_X509_NAME_new_null()) == NULL))
635         return(0);
636     if ((name=X509_NAME_dup(X509_get_subject_name(x))) == NULL)
637         return(0);
638     if (!sk_X509_NAME_push(*sk, name))
639     {
640         X509_NAME_free(name);
641         return(0);
642     }
643     return(1);
644 }

646 int SSL_add_client_CA(SSL *ssl, X509 *x)
647 {
648     return(add_client_CA(&(ssl->client_CA), x));
649 }

651 int SSL_CTX_add_client_CA(SSL_CTX *ctx, X509 *x)
652 {
653     return(add_client_CA(&(ctx->client_CA), x));
654 }

```

```

656     }
657
658 static int xname_cmp(const X509_NAME * const *a, const X509_NAME * const *b)
659 {
660     return(X509_NAME_cmp(*a,*b));
661 }
662
663 #ifndef OPENSSSL_NO_STDIO
664 /*!
665 * Load CA certs from a file into a ::STACK. Note that it is somewhat misnamed;
666 * it doesn't really have anything to do with clients (except that a common use
667 * for a stack of CAs is to send it to the client). Actually, it doesn't have
668 * much to do with CAs, either, since it will load any old cert.
669 * \param file the file containing one or more certs.
670 * \return a ::STACK containing the certs.
671 */
672 STACK_OF(X509_NAME) *SSL_load_client_CA_file(const char *file)
673 {
674     BIO *in;
675     X509 *x=NULL;
676     X509_NAME *xn=NULL;
677     STACK_OF(X509_NAME) *ret = NULL,*sk;
678
679     sk=sk_X509_NAME_new(xname_cmp);
680
681     in=BIO_new(BIO_s_file_internal());
682
683     if ((sk == NULL) || (in == NULL))
684     {
685         SSLerr(SSL_F_SSL_LOAD_CLIENT_CA_FILE,ERR_R_MALLOC_FAILURE);
686         goto err;
687     }
688
689     if (!BIO_read_filename(in,file))
690         goto err;
691
692     for (;;)
693     {
694         if (PEM_read_bio_X509(in,&x,NULL,NULL) == NULL)
695             break;
696         if (ret == NULL)
697         {
698             ret = sk_X509_NAME_new_null();
699             if (ret == NULL)
700             {
701                 SSLerr(SSL_F_SSL_LOAD_CLIENT_CA_FILE,ERR_R_MALLOC_FAILURE);
702                 goto err;
703             }
704         }
705         if ((xn=X509_get_subject_name(x)) == NULL) goto err;
706         /* check for duplicates */
707         xn=X509_NAME_dup(xn);
708         if (xn == NULL) goto err;
709         if (sk_X509_NAME_find(sk,xn) >= 0)
710             X509_NAME_free(xn);
711         else
712         {
713             sk_X509_NAME_push(sk,xn);
714             sk_X509_NAME_push(ret,xn);
715         }
716     }
717
718     if (0)
719     {
720 err:
721         if (ret != NULL) sk_X509_NAME_pop_free(ret,X509_NAME_free);

```

```

722         ret=NULL;
723     }
724     if (sk != NULL) sk_X509_NAME_free(sk);
725     if (in != NULL) BIO_free(in);
726     if (x != NULL) X509_free(x);
727     if (ret != NULL)
728         ERR_clear_error();
729     return(ret);
730 }
731 #endif
732
733 /*!
734 * Add a file of certs to a stack.
735 * \param stack the stack to add to.
736 * \param file the file to add from. All certs in this file that are not
737 * already in the stack will be added.
738 * \return 1 for success, 0 for failure. Note that in the case of failure some
739 * certs may have been added to \c stack.
740 */
741
742 int SSL_add_file_cert_subjects_to_stack(STACK_OF(X509_NAME) *stack,
743                                         const char *file)
744 {
745     BIO *in;
746     X509 *x=NULL;
747     X509_NAME *xn=NULL;
748     int ret=1;
749     int (*oldcmp)(const X509_NAME * const *a, const X509_NAME * const *b);
750
751     oldcmp=sk_X509_NAME_set_cmp_func(stack,xname_cmp);
752
753     in=BIO_new(BIO_s_file_internal());
754
755     if (in == NULL)
756     {
757         SSLerr(SSL_F_SSL_ADD_FILE_CERT_SUBJECTS_TO_STACK,ERR_R_MALLOC_FAILURE);
758         goto err;
759     }
760
761     if (!BIO_read_filename(in,file))
762         goto err;
763
764     for (;;)
765     {
766         if (PEM_read_bio_X509(in,&x,NULL,NULL) == NULL)
767             break;
768         if ((xn=X509_get_subject_name(x)) == NULL) goto err;
769         xn=X509_NAME_dup(xn);
770         if (xn == NULL) goto err;
771         if (sk_X509_NAME_find(stack,xn) >= 0)
772             X509_NAME_free(xn);
773         else
774             sk_X509_NAME_push(stack,xn);
775     }
776
777     ERR_clear_error();
778
779     if (0)
780     {
781 err:
782         ret=0;
783     }
784     if(in != NULL)
785         BIO_free(in);
786     if(x != NULL)
787         X509_free(x);

```

```

788
789     (void)sk_X509_NAME_set_cmp_func(stack,oldcmp);
791
792     return ret;
793 }
794
795 /*!
796 * Add a directory of certs to a stack.
797 * \param stack the stack to append to.
798 * \param dir the directory to append from. All files in this directory will be
799 * examined as potential certs. Any that are acceptable to
800 * SSL_add_dir_cert_subjects_to_stack() that are not already in the stack will be
801 * included.
802 * \return 1 for success, 0 for failure. Note that in the case of failure some
803 * certs may have been added to \c stack.
804 */
805 int SSL_add_dir_cert_subjects_to_stack(STACK_OF(X509_NAME) *stack,
806                                       const char *dir)
807 {
808     OPENSSL_DIR_CTX *d = NULL;
809     const char *filename;
810     int ret = 0;
811
812     CRYPTO_w_lock(CRYPTO_LOCK_READDIR);
813
814     /* Note that a side effect is that the CAs will be sorted by name */
815
816     while((filename = OPENSSL_DIR_read(&d, dir)))
817     {
818         char buf[1024];
819         int r;
820
821         if(strlen(dir)+strlen(filename)+2 > sizeof buf)
822         {
823             SSLerr(SSL_F_SSL_ADD_DIR_CERT_SUBJECTS_TO_STACK,SSL_R_PA
824                  goto err;
825         }
826
827 #ifdef OPENSSL_SYS_VMS
828         r = BIO_snprintf(buf,sizeof buf,"%s%s",dir,filename);
829 #else
830         r = BIO_snprintf(buf,sizeof buf,"%s/%s",dir,filename);
831 #endif
832         if (r <= 0 || r >= (int)sizeof(buf))
833             goto err;
834         if(!SSL_add_file_cert_subjects_to_stack(stack,buf))
835             goto err;
836     }
837
838     if (errno)
839     {
840         SYSerr(SYS_F_OPENDIR, get_last_sys_error());
841         ERR_add_error_data(3, "OPENSSL_DIR_read(&ctx, '", dir, "'");
842         SSLerr(SSL_F_SSL_ADD_DIR_CERT_SUBJECTS_TO_STACK, ERR_R_SYS_LIB);
843         goto err;
844     }
845
846     ret = 1;
847
848 err:
849     if (d) OPENSSL_DIR_end(&d);
850     CRYPTO_w_unlock(CRYPTO_LOCK_READDIR);
851     return ret;
852 }

```

```

*****
52124 Fri May 30 18:32:22 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_ciph.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/ssl_ciph.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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52 *
53 * The licence and distribution terms for any publically available version or
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58 /* =====
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60 *
61 * Redistribution and use in source and binary forms, with or without

```

```

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104 * =====
105 *
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139 * OTHER ENTITY BASED ON INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR
140 * OTHERWISE.
141 */

143 #include <stdio.h>
144 #include <openssl/objects.h>
145 #ifndef OPENSSL_NO_COMP
146 #include <openssl/comp.h>
147 #endif
148 #ifndef OPENSSL_NO_ENGINE
149 #include <openssl/engine.h>
150 #endif
151 #include "ssl_locl.h"

153 #define SSL_ENC_DES_IDX      0
154 #define SSL_ENC_3DES_IDX    1
155 #define SSL_ENC_RC4_IDX     2
156 #define SSL_ENC_RC2_IDX     3
157 #define SSL_ENC_IDEA_IDX    4
158 #define SSL_ENC_NULL_IDX    5
159 #define SSL_ENC_AES128_IDX  6
160 #define SSL_ENC_AES256_IDX  7
161 #define SSL_ENC_CAMELLIA128_IDX 8
162 #define SSL_ENC_CAMELLIA256_IDX 9
163 #define SSL_ENC_GOST89_IDX  10
164 #define SSL_ENC_SEED_IDX    11
165 #define SSL_ENC_AES128GCM_IDX 12
166 #define SSL_ENC_AES256GCM_IDX 13
167 #define SSL_ENC_NUM_IDX     14

170 static const EVP_CIPHER *ssl_cipher_methods[SSL_ENC_NUM_IDX]={
171     NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL
172 };

174 #define SSL_COMP_NULL_IDX    0
175 #define SSL_COMP_ZLIB_IDX    1
176 #define SSL_COMP_NUM_IDX     2

178 static STACK_OF(SSL_COMP) *ssl_comp_methods=NULL;

180 #define SSL_MD_MD5_IDX 0
181 #define SSL_MD_SHA1_IDX 1
182 #define SSL_MD_GOST94_IDX 2
183 #define SSL_MD_GOST89MAC_IDX 3
184 #define SSL_MD_SHA256_IDX 4
185 #define SSL_MD_SHA384_IDX 5
186 /*Constant SSL_MAX_DIGEST equal to size of digests array should be
187 * defined in the
188 * ssl_locl.h */
189 #define SSL_MD_NUM_IDX SSL_MAX_DIGEST
190 static const EVP_MD *ssl_digest_methods[SSL_MD_NUM_IDX]={
191     NULL,NULL,NULL,NULL,NULL,NULL
192 };
193 /* PKEY_TYPE for GOST89MAC is known in advance, but, because

```

```

194 * implementation is engine-provided, we'll fill it only if
195 * corresponding EVP_PKEY_METHOD is found
196 */
197 static int ssl_mac_pkey_id[SSL_MD_NUM_IDX]={
198     EVP_PKEY_HMAC,EVP_PKEY_HMAC,EVP_PKEY_HMAC,NID_undef,
199     EVP_PKEY_HMAC,EVP_PKEY_HMAC
200 };

202 static int ssl_mac_secret_size[SSL_MD_NUM_IDX]={
203     0,0,0,0,0,0
204 };

206 static int ssl_handshake_digest_flag[SSL_MD_NUM_IDX]={
207     SSL_HANDSHAKE_MAC_MD5,SSL_HANDSHAKE_MAC_SHA,
208     SSL_HANDSHAKE_MAC_GOST94, 0, SSL_HANDSHAKE_MAC_SHA256,
209     SSL_HANDSHAKE_MAC_SHA384
210 };

212 #define CIPHER_ADD      1
213 #define CIPHER_KILL     2
214 #define CIPHER_DEL      3
215 #define CIPHER_ORD      4
216 #define CIPHER_SPECIAL  5

218 typedef struct cipher_order_st
219 {
220     const SSL_CIPHER *cipher;
221     int active;
222     int dead;
223     struct cipher_order_st *next,*prev;
224 } CIPHER_ORDER;

226 static const SSL_CIPHER cipher_aliases[]={
227     /* "ALL" doesn't include eNULL (must be specifically enabled) */
228     {0,SSL_TXT_ALL,0,0,0,~SSL_eNULL,0,0,0,0,0,0},
229     /* "COMPLEMENTOFALL" */
230     {0,SSL_TXT_CMPALL,0,0,0,SSL_eNULL,0,0,0,0,0,0},

232     /* "COMPLEMENTOFDEFAULT" (does *not* include ciphersuites not found in A
233     {0,SSL_TXT_CMPDEF,0,SSL_KEDH|SSL_KECDH,SSL_aNULL,~SSL_eNULL,0,0,0,0,0,0

235     /* key exchange aliases
236     * (some of those using only a single bit here combine
237     * multiple key exchange algs according to the RFCs,
238     * e.g. KEDH combines DHE_DSS and DHE_RSA) */
239     {0,SSL_TXT_KRSA,0,SSL_KRSA,0,0,0,0,0,0,0,0},

241     {0,SSL_TXT_KDHR,0,SSL_KDHR,0,0,0,0,0,0,0,0}, /* no such ciphersuit
242     {0,SSL_TXT_KDHD,0,SSL_KDHD,0,0,0,0,0,0,0,0}, /* no such ciphersuit
243     {0,SSL_TXT_KDH,0,SSL_KDH|SSL_KDHD,0,0,0,0,0,0,0,0}, /* no such cip
244     {0,SSL_TXT_KEDH,0,SSL_KEDH,0,0,0,0,0,0,0,0},
245     {0,SSL_TXT_DH,0,SSL_KDH|SSL_KDHD|SSL_KEDH,0,0,0,0,0,0,0,0},

247     {0,SSL_TXT_KKRB5,0,SSL_KKRB5,0,0,0,0,0,0,0,0},

249     {0,SSL_TXT_KECDHR,0,SSL_KECDHR,0,0,0,0,0,0,0,0},
250     {0,SSL_TXT_KECDHe,0,SSL_KECDHe,0,0,0,0,0,0,0,0},
251     {0,SSL_TXT_KECDH,0,SSL_KECDHR|SSL_KECDHe,0,0,0,0,0,0,0,0},
252     {0,SSL_TXT_KEECDH,0,SSL_KEECDH,0,0,0,0,0,0,0,0},
253     {0,SSL_TXT_ECDH,0,SSL_KECDHR|SSL_KECDHe|SSL_KEECDH,0,0,0,0,0,0,0,0},

255     {0,SSL_TXT_KPSK,0,SSL_KPSK,0,0,0,0,0,0,0,0},
256     {0,SSL_TXT_KSRP,0,SSL_KSRP,0,0,0,0,0,0,0,0},
257     {0,SSL_TXT_KGOST,0,SSL_KGOST,0,0,0,0,0,0,0,0},

259     /* server authentication aliases */

```

```

260 {0, SSL_TXT_RSA, 0, 0, SSL_RSA, 0, 0, 0, 0, 0, 0},
261 {0, SSL_TXT_ADSS, 0, 0, SSL_ADSS, 0, 0, 0, 0, 0, 0},
262 {0, SSL_TXT_DSS, 0, 0, SSL_ADSS, 0, 0, 0, 0, 0, 0},
263 {0, SSL_TXT_AKRB5, 0, 0, SSL_AKRB5, 0, 0, 0, 0, 0, 0},
264 {0, SSL_TXT_ANULL, 0, 0, SSL_ANULL, 0, 0, 0, 0, 0, 0},
265 {0, SSL_TXT_ADH, 0, 0, SSL_ADH, 0, 0, 0, 0, 0, 0}, /* no such ciphersuit
266 {0, SSL_TXT_AECDH, 0, 0, SSL_AECDH, 0, 0, 0, 0, 0, 0},
267 {0, SSL_TXT_AECDH, 0, 0, SSL_AECDH, 0, 0, 0, 0, 0, 0},
268 {0, SSL_TXT_ECDSA, 0, 0, SSL_ECDSA, 0, 0, 0, 0, 0, 0},
269 {0, SSL_TXT_APSK, 0, 0, SSL_APSK, 0, 0, 0, 0, 0, 0},
270 {0, SSL_TXT_AGOST94, 0, 0, SSL_AGOST94, 0, 0, 0, 0, 0, 0},
271 {0, SSL_TXT_AGOST01, 0, 0, SSL_AGOST01, 0, 0, 0, 0, 0, 0},
272 {0, SSL_TXT_AGOST, 0, 0, SSL_AGOST94|SSL_AGOST01, 0, 0, 0, 0, 0, 0},

274 /* aliases combining key exchange and server authentication */
275 {0, SSL_TXT_EDH, 0, 0, SSL_KEDH, ~SSL_ANULL, 0, 0, 0, 0, 0, 0},
276 {0, SSL_TXT_ECDH, 0, 0, SSL_KECDH, ~SSL_ANULL, 0, 0, 0, 0, 0, 0},
277 {0, SSL_TXT_NULL, 0, 0, SSL_eNULL, 0, 0, 0, 0, 0, 0},
278 {0, SSL_TXT_KRB5, 0, 0, SSL_KRB5, SSL_AKRB5, 0, 0, 0, 0, 0, 0},
279 {0, SSL_TXT_RSA, 0, 0, SSL_KRSA, SSL_RSA, 0, 0, 0, 0, 0, 0},
280 {0, SSL_TXT_ADH, 0, 0, SSL_KEDH, SSL_ANULL, 0, 0, 0, 0, 0, 0},
281 {0, SSL_TXT_AECDH, 0, 0, SSL_KECDH, SSL_ANULL, 0, 0, 0, 0, 0, 0},
282 {0, SSL_TXT_PSK, 0, 0, SSL_KPSK, SSL_APSK, 0, 0, 0, 0, 0, 0},
283 {0, SSL_TXT_SRP, 0, 0, SSL_KSRP, 0, 0, 0, 0, 0, 0},

286 /* symmetric encryption aliases */
287 {0, SSL_TXT_DES, 0, 0, 0, SSL_DES, 0, 0, 0, 0, 0, 0},
288 {0, SSL_TXT_3DES, 0, 0, 0, SSL_3DES, 0, 0, 0, 0, 0, 0},
289 {0, SSL_TXT_RC4, 0, 0, 0, SSL_RC4, 0, 0, 0, 0, 0, 0},
290 {0, SSL_TXT_RC2, 0, 0, 0, SSL_RC2, 0, 0, 0, 0, 0, 0},
291 {0, SSL_TXT_IDEA, 0, 0, 0, SSL_IDEA, 0, 0, 0, 0, 0, 0},
292 {0, SSL_TXT_SEED, 0, 0, 0, SSL_SEED, 0, 0, 0, 0, 0, 0},
293 {0, SSL_TXT_eNULL, 0, 0, 0, SSL_eNULL, 0, 0, 0, 0, 0, 0},
294 {0, SSL_TXT_AES128, 0, 0, 0, SSL_AES128|SSL_AES128GCM, 0, 0, 0, 0, 0, 0},
295 {0, SSL_TXT_AES256, 0, 0, 0, SSL_AES256|SSL_AES256GCM, 0, 0, 0, 0, 0, 0},
296 {0, SSL_TXT_AES, 0, 0, 0, SSL_AES, 0, 0, 0, 0, 0, 0},
297 {0, SSL_TXT_AES_GCM, 0, 0, 0, SSL_AES128GCM|SSL_AES256GCM, 0, 0, 0, 0, 0, 0},
298 {0, SSL_TXT_CAMELLIA128, 0, 0, 0, SSL_CAMELLIA128, 0, 0, 0, 0, 0, 0},
299 {0, SSL_TXT_CAMELLIA256, 0, 0, 0, SSL_CAMELLIA256, 0, 0, 0, 0, 0, 0},
300 {0, SSL_TXT_CAMELLIA, 0, 0, 0, SSL_CAMELLIA128|SSL_CAMELLIA256, 0, 0, 0, 0, 0, 0},

302 /* MAC aliases */
303 {0, SSL_TXT_MD5, 0, 0, 0, SSL_MD5, 0, 0, 0, 0, 0, 0},
304 {0, SSL_TXT_SHA1, 0, 0, 0, SSL_SHA1, 0, 0, 0, 0, 0, 0},
305 {0, SSL_TXT_SHA, 0, 0, 0, SSL_SHA1, 0, 0, 0, 0, 0, 0},
306 {0, SSL_TXT_GOST94, 0, 0, 0, SSL_GOST94, 0, 0, 0, 0, 0, 0},
307 {0, SSL_TXT_GOST89MAC, 0, 0, 0, SSL_GOST89MAC, 0, 0, 0, 0, 0, 0},
308 {0, SSL_TXT_SHA256, 0, 0, 0, SSL_SHA256, 0, 0, 0, 0, 0, 0},
309 {0, SSL_TXT_SHA384, 0, 0, 0, SSL_SHA384, 0, 0, 0, 0, 0, 0},

311 /* protocol version aliases */
312 {0, SSL_TXT_SSLV2, 0, 0, 0, 0, SSL_SSLV2, 0, 0, 0, 0},
313 {0, SSL_TXT_SSLV3, 0, 0, 0, 0, SSL_SSLV3, 0, 0, 0, 0},
314 {0, SSL_TXT_TL SV1, 0, 0, 0, 0, SSL_TL SV1, 0, 0, 0, 0},
315 {0, SSL_TXT_TL SV1_2, 0, 0, 0, 0, SSL_TL SV1_2, 0, 0, 0, 0},

317 /* export flag */
318 {0, SSL_TXT_EXP, 0, 0, 0, 0, 0, SSL_EXPORT, 0, 0, 0, 0},
319 {0, SSL_TXT_EXPORT, 0, 0, 0, 0, 0, 0, SSL_EXPORT, 0, 0, 0, 0},

321 /* strength classes */
322 {0, SSL_TXT_EXP40, 0, 0, 0, 0, 0, 0, SSL_EXP40, 0, 0, 0, 0},
323 {0, SSL_TXT_EXP56, 0, 0, 0, 0, 0, 0, 0, SSL_EXP56, 0, 0, 0, 0},
324 {0, SSL_TXT_LOW, 0, 0, 0, 0, 0, 0, 0, 0, SSL_LOW, 0, 0, 0, 0},
325 {0, SSL_TXT_MEDIUM, 0, 0, 0, 0, 0, 0, 0, 0, 0, SSL_MEDIUM, 0, 0, 0, 0},

```

```

326 {0, SSL_TXT_HIGH, 0, 0, 0, 0, 0, 0, 0, SSL_HIGH, 0, 0, 0, 0},
327 /* FIPS 140-2 approved ciphersuite */
328 {0, SSL_TXT_FIPS, 0, 0, 0, ~SSL_eNULL, 0, 0, 0, 0, SSL_FIPS, 0, 0, 0, 0},
329 };
330 /* Search for public key algorithm with given name and
331 * return its pkey_id if it is available. Otherwise return 0
332 */
333 #ifdef OPENSSL_NO_ENGINE

335 static int get_optional_pkey_id(const char *pkey_name)
336 {
337     const EVP_PKEY_ASN1_METHOD *ameth;
338     int pkey_id=0;
339     ameth = EVP_PKEY_asn1_find_str(NULL, pkey_name, -1);
340     if (ameth)
341     {
342         EVP_PKEY_asn1_get0_info(&pkey_id, NULL, NULL, NULL, NULL, ameth);
343     }
344     return pkey_id;
345 }

347 #else

349 static int get_optional_pkey_id(const char *pkey_name)
350 {
351     const EVP_PKEY_ASN1_METHOD *ameth;
352     ENGINE *tmpeng = NULL;
353     int pkey_id=0;
354     ameth = EVP_PKEY_asn1_find_str(&tmpeng, pkey_name, -1);
355     if (ameth)
356     {
357         EVP_PKEY_asn1_get0_info(&pkey_id, NULL, NULL, NULL, NULL, ameth);
358     }
359     if (tmpeng) ENGINE_finish(tmpeng);
360     return pkey_id;
361 }

363 #endif

365 void ssl_load_ciphers(void)
366 {
367     ssl_cipher_methods[SSL_ENC_DES_IDX]=
368         EVP_get_cipherbyname(SN_des_cbc);
369     ssl_cipher_methods[SSL_ENC_3DES_IDX]=
370         EVP_get_cipherbyname(SN_des_ede3_cbc);
371     ssl_cipher_methods[SSL_ENC_RC4_IDX]=
372         EVP_get_cipherbyname(SN_rc4);
373     ssl_cipher_methods[SSL_ENC_RC2_IDX]=
374         EVP_get_cipherbyname(SN_rc2_cbc);
375 #ifndef OPENSSL_NO_IDEA
376     ssl_cipher_methods[SSL_ENC_IDEA_IDX]=
377         EVP_get_cipherbyname(SN_idea_cbc);
378 #else
379     ssl_cipher_methods[SSL_ENC_IDEA_IDX]= NULL;
380 #endif

381     ssl_cipher_methods[SSL_ENC_AES128_IDX]=
382         EVP_get_cipherbyname(SN_aes_128_cbc);
383     ssl_cipher_methods[SSL_ENC_AES256_IDX]=
384         EVP_get_cipherbyname(SN_aes_256_cbc);
385     ssl_cipher_methods[SSL_ENC_CAMELLIA128_IDX]=
386         EVP_get_cipherbyname(SN_camellia_128_cbc);
387     ssl_cipher_methods[SSL_ENC_CAMELLIA256_IDX]=
388         EVP_get_cipherbyname(SN_camellia_256_cbc);
389     ssl_cipher_methods[SSL_ENC_GOST89_IDX]=
390         EVP_get_cipherbyname(SN_gost89_cnt);
391     ssl_cipher_methods[SSL_ENC_SEED_IDX]=

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```

392     EVP_get_cipherbyname(SN_seed_cbc);

394     ssl_cipher_methods[SSL_ENC_AES128GCM_IDX]=
395     EVP_get_cipherbyname(SN_aes_128_gcm);
396     ssl_cipher_methods[SSL_ENC_AES256GCM_IDX]=
397     EVP_get_cipherbyname(SN_aes_256_gcm);

399     ssl_digest_methods[SSL_MD_MD5_IDX]=
400     EVP_get_digestbyname(SN_md5);
401     ssl_mac_secret_size[SSL_MD_MD5_IDX]=
402     EVP_MD_size(ssl_digest_methods[SSL_MD_MD5_IDX]);
403     OPENSSL_assert(ssl_mac_secret_size[SSL_MD_MD5_IDX] >= 0);
404     ssl_digest_methods[SSL_MD_SHA1_IDX]=
405     EVP_get_digestbyname(SN_sha1);
406     ssl_mac_secret_size[SSL_MD_SHA1_IDX]=
407     EVP_MD_size(ssl_digest_methods[SSL_MD_SHA1_IDX]);
408     OPENSSL_assert(ssl_mac_secret_size[SSL_MD_SHA1_IDX] >= 0);
409     ssl_digest_methods[SSL_MD_GOST94_IDX]=
410     EVP_get_digestbyname(SN_id_GostR3411_94);
411     if (ssl_digest_methods[SSL_MD_GOST94_IDX])
412     {
413         ssl_mac_secret_size[SSL_MD_GOST94_IDX]=
414         EVP_MD_size(ssl_digest_methods[SSL_MD_GOST94_IDX]);
415         OPENSSL_assert(ssl_mac_secret_size[SSL_MD_GOST94_IDX] >= 0);
416     }
417     ssl_digest_methods[SSL_MD_GOST89MAC_IDX]=
418     EVP_get_digestbyname(SN_id_Gost28147_89_MAC);
419     ssl_mac_pkey_id[SSL_MD_GOST89MAC_IDX] = get_optional_pkey_id("go
420     if (ssl_mac_pkey_id[SSL_MD_GOST89MAC_IDX]) {
421         ssl_mac_secret_size[SSL_MD_GOST89MAC_IDX]=32;
422     }

424     ssl_digest_methods[SSL_MD_SHA256_IDX]=
425     EVP_get_digestbyname(SN_sha256);
426     ssl_mac_secret_size[SSL_MD_SHA256_IDX]=
427     EVP_MD_size(ssl_digest_methods[SSL_MD_SHA256_IDX]);
428     ssl_digest_methods[SSL_MD_SHA384_IDX]=
429     EVP_get_digestbyname(SN_sha384);
430     ssl_mac_secret_size[SSL_MD_SHA384_IDX]=
431     EVP_MD_size(ssl_digest_methods[SSL_MD_SHA384_IDX]);
432 }
433 #ifndef OPENSSL_NO_COMP

435 static int sk_comp_cmp(const SSL_COMP * const *a,
436                       const SSL_COMP * const *b)
437 {
438     return((*a)->id-(*b)->id);
439 }

441 static void load_builtin_compressions(void)
442 {
443     int got_write_lock = 0;

445     CRYPTO_r_lock(CRYPTO_LOCK_SSL);
446     if (ssl_comp_methods == NULL)
447     {
448         CRYPTO_r_unlock(CRYPTO_LOCK_SSL);
449         CRYPTO_w_lock(CRYPTO_LOCK_SSL);
450         got_write_lock = 1;
451
452         if (ssl_comp_methods == NULL)
453         {
454             SSL_COMP *comp = NULL;

456             MemCheck_off();
457             ssl_comp_methods=sk_SSL_COMP_new(sk_comp_cmp);

```

```

458         if (ssl_comp_methods != NULL)
459         {
460             comp=(SSL_COMP *)OPENSSL_malloc(sizeof(SSL_COMP)
461             if (comp != NULL)
462             {
463                 comp->method=COMP_zlib();
464                 if (comp->method
465                     && comp->method->type == NID_und
466                     OPENSSL_free(comp);
467             }
468             else
469             {
470                 comp->id=SSL_COMP_ZLIB_IDX;
471                 comp->name=comp->method->name;
472                 sk_SSL_COMP_push(ssl_comp_method
473             }
474             sk_SSL_COMP_sort(ssl_comp_methods);
475         }
476         MemCheck_on();
477     }
478 }
479
480 if (got_write_lock)
481     CRYPTO_w_unlock(CRYPTO_LOCK_SSL);
482 else
483     CRYPTO_r_unlock(CRYPTO_LOCK_SSL);
484 }
485 #endif

487 int ssl_cipher_get_evp(const SSL_SESSION *s, const EVP_CIPHER **enc,
488                       const EVP_MD **md, int *mac_pkey_type, int *mac_secret_size,SSL_COM
489 {
490     int i;
491     const SSL_CIPHER *c;

493     c=s->cipher;
494     if (c == NULL) return(0);
495     if (comp != NULL)
496     {
497         SSL_COMP ctmp;
498         #ifndef OPENSSL_NO_COMP
499             load_builtin_compressions();
500         #endif

502         *comp=NULL;
503         ctmp.id=s->compress_meth;
504         if (ssl_comp_methods != NULL)
505         {
506             i=sk_SSL_COMP_find(ssl_comp_methods,&ctmp);
507             if (i >= 0)
508                 *comp=sk_SSL_COMP_value(ssl_comp_methods,i);
509             else
510                 *comp=NULL;
511         }
512     }

514     if ((enc == NULL) || (md == NULL)) return(0);

516     switch (c->algorithm_enc)
517     {
518     case SSL_DES:
519         i=SSL_ENC_DES_IDX;
520         break;
521     case SSL_3DES:
522         i=SSL_ENC_3DES_IDX;
523         break;

```

```

524     case SSL_RC4:
525         i=SSL_ENC_RC4_IDX;
526         break;
527     case SSL_RC2:
528         i=SSL_ENC_RC2_IDX;
529         break;
530     case SSL_IDEA:
531         i=SSL_ENC_IDEA_IDX;
532         break;
533     case SSL_eNULL:
534         i=SSL_ENC_NULL_IDX;
535         break;
536     case SSL_AES128:
537         i=SSL_ENC_AES128_IDX;
538         break;
539     case SSL_AES256:
540         i=SSL_ENC_AES256_IDX;
541         break;
542     case SSL_CAMELLIA128:
543         i=SSL_ENC_CAMELLIA128_IDX;
544         break;
545     case SSL_CAMELLIA256:
546         i=SSL_ENC_CAMELLIA256_IDX;
547         break;
548     case SSL_eGOST2814789CNT:
549         i=SSL_ENC_GOST89_IDX;
550         break;
551     case SSL_SEED:
552         i=SSL_ENC_SEED_IDX;
553         break;
554     case SSL_AES128GCM:
555         i=SSL_ENC_AES128GCM_IDX;
556         break;
557     case SSL_AES256GCM:
558         i=SSL_ENC_AES256GCM_IDX;
559         break;
560     default:
561         i= -1;
562         break;
563     }

565     if ((i < 0) || (i > SSL_ENC_NUM_IDX))
566         *enc=NULL;
567     else
568     {
569         if (i == SSL_ENC_NULL_IDX)
570             *enc=EVP_enc_null();
571         else
572             *enc=ssl_cipher_methods[i];
573     }

575     switch (c->algorithm_mac)
576     {
577     case SSL_MD5:
578         i=SSL_MD_MD5_IDX;
579         break;
580     case SSL_SHA1:
581         i=SSL_MD_SHA1_IDX;
582         break;
583     case SSL_SHA256:
584         i=SSL_MD_SHA256_IDX;
585         break;
586     case SSL_SHA384:
587         i=SSL_MD_SHA384_IDX;
588         break;
589     case SSL_GOST94:

```

```

590         i = SSL_MD_GOST94_IDX;
591         break;
592     case SSL_GOST89MAC:
593         i = SSL_MD_GOST89MAC_IDX;
594         break;
595     default:
596         i= -1;
597         break;
598     }
599     if ((i < 0) || (i > SSL_MD_NUM_IDX))
600     {
601         *md=NULL;
602         if (mac_pkey_type!=NULL) *mac_pkey_type = NID_undef;
603         if (mac_secret_size!=NULL) *mac_secret_size = 0;
604         if (c->algorithm_mac == SSL_AEAD)
605             mac_pkey_type = NULL;
606     }
607     else
608     {
609         *md=ssl_digest_methods[i];
610         if (mac_pkey_type!=NULL) *mac_pkey_type = ssl_mac_pkey_id[i];
611         if (mac_secret_size!=NULL) *mac_secret_size = ssl_mac_secret_siz
612     }

614     if ((*enc != NULL) &&
615         (*md != NULL || (EVP_CIPHER_flags(*enc)&EVP_CIPH_FLAG_AEAD_CIPHER))
616         (!mac_pkey_type || *mac_pkey_type != NID_undef))
617     {
618         const EVP_CIPHER *evp;

620         if (s->ssl_version>>8 != TLS1_VERSION_MAJOR ||
621             s->ssl_version < TLS1_VERSION)
622             return 1;

624     #ifdef OPENSSSL_FIPS
625         if (FIPS_mode())
626             return 1;
627     #endif

629     if (c->algorithm_enc == SSL_RC4 &&
630         c->algorithm_mac == SSL_MD5 &&
631         (evp=EVP_get_cipherbyname("RC4-HMAC-MD5")))
632         *enc = evp, *md = NULL;
633     else if (c->algorithm_enc == SSL_AES128 &&
634         c->algorithm_mac == SSL_SHA1 &&
635         (evp=EVP_get_cipherbyname("AES-128-CBC-HMAC-SHA1")))
636         *enc = evp, *md = NULL;
637     else if (c->algorithm_enc == SSL_AES256 &&
638         c->algorithm_mac == SSL_SHA1 &&
639         (evp=EVP_get_cipherbyname("AES-256-CBC-HMAC-SHA1")))
640         *enc = evp, *md = NULL;
641     return(1);
642     }
643     else
644         return(0);
645     }

647     int ssl_get_handshake_digest(int idx, long *mask, const EVP_MD **md)
648     {
649         if (idx < 0 || idx >= SSL_MD_NUM_IDX)
650         {
651             return 0;
652         }
653         *mask = ssl_handshake_digest_flag[idx];
654         if (*mask)
655             *md = ssl_digest_methods[idx];

```



```

656     else
657         *md = NULL;
658     return 1;
659 }

661 #define ITEM_SEP(a) \
662     ((a) == ':' || ((a) == ' ') || ((a) == ';') || ((a) == ','))

664 static void ll_append_tail(CIPHER_ORDER **head, CIPHER_ORDER *curr,
665     CIPHER_ORDER **tail)
666 {
667     if (curr == *tail) return;
668     if (curr == *head)
669         *head=curr->next;
670     if (curr->prev != NULL)
671         curr->prev->next=curr->next;
672     if (curr->next != NULL)
673         curr->next->prev=curr->prev;
674     (*tail)->next=curr;
675     curr->prev= *tail;
676     curr->next=NULL;
677     *tail=curr;
678 }

680 static void ll_append_head(CIPHER_ORDER **head, CIPHER_ORDER *curr,
681     CIPHER_ORDER **tail)
682 {
683     if (curr == *head) return;
684     if (curr == *tail)
685         *tail=curr->prev;
686     if (curr->next != NULL)
687         curr->next->prev=curr->prev;
688     if (curr->prev != NULL)
689         curr->prev->next=curr->next;
690     (*head)->prev=curr;
691     curr->next= *head;
692     curr->prev=NULL;
693     *head=curr;
694 }

696 static void ssl_cipher_get_disabled(unsigned long *mkey, unsigned long *auth, un
697 {
698     *mkey = 0;
699     *auth = 0;
700     *enc = 0;
701     *mac = 0;
702     *ssl = 0;

704 #ifdef OPENSSL_NO_RSA
705     *mkey |= SSL_kRSA;
706     *auth |= SSL_aRSA;
707 #endif
708 #ifdef OPENSSL_NO_DSA
709     *auth |= SSL_aDSS;
710 #endif
711     *mkey |= SSL_kDhR|SSL_kDHd; /* no such ciphersuites supported! */
712     *auth |= SSL_aDH;
713 #ifdef OPENSSL_NO_DH
714     *mkey |= SSL_kDhR|SSL_kDHd|SSL_kEDH;
715     *auth |= SSL_aDH;
716 #endif
717 #ifdef OPENSSL_NO_KRB5
718     *mkey |= SSL_kKRB5;
719     *auth |= SSL_aKRB5;
720 #endif
721 #ifdef OPENSSL_NO_ECDSA

```

```

722     *auth |= SSL_aECDsa;
723 #endif
724 #ifdef OPENSSL_NO_ECDH
725     *mkey |= SSL_kECDHe|SSL_kECDHr;
726     *auth |= SSL_aECDH;
727 #endif
728 #ifdef OPENSSL_NO_PSK
729     *mkey |= SSL_kPSK;
730     *auth |= SSL_aPSK;
731 #endif
732 #ifdef OPENSSL_NO_SRP
733     *mkey |= SSL_kSRP;
734 #endif
735     /* Check for presence of GOST 34.10 algorithms, and if they
736      * do not present, disable appropriate auth and key exchange */
737     if (!get_optional_pkey_id("gost94")) {
738         *auth |= SSL_aGOST94;
739     }
740     if (!get_optional_pkey_id("gost2001")) {
741         *auth |= SSL_aGOST01;
742     }
743     /* Disable GOST key exchange if no GOST signature algs are available */
744     if ((*auth & (SSL_aGOST94|SSL_aGOST01)) == (SSL_aGOST94|SSL_aGOST01)) {
745         *mkey |= SSL_kGOST;
746     }
747 #ifdef SSL_FORBID_ENULL
748     *enc |= SSL_eNULL;
749 #endif
750

753     *enc |= (ssl_cipher_methods[SSL_ENC_DES_IDX] == NULL) ? SSL_DES : 0;
754     *enc |= (ssl_cipher_methods[SSL_ENC_3DES_IDX] == NULL) ? SSL_3DES : 0;
755     *enc |= (ssl_cipher_methods[SSL_ENC_RC4_IDX] == NULL) ? SSL_RC4 : 0;
756     *enc |= (ssl_cipher_methods[SSL_ENC_RC2_IDX] == NULL) ? SSL_RC2 : 0;
757     *enc |= (ssl_cipher_methods[SSL_ENC_IDEA_IDX] == NULL) ? SSL_IDEA : 0;
758     *enc |= (ssl_cipher_methods[SSL_ENC_AES128_IDX] == NULL) ? SSL_AES128 : 0;
759     *enc |= (ssl_cipher_methods[SSL_ENC_AES256_IDX] == NULL) ? SSL_AES256 : 0;
760     *enc |= (ssl_cipher_methods[SSL_ENC_AES128GCM_IDX] == NULL) ? SSL_AES128
761     *enc |= (ssl_cipher_methods[SSL_ENC_AES256GCM_IDX] == NULL) ? SSL_AES256
762     *enc |= (ssl_cipher_methods[SSL_ENC_CAMELLIA128_IDX] == NULL) ? SSL_CAME
763     *enc |= (ssl_cipher_methods[SSL_ENC_CAMELLIA256_IDX] == NULL) ? SSL_CAME
764     *enc |= (ssl_cipher_methods[SSL_ENC_GOST89_IDX] == NULL) ? SSL_eGOST2814
765     *enc |= (ssl_cipher_methods[SSL_ENC_SEED_IDX] == NULL) ? SSL_SEED : 0;

767     *mac |= (ssl_digest_methods[SSL_MD_MD5_IDX] == NULL) ? SSL_MD5 : 0;
768     *mac |= (ssl_digest_methods[SSL_MD_SHA1_IDX] == NULL) ? SSL_SHA1 : 0;
769     *mac |= (ssl_digest_methods[SSL_MD_SHA256_IDX] == NULL) ? SSL_SHA256 : 0;
770     *mac |= (ssl_digest_methods[SSL_MD_SHA384_IDX] == NULL) ? SSL_SHA384 : 0;
771     *mac |= (ssl_digest_methods[SSL_MD_GOST94_IDX] == NULL) ? SSL_GOST94 : 0;
772     *mac |= (ssl_digest_methods[SSL_MD_GOST89MAC_IDX] == NULL || ssl_mac_pke

774     }

776 static void ssl_cipher_collect_ciphers(const SSL_METHOD *ssl_method,
777     int num_of_ciphers,
778     unsigned long disabled_mkey, unsigned long disabled_auth,
779     unsigned long disabled_enc, unsigned long disabled_mac,
780     unsigned long disabled_ssl,
781     CIPHER_ORDER *co_list,
782     CIPHER_ORDER **head_p, CIPHER_ORDER **tail_p)
783 {
784     int i, co_list_num;
785     const SSL_CIPHER *c;

787     /*

```

```

788     * We have num_of_ciphers descriptions compiled in, depending on the
789     * method selected (SSLv2 and/or SSLv3, TLSv1 etc).
790     * These will later be sorted in a linked list with at most num
791     * entries.
792     */

794     /* Get the initial list of ciphers */
795     co_list_num = 0; /* actual count of ciphers */
796     for (i = 0; i < num_of_ciphers; i++)
797     {
798         c = ssl_method->get_cipher(i);
799         /* drop those that use any of that is not available */
800         if ((c != NULL) && c->valid &&
801 #ifdef OPENSSL_FIPS
802             (!FIPS_mode() || (c->algo_strength & SSL_FIPS)) &&
803 #endif
804             !(c->algorithm_mkey & disabled_mkey) &&
805             !(c->algorithm_auth & disabled_auth) &&
806             !(c->algorithm_enc & disabled_enc) &&
807             !(c->algorithm_mac & disabled_mac) &&
808             !(c->algorithm_ssl & disabled_ssl))
809         {
810             co_list[co_list_num].cipher = c;
811             co_list[co_list_num].next = NULL;
812             co_list[co_list_num].prev = NULL;
813             co_list[co_list_num].active = 0;
814             co_list_num++;
815 #ifdef KSSL_DEBUG
816             printf("\t%d: %s %lx %lx %lx\n", i, c->name, c->id, c->algor
817 #endif /* KSSL_DEBUG */
818             /*
819              * if (!sk_push(ca_list, (char *)c)) goto err;
820              */
821         }
822     }

824     /*
825     * Prepare linked list from list entries
826     */
827     if (co_list_num > 0)
828     {
829         co_list[0].prev = NULL;

831         if (co_list_num > 1)
832         {
833             co_list[0].next = &co_list[1];
834
835             for (i = 1; i < co_list_num - 1; i++)
836             {
837                 co_list[i].prev = &co_list[i - 1];
838                 co_list[i].next = &co_list[i + 1];
839             }

841             co_list[co_list_num - 1].prev = &co_list[co_list_num - 2]
842         }

843         co_list[co_list_num - 1].next = NULL;

846         *head_p = &co_list[0];
847         *tail_p = &co_list[co_list_num - 1];
848     }
849 }

851 static void ssl_cipher_collect_aliases(const SSL_CIPHER **ca_list,
852 int num_of_group_aliases,
853 unsigned long disabled_mkey, unsigned long disabled_auth

```

```

854     unsigned long disabled_enc, unsigned long disabled_mac,
855     unsigned long disabled_ssl,
856     CIPHER_ORDER *head)
857 {
858     CIPHER_ORDER *ciph_curr;
859     const SSL_CIPHER **ca_curr;
860     int i;
861     unsigned long mask_mkey = ~disabled_mkey;
862     unsigned long mask_auth = ~disabled_auth;
863     unsigned long mask_enc = ~disabled_enc;
864     unsigned long mask_mac = ~disabled_mac;
865     unsigned long mask_ssl = ~disabled_ssl;

867     /*
868     * First, add the real ciphers as already collected
869     */
870     ciph_curr = head;
871     ca_curr = ca_list;
872     while (ciph_curr != NULL)
873     {
874         *ca_curr = ciph_curr->cipher;
875         ca_curr++;
876         ciph_curr = ciph_curr->next;
877     }

879     /*
880     * Now we add the available ones from the cipher_aliases[] table.
881     * They represent either one or more algorithms, some of which
882     * in any affected category must be supported (set in enabled_mask),
883     * or represent a cipher strength value (will be added in any case becau
884     */
885     for (i = 0; i < num_of_group_aliases; i++)
886     {
887         unsigned long algorithm_mkey = cipher_aliases[i].algorithm_mkey;
888         unsigned long algorithm_auth = cipher_aliases[i].algorithm_auth;
889         unsigned long algorithm_enc = cipher_aliases[i].algorithm_enc;
890         unsigned long algorithm_mac = cipher_aliases[i].algorithm_mac;
891         unsigned long algorithm_ssl = cipher_aliases[i].algorithm_ssl;

893         if (algorithm_mkey)
894             if ((algorithm_mkey & mask_mkey) == 0)
895                 continue;

897         if (algorithm_auth)
898             if ((algorithm_auth & mask_auth) == 0)
899                 continue;

901         if (algorithm_enc)
902             if ((algorithm_enc & mask_enc) == 0)
903                 continue;

904         if (algorithm_mac)
905             if ((algorithm_mac & mask_mac) == 0)
906                 continue;

907         if (algorithm_ssl)
908             if ((algorithm_ssl & mask_ssl) == 0)
909                 continue;

910         *ca_curr = (SSL_CIPHER *) (cipher_aliases + i);
911         ca_curr++;
912     }

917     *ca_curr = NULL; /* end of list */
918 }

```

```

920 static void ssl_cipher_apply_rule(unsigned long cipher_id,
921     unsigned long alg_mkey, unsigned long alg_auth,
922     unsigned long alg_enc, unsigned long alg_mac,
923     unsigned long alg_ssl,
924     unsigned long algo_strength,
925     int rule, int strength_bits,
926     CIPHER_ORDER **head_p, CIPHER_ORDER **tail_p)
927 {
928     CIPHER_ORDER *head, *tail, *curr, *curr2, *last;
929     const SSL_CIPHER *cp;
930     int reverse = 0;

932 #ifdef CIPHER_DEBUG
933     printf("Applying rule %d with %08lx/%08lx/%08lx/%08lx/%08lx %08lx (%d)\n"
934         rule, alg_mkey, alg_auth, alg_enc, alg_mac, alg_ssl, algo_streng
935 #endif

937     if (rule == CIPHER_DEL)
938         reverse = 1; /* needed to maintain sorting between currently del

940     head = *head_p;
941     tail = *tail_p;

943     if (reverse)
944     {
945         curr = tail;
946         last = head;
947     }
948     else
949     {
950         curr = head;
951         last = tail;
952     }

954     curr2 = curr;
955     for (;;)
956     {
957         if ((curr == NULL) || (curr == last)) break;
958         curr = curr2;
959         curr2 = reverse ? curr->prev : curr->next;

961         cp = curr->cipher;

963         /*
964          * Selection criteria is either the value of strength_bits
965          * or the algorithms used.
966          */
967         if (strength_bits >= 0)
968         {
969             if (strength_bits != cp->strength_bits)
970                 continue;
971         }
972         else
973         {
974             #ifdef CIPHER_DEBUG
975                 printf("\nName: %s:\nAlgo = %08lx/%08lx/%08lx/%08lx/%08l
976             #endif

978             if (alg_mkey && !(alg_mkey & cp->algorithm_mkey))
979                 continue;
980             if (alg_auth && !(alg_auth & cp->algorithm_auth))
981                 continue;
982             if (alg_enc && !(alg_enc & cp->algorithm_enc))
983                 continue;
984             if (alg_mac && !(alg_mac & cp->algorithm_mac))
985                 continue;

```

```

986         if (alg_ssl && !(alg_ssl & cp->algorithm_ssl))
987             continue;
988         if ((algo_strength & SSL_EXP_MASK) && !(algo_strength &
989             continue;
990         if ((algo_strength & SSL_STRONG_MASK) && !(algo_strength
991             continue;
992         }

994 #ifdef CIPHER_DEBUG
995     printf("Action = %d\n", rule);
996 #endif

998     /* add the cipher if it has not been added yet. */
999     if (rule == CIPHER_ADD)
1000     {
1001         /* reverse == 0 */
1002         if (!curr->active)
1003         {
1004             ll_append_tail(&head, curr, &tail);
1005             curr->active = 1;
1006         }
1007     }
1008     /* Move the added cipher to this location */
1009     else if (rule == CIPHER_ORD)
1010     {
1011         /* reverse == 0 */
1012         if (curr->active)
1013         {
1014             ll_append_tail(&head, curr, &tail);
1015         }
1016     }
1017     else if (rule == CIPHER_DEL)
1018     {
1019         /* reverse == 1 */
1020         if (curr->active)
1021         {
1022             /* most recently deleted ciphersuites get best p
1023              * for any future CIPHER_ADD (note that the CIPH
1024              * works in reverse to maintain the order) */
1025             ll_append_head(&head, curr, &tail);
1026             curr->active = 0;
1027         }
1028     }
1029     else if (rule == CIPHER_KILL)
1030     {
1031         /* reverse == 0 */
1032         if (head == curr)
1033             head = curr->next;
1034         else
1035             curr->prev->next = curr->next;
1036         if (tail == curr)
1037             tail = curr->prev;
1038         curr->active = 0;
1039         if (curr->next != NULL)
1040             curr->next->prev = curr->prev;
1041         if (curr->prev != NULL)
1042             curr->prev->next = curr->next;
1043         curr->next = NULL;
1044         curr->prev = NULL;
1045     }
1046 }

1048 *head_p = head;
1049 *tail_p = tail;
1050 }

```

```

1052 static int ssl_cipher_strength_sort(CIPHER_ORDER **head_p,
1053                                     CIPHER_ORDER **tail_p)
1054 {
1055     int max_strength_bits, i, *number_uses;
1056     CIPHER_ORDER *curr;
1057
1058     /*
1059      * This routine sorts the ciphers with descending strength. The sorting
1060      * must keep the pre-sorted sequence, so we apply the normal sorting
1061      * routine as '+' movement to the end of the list.
1062      */
1063     max_strength_bits = 0;
1064     curr = *head_p;
1065     while (curr != NULL)
1066     {
1067         if (curr->active &&
1068             (curr->cipher->strength_bits > max_strength_bits))
1069             max_strength_bits = curr->cipher->strength_bits;
1070         curr = curr->next;
1071     }
1072
1073     number_uses = OPENSSL_malloc((max_strength_bits + 1) * sizeof(int));
1074     if (!number_uses)
1075     {
1076         SSLerr(SSL_F_SSL_CIPHER_STRENGTH_SORT, ERR_R_MALLOC_FAILURE);
1077         return(0);
1078     }
1079     memset(number_uses, 0, (max_strength_bits + 1) * sizeof(int));
1080
1081     /*
1082      * Now find the strength_bits values actually used
1083      */
1084     curr = *head_p;
1085     while (curr != NULL)
1086     {
1087         if (curr->active)
1088             number_uses[curr->cipher->strength_bits]++;
1089         curr = curr->next;
1090     }
1091     /*
1092      * Go through the list of used strength_bits values in descending
1093      * order.
1094      */
1095     for (i = max_strength_bits; i >= 0; i--)
1096         if (number_uses[i] > 0)
1097             ssl_cipher_apply_rule(0, 0, 0, 0, 0, 0, 0, CIPHER_ORD, i
1098
1099     OPENSSL_free(number_uses);
1100     return(1);
1101 }
1102
1103 static int ssl_cipher_process_rulestr(const char *rule_str,
1104                                     CIPHER_ORDER **head_p, CIPHER_ORDER **tail_p,
1105                                     const SSL_CIPHER **ca_list)
1106 {
1107     unsigned long alg_mkey, alg_auth, alg_enc, alg_mac, alg_ssl, algo_streng
1108     const char *l, *buf;
1109     int j, multi, found, rule, retval, ok, buflen;
1110     unsigned long cipher_id = 0;
1111     char ch;
1112
1113     retval = 1;
1114     l = rule_str;
1115     for (;;)
1116     {
1117         ch = *l;

```

```

1119         if (ch == '\0')
1120             break; /* done */
1121         if (ch == '-')
1122             { rule = CIPHER_DEL; l++; }
1123         else if (ch == '+')
1124             { rule = CIPHER_ORD; l++; }
1125         else if (ch == '!')
1126             { rule = CIPHER_KILL; l++; }
1127         else if (ch == '@')
1128             { rule = CIPHER_SPECIAL; l++; }
1129         else
1130             { rule = CIPHER_ADD; }
1131
1132         if (ITEM_SEP(ch))
1133             {
1134                 l++;
1135                 continue;
1136             }
1137
1138         alg_mkey = 0;
1139         alg_auth = 0;
1140         alg_enc = 0;
1141         alg_mac = 0;
1142         alg_ssl = 0;
1143         algo_strength = 0;
1144
1145         for (;;)
1146         {
1147             ch = *l;
1148             buf = l;
1149             buflen = 0;
1150             #ifndef CHARSET_EBCDIC
1151             while ( ((ch >= 'A') && (ch <= 'Z')) ||
1152                     ((ch >= 'a') && (ch <= 'z')) ||
1153                     ((ch >= '0') && (ch <= '9')) ||
1154                     (ch == '-') || (ch == '.') )
1155             {
1156                 while ( isalnum(ch) || (ch == '-') || (ch == '.'))
1157                     {
1158                         ch = *(++l);
1159                         buflen++;
1160                     }
1161
1162                 if (buflen == 0)
1163                 {
1164                     /*
1165                      * We hit something we cannot deal with,
1166                      * it is no command or separator nor
1167                      * alphanumeric, so we call this an error.
1168                      */
1169                     SSLerr(SSL_F_SSL_CIPHER_PROCESS_RULESTR,
1170                             SSL_R_INVALID_COMMAND);
1171                     retval = found = 0;
1172                     l++;
1173                     break;
1174                 }
1175
1176                 if (rule == CIPHER_SPECIAL)
1177                 {
1178                     found = 0; /* unused -- avoid compiler warning */
1179                     break; /* special treatment */
1180                 }
1181
1182                 /* check for multi-part specification */

```

```

1184         if (ch == '+')
1185             {
1186                 multi=1;
1187                 l++;
1188             }
1189         else
1190             multi=0;
1191
1192         /*
1193          * Now search for the cipher alias in the ca_list. Be ca
1194          * with the strncmp, because the "buflen" limitation
1195          * will make the rule "ADH:SOME" and the cipher
1196          * "ADH-MY-CIPHER" look like a match for buflen=3.
1197          * So additionally check whether the cipher name found
1198          * has the correct length. We can save a strlen() call:
1199          * just checking for the '\0' at the right place is
1200          * sufficient, we have to strncmp() anyway. (We cannot
1201          * use strcmp(), because buf is not '\0' terminated.)
1202          */
1203         j = found = 0;
1204         cipher_id = 0;
1205         while (ca_list[j])
1206             {
1207                 if (!strncmp(buf, ca_list[j]->name, buflen) &&
1208                     (ca_list[j]->name[buflen] == '\0'))
1209                     {
1210                         found = 1;
1211                         break;
1212                     }
1213                 else
1214                     j++;
1215             }
1216
1217         if (!found)
1218             break; /* ignore this entry */
1219
1220         if (ca_list[j]->algorithm_mkey)
1221             {
1222                 if (alg_mkey)
1223                     {
1224                         alg_mkey &= ca_list[j]->algorithm_mkey;
1225                         if (!alg_mkey) { found = 0; break; }
1226                     }
1227                 else
1228                     alg_mkey = ca_list[j]->algorithm_mkey;
1229             }
1230
1231         if (ca_list[j]->algorithm_auth)
1232             {
1233                 if (alg_auth)
1234                     {
1235                         alg_auth &= ca_list[j]->algorithm_auth;
1236                         if (!alg_auth) { found = 0; break; }
1237                     }
1238                 else
1239                     alg_auth = ca_list[j]->algorithm_auth;
1240             }
1241
1242         if (ca_list[j]->algorithm_enc)
1243             {
1244                 if (alg_enc)
1245                     {
1246                         alg_enc &= ca_list[j]->algorithm_enc;
1247                         if (!alg_enc) { found = 0; break; }
1248                     }
1249                 else

```

```

1250             alg_enc = ca_list[j]->algorithm_enc;
1251         }
1252         if (ca_list[j]->algorithm_mac)
1253             {
1254                 if (alg_mac)
1255                     {
1256                         alg_mac &= ca_list[j]->algorithm_mac;
1257                         if (!alg_mac) { found = 0; break; }
1258                     }
1259                 else
1260                     alg_mac = ca_list[j]->algorithm_mac;
1261             }
1262         if (ca_list[j]->algo_strength & SSL_EXP_MASK)
1263             {
1264                 if (algo_strength & SSL_EXP_MASK)
1265                     {
1266                         algo_strength &= (ca_list[j]->algo_stren
1267                             if (!(algo_strength & SSL_EXP_MASK)) { f
1268                     }
1269                 else
1270                     algo_strength |= ca_list[j]->algo_streng
1271             }
1272
1273         if (ca_list[j]->algo_strength & SSL_STRONG_MASK)
1274             {
1275                 if (algo_strength & SSL_STRONG_MASK)
1276                     {
1277                         algo_strength &= (ca_list[j]->algo_stren
1278                             if (!(algo_strength & SSL_STRONG_MASK))
1279                     }
1280                 else
1281                     algo_strength |= ca_list[j]->algo_streng
1282             }
1283
1284         if (ca_list[j]->valid)
1285             {
1286                 /* explicit ciphersuite found; its protocol vers
1287                  * does not become part of the search pattern!*/
1288                 cipher_id = ca_list[j]->id;
1289             }
1290         else
1291             {
1292                 /* not an explicit ciphersuite; only in this cas
1293                  * protocol version is considered part of the se
1294                 if (ca_list[j]->algorithm_ssl)
1295                     {
1296                         if (alg_ssl)
1297                             {
1298                                 alg_ssl &= ca_list[j]->algorithm
1299                                 if (!alg_ssl) { found = 0; break
1300                             }
1301                         else
1302                             alg_ssl = ca_list[j]->algorithm_
1303                     }
1304             }
1305
1306         if (!multi) break;
1307     }
1308
1309     /*
1310     * Ok, we have the rule, now apply it
1311     */

```

```

1316     if (rule == CIPHER_SPECIAL)
1317     {
1318         /* special command */
1319         ok = 0;
1320         if ((buflen == 8) &&
1321             !strcmp(buf, "STRENGTH", 8))
1322             ok = ssl_cipher_strength_sort(head_p, tail_p);
1323         else
1324             SSLerr(SSL_F_SSL_CIPHER_PROCESS_RULESTR,
1325                   SSL_R_INVALID_COMMAND);
1326         if (ok == 0)
1327             retval = 0;
1328         /*
1329          * We do not support any "multi" options
1330          * together with "@", so throw away the
1331          * rest of the command, if any left, until
1332          * end or ':' is found.
1333          */
1334         while ((*l != '\0') && !ITEM_SEP(*l))
1335             l++;
1336     }
1337     else if (found)
1338     {
1339         ssl_cipher_apply_rule(cipher_id,
1340                             alg_mkey, alg_auth, alg_enc, alg_mac, alg_ssl, a
1341                             rule, -1, head_p, tail_p);
1342     }
1343     else
1344     {
1345         while ((*l != '\0') && !ITEM_SEP(*l))
1346             l++;
1347     }
1348     if (*l == '\0') break; /* done */
1349 }
1350 return(retval);
1351 }

1353 STACK_OF(SSL_CIPHER) *ssl_create_cipher_list(const SSL_METHOD *ssl_method,
1354 STACK_OF(SSL_CIPHER) **cipher_list,
1355 STACK_OF(SSL_CIPHER) **cipher_list_by_id,
1356 const char *rule_str)
1357 {
1358     int ok, num_of_ciphers, num_of_alias_max, num_of_group_aliases;
1359     unsigned long disabled_mkey, disabled_auth, disabled_enc, disabled_mac,
1360     STACK_OF(SSL_CIPHER) *cipherstack, *tmp_cipher_list;
1361     const char *rule_p;
1362     CIPHER_ORDER *co_list = NULL, *head = NULL, *tail = NULL, *curr;
1363     const SSL_CIPHER **ca_list = NULL;

1365     /*
1366      * Return with error if nothing to do.
1367      */
1368     if (rule_str == NULL || cipher_list == NULL || cipher_list_by_id == NULL
1369         return NULL;

1371     /*
1372      * To reduce the work to do we only want to process the compiled
1373      * in algorithms, so we first get the mask of disabled ciphers.
1374      */
1375     ssl_cipher_get_disabled(&disabled_mkey, &disabled_auth, &disabled_enc, &

1377     /*
1378      * Now we have to collect the available ciphers from the compiled
1379      * in ciphers. We cannot get more than the number compiled in, so
1380      * it is used for allocation.
1381      */

```

```

1382     num_of_ciphers = ssl_method->num_ciphers();
1383     #ifdef KSSL_DEBUG
1384     printf("ssl_create_cipher_list() for %d ciphers\n", num_of_ciphers);
1385     #endif
1386     /* KSSL_DEBUG */
1387     co_list = (CIPHER_ORDER *)OPENSSL_malloc(sizeof(CIPHER_ORDER) * num_of_c
1388     if (co_list == NULL)
1389     {
1390         SSLerr(SSL_F_SSL_CREATE_CIPHER_LIST, ERR_R_MALLOC_FAILURE);
1391         return(NULL); /* Failure */
1392     }

1393     ssl_cipher_collect_ciphers(ssl_method, num_of_ciphers,
1394                             disabled_mkey, disabled_auth, disabled_enc, d
1395                             co_list, &head, &tail);

1398     /* Now arrange all ciphers by preference: */

1400     /* Everything else being equal, prefer ephemeral ECDH over other key exc
1401     ssl_cipher_apply_rule(0, SSL_KEECDH, 0, 0, 0, 0, 0, CIPHER_ADD, -1, &hea
1402     ssl_cipher_apply_rule(0, SSL_KEECDH, 0, 0, 0, 0, 0, CIPHER_DEL, -1, &hea

1404     /* AES is our preferred symmetric cipher */
1405     ssl_cipher_apply_rule(0, 0, 0, SSL_AES, 0, 0, 0, CIPHER_ADD, -1, &head,

1407     /* Temporarily enable everything else for sorting */
1408     ssl_cipher_apply_rule(0, 0, 0, 0, 0, 0, 0, CIPHER_ADD, -1, &head, &tail)

1410     /* Low priority for MD5 */
1411     ssl_cipher_apply_rule(0, 0, 0, 0, SSL_MD5, 0, 0, CIPHER_ORD, -1, &head,

1413     /* Move anonymous ciphers to the end. Usually, these will remain disabl
1414     * (For applications that allow them, they aren't too bad, but we prefer
1415     * authenticated ciphers.) */
1416     ssl_cipher_apply_rule(0, 0, SSL_aNULL, 0, 0, 0, 0, CIPHER_ORD, -1, &head

1418     /* Move ciphers without forward secrecy to the end */
1419     ssl_cipher_apply_rule(0, 0, SSL_aECDH, 0, 0, 0, 0, CIPHER_ORD, -1, &head
1420     /* ssl_cipher_apply_rule(0, 0, SSL_aDH, 0, 0, 0, 0, CIPHER_ORD, -1, &hea
1421     ssl_cipher_apply_rule(0, SSL_kRSA, 0, 0, 0, 0, 0, CIPHER_ORD, -1, &head,
1422     ssl_cipher_apply_rule(0, SSL_kPSK, 0, 0, 0, 0, 0, CIPHER_ORD, -1, &head,
1423     ssl_cipher_apply_rule(0, SSL_kKRB5, 0, 0, 0, 0, 0, CIPHER_ORD, -1, &head,

1425     /* RC4 is sort-of broken -- move the the end */
1426     ssl_cipher_apply_rule(0, 0, 0, SSL_RC4, 0, 0, 0, CIPHER_ORD, -1, &head,

1428     /* Now sort by symmetric encryption strength. The above ordering remain
1429     * in force within each class */
1430     if (!ssl_cipher_strength_sort(&head, &tail))
1431     {
1432         OPENSSL_free(co_list);
1433         return NULL;
1434     }

1436     /* Now disable everything (maintaining the ordering!) */
1437     ssl_cipher_apply_rule(0, 0, 0, 0, 0, 0, 0, CIPHER_DEL, -1, &head, &tail)

1440     /*
1441     * We also need cipher aliases for selecting based on the rule_str.
1442     * There might be two types of entries in the rule_str: 1) names
1443     * of ciphers themselves 2) aliases for groups of ciphers.
1444     * For 1) we need the available ciphers and for 2) the cipher
1445     * groups of cipher_aliases added together in one list (otherwise
1446     * we would be happy with just the cipher_aliases table).
1447     */

```

```

1448     num_of_group_aliases = sizeof(cipher_aliases) / sizeof(SSL_CIPHER);
1449     num_of_alias_max = num_of_ciphers + num_of_group_aliases + 1;
1450     ca_list = OPENSSL_malloc(sizeof(SSL_CIPHER *) * num_of_alias_max);
1451     if (ca_list == NULL)
1452     {
1453         OPENSSL_free(co_list);
1454         SSLerr(SSL_F_SSL_CREATE_CIPHER_LIST, ERR_R_MALLOC_FAILURE);
1455         return(NULL); /* Failure */
1456     }
1457     ssl_cipher_collect_aliases(ca_list, num_of_group_aliases,
1458                             disabled_mkey, disabled_auth, disabled_enc,
1459                             disabled_mac, disabled_ssl, head);
1461     /*
1462     * If the rule_string begins with DEFAULT, apply the default rule
1463     * before using the (possibly available) additional rules.
1464     */
1465     ok = 1;
1466     rule_p = rule_str;
1467     if (strncmp(rule_str, "DEFAULT", 7) == 0)
1468     {
1469         ok = ssl_cipher_process_rulestr(SSL_DEFAULT_CIPHER_LIST,
1470                                     &head, &tail, ca_list);
1471         rule_p += 7;
1472         if (*rule_p == ':')
1473             rule_p++;
1474     }
1476     if (ok && (strlen(rule_p) > 0))
1477         ok = ssl_cipher_process_rulestr(rule_p, &head, &tail, ca_list);
1479     OPENSSL_free((void *)ca_list); /* Not needed anymore */
1481     if (!ok)
1482     { /* Rule processing failure */
1483         OPENSSL_free(co_list);
1484         return(NULL);
1485     }
1487     /*
1488     * Allocate new "cipherstack" for the result, return with error
1489     * if we cannot get one.
1490     */
1491     if ((cipherstack = sk_SSL_CIPHER_new_null()) == NULL)
1492     {
1493         OPENSSL_free(co_list);
1494         return(NULL);
1495     }
1497     /*
1498     * The cipher selection for the list is done. The ciphers are added
1499     * to the resulting precedence to the STACK_OF(SSL_CIPHER).
1500     */
1501     for (curr = head; curr != NULL; curr = curr->next)
1502     {
1503 #ifdef OPENSSL_FIPS
1504         if (curr->active && (!FIPS_mode()) || curr->cipher->algo_strength
1505 #else
1506         if (curr->active)
1507 #endif
1508         {
1509             sk_SSL_CIPHER_push(cipherstack, curr->cipher);
1510 #ifdef CIPHER_DEBUG
1511             printf("<%s>\n", curr->cipher->name);
1512 #endif
1513         }

```

```

1514     }
1515     OPENSSL_free(co_list); /* Not needed any longer */
1517     tmp_cipher_list = sk_SSL_CIPHER_dup(cipherstack);
1518     if (tmp_cipher_list == NULL)
1519     {
1520         sk_SSL_CIPHER_free(cipherstack);
1521         return NULL;
1522     }
1523     if (*cipher_list != NULL)
1524         sk_SSL_CIPHER_free(*cipher_list);
1525     *cipher_list = cipherstack;
1526     if (*cipher_list_by_id != NULL)
1527         sk_SSL_CIPHER_free(*cipher_list_by_id);
1528     *cipher_list_by_id = tmp_cipher_list;
1529     (void)sk_SSL_CIPHER_set_cmp_func(*cipher_list_by_id, ssl_cipher_ptr_id_cm);
1531     sk_SSL_CIPHER_sort(*cipher_list_by_id);
1532     return(cipherstack);
1533 }
1535 char *SSL_CIPHER_description(const SSL_CIPHER *cipher, char *buf, int len)
1536 {
1537     int is_export, pk1, kl;
1538     const char *ver, *exp_str;
1539     const char *kx, *au, *enc, *mac;
1540     unsigned long alg_mkey, alg_auth, alg_enc, alg_mac, alg_ssl, alg2;
1541 #ifdef KSSL_DEBUG
1542     static const char *format="%-23s %s Kx=%-8s Au=%-4s Enc=%-9s Mac=%-4s%s\n";
1543 #else
1544     static const char *format="%-23s %s Kx=%-8s Au=%-4s Enc=%-9s Mac=%-4s%s";
1545 #endif /* KSSL_DEBUG */
1547     alg_mkey = cipher->algorithm_mkey;
1548     alg_auth = cipher->algorithm_auth;
1549     alg_enc = cipher->algorithm_enc;
1550     alg_mac = cipher->algorithm_mac;
1551     alg_ssl = cipher->algorithm_ssl;
1553     alg2=cipher->algorithm2;
1555     is_export=SSL_C_IS_EXPORT(cipher);
1556     pk1=SSL_C_EXPORT_PKEYLENGTH(cipher);
1557     kl=SSL_C_EXPORT_KEYLENGTH(cipher);
1558     exp_str=is_export?" export":"";
1559
1560     if (alg_ssl & SSL_SSLV2)
1561         ver="SSLv2";
1562     else if (alg_ssl & SSL_SSLV3)
1563         ver="SSLv3";
1564     else if (alg_ssl & SSL_TLSV1_2)
1565         ver="TLSv1.2";
1566     else
1567         ver="unknown";
1569     switch (alg_mkey)
1570     {
1571     case SSL_kRSA:
1572         kx=is_export?(pk1 == 512 ? "RSA(512)" : "RSA(1024)"): "RSA";
1573         break;
1574     case SSL_kDHr:
1575         kx="DH/RSA";
1576         break;
1577     case SSL_kDHd:
1578         kx="DH/DSS";
1579         break;

```

```

1580 case SSL_kKRB5:
1581     kx="KRB5";
1582     break;
1583 case SSL_kEDH:
1584     kx=is_export?(pkl == 512 ? "DH(512)" : "DH(1024)");"DH";
1585     break;
1586 case SSL_kECDHr:
1587     kx="ECDH/RSA";
1588     break;
1589 case SSL_kECDHe:
1590     kx="ECDH/ECDSA";
1591     break;
1592 case SSL_kECDH:
1593     kx="ECDH";
1594     break;
1595 case SSL_kPSK:
1596     kx="PSK";
1597     break;
1598 case SSL_kSRP:
1599     kx="SRP";
1600     break;
1601 default:
1602     kx="unknown";
1603 }

1605 switch (alg_auth)
1606 {
1607 case SSL_aRSA:
1608     au="RSA";
1609     break;
1610 case SSL_aDSS:
1611     au="DSS";
1612     break;
1613 case SSL_aDH:
1614     au="DH";
1615     break;
1616 case SSL_aKRB5:
1617     au="KRB5";
1618     break;
1619 case SSL_aECDH:
1620     au="ECDH";
1621     break;
1622 case SSL_aNULL:
1623     au="None";
1624     break;
1625 case SSL_aECDSA:
1626     au="ECDSA";
1627     break;
1628 case SSL_aPSK:
1629     au="PSK";
1630     break;
1631 default:
1632     au="unknown";
1633     break;
1634 }

1636 switch (alg_enc)
1637 {
1638 case SSL_DES:
1639     enc=(is_export && kl == 5)?"DES(40)": "DES(56)";
1640     break;
1641 case SSL_3DES:
1642     enc="3DES(168)";
1643     break;
1644 case SSL_RC4:
1645     enc=is_export?(kl == 5 ? "RC4(40)" : "RC4(56)")

```

```

1646         : ((alg2&SSL2_CF_8_BYTE_ENC)? "RC4(64)": "RC4(128)");
1647     break;
1648 case SSL_RC2:
1649     enc=is_export?(kl == 5 ? "RC2(40)" : "RC2(56)");"RC2(128)";
1650     break;
1651 case SSL_IDEA:
1652     enc="IDEA(128)";
1653     break;
1654 case SSL_eNULL:
1655     enc="None";
1656     break;
1657 case SSL_AES128:
1658     enc="AES(128)";
1659     break;
1660 case SSL_AES256:
1661     enc="AES(256)";
1662     break;
1663 case SSL_AES128GCM:
1664     enc="AESGCM(128)";
1665     break;
1666 case SSL_AES256GCM:
1667     enc="AESGCM(256)";
1668     break;
1669 case SSL_CAMELLIA128:
1670     enc="Camellia(128)";
1671     break;
1672 case SSL_CAMELLIA256:
1673     enc="Camellia(256)";
1674     break;
1675 case SSL_SEED:
1676     enc="SEED(128)";
1677     break;
1678 default:
1679     enc="unknown";
1680     break;
1681 }

1683 switch (alg_mac)
1684 {
1685 case SSL_MD5:
1686     mac="MD5";
1687     break;
1688 case SSL_SHA1:
1689     mac="SHA1";
1690     break;
1691 case SSL_SHA256:
1692     mac="SHA256";
1693     break;
1694 case SSL_SHA384:
1695     mac="SHA384";
1696     break;
1697 case SSL_AEAD:
1698     mac="AEAD";
1699     break;
1700 default:
1701     mac="unknown";
1702     break;
1703 }

1705 if (buf == NULL)
1706 {
1707     len=128;
1708     buf=OPENSSL_malloc(len);
1709     if (buf == NULL) return("OPENSSL_malloc Error");
1710 }
1711 else if (len < 128)

```



```

1712         return("Buffer too small");

1714 #ifdef KSSL_DEBUG
1715     BIO_snprintf(buf, len, format, cipher->name, ver, kx, au, enc, mac, exp_str, alg_m
1716 #else
1717     BIO_snprintf(buf, len, format, cipher->name, ver, kx, au, enc, mac, exp_str);
1718 #endif /* KSSL_DEBUG */
1719     return(buf);
1720 }

1722 char *SSL_CIPHER_get_version(const SSL_CIPHER *c)
1723 {
1724     int i;

1726     if (c == NULL) return("(NONE)");
1727     i=(int)(c->id>>24L);
1728     if (i == 3)
1729         return("TLSv1/SSLv3");
1730     else if (i == 2)
1731         return("SSLv2");
1732     else
1733         return("unknown");
1734 }

1736 /* return the actual cipher being used */
1737 const char *SSL_CIPHER_get_name(const SSL_CIPHER *c)
1738 {
1739     if (c != NULL)
1740         return(c->name);
1741     return("(NONE)");
1742 }

1744 /* number of bits for symmetric cipher */
1745 int SSL_CIPHER_get_bits(const SSL_CIPHER *c, int *alg_bits)
1746 {
1747     int ret=0;

1749     if (c != NULL)
1750     {
1751         if (alg_bits != NULL) *alg_bits = c->alg_bits;
1752         ret = c->strength_bits;
1753     }
1754     return(ret);
1755 }

1757 unsigned long SSL_CIPHER_get_id(const SSL_CIPHER *c)
1758 {
1759     return c->id;
1760 }

1762 SSL_COMP *ssl3_comp_find(STACK_OF(SSL_COMP) *sk, int n)
1763 {
1764     SSL_COMP *ctmp;
1765     int i, nn;

1767     if ((n == 0) || (sk == NULL)) return(NULL);
1768     nn=sk_SSL_COMP_num(sk);
1769     for (i=0; i<nn; i++)
1770     {
1771         ctmp=sk_SSL_COMP_value(sk, i);
1772         if (ctmp->id == n)
1773             return(ctmp);
1774     }
1775     return(NULL);
1776 }

```

```

1778 #ifdef OPENSSL_NO_COMP
1779 void *SSL_COMP_get_compression_methods(void)
1780 {
1781     return NULL;
1782 }
1783 int SSL_COMP_add_compression_method(int id, void *cm)
1784 {
1785     return 1;
1786 }

1788 const char *SSL_COMP_get_name(const void *comp)
1789 {
1790     return NULL;
1791 }
1792 #else
1793 STACK_OF(SSL_COMP) *SSL_COMP_get_compression_methods(void)
1794 {
1795     load_builtin_compressions();
1796     return(ssl_comp_methods);
1797 }

1799 int SSL_COMP_add_compression_method(int id, COMP_METHOD *cm)
1800 {
1801     SSL_COMP *comp;

1803     if (cm == NULL || cm->type == NID_undef)
1804         return 1;

1806     /* According to draft-ietf-tls-compression-04.txt, the
1807        compression number ranges should be the following:

1809        0 to 63:  methods defined by the IETF
1810        64 to 192: external party methods assigned by IANA
1811        193 to 255: reserved for private use */
1812     if (id < 193 || id > 255)
1813     {
1814         SSLerr(SSL_F_SSL_COMP_ADD_COMPRESSION_METHOD, SSL_R_COMPRESSION_I
1815         return 0;
1816     }

1818     MemCheck_off();
1819     comp=(SSL_COMP *)OPENSSL_malloc(sizeof(SSL_COMP));
1820     comp->id=id;
1821     comp->method=cm;
1822     load_builtin_compressions();
1823     if (ssl_comp_methods
1824         && sk_SSL_COMP_find(ssl_comp_methods, comp) >= 0)
1825     {
1826         OPENSSL_free(comp);
1827         MemCheck_on();
1828         SSLerr(SSL_F_SSL_COMP_ADD_COMPRESSION_METHOD, SSL_R_DUPLICATE_COM
1829         return(1);
1830     }
1831     else if ((ssl_comp_methods == NULL)
1832             || !sk_SSL_COMP_push(ssl_comp_methods, comp))
1833     {
1834         OPENSSL_free(comp);
1835         MemCheck_on();
1836         SSLerr(SSL_F_SSL_COMP_ADD_COMPRESSION_METHOD, ERR_R_MALLOC_FAILUR
1837         return(1);
1838     }
1839     else
1840     {
1841         MemCheck_on();
1842         return(0);
1843     }

```

```
1844     }
1846 const char *SSL_COMP_get_name(const COMP_METHOD *comp)
1847 {
1848     if (comp)
1849         return comp->name;
1850     return NULL;
1851 }
1853 #endif
```

```

*****
39618 Fri May 30 18:32:22 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_err.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/ssl_err.c */
2 /* =====
3 * Copyright (c) 1999-2011 The OpenSSL Project. All rights reserved.
4 *
5 * Redistribution and use in source and binary forms, with or without
6 * modification, are permitted provided that the following conditions
7 * are met:
8 *
9 * 1. Redistributions of source code must retain the above copyright
10 * notice, this list of conditions and the following disclaimer.
11 *
12 * 2. Redistributions in binary form must reproduce the above copyright
13 * notice, this list of conditions and the following disclaimer in
14 * the documentation and/or other materials provided with the
15 * distribution.
16 *
17 * 3. All advertising materials mentioning features or use of this
18 * software must display the following acknowledgment:
19 * "This product includes software developed by the OpenSSL Project
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21 *
22 * 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
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35 *
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37 * EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
38 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
39 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
40 * ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
41 * SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
42 * NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
43 * LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
44 * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
45 * STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
46 * ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
47 * OF THE POSSIBILITY OF SUCH DAMAGE.
48 * =====
49 *
50 * This product includes cryptographic software written by Eric Young
51 * (eay@cryptsoft.com). This product includes software written by Tim
52 * Hudson (tjh@cryptsoft.com).
53 *
54 */
55
56 /* NOTE: this file was auto generated by the mkerr.pl script: any changes
57 * made to it will be overwritten when the script next updates this file,
58 * only reason strings will be preserved.
59 */
60
61 #include <stdio.h>

```

```

62 #include <openssl/err.h>
63 #include <openssl/ssl.h>
64
65 /* BEGIN ERROR CODES */
66 #ifndef OPENSSL_NO_ERR
67
68 #define ERR_FUNC(func) ERR_PACK(ERR_LIB_SSL,func,0)
69 #define ERR_REASON(reason) ERR_PACK(ERR_LIB_SSL,0,reason)
70
71 static ERR_STRING_DATA SSL_str_functs[]=
72 {
73 {ERR_FUNC(SSL_F_CLIENT_CERTIFICATE), "CLIENT_CERTIFICATE"},
74 {ERR_FUNC(SSL_F_CLIENT_FINISHED), "CLIENT_FINISHED"},
75 {ERR_FUNC(SSL_F_CLIENT_HELLO), "CLIENT_HELLO"},
76 {ERR_FUNC(SSL_F_CLIENT_MASTER_KEY), "CLIENT_MASTER_KEY"},
77 {ERR_FUNC(SSL_F_D2I_SSL_SESSION), "D2I_SSL_SESSION"},
78 {ERR_FUNC(SSL_F_DO_DTLS1_WRITE), "DO_DTLS1_WRITE"},
79 {ERR_FUNC(SSL_F_DO_SSL3_WRITE), "DO_SSL3_WRITE"},
80 {ERR_FUNC(SSL_F_DTLS1_ACCEPT), "DTLS1_ACCEPT"},
81 {ERR_FUNC(SSL_F_DTLS1_ADD_CERT_TO_BUF), "DTLS1_ADD_CERT_TO_BUF"},
82 {ERR_FUNC(SSL_F_DTLS1_BUFFER_RECORD), "DTLS1_BUFFER_RECORD"},
83 {ERR_FUNC(SSL_F_DTLS1_CHECK_TIMEOUT_NUM), "DTLS1_CHECK_TIMEOUT_NUM"},
84 {ERR_FUNC(SSL_F_DTLS1_CLIENT_HELLO), "DTLS1_CLIENT_HELLO"},
85 {ERR_FUNC(SSL_F_DTLS1_CONNECT), "DTLS1_CONNECT"},
86 {ERR_FUNC(SSL_F_DTLS1_ENC), "DTLS1_ENC"},
87 {ERR_FUNC(SSL_F_DTLS1_GET_HELLO_VERIFY), "DTLS1_GET_HELLO_VERIFY"},
88 {ERR_FUNC(SSL_F_DTLS1_GET_MESSAGE), "DTLS1_GET_MESSAGE"},
89 {ERR_FUNC(SSL_F_DTLS1_GET_MESSAGE_FRAGMENT), "DTLS1_GET_MESSAGE_FRAGMENT"},
90 {ERR_FUNC(SSL_F_DTLS1_GET_RECORD), "DTLS1_GET_RECORD"},
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92 {ERR_FUNC(SSL_F_DTLS1_HEARTBEAT), "DTLS1_HEARTBEAT"},
93 {ERR_FUNC(SSL_F_DTLS1_OUTPUT_CERT_CHAIN), "DTLS1_OUTPUT_CERT_CHAIN"},
94 {ERR_FUNC(SSL_F_DTLS1_PREPROCESS_FRAGMENT), "DTLS1_PREPROCESS_FRAGMENT"},
95 {ERR_FUNC(SSL_F_DTLS1_PROCESS_OUT_OF_SEQ_MESSAGE), "DTLS1_PROCESS_OUT_OF_SEQ"},
96 {ERR_FUNC(SSL_F_DTLS1_PROCESS_RECORD), "DTLS1_PROCESS_RECORD"},
97 {ERR_FUNC(SSL_F_DTLS1_READ_BYTES), "DTLS1_READ_BYTES"},
98 {ERR_FUNC(SSL_F_DTLS1_READ_FAILED), "DTLS1_READ_FAILED"},
99 {ERR_FUNC(SSL_F_DTLS1_SEND_CERTIFICATE_REQUEST), "DTLS1_SEND_CERTIFICATE"},
100 {ERR_FUNC(SSL_F_DTLS1_SEND_CLIENT_CERTIFICATE), "DTLS1_SEND_CLIENT_CERTIFICATE"},
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102 {ERR_FUNC(SSL_F_DTLS1_SEND_CLIENT_VERIFY), "DTLS1_SEND_CLIENT_VERIFY"},
103 {ERR_FUNC(SSL_F_DTLS1_SEND_HELLO_VERIFY_REQUEST), "DTLS1_SEND_HELLO_VERIFY"},
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105 {ERR_FUNC(SSL_F_DTLS1_SEND_SERVER_HELLO), "DTLS1_SEND_SERVER_HELLO"},
106 {ERR_FUNC(SSL_F_DTLS1_SEND_SERVER_KEY_EXCHANGE), "DTLS1_SEND_SERVER_KEY_E"},
107 {ERR_FUNC(SSL_F_DTLS1_WRITE_APP_DATA_BYTES), "DTLS1_WRITE_APP_DATA_BYTES"},
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116 {ERR_FUNC(SSL_F_REQUEST_CERTIFICATE), "REQUEST_CERTIFICATE"},
117 {ERR_FUNC(SSL_F_SERVER_FINISH), "SERVER_FINISH"},
118 {ERR_FUNC(SSL_F_SERVER_HELLO), "SERVER_HELLO"},
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124 {ERR_FUNC(SSL_F_SSL23_GET_SERVER_HELLO), "SSL23_GET_SERVER_HELLO"},
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130 {ERR_FUNC(SSL_F_SSL2_ENC_INIT), "SSL2_ENC_INIT"},
131 {ERR_FUNC(SSL_F_SSL2_GENERATE_KEY_MATERIAL), "SSL2_GENERATE_KEY_MATERIAL"},
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139 {ERR_FUNC(SSL_F_SSL3_CALLBACK_CTRL), "SSL3_CALLBACK_CTRL"},
140 {ERR_FUNC(SSL_F_SSL3_CHANGE_CIPHER_STATE), "SSL3_CHANGE_CIPHER_STATE"},
141 {ERR_FUNC(SSL_F_SSL3_CHECK_CERT_AND_ALGORITHM), "SSL3_CHECK_CERT_AND_ALGORITHM"},
142 {ERR_FUNC(SSL_F_SSL3_CHECK_CLIENT_HELLO), "SSL3_CHECK_CLIENT_HELLO"},
143 {ERR_FUNC(SSL_F_SSL3_CLIENT_HELLO), "SSL3_CLIENT_HELLO"},
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146 {ERR_FUNC(SSL_F_SSL3_CTX_CTRL), "SSL3_CTX_CTRL"},
147 {ERR_FUNC(SSL_F_SSL3_DIGEST_CACHED_RECORDS), "SSL3_DIGEST_CACHED_RECORDS"},
148 {ERR_FUNC(SSL_F_SSL3_DO_CHANGE_CIPHER_SPEC), "SSL3_DO_CHANGE_CIPHER_SPEC"},
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150 {ERR_FUNC(SSL_F_SSL3_GENERATE_KEY_BLOCK), "SSL3_GENERATE_KEY_BLOCK"},
151 {ERR_FUNC(SSL_F_SSL3_GET_CERTIFICATE_REQUEST), "SSL3_GET_CERTIFICATE_REQUEST"},
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155 {ERR_FUNC(SSL_F_SSL3_GET_CLIENT_HELLO), "SSL3_GET_CLIENT_HELLO"},
156 {ERR_FUNC(SSL_F_SSL3_GET_CLIENT_KEY_EXCHANGE), "SSL3_GET_CLIENT_KEY_EXCHANGE"},
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159 {ERR_FUNC(SSL_F_SSL3_GET_MESSAGE), "SSL3_GET_MESSAGE"},
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165 {ERR_FUNC(SSL_F_SSL3_GET_SERVER_HELLO), "SSL3_GET_SERVER_HELLO"},
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185 {ERR_FUNC(SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT), "SSL_ADD_CLIENTHELLO_TLSEXT"},
186 {ERR_FUNC(SSL_F_SSL_ADD_CLIENTHELLO_USE_SRTP_EXT), "SSL_ADD_CLIENTHELLO_USE"},
187 {ERR_FUNC(SSL_F_SSL_ADD_DIR_CERT_SUBJECTS_TO_STACK), "SSL_add_dir_cert_subjec"},
188 {ERR_FUNC(SSL_F_SSL_ADD_FILE_CERT_SUBJECTS_TO_STACK), "SSL_add_file_cert_subje"},
189 {ERR_FUNC(SSL_F_SSL_ADD_SERVERHELLO_RENEGOTIATE_EXT), "SSL_ADD_SERVERHELLO_REN"},
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199 {ERR_FUNC(SSL_F_SSL_CHECK_SERVERHELLO_TLSEXT), "SSL_CHECK_SERVERHELLO_TLSEXT"},
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201 {ERR_FUNC(SSL_F_SSL_CIPHER_PROCESS_RULESTR), "SSL_CIPHER_PROCESS_RULESTR"},
202 {ERR_FUNC(SSL_F_SSL_CIPHER_STRENGTH_SORT), "SSL_CIPHER_STRENGTH_SORT"},
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204 {ERR_FUNC(SSL_F_SSL_COMP_ADD_COMPRESSION_METHOD), "SSL_COMP_add_compressio"},
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229 {ERR_FUNC(SSL_F_SSL_GET_PREV_SESSION), "SSL_GET_PREV_SESSION"},
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259 {ERR_FUNC(SSL_F_SSL_SET_SESSION_ID_CONTEXT), "SSL_set_session_id_context"},

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274 {ERR_FUNC(SSL_F_SSL_USE_PSK_IDENTITY_HINT), "SSL_use_psk_identity_hint"},
275 {ERR_FUNC(SSL_F_SSL_USE_RSAPRIVATEKEY), "SSL_use_RSAPrivateKey"},
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277 {ERR_FUNC(SSL_F_SSL_USE_RSAPRIVATEKEY_FILE), "SSL_use_RSAPrivateKey_file"},
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282 {ERR_FUNC(SSL_F_TLS1_CHECK_SERVERHELLO_TLSEXT), "TLS1_CHECK_SERVERHELLO_TLSEXT"},
283 {ERR_FUNC(SSL_F_TLS1_ENC), "TLS1_ENC"},
284 {ERR_FUNC(SSL_F_TLS1_EXPORT_KEYING_MATERIAL), "TLS1_EXPORT_KEYING_MATERIAL"},
285 {ERR_FUNC(SSL_F_TLS1_HEARTBEAT), "SSL_F_TLS1_HEARTBEAT"},
286 {ERR_FUNC(SSL_F_TLS1_PREPARE_CLIENTHELLO_TLSEXT), "TLS1_PREPARE_CLIENTHELL"},
287 {ERR_FUNC(SSL_F_TLS1_PREPARE_SERVERHELLO_TLSEXT), "TLS1_PREPARE_SERVERHELL"},
288 {ERR_FUNC(SSL_F_TLS1_PRF), "tls1_prf"},
289 {ERR_FUNC(SSL_F_TLS1_SETUP_KEY_BLOCK), "TLS1_SETUP_KEY_BLOCK"},
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291 {0, NULL}
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295 {
296 {ERR_REASON(SSL_R_APP_DATA_IN_HANDSHAKE), "app data in handshake"},
297 {ERR_REASON(SSL_R_ATTEMPT_TO_REUSE_SESSION_IN_DIFFERENT_CONTEXT), "attempt to reu"},
298 {ERR_REASON(SSL_R_BAD_ALERT_RECORD), "bad alert record"},
299 {ERR_REASON(SSL_R_BAD_AUTHENTICATION_TYPE), "bad authentication type"},
300 {ERR_REASON(SSL_R_BAD_CHANGE_CIPHER_SPEC), "bad change cipher spec"},
301 {ERR_REASON(SSL_R_BAD_CHECKSUM), "bad checksum"},
302 {ERR_REASON(SSL_R_BAD_DATA_RETURNED_BY_CALLBACK), "bad data returned by callback"},
303 {ERR_REASON(SSL_R_BAD_DECOMPRESSION), "bad decompression"},
304 {ERR_REASON(SSL_R_BAD_DH_G_LENGTH), "bad dh g length"},
305 {ERR_REASON(SSL_R_BAD_DH_PUB_KEY_LENGTH), "bad dh pub key length"},
306 {ERR_REASON(SSL_R_BAD_DH_P_LENGTH), "bad dh p length"},
307 {ERR_REASON(SSL_R_BAD_DIGEST_LENGTH), "bad digest length"},
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309 {ERR_REASON(SSL_R_BAD_ECC_CERT), "bad ecc cert"},
310 {ERR_REASON(SSL_R_BAD_ECDSA_SIGNATURE), "bad ecdsa signature"},
311 {ERR_REASON(SSL_R_BAD_ECPPOINT), "bad ecpoint"},
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316 {ERR_REASON(SSL_R_BAD_MAC_LENGTH), "bad mac length"},
317 {ERR_REASON(SSL_R_BAD_MESSAGE_TYPE), "bad message type"},
318 {ERR_REASON(SSL_R_BAD_PACKET_LENGTH), "bad packet length"},
319 {ERR_REASON(SSL_R_BAD_PROTOCOL_VERSION_NUMBER), "bad protocol version number"},
320 {ERR_REASON(SSL_R_BAD_PSK_IDENTITY_HINT_LENGTH), "bad psk identity hint length"},
321 {ERR_REASON(SSL_R_BAD_RESPONSE_ARGUMENT), "bad response argument"},
322 {ERR_REASON(SSL_R_BAD_RSA_DECRYPT), "bad rsa decrypt"},
323 {ERR_REASON(SSL_R_BAD_RSA_ENCRYPT), "bad rsa encrypt"},
324 {ERR_REASON(SSL_R_BAD_RSA_E_LENGTH), "bad rsa e length"},
325 {ERR_REASON(SSL_R_BAD_RSA_MODULUS_LENGTH), "bad rsa modulus length"},

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327 {ERR_REASON(SSL_R_BAD_SIGNATURE), "bad signature"},
328 {ERR_REASON(SSL_R_BAD_SRP_A_LENGTH), "bad srp a length"},
329 {ERR_REASON(SSL_R_BAD_SRP_B_LENGTH), "bad srp b length"},
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331 {ERR_REASON(SSL_R_BAD_SRP_N_LENGTH), "bad srp n length"},
332 {ERR_REASON(SSL_R_BAD_SRP_S_LENGTH), "bad srp s length"},
333 {ERR_REASON(SSL_R_BAD_SRTP_MKI_VALUE), "bad srtp mki value"},
334 {ERR_REASON(SSL_R_BAD_SRTP_PROTECTION_PROFILE_LIST), "bad srtp protection profile"},
335 {ERR_REASON(SSL_R_BAD_SSL_FILETYPE), "bad ssl filetype"},
336 {ERR_REASON(SSL_R_BAD_SSL_SESSION_ID_LENGTH), "bad ssl session id length"},
337 {ERR_REASON(SSL_R_BAD_STATE), "bad state"},
338 {ERR_REASON(SSL_R_BAD_WRITE_RETRY), "bad write retry"},
339 {ERR_REASON(SSL_R_BIO_NOT_SET), "bio not set"},
340 {ERR_REASON(SSL_R_BLOCK_CIPHER_PAD_IS_WRONG), "block cipher pad is wrong"},
341 {ERR_REASON(SSL_R_BN_LIB), "bn lib"},
342 {ERR_REASON(SSL_R_CA_DN_LENGTH_MISMATCH), "ca dn length mismatch"},
343 {ERR_REASON(SSL_R_CA_DN_TOO_LONG), "ca dn too long"},
344 {ERR_REASON(SSL_R_CCS_RECEIVED_EARLY), "ccs received early"},
345 {ERR_REASON(SSL_R_CERTIFICATE_VERIFY_FAILED), "certificate verify failed"},
346 {ERR_REASON(SSL_R_CERT_LENGTH_MISMATCH), "cert length mismatch"},
347 {ERR_REASON(SSL_R_CHALLENGE_IS_DIFFERENT), "challenge is different"},
348 {ERR_REASON(SSL_R_CIPHER_CODE_WRONG_LENGTH), "cipher code wrong length"},
349 {ERR_REASON(SSL_R_CIPHER_OR_HASH_UNAVAILABLE), "cipher or hash unavailable"},
350 {ERR_REASON(SSL_R_CIPHER_TABLE_SRC_ERROR), "cipher table src error"},
351 {ERR_REASON(SSL_R_CLIENTHELLO_TLSEXT), "clienthello tlsext"},
352 {ERR_REASON(SSL_R_COMPRESSED_LENGTH_TOO_LONG), "compressed length too long"},
353 {ERR_REASON(SSL_R_COMPRESSION_DISABLED), "compression disabled"},
354 {ERR_REASON(SSL_R_COMPRESSION_FAILURE), "compression failure"},
355 {ERR_REASON(SSL_R_COMPRESSION_ID_NOT_WITHIN_PRIVATE_RANGE), "compression id not w"},
356 {ERR_REASON(SSL_R_COMPRESSION_LIBRARY_ERROR), "compression library error"},
357 {ERR_REASON(SSL_R_CONNECTION_ID_IS_DIFFERENT), "connection id is different"},
358 {ERR_REASON(SSL_R_CONNECTION_TYPE_NOT_SET), "connection type not set"},
359 {ERR_REASON(SSL_R_COOKIE_MISMATCH), "cookie mismatch"},
360 {ERR_REASON(SSL_R_DATA_BETWEEN_CCS_AND_FINISHED), "data between ccs and finished"},
361 {ERR_REASON(SSL_R_DATA_LENGTH_TOO_LONG), "data length too long"},
362 {ERR_REASON(SSL_R_DECRYPTION_FAILED), "decryption failed"},
363 {ERR_REASON(SSL_R_DECRYPTION_FAILED_OR_BAD_RECORD_MAC), "decryption failed or bad"},
364 {ERR_REASON(SSL_R_DH_PUBLIC_VALUE_LENGTH_IS_WRONG), "dh public value length is wr"},
365 {ERR_REASON(SSL_R_DIGEST_CHECK_FAILED), "digest check failed"},
366 {ERR_REASON(SSL_R_DTLS_MESSAGE_TOO_BIG), "dtls message too big"},
367 {ERR_REASON(SSL_R_DUPLICATE_COMPRESSION_ID), "duplicate compression id"},
368 {ERR_REASON(SSL_R_ECC_CERT_NOT_FOR_KEY_AGREEMENT), "ecc cert not for key agreemen"},
369 {ERR_REASON(SSL_R_ECC_CERT_NOT_FOR_SIGNING), "ecc cert not for signing"},
370 {ERR_REASON(SSL_R_ECC_CERT_SHOULD_HAVE_RSA_SIGNATURE), "ecc cert should have rsa"},
371 {ERR_REASON(SSL_R_ECC_CERT_SHOULD_HAVE_SHA1_SIGNATURE), "ecc cert should have sha"},
372 {ERR_REASON(SSL_R_ECGROUP_TOO_LARGE_FOR_CIPHER), "ecgroup too large for cipher"},
373 {ERR_REASON(SSL_R_EMPTY_SRTP_PROTECTION_PROFILE_LIST), "empty srtp protection pro"},
374 {ERR_REASON(SSL_R_ENCRYPTED_LENGTH_TOO_LONG), "encrypted length too long"},
375 {ERR_REASON(SSL_R_ERROR_GENERATING_TMP_RSA_KEY), "error generating tmp rsa key"},
376 {ERR_REASON(SSL_R_ERROR_IN_RECEIVED_CIPHER_LIST), "error in received cipher list"},
377 {ERR_REASON(SSL_R_EXCESSIVE_MESSAGE_SIZE), "excessive message size"},
378 {ERR_REASON(SSL_R_EXTRA_DATA_IN_MESSAGE), "extra data in message"},
379 {ERR_REASON(SSL_R_GOT_A_FIN_BEFORE_A_CCS), "got a fin before a ccs"},
380 {ERR_REASON(SSL_R_GOT_NEXT_PROTO_BEFORE_A_CCS), "got next proto before a ccs"},
381 {ERR_REASON(SSL_R_GOT_NEXT_PROTO_WITHOUT_EXTENSION), "got next proto without seei"},
382 {ERR_REASON(SSL_R_HTTPS_PROXY_REQUEST), "https proxy request"},
383 {ERR_REASON(SSL_R_HTTP_REQUEST), "http request"},
384 {ERR_REASON(SSL_R_ILLEGAL_PADDING), "illegal padding"},
385 {ERR_REASON(SSL_R_INCONSISTENT_COMPRESSION), "inconsistent compression"},
386 {ERR_REASON(SSL_R_INVALID_CHALLENGE_LENGTH), "invalid challenge length"},
387 {ERR_REASON(SSL_R_INVALID_COMMAND), "invalid command"},
388 {ERR_REASON(SSL_R_INVALID_COMPRESSION_ALGORITHM), "invalid compression algorithm"},
389 {ERR_REASON(SSL_R_INVALID_PURPOSE), "invalid purpose"},
390 {ERR_REASON(SSL_R_INVALID_SRP_USERNAME), "invalid srp username"},
391 {ERR_REASON(SSL_R_INVALID_STATUS_RESPONSE), "invalid status response"},

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392 {ERR_REASON(SSL_R_INVALID_TICKET_KEYS_LENGTH),"invalid ticket keys length"},
393 {ERR_REASON(SSL_R_INVALID_TRUST),"invalid trust"},
394 {ERR_REASON(SSL_R_KEY_ARG_TOO_LONG),"key arg too long"},
395 {ERR_REASON(SSL_R_KRB5),"krb5"},
396 {ERR_REASON(SSL_R_KRB5_C_CC_PRINC),"krb5 client cc principal (no tkt?)"},
397 {ERR_REASON(SSL_R_KRB5_C_GET_CRED),"krb5 client get cred"},
398 {ERR_REASON(SSL_R_KRB5_C_INIT),"krb5 client init"},
399 {ERR_REASON(SSL_R_KRB5_C_MK_REQ),"krb5 client mk_req (expired tkt?)"},
400 {ERR_REASON(SSL_R_KRB5_S_BAD_TICKET),"krb5 server bad ticket"},
401 {ERR_REASON(SSL_R_KRB5_S_INIT),"krb5 server init"},
402 {ERR_REASON(SSL_R_KRB5_S_RD_REQ),"krb5 server rd_req (keytab perms?)"},
403 {ERR_REASON(SSL_R_KRB5_S_TKT_EXPIRED),"krb5 server tkt expired"},
404 {ERR_REASON(SSL_R_KRB5_S_TKT_NYV),"krb5 server tkt not yet valid"},
405 {ERR_REASON(SSL_R_KRB5_S_TKT_SKEW),"krb5 server tkt skew"},
406 {ERR_REASON(SSL_R_LENGTH_MISMATCH),"length mismatch"},
407 {ERR_REASON(SSL_R_LENGTH_TOO_SHORT),"length too short"},
408 {ERR_REASON(SSL_R_LIBRARY_BUG),"library bug"},
409 {ERR_REASON(SSL_R_LIBRARY_HAS_NO_CIPHERS),"library has no ciphers"},
410 {ERR_REASON(SSL_R_MESSAGE_TOO_LONG),"message too long"},
411 {ERR_REASON(SSL_R_MISSING_DH_DSA_CERT),"missing dh dsa cert"},
412 {ERR_REASON(SSL_R_MISSING_DH_KEY),"missing dh key"},
413 {ERR_REASON(SSL_R_MISSING_DH_RSA_CERT),"missing dh rsa cert"},
414 {ERR_REASON(SSL_R_MISSING_DSA_SIGNING_CERT),"missing dsa signing cert"},
415 {ERR_REASON(SSL_R_MISSING_EXPORT_TMP_DH_KEY),"missing export tmp dh key"},
416 {ERR_REASON(SSL_R_MISSING_EXPORT_TMP_RSA_KEY),"missing export tmp rsa key"},
417 {ERR_REASON(SSL_R_MISSING_RSA_CERTIFICATE),"missing rsa certificate"},
418 {ERR_REASON(SSL_R_MISSING_RSA_ENCRYPTING_CERT),"missing rsa encrypting cert"},
419 {ERR_REASON(SSL_R_MISSING_RSA_SIGNING_CERT),"missing rsa signing cert"},
420 {ERR_REASON(SSL_R_MISSING_SRP_PARAM),"can't find SRP server param"},
421 {ERR_REASON(SSL_R_MISSING_TMP_DH_KEY),"missing tmp dh key"},
422 {ERR_REASON(SSL_R_MISSING_TMP_ECDH_KEY),"missing tmp ecdh key"},
423 {ERR_REASON(SSL_R_MISSING_TMP_RSA_KEY),"missing tmp rsa key"},
424 {ERR_REASON(SSL_R_MISSING_TMP_RSA_PKEY),"missing tmp rsa pkey"},
425 {ERR_REASON(SSL_R_MISSING_VERIFY_MESSAGE),"missing verify message"},
426 {ERR_REASON(SSL_R_MULTIPLE_SGC_RESTARTS),"multiple sgc restarts"},
427 {ERR_REASON(SSL_R_NON_SSLV2_INITIAL_PACKET),"non sslv2 initial packet"},
428 {ERR_REASON(SSL_R_NO_CERTIFICATES_RETURNED),"no certificates returned"},
429 {ERR_REASON(SSL_R_NO_CERTIFICATE_ASSIGNED),"no certificate assigned"},
430 {ERR_REASON(SSL_R_NO_CERTIFICATE_RETURNED),"no certificate returned"},
431 {ERR_REASON(SSL_R_NO_CERTIFICATE_SET),"no certificate set"},
432 {ERR_REASON(SSL_R_NO_CERTIFICATE_SPECIFIED),"no certificate specified"},
433 {ERR_REASON(SSL_R_NO_CIPHERS_AVAILABLE),"no ciphers available"},
434 {ERR_REASON(SSL_R_NO_CIPHERS_PASSED),"no ciphers passed"},
435 {ERR_REASON(SSL_R_NO_CIPHERS_SPECIFIED),"no ciphers specified"},
436 {ERR_REASON(SSL_R_NO_CIPHER_LIST),"no cipher list"},
437 {ERR_REASON(SSL_R_NO_CIPHER_MATCH),"no cipher match"},
438 {ERR_REASON(SSL_R_NO_CLIENT_CERT_METHOD),"no client cert method"},
439 {ERR_REASON(SSL_R_NO_CLIENT_CERT_RECEIVED),"no client cert received"},
440 {ERR_REASON(SSL_R_NO_COMPRESSION_SPECIFIED),"no compression specified"},
441 {ERR_REASON(SSL_R_NO_GOST_CERTIFICATE_SENT_BY_PEER),"Peer haven't sent GOST cert"},
442 {ERR_REASON(SSL_R_NO_METHOD_SPECIFIED),"no method specified"},
443 {ERR_REASON(SSL_R_NO_PRIVATEKEY),"no privatekey"},
444 {ERR_REASON(SSL_R_NO_PRIVATE_KEY_ASSIGNED),"no private key assigned"},
445 {ERR_REASON(SSL_R_NO_PROTOCOLS_AVAILABLE),"no protocols available"},
446 {ERR_REASON(SSL_R_NO_PUBLICKEY),"no publickey"},
447 {ERR_REASON(SSL_R_NO_RENEGOTIATION),"no renegotiation"},
448 {ERR_REASON(SSL_R_NO_REQUIRED_DIGEST),"digest required for handshake isn't co"},
449 {ERR_REASON(SSL_R_NO_SHARED_CIPHER),"no shared cipher"},
450 {ERR_REASON(SSL_R_NO_SRP_PROFILES),"no srp profiles"},
451 {ERR_REASON(SSL_R_NO_VERIFY_CALLBACK),"no verify callback"},
452 {ERR_REASON(SSL_R_NULL_SSL_CTX),"null ssl ctx"},
453 {ERR_REASON(SSL_R_NULL_SSL_METHOD_PASSED),"null ssl method passed"},
454 {ERR_REASON(SSL_R_OLD_SESSION_CIPHER_NOT_RETURNED),"old session cipher not retur"},
455 {ERR_REASON(SSL_R_OLD_SESSION_COMPRESSION_ALGORITHM_NOT_RETURNED),"old session c"},
456 {ERR_REASON(SSL_R_ONLY_TLS_ALLOWED_IN_FIPS_MODE),"only tls allowed in fips mode"},
457 {ERR_REASON(SSL_R_OPAQUE_PRF_INPUT_TOO_LONG),"opaque PRF input too long"},

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458 {ERR_REASON(SSL_R_PACKET_LENGTH_TOO_LONG),"packet length too long"},
459 {ERR_REASON(SSL_R_PARSE_TLSEXT),"parse tlsext"},
460 {ERR_REASON(SSL_R_PATH_TOO_LONG),"path too long"},
461 {ERR_REASON(SSL_R_PEER_DID_NOT_RETURN_A_CERTIFICATE),"peer did not return a cert"},
462 {ERR_REASON(SSL_R_PEER_ERROR),"peer error"},
463 {ERR_REASON(SSL_R_PEER_ERROR_CERTIFICATE),"peer error certificate"},
464 {ERR_REASON(SSL_R_PEER_ERROR_NO_CERTIFICATE),"peer error no certificate"},
465 {ERR_REASON(SSL_R_PEER_ERROR_NO_CIPHER),"peer error no cipher"},
466 {ERR_REASON(SSL_R_PEER_ERROR_UNSUPPORTED_CERTIFICATE_TYPE),"peer error unsupported"},
467 {ERR_REASON(SSL_R_PRE_MAC_LENGTH_TOO_LONG),"pre mac length too long"},
468 {ERR_REASON(SSL_R_PROBLEMS_MAPPING_CIPHER_FUNCTIONS),"problems mapping cipher fu"},
469 {ERR_REASON(SSL_R_PROTOCOL_IS_SHUTDOWN),"protocol is shutdown"},
470 {ERR_REASON(SSL_R_PSK_IDENTITY_NOT_FOUND),"psk identity not found"},
471 {ERR_REASON(SSL_R_PSK_NO_CLIENT_CB),"psk no client cb"},
472 {ERR_REASON(SSL_R_PSK_NO_SERVER_CB),"psk no server cb"},
473 {ERR_REASON(SSL_R_PUBLIC_KEY_ENCRYPT_ERROR),"public key encrypt error"},
474 {ERR_REASON(SSL_R_PUBLIC_KEY_IS_NOT_RSA),"public key is not rsa"},
475 {ERR_REASON(SSL_R_PUBLIC_KEY_NOT_RSA),"public key not rsa"},
476 {ERR_REASON(SSL_R_READ_BIO_NOT_SET),"read bio not set"},
477 {ERR_REASON(SSL_R_READ_TIMEOUT_EXPIRED),"read timeout expired"},
478 {ERR_REASON(SSL_R_READ_WRONG_PACKET_TYPE),"read wrong packet type"},
479 {ERR_REASON(SSL_R_RECORD_LENGTH_MISMATCH),"record length mismatch"},
480 {ERR_REASON(SSL_R_RECORD_TOO_LARGE),"record too large"},
481 {ERR_REASON(SSL_R_RECORD_TOO_SMALL),"record too small"},
482 {ERR_REASON(SSL_R_RENEGOTIATE_EXT_TOO_LONG),"renegotiate ext too long"},
483 {ERR_REASON(SSL_R_RENEGOTIATION_ENCODING_ERR),"renegotiation encoding err"},
484 {ERR_REASON(SSL_R_RENEGOTIATION_MISMATCH),"renegotiation mismatch"},
485 {ERR_REASON(SSL_R_REQUIRED_CIPHER_MISSING),"required cipher missing"},
486 {ERR_REASON(SSL_R_REQUIRED_COMPRESSION_ALGORITHM_MISSING),"required compresssio"},
487 {ERR_REASON(SSL_R_REUSE_CERT_LENGTH_NOT_ZERO),"reuse cert length not zero"},
488 {ERR_REASON(SSL_R_REUSE_CERT_TYPE_NOT_ZERO),"reuse cert type not zero"},
489 {ERR_REASON(SSL_R_REUSE_CIPHER_LIST_NOT_ZERO),"reuse cipher list not zero"},
490 {ERR_REASON(SSL_R_SCSV_RECEIVED_WHEN_RENEGOTIATING),"scsv received when renegototi"},
491 {ERR_REASON(SSL_R_SERVERHELLO_TLSEXT),"serverhello tlsext"},
492 {ERR_REASON(SSL_R_SESSION_ID_CONTEXT_UNINITIALIZED),"session id context uninitia"},
493 {ERR_REASON(SSL_R_SHORT_READ),"short read"},
494 {ERR_REASON(SSL_R_SIGNATURE_ALGORITHMS_ERROR),"signature algorithms error"},
495 {ERR_REASON(SSL_R_SIGNATURE_FOR_NON_SIGNING_CERTIFICATE),"signature for non sign"},
496 {ERR_REASON(SSL_R_SRP_A_CALC),"error with the srp params"},
497 {ERR_REASON(SSL_R_SRTP_COULD_NOT_ALLOCATE_PROFILES),"srtp could not allocate pro"},
498 {ERR_REASON(SSL_R_SRTP_PROTECTION_PROFILE_LIST_TOO_LONG),"srtp protection profil"},
499 {ERR_REASON(SSL_R_SRTP_UNKNOWN_PROTECTION_PROFILE),"srtp unknown protection prof"},
500 {ERR_REASON(SSL_R_SSL23_DOING_SESSION_ID_REUSE),"ssl23 doing session id reuse"},
501 {ERR_REASON(SSL_R_SSL2_CONNECTION_ID_TOO_LONG),"ssl2 connection id too long"},
502 {ERR_REASON(SSL_R_SSL3_EXT_INVALID_ECPOINTFORMAT),"ssl3 ext invalid ecpointforma"},
503 {ERR_REASON(SSL_R_SSL3_EXT_INVALID_SERVERNAME),"ssl3 ext invalid servername"},
504 {ERR_REASON(SSL_R_SSL3_EXT_INVALID_SERVERNAME_TYPE),"ssl3 ext invalid servername"},
505 {ERR_REASON(SSL_R_SSL3_SESSION_ID_TOO_LONG),"ssl3 session id too long"},
506 {ERR_REASON(SSL_R_SSL3_SESSION_ID_TOO_SHORT),"ssl3 session id too short"},
507 {ERR_REASON(SSL_R_SSLV3_ALERT_BAD_CERTIFICATE),"ssl3 alert bad certificate"},
508 {ERR_REASON(SSL_R_SSLV3_ALERT_BAD_RECORD_MAC),"ssl3 alert bad record mac"},
509 {ERR_REASON(SSL_R_SSLV3_ALERT_CERTIFICATE_EXPIRED),"ssl3 alert certificate expi"},
510 {ERR_REASON(SSL_R_SSLV3_ALERT_CERTIFICATE_REVOKED),"ssl3 alert certificate revo"},
511 {ERR_REASON(SSL_R_SSLV3_ALERT_CERTIFICATE_UNKNOWN),"ssl3 alert certificate unkn"},
512 {ERR_REASON(SSL_R_SSLV3_ALERT_DECOMPRESSION_FAILURE),"ssl3 alert decompression"},
513 {ERR_REASON(SSL_R_SSLV3_ALERT_HANDSHAKE_FAILURE),"ssl3 alert handshake failure"},
514 {ERR_REASON(SSL_R_SSLV3_ALERT_ILLEGAL_PARAMETER),"ssl3 alert illegal parameter"},
515 {ERR_REASON(SSL_R_SSLV3_ALERT_NO_CERTIFICATE),"ssl3 alert no certificate"},
516 {ERR_REASON(SSL_R_SSLV3_ALERT_UNEXPECTED_MESSAGE),"ssl3 alert unexpected messag"},
517 {ERR_REASON(SSL_R_SSLV3_ALERT_UNSUPPORTED_CERTIFICATE),"ssl3 alert unsupported"},
518 {ERR_REASON(SSL_R_SSL_CTX_HAS_NO_DEFAULT_SSL_VERSION),"ssl ctx has no default ss"},
519 {ERR_REASON(SSL_R_SSL_HANDSHAKE_FAILURE),"ssl handshake failure"},
520 {ERR_REASON(SSL_R_SSL_LIBRARY_HAS_NO_CIPHERS),"ssl library has no ciphers"},
521 {ERR_REASON(SSL_R_SSL_SESSION_ID_CALLBACK_FAILED),"ssl session id callback faile"},
522 {ERR_REASON(SSL_R_SSL_SESSION_ID_CONFLICT),"ssl session id conflict"},
523 {ERR_REASON(SSL_R_SSL_SESSION_ID_CONTEXT_TOO_LONG),"ssl session id context too l"}

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524 {ERR_REASON(SSL_R_SSL_SESSION_ID_HAS_BAD_LENGTH),"ssl session id has bad length"}
525 {ERR_REASON(SSL_R_SSL_SESSION_ID_IS_DIFFERENT),"ssl session id is different"},
526 {ERR_REASON(SSL_R_TLSV1_ALERT_ACCESS_DENIED),"tlsv1 alert access denied"},
527 {ERR_REASON(SSL_R_TLSV1_ALERT_DECODE_ERROR),"tlsv1 alert decode error"},
528 {ERR_REASON(SSL_R_TLSV1_ALERT_DECRYPTION_FAILED),"tlsv1 alert decryption failed"}
529 {ERR_REASON(SSL_R_TLSV1_ALERT_DECRYPT_ERROR),"tlsv1 alert decrypt error"},
530 {ERR_REASON(SSL_R_TLSV1_ALERT_EXPORT_RESTRICTION),"tlsv1 alert export restrictio"},
531 {ERR_REASON(SSL_R_TLSV1_ALERT_INSUFFICIENT_SECURITY),"tlsv1 alert insufficient s"},
532 {ERR_REASON(SSL_R_TLSV1_ALERT_INTERNAL_ERROR),"tlsv1 alert internal error"},
533 {ERR_REASON(SSL_R_TLSV1_ALERT_NO_RENEGOTIATION),"tlsv1 alert no renegotiation"},
534 {ERR_REASON(SSL_R_TLSV1_ALERT_PROTOCOL_VERSION),"tlsv1 alert protocol version"},
535 {ERR_REASON(SSL_R_TLSV1_ALERT_RECORD_OVERFLOW),"tlsv1 alert record overflow"},
536 {ERR_REASON(SSL_R_TLSV1_ALERT_UNKNOWN_CA),"tlsv1 alert unknown ca"},
537 {ERR_REASON(SSL_R_TLSV1_ALERT_USER_CANCELLED),"tlsv1 alert user cancelled"},
538 {ERR_REASON(SSL_R_TLSV1_BAD_CERTIFICATE_HASH_VALUE),"tlsv1 bad certificate hash"},
539 {ERR_REASON(SSL_R_TLSV1_BAD_CERTIFICATE_STATUS_RESPONSE),"tlsv1 bad certificate"},
540 {ERR_REASON(SSL_R_TLSV1_CERTIFICATE_UNOBTAINABLE),"tlsv1 certificate unobtainabl"},
541 {ERR_REASON(SSL_R_TLSV1_UNRECOGNIZED_NAME),"tlsv1 unrecognized name"},
542 {ERR_REASON(SSL_R_TLSV1_UNSUPPORTED_EXTENSION),"tlsv1 unsupported extension"},
543 {ERR_REASON(SSL_R_TLS_CLIENT_CERT_REQ_WITH_ANON_CIPHER),"tls client cert req wit"},
544 {ERR_REASON(SSL_R_TLS_HEARTBEAT_PEER_DOESNT_ACCEPT),"peer does not accept heartb"},
545 {ERR_REASON(SSL_R_TLS_HEARTBEAT_PENDING),"heartbeat request already pending"},
546 {ERR_REASON(SSL_R_TLS_ILLEGAL_EXPORTER_LABEL),"tls illegal exporter label"},
547 {ERR_REASON(SSL_R_TLS_INVALID_ECPOINTFORMAT_LIST),"tls invalid ecpointformat lis"},
548 {ERR_REASON(SSL_R_TLS_PEER_DID_NOT_RESPOND_WITH_CERTIFICATE_LIST),"tls peer did"},
549 {ERR_REASON(SSL_R_TLS_RSA_ENCRYPTED_VALUE_LENGTH_IS_WRONG),"tls rsa encrypted va"},
550 {ERR_REASON(SSL_R_TRIED_TO_USE_UNSUPPORTED_CIPHER),"tried to use unsupported cip"},
551 {ERR_REASON(SSL_R_UNABLE_TO_DECODE_DH_CERTS),"unable to decode dh certs"},
552 {ERR_REASON(SSL_R_UNABLE_TO_DECODE_ECDH_CERTS),"unable to decode ecdh certs"},
553 {ERR_REASON(SSL_R_UNABLE_TO_EXTRACT_PUBLIC_KEY),"unable to extract public key"},
554 {ERR_REASON(SSL_R_UNABLE_TO_FIND_DH_PARAMETERS),"unable to find dh parameters"},
555 {ERR_REASON(SSL_R_UNABLE_TO_FIND_ECDH_PARAMETERS),"unable to find ecdh parameter"},
556 {ERR_REASON(SSL_R_UNABLE_TO_FIND_PUBLIC_KEY_PARAMETERS),"unable to find public k"},
557 {ERR_REASON(SSL_R_UNABLE_TO_FIND_SSL_METHOD),"unable to find ssl method"},
558 {ERR_REASON(SSL_R_UNABLE_TO_LOAD_SSL2_MD5_ROUTINES),"unable to load ssl2 md5 rou"},
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562 {ERR_REASON(SSL_R_UNEXPECTED_RECORD),"unexpected record"},
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564 {ERR_REASON(SSL_R_UNKNOWN_ALERT_TYPE),"unknown alert type"},
565 {ERR_REASON(SSL_R_UNKNOWN_CERTIFICATE_TYPE),"unknown certificate type"},
566 {ERR_REASON(SSL_R_UNKNOWN_CIPHER_RETURNED),"unknown cipher returned"},
567 {ERR_REASON(SSL_R_UNKNOWN_CIPHER_TYPE),"unknown cipher type"},
568 {ERR_REASON(SSL_R_UNKNOWN_DIGEST),"unknown digest"},
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570 {ERR_REASON(SSL_R_UNKNOWN_PKEY_TYPE),"unknown pkey type"},
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572 {ERR_REASON(SSL_R_UNKNOWN_REMOTE_ERROR_TYPE),"unknown remote error type"},
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575 {ERR_REASON(SSL_R_UNSAFE_LEGACY_RENEGOTIATION_DISABLED),"unsafe legacy renegotia"},
576 {ERR_REASON(SSL_R_UNSUPPORTED_CIPHER),"unsupported cipher"},
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581 {ERR_REASON(SSL_R_UNSUPPORTED_SSL_VERSION),"unsupported ssl version"},
582 {ERR_REASON(SSL_R_UNSUPPORTED_STATUS_TYPE),"unsupported status type"},
583 {ERR_REASON(SSL_R_USE_SRTP_NOT_NEGOTIATED),"use srtp not negotiated"},
584 {ERR_REASON(SSL_R_WRITE_BIO_NOT_SET),"write bio not set"},
585 {ERR_REASON(SSL_R_WRONG_CIPHER_RETURNED),"wrong cipher returned"},
586 {ERR_REASON(SSL_R_WRONG_MESSAGE_TYPE),"wrong message type"},
587 {ERR_REASON(SSL_R_WRONG_NUMBER_OF_KEY_BITS),"wrong number of key bits"},
588 {ERR_REASON(SSL_R_WRONG_SIGNATURE_LENGTH),"wrong signature length"},
589 {ERR_REASON(SSL_R_WRONG_SIGNATURE_SIZE),"wrong signature size"},

```

```

590 {ERR_REASON(SSL_R_WRONG_SIGNATURE_TYPE),"wrong signature type"},
591 {ERR_REASON(SSL_R_WRONG_SSL_VERSION),"wrong ssl version"},
592 {ERR_REASON(SSL_R_WRONG_VERSION_NUMBER),"wrong version number"},
593 {ERR_REASON(SSL_R_X509_LIB),"x509 lib"},
594 {ERR_REASON(SSL_R_X509_VERIFICATION_SETUP_PROBLEMS),"x509 verification setup pro"},
595 {0, NULL}
596 };

598 #endif

600 void ERR_load_SSL_strings(void)
601 {
602     #ifndef OPENSSL_NO_ERR

604         if (ERR_func_error_string(SSL_str_functs[0].error) == NULL)
605         {
606             ERR_load_strings(0, SSL_str_functs);
607             ERR_load_strings(0, SSL_str_reasons);
608         }
609     #endif
610 }

```

```

*****
3385 Fri May 30 18:32:22 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_err2.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/ssl_err2.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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4  *
5  * This package is an SSL implementation written
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57 */
58
59 #include <stdio.h>
60 #include <openssl/err.h>
61 #include <openssl/ssl.h>

```

```

63 void SSL_load_error_strings(void)
64 {
65     #ifndef OPENSSL_NO_ERR
66         ERR_load_crypto_strings();
67         ERR_load_SSL_strings();
68     #endif
69 }

```



```

*****
83000 Fri May 30 18:32:22 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_lib.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /*! \file ssl/ssl_lib.c
2 * \brief Version independent SSL functions.
3 */
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```

```

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141 * OTHER ENTITY BASED ON INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR
142 * OTHERWISE.
143 */

145 #ifdef REF_CHECK
146 # include <assert.h>
147 #endif
148 #include <stdio.h>
149 #include "ssl_loc1.h"
150 #include "kssl_lcl.h"
151 #include <openssl/objects.h>
152 #include <openssl/lhash.h>
153 #include <openssl/x509v3.h>
154 #include <openssl/rand.h>
155 #include <openssl/ocsp.h>
156 #ifndef OPENSSL_NO_DH
157 #include <openssl/dh.h>
158 #endif
159 #ifndef OPENSSL_NO_ENGINE
160 #include <openssl/engine.h>
161 #endif

163 const char *SSL_version_str=OPENSSL_VERSION_TEXT;

165 SSL3_ENC_METHOD ssl3_undef_enc_method={
166     /* evil casts, but these functions are only called if there's a library
167     (int (*)(SSL *,int))ssl_undefined_function,
168     (int (*)(SSL *, unsigned char *, int))ssl_undefined_function,
169     ssl_undefined_function,
170     (int (*)(SSL *, unsigned char *, unsigned char *, int))ssl_undefined_fun
171     (int (*)(SSL *, int))ssl_undefined_function,
172     (int (*)(SSL *, const char *, int, unsigned char *))ssl_undefined_functi
173     0, /* finish_mac_length */
174     (int (*)(SSL *, int, unsigned char *))ssl_undefined_function,
175     NULL, /* client_finished_label */
176     0, /* client_finished_label_len */
177     NULL, /* server_finished_label */
178     0, /* server_finished_label_len */
179     (int (*)(int))ssl_undefined_function,
180     (int (*)(SSL *, unsigned char *, size_t, const char *,
181     size_t, const unsigned char *, size_t,
182     int use_context)) ssl_undefined_function,
183 };

185 int SSL_clear(SSL *s)
186 {
188     if (s->method == NULL)
189     {
190         SSLerr(SSL_F_SSL_CLEAR, SSL_R_NO_METHOD_SPECIFIED);
191         return(0);
192     }

```

```

194     if (ssl_clear_bad_session(s))
195     {
196         SSL_SESSION_free(s->session);
197         s->session=NULL;
198     }

200     s->error=0;
201     s->hit=0;
202     s->shutdown=0;

204 #if 0 /* Disabled since version 1.10 of this file (early return not
205      * needed because SSL_clear is not called when doing renegotiation) */
206      /* This is set if we are doing dynamic renegotiation so keep
207      * the old cipher. It is sort of a SSL_clear_lite :- */
208      if (s->renegotiate) return(1);
209 #else
210     if (s->renegotiate)
211     {
212         SSLerr(SSL_F_SSL_CLEAR, ERR_R_INTERNAL_ERROR);
213         return 0;
214     }
215 #endif

217     s->type=0;

219     s->state=SSL_ST_BEFORE|((s->server)?SSL_ST_ACCEPT:SSL_ST_CONNECT);

221     s->version=s->method->version;
222     s->client_version=s->version;
223     s->rwstate=SSL_NOTHING;
224     s->rstate=SSL_ST_READ_HEADER;
225 #if 0
226     s->read_ahead=s->ctx->read_ahead;
227 #endif

229     if (s->init_buf != NULL)
230     {
231         BUF_MEM_free(s->init_buf);
232         s->init_buf=NULL;
233     }

235     ssl_clear_cipher_ctx(s);
236     ssl_clear_hash_ctx(&s->read_hash);
237     ssl_clear_hash_ctx(&s->write_hash);

239     s->first_packet=0;

241 #if 1
242     /* Check to see if we were changed into a different method, if
243     * so, revert back if we are not doing session-id reuse. */
244     if (!s->in_handshake && (s->session == NULL) && (s->method != s->ctx->me
245     {
246         s->method->ssl_free(s);
247         s->method=s->ctx->method;
248         if (!s->method->ssl_new(s))
249             return(0);
250     }
251     else
252     #endif
253         s->method->ssl_clear(s);
254     return(1);
255 }

257 /** Used to change an SSL_CTXs default SSL method type */
258 int SSL_CTX_set_ssl_version(SSL_CTX *ctx, const SSL_METHOD *meth)
259 {

```

```

260     STACK_OF(SSL_CIPHER) *sk;
262     ctx->method=meth;

264     sk=ssl_create_cipher_list(ctx->method,&(ctx->cipher_list),
265                               &(ctx->cipher_list_by_id),
266                               meth->version == SSL2_VERSION ? "SSLv2" : SSL_DEFAULT_CIPHER_LIS
267     if ((sk == NULL) || (sk_SSL_CIPHER_num(sk) <= 0))
268     {
269         SSLerr(SSL_F_SSL_CTX_SET_SSL_VERSION,SSL_R_SSL_LIBRARY_HAS_NO_CI
270         return(0);
271     }
272     return(1);
273 }

275 SSL *SSL_new(SSL_CTX *ctx)
276 {
277     SSL *s;

279     if (ctx == NULL)
280     {
281         SSLerr(SSL_F_SSL_NEW,SSL_R_NULL_SSL_CTX);
282         return(NULL);
283     }
284     if (ctx->method == NULL)
285     {
286         SSLerr(SSL_F_SSL_NEW,SSL_R_SSL_CTX_HAS_NO_DEFAULT_SSL_VERSION);
287         return(NULL);
288     }

290     s=(SSL *)OPENSSL_malloc(sizeof(SSL));
291     if (s == NULL) goto err;
292     memset(s,0,sizeof(SSL));

294 #ifndef OPENSSL_NO_KRB5
295     s->kssl_ctx = kssl_ctx_new();
296 #endif /* OPENSSL_NO_KRB5 */

298     s->options=ctx->options;
299     s->mode=ctx->mode;
300     s->max_cert_list=ctx->max_cert_list;

302     if (ctx->cert != NULL)
303     {
304         /* Earlier library versions used to copy the pointer to
305         * the CERT, not its contents; only when setting new
306         * parameters for the per-SSL copy, ssl_cert_new would be
307         * called (and the direct reference to the per-SSL_CTX
308         * settings would be lost, but those still were indirectly
309         * accessed for various purposes, and for that reason they
310         * used to be known as s->ctx->default_cert).
311         * Now we don't look at the SSL_CTX's CERT after having
312         * duplicated it once. */

314         s->cert = ssl_cert_dup(ctx->cert);
315         if (s->cert == NULL)
316             goto err;
317     }
318     else
319         s->cert=NULL; /* Cannot really happen (see SSL_CTX_new) */

321     s->read_ahead=ctx->read_ahead;
322     s->msg_callback=ctx->msg_callback;
323     s->msg_callback_arg=ctx->msg_callback_arg;
324     s->verify_mode=ctx->verify_mode;
325 #if 0

```

```

326     s->verify_depth=ctx->verify_depth;
327 #endif
328     s->sid_ctx_length=ctx->sid_ctx_length;
329     OPENSSL_assert(s->sid_ctx_length <= sizeof s->sid_ctx);
330     memcpy(&s->sid_ctx,&ctx->sid_ctx,sizeof(s->sid_ctx));
331     s->verify_callback=ctx->default_verify_callback;
332     s->generate_session_id=ctx->generate_session_id;

334     s->param = X509_VERIFY_PARAM_new();
335     if (!s->param)
336         goto err;
337     X509_VERIFY_PARAM_inherit(s->param, ctx->param);
338 #if 0
339     s->purpose = ctx->purpose;
340     s->trust = ctx->trust;
341 #endif
342     s->quiet_shutdown=ctx->quiet_shutdown;
343     s->max_send_fragment = ctx->max_send_fragment;

345     CRYPTO_add(&ctx->references,1,CRYPTO_LOCK_SSL_CTX);
346     s->ctx=ctx;
347 #ifndef OPENSSL_NO_TLSEXT
348     s->tlsext_debug_cb = 0;
349     s->tlsext_debug_arg = NULL;
350     s->tlsext_ticket_expected = 0;
351     s->tlsext_status_type = -1;
352     s->tlsext_status_expected = 0;
353     s->tlsext_ocsp_ids = NULL;
354     s->tlsext_ocsp_exts = NULL;
355     s->tlsext_ocsp_resp = NULL;
356     s->tlsext_ocsp_resplen = -1;
357     CRYPTO_add(&ctx->references,1,CRYPTO_LOCK_SSL_CTX);
358     s->initial_ctx=ctx;
359 # ifndef OPENSSL_NO_NEXTPROTONEG
360     s->next_proto_negotiated = NULL;
361 # endif
362 #endif

364     s->verify_result=X509_V_OK;

366     s->method=ctx->method;

368     if (!s->method->ssl_new(s))
369         goto err;

371     s->references=1;
372     s->server=(ctx->method->ssl_accept == ssl_undefined_function)?0:1;

374     SSL_clear(s);

376     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_SSL, s, &s->ex_data);

378 #ifndef OPENSSL_NO_PSK
379     s->psk_client_callback=ctx->psk_client_callback;
380     s->psk_server_callback=ctx->psk_server_callback;
381 #endif

383     return(s);
384 err:
385     if (s != NULL)
386     {
387         if (s->cert != NULL)
388             ssl_cert_free(s->cert);
389         if (s->ctx != NULL)
390             SSL_CTX_free(s->ctx); /* decrement reference count */
391         OPENSSL_free(s);

```

```

392     }
393     SSLerr(SSL_F_SSL_NEW,ERR_R_MALLOC_FAILURE);
394     return(NULL);
395 }

397 int SSL_CTX_set_session_id_context(SSL_CTX *ctx,const unsigned char *sid_ctx,
398                                   unsigned int sid_ctx_len)
399 {
400     if(sid_ctx_len > sizeof ctx->sid_ctx)
401     {
402         SSLerr(SSL_F_SSL_CTX_SET_SESSION_ID_CONTEXT,SSL_R_SSL_SESSION_ID_CONTEXT
403         return 0;
404     }
405     ctx->sid_ctx_length=sid_ctx_len;
406     memcpy(ctx->sid_ctx,sid_ctx,sid_ctx_len);

408     return 1;
409 }

411 int SSL_set_session_id_context(SSL *ssl,const unsigned char *sid_ctx,
412                                unsigned int sid_ctx_len)
413 {
414     if(sid_ctx_len > SSL_MAX_SID_CTX_LENGTH)
415     {
416         SSLerr(SSL_F_SSL_SET_SESSION_ID_CONTEXT,SSL_R_SSL_SESSION_ID_CONTEXT_TOO
417         return 0;
418     }
419     ssl->sid_ctx_length=sid_ctx_len;
420     memcpy(ssl->sid_ctx,sid_ctx,sid_ctx_len);

422     return 1;
423 }

425 int SSL_CTX_set_generate_session_id(SSL_CTX *ctx, GEN_SESSION_CB cb)
426 {
427     CRYPTO_w_lock(CRYPTO_LOCK_SSL_CTX);
428     ctx->generate_session_id = cb;
429     CRYPTO_w_unlock(CRYPTO_LOCK_SSL_CTX);
430     return 1;
431 }

433 int SSL_set_generate_session_id(SSL *ssl, GEN_SESSION_CB cb)
434 {
435     CRYPTO_w_lock(CRYPTO_LOCK_SSL);
436     ssl->generate_session_id = cb;
437     CRYPTO_w_unlock(CRYPTO_LOCK_SSL);
438     return 1;
439 }

441 int SSL_has_matching_session_id(const SSL *ssl, const unsigned char *id,
442                                 unsigned int id_len)
443 {
444     /* A quick examination of SSL_SESSION_hash and SSL_SESSION_cmp shows how
445     * we can "construct" a session to give us the desired check - ie. to
446     * find if there's a session in the hash table that would conflict with
447     * any new session built out of this id/id_len and the ssl_version in
448     * use by this SSL. */
449     SSL_SESSION r, *p;

451     if(id_len > sizeof r.session_id)
452         return 0;

454     r.ssl_version = ssl->version;
455     r.session_id_length = id_len;
456     memcpy(r.session_id, id, id_len);
457     /* NB: SSLv2 always uses a fixed 16-byte session ID, so even if a

```

```

458     * callback is calling us to check the uniqueness of a shorter ID, it
459     * must be compared as a padded-out ID because that is what it will be
460     * converted to when the callback has finished choosing it. */
461     if((r.ssl_version == SSL2_VERSION) &&
462        (id_len < SSL2_SSL_SESSION_ID_LENGTH))
463     {
464         memset(r.session_id + id_len, 0,
465              SSL2_SSL_SESSION_ID_LENGTH - id_len);
466         r.session_id_length = SSL2_SSL_SESSION_ID_LENGTH;
467     }

469     CRYPTO_r_lock(CRYPTO_LOCK_SSL_CTX);
470     p = lh_SSL_SESSION_retrieve(ssl->ctx->sessions, &r);
471     CRYPTO_r_unlock(CRYPTO_LOCK_SSL_CTX);
472     return (p != NULL);
473 }

475 int SSL_CTX_set_purpose(SSL_CTX *s, int purpose)
476 {
477     return X509_VERIFY_PARAM_set_purpose(s->param, purpose);
478 }

480 int SSL_set_purpose(SSL *s, int purpose)
481 {
482     return X509_VERIFY_PARAM_set_purpose(s->param, purpose);
483 }

485 int SSL_CTX_set_trust(SSL_CTX *s, int trust)
486 {
487     return X509_VERIFY_PARAM_set_trust(s->param, trust);
488 }

490 int SSL_set_trust(SSL *s, int trust)
491 {
492     return X509_VERIFY_PARAM_set_trust(s->param, trust);
493 }

495 int SSL_CTX_set1_param(SSL_CTX *ctx, X509_VERIFY_PARAM *vpm)
496 {
497     return X509_VERIFY_PARAM_set1(ctx->param, vpm);
498 }

500 int SSL_set1_param(SSL *ssl, X509_VERIFY_PARAM *vpm)
501 {
502     return X509_VERIFY_PARAM_set1(ssl->param, vpm);
503 }

505 void SSL_free(SSL *s)
506 {
507     int i;

509     if(s == NULL)
510         return;

512     i=CRYPTO_add(&s->references,-1,CRYPTO_LOCK_SSL);
513     #ifdef REF_PRINT
514     REF_PRINT("SSL",s);
515     #endif
516     if (i > 0) return;
517     #ifdef REF_CHECK
518     if (i < 0)
519     {
520         fprintf(stderr,"SSL_free, bad reference count\n");
521         abort(); /* ok */
522     }
523     #endif

```

```

525     if (s->param)
526         X509_VERIFY_PARAM_free(s->param);
528     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_SSL, s, &s->ex_data);
530     if (s->bbio != NULL)
531     {
532         /* If the buffering BIO is in place, pop it off */
533         if (s->bbio == s->wbio)
534         {
535             s->wbio=BIO_pop(s->wbio);
536         }
537         BIO_free(s->bbio);
538         s->bbio=NULL;
539     }
540     if (s->rbio != NULL)
541         BIO_free_all(s->rbio);
542     if ((s->wbio != NULL) && (s->wbio != s->rbio))
543         BIO_free_all(s->wbio);
545     if (s->init_buf != NULL) BUF_MEM_free(s->init_buf);
547     /* add extra stuff */
548     if (s->cipher_list != NULL) sk_SSL_CIPHER_free(s->cipher_list);
549     if (s->cipher_list_by_id != NULL) sk_SSL_CIPHER_free(s->cipher_list_by_id);
551     /* Make the next call work :- ) */
552     if (s->session != NULL)
553     {
554         ssl_clear_bad_session(s);
555         SSL_SESSION_free(s->session);
556     }
558     ssl_clear_cipher_ctx(s);
559     ssl_clear_hash_ctx(&s->read_hash);
560     ssl_clear_hash_ctx(&s->write_hash);
562     if (s->cert != NULL) ssl_cert_free(s->cert);
563     /* Free up if allocated */
565 #ifndef OPENSSL_NO_TLSEXT
566     if (s->tlsext_hostname)
567         OPENSSL_free(s->tlsext_hostname);
568     if (s->initial_ctx) SSL_CTX_free(s->initial_ctx);
569 #ifndef OPENSSL_NO_EC
570     if (s->tlsext_ecpointformatlist) OPENSSL_free(s->tlsext_ecpointformatlist);
571     if (s->tlsext_ellipticcurvelist) OPENSSL_free(s->tlsext_ellipticcurvelist);
572 #endif /* OPENSSL_NO_EC */
573     if (s->tlsext_opaque_prf_input) OPENSSL_free(s->tlsext_opaque_prf_input);
574     if (s->tlsext_ocsp_exts)
575         sk_X509_EXTENSION_pop_free(s->tlsext_ocsp_exts,
576                                   X509_EXTENSION_free);
577     if (s->tlsext_ocsp_ids)
578         sk_OCSP_RESPID_pop_free(s->tlsext_ocsp_ids, OCSP_RESPID_free);
579     if (s->tlsext_ocsp_resp)
580         OPENSSL_free(s->tlsext_ocsp_resp);
581 #endif
583     if (s->client_CA != NULL)
584         sk_X509_NAME_pop_free(s->client_CA, X509_NAME_free);
586     if (s->method != NULL) s->method->ssl_free(s);
588     if (s->ctx) SSL_CTX_free(s->ctx);

```

```

590 #ifndef OPENSSL_NO_KRB5
591     if (s->kssl_ctx != NULL)
592         kssl_ctx_free(s->kssl_ctx);
593 #endif /* OPENSSL_NO_KRB5 */
595 #if !defined(OPENSSL_NO_TLSEXT) && !defined(OPENSSL_NO_NEXTPROTONEG)
596     if (s->next_proto_negotiated)
597         OPENSSL_free(s->next_proto_negotiated);
598 #endif
600 #ifndef OPENSSL_NO_SRTMP
601     if (s->srtp_profiles)
602         sk_SRTMP_PROTECTION_PROFILE_free(s->srtp_profiles);
603 #endif
605     OPENSSL_free(s);
606 }
608 void SSL_set_bio(SSL *s, BIO *rbio, BIO *wbio)
609 {
610     /* If the output buffering BIO is still in place, remove it
611     */
612     if (s->bbio != NULL)
613     {
614         if (s->wbio == s->bbio)
615         {
616             s->wbio=s->wbio->next_bio;
617             s->bbio->next_bio=NULL;
618         }
619     }
620     if ((s->rbio != NULL) && (s->rbio != rbio))
621         BIO_free_all(s->rbio);
622     if ((s->wbio != NULL) && (s->wbio != wbio) && (s->rbio != s->wbio))
623         BIO_free_all(s->wbio);
624     s->rbio=rbio;
625     s->wbio=wbio;
626 }
628 BIO *SSL_get_rbio(const SSL *s)
629 { return(s->rbio); }
631 BIO *SSL_get_wbio(const SSL *s)
632 { return(s->wbio); }
634 int SSL_get_fd(const SSL *s)
635 {
636     return(SSL_get_rfd(s));
637 }
639 int SSL_get_rfd(const SSL *s)
640 {
641     int ret= -1;
642     BIO *b,*r;
644     b=SSL_get_rbio(s);
645     r=BIO_find_type(b,BIO_TYPE_DESCRIPTOR);
646     if (r != NULL)
647         BIO_get_fd(r,&ret);
648     return(ret);
649 }
651 int SSL_get_wfd(const SSL *s)
652 {
653     int ret= -1;
654     BIO *b,*r;

```

```

656     b=SSL_get_wbio(s);
657     r=BIO_find_type(b,BIO_TYPE_DESCRIPTOR);
658     if (r != NULL)
659         BIO_get_fd(r,&ret);
660     return(ret);
661 }

663 #ifndef OPENSSSL_NO_SOCKET
664 int SSL_set_fd(SSL *s,int fd)
665 {
666     int ret=0;
667     BIO *bio=NULL;

669     bio=BIO_new(BIO_s_socket());

671     if (bio == NULL)
672     {
673         SSLerr(SSL_F_SSL_SET_FD,ERR_R_BUF_LIB);
674         goto err;
675     }
676     BIO_set_fd(bio,fd,BIO_NOCLOSE);
677     SSL_set_bio(s,bio,bio);
678     ret=1;
679 err:
680     return(ret);
681 }

683 int SSL_set_wfd(SSL *s,int fd)
684 {
685     int ret=0;
686     BIO *bio=NULL;

688     if ((s->rbio == NULL) || (BIO_method_type(s->rbio) != BIO_TYPE_SOCKET)
689         || ((int)BIO_get_fd(s->rbio,NULL) != fd))
690     {
691         bio=BIO_new(BIO_s_socket());

693         if (bio == NULL)
694         {
695             SSLerr(SSL_F_SSL_SET_WFD,ERR_R_BUF_LIB); goto err; }
696         BIO_set_fd(bio,fd,BIO_NOCLOSE);
697         SSL_set_bio(s,SSL_get_rbio(s),bio);
698     }
699     else
700     {
701         SSL_set_bio(s,SSL_get_rbio(s),SSL_get_rbio(s));
702         ret=1;
703     }
704 err:
705     return(ret);
706 }

708 int SSL_set_rfd(SSL *s,int fd)
709 {
710     int ret=0;
711     BIO *bio=NULL;

713     if ((s->wbio == NULL) || (BIO_method_type(s->wbio) != BIO_TYPE_SOCKET)
714         || ((int)BIO_get_fd(s->wbio,NULL) != fd))
715     {
716         bio=BIO_new(BIO_s_socket());

718         if (bio == NULL)
719         {
720             SSLerr(SSL_F_SSL_SET_RFD,ERR_R_BUF_LIB);
721             goto err;
722         }
723         BIO_set_fd(bio,fd,BIO_NOCLOSE);
724         SSL_set_bio(s,bio,SSL_get_wbio(s));

```

```

722     }
723     else
724         SSL_set_bio(s,SSL_get_wbio(s),SSL_get_wbio(s));
725     ret=1;
726 err:
727     return(ret);
728 }
729 #endif

732 /* return length of latest Finished message we sent, copy to 'buf' */
733 size_t SSL_get_finished(const SSL *s, void *buf, size_t count)
734 {
735     size_t ret = 0;
736
737     if (s->s3 != NULL)
738     {
739         ret = s->s3->tmp.finish_md_len;
740         if (count > ret)
741             count = ret;
742         memcpy(buf, s->s3->tmp.finish_md, count);
743     }
744     return ret;
745 }

747 /* return length of latest Finished message we expected, copy to 'buf' */
748 size_t SSL_get_peer_finished(const SSL *s, void *buf, size_t count)
749 {
750     size_t ret = 0;
751
752     if (s->s3 != NULL)
753     {
754         ret = s->s3->tmp.peer_finish_md_len;
755         if (count > ret)
756             count = ret;
757         memcpy(buf, s->s3->tmp.peer_finish_md, count);
758     }
759     return ret;
760 }

763 int SSL_get_verify_mode(const SSL *s)
764 {
765     return(s->verify_mode);
766 }

768 int SSL_get_verify_depth(const SSL *s)
769 {
770     return X509_VERIFY_PARAM_get_depth(s->param);
771 }

773 int (*SSL_get_verify_callback(const SSL *s))(int,X509_STORE_CTX *)
774 {
775     return(s->verify_callback);
776 }

778 int SSL_CTX_get_verify_mode(const SSL_CTX *ctx)
779 {
780     return(ctx->verify_mode);
781 }

783 int SSL_CTX_get_verify_depth(const SSL_CTX *ctx)
784 {
785     return X509_VERIFY_PARAM_get_depth(ctx->param);
786 }

```

```

788 int (*SSL_CTX_get_verify_callback(const SSL_CTX *ctx))(int,X509_STORE_CTX *)
789 {
790     return(ctx->default_verify_callback);
791 }

793 void SSL_set_verify(SSL *s,int mode,
794                     int (*callback)(int ok,X509_STORE_CTX *ctx))
795 {
796     s->verify_mode=mode;
797     if (callback != NULL)
798         s->verify_callback=callback;
799 }

801 void SSL_set_verify_depth(SSL *s,int depth)
802 {
803     X509_VERIFY_PARAM_set_depth(s->param, depth);
804 }

806 void SSL_set_read_ahead(SSL *s,int yes)
807 {
808     s->read_ahead=yes;
809 }

811 int SSL_get_read_ahead(const SSL *s)
812 {
813     return(s->read_ahead);
814 }

816 int SSL_pending(const SSL *s)
817 {
818     /* SSL_pending cannot work properly if read-ahead is enabled
819     * (SSL_CTX_ctrl(..., SSL_CTRL_SET_READ_AHEAD, 1, NULL)),
820     * and it is impossible to fix since SSL_pending cannot report
821     * errors that may be observed while scanning the new data.
822     * (Note that SSL_pending() is often used as a boolean value,
823     * so we'd better not return -1.)
824     */
825     return(s->method->ssl_pending(s));
826 }

828 X509 *SSL_get_peer_certificate(const SSL *s)
829 {
830     X509 *r;
831
832     if ((s == NULL) || (s->session == NULL))
833         r=NULL;
834     else
835         r=s->session->peer;

837     if (r == NULL) return(r);

839     CRYPTO_add(&r->references,1,CRYPTO_LOCK_X509);

841     return(r);
842 }

844 STACK_OF(X509) *SSL_get_peer_cert_chain(const SSL *s)
845 {
846     STACK_OF(X509) *r;
847
848     if ((s == NULL) || (s->session == NULL) || (s->session->sess_cert == NUL
849         r=NULL;
850     else
851         r=s->session->sess_cert->cert_chain;

853     /* If we are a client, cert_chain includes the peer's own

```

```

854     * certificate; if we are a server, it does not. */
855
856     return(r);
857 }

859 /* Now in theory, since the calling process own 't' it should be safe to
860 * modify. We need to be able to read f without being hassled */
861 void SSL_copy_session_id(SSL *t,const SSL *f)
862 {
863     CERT *tmp;

865     /* Do we need to to SSL locking? */
866     SSL_set_session(t,SSL_get_session(f));

868     /* what if we are setup as SSLv2 but want to talk SSLv3 or
869     * vice-versa */
870     if (t->method != f->method)
871     {
872         t->method->ssl_free(t); /* cleanup current */
873         t->method=f->method; /* change method */
874         t->method->ssl_new(t); /* setup new */
875     }

877     tmp=t->cert;
878     if (f->cert != NULL)
879     {
880         CRYPTO_add(&f->cert->references,1,CRYPTO_LOCK_SSL_CERT);
881         t->cert=f->cert;
882     }
883     else
884         t->cert=NULL;
885     if (tmp != NULL) ssl_cert_free(tmp);
886     SSL_set_session_id_context(t,f->sid_ctx,f->sid_ctx_length);
887 }

889 /* Fix this so it checks all the valid key/cert options */
890 int SSL_CTX_check_private_key(const SSL_CTX *ctx)
891 {
892     if ( (ctx == NULL) ||
893          (ctx->cert == NULL) ||
894          (ctx->cert->key->x509 == NULL))
895     {
896         SSLerr(SSL_F_SSL_CTX_CHECK_PRIVATE_KEY,SSL_R_NO_CERTIFICATE_ASSI
897         return(0);
898     }
899     if (ctx->cert->key->privatekey == NULL)
900     {
901         SSLerr(SSL_F_SSL_CTX_CHECK_PRIVATE_KEY,SSL_R_NO_PRIVATE_KEY_ASSI
902         return(0);
903     }
904     return(X509_check_private_key(ctx->cert->key->x509, ctx->cert->key->priv
905 }

907 /* Fix this function so that it takes an optional type parameter */
908 int SSL_check_private_key(const SSL *ssl)
909 {
910     if (ssl == NULL)
911     {
912         SSLerr(SSL_F_SSL_CHECK_PRIVATE_KEY,ERR_R_PASSED_NULL_PARAMETER);
913         return(0);
914     }
915     if (ssl->cert == NULL)
916     {
917         SSLerr(SSL_F_SSL_CHECK_PRIVATE_KEY,SSL_R_NO_CERTIFICATE_ASSIGNED
918         return 0;
919     }

```

```

920     if (ssl->cert->key->x509 == NULL)
921     {
922         SSLerr(SSL_F_SSL_CHECK_PRIVATE_KEY, SSL_R_NO_CERTIFICATE_ASSIGNED
923         return(0);
924     }
925     if (ssl->cert->key->privatekey == NULL)
926     {
927         SSLerr(SSL_F_SSL_CHECK_PRIVATE_KEY, SSL_R_NO_PRIVATE_KEY_ASSIGNED
928         return(0);
929     }
930     return(X509_check_private_key(ssl->cert->key->x509,
931     ssl->cert->key->privatekey));
932 }

934 int SSL_accept(SSL *s)
935 {
936     if (s->handshake_func == 0)
937         /* Not properly initialized yet */
938         SSL_set_accept_state(s);

940     return(s->method->ssl_accept(s));
941 }

943 int SSL_connect(SSL *s)
944 {
945     if (s->handshake_func == 0)
946         /* Not properly initialized yet */
947         SSL_set_connect_state(s);

949     return(s->method->ssl_connect(s));
950 }

952 long SSL_get_default_timeout(const SSL *s)
953 {
954     return(s->method->get_timeout());
955 }

957 int SSL_read(SSL *s, void *buf, int num)
958 {
959     if (s->handshake_func == 0)
960     {
961         SSLerr(SSL_F_SSL_READ, SSL_R_UNINITIALIZED);
962         return -1;
963     }

965     if (s->shutdown & SSL_RECEIVED_SHUTDOWN)
966     {
967         s->rwstate=SSL_NOTHING;
968         return(0);
969     }
970     return(s->method->ssl_read(s, buf, num));
971 }

973 int SSL_peek(SSL *s, void *buf, int num)
974 {
975     if (s->handshake_func == 0)
976     {
977         SSLerr(SSL_F_SSL_PEEK, SSL_R_UNINITIALIZED);
978         return -1;
979     }

981     if (s->shutdown & SSL_RECEIVED_SHUTDOWN)
982     {
983         return(0);
984     }
985     return(s->method->ssl_peek(s, buf, num));

```

```

986     }

988 int SSL_write(SSL *s, const void *buf, int num)
989 {
990     if (s->handshake_func == 0)
991     {
992         SSLerr(SSL_F_SSL_WRITE, SSL_R_UNINITIALIZED);
993         return -1;
994     }

996     if (s->shutdown & SSL_SENT_SHUTDOWN)
997     {
998         s->rwstate=SSL_NOTHING;
999         SSLerr(SSL_F_SSL_WRITE, SSL_R_PROTOCOL_IS_SHUTDOWN);
1000         return(-1);
1001     }
1002     return(s->method->ssl_write(s, buf, num));
1003 }

1005 int SSL_shutdown(SSL *s)
1006 {
1007     /* Note that this function behaves differently from what one might
1008     * expect. Return values are 0 for no success (yet),
1009     * 1 for success; but calling it once is usually not enough,
1010     * even if blocking I/O is used (see ssl3_shutdown).
1011     */

1013     if (s->handshake_func == 0)
1014     {
1015         SSLerr(SSL_F_SSL_SHUTDOWN, SSL_R_UNINITIALIZED);
1016         return -1;
1017     }

1019     if ((s != NULL) && !SSL_in_init(s))
1020         return(s->method->ssl_shutdown(s));
1021     else
1022         return(1);
1023 }

1025 int SSL_renegotiate(SSL *s)
1026 {
1027     if (s->renegotiate == 0)
1028         s->renegotiate=1;

1030     s->new_session=1;

1032     return(s->method->ssl_renegotiate(s));
1033 }

1035 int SSL_renegotiate_abbreviated(SSL *s)
1036 {
1037     if (s->renegotiate == 0)
1038         s->renegotiate=1;

1040     s->new_session=0;

1042     return(s->method->ssl_renegotiate(s));
1043 }

1045 int SSL_renegotiate_pending(SSL *s)
1046 {
1047     /* becomes true when negotiation is requested;
1048     * false again once a handshake has finished */
1049     return (s->renegotiate != 0);
1050 }

```



```

1052 long SSL_ctrl(SSL *s,int cmd,long larg,void *parg)
1053 {
1054     long l;

1056     switch (cmd)
1057     {
1058     case SSL_CTRL_GET_READ_AHEAD:
1059         return(s->read_ahead);
1060     case SSL_CTRL_SET_READ_AHEAD:
1061         l=s->read_ahead;
1062         s->read_ahead=larg;
1063         return(l);

1065     case SSL_CTRL_SET_MSG_CALLBACK_ARG:
1066         s->msg_callback_arg = parg;
1067         return 1;

1069     case SSL_CTRL_OPTIONS:
1070         return(s->options|=larg);
1071     case SSL_CTRL_CLEAR_OPTIONS:
1072         return(s->options&=~larg);
1073     case SSL_CTRL_MODE:
1074         return(s->mode|=larg);
1075     case SSL_CTRL_CLEAR_MODE:
1076         return(s->mode &=~larg);
1077     case SSL_CTRL_GET_MAX_CERT_LIST:
1078         return(s->max_cert_list);
1079     case SSL_CTRL_SET_MAX_CERT_LIST:
1080         l=s->max_cert_list;
1081         s->max_cert_list=larg;
1082         return(l);
1083     case SSL_CTRL_SET_MTU:
1084 #ifndef OPENSSL_NO_DTLS1
1085         if (larg < (long)dtls1_min_mtu())
1086             return 0;
1087 #endif

1089         if (SSL_version(s) == DTLS1_VERSION ||
1090             SSL_version(s) == DTLS1_BAD_VER)
1091         {
1092             s->d1->mtu = larg;
1093             return larg;
1094         }
1095         return 0;
1096     case SSL_CTRL_SET_MAX_SEND_FRAGMENT:
1097         if (larg < 512 || larg > SSL3_RT_MAX_PLAIN_LENGTH)
1098             return 0;
1099         s->max_send_fragment = larg;
1100         return 1;
1101     case SSL_CTRL_GET_RI_SUPPORT:
1102         if (s->s3)
1103             return s->s3->send_connection_binding;
1104         else return 0;
1105     default:
1106         return(s->method->ssl_ctrl(s,cmd,larg,parg));
1107     }
1108 }

1110 long SSL_callback_ctrl(SSL *s, int cmd, void (*fp)(void))
1111 {
1112     switch(cmd)
1113     {
1114     case SSL_CTRL_SET_MSG_CALLBACK:
1115         s->msg_callback = (void (*)(int write_p, int version, int conten
1116         return 1;
1117

```

```

1118     default:
1119         return(s->method->ssl_callback_ctrl(s,cmd,fp));
1120     }
1121 }

1123 LHASH_OF(SSL_SESSION) *SSL_CTX_sessions(SSL_CTX *ctx)
1124 {
1125     return ctx->sessions;
1126 }

1128 long SSL_CTX_ctrl(SSL_CTX *ctx,int cmd,long larg,void *parg)
1129 {
1130     long l;

1132     switch (cmd)
1133     {
1134     case SSL_CTRL_GET_READ_AHEAD:
1135         return(ctx->read_ahead);
1136     case SSL_CTRL_SET_READ_AHEAD:
1137         l=ctx->read_ahead;
1138         ctx->read_ahead=larg;
1139         return(l);

1141     case SSL_CTRL_SET_MSG_CALLBACK_ARG:
1142         ctx->msg_callback_arg = parg;
1143         return 1;

1145     case SSL_CTRL_GET_MAX_CERT_LIST:
1146         return(ctx->max_cert_list);
1147     case SSL_CTRL_SET_MAX_CERT_LIST:
1148         l=ctx->max_cert_list;
1149         ctx->max_cert_list=larg;
1150         return(l);

1152     case SSL_CTRL_SET_SESS_CACHE_SIZE:
1153         l=ctx->session_cache_size;
1154         ctx->session_cache_size=larg;
1155         return(l);
1156     case SSL_CTRL_GET_SESS_CACHE_SIZE:
1157         return(ctx->session_cache_size);
1158     case SSL_CTRL_SET_SESS_CACHE_MODE:
1159         l=ctx->session_cache_mode;
1160         ctx->session_cache_mode=larg;
1161         return(l);
1162     case SSL_CTRL_GET_SESS_CACHE_MODE:
1163         return(ctx->session_cache_mode);

1165     case SSL_CTRL_SESS_NUMBER:
1166         return(lh_SSL_SESSION_num_items(ctx->sessions));
1167     case SSL_CTRL_SESS_CONNECT:
1168         return(ctx->stats.sess_connect);
1169     case SSL_CTRL_SESS_CONNECT_GOOD:
1170         return(ctx->stats.sess_connect_good);
1171     case SSL_CTRL_SESS_CONNECT_RENEGOTIATE:
1172         return(ctx->stats.sess_connect_renegotiate);
1173     case SSL_CTRL_SESS_ACCEPT:
1174         return(ctx->stats.sess_accept);
1175     case SSL_CTRL_SESS_ACCEPT_GOOD:
1176         return(ctx->stats.sess_accept_good);
1177     case SSL_CTRL_SESS_ACCEPT_RENEGOTIATE:
1178         return(ctx->stats.sess_accept_renegotiate);
1179     case SSL_CTRL_SESS_HIT:
1180         return(ctx->stats.sess_hit);
1181     case SSL_CTRL_SESS_CB_HIT:
1182         return(ctx->stats.sess_cb_hit);
1183     case SSL_CTRL_SESS_MISSES:

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```

1184         return(ctx->stats.sess_miss);
1185     case SSL_CTRL_SESS_TIMEOUTS:
1186         return(ctx->stats.sess_timeout);
1187     case SSL_CTRL_SESS_CACHE_FULL:
1188         return(ctx->stats.sess_cache_full);
1189     case SSL_CTRL_OPTIONS:
1190         return(ctx->options|=larg);
1191     case SSL_CTRL_CLEAR_OPTIONS:
1192         return(ctx->options&=~larg);
1193     case SSL_CTRL_MODE:
1194         return(ctx->mode|=larg);
1195     case SSL_CTRL_CLEAR_MODE:
1196         return(ctx->mode&=~larg);
1197     case SSL_CTRL_SET_MAX_SEND_FRAGMENT:
1198         if (larg < 512 || larg > SSL3_RT_MAX_PLAIN_LENGTH)
1199             return 0;
1200         ctx->max_send_fragment = larg;
1201         return 1;
1202     default:
1203         return(ctx->method->ssl_ctx_ctrl(ctx,cmd,larg,parg));
1204     }
1205 }

1207 long SSL_CTX_callback_ctrl(SSL_CTX *ctx, int cmd, void (*fp)(void))
1208 {
1209     switch(cmd)
1210     {
1211     case SSL_CTRL_SET_MSG_CALLBACK:
1212         ctx->msg_callback = (void (*)(int write_p, int version, int cont
1213         return 1;

1215     default:
1216         return(ctx->method->ssl_ctx_callback_ctrl(ctx,cmd,fp));
1217     }
1218 }

1220 int ssl_cipher_id_cmp(const SSL_CIPHER *a, const SSL_CIPHER *b)
1221 {
1222     long l;

1224     l=a->id-b->id;
1225     if (l == 0L)
1226         return(0);
1227     else
1228         return((l > 0)?1:-1);
1229 }

1231 int ssl_cipher_ptr_id_cmp(const SSL_CIPHER * const *ap,
1232                          const SSL_CIPHER * const *bp)
1233 {
1234     long l;

1236     l=(*ap)->id-(*bp)->id;
1237     if (l == 0L)
1238         return(0);
1239     else
1240         return((l > 0)?1:-1);
1241 }

1243 /** return a STACK of the ciphers available for the SSL and in order of
1244  * preference */
1245 STACK_OF(SSL_CIPHER) *SSL_get_ciphers(const SSL *s)
1246 {
1247     if (s != NULL)
1248     {
1249         if (s->cipher_list != NULL)

```

```

1250     {
1251         return(s->cipher_list);
1252     }
1253     else if ((s->ctx != NULL) &&
1254             (s->ctx->cipher_list != NULL))
1255     {
1256         return(s->ctx->cipher_list);
1257     }
1258 }
1259 return(NULL);
1260 }

1262 /** return a STACK of the ciphers available for the SSL and in order of
1263  * algorithm id */
1264 STACK_OF(SSL_CIPHER) *ssl_get_ciphers_by_id(SSL *s)
1265 {
1266     if (s != NULL)
1267     {
1268         if (s->cipher_list_by_id != NULL)
1269         {
1270             return(s->cipher_list_by_id);
1271         }
1272         else if ((s->ctx != NULL) &&
1273                 (s->ctx->cipher_list_by_id != NULL))
1274         {
1275             return(s->ctx->cipher_list_by_id);
1276         }
1277     }
1278     return(NULL);
1279 }

1281 /** The old interface to get the same thing as SSL_get_ciphers() */
1282 const char *SSL_get_cipher_list(const SSL *s,int n)
1283 {
1284     SSL_CIPHER *c;
1285     STACK_OF(SSL_CIPHER) *sk;

1287     if (s == NULL) return(NULL);
1288     sk=SSL_get_ciphers(s);
1289     if ((sk == NULL) || (sk_SSL_CIPHER_num(sk) <= n))
1290         return(NULL);
1291     c=sk_SSL_CIPHER_value(sk,n);
1292     if (c == NULL) return(NULL);
1293     return(c->name);
1294 }

1296 /** specify the ciphers to be used by default by the SSL_CTX */
1297 int SSL_CTX_set_cipher_list(SSL_CTX *ctx, const char *str)
1298 {
1299     STACK_OF(SSL_CIPHER) *sk;
1300
1301     sk=ssl_create_cipher_list(ctx->method,&ctx->cipher_list,
1302                             &ctx->cipher_list_by_id,str);
1303     /* ssl_create_cipher_list may return an empty stack if it
1304      * was unable to find a cipher matching the given rule string
1305      * (for example if the rule string specifies a cipher which
1306      * has been disabled). This is not an error as far as
1307      * ssl_create_cipher_list is concerned, and hence
1308      * ctx->cipher_list and ctx->cipher_list_by_id has been
1309      * updated. */
1310     if (sk == NULL)
1311         return 0;
1312     else if (sk_SSL_CIPHER_num(sk) == 0)
1313     {
1314         SSLerr(SSL_F_SSL_CTX_SET_CIPHER_LIST, SSL_R_NO_CIPHER_MATCH);
1315         return 0;

```

```

1316     }
1317     return 1;
1318 }

1320 /** specify the ciphers to be used by the SSL */
1321 int SSL_set_cipher_list(SSL *s, const char *str)
1322 {
1323     STACK_OF(SSL_CIPHER) *sk;
1324
1325     sk = ssl_create_cipher_list(s->ctx->method, &s->cipher_list,
1326                                &s->cipher_list_by_id, str);
1327     /* see comment in SSL_CTX_set_cipher_list */
1328     if (sk == NULL)
1329         return 0;
1330     else if (sk_SSL_CIPHER_num(sk) == 0)
1331     {
1332         SSLerr(SSL_F_SSL_SET_CIPHER_LIST, SSL_R_NO_CIPHER_MATCH);
1333         return 0;
1334     }
1335     return 1;
1336 }

1338 /* works well for SSLv2, not so good for SSLv3 */
1339 char *SSL_get_shared_ciphers(const SSL *s, char *buf, int len)
1340 {
1341     char *p;
1342     STACK_OF(SSL_CIPHER) *sk;
1343     SSL_CIPHER *c;
1344     int i;

1346     if ((s->session == NULL) || (s->session->ciphers == NULL) ||
1347         (len < 2))
1348         return(NULL);

1350     p = buf;
1351     sk = s->session->ciphers;
1352     for (i = 0; i < sk_SSL_CIPHER_num(sk); i++)
1353     {
1354         int n;

1356         c = sk_SSL_CIPHER_value(sk, i);
1357         n = strlen(c->name);
1358         if (n + 1 > len)
1359             {
1360                 if (p != buf)
1361                     --p;
1362                 *p = '\0';
1363                 return buf;
1364             }
1365         strcpy(p, c->name);
1366         p += n;
1367         *(p++) = ':';
1368         len -= n + 1;
1369     }
1370     p[-1] = '\0';
1371     return(buf);
1372 }

1374 int ssl_cipher_list_to_bytes(SSL *s, STACK_OF(SSL_CIPHER) *sk, unsigned char *p,
1375                             int (*put_cb)(const SSL_CIPHER *, unsigned char *))
1376 {
1377     int i, j = 0;
1378     SSL_CIPHER *c;
1379     unsigned char *q;
1380 #ifndef OPENSSL_NO_KRB5
1381     int nokrb5 = !kssl_tgt_is_available(s->kssl_ctx);

```

```

1382 #endif /* OPENSSL_NO_KRB5 */

1384     if (sk == NULL) return(0);
1385     q = p;

1387     for (i = 0; i < sk_SSL_CIPHER_num(sk); i++)
1388     {
1389         c = sk_SSL_CIPHER_value(sk, i);
1390         /* Skip TLS v1.2 only ciphersuites if lower than v1.2 */
1391         if (((c->algorithm_ssl & SSL_TLSV1_2) &&
1392             (TLS1_get_client_version(s) < TLS1_2_VERSION))
1393             continue;
1394 #ifndef OPENSSL_NO_KRB5
1395         if (((c->algorithm_mkey & SSL_KRB5) || (c->algorithm_auth & SSL_
1396             nokrb5)
1397             continue;
1398 #endif /* OPENSSL_NO_KRB5 */
1399 #ifndef OPENSSL_NO_PSK
1400         /* with PSK there must be client callback set */
1401         if (((c->algorithm_mkey & SSL_KPSK) || (c->algorithm_auth & SSL_
1402             s->psk_client_callback == NULL)
1403             continue;
1404 #endif /* OPENSSL_NO_PSK */
1405         j = put_cb ? put_cb(c, p) : ssl_put_cipher_by_char(s, c, p);
1406         p += j;
1407     }
1408     /* If p == q, no ciphers and caller indicates an error. Otherwise
1409     * add SCSV if not renegotiating.
1410     */
1411     if (p != q && !s->renegotiate)
1412     {
1413         static SSL_CIPHER scsv =
1414             {
1415                 0, NULL, SSL3_CK_SCSV, 0, 0, 0, 0, 0, 0, 0, 0, 0
1416             };
1417         j = put_cb ? put_cb(&scsv, p) : ssl_put_cipher_by_char(s, &scsv, p);
1418         p += j;
1419 #ifdef OPENSSL_RI_DEBUG
1420         fprintf(stderr, "SCSV sent by client\n");
1421 #endif
1422     }

1424     return(p - q);
1425 }

1427 STACK_OF(SSL_CIPHER) *ssl_bytes_to_cipher_list(SSL *s, unsigned char *p, int num,
1428                                                STACK_OF(SSL_CIPHER) **skp)
1429 {
1430     const SSL_CIPHER *c;
1431     STACK_OF(SSL_CIPHER) *sk;
1432     int i, n;
1433     if (s->s3)
1434         s->s3->send_connection_binding = 0;

1436     n = ssl_put_cipher_by_char(s, NULL, NULL);
1437     if ((num % n) != 0)
1438     {
1439         SSLerr(SSL_F_SSL_BYTES_TO_CIPHER_LIST, SSL_R_ERROR_IN_RECEIVED_CI);
1440         return(NULL);
1441     }
1442     if ((skp == NULL) || (*skp == NULL))
1443         sk = sk_SSL_CIPHER_new_null(); /* change perhaps later */
1444     else
1445     {
1446         sk = *skp;
1447         sk_SSL_CIPHER_zero(sk);

```

```

1448     }
1450     for (i=0; i<num; i+=n)
1451     {
1452         /* Check for SCSV */
1453         if (s->s3 && (n != 3 || !p[0]) &&
1454             (p[n-2] == ((SSL3_CK_SCSV >> 8) & 0xff)) &&
1455             (p[n-1] == (SSL3_CK_SCSV & 0xff)))
1456         {
1457             /* SCSV fatal if renegotiating */
1458             if (s->renegotiate)
1459             {
1460                 SSLerr(SSL_F_SSL_BYTES_TO_CIPHER_LIST,SSL_R_SCSV
1461                     ssl3_send_alert(s,SSL3_AL_FATAL,SSL_AD_HANDSHAKE
1462                         goto err;
1463             }
1464             s->s3->send_connection_binding = 1;
1465             p += n;
1466 #ifdef OPENSSE_RI_DEBUG
1467             fprintf(stderr, "SCSV received by server\n");
1468 #endif
1469             continue;
1470         }
1472         c=ssl_get_cipher_by_char(s,p);
1473         p+=n;
1474         if (c != NULL)
1475         {
1476             if (!sk_SSL_CIPHER_push(sk,c))
1477             {
1478                 SSLerr(SSL_F_SSL_BYTES_TO_CIPHER_LIST,ERR_R_MALLOC
1479                     goto err;
1480             }
1481         }
1482     }
1484     if (skp != NULL)
1485         *skp=sk;
1486     return(sk);
1487 err:
1488     if ((skp == NULL) || (*skp == NULL))
1489         sk_SSL_CIPHER_free(sk);
1490     return(NULL);
1491 }
1494 #ifndef OPENSSE_NO_TLSEXT
1495 /** return a servername extension value if provided in Client Hello, or NULL.
1496  * So far, only host_name types are defined (RFC 3546).
1497  */
1499 const char *SSL_get_servername(const SSL *s, const int type)
1500 {
1501     if (type != TLSEXT_NAMETYPE_host_name)
1502         return NULL;
1504     return s->session && !s->tlsext_hostname ?
1505         s->session->tlsext_hostname :
1506         s->tlsext_hostname;
1507 }
1509 int SSL_get_servername_type(const SSL *s)
1510 {
1511     if (s->session && (!s->tlsext_hostname ? s->session->tlsext_hostname : s
1512         return TLSEXT_NAMETYPE_host_name;
1513     return -1;

```

```

1514     }
1516 #ifndef OPENSSE_NO_NEXTPROTONEG
1517 /* SSL_select_next_proto implements the standard protocol selection. It is
1518  * expected that this function is called from the callback set by
1519  * SSL_CTX_set_next_proto_select_cb.
1520  *
1521  * The protocol data is assumed to be a vector of 8-bit, length prefixed byte
1522  * strings. The length byte itself is not included in the length. A byte
1523  * string of length 0 is invalid. No byte string may be truncated.
1524  *
1525  * The current, but experimental algorithm for selecting the protocol is:
1526  *
1527  * 1) If the server doesn't support NPN then this is indicated to the
1528  * callback. In this case, the client application has to abort the connection
1529  * or have a default application level protocol.
1530  *
1531  * 2) If the server supports NPN, but advertises an empty list then the
1532  * client selects the first protocol in its list, but indicates via the
1533  * API that this fallback case was enacted.
1534  *
1535  * 3) Otherwise, the client finds the first protocol in the server's list
1536  * that it supports and selects this protocol. This is because it's
1537  * assumed that the server has better information about which protocol
1538  * a client should use.
1539  *
1540  * 4) If the client doesn't support any of the server's advertised
1541  * protocols, then this is treated the same as case 2.
1542  *
1543  * It returns either
1544  * OPENSSE_NPN_NEGOTIATED if a common protocol was found, or
1545  * OPENSSE_NPN_NO_OVERLAP if the fallback case was reached.
1546  */
1547 int SSL_select_next_proto(unsigned char **out, unsigned char *outlen, const unsi
1548 {
1549     unsigned int i, j;
1550     const unsigned char *result;
1551     int status = OPENSSE_NPN_UNSUPPORTED;
1553     /* For each protocol in server preference order, see if we support it. */
1554     for (i = 0; i < server_len; )
1555     {
1556         for (j = 0; j < client_len; )
1557         {
1558             if (server[i] == client[j] &&
1559                 memcmp(&server[i+1], &client[j+1], server[i]) == 0)
1560             {
1561                 /* We found a match */
1562                 result = &server[i];
1563                 status = OPENSSE_NPN_NEGOTIATED;
1564                 goto found;
1565             }
1566             j += client[j];
1567             j++;
1568         }
1569         i += server[i];
1570         i++;
1571     }
1573     /* There's no overlap between our protocols and the server's list. */
1574     result = client;
1575     status = OPENSSE_NPN_NO_OVERLAP;
1577 found:
1578     *out = (unsigned char *) result + 1;
1579     *outlen = result[0];

```

```

1580     return status;
1581 }

1583 /* SSL_get0_next_proto_negotiated sets *data and *len to point to the client's
1584  * requested protocol for this connection and returns 0. If the client didn't
1585  * request any protocol, then *data is set to NULL.
1586  *
1587  * Note that the client can request any protocol it chooses. The value returned
1588  * from this function need not be a member of the list of supported protocols
1589  * provided by the callback.
1590  */
1591 void SSL_get0_next_proto_negotiated(const SSL *s, const unsigned char **data, un
1592     {
1593     *data = s->next_proto_negotiated;
1594     if (!*data) {
1595         *len = 0;
1596     } else {
1597         *len = s->next_proto_negotiated_len;
1598     }
1599 }

1601 /* SSL_CTX_set_next_protos_advertised_cb sets a callback that is called when a
1602  * TLS server needs a list of supported protocols for Next Protocol
1603  * Negotiation. The returned list must be in wire format. The list is returned
1604  * by setting |out| to point to it and |outlen| to its length. This memory will
1605  * not be modified, but one should assume that the SSL* keeps a reference to
1606  * it.
1607  *
1608  * The callback should return SSL_TLSEXT_ERR_OK if it wishes to advertise. Other
1609  * such extension will be included in the ServerHello. */
1610 void SSL_CTX_set_next_protos_advertised_cb(SSL_CTX *ctx, int (*cb) (SSL *ssl, co
1611     {
1612     ctx->next_protos_advertised_cb = cb;
1613     ctx->next_protos_advertised_cb_arg = arg;
1614 }

1616 /* SSL_CTX_set_next_proto_select_cb sets a callback that is called when a
1617  * client needs to select a protocol from the server's provided list. |out|
1618  * must be set to point to the selected protocol (which may be within |in|).
1619  * The length of the protocol name must be written into |outlen|. The server's
1620  * advertised protocols are provided in |in| and |inlen|. The callback can
1621  * assume that |in| is syntactically valid.
1622  *
1623  * The client must select a protocol. It is fatal to the connection if this
1624  * callback returns a value other than SSL_TLSEXT_ERR_OK.
1625  */
1626 void SSL_CTX_set_next_proto_select_cb(SSL_CTX *ctx, int (*cb) (SSL *s, unsigned
1627     {
1628     ctx->next_proto_select_cb = cb;
1629     ctx->next_proto_select_cb_arg = arg;
1630 }
1631 #endif
1632 #endif

1634 int SSL_export_keying_material(SSL *s, unsigned char *out, size_t olen,
1635     const char *label, size_t llen, const unsigned char *p, size_t plen,
1636     int use_context)
1637 {
1638     if (s->version < TLS1_VERSION)
1639         return -1;

1641     return s->method->ssl3_enc->export_keying_material(s, out, olen, label,
1642         llen, p, plen,
1643         use_context);
1644 }

```

```

1646 static unsigned long ssl_session_hash(const SSL_SESSION *a)
1647 {
1648     unsigned long l;

1650     l=(unsigned long)
1651         (((unsigned int) a->session_id[0]
1652          ((unsigned int) a->session_id[1]<< 8L))
1653          ((unsigned long)a->session_id[2]<<16L))
1654          ((unsigned long)a->session_id[3]<<24L);
1655     return(l);
1656 }

1658 /* NB: If this function (or indeed the hash function which uses a sort of
1659  * coarser function than this one) is changed, ensure
1660  * SSL_CTX_has_matching_session_id() is checked accordingly. It relies on being
1661  * able to construct an SSL_SESSION that will collide with any existing session
1662  * with a matching session ID. */
1663 static int ssl_session_cmp(const SSL_SESSION *a,const SSL_SESSION *b)
1664 {
1665     if (a->ssl_version != b->ssl_version)
1666         return(1);
1667     if (a->session_id_length != b->session_id_length)
1668         return(1);
1669     return(memcmp(a->session_id,b->session_id,a->session_id_length));
1670 }

1672 /* These wrapper functions should remain rather than redeclaring
1673  * SSL_SESSION_hash and SSL_SESSION_cmp for void* types and casting each
1674  * variable. The reason is that the functions aren't static, they're exposed via
1675  * ssl.h. */
1676 static IMPLEMENT_LHASH_HASH_FN(ssl_session, SSL_SESSION)
1677 static IMPLEMENT_LHASH_COMP_FN(ssl_session, SSL_SESSION)

1679 SSL_CTX *SSL_CTX_new(const SSL_METHOD *meth)
1680 {
1681     SSL_CTX *ret=NULL;

1683     if (meth == NULL)
1684     {
1685         SSLerr(SSL_F_SSL_CTX_NEW,SSL_R_NULL_SSL_METHOD_PASSED);
1686         return(NULL);
1687     }

1689 #ifdef OPENSSL_FIPS
1690     if (FIPS_mode() && (meth->version < TLS1_VERSION))
1691     {
1692         SSLerr(SSL_F_SSL_CTX_NEW, SSL_R_ONLY_TLS_ALLOWED_IN_FIPS_MODE);
1693         return NULL;
1694     }
1695 #endif

1697     if (SSL_get_ex_data_X509_STORE_CTX_idx() < 0)
1698     {
1699         SSLerr(SSL_F_SSL_CTX_NEW,SSL_R_X509_VERIFICATION_SETUP_PROBLEMS)
1700         goto err;
1701     }

1702     ret=(SSL_CTX *)OPENSSL_malloc(sizeof(SSL_CTX));
1703     if (ret == NULL)
1704         goto err;

1706     memset(ret,0,sizeof(SSL_CTX));

1708     ret->method=meth;

1710     ret->cert_store=NULL;
1711     ret->session_cache_mode=SSL_SESS_CACHE_SERVER;

```

```

1712     ret->session_cache_size=SSL_SESSION_CACHE_MAX_SIZE_DEFAULT;
1713     ret->session_cache_head=NULL;
1714     ret->session_cache_tail=NULL;

1716     /* We take the system default */
1717     ret->session_timeout=meth->get_timeout();

1719     ret->new_session_cb=0;
1720     ret->remove_session_cb=0;
1721     ret->get_session_cb=0;
1722     ret->generate_session_id=0;

1724     memset((char *)&ret->stats,0,sizeof(ret->stats));

1726     ret->references=1;
1727     ret->quiet_shutdown=0;

1729     /* ret->cipher=NULL; */
1730     /* ret->s2->challenge=NULL; */
1731     /* ret->master_key=NULL; */
1732     /* ret->key_arg=NULL; */
1733     /* ret->s2->conn_id=NULL; */

1735     ret->info_callback=NULL;

1737     ret->app_verify_callback=0;
1738     ret->app_verify_arg=NULL;

1740     ret->max_cert_list=SSL_MAX_CERT_LIST_DEFAULT;
1741     ret->read_ahead=0;
1742     ret->msg_callback=0;
1743     ret->msg_callback_arg=NULL;
1744     ret->verify_mode=SSL_VERIFY_NONE;
1745     #if 0
1746     ret->verify_depth=-1; /* Don't impose a limit (but x509_lu.c does) */
1747     #endif
1748     ret->sid_ctx_length=0;
1749     ret->default_verify_callback=NULL;
1750     if ((ret->cert=ssl_cert_new()) == NULL)
1751         goto err;

1753     ret->default_passwd_callback=0;
1754     ret->default_passwd_callback_userdata=NULL;
1755     ret->client_cert_cb=0;
1756     ret->app_gen_cookie_cb=0;
1757     ret->app_verify_cookie_cb=0;

1759     ret->sessions=lh_SSL_SESSION_new();
1760     if (ret->sessions == NULL) goto err;
1761     ret->cert_store=X509_STORE_new();
1762     if (ret->cert_store == NULL) goto err;

1764     ssl_create_cipher_list(ret->method,
1765                          &ret->cipher_list,&ret->cipher_list_by_id,
1766                          meth->version == SSL2_VERSION ? "SSLv2" : SSL_DEFAULT_CIPHER_LIS
1767     if (ret->cipher_list == NULL
1768         || sk_SSL_CIPHER_num(ret->cipher_list) <= 0)
1769     {
1770         SSLerr(SSL_F_SSL_CTX_NEW,SSL_R_LIBRARY_HAS_NO_CIPHERS);
1771         goto err2;
1772     }

1774     ret->param = X509_VERIFY_PARAM_new();
1775     if (!ret->param)
1776         goto err;

```

```

1778     if ((ret->rsa_md5=EVP_get_digestbyname("ssl2-md5")) == NULL)
1779     {
1780         SSLerr(SSL_F_SSL_CTX_NEW,SSL_R_UNABLE_TO_LOAD_SSL2_MD5_ROUTINES)
1781         goto err2;
1782     }
1783     if ((ret->md5=EVP_get_digestbyname("ssl3-md5")) == NULL)
1784     {
1785         SSLerr(SSL_F_SSL_CTX_NEW,SSL_R_UNABLE_TO_LOAD_SSL3_MD5_ROUTINES)
1786         goto err2;
1787     }
1788     if ((ret->sha1=EVP_get_digestbyname("ssl3-sha1")) == NULL)
1789     {
1790         SSLerr(SSL_F_SSL_CTX_NEW,SSL_R_UNABLE_TO_LOAD_SSL3_SHA1_ROUTINES)
1791         goto err2;
1792     }

1794     if ((ret->client_CA=sk_X509_NAME_new_null()) == NULL)
1795         goto err;

1797     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_SSL_CTX, ret, &ret->ex_data);

1799     ret->extra_certs=NULL;
1800     /* No compression for DTLS */
1801     if (meth->version != DTLS1_VERSION)
1802         ret->comp_methods=SSL_COMP_get_compression_methods();

1804     ret->max_send_fragment = SSL3_RT_MAX_PLAIN_LENGTH;

1806     #ifndef OPENSSL_NO_TLSEXT
1807     ret->tlsext_servername_callback = 0;
1808     ret->tlsext_servername_arg = NULL;
1809     /* Setup RFC4507 ticket keys */
1810     if ((RAND_pseudo_bytes(ret->tlsext_tick_key_name, 16) <= 0)
1811         || (RAND_bytes(ret->tlsext_tick_hmac_key, 16) <= 0)
1812         || (RAND_bytes(ret->tlsext_tick_aes_key, 16) <= 0))
1813         ret->options |= SSL_OP_NO_TICKET;

1815     ret->tlsext_status_cb = 0;
1816     ret->tlsext_status_arg = NULL;

1818     #ifndef OPENSSL_NO_NEXTPROTONEG
1819     ret->next_protos_advertised_cb = 0;
1820     ret->next_proto_select_cb = 0;
1821     #endif
1822     #endif
1823     #ifndef OPENSSL_NO_PSK
1824     ret->psk_identity_hint=NULL;
1825     ret->psk_client_callback=NULL;
1826     ret->psk_server_callback=NULL;
1827     #endif
1828     #ifndef OPENSSL_NO_SRP
1829     SSL_CTX_SRP_CTX_init(ret);
1830     #endif
1831     #ifndef OPENSSL_NO_BUF_FREELISTS
1832     ret->freelist_max_len = SSL_MAX_BUF_FREELIST_LEN_DEFAULT;
1833     ret->rbuf_freelist = OPENSSL_malloc(sizeof(SSL3_BUF_FREELIST));
1834     if (!ret->rbuf_freelist)
1835         goto err;
1836     ret->rbuf_freelist->chunklen = 0;
1837     ret->rbuf_freelist->len = 0;
1838     ret->rbuf_freelist->head = NULL;
1839     ret->wbuf_freelist = OPENSSL_malloc(sizeof(SSL3_BUF_FREELIST));
1840     if (!ret->wbuf_freelist)
1841     {
1842         OPENSSL_free(ret->rbuf_freelist);
1843         goto err;

```

```

1844     }
1845     ret->wbuf_freelist->chunklen = 0;
1846     ret->wbuf_freelist->len = 0;
1847     ret->wbuf_freelist->head = NULL;
1848 #endif
1849 #ifndef OPENSSL_NO_ENGINE
1850     ret->client_cert_engine = NULL;
1851 #ifdef OPENSSL_SSL_CLIENT_ENGINE_AUTO
1852     #define eng_str(x) #x
1853     #define eng_str(x) eng_str(x)
1854     /* Use specific client engine automatically... ignore errors */
1855     {
1856         ENGINE *eng;
1857         eng = ENGINE_by_id(eng_str(OPENSSL_SSL_CLIENT_ENGINE_AUTO));
1858         if (!eng)
1859         {
1860             ERR_clear_error();
1861             ENGINE_load_builtin_engines();
1862             eng = ENGINE_by_id(eng_str(OPENSSL_SSL_CLIENT_ENGINE_AUTO));
1863         }
1864         if (!eng || !SSL_CTX_set_client_cert_engine(ret, eng))
1865             ERR_clear_error();
1866     }
1867 #endif
1868 #endif
1869 /* Default is to connect to non-RI servers. When RI is more widely
1870  * deployed might change this.
1871  */
1872     ret->options |= SSL_OP_LEGACY_SERVER_CONNECT;

1874     return(ret);
1875 err:
1876     SSLerr(SSL_F_SSL_CTX_NEW,ERR_R_MALLOC_FAILURE);
1877 err2:
1878     if (ret != NULL) SSL_CTX_free(ret);
1879     return(NULL);
1880 }

1882 #if 0
1883 static void SSL_COMP_free(SSL_COMP *comp)
1884 { OPENSSL_free(comp); }
1885 #endif

1887 #ifndef OPENSSL_NO_BUF_FREELISTS
1888 static void
1889 ssl_buf_freelist_free(SSL3_BUF_FREELIST *list)
1890 {
1891     SSL3_BUF_FREELIST_ENTRY *ent, *next;
1892     for (ent = list->head; ent; ent = next)
1893     {
1894         next = ent->next;
1895         OPENSSL_free(ent);
1896     }
1897     OPENSSL_free(list);
1898 }
1899 #endif

1901 void SSL_CTX_free(SSL_CTX *a)
1902 {
1903     int i;

1905     if (a == NULL) return;

1907     i=CRYPTO_add(&a->references, -1, CRYPTO_LOCK_SSL_CTX);
1908 #ifdef REF_PRINT
1909     REF_PRINT("SSL_CTX", a);

```

```

1910 #endif
1911     if (i > 0) return;
1912 #ifdef REF_CHECK
1913     if (i < 0)
1914     {
1915         fprintf(stderr, "SSL_CTX_free, bad reference count\n");
1916         abort(); /* ok */
1917     }
1918 #endif

1920     if (a->param)
1921         X509_VERIFY_PARAM_free(a->param);

1923     /*
1924      * Free internal session cache. However: the remove_cb() may reference
1925      * the ex_data of SSL_CTX, thus the ex_data store can only be removed
1926      * after the sessions were flushed.
1927      * As the ex_data handling routines might also touch the session cache,
1928      * the most secure solution seems to be: empty (flush) the cache, then
1929      * free ex_data, then finally free the cache.
1930      * (See ticket [openssl.org #212].)
1931      */
1932     if (a->sessions != NULL)
1933         SSL_CTX_flush_sessions(a, 0);

1935     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_SSL_CTX, a, &a->ex_data);

1937     if (a->sessions != NULL)
1938         lh_SSL_SESSION_free(a->sessions);

1940     if (a->cert_store != NULL)
1941         X509_STORE_free(a->cert_store);
1942     if (a->cipher_list != NULL)
1943         sk_SSL_CIPHER_free(a->cipher_list);
1944     if (a->cipher_list_by_id != NULL)
1945         sk_SSL_CIPHER_free(a->cipher_list_by_id);
1946     if (a->cert != NULL)
1947         ssl_cert_free(a->cert);
1948     if (a->client_CA != NULL)
1949         sk_X509_NAME_pop_free(a->client_CA, X509_NAME_free);
1950     if (a->extra_certs != NULL)
1951         sk_X509_pop_free(a->extra_certs, X509_free);
1952 #if 0 /* This should never be done, since it removes a global database */
1953     if (a->comp_methods != NULL)
1954         sk_SSL_COMP_pop_free(a->comp_methods, SSL_COMP_free);
1955 #else
1956     a->comp_methods = NULL;
1957 #endif

1959 #ifndef OPENSSL_NO_SRTP
1960     if (a->srtp_profiles)
1961         sk_SRTP_PROTECTION_PROFILE_free(a->srtp_profiles);
1962 #endif

1964 #ifndef OPENSSL_NO_PSK
1965     if (a->psk_identity_hint)
1966         OPENSSL_free(a->psk_identity_hint);
1967 #endif
1968 #ifndef OPENSSL_NO_SRP
1969     SSL_CTX_SRP_CTX_free(a);
1970 #endif
1971 #ifndef OPENSSL_NO_ENGINE
1972     if (a->client_cert_engine)
1973         ENGINE_finish(a->client_cert_engine);
1974 #endif

```

```

1976 #ifndef OPENSSL_NO_BUF_FREELISTS
1977     if (a->wbuf_freelist)
1978         ssl_buf_freelist_free(a->wbuf_freelist);
1979     if (a->rbuf_freelist)
1980         ssl_buf_freelist_free(a->rbuf_freelist);
1981 #endif
1983     OPENSSL_free(a);
1984 }
1986 void SSL_CTX_set_default_passwd_cb(SSL_CTX *ctx, pem_password_cb *cb)
1987 {
1988     ctx->default_passwd_callback=cb;
1989 }
1991 void SSL_CTX_set_default_passwd_cb_userdata(SSL_CTX *ctx, void *u)
1992 {
1993     ctx->default_passwd_callback_userdata=u;
1994 }
1996 void SSL_CTX_set_cert_verify_callback(SSL_CTX *ctx, int (*cb)(X509_STORE_CTX *, void *), void *)
1997 {
1998     ctx->app_verify_callback=cb;
1999     ctx->app_verify_arg=arg;
2000 }
2002 void SSL_CTX_set_verify(SSL_CTX *ctx, int mode, int (*cb)(int, X509_STORE_CTX *))
2003 {
2004     ctx->verify_mode=mode;
2005     ctx->default_verify_callback=cb;
2006 }
2008 void SSL_CTX_set_verify_depth(SSL_CTX *ctx, int depth)
2009 {
2010     X509_VERIFY_PARAM_set_depth(ctx->param, depth);
2011 }
2013 void ssl_set_cert_masks(CERT *c, const SSL_CIPHER *cipher)
2014 {
2015     CERT_PKEY *cpk;
2016     int rsa_enc, rsa_tmp, rsa_sign, dh_tmp, dh_rsa, dh_dsa, dsa_sign;
2017     int rsa_enc_export, dh_rsa_export, dh_dsa_export;
2018     int rsa_tmp_export, dh_tmp_export, kl;
2019     unsigned long mask_k, mask_a, emask_k, emask_a;
2020     int have_ecc_cert, ecdh_ok, ecdsa_ok, ecc_pkey_size;
2021 #ifndef OPENSSL_NO_ECDH
2022     int have_ecdh_tmp;
2023 #endif
2024     X509 *x = NULL;
2025     EVP_PKEY *ecc_pkey = NULL;
2026     int signature_nid = 0, pk_nid = 0, md_nid = 0;
2028     if (c == NULL) return;
2030     kl=SSL_C_EXPORT_PKEYLENGTH(cipher);
2032 #ifndef OPENSSL_NO_RSA
2033     rsa_tmp=(c->rsa_tmp != NULL || c->rsa_tmp_cb != NULL);
2034     rsa_tmp_export=(c->rsa_tmp_cb != NULL ||
2035         (rsa_tmp && RSA_size(c->rsa_tmp)*8 <= kl));
2036 #else
2037     rsa_tmp=rsa_tmp_export=0;
2038 #endif
2039 #ifndef OPENSSL_NO_DH
2040     dh_tmp=(c->dh_tmp != NULL || c->dh_tmp_cb != NULL);
2041     dh_tmp_export=(c->dh_tmp_cb != NULL ||

```

```

2042         (dh_tmp && DH_size(c->dh_tmp)*8 <= kl));
2043 #else
2044     dh_tmp=dh_tmp_export=0;
2045 #endif
2047 #ifndef OPENSSL_NO_ECDH
2048     have_ecdh_tmp=(c->ecdh_tmp != NULL || c->ecdh_tmp_cb != NULL);
2049 #endif
2050     cpk= &(c->pkeys[SSL_PKEY_RSA_ENC]);
2051     rsa_enc= (cpk->x509 != NULL && cpk->privatekey != NULL);
2052     rsa_enc_export=(rsa_enc && EVP_PKEY_size(cpk->privatekey)*8 <= kl);
2053     cpk= &(c->pkeys[SSL_PKEY_RSA_SIGN]);
2054     rsa_sign=(cpk->x509 != NULL && cpk->privatekey != NULL);
2055     cpk= &(c->pkeys[SSL_PKEY_DSA_SIGN]);
2056     dsa_sign=(cpk->x509 != NULL && cpk->privatekey != NULL);
2057     cpk= &(c->pkeys[SSL_PKEY_DH_RSA]);
2058     dh_rsa= (cpk->x509 != NULL && cpk->privatekey != NULL);
2059     dh_rsa_export=(dh_rsa && EVP_PKEY_size(cpk->privatekey)*8 <= kl);
2060     cpk= &(c->pkeys[SSL_PKEY_DH_DSA]);
2061     /* FIX THIS EAY EAY EAY */
2062     dh_dsa= (cpk->x509 != NULL && cpk->privatekey != NULL);
2063     dh_dsa_export=(dh_dsa && EVP_PKEY_size(cpk->privatekey)*8 <= kl);
2064     cpk= &(c->pkeys[SSL_PKEY_ECC]);
2065     have_ecc_cert= (cpk->x509 != NULL && cpk->privatekey != NULL);
2066     mask_k=0;
2067     mask_a=0;
2068     emask_k=0;
2069     emask_a=0;
2071
2073 #ifdef CIPHER_DEBUG
2074     printf("rt=%d rte=%d dht=%d ecdht=%d re=%d ree=%d rs=%d ds=%d dhr=%d dhd\n",
2075         rsa_tmp, rsa_tmp_export, dh_tmp, have_ecdh_tmp,
2076         rsa_enc, rsa_enc_export, rsa_sign, dsa_sign, dh_rsa, dh_dsa);
2077 #endif
2078
2079     cpk = &(c->pkeys[SSL_PKEY_GOST01]);
2080     if (cpk->x509 != NULL && cpk->privatekey != NULL) {
2081         mask_k |= SSL_kGOST;
2082         mask_a |= SSL_aGOST01;
2083     }
2084     cpk = &(c->pkeys[SSL_PKEY_GOST94]);
2085     if (cpk->x509 != NULL && cpk->privatekey != NULL) {
2086         mask_k |= SSL_kGOST;
2087         mask_a |= SSL_aGOST94;
2088     }
2090     if (rsa_enc || (rsa_tmp && rsa_sign))
2091         mask_k|=SSL_kRSA;
2092     if (rsa_enc_export || (rsa_tmp_export && (rsa_sign || rsa_enc)))
2093         emask_k|=SSL_kRSA;
2095 #if 0
2096     /* The match needs to be both kEDH and aRSA or aDSA, so don't worry */
2097     if ( (dh_tmp || dh_rsa || dh_dsa) &&
2098         (rsa_enc || rsa_sign || dsa_sign))
2099         mask_k|=SSL_kEDH;
2100     if ((dh_tmp_export || dh_rsa_export || dh_dsa_export) &&
2101         (rsa_enc || rsa_sign || dsa_sign))
2102         emask_k|=SSL_kEDH;
2103 #endif
2105     if (dh_tmp_export)
2106         emask_k|=SSL_kEDH;

```



```

2108     if (dh_tmp)
2109         mask_k|=SSL_kEDH;

2111     if (dh_rsa) mask_k|=SSL_kDhR;
2112     if (dh_rsa_export) emask_k|=SSL_kDhR;

2114     if (dh_dsa) mask_k|=SSL_kDhD;
2115     if (dh_dsa_export) emask_k|=SSL_kDhD;

2117     if (rsa_enc || rsa_sign)
2118     {
2119         mask_a|=SSL_aRSA;
2120         emask_a|=SSL_aRSA;
2121     }

2123     if (dsa_sign)
2124     {
2125         mask_a|=SSL_aDSS;
2126         emask_a|=SSL_aDSS;
2127     }

2129     mask_a|=SSL_aNULL;
2130     emask_a|=SSL_aNULL;

2132 #ifndef OPENSSSL_NO_KRB5
2133     mask_k|=SSL_kKRB5;
2134     mask_a|=SSL_aKRB5;
2135     emask_k|=SSL_kKRB5;
2136     emask_a|=SSL_aKRB5;
2137 #endif

2139     /* An ECC certificate may be usable for ECDH and/or
2140      * ECDSA cipher suites depending on the key usage extension.
2141      */
2142     if (have_ecc_cert)
2143     {
2144         /* This call populates extension flags (ex_flags) */
2145         x = (c->pkeys[SSL_PKEY_ECC]).x509;
2146         X509_check_purpose(x, -1, 0);
2147         ecdh_ok = (x->ex_flags & EXFLAG_KUSAGE) ?
2148             (x->ex_kusage & X509v3_KU_KEY_AGREEMENT) : 1;
2149         ecdsa_ok = (x->ex_flags & EXFLAG_KUSAGE) ?
2150             (x->ex_kusage & X509v3_KU_DIGITAL_SIGNATURE) : 1;
2151         ecc_pkey = X509_get_pubkey(x);
2152         ecc_pkey_size = (ecc_pkey != NULL) ?
2153             EVP_PKEY_bits(ecc_pkey) : 0;
2154         EVP_PKEY_free(ecc_pkey);
2155         if ((x->sig_alg) && (x->sig_alg->algorithm))
2156         {
2157             signature_nid = OBJ_obj2nid(x->sig_alg->algorithm);
2158             OBJ_find_sigid_algs(signature_nid, &md_nid, &pk_nid);
2159         }
2160 #ifndef OPENSSSL_NO_ECDH
2161         if (ecdh_ok)
2162         {
2163             if (pk_nid == NID_rsaEncryption || pk_nid == NID_rsa)
2164             {
2165                 mask_k|=SSL_kECDHr;
2166                 mask_a|=SSL_aECDH;
2167                 if (ecc_pkey_size <= 163)
2168                 {
2169                     emask_k|=SSL_kECDHr;
2170                     emask_a|=SSL_aECDH;
2171                 }
2172             }
2173         }

```

```

2175         if (pk_nid == NID_X9_62_id_ecPublicKey)
2176         {
2177             mask_k|=SSL_kECDHe;
2178             mask_a|=SSL_aECDH;
2179             if (ecc_pkey_size <= 163)
2180             {
2181                 emask_k|=SSL_kECDHe;
2182                 emask_a|=SSL_aECDH;
2183             }
2184         }
2185     }
2186 #endif
2187 #ifndef OPENSSSL_NO_ECDSA
2188     if (ecdsa_ok)
2189     {
2190         mask_a|=SSL_aECDSA;
2191         emask_a|=SSL_aECDSA;
2192     }
2193 #endif
2194 }

2196 #ifndef OPENSSSL_NO_ECDH
2197     if (have_ecdh_tmp)
2198     {
2199         mask_k|=SSL_kEECDH;
2200         emask_k|=SSL_kEECDH;
2201     }
2202 #endif

2204 #ifndef OPENSSSL_NO_PSK
2205     mask_k |= SSL_kPSK;
2206     mask_a |= SSL_aPSK;
2207     emask_k |= SSL_kPSK;
2208     emask_a |= SSL_aPSK;
2209 #endif

2211     c->mask_k=mask_k;
2212     c->mask_a=mask_a;
2213     c->export_mask_k=emask_k;
2214     c->export_mask_a=emask_a;
2215     c->valid=1;
2216 }

2218 /* This handy macro borrowed from crypto/x509v3/v3_purp.c */
2219 #define ku_reject(x, usage) \
2220     (((x)->ex_flags & EXFLAG_KUSAGE) && !((x)->ex_kusage & (usage)))

2222 #ifndef OPENSSSL_NO_EC
2223 int ssl_check_srvr_ecc_cert_and_alg(X509 *x, SSL *s)
2224 {
2225     unsigned long alg_k, alg_a;
2226     EVP_PKEY *pkey = NULL;
2227     int keysize = 0;
2228     int signature_nid = 0, md_nid = 0, pk_nid = 0;
2229     const SSL_CIPHER *cs = s->s3->tmp.new_cipher;
2230
2232     alg_k = cs->algorithm_mkey;
2233     alg_a = cs->algorithm_auth;

2235     if (SSL_C_IS_EXPORT(cs))
2236     {
2237         /* ECDH key length in export ciphers must be <= 163 bits */
2238         pkey = X509_get_pubkey(x);
2239         if (pkey == NULL) return 0;

```

```

2240     keysize = EVP_PKEY_bits(pkey);
2241     EVP_PKEY_free(pkey);
2242     if (keysize > 163) return 0;
2243 }
2244
2245 /* This call populates the ex_flags field correctly */
2246 X509_check_purpose(x, -1, 0);
2247 if ((x->sig_alg) && (x->sig_alg->algorithm))
2248 {
2249     signature_nid = OBJ_obj2nid(x->sig_alg->algorithm);
2250     OBJ_find_sigid_algs(signature_nid, &md_nid, &pk_nid);
2251 }
2252 if (alg_k & SSL_kECDHe || alg_k & SSL_kECDHr)
2253 {
2254     /* key usage, if present, must allow key agreement */
2255     if (ku_reject(x, X509v3_KU_KEY_AGREEMENT))
2256     {
2257         SSLerr(SSL_F_SSL_CHECK_SRVR_ECC_CERT_AND_ALG, SSL_R_ECC
2258             return 0;
2259     }
2260     if ((alg_k & SSL_kECDHe) && TLS1_get_version(s) < TLS1_2_VERSION
2261     {
2262         /* signature alg must be ECDSA */
2263         if (pk_nid != NID_X9_62_id_ecPublicKey)
2264         {
2265             SSLerr(SSL_F_SSL_CHECK_SRVR_ECC_CERT_AND_ALG, SS
2266                 return 0;
2267         }
2268     }
2269     if ((alg_k & SSL_kECDHr) && TLS1_get_version(s) < TLS1_2_VERSION
2270     {
2271         /* signature alg must be RSA */
2272         if (pk_nid != NID_rsaEncryption && pk_nid != NID_rsa)
2273         {
2274             SSLerr(SSL_F_SSL_CHECK_SRVR_ECC_CERT_AND_ALG, SS
2275                 return 0;
2276         }
2277     }
2278 }
2279 if (alg_a & SSL_aECDSA)
2280 {
2281     /* key usage, if present, must allow signing */
2282     if (ku_reject(x, X509v3_KU_DIGITAL_SIGNATURE))
2283     {
2284         SSLerr(SSL_F_SSL_CHECK_SRVR_ECC_CERT_AND_ALG, SSL_R_ECC
2285             return 0;
2286     }
2287 }
2288
2290 return 1; /* all checks are ok */
2291 }
2292
2293 #endif
2294
2295 /* THIS NEEDS CLEANING UP */
2296 CERT_PKEY *ssl_get_server_send_pkey(const SSL *s)
2297 {
2298     unsigned long alg_k, alg_a;
2299     CERT *c;
2300     int i;
2301
2302     c=s->cert;
2303     ssl_set_cert_masks(c, s->s3->tmp.new_cipher);
2304     alg_k = s->s3->tmp.new_cipher->algorithm_mkey;

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```

2306     alg_a = s->s3->tmp.new_cipher->algorithm_auth;
2307
2308     if (alg_k & (SSL_kECDHr|SSL_kECDHe))
2309     {
2310         /* we don't need to look at SSL_kECDH
2311         * since no certificate is needed for
2312         * anon ECDH and for authenticated
2313         * ECDH, the check for the auth
2314         * algorithm will set i correctly
2315         * NOTE: For ECDH-RSA, we need an ECC
2316         * not an RSA cert but for ECDH-RSA
2317         * we need an RSA cert. Placing the
2318         * checks for SSL_kECDH before RSA
2319         * checks ensures the correct cert is chosen.
2320         */
2321         i=SSL_PKEY_ECC;
2322     }
2323     else if (alg_a & SSL_aECDSA)
2324     {
2325         i=SSL_PKEY_ECC;
2326     }
2327     else if (alg_k & SSL_kDhr)
2328     {
2329         i=SSL_PKEY_DH_RSA;
2330     }
2331     else if (alg_k & SSL_kDHd)
2332     {
2333         i=SSL_PKEY_DH_DSA;
2334     }
2335     else if (alg_a & SSL_aDSS)
2336     {
2337         i=SSL_PKEY_DSA_SIGN;
2338     }
2339     else if (alg_a & SSL_aRSA)
2340     {
2341         if (c->pkeys[SSL_PKEY_RSA_ENC].x509 == NULL)
2342             i=SSL_PKEY_RSA_SIGN;
2343         else
2344             i=SSL_PKEY_RSA_ENC;
2345     }
2346     else if (alg_a & SSL_aKRB5)
2347     {
2348         /* VRS something else here? */
2349         return(NULL);
2350     }
2351     else if (alg_a & SSL_aGOST94)
2352     {
2353         i=SSL_PKEY_GOST94;
2354     }
2355     else if (alg_a & SSL_aGOST01)
2356     {
2357         i=SSL_PKEY_GOST01;
2358     }
2359     else /* if (alg_a & SSL_aNULL) */
2360     {
2361         SSLerr(SSL_F_SSL_GET_SERVER_SEND_PKEY, ERR_R_INTERNAL_ERROR);
2362         return(NULL);
2363     }
2364
2365     return c->pkeys + i;
2366 }
2367
2368 X509 *ssl_get_server_send_cert(const SSL *s)
2369 {
2370     CERT_PKEY *cpk;
2371     cpk = ssl_get_server_send_pkey(s);
2372     if (!cpk)
2373         return NULL;
2374     return cpk->x509;
2375 }
2376
2377 EVP_PKEY *ssl_get_sign_pkey(SSL *s, const SSL_CIPHER *cipher, const EVP_MD **pmd)
2378 {
2379     unsigned long alg_a;
2380     CERT *c;
2381     int idx = -1;

```

```

2373     alg_a = cipher->algorithm_auth;
2374     c=s->cert;

2376     if ((alg_a & SSL_aDSS) &&
2377         (c->pkeys[SSL_PKEY_DSA_SIGN].privatekey != NULL))
2378         idx = SSL_PKEY_DSA_SIGN;
2379     else if (alg_a & SSL_aRSA)
2380     {
2381         if (c->pkeys[SSL_PKEY_RSA_SIGN].privatekey != NULL)
2382             idx = SSL_PKEY_RSA_SIGN;
2383         else if (c->pkeys[SSL_PKEY_RSA_ENC].privatekey != NULL)
2384             idx = SSL_PKEY_RSA_ENC;
2385     }
2386     else if ((alg_a & SSL_aECDSA) &&
2387              (c->pkeys[SSL_PKEY_ECC].privatekey != NULL))
2388         idx = SSL_PKEY_ECC;
2389     if (idx == -1)
2390     {
2391         SSLerr(SSL_F_SSL_GET_SIGN_PKEY,ERR_R_INTERNAL_ERROR);
2392         return(NULL);
2393     }
2394     if (pmd)
2395         *pmd = c->pkeys[idx].digest;
2396     return c->pkeys[idx].privatekey;
2397 }

2399 void ssl_update_cache(SSL *s,int mode)
2400 {
2401     int i;

2403     /* If the session_id_length is 0, we are not supposed to cache it,
2404      * and it would be rather hard to do anyway :-) */
2405     if (s->session->session_id_length == 0) return;

2407     i=s->session_ctx->session_cache_mode;
2408     if ((i & mode) && (!s->hit)
2409         && ((i & SSL_SESS_CACHE_NO_INTERNAL_STORE)
2410             || SSL_CTX_add_session(s->session_ctx,s->session))
2411         && (s->session_ctx->new_session_cb != NULL))
2412     {
2413         CRYPTO_add(&s->session->references,1,CRYPTO_LOCK_SSL_SESSION);
2414         if (!s->session_ctx->new_session_cb(s,s->session))
2415             SSL_SESSION_free(s->session);
2416     }

2418     /* auto flush every 255 connections */
2419     if (((i & SSL_SESS_CACHE_NO_AUTO_CLEAR)) &&
2420         ((i & mode) == mode))
2421     {
2422         if ( (((mode & SSL_SESS_CACHE_CLIENT)
2423              ?s->session_ctx->stats.sess_connect_good
2424              :s->session_ctx->stats.sess_accept_good) & 0xff) == 0xff)
2425         {
2426             SSL_CTX_flush_sessions(s->session_ctx,(unsigned long)tim
2427         )
2428         }
2429     }

2431     const SSL_METHOD *SSL_get_ssl_method(SSL *s)
2432     {
2433         return(s->method);
2434     }

2436     int SSL_set_ssl_method(SSL *s, const SSL_METHOD *meth)
2437     {

```

```

2438     int conn= -1;
2439     int ret=1;

2441     if (s->method != meth)
2442     {
2443         if (s->handshake_func != NULL)
2444             conn=(s->handshake_func == s->method->ssl_connect);

2446         if (s->method->version == meth->version)
2447             s->method=meth;
2448         else
2449         {
2450             s->method->ssl_free(s);
2451             s->method=meth;
2452             ret=s->method->ssl_new(s);
2453         }

2455         if (conn == 1)
2456             s->handshake_func=meth->ssl_connect;
2457         else if (conn == 0)
2458             s->handshake_func=meth->ssl_accept;
2459     }
2460     return(ret);
2461 }

2463 int SSL_get_error(const SSL *s,int i)
2464 {
2465     int reason;
2466     unsigned long l;
2467     BIO *bio;

2469     if (i > 0) return(SSL_ERROR_NONE);

2471     /* Make things return SSL_ERROR_SYSCALL when doing SSL_do_handshake
2472      * etc, where we do encode the error */
2473     if ((l=ERR_peek_error()) != 0)
2474     {
2475         if (ERR_GET_LIB(l) == ERR_LIB_SYS)
2476             return(SSL_ERROR_SYSCALL);
2477         else
2478             return(SSL_ERROR_SSL);
2479     }

2481     if ((i < 0) && SSL_want_read(s))
2482     {
2483         bio=SSL_get_rbio(s);
2484         if (BIO_should_read(bio))
2485             return(SSL_ERROR_WANT_READ);
2486         else if (BIO_should_write(bio))
2487             /* This one doesn't make too much sense ... We never try
2488              * to write to the rbio, and an application program wher
2489              * rbio and wbio are separate couldn't even know what it
2490              * should wait for.
2491              * However if we ever set s->rwstate incorrectly
2492              * (so that we have SSL_want_read(s) instead of
2493              * SSL_want_write(s)) and rbio and wbio *are* the same,
2494              * this test works around that bug; so it might be safer
2495              * to keep it. */
2496             return(SSL_ERROR_WANT_WRITE);
2497         else if (BIO_should_io_special(bio))
2498         {
2499             reason=BIO_get_retry_reason(bio);
2500             if (reason == BIO_RR_CONNECT)
2501                 return(SSL_ERROR_WANT_CONNECT);
2502             else if (reason == BIO_RR_ACCEPT)
2503                 return(SSL_ERROR_WANT_ACCEPT);

```

```

2504         else
2505             return(SSL_ERROR_SYSCALL); /* unknown */
2506     }
2507 }
2509 if ((i < 0) && SSL_want_write(s))
2510 {
2511     bio=SSL_get_wbio(s);
2512     if (BIO_should_write(bio))
2513         return(SSL_ERROR_WANT_WRITE);
2514     else if (BIO_should_read(bio))
2515         /* See above (SSL_want_read(s) with BIO_should_write(bio)
2516         return(SSL_ERROR_WANT_READ);
2517     else if (BIO_should_io_special(bio))
2518     {
2519         reason=BIO_get_retry_reason(bio);
2520         if (reason == BIO_RR_CONNECT)
2521             return(SSL_ERROR_WANT_CONNECT);
2522         else if (reason == BIO_RR_ACCEPT)
2523             return(SSL_ERROR_WANT_ACCEPT);
2524         else
2525             return(SSL_ERROR_SYSCALL);
2526     }
2527 }
2528 if ((i < 0) && SSL_want_x509_lookup(s))
2529 {
2530     return(SSL_ERROR_WANT_X509_LOOKUP);
2531 }
2533 if (i == 0)
2534 {
2535     if (s->version == SSL2_VERSION)
2536     {
2537         /* assume it is the socket being closed */
2538         return(SSL_ERROR_ZERO_RETURN);
2539     }
2540     else
2541     {
2542         if ((s->shutdown & SSL_RECEIVED_SHUTDOWN) &&
2543             (s->s3->warn_alert == SSL_AD_CLOSE_NOTIFY))
2544             return(SSL_ERROR_ZERO_RETURN);
2545     }
2546 }
2547 return(SSL_ERROR_SYSCALL);
2548 }
2550 int SSL_do_handshake(SSL *s)
2551 {
2552     int ret=1;
2554     if (s->handshake_func == NULL)
2555     {
2556         SSLerr(SSL_F_SSL_DO_HANDSHAKE,SSL_R_CONNECTION_TYPE_NOT_SET);
2557         return(-1);
2558     }
2560     s->method->ssl_renegotiate_check(s);
2562     if (SSL_in_init(s) || SSL_in_before(s))
2563     {
2564         ret=s->handshake_func(s);
2565     }
2566     return(ret);
2567 }

```

2569 /* For the next 2 functions, SSL_clear() sets shutdown and so

```

2570 * one of these calls will reset it */
2571 void SSL_set_accept_state(SSL *s)
2572 {
2573     s->server=1;
2574     s->shutdown=0;
2575     s->state=SSL_ST_ACCEPT|SSL_ST_BEFORE;
2576     s->handshake_func=s->method->ssl_accept;
2577     /* clear the current cipher */
2578     ssl_clear_cipher_ctx(s);
2579     ssl_clear_hash_ctx(&s->read_hash);
2580     ssl_clear_hash_ctx(&s->write_hash);
2581 }
2583 void SSL_set_connect_state(SSL *s)
2584 {
2585     s->server=0;
2586     s->shutdown=0;
2587     s->state=SSL_ST_CONNECT|SSL_ST_BEFORE;
2588     s->handshake_func=s->method->ssl_connect;
2589     /* clear the current cipher */
2590     ssl_clear_cipher_ctx(s);
2591     ssl_clear_hash_ctx(&s->read_hash);
2592     ssl_clear_hash_ctx(&s->write_hash);
2593 }
2595 int ssl_undefined_function(SSL *s)
2596 {
2597     SSLerr(SSL_F_SSL_UNDEFINED_FUNCTION,ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
2598     return(0);
2599 }
2601 int ssl_undefined_void_function(void)
2602 {
2603     SSLerr(SSL_F_SSL_UNDEFINED_VOID_FUNCTION,ERR_R_SHOULD_NOT_HAVE_BEEN_CALL
2604     return(0);
2605 }
2607 int ssl_undefined_const_function(const SSL *s)
2608 {
2609     SSLerr(SSL_F_SSL_UNDEFINED_CONST_FUNCTION,ERR_R_SHOULD_NOT_HAVE_BEEN_CAL
2610     return(0);
2611 }
2613 SSL_METHOD *ssl_bad_method(int ver)
2614 {
2615     SSLerr(SSL_F_SSL_BAD_METHOD,ERR_R_SHOULD_NOT_HAVE_BEEN_CALLED);
2616     return(NULL);
2617 }
2619 const char *SSL_get_version(const SSL *s)
2620 {
2621     if (s->version == TLS1_2_VERSION)
2622         return("TLSv1.2");
2623     else if (s->version == TLS1_1_VERSION)
2624         return("TLSv1.1");
2625     else if (s->version == TLS1_VERSION)
2626         return("TLSv1");
2627     else if (s->version == SSL3_VERSION)
2628         return("SSLv3");
2629     else if (s->version == SSL2_VERSION)
2630         return("SSLv2");
2631     else
2632         return("unknown");
2633 }
2635 SSL *SSL_dup(SSL *s)

```

```

2636     {
2637         STACK_OF(X509_NAME) *sk;
2638         X509_NAME *xn;
2639         SSL *ret;
2640         int i;
2641
2642         if ((ret=SSL_new(SSL_get_SSL_CTX(s))) == NULL)
2643             return(NULL);
2644
2645         ret->version = s->version;
2646         ret->type = s->type;
2647         ret->method = s->method;
2648
2649         if (s->session != NULL)
2650             /* This copies session-id, SSL_METHOD, sid_ctx, and 'cert' */
2651             SSL_copy_session_id(ret,s);
2652         else
2653             /* No session has been established yet, so we have to expect
2654              * that s->cert or ret->cert will be changed later --
2655              * they should not both point to the same object,
2656              * and thus we can't use SSL_copy_session_id. */
2657
2658             ret->method->ssl_free(ret);
2659             ret->method = s->method;
2660             ret->method->ssl_new(ret);
2661
2662             if (s->cert != NULL)
2663             {
2664                 if (ret->cert != NULL)
2665                     ssl_cert_free(ret->cert);
2666                 ret->cert = ssl_cert_dup(s->cert);
2667                 if (ret->cert == NULL)
2668                     goto err;
2669             }
2670
2671             SSL_set_session_id_context(ret,
2672                                     s->sid_ctx, s->sid_ctx_length);
2673
2674             ret->options=s->options;
2675             ret->mode=s->mode;
2676             SSL_set_max_cert_list(ret,SSL_get_max_cert_list(s));
2677             SSL_set_read_ahead(ret,SSL_get_read_ahead(s));
2678             ret->msg_callback = s->msg_callback;
2679             ret->msg_callback_arg = s->msg_callback_arg;
2680             SSL_set_verify(ret,SSL_get_verify_mode(s),
2681                          SSL_get_verify_callback(s));
2682             SSL_set_verify_depth(ret,SSL_get_verify_depth(s));
2683             ret->generate_session_id = s->generate_session_id;
2684
2685             SSL_set_info_callback(ret,SSL_get_info_callback(s));
2686
2687             ret->debug=s->debug;
2688
2689             /* copy app data, a little dangerous perhaps */
2690             if (!CRYPTO_dup_ex_data(CRYPTO_EX_INDEX_SSL, &ret->ex_data, &s->ex_data)
2691                 goto err;
2692
2693             /* setup rbio, and wbio */
2694             if (s->rbio != NULL)
2695             {

```

```

2702         if (!BIO_dup_state(s->rbio,(char *)&ret->rbio))
2703             goto err;
2704     }
2705     if (s->wbio != NULL)
2706     {
2707         if (s->wbio != s->rbio)
2708         {
2709             if (!BIO_dup_state(s->wbio,(char *)&ret->wbio))
2710                 goto err;
2711         }
2712         else
2713             ret->wbio=ret->rbio;
2714     }
2715     ret->rwstate = s->rwstate;
2716     ret->in_handshake = s->in_handshake;
2717     ret->handshake_func = s->handshake_func;
2718     ret->server = s->server;
2719     ret->renegotiate = s->renegotiate;
2720     ret->new_session = s->new_session;
2721     ret->quiet_shutdown = s->quiet_shutdown;
2722     ret->shutdown=s->shutdown;
2723     ret->state=s->state; /* SSL_dup does not really work at any state, though
2724     ret->rstate=s->rstate;
2725     ret->init_num = 0; /* would have to copy ret->init_buf, ret->init_msg, r
2726     ret->hit=s->hit;
2727
2728     X509_VERIFY_PARAM_inherit(ret->param, s->param);
2729
2730     /* dup the cipher_list and cipher_list_by_id stacks */
2731     if (s->cipher_list != NULL)
2732     {
2733         if ((ret->cipher_list=sk_SSL_CIPHER_dup(s->cipher_list)) == NULL
2734             goto err;
2735     }
2736     if (s->cipher_list_by_id != NULL)
2737     {
2738         if ((ret->cipher_list_by_id=sk_SSL_CIPHER_dup(s->cipher_list_by_
2739             == NULL)
2740             goto err;
2741
2742     /* Dup the client_CA list */
2743     if (s->client_CA != NULL)
2744     {
2745         if ((sk=sk_X509_NAME_dup(s->client_CA)) == NULL) goto err;
2746         ret->client_CA=sk;
2747         for (i=0; i<sk_X509_NAME_num(sk); i++)
2748         {
2749             xn=sk_X509_NAME_value(sk,i);
2750             if (sk_X509_NAME_set(sk,i,X509_NAME_dup(xn)) == NULL)
2751             {
2752                 X509_NAME_free(xn);
2753                 goto err;
2754             }
2755         }
2756     }
2757
2758     if (0)
2759     {
2760         err:
2761         if (ret != NULL) SSL_free(ret);
2762         ret=NULL;
2763     }
2764     return(ret);
2765
2766 void ssl_clear_cipher_ctx(SSL *s)
2767 {

```

```

2768     if (s->enc_read_ctx != NULL)
2769     {
2770         EVP_CIPHER_CTX_cleanup(s->enc_read_ctx);
2771         OPENSSL_free(s->enc_read_ctx);
2772         s->enc_read_ctx=NULL;
2773     }
2774     if (s->enc_write_ctx != NULL)
2775     {
2776         EVP_CIPHER_CTX_cleanup(s->enc_write_ctx);
2777         OPENSSL_free(s->enc_write_ctx);
2778         s->enc_write_ctx=NULL;
2779     }
2780 #ifndef OPENSSL_NO_COMP
2781     if (s->expand != NULL)
2782     {
2783         COMP_CTX_free(s->expand);
2784         s->expand=NULL;
2785     }
2786     if (s->compress != NULL)
2787     {
2788         COMP_CTX_free(s->compress);
2789         s->compress=NULL;
2790     }
2791 #endif
2792 }

2794 /* Fix this function so that it takes an optional type parameter */
2795 X509 *SSL_get_certificate(const SSL *s)
2796 {
2797     if (s->cert != NULL)
2798         return(s->cert->key->x509);
2799     else
2800         return(NULL);
2801 }

2803 /* Fix this function so that it takes an optional type parameter */
2804 EVP_PKEY *SSL_get_privatekey(SSL *s)
2805 {
2806     if (s->cert != NULL)
2807         return(s->cert->key->privatekey);
2808     else
2809         return(NULL);
2810 }

2812 const SSL_CIPHER *SSL_get_current_cipher(const SSL *s)
2813 {
2814     if ((s->session != NULL) && (s->session->cipher != NULL))
2815         return(s->session->cipher);
2816     return(NULL);
2817 }
2818 #ifdef OPENSSL_NO_COMP
2819 const void *SSL_get_current_compression(SSL *s)
2820 {
2821     return NULL;
2822 }
2823 const void *SSL_get_current_expansion(SSL *s)
2824 {
2825     return NULL;
2826 }
2827 #else
2829 const COMP_METHOD *SSL_get_current_compression(SSL *s)
2830 {
2831     if (s->compress != NULL)
2832         return(s->compress->meth);
2833     return(NULL);

```

```

2834     }

2836 const COMP_METHOD *SSL_get_current_expansion(SSL *s)
2837 {
2838     if (s->expand != NULL)
2839         return(s->expand->meth);
2840     return(NULL);
2841 }
2842 #endif

2844 int ssl_init_wbio_buffer(SSL *s,int push)
2845 {
2846     BIO *bbio;

2848     if (s->bbio == NULL)
2849     {
2850         bbio=BIO_new(BIO_f_buffer());
2851         if (bbio == NULL) return(0);
2852         s->bbio=bbio;
2853     }
2854     else
2855     {
2856         bbio=s->bbio;
2857         if (s->bbio == s->wbio)
2858             s->wbio=BIO_pop(s->wbio);
2859     }
2860     (void)BIO_reset(bbio);
2861     /* if (!BIO_set_write_buffer_size(bbio,16*1024)) */
2862     /* if (!BIO_set_read_buffer_size(bbio,1)) */
2863     {
2864         SSLerr(SSL_F_SSL_INIT_WBIO_BUFFER,ERR_R_BUF_LIB);
2865         return(0);
2866     }
2867     if (push)
2868     {
2869         if (s->wbio != bbio)
2870             s->wbio=BIO_push(bbio,s->wbio);
2871     }
2872     else
2873     {
2874         if (s->wbio == bbio)
2875             s->wbio=BIO_pop(bbio);
2876     }
2877     return(1);
2878 }

2880 void ssl_free_wbio_buffer(SSL *s)
2881 {
2882     if (s->bbio == NULL) return;

2884     if (s->bbio == s->wbio)
2885     {
2886         /* remove buffering */
2887         s->wbio=BIO_pop(s->wbio);
2888     }
2889 #ifdef REF_CHECK /* not the usual REF_CHECK, but this avoids adding one more pre
2890 assert(s->wbio != NULL);
2891 #endif
2892     BIO_free(s->bbio);
2893     s->bbio=NULL;
2894 }

2895 void SSL_CTX_set_quiet_shutdown(SSL_CTX *ctx,int mode)
2896 {
2897     ctx->quiet_shutdown=mode;
2898 }

```

```

2901 int SSL_CTX_get_quiet_shutdown(const SSL_CTX *ctx)
2902 {
2903     return(ctx->quiet_shutdown);
2904 }
2906 void SSL_set_quiet_shutdown(SSL *s,int mode)
2907 {
2908     s->quiet_shutdown=mode;
2909 }
2911 int SSL_get_quiet_shutdown(const SSL *s)
2912 {
2913     return(s->quiet_shutdown);
2914 }
2916 void SSL_set_shutdown(SSL *s,int mode)
2917 {
2918     s->shutdown=mode;
2919 }
2921 int SSL_get_shutdown(const SSL *s)
2922 {
2923     return(s->shutdown);
2924 }
2926 int SSL_version(const SSL *s)
2927 {
2928     return(s->version);
2929 }
2931 SSL_CTX *SSL_get_SSL_CTX(const SSL *ssl)
2932 {
2933     return(ssl->ctx);
2934 }
2936 SSL_CTX *SSL_set_SSL_CTX(SSL *ssl, SSL_CTX* ctx)
2937 {
2938     if (ssl->ctx == ctx)
2939         return ssl->ctx;
2940 #ifndef OPENSSL_NO_TLSEXT
2941     if (ctx == NULL)
2942         ctx = ssl->initial_ctx;
2943 #endif
2944     if (ssl->cert != NULL)
2945         ssl_cert_free(ssl->cert);
2946     ssl->cert = ssl_cert_dup(ctx->cert);
2947     CRYPTO_add(&ctx->references,1,CRYPTO_LOCK_SSL_CTX);
2948     if (ssl->ctx != NULL)
2949         SSL_CTX_free(ssl->ctx); /* decrement reference count */
2950     ssl->ctx = ctx;
2951     return(ssl->ctx);
2952 }
2954 #ifndef OPENSSL_NO_STDIO
2955 int SSL_CTX_set_default_verify_paths(SSL_CTX *ctx)
2956 {
2957     return(X509_STORE_set_default_paths(ctx->cert_store));
2958 }
2960 int SSL_CTX_load_verify_locations(SSL_CTX *ctx, const char *CAfile,
2961     const char *CApath)
2962 {
2963     return(X509_STORE_load_locations(ctx->cert_store,CAfile,CApath));
2964 }
2965 #endif

```

```

2967 void SSL_set_info_callback(SSL *ssl,
2968     void (*cb)(const SSL *ssl,int type,int val))
2969 {
2970     ssl->info_callback=cb;
2971 }
2973 /* One compiler (Diab DCC) doesn't like argument names in returned
2974    function pointer. */
2975 void (*SSL_get_info_callback(const SSL *ssl))(const SSL * /*ssl*/,int /*type*/,i
2976 {
2977     return ssl->info_callback;
2978 }
2980 int SSL_state(const SSL *ssl)
2981 {
2982     return(ssl->state);
2983 }
2985 void SSL_set_state(SSL *ssl, int state)
2986 {
2987     ssl->state = state;
2988 }
2990 void SSL_set_verify_result(SSL *ssl,long arg)
2991 {
2992     ssl->verify_result=arg;
2993 }
2995 long SSL_get_verify_result(const SSL *ssl)
2996 {
2997     return(ssl->verify_result);
2998 }
3000 int SSL_get_ex_new_index(long argl,void *argp,CRYPTO_EX_new *new_func,
3001     CRYPTO_EX_dup *dup_func,CRYPTO_EX_free *free_func)
3002 {
3003     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_SSL, argl, argp,
3004         new_func, dup_func, free_func);
3005 }
3007 int SSL_set_ex_data(SSL *s,int idx,void *arg)
3008 {
3009     return(CRYPTO_set_ex_data(&s->ex_data,idx,arg));
3010 }
3012 void *SSL_get_ex_data(const SSL *s,int idx)
3013 {
3014     return(CRYPTO_get_ex_data(&s->ex_data,idx));
3015 }
3017 int SSL_CTX_get_ex_new_index(long argl,void *argp,CRYPTO_EX_new *new_func,
3018     CRYPTO_EX_dup *dup_func,CRYPTO_EX_free *free_func)
3019 {
3020     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_SSL_CTX, argl, argp,
3021         new_func, dup_func, free_func);
3022 }
3024 int SSL_CTX_set_ex_data(SSL_CTX *s,int idx,void *arg)
3025 {
3026     return(CRYPTO_set_ex_data(&s->ex_data,idx,arg));
3027 }
3029 void *SSL_CTX_get_ex_data(const SSL_CTX *s,int idx)
3030 {
3031     return(CRYPTO_get_ex_data(&s->ex_data,idx));

```

```

3032     }
3034 int ssl_ok(SSL *s)
3035 {
3036     return(1);
3037 }
3039 X509_STORE *SSL_CTX_get_cert_store(const SSL_CTX *ctx)
3040 {
3041     return(ctx->cert_store);
3042 }
3044 void SSL_CTX_set_cert_store(SSL_CTX *ctx, X509_STORE *store)
3045 {
3046     if (ctx->cert_store != NULL)
3047         X509_STORE_free(ctx->cert_store);
3048     ctx->cert_store=store;
3049 }
3051 int SSL_want(const SSL *s)
3052 {
3053     return(s->rwstate);
3054 }
3056 /*!
3057  * \brief Set the callback for generating temporary RSA keys.
3058  * \param ctx the SSL context.
3059  * \param cb the callback
3060  */
3062 #ifndef OPENSSL_NO_RSA
3063 void SSL_CTX_set_tmp_rsa_callback(SSL_CTX *ctx, RSA *(*cb)(SSL *ssl,
3064                                     int is_export,
3065                                     int keylength))
3066 {
3067     SSL_CTX_callback_ctrl(ctx, SSL_CTRL_SET_TMP_RSA_CB, (void (*)(void))cb);
3068 }
3070 void SSL_set_tmp_rsa_callback(SSL *ssl, RSA *(*cb)(SSL *ssl,
3071                                     int is_export,
3072                                     int keylength))
3073 {
3074     SSL_callback_ctrl(ssl, SSL_CTRL_SET_TMP_RSA_CB, (void (*)(void))cb);
3075 }
3076 #endif
3078 #ifdef DOXYGEN
3079 /*!
3080  * \brief The RSA temporary key callback function.
3081  * \param ssl the SSL session.
3082  * \param is_export \c TRUE if the temp RSA key is for an export ciphersuite.
3083  * \param keylength if \c is_export is \c TRUE, then \c keylength is the size
3084  * of the required key in bits.
3085  * \return the temporary RSA key.
3086  * \sa SSL_CTX_set_tmp_rsa_callback, SSL_set_tmp_rsa_callback
3087  */
3089 RSA *cb(SSL *ssl, int is_export, int keylength)
3090 {
3091     #endif
3093 /*!
3094  * \brief Set the callback for generating temporary DH keys.
3095  * \param ctx the SSL context.
3096  * \param dh the callback
3097  */

```

```

3099 #ifndef OPENSSL_NO_DH
3100 void SSL_CTX_set_tmp_dh_callback(SSL_CTX *ctx, DH *(*dh)(SSL *ssl, int is_export,
3101                                     int keylength))
3102 {
3103     SSL_CTX_callback_ctrl(ctx, SSL_CTRL_SET_TMP_DH_CB, (void (*)(void))dh);
3104 }
3106 void SSL_set_tmp_dh_callback(SSL *ssl, DH *(*dh)(SSL *ssl, int is_export,
3107                                     int keylength))
3108 {
3109     SSL_callback_ctrl(ssl, SSL_CTRL_SET_TMP_DH_CB, (void (*)(void))dh);
3110 }
3111 #endif
3113 #ifndef OPENSSL_NO_ECDH
3114 void SSL_CTX_set_tmp_ecdh_callback(SSL_CTX *ctx, EC_KEY *(*ecdh)(SSL *ssl, int is_
3115                                     int keylength))
3116 {
3117     SSL_CTX_callback_ctrl(ctx, SSL_CTRL_SET_TMP_ECDH_CB, (void (*)(void))ecdh);
3118 }
3120 void SSL_set_tmp_ecdh_callback(SSL *ssl, EC_KEY *(*ecdh)(SSL *ssl, int is_export,
3121                                     int keylength))
3122 {
3123     SSL_callback_ctrl(ssl, SSL_CTRL_SET_TMP_ECDH_CB, (void (*)(void))ecdh);
3124 }
3125 #endif
3127 #ifndef OPENSSL_NO_PSK
3128 int SSL_CTX_use_psk_identity_hint(SSL_CTX *ctx, const char *identity_hint)
3129 {
3130     if (identity_hint != NULL && strlen(identity_hint) > PSK_MAX_IDENTITY_LE
3131     {
3132         SSLerr(SSL_F_SSL_CTX_USE_PSK_IDENTITY_HINT, SSL_R_DATA_LENGTH_TOO
3133         return 0;
3134     }
3135     if (ctx->psk_identity_hint != NULL)
3136         OPENSSL_free(ctx->psk_identity_hint);
3137     if (identity_hint != NULL)
3138     {
3139         ctx->psk_identity_hint = BUF_strdup(identity_hint);
3140         if (ctx->psk_identity_hint == NULL)
3141             return 0;
3142     }
3143     else
3144         ctx->psk_identity_hint = NULL;
3145     return 1;
3146 }
3148 int SSL_use_psk_identity_hint(SSL *s, const char *identity_hint)
3149 {
3150     if (s == NULL)
3151         return 0;
3153     if (s->session == NULL)
3154         return 1; /* session not created yet, ignored */
3156     if (identity_hint != NULL && strlen(identity_hint) > PSK_MAX_IDENTITY_LE
3157     {
3158         SSLerr(SSL_F_SSL_USE_PSK_IDENTITY_HINT, SSL_R_DATA_LENGTH_TOO_LO
3159         return 0;
3160     }
3161     if (s->session->psk_identity_hint != NULL)
3162         OPENSSL_free(s->session->psk_identity_hint);
3163     if (identity_hint != NULL)

```



```

3164         {
3165             s->session->psk_identity_hint = BUF_strdup(identity_hint);
3166             if (s->session->psk_identity_hint == NULL)
3167                 return 0;
3168         }
3169     else
3170         s->session->psk_identity_hint = NULL;
3171     return 1;
3172 }

3174 const char *SSL_get_psk_identity_hint(const SSL *s)
3175 {
3176     if (s == NULL || s->session == NULL)
3177         return NULL;
3178     return(s->session->psk_identity_hint);
3179 }

3181 const char *SSL_get_psk_identity(const SSL *s)
3182 {
3183     if (s == NULL || s->session == NULL)
3184         return NULL;
3185     return(s->session->psk_identity);
3186 }

3188 void SSL_set_psk_client_callback(SSL *s,
3189     unsigned int (*cb)(SSL *ssl, const char *hint,
3190         char *identity, unsigned int max_identity_len, unsigned c
3191         unsigned int max_psk_len))
3192 {
3193     s->psk_client_callback = cb;
3194 }

3196 void SSL_CTX_set_psk_client_callback(SSL_CTX *ctx,
3197     unsigned int (*cb)(SSL *ssl, const char *hint,
3198         char *identity, unsigned int max_identity_len, unsigned c
3199         unsigned int max_psk_len))
3200 {
3201     ctx->psk_client_callback = cb;
3202 }

3204 void SSL_set_psk_server_callback(SSL *s,
3205     unsigned int (*cb)(SSL *ssl, const char *identity,
3206         unsigned char *psk, unsigned int max_psk_len))
3207 {
3208     s->psk_server_callback = cb;
3209 }

3211 void SSL_CTX_set_psk_server_callback(SSL_CTX *ctx,
3212     unsigned int (*cb)(SSL *ssl, const char *identity,
3213         unsigned char *psk, unsigned int max_psk_len))
3214 {
3215     ctx->psk_server_callback = cb;
3216 }
3217 #endif

3219 void SSL_CTX_set_msg_callback(SSL_CTX *ctx, void (*cb)(int write_p, int version,
3220     {
3221         SSL_CTX_callback_ctrl(ctx, SSL_CTRL_SET_MSG_CALLBACK, (void (*)(void))cb)
3222     }
3223 void SSL_set_msg_callback(SSL *ssl, void (*cb)(int write_p, int version, int con
3224     {
3225         SSL_callback_ctrl(ssl, SSL_CTRL_SET_MSG_CALLBACK, (void (*)(void))cb);
3226     }

3228 /* Allocates new EVP_MD_CTX and sets pointer to it into given pointer
3229  * vairable, freeing EVP_MD_CTX previously stored in that variable, if

```

```

3230  * any. If EVP_MD pointer is passed, initializes ctx with this md
3231  * Returns newly allocated ctx;
3232  */

3234 EVP_MD_CTX *ssl_replace_hash(EVP_MD_CTX **hash, const EVP_MD *md)
3235 {
3236     ssl_clear_hash_ctx(hash);
3237     *hash = EVP_MD_CTX_create();
3238     if (md) EVP_DigestInit_ex(*hash, md, NULL);
3239     return *hash;
3240 }
3241 void ssl_clear_hash_ctx(EVP_MD_CTX **hash)
3242 {
3244     if (*hash) EVP_MD_CTX_destroy(*hash);
3245     *hash=NULL;
3246 }

3248 void SSL_set_debug(SSL *s, int debug)
3249 {
3250     s->debug = debug;
3251 }

3253 int SSL_cache_hit(SSL *s)
3254 {
3255     return s->hit;
3256 }

3258 #if defined(WINDOWS) && defined(OPENSSL_SYS_WIN16)
3259 #include "../crypto/bio/bss_file.c"
3260 #endif

3262 IMPLEMENT_STACK_OF(SSL_CIPHER)
3263 IMPLEMENT_STACK_OF(SSL_COMP)
3264 IMPLEMENT_OBJ_BSEARCH_GLOBAL_CMP_FN(SSL_CIPHER, SSL_CIPHER,
3265     ssl_cipher_id);

```

18103 Fri May 30 18:32:22 2014
 new/usr/src/lib/openssl/libsunw_ssl/ssl_rsa.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

1  /* ssl/ssl_rsa.c */
2  /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3   * All rights reserved.
4   *
5   * This package is an SSL implementation written
6   * by Eric Young (eay@cryptsoft.com).
7   * The implementation was written so as to conform with Netscapes SSL.
8   *
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21  * in documentation (online or textual) provided with the package.
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42  * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
43  * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE
44  * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
45  * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
46  * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS
47  * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
48  * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT
49  * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
50  * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
51  * SUCH DAMAGE.
52  *
53  * The licence and distribution terms for any publically available version or
54  * derivative of this code cannot be changed. i.e. this code cannot simply be
55  * copied and put under another distribution licence
56  * [including the GNU Public Licence.]
57  */

59 #include <stdio.h>
60 #include "ssl_locl.h"
61 #include <openssl/bio.h>

```

```

62 #include <openssl/objects.h>
63 #include <openssl/evp.h>
64 #include <openssl/x509.h>
65 #include <openssl/pem.h>

67 static int ssl_set_cert(CERT *c, X509 *x509);
68 static int ssl_set_pkey(CERT *c, EVP_PKEY *pkey);
69 int SSL_use_certificate(SSL *ssl, X509 *x)
70 {
71     if (x == NULL)
72     {
73         SSLerr(SSL_F_SSL_USE_CERTIFICATE, ERR_R_PASSED_NULL_PARAMETER);
74         return(0);
75     }
76     if (!ssl_cert_inst(&ssl->cert))
77     {
78         SSLerr(SSL_F_SSL_USE_CERTIFICATE, ERR_R_MALLOC_FAILURE);
79         return(0);
80     }
81     return(ssl_set_cert(ssl->cert, x));
82 }

84 #ifndef OPENSSL_NO_STDIO
85 int SSL_use_certificate_file(SSL *ssl, const char *file, int type)
86 {
87     int j;
88     BIO *in;
89     int ret=0;
90     X509 *x=NULL;

92     in=BIO_new(BIO_s_file_internal());
93     if (in == NULL)
94     {
95         SSLerr(SSL_F_SSL_USE_CERTIFICATE_FILE, ERR_R_BUF_LIB);
96         goto end;
97     }

99     if (BIO_read_filename(in, file) <= 0)
100     {
101         SSLerr(SSL_F_SSL_USE_CERTIFICATE_FILE, ERR_R_SYS_LIB);
102         goto end;
103     }
104     if (type == SSL_FILETYPE_ASN1)
105     {
106         j=ERR_R_ASN1_LIB;
107         x=d2i_X509_bio(in, NULL);
108     }
109     else if (type == SSL_FILETYPE_PEM)
110     {
111         j=ERR_R_PEM_LIB;
112         x=PEM_read_bio_X509(in, NULL, ssl->ctx->default_passwd_callback, ss
113     }
114     else
115     {
116         SSLerr(SSL_F_SSL_USE_CERTIFICATE_FILE, SSL_R_BAD_SSL_FILETYPE);
117         goto end;
118     }

120     if (x == NULL)
121     {
122         SSLerr(SSL_F_SSL_USE_CERTIFICATE_FILE, j);
123         goto end;
124     }

126     ret=SSL_use_certificate(ssl, x);
127 end:

```

```

128     if (x != NULL) X509_free(x);
129     if (in != NULL) BIO_free(in);
130     return(ret);
131 }
132 #endif

134 int SSL_use_certificate_ASN1(SSL *ssl, const unsigned char *d, int len)
135 {
136     X509 *x;
137     int ret;

139     x=d2i_X509(NULL,&d,(long)len);
140     if (x == NULL)
141     {
142         SSLerr(SSL_F_SSL_USE_CERTIFICATE_ASN1,ERR_R_ASN1_LIB);
143         return(0);
144     }

146     ret=SSL_use_certificate(ssl,x);
147     X509_free(x);
148     return(ret);
149 }

151 #ifndef OPENSSL_NO_RSA
152 int SSL_use_RSAPrivateKey(SSL *ssl, RSA *rsa)
153 {
154     EVP_PKEY *pkey;
155     int ret;

157     if (rsa == NULL)
158     {
159         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY,ERR_R_PASSED_NULL_PARAMETER);
160         return(0);
161     }
162     if (!ssl_cert_inst(&ssl->cert))
163     {
164         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY,ERR_R_MALLOC_FAILURE);
165         return(0);
166     }
167     if ((pkey=EVP_PKEY_new()) == NULL)
168     {
169         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY,ERR_R_EVP_LIB);
170         return(0);
171     }

173     RSA_up_ref(rsa);
174     EVP_PKEY_assign_RSA(pkey,rsa);

176     ret=ssl_set_pkey(ssl->cert,pkey);
177     EVP_PKEY_free(pkey);
178     return(ret);
179 }
180 #endif

182 static int ssl_set_pkey(CERT *c, EVP_PKEY *pkey)
183 {
184     int i;

186     i=ssl_cert_type(NULL,pkey);
187     if (i < 0)
188     {
189         SSLerr(SSL_F_SSL_SET_PKEY,SSL_R_UNKNOWN_CERTIFICATE_TYPE);
190         return(0);
191     }

193     if (c->pkeys[i].x509 != NULL)

```

```

194     {
195         EVP_PKEY *pktmp;
196         pktmp = X509_get_pubkey(c->pkeys[i].x509);
197         EVP_PKEY_copy_parameters(pktmp,pkey);
198         EVP_PKEY_free(pktmp);
199         ERR_clear_error();
200     }

201 #ifndef OPENSSL_NO_RSA
202     /* Don't check the public/private key, this is mostly
203      * for smart cards. */
204     if ((pkey->type == EVP_PKEY_RSA) &&
205         (RSA_flags(pkey->pkey.rsa) & RSA_METHOD_FLAG_NO_CHECK))
206     {
207         else
208     #endif
209         if (!X509_check_private_key(c->pkeys[i].x509,pkey))
210         {
211             X509_free(c->pkeys[i].x509);
212             c->pkeys[i].x509 = NULL;
213             return 0;
214         }
215     }

217     if (c->pkeys[i].privatekey != NULL)
218         EVP_PKEY_free(c->pkeys[i].privatekey);
219     CRYPTO_add(&pkey->references,1,CRYPTO_LOCK_EVP_PKEY);
220     c->pkeys[i].privatekey=pkey;
221     c->key= &(c->pkeys[i]);

223     c->valid=0;
224     return(1);
225 }

227 #ifndef OPENSSL_NO_RSA
228 #ifndef OPENSSL_NO_STDIO
229 int SSL_use_RSAPrivateKey_file(SSL *ssl, const char *file, int type)
230 {
231     int j,ret=0;
232     BIO *in;
233     RSA *rsa=NULL;

235     in=BIO_new(BIO_s_file_internal());
236     if (in == NULL)
237     {
238         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY_FILE,ERR_R_BUF_LIB);
239         goto end;
240     }

242     if (BIO_read_filename(in,file) <= 0)
243     {
244         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY_FILE,ERR_R_SYS_LIB);
245         goto end;
246     }

247     if
248     {
249         (type == SSL_FILETYPE_ASN1)
250         {
251             j=ERR_R_ASN1_LIB;
252             rsa=d2i_RSAPrivateKey_bio(in,NULL);
253         }
254     }
255     else if (type == SSL_FILETYPE_PEM)
256     {
257         j=ERR_R_PEM_LIB;
258         rsa=PEM_read_bio_RSAPrivateKey(in,NULL,
259             ssl->ctx->default_passwd_callback,ssl->ctx->default_pass

```

```

260         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY_FILE,SSL_R_BAD_SSL_FILETYPE);
261         goto end;
262     }
263     if (rsa == NULL)
264     {
265         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY_FILE,j);
266         goto end;
267     }
268     ret=SSL_use_RSAPrivateKey(ssl,rsa);
269     RSA_free(rsa);
270 end:
271     if (in != NULL) BIO_free(in);
272     return(ret);
273 }
274 #endif

276 int SSL_use_RSAPrivateKey_ASN1(SSL *ssl, unsigned char *d, long len)
277 {
278     int ret;
279     const unsigned char *p;
280     RSA *rsa;

282     p=d;
283     if ((rsa=d2i_RSAPrivateKey(NULL,&p,(long)len)) == NULL)
284     {
285         SSLerr(SSL_F_SSL_USE_RSAPRIVATEKEY_ASN1,ERR_R_ASN1_LIB);
286         return(0);
287     }

289     ret=SSL_use_RSAPrivateKey(ssl,rsa);
290     RSA_free(rsa);
291     return(ret);
292 }
293 #endif /* !OPENSSL_NO_RSA */

295 int SSL_use_PrivateKey(SSL *ssl, EVP_PKEY *pkey)
296 {
297     int ret;

299     if (pkey == NULL)
300     {
301         SSLerr(SSL_F_SSL_USE_PRIVATEKEY,ERR_R_PASSED_NULL_PARAMETER);
302         return(0);
303     }
304     if (!ssl_cert_inst(&ssl->cert))
305     {
306         SSLerr(SSL_F_SSL_USE_PRIVATEKEY,ERR_R_MALLOC_FAILURE);
307         return(0);
308     }
309     ret=ssl_set_pkey(ssl->cert,pkey);
310     return(ret);
311 }

313 #ifndef OPENSSL_NO_STDIO
314 int SSL_use_PrivateKey_file(SSL *ssl, const char *file, int type)
315 {
316     int j,ret=0;
317     BIO *in;
318     EVP_PKEY *pkey=NULL;

320     in=BIO_new(BIO_s_file_internal());
321     if (in == NULL)
322     {
323         SSLerr(SSL_F_SSL_USE_PRIVATEKEY_FILE,ERR_R_BUF_LIB);
324         goto end;
325     }

```

```

327     if (BIO_read_filename(in,file) <= 0)
328     {
329         SSLerr(SSL_F_SSL_USE_PRIVATEKEY_FILE,ERR_R_SYS_LIB);
330         goto end;
331     }
332     if (type == SSL_FILETYPE_PEM)
333     {
334         j=ERR_R_PEM_LIB;
335         pkey=PEM_read_bio_PrivateKey(in,NULL,
336             ssl->ctx->default_passwd_callback,ssl->ctx->default_pass
337     }
338     else if (type == SSL_FILETYPE_ASN1)
339     {
340         j = ERR_R_ASN1_LIB;
341         pkey = d2i_PrivateKey_bio(in,NULL);
342     }
343     else
344     {
345         SSLerr(SSL_F_SSL_USE_PRIVATEKEY_FILE,SSL_R_BAD_SSL_FILETYPE);
346         goto end;
347     }
348     if (pkey == NULL)
349     {
350         SSLerr(SSL_F_SSL_USE_PRIVATEKEY_FILE,j);
351         goto end;
352     }
353     ret=SSL_use_PrivateKey(ssl,pkey);
354     EVP_PKEY_free(pkey);
355 end:
356     if (in != NULL) BIO_free(in);
357     return(ret);
358 }
359 #endif

361 int SSL_use_PrivateKey_ASN1(int type, SSL *ssl, const unsigned char *d, long len)
362 {
363     int ret;
364     const unsigned char *p;
365     EVP_PKEY *pkey;

367     p=d;
368     if ((pkey=d2i_PrivateKey(type,NULL,&p,(long)len)) == NULL)
369     {
370         SSLerr(SSL_F_SSL_USE_PRIVATEKEY_ASN1,ERR_R_ASN1_LIB);
371         return(0);
372     }

374     ret=SSL_use_PrivateKey(ssl,pkey);
375     EVP_PKEY_free(pkey);
376     return(ret);
377 }

379 int SSL_CTX_use_certificate(SSL_CTX *ctx, X509 *x)
380 {
381     if (x == NULL)
382     {
383         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE,ERR_R_PASSED_NULL_PARAMETER);
384         return(0);
385     }
386     if (!ssl_cert_inst(&ctx->cert))
387     {
388         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE,ERR_R_MALLOC_FAILURE);
389         return(0);
390     }
391     return(ssl_set_cert(ctx->cert, x));

```

```

392     }
393
394 static int ssl_set_cert(CERT *c, X509 *x)
395 {
396     EVP_PKEY *pkey;
397     int i;
398
399     pkey=X509_get_pubkey(x);
400     if (pkey == NULL)
401     {
402         SSLerr(SSL_F_SSL_SET_CERT,SSL_R_X509_LIB);
403         return(0);
404     }
405
406     i=ssl_cert_type(x,pkey);
407     if (i < 0)
408     {
409         SSLerr(SSL_F_SSL_SET_CERT,SSL_R_UNKNOWN_CERTIFICATE_TYPE);
410         EVP_PKEY_free(pkey);
411         return(0);
412     }
413
414     if (c->pkeys[i].privatekey != NULL)
415     {
416         EVP_PKEY_copy_parameters(pkey,c->pkeys[i].privatekey);
417         ERR_clear_error();
418     }
419
420 #ifndef OPENSSL_NO_RSA
421     /* Don't check the public/private key, this is mostly
422      * for smart cards. */
423     if ((c->pkeys[i].privatekey->type == EVP_PKEY_RSA) &&
424         (RSA_flags(c->pkeys[i].privatekey->pkey.rsa) &
425          RSA_METHOD_FLAG_NO_CHECK))
426     {
427         else
428     #endif /* OPENSSL_NO_RSA */
429     if (!X509_check_private_key(x,c->pkeys[i].privatekey))
430     {
431         /* don't fail for a cert/key mismatch, just free
432          * current private key (when switching to a different
433          * cert & key, first this function should be used,
434          * then ssl_set_pkey */
435         EVP_PKEY_free(c->pkeys[i].privatekey);
436         c->pkeys[i].privatekey=NULL;
437         /* clear error queue */
438         ERR_clear_error();
439     }
440
441     EVP_PKEY_free(pkey);
442
443     if (c->pkeys[i].x509 != NULL)
444         X509_free(c->pkeys[i].x509);
445     CRYPTO_add(&x->references,1,CRYPTO_LOCK_X509);
446     c->pkeys[i].x509=x;
447     c->key= &(c->pkeys[i]);
448
449     c->valid=0;
450     return(1);
451 }
452
453 #ifndef OPENSSL_NO_STDIO
454 int SSL_CTX_use_certificate_file(SSL_CTX *ctx, const char *file, int type)
455 {
456     int j;
457     BIO *in;

```

```

458     int ret=0;
459     X509 *x=NULL;
460
461     in=BIO_new(BIO_s_file_internal());
462     if (in == NULL)
463     {
464         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_FILE,ERR_R_BUF_LIB);
465         goto end;
466     }
467
468     if (BIO_read_filename(in,file) <= 0)
469     {
470         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_FILE,ERR_R_SYS_LIB);
471         goto end;
472     }
473     if (type == SSL_FILETYPE_ASN1)
474     {
475         j=ERR_R_ASN1_LIB;
476         x=d2i_X509_bio(in,NULL);
477     }
478     else if (type == SSL_FILETYPE_PEM)
479     {
480         j=ERR_R_PEM_LIB;
481         x=PEM_read_bio_X509(in,NULL,ctx->default_passwd_callback,ctx->de
482     }
483     else
484     {
485         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_FILE,SSL_R_BAD_SSL_FILETYPE
486         goto end;
487     }
488
489     if (x == NULL)
490     {
491         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_FILE,j);
492         goto end;
493     }
494
495     ret=SSL_CTX_use_certificate(ctx,x);
496 end:
497     if (x != NULL) X509_free(x);
498     if (in != NULL) BIO_free(in);
499     return(ret);
500 }
501 #endif
502
503 int SSL_CTX_use_certificate_ASN1(SSL_CTX *ctx, int len, const unsigned char *d)
504 {
505     X509 *x;
506     int ret;
507
508     x=d2i_X509(NULL,&d,(long)len);
509     if (x == NULL)
510     {
511         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_ASN1,ERR_R_ASN1_LIB);
512         return(0);
513     }
514
515     ret=SSL_CTX_use_certificate(ctx,x);
516     X509_free(x);
517     return(ret);
518 }
519
520 #ifndef OPENSSL_NO_RSA
521 int SSL_CTX_use_RSAPrivateKey(SSL_CTX *ctx, RSA *rsa)
522 {
523     int ret;

```

```

524     EVP_PKEY *pkey;

526     if (rsa == NULL)
527     {
528         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY, ERR_R_PASSED_NULL_PARAMET
529         return(0);
530     }
531     if (!ssl_cert_inst(&ctx->cert))
532     {
533         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY, ERR_R_MALLOC_FAILURE);
534         return(0);
535     }
536     if ((pkey=EVP_PKEY_new()) == NULL)
537     {
538         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY, ERR_R_EVP_LIB);
539         return(0);
540     }

542     RSA_up_ref(rsa);
543     EVP_PKEY_assign_RSA(pkey,rsa);

545     ret=ssl_set_pkey(ctx->cert, pkey);
546     EVP_PKEY_free(pkey);
547     return(ret);
548 }

550 #ifndef OPENSSL_NO_STDIO
551 int SSL_CTX_use_RSAPrivateKey_file(SSL_CTX *ctx, const char *file, int type)
552 {
553     int j,ret=0;
554     BIO *in;
555     RSA *rsa=NULL;

557     in=BIO_new(BIO_s_file_internal());
558     if (in == NULL)
559     {
560         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY_FILE, ERR_R_BUF_LIB);
561         goto end;
562     }

564     if (BIO_read_filename(in,file) <= 0)
565     {
566         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY_FILE, ERR_R_SYS_LIB);
567         goto end;
568     }
569     if (type == SSL_FILETYPE_ASN1)
570     {
571         j=ERR_R_ASN1_LIB;
572         rsa=d2i_RSAPrivateKey_bio(in,NULL);
573     }
574     else if (type == SSL_FILETYPE_PEM)
575     {
576         j=ERR_R_PEM_LIB;
577         rsa=PEM_read_bio_RSAPrivateKey(in,NULL,
578         ctx->default_passwd_callback,ctx->default_passwd_callback
579     }
580     else
581     {
582         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY_FILE, SSL_R_BAD_SSL_FILETY
583         goto end;
584     }
585     if (rsa == NULL)
586     {
587         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY_FILE, j);
588         goto end;
589     }

```

```

590     ret=SSL_CTX_use_RSAPrivateKey(ctx,rsa);
591     RSA_free(rsa);
592 }
593 if (in != NULL) BIO_free(in);
594 return(ret);
595 }
596 #endif

598 int SSL_CTX_use_RSAPrivateKey_ASN1(SSL_CTX *ctx, const unsigned char *d, long le
599 {
600     int ret;
601     const unsigned char *p;
602     RSA *rsa;

604     p=d;
605     if ((rsa=d2i_RSAPrivateKey(NULL,&p,(long)len)) == NULL)
606     {
607         SSLerr(SSL_F_SSL_CTX_USE_RSAPRIVATEKEY_ASN1, ERR_R_ASN1_LIB);
608         return(0);
609     }

611     ret=SSL_CTX_use_RSAPrivateKey(ctx,rsa);
612     RSA_free(rsa);
613     return(ret);
614 }
615 #endif /* !OPENSSL_NO_RSA */

617 int SSL_CTX_use_PrivateKey(SSL_CTX *ctx, EVP_PKEY *pkey)
618 {
619     if (pkey == NULL)
620     {
621         SSLerr(SSL_F_SSL_CTX_USE_PRIVATEKEY, ERR_R_PASSED_NULL_PARAMETER)
622         return(0);
623     }
624     if (!ssl_cert_inst(&ctx->cert))
625     {
626         SSLerr(SSL_F_SSL_CTX_USE_PRIVATEKEY, ERR_R_MALLOC_FAILURE);
627         return(0);
628     }
629     return(ssl_set_pkey(ctx->cert,pkey));
630 }

632 #ifndef OPENSSL_NO_STDIO
633 int SSL_CTX_use_PrivateKey_file(SSL_CTX *ctx, const char *file, int type)
634 {
635     int j,ret=0;
636     BIO *in;
637     EVP_PKEY *pkey=NULL;

639     in=BIO_new(BIO_s_file_internal());
640     if (in == NULL)
641     {
642         SSLerr(SSL_F_SSL_CTX_USE_PRIVATEKEY_FILE, ERR_R_BUF_LIB);
643         goto end;
644     }

646     if (BIO_read_filename(in,file) <= 0)
647     {
648         SSLerr(SSL_F_SSL_CTX_USE_PRIVATEKEY_FILE, ERR_R_SYS_LIB);
649         goto end;
650     }
651     if (type == SSL_FILETYPE_PEM)
652     {
653         j=ERR_R_PEM_LIB;
654         pkey=PEM_read_bio_PrivateKey(in,NULL,
655         ctx->default_passwd_callback,ctx->default_passwd_callback

```

```

656     }
657     else if (type == SSL_FILETYPE_ASN1)
658     {
659         j = ERR_R_ASN1_LIB;
660         pkey = d2i_PrivateKey_bio(in, NULL);
661     }
662     else
663     {
664         SSLerr(SSL_F_SSL_CTX_USE_PRIVATEKEY_FILE, SSL_R_BAD_SSL_FILETYPE)
665         goto end;
666     }
667     if (pkey == NULL)
668     {
669         SSLerr(SSL_F_SSL_CTX_USE_PRIVATEKEY_FILE, j);
670         goto end;
671     }
672     ret=SSL_CTX_use_PrivateKey(ctx, pkey);
673     EVP_PKEY_free(pkey);
674 end:
675     if (in != NULL) BIO_free(in);
676     return(ret);
677 }
678 #endif

680 int SSL_CTX_use_PrivateKey_ASN1(int type, SSL_CTX *ctx, const unsigned char *d,
681                                 long len)
682 {
683     int ret;
684     const unsigned char *p;
685     EVP_PKEY *pkey;

687     p=d;
688     if ((pkey=d2i_PrivateKey(type, NULL, &p, (long)len)) == NULL)
689     {
690         SSLerr(SSL_F_SSL_CTX_USE_PRIVATEKEY_ASN1, ERR_R_ASN1_LIB);
691         return(0);
692     }

694     ret=SSL_CTX_use_PrivateKey(ctx, pkey);
695     EVP_PKEY_free(pkey);
696     return(ret);
697 }

700 #ifndef OPENSSL_NO_STDIO
701 /* Read a file that contains our certificate in "PEM" format,
702  * possibly followed by a sequence of CA certificates that should be
703  * sent to the peer in the Certificate message.
704  */
705 int SSL_CTX_use_certificate_chain_file(SSL_CTX *ctx, const char *file)
706 {
707     BIO *in;
708     int ret=0;
709     X509 *x=NULL;

711     ERR_clear_error(); /* clear error stack for SSL_CTX_use_certificate() */

713     in = BIO_new(BIO_s_file_internal());
714     if (in == NULL)
715     {
716         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_CHAIN_FILE, ERR_R_BUF_LIB);
717         goto end;
718     }

720     if (BIO_read_filename(in, file) <= 0)
721     {

```

```

722         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_CHAIN_FILE, ERR_R_SYS_LIB);
723         goto end;
724     }

726     x=PEM_read_bio_X509_AUX(in, NULL, ctx->default_passwd_callback,
727                             ctx->default_passwd_callback_userdata);
728     if (x == NULL)
729     {
730         SSLerr(SSL_F_SSL_CTX_USE_CERTIFICATE_CHAIN_FILE, ERR_R_PEM_LIB);
731         goto end;
732     }

734     ret = SSL_CTX_use_certificate(ctx, x);

736     if (ERR_peek_error() != 0)
737         ret = 0; /* Key/certificate mismatch doesn't imply ret==0 ... */
738     if (ret)
739     {
740         /* If we could set up our certificate, now proceed to
741          * the CA certificates.
742          */
743         X509 *ca;
744         int r;
745         unsigned long err;

747         if (ctx->extra_certs != NULL)
748         {
749             sk_X509_pop_free(ctx->extra_certs, X509_free);
750             ctx->extra_certs = NULL;
751         }

753         while ((ca = PEM_read_bio_X509(in, NULL,
754                                         ctx->default_passwd_callback,
755                                         ctx->default_passwd_callback_userdata))
756               != NULL)
757         {
758             r = SSL_CTX_add_extra_chain_cert(ctx, ca);
759             if (!r)
760             {
761                 X509_free(ca);
762                 ret = 0;
763                 goto end;
764             }

765             /* Note that we must not free r if it was successfully
766              * added to the chain (while we must free the main
767              * certificate, since its reference count is increased
768              * by SSL_CTX_use_certificate). */
769         }

770         /* When the while loop ends, it's usually just EOF. */
771         err = ERR_peek_last_error();
772         if (ERR_GET_LIB(err) == ERR_LIB_PEM && ERR_GET_REASON(err) == PE
773             ERR_clear_error();
774         else
775             ret = 0; /* some real error */
776     }

778 end:
779     if (x != NULL) X509_free(x);
780     if (in != NULL) BIO_free(in);
781     return(ret);
782 }
783 #endif

```

```

*****
34107 Fri May 30 18:32:22 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_sess.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/ssl_sess.c */
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3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
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57 */
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```

```

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135 * OTHERWISE.
136 */

138 #include <stdio.h>
139 #include <openssl/lhash.h>
140 #include <openssl/rand.h>
141 #ifndef OPENSSL_NO_ENGINE
142 #include <openssl/engine.h>
143 #endif
144 #include "ssl_loc1.h"

146 static void SSL_SESSION_list_remove(SSL_CTX *ctx, SSL_SESSION *s);
147 static void SSL_SESSION_list_add(SSL_CTX *ctx, SSL_SESSION *s);
148 static int remove_session_lock(SSL_CTX *ctx, SSL_SESSION *c, int lck);

150 SSL_SESSION *SSL_get_session(const SSL *ssl)
151 /* aka SSL_get0_session; gets 0 objects, just returns a copy of the pointer */
152 {
153     return(ssl->session);
154 }

156 SSL_SESSION *SSL_get1_session(SSL *ssl)
157 /* variant of SSL_get_session: caller really gets something */
158 {
159     SSL_SESSION *sess;
160     /* Need to lock this all up rather than just use CRYPTO_add so that
161      * somebody doesn't free ssl->session between when we check it's
162      * non-null and when we up the reference count. */
163     CRYPTO_w_lock(CRYPTO_LOCK_SSL_SESSION);
164     sess = ssl->session;
165     if(sess)
166         sess->references++;
167     CRYPTO_w_unlock(CRYPTO_LOCK_SSL_SESSION);
168     return(sess);
169 }

171 int SSL_SESSION_get_ex_new_index(long argl, void *argp, CRYPTO_EX_new *new_func,
172     CRYPTO_EX_dup *dup_func, CRYPTO_EX_free *free_func)
173 {
174     return CRYPTO_get_ex_new_index(CRYPTO_EX_INDEX_SSL_SESSION, argl, argp,
175     new_func, dup_func, free_func);
176 }

178 int SSL_SESSION_set_ex_data(SSL_SESSION *s, int idx, void *arg)
179 {
180     return(CRYPTO_set_ex_data(&s->ex_data, idx, arg));
181 }

183 void *SSL_SESSION_get_ex_data(const SSL_SESSION *s, int idx)
184 {
185     return(CRYPTO_get_ex_data(&s->ex_data, idx));
186 }

188 SSL_SESSION *SSL_SESSION_new(void)
189 {
190     SSL_SESSION *ss;

192     ss=(SSL_SESSION *)OPENSSL_malloc(sizeof(SSL_SESSION));
193     if (ss == NULL)

```

```

194     {
195         SSLerr(SSL_F_SSL_SESSION_NEW, ERR_R_MALLOC_FAILURE);
196         return(0);
197     }
198     memset(ss, 0, sizeof(SSL_SESSION));

200     ss->verify_result = 1; /* avoid 0 (= X509_V_OK) just in case */
201     ss->references=1;
202     ss->timeout=60*5+4; /* 5 minute timeout by default */
203     ss->time=(unsigned long)time(NULL);
204     ss->prev=NULL;
205     ss->next=NULL;
206     ss->compress_meth=0;
207 #ifndef OPENSSL_NO_TLSEXT
208     ss->tlsext_hostname = NULL;
209 #endif
210 #ifndef OPENSSL_NO_EC
211     ss->tlsext_ecpointformatlist_length = 0;
212     ss->tlsext_ecpointformatlist = NULL;
213     ss->tlsext_ellipticcurvelist_length = 0;
214     ss->tlsext_ellipticcurvelist = NULL;
215 #endif
216     CRYPTO_new_ex_data(CRYPTO_EX_INDEX_SSL_SESSION, ss, &ss->ex_data);
217 #ifndef OPENSSL_NO_PSK
218     ss->psk_identity_hint=NULL;
219     ss->psk_identity=NULL;
220 #endif
221 #ifndef OPENSSL_NO_SRP
222     ss->srp_username=NULL;
223 #endif
224     return(ss);
225 }

227 const unsigned char *SSL_SESSION_get_id(const SSL_SESSION *s, unsigned int *len)
228 {
229     if(len)
230         *len = s->session_id_length;
231     return s->session_id;
232 }

234 unsigned int SSL_SESSION_get_compress_id(const SSL_SESSION *s)
235 {
236     return s->compress_meth;
237 }

239 /* Even with SSLv2, we have 16 bytes (128 bits) of session ID space. SSLv3/TLSv1
240 * has 32 bytes (256 bits). As such, filling the ID with random gunk repeatedly
241 * until we have no conflict is going to complete in one iteration pretty much
242 * "most" of the time (btw: understatement). So, if it takes us 10 iterations
243 * and we still can't avoid a conflict - well that's a reasonable point to call
244 * it quits. Either the RAND code is broken or someone is trying to open roughly
245 * very close to 2^128 (or 2^256) SSL sessions to our server. How you might
246 * store that many sessions is perhaps a more interesting question ... */

248 #define MAX_SESS_ID_ATTEMPTS 10
249 static int def_generate_session_id(const SSL *ssl, unsigned char *id,
250     unsigned int *id_len)
251 {
252     unsigned int retry = 0;
253     do
254         if (RAND_pseudo_bytes(id, *id_len) <= 0)
255             return 0;
256     while(SSL_has_matching_session_id(ssl, id, *id_len) &&
257         (++retry < MAX_SESS_ID_ATTEMPTS));
258     if(retry < MAX_SESS_ID_ATTEMPTS)
259         return 1;

```

```

260 /* else - woops a session_id match */
261 /* XXX We should also check the external cache --
262  * but the probability of a collision is negligible, and
263  * we could not prevent the concurrent creation of sessions
264  * with identical IDs since we currently don't have means
265  * to atomically check whether a session ID already exists
266  * and make a reservation for it if it does not
267  * (this problem applies to the internal cache as well).
268  */
269 return 0;
270 }

272 int ssl_get_new_session(SSL *s, int session)
273 {
274     /* This gets used by clients and servers. */

276     unsigned int tmp;
277     SSL_SESSION *ss=NULL;
278     GEN_SESSION_CB cb = def_generate_session_id;

280     if ((ss=SSL_SESSION_new()) == NULL) return(0);

282     /* If the context has a default timeout, use it */
283     if (s->session_ctx->session_timeout == 0)
284         ss->timeout=SSL_get_default_timeout(s);
285     else
286         ss->timeout=s->session_ctx->session_timeout;

288     if (s->session != NULL)
289     {
290         SSL_SESSION_free(s->session);
291         s->session=NULL;
292     }

294     if (session)
295     {
296         if (s->version == SSL2_VERSION)
297         {
298             ss->ssl_version=SSL2_VERSION;
299             ss->session_id_length=SSL2_SSL_SESSION_ID_LENGTH;
300         }
301         else if (s->version == SSL3_VERSION)
302         {
303             ss->ssl_version=SSL3_VERSION;
304             ss->session_id_length=SSL3_SSL_SESSION_ID_LENGTH;
305         }
306         else if (s->version == TLS1_VERSION)
307         {
308             ss->ssl_version=TLS1_VERSION;
309             ss->session_id_length=SSL3_SSL_SESSION_ID_LENGTH;
310         }
311         else if (s->version == TLS1_1_VERSION)
312         {
313             ss->ssl_version=TLS1_1_VERSION;
314             ss->session_id_length=SSL3_SSL_SESSION_ID_LENGTH;
315         }
316         else if (s->version == TLS1_2_VERSION)
317         {
318             ss->ssl_version=TLS1_2_VERSION;
319             ss->session_id_length=SSL3_SSL_SESSION_ID_LENGTH;
320         }
321         else if (s->version == DTLS1_BAD_VER)
322         {
323             ss->ssl_version=DTLS1_BAD_VER;
324             ss->session_id_length=SSL3_SSL_SESSION_ID_LENGTH;
325         }
326     }

```

```

326     else if (s->version == DTLS1_VERSION)
327     {
328         ss->ssl_version=DTLS1_VERSION;
329         ss->session_id_length=SSL3_SSL_SESSION_ID_LENGTH;
330     }
331     else
332     {
333         SSLerr(SSL_F_SSL_GET_NEW_SESSION, SSL_R_UNSUPPORTED_SSL_V
334         SSL_SESSION_free(ss);
335         return(0);
336     }
337 #ifndef OPENSSL_NO_TLSEXT
338     /* If RFC4507 ticket use empty session ID */
339     if (s->tlsext_ticket_expected)
340     {
341         ss->session_id_length = 0;
342         goto sess_id_done;
343     }
344 #endif

345     /* Choose which callback will set the session ID */
346     CRYPTO_r_lock(CRYPTO_LOCK_SSL_CTX);
347     if(s->generate_session_id)
348         cb = s->generate_session_id;
349     else if(s->session_ctx->generate_session_id)
350         cb = s->session_ctx->generate_session_id;
351     CRYPTO_r_unlock(CRYPTO_LOCK_SSL_CTX);
352     /* Choose a session ID */
353     tmp = ss->session_id_length;
354     if(!cb(s, ss->session_id, &tmp))
355     {
356         /* The callback failed */
357         SSLerr(SSL_F_SSL_GET_NEW_SESSION,
358             SSL_R_SSL_SESSION_ID_CALLBACK_FAILED);
359         SSL_SESSION_free(ss);
360         return(0);
361     }
362     /* Don't allow the callback to set the session length to zero.
363     * nor set it higher than it was. */
364     if(!tmp || (tmp > ss->session_id_length))
365     {
366         /* The callback set an illegal length */
367         SSLerr(SSL_F_SSL_GET_NEW_SESSION,
368             SSL_R_SSL_SESSION_ID_HAS_BAD_LENGTH);
369         SSL_SESSION_free(ss);
370         return(0);
371     }
372     /* If the session length was shrunk and we're SSLv2, pad it */
373     if((tmp < ss->session_id_length) && (s->version == SSL2_VERSION))
374         memset(ss->session_id + tmp, 0, ss->session_id_length -
375         tmp);
376     ss->session_id_length = tmp;
377     /* Finally, check for a conflict */
378     if(SSL_has_matching_session_id(s, ss->session_id,
379         ss->session_id_length))
380     {
381         SSLerr(SSL_F_SSL_GET_NEW_SESSION,
382             SSL_R_SSL_SESSION_ID_CONFLICT);
383         SSL_SESSION_free(ss);
384         return(0);
385     }
386 #ifndef OPENSSL_NO_TLSEXT
387     sess_id_done:
388     if (s->tlsext_hostname) {
389         ss->tlsext_hostname = BUF_strdup(s->tlsext_hostname);
390         if (ss->tlsext_hostname == NULL) {
391             SSLerr(SSL_F_SSL_GET_NEW_SESSION, ERR_R_INTERNAL

```

```

392         SSL_SESSION_free(ss);
393         return 0;
394     }
395 }
396 #ifndef OPENSSL_NO_EC
397 if (s->tlsext_ecpointformatlist)
398 {
399     if (ss->tlsext_ecpointformatlist != NULL) OPENSSL_free(s
400     if ((ss->tlsext_ecpointformatlist = OPENSSL_malloc(s->tl
401     {
402         SSLerr(SSL_F_SSL_GET_NEW_SESSION, ERR_R_MALLOC_F
403         SSL_SESSION_free(ss);
404         return 0;
405     }
406     ss->tlsext_ecpointformatlist_length = s->tlsext_ecpointf
407     memcpy(ss->tlsext_ecpointformatlist, s->tlsext_ecpointfo
408     }
409     if (s->tlsext_ellipticcurvelist)
410     {
411         if (ss->tlsext_ellipticcurvelist != NULL) OPENSSL_free(s
412         if ((ss->tlsext_ellipticcurvelist = OPENSSL_malloc(s->tl
413         {
414             SSLerr(SSL_F_SSL_GET_NEW_SESSION, ERR_R_MALLOC_F
415             SSL_SESSION_free(ss);
416             return 0;
417         }
418         ss->tlsext_ellipticcurvelist_length = s->tlsext_elliptic
419         memcpy(ss->tlsext_ellipticcurvelist, s->tlsext_ellipticc
420     }
421 #endif
422 #endif
423     }
424     else
425     {
426         ss->session_id_length=0;
427     }
428
429     if (s->sid_ctx_length > sizeof ss->sid_ctx)
430     {
431         SSLerr(SSL_F_SSL_GET_NEW_SESSION, ERR_R_INTERNAL_ERROR);
432         SSL_SESSION_free(ss);
433         return 0;
434     }
435     memcpy(ss->sid_ctx,s->sid_ctx,s->sid_ctx_length);
436     ss->sid_ctx_length=s->sid_ctx_length;
437     s->session=ss;
438     ss->ssl_version=s->version;
439     ss->verify_result = X509_V_OK;
440
441     return(1);
442 }
443
444 /* ssl_get_prev attempts to find an SSL_SESSION to be used to resume this
445 * connection. It is only called by servers.
446 *
447 * session_id: points at the session ID in the ClientHello. This code will
448 * read past the end of this in order to parse out the session ticket
449 * extension, if any.
450 * len: the length of the session ID.
451 * limit: a pointer to the first byte after the ClientHello.
452 *
453 * Returns:
454 * -1: error
455 * 0: a session may have been found.
456 *
457 * Side effects:

```

```

458 * - If a session is found then s->session is pointed at it (after freeing an
459 * existing session if need be) and s->verify_result is set from the session
460 * - Both for new and resumed sessions, s->tlsext_ticket_expected is set to 1
461 * if the server should issue a new session ticket (to 0 otherwise).
462 */
463 int ssl_get_prev_session(SSL *s, unsigned char *session_id, int len,
464     const unsigned char *limit)
465 {
466     /* This is used only by servers. */
467
468     SSL_SESSION *ret=NULL;
469     int fatal = 0;
470     int try_session_cache = 1;
471 #ifndef OPENSSL_NO_TLSEXT
472     int r;
473 #endif
474
475     if (len > SSL_MAX_SSL_SESSION_ID_LENGTH)
476         goto err;
477
478     if (len == 0)
479         try_session_cache = 0;
480
481 #ifndef OPENSSL_NO_TLSEXT
482     r = tls1_process_ticket(s, session_id, len, limit, &ret); /* sets s->tls
483     switch (r)
484     {
485         case -1: /* Error during processing */
486             fatal = 1;
487             goto err;
488         case 0: /* No ticket found */
489             break; /* Ok to carry on processing session id. */
490         case 1: /* Zero length ticket found */
491             break; /* Ticket found but not decrypted. */
492         case 2: /* Ticket decrypted, *ret has been set. */
493             try_session_cache = 0;
494             break;
495         default:
496             abort();
497     }
498 #endif
499
500     if (try_session_cache &&
501         ret == NULL &&
502         !(s->session_ctx->session_cache_mode & SSL_SESS_CACHE_NO_INTERNAL_LO
503     {
504         SSL_SESSION data;
505         data.ssl_version=s->version;
506         data.session_id_length=len;
507         if (len == 0)
508             return 0;
509         memcpy(data.session_id,session_id,len);
510         CRYPTO_r_lock(CRYPTO_LOCK_SSL_CTX);
511         ret=lh_SSL_SESSION_retrieve(s->session_ctx->sessions,&data);
512         if (ret != NULL)
513         {
514             /* don't allow other threads to steal it: */
515             CRYPTO_add(&ret->references,1,CRYPTO_LOCK_SSL_SESSION);
516         }
517         CRYPTO_r_unlock(CRYPTO_LOCK_SSL_CTX);
518         if (ret == NULL)
519             s->session_ctx->stats.sess_miss++;
520     }
521
522     if (try_session_cache &&
523         ret == NULL &&

```

```

524     s->session_ctx->get_session_cb != NULL)
525     {
526         int copy=1;
527
528         if ((ret=s->session_ctx->get_session_cb(s,session_id,len,&copy))
529             {
530                 s->session_ctx->stats.sess_cb_hit++;
531
532                 /* Increment reference count now if the session callback
533                  * asks us to do so (note that if the session structures
534                  * returned by the callback are shared between threads,
535                  * it must handle the reference count itself [i.e. copy
536                  * or things won't be thread-safe). */
537                 if (copy)
538                     CRYPTO_add(&ret->references,1,CRYPTO_LOCK_SSL_SE
539
540                 /* Add the externally cached session to the internal
541                  * cache as well if and only if we are supposed to. */
542                 if(!(s->session_ctx->session_cache_mode & SSL_SESS_CACHE
543                     /* The following should not return 1, otherwise,
544                      * things are very strange */
545                     SSL_CTX_add_session(s->session_ctx,ret);
546             }
547         }
548
549         if (ret == NULL)
550             goto err;
551
552         /* Now ret is non-NULL and we own one of its reference counts. */
553
554         if (ret->sid_ctx_length != s->sid_ctx_length
555             || memcmp(ret->sid_ctx,s->sid_ctx,ret->sid_ctx_length))
556         {
557             /* We have the session requested by the client, but we don't
558              * want to use it in this context. */
559             goto err; /* treat like cache miss */
560         }
561
562         if((s->verify_mode & SSL_VERIFY_PEER) && s->sid_ctx_length == 0)
563         {
564             /* We can't be sure if this session is being used out of
565              * context, which is especially important for SSL_VERIFY_PEER.
566              * The application should have used SSL[_CTX]_set_session_id_con
567              *
568              * For this error case, we generate an error instead of treating
569              * the event like a cache miss (otherwise it would be easy for
570              * applications to effectively disable the session cache by
571              * accident without anyone noticing).
572              */
573             SSLerr(SSL_F_SSL_GET_PREV_SESSION,SSL_R_SESSION_ID_CONTEXT_UNINI
574                 fatal = 1;
575             goto err;
576         }
577
578         if (ret->cipher == NULL)
579         {
580             unsigned char buf[5],*p;
581             unsigned long l;
582
583             p=buf;
584             l=ret->cipher_id;
585             l2n(l,p);
586             if ((ret->ssl_version>>8) >= SSL3_VERSION_MAJOR)
587                 ret->cipher=ssl_get_cipher_by_char(s,&(buf[2]));
588             else
589

```

```

590             ret->cipher=ssl_get_cipher_by_char(s,&(buf[1]));
591             if (ret->cipher == NULL)
592                 goto err;
593         }
594
595         if (ret->timeout < (long)(time(NULL) - ret->time)) /* timeout */
596         {
597             s->session_ctx->stats.sess_timeout++;
598             if (try_session_cache)
599             {
600                 /* session was from the cache, so remove it */
601                 SSL_CTX_remove_session(s->session_ctx,ret);
602             }
603             goto err;
604         }
605
606         s->session_ctx->stats.sess_hit++;
607
608         if (s->session != NULL)
609             SSL_SESSION_free(s->session);
610         s->session=ret;
611         s->verify_result = s->session->verify_result;
612         return 1;
613
614     err:
615         if (ret != NULL)
616         {
617             SSL_SESSION_free(ret);
618 #ifndef OPENSSL_NO_TLSEXT
619             if (!try_session_cache)
620             {
621                 /* The session was from a ticket, so we should
622                  * issue a ticket for the new session */
623                 s->tlsext_ticket_expected = 1;
624             }
625 #endif
626         }
627         if (fatal)
628             return -1;
629         else
630             return 0;
631     }
632
633     int SSL_CTX_add_session(SSL_CTX *ctx, SSL_SESSION *c)
634     {
635         int ret=0;
636         SSL_SESSION *s;
637
638         /* add just 1 reference count for the SSL_CTX's session cache
639          * even though it has two ways of access: each session is in a
640          * doubly linked list and an lhash */
641         CRYPTO_add(&c->references,1,CRYPTO_LOCK_SSL_SESSION);
642         /* if session c is in already in cache, we take back the increment later
643
644         CRYPTO_w_lock(CRYPTO_LOCK_SSL_CTX);
645         s=lh_SSL_SESSION_insert(ctx->sessions,c);
646
647         /* s != NULL iff we already had a session with the given PID.
648          * In this case, s == c should hold (then we did not really modify
649          * ctx->sessions), or we're in trouble. */
650         if (s != NULL && s != c)
651         {
652             /* We *are* in trouble ... */
653             SSL_SESSION_list_remove(ctx,s);
654             SSL_SESSION_free(s);
655             /* ... so pretend the other session did not exist in cache

```

```

656      * (we cannot handle two SSL_SESSION structures with identical
657      * session ID in the same cache, which could happen e.g. when
658      * two threads concurrently obtain the same session from an exte
659      * cache) */
660      s = NULL;
661  }

663  /* Put at the head of the queue unless it is already in the cache */
664  if (s == NULL)
665      SSL_SESSION_list_add(ctx,c);

667  if (s != NULL)
668  {
669      /* existing cache entry -- decrement previously incremented refe
670      * count because it already takes into account the cache */

672      SSL_SESSION_free(s); /* s == c */
673      ret=0;
674  }
675  else
676  {
677      /* new cache entry -- remove old ones if cache has become too la
678      ret=1;
679

681      if (SSL_CTX_sess_get_cache_size(ctx) > 0)
682      {
683          while (SSL_CTX_sess_number(ctx) >
684                SSL_CTX_sess_get_cache_size(ctx))
685          {
686              if (!remove_session_lock(ctx,
687                                     ctx->session_cache_tail, 0))
688                  break;
689              else
690                  ctx->stats.sess_cache_full++;
691          }
692      }
693      CRYPTO_w_unlock(CRYPTO_LOCK_SSL_CTX);
694      return(ret);
695  }
696

698 int SSL_CTX_remove_session(SSL_CTX *ctx, SSL_SESSION *c)
699 {
700     return remove_session_lock(ctx, c, 1);
701 }

703 static int remove_session_lock(SSL_CTX *ctx, SSL_SESSION *c, int lck)
704 {
705     SSL_SESSION *r;
706     int ret=0;

708     if ((c != NULL) && (c->session_id_length != 0))
709     {
710         if(lck) CRYPTO_w_lock(CRYPTO_LOCK_SSL_CTX);
711         if ((r = lh_SSL_SESSION_retrieve(ctx->sessions,c)) == c)
712         {
713             ret=1;
714             r=lh_SSL_SESSION_delete(ctx->sessions,c);
715             SSL_SESSION_list_remove(ctx,c);
716         }

718         if(lck) CRYPTO_w_unlock(CRYPTO_LOCK_SSL_CTX);

720         if (ret)
721     {

```

```

722         r->not_resumable=1;
723         if (ctx->remove_session_cb != NULL)
724             ctx->remove_session_cb(ctx,r);
725         SSL_SESSION_free(r);
726     }
727 }
728 else
729     ret=0;
730 return(ret);
731 }

733 void SSL_SESSION_free(SSL_SESSION *ss)
734 {
735     int i;

737     if(ss == NULL)
738         return;

740     i=CRYPTO_add(&ss->references,-1,CRYPTO_LOCK_SSL_SESSION);
741 #ifdef REF_PRINT
742     REF_PRINT("SSL_SESSION",ss);
743 #endif
744     if (i > 0) return;
745 #ifdef REF_CHECK
746     if (i < 0)
747     {
748         fprintf(stderr,"SSL_SESSION_free, bad reference count\n");
749         abort(); /* ok */
750     }
751 #endif

753     CRYPTO_free_ex_data(CRYPTO_EX_INDEX_SSL_SESSION, ss, &ss->ex_data);

755     OPENSSL_cleanse(ss->key_arg,sizeof ss->key_arg);
756     OPENSSL_cleanse(ss->master_key,sizeof ss->master_key);
757     OPENSSL_cleanse(ss->session_id,sizeof ss->session_id);
758     if (ss->sess_cert != NULL) ssl_sess_cert_free(ss->sess_cert);
759     if (ss->peer != NULL) X509_free(ss->peer);
760     if (ss->ciphers != NULL) sk_SSL_CIPHER_free(ss->ciphers);
761 #ifndef OPENSSL_NO_TLSEXT
762     if (ss->tlsext_hostname != NULL) OPENSSL_free(ss->tlsext_hostname);
763     if (ss->tlsext_tick != NULL) OPENSSL_free(ss->tlsext_tick);
764 #ifndef OPENSSL_NO_EC
765     ss->tlsext_ecpointformatlist_length = 0;
766     if (ss->tlsext_ecpointformatlist != NULL) OPENSSL_free(ss->tlsext_ecpoin
767     ss->tlsext_ellipticcurvelist_length = 0;
768     if (ss->tlsext_ellipticcurvelist != NULL) OPENSSL_free(ss->tlsext_ellipt
769 #endif /* OPENSSL_NO_EC */
770 #endif
771 #ifndef OPENSSL_NO_PSK
772     if (ss->psk_identity_hint != NULL)
773         OPENSSL_free(ss->psk_identity_hint);
774     if (ss->psk_identity != NULL)
775         OPENSSL_free(ss->psk_identity);
776 #endif
777 #ifndef OPENSSL_NO_SRP
778     if (ss->srp_username != NULL)
779         OPENSSL_free(ss->srp_username);
780 #endif
781     OPENSSL_cleanse(ss,sizeof(*ss));
782     OPENSSL_free(ss);
783 }

785 int SSL_set_session(SSL *s, SSL_SESSION *session)
786 {
787     int ret=0;

```

```

788     const SSL_METHOD *meth;
790     if (session != NULL)
791     {
792         meth=s->ctx->method->get_ssl_method(session->ssl_version);
793         if (meth == NULL)
794             meth=s->method->get_ssl_method(session->ssl_version);
795         if (meth == NULL)
796         {
797             SSLerr(SSL_F_SSL_SET_SESSION,SSL_R_UNABLE_TO_FIND_SSL_ME
798             return(0);
799         }
801         if (meth != s->method)
802         {
803             if (!SSL_set_ssl_method(s,meth))
804                 return(0);
805         }
807 #ifndef OPENSSL_NO_KRB5
808     if (s->kssl_ctx && !s->kssl_ctx->client_princ &&
809         session->krb5_client_princ_len > 0)
810     {
811         s->kssl_ctx->client_princ = (char *)OPENSSL_malloc(session->
812         memcpy(s->kssl_ctx->client_princ,session->krb5_client_princ,
813         session->krb5_client_princ_len);
814         s->kssl_ctx->client_princ[session->krb5_client_princ_len] =
815     }
816 #endif /* OPENSSL_NO_KRB5 */
818     /* CRYPTO_w_lock(CRYPTO_LOCK_SSL);*/
819     CRYPTO_add(&session->references,1,CRYPTO_LOCK_SSL_SESSION);
820     if (s->session != NULL)
821         SSL_SESSION_free(s->session);
822     s->session=session;
823     s->verify_result = s->session->verify_result;
824     /* CRYPTO_w_unlock(CRYPTO_LOCK_SSL);*/
825     ret=1;
826 }
827 else
828 {
829     if (s->session != NULL)
830     {
831         SSL_SESSION_free(s->session);
832         s->session=NULL;
833     }
835     meth=s->ctx->method;
836     if (meth != s->method)
837     {
838         if (!SSL_set_ssl_method(s,meth))
839             return(0);
840     }
841     ret=1;
842 }
843 return(ret);
844 }
846 long SSL_SESSION_set_timeout(SSL_SESSION *s, long t)
847 {
848     if (s == NULL) return(0);
849     s->timeout=t;
850     return(1);
851 }
853 long SSL_SESSION_get_timeout(const SSL_SESSION *s)

```

```

854     {
855         if (s == NULL) return(0);
856         return(s->timeout);
857     }
859 long SSL_SESSION_get_time(const SSL_SESSION *s)
860 {
861     if (s == NULL) return(0);
862     return(s->time);
863 }
865 long SSL_SESSION_set_time(SSL_SESSION *s, long t)
866 {
867     if (s == NULL) return(0);
868     s->time=t;
869     return(t);
870 }
872 X509 *SSL_SESSION_get0_peer(SSL_SESSION *s)
873 {
874     return s->peer;
875 }
877 int SSL_SESSION_set1_id_context(SSL_SESSION *s,const unsigned char *sid_ctx,
878                                unsigned int sid_ctx_len)
879 {
880     if(sid_ctx_len > SSL_MAX_SID_CTX_LENGTH)
881     {
882         SSLerr(SSL_F_SSL_SESSION_SET1_ID_CONTEXT,SSL_R_SSL_SESSION_ID_CO
883         return 0;
884     }
885     s->sid_ctx_length=sid_ctx_len;
886     memcpy(s->sid_ctx,sid_ctx,sid_ctx_len);
888     return 1;
889 }
891 long SSL_CTX_set_timeout(SSL_CTX *s, long t)
892 {
893     long l;
894     if (s == NULL) return(0);
895     l=s->session_timeout;
896     s->session_timeout=t;
897     return(l);
898 }
900 long SSL_CTX_get_timeout(const SSL_CTX *s)
901 {
902     if (s == NULL) return(0);
903     return(s->session_timeout);
904 }
906 #ifndef OPENSSL_NO_TLSEXT
907 int SSL_set_session_secret_cb(SSL *s, int (*tls_session_secret_cb)(SSL *s, void
908     STACK_OF(SSL_CIPHER) *peer_ciphers, SSL_CIPHER **cipher, void *arg), voi
909 {
910     if (s == NULL) return(0);
911     s->tls_session_secret_cb = tls_session_secret_cb;
912     s->tls_session_secret_cb_arg = arg;
913     return(1);
914 }
916 int SSL_set_session_ticket_ext_cb(SSL *s, tls_session_ticket_ext_cb_fn cb,
917     void *arg)
918 {
919     if (s == NULL) return(0);

```

```

920     s->tls_session_ticket_ext_cb = cb;
921     s->tls_session_ticket_ext_cb_arg = arg;
922     return(1);
923 }

925 int SSL_set_session_ticket_ext(SSL *s, void *ext_data, int ext_len)
926 {
927     if (s->version >= TLS1_VERSION)
928     {
929         if (s->tlsext_session_ticket)
930         {
931             OPENSSL_free(s->tlsext_session_ticket);
932             s->tlsext_session_ticket = NULL;
933         }

935         s->tlsext_session_ticket = OPENSSL_malloc(sizeof(TLS_SESSION_TIC
936         if (!s->tlsext_session_ticket)
937         {
938             SSLerr(SSL_F_SSL_SET_SESSION_TICKET_EXT, ERR_R_MALLOC_FA
939             return 0;
940         }

942         if (ext_data)
943         {
944             s->tlsext_session_ticket->length = ext_len;
945             s->tlsext_session_ticket->data = s->tlsext_session_ticke
946             memcpy(s->tlsext_session_ticket->data, ext_data, ext_len
947         }
948         else
949         {
950             s->tlsext_session_ticket->length = 0;
951             s->tlsext_session_ticket->data = NULL;
952         }

954         return 1;
955     }

957     return 0;
958 }
959 #endif /* OPENSLL_NO_TLSEXT */

961 typedef struct timeout_param_st
962 {
963     SSL_CTX *ctx;
964     long time;
965     LHASH_OF(SSL_SESSION) *cache;
966 } TIMEOUT_PARAM;

968 static void timeout_doall_arg(SSL_SESSION *s, TIMEOUT_PARAM *p)
969 {
970     if ((p->time == 0) || (p->time > (s->time+s->timeout))) /* timeout */
971     {
972         /* The reason we don't call SSL_CTX_remove_session() is to
973          * save on locking overhead */
974         (void)lh_SSL_SESSION_delete(p->cache,s);
975         SSL_SESSION_list_remove(p->ctx,s);
976         s->not_resumable=1;
977         if (p->ctx->remove_session_cb != NULL)
978             p->ctx->remove_session_cb(p->ctx,s);
979         SSL_SESSION_free(s);
980     }
981 }

983 static IMPLEMENT_LHASH_DOALL_ARG_FN(timeout, SSL_SESSION, TIMEOUT_PARAM)

985 void SSL_CTX_flush_sessions(SSL_CTX *s, long t)

```

```

986     {
987         unsigned long i;
988         TIMEOUT_PARAM tp;

990         tp.ctx=s;
991         tp.cache=s->sessions;
992         if (tp.cache == NULL) return;
993         tp.time=t;
994         CRYPTO_w_lock(CRYPTO_LOCK_SSL_CTX);
995         i=CHECKED_LHASH_OF(SSL_SESSION, tp.cache)->down_load;
996         CHECKED_LHASH_OF(SSL_SESSION, tp.cache)->down_load=0;
997         lh_SSL_SESSION_doall_arg(tp.cache, LHASH_DOALL_ARG_FN(timeout),
998             TIMEOUT_PARAM, &tp);
999         CHECKED_LHASH_OF(SSL_SESSION, tp.cache)->down_load=i;
1000         CRYPTO_w_unlock(CRYPTO_LOCK_SSL_CTX);
1001     }

1003 int ssl_clear_bad_session(SSL *s)
1004 {
1005     if ( (s->session != NULL) &&
1006         !(s->shutdown & SSL_SENT_SHUTDOWN) &&
1007         !(SSL_in_init(s) || SSL_in_before(s)))
1008     {
1009         SSL_CTX_remove_session(s->ctx,s->session);
1010         return(1);
1011     }
1012     else
1013         return(0);
1014 }

1016 /* locked by SSL_CTX in the calling function */
1017 static void SSL_SESSION_list_remove(SSL_CTX *ctx, SSL_SESSION *s)
1018 {
1019     if ((s->next == NULL) || (s->prev == NULL)) return;

1021     if (s->next == (SSL_SESSION *)&(ctx->session_cache_tail))
1022     { /* last element in list */
1023         if (s->prev == (SSL_SESSION *)&(ctx->session_cache_head))
1024             /* only one element in list */
1025             ctx->session_cache_head=NULL;
1026             ctx->session_cache_tail=NULL;
1027         }
1028     else
1029     {
1030         ctx->session_cache_tail=s->prev;
1031         s->prev->next=(SSL_SESSION *)&(ctx->session_cache_tail);
1032     }
1033 }
1034 else
1035 {
1036     if (s->prev == (SSL_SESSION *)&(ctx->session_cache_head))
1037     { /* first element in list */
1038         ctx->session_cache_head=s->next;
1039         s->next->prev=(SSL_SESSION *)&(ctx->session_cache_head);
1040     }
1041     else
1042     { /* middle of list */
1043         s->next->prev=s->prev;
1044         s->prev->next=s->next;
1045     }
1046 }
1047 s->prev=s->next=NULL;
1048 }

1050 static void SSL_SESSION_list_add(SSL_CTX *ctx, SSL_SESSION *s)
1051 {

```

```

1052     if ((s->next != NULL) && (s->prev != NULL))
1053         SSL_SESSION_list_remove(ctx,s);

1055     if (ctx->session_cache_head == NULL)
1056     {
1057         ctx->session_cache_head=s;
1058         ctx->session_cache_tail=s;
1059         s->prev=(SSL_SESSION *)&(ctx->session_cache_head);
1060         s->next=(SSL_SESSION *)&(ctx->session_cache_tail);
1061     }
1062     else
1063     {
1064         s->next=ctx->session_cache_head;
1065         s->next->prev=s;
1066         s->prev=(SSL_SESSION *)&(ctx->session_cache_head);
1067         ctx->session_cache_head=s;
1068     }
1069 }

1071 void SSL_CTX_sess_set_new_cb(SSL_CTX *ctx,
1072     int (*cb)(struct ssl_st *ssl,SSL_SESSION *sess))
1073 {
1074     ctx->new_session_cb=cb;
1075 }

1077 int (*SSL_CTX_sess_get_new_cb(SSL_CTX *ctx))(SSL *ssl, SSL_SESSION *sess)
1078 {
1079     return ctx->new_session_cb;
1080 }

1082 void SSL_CTX_sess_set_remove_cb(SSL_CTX *ctx,
1083     void (*cb)(SSL_CTX *ctx,SSL_SESSION *sess))
1084 {
1085     ctx->remove_session_cb=cb;
1086 }

1088 void (*SSL_CTX_sess_get_remove_cb(SSL_CTX *ctx))(SSL_CTX * ctx,SSL_SESSION *sess)
1089 {
1090     return ctx->remove_session_cb;
1091 }

1093 void SSL_CTX_sess_set_get_cb(SSL_CTX *ctx,
1094     SSL_SESSION *(*cb)(struct ssl_st *ssl,
1095         unsigned char *data,int len,int *copy))
1096 {
1097     ctx->get_session_cb=cb;
1098 }

1100 SSL_SESSION * (*SSL_CTX_sess_get_get_cb(SSL_CTX *ctx))(SSL *ssl,
1101     unsigned char *data,int len,int *copy)
1102 {
1103     return ctx->get_session_cb;
1104 }

1106 void SSL_CTX_set_info_callback(SSL_CTX *ctx,
1107     void (*cb)(const SSL *ssl,int type,int val))
1108 {
1109     ctx->info_callback=cb;
1110 }

1112 void (*SSL_CTX_get_info_callback(SSL_CTX *ctx))(const SSL *ssl,int type,int val)
1113 {
1114     return ctx->info_callback;
1115 }

1117 void SSL_CTX_set_client_cert_cb(SSL_CTX *ctx,

```

```

1118     int (*cb)(SSL *ssl, X509 **x509, EVP_PKEY **pkey))
1119     {
1120         ctx->client_cert_cb=cb;
1121     }

1123 int (*SSL_CTX_get_client_cert_cb(SSL_CTX *ctx))(SSL * ssl, X509 ** x509 , EVP_PK
1124     {
1125         return ctx->client_cert_cb;
1126     }

1128 #ifndef OPENSSL_NO_ENGINE
1129 int SSL_CTX_set_client_cert_engine(SSL_CTX *ctx, ENGINE *e)
1130 {
1131     if (!ENGINE_init(e))
1132     {
1133         SSLerr(SSL_F_SSL_CTX_SET_CLIENT_CERT_ENGINE, ERR_R_ENGINE_LIB);
1134         return 0;
1135     }
1136     if(!ENGINE_get_ssl_client_cert_function(e))
1137     {
1138         SSLerr(SSL_F_SSL_CTX_SET_CLIENT_CERT_ENGINE, SSL_R_NO_CLIENT_CER
1139             ENGINE_finish(e);
1140             return 0;
1141         }
1142     ctx->client_cert_engine = e;
1143     return 1;
1144 }
1145 #endif

1147 void SSL_CTX_set_cookie_generate_cb(SSL_CTX *ctx,
1148     int (*cb)(SSL *ssl, unsigned char *cookie, unsigned int *cookie_len))
1149 {
1150     ctx->app_gen_cookie_cb=cb;
1151 }

1153 void SSL_CTX_set_cookie_verify_cb(SSL_CTX *ctx,
1154     int (*cb)(SSL *ssl, unsigned char *cookie, unsigned int cookie_len))
1155 {
1156     ctx->app_verify_cookie_cb=cb;
1157 }

1159 IMPLEMENT_PEM_rw(SSL_SESSION, SSL_SESSION, PEM_STRING_SSL_SESSION, SSL_SESSION)

```



```

*****
24590 Fri May 30 18:32:22 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_stat.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****

```

```

1 /* ssl/ssl_stat.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
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57 */
58 /* =====
59 * Copyright 2005 Nokia. All rights reserved.
60 *
61 * The portions of the attached software ("Contribution") is developed by

```

```

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63 * license.
64 *
65 * The Contribution, originally written by Mika Kousa and Pasi Eronen of
66 * Nokia Corporation, consists of the "PSK" (Pre-Shared Key) ciphersuites
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80 * SPECIFICALLY DISCLAIMS ANY LIABILITY FOR CLAIMS BROUGHT BY YOU OR ANY
81 * OTHER ENTITY BASED ON INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR
82 * OTHERWISE.
83 */
84
85 #include <stdio.h>
86 #include "ssl_locl.h"
87
88 const char *SSL_state_string_long(const SSL *s)
89 {
90     const char *str;
91
92     switch (s->state)
93     {
94     case SSL_ST_BEFORE: str="before SSL initialization"; break;
95     case SSL_ST_ACCEPT: str="before accept initialization"; break;
96     case SSL_ST_CONNECT: str="before connect initialization"; break;
97     case SSL_ST_OK: str="SSL negotiation finished successfully"; break;
98     case SSL_ST_RENEGOTIATE: str="SSL renegotiate ciphers"; break;
99     case SSL_ST_BEFORE|SSL_ST_CONNECT: str="before/connect initialization"; break;
100    case SSL_ST_OK|SSL_ST_CONNECT: str="ok/connect SSL initialization"; break;
101    case SSL_ST_BEFORE|SSL_ST_ACCEPT: str="before/accept initialization"; break;
102    case SSL_ST_OK|SSL_ST_ACCEPT: str="ok/accept SSL initialization"; break;
103    #ifndef OPENSSL_NO_SSL2
104    case SSL2_ST_CLIENT_START_ENCRYPTION: str="SSLv2 client start encryption"; break
105    case SSL2_ST_SERVER_START_ENCRYPTION: str="SSLv2 server start encryption"; break
106    case SSL2_ST_SEND_CLIENT_HELLO_A: str="SSLv2 write client hello A"; break;
107    case SSL2_ST_SEND_CLIENT_HELLO_B: str="SSLv2 write client hello B"; break;
108    case SSL2_ST_GET_SERVER_HELLO_A: str="SSLv2 read server hello A"; break;
109    case SSL2_ST_GET_SERVER_HELLO_B: str="SSLv2 read server hello B"; break;
110    case SSL2_ST_SEND_CLIENT_MASTER_KEY_A: str="SSLv2 write client master key A"; br
111    case SSL2_ST_SEND_CLIENT_MASTER_KEY_B: str="SSLv2 write client master key B"; br
112    case SSL2_ST_SEND_CLIENT_FINISHED_A: str="SSLv2 write client finished A"; break;
113    case SSL2_ST_SEND_CLIENT_FINISHED_B: str="SSLv2 write client finished B"; break;
114    case SSL2_ST_SEND_CLIENT_CERTIFICATE_A: str="SSLv2 write client certificate A";
115    case SSL2_ST_SEND_CLIENT_CERTIFICATE_B: str="SSLv2 write client certificate B";
116    case SSL2_ST_SEND_CLIENT_CERTIFICATE_C: str="SSLv2 write client certificate C";
117    case SSL2_ST_SEND_CLIENT_CERTIFICATE_D: str="SSLv2 write client certificate D";
118    case SSL2_ST_GET_SERVER_VERIFY_A: str="SSLv2 read server verify A"; break;
119    case SSL2_ST_GET_SERVER_VERIFY_B: str="SSLv2 read server verify B"; break;
120    case SSL2_ST_GET_SERVER_FINISHED_A: str="SSLv2 read server finished A"; break;
121    case SSL2_ST_GET_SERVER_FINISHED_B: str="SSLv2 read server finished B"; break;
122    case SSL2_ST_GET_CLIENT_HELLO_A: str="SSLv2 read client hello A"; break;
123    case SSL2_ST_GET_CLIENT_HELLO_B: str="SSLv2 read client hello B"; break;
124    case SSL2_ST_GET_CLIENT_HELLO_C: str="SSLv2 read client hello C"; break;
125    case SSL2_ST_SEND_SERVER_HELLO_A: str="SSLv2 write server hello A"; break;
126    case SSL2_ST_SEND_SERVER_HELLO_B: str="SSLv2 write server hello B"; break;
127    case SSL2_ST_GET_CLIENT_MASTER_KEY_A: str="SSLv2 read client master key A"; brea

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128 case SSL2_ST_GET_CLIENT_MASTER_KEY_B: str="SSLv2 read client master key B"; brea
129 case SSL2_ST_SEND_SERVER_VERIFY_A: str="SSLv2 write server verify A"; break;
130 case SSL2_ST_SEND_SERVER_VERIFY_B: str="SSLv2 write server verify B"; break;
131 case SSL2_ST_SEND_SERVER_VERIFY_C: str="SSLv2 write server verify C"; break;
132 case SSL2_ST_GET_CLIENT_FINISHED_A: str="SSLv2 read client finished A"; break;
133 case SSL2_ST_GET_CLIENT_FINISHED_B: str="SSLv2 read client finished B"; break;
134 case SSL2_ST_SEND_SERVER_FINISHED_A: str="SSLv2 write server finished A"; break;
135 case SSL2_ST_SEND_SERVER_FINISHED_B: str="SSLv2 write server finished B"; break;
136 case SSL2_ST_SEND_REQUEST_CERTIFICATE_A: str="SSLv2 write request certificate A"
137 case SSL2_ST_SEND_REQUEST_CERTIFICATE_B: str="SSLv2 write request certificate B"
138 case SSL2_ST_SEND_REQUEST_CERTIFICATE_C: str="SSLv2 write request certificate C"
139 case SSL2_ST_SEND_REQUEST_CERTIFICATE_D: str="SSLv2 write request certificate D"
140 case SSL2_ST_X509_GET_SERVER_CERTIFICATE: str="SSLv2 X509 read server certificat
141 case SSL2_ST_X509_GET_CLIENT_CERTIFICATE: str="SSLv2 X509 read client certificat
142 #endif

144 #ifndef OPENSSL_NO_SSL3
145 /* SSLv3 additions */
146 case SSL3_ST_SW_CLNT_HELLO_A: str="SSLv3 write client hello A"; break;
147 case SSL3_ST_SW_CLNT_HELLO_B: str="SSLv3 write client hello B"; break;
148 case SSL3_ST_CR_SRVR_HELLO_A: str="SSLv3 read server hello A"; break;
149 case SSL3_ST_CR_SRVR_HELLO_B: str="SSLv3 read server hello B"; break;
150 case SSL3_ST_CR_CERT_A: str="SSLv3 read server certificate A"; break;
151 case SSL3_ST_CR_CERT_B: str="SSLv3 read server certificate B"; break;
152 case SSL3_ST_CR_KEY_EXCH_A: str="SSLv3 read server key exchange A"; break;
153 case SSL3_ST_CR_KEY_EXCH_B: str="SSLv3 read server key exchange B"; break;
154 case SSL3_ST_CR_CERT_REQ_A: str="SSLv3 read server certificate request A"; b
155 case SSL3_ST_CR_CERT_REQ_B: str="SSLv3 read server certificate request B"; b
156 case SSL3_ST_CR_SESSION_TICKET_A: str="SSLv3 read server session ticket A";break
157 case SSL3_ST_CR_SESSION_TICKET_B: str="SSLv3 read server session ticket B";break
158 case SSL3_ST_CR_SRVR_DONE_A: str="SSLv3 read server done A"; break;
159 case SSL3_ST_CR_SRVR_DONE_B: str="SSLv3 read server done B"; break;
160 case SSL3_ST_SW_CERT_A: str="SSLv3 write client certificate A"; break;
161 case SSL3_ST_SW_CERT_B: str="SSLv3 write client certificate B"; break;
162 case SSL3_ST_SW_CERT_C: str="SSLv3 write client certificate C"; break;
163 case SSL3_ST_SW_CERT_D: str="SSLv3 write client certificate D"; break;
164 case SSL3_ST_SW_KEY_EXCH_A: str="SSLv3 write client key exchange A"; break;
165 case SSL3_ST_SW_KEY_EXCH_B: str="SSLv3 write client key exchange B"; break;
166 case SSL3_ST_SW_CERT_VRFY_A: str="SSLv3 write certificate verify A"; break;
167 case SSL3_ST_SW_CERT_VRFY_B: str="SSLv3 write certificate verify B"; break;

169 case SSL3_ST_SW_CHANGE_A: str="SSLv3 write change cipher spec A"; break;
170 case SSL3_ST_SW_CHANGE_B: str="SSLv3 write change cipher spec B"; break;
171 case SSL3_ST_SW_CHANGE_C: str="SSLv3 write change cipher spec C"; break;
172 case SSL3_ST_SW_CHANGE_D: str="SSLv3 write change cipher spec D"; break;
173 case SSL3_ST_SW_FINISHED_A: str="SSLv3 write finished A"; break;
174 case SSL3_ST_SW_FINISHED_B: str="SSLv3 write finished B"; break;
175 case SSL3_ST_SW_FINISHED_C: str="SSLv3 write finished C"; break;
176 case SSL3_ST_SW_FINISHED_D: str="SSLv3 write finished D"; break;
177 case SSL3_ST_SR_CHANGE_A: str="SSLv3 read change cipher spec A"; break;
178 case SSL3_ST_SR_CHANGE_B: str="SSLv3 read change cipher spec B"; break;
179 case SSL3_ST_SR_CHANGE_C: str="SSLv3 read change cipher spec C"; break;
180 case SSL3_ST_SR_CHANGE_D: str="SSLv3 read change cipher spec D"; break;
181 case SSL3_ST_SR_FINISHED_A: str="SSLv3 read finished A"; break;
182 case SSL3_ST_SR_FINISHED_B: str="SSLv3 read finished B"; break;
183 case SSL3_ST_SR_FINISHED_C: str="SSLv3 read finished C"; break;
184 case SSL3_ST_SR_FINISHED_D: str="SSLv3 read finished D"; break;

186 case SSL3_ST_SW_FLUSH: str="SSLv3 flush data"; break;
187 case SSL3_ST_SW_FLUSH: str="SSLv3 flush data"; break;

189 case SSL3_ST_SR_CLNT_HELLO_A: str="SSLv3 read client hello A"; break;
190 case SSL3_ST_SR_CLNT_HELLO_B: str="SSLv3 read client hello B"; break;
191 case SSL3_ST_SR_CLNT_HELLO_C: str="SSLv3 read client hello C"; break;
192 case SSL3_ST_SW_HELLO_REQ_A: str="SSLv3 write hello request A"; break;
193 case SSL3_ST_SW_HELLO_REQ_B: str="SSLv3 write hello request B"; break;

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```

194 case SSL3_ST_SW_HELLO_REQ_C: str="SSLv3 write hello request C"; break;
195 case SSL3_ST_SW_SRVR_HELLO_A: str="SSLv3 write server hello A"; break;
196 case SSL3_ST_SW_SRVR_HELLO_B: str="SSLv3 write server hello B"; break;
197 case SSL3_ST_SW_CERT_A: str="SSLv3 write certificate A"; break;
198 case SSL3_ST_SW_CERT_B: str="SSLv3 write certificate B"; break;
199 case SSL3_ST_SW_KEY_EXCH_A: str="SSLv3 write key exchange A"; break;
200 case SSL3_ST_SW_KEY_EXCH_B: str="SSLv3 write key exchange B"; break;
201 case SSL3_ST_SW_CERT_REQ_A: str="SSLv3 write certificate request A"; break;
202 case SSL3_ST_SW_CERT_REQ_B: str="SSLv3 write certificate request B"; break;
203 case SSL3_ST_SW_SESSION_TICKET_A: str="SSLv3 write session ticket A"; break;
204 case SSL3_ST_SW_SESSION_TICKET_B: str="SSLv3 write session ticket B"; break;
205 case SSL3_ST_SW_SRVR_DONE_A: str="SSLv3 write server done A"; break;
206 case SSL3_ST_SW_SRVR_DONE_B: str="SSLv3 write server done B"; break;
207 case SSL3_ST_SR_CERT_A: str="SSLv3 read client certificate A"; break;
208 case SSL3_ST_SR_CERT_B: str="SSLv3 read client certificate B"; break;
209 case SSL3_ST_SR_KEY_EXCH_A: str="SSLv3 read client key exchange A"; break;
210 case SSL3_ST_SR_KEY_EXCH_B: str="SSLv3 read client key exchange B"; break;
211 case SSL3_ST_SR_CERT_VRFY_A: str="SSLv3 read certificate verify A"; break;
212 case SSL3_ST_SR_CERT_VRFY_B: str="SSLv3 read certificate verify B"; break;
213 #endif

215 #if !defined(OPENSSL_NO_SSL2) && !defined(OPENSSL_NO_SSL3)
216 /* SSLv2/v3 compatibility states */
217 /* client */
218 case SSL23_ST_SW_CLNT_HELLO_A: str="SSLv2/v3 write client hello A"; break;
219 case SSL23_ST_SW_CLNT_HELLO_B: str="SSLv2/v3 write client hello B"; break;
220 case SSL23_ST_CR_SRVR_HELLO_A: str="SSLv2/v3 read server hello A"; break;
221 case SSL23_ST_CR_SRVR_HELLO_B: str="SSLv2/v3 read server hello B"; break;
222 /* server */
223 case SSL23_ST_SR_CLNT_HELLO_A: str="SSLv2/v3 read client hello A"; break;
224 case SSL23_ST_SR_CLNT_HELLO_B: str="SSLv2/v3 read client hello B"; break;
225 #endif

227 /* DTLS */
228 case DTLS1_ST_CR_HELLO_VERIFY_REQUEST_A: str="DTLS1 read hello verify request A"
229 case DTLS1_ST_CR_HELLO_VERIFY_REQUEST_B: str="DTLS1 read hello verify request B"
230 case DTLS1_ST_SW_HELLO_VERIFY_REQUEST_A: str="DTLS1 write hello verify request A"
231 case DTLS1_ST_SW_HELLO_VERIFY_REQUEST_B: str="DTLS1 write hello verify request B"

233 default: str="unknown state"; break;
234 }
235 return(str);
236 }

238 const char *SSL_rstate_string(const SSL *s)
239 {
240     const char *str;

242     switch (s->rstate)
243     {
244         case SSL_ST_READ_HEADER: str="read header"; break;
245         case SSL_ST_READ_BODY: str="read body"; break;
246         case SSL_ST_READ_DONE: str="read done"; break;
247         default: str="unknown"; break;
248     }
249     return(str);
250 }

252 const char *SSL_state_string(const SSL *s)
253 {
254     const char *str;

256     switch (s->state)
257     {
258         case SSL_ST_BEFORE: str="PINIT "; break;
259         case SSL_ST_ACCEPT: str="AINIT "; break;

```

```

260 case SSL_ST_CONNECT: str="CINIT "; break;
261 case SSL_ST_OK: str="SSLOK "; break;
262 #ifndef OPENSSSL_NO_SSL2
263 case SSL2_ST_CLIENT_START_ENCRYPTION: str="2CSENC"; break;
264 case SSL2_ST_SERVER_START_ENCRYPTION: str="2SSENC"; break;
265 case SSL2_ST_SEND_CLIENT_HELLO_A: str="2SCH_A"; break;
266 case SSL2_ST_SEND_CLIENT_HELLO_B: str="2SCH_B"; break;
267 case SSL2_ST_GET_SERVER_HELLO_A: str="2GSH_A"; break;
268 case SSL2_ST_GET_SERVER_HELLO_B: str="2GSH_B"; break;
269 case SSL2_ST_SEND_CLIENT_MASTER_KEY_A: str="2SCMKA"; break;
270 case SSL2_ST_SEND_CLIENT_MASTER_KEY_B: str="2SCMKB"; break;
271 case SSL2_ST_SEND_CLIENT_FINISHED_A: str="2SCF_A"; break;
272 case SSL2_ST_SEND_CLIENT_FINISHED_B: str="2SCF_B"; break;
273 case SSL2_ST_SEND_CLIENT_CERTIFICATE_A: str="2SCC_A"; break;
274 case SSL2_ST_SEND_CLIENT_CERTIFICATE_B: str="2SCC_B"; break;
275 case SSL2_ST_SEND_CLIENT_CERTIFICATE_C: str="2SCC_C"; break;
276 case SSL2_ST_SEND_CLIENT_CERTIFICATE_D: str="2SCC_D"; break;
277 case SSL2_ST_GET_SERVER_VERIFY_A: str="2GSV_A"; break;
278 case SSL2_ST_GET_SERVER_VERIFY_B: str="2GSV_B"; break;
279 case SSL2_ST_GET_SERVER_FINISHED_A: str="2GSF_A"; break;
280 case SSL2_ST_GET_SERVER_FINISHED_B: str="2GSF_B"; break;
281 case SSL2_ST_GET_CLIENT_HELLO_A: str="2GCH_A"; break;
282 case SSL2_ST_GET_CLIENT_HELLO_B: str="2GCH_B"; break;
283 case SSL2_ST_GET_CLIENT_HELLO_C: str="2GCH_C"; break;
284 case SSL2_ST_SEND_SERVER_HELLO_A: str="2SSH_A"; break;
285 case SSL2_ST_SEND_SERVER_HELLO_B: str="2SSH_B"; break;
286 case SSL2_ST_GET_CLIENT_MASTER_KEY_A: str="2GCMKA"; break;
287 case SSL2_ST_GET_CLIENT_MASTER_KEY_B: str="2GCMKB"; break;
288 case SSL2_ST_SEND_SERVER_VERIFY_A: str="2SSV_A"; break;
289 case SSL2_ST_SEND_SERVER_VERIFY_B: str="2SSV_B"; break;
290 case SSL2_ST_SEND_SERVER_VERIFY_C: str="2SSV_C"; break;
291 case SSL2_ST_GET_CLIENT_FINISHED_A: str="2GCF_A"; break;
292 case SSL2_ST_GET_CLIENT_FINISHED_B: str="2GCF_B"; break;
293 case SSL2_ST_SEND_SERVER_FINISHED_A: str="2SSF_A"; break;
294 case SSL2_ST_SEND_SERVER_FINISHED_B: str="2SSF_B"; break;
295 case SSL2_ST_SEND_REQUEST_CERTIFICATE_A: str="2SRC_A"; break;
296 case SSL2_ST_SEND_REQUEST_CERTIFICATE_B: str="2SRC_B"; break;
297 case SSL2_ST_SEND_REQUEST_CERTIFICATE_C: str="2SRC_C"; break;
298 case SSL2_ST_SEND_REQUEST_CERTIFICATE_D: str="2SRC_D"; break;
299 case SSL2_ST_X509_GET_SERVER_CERTIFICATE: str="2X9GSC"; break;
300 case SSL2_ST_X509_GET_CLIENT_CERTIFICATE: str="2X9GCC"; break;
301 #endif

303 #ifndef OPENSSSL_NO_SSL3
304 /* SSLv3 additions */
305 case SSL3_ST_SW_FLUSH: str="3FLUSH"; break;
306 case SSL3_ST_CW_FLUSH: str="3WCH_A"; break;
307 case SSL3_ST_CW_CLNT_HELLO_A: str="3WCH_B"; break;
308 case SSL3_ST_CW_CLNT_HELLO_B: str="3WCH_C"; break;
309 case SSL3_ST_CR_SRVR_HELLO_A: str="3RSH_A"; break;
310 case SSL3_ST_CR_SRVR_HELLO_B: str="3RSH_B"; break;
311 case SSL3_ST_CR_CERT_A: str="3RSC_A"; break;
312 case SSL3_ST_CR_CERT_B: str="3RSC_B"; break;
313 case SSL3_ST_CR_KEY_EXCH_A: str="3RSKEA"; break;
314 case SSL3_ST_CR_KEY_EXCH_B: str="3RSKEB"; break;
315 case SSL3_ST_CR_CERT_REQ_A: str="3RCR_A"; break;
316 case SSL3_ST_CR_CERT_REQ_B: str="3RCR_B"; break;
317 case SSL3_ST_CR_SRVR_DONE_A: str="3RSD_A"; break;
318 case SSL3_ST_CR_SRVR_DONE_B: str="3RSD_B"; break;
319 case SSL3_ST_CW_CERT_A: str="3WCC_A"; break;
320 case SSL3_ST_CW_CERT_B: str="3WCC_B"; break;
321 case SSL3_ST_CW_CERT_C: str="3WCC_C"; break;
322 case SSL3_ST_CW_CERT_D: str="3WCC_D"; break;
323 case SSL3_ST_CW_KEY_EXCH_A: str="3WCKEA"; break;
324 case SSL3_ST_CW_KEY_EXCH_B: str="3WCKEB"; break;
325 case SSL3_ST_CW_CERT_VRFY_A: str="3WCV_A"; break;

```

```

326 case SSL3_ST_CW_CERT_VRFY_B: str="3WCV_B"; break;

328 case SSL3_ST_SW_CHANGE_A:
329 case SSL3_ST_CW_CHANGE_A: str="3WCCSA"; break;
330 case SSL3_ST_SW_CHANGE_B:
331 case SSL3_ST_CW_CHANGE_B: str="3WCCSB"; break;
332 case SSL3_ST_SW_FINISHED_A:
333 case SSL3_ST_CW_FINISHED_A: str="3WFINA"; break;
334 case SSL3_ST_SW_FINISHED_B:
335 case SSL3_ST_CW_FINISHED_B: str="3WFINB"; break;
336 case SSL3_ST_SR_CHANGE_A:
337 case SSL3_ST_CR_CHANGE_A: str="3RCCSA"; break;
338 case SSL3_ST_SR_CHANGE_B:
339 case SSL3_ST_CR_CHANGE_B: str="3RCCSB"; break;
340 case SSL3_ST_SR_FINISHED_A:
341 case SSL3_ST_CR_FINISHED_A: str="3RFINA"; break;
342 case SSL3_ST_SR_FINISHED_B:
343 case SSL3_ST_CR_FINISHED_B: str="3RFINB"; break;

345 case SSL3_ST_SW_HELLO_REQ_A: str="3WHR_A"; break;
346 case SSL3_ST_SW_HELLO_REQ_B: str="3WHR_B"; break;
347 case SSL3_ST_SW_HELLO_REQ_C: str="3WHR_C"; break;
348 case SSL3_ST_SR_CLNT_HELLO_A: str="3RCH_A"; break;
349 case SSL3_ST_SR_CLNT_HELLO_B: str="3RCH_B"; break;
350 case SSL3_ST_SR_CLNT_HELLO_C: str="3RCH_C"; break;
351 case SSL3_ST_SW_SRVR_HELLO_A: str="3WSH_A"; break;
352 case SSL3_ST_SW_SRVR_HELLO_B: str="3WSH_B"; break;
353 case SSL3_ST_SW_CERT_A: str="3WSC_A"; break;
354 case SSL3_ST_SW_CERT_B: str="3WSC_B"; break;
355 case SSL3_ST_SW_KEY_EXCH_A: str="3WSKEA"; break;
356 case SSL3_ST_SW_KEY_EXCH_B: str="3WSKEB"; break;
357 case SSL3_ST_SW_CERT_REQ_A: str="3WCR_A"; break;
358 case SSL3_ST_SW_CERT_REQ_B: str="3WCR_B"; break;
359 case SSL3_ST_SW_SRVR_DONE_A: str="3WSD_A"; break;
360 case SSL3_ST_SW_SRVR_DONE_B: str="3WSD_B"; break;
361 case SSL3_ST_SR_CERT_A: str="3RCC_A"; break;
362 case SSL3_ST_SR_CERT_B: str="3RCC_B"; break;
363 case SSL3_ST_SR_KEY_EXCH_A: str="3RCKEA"; break;
364 case SSL3_ST_SR_KEY_EXCH_B: str="3RCKEB"; break;
365 case SSL3_ST_SR_CERT_VRFY_A: str="3RCV_A"; break;
366 case SSL3_ST_SR_CERT_VRFY_B: str="3RCV_B"; break;
367 #endif

369 #if !defined(OPENSSSL_NO_SSL2) && !defined(OPENSSSL_NO_SSL3)
370 /* SSLv2/v3 compatibility states */
371 /* client */
372 case SSL23_ST_CW_CLNT_HELLO_A: str="23WCHA"; break;
373 case SSL23_ST_CW_CLNT_HELLO_B: str="23WCHB"; break;
374 case SSL23_ST_CR_SRVR_HELLO_A: str="23RSHA"; break;
375 case SSL23_ST_CR_SRVR_HELLO_B: str="23RSHB"; break;
376 /* server */
377 case SSL23_ST_SR_CLNT_HELLO_A: str="23RCHA"; break;
378 case SSL23_ST_SR_CLNT_HELLO_B: str="23RCHB"; break;
379 #endif
380 /* DTLS */
381 case DTLS1_ST_CR_HELLO_VERIFY_REQUEST_A: str="DRCHVA"; break;
382 case DTLS1_ST_CR_HELLO_VERIFY_REQUEST_B: str="DRCHVB"; break;
383 case DTLS1_ST_SW_HELLO_VERIFY_REQUEST_A: str="DWCHVA"; break;
384 case DTLS1_ST_SW_HELLO_VERIFY_REQUEST_B: str="DWCHVB"; break;

386 default: str="UNKWN "; break;
387 }
388 return(str);
389 }

391 const char *SSL_alert_type_string_long(int value)

```

```

392     {
393         value>=8;
394         if (value == SSL3_AL_WARNING)
395             return("warning");
396         else if (value == SSL3_AL_FATAL)
397             return("fatal");
398         else
399             return("unknown");
400     }
401
402 const char *SSL_alert_type_string(int value)
403 {
404     value>=8;
405     if (value == SSL3_AL_WARNING)
406         return("W");
407     else if (value == SSL3_AL_FATAL)
408         return("F");
409     else
410         return("U");
411 }
412
413 const char *SSL_alert_desc_string(int value)
414 {
415     const char *str;
416
417     switch (value & 0xff)
418     {
419     case SSL3_AD_CLOSE_NOTIFY:      str="CN"; break;
420     case SSL3_AD_UNEXPECTED_MESSAGE: str="UM"; break;
421     case SSL3_AD_BAD_RECORD_MAC:    str="BM"; break;
422     case SSL3_AD_DECOMPRESSION_FAILURE: str="DF"; break;
423     case SSL3_AD_HANDSHAKE_FAILURE: str="HF"; break;
424     case SSL3_AD_NO_CERTIFICATE:    str="NC"; break;
425     case SSL3_AD_BAD_CERTIFICATE:   str="BC"; break;
426     case SSL3_AD_UNSUPPORTED_CERTIFICATE: str="UC"; break;
427     case SSL3_AD_CERTIFICATE_REVOKED: str="CR"; break;
428     case SSL3_AD_CERTIFICATE_EXPIRED: str="CE"; break;
429     case SSL3_AD_CERTIFICATE_UNKNOWN: str="CU"; break;
430     case SSL3_AD_ILLEGAL_PARAMETER: str="IP"; break;
431     case TLS1_AD_DECRYPTION_FAILED: str="DC"; break;
432     case TLS1_AD_RECORD_OVERFLOW:   str="RO"; break;
433     case TLS1_AD_UNKNOWN_CA:        str="CA"; break;
434     case TLS1_AD_ACCESS_DENIED:     str="AD"; break;
435     case TLS1_AD_DECODE_ERROR:      str="DE"; break;
436     case TLS1_AD_DECRYPT_ERROR:      str="CY"; break;
437     case TLS1_AD_EXPORT_RESTRICTION: str="ER"; break;
438     case TLS1_AD_PROTOCOL_VERSION:  str="PV"; break;
439     case TLS1_AD_INSUFFICIENT_SECURITY: str="IS"; break;
440     case TLS1_AD_INTERNAL_ERROR:    str="IE"; break;
441     case TLS1_AD_USER_CANCELLED:     str="US"; break;
442     case TLS1_AD_NO_RENEGOTIATION:   str="NR"; break;
443     case TLS1_AD_UNSUPPORTED_EXTENSION: str="UE"; break;
444     case TLS1_AD_CERTIFICATE_UNOBTAINABLE: str="CO"; break;
445     case TLS1_AD_UNRECOGNIZED_NAME:  str="UN"; break;
446     case TLS1_AD_BAD_CERTIFICATE_STATUS_RESPONSE: str="BR"; break;
447     case TLS1_AD_BAD_CERTIFICATE_HASH_VALUE: str="BH"; break;
448     case TLS1_AD_UNKNOWN_PSK_IDENTITY: str="UP"; break;
449     default:                         str="UK"; break;
450     }
451     return(str);
452 }
453
454 const char *SSL_alert_desc_string_long(int value)
455 {
456     const char *str;

```

```

458     switch (value & 0xff)
459     {
460     case SSL3_AD_CLOSE_NOTIFY:      str="close notify";
461                                     break;
462     case SSL3_AD_UNEXPECTED_MESSAGE: str="unexpected_message";
463                                     break;
464     case SSL3_AD_BAD_RECORD_MAC:    str="bad record mac";
465                                     break;
466     case SSL3_AD_DECOMPRESSION_FAILURE: str="decompression failure";
467                                     break;
468     case SSL3_AD_HANDSHAKE_FAILURE: str="handshake failure";
469                                     break;
470     case SSL3_AD_NO_CERTIFICATE:    str="no certificate";
471                                     break;
472     case SSL3_AD_BAD_CERTIFICATE:   str="bad certificate";
473                                     break;
474     case SSL3_AD_UNSUPPORTED_CERTIFICATE: str="unsupported certificate";
475                                     break;
476     case SSL3_AD_CERTIFICATE_REVOKED: str="certificate revoked";
477                                     break;
478     case SSL3_AD_CERTIFICATE_EXPIRED: str="certificate expired";
479                                     break;
480     case SSL3_AD_CERTIFICATE_UNKNOWN: str="certificate unknown";
481                                     break;
482     case SSL3_AD_ILLEGAL_PARAMETER: str="illegal parameter";
483                                     break;
484     case TLS1_AD_DECRYPTION_FAILED: str="decryption failed";
485                                     break;
486     case TLS1_AD_RECORD_OVERFLOW:   str="record overflow";
487                                     break;
488     case TLS1_AD_UNKNOWN_CA:        str="unknown CA";
489                                     break;
490     case TLS1_AD_ACCESS_DENIED:     str="access denied";
491                                     break;
492     case TLS1_AD_DECODE_ERROR:      str="decode error";
493                                     break;
494     case TLS1_AD_DECRYPT_ERROR:      str="decrypt error";
495                                     break;
496     case TLS1_AD_EXPORT_RESTRICTION: str="export restriction";
497                                     break;
498     case TLS1_AD_PROTOCOL_VERSION:  str="protocol version";
499                                     break;
500     case TLS1_AD_INSUFFICIENT_SECURITY: str="insufficient security";
501                                     break;
502     case TLS1_AD_INTERNAL_ERROR:    str="internal error";
503                                     break;

```

```
524         str="internal error";
525         break;
526     case TLS1_AD_USER_CANCELLED:
527         str="user canceled";
528         break;
529     case TLS1_AD_NO_RENEGOTIATION:
530         str="no renegotiation";
531         break;
532     case TLS1_AD_UNSUPPORTED_EXTENSION:
533         str="unsupported extension";
534         break;
535     case TLS1_AD_CERTIFICATE_UNOBTAINABLE:
536         str="certificate unobtainable";
537         break;
538     case TLS1_AD_UNRECOGNIZED_NAME:
539         str="unrecognized name";
540         break;
541     case TLS1_AD_BAD_CERTIFICATE_STATUS_RESPONSE:
542         str="bad certificate status response";
543         break;
544     case TLS1_AD_BAD_CERTIFICATE_HASH_VALUE:
545         str="bad certificate hash value";
546         break;
547     case TLS1_AD_UNKNOWN_PSK_IDENTITY:
548         str="unknown PSK identity";
549         break;
550     default: str="unknown"; break;
551     }
552     return(str);
553 }

555 const char *SSL_rstate_string(const SSL *s)
556 {
557     const char *str;

559     switch (s->rstate)
560     {
561     case SSL_ST_READ_HEADER: str="RH"; break;
562     case SSL_ST_READ_BODY: str="RB"; break;
563     case SSL_ST_READ_DONE: str="RD"; break;
564     default: str="unknown"; break;
565     }
566     return(str);
567 }
```

new/usr/src/lib/openssl/libsunw_ssl/ssl_txt.c

1

```
*****
8704 Fri May 30 18:32:23 2014
new/usr/src/lib/openssl/libsunw_ssl/ssl_txt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/ssl_txt.c */
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58 /* =====
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60 *
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```

new/usr/src/lib/openssl/libsunw_ssl/ssl_txt.c

2

```
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82 * OTHERWISE.
83 */
84
85 #include <stdio.h>
86 #include <openssl/buffer.h>
87 #include "ssl_locl.h"
88
89 #ifndef OPENSSL_NO_FP_API
90 int SSL_SESSION_print_fp(FILE *fp, const SSL_SESSION *x)
91 {
92     BIO *b;
93     int ret;
94
95     if ((b=BIO_new(BIO_s_file_internal())) == NULL)
96     {
97         SSLerr(SSL_F_SSL_SESSION_PRINT_FP,ERR_R_BUF_LIB);
98         return(0);
99     }
100     BIO_set_fp(b,fp,BIO_NOCLOSE);
101     ret=SSL_SESSION_print(b,x);
102     BIO_free(b);
103     return(ret);
104 }
105 #endif
106
107 int SSL_SESSION_print(BIO *bp, const SSL_SESSION *x)
108 {
109     unsigned int i;
110     const char *s;
111
112     if (x == NULL) goto err;
113     if (BIO_puts(bp,"SSL-Session:\n") <= 0) goto err;
114     if (x->ssl_version == SSL2_VERSION)
115         s="SSLv2";
116     else if (x->ssl_version == SSL3_VERSION)
117         s="SSLv3";
118     else if (x->ssl_version == TLS1_2_VERSION)
119         s="TLSv1.2";
120     else if (x->ssl_version == TLS1_1_VERSION)
121         s="TLSv1.1";
122     else if (x->ssl_version == TLS1_VERSION)
123         s="TLSv1";
124     else if (x->ssl_version == DTLS1_VERSION)
125         s="DTLSv1";
126     else if (x->ssl_version == DTLS1_BAD_VER)
127         s="DTLSv1-bad";
```

```

128     else
129         s="unknown";
130     if (BIO_printf(bp,"    Protocol : %s\n",s) <= 0) goto err;

132     if (x->cipher == NULL)
133     {
134         if (((x->cipher_id) & 0xff000000) == 0x02000000)
135         {
136             if (BIO_printf(bp,"    Cipher : %06lX\n",x->cipher_id)
137                 goto err;
138         }
139         else
140         {
141             if (BIO_printf(bp,"    Cipher : %04lX\n",x->cipher_id)
142                 goto err;
143         }
144     }
145     else
146     {
147         if (BIO_printf(bp,"    Cipher : %s\n",((x->cipher == NULL)? "u
148             goto err;
149     }
150     if (BIO_puts(bp,"    Session-ID: ") <= 0) goto err;
151     for (i=0; i<x->session_id_length; i++)
152     {
153         if (BIO_printf(bp,"%02X",x->session_id[i]) <= 0) goto err;
154     }
155     if (BIO_puts(bp,"\n    Session-ID-ctx: ") <= 0) goto err;
156     for (i=0; i<x->sid_ctx_length; i++)
157     {
158         if (BIO_printf(bp,"%02X",x->sid_ctx[i]) <= 0)
159             goto err;
160     }
161     if (BIO_puts(bp,"\n    Master-Key: ") <= 0) goto err;
162     for (i=0; i<(unsigned int)x->master_key_length; i++)
163     {
164         if (BIO_printf(bp,"%02X",x->master_key[i]) <= 0) goto err;
165     }
166     if (BIO_puts(bp,"\n    Key-Arg : ") <= 0) goto err;
167     if (x->key_arg_length == 0)
168     {
169         if (BIO_puts(bp,"None") <= 0) goto err;
170     }
171     else
172     {
173         for (i=0; i<x->key_arg_length; i++)
174         {
175             if (BIO_printf(bp,"%02X",x->key_arg[i]) <= 0) goto err;
176         }
177     }
178     #ifndef OPENSSL_NO_KRB5
179     if (BIO_puts(bp,"\n    Krb5 Principal: ") <= 0) goto err;
180     if (x->krb5_client_princ_len == 0)
181     {
182         if (BIO_puts(bp,"None") <= 0) goto err;
183     }
184     else
185     {
186         for (i=0; i<x->krb5_client_princ_len; i++)
187         {
188             if (BIO_printf(bp,"%02X",x->krb5_client_princ[i]) <= 0)
189                 goto err;
190         }
191     }
192     #endif /* OPENSSL_NO_KRB5 */
193     #ifndef OPENSSL_NO_PSK
194     if (BIO_puts(bp,"\n    PSK identity: ") <= 0) goto err;
195     if (BIO_printf(bp,"%s", x->psk_identity ? x->psk_identity : "None") <=
196         0) goto err;
197     if (BIO_puts(bp,"\n    PSK identity hint: ") <= 0) goto err;
198     if (BIO_printf(bp,"%s", x->psk_identity_hint ? x->psk_identity_hint : "
199         goto err;
200     #endif

```

```

194 #ifndef OPENSSL_NO_SRP
195     if (BIO_puts(bp,"\n    SRP username: ") <= 0) goto err;
196     if (BIO_printf(bp,"%s", x->srp_username ? x->srp_username : "None") <=
197         0) goto err;
198 #endif
199 #ifndef OPENSSL_NO_TLSEXT
200     if (x->tlsext_tick_lifetime_hint)
201     {
202         if (BIO_printf(bp,
203             "\n    TLS session ticket lifetime hint: %ld (seconds)",
204             x->tlsext_tick_lifetime_hint) <= 0)
205             goto err;
206     }
207     if (x->tlsext_tick)
208     {
209         if (BIO_puts(bp,"\n    TLS session ticket:\n") <= 0) goto err;
210         if (BIO_dump_indent(bp, (char *)x->tlsext_tick, x->tlsext_ticklen)
211             <= 0) goto err;
212     }
213 #endif

214 #ifndef OPENSSL_NO_COMP
215     if (x->compress_meth != 0)
216     {
217         SSL_COMP *comp = NULL;

219         ssl_cipher_get_evp(x,NULL,NULL,NULL,NULL,&comp);
220         if (comp == NULL)
221         {
222             if (BIO_printf(bp,"\n    Compression: %d",x->compress_meth)
223                 <= 0) goto err;
224         }
225         else
226         {
227             if (BIO_printf(bp,"\n    Compression: %d (%s)", comp->id,
228                 comp->name) <= 0) goto err;
229         }
230     }
231 #endif
232     if (x->time != 0L)
233     {
234         if (BIO_printf(bp,"\n    Start Time: %ld",x->time) <= 0) goto err;
235     }
236     if (x->timeout != 0L)
237     {
238         if (BIO_printf(bp,"\n    Timeout : %ld (sec)",x->timeout) <=
239             0) goto err;
240     }
241     if (BIO_puts(bp,"\n") <= 0) goto err;

242     if (BIO_puts(bp,"    Verify return code: ") <= 0) goto err;
243     if (BIO_printf(bp,"%ld (%s)\n", x->verify_result,
244         X509_verify_cert_error_string(x->verify_result)) <= 0) goto err;

245     return(1);
246 err:
247     return(0);

```

```

*****
4059 Fri May 30 18:32:23 2014
new/usr/src/lib/openssl/libsunw_ssl/t1_clnt.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/t1_clnt.c */
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57 */
58
59 #include <stdio.h>
60 #include "ssl_locl.h"
61 #include <openssl/buffer.h>

```

```

62 #include <openssl/rand.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65
66 static const SSL_METHOD *tls1_get_client_method(int ver);
67 static const SSL_METHOD *tls1_get_client_method(int ver)
68 {
69     if (ver == TLS1_2_VERSION)
70         return TLSv1_2_client_method();
71     if (ver == TLS1_1_VERSION)
72         return TLSv1_1_client_method();
73     if (ver == TLS1_VERSION)
74         return TLSv1_client_method();
75     return NULL;
76 }
77
78 IMPLEMENT_tls_meth_func(TLS1_2_VERSION, TLSv1_2_client_method,
79                          ssl_undefined_function,
80                          ssl3_connect,
81                          tls1_get_client_method)
82
83 IMPLEMENT_tls_meth_func(TLS1_1_VERSION, TLSv1_1_client_method,
84                          ssl_undefined_function,
85                          ssl3_connect,
86                          tls1_get_client_method)
87
88 IMPLEMENT_tls_meth_func(TLS1_VERSION, TLSv1_client_method,
89                          ssl_undefined_function,
90                          ssl3_connect,
91                          tls1_get_client_method)

```

37438 Fri May 30 18:32:23 2014
 new/usr/src/lib/openssl/libsunw_ssl/t1_enc.c
 4853 illumos-gate is not lint-clean when built with openssl 1.0

```

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```

```

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136 */

138 #include <stdio.h>
139 #include "ssl_locl.h"
140 #ifndef OPENSSL_NO_COMP
141 #include <openssl/comp.h>
142 #endif
143 #include <openssl/evp.h>
144 #include <openssl/hmac.h>
145 #include <openssl/md5.h>
146 #include <openssl/rand.h>
147 #ifdef KSSL_DEBUG
148 #include <openssl/des.h>
149 #endif

151 /* seed1 through seed5 are virtually concatenated */
152 static int tls1_P_hash(const EVP_MD *md, const unsigned char *sec,
153                       int sec_len,
154                       const void *seed1, int seed1_len,
155                       const void *seed2, int seed2_len,
156                       const void *seed3, int seed3_len,
157                       const void *seed4, int seed4_len,
158                       const void *seed5, int seed5_len,
159                       unsigned char *out, int olen)
160 {
161     int chunk;
162     size_t j;
163     EVP_MD_CTX ctx, ctx_tmp;
164     EVP_PKEY *mac_key;
165     unsigned char A1[EVP_MAX_MD_SIZE];
166     size_t A1_len;
167     int ret = 0;
168
169     chunk=EVP_MD_size(md);
170     OPENSSL_assert(chunk >= 0);

172     EVP_MD_CTX_init(&ctx);
173     EVP_MD_CTX_init(&ctx_tmp);
174     EVP_MD_CTX_set_flags(&ctx, EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
175     EVP_MD_CTX_set_flags(&ctx_tmp, EVP_MD_CTX_FLAG_NON_FIPS_ALLOW);
176     mac_key = EVP_PKEY_new_mac_key(EVP_PKEY_HMAC, NULL, sec, sec_len);
177     if (!mac_key)
178         goto err;
179     if (!EVP_DigestSignInit(&ctx,NULL,md, NULL, mac_key))
180         goto err;
181     if (!EVP_DigestSignInit(&ctx_tmp,NULL,md, NULL, mac_key))
182         goto err;
183     if (seed1 && !EVP_DigestSignUpdate(&ctx,seed1,seed1_len))
184         goto err;
185     if (seed2 && !EVP_DigestSignUpdate(&ctx,seed2,seed2_len))
186         goto err;
187     if (seed3 && !EVP_DigestSignUpdate(&ctx,seed3,seed3_len))
188         goto err;
189     if (seed4 && !EVP_DigestSignUpdate(&ctx,seed4,seed4_len))
190         goto err;
191     if (seed5 && !EVP_DigestSignUpdate(&ctx,seed5,seed5_len))
192         goto err;
193     if (!EVP_DigestSignFinal(&ctx,A1,&A1_len))

```

```

194         goto err;

196     for (;;)
197     {
198         /* Reinit mac contexts */
199         if (!EVP_DigestSignInit(&ctx,NULL,md, NULL, mac_key))
200             goto err;
201         if (!EVP_DigestSignInit(&ctx_tmp,NULL,md, NULL, mac_key))
202             goto err;
203         if (!EVP_DigestSignUpdate(&ctx,A1,A1_len))
204             goto err;
205         if (!EVP_DigestSignUpdate(&ctx_tmp,A1,A1_len))
206             goto err;
207         if (seed1 && !EVP_DigestSignUpdate(&ctx,seed1,seed1_len))
208             goto err;
209         if (seed2 && !EVP_DigestSignUpdate(&ctx,seed2,seed2_len))
210             goto err;
211         if (seed3 && !EVP_DigestSignUpdate(&ctx,seed3,seed3_len))
212             goto err;
213         if (seed4 && !EVP_DigestSignUpdate(&ctx,seed4,seed4_len))
214             goto err;
215         if (seed5 && !EVP_DigestSignUpdate(&ctx,seed5,seed5_len))
216             goto err;

218         if (olen > chunk)
219         {
220             if (!EVP_DigestSignFinal(&ctx,out,&j))
221                 goto err;
222             out+=j;
223             olen-=j;
224             /* calc the next A1 value */
225             if (!EVP_DigestSignFinal(&ctx_tmp,A1,&A1_len))
226                 goto err;
227         }
228         else /* last one */
229         {
230             if (!EVP_DigestSignFinal(&ctx,A1,&A1_len))
231                 goto err;
232             memcpy(out,A1,olen);
233             break;
234         }
235     }
236     ret = 1;
237 err:
238     EVP_PKEY_free(mac_key);
239     EVP_MD_CTX_cleanup(&ctx);
240     EVP_MD_CTX_cleanup(&ctx_tmp);
241     OPENSSL_cleanse(A1,sizeof(A1));
242     return ret;
243 }

245 /* seed1 through seed5 are virtually concatenated */
246 static int tls1_PRF(long digest_mask,
247                    const void *seed1, int seed1_len,
248                    const void *seed2, int seed2_len,
249                    const void *seed3, int seed3_len,
250                    const void *seed4, int seed4_len,
251                    const void *seed5, int seed5_len,
252                    const unsigned char *sec, int slen,
253                    unsigned char *out1,
254                    unsigned char *out2, int olen)
255 {
256     int len,i,idx,count;
257     const unsigned char *S1;
258     long m;
259     const EVP_MD *md;

```

```

260     int ret = 0;

262     /* Count number of digests and partition sec evenly */
263     count=0;
264     for (idx=0;ssl_get_handshake_digest(idx,&m,&md);idx++) {
265         if ((m<<TLS1_PRF_DGST_SHIFT) & digest_mask) count++;
266     }
267     len=slen/count;
268     if (count == 1)
269         slen = 0;
270     S1=sec;
271     memset(out1,0,olen);
272     for (idx=0;ssl_get_handshake_digest(idx,&m,&md);idx++) {
273         if ((m<<TLS1_PRF_DGST_SHIFT) & digest_mask) {
274             if (!md) {
275                 SSLerr(SSL_F_TLS1_PRF,
276                     SSL_R_UNSUPPORTED_DIGEST_TYPE);
277                 goto err;
278             }
279             if (!tls1_P_hash(md, S1, len+(slen&1),
280                 seed1, seed1_len, seed2, seed2_len, seed3, se
281                 out2, olen))
282                 goto err;
283             S1+=len;
284             for (i=0; i<olen; i++)
285             {
286                 out1[i]^=out2[i];
287             }
288         }
289     }
290     ret = 1;
291 err:
292     return ret;
293 }
294 static int tls1_generate_key_block(SSL *s, unsigned char *km,
295     unsigned char *tmp, int num)
296 {
297     int ret;
298     ret = tls1_PRF(ssl_get_algorithm2(s),
299         TLS_MD_KEY_EXPANSION_CONST,TLS_MD_KEY_EXPANSION_CONST_SIZE,
300         s->s3->server_random,SSL3_RANDOM_SIZE,
301         s->s3->client_random,SSL3_RANDOM_SIZE,
302         NULL,0,NULL,0,
303         s->session->master_key,s->session->master_key_length,
304         km,tmp,num);
305 #ifdef KSSL_DEBUG
306     printf("tls1_generate_key_block() ==> %d byte master_key =\n\t",
307         s->session->master_key_length);
308     {
309         int i;
310         for (i=0; i < s->session->master_key_length; i++)
311             printf("%02X", s->session->master_key[i]);
312     }
313     printf("\n");
314 #endif /* KSSL_DEBUG */
315     return ret;
316 }
317
319 int tls1_change_cipher_state(SSL *s, int which)
320 {
321     static const unsigned char empty[]="";
322     unsigned char *p,*mac_secret;
323     unsigned char *exp_label;
324     unsigned char tmp1[EVP_MAX_KEY_LENGTH];
325     unsigned char tmp2[EVP_MAX_KEY_LENGTH];

```

```

326     unsigned char iv1[EVP_MAX_IV_LENGTH*2];
327     unsigned char iv2[EVP_MAX_IV_LENGTH*2];
328     unsigned char *ms,*key,*iv;
329     int client_write;
330     EVP_CIPHER_CTX *dd;
331     const EVP_CIPHER *c;
332 #ifndef OPENSSL_NO_COMP
333     const SSL_COMP *comp;
334 #endif
335     const EVP_MD *m;
336     int mac_type;
337     int *mac_secret_size;
338     EVP_MD_CTX *mac_ctx;
339     EVP_PKEY *mac_key;
340     int is_export,n,i,j,k,exp_label_len,cl;
341     int reuse_dd = 0;

343     is_export=SSL_C_IS_EXPORT(s->s3->tmp.new_cipher);
344     c=s->s3->tmp.new_sym_enc;
345     m=s->s3->tmp.new_hash;
346     mac_type = s->s3->tmp.new_mac_pkey_type;
347 #ifndef OPENSSL_NO_COMP
348     comp=s->s3->tmp.new_compression;
349 #endif

351 #ifdef KSSL_DEBUG
352     printf("tls1_change_cipher_state(which= %d) w/\n", which);
353     printf("\talg= %ld/%ld, comp= %p\n",
354         s->s3->tmp.new_cipher->algorithm_mkey,
355         s->s3->tmp.new_cipher->algorithm_auth,
356         comp);
357     printf("\tevp_cipher == %p ==? &dcbc_ede_cipher3\n", c);
358     printf("\tevp_cipher: nid, blksz= %d, %d, keylen=%d, ivlen=%d\n",
359         c->nid,c->block_size,c->key_len,c->iv_len);
360     printf("\tkey_block: len= %d, data= ", s->s3->tmp.key_block_length);
361     {
362         int i;
363         for (i=0; i<s->s3->tmp.key_block_length; i++)
364             printf("%02x", s->s3->tmp.key_block[i]); printf("\n");
365     }
366 #endif /* KSSL_DEBUG */

368     if (which & SSL3_CC_READ)
369     {
370         if (s->s3->tmp.new_cipher->algorithm2 & TLS1_STREAM_MAC)
371             s->mac_flags |= SSL_MAC_FLAG_READ_MAC_STREAM;
372         else
373             s->mac_flags &= ~SSL_MAC_FLAG_READ_MAC_STREAM;

375         if (s->enc_read_ctx != NULL)
376             reuse_dd = 1;
377         else if ((s->enc_read_ctx=OPENSSL_malloc(sizeof(EVP_CIPHER_CTX)))
378             goto err;
379         else
380             /* make sure it's intialized in case we exit later with
381             EVP_CIPHER_CTX_init(s->enc_read_ctx);
382             dd= s->enc_read_ctx;
383             mac_ctx=ssl_replace_hash(&s->read_hash,NULL);
384 #ifndef OPENSSL_NO_COMP
385             if (s->expand != NULL)
386             {
387                 COMP_CTX_free(s->expand);
388                 s->expand=NULL;
389             }
390             if (comp != NULL)
391             {

```

```

392         s->expand=COMP_CTX_new(comp->method);
393         if (s->expand == NULL)
394             {
395                 SSLerr(SSL_F_TLS1_CHANGE_CIPHER_STATE, SSL_R_COMP
396                     goto err2;
397             }
398         if (s->s3->rrec.comp == NULL)
399             s->s3->rrec.comp=(unsigned char *)
400             OPENSSL_malloc(SSL3_RT_MAX_ENCRYPTED_LEN
401         if (s->s3->rrec.comp == NULL)
402             goto err;
403     }
404 #endif
405     /* this is done by dtls1_reset_seq_numbers for DTLS1_VERSION */
406     if (s->version != DTLS1_VERSION)
407         memset(&(s->s3->read_sequence[0]),0,8);
408     mac_secret= &(s->s3->read_mac_secret[0]);
409     mac_secret_size=&(s->s3->read_mac_secret_size);
410 }
411 else
412 {
413     if (s->s3->tmp.new_cipher->algorithm2 & TLS1_STREAM_MAC)
414         s->mac_flags |= SSL_MAC_FLAG_WRITE_MAC_STREAM;
415     else
416         s->mac_flags &= ~SSL_MAC_FLAG_WRITE_MAC_STREAM;
417     if (s->enc_write_ctx != NULL && !SSL_IS_DTLS(s))
418         reuse_dd = 1;
419     else if ((s->enc_write_ctx=EVP_CIPHER_CTX_new()) == NULL)
420         goto err;
421     dd= s->enc_write_ctx;
422     if (SSL_IS_DTLS(s))
423     {
424         mac_ctx = EVP_MD_CTX_create();
425         if (!mac_ctx)
426             goto err;
427         s->write_hash = mac_ctx;
428     }
429     else
430         mac_ctx = ssl_replace_hash(&s->write_hash,NULL);
431 #ifndef OPENSSL_NO_COMP
432     if (s->compress != NULL)
433     {
434         COMP_CTX_free(s->compress);
435         s->compress=NULL;
436     }
437     if (comp != NULL)
438     {
439         s->compress=COMP_CTX_new(comp->method);
440         if (s->compress == NULL)
441             {
442                 SSLerr(SSL_F_TLS1_CHANGE_CIPHER_STATE, SSL_R_COMP
443                     goto err2;
444             }
445     }
446 #endif
447     /* this is done by dtls1_reset_seq_numbers for DTLS1_VERSION */
448     if (s->version != DTLS1_VERSION)
449         memset(&(s->s3->write_sequence[0]),0,8);
450     mac_secret= &(s->s3->write_mac_secret[0]);
451     mac_secret_size = &(s->s3->write_mac_secret_size);
452 }
453
454 if (reuse_dd)
455     EVP_CIPHER_CTX_cleanup(dd);
456
457 p=s->s3->tmp.key_block;

```

```

458     i=*mac_secret_size=s->s3->tmp.new_mac_secret_size;
459
460     cl=EVP_CIPHER_key_length(c);
461     j=is_export ? (cl < SSL_C_EXPORT_KEYLENGTH(s->s3->tmp.new_cipher) ?
462         cl : SSL_C_EXPORT_KEYLENGTH(s->s3->tmp.new_cipher)) : cl;
463     /* Was j=(exp)?5:EVP_CIPHER_key_length(c); */
464     /* If GCM mode only part of IV comes from PRF */
465     if (EVP_CIPHER_mode(c) == EVP_CIPH_GCM_MODE)
466         k = EVP_GCM_TLS_FIXED_IV_LEN;
467     else
468         k=EVP_CIPHER_iv_length(c);
469     if (
470         (which == SSL3_CHANGE_CIPHER_CLIENT_WRITE) ||
471         (which == SSL3_CHANGE_CIPHER_SERVER_READ))
472     {
473         ms= &(p[ 0]); n=i+i;
474         key= &(p[ n]); n+=j+j;
475         iv= &(p[ n]); n+=k+k;
476         exp_label=(unsigned char *)TLS_MD_CLIENT_WRITE_KEY_CONST;
477         exp_label_len=TLS_MD_CLIENT_WRITE_KEY_CONST_SIZE;
478         client_write=1;
479     }
480     else
481     {
482         n=i;
483         ms= &(p[ n]); n+=i+j;
484         key= &(p[ n]); n+=j+k;
485         iv= &(p[ n]); n+=k;
486         exp_label=(unsigned char *)TLS_MD_SERVER_WRITE_KEY_CONST;
487         exp_label_len=TLS_MD_SERVER_WRITE_KEY_CONST_SIZE;
488         client_write=0;
489     }
490     if (n > s->s3->tmp.key_block_length)
491     {
492         SSLerr(SSL_F_TLS1_CHANGE_CIPHER_STATE, ERR_R_INTERNAL_ERROR);
493         goto err2;
494     }
495
496     memcpy(mac_secret,ms,i);
497
498     if (!(EVP_CIPHER_flags(c)&EVP_CIPH_FLAG_AEAD_CIPHER))
499     {
500         mac_key = EVP_PKEY_new_mac_key(mac_type, NULL,
501             mac_secret,*mac_secret_size);
502         EVP_DigestSignInit(mac_ctx,NULL,m,NULL,mac_key);
503         EVP_PKEY_free(mac_key);
504     }
505 #ifdef TLS_DEBUG
506     printf("which = %04X\nmac key=",which);
507     { int z; for (z=0; z<i; z++) printf("%02X%c",ms[z],((z+1)%16)? ' ':'\n'); }
508 #endif
509     if (is_export)
510     {
511         /* In here I set both the read and write key/iv to the
512            * same value since only the correct one will be used :-).
513            */
514         if (!tls1_PRF(ssl_get_algorithm2(s),
515             exp_label,exp_label_len,
516             s->s3->client_random,SSL3_RANDOM_SIZE,
517             s->s3->server_random,SSL3_RANDOM_SIZE,
518             NULL,0,NULL,0,
519             key,j,tmp1,tmp2,EVP_CIPHER_key_length(c)))
520             goto err2;
521         key=tmp1;
522     }
523     if (k > 0)

```

```

524         {
525             if (!tls1_PRF(ssl_get_algorithm2(s),
526                 TLS_MD_IV_BLOCK_CONST, TLS_MD_IV_BLOCK_CO
527                 s->s3->client_random, SSL3_RANDOM_SIZE,
528                 s->s3->server_random, SSL3_RANDOM_SIZE,
529                 NULL, 0, NULL, 0,
530                 empty, 0, iv1, iv2, k*2))
531                 goto err2;
532             if (client_write)
533                 iv=iv1;
534             else
535                 iv= &(iv1[k]);
536         }
537     }

539     s->session->key_arg_length=0;
540 #ifdef KSSL_DEBUG
541     {
542         int i;
543         printf("EVP_CipherInit_ex(dd,c,key=,iv=,which)\n");
544         printf("\tkey= "); for (i=0; i<c->key_len; i++) printf("%02x", key[i]);
545         printf("\n");
546         printf("\t iv= "); for (i=0; i<c->iv_len; i++) printf("%02x", iv[i]);
547         printf("\n");
548     }
549 #endif /* KSSL_DEBUG */

551     if (EVP_CIPHER_mode(c) == EVP_CIPH_GCM_MODE)
552     {
553         EVP_CipherInit_ex(dd,c,NULL,key,NULL,(which & SSL3_CC_WRITE));
554         EVP_CIPHER_CTX_ctrl(dd, EVP_CTRL_GCM_SET_IV_FIXED, k, iv);
555     }
556     else
557         EVP_CipherInit_ex(dd,c,NULL,key,iv,(which & SSL3_CC_WRITE));

559     /* Needed for "composite" AEADs, such as RC4-HMAC-MD5 */
560     if ((EVP_CIPHER_flags(c)&EVP_CIPH_FLAG_AEAD_CIPHER) && *mac_secret_size)
561         EVP_CIPHER_CTX_ctrl(dd,EVP_CTRL_AEAD_SET_MAC_KEY,
562             *mac_secret_size,mac_secret);

564 #ifdef TLS_DEBUG
565     printf("which = %04X\nkey=",which);
566     { int z; for (z=0; z<EVP_CIPHER_key_length(c); z++) printf("%02X%c",key[z],((z+1
567     printf("\niv=");
568     { int z; for (z=0; z<k; z++) printf("%02X%c",iv[z],((z+1)%16)?' ':'\n'); }
569     printf("\n");
570 #endif

572     OPENSSL_cleanse(tmp1,sizeof(tmp1));
573     OPENSSL_cleanse(tmp2,sizeof(tmp1));
574     OPENSSL_cleanse(iv1,sizeof(iv1));
575     OPENSSL_cleanse(iv2,sizeof(iv2));
576     return(1);
577 err:
578     SSLerr(SSL_F_TLS1_CHANGE_CIPHER_STATE,ERR_R_MALLOC_FAILURE);
579 err2:
580     return(0);
581 }

583 int tls1_setup_key_block(SSL *s)
584 {
585     unsigned char *p1,*p2=NULL;
586     const EVP_CIPHER *c;
587     const EVP_MD *hash;
588     int num;
589     SSL_COMP *comp;

```

```

590     int mac_type= NID_undef,mac_secret_size=0;
591     int ret=0;

593 #ifdef KSSL_DEBUG
594     printf ("tls1_setup_key_block()\n");
595 #endif /* KSSL_DEBUG */

597     if (s->s3->tmp.key_block_length != 0)
598         return(1);

600     if (!ssl_cipher_get_evp(s->session,&c,&hash,&mac_type,&mac_secret_size,&
601         {
602             SSLerr(SSL_F_TLS1_SETUP_KEY_BLOCK,SSL_R_CIPHER_OR_HASH_UNAVAILAB
603             return(0);
604         }

606     s->s3->tmp.new_sym_enc=c;
607     s->s3->tmp.new_hash=hash;
608     s->s3->tmp.new_mac_pkey_type = mac_type;
609     s->s3->tmp.new_mac_secret_size = mac_secret_size;
610     num=EVP_CIPHER_key_length(c)+mac_secret_size+EVP_CIPHER_iv_length(c);
611     num*=2;

613     ssl3_cleanup_key_block(s);

615     if ((p1=(unsigned char *)OPENSSL_malloc(num)) == NULL)
616     {
617         SSLerr(SSL_F_TLS1_SETUP_KEY_BLOCK,ERR_R_MALLOC_FAILURE);
618         goto err;
619     }

621     s->s3->tmp.key_block_length=num;
622     s->s3->tmp.key_block=p1;

624     if ((p2=(unsigned char *)OPENSSL_malloc(num)) == NULL)
625     {
626         SSLerr(SSL_F_TLS1_SETUP_KEY_BLOCK,ERR_R_MALLOC_FAILURE);
627         goto err;
628     }

630 #ifdef TLS_DEBUG
631     printf("client random\n");
632     { int z; for (z=0; z<SSL3_RANDOM_SIZE; z++) printf("%02X%c",s->s3->client_random
633     printf("server random\n");
634     { int z; for (z=0; z<SSL3_RANDOM_SIZE; z++) printf("%02X%c",s->s3->server_random
635     printf("pre-master\n");
636     { int z; for (z=0; z<s->session->master_key_length; z++) printf("%02X%c",s->sess
637 #endif
638     if (!tls1_generate_key_block(s,p1,p2,num))
639         goto err;
640 #ifdef TLS_DEBUG
641     printf("\nkey block\n");
642     { int z; for (z=0; z<num; z++) printf("%02X%c",p1[z],((z+1)%16)?' ':'\n'); }
643 #endif

645     if (!(s->options & SSL_OP_DONT_INSERT_EMPTY_FRAGMENTS)
646         && s->method->version <= TLS1_VERSION)
647     {
648         /* enable vulnerability countermeasure for CBC ciphers with
649         * known-IV problem (http://www.openssl.org/~bodo/tls-cbc.txt)
650         */
651         s->s3->need_empty_fragments = 1;

653     if (s->session->cipher != NULL)
654     {
655         if (s->session->cipher->algorithm_enc == SSL_eNULL)

```

```

656         s->s3->need_empty_fragments = 0;
657
658 #ifndef OPENSSSL_NO_RC4
659         if (s->session->cipher->algorithm_enc == SSL_RC4)
660             s->s3->need_empty_fragments = 0;
661 #endif
662     }
663 }
664
665     ret = 1;
666 err:
667     if (p2)
668     {
669         OPENSSL_cleanse(p2,num);
670         OPENSSL_free(p2);
671     }
672     return(ret);
673 }

```

675 /* tls1_enc encrypts/decrypts the record in |s->wrec| / |s->rrec|, respectively.

676 * Returns:

677 * 0: (in non-constant time) if the record is publically invalid (i.e. too short etc).

678 * 1: if the record's padding is valid / the encryption was successful.

681 * -1: if the record's padding/AEAD-authenticator is invalid or, if sending, an internal error ocured.

683 */

```

684 int tls1_enc(SSL *s, int send)
685 {
686     SSL3_RECORD *rec;
687     EVP_CIPHER_CTX *ds;
688     unsigned long l;
689     int bs,i,j,k,pad=0,ret,mac_size=0;
690     const EVP_CIPHER *enc;

```

692 if (send)

```

693     {
694         if (EVP_MD_CTX_md(s->write_hash))
695         {
696             int n=EVP_MD_CTX_size(s->write_hash);
697             OPENSSL_assert(n >= 0);
698         }
699         ds=s->enc_write_ctx;
700         rec= &(s->s3->wrec);
701         if (s->enc_write_ctx == NULL)
702             enc=NULL;
703         else
704         {
705             int ivlen;
706             enc=EVP_CIPHER_CTX_cipher(s->enc_write_ctx);
707             /* For TLSv1.1 and later explicit IV */
708             if (s->version >= TLS1_1_VERSION
709                 && EVP_CIPHER_mode(enc) == EVP_CIPHER_CBC_MODE)
710                 ivlen = EVP_CIPHER_iv_length(enc);
711             else
712                 ivlen = 0;
713             if (ivlen > 1)
714             {
715                 if ( rec->data != rec->input)
716                     /* we can't write into the input stream:
717                      * Can this ever happen?? (steve)
718                      */
719                     fprintf(stderr,
720                         "%s:%d: rec->data != rec->input\
721                         _FILE_, _LINE_);

```

```

722         else if (RAND_bytes(rec->input, ivlen) <= 0)
723             return -1;
724     }
725 }
726
727     else
728     {
729         if (EVP_MD_CTX_md(s->read_hash))
730         {
731             int n=EVP_MD_CTX_size(s->read_hash);
732             OPENSSL_assert(n >= 0);
733         }
734         ds=s->enc_read_ctx;
735         rec= &(s->s3->rrec);
736         if (s->enc_read_ctx == NULL)
737             enc=NULL;
738         else
739             enc=EVP_CIPHER_CTX_cipher(s->enc_read_ctx);
740     }

```

742 #ifdef KSSL_DEBUG

```

743     printf("tls1_enc(%d)\n", send);
744 #endif
    /* KSSL_DEBUG */

```

746 if ((s->session == NULL) || (ds == NULL) || (enc == NULL))

```

747     {
748         memmove(rec->data,rec->input,rec->length);
749         rec->input=rec->data;
750         ret = 1;
751     }
752     else
753     {
754         l=rec->length;
755         bs=EVP_CIPHER_block_size(ds->cipher);

```

757 if (EVP_CIPHER_flags(ds->cipher)&EVP_CIPHER_FLAG_AEAD_CIPHER)

```

758         {
759             unsigned char buf[13],*seq;

```

761 seq = send?s->s3->write_sequence:s->s3->read_sequence;

763 if (s->version == DTLS1_VERSION || s->version == DTLS1_B

```

764             {
765                 unsigned char dtlsseq[9],*p=dtlsseq;

```

767 s2n(send?s->d1->w_epoch:s->d1->r_epoch,p);

```

768                 memcpy(p,&seq[2],6);
769                 memcpy(buf,dtlsseq,8);
770             }
771             else
772             {
773                 memcpy(buf,seq,8);
774                 for (i=7; i>=0; i--) /* increment */
775                 {
776                     ++seq[i];
777                     if (seq[i] != 0) break;
778                 }
779             }

```

781 buf[8]=rec->type;

```

782             buf[9]=(unsigned char)(s->version>>8);
783             buf[10]=(unsigned char)(s->version);
784             buf[11]=rec->length>>8;
785             buf[12]=rec->length&0xff;
786             pad=EVP_CIPHER_CTX_ctrl(ds,EVP_CTRL_AEAD_TLS1_AAD,13,buf
787             if (send)

```

```

788         {
789             l+=pad;
790             rec->length+=pad;
791         }
792     }
793     else if ((bs != 1) && send)
794     {
795         i=bs-((int)l%bs);
796
797         /* Add weird padding of upto 256 bytes */
798
799         /* we need to add 'i' padding bytes of value j */
800         j=i-1;
801         if (s->options & SSL_OP_TLS_BLOCK_PADDING_BUG)
802         {
803             if (s->s3->flags & TLS1_FLAGS_TLS_PADDING_BUG)
804                 j++;
805         }
806         for (k=(int)l; k<(int)(l+i); k++)
807             rec->input[k]=j;
808         l+=i;
809         rec->length+=i;
810     }
811
812 #ifdef KSSL_DEBUG
813 {
814     unsigned long ui;
815     printf("EVP_Cipher(ds=%p,rec->data=%p,rec->input=%p,l=%ld) ==>\n",
816           ds,rec->data,rec->input,l);
817     printf("\tEVP_CIPHER_CTX: %d buf_len, %d key_len [%d %d], %d iv_
818           ds->buf_len, ds->cipher->key_len,
819           DES_KEY_SZ, DES_SCHEDULE_SZ,
820           ds->cipher->iv_len);
821     printf("\t\tIV: ");
822     for (i=0; i<ds->cipher->iv_len; i++) printf("%02X", ds->iv[i]);
823     printf("\n");
824     printf("\trec->input=");
825     for (ui=0; ui<l; ui++) printf(" %02x", rec->input[ui]);
826     printf("\n");
827 }
828 #endif /* KSSL_DEBUG */
829
830 if (!send)
831 {
832     if (l == 0 || l%bs != 0)
833         return 0;
834 }
835
836 i = EVP_Cipher(ds,rec->data,rec->input,l);
837 if ((EVP_CIPHER_flags(ds->cipher)&EVP_CIPHER_FLAG_CUSTOM_CIPHER)
838     ?(i<0)
839     :(i==0))
840     return -1; /* AEAD can fail to verify MAC */
841 if (EVP_CIPHER_mode(enc) == EVP_CIPHER_GCM_MODE && !send)
842 {
843     rec->data += EVP_GCM_TLS_EXPLICIT_IV_LEN;
844     rec->input += EVP_GCM_TLS_EXPLICIT_IV_LEN;
845     rec->length -= EVP_GCM_TLS_EXPLICIT_IV_LEN;
846 }
847
848 #ifdef KSSL_DEBUG
849 {
850     unsigned long i;
851     printf("\trec->data=");
852     for (i=0; i<l; i++)
853         printf(" %02x", rec->data[i]); printf("\n");

```

```

854     }
855 #endif /* KSSL_DEBUG */
856
857     ret = 1;
858     if (EVP_MD_CTX_md(s->read_hash) != NULL)
859         mac_size = EVP_MD_CTX_size(s->read_hash);
860     if ((bs != 1) && !send)
861         ret = tls1_cbc_remove_padding(s, rec, bs, mac_size);
862     if (pad && !send)
863         rec->length -= pad;
864 }
865 return ret;
866 }
867
868 int tls1_cert_verify_mac(SSL *s, int md_nid, unsigned char *out)
869 {
870     unsigned int ret;
871     EVP_MD_CTX ctx, *d=NULL;
872     int i;
873
874     if (s->s3->handshake_buffer)
875         if (!ssl3_digest_cached_records(s))
876             return 0;
877
878     for (i=0;i<SSL_MAX_DIGEST;i++)
879     {
880         if (s->s3->handshake_dgst[i]&&EVP_MD_CTX_type(s->s3->handshake
881             {
882                 d=s->s3->handshake_dgst[i];
883                 break;
884             }
885         )
886     {
887         if (!d) {
888             SSLerr(SSL_F_TLS1_CERT_VERIFY_MAC,SSL_R_NO_REQUIRED_DIGEST);
889             return 0;
890         }
891
892         EVP_MD_CTX_init(&ctx);
893         EVP_MD_CTX_copy_ex(&ctx,d);
894         EVP_DigestFinal_ex(&ctx,out,&ret);
895         EVP_MD_CTX_cleanup(&ctx);
896         return((int)ret);
897     }
898 }
899
900 int tls1_final_finish_mac(SSL *s,
901     const char *str, int slen, unsigned char *out)
902 {
903     unsigned int i;
904     EVP_MD_CTX ctx;
905     unsigned char buf[2*EVP_MAX_MD_SIZE];
906     unsigned char *q,buf2[12];
907     int idx;
908     long mask;
909     int err=0;
910     const EVP_MD *md;
911
912     q=buf;
913
914     if (s->s3->handshake_buffer)
915         if (!ssl3_digest_cached_records(s))
916             return 0;
917
918     EVP_MD_CTX_init(&ctx);
919
920     for (idx=0;ssl_get_handshake_digest(idx,&mask,&md);idx++)
921     {

```

```

920         if (mask & ssl_get_algorithm2(s))
921         {
922             int hashsize = EVP_MD_size(md);
923             EVP_MD_CTX *hdgst = s->s3->handshake_dgst[idx];
924             if (!hdgst || hashsize < 0 || hashsize > (int)(sizeof bu
925             {
926                 /* internal error: 'buf' is too small for this c
927                 err = 1;
928             }
929         else
930         {
931             if (!EVP_MD_CTX_copy_ex(&ctx, hdgst) ||
932             !EVP_DigestFinal_ex(&ctx,q,&i) ||
933             (i != (unsigned int)hashsize))
934                 err = 1;
935             q+=hashsize;
936         }
937     }
938 }
939
940 if (!tls1_PRf(ssl_get_algorithm2(s),
941 str,slen, buf,(int)(q-buf), NULL,0, NULL,0, NULL,0,
942 s->session->master_key,s->session->master_key_length,
943 out,buf2,sizeof buf2))
944     err = 1;
945 EVP_MD_CTX_cleanup(&ctx);
946
947 if (err)
948     return 0;
949 else
950     return sizeof buf2;
951 }
952
953 int tls1_mac(SSL *ssl, unsigned char *md, int send)
954 {
955     SSL3_RECORD *rec;
956     unsigned char *seq;
957     EVP_MD_CTX *hash;
958     size_t md_size, orig_len;
959     int i;
960     EVP_MD_CTX hmac, *mac_ctx;
961     unsigned char header[13];
962     int stream_mac = (send?(ssl->mac_flags & SSL_MAC_FLAG_WRITE_MAC_STREAM):
963     int t;
964
965     if (send)
966     {
967         rec = &(ssl->s3->wrec);
968         seq = &(ssl->s3->write_sequence[0]);
969         hash=ssl->write_hash;
970     }
971     else
972     {
973         rec = &(ssl->s3->rrec);
974         seq = &(ssl->s3->read_sequence[0]);
975         hash=ssl->read_hash;
976     }
977
978     t=EVP_MD_CTX_size(hash);
979     OPENSSL_assert(t >= 0);
980     md_size=t;
981
982     /* I should fix this up TLS TLS TLS TLS XXXXXXXX */
983     if (stream_mac)
984     {
985         mac_ctx = hash;

```

```

986     }
987     else
988     {
989         if (!EVP_MD_CTX_copy(&hmac,hash))
990             return -1;
991         mac_ctx = &hmac;
992     }
993
994     if (ssl->version == DTLS1_VERSION || ssl->version == DTLS1_BAD_VER)
995     {
996         unsigned char dtlsseq[8],*p=dtlsseq;
997
998         s2n(send?ssl->d1->w_epoch:ssl->d1->r_epoch, p);
999         memcpy(p,&seq[2],6);
1000
1001         memcpy(header, dtlsseq, 8);
1002     }
1003     else
1004         memcpy(header, seq, 8);
1005
1006     /* kludge: tls1_cbc_remove_padding passes padding length in rec->type */
1007     orig_len = rec->length+md_size+((unsigned int)rec->type>>8);
1008     rec->type &= 0xff;
1009
1010     header[8]=rec->type;
1011     header[9]=(unsigned char)(ssl->version>>8);
1012     header[10]=(unsigned char)(ssl->version);
1013     header[11]=(rec->length)>>8;
1014     header[12]=(rec->length)&0xff;
1015
1016     if (!send &&
1017         EVP_CIPHER_CTX_mode(ssl->enc_read_ctx) == EVP_CIPH_CBC_MODE &&
1018         ssl3_cbc_record_digest_supported(mac_ctx))
1019     {
1020         /* This is a CBC-encrypted record. We must avoid leaking any
1021         * timing-side channel information about how many blocks of
1022         * data we are hashing because that gives an attacker a
1023         * timing-oracle. */
1024         ssl3_cbc_digest_record(
1025             mac_ctx,
1026             md,&md_size,
1027             header, rec->input,
1028             rec->length + md_size, orig_len,
1029             ssl->s3->read_mac_secret,
1030             ssl->s3->read_mac_secret_size,
1031             0 /* not SSLv3 */);
1032     }
1033     else
1034     {
1035         EVP_DigestSignUpdate(mac_ctx,header,sizeof(header));
1036         EVP_DigestSignUpdate(mac_ctx,rec->input,rec->length);
1037         t=EVP_DigestSignFinal(mac_ctx,md,&md_size);
1038         OPENSSL_assert(t > 0);
1039 #ifdef OPENSSL_FIPS
1040         if (!send && FIPS_mode())
1041             tls_fips_digest_extra(
1042                 ssl->enc_read_ctx,
1043                 mac_ctx, rec->input,
1044                 rec->length, orig_len);
1045 #endif
1046     }
1047
1048     if (!stream_mac)
1049         EVP_MD_CTX_cleanup(&hmac);
1050 #ifdef TLS_DEBUG
1051     printf("sec=");

```



```

1052 {unsigned int z; for (z=0; z<md_size; z++) printf("%02X ",mac_sec[z]); printf("\n");
1053 printf("seq=");
1054 {int z; for (z=0; z<8; z++) printf("%02X ",seq[z]); printf("\n"); }
1055 printf("buf=");
1056 {int z; for (z=0; z<5; z++) printf("%02X ",buf[z]); printf("\n"); }
1057 printf("rec=");
1058 {unsigned int z; for (z=0; z<rec->length; z++) printf("%02X ",buf[z]); printf("\n");
1059 #endif

1061     if (ssl->version != DTLS1_VERSION && ssl->version != DTLS1_BAD_VER)
1062     {
1063         for (i=7; i>=0; i--)
1064         {
1065             ++seq[i];
1066             if (seq[i] != 0) break;
1067         }
1068     }

1070 #ifdef TLS_DEBUG
1071 {unsigned int z; for (z=0; z<md_size; z++) printf("%02X ",md[z]); printf("\n");
1072 #endif
1073     return(md_size);
1074 }

1076 int tls1_generate_master_secret(SSL *s, unsigned char *out, unsigned char *p,
1077                                int len)
1078 {
1079     unsigned char buff[SSL_MAX_MASTER_KEY_LENGTH];
1080     const void *co = NULL, *so = NULL;
1081     int col = 0, sol = 0;

1084 #ifdef KSSL_DEBUG
1085     printf ("tls1_generate_master_secret(%p,%p, %p, %d)\n", s,out, p,len);
1086 #endif /* KSSL_DEBUG */

1088 #ifdef TLSEXT_TYPE_opaque_prf_input
1089     if (s->s3->client_opaque_prf_input != NULL && s->s3->server_opaque_prf_input
1090         s->s3->client_opaque_prf_input_len > 0 &&
1091         s->s3->client_opaque_prf_input_len == s->s3->server_opaque_prf_input
1092         {
1093         co = s->s3->client_opaque_prf_input;
1094         col = s->s3->server_opaque_prf_input_len;
1095         so = s->s3->server_opaque_prf_input;
1096         sol = s->s3->client_opaque_prf_input_len; /* must be same as col */
1097     }
1098 #endif

1100     tls1_PRF(ssl_get_algorithm2(s),
1101              TLS_MD_MASTER_SECRET_CONST,TLS_MD_MASTER_SECRET_CONST_SIZE,
1102              s->s3->client_random,SSL3_RANDOM_SIZE,
1103              co, col,
1104              s->s3->server_random,SSL3_RANDOM_SIZE,
1105              so, sol,
1106              p, len,
1107              s->session->master_key,buff,sizeof buff);

1108 #ifdef SSL_DEBUG
1109     fprintf(stderr, "Premaster Secret:\n");
1110     BIO_dump_fp(stderr, (char *)p, len);
1111     fprintf(stderr, "Client Random:\n");
1112     BIO_dump_fp(stderr, (char *)s->s3->client_random, SSL3_RANDOM_SIZE);
1113     fprintf(stderr, "Server Random:\n");
1114     BIO_dump_fp(stderr, (char *)s->s3->server_random, SSL3_RANDOM_SIZE);
1115     fprintf(stderr, "Master Secret:\n");
1116     BIO_dump_fp(stderr, (char *)s->session->master_key, SSL3_MASTER_SECRET_S
1117 #endif

```

```

1119 #ifdef KSSL_DEBUG
1120     printf ("tls1_generate_master_secret() complete\n");
1121 #endif /* KSSL_DEBUG */
1122     return(SSL3_MASTER_SECRET_SIZE);
1123 }

1125 int tls1_export_keying_material(SSL *s, unsigned char *out, size_t olen,
1126                                const char *label, size_t llen, const unsigned char *context,
1127                                size_t contextlen, int use_context)
1128 {
1129     unsigned char *buff;
1130     unsigned char *val = NULL;
1131     size_t vallen, currentvalpos;
1132     int rv;

1134 #ifdef KSSL_DEBUG
1135     printf ("tls1_export_keying_material(%p,%p,%d,%s,%d,%p,%d)\n", s, out, o
1136 #endif /* KSSL_DEBUG */

1138     buff = OPENSSL_malloc(olen);
1139     if (buff == NULL) goto err2;

1141     /* construct PRF arguments
1142     * we construct the PRF argument ourself rather than passing separate
1143     * values into the TLS PRF to ensure that the concatenation of values
1144     * does not create a prohibited label.
1145     */
1146     vallen = llen + SSL3_RANDOM_SIZE * 2;
1147     if (use_context)
1148     {
1149         vallen += 2 + contextlen;
1150     }

1152     val = OPENSSL_malloc(vallen);
1153     if (val == NULL) goto err2;
1154     currentvalpos = 0;
1155     memcpy(val + currentvalpos, (unsigned char *) label, llen);
1156     currentvalpos += llen;
1157     memcpy(val + currentvalpos, s->s3->client_random, SSL3_RANDOM_SIZE);
1158     currentvalpos += SSL3_RANDOM_SIZE;
1159     memcpy(val + currentvalpos, s->s3->server_random, SSL3_RANDOM_SIZE);
1160     currentvalpos += SSL3_RANDOM_SIZE;

1162     if (use_context)
1163     {
1164         val[currentvalpos] = (contextlen >> 8) & 0xff;
1165         currentvalpos++;
1166         val[currentvalpos] = contextlen & 0xff;
1167         currentvalpos++;
1168         if ((contextlen > 0) || (context != NULL))
1169         {
1170             memcpy(val + currentvalpos, context, contextlen);
1171         }
1172     }

1174     /* disallow prohibited labels
1175     * note that SSL3_RANDOM_SIZE > max(prohibited label len) =
1176     * 15, so size of val > max(prohibited label len) = 15 and the
1177     * comparisons won't have buffer overflow
1178     */
1179     if (memcmp(val, TLS_MD_CLIENT_FINISH_CONST,
1180               TLS_MD_CLIENT_FINISH_CONST_SIZE) == 0) goto err1;
1181     if (memcmp(val, TLS_MD_SERVER_FINISH_CONST,
1182               TLS_MD_SERVER_FINISH_CONST_SIZE) == 0) goto err1;
1183     if (memcmp(val, TLS_MD_MASTER_SECRET_CONST,

```

```

1184         TLS_MD_MASTER_SECRET_CONST_SIZE) == 0) goto err1;
1185     if (memcmp(val, TLS_MD_KEY_EXPANSION_CONST,
1186         TLS_MD_KEY_EXPANSION_CONST_SIZE) == 0) goto err1;
1188     rv = tls1_PRF(s->s3->tmp.new_cipher->algorithm2,
1189         val, vallen,
1190         NULL, 0,
1191         NULL, 0,
1192         NULL, 0,
1193         NULL, 0,
1194         s->session->master_key, s->session->master_key_length,
1195         out, buff, olen);
1197 #ifdef KSSL_DEBUG
1198     printf("tls1_export_keying_material() complete\n");
1199 #endif
1200     goto ret;
1201 err1:
1202     SSLerr(SSL_F_TLS1_EXPORT_KEYING_MATERIAL, SSL_R_TLS_ILLEGAL_EXPORTER_LABEL,
1203         rv = 0;
1204         goto ret;
1205 err2:
1206     SSLerr(SSL_F_TLS1_EXPORT_KEYING_MATERIAL, ERR_R_MALLOC_FAILURE);
1207     rv = 0;
1208 ret:
1209     if (buff != NULL) OPENSSL_free(buff);
1210     if (val != NULL) OPENSSL_free(val);
1211     return(rv);
1212 }
1214 int tls1_alert_code(int code)
1215 {
1216     switch (code)
1217     {
1218     case SSL_AD_CLOSE_NOTIFY: return(SSL3_AD_CLOSE_NOTIFY);
1219     case SSL_AD_UNEXPECTED_MESSAGE: return(SSL3_AD_UNEXPECTED_MESSAGE);
1220     case SSL_AD_BAD_RECORD_MAC: return(SSL3_AD_BAD_RECORD_MAC);
1221     case SSL_AD_DECRYPTION_FAILED: return(TLS1_AD_DECRYPTION_FAILED);
1222     case SSL_AD_RECORD_OVERFLOW: return(TLS1_AD_RECORD_OVERFLOW);
1223     case SSL_AD_DECOMPRESSION_FAILURE: return(SSL3_AD_DECOMPRESSION_FAILURE);
1224     case SSL_AD_HANDSHAKE_FAILURE: return(SSL3_AD_HANDSHAKE_FAILURE);
1225     case SSL_AD_NO_CERTIFICATE: return(-1);
1226     case SSL_AD_BAD_CERTIFICATE: return(SSL3_AD_BAD_CERTIFICATE);
1227     case SSL_AD_UNSUPPORTED_CERTIFICATE: return(SSL3_AD_UNSUPPORTED_CERTIFICATE);
1228     case SSL_AD_CERTIFICATE_REVOKED: return(SSL3_AD_CERTIFICATE_REVOKED);
1229     case SSL_AD_CERTIFICATE_EXPIRED: return(SSL3_AD_CERTIFICATE_EXPIRED);
1230     case SSL_AD_CERTIFICATE_UNKNOWN: return(SSL3_AD_CERTIFICATE_UNKNOWN);
1231     case SSL_AD_ILLEGAL_PARAMETER: return(SSL3_AD_ILLEGAL_PARAMETER);
1232     case SSL_AD_UNKNOWN_CA: return(TLS1_AD_UNKNOWN_CA);
1233     case SSL_AD_ACCESS_DENIED: return(TLS1_AD_ACCESS_DENIED);
1234     case SSL_AD_DECODE_ERROR: return(TLS1_AD_DECODE_ERROR);
1235     case SSL_AD_DECRYPT_ERROR: return(TLS1_AD_DECRYPT_ERROR);
1236     case SSL_AD_EXPORT_RESTRICTION: return(TLS1_AD_EXPORT_RESTRICTION);
1237     case SSL_AD_PROTOCOL_VERSION: return(TLS1_AD_PROTOCOL_VERSION);
1238     case SSL_AD_INSUFFICIENT_SECURITY: return(TLS1_AD_INSUFFICIENT_SECURITY);
1239     case SSL_AD_INTERNAL_ERROR: return(TLS1_AD_INTERNAL_ERROR);
1240     case SSL_AD_USER_CANCELLED: return(TLS1_AD_USER_CANCELLED);
1241     case SSL_AD_NO_RENEGOTIATION: return(TLS1_AD_NO_RENEGOTIATION);
1242     case SSL_AD_UNSUPPORTED_EXTENSION: return(TLS1_AD_UNSUPPORTED_EXTENSION);
1243     case SSL_AD_CERTIFICATE_UNOBTAINABLE: return(TLS1_AD_CERTIFICATE_UNOBTAINABLE);
1244     case SSL_AD_UNRECOGNIZED_NAME: return(TLS1_AD_UNRECOGNIZED_NAME);
1245     case SSL_AD_BAD_CERTIFICATE_STATUS_RESPONSE: return(TLS1_AD_BAD_CERTIFICATE_STATUS_RESPONSE);
1246     case SSL_AD_BAD_CERTIFICATE_HASH_VALUE: return(TLS1_AD_BAD_CERTIFICATE_HASH_VALUE);
1247     case SSL_AD_UNKNOWN_PSK_IDENTITY: return(TLS1_AD_UNKNOWN_PSK_IDENTITY);
1248 #if 0 /* not appropriate for TLS, not used for DTLS */
1249     case DTLS1_AD_MISSING_HANDSHAKE_MESSAGE: return

```

```

1250                                     (DTLS1_AD_MISSING_HANDSHAKE_MESSAGE);
1251 #endif
1252     default: return(-1);
1253     }
1254 }

```



```

128 SSL3_ENC_METHOD TLsv1_enc_data={
129     tls1_enc,
130     tls1_mac,
131     tls1_setup_key_block,
132     tls1_generate_master_secret,
133     tls1_change_cipher_state,
134     tls1_final_finish_mac,
135     TLS1_FINISH_MAC_LENGTH,
136     tls1_cert_verify_mac,
137     TLS_MD_CLIENT_FINISH_CONST, TLS_MD_CLIENT_FINISH_CONST_SIZE,
138     TLS_MD_SERVER_FINISH_CONST, TLS_MD_SERVER_FINISH_CONST_SIZE,
139     tls1_alert_code,
140     tls1_export_keying_material,
141 };

143 long tls1_default_timeout(void)
144 {
145     /* 2 hours, the 24 hours mentioned in the TLsv1 spec
146      * is way too long for http, the cache would over fill */
147     return(60*60*2);
148 }

150 int tls1_new(SSL *s)
151 {
152     if (!ssl3_new(s)) return(0);
153     s->method->ssl_clear(s);
154     return(1);
155 }

157 void tls1_free(SSL *s)
158 {
159 #ifndef OPENSSL_NO_TLSEXT
160     if (s->tlsext_session_ticket)
161     {
162         OPENSSL_free(s->tlsext_session_ticket);
163     }
164 #endif /* OPENSSL_NO_TLSEXT */
165     ssl3_free(s);
166 }

168 void tls1_clear(SSL *s)
169 {
170     ssl3_clear(s);
171     s->version = s->method->version;
172 }

174 #ifndef OPENSSL_NO_EC
176 static int nid_list[] =
177 {
178     NID_sect163k1, /* sect163k1 (1) */
179     NID_sect163r1, /* sect163r1 (2) */
180     NID_sect163r2, /* sect163r2 (3) */
181     NID_sect193r1, /* sect193r1 (4) */
182     NID_sect193r2, /* sect193r2 (5) */
183     NID_sect233k1, /* sect233k1 (6) */
184     NID_sect233r1, /* sect233r1 (7) */
185     NID_sect239k1, /* sect239k1 (8) */
186     NID_sect283k1, /* sect283k1 (9) */
187     NID_sect283r1, /* sect283r1 (10) */
188     NID_sect409k1, /* sect409k1 (11) */
189     NID_sect409r1, /* sect409r1 (12) */
190     NID_sect571k1, /* sect571k1 (13) */
191     NID_sect571r1, /* sect571r1 (14) */
192     NID_secp160k1, /* secp160k1 (15) */
193     NID_secp160r1, /* secp160r1 (16) */

```

```

194     NID_secp160r2, /* secp160r2 (17) */
195     NID_secp192k1, /* secp192k1 (18) */
196     NID_X9_62_prime192v1, /* secp192r1 (19) */
197     NID_secp224k1, /* secp224k1 (20) */
198     NID_secp224r1, /* secp224r1 (21) */
199     NID_secp256k1, /* secp256k1 (22) */
200     NID_X9_62_prime256v1, /* secp256r1 (23) */
201     NID_secp384r1, /* secp384r1 (24) */
202     NID_secp521r1 /* secp521r1 (25) */
203 };

205 static int pref_list[] =
206 {
207     NID_sect571r1, /* sect571r1 (14) */
208     NID_sect571k1, /* sect571k1 (13) */
209     NID_secp521r1, /* secp521r1 (25) */
210     NID_sect409k1, /* sect409k1 (11) */
211     NID_sect409r1, /* sect409r1 (12) */
212     NID_secp384r1, /* secp384r1 (24) */
213     NID_sect283k1, /* sect283k1 (9) */
214     NID_sect283r1, /* sect283r1 (10) */
215     NID_secp256k1, /* secp256k1 (22) */
216     NID_X9_62_prime256v1, /* secp256r1 (23) */
217     NID_sect239k1, /* sect239k1 (8) */
218     NID_sect233k1, /* sect233k1 (6) */
219     NID_sect233r1, /* sect233r1 (7) */
220     NID_secp224k1, /* secp224k1 (20) */
221     NID_secp224r1, /* secp224r1 (21) */
222     NID_sect193r1, /* sect193r1 (4) */
223     NID_sect193r2, /* sect193r2 (5) */
224     NID_secp192k1, /* secp192k1 (18) */
225     NID_X9_62_prime192v1, /* secp192r1 (19) */
226     NID_sect163k1, /* sect163k1 (1) */
227     NID_sect163r1, /* sect163r1 (2) */
228     NID_sect163r2, /* sect163r2 (3) */
229     NID_secp160k1, /* secp160k1 (15) */
230     NID_secp160r1, /* secp160r1 (16) */
231     NID_secp160r2, /* secp160r2 (17) */
232 };

234 int tls1_ec_curve_id2nid(int curve_id)
235 {
236     /* ECC curves from draft-ietf-tls-ecc-12.txt (Oct. 17, 2005) */
237     if ((curve_id < 1) || ((unsigned int)curve_id >
238         sizeof(nid_list)/sizeof(nid_list[0])))
239         return 0;
240     return nid_list[curve_id-1];
241 }

243 int tls1_ec_nid2curve_id(int nid)
244 {
245     /* ECC curves from draft-ietf-tls-ecc-12.txt (Oct. 17, 2005) */
246     switch (nid)
247     {
248     case NID_sect163k1: /* sect163k1 (1) */
249         return 1;
250     case NID_sect163r1: /* sect163r1 (2) */
251         return 2;
252     case NID_sect163r2: /* sect163r2 (3) */
253         return 3;
254     case NID_sect193r1: /* sect193r1 (4) */
255         return 4;
256     case NID_sect193r2: /* sect193r2 (5) */
257         return 5;
258     case NID_sect233k1: /* sect233k1 (6) */
259         return 6;

```

```

260     case NID_sect233r1: /* sect233r1 (7) */
261         return 7;
262     case NID_sect239k1: /* sect239k1 (8) */
263         return 8;
264     case NID_sect283k1: /* sect283k1 (9) */
265         return 9;
266     case NID_sect283r1: /* sect283r1 (10) */
267         return 10;
268     case NID_sect409k1: /* sect409k1 (11) */
269         return 11;
270     case NID_sect409r1: /* sect409r1 (12) */
271         return 12;
272     case NID_sect571k1: /* sect571k1 (13) */
273         return 13;
274     case NID_sect571r1: /* sect571r1 (14) */
275         return 14;
276     case NID_secp160k1: /* secp160k1 (15) */
277         return 15;
278     case NID_secp160r1: /* secp160r1 (16) */
279         return 16;
280     case NID_secp160r2: /* secp160r2 (17) */
281         return 17;
282     case NID_secp192k1: /* secp192k1 (18) */
283         return 18;
284     case NID_X9_62_prime192v1: /* secp192r1 (19) */
285         return 19;
286     case NID_secp224k1: /* secp224k1 (20) */
287         return 20;
288     case NID_secp224r1: /* secp224r1 (21) */
289         return 21;
290     case NID_secp256k1: /* secp256k1 (22) */
291         return 22;
292     case NID_X9_62_prime256v1: /* secp256r1 (23) */
293         return 23;
294     case NID_secp384r1: /* secp384r1 (24) */
295         return 24;
296     case NID_secp521r1: /* secp521r1 (25) */
297         return 25;
298     default:
299         return 0;
300     }
301 }
302 #endif /* OPENSSL_NO_EC */

304 #ifndef OPENSSL_NO_TLSEXT

306 /* List of supported signature algorithms and hashes. Should make this
307  * customisable at some point, for now include everything we support.
308  */

310 #ifdef OPENSSL_NO_RSA
311 #define tlsext_sigalg_rsa(md) /* */
312 #else
313 #define tlsext_sigalg_rsa(md) md, TLSEXT_signature_rsa,
314 #endif

316 #ifdef OPENSSL_NO_DSA
317 #define tlsext_sigalg_dsa(md) /* */
318 #else
319 #define tlsext_sigalg_dsa(md) md, TLSEXT_signature_dsa,
320 #endif

322 #ifdef OPENSSL_NO_ECDSA
323 #define tlsext_sigalg_ecdsa(md) /* */
324 #else
325 #define tlsext_sigalg_ecdsa(md) md, TLSEXT_signature_ecdsa,

```

```

326 #endif

328 #define tlsext_sigalg(md) \
329     tlsext_sigalg_rsa(md) \
330     tlsext_sigalg_dsa(md) \
331     tlsext_sigalg_ecdsa(md)

333 static unsigned char tls12_sigalgs[] = {
334 #ifndef OPENSSL_NO_SHA512
335     tlsext_sigalg(TLSEXT_hash_sha512)
336     tlsext_sigalg(TLSEXT_hash_sha384)
337 #endif
338 #ifndef OPENSSL_NO_SHA256
339     tlsext_sigalg(TLSEXT_hash_sha256)
340     tlsext_sigalg(TLSEXT_hash_sha224)
341 #endif
342 #ifndef OPENSSL_NO_SHA
343     tlsext_sigalg(TLSEXT_hash_sha1)
344 #endif
345 };

347 int tls12_get_req_sig_algs(SSL *s, unsigned char *p)
348 {
349     size_t slen = sizeof(tls12_sigalgs);
350     if (p)
351         memcpy(p, tls12_sigalgs, slen);
352     return (int)slen;
353 }

355 unsigned char *ssl_add_clienthello_tlsext(SSL *s, unsigned char *p, unsigned cha
356 {
357     int extdatalen=0;
358     unsigned char *ret = p;

360     /* don't add extensions for SSLv3 unless doing secure renegotiation */
361     if (s->client_version == SSL3_VERSION
362         && !s->s3->send_connection_binding)
363         return p;

365     ret+=2;

367     if (ret>=limit) return NULL; /* this really never occurs, but ... */

369     if (s->tlsext_hostname != NULL)
370     {
371         /* Add TLS extension servername to the Client Hello message */
372         unsigned long size_str;
373         long lenmax;

375         /* check for enough space.
376          * 4 for the servername type and extension length
377          * 2 for servernamelist length
378          * 1 for the hostname type
379          * 2 for hostname length
380          * + hostname length
381          */
382
383         if ((lenmax = limit - ret - 9) < 0
384             || (size_str = strlen(s->tlsext_hostname)) > (unsigned long)
385                 return NULL;

386
387         /* extension type and length */
388         s2n(TLSEXT_TYPE_server_name,ret);
389         s2n(size_str+5,ret);
390
391         /* length of servername list */

```

```

392         s2n(size_str+3,ret);
393
394         /* hostname type, length and hostname */
395         *(ret++) = (unsigned char) TLSEXT_NAMETYPE_host_name;
396         s2n(size_str,ret);
397         memcpy(ret, s->tlsext_hostname, size_str);
398         ret+=size_str;
399     }
401
402     /* Add RI if renegotiating */
403     if (s->renegotiate)
404     {
405         int el;
406
407         if(!ssl_add_clienthello_renegotiate_ext(s, 0, &el, 0))
408         {
409             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT, ERR_R_INTERNAL_ERROR);
410             return NULL;
411         }
412
413         if((limit - p - 4 - el) < 0) return NULL;
414
415         s2n(TLSEXT_TYPE_renegotiate,ret);
416         s2n(el,ret);
417
418         if(!ssl_add_clienthello_renegotiate_ext(s, ret, &el, el))
419         {
420             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT, ERR_R_INTERNAL_ERROR);
421             return NULL;
422         }
423
424         ret += el;
425     }
426
427 #ifndef OPENSSL_NO_SRP
428     /* Add SRP username if there is one */
429     if (s->srp_ctx.login != NULL)
430     { /* Add TLS extension SRP username to the Client Hello message
431
432         int login_len = strlen(s->srp_ctx.login);
433         if (login_len > 255 || login_len == 0)
434         {
435             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT, ERR_R_INTERNAL_ERROR);
436             return NULL;
437         }
438
439         /* check for enough space.
440         4 for the srp type type and extension length
441         1 for the srp user identity
442         + srp user identity length
443         */
444         if ((limit - ret - 5 - login_len) < 0) return NULL;
445
446         /* fill in the extension */
447         s2n(TLSEXT_TYPE_srp,ret);
448         s2n(login_len+1,ret);
449         (*ret++) = (unsigned char) login_len;
450         memcpy(ret, s->srp_ctx.login, login_len);
451         ret+=login_len;
452     }
453 #endif
454
455 #ifndef OPENSSL_NO_EC
456     if (s->tlsext_ecpointformatlist != NULL &&
457         s->version != DTLS1_VERSION)

```

```

458         /* Add TLS extension ECPointFormats to the ClientHello message */
459         long lenmax;
460
461         if ((lenmax = limit - ret - 5) < 0) return NULL;
462         if (s->tlsext_ecpointformatlist_length > (unsigned long)lenmax)
463         if (s->tlsext_ecpointformatlist_length > 255)
464         {
465             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT, ERR_R_INTERNAL_ERROR);
466             return NULL;
467         }
468
469         s2n(TLSEXT_TYPE_ec_point_formats,ret);
470         s2n(s->tlsext_ecpointformatlist_length + 1,ret);
471         *(ret++) = (unsigned char) s->tlsext_ecpointformatlist_length;
472         memcpy(ret, s->tlsext_ecpointformatlist, s->tlsext_ecpointformatlist_length);
473         ret+=s->tlsext_ecpointformatlist_length;
474
475         if (s->tlsext_ellipticcurvelist != NULL &&
476             s->version != DTLS1_VERSION)
477         {
478             /* Add TLS extension EllipticCurves to the ClientHello message */
479             long lenmax;
480
481             if ((lenmax = limit - ret - 6) < 0) return NULL;
482             if (s->tlsext_ellipticcurvelist_length > (unsigned long)lenmax)
483             if (s->tlsext_ellipticcurvelist_length > 65532)
484             {
485                 SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT, ERR_R_INTERNAL_ERROR);
486                 return NULL;
487             }
488
489             s2n(TLSEXT_TYPE_elliptic_curves,ret);
490             s2n(s->tlsext_ellipticcurvelist_length + 2, ret);
491
492             /* NB: draft-ietf-tls-ecc-12.txt uses a one-byte prefix for
493             * elliptic_curve_list, but the examples use two bytes.
494             * http://www1.ietf.org/mail-archive/web/tls/current/msg00538.htm
495             * resolves this to two bytes.
496             */
497             s2n(s->tlsext_ellipticcurvelist_length, ret);
498             memcpy(ret, s->tlsext_ellipticcurvelist, s->tlsext_ellipticcurvelist_length);
499             ret+=s->tlsext_ellipticcurvelist_length;
500         }
501 #endif /* OPENSSL_NO_EC */
502
503     if (!(SSL_get_options(s) & SSL_OP_NO_TICKET))
504     {
505         int ticklen;
506         if (!s->new_session && s->session && s->session->tlsext_tick)
507             ticklen = s->session->tlsext_ticklen;
508         else if (s->session && s->tlsext_session_ticket &&
509             s->tlsext_session_ticket->data)
510         {
511             ticklen = s->tlsext_session_ticket->length;
512             s->session->tlsext_tick = OPENSSL_malloc(ticklen);
513             if (!s->session->tlsext_tick)
514                 return NULL;
515             memcpy(s->session->tlsext_tick,
516                 s->tlsext_session_ticket->data,
517                 ticklen);
518             s->session->tlsext_ticklen = ticklen;
519         }
520         else
521             ticklen = 0;
522         if (ticklen == 0 && s->tlsext_session_ticket &&
523             s->tlsext_session_ticket->data == NULL)

```

```

524         goto skip_ext;
525         /* Check for enough room 2 for extension type, 2 for len
526         * rest for ticket
527         */
528         if ((long)(limit - ret - 4 - ticklen) < 0) return NULL;
529         s2n(TLSEXT_TYPE_session_ticket, ret);
530         s2n(ticklen, ret);
531         if (ticklen)
532         {
533             memcpy(ret, s->session->tlsext_tick, ticklen);
534             ret += ticklen;
535         }
536     },
537     skip_ext:

539     if (TLS1_get_client_version(s) >= TLS1_2_VERSION)
540     {
541         if ((size_t)(limit - ret) < sizeof(tls12_sigalgs) + 6)
542             return NULL;
543         s2n(TLSEXT_TYPE_signature_algorithms, ret);
544         s2n(sizeof(tls12_sigalgs) + 2, ret);
545         s2n(sizeof(tls12_sigalgs), ret);
546         memcpy(ret, tls12_sigalgs, sizeof(tls12_sigalgs));
547         ret += sizeof(tls12_sigalgs);
548     }

550 #ifdef TLSEXT_TYPE_opaque_prf_input
551     if (s->s3->client_opaque_prf_input != NULL &&
552         s->version != DTLS1_VERSION)
553     {
554         size_t col = s->s3->client_opaque_prf_input_len;
555
556         if ((long)(limit - ret - 6 - col < 0))
557             return NULL;
558         if (col > 0xFFFFD) /* can't happen */
559             return NULL;

561         s2n(TLSEXT_TYPE_opaque_prf_input, ret);
562         s2n(col + 2, ret);
563         s2n(col, ret);
564         memcpy(ret, s->s3->client_opaque_prf_input, col);
565         ret += col;
566     }
567 #endif

569     if (s->tlsext_status_type == TLSEXT_STATUSTYPE_ocsp &&
570         s->version != DTLS1_VERSION)
571     {
572         int i;
573         long extlen, idlen, itmp;
574         OCSP_RESPID *id;

576         idlen = 0;
577         for (i = 0; i < sk_OCSP_RESPID_num(s->tlsext_ocsp_ids); i++)
578         {
579             id = sk_OCSP_RESPID_value(s->tlsext_ocsp_ids, i);
580             itmp = i2d_OCSP_RESPID(id, NULL);
581             if (itmp <= 0)
582                 return NULL;
583             idlen += itmp + 2;
584         }

586         if (s->tlsext_ocsp_exts)
587         {
588             extlen = i2d_X509_EXTENSIONS(s->tlsext_ocsp_exts, NULL);
589             if (extlen < 0)

```

```

590         return NULL;
591     }
592     else
593         extlen = 0;

594     if ((long)(limit - ret - 7 - extlen - idlen) < 0) return NULL;
595     s2n(TLSEXT_TYPE_status_request, ret);
596     if (extlen + idlen > 0xFFFF0)
597         return NULL;
598     s2n(extlen + idlen + 5, ret);
599     *(ret++) = TLSEXT_STATUSTYPE_ocsp;
600     s2n(idlen, ret);
601     for (i = 0; i < sk_OCSP_RESPID_num(s->tlsext_ocsp_ids); i++)
602     {
603         /* save position of id len */
604         unsigned char *q = ret;
605         id = sk_OCSP_RESPID_value(s->tlsext_ocsp_ids, i);
606         /* skip over id len */
607         ret += 2;
608         itmp = i2d_OCSP_RESPID(id, &ret);
609         /* write id len */
610         s2n(itmp, q);
611     }
612     s2n(extlen, ret);
613     if (extlen > 0)
614         i2d_X509_EXTENSIONS(s->tlsext_ocsp_exts, &ret);
615 }

618 #ifndef OPENSSL_NO_HEARTBEATS
619     /* Add Heartbeat extension */
620     s2n(TLSEXT_TYPE_heartbeat, ret);
621     s2n(1, ret);
622     /* Set mode:
623     * 1: peer may send requests
624     * 2: peer not allowed to send requests
625     */
626     if (s->tlsext_heartbeat & SSL_TLSEXT_HB_DONT_RECV_REQUESTS)
627         *(ret++) = SSL_TLSEXT_HB_DONT_SEND_REQUESTS;
628     else
629         *(ret++) = SSL_TLSEXT_HB_ENABLED;
630 #endif

632 #ifndef OPENSSL_NO_NEXTPROTONEG
633     if (s->ctx->next_proto_select_cb && !s->s3->tmp.finish_md_len)
634     {
635         /* The client advertises an empty extension to indicate its
636         * support for Next Protocol Negotiation */
637         if (limit - ret - 4 < 0)
638             return NULL;
639         s2n(TLSEXT_TYPE_next_proto_neg, ret);
640         s2n(0, ret);
641     }
642 #endif

644 #ifndef OPENSSL_NO_SRTTP
645     if (SSL_get_srttp_profiles(s))
646     {
647         int el;

649         ssl_add_clienthello_use_srttp_ext(s, 0, &el, 0);
650
651         if ((limit - p - 4 - el) < 0) return NULL;

653         s2n(TLSEXT_TYPE_use_srttp, ret);
654         s2n(el, ret);

```

```

656         if(ssl_add_clienthello_use_srtp_ext(s, ret, &el, el))
657         {
658             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_TLSEXT, ERR_R_INTERNAL_
659                 return NULL;
660         }
661         ret += el;
662     }
663 #endif

665 #ifdef TLSEXT_TYPE_padding
666     /* Add padding to workaround bugs in F5 terminators.
667     * See https://tools.ietf.org/html/draft-agl-tls-padding-03
668     * NB: because this code works out the length of all existing
669     * extensions it MUST always appear last.
670     */
671     {
672         int hlen = ret - (unsigned char *)s->init_buf->data;
673         /* The code in s23_clnt.c to build ClientHello messages includes the
674         * 5-byte record header in the buffer, while the code in s3_clnt.c does
675         * not. */
676         if (s->state == SSL23_ST_CW_CLNT_HELLO_A)
677             hlen -= 5;
678         if (hlen > 0xff && hlen < 0x200)
679         {
680             hlen = 0x200 - hlen;
681             if (hlen >= 4)
682                 hlen -= 4;
683             else
684                 hlen = 0;
685
686             s2n(TLSEXT_TYPE_padding, ret);
687             s2n(hlen, ret);
688             memset(ret, 0, hlen);
689             ret += hlen;
690         }
691     }
692 #endif

695     if ((extdatalen = ret-p-2) == 0)
696         return p;

698     s2n(extdatalen,p);
699     return ret;
700 }

702 unsigned char *ssl_add_serverhello_tlsext(SSL *s, unsigned char *p, unsigned cha
703 {
704     int extdatalen=0;
705     unsigned char *ret = p;
706 #ifndef OPENSSL_NO_NEXTPROTONEG
707     int next_proto_neg_seen;
708 #endif

710     /* don't add extensions for SSLv3, unless doing secure renegotiation */
711     if (s->version == SSL3_VERSION && !s->s3->send_connection_binding)
712         return p;
713
714     ret+=2;
715     if (ret>=limit) return NULL; /* this really never occurs, but ... */

717     if (!s->hit && s->servername_done == 1 && s->session->tlsext_hostname !=
718     {
719         if ((long)(limit - ret - 4) < 0) return NULL;
720     }

721     s2n(TLSEXT_TYPE_server_name,ret);

```

```

722         s2n(0,ret);
723     }

725     if(s->s3->send_connection_binding)
726     {
727         int el;
728
729         if(!ssl_add_serverhello_renegotiate_ext(s, 0, &el, 0))
730         {
731             SSLerr(SSL_F_SSL_ADD_SERVERHELLO_TLSEXT, ERR_R_INTERNAL_ERROR);
732             return NULL;
733         }

735         if((limit - p - 4 - el) < 0) return NULL;
736
737         s2n(TLSEXT_TYPE_renegotiate,ret);
738         s2n(el,ret);

740         if(!ssl_add_serverhello_renegotiate_ext(s, ret, &el, el))
741         {
742             SSLerr(SSL_F_SSL_ADD_SERVERHELLO_TLSEXT, ERR_R_INTERNAL_ERROR);
743             return NULL;
744         }

746         ret += el;
747     }

749 #ifndef OPENSSL_NO_EC
750     if (s->tlsext_ecpointformatlist != NULL &&
751         s->version != DTLS1_VERSION)
752     {
753         /* Add TLS extension ECPointFormats to the ServerHello message *
754         long lenmax;

756         if ((lenmax = limit - ret - 5) < 0) return NULL;
757         if (s->tlsext_ecpointformatlist_length > (unsigned long)lenmax)
758             if (s->tlsext_ecpointformatlist_length > 255)
759             {
760                 SSLerr(SSL_F_SSL_ADD_SERVERHELLO_TLSEXT, ERR_R_INTERNAL_
761                     return NULL;
762             }

763         s2n(TLSEXT_TYPE_ec_point_formats,ret);
764         s2n(s->tlsext_ecpointformatlist_length + 1,ret);
765         *(ret++) = (unsigned char) s->tlsext_ecpointformatlist_length;
766         memcpy(ret, s->tlsext_ecpointformatlist, s->tlsext_ecpointformat
767             ret+=s->tlsext_ecpointformatlist_length;
768     }

770     /* Currently the server should not respond with a SupportedCurves extens
771     #endif /* OPENSSL_NO_EC */

774     if (s->tlsext_ticket_expected
775         && !(SSL_get_options(s) & SSL_OP_NO_TICKET))
776     {
777         if ((long)(limit - ret - 4) < 0) return NULL;
778         s2n(TLSEXT_TYPE_session_ticket,ret);
779         s2n(0,ret);
780     }

782     if (s->tlsext_status_expected)
783     {
784         if ((long)(limit - ret - 4) < 0) return NULL;
785         s2n(TLSEXT_TYPE_status_request,ret);
786         s2n(0,ret);
787     }

```



```

789 #ifdef TLSEXT_TYPE_opaque_prf_input
790     if (s->s3->server_opaque_prf_input != NULL &&
791         s->version != DTLS1_VERSION)
792     {
793         size_t sol = s->s3->server_opaque_prf_input_len;
794
795         if ((long)(limit - ret - 6 - sol) < 0)
796             return NULL;
797         if (sol > 0xFFFFD) /* can't happen */
798             return NULL;
799
800         s2n(TLSEXT_TYPE_opaque_prf_input, ret);
801         s2n(sol + 2, ret);
802         s2n(sol, ret);
803         memcpy(ret, s->s3->server_opaque_prf_input, sol);
804         ret += sol;
805     }
806 #endif
807
808 #ifndef OPENSSL_NO_SRTMP
809     if(s->srtmp_profile)
810     {
811         int el;
812
813         ssl_add_serverhello_use_srtp_ext(s, 0, &el, 0);
814
815         if((limit - p - 4 - el) < 0) return NULL;
816
817         s2n(TLSEXT_TYPE_use_srtp,ret);
818         s2n(el,ret);
819
820         if(ssl_add_serverhello_use_srtp_ext(s, ret, &el, el))
821         {
822             SSLerr(SSL_F_SSL_ADD_SERVERHELLO_TLSEXT, ERR_R_INTERNAL_
823                 return NULL;
824         }
825         ret+=el;
826     }
827 #endif
828
829     if (((s->s3->tmp.new_cipher->id & 0xFFFF)==0x80 || (s->s3->tmp.new_ciphe
830         && (SSL_get_options(s) & SSL_OP_CRYPTOPRO_TLSEXT_BUG)))
831         { const unsigned char cryptopro_ext[36] = {
832             0xfd, 0xe8, /*65000*/
833             0x00, 0x20, /*32 bytes length*/
834             0x30, 0x1e, 0x30, 0x08, 0x06, 0x06, 0x2a, 0x85,
835             0x03, 0x02, 0x02, 0x09, 0x30, 0x08, 0x06, 0x06,
836             0x2a, 0x85, 0x03, 0x02, 0x02, 0x16, 0x30, 0x08,
837             0x06, 0x06, 0x2a, 0x85, 0x03, 0x02, 0x02, 0x17};
838             if (limit-ret<36) return NULL;
839             memcpy(ret,cryptopro_ext,36);
840             ret+=36;
841         }
842     }
843
844 #ifndef OPENSSL_NO_HEARTBEATS
845     /* Add Heartbeat extension if we've received one */
846     if (s->tlsext_heartbeat & SSL_TLSEXT_HB_ENABLED)
847     {
848         s2n(TLSEXT_TYPE_heartbeat,ret);
849         s2n(1,ret);
850         /* Set mode:
851          * 1: peer may send requests
852          * 2: peer not allowed to send requests
853          */

```

```

854         if (s->tlsext_heartbeat & SSL_TLSEXT_HB_DONT_RECV_REQUESTS)
855             *(ret++) = SSL_TLSEXT_HB_DONT_SEND_REQUESTS;
856         else
857             *(ret++) = SSL_TLSEXT_HB_ENABLED;
858     }
859 #endif
860
861 #ifndef OPENSSL_NO_NEXTPROTONEG
862     next_proto_neg_seen = s->s3->next_proto_neg_seen;
863     s->s3->next_proto_neg_seen = 0;
864     if (next_proto_neg_seen && s->ctx->next_protos_advertised_cb)
865     {
866         const unsigned char *npa;
867         unsigned int npalen;
868         int r;
869
870         r = s->ctx->next_protos_advertised_cb(s, &npa, &npalen, s->ctx->
871             if (r == SSL_TLSEXT_ERR_OK)
872             {
873                 if ((long)(limit - ret - 4 - npalen) < 0) return NULL;
874                 s2n(TLSEXT_TYPE_next_proto_neg,ret);
875                 s2n(npalen,ret);
876                 memcpy(ret, npa, npalen);
877                 ret += npalen;
878                 s->s3->next_proto_neg_seen = 1;
879             }
880     }
881 #endif
882
883     if ((extdatalen = ret-p-2)== 0)
884         return p;
885
886     s2n(extdatalen,p);
887     return ret;
888 }
889
890 #ifndef OPENSSL_NO_EC
891 /* ssl_check_for_safari attempts to fingerprint Safari using OS X
892 * SecureTransport using the TLS extension block in |d|, of length |n|.
893 * Safari, since 10.6, sends exactly these extensions, in this order:
894 *     SNI,
895 *     elliptic_curves
896 *     ec_point_formats
897 *
898 * We wish to fingerprint Safari because they broke ECDHE-ECDSA support in 10.8,
899 * but they advertise support. So enabling ECDHE-ECDSA ciphers breaks them.
900 * Sadly we cannot differentiate 10.6, 10.7 and 10.8.4 (which work), from
901 * 10.8..10.8.3 (which don't work).
902 */
903 static void ssl_check_for_safari(SSL *s, const unsigned char *data, const unsign
904     unsigned short type, size;
905     static const unsigned char kSafariExtensionsBlock[] = {
906         0x00, 0x0a, /* elliptic curves extension */
907         0x00, 0x08, /* 8 bytes */
908         0x00, 0x06, /* 6 bytes of curve ids */
909         0x00, 0x17, /* P-256 */
910         0x00, 0x18, /* P-384 */
911         0x00, 0x19, /* P-521 */
912
913         0x00, 0x0b, /* ec_point_formats */
914         0x00, 0x02, /* 2 bytes */
915         0x01, /* 1 point format */
916         0x00, /* uncompressed */
917     };
918 }

```

```

920  /* The following is only present in TLS 1.2 */
921  static const unsigned char kSafariTLS12ExtensionsBlock[] = {
922      0x00, 0x0d, /* signature_algorithms */
923      0x00, 0x0c, /* 12 bytes */
924      0x00, 0x0a, /* 10 bytes */
925      0x05, 0x01, /* SHA-384/RSA */
926      0x04, 0x01, /* SHA-256/RSA */
927      0x02, 0x01, /* SHA-1/RSA */
928      0x04, 0x03, /* SHA-256/ECDSA */
929      0x02, 0x03, /* SHA-1/ECDSA */
930  };
931
932  if (data >= (d+n-2))
933      return;
934  data += 2;
935
936  if (data > (d+n-4))
937      return;
938  n2s(data, type);
939  n2s(data, size);
940
941  if (type != TLSEXT_TYPE_server_name)
942      return;
943
944  if (data+size > d+n)
945      return;
946  data += size;
947
948  if (TLS1_get_client_version(s) >= TLS1_2_VERSION)
949  {
950      const size_t len1 = sizeof(kSafariExtensionsBlock);
951      const size_t len2 = sizeof(kSafariTLS12ExtensionsBlock);
952
953      if (data + len1 + len2 != d+n)
954          return;
955      if (memcmp(data, kSafariExtensionsBlock, len1) != 0)
956          return;
957      if (memcmp(data + len1, kSafariTLS12ExtensionsBlock, len2) != 0)
958          return;
959  }
960  else
961  {
962      const size_t len = sizeof(kSafariExtensionsBlock);
963
964      if (data + len != d+n)
965          return;
966      if (memcmp(data, kSafariExtensionsBlock, len) != 0)
967          return;
968  }
969
970  s->s3->is_probably_safari = 1;
971  }
972  #endif /* !OPENSSL_NO_EC */
973
974  int ssl_parse_clienthello_tlsext(SSL *s, unsigned char **p, unsigned char *d, in
975  {
976      unsigned short type;
977      unsigned short size;
978      unsigned short len;
979      unsigned char *data = *p;
980      int renegotiate_seen = 0;
981      int sigalg_seen = 0;
982
983      s->servername_done = 0;
984      s->tlsext_status_type = -1;
985  #ifndef OPENSSL_NO_NEXTPROTONEG

```

```

986      s->s3->next_proto_neg_seen = 0;
987  #endif
988
989  #ifndef OPENSSL_NO_HEARTBEATS
990      s->tlsext_heartbeat &= ~(SSL_TLSEXT_HB_ENABLED |
991                               SSL_TLSEXT_HB_DONT_SEND_REQUESTS);
992  #endif
993
994  #ifndef OPENSSL_NO_EC
995      if (s->options & SSL_OP_SAFARI_ECDHE_ECDSA_BUG)
996          ssl_check_for_safari(s, data, d, n);
997  #endif /* !OPENSSL_NO_EC */
998
999      if (data >= (d+n-2))
1000          goto ri_check;
1001      n2s(data, len);
1002
1003      if (data > (d+n-len))
1004          goto ri_check;
1005
1006      while (data <= (d+n-4))
1007      {
1008          n2s(data, type);
1009          n2s(data, size);
1010
1011          if (data+size > (d+n))
1012              goto ri_check;
1013          #if 0
1014              fprintf(stderr, "Received extension type %d size %d\n", type, size)
1015          #endif
1016          if (s->tlsext_debug_cb)
1017              s->tlsext_debug_cb(s, 0, type, data, size,
1018                               s->tlsext_debug_arg);
1019          /* The servername extension is treated as follows:
1020
1021          - Only the hostname type is supported with a maximum length of 255.
1022          - The servername is rejected if too long or if it contains zeros,
1023            in which case a fatal alert is generated.
1024          - The servername field is maintained together with the session cache.
1025          - When a session is resumed, the servername call back invoked in order
1026            to allow the application to position itself to the right context.
1027          - The servername is acknowledged if it is new for a session or when
1028            it is identical to a previously used for the same session.
1029            Applications can control the behaviour. They can at any time
1030            set a 'desirable' servername for a new SSL object. This can be the
1031            case for example with HTTPS when a Host: header field is received and
1032            a renegotiation is requested. In this case, a possible servername
1033            presented in the new client hello is only acknowledged if it matches
1034            the value of the Host: field.
1035          - Applications must use SSL_OP_NO_SESSION_RESUMPTION_ON_RENEGOTIATION
1036            if they provide for changing an explicit servername context for the session
1037            i.e. when the session has been established with a servername extension.
1038          - On session reconnect, the servername extension may be absent.
1039
1040          */
1041
1042          if (type == TLSEXT_TYPE_server_name)
1043          {
1044              unsigned char *sdata;
1045              int servname_type;
1046              int dsize;
1047
1048              if (size < 2)
1049              {
1050                  *al = SSL_AD_DECODE_ERROR;
1051                  return 0;

```

```

1052     }
1053     n2s(data,dsize);
1054     size -= 2;
1055     if (dsize > size )
1056     {
1057         *al = SSL_AD_DECODE_ERROR;
1058         return 0;
1059     }
1060
1061     sdata = data;
1062     while (dsize > 3)
1063     {
1064         servname_type = *(sdata++);
1065         n2s(sdata,len);
1066         dsize -= 3;
1067
1068         if (len > dsize)
1069         {
1070             *al = SSL_AD_DECODE_ERROR;
1071             return 0;
1072         }
1073         if (s->servername_done == 0)
1074             switch (servname_type)
1075             {
1076                 case TLSEXT_NAMETYPE_host_name:
1077                     if (!s->hit)
1078                     {
1079                         if(s->session->tlsext_hostname)
1080                         {
1081                             *al = SSL_AD_DECODE_ERROR;
1082                             return 0;
1083                         }
1084                         if (len > TLSEXT_MAXLEN_host_name)
1085                         {
1086                             *al = TLS1_AD_UNRECOGNIZED_EXTENSION;
1087                             return 0;
1088                         }
1089                         if ((s->session->tlsext_hostname)
1090                             {
1091                                 *al = TLS1_AD_INTERNAL_ERROR;
1092                                 return 0;
1093                             }
1094                         memcpy(s->session->tlsext_hostname,
1095                                s->session->tlsext_hostname[len],
1096                                if (strlen(s->session->tlsext_hostname)
1097                                    OPENSSL_free(s->session->tlsext_hostname);
1098                                    *al = TLS1_AD_UNRECOGNIZED_EXTENSION;
1099                                    return 0;
1100                                }
1101                         s->servername_done = 1;
1102                     }
1103                 else
1104                     s->servername_done = s->session->tlsext_hostname
1105                     && strlen(s->session->tlsext_hostname)
1106                     && strncmp(s->session->tlsext_hostname,
1107                                break;
1108
1109                 default:
1110                     break;
1111             }
1112     }
1113     dsize -= len;
1114 }

```

```

1118     if (dsize != 0)
1119     {
1120         *al = SSL_AD_DECODE_ERROR;
1121         return 0;
1122     }
1123
1124     }
1125     #ifndef OPENSSL_NO_SRTP
1126     else if (type == TLSEXT_TYPE_srtp)
1127     {
1128         if (size <= 0 || ((len = data[0])) != (size - 1))
1129         {
1130             *al = SSL_AD_DECODE_ERROR;
1131             return 0;
1132         }
1133         if (s->srtp_ctx.login != NULL)
1134         {
1135             *al = SSL_AD_DECODE_ERROR;
1136             return 0;
1137         }
1138         if ((s->srtp_ctx.login = OPENSSL_malloc(len+1)) == NULL)
1139             return -1;
1140         memcpy(s->srtp_ctx.login, &data[1], len);
1141         s->srtp_ctx.login[len]='\0';
1142         if (strlen(s->srtp_ctx.login) != len)
1143         {
1144             *al = SSL_AD_DECODE_ERROR;
1145             return 0;
1146         }
1147     }
1148     #endif
1149
1150     #ifndef OPENSSL_NO_EC
1151     else if (type == TLSEXT_TYPE_ec_point_formats &&
1152              s->version != DTLS1_VERSION)
1153     {
1154         unsigned char *sdata = data;
1155         int ecpointformatlist_length = *(sdata++);
1156
1157         if (ecpointformatlist_length != size - 1)
1158         {
1159             *al = TLS1_AD_DECODE_ERROR;
1160             return 0;
1161         }
1162         if (!s->hit)
1163         {
1164             if(s->session->tlsext_ecpointformatlist)
1165             {
1166                 OPENSSL_free(s->session->tlsext_ecpointformatlist);
1167                 s->session->tlsext_ecpointformatlist = NULL;
1168             }
1169             s->session->tlsext_ecpointformatlist_length = 0;
1170             if ((s->session->tlsext_ecpointformatlist = OPENSSL_malloc(ecpointformatlist_length))
1171                 {
1172                     *al = TLS1_AD_INTERNAL_ERROR;
1173                     return 0;
1174                 }
1175             s->session->tlsext_ecpointformatlist_length = ecpointformatlist_length;
1176             memcpy(s->session->tlsext_ecpointformatlist, sdata, ecpointformatlist_length);
1177         }
1178         #if 0
1179         fprintf(stderr,"ssl_parse_clienthello_tlsext s->session->tlsext_ecpointformatlist = s->session->tlsext_ecpointformatlist;
1180         for (i = 0; i < s->session->tlsext_ecpointformatlist_length; i++)
1181             fprintf(stderr,"%i ",*(sdata++));
1182         #endif

```

```

1184         fprintf(stderr, "\n");
1185     #endif
1186     }
1187     else if (type == TLSEXT_TYPE_elliptic_curves &&
1188             s->version != DTLS1_VERSION)
1189     {
1190         unsigned char *sdata = data;
1191         int ellipticcurvelist_length = (*(sdata++) << 8);
1192         ellipticcurvelist_length += (*(sdata++));
1193
1194         if (ellipticcurvelist_length != size - 2 ||
1195             ellipticcurvelist_length < 1)
1196         {
1197             *al = TLS1_AD_DECODE_ERROR;
1198             return 0;
1199         }
1200         if (!s->hit)
1201         {
1202             if (s->session->tlsext_ellipticcurvelist)
1203             {
1204                 *al = TLS1_AD_DECODE_ERROR;
1205                 return 0;
1206             }
1207             s->session->tlsext_ellipticcurvelist_length = 0;
1208             if ((s->session->tlsext_ellipticcurvelist = OPEN
1209                 {
1210                     *al = TLS1_AD_INTERNAL_ERROR;
1211                     return 0;
1212                 }
1213             s->session->tlsext_ellipticcurvelist_length = el
1214             memcpy(s->session->tlsext_ellipticcurvelist, sda
1215             )
1216         #if 0
1217             fprintf(stderr, "ssl_parse_clienthello_tlsext s->session-
1218             sdata = s->session->tlsext_ellipticcurvelist;
1219             for (i = 0; i < s->session->tlsext_ellipticcurvelist_len
1220                 fprintf(stderr, "%i ", *(sdata++));
1221             fprintf(stderr, "\n");
1222         #endif
1223     }
1224     #endif /* OPENSSSL_NO_EC */
1225     #ifdef TLSEXT_TYPE_opaque_prf_input
1226     else if (type == TLSEXT_TYPE_opaque_prf_input &&
1227             s->version != DTLS1_VERSION)
1228     {
1229         unsigned char *sdata = data;
1230
1231         if (size < 2)
1232         {
1233             *al = SSL_AD_DECODE_ERROR;
1234             return 0;
1235         }
1236         n2s(sdata, s->s3->client_opaque_prf_input_len);
1237         if (s->s3->client_opaque_prf_input_len != size - 2)
1238         {
1239             *al = SSL_AD_DECODE_ERROR;
1240             return 0;
1241         }
1242
1243         if (s->s3->client_opaque_prf_input != NULL) /* shouldn't
1244             OPENSSL_free(s->s3->client_opaque_prf_input);
1245         if (s->s3->client_opaque_prf_input_len == 0)
1246             s->s3->client_opaque_prf_input = OPENSSL_malloc(
1247         else
1248             s->s3->client_opaque_prf_input = BUF_memdup(sdat
1249         if (s->s3->client_opaque_prf_input == NULL)

```

```

1250         {
1251             *al = TLS1_AD_INTERNAL_ERROR;
1252             return 0;
1253         }
1254     }
1255     #endif
1256     else if (type == TLSEXT_TYPE_session_ticket)
1257     {
1258         if (s->tls_session_ticket_ext_cb &&
1259             !s->tls_session_ticket_ext_cb(s, data, size, s->tls_
1260                 {
1261                     *al = TLS1_AD_INTERNAL_ERROR;
1262                     return 0;
1263                 }
1264         )
1265     else if (type == TLSEXT_TYPE_renegotiate)
1266     {
1267         if (!ssl_parse_clienthello_renegotiate_ext(s, data, size,
1268             return 0;
1269         renegotiate_seen = 1;
1270     }
1271     else if (type == TLSEXT_TYPE_signature_algorithms)
1272     {
1273         int dsize;
1274         if (sigalg_seen || size < 2)
1275         {
1276             *al = SSL_AD_DECODE_ERROR;
1277             return 0;
1278         }
1279         sigalg_seen = 1;
1280         n2s(data, dsize);
1281         size -= 2;
1282         if (dsize != size || dsize & 1)
1283         {
1284             *al = SSL_AD_DECODE_ERROR;
1285             return 0;
1286         }
1287         if (!tls1_process_sigalgs(s, data, dsize))
1288         {
1289             *al = SSL_AD_DECODE_ERROR;
1290             return 0;
1291         }
1292     }
1293     else if (type == TLSEXT_TYPE_status_request &&
1294             s->version != DTLS1_VERSION)
1295     {
1296         if (size < 5)
1297         {
1298             *al = SSL_AD_DECODE_ERROR;
1299             return 0;
1300         }
1301
1302         s->tlsext_status_type = *data++;
1303         size--;
1304         if (s->tlsext_status_type == TLSEXT_STATUSTYPE_ocsp)
1305         {
1306             const unsigned char *sdata;
1307             int dsize;
1308             /* Read in responder_id_list */
1309             n2s(data, dsize);
1310             size -= 2;
1311             if (dsize > size )
1312             {
1313                 *al = SSL_AD_DECODE_ERROR;
1314                 return 0;
1315             }

```

```

1316     }
1317     while (dsize > 0)
1318     {
1319         OCSP_RESPID *id;
1320         int idsize;
1321         if (dsize < 4)
1322         {
1323             *al = SSL_AD_DECODE_ERROR;
1324             return 0;
1325         }
1326         n2s(data, idsize);
1327         dsize -= 2 + idsize;
1328         size -= 2 + idsize;
1329         if (dsize < 0)
1330         {
1331             *al = SSL_AD_DECODE_ERROR;
1332             return 0;
1333         }
1334         sdata = data;
1335         data += idsize;
1336         id = d2i_OCSP_RESPID(NULL,
1337                             &sdata, idsize);
1338         if (!id)
1339         {
1340             *al = SSL_AD_DECODE_ERROR;
1341             return 0;
1342         }
1343         if (data != sdata)
1344         {
1345             OCSP_RESPID_free(id);
1346             *al = SSL_AD_DECODE_ERROR;
1347             return 0;
1348         }
1349         if (!s->tlsext_ocsp_ids
1350             && !(s->tlsext_ocsp_ids =
1351                 sk_OCSP_RESPID_new_null()))
1352         {
1353             OCSP_RESPID_free(id);
1354             *al = SSL_AD_INTERNAL_ERROR;
1355             return 0;
1356         }
1357         if (!sk_OCSP_RESPID_push(
1358             s->tlsext_ocsp_ids, id))
1359         {
1360             OCSP_RESPID_free(id);
1361             *al = SSL_AD_INTERNAL_ERROR;
1362             return 0;
1363         }
1364     }

1366     /* Read in request_extensions */
1367     if (size < 2)
1368     {
1369         *al = SSL_AD_DECODE_ERROR;
1370         return 0;
1371     }
1372     n2s(data, dsize);
1373     size -= 2;
1374     if (dsize != size)
1375     {
1376         *al = SSL_AD_DECODE_ERROR;
1377         return 0;
1378     }
1379     sdata = data;
1380     if (dsize > 0)
1381     {

```

```

1382         if (s->tlsext_ocsp_exts)
1383         {
1384             sk_X509_EXTENSION_pop_free(s->tl
1385                                     X509_
1386                                     );
1387         }
1388         s->tlsext_ocsp_exts =
1389             d2i_X509_EXTENSIONS(NULL,
1390                                 &sdata, dsize);
1391         if (!s->tlsext_ocsp_exts
1392             || (data + dsize != sdata))
1393         {
1394             *al = SSL_AD_DECODE_ERROR;
1395             return 0;
1396         }
1397     }
1398     /* We don't know what to do with any other type
1399     * so ignore it.
1400     */
1401     else
1402         s->tlsext_status_type = -1;
1403
1404     }
1405     #ifndef OPENSSL_NO_HEARTBEATS
1406     else if (type == TLSEXT_TYPE_heartbeat)
1407     {
1408         switch(data[0])
1409         {
1410             case 0x01: /* Client allows us to send HB r
1411                         s->tlsext_heartbeat |= S
1412                         break;
1413             case 0x02: /* Client doesn't accept HB requ
1414                         s->tlsext_heartbeat |= S
1415                         s->tlsext_heartbeat |= S
1416                         break;
1417             default:    *al = SSL_AD_ILLEGAL_PARAMETER;
1418                         return 0;
1419         }
1420     }
1421     #endif
1422     #ifndef OPENSSL_NO_NEXTPROTONEG
1423     else if (type == TLSEXT_TYPE_next_proto_neg &&
1424             s->s3->tmp.finish_md_len == 0)
1425     {
1426         /* We shouldn't accept this extension on a
1427         * renegotiation.
1428         *
1429         * s->new_session will be set on renegotiation, but we
1430         * probably shouldn't rely that it couldn't be set on
1431         * the initial renegotiation too in certain cases (when
1432         * there's some other reason to disallow resuming an
1433         * earlier session -- the current code won't be doing
1434         * anything like that, but this might change).
1435
1436         * A valid sign that there's been a previous handshake
1437         * in this connection is if s->s3->tmp.finish_md_len >
1438         * 0. (We are talking about a check that will happen
1439         * in the Hello protocol round, well before a new
1440         * Finished message could have been computed.) */
1441         s->s3->next_proto_neg_seen = 1;
1442     }
1443     #endif

1445     /* session ticket processed earlier */
1446     #ifndef OPENSSL_NO_SRTTP
1447     else if (type == TLSEXT_TYPE_use_srtp)

```

```

1448         {
1449             if(ssl_parse_clienthello_use_srtp_ext(s, data, size,
1450                 al))
1451                 return 0;
1452         }
1453 #endif
1454
1455         data+=size;
1456     }
1457
1458     *p = data;
1459
1460     ri_check:
1461
1462     /* Need RI if renegotiating */
1463
1464     if (!renegotiate_seen && s->renegotiate &&
1465         !(s->options & SSL_OP_ALLOW_UNSAFE_LEGACY_RENEGOTIATION))
1466     {
1467         *al = SSL_AD_HANDSHAKE_FAILURE;
1468         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_TLSEXT,
1469             SSL_R_UNSAFE_LEGACY_RENEGOTIATION_DISABLED);
1470         return 0;
1471     }
1472
1473     return 1;
1474 }
1475
1476 #ifndef OPENSSL_NO_NEXTPROTONEG
1477 /* ssl_next_proto_validate validates a Next Protocol Negotiation block. No
1478  * elements of zero length are allowed and the set of elements must exactly fill
1479  * the length of the block. */
1480 static char ssl_next_proto_validate(unsigned char *d, unsigned len)
1481 {
1482     unsigned int off = 0;
1483
1484     while (off < len)
1485     {
1486         if (d[off] == 0)
1487             return 0;
1488         off += d[off];
1489         off++;
1490     }
1491
1492     return off == len;
1493 }
1494 #endif
1495
1496 int ssl_parse_serverhello_tlsext(SSL *s, unsigned char **p, unsigned char *d, in
1497 {
1498     unsigned short length;
1499     unsigned short type;
1500     unsigned short size;
1501     unsigned char *data = *p;
1502     int tlsext_servername = 0;
1503     int renegotiate_seen = 0;
1504
1505     #ifndef OPENSSL_NO_NEXTPROTONEG
1506     s->s3->next_proto_neg_seen = 0;
1507     #endif
1508
1509     #ifndef OPENSSL_NO_HEARTBEATS
1510     s->tlsext_heartbeat &= ~(SSL_TLSEXT_HB_ENABLED |
1511         SSL_TLSEXT_HB_DONT_SEND_REQUESTS);
1512     #endif

```

```

1514         if (data >= (d+n-2))
1515             goto ri_check;
1516
1517         n2s(data, length);
1518         if (data+length != d+n)
1519         {
1520             *al = SSL_AD_DECODE_ERROR;
1521             return 0;
1522         }
1523
1524         while(data <= (d+n-4))
1525         {
1526             n2s(data, type);
1527             n2s(data, size);
1528
1529             if (data+size > (d+n))
1530                 goto ri_check;
1531
1532             if (s->tlsext_debug_cb)
1533                 s->tlsext_debug_cb(s, 1, type, data, size,
1534                     s->tlsext_debug_arg);
1535
1536             if (type == TLSEXT_TYPE_server_name)
1537             {
1538                 if (s->tlsext_hostname == NULL || size > 0)
1539                 {
1540                     *al = TLS1_AD_UNRECOGNIZED_NAME;
1541                     return 0;
1542                 }
1543                 tlsext_servername = 1;
1544             }
1545
1546             #ifndef OPENSSL_NO_EC
1547             else if (type == TLSEXT_TYPE_ec_point_formats &&
1548                 s->version != DTLS1_VERSION)
1549             {
1550                 unsigned char *sdata = data;
1551                 int ecpointformatlist_length = *(sdata++);
1552
1553                 if (ecpointformatlist_length != size - 1 ||
1554                     ecpointformatlist_length < 1)
1555                 {
1556                     *al = TLS1_AD_DECODE_ERROR;
1557                     return 0;
1558                 }
1559                 s->session->tlsext_ecpointformatlist_length = 0;
1560                 if (s->session->tlsext_ecpointformatlist != NULL) OPENSSL
1561                 if ((s->session->tlsext_ecpointformatlist = OPENSSL_malloc
1562                     {
1563                         *al = TLS1_AD_INTERNAL_ERROR;
1564                         return 0;
1565                     }
1566                 s->session->tlsext_ecpointformatlist_length = ecpointfor
1567                 memcpy(s->session->tlsext_ecpointformatlist, sdata, ecpo
1568                 #if 0
1569                 fprintf(stderr, "ssl_parse_serverhello_tlsext s->session-
1570 sdata = s->session->tlsext_ecpointformatlist;
1571 for (i = 0; i < s->session->tlsext_ecpointformatlist_len
1572     fprintf(stderr, "%i ", *(sdata++));
1573     fprintf(stderr, "\n");
1574     #endif
1575     }
1576     #endif /* OPENSSL_NO_EC */
1577
1578     else if (type == TLSEXT_TYPE_session_ticket)
1579     {

```

```

1580         if (s->tls_session_ticket_ext_cb &&
1581             !s->tls_session_ticket_ext_cb(s, data, size, s->tls_
1582             {
1583                 *al = TLS1_AD_INTERNAL_ERROR;
1584                 return 0;
1585             }
1586         if ((SSL_get_options(s) & SSL_OP_NO_TICKET)
1587             || (size > 0))
1588             {
1589                 *al = TLS1_AD_UNSUPPORTED_EXTENSION;
1590                 return 0;
1591             }
1592         s->tlsext_ticket_expected = 1;
1593     }
1594 #ifdef TLSEXT_TYPE_opaque_prf_input
1595     else if (type == TLSEXT_TYPE_opaque_prf_input &&
1596             s->version != DTLS1_VERSION)
1597     {
1598         unsigned char *sdata = data;
1599
1600         if (size < 2)
1601         {
1602             *al = SSL_AD_DECODE_ERROR;
1603             return 0;
1604         }
1605         n2s(sdata, s->s3->server_opaque_prf_input_len);
1606         if (s->s3->server_opaque_prf_input_len != size - 2)
1607         {
1608             *al = SSL_AD_DECODE_ERROR;
1609             return 0;
1610         }
1611
1612         if (s->s3->server_opaque_prf_input != NULL) /* shouldn't
1613             OPENSSL_free(s->s3->server_opaque_prf_input);
1614         if (s->s3->server_opaque_prf_input_len == 0)
1615             s->s3->server_opaque_prf_input = OPENSSL_malloc(
1616             else
1617                 s->s3->server_opaque_prf_input = BUF_memdup(sdat
1618
1619         if (s->s3->server_opaque_prf_input == NULL)
1620         {
1621             *al = TLS1_AD_INTERNAL_ERROR;
1622             return 0;
1623         }
1624     }
1625 #endif
1626     else if (type == TLSEXT_TYPE_status_request &&
1627             s->version != DTLS1_VERSION)
1628     {
1629         /* MUST be empty and only sent if we've requested
1630          * a status request message.
1631          */
1632         if ((s->tlsext_status_type == -1) || (size > 0))
1633         {
1634             *al = TLS1_AD_UNSUPPORTED_EXTENSION;
1635             return 0;
1636         }
1637         /* Set flag to expect CertificateStatus message */
1638         s->tlsext_status_expected = 1;
1639     }
1640 #ifndef OPENSSL_NO_NEXTPROTONEG
1641     else if (type == TLSEXT_TYPE_next_proto_neg &&
1642             s->s3->tmp.finish_md_len == 0)
1643     {
1644         unsigned char *selected;
1645         unsigned char selected_len;

```

```

1647         /* We must have requested it. */
1648         if (s->ctx->next_proto_select_cb == NULL)
1649         {
1650             *al = TLS1_AD_UNSUPPORTED_EXTENSION;
1651             return 0;
1652         }
1653         /* The data must be valid */
1654         if (!ssl_next_proto_validate(data, size))
1655         {
1656             *al = TLS1_AD_DECODE_ERROR;
1657             return 0;
1658         }
1659         if (s->ctx->next_proto_select_cb(s, &selected, &selected_
1660         {
1661             *al = TLS1_AD_INTERNAL_ERROR;
1662             return 0;
1663         }
1664         s->next_proto_negotiated = OPENSSL_malloc(selected_len);
1665         if (!s->next_proto_negotiated)
1666         {
1667             *al = TLS1_AD_INTERNAL_ERROR;
1668             return 0;
1669         }
1670         memcpy(s->next_proto_negotiated, selected, selected_len)
1671         s->next_proto_negotiated_len = selected_len;
1672         s->s3->next_proto_neg_seen = 1;
1673     }
1674 #endif
1675     else if (type == TLSEXT_TYPE_renegotiate)
1676     {
1677         if (!ssl_parse_serverhello_renegotiate_ext(s, data, size,
1678             renegotiate_seen = 1;
1679     }
1680 #ifndef OPENSSL_NO_HEARTBEATS
1681     else if (type == TLSEXT_TYPE_heartbeat)
1682     {
1683         switch(data[0])
1684         {
1685             case 0x01: /* Server allows us to send HB r
1686                 s->tlsext_heartbeat |= S
1687                 break;
1688             case 0x02: /* Server doesn't accept HB requ
1689                 s->tlsext_heartbeat |= S
1690                 s->tlsext_heartbeat |= S
1691                 break;
1692             default: *al = SSL_AD_ILLEGAL_PARAMETER;
1693                     return 0;
1694         }
1695     }
1696 #endif
1697 #ifndef OPENSSL_NO_SRTP
1698     else if (type == TLSEXT_TYPE_use_srtp)
1699     {
1700         if (ssl_parse_serverhello_use_srtp_ext(s, data, size,
1701             al))
1702             return 0;
1703     }
1704 #endif
1705
1706         data+=size;
1707     }
1708
1709     if (data != d+n)
1710     {

```

```

1712         *al = SSL_AD_DECODE_ERROR;
1713         return 0;
1714     }

1716     if (!s->hit && tlsext_servername == 1)
1717     {
1718         if (s->tlsext_hostname)
1719         {
1720             if (s->session->tlsext_hostname == NULL)
1721             {
1722                 s->session->tlsext_hostname = BUF_strdup(s->tlsext_hostname);
1723                 if (!s->session->tlsext_hostname)
1724                 {
1725                     *al = SSL_AD_UNRECOGNIZED_NAME;
1726                     return 0;
1727                 }
1728             }
1729             else
1730             {
1731                 *al = SSL_AD_DECODE_ERROR;
1732                 return 0;
1733             }
1734         }
1735     }

1737     *p = data;

1739     ri_check:

1741     /* Determine if we need to see RI. Strictly speaking if we want to
1742     * avoid an attack we should *always* see RI even on initial server
1743     * hello because the client doesn't see any renegotiation during an
1744     * attack. However this would mean we could not connect to any server
1745     * which doesn't support RI so for the immediate future tolerate RI
1746     * absence on initial connect only.
1747     */
1748     if (!renegotiate_seen
1749         && !(s->options & SSL_OP_LEGACY_SERVER_CONNECT)
1750         && !(s->options & SSL_OP_ALLOW_UNSAFE_LEGACY_RENEGOTIATION))
1751     {
1752         *al = SSL_AD_HANDSHAKE_FAILURE;
1753         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_TLSEXT,
1754              SSL_R_UNSAFE_LEGACY_RENEGOTIATION_DISABLED);
1755         return 0;
1756     }

1758     return 1;
1759 }

1762 int ssl_prepare_clienthello_tlsext(SSL *s)
1763 {
1764     #ifndef OPENSSL_NO_EC
1765     /* If we are client and using an elliptic curve cryptography cipher suit
1766     * and elliptic curves we support.
1767     */
1768     int using_ecc = 0;
1769     int i;
1770     unsigned char *j;
1771     unsigned long alg_k, alg_a;
1772     STACK_OF(SSL_CIPHER) *cipher_stack = SSL_get_ciphers(s);

1774     for (i = 0; i < sk_SSL_CIPHER_num(cipher_stack); i++)
1775     {
1776         SSL_CIPHER *c = sk_SSL_CIPHER_value(cipher_stack, i);

```

```

1778         alg_k = c->algorithm_mkey;
1779         alg_a = c->algorithm_auth;
1780         if ((alg_k & (SSL_kECDH|SSL_kECDHr|SSL_kECDHe) || (alg_a & SSL_
1781             {
1782                 using_ecc = 1;
1783                 break;
1784             }
1785         }
1786         using_ecc = using_ecc && (s->version >= TLS1_VERSION);
1787         if (using_ecc)
1788         {
1789             if (s->tlsext_ecpointformatlist != NULL) OPENSSL_free(s->tlsext_
1790             if ((s->tlsext_ecpointformatlist = OPENSSL_malloc(3)) == NULL)
1791             {
1792                 SSLerr(SSL_F_SSL_PREPARE_CLIENTHELLO_TLSEXT, ERR_R_MALLOC
1793                 return -1;
1794             }
1795             s->tlsext_ecpointformatlist_length = 3;
1796             s->tlsext_ecpointformatlist[0] = TLSEXT_ECPOINTFORMAT_uncompress
1797             s->tlsext_ecpointformatlist[1] = TLSEXT_ECPOINTFORMAT_ansiX962_c
1798             s->tlsext_ecpointformatlist[2] = TLSEXT_ECPOINTFORMAT_ansiX962_c

1800         /* we support all named elliptic curves in draft-ietf-tls-ecc-12
1801         if (s->tlsext_ellipticcurvelist != NULL) OPENSSL_free(s->tlsext_
1802         s->tlsext_ellipticcurvelist_length = sizeof(pref_list)/sizeof(pr
1803         if ((s->tlsext_ellipticcurvelist = OPENSSL_malloc(s->tlsext_elli
1804             {
1805                 s->tlsext_ellipticcurvelist_length = 0;
1806                 SSLerr(SSL_F_SSL_PREPARE_CLIENTHELLO_TLSEXT, ERR_R_MALLOC
1807                 return -1;
1808             }
1809         for (i = 0, j = s->tlsext_ellipticcurvelist; (unsigned int)i <
1810             sizeof(pref_list)/sizeof(pref_list[0]); i++)
1811         {
1812             int id = tls1_ec_nid2curve_id(pref_list[i]);
1813             s2n(id, j);
1814         }
1815     }
1816     #endif /* OPENSSL_NO_EC */

1818     #ifdef TLSEXT_TYPE_opaque_prf_input
1819     {
1820         int r = 1;

1821         if (s->ctx->tlsext_opaque_prf_input_callback != 0)
1822         {
1823             r = s->ctx->tlsext_opaque_prf_input_callback(s, NULL, 0,
1824             if (!r)
1825                 return -1;
1826         }

1827         if (s->tlsext_opaque_prf_input != NULL)
1828         {
1829             if (s->s3->client_opaque_prf_input != NULL) /* shouldn't
1830             OPENSSL_free(s->s3->client_opaque_prf_input);

1831             if (s->tlsext_opaque_prf_input_len == 0)
1832                 s->s3->client_opaque_prf_input = OPENSSL_malloc(
1833             else
1834                 s->s3->client_opaque_prf_input = BUF_memdup(s->t
1835             if (s->s3->client_opaque_prf_input == NULL)
1836             {
1837                 SSLerr(SSL_F_SSL_PREPARE_CLIENTHELLO_TLSEXT, ERR_
1838                 return -1;
1839             }
1840             s->s3->client_opaque_prf_input_len = s->tlsext_opaque_pr

```



```

1844         }
1845
1846         if (r == 2)
1847             /* at callback's request, insist on receiving an appropri
1848             s->s3->server_opaque_prf_input_len = s->tlsext_opaque_pr
1849     }
1850 #endif
1851
1852     return 1;
1853 }
1854
1855 int ssl_prepare_serverhello_tlsext(SSL *s)
1856 {
1857     #ifndef OPENSSL_NO_EC
1858     /* If we are server and using an ECC cipher suite, send the point format
1859     * if the client sent us an ECPointsFormat extension. Note that the ser
1860     * supposed to send an EllipticCurves extension.
1861     */
1862
1863     unsigned long alg_k = s->s3->tmp.new_cipher->algorithm_mkey;
1864     unsigned long alg_a = s->s3->tmp.new_cipher->algorithm_auth;
1865     int using_ecc = (alg_k & (SSL_kECDH|SSL_kECDHr|SSL_kECDHe)) || (alg_a &
1866     using_ecc = using_ecc && (s->session->tlsext_ecpointformatlist != NULL);
1867
1868     if (using_ecc)
1869     {
1870         if (s->tlsext_ecpointformatlist != NULL) OPENSSL_free(s->tlsext_
1871         if ((s->tlsext_ecpointformatlist = OPENSSL_malloc(3)) == NULL)
1872         {
1873             SSLerr(SSL_F_SSL_PREPARE_SERVERHELLO_TLSEXT, ERR_R_MALLOC
1874             return -1;
1875         }
1876         s->tlsext_ecpointformatlist_length = 3;
1877         s->tlsext_ecpointformatlist[0] = TLSEXT_ECPOINTFORMAT_uncompress
1878         s->tlsext_ecpointformatlist[1] = TLSEXT_ECPOINTFORMAT_ansiX962_c
1879         s->tlsext_ecpointformatlist[2] = TLSEXT_ECPOINTFORMAT_ansiX962_c
1880     }
1881 #endif /* OPENSSL_NO_EC */
1882
1883     return 1;
1884 }
1885
1886 int ssl_check_clienthello_tlsext_early(SSL *s)
1887 {
1888     int ret=SSL_TLSEXT_ERR_NOACK;
1889     int al = SSL_AD_UNRECOGNIZED_NAME;
1890
1891     #ifndef OPENSSL_NO_EC
1892     /* The handling of the ECPointFormats extension is done elsewhere, namel
1893     * ssl3_choose_cipher in s3_lib.c.
1894     */
1895     /* The handling of the EllipticCurves extension is done elsewhere, namel
1896     * ssl3_choose_cipher in s3_lib.c.
1897     */
1898 #endif
1899
1900     if (s->ctx != NULL && s->ctx->tlsext_servername_callback != 0)
1901         ret = s->ctx->tlsext_servername_callback(s, &al, s->ctx->tlsext_
1902     else if (s->initial_ctx != NULL && s->initial_ctx->tlsext_servername_cal
1903         ret = s->initial_ctx->tlsext_servername_callback(s, &al, s->init
1904
1905     #ifdef TLSEXT_TYPE_opaque_prf_input
1906     {
1907         /* This sort of belongs into ssl_prepare_serverhello_tlsext(),
1908         * but we might be sending an alert in response to the client he
1909         * so this has to happen here in

```

```

1910         * ssl_check_clienthello_tlsext_early(). */
1911
1912     int r = 1;
1913
1914     if (s->ctx->tlsext_opaque_prf_input_callback != 0)
1915     {
1916         r = s->ctx->tlsext_opaque_prf_input_callback(s, NULL, 0,
1917         if (!r)
1918         {
1919             ret = SSL_TLSEXT_ERR_ALERT_FATAL;
1920             al = SSL_AD_INTERNAL_ERROR;
1921             goto err;
1922         }
1923     }
1924
1925     if (s->s3->server_opaque_prf_input != NULL) /* shouldn't really
1926         OPENSSL_free(s->s3->server_opaque_prf_input);
1927     s->s3->server_opaque_prf_input = NULL;
1928
1929     if (s->tlsext_opaque_prf_input != NULL)
1930     {
1931         if (s->s3->client_opaque_prf_input != NULL &&
1932             s->s3->client_opaque_prf_input_len == s->tlsext_
1933         {
1934             /* can only use this extension if we have a serv
1935             * of the same length as the client opaque PRF i
1936
1937             if (s->tlsext_opaque_prf_input_len == 0)
1938                 s->s3->server_opaque_prf_input = OPENSSL
1939             else
1940                 s->s3->server_opaque_prf_input = BUF_mem
1941             if (s->s3->server_opaque_prf_input == NULL)
1942             {
1943                 ret = SSL_TLSEXT_ERR_ALERT_FATAL;
1944                 al = SSL_AD_INTERNAL_ERROR;
1945                 goto err;
1946             }
1947             s->s3->server_opaque_prf_input_len = s->tlsext_o
1948         }
1949     }
1950
1951     if (r == 2 && s->s3->server_opaque_prf_input == NULL)
1952     {
1953         /* The callback wants to enforce use of the extension,
1954         * but we can't do that with the client opaque PRF input
1955         * abort the handshake.
1956         */
1957         ret = SSL_TLSEXT_ERR_ALERT_FATAL;
1958         al = SSL_AD_HANDSHAKE_FAILURE;
1959     }
1960 }
1961
1962 err:
1963 #endif
1964
1965     switch (ret)
1966     {
1967     case SSL_TLSEXT_ERR_ALERT_FATAL:
1968         ssl3_send_alert(s, SSL3_AL_FATAL, al);
1969         return -1;
1970
1971     case SSL_TLSEXT_ERR_ALERT_WARNING:
1972         ssl3_send_alert(s, SSL3_AL_WARNING, al);
1973         return 1;
1974
1975     case SSL_TLSEXT_ERR_NOACK:
1976         s->servername_done=0;

```

```

1976         default:
1977             return 1;
1978         }
1979     }

1981 int ssl_check_clienthello_tlsext_late(SSL *s)
1982 {
1983     int ret = SSL_TLSEXT_ERR_OK;
1984     int al;

1986     /* If status request then ask callback what to do.
1987      * Note: this must be called after servername callbacks in case
1988      * the certificate has changed, and must be called after the cipher
1989      * has been chosen because this may influence which certificate is sent
1990      */
1991     if ((s->tlsext_status_type != -1) && s->ctx && s->ctx->tlsext_status_cb)
1992     {
1993         int r;
1994         CERT_PKEY *certpkey;
1995         certpkey = ssl_get_server_send_pkey(s);
1996         /* If no certificate can't return certificate status */
1997         if (certpkey == NULL)
1998         {
1999             s->tlsext_status_expected = 0;
2000             return 1;
2001         }
2002         /* Set current certificate to one we will use so
2003          * SSL_get_certificate et al can pick it up.
2004          */
2005         s->cert->key = certpkey;
2006         r = s->ctx->tlsext_status_cb(s, s->ctx->tlsext_status_arg);
2007         switch (r)
2008         {
2009             /* We don't want to send a status request response */
2010             case SSL_TLSEXT_ERR_NOACK:
2011                 s->tlsext_status_expected = 0;
2012                 break;
2013             /* status request response should be sent */
2014             case SSL_TLSEXT_ERR_OK:
2015                 if (s->tlsext_ocsp_resp)
2016                     s->tlsext_status_expected = 1;
2017                 else
2018                     s->tlsext_status_expected = 0;
2019                 break;
2020             /* something bad happened */
2021             case SSL_TLSEXT_ERR_ALERT_FATAL:
2022                 ret = SSL_TLSEXT_ERR_ALERT_FATAL;
2023                 al = SSL_AD_INTERNAL_ERROR;
2024                 goto err;
2025         }
2026     }
2027     else
2028         s->tlsext_status_expected = 0;

2030 err:
2031     switch (ret)
2032     {
2033         case SSL_TLSEXT_ERR_ALERT_FATAL:
2034             ssl3_send_alert(s, SSL3_AL_FATAL, al);
2035             return -1;

2037         case SSL_TLSEXT_ERR_ALERT_WARNING:
2038             ssl3_send_alert(s, SSL3_AL_WARNING, al);
2039             return 1;

2041     default:

```

```

2042         return 1;
2043     }
2044 }

2046 int ssl_check_serverhello_tlsext(SSL *s)
2047 {
2048     int ret=SSL_TLSEXT_ERR_NOACK;
2049     int al = SSL_AD_UNRECOGNIZED_NAME;

2051 #ifndef OPENSSL_NO_EC
2052     /* If we are client and using an elliptic curve cryptography cipher
2053      * suite, then if server returns an EC point formats lists extension
2054      * it must contain uncompressed.
2055      */
2056     unsigned long alg_k = s->s3->tmp.new_cipher->algorithm_mkey;
2057     unsigned long alg_a = s->s3->tmp.new_cipher->algorithm_auth;
2058     if ((s->tlsext_ecpointformatlist != NULL) && (s->tlsext_ecpointformatlis
2059         (s->session->tlsext_ecpointformatlist != NULL) && (s->session->tlsex
2060             ((alg_k & (SSL_kECDH|SSL_kECDHr|SSL_kECDHe)) || (alg_a & SSL_aECDSA
2061                 /* we are using an ECC cipher */
2062                 size_t i;
2063                 unsigned char *list;
2064                 int found_uncompressed = 0;
2065                 list = s->session->tlsext_ecpointformatlist;
2066                 for (i = 0; i < s->session->tlsext_ecpointformatlist_length; i++)
2067                 {
2068                     if (*(list++) == TLSEXT_ECPOINTFORMAT_uncompressed)
2069                     {
2070                         found_uncompressed = 1;
2071                         break;
2072                     }
2073                 }
2074                 if (!found_uncompressed)
2075                 {
2076                     SSLerr(SSL_F_SSL_CHECK_SERVERHELLO_TLSEXT, SSL_R_TLS_INVA
2077                         return -1;
2078                 }
2079             }
2080             ret = SSL_TLSEXT_ERR_OK;
2081 #endif /* OPENSSL_NO_EC */

2084     if (s->ctx != NULL && s->ctx->tlsext_servername_callback != 0)
2085         ret = s->ctx->tlsext_servername_callback(s, &al, s->ctx->tlsext
2086     else if (s->initial_ctx != NULL && s->initial_ctx->tlsext_servername_cal
2087         ret = s->initial_ctx->tlsext_servername_callback(s, &al, s->init

2089 #ifdef TLSEXT_TYPE_opaque_prf_input
2090     if (s->s3->server_opaque_prf_input_len > 0)
2091     {
2092         /* This case may indicate that we, as a client, want to insist o
2093          * So first verify that we really have a value from the server t

2095         if (s->s3->server_opaque_prf_input == NULL)
2096         {
2097             ret = SSL_TLSEXT_ERR_ALERT_FATAL;
2098             al = SSL_AD_HANDSHAKE_FAILURE;
2099         }

2100         /* Anytime the server *has* sent an opaque PRF input, we need to
2101          * that we have a client opaque PRF input of the same size. */
2102         if (s->s3->client_opaque_prf_input == NULL ||
2103             s->s3->client_opaque_prf_input_len != s->s3->server_opaque_p
2104         {
2105             ret = SSL_TLSEXT_ERR_ALERT_FATAL;
2106             al = SSL_AD_ILLEGAL_PARAMETER;
2107         }

```

```

2108     }
2109     }
2110 #endif

2112 /* If we've requested certificate status and we wont get one
2113  * tell the callback
2114  */
2115 if ((s->tlsext_status_type != -1) && !(s->tlsext_status_expected)
2116     && s->ctx && s->ctx->tlsext_status_cb)
2117 {
2118     int r;
2119     /* Set resp to NULL, resplen to -1 so callback knows
2120      * there is no response.
2121      */
2122     if (s->tlsext_ocsp_resp)
2123     {
2124         OPENSSL_free(s->tlsext_ocsp_resp);
2125         s->tlsext_ocsp_resp = NULL;
2126     }
2127     s->tlsext_ocsp_resplen = -1;
2128     r = s->ctx->tlsext_status_cb(s, s->ctx->tlsext_status_arg);
2129     if (r == 0)
2130     {
2131         al = SSL_AD_BAD_CERTIFICATE_STATUS_RESPONSE;
2132         ret = SSL_TLSEXT_ERR_ALERT_FATAL;
2133     }
2134     if (r < 0)
2135     {
2136         al = SSL_AD_INTERNAL_ERROR;
2137         ret = SSL_TLSEXT_ERR_ALERT_FATAL;
2138     }
2139 }

2141 switch (ret)
2142 {
2143     case SSL_TLSEXT_ERR_ALERT_FATAL:
2144         ssl3_send_alert(s, SSL3_AL_FATAL, al);
2145         return -1;

2147     case SSL_TLSEXT_ERR_ALERT_WARNING:
2148         ssl3_send_alert(s, SSL3_AL_WARNING, al);
2149         return 1;

2150     case SSL_TLSEXT_ERR_NOACK:
2151         s->servername_done=0;
2152         default:
2153             return 1;
2154 }
2155 }
2156

2158 /* Since the server cache lookup is done early on in the processing of the
2159  * ClientHello, and other operations depend on the result, we need to handle
2160  * any TLS session ticket extension at the same time.
2161  *
2162  * session_id: points at the session ID in the ClientHello. This code will
2163  * read past the end of this in order to parse out the session ticket
2164  * extension, if any.
2165  * len: the length of the session ID.
2166  * limit: a pointer to the first byte after the ClientHello.
2167  * ret: (output) on return, if a ticket was decrypted, then this is set to
2168  * point to the resulting session.
2169  *
2170  * If s->tls_session_secret_cb is set then we are expecting a pre-shared key
2171  * ciphersuite, in which case we have no use for session tickets and one will
2172  * never be decrypted, nor will s->tlsext_ticket_expected be set to 1.
2173  */

```

```

2174 * Returns:
2175 * -1: fatal error, either from parsing or decrypting the ticket.
2176 * 0: no ticket was found (or was ignored, based on settings).
2177 * 1: a zero length extension was found, indicating that the client supports
2178 * session tickets but doesn't currently have one to offer.
2179 * 2: either s->tls_session_secret_cb was set, or a ticket was offered but
2180 * couldn't be decrypted because of a non-fatal error.
2181 * 3: a ticket was successfully decrypted and *ret was set.
2182 *
2183 * Side effects:
2184 * Sets s->tlsext_ticket_expected to 1 if the server will have to issue
2185 * a new session ticket to the client because the client indicated support
2186 * (and s->tls_session_secret_cb is NULL) but the client either doesn't have
2187 * a session ticket or we couldn't use the one it gave us, or if
2188 * s->ctx->tlsext_ticket_key_cb asked to renew the client's ticket.
2189 * Otherwise, s->tlsext_ticket_expected is set to 0.
2190 */
2191 int tls1_process_ticket(SSL *s, unsigned char *session_id, int len,
2192                        const unsigned char *limit, SSL_SESSION **ret)
2193 {
2194     /* Point after session ID in client hello */
2195     const unsigned char *p = session_id + len;
2196     unsigned short i;

2198     *ret = NULL;
2199     s->tlsext_ticket_expected = 0;

2201     /* If tickets disabled behave as if no ticket present
2202      * to permit stateful resumption.
2203      */
2204     if (SSL_get_options(s) & SSL_OP_NO_TICKET)
2205         return 0;
2206     if ((s->version <= SSL3_VERSION) || !limit)
2207         return 0;
2208     if (p >= limit)
2209         return -1;
2210     /* Skip past DTLS cookie */
2211     if (s->version == DTLS1_VERSION || s->version == DTLS1_BAD_VER)
2212     {
2213         i = *(p++);
2214         p += i;
2215         if (p >= limit)
2216             return -1;
2217     }
2218     /* Skip past cipher list */
2219     n2s(p, i);
2220     p += i;
2221     if (p >= limit)
2222         return -1;
2223     /* Skip past compression algorithm list */
2224     i = *(p++);
2225     p += i;
2226     if (p >= limit)
2227         return -1;
2228     /* Now at start of extensions */
2229     if ((p + 2) >= limit)
2230         return 0;
2231     n2s(p, i);
2232     while ((p + 4) <= limit)
2233     {
2234         unsigned short type, size;
2235         n2s(p, type);
2236         n2s(p, size);
2237         if (p + size > limit)
2238             return 0;
2239         if (type == TLSEXT_TYPE_session_ticket)

```

```

2240     {
2241         int r;
2242         if (size == 0)
2243         {
2244             /* The client will accept a ticket but doesn't
2245              * currently have one. */
2246             s->tlsext_ticket_expected = 1;
2247             return 1;
2248         }
2249         if (s->tls_session_secret_cb)
2250         {
2251             /* Indicate that the ticket couldn't be
2252              * decrypted rather than generating the session
2253              * from ticket now, trigger abbreviated
2254              * handshake based on external mechanism to
2255              * calculate the master secret later. */
2256             return 2;
2257         }
2258         r = tls_decrypt_ticket(s, p, size, session_id, len, ret)
2259         switch (r)
2260         {
2261             case 2: /* ticket couldn't be decrypted */
2262                 s->tlsext_ticket_expected = 1;
2263                 return 2;
2264             case 3: /* ticket was decrypted */
2265                 return r;
2266             case 4: /* ticket decrypted but need to renew */
2267                 s->tlsext_ticket_expected = 1;
2268                 return 3;
2269             default: /* fatal error */
2270                 return -1;
2271         }
2272     }
2273     p += size;
2274 }
2275 return 0;
2276 }

```

2278 /* tls_decrypt_ticket attempts to decrypt a session ticket.

2279 *

2280 * etick: points to the body of the session ticket extension.

2281 * eticklen: the length of the session tickets extension.

2282 * sess_id: points at the session ID.

2283 * sesslen: the length of the session ID.

2284 * psess: (output) on return, if a ticket was decrypted, then this is set to

2285 * point to the resulting session.

2286 *

2287 * Returns:

2288 * -1: fatal error, either from parsing or decrypting the ticket.

2289 * 2: the ticket couldn't be decrypted.

2290 * 3: a ticket was successfully decrypted and *psess was set.

2291 * 4: same as 3, but the ticket needs to be renewed.

2292 */

```

2293 static int tls_decrypt_ticket(SSL *s, const unsigned char *etick, int eticklen,
2294                             const unsigned char *sess_id, int sesslen,
2295                             SSL_SESSION **psess)
2296 {
2297     SSL_SESSION *sess;
2298     unsigned char *sdec;
2299     const unsigned char *p;
2300     int slen, mlen, renew_ticket = 0;
2301     unsigned char tick_hmac[EVP_MAX_MD_SIZE];
2302     HMAC_CTX hctx;
2303     EVP_CIPHER_CTX ctx;
2304     SSL_CTX *tctx = s->initial_ctx;
2305     /* Need at least keyname + iv + some encrypted data */

```

```

2306     if (eticklen < 48)
2307         return 2;
2308     /* Initialize session ticket encryption and HMAC contexts */
2309     HMAC_CTX_init(&hctx);
2310     EVP_CIPHER_CTX_init(&ctx);
2311     if (tctx->tlsext_ticket_key_cb)
2312     {
2313         unsigned char *nctick = (unsigned char *)etick;
2314         int rv = tctx->tlsext_ticket_key_cb(s, nctick, nctick + 16,
2315                                           &ctx, &hctx, 0);
2316         if (rv < 0)
2317             return -1;
2318         if (rv == 0)
2319             return 2;
2320         if (rv == 2)
2321             renew_ticket = 1;
2322     }
2323     else
2324     {
2325         /* Check key name matches */
2326         if (memcmp(etick, tctx->tlsext_tick_key_name, 16))
2327             return 2;
2328         HMAC_Init_ex(&hctx, tctx->tlsext_tick_hmac_key, 16,
2329                     tctx->tlsext_tick_md(), NULL);
2330         EVP_DecryptInit_ex(&ctx, EVP_aes_128_cbc(), NULL,
2331                           tctx->tlsext_tick_aes_key, etick + 16);
2332     }
2333     /* Attempt to process session ticket, first conduct sanity and
2334      * integrity checks on ticket.
2335      */
2336     mlen = HMAC_size(&hctx);
2337     if (mlen < 0)
2338     {
2339         EVP_CIPHER_CTX_cleanup(&ctx);
2340         return -1;
2341     }
2342     eticklen -= mlen;
2343     /* Check HMAC of encrypted ticket */
2344     HMAC_Update(&hctx, etick, eticklen);
2345     HMAC_Final(&hctx, tick_hmac, NULL);
2346     HMAC_CTX_cleanup(&hctx);
2347     if (CRYPTO_memcmp(tick_hmac, etick + eticklen, mlen))
2348         return 2;
2349     /* Attempt to decrypt session data */
2350     /* Move p after IV to start of encrypted ticket, update length */
2351     p = etick + 16 + EVP_CIPHER_CTX_iv_length(&ctx);
2352     eticklen -= 16 + EVP_CIPHER_CTX_iv_length(&ctx);
2353     sdec = OPENSSL_malloc(eticklen);
2354     if (!sdec)
2355     {
2356         EVP_CIPHER_CTX_cleanup(&ctx);
2357         return -1;
2358     }
2359     EVP_DecryptUpdate(&ctx, sdec, &slen, p, eticklen);
2360     if (EVP_DecryptFinal(&ctx, sdec + slen, &mlen) <= 0)
2361         return 2;
2362     slen += mlen;
2363     EVP_CIPHER_CTX_cleanup(&ctx);
2364     p = sdec;

```

2366 sess = d2i_SSL_SESSION(NULL, &p, slen);

2367 OPENSSL_free(sdec);

2368 if (sess)

2369 {

2370 /* The session ID, if non-empty, is used by some clients to

2371 * detect that the ticket has been accepted. So we copy it to

```

2372     * the session structure. If it is empty set length to zero
2373     * as required by standard.
2374     */
2375     if (sesslen)
2376         memcpy(sess->session_id, sess_id, sesslen);
2377     sess->session_id_length = sesslen;
2378     *psess = sess;
2379     if (renew_ticket)
2380         return 4;
2381     else
2382         return 3;
2383 }
2384 ERR_clear_error();
2385 /* For session parse failure, indicate that we need to send a new
2386  * ticket. */
2387 return 2;
2388 }

2390 /* Tables to translate from NIDs to TLS v1.2 ids */

2392 typedef struct
2393 {
2394     int nid;
2395     int id;
2396 } tls12_lookup;

2398 static tls12_lookup tls12_md[] = {
2399 #ifndef OPENSSL_NO_MD5
2400     {NID_md5, TLSEXT_hash_md5},
2401 #endif
2402 #ifndef OPENSSL_NO_SHA
2403     {NID_sha1, TLSEXT_hash_sha1},
2404 #endif
2405 #ifndef OPENSSL_NO_SHA256
2406     {NID_sha224, TLSEXT_hash_sha224},
2407     {NID_sha256, TLSEXT_hash_sha256},
2408 #endif
2409 #ifndef OPENSSL_NO_SHA512
2410     {NID_sha384, TLSEXT_hash_sha384},
2411     {NID_sha512, TLSEXT_hash_sha512},
2412 #endif
2413 };

2415 static tls12_lookup tls12_sig[] = {
2416 #ifndef OPENSSL_NO_RSA
2417     {EVP_PKEY_RSA, TLSEXT_signature_rsa},
2418 #endif
2419 #ifndef OPENSSL_NO_DSA
2420     {EVP_PKEY_DSA, TLSEXT_signature_dsa},
2421 #endif
2422 #ifndef OPENSSL_NO_ECDSA
2423     {EVP_PKEY_EC, TLSEXT_signature_ecdsa},
2424 #endif
2425 };

2427 static int tls12_find_id(int nid, tls12_lookup *table, size_t tlen)
2428 {
2429     size_t i;
2430     for (i = 0; i < tlen; i++)
2431     {
2432         if (table[i].nid == nid)
2433             return table[i].id;
2434     }
2435     return -1;
2436 }
2437 #if 0

```

```

2438 static int tls12_find_nid(int id, tls12_lookup *table, size_t tlen)
2439 {
2440     size_t i;
2441     for (i = 0; i < tlen; i++)
2442     {
2443         if (table[i].id == id)
2444             return table[i].nid;
2445     }
2446     return -1;
2447 }
2448 #endif

2450 int tls12_get_sigandhash(unsigned char *p, const EVP_PKEY *pk, const EVP_MD *md)
2451 {
2452     int sig_id, md_id;
2453     if (!md)
2454         return 0;
2455     md_id = tls12_find_id(EVP_MD_type(md), tls12_md,
2456                          sizeof(tls12_md)/sizeof(tls12_lookup));
2457     if (md_id == -1)
2458         return 0;
2459     sig_id = tls12_get_sigid(pk);
2460     if (sig_id == -1)
2461         return 0;
2462     p[0] = (unsigned char)md_id;
2463     p[1] = (unsigned char)sig_id;
2464     return 1;
2465 }

2467 int tls12_get_sigid(const EVP_PKEY *pk)
2468 {
2469     return tls12_find_id(pk->type, tls12_sig,
2470                          sizeof(tls12_sig)/sizeof(tls12_lookup));
2471 }

2473 const EVP_MD *tls12_get_hash(unsigned char hash_alg)
2474 {
2475     switch(hash_alg)
2476     {
2477 #ifndef OPENSSL_NO_SHA
2478         case TLSEXT_hash_sha1:
2479             return EVP_sha1();
2480 #endif
2481 #ifndef OPENSSL_NO_SHA256
2482         case TLSEXT_hash_sha224:
2483             return EVP_sha224();
2484
2485         case TLSEXT_hash_sha256:
2486             return EVP_sha256();
2487 #endif
2488 #ifndef OPENSSL_NO_SHA512
2489         case TLSEXT_hash_sha384:
2490             return EVP_sha384();
2491
2492         case TLSEXT_hash_sha512:
2493             return EVP_sha512();
2494 #endif
2495         default:
2496             return NULL;
2497     }
2498 }
2499 }

2501 /* Set preferred digest for each key type */

2503 int tls1_process_sigalgs(SSL *s, const unsigned char *data, int dsize)

```

```

2504     {
2505         int i, idx;
2506         const EVP_MD *md;
2507         CERT *c = s->cert;
2508         /* Extension ignored for TLS versions below 1.2 */
2509         if (TLS1_get_version(s) < TLS1_2_VERSION)
2510             return 1;
2511         /* Should never happen */
2512         if (!c)
2513             return 0;
2514
2515         c->pkeys[SSL_PKEY_DSA_SIGN].digest = NULL;
2516         c->pkeys[SSL_PKEY_RSA_SIGN].digest = NULL;
2517         c->pkeys[SSL_PKEY_RSA_ENC].digest = NULL;
2518         c->pkeys[SSL_PKEY_ECC].digest = NULL;
2519
2520         for (i = 0; i < dsize; i += 2)
2521         {
2522             unsigned char hash_alg = data[i], sig_alg = data[i+1];
2523
2524             switch(sig_alg)
2525             {
2526 #ifndef OPENSSSL_NO_RSA
2527                 case TLSEXT_signature_rsa:
2528                     idx = SSL_PKEY_RSA_SIGN;
2529                     break;
2530 #endif
2531 #ifndef OPENSSSL_NO_DSA
2532                 case TLSEXT_signature_dsa:
2533                     idx = SSL_PKEY_DSA_SIGN;
2534                     break;
2535 #endif
2536 #ifndef OPENSSSL_NO_ECDSA
2537                 case TLSEXT_signature_ecdsa:
2538                     idx = SSL_PKEY_ECC;
2539                     break;
2540 #endif
2541                 default:
2542                     continue;
2543             }
2544
2545             if (c->pkeys[idx].digest == NULL)
2546             {
2547                 md = tls12_get_hash(hash_alg);
2548                 if (md)
2549                 {
2550                     c->pkeys[idx].digest = md;
2551                     if (idx == SSL_PKEY_RSA_SIGN)
2552                         c->pkeys[SSL_PKEY_RSA_ENC].digest = md;
2553                 }
2554             }
2555         }
2556
2557         /* Set any remaining keys to default values. NOTE: if alg is not
2558          * supported it stays as NULL.
2559          */
2560 #ifndef OPENSSSL_NO_DSA
2561         if (!c->pkeys[SSL_PKEY_DSA_SIGN].digest)
2562             c->pkeys[SSL_PKEY_DSA_SIGN].digest = EVP_sha1();
2563 #endif
2564 #ifndef OPENSSSL_NO_RSA
2565         if (!c->pkeys[SSL_PKEY_RSA_SIGN].digest)
2566             c->pkeys[SSL_PKEY_RSA_SIGN].digest = EVP_sha1();
2567 #endif
2568         if (!c->pkeys[SSL_PKEY_RSA_SIGN].digest)
2569             c->pkeys[SSL_PKEY_RSA_SIGN].digest = EVP_sha1();

```

```

2570         c->pkeys[SSL_PKEY_RSA_ENC].digest = EVP_sha1();
2571     }
2572 #endif
2573 #ifndef OPENSSSL_NO_ECDSA
2574     if (!c->pkeys[SSL_PKEY_ECC].digest)
2575         c->pkeys[SSL_PKEY_ECC].digest = EVP_sha1();
2576 #endif
2577     return 1;
2578 }
2579
2580 #endif
2581
2582 #ifndef OPENSSSL_NO_HEARTBEATS
2583 int
2584 tls1_process_heartbeat(SSL *s)
2585 {
2586     unsigned char *p = &s->s3->rrec.data[0], *pl;
2587     unsigned short hbtype;
2588     unsigned int payload;
2589     unsigned int padding = 16; /* Use minimum padding */
2590
2591     if (s->msg_callback)
2592         s->msg_callback(0, s->version, TLS1_RT_HEARTBEAT,
2593             &s->s3->rrec.data[0], s->s3->rrec.length,
2594             s, s->msg_callback_arg);
2595
2596     /* Read type and payload length first */
2597     if (1 + 2 + 16 > s->s3->rrec.length)
2598         return 0; /* silently discard */
2599     hbtype = *p++;
2600     n2s(p, payload);
2601     if (1 + 2 + payload + 16 > s->s3->rrec.length)
2602         return 0; /* silently discard per RFC 6520 sec. 4 */
2603     pl = p;
2604
2605     if (hbtype == TLS1_HB_REQUEST)
2606     {
2607         unsigned char *buffer, *bp;
2608         int r;
2609
2610         /* Allocate memory for the response, size is 1 bytes
2611          * message type, plus 2 bytes payload length, plus
2612          * payload, plus padding
2613          */
2614         buffer = OPENSSSL_malloc(1 + 2 + payload + padding);
2615         bp = buffer;
2616
2617         /* Enter response type, length and copy payload */
2618         *bp++ = TLS1_HB_RESPONSE;
2619         s2n(payload, bp);
2620         memcpy(bp, pl, payload);
2621         bp += payload;
2622         /* Random padding */
2623         RAND_pseudo_bytes(bp, padding);
2624
2625         r = ssl3_write_bytes(s, TLS1_RT_HEARTBEAT, buffer, 3 + payload +
2626             padding);
2627         if (r >= 0 && s->msg_callback)
2628             s->msg_callback(1, s->version, TLS1_RT_HEARTBEAT,
2629                 buffer, 3 + payload + padding,
2630                 s, s->msg_callback_arg);
2631
2632         OPENSSSL_free(buffer);
2633
2634         if (r < 0)
2635             return r;

```

```

2636     }
2637     else if (hbtype == TLS1_HB_RESPONSE)
2638     {
2639         unsigned int seq;
2640
2641         /* We only send sequence numbers (2 bytes unsigned int),
2642          * and 16 random bytes, so we just try to read the
2643          * sequence number */
2644         n2s(pl, seq);
2645
2646         if (payload == 18 && seq == s->tlsext_hb_seq)
2647         {
2648             s->tlsext_hb_seq++;
2649             s->tlsext_hb_pending = 0;
2650         }
2651     }
2652
2653     return 0;
2654 }
2655
2656 int
2657 tls1_heartbeat(SSL *s)
2658 {
2659     unsigned char *buf, *p;
2660     int ret;
2661     unsigned int payload = 18; /* Sequence number + random bytes */
2662     unsigned int padding = 16; /* Use minimum padding */
2663
2664     /* Only send if peer supports and accepts HB requests... */
2665     if (!(s->tlsext_heartbeat & SSL_TLSEXT_HB_ENABLED) ||
2666         s->tlsext_heartbeat & SSL_TLSEXT_HB_DONT_SEND_REQUESTS)
2667     {
2668         SSLerr(SSL_F_TLS1_HEARTBEAT, SSL_R_TLS_HEARTBEAT_PEER_DOESNT_ACCE
2669             return -1;
2670     }
2671
2672     /* ...and there is none in flight yet... */
2673     if (s->tlsext_hb_pending)
2674     {
2675         SSLerr(SSL_F_TLS1_HEARTBEAT, SSL_R_TLS_HEARTBEAT_PENDING);
2676         return -1;
2677     }
2678
2679     /* ...and no handshake in progress. */
2680     if (SSL_in_init(s) || s->in_handshake)
2681     {
2682         SSLerr(SSL_F_TLS1_HEARTBEAT, SSL_R_UNEXPECTED_MESSAGE);
2683         return -1;
2684     }
2685
2686     /* Check if padding is too long, payload and padding
2687      * must not exceed 2^14 - 3 = 16381 bytes in total.
2688      */
2689     OPENSSL_assert(payload + padding <= 16381);
2690
2691     /* Create HeartBeat message, we just use a sequence number
2692      * as payload to distinguish different messages and add
2693      * some random stuff.
2694      * - Message Type, 1 byte
2695      * - Payload Length, 2 bytes (unsigned int)
2696      * - Payload, the sequence number (2 bytes uint)
2697      * - Payload, random bytes (16 bytes uint)
2698      * - Padding
2699      */
2700     buf = OPENSSL_malloc(1 + 2 + payload + padding);
2701     p = buf;

```

```

2702     /* Message Type */
2703     *p++ = TLS1_HB_REQUEST;
2704     /* Payload length (18 bytes here) */
2705     s2n(payload, p);
2706     /* Sequence number */
2707     s2n(s->tlsext_hb_seq, p);
2708     /* 16 random bytes */
2709     RAND_pseudo_bytes(p, 16);
2710     p += 16;
2711     /* Random padding */
2712     RAND_pseudo_bytes(p, padding);
2713
2714     ret = ssl3_write_bytes(s, TLS1_RT_HEARTBEAT, buf, 3 + payload + padding)
2715     if (ret >= 0)
2716     {
2717         if (s->msg_callback)
2718             s->msg_callback(1, s->version, TLS1_RT_HEARTBEAT,
2719                 buf, 3 + payload + padding,
2720                 s, s->msg_callback_arg);
2721
2722         s->tlsext_hb_pending = 1;
2723     }
2724
2725     OPENSSL_free(buf);
2726
2727     return ret;
2728 }
2729 #endif

```

```

*****
3819 Fri May 30 18:32:23 2014
new/usr/src/lib/openssl/libsunw_ssl/t1_meth.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/t1_meth.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include <openssl/objects.h>
61 #include "ssl_locl.h"

```

```

63 static const SSL_METHOD *tls1_get_method(int ver)
64 {
65     if (ver == TLS1_2_VERSION)
66         return TLSv1_2_method();
67     if (ver == TLS1_1_VERSION)
68         return TLSv1_1_method();
69     if (ver == TLS1_VERSION)
70         return TLSv1_method();
71     return NULL;
72 }
73
74 IMPLEMENT_tls_meth_func(TLS1_2_VERSION, TLSv1_2_method,
75                          ssl3_accept,
76                          ssl3_connect,
77                          tls1_get_method)
78
79 IMPLEMENT_tls_meth_func(TLS1_1_VERSION, TLSv1_1_method,
80                          ssl3_accept,
81                          ssl3_connect,
82                          tls1_get_method)
83
84 IMPLEMENT_tls_meth_func(TLS1_VERSION, TLSv1_method,
85                          ssl3_accept,
86                          ssl3_connect,
87                          tls1_get_method)

```



```

*****
11086 Fri May 30 18:32:23 2014
new/usr/src/lib/openssl/libsunw_ssl/t1_reneg.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/t1_reneg.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
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7  * The implementation was written so as to conform with Netscapes SSL.
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```

```

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104 * =====
105 *
106 * This product includes cryptographic software written by Eric Young
107 * (eay@cryptsoft.com). This product includes software written by Tim
108 * Hudson (tjh@cryptsoft.com).
109 *
110 */
111 #include <stdio.h>
112 #include <openssl/objects.h>
113 #include "ssl_locl.h"
114
115 /* Add the client's renegotiation binding */
116 int ssl_add_clienthello_renegotiate_ext(SSL *s, unsigned char *p, int *len,
117                                         int maxlen)
118 {
119     if(p)
120     {
121         if((s->s3->previous_client_finished_len+1) > maxlen)
122         {
123             SSLerr(SSL_F_SSL_ADD_CLIENTHELLO_RENEGOTIATE_EXT, SSL_R_RENEGOTIATE_E
124                 return 0;
125         }
126     }
127     /* Length byte */

```

```

128     *p = s->s3->previous_client_finished_len;
129     p++;

131     memcpy(p, s->s3->previous_client_finished,
132            s->s3->previous_client_finished_len);
133 #ifdef OPENSSL_RI_DEBUG
134     fprintf(stderr, "%s RI extension sent by client\n",
135            s->s3->previous_client_finished_len ? "Non-empty" : "Empty");
136 #endif
137 }
138
139 *len=s->s3->previous_client_finished_len + 1;

141
142 return 1;
143 }

145 /* Parse the client's renegotiation binding and abort if it's not
146    right */
147 int ssl_parse_clienthello_renegotiate_ext(SSL *s, unsigned char *d, int len,
148                                           int *al)
149 {
150     int ilen;

152     /* Parse the length byte */
153     if(len < 1)
154     {
155         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_E
156              *al=SSL_AD_ILLEGAL_PARAMETER;
157              return 0;
158     }
159     ilen = *d;
160     d++;

162     /* Consistency check */
163     if((ilen+1) != len)
164     {
165         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_E
166              *al=SSL_AD_ILLEGAL_PARAMETER;
167              return 0;
168     }

170     /* Check that the extension matches */
171     if(ilen != s->s3->previous_client_finished_len)
172     {
173         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_M
174              *al=SSL_AD_HANDSHAKE_FAILURE;
175              return 0;
176     }

177     if(memcmp(d, s->s3->previous_client_finished,
178             s->s3->previous_client_finished_len))
179     {
180         SSLerr(SSL_F_SSL_PARSE_CLIENTHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_M
181              *al=SSL_AD_HANDSHAKE_FAILURE;
182              return 0;
183     }
184 }

185 #ifdef OPENSSL_RI_DEBUG
186     fprintf(stderr, "%s RI extension received by server\n",
187            ilen ? "Non-empty" : "Empty");
188 #endif

190     s->s3->send_connection_binding=1;

192     return 1;
193 }

```

```

195 /* Add the server's renegotiation binding */
196 int ssl_add_serverhello_renegotiate_ext(SSL *s, unsigned char *p, int *len,
197                                         int maxlen)
198 {
199     if(p)
200     {
201         if((s->s3->previous_client_finished_len +
202            s->s3->previous_server_finished_len + 1) > maxlen)
203         {
204             SSLerr(SSL_F_SSL_ADD_SERVERHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATE_E
205                 return 0;
206         }
207
208         /* Length byte */
209         *p = s->s3->previous_client_finished_len + s->s3->previous_server_finish
210         p++;

212         memcpy(p, s->s3->previous_client_finished,
213                s->s3->previous_client_finished_len);
214         p += s->s3->previous_client_finished_len;

216         memcpy(p, s->s3->previous_server_finished,
217                s->s3->previous_server_finished_len);
218 #ifdef OPENSSL_RI_DEBUG
219         fprintf(stderr, "%s RI extension sent by server\n",
220                s->s3->previous_client_finished_len ? "Non-empty" : "Empty");
221 #endif
222     }
223
224     *len=s->s3->previous_client_finished_len
225         + s->s3->previous_server_finished_len + 1;

227     return 1;
228 }

230 /* Parse the server's renegotiation binding and abort if it's not
231    right */
232 int ssl_parse_serverhello_renegotiate_ext(SSL *s, unsigned char *d, int len,
233                                           int *al)
234 {
235     int expected_len=s->s3->previous_client_finished_len
236         + s->s3->previous_server_finished_len;
237     int ilen;

239     /* Check for logic errors */
240     OPENSSL_assert(!expected_len || s->s3->previous_client_finished_len);
241     OPENSSL_assert(!expected_len || s->s3->previous_server_finished_len);

242     /* Parse the length byte */
243     if(len < 1)
244     {
245         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_E
246              *al=SSL_AD_ILLEGAL_PARAMETER;
247              return 0;
248     }
249
250     ilen = *d;
251     d++;

253     /* Consistency check */
254     if(ilen+1 != len)
255     {
256         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_E
257              *al=SSL_AD_ILLEGAL_PARAMETER;
258              return 0;
259     }

```

```
260
261     /* Check that the extension matches */
262     if(ilen != expected_len)
263     {
264         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_M
265         *al=SSL_AD_HANDSHAKE_FAILURE;
266         return 0;
267     }
268
269     if(memcmp(d, s->s3->previous_client_finished,
270             s->s3->previous_client_finished_len))
271     {
272         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_M
273         *al=SSL_AD_HANDSHAKE_FAILURE;
274         return 0;
275     }
276     d += s->s3->previous_client_finished_len;
277
278     if(memcmp(d, s->s3->previous_server_finished,
279             s->s3->previous_server_finished_len))
280     {
281         SSLerr(SSL_F_SSL_PARSE_SERVERHELLO_RENEGOTIATE_EXT,SSL_R_RENEGOTIATION_M
282         *al=SSL_AD_ILLEGAL_PARAMETER;
283         return 0;
284     }
285 #ifdef OPENSSL_RI_DEBUG
286     fprintf(stderr, "%s RI extension received by client\n",
287             ilen ? "Non-empty" : "Empty");
288 #endif
289     s->s3->send_connection_binding=1;
290
291     return 1;
292 }
```

new/usr/src/lib/openssl/libsunw_ssl/t1_srvr.c

1

4082 Fri May 30 18:32:23 2014
new/usr/src/lib/openssl/libsunw_ssl/t1_srvr.c
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 /* ssl/t1_srvr.c */
2 /* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
3  * All rights reserved.
4  *
5  * This package is an SSL implementation written
6  * by Eric Young (eay@cryptsoft.com).
7  * The implementation was written so as to conform with Netscapes SSL.
8  *
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47 * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
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51 * SUCH DAMAGE.
52 *
53 * The licence and distribution terms for any publically available version or
54 * derivative of this code cannot be changed. i.e. this code cannot simply be
55 * copied and put under another distribution licence
56 * [including the GNU Public Licence.]
57 */
58
59 #include <stdio.h>
60 #include "ssl_locl.h"
61 #include <openssl/buffer.h>
```

new/usr/src/lib/openssl/libsunw_ssl/t1_srvr.c

2

```
62 #include <openssl/rand.h>
63 #include <openssl/objects.h>
64 #include <openssl/evp.h>
65 #include <openssl/x509.h>
66
67 static const SSL_METHOD *tls1_get_server_method(int ver);
68 static const SSL_METHOD *tls1_get_server_method(int ver)
69 {
70     if (ver == TLS1_2_VERSION)
71         return TLSv1_2_server_method();
72     if (ver == TLS1_1_VERSION)
73         return TLSv1_1_server_method();
74     if (ver == TLS1_VERSION)
75         return TLSv1_server_method();
76     return NULL;
77 }
78
79 IMPLEMENT_tls_meth_func(TLS1_2_VERSION, TLSv1_2_server_method,
80                         ssl3_accept,
81                         ssl_undefined_function,
82                         tls1_get_server_method)
83
84 IMPLEMENT_tls_meth_func(TLS1_1_VERSION, TLSv1_1_server_method,
85                         ssl3_accept,
86                         ssl_undefined_function,
87                         tls1_get_server_method)
88
89 IMPLEMENT_tls_meth_func(TLS1_VERSION, TLSv1_server_method,
90                         ssl3_accept,
91                         ssl_undefined_function,
92                         tls1_get_server_method)
```

```

*****
14148 Fri May 30 18:32:23 2014
new/usr/src/lib/openssl/libsunw_ssl/tls_srp.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
1 /* ssl/tls_srp.c */
2 /* Written by Christophe Renou (christophe.renou@edelweb.fr) with
3  * the precious help of Peter Sylvester (peter.sylvester@edelweb.fr)
4  * for the EdelKey project and contributed to the OpenSSL project 2004.
5  */
6 /* =====
7  * Copyright (c) 2004-2011 The OpenSSL Project. All rights reserved.
8  *
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10 * modification, are permitted provided that the following conditions
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51 * OF THE POSSIBILITY OF SUCH DAMAGE.
52 * =====
53 *
54 * This product includes cryptographic software written by Eric Young
55 * (eay@cryptsoft.com). This product includes software written by Tim
56 * Hudson (tjh@cryptsoft.com).
57 *
58 */
59 #include "ssl_loc1.h"
60 #ifndef OPENSSL_NO_SRP

```

```

62 #include <openssl/rand.h>
63 #include <openssl/srp.h>
64 #include <openssl/err.h>

66 int SSL_CTX_SRP_CTX_free(struct ssl_ctx_st *ctx)
67 {
68     if (ctx == NULL)
69         return 0;
70     OPENSSL_free(ctx->srp_ctx.login);
71     BN_free(ctx->srp_ctx.N);
72     BN_free(ctx->srp_ctx.g);
73     BN_free(ctx->srp_ctx.s);
74     BN_free(ctx->srp_ctx.B);
75     BN_free(ctx->srp_ctx.A);
76     BN_free(ctx->srp_ctx.a);
77     BN_free(ctx->srp_ctx.b);
78     BN_free(ctx->srp_ctx.v);
79     ctx->srp_ctx.TLS_ext_srp_username_callback = NULL;
80     ctx->srp_ctx.SRP_cb_arg = NULL;
81     ctx->srp_ctx.SRP_verify_param_callback = NULL;
82     ctx->srp_ctx.SRP_give_srp_client_pwd_callback = NULL;
83     ctx->srp_ctx.N = NULL;
84     ctx->srp_ctx.g = NULL;
85     ctx->srp_ctx.s = NULL;
86     ctx->srp_ctx.B = NULL;
87     ctx->srp_ctx.A = NULL;
88     ctx->srp_ctx.a = NULL;
89     ctx->srp_ctx.b = NULL;
90     ctx->srp_ctx.v = NULL;
91     ctx->srp_ctx.login = NULL;
92     ctx->srp_ctx.info = NULL;
93     ctx->srp_ctx.strength = SRP_MINIMAL_N;
94     ctx->srp_ctx.srp_mask = 0;
95     return (1);
96 }

98 int SSL_SRP_CTX_free(struct ssl_st *s)
99 {
100     if (s == NULL)
101         return 0;
102     OPENSSL_free(s->srp_ctx.login);
103     BN_free(s->srp_ctx.N);
104     BN_free(s->srp_ctx.g);
105     BN_free(s->srp_ctx.s);
106     BN_free(s->srp_ctx.B);
107     BN_free(s->srp_ctx.A);
108     BN_free(s->srp_ctx.a);
109     BN_free(s->srp_ctx.b);
110     BN_free(s->srp_ctx.v);
111     s->srp_ctx.TLS_ext_srp_username_callback = NULL;
112     s->srp_ctx.SRP_cb_arg = NULL;
113     s->srp_ctx.SRP_verify_param_callback = NULL;
114     s->srp_ctx.SRP_give_srp_client_pwd_callback = NULL;
115     s->srp_ctx.N = NULL;
116     s->srp_ctx.g = NULL;
117     s->srp_ctx.s = NULL;
118     s->srp_ctx.B = NULL;
119     s->srp_ctx.A = NULL;
120     s->srp_ctx.a = NULL;
121     s->srp_ctx.b = NULL;
122     s->srp_ctx.v = NULL;
123     s->srp_ctx.login = NULL;
124     s->srp_ctx.info = NULL;
125     s->srp_ctx.strength = SRP_MINIMAL_N;
126     s->srp_ctx.srp_mask = 0;
127     return (1);

```

```

128     }
129
130 int SSL_SRP_CTX_init(struct ssl_st *s)
131 {
132     SSL_CTX *ctx;
133
134     if ((s == NULL) || ((ctx = s->ctx) == NULL))
135         return 0;
136     s->srp_ctx.SRP_cb_arg = ctx->srp_ctx.SRP_cb_arg;
137     /* set client Hello login callback */
138     s->srp_ctx.TLS_ext_srp_username_callback = ctx->srp_ctx.TLS_ext_srp_user
139     /* set SRP N/g param callback for verification */
140     s->srp_ctx.SRP_verify_param_callback = ctx->srp_ctx.SRP_verify_param_cal
141     /* set SRP client passwd callback */
142     s->srp_ctx.SRP_give_srp_client_pwd_callback = ctx->srp_ctx.SRP_give_srp_
143
144     s->srp_ctx.N = NULL;
145     s->srp_ctx.g = NULL;
146     s->srp_ctx.s = NULL;
147     s->srp_ctx.B = NULL;
148     s->srp_ctx.A = NULL;
149     s->srp_ctx.a = NULL;
150     s->srp_ctx.b = NULL;
151     s->srp_ctx.v = NULL;
152     s->srp_ctx.login = NULL;
153     s->srp_ctx.info = ctx->srp_ctx.info;
154     s->srp_ctx.strength = ctx->srp_ctx.strength;
155
156     if (((ctx->srp_ctx.N != NULL) &&
157         ((s->srp_ctx.N = BN_dup(ctx->srp_ctx.N)) == NULL)) ||
158         ((ctx->srp_ctx.g != NULL) &&
159         ((s->srp_ctx.g = BN_dup(ctx->srp_ctx.g)) == NULL)) ||
160         ((ctx->srp_ctx.s != NULL) &&
161         ((s->srp_ctx.s = BN_dup(ctx->srp_ctx.s)) == NULL)) ||
162         ((ctx->srp_ctx.B != NULL) &&
163         ((s->srp_ctx.B = BN_dup(ctx->srp_ctx.B)) == NULL)) ||
164         ((ctx->srp_ctx.A != NULL) &&
165         ((s->srp_ctx.A = BN_dup(ctx->srp_ctx.A)) == NULL)) ||
166         ((ctx->srp_ctx.a != NULL) &&
167         ((s->srp_ctx.a = BN_dup(ctx->srp_ctx.a)) == NULL)) ||
168         ((ctx->srp_ctx.v != NULL) &&
169         ((s->srp_ctx.v = BN_dup(ctx->srp_ctx.v)) == NULL)) ||
170         ((ctx->srp_ctx.b != NULL) &&
171         ((s->srp_ctx.b = BN_dup(ctx->srp_ctx.b)) == NULL)))
172     {
173         SSLerr(SSL_F_SSL_SRP_CTX_INIT, ERR_R_BN_LIB);
174         goto err;
175     }
176     if ((ctx->srp_ctx.login != NULL) &&
177         ((s->srp_ctx.login = BUF_strdup(ctx->srp_ctx.login)) == NULL))
178     {
179         SSLerr(SSL_F_SSL_SRP_CTX_INIT, ERR_R_INTERNAL_ERROR);
180         goto err;
181     }
182     s->srp_ctx.srp_Mask = ctx->srp_ctx.srp_Mask;
183
184     return (1);
185 err:
186     OPENSSL_free(s->srp_ctx.login);
187     BN_free(s->srp_ctx.N);
188     BN_free(s->srp_ctx.g);
189     BN_free(s->srp_ctx.s);
190     BN_free(s->srp_ctx.B);
191     BN_free(s->srp_ctx.A);
192     BN_free(s->srp_ctx.a);
193     BN_free(s->srp_ctx.b);

```

```

194     BN_free(s->srp_ctx.v);
195     return (0);
196 }
197
198 int SSL_CTX_SRP_CTX_init(struct ssl_ctx_st *ctx)
199 {
200     if (ctx == NULL)
201         return 0;
202
203     ctx->srp_ctx.SRP_cb_arg = NULL;
204     /* set client Hello login callback */
205     ctx->srp_ctx.TLS_ext_srp_username_callback = NULL;
206     /* set SRP N/g param callback for verification */
207     ctx->srp_ctx.SRP_verify_param_callback = NULL;
208     /* set SRP client passwd callback */
209     ctx->srp_ctx.SRP_give_srp_client_pwd_callback = NULL;
210
211     ctx->srp_ctx.N = NULL;
212     ctx->srp_ctx.g = NULL;
213     ctx->srp_ctx.s = NULL;
214     ctx->srp_ctx.B = NULL;
215     ctx->srp_ctx.A = NULL;
216     ctx->srp_ctx.a = NULL;
217     ctx->srp_ctx.b = NULL;
218     ctx->srp_ctx.v = NULL;
219     ctx->srp_ctx.login = NULL;
220     ctx->srp_ctx.srp_Mask = 0;
221     ctx->srp_ctx.info = NULL;
222     ctx->srp_ctx.strength = SRP_MINIMAL_N;
223
224     return (1);
225 }
226
227 /* server side */
228 int SSL_srp_server_param_with_username(SSL *s, int *ad)
229 {
230     unsigned char b[SSL_MAX_MASTER_KEY_LENGTH];
231     int al;
232
233     *ad = SSL_AD_UNKNOWN_PSK_IDENTITY;
234     if ((s->srp_ctx.TLS_ext_srp_username_callback != NULL) &&
235         ((al = s->srp_ctx.TLS_ext_srp_username_callback(s, ad, s->srp_ctx
236             return al;
237
238     *ad = SSL_AD_INTERNAL_ERROR;
239     if ((s->srp_ctx.N == NULL) ||
240         (s->srp_ctx.g == NULL) ||
241         (s->srp_ctx.s == NULL) ||
242         (s->srp_ctx.v == NULL))
243         return SSL3_AL_FATAL;
244
245     if (RAND_bytes(b, sizeof(b)) <= 0)
246         return SSL3_AL_FATAL;
247     s->srp_ctx.b = BN_bin2bn(b, sizeof(b), NULL);
248     OPENSSL_cleanse(b, sizeof(b));
249
250     /* Calculate: B = (kv + g^b) % N */
251
252     return ((s->srp_ctx.B = SRP_Calc_B(s->srp_ctx.b, s->srp_ctx.N, s->srp_ctx
253         SSL_ERROR_NONE:SSL3_AL_FATAL;
254 }
255
256 /* If the server just has the raw password, make up a verifier entry on the fly
257 int SSL_set_srp_server_param_pw(SSL *s, const char *user, const char *pass, cons
258 {
259     SRP_gN *gN = SRP_get_default_gN(grp);

```

```

260     if(GN == NULL) return -1;
261     s->srp_ctx.N = BN_dup(GN->N);
262     s->srp_ctx.g = BN_dup(GN->g);
263     if(s->srp_ctx.v != NULL)
264     {
265         BN_clear_free(s->srp_ctx.v);
266         s->srp_ctx.v = NULL;
267     }
268     if(s->srp_ctx.s != NULL)
269     {
270         BN_clear_free(s->srp_ctx.s);
271         s->srp_ctx.s = NULL;
272     }
273     if(!SRP_create_verifier_BN(user, pass, &s->srp_ctx.s, &s->srp_ctx.v, GN-

275     return 1;
276 }

278 int SSL_set_srp_server_param(SSL *s, const BIGNUM *N, const BIGNUM *g,
279                             BIGNUM *sa, BIGNUM *v, char *info)
280 {
281     if (N != NULL)
282     {
283         if (s->srp_ctx.N != NULL)
284         {
285             if (!BN_copy(s->srp_ctx.N, N))
286             {
287                 BN_free(s->srp_ctx.N);
288                 s->srp_ctx.N = NULL;
289             }
290         }
291         else
292             s->srp_ctx.N = BN_dup(N);
293     }
294     if (g != NULL)
295     {
296         if (s->srp_ctx.g != NULL)
297         {
298             if (!BN_copy(s->srp_ctx.g, g))
299             {
300                 BN_free(s->srp_ctx.g);
301                 s->srp_ctx.g = NULL;
302             }
303         }
304         else
305             s->srp_ctx.g = BN_dup(g);
306     }
307     if (sa != NULL)
308     {
309         if (s->srp_ctx.s != NULL)
310         {
311             if (!BN_copy(s->srp_ctx.s, sa))
312             {
313                 BN_free(s->srp_ctx.s);
314                 s->srp_ctx.s = NULL;
315             }
316         }
317         else
318             s->srp_ctx.s = BN_dup(sa);
319     }
320     if (v != NULL)
321     {
322         if (s->srp_ctx.v != NULL)
323         {
324             if (!BN_copy(s->srp_ctx.v, v))
325             {

```

```

326         BN_free(s->srp_ctx.v);
327         s->srp_ctx.v = NULL;
328     }
329     }
330     else
331         s->srp_ctx.v = BN_dup(v);
332     }
333     s->srp_ctx.info = info;

335     if (!(s->srp_ctx.N) ||
336         !(s->srp_ctx.g) ||
337         !(s->srp_ctx.s) ||
338         !(s->srp_ctx.v))
339         return -1;

341     return 1;
342 }

344 int SRP_generate_server_master_secret(SSL *s, unsigned char *master_key)
345 {
346     BIGNUM *K = NULL, *u = NULL;
347     int ret = -1, tmp_len;
348     unsigned char *tmp = NULL;

350     if (!SRP_Verify_A_mod_N(s->srp_ctx.A, s->srp_ctx.N))
351         goto err;
352     if (!(u = SRP_Calc_u(s->srp_ctx.A, s->srp_ctx.B, s->srp_ctx.N)))
353         goto err;
354     if (!(K = SRP_Calc_server_key(s->srp_ctx.A, s->srp_ctx.v, u, s->srp_ctx.

355         goto err;

357     tmp_len = BN_num_bytes(K);
358     if ((tmp = OPENSSL_malloc(tmp_len)) == NULL)
359         goto err;
360     BN_bn2bin(K, tmp);
361     ret = s->method->ssl3_enc->generate_master_secret(s, master_key, tmp, tmp_l

362 err:
363     if (tmp)
364     {
365         OPENSSL_cleanse(tmp, tmp_len);
366         OPENSSL_free(tmp);
367     }
368     BN_clear_free(K);
369     BN_clear_free(u);
370     return ret;
371 }

373 /* client side */
374 int SRP_generate_client_master_secret(SSL *s, unsigned char *master_key)
375 {
376     BIGNUM *x = NULL, *u = NULL, *K = NULL;
377     int ret = -1, tmp_len;
378     char *passwd = NULL;
379     unsigned char *tmp = NULL;

381     /* Checks if b % n == 0
382     */
383     if (SRP_Verify_B_mod_N(s->srp_ctx.B, s->srp_ctx.N) == 0) goto err;
384     if (!(u = SRP_Calc_u(s->srp_ctx.A, s->srp_ctx.B, s->srp_ctx.N))) goto err;
385     if (s->srp_ctx.SRP_give_srp_client_pwd_callback == NULL) goto err;
386     if (!(passwd = s->srp_ctx.SRP_give_srp_client_pwd_callback(s, s->srp_ctx
387     if (!(x = SRP_Calc_x(s->srp_ctx.s, s->srp_ctx.login, passwd))) goto err;
388     if (!(K = SRP_Calc_client_key(s->srp_ctx.N, s->srp_ctx.B, s->srp_ctx.g,

390     tmp_len = BN_num_bytes(K);
391     if ((tmp = OPENSSL_malloc(tmp_len)) == NULL) goto err;

```

```

392     BN_bn2bin(K, tmp);
393     ret = s->method->ssl3_enc->generate_master_secret(s, master_key, tmp, tmp_len);
394 err:
395     if (tmp)
396     {
397         OPENSSL_cleanse(tmp, tmp_len);
398         OPENSSL_free(tmp);
399     }
400     BN_clear_free(K);
401     BN_clear_free(x);
402     if (passwd)
403     {
404         OPENSSL_cleanse(passwd, strlen(passwd));
405         OPENSSL_free(passwd);
406     }
407     BN_clear_free(u);
408     return ret;
409 }

411 int SRP_Calc_A_param(SSL *s)
412 {
413     unsigned char rnd[SSL_MAX_MASTER_KEY_LENGTH];

415     if (BN_num_bits(s->srp_ctx.N) < s->srp_ctx.strength)
416         return -1;

418     if (s->srp_ctx.SRP_verify_param_callback == NULL &&
419         !SRP_check_known_gN_param(s->srp_ctx.g, s->srp_ctx.N))
420         return -1;

422     RAND_bytes(rnd, sizeof(rnd));
423     s->srp_ctx.a = BN_bin2bn(rnd, sizeof(rnd), s->srp_ctx.a);
424     OPENSSL_cleanse(rnd, sizeof(rnd));

426     if (!(s->srp_ctx.A = SRP_Calc_A(s->srp_ctx.a, s->srp_ctx.N, s->srp_ctx.g)))
427         return -1;

429     /* We can have a callback to verify SRP param!! */
430     if (s->srp_ctx.SRP_verify_param_callback != NULL)
431         return s->srp_ctx.SRP_verify_param_callback(s, s->srp_ctx.SRP_cb);

433     return 1;
434 }

436 BIGNUM *SSL_get_srp_g(SSL *s)
437 {
438     if (s->srp_ctx.g != NULL)
439         return s->srp_ctx.g;
440     return s->ctx->srp_ctx.g;
441 }

443 BIGNUM *SSL_get_srp_N(SSL *s)
444 {
445     if (s->srp_ctx.N != NULL)
446         return s->srp_ctx.N;
447     return s->ctx->srp_ctx.N;
448 }

450 char *SSL_get_srp_username(SSL *s)
451 {
452     if (s->srp_ctx.login != NULL)
453         return s->srp_ctx.login;
454     return s->ctx->srp_ctx.login;
455 }

457 char *SSL_get_srp_userinfo(SSL *s)

```

```

458     {
459         if (s->srp_ctx.info != NULL)
460             return s->srp_ctx.info;
461         return s->ctx->srp_ctx.info;
462     }

464 #define tls1_ctx_ctrl ssl3_ctx_ctrl
465 #define tls1_ctx_callback_ctrl ssl3_ctx_callback_ctrl

467 int SSL_CTX_set_srp_username(SSL_CTX *ctx, char *name)
468 {
469     return tls1_ctx_ctrl(ctx, SSL_CTRL_SET_TLS_EXT_SRP_USERNAME, 0, name);
470 }

472 int SSL_CTX_set_srp_password(SSL_CTX *ctx, char *password)
473 {
474     return tls1_ctx_ctrl(ctx, SSL_CTRL_SET_TLS_EXT_SRP_PASSWORD, 0, password);
475 }

477 int SSL_CTX_set_srp_strength(SSL_CTX *ctx, int strength)
478 {
479     return tls1_ctx_ctrl(ctx, SSL_CTRL_SET_TLS_EXT_SRP_STRENGTH, strength,
480                          NULL);
481 }

483 int SSL_CTX_set_srp_verify_param_callback(SSL_CTX *ctx, int (*cb)(SSL *, void *))
484 {
485     return tls1_ctx_callback_ctrl(ctx, SSL_CTRL_SET_SRP_VERIFY_PARAM_CB,
486                                   (void (*)(void))cb);
487 }

489 int SSL_CTX_set_srp_cb_arg(SSL_CTX *ctx, void *arg)
490 {
491     return tls1_ctx_ctrl(ctx, SSL_CTRL_SET_SRP_ARG, 0, arg);
492 }

494 int SSL_CTX_set_srp_username_callback(SSL_CTX *ctx,
495                                       int (*cb)(SSL *, int *, void *))
496 {
497     return tls1_ctx_callback_ctrl(ctx, SSL_CTRL_SET_TLS_EXT_SRP_USERNAME_CB,
498                                   (void (*)(void))cb);
499 }

501 int SSL_CTX_set_srp_client_pwd_callback(SSL_CTX *ctx, char *(*cb)(SSL *, void *))
502 {
503     return tls1_ctx_callback_ctrl(ctx, SSL_CTRL_SET_SRP_GIVE_CLIENT_PWD_CB,
504                                   (void (*)(void))cb);
505 }

507 #endif

```


new/usr/src/lib/pkcs11/pkcs11_tpm/Makefile.com

1

```
*****
2442 Fri May 30 18:32:23 2014
new/usr/src/lib/pkcs11/pkcs11_tpm/Makefile.com
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #
24 LIBRARY =      pkcs11_tpm.a
25 VERS =        .1

27 OBJECTS= api_interface.o \
28          apiutil.o \
29          asn1.o \
30          cert.o \
31          data_obj.o \
32          decr_mgr.o \
33          dig_mgr.o \
34          encr_mgr.o \
35          globals.o \
36          hwf_obj.o \
37          key.o \
38          key_mgr.o \
39          loadsave.o \
40          log.o \
41          mech_md5.o \
42          mech_rsa.o \
43          mech_sha.o \
44          new_host.o \
45          obj_mgr.o \
46          object.o \
47          sess_mgr.o \
48          sign_mgr.o \
49          template.o \
50          tpm_specific.o \
51          utility.o \
52          verify_mgr.o
```

55 include \$(SRC)/lib/Makefile.lib

57 SRCDIR= ../common

59 SRCS= \$(OBJECTS:%.o=\$(SRCDIR)/%.c)

61 # set signing mode

new/usr/src/lib/pkcs11/pkcs11_tpm/Makefile.com

2

```
62 POST_PROCESS_S0 +=      ; $(ELFSIGN_CRYPT0)

64 ROOTLIBDIR=$(ROOT)/usr/lib/security
65 ROOTLIBDIR64=$(ROOT)/usr/lib/security/$(MACH64)

67 LIBS=$(DYNLIB) $(DYNLIB64)

69 TSSROOT=$(ADJUNCT_PROTO)
70 TSPILIBDIR=$(TSSROOT)/usr/lib
71 TSPINCDIR=$(TSSROOT)/usr/include
72 TSSLIB=-L$(TSPILIBDIR)
73 TSSLIB64=-L$(TSPILIBDIR)/$(MACH64)
74 TSSINC=-I$(TSPINCDIR)

76 LDLIBS += $(TSSLIB) -L$(ADJUNCT_PROTO)/lib -lc -luuid -lmd -ltspi

78 # libcrypto has no lint library, so we can only use it when
79 # building
80 $(LIBS) := LDLIBS += -lsunw_crypto
81 CPPFLAGS += -xCC -D_POSIX_PTHREAD_SEMANTICS $(TSSINC)
82 CPPFLAGS64 += $(CPPFLAGS)
83 C99MODE=      $(C99_ENABLE)

85 CERRWARN +=      -_gcc=-Wno-parentheses
86 CERRWARN +=      -_gcc=-Wno-unused-label
87 CERRWARN +=      -_gcc=-Wno-uninitialized

89 LINTSRC= $(OBJECTS:%.o=$(SRCDIR)/%.c)

91 $(LINTLIB):=      SRCS      =      $(SRCDIR)/$(LINTSRC)
92 LINTSRC= $(SRCS)

94 CLOBBERFILES += C.ln

96 .KEEP_STATE:

98 all: $(LIBS)
99
100 lint: $$$(LINTSRC)
101      $$(LINT.c) $$(LINTCHECKFLAGS) $$(LINTSRC) $$(LDLIBS)

103 pics/%.o: $(SRCDIR)/%.c
104      $(COMPILE.c) -o $$@ $<
105      $(POST_PROCESS_0)

107 include $(SRC)/lib/Makefile.targ
```

new/usr/src/lib/pkcs11/pkcs11_tpm/common/tpm_specific.c

1

```
*****
71718 Fri May 30 18:32:24 2014
new/usr/src/lib/pkcs11/pkcs11_tpm/common/tpm_specific.c
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 /*
2  * The Initial Developer of the Original Code is International
3  * Business Machines Corporation. Portions created by IBM
4  * Corporation are Copyright (C) 2005 International Business
5  * Machines Corporation. All Rights Reserved.
6  *
7  * This program is free software; you can redistribute it and/or modify
8  * it under the terms of the Common Public License as published by
9  * IBM Corporation; either version 1 of the License, or (at your option)
10 * any later version.
11 *
12 * This program is distributed in the hope that it will be useful,
13 * but WITHOUT ANY WARRANTY; without even the implied warranty of
14 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
15 * Common Public License for more details.
16 *
17 * You should have received a copy of the Common Public License
18 * along with this program; if not, a copy can be viewed at
19 * http://www.opensource.org/licenses/cpl1.0.php.
20 */
21 *
22 * Copyright 2010 Sun Microsystems, Inc. All rights reserved.
23 * Use is subject to license terms.
24 * Copyright 2012 Milan Jurik. All rights reserved.
25 */
```

```
27 #include <pthread.h>
28 #include <string.h>
29
30 #include <sys/types.h>
31 #include <sys/stat.h>
32 #include <uuid/uuid.h>
33 #include <fcntl.h>
34 #include <errno.h>
35 #include <pwd.h>
36 #include <syslog.h>
37
38 #include <openssl/opensslconf.h>
39 #include <openssl/rsa.h>
```

```
41 #include <tss/platform.h>
42 #include <tss/tss_defines.h>
43 #include <tss/tss_typedef.h>
44 #include <tss/tss_structs.h>
45 #include <tss/tss_error.h>
46 #include <tss/tcs_error.h>
47 #include <tss/tpspi.h>
48 #include <trousers/trousers.h>
```

```
50 #include "tpmtok_int.h"
51 #include "tpmtok_defs.h"
```

```
53 #define MAX_RSA_KEYLENGTH 512
```

```
55 extern void stlogit(char *fmt, ...);
```

```
57 CK_RV token_rng(TSS_HCONTEXT, CK_BYTE *, CK_ULONG);
58 int tok_slot2local(CK_SLOT_ID);
59 CK_RV token_specific_session(CK_SLOT_ID);
60 CK_RV token_specific_final(TSS_HCONTEXT);
```

new/usr/src/lib/pkcs11/pkcs11_tpm/common/tpm_specific.c

2

```
62 CK_RV
63 token_specific_rsa_decrypt(
64     TSS_HCONTEXT,
65     CK_BYTE *,
66     CK_ULONG,
67     CK_BYTE *,
68     CK_ULONG *,
69     OBJECT *);
70
71 CK_RV
72 token_specific_rsa_encrypt(
73     TSS_HCONTEXT,
74     CK_BYTE *,
75     CK_ULONG,
76     CK_BYTE *,
77     CK_ULONG *,
78     OBJECT *);
79
80 CK_RV
81 token_specific_rsa_sign(
82     TSS_HCONTEXT,
83     CK_BYTE *,
84     CK_ULONG,
85     CK_BYTE *,
86     CK_ULONG *,
87     OBJECT *);
88
89 CK_RV
90 token_specific_rsa_verify(TSS_HCONTEXT, CK_BYTE *,
91     CK_ULONG, CK_BYTE *, CK_ULONG, OBJECT *);
92
93 CK_RV
94 token_specific_rsa_generate_keypair(TSS_HCONTEXT,
95     TEMPLATE *,
96     TEMPLATE *);
97
98 CK_RV
99 token_specific_sha_init(DIGEST_CONTEXT *);
100
101 CK_RV
102 token_specific_sha_update(DIGEST_CONTEXT *,
103     CK_BYTE *,
104     CK_ULONG);
105
106 CK_RV
107 token_specific_sha_final(DIGEST_CONTEXT *,
108     CK_BYTE *,
109     CK_ULONG *);
110
111 CK_RV token_specific_login(TSS_HCONTEXT, CK_USER_TYPE, CK_CHAR_PTR, CK_ULONG);
112 CK_RV token_specific_logout(TSS_HCONTEXT);
113 CK_RV token_specific_init_pin(TSS_HCONTEXT, CK_CHAR_PTR, CK_ULONG);
114 CK_RV token_specific_set_pin(ST_SESSION_HANDLE, CK_CHAR_PTR,
115     CK_ULONG, CK_CHAR_PTR, CK_ULONG);
116 CK_RV token_specific_verify_so_pin(TSS_HCONTEXT, CK_CHAR_PTR, CK_ULONG);
117
118 static CK_RV
119 token_specific_init(char *, CK_SLOT_ID, TSS_HCONTEXT *);
120
121 struct token_specific_struct token_specific = {
122     "TPM_Debug",
123     &token_specific_init,
124     NULL,
125     &token_rng,
126     &token_specific_session,
127     &token_specific_final,
```

```

128     &token_specific_rsa_decrypt,
129     &token_specific_rsa_encrypt,
130     &token_specific_rsa_sign,
131     &token_specific_rsa_verify,
132     &token_specific_rsa_generate_keypair,
133     NULL,
134     NULL,
135     NULL,
136     &token_specific_login,
137     &token_specific_logout,
138     &token_specific_init_pin,
139     &token_specific_set_pin,
140     &token_specific_verify_so_pin
141 };

143 /* The context we'll use globally to connect to the TSP */

145 /* TSP key handles */
146 TSS_HKEY hPublicRootKey = NULL_HKEY;
147 TSS_HKEY hPublicLeafKey = NULL_HKEY;
148 TSS_HKEY hPrivateRootKey = NULL_HKEY;
149 TSS_HKEY hPrivateLeafKey = NULL_HKEY;

151 TSS_UUID publicRootKeyUUID;
152 TSS_UUID publicLeafKeyUUID;
153 TSS_UUID privateRootKeyUUID;
154 TSS_UUID privateLeafKeyUUID;

156 /* TSP policy handles */
157 TSS_HPOLICY hDefaultPolicy = NULL_HPOLICY;

159 /* PKCS#11 key handles */
160 int not_initialized = 0;

162 CK_BYTE current_user_pin_sha[SHA1_DIGEST_LENGTH];
163 CK_BYTE current_so_pin_sha[SHA1_DIGEST_LENGTH];

165 static TPM_CAP_VERSION_INFO tpmvinfo;

167 static CK_RV
168 verify_user_pin(TSS_HCONTEXT, CK_BYTE *);

170 static TSS_RESULT
171 tss_assign_secret_key_policy(TSS_HCONTEXT, TSS_FLAG, TSS_HKEY, CK_CHAR *);

173 static TSS_RESULT
174 set_legacy_key_params(TSS_HKEY);

176 static void
177 local_uuid_clear(TSS_UUID *uuid)
178 {
179     if (uuid == NULL)
180         return;
181     (void) memset(uuid, 0, sizeof (TSS_UUID));
182 }

185 /* convert from TSS_UUID to uuid_t */
186 static void
187 tss_uuid_convert_from(TSS_UUID *uu, uuid_t ptr)
188 {
189     uint_t      tmp;
190     uchar_t     *out = ptr;

192     tmp = ntohl(uu->ulTimeLow);
193     out[3] = (uchar_t)tmp;

```

```

194     tmp >>= 8;
195     out[2] = (uchar_t)tmp;
196     tmp >>= 8;
197     out[1] = (uchar_t)tmp;
198     tmp >>= 8;
199     out[0] = (uchar_t)tmp;

201     tmp = ntohs(uu->usTimeMid);
202     out[5] = (uchar_t)tmp;
203     tmp >>= 8;
204     out[4] = (uchar_t)tmp;

206     tmp = ntohs(uu->usTimeHigh);
207     out[7] = (uchar_t)tmp;
208     tmp >>= 8;
209     out[6] = (uchar_t)tmp;

211     tmp = uu->bClockSeqHigh;
212     out[8] = (uchar_t)tmp;
213     tmp = uu->bClockSeqLow;
214     out[9] = (uchar_t)tmp;

216     (void) memcpy(out+10, uu->rgbNode, 6);
217 }

219 /* convert from uuid_t to TSS_UUID */
220 static void
221 tss_uuid_convert_to(TSS_UUID *uuid, uuid_t in)
222 {
223     uchar_t     *ptr;
224     uint32_t     ltmp;
225     uint16_t     stmp;

227     ptr = in;

229     ltmp = *ptr++;
230     ltmp = (ltmp << 8) | *ptr++;
231     ltmp = (ltmp << 8) | *ptr++;
232     ltmp = (ltmp << 8) | *ptr++;
233     uuid->ulTimeLow = ntohl(ltmp);

235     stmp = *ptr++;
236     stmp = (stmp << 8) | *ptr++;
237     uuid->usTimeMid = ntohs(stmp);

239     stmp = *ptr++;
240     stmp = (stmp << 8) | *ptr++;
241     uuid->usTimeHigh = ntohs(stmp);

243     uuid->bClockSeqHigh = *ptr++;
245     uuid->bClockSeqLow = *ptr++;

247     (void) memcpy(uuid->rgbNode, ptr, 6);
248 }

250 static void
251 local_uuid_copy(TSS_UUID *dst, TSS_UUID *src)
252 {
253     uuid_t udst, usrc;

255     tss_uuid_convert_from(dst, udst);
256     tss_uuid_convert_from(src, usrc);

258     uuid_copy(udst, usrc);

```

```

260     tss_uuid_convert_to(dst, udst);
261 }

263 static void
264 local_uuid_generate(TSS_UUID *uu)
265 {
266     uuid_t newuuid;

268     uuid_generate(newuuid);

270     tss_uuid_convert_to(uu, newuuid);
271 }

273 static int
274 local_copy_file(char *dst, char *src)
275 {
276     FILE *fdest, *fsrc;
277     char line[BUFSIZ];

279     fdest = fopen(dst, "w");
280     if (fdest == NULL)
281         return (-1);

283     fsrc = fopen(src, "r");
284     if (fsrc == NULL) {
285         (void) fclose(fdest);
286         return (-1);
287     }

289     while (fread(line, sizeof (line), 1, fsrc))
290         (void) fprintf(fdest, "%s\n", line);
291     (void) fclose(fsrc);
292     (void) fclose(fdest);
293     return (0);
294 }

296 static int
297 remove_uuid(char *keyname)
298 {
299     int ret = 0;
300     FILE *fp, *newfp;
301     char fname[MAXPATHLEN];
302     char line[BUFSIZ], key[BUFSIZ], idstr[BUFSIZ];
303     char *tmpfname;
304     char *p = get_tpm_keystore_path();

306     if (p == NULL)
307         return (-1);

309     (void) snprintf(fname, sizeof (fname),
310         "%s/%s", p, TPMTOK_UUID_INDEX_FILENAME);

312     fp = fopen(fname, "r");
313     if (fp == NULL) {
314         return (-1);
315     }

317     tmpfname = tempnam("/tmp", "tpmtok");
318     newfp = fopen(tmpfname, "w+");
319     if (newfp == NULL) {
320         free(tmpfname);
321         (void) fclose(fp);
322         return (-1);
323     }

325     while (!feof(fp)) {

```

```

326         (void) fgetc(line, sizeof (line), fp);
327         if (sscanf(line, "%1024s %1024s", key, idstr) == 2) {
328             if (strcmp(key, keyname))
329                 (void) fprintf(newfp, "%s\n", line);
330         }
331     }

333     (void) fclose(fp);
334     (void) fclose(newfp);
335     if (local_copy_file(fname, tmpfname) == 0)
336         (void) unlink(tmpfname);

338     free(tmpfname);

340     return (ret);
341 }

343 static int
344 find_uuid(char *keyname, TSS_UUID *uu)
345 {
346     int ret = 0, found = 0;
347     FILE *fp = NULL;
348     char fname[MAXPATHLEN];
349     char line[BUFSIZ], key[BUFSIZ], idstr[BUFSIZ];
350     uuid_t uuid;
351     char *p = get_tpm_keystore_path();

353     if (p == NULL)
354         return (-1);

356     tss_uuid_convert_from(uu, uuid);

358     (void) snprintf(fname, sizeof (fname),
359         "%s/%s", p, TPMTOK_UUID_INDEX_FILENAME);

361     /* Open UUID Index file */
362     fp = fopen(fname, "r");
363     if (fp == NULL) {
364         if (errno == ENOENT) {
365             /* initialize the file */
366             fp = fopen(fname, "w");
367             if (fp != NULL)
368                 (void) fclose(fp);
369         }
370         return (-1);
371     }

373     while (!feof(fp)) {
374         (void) fgetc(line, sizeof (line), fp);
375         if (sscanf(line, "%1024s %1024s", key, idstr) == 2) {
376             if (strcmp(key, keyname) == 0) {
377                 ret = uuid_parse(idstr, uuid);
378                 if (ret == 0) {
379                     found = 1;
380                     tss_uuid_convert_to(uu,
381                         uuid);
382                 }
383                 break;
384             }
385         }
386     }
387     (void) fclose(fp);

389     if (!found)
390         ret = -1;
391     return (ret);

```

```

392 }

394 static int
395 local_uuid_is_null(TSS_UUID *uu)
396 {
397     uuid_t uuid;
398     int nulluuid;

400     tss_uuid_convert_from(uu, uuid);

402     nulluuid = uuid_is_null(uuid);
403     return (nulluuid);
404 }

406 static int
407 add_uuid(char *keyname, TSS_UUID *uu)
408 {
409     FILE *fp = NULL;
410     char fname[MAXPATHLEN];
411     char idstr[BUFSIZ];
412     uuid_t uuid;
413     char *p = get_tpm_keystore_path();

415     if (p == NULL)
416         return (-1);

418     tss_uuid_convert_from(uu, uuid);

420     if (uuid_is_null(uuid))
421         return (-1);

423     uuid_unparse(uuid, idstr);

425     (void) snprintf(fname, sizeof (fname),
426         "%s/%s", p, TPMTOK_UUID_INDEX_FILENAME);

428     fp = fopen(fname, "a");
429     if (fp == NULL)
430         return (-1);

432     (void) fprintf(fp, "%s %s\n", keyname, idstr);
433     (void) fclose(fp);

435     return (0);
436 }

439 static UINT32
440 util_get_keysize_flag(CK_ULONG size)
441 {
442     switch (size) {
443         case 512:
444             return (TSS_KEY_SIZE_512);
445         case 1024:
446             return (TSS_KEY_SIZE_1024);
447         case 2048:
448             return (TSS_KEY_SIZE_2048);
449         default:
450             break;
451     }

453     return (0);
454 }

456 /* make sure the public exponent attribute is 65537 */
457 static CK_ULONG

```

```

458 util_check_public_exponent(TEMPLATE *tmpl)
459 {
460     CK_BBOOL flag;
461     CK_ATTRIBUTE *publ_exp_attr;
462     CK_BYTE pubexp_bytes[] = { 1, 0, 1 };
463     CK_ULONG publ_exp, rc = 1;

465     flag = template_attribute_find(tmpl, CKA_PUBLIC_EXPONENT,
466         &publ_exp_attr);
467     if (!flag) {
468         LogError1("Couldn't find public exponent attribute");
469         return (CKR_TEMPLATE_INCOMPLETE);
470     }

472     switch (publ_exp_attr->ulValueLen) {
473         case 3:
474             rc = memcmp(pubexp_bytes, publ_exp_attr->pValue, 3);
475             break;
476         case sizeof (CK_ULONG):
477             publ_exp = *((CK_ULONG *)publ_exp_attr->pValue);
478             if (publ_exp == 65537)
479                 rc = 0;
480             break;
481         default:
482             break;
483     }

485     return (rc);
486 }

488 TSS_RESULT
489 set_public_modulus(TSS_HCONTEXT hContext, TSS_HKEY hKey,
490     unsigned long size_n, unsigned char *n)
491 {
492     UINT64 offset;
493     UINT32 blob_size;
494     BYTE *blob, pub_blob[1024];
495     TCPA_PUBKEY pub_key;
496     TSS_RESULT result;

498     /* Get the TCPA_PUBKEY blob from the key object. */
499     result = Tspi_GetAttribData(hKey, TSS_TSPATTRIB_KEY_BLOB,
500         TSS_TSPATTRIB_KEYBLOB_PUBLIC_KEY, &blob_size, &blob);
501     if (result != TSS_SUCCESS) {
502         stlogit("Tspi_GetAttribData failed: rc=0x%x - %s\n",
503             result, Trspi_Error_String(result));
504         return (result);
505     }

507     offset = 0;
508     result = Trspi_UnloadBlob_PUBKEY(&offset, blob, &pub_key);
509     if (result != TSS_SUCCESS) {
510         stlogit("Trspi_UnloadBlob_PUBKEY failed: rc=0x%x - %s\n",
511             result, Trspi_Error_String(result));
512         return (result);
513     }

515     Tspi_Context_FreeMemory(hContext, blob);
516     /* Free the first dangling reference, putting 'n' in its place */
517     free(pub_key.pubKey.key);
518     pub_key.pubKey.keyLength = size_n;
519     pub_key.pubKey.key = n;

521     offset = 0;
522     Trspi_LoadBlob_PUBKEY(&offset, pub_blob, &pub_key);

```

```

524     /* Free the second dangling reference */
525     free(pub_key.algorithmParms.parms);

527     /* set the public key data in the TSS object */
528     result = Tspi_SetAttribData(hKey, TSS_TPATTRIB_KEY_BLOB,
529     TSS_TPATTRIB_KEYBLOB_PUBLIC_KEY, (UINT32)offset, pub_blob);
530     if (result != TSS_SUCCESS) {
531         stlogit("Tspi_SetAttribData failed: rc=0x%0x - %s\n",
532             result, Trspi_Error_String(result));
533         return (result);
534     }

536     return (result);
537 }

539 /*
540  * Get details about the TPM to put into the token_info structure.
541  */
542 CK_RV
543 token_get_tpm_info(TSS_HCONTEXT hContext, TOKEN_DATA *td)
544 {
545     TSS_RESULT result;
546     TPM_CAPABILITY_AREA capArea = TSS_TPMCAP_VERSION_VAL;
547     UINT32 datalen;
548     BYTE *data;
549     TSS_HTPM hTPM;

551     if ((result = Tspi_Context_GetTpmObject(hContext, &hTPM)) {
552         stlogit("Tspi_Context_GetTpmObject: 0x%0x - %s",
553             result, Trspi_Error_String(result));
554         return (CKR_FUNCTION_FAILED);
555     }
556     if ((result = Tspi_TPM_GetCapability(hTPM,
557     capArea, 0, NULL, &datalen, &data)) != 0 || datalen == 0 ||
558     data == NULL) {
559         stlogit("Tspi_Context_GetCapability: 0x%0x - %s",
560             result, Trspi_Error_String(result));
561         return (CKR_FUNCTION_FAILED);
562     }
563     if (datalen > sizeof (tpmvinfo)) {
564         Tspi_Context_FreeMemory(hContext, data);
565         return (CKR_FUNCTION_FAILED);
566     }

568     (void) memcpy(&tpmvinfo, (void *)data, datalen);

570     bzero(td->token_info.manufacturerID,
571     sizeof (td->token_info.manufacturerID));

573     (void) memset(td->token_info.manufacturerID, ' ',
574     sizeof (td->token_info.manufacturerID) - 1);

576     (void) memcpy(td->token_info.manufacturerID,
577     tpmvinfo.tpmVendorID, sizeof (tpmvinfo.tpmVendorID));

579     (void) memset(td->token_info.label, ' ',
580     sizeof (td->token_info.label) - 1);

582     (void) memcpy(td->token_info.label, "TPM", 3);

584     td->token_info.hardwareVersion.major = tpmvinfo.version.major;
585     td->token_info.hardwareVersion.minor = tpmvinfo.version.minor;
586     td->token_info.firmwareVersion.major = tpmvinfo.version.revMajor;
587     td->token_info.firmwareVersion.minor = tpmvinfo.version.revMinor;

589     Tspi_Context_FreeMemory(hContext, data);

```

```

590     return (CKR_OK);
591 }

593 /*ARGSUSED*/
594 CK_RV
595 token_specific_session(CK_SLOT_ID slotid)
596 {
597     return (CKR_OK);
598 }

600 CK_RV
601 token_rng(TSS_HCONTEXT hContext, CK_BYTE *output, CK_ULONG bytes)
602 {
603     TSS_RESULT rc;
604     TSS_HTPM hTPM;
605     BYTE *random_bytes = NULL;

607     if ((rc = Tspi_Context_GetTpmObject(hContext, &hTPM)) {
608         stlogit("Tspi_Context_GetTpmObject: 0x%0x - %s",
609             rc, Trspi_Error_String(rc));
610         return (CKR_FUNCTION_FAILED);
611     }

613     if ((rc = Tspi_TPM_GetRandom(hTPM, bytes, &random_bytes)) {
614         stlogit("Tspi_TPM_GetRandom: 0x%0x - %s",
615             rc, Trspi_Error_String(rc));
616         return (CKR_FUNCTION_FAILED);
617     }

619     (void) memcpy(output, random_bytes, bytes);
620     Tspi_Context_FreeMemory(hContext, random_bytes);

622     return (CKR_OK);
623 }

625 TSS_RESULT
626 open_tss_context(TSS_HCONTEXT *pContext)
627 {
628     TSS_RESULT result;

630     if ((result = Tspi_Context_Create(pContext)) {
631         stlogit("Tspi_Context_Create: 0x%0x - %s",
632             result, Trspi_Error_String(result));
633         return (CKR_FUNCTION_FAILED);
634     }

636     if ((result = Tspi_Context_Connect(*pContext, NULL)) {
637         stlogit("Tspi_Context_Connect: 0x%0x - %s",
638             result, Trspi_Error_String(result));
639         Tspi_Context_Close(*pContext);
640         *pContext = 0;
641         return (CKR_FUNCTION_FAILED);
642     }
643     return (result);
644 }

646 /*ARGSUSED*/
647 static CK_RV
648 token_specific_init(char *Correlator, CK_SLOT_ID SlotNumber,
649     TSS_HCONTEXT *hContext)
650 {
651     TSS_RESULT result;

653     result = open_tss_context(hContext);
654     if (result)
655         return (CKR_FUNCTION_FAILED);

```

```

657     if ((result = Tspi_Context_GetDefaultPolicy(*hContext,
658         &hDefaultPolicy))) {
659         stlogit("Tspi_Context_GetDefaultPolicy: 0x%0x - %s",
660             result, Trspi_Error_String(result));
661         return (CKR_FUNCTION_FAILED);
662     }

664     local_uuid_clear(&publicRootKeyUUID);
665     local_uuid_clear(&privateRootKeyUUID);
666     local_uuid_clear(&publicLeafKeyUUID);
667     local_uuid_clear(&privateLeafKeyUUID);

669     result = token_get_tpm_info(*hContext, nv_token_data);
670     return (result);
671 }

673 /*
674  * Given a modulus and prime from an RSA key, create a TSS_HKEY object by
675  * wrapping the RSA key with a key from the TPM (SRK or other previously stored
676  * key).
677  */
678 static CK_RV
679 token_wrap_sw_key(
680     TSS_HCONTEXT hContext,
681     int size_n,
682     unsigned char *n,
683     int size_p,
684     unsigned char *p,
685     TSS_HKEY hParentKey,
686     TSS_FLAG initFlags,
687     TSS_HKEY *phKey)
688 {
689     TSS_RESULT result;
690     UINT32 key_size;

692     key_size = util_get_keysize_flag(size_n * 8);
693     if (initFlags == 0) {
694         return (CKR_FUNCTION_FAILED);
695     }

697     /* create the TSS key object */
698     result = Tspi_Context_CreateObject(hContext, TSS_OBJECT_TYPE_RSAKEY,
699         TSS_KEY_MIGRATABLE | initFlags | key_size, phKey);
700     if (result != TSS_SUCCESS) {
701         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
702             result, Trspi_Error_String(result));
703         return (CKR_FUNCTION_FAILED);
704     }

706     result = set_public_modulus(hContext, *phKey, size_n, n);
707     if (result != TSS_SUCCESS) {
708         Tspi_Context_CloseObject(hContext, *phKey);
709         *phKey = NULL_HKEY;
710         return (CKR_FUNCTION_FAILED);
711     }

713     /* set the private key data in the TSS object */
714     result = Tspi_SetAttribData(*phKey, TSS_TSPATTRIB_KEY_BLOB,
715         TSS_TSPATTRIB_KEYBLOB_PRIVATE_KEY, size_p, p);
716     if (result != TSS_SUCCESS) {
717         stlogit("Tspi_SetAttribData: 0x%0x - %s",
718             result, Trspi_Error_String(result));
719         Tspi_Context_CloseObject(hContext, *phKey);
720         *phKey = NULL_HKEY;
721         return (CKR_FUNCTION_FAILED);

```

```

722     }

724     result = tss_assign_secret_key_policy(hContext, TSS_POLICY_MIGRATION,
725         *phKey, NULL);

727     if (TPMTOK_TSS_KEY_TYPE(initFlags) == TSS_KEY_TYPE_LEGACY) {
728         if ((result = Tspi_SetAttribUint32(*phKey,
729             TSS_TSPATTRIB_KEY_INFO, TSS_TSPATTRIB_KEYINFO_ENCScheme,
730             TSS_ES_RSAESPKCSV15))) {
731             stlogit("Tspi_SetAttribUint32: 0x%0x - %s\n",
732                 result, Trspi_Error_String(result));
733             Tspi_Context_CloseObject(hContext, *phKey);
734             return (CKR_FUNCTION_FAILED);
735         }

737         if ((result = Tspi_SetAttribUint32(*phKey,
738             TSS_TSPATTRIB_KEY_INFO, TSS_TSPATTRIB_KEYINFO_SIGScheme,
739             TSS_SS_RSASSAPKCS1V15_DER))) {
740             stlogit("Tspi_SetAttribUint32: 0x%0x - %s\n",
741                 result, Trspi_Error_String(result));
742             Tspi_Context_CloseObject(hContext, *phKey);
743             return (CKR_FUNCTION_FAILED);
744         }
745     }

747     result = Tspi_Key_WrapKey(*phKey, hParentKey, NULL_HPCRS);
748     if (result != TSS_SUCCESS) {
749         stlogit("Tspi_Key_WrapKey: 0x%0x - %s",
750             result, Trspi_Error_String(result));
751         Tspi_Context_CloseObject(hContext, *phKey);
752         *phKey = NULL_HKEY;
753         return (CKR_FUNCTION_FAILED);
754     }

756     return (CKR_OK);
757 }

759 /*
760  * Create a TPM key blob for an imported key. This function is only called when
761  * a key is in active use, so any failure should trickle through.
762  */
763 static CK_RV
764 token_wrap_key_object(TSS_HCONTEXT hContext,
765     CK_OBJECT_HANDLE ckObject,
766     TSS_HKEY hParentKey, TSS_HKEY *phKey)
767 {
768     CK_RV rc = CKR_OK;
769     CK_ATTRIBUTE *attr = NULL, *new_attr, *prime_attr;
770     CK_ULONG class, key_type;
771     OBJECT *obj;

773     TSS_RESULT result;
774     TSS_FLAG initFlags = 0;
775     BYTE *rgbBlob;
776     UINT32 ulBlobLen;

778     if ((rc = object_mgr_find_in_map1(hContext, ckObject, &obj))) {
779         return (rc);
780     }

782     /* if the object isn't a key, fail */
783     if (template_attribute_find(obj->template, CKA_KEY_TYPE,
784         &attr) == FALSE) {
785         return (CKR_TEMPLATE_INCOMPLETE);
786     }

```

```

788     key_type = *((CK_ULONG *)attr->pValue);
790     if (key_type != CKK_RSA) {
791         return (CKR_TEMPLATE_INCONSISTENT);
792     }
794     if (template_attribute_find(obj->template, CKA_CLASS,
795         &attr) == FALSE) {
796         return (CKR_TEMPLATE_INCOMPLETE);
797     }
799     class = *((CK_ULONG *)attr->pValue);
801     if (class == CKO_PRIVATE_KEY) {
802         /*
803          * In order to create a full TSS key blob using a PKCS#11
804          * private key object, we need one of the two primes, the
805          * modulus and the private exponent and we need the public
806          * exponent to be correct.
807          */
809         /*
810          * Check the least likely attribute to exist first, the
811          * primes.
812          */
813         if (template_attribute_find(obj->template, CKA_PRIME_1,
814             &prime_attr) == FALSE) {
815             if (template_attribute_find(obj->template,
816                 CKA_PRIME_2, &prime_attr) == FALSE) {
817                 return (CKR_TEMPLATE_INCOMPLETE);
818             }
819         }
821         /* Make sure the public exponent is usable */
822         if ((rc = util_check_public_exponent(obj->template))) {
823             return (CKR_TEMPLATE_INCONSISTENT);
824         }
826         /* get the modulus */
827         if (template_attribute_find(obj->template, CKA_MODULUS,
828             &attr) == FALSE) {
829             return (CKR_TEMPLATE_INCOMPLETE);
830         }
832         /* make sure the key size is usable */
833         initFlags = util_get_keysize_flag(attr->ulValueLen * 8);
834         if (initFlags == 0) {
835             return (CKR_TEMPLATE_INCONSISTENT);
836         }
838         /* generate the software based key */
839         if ((rc = token_wrap_sw_key(hContext,
840             (int)attr->ulValueLen, attr->pValue,
841             (int)prime_attr->ulValueLen, prime_attr->pValue,
842             hParentKey, TSS_KEY_TYPE_LEGACY | TSS_KEY_NO_AUTHORIZATION,
843             phKey))) {
844             return (rc);
845         }
846     } else if (class == CKO_PUBLIC_KEY) {
847         /* Make sure the public exponent is usable */
848         if ((util_check_public_exponent(obj->template))) {
849             return (CKR_TEMPLATE_INCONSISTENT);
850         }
852         /* grab the modulus to put into the TSS key object */
853         if (template_attribute_find(obj->template,

```

```

854         CKA_MODULUS, &attr) == FALSE) {
855             return (CKR_TEMPLATE_INCONSISTENT);
856         }
858         /* make sure the key size is usable */
859         initFlags = util_get_keysize_flag(attr->ulValueLen * 8);
860         if (initFlags == 0) {
861             return (CKR_TEMPLATE_INCONSISTENT);
862         }
864         initFlags |= TSS_KEY_MIGRATABLE | TSS_KEY_NO_AUTHORIZATION |
865             TSS_KEY_TYPE_LEGACY;
867         if ((result = Tspi_Context_CreateObject(hContext,
868             TSS_OBJECT_TYPE_RSAKEY, initFlags, phKey))) {
869             stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
870                 result, Trspi_Error_String(result));
871             return (result);
872         }
874         if ((result = set_public_modulus(hContext, *phKey,
875             attr->ulValueLen, attr->pValue))) {
876             Tspi_Context_CloseObject(hContext, *phKey);
877             *phKey = NULL_HKEY;
878             return (CKR_FUNCTION_FAILED);
879         }
880         result = tss_assign_secret_key_policy(hContext,
881             TSS_POLICY_MIGRATION, *phKey, NULL);
882         if (result) {
883             Tspi_Context_CloseObject(hContext, *phKey);
884             *phKey = NULL_HKEY;
885             return (CKR_FUNCTION_FAILED);
886         }
888         result = set_legacy_key_params(*phKey);
889         if (result) {
890             Tspi_Context_CloseObject(hContext, *phKey);
891             *phKey = NULL_HKEY;
892             return (CKR_FUNCTION_FAILED);
893         }
894     } else {
895         return (CKR_FUNCTION_FAILED);
896     }
898     /* grab the entire key blob to put into the PKCS#11 object */
899     if ((result = Tspi_GetAttribData(*phKey, TSS_TSPATTRIB_KEY_BLOB,
900         TSS_TSPATTRIB_KEYBLOB_BLOB, &ulBlobLen, &rgbBlob))) {
901         stlogit("Tspi_GetAttribData: 0x%0x - %s",
902             result, Trspi_Error_String(result));
903         return (CKR_FUNCTION_FAILED);
904     }
906     /* insert the key blob into the object */
907     if ((rc = build_attribute(CKA_IBM_OPAQUE, rgbBlob, ulBlobLen,
908         &new_attr))) {
909         Tspi_Context_FreeMemory(hContext, rgbBlob);
910         return (rc);
911     }
912     (void) template_update_attribute(obj->template, new_attr);
913     Tspi_Context_FreeMemory(hContext, rgbBlob);
915     /*
916     * If this is a token object, save it with the new attribute
917     * so that we don't have to go down this path again.
918     */
919     if (!object_is_session_object(obj)) {

```



```

920         rc = save_token_object(hContext, obj);
921     }
922
923     return (rc);
924 }
925
926 static TSS_RESULT
927 tss_assign_secret_key_policy(TSS_HCONTEXT hContext, TSS_FLAG policyType,
928     TSS_HKEY hKey, CK_CHAR *passHash)
929 {
930     TSS_RESULT result;
931     TSS_HPOLICY hPolicy;
932
933     if ((result = Tspi_Context_CreateObject(hContext,
934         TSS_OBJECT_TYPE_POLICY, policyType, &hPolicy))) {
935         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
936             result, Trspi_Error_String(result));
937         return (result);
938     }
939     if ((result = Tspi_Policy_AssignToObject(hPolicy, hKey))) {
940         stlogit("Tspi_Policy_AssignToObject: 0x%0x - %s",
941             result, Trspi_Error_String(result));
942         goto done;
943     }
944     if (passHash == NULL) {
945         result = Tspi_Policy_SetSecret(hPolicy, TSS_SECRET_MODE_NONE,
946             0, NULL);
947     } else {
948         result = Tspi_Policy_SetSecret(hPolicy, TSS_SECRET_MODE_SHA1,
949             SHA1_DIGEST_LENGTH, passHash);
950     }
951     if (result != TSS_SUCCESS) {
952         stlogit("Tspi_Policy_SetSecret: 0x%0x - %s",
953             result, Trspi_Error_String(result));
954         goto done;
955     }
956 done:
957     if (result != TSS_SUCCESS)
958         Tspi_Context_CloseObject(hContext, hPolicy);
959     return (result);
960 }
961
962 /*
963  * Take a key from the TSS store (on-disk) and load it into the TPM, wrapped
964  * by an already TPM-resident key and protected with a PIN (optional).
965  */
966 static CK_RV
967 token_load_key(
968     TSS_HCONTEXT hContext,
969     CK_OBJECT_HANDLE ckKey,
970     TSS_HKEY hParentKey,
971     CK_CHAR_PTR passHash,
972     TSS_HKEY *phKey)
973 {
974     TSS_RESULT result;
975     CK_RV rc;
976
977     /*
978      * The key blob wasn't found, load the parts of the key
979      * from the object DB and create a new key object that
980      * gets loaded into the TPM, wrapped with the parent key.
981      */
982     if ((rc = token_wrap_key_object(hContext, ckKey,
983         hParentKey, phKey))) {
984         return (rc);
985     }

```

```

987     /*
988      * Assign the PIN hash (optional) to the newly loaded key object,
989      * if this PIN is incorrect, the TPM will not be able to decrypt
990      * the private key and use it.
991      */
992     result = tss_assign_secret_key_policy(hContext, TSS_POLICY_USAGE,
993         *phKey, passHash);
994
995     return (result);
996 }
997
998 /*
999  * Load the SRK into the TPM by referencing its well-known UUID and using the
1000  * default SRK PIN (20 bytes of 0x00).
1001  *
1002  * NOTE - if the SRK PIN is changed by an administrative tool, this code will
1003  * fail because it assumes that the well-known PIN is still being used.
1004  */
1005 static TSS_RESULT
1006 token_load_srk(TSS_HCONTEXT hContext, TSS_HKEY *hSRK)
1007 {
1008     TSS_HPOLICY hPolicy;
1009     TSS_RESULT result;
1010     TSS_UUID SRK_UUID = TSS_UUID_SRK;
1011     BYTE wellKnown[] = TSS_WELL_KNOWN_SECRET;
1012     TSS_HTPM hTPM;
1013
1014     if ((result = Tspi_Context_GetTpmObject(hContext, &hTPM))) {
1015         stlogit("Tspi_Context_GetTpmObject: 0x%0x - %s",
1016             result, Trspi_Error_String(result));
1017         return (CKR_FUNCTION_FAILED);
1018     }
1019
1020     /* load the SRK */
1021     if ((result = Tspi_Context_LoadKeyByUUID(hContext,
1022         TSS_PS_TYPE_SYSTEM, SRK_UUID, hSRK))) {
1023         stlogit("Tspi_Context_LoadKeyByUUID: 0x%0x - %s",
1024             result, Trspi_Error_String(result));
1025         goto done;
1026     }
1027     if ((result = Tspi_GetPolicyObject(*hSRK, TSS_POLICY_USAGE,
1028         &hPolicy))) {
1029         stlogit("Tspi_GetPolicyObject: 0x%0x - %s",
1030             result, Trspi_Error_String(result));
1031         goto done;
1032     }
1033     if ((result = Tspi_Policy_SetSecret(hPolicy, TSS_SECRET_MODE_SHA1,
1034         sizeof(wellKnown), wellKnown))) {
1035         stlogit("Tspi_Policy_SetSecret: 0x%0x - %s",
1036             result, Trspi_Error_String(result));
1037         goto done;
1038     }
1039
1040 done:
1041     return (result);
1042 }
1043
1044 static TSS_RESULT
1045 tss_find_and_load_key(TSS_HCONTEXT hContext,
1046     char *keyid, TSS_UUID *uuid, TSS_HKEY hParent,
1047     BYTE *hash, TSS_HKEY *hKey)
1048 {
1049     TSS_RESULT result;
1050
1051     if (local_uuid_is_null(uuid) &&

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```

1052     find_uuid(keyid, uuid)) {
1053         /* The UUID was not created or saved yet */
1054         return (1);
1055     }
1056     result = Tspi_Context_GetKeyByUUID(hContext,
1057         TSS_PS_TYPE_USER, *uuid, hKey);
1058     if (result) {
1059         stlogit("Tspi_Context_GetKeyByUUID: 0x%0x - %s",
1060             result, Trspi_Error_String(result));
1061         return (result);
1062     }
1064     if (hash != NULL) {
1065         result = tss_assign_secret_key_policy(hContext,
1066             TSS_POLICY_USAGE, *hKey, (CK_BYTE *)hash);
1067         if (result)
1068             return (result);
1069     }
1071     result = Tspi_Key_LoadKey(*hKey, hParent);
1072     if (result)
1073         stlogit("Tspi_Key_LoadKey: 0x%0x - %s",
1074             result, Trspi_Error_String(result));
1076     return (result);
1077 }

1079 static TSS_RESULT
1080 token_load_public_root_key(TSS_HCONTEXT hContext)
1081 {
1082     TSS_RESULT result;
1083     TSS_HKEY hSRK;

1085     if (hPublicRootKey != NULL_HKEY)
1086         return (TSS_SUCCESS);

1088     if ((result = token_load_srk(hContext, &hSRK))) {
1089         return (result);
1090     }

1092     result = tss_find_and_load_key(hContext,
1093         TPMTOK_PUBLIC_ROOT_KEY_ID,
1094         &publicRootKeyUUID, hSRK, NULL, &hPublicRootKey);
1095     if (result)
1096         return (result);

1098     return (result);
1099 }

1101 static TSS_RESULT
1102 set_legacy_key_params(TSS_HKEY hKey)
1103 {
1104     TSS_RESULT result;

1106     if ((result = Tspi_SetAttribUint32(hKey,
1107         TSS_TSPATTRIB_KEY_INFO,
1108         TSS_TSPATTRIB_KEYINFO_ENCSCHEME,
1109         TSS_ES_RSAESPKCSV15))) {
1110         stlogit("Tspi_SetAttribUint32: 0x%0x - %s",
1111             result, Trspi_Error_String(result));
1112         return (result);
1113     }

1115     if ((result = Tspi_SetAttribUint32(hKey,
1116         TSS_TSPATTRIB_KEY_INFO,
1117         TSS_TSPATTRIB_KEYINFO_SIGSCHEME,

```

```

1118     TSS_SS_RSASSAPKCS1V15_DER))) {
1119         stlogit("Tspi_SetAttribUint32: 0x%0x - %s",
1120             result, Trspi_Error_String(result));
1121         return (result);
1122     }

1124     return (result);
1125 }

1127 static TSS_RESULT
1128 tss_generate_key(TSS_HCONTEXT hContext, TSS_FLAG initFlags, BYTE *passHash,
1129     TSS_HKEY hParentKey, TSS_HKEY *phKey)
1130 {
1131     TSS_RESULT result;
1132     TSS_HPOLICY hMigPolicy;

1134     if ((result = Tspi_Context_CreateObject(hContext,
1135         TSS_OBJECT_TYPE_RSAKEY, initFlags, phKey))) {
1136         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
1137             result, Trspi_Error_String(result));
1138         return (result);
1139     }
1140     result = tss_assign_secret_key_policy(hContext, TSS_POLICY_USAGE,
1141         *phKey, passHash);

1143     if (result) {
1144         Tspi_Context_CloseObject(hContext, *phKey);
1145         return (result);
1146     }

1148     if (TPMTOK_TSS_KEY_MIG_TYPE(initFlags) == TSS_KEY_MIGRATABLE) {
1149         if ((result = Tspi_Context_CreateObject(hContext,
1150             TSS_OBJECT_TYPE_POLICY, TSS_POLICY_MIGRATION,
1151             &hMigPolicy))) {
1152             stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
1153                 result, Trspi_Error_String(result));
1154             Tspi_Context_CloseObject(hContext, *phKey);
1155             return (result);
1156         }

1158         if (passHash == NULL) {
1159             result = Tspi_Policy_SetSecret(hMigPolicy,
1160                 TSS_SECRET_MODE_NONE, 0, NULL);
1161         } else {
1162             result = Tspi_Policy_SetSecret(hMigPolicy,
1163                 TSS_SECRET_MODE_SHA1, 20, passHash);
1164         }

1166         if (result != TSS_SUCCESS) {
1167             stlogit("Tspi_Policy_SetSecret: 0x%0x - %s",
1168                 result, Trspi_Error_String(result));
1169             Tspi_Context_CloseObject(hContext, *phKey);
1170             Tspi_Context_CloseObject(hContext, hMigPolicy);
1171             return (result);
1172         }

1174         if ((result = Tspi_Policy_AssignToObject(hMigPolicy, *phKey))) {
1175             stlogit("Tspi_Policy_AssignToObject: 0x%0x - %s",
1176                 result, Trspi_Error_String(result));
1177             Tspi_Context_CloseObject(hContext, *phKey);
1178             Tspi_Context_CloseObject(hContext, hMigPolicy);
1179             return (result);
1180         }
1181     }

1183     if (TPMTOK_TSS_KEY_TYPE(initFlags) == TSS_KEY_TYPE_LEGACY) {

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```

1184         result = set_legacy_key_params(*phKey);
1185         if (result) {
1186             Tspi_Context_CloseObject(hContext, *phKey);
1187             Tspi_Context_CloseObject(hContext, hMigPolicy);
1188             return (result);
1189         }
1190     }

1192     if ((result = Tspi_Key_CreateKey(*phKey, hParentKey, 0))) {
1193         stlogit("Tspi_Key_CreateKey: 0x%0x - %s",
1194             result, Trspi_Error_String(result));
1195         Tspi_Context_CloseObject(hContext, *phKey);
1196         Tspi_Context_CloseObject(hContext, hMigPolicy);
1197     }

1199     return (result);
1200 }

1202 static TSS_RESULT
1203 tss_change_auth(
1204     TSS_HCONTEXT hContext,
1205     TSS_HKEY hObjectToChange, TSS_HKEY hParentObject,
1206     TSS_UUID objUUID, TSS_UUID parentUUID,
1207     CK_CHAR *passHash)
1208 {
1209     TSS_RESULT result;
1210     TSS_HPOLICY hPolicy;
1211     TSS_HKEY oldkey;

1213     if ((result = Tspi_Context_CreateObject(hContext,
1214         TSS_OBJECT_TYPE_POLICY, TSS_POLICY_USAGE, &hPolicy))) {
1215         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
1216             result, Trspi_Error_String(result));
1217         return (result);
1218     }

1220     if ((result = Tspi_Policy_SetSecret(hPolicy, TSS_SECRET_MODE_SHA1,
1221         SHA1_DIGEST_LENGTH, passHash))) {
1222         stlogit("Tspi_Policy_SetSecret: 0x%0x - %s",
1223             result, Trspi_Error_String(result));
1224         return (result);
1225     }

1227     if ((result = Tspi_ChangeAuth(hObjectToChange, hParentObject,
1228         hPolicy))) {
1229         stlogit("Tspi_ChangeAuth: 0x%0x - %s",
1230             result, Trspi_Error_String(result));
1231     }
1232     /*
1233     * Update the PS key by unregistering the key UUID and then
1234     * re-registering with the same UUID. This forces the updated
1235     * auth data associated with the key to be stored in PS so
1236     * the new PIN can be used next time.
1237     */
1238     if ((result = Tspi_Context_UnregisterKey(hContext,
1239         TSS_PS_TYPE_USER, objUUID, &oldkey)))
1240         stlogit("Tspi_Context_UnregisterKey: 0x%0x - %s",
1241             result, Trspi_Error_String(result));

1243     if ((result = Tspi_Context_RegisterKey(hContext, hObjectToChange,
1244         TSS_PS_TYPE_USER, objUUID, TSS_PS_TYPE_USER, parentUUID)))
1245         stlogit("Tspi_Context_RegisterKey: 0x%0x - %s",
1246             result, Trspi_Error_String(result));

1248     return (result);
1249 }

```

```

1251 static CK_RV
1252 token_generate_leaf_key(TSS_HCONTEXT hContext,
1253     int key_type, CK_CHAR_PTR passHash, TSS_HKEY *phKey)
1254 {
1255     CK_RV          rc = CKR_FUNCTION_FAILED;
1256     TSS_RESULT      result;
1257     TSS_HKEY        hParentKey;
1258     TSS_UUID        newuuid, parentUUID;
1259     char            *keyid;
1260     TSS_FLAG        initFlags = TSS_KEY_MIGRATABLE |
1261         TSS_KEY_TYPE_BIND | TSS_KEY_SIZE_2048 | TSS_KEY_AUTHORIZATION;

1263     switch (key_type) {
1264         case TPMTOK_PUBLIC_LEAF_KEY:
1265             hParentKey = hPublicRootKey;
1266             keyid = TPMTOK_PUBLIC_LEAF_KEY_ID;
1267             local_uuid_copy(&parentUUID, &publicRootKeyUUID);
1268             break;
1269         case TPMTOK_PRIVATE_LEAF_KEY:
1270             hParentKey = hPrivateRootKey;
1271             keyid = TPMTOK_PRIVATE_LEAF_KEY_ID;
1272             local_uuid_copy(&parentUUID, &privateRootKeyUUID);
1273             break;
1274         default:
1275             stlogit("Unknown key type 0x%0x", key_type);
1276             goto done;
1277     }

1279     if (result = tss_generate_key(hContext, initFlags, passHash,
1280         hParentKey, phKey)) {
1281         return (rc);
1282     }

1284     /*
1285     * - generate newUUID
1286     * - Tspi_Context_RegisterKey(hContext, hPrivateRootKey,
1287     *   USER, newUUID, USER, parentUUID);
1288     * - store newUUID
1289     */
1290     (void) local_uuid_generate(&newuuid);

1292     result = Tspi_Context_RegisterKey(hContext, *phKey,
1293         TSS_PS_TYPE_USER, newuuid,
1294         TSS_PS_TYPE_USER, parentUUID);
1295     if (result == TSS_SUCCESS) {
1296         int ret;
1297         /*
1298         * Add the UUID to the token UUID index.
1299         */
1300         ret = add_uuid(keyid, &newuuid);

1302         if (ret)
1303             result = Tspi_Context_UnregisterKey(hContext,
1304                 TSS_PS_TYPE_USER, newuuid, phKey);
1305         else
1306             rc = CKR_OK;
1307     }

1309 done:
1310     return (rc);
1311 }

1313 /*
1314 * PINs are verified by attempting to bind/unbind random data using a
1315 * TPM resident key that has the PIN being tested assigned as its "secret".

```

```

1316  * If the PIN is incorrect, the unbind operation will fail.
1317  */
1318  static CK_RV
1319  token_verify_pin(TSS_HCONTEXT hContext, TSS_HKEY hKey)
1320  {
1321      TSS_HENCADATA hEncData;
1322      UINT32 ulUnboundDataLen;
1323      BYTE *rgbUnboundData = NULL;
1324      BYTE rgbData[16];
1325      TSS_RESULT result;
1326      CK_RV rc = CKR_FUNCTION_FAILED;

1328      if ((result = Tspi_Context_CreateObject(hContext,
1329          TSS_OBJECT_TYPE_ENCDATA, TSS_ENCDATA_BIND, &hEncData))) {
1330          stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
1331              result, Trspi_Error_String(result));
1332          goto done;
1333      }

1335      /* Use some random data */
1336      rc = token_rng(hContext, rgbData, sizeof (rgbData));
1337      if (rc)
1338          goto done;

1340      if ((result = Tspi_Data_Bind(hEncData, hKey,
1341          sizeof (rgbData), rgbData))) {
1342          stlogit("Tspi_Data_Bind: 0x%0x - %s",
1343              result, Trspi_Error_String(result));
1344          goto done;
1345      }

1347      /* unbind the junk data to test the key's auth data */
1348      result = Tspi_Data_Unbind(hEncData, hKey, &ulUnboundDataLen,
1349          &rgbUnboundData);
1350      if (result == TPM_E_AUTHFAIL) {
1351          rc = CKR_PIN_INCORRECT;
1352          stlogit("Tspi_Data_Unbind: 0x%0x - %s",
1353              result, Trspi_Error_String(result));
1354          goto done;
1355      } else if (result != TSS_SUCCESS) {
1356          stlogit("Tspi_Data_Unbind: 0x%0x - %s",
1357              result, Trspi_Error_String(result));
1358          rc = CKR_FUNCTION_FAILED;
1359          goto done;
1360      }

1362      if (memcmp(rgbUnboundData, rgbData, ulUnboundDataLen))
1363          rc = CKR_PIN_INCORRECT;
1364      else
1365          rc = CKR_OK;

1367  done:
1368      if (rgbUnboundData != NULL)
1369          Tspi_Context_FreeMemory(hContext, rgbUnboundData);
1370      Tspi_Context_CloseObject(hContext, hEncData);
1371      return (rc);
1372  }

1374  static CK_RV
1375  token_create_private_tree(TSS_HCONTEXT hContext, CK_BYTE *pinHash)
1376  {
1377      CK_RV rc;
1378      TSS_RESULT result;
1379      int ret;
1380      TSS_FLAG initFlags = TSS_KEY_SIZE_2048 |
1381          TSS_KEY_NO_AUTHORIZATION | TSS_KEY_TYPE_STORAGE;

```

```

1382      TSS_UUID SRK_UUID = TSS_UUID_SRK;
1383      TSS_HKEY hSRK;

1385      if (token_load_srk(hContext, &hSRK))
1386          return (CKR_FUNCTION_FAILED);

1388      /*
1389       * - create UUID privateRootKeyUUID
1390       * - Tspi_Context_RegisterKey(hContext, hPrivateRootKey,
1391       *   USER, privateRootKeyUUID, system, UUID_SRK);
1392       * - store privateRootKeyUUID in users private token space.
1393       */
1394      if ((result = tss_generate_key(hContext, initFlags, NULL, hSRK,
1395          &hPrivateRootKey))) {
1396          return (result);
1397      }
1398      if (local_uuid_is_null(&privateRootKeyUUID))
1399          local_uuid_generate(&privateRootKeyUUID);

1401      result = Tspi_Context_RegisterKey(hContext, hPrivateRootKey,
1402          TSS_PS_TYPE_USER, privateRootKeyUUID,
1403          TSS_PS_TYPE_SYSTEM, SRK_UUID);

1405      if (result) {
1406          local_uuid_clear(&privateRootKeyUUID);
1407          return (result);
1408      }

1410      ret = add_uuid(TPMOK_PRIVATE_ROOT_KEY_ID, &privateRootKeyUUID);
1411      if (ret) {
1412          result = Tspi_Context_UnregisterKey(hContext,
1413              TSS_PS_TYPE_USER, privateRootKeyUUID,
1414              &hPrivateRootKey);
1415          return (CKR_FUNCTION_FAILED);
1416      }

1418      if ((result = Tspi_Key_LoadKey(hPrivateRootKey, hSRK))) {
1419          stlogit("Tspi_Key_LoadKey: 0x%0x - %s",
1420              result, Trspi_Error_String(result));
1421          Tspi_Context_CloseObject(hContext, hPrivateRootKey);
1422          (void) remove_uuid(TPMOK_PRIVATE_ROOT_KEY_ID);
1423          local_uuid_clear(&privateRootKeyUUID);

1426          hPrivateRootKey = NULL_HKEY;
1427          return (CKR_FUNCTION_FAILED);
1428      }

1431      /* generate the private leaf key */
1432      if ((rc = token_generate_leaf_key(hContext,
1433          TPMOK_PRIVATE_LEAF_KEY,
1434          pinHash, &hPrivateLeafKey))) {
1435          return (rc);
1436      }

1438      if ((result = Tspi_Key_LoadKey(hPrivateLeafKey, hPrivateRootKey))) {
1439          stlogit("Tspi_Key_LoadKey: 0x%0x - %s",
1440              result, Trspi_Error_String(result));

1442          (void) Tspi_Context_UnregisterKey(hContext,
1443              TSS_PS_TYPE_USER, privateLeafKeyUUID,
1444              &hPrivateLeafKey);
1445          (void) remove_uuid(TPMOK_PRIVATE_LEAF_KEY_ID);
1446          local_uuid_clear(&privateLeafKeyUUID);

```

```

1448         (void) Tspi_Context_UnregisterKey(hContext,
1449             TSS_PS_TYPE_USER, privateRootKeyUUID,
1450             &hPrivateRootKey);
1451         (void) remove_uuid(TPMOK_PRIVATE_ROOT_KEY_ID);
1452         local_uuid_clear(&privateRootKeyUUID);

1454         Tspi_Context_CloseObject(hContext, hPrivateRootKey);
1455         hPrivateRootKey = NULL_HKEY;

1457         Tspi_Context_CloseObject(hContext, hPrivateLeafKey);
1458         hPrivateLeafKey = NULL_HKEY;

1460         return (CKR_FUNCTION_FAILED);
1461     }
1462     return (rc);
1463 }

1465 static CK_RV
1466 token_create_public_tree(TSS_HCONTEXT hContext, CK_BYTE *pinHash)
1467 {
1468     CK_RV          rc;
1469     TSS_RESULT      result;
1470     int             ret;
1471     TSS_FLAG initFlags = TSS_KEY_SIZE_2048 |
1472         TSS_KEY_NO_AUTHORIZATION | TSS_KEY_TYPE_STORAGE;
1473     TSS_UUID srk_uuid = TSS_UUID_SRK;
1474     TSS_HKEY hSRK;

1476     if (token_load_srk(hContext, &hSRK))
1477         return (CKR_FUNCTION_FAILED);

1479     /*
1480      * - create publicRootKeyUUID
1481      * - Tspi_Context_RegisterKey(hContext, hPublicRootKey,
1482      *   USER, publicRootKeyUUID, system, UUID_SRK);
1483      * - store publicRootKeyUUID in users private token space.
1484      */
1485     if ((result = tss_generate_key(hContext, initFlags, NULL, hSRK,
1486         &hPublicRootKey))) {
1487         return (CKR_FUNCTION_FAILED);
1488     }
1489     if (local_uuid_is_null(&publicRootKeyUUID))
1490         local_uuid_generate(&publicRootKeyUUID);

1492     result = Tspi_Context_RegisterKey(hContext, hPublicRootKey,
1493         TSS_PS_TYPE_USER, publicRootKeyUUID,
1494         TSS_PS_TYPE_SYSTEM, srk_uuid);

1496     if (result) {
1497         local_uuid_clear(&publicRootKeyUUID);
1498         return (CKR_FUNCTION_FAILED);
1499     }

1501     ret = add_uuid(TPMOK_PUBLIC_ROOT_KEY_ID, &publicRootKeyUUID);
1502     if (ret) {
1503         result = Tspi_Context_UnregisterKey(hContext,
1504             TSS_PS_TYPE_USER, publicRootKeyUUID,
1505             &hPublicRootKey);
1506         /* does result matter here? */
1507         return (CKR_FUNCTION_FAILED);
1508     }

1510     /* Load the newly created publicRootKey into the TPM using the SRK */
1511     if ((result = Tspi_Key_LoadKey(hPublicRootKey, hSRK))) {
1512         stlogit("Tspi_Key_LoadKey: 0x%x - %s", result,
1513             Trspi_Error_String(result));

```

```

1514         Tspi_Context_CloseObject(hContext, hPublicRootKey);
1515         hPublicRootKey = NULL_HKEY;
1516         return (CKR_FUNCTION_FAILED);
1517     }

1519     /* create the SO's leaf key */
1520     if ((rc = token_generate_leaf_key(hContext, TPMOK_PUBLIC_LEAF_KEY,
1521         pinHash, &hPublicLeafKey))) {
1522         return (rc);
1523     }

1525     if ((result = Tspi_Key_LoadKey(hPublicLeafKey, hPublicRootKey))) {
1526         stlogit("Tspi_Key_LoadKey: 0x%x - %s",
1527             result, Trspi_Error_String(result));

1529         /* Unregister keys and clear UUIDs */
1530         (void) Tspi_Context_UnregisterKey(hContext,
1531             TSS_PS_TYPE_USER, publicLeafKeyUUID,
1532             &hPublicLeafKey);
1533         (void) remove_uuid(TPMOK_PUBLIC_LEAF_KEY_ID);

1535         (void) Tspi_Context_UnregisterKey(hContext,
1536             TSS_PS_TYPE_USER, publicRootKeyUUID,
1537             &hPublicRootKey);
1538         (void) remove_uuid(TPMOK_PUBLIC_ROOT_KEY_ID);

1540         Tspi_Context_CloseObject(hContext, hPublicRootKey);
1541         hPublicRootKey = NULL_HKEY;

1543         Tspi_Context_CloseObject(hContext, hPublicLeafKey);
1544         hPublicLeafKey = NULL_HKEY;

1546         return (CKR_FUNCTION_FAILED);
1547     }

1549     return (rc);
1550 }

1552 CK_RV
1553 token_specific_login(
1554     TSS_HCONTEXT hContext,
1555     CK_USER_TYPE userType,
1556     CK_CHAR_PTR pPin,
1557     CK_ULONG ulPinLen)
1558 {
1559     CK_RV rc;
1560     CK_BYTE hash_sha[SHA1_DIGEST_LENGTH];
1561     TSS_RESULT result;
1562     TSS_HKEY hSRK;

1564     /* Make sure the SRK is loaded into the TPM */
1565     if ((result = token_load_srk(hContext, &hSRK))) {
1566         return (CKR_FUNCTION_FAILED);
1567     }

1569     if ((rc = compute_sha(pPin, ulPinLen, hash_sha))) {
1570         return (CKR_FUNCTION_FAILED);
1571     }

1573     if (userType == CKU_USER) {
1574         /*
1575          * If the public root key doesn't exist yet,
1576          * the SO hasn't init'd the token.
1577          */
1578         if ((result = token_load_public_root_key(hContext))) {
1579             if (result == TPM_E_DECRYPT_ERROR) {

```

```

1580         return (CKR_USER_PIN_NOT_INITIALIZED);
1581     }
1582 }
1583
1584 /*
1585  * - find privateRootKeyUUID
1586  * - load by UUID (SRK parent)
1587  */
1588 if (local_uuid_is_null(&privateRootKeyUUID) &&
1589     find_uuid(TPMTOK_PRIVATE_ROOT_KEY_ID,
1590         &privateRootKeyUUID)) {
1591     if (memcmp(hash_sha,
1592         default_user_pin_sha,
1593         SHA1_DIGEST_LENGTH))
1594         return (CKR_PIN_INCORRECT);
1595
1596     not_initialized = 1;
1597     return (CKR_OK);
1598 }
1599
1600 if ((rc = verify_user_pin(hContext, hash_sha))) {
1601     return (rc);
1602 }
1603
1604 (void) memcpy(current_user_pin_sha, hash_sha,
1605     SHA1_DIGEST_LENGTH);
1606
1607 rc = load_private_token_objects(hContext);
1608 if (rc == CKR_OK) {
1609     (void) XProcLock(xproclock);
1610     global_shm->priv_loaded = TRUE;
1611     (void) XProcUnLock(xproclock);
1612 }
1613 } else {
1614     /*
1615      * SO login logic:
1616      * - find publicRootKey UUID
1617      * - load by UUID wrap with hSRK from above
1618      */
1619 if (local_uuid_is_null(&publicRootKeyUUID) &&
1620     find_uuid(TPMTOK_PUBLIC_ROOT_KEY_ID,
1621         &publicRootKeyUUID)) {
1622     if (memcmp(hash_sha,
1623         default_so_pin_sha,
1624         SHA1_DIGEST_LENGTH))
1625         return (CKR_PIN_INCORRECT);
1626
1627     not_initialized = 1;
1628     return (CKR_OK);
1629 }
1630
1631 if (hPublicRootKey == NULL_HKEY) {
1632     result = tss_find_and_load_key(
1633         hContext,
1634         TPMTOK_PUBLIC_ROOT_KEY_ID,
1635         &publicRootKeyUUID, hSRK, NULL,
1636         &hPublicRootKey);
1637
1638     if (result)
1639         return (CKR_FUNCTION_FAILED);
1640 }
1641
1642 /* find, load the public leaf key */
1643 if (hPublicLeafKey == NULL_HKEY) {
1644     result = tss_find_and_load_key(

```

```

1646         hContext,
1647         TPMTOK_PUBLIC_LEAF_KEY_ID,
1648         &publicLeafKeyUUID, hPublicRootKey, hash_sha,
1649         &hPublicLeafKey);
1650     if (result)
1651         return (CKR_FUNCTION_FAILED);
1652 }
1653
1654 if ((rc = token_verify_pin(hContext, hPublicLeafKey))) {
1655     return (rc);
1656 }
1657
1658 (void) memcpy(current_so_pin_sha, hash_sha, SHA1_DIGEST_LENGTH);
1659 }
1660
1661 return (rc);
1662 }
1663
1664 CK_RV
1665 token_specific_logout(TSS_HCONTEXT hContext)
1666 {
1667     if (hPrivateLeafKey != NULL_HKEY) {
1668         Tspi_Key_UnloadKey(hPrivateLeafKey);
1669         hPrivateLeafKey = NULL_HKEY;
1670     } else if (hPublicLeafKey != NULL_HKEY) {
1671         Tspi_Key_UnloadKey(hPublicLeafKey);
1672         hPublicLeafKey = NULL_HKEY;
1673     }
1674
1675     local_uuid_clear(&publicRootKeyUUID);
1676     local_uuid_clear(&publicLeafKeyUUID);
1677     local_uuid_clear(&privateRootKeyUUID);
1678     local_uuid_clear(&privateLeafKeyUUID);
1679
1680     (void) memset(current_so_pin_sha, 0, SHA1_DIGEST_LENGTH);
1681     (void) memset(current_user_pin_sha, 0, SHA1_DIGEST_LENGTH);
1682
1683     (void) object_mgr_purge_private_token_objects(hContext);
1684
1685     return (CKR_OK);
1686 }
1687
1688 /*ARGSUSED*/
1689 CK_RV
1690 token_specific_init_pin(TSS_HCONTEXT hContext,
1691     CK_CHAR_PTR pPin, CK_ULONG ulPinLen)
1692 {
1693     /*
1694      * Since the SO must log in before calling C_InitPIN, we will
1695      * be able to return (CKR_OK) automatically here.
1696      * This is because the USER key structure is created at the
1697      * time of her first login, not at C_InitPIN time.
1698      */
1699     return (CKR_OK);
1700 }
1701
1702 static CK_RV
1703 check_pin_properties(CK_USER_TYPE userType, CK_BYTE *pinHash,
1704     CK_ULONG ulPinLen)
1705 {
1706     /* make sure the new PIN is different */
1707     if (userType == CKU_USER) {
1708         if (!memcmp(pinHash, default_user_pin_sha,
1709             SHA1_DIGEST_LENGTH)) {
1710             LogError1("new PIN must not be the default");
1711             return (CKR_PIN_INVALID);

```

```

1712     }
1713     } else {
1714         if (!memcmp(pinHash, default_so_pin_sha,
1715             SHA1_DIGEST_LENGTH)) {
1716             LogError1("new PIN must not be the default");
1717             return (CKR_PIN_INVALID);
1718         }
1719     }
1720
1721     if (ulPinLen > MAX_PIN_LEN || ulPinLen < MIN_PIN_LEN) {
1722         LogError1("New PIN is out of size range");
1723         return (CKR_PIN_LEN_RANGE);
1724     }
1725
1726     return (CKR_OK);
1727 }
1728
1729 /*
1730  * This function is called from set_pin only, where a non-logged-in public
1731  * session can provide the user pin which must be verified. This function
1732  * assumes that the pin has already been set once, so there's no migration
1733  * path option or checking of the default user pin.
1734  */
1735 static CK_RV
1736 verify_user_pin(TSS_HCONTEXT hContext, CK_BYTE *hash_sha)
1737 {
1738     CK_RV rc;
1739     TSS_RESULT result;
1740     TSS_HKEY hSRK;
1741
1742     if (token_load_srk(hContext, &hSRK))
1743         return (CKR_FUNCTION_FAILED);
1744
1745     /*
1746      * Verify the user by loading the privateLeafKey
1747      * into the TPM (if it's not already) and then
1748      * call the verify_pin operation.
1749      *
1750      * The hashed PIN is assigned to the private leaf key.
1751      * If it is incorrect (not the same as the one originally
1752      * used when the key was created), the verify operation
1753      * will fail.
1754      */
1755     if (hPrivateRootKey == NULL_HKEY) {
1756         result = tss_find_and_load_key(
1757             hContext,
1758             TPMTOK_PRIVATE_ROOT_KEY_ID,
1759             &privateRootKeyUUID, hSRK, NULL, &hPrivateRootKey);
1760         if (result)
1761             return (CKR_FUNCTION_FAILED);
1762     }
1763
1764     if (hPrivateLeafKey == NULL_HKEY) {
1765         result = tss_find_and_load_key(
1766             hContext,
1767             TPMTOK_PRIVATE_LEAF_KEY_ID,
1768             &privateLeafKeyUUID, hPrivateRootKey, hash_sha,
1769             &hPrivateLeafKey);
1770
1771         if (result)
1772             return (CKR_FUNCTION_FAILED);
1773     }
1774
1775     /*
1776      * Verify that the PIN is correct by attempting to wrap/unwrap some
1777      * random data.

```

```

1778     */
1779     if ((rc = token_verify_pin(hContext, hPrivateLeafKey)) {
1780         return (rc);
1781     }
1782
1783     return (CKR_OK);
1784 }
1785
1786 CK_RV
1787 token_specific_set_pin(ST_SESSION_HANDLE session,
1788     CK_CHAR_PTR pOldPin, CK_ULONG ulOldPinLen,
1789     CK_CHAR_PTR pNewPin, CK_ULONG ulNewPinLen)
1790 {
1791     SESSION *sess = session_mgr_find(session.sessionh);
1792     CK_BYTE oldpin_hash[SHA1_DIGEST_LENGTH];
1793     CK_BYTE newpin_hash[SHA1_DIGEST_LENGTH];
1794     CK_RV rc;
1795     TSS_HKEY hSRK;
1796
1797     if (!sess) {
1798         return (CKR_SESSION_HANDLE_INVALID);
1799     }
1800
1801     if ((rc = compute_sha(pOldPin, ulOldPinLen, oldpin_hash)) {
1802         return (CKR_FUNCTION_FAILED);
1803     }
1804     if ((rc = compute_sha(pNewPin, ulNewPinLen, newpin_hash)) {
1805         return (CKR_FUNCTION_FAILED);
1806     }
1807
1808     if (token_load_srk(sess->hContext, &hSRK)) {
1809         return (CKR_FUNCTION_FAILED);
1810     }
1811
1812     /*
1813      * From the PKCS#11 2.20 spec: "C_SetPIN modifies the PIN of
1814      * the user that is currently logged in, or the CKU_USER PIN
1815      * if the session is not logged in."
1816      * A non R/W session fails with CKR_SESSION_READ_ONLY.
1817      */
1818     if (sess->session_info.state == CKS_RW_USER_FUNCTIONS ||
1819         sess->session_info.state == CKS_RW_PUBLIC_SESSION) {
1820         if (not_initialized) {
1821             if (memcmp(oldpin_hash, default_user_pin_sha,
1822                 SHA1_DIGEST_LENGTH)) {
1823                 return (CKR_PIN_INCORRECT);
1824             }
1825         }
1826         if ((rc = check_pin_properties(CKU_USER, newpin_hash,
1827             ulNewPinLen))) {
1828             return (rc);
1829         }
1830
1831         if ((rc = token_create_private_tree(sess->hContext,
1832             newpin_hash))) {
1833             return (CKR_FUNCTION_FAILED);
1834         }
1835
1836         nv_token_data->token_info.flags &=
1837             ~(CKF_USER_PIN_TO_BE_CHANGED);
1838         nv_token_data->token_info.flags |=
1839             CKF_USER_PIN_INITIALIZED;
1840
1841         nv_token_data->token_info.flags &=
1842             ~(CKF_USER_PIN_TO_BE_CHANGED);
1843         nv_token_data->token_info.flags |=

```

```

1844         CKF_USER_PIN_INITIALIZED;
1846         return (save_token_data(nv_token_data));
1847     }
1849     if (sess->session_info.state == CKS_RW_USER_FUNCTIONS) {
1850         /* if we're already logged in, just verify the hash */
1851         if (memcmp(current_user_pin_sha, oldpin_hash,
1852             SHA1_DIGEST_LENGTH)) {
1853             return (CKR_PIN_INCORRECT);
1854         }
1855     } else {
1856         if ((rc = verify_user_pin(sess->hContext,
1857             oldpin_hash))) {
1858             return (rc);
1859         }
1860     }
1862     if ((rc = check_pin_properties(CKU_USER, newpin_hash,
1863         ulNewPinLen)))
1864         return (rc);
1866     /* change the auth on the TSS object */
1867     if (tss_change_auth(sess->hContext,
1868         hPrivateLeafKey, hPrivateRootKey,
1869         privateLeafKeyUUID, privateRootKeyUUID,
1870         newpin_hash))
1871         return (CKR_FUNCTION_FAILED);
1873 } else if (sess->session_info.state == CKS_RW_SO_FUNCTIONS) {
1874     if (not_initialized) {
1875         if (memcmp(default_so_pin_sha, oldpin_hash,
1876             SHA1_DIGEST_LENGTH))
1877             return (CKR_PIN_INCORRECT);
1879         if ((rc = check_pin_properties(CKU_SO,
1880             newpin_hash, ulNewPinLen)))
1881             return (rc);
1883         if ((rc = token_create_public_tree(sess->hContext,
1884             newpin_hash)))
1885             return (CKR_FUNCTION_FAILED);
1887         nv_token_data->token_info.flags &=
1888             ~(CKF_SO_PIN_TO_BE_CHANGED);
1890         return (save_token_data(nv_token_data));
1891     }
1893     if (memcmp(current_so_pin_sha, oldpin_hash,
1894         SHA1_DIGEST_LENGTH))
1895         return (CKR_PIN_INCORRECT);
1897     if ((rc = check_pin_properties(CKU_SO, newpin_hash,
1898         ulNewPinLen)))
1899         return (rc);
1901     /* change auth on the SO's leaf key */
1902     if (tss_change_auth(sess->hContext,
1903         hPublicLeafKey, hPublicRootKey,
1904         publicLeafKeyUUID, publicRootKeyUUID,
1905         newpin_hash))
1906         return (CKR_FUNCTION_FAILED);
1908 } else {
1909     rc = CKR_SESSION_READ_ONLY;

```

```

1910     }
1912     return (rc);
1913 }
1915 /* only called at token init time */
1916 CK_RV
1917 token_specific_verify_so_pin(TSS_HCONTEXT hContext, CK_CHAR_PTR pPin,
1918     CK_ULONG ulPinLen)
1919 {
1920     CK_BYTE hash_sha[SHA1_DIGEST_LENGTH];
1921     CK_RV rc;
1922     TSS_RESULT result;
1923     TSS_HKEY hSRK;
1925     if ((rc = compute_sha(pPin, ulPinLen, hash_sha))) {
1926         return (CKR_FUNCTION_FAILED);
1927     }
1928     if ((rc = token_load_srk(hContext, &hSRK))) {
1929         return (CKR_FUNCTION_FAILED);
1930     }
1932     /*
1933     * TRYME INSTEAD:
1934     * - find publicRootKeyUUID
1935     * - Load publicRootKey by UUID (SRK parent)
1936     * - find publicLeafKeyUUID
1937     * - Load publicLeafKey by UUID (publicRootKey parent)
1938     * - set password policy on publicLeafKey
1939     */
1940     if (local_uuid_is_null(&publicRootKeyUUID) &&
1941         find_uuid(TPMTOK_PUBLIC_ROOT_KEY_ID, &publicRootKeyUUID)) {
1942         /*
1943         * The SO hasn't set her PIN yet, compare the
1944         * login pin with the hard-coded value.
1945         */
1946         if (memcmp(default_so_pin_sha, hash_sha,
1947             SHA1_DIGEST_LENGTH)) {
1948             return (CKR_PIN_INCORRECT);
1949         }
1950         return (CKR_OK);
1951     }
1953     result = Tspi_Context_GetKeyByUUID(hContext,
1954         TSS_PS_TYPE_USER, publicRootKeyUUID, &hPublicRootKey);
1956     if (result)
1957         return (CKR_FUNCTION_FAILED);
1959     result = Tspi_Key_LoadKey(hPublicRootKey, hSRK);
1960     if (result)
1961         return (CKR_FUNCTION_FAILED);
1963     if (local_uuid_is_null(&publicLeafKeyUUID) &&
1964         find_uuid(TPMTOK_PUBLIC_LEAF_KEY_ID, &publicLeafKeyUUID))
1965         return (CKR_FUNCTION_FAILED);
1967     result = Tspi_Context_GetKeyByUUID(hContext,
1968         TSS_PS_TYPE_USER, publicLeafKeyUUID, &hPublicLeafKey);
1969     if (result)
1970         return (CKR_FUNCTION_FAILED);
1972     result = tss_assign_secret_key_policy(hContext, TSS_POLICY_USAGE,
1973         hPublicLeafKey, hash_sha);
1974     if (result)
1975         return (CKR_FUNCTION_FAILED);

```



```

1977     result = Tspi_Key_LoadKey(hPublicLeafKey, hPublicRootKey);
1978     if (result)
1979         return (CKR_FUNCTION_FAILED);

1981     /* If the hash given is wrong, the verify will fail */
1982     if ((rc = token_verify_pin(hContext, hPublicLeafKey))) {
1983         return (rc);
1984     }

1986     return (CKR_OK);
1987 }

1989 CK_RV
1990 token_specific_final(TSS_HCONTEXT hContext)
1991 {
1992     if (hPublicRootKey != NULL_HKEY) {
1993         Tspi_Context_CloseObject(hContext, hPublicRootKey);
1994         hPublicRootKey = NULL_HKEY;
1995     }
1996     if (hPublicLeafKey != NULL_HKEY) {
1997         Tspi_Context_CloseObject(hContext, hPublicLeafKey);
1998         hPublicLeafKey = NULL_HKEY;
1999     }
2000     if (hPrivateRootKey != NULL_HKEY) {
2001         Tspi_Context_CloseObject(hContext, hPrivateRootKey);
2002         hPrivateRootKey = NULL_HKEY;
2003     }
2004     if (hPrivateLeafKey != NULL_HKEY) {
2005         Tspi_Context_CloseObject(hContext, hPrivateLeafKey);
2006         hPrivateLeafKey = NULL_HKEY;
2007     }
2008     return (CKR_OK);
2009 }

2011 /*
2012  * Wrap the 20 bytes of auth data and store in an attribute of the two
2013  * keys.
2014  */
2015 static CK_RV
2016 token_wrap_auth_data(TSS_HCONTEXT hContext,
2017     CK_BYTE *authData, TEMPLATE *publ_tmpl,
2018     TEMPLATE *priv_tmpl)
2019 {
2020     CK_RV      rc;
2021     CK_ATTRIBUTE *new_attr;

2023     TSS_RESULT  ret;
2024     TSS_HKEY    hParentKey;
2025     TSS_HENCDATA hEncData;
2026     BYTE        *blob;
2027     UINT32      blob_size;

2029     if ((hPrivateLeafKey == NULL_HKEY) && (hPublicLeafKey == NULL_HKEY)) {
2030         return (CKR_FUNCTION_FAILED);
2031     } else if (hPublicLeafKey != NULL_HKEY) {
2032         hParentKey = hPublicLeafKey;
2033     } else {
2034         hParentKey = hPrivateLeafKey;
2035     }

2037     /* create the encrypted data object */
2038     if ((ret = Tspi_Context_CreateObject(hContext,
2039         TSS_OBJECT_TYPE_ENCDATA, TSS_ENCDATA_BIND, &hEncData))) {
2040         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
2041             ret, Trspi_Error_String(ret));

```

```

2042         return (CKR_FUNCTION_FAILED);
2043     }

2045     if ((ret = Tspi_Data_Bind(hEncData, hParentKey, SHA1_DIGEST_LENGTH,
2046         authData))) {
2047         stlogit("Tspi_Data_Bind: 0x%0x - %s",
2048             ret, Trspi_Error_String(ret));
2049         return (CKR_FUNCTION_FAILED);
2050     }

2052     /* pull the encrypted data out of the encrypted data object */
2053     if ((ret = Tspi_GetAttribData(hEncData, TSS_TSPATTRIB_ENCDATA_BLOB,
2054         TSS_TSPATTRIB_ENCDATABLOB_BLOB, &blob_size, &blob))) {
2055         stlogit("Tspi_SetAttribData: 0x%0x - %s",
2056             ret, Trspi_Error_String(ret));
2057         return (CKR_FUNCTION_FAILED);
2058     }

2060     if ((rc = build_attribute(CKA_ENC_AUTHDATA, blob, blob_size,
2061         &new_attr))) {
2062         return (rc);
2063     }
2064     (void) template_update_attribute(publ_tmpl, new_attr);

2066     if ((rc = build_attribute(CKA_ENC_AUTHDATA, blob,
2067         blob_size, &new_attr))) {
2068         return (rc);
2069     }
2070     (void) template_update_attribute(priv_tmpl, new_attr);

2072     return (rc);
2073 }

2075 static CK_RV
2076 token_unwrap_auth_data(TSS_HCONTEXT hContext, CK_BYTE *encAuthData,
2077     CK_ULONG encAuthDataLen, TSS_HKEY hKey,
2078     BYTE **authData)
2079 {
2080     TSS_RESULT  result;
2081     TSS_HENCDATA hEncData;
2082     BYTE        *buf;
2083     UINT32      buf_size;

2085     if ((result = Tspi_Context_CreateObject(hContext,
2086         TSS_OBJECT_TYPE_ENCDATA, TSS_ENCDATA_BIND, &hEncData))) {
2087         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
2088             result, Trspi_Error_String(result));
2089         return (CKR_FUNCTION_FAILED);
2090     }

2092     if ((result = Tspi_SetAttribData(hEncData,
2093         TSS_TSPATTRIB_ENCDATA_BLOB, TSS_TSPATTRIB_ENCDATABLOB_BLOB,
2094         encAuthDataLen, encAuthData))) {
2095         stlogit("Tspi_SetAttribData: 0x%0x - %s",
2096             result, Trspi_Error_String(result));
2097         return (CKR_FUNCTION_FAILED);
2098     }

2100     /* unbind the data, receiving the plaintext back */
2101     if ((result = Tspi_Data_Unbind(hEncData, hKey, &buf_size, &buf))) {
2102         stlogit("Tspi_Data_Unbind: 0x%0x - %s",
2103             result, Trspi_Error_String(result));
2104         return (CKR_FUNCTION_FAILED);
2105     }

2107     if (buf_size != SHA1_DIGEST_LENGTH) {

```

```

2108         return (CKR_FUNCTION_FAILED);
2109     }

2111     *authData = buf;

2113     return (CKR_OK);
2114 }

2116 CK_RV
2117 token_specific_rsa_generate_keypair(
2118     TSS_HCONTEXT hContext,
2119     TEMPLATE *publ_tmpl,
2120     TEMPLATE *priv_tmpl)
2121 {
2122     CK_ATTRIBUTE *attr = NULL;
2123     CK_ULONG mod_bits = 0;
2124     CK_BBOOL flag;
2125     CK_RV rc;

2127     TSS_FLAG initFlags = 0;
2128     BYTE authHash[SHA1_DIGEST_LENGTH];
2129     BYTE *authData = NULL;
2130     TSS_HKEY hKey = NULL_HKEY;
2131     TSS_HKEY hParentKey = NULL_HKEY;
2132     TSS_RESULT result;
2133     UINT32 ulBlobLen;
2134     BYTE *rgbBlob;

2136     /* Make sure the public exponent is usable */
2137     if ((util_check_public_exponent(publ_tmpl))) {
2138         return (CKR_TEMPLATE_INCONSISTENT);
2139     }

2141     flag = template_attribute_find(publ_tmpl, CKA_MODULUS_BITS, &attr);
2142     if (!flag) {
2143         return (CKR_TEMPLATE_INCOMPLETE);
2144     }
2145     mod_bits = *(CK_ULONG *)attr->pValue;

2147     if ((initFlags = util_get_keysize_flag(mod_bits)) == 0) {
2148         return (CKR_KEY_SIZE_RANGE);
2149     }

2151     /*
2152      * If we're not logged in, hPrivateLeafKey and hPublicLeafKey
2153      * should be NULL.
2154      */
2155     if ((hPrivateLeafKey == NULL_HKEY) &&
2156         (hPublicLeafKey == NULL_HKEY)) {
2157         /* public session, wrap key with the PRK */
2158         initFlags |= TSS_KEY_TYPE_LEGACY |
2159             TSS_KEY_NO_AUTHORIZATION | TSS_KEY_MIGRATABLE;

2161         if ((result = token_load_public_root_key(hContext))) {
2162             return (CKR_FUNCTION_FAILED);
2163         }

2165         hParentKey = hPublicRootKey;
2166     } else if (hPrivateLeafKey != NULL_HKEY) {
2167         /* logged in USER session */
2168         initFlags |= TSS_KEY_TYPE_LEGACY |
2169             TSS_KEY_AUTHORIZATION | TSS_KEY_MIGRATABLE;

2171         /* get a random SHA1 hash for the auth data */
2172         if ((rc = token_rng(hContext, authHash, SHA1_DIGEST_LENGTH))) {
2173             return (CKR_FUNCTION_FAILED);

```

```

2174     }

2176     authData = authHash;
2177     hParentKey = hPrivateRootKey;
2178 } else {
2179     /* logged in SO session */
2180     initFlags |= TSS_KEY_TYPE_LEGACY |
2181         TSS_KEY_AUTHORIZATION | TSS_KEY_MIGRATABLE;

2183     /* get a random SHA1 hash for the auth data */
2184     if ((rc = token_rng(hContext, authHash, SHA1_DIGEST_LENGTH))) {
2185         return (CKR_FUNCTION_FAILED);
2186     }

2188     authData = authHash;
2189     hParentKey = hPublicRootKey;
2190 }

2192 if ((result = tss_generate_key(hContext, initFlags, authData,
2193     hParentKey, &hKey))) {
2194     return (result);
2195 }

2197 if ((result = Tspi_GetAttribData(hKey, TSS_TSPATTRIB_KEY_BLOB,
2198     TSS_TSPATTRIB_KEYBLOB_BLOB, &ulBlobLen, &rgbBlob))) {
2199     stlogit("Tspi_GetAttribData: 0x%0x - %s",
2200         result, Trspi_Error_String(result));
2201     return (CKR_FUNCTION_FAILED);
2202 }

2204 if ((rc = build_attribute(CKA_IBM_OPAQUE, rgbBlob,
2205     ulBlobLen, &attr))) {
2206     Tspi_Context_FreeMemory(hContext, rgbBlob);
2207     return (rc);
2208 }
2209 (void) template_update_attribute(priv_tmpl, attr);
2210 if ((rc = build_attribute(CKA_IBM_OPAQUE, rgbBlob,
2211     ulBlobLen, &attr))) {
2212     Tspi_Context_FreeMemory(hContext, rgbBlob);
2213     return (rc);
2214 }
2215 (void) template_update_attribute(publ_tmpl, attr);

2217 Tspi_Context_FreeMemory(hContext, rgbBlob);

2219 /* grab the public key to put into the public key object */
2220 if ((result = Tspi_GetAttribData(hKey, TSS_TSPATTRIB_RSAKEY_INFO,
2221     TSS_TSPATTRIB_KEYINFO_RSA_MODULUS, &ulBlobLen, &rgbBlob))) {
2222     stlogit("Tspi_GetAttribData: 0x%0x - %s",
2223         result, Trspi_Error_String(result));
2224     return (result);
2225 }

2227 /* add the public key blob to the object template */
2228 if ((rc = build_attribute(CKA_MODULUS, rgbBlob, ulBlobLen, &attr))) {
2229     Tspi_Context_FreeMemory(hContext, rgbBlob);
2230     return (rc);
2231 }
2232 (void) template_update_attribute(publ_tmpl, attr);

2234 /* add the public key blob to the object template */
2235 if ((rc = build_attribute(CKA_MODULUS, rgbBlob, ulBlobLen, &attr))) {
2236     Tspi_Context_FreeMemory(hContext, rgbBlob);
2237     return (rc);
2238 }
2239 (void) template_update_attribute(priv_tmpl, attr);

```

```

2240     Tspi_Context_FreeMemory(hContext, rgbBlob);

2242     /* wrap the authdata and put it into an object */
2243     if (authData != NULL) {
2244         rc = token_wrap_auth_data(hContext, authData, publ_tmpl,
2245                                 priv_tmpl);
2246     }

2248     return (rc);
2249 }

2251 static CK_RV
2252 token_rsa_load_key(
2253     TSS_HCONTEXT hContext,
2254     OBJECT *key_obj,
2255     TSS_HKEY *phKey)
2256 {
2257     TSS_RESULT result;
2258     TSS_HPOLICY hPolicy = NULL_HPOLICY;
2259     TSS_HKEY hParentKey;
2260     BYTE *authData = NULL;
2261     CK_ATTRIBUTE *attr;
2262     CK_RV rc;
2263     CK_OBJECT_HANDLE handle;
2264     CK_ULONG class;

2266     if (hPrivateLeafKey != NULL_HKEY) {
2267         hParentKey = hPrivateRootKey;
2268     } else {
2269         if ((result = token_load_public_root_key(hContext)))
2270             return (CKR_FUNCTION_FAILED);

2272         hParentKey = hPublicRootKey;
2273     }

2275     *phKey = NULL;
2276     if (template_attribute_find(key_obj->template, CKA_CLASS,
2277                               &attr) == FALSE) {
2278         return (CKR_TEMPLATE_INCOMPLETE);
2279     }
2280     class = *((CK_ULONG *)attr->pValue);

2282     rc = template_attribute_find(key_obj->template,
2283                                CKA_IBM_OPAQUE, &attr);
2284     /*
2285      * A public key cannot use the OPAQUE data attribute so they
2286      * must be created in software. A private key may not yet
2287      * have its "opaque" data defined and needs to be created
2288      * and loaded so it can be used inside the TPM.
2289      */
2290     if (class == CKO_PUBLIC_KEY || rc == FALSE) {
2291         rc = object_mgr_find_in_map2(hContext, key_obj, &handle);
2292         if (rc != CKR_OK)
2293             return (CKR_FUNCTION_FAILED);

2295         if ((rc = token_load_key(hContext,
2296                                handle, hParentKey, NULL, phKey))) {
2297             return (rc);
2298         }
2299     }
2300     /*
2301      * If this is a private key, get the blob and load it in the TPM.
2302      * If it is public, the key is already loaded in software.
2303      */
2304     if (class == CKO_PRIVATE_KEY) {
2305         /* If we already have a handle, just load it */

```

```

2306         if (*phKey != NULL) {
2307             result = Tspi_Key_LoadKey(*phKey, hParentKey);
2308             if (result) {
2309                 stlogit("Tspi_Context_LoadKeyByBlob: "
2310                        "0x%0x - %s",
2311                        result, Trspi_Error_String(result));
2312                 return (CKR_FUNCTION_FAILED);
2313             }
2314         } else {
2315             /* try again to get the CKA_IBM_OPAQUE attr */
2316             if ((rc = template_attribute_find(key_obj->template,
2317                                              CKA_IBM_OPAQUE, &attr)) == FALSE) {
2318                 return (rc);
2319             }
2320             if ((result = Tspi_Context_LoadKeyByBlob(hContext,
2321                                                     hParentKey, attr->ulValueLen, attr->pValue,
2322                                                     phKey))) {
2323                 stlogit("Tspi_Context_LoadKeyByBlob: "
2324                        "0x%0x - %s",
2325                        result, Trspi_Error_String(result));
2326                 return (CKR_FUNCTION_FAILED);
2327             }
2328         }
2329     }

2331     /* auth data may be required */
2332     if (template_attribute_find(key_obj->template, CKA_ENC_AUTHDATA,
2333                               &attr) == TRUE && attr) {
2334         if ((hPrivateLeafKey == NULL_HKEY) &&
2335             (hPublicLeafKey == NULL_HKEY)) {
2336             return (CKR_FUNCTION_FAILED);
2337         } else if (hPublicLeafKey != NULL_HKEY) {
2338             hParentKey = hPublicLeafKey;
2339         } else {
2340             hParentKey = hPrivateLeafKey;
2341         }

2343         if ((result = token_unwrap_auth_data(hContext,
2344                                              attr->pValue, attr->ulValueLen,
2345                                              hParentKey, &authData))) {
2346             return (CKR_FUNCTION_FAILED);
2347         }
2348     }

2349     if ((result = Tspi_GetPolicyObject(*phKey,
2350                                       TSS_POLICY_USAGE, &hPolicy))) {
2351         stlogit("Tspi_GetPolicyObject: 0x%0x - %s",
2352                result, Trspi_Error_String(result));
2353         return (CKR_FUNCTION_FAILED);
2354     }

2356     /*
2357      * If the policy handle returned is the same as the
2358      * context's default policy, then a new policy must
2359      * be created and assigned to the key. Otherwise, just set the
2360      * secret in the policy.
2361      */
2362     if (hPolicy == hDefaultPolicy) {
2363         if ((result = Tspi_Context_CreateObject(hContext,
2364                                                TSS_OBJECT_TYPE_POLICY, TSS_POLICY_USAGE,
2365                                                &hPolicy))) {
2366             stlogit("Tspi_Context_CreateObject: "
2367                    "0x%0x - %s",
2368                    result, Trspi_Error_String(result));
2369             return (CKR_FUNCTION_FAILED);
2370         }
2371     }

```

```

2372         if ((result = Tspi_Policy_SetSecret(hPolicy,
2373         TSS_SECRET_MODE_SHA1,
2374         SHA1_DIGEST_LENGTH, authData))) {
2375             stlogit("Tspi_Policy_SetSecret: "
2376             "0x%0x - %s",
2377             result, Trspi_Error_String(result));
2378             return (CKR_FUNCTION_FAILED);
2379         }
2381         if ((result = Tspi_Policy_AssignToObject(hPolicy,
2382         *phKey))) {
2383             stlogit("Tspi_Policy_AssignToObject: "
2384             "0x%0x - %s",
2385             result, Trspi_Error_String(result));
2386             return (CKR_FUNCTION_FAILED);
2387         }
2388     } else if ((result = Tspi_Policy_SetSecret(hPolicy,
2389     TSS_SECRET_MODE_SHA1, SHA1_DIGEST_LENGTH, authData))) {
2390         stlogit("Tspi_Policy_SetSecret: 0x%0x - %s",
2391         result, Trspi_Error_String(result));
2392         return (CKR_FUNCTION_FAILED);
2393     }
2395     Tspi_Context_FreeMemory(hContext, authData);
2396 }
2398 return (CKR_OK);
2399 }
2401 CK_RV
2402 tpm_decrypt_data(
2403     TSS_HCONTEXT hContext,
2404     TSS_HKEY hKey,
2405     CK_BYTE * in_data,
2406     CK_ULONG in_data_len,
2407     CK_BYTE * out_data,
2408     CK_ULONG * out_data_len)
2409 {
2410     TSS_RESULT result;
2411     TSS_HENCADATA hEncData = NULL_HENCADATA;
2412     UINT32 buf_size = 0, modLen;
2413     BYTE *buf = NULL, *modulus = NULL;
2414     CK_ULONG chunklen, remain, outlen;
2416     /* push the data into the encrypted data object */
2417     if ((result = Tspi_Context_CreateObject(hContext,
2418     TSS_OBJECT_TYPE_ENCDATA, TSS_ENCDATA_BIND, &hEncData))) {
2419         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
2420         result, Trspi_Error_String(result));
2421         return (CKR_FUNCTION_FAILED);
2422     }
2424     /*
2425     * Figure out the modulus size so we can break the data
2426     * into smaller chunks if necessary.
2427     */
2428     if ((result = Tspi_GetAttribData(hKey, TSS_TSPATTRIB_RSAKEY_INFO,
2429     TSS_TSPATTRIB_KEYINFO_RSA_MODULUS, &modLen, &modulus))) {
2430         stlogit("Tspi_GetAttribData: 0x%0x - %s",
2431         result, Trspi_Error_String(result));
2432         return (result);
2433     }
2434     /* we don't need the actual modulus */
2435     Tspi_Context_FreeMemory(hContext, modulus);
2437     chunklen = (in_data_len > modLen ? modLen : in_data_len);

```

```

2438     remain = in_data_len;
2439     outlen = 0;
2441     while (remain > 0) {
2442         if ((result = Tspi_SetAttribData(hEncData,
2443         TSS_TSPATTRIB_ENCDATA_BLOB,
2444         TSS_TSPATTRIB_ENCDATA_BLOB,
2445         chunklen, in_data))) {
2446             stlogit("Tspi_SetAttribData: 0x%0x - %s",
2447             result, Trspi_Error_String(result));
2448             return (CKR_FUNCTION_FAILED);
2449         }
2451         /* unbind the data, receiving the plaintext back */
2452         if ((result = Tspi_Data_Unbind(hEncData, hKey,
2453         &buf_size, &buf))) {
2454             stlogit("Tspi_Data_Unbind: 0x%0x - %s",
2455             result, Trspi_Error_String(result));
2456             return (CKR_FUNCTION_FAILED);
2457         }
2459         if (*out_data_len < buf_size + outlen) {
2460             Tspi_Context_FreeMemory(hContext, buf);
2461             return (CKR_BUFFER_TOO_SMALL);
2462         }
2464         (void) memcpy(out_data + outlen, buf, buf_size);
2466         outlen += buf_size;
2467         in_data += chunklen;
2468         remain -= chunklen;
2470         Tspi_Context_FreeMemory(hContext, buf);
2471         if (chunklen > remain)
2472             chunklen = remain;
2473     }
2474     *out_data_len = outlen;
2475     return (CKR_OK);
2476 }
2478 CK_RV
2479 token_specific_rsa_decrypt(
2480     TSS_HCONTEXT hContext,
2481     CK_BYTE * in_data,
2482     CK_ULONG in_data_len,
2483     CK_BYTE * out_data,
2484     CK_ULONG * out_data_len,
2485     OBJECT * key_obj)
2486 {
2487     CK_RV rc;
2488     TSS_HKEY hKey;
2490     if ((rc = token_rsa_load_key(hContext, key_obj, &hKey))) {
2491         return (rc);
2492     }
2494     rc = tpm_decrypt_data(hContext, hKey, in_data, in_data_len,
2495     out_data, out_data_len);
2497     return (rc);
2498 }
2500 CK_RV
2501 token_specific_rsa_verify(
2502     TSS_HCONTEXT hContext,
2503     CK_BYTE * in_data,

```

```

2504     CK_ULONG    in_data_len,
2505     CK_BYTE     * sig,
2506     CK_ULONG    sig_len,
2507     OBJECT      * key_obj)
2508 {
2509     TSS_RESULT    result;
2510     TSS_HHASH     hHash;
2511     TSS_HKEY      hKey;
2512     CK_RV         rc;

2514     if ((rc = token_rsa_load_key(hContext, key_obj, &hKey))) {
2515         return (rc);
2516     }

2518     /* Create the hash object we'll use to sign */
2519     if ((result = Tspi_Context_CreateObject(hContext,
2520     TSS_OBJECT_TYPE_HASH, TSS_HASH_OTHER, &hHash))) {
2521         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
2522         result, Trspi_Error_String(result));
2523         return (CKR_FUNCTION_FAILED);
2524     }

2526     /* Insert the data into the hash object */
2527     if ((result = Tspi_Hash_SetHashValue(hHash, in_data_len,
2528     in_data))) {
2529         stlogit("Tspi_Hash_SetHashValue: 0x%0x - %s",
2530         result, Trspi_Error_String(result));
2531         return (CKR_FUNCTION_FAILED);
2532     }

2534     /* Verify */
2535     result = Tspi_Hash_VerifySignature(hHash, hKey, sig_len, sig);
2536     if (result != TSS_SUCCESS &&
2537     TPMTOK_TSS_ERROR_CODE(result) != TSS_E_FAIL) {
2538         stlogit("Tspi_Hash_VerifySignature: 0x%0x - %s",
2539         result, Trspi_Error_String(result));
2540     }

2542     if (TPMTOK_TSS_ERROR_CODE(result) == TSS_E_FAIL) {
2543         rc = CKR_SIGNATURE_INVALID;
2544     } else {
2545         rc = CKR_OK;
2546     }

2548     return (rc);
2549 }

2551 CK_RV
2552 token_specific_rsa_sign(
2553     TSS_HCONTEXT hContext,
2554     CK_BYTE     * in_data,
2555     CK_ULONG    in_data_len,
2556     CK_BYTE     * out_data,
2557     CK_ULONG    out_data_len,
2558     OBJECT      * key_obj)
2559 {
2560     TSS_RESULT    result;
2561     TSS_HHASH     hHash;
2562     BYTE          *sig;
2563     UINT32        sig_len;
2564     TSS_HKEY      hKey;
2565     CK_RV         rc;

2567     if ((rc = token_rsa_load_key(hContext, key_obj, &hKey))) {
2568         return (rc);
2569     }

```

```

2571     /* Create the hash object we'll use to sign */
2572     if ((result = Tspi_Context_CreateObject(hContext,
2573     TSS_OBJECT_TYPE_HASH, TSS_HASH_OTHER, &hHash))) {
2574         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
2575         result, Trspi_Error_String(result));
2576         return (CKR_FUNCTION_FAILED);
2577     }

2579     /* Insert the data into the hash object */
2580     if ((result = Tspi_Hash_SetHashValue(hHash, in_data_len,
2581     in_data))) {
2582         stlogit("Tspi_Hash_SetHashValue: 0x%0x - %s",
2583         result, Trspi_Error_String(result));
2584         return (CKR_FUNCTION_FAILED);
2585     }

2587     /* Sign */
2588     if ((result = Tspi_Hash_Sign(hHash, hKey, &sig_len, &sig))) {
2589         stlogit("Tspi_Hash_Sign: 0x%0x - %s",
2590         result, Trspi_Error_String(result));
2591         return (CKR_DATA_LEN_RANGE);
2592     }

2594     if (sig_len > *out_data_len) {
2595         Tspi_Context_FreeMemory(hContext, sig);
2596         return (CKR_BUFFER_TOO_SMALL);
2597     }

2599     (void) memcpy(out_data, sig, sig_len);
2600     *out_data_len = sig_len;
2601     Tspi_Context_FreeMemory(hContext, sig);

2603     return (CKR_OK);
2604 }

2606 CK_RV
2607 tpm_encrypt_data(
2608     TSS_HCONTEXT hContext,
2609     TSS_HKEY hKey,
2610     CK_BYTE *in_data,
2611     CK_ULONG in_data_len,
2612     CK_BYTE *out_data,
2613     CK_ULONG *out_data_len)
2614 {
2615     TSS_RESULT    result;
2616     TSS_HENCDATA  hEncData;
2617     BYTE          *dataBlob, *modulus;
2618     UINT32        dataBlobSize, modLen;
2619     CK_ULONG      chunklen, remain;
2620     CK_ULONG      outlen;
2621     UINT32        keyusage, scheme, maxsize;

2623     if ((result = Tspi_Context_CreateObject(hContext,
2624     TSS_OBJECT_TYPE_ENCDATA, TSS_ENCDATA_BIND, &hEncData))) {
2625         stlogit("Tspi_Context_CreateObject: 0x%0x - %s",
2626         result, Trspi_Error_String(result));
2627         return (CKR_FUNCTION_FAILED);
2628     }
2629     /*
2630     * Figure out the modulus size so we can break the data
2631     * into smaller chunks if necessary.
2632     */
2633     if ((result = Tspi_GetAttribData(hKey, TSS_TPATTRIB_RSAKEY_INFO,
2634     TSS_TPATTRIB_KEYINFO_RSA_MODULUS, &modLen, &modulus))) {
2635         stlogit("Tspi_GetAttribData: 0x%0x - %s",

```

```

2636         result, Trspi_Error_String(result));
2637     return (result);
2638 }
2639 /* we don't need the actual modulus */
2640 Tspi_Context_FreeMemory(hContext, modulus);

2642 /*
2643  * According to TSS spec for Tspi_Data_Bind (4.3.4.21.5),
2644  * Max input data size varies depending on the key type and
2645  * encryption scheme.
2646  */
2647 if ((result = Tspi_GetAttribUint32(hKey, TSS_TSPATTRIB_KEY_INFO,
2648     TSS_TSPATTRIB_KEYINFO_USAGE, &keyusage))) {
2649     stlogit("Cannot find USAGE: %s\n",
2650         Trspi_Error_String(result));
2651     return (result);
2652 }
2653 if ((result = Tspi_GetAttribUint32(hKey, TSS_TSPATTRIB_KEY_INFO,
2654     TSS_TSPATTRIB_KEYINFO_ENCScheme, &scheme))) {
2655     stlogit("Cannot find ENCScheme: %s\n",
2656         Trspi_Error_String(result));
2657     return (result);
2658 }
2659 switch (scheme) {
2660     case TSS_ES_RSAESPKCSV15:
2661         if (keyusage == TSS_KEYUSAGE_BIND)
2662             maxsize = 16;
2663         else /* legacy */
2664             maxsize = 11;
2665         break;
2666     case TSS_ES_RSAESOAEP_SHA1_MGF1:
2667         maxsize = 47;
2668         break;
2669     default:
2670         maxsize = 0;
2671 }

2673 modLen -= maxsize;

2675 chunklen = (in_data_len > modLen ? modLen : in_data_len);
2676 remain = in_data_len;
2677 outlen = 0;
2678 while (remain > 0) {
2679     if ((result = Tspi_Data_Bind(hEncData, hKey,
2680         chunklen, in_data))) {
2681         stlogit("Tspi_Data_Bind: 0x%0x - %s",
2682             result, Trspi_Error_String(result));
2683         return (CKR_FUNCTION_FAILED);
2684     }

2686     if ((result = Tspi_GetAttribData(hEncData,
2687         TSS_TSPATTRIB_ENCDATA_BLOB,
2688         TSS_TSPATTRIB_ENCDATA_BLOB_BLOB,
2689         &dataBlobSize, &dataBlob))) {
2690         stlogit("Tspi_GetAttribData: 0x%0x - %s",
2691             result, Trspi_Error_String(result));
2692         return (CKR_FUNCTION_FAILED);
2693     }

2695     if (outlen + dataBlobSize > *out_data_len) {
2696         Tspi_Context_FreeMemory(hContext, dataBlob);
2697         return (CKR_DATA_LEN_RANGE);
2698     }

2700     (void) memcpy(out_data + outlen,
2701         dataBlob, dataBlobSize);

```

```

2703         outlen += dataBlobSize;
2704         in_data += chunklen;
2705         remain -= chunklen;

2707         if (chunklen > remain)
2708             chunklen = remain;

2710         Tspi_Context_FreeMemory(hContext, dataBlob);
2711     }
2712     *out_data_len = outlen;

2714     return (CKR_OK);
2715 }

2717 CK_RV
2718 token_specific_rsa_encrypt(
2719     TSS_HCONTEXT hContext,
2720     CK_BYTE *in_data,
2721     CK_ULONG in_data_len,
2722     CK_BYTE *out_data,
2723     CK_ULONG *out_data_len,
2724     OBJECT *key_obj)
2725 {
2726     TSS_HKEY hKey;
2727     CK_RV rc;

2729     if ((rc = token_rsa_load_key(hContext, key_obj, &hKey))) {
2730         return (rc);
2731     }

2733     rc = tpm_encrypt_data(hContext, hKey, in_data, in_data_len,
2734         out_data, out_data_len);

2736     return (rc);
2737 }

2739 /*
2740  * RSA Verify Recover
2741  *
2742  * Public key crypto is done in software, not by the TPM.
2743  * We bypass the TSPI library here in favor of calls directly
2744  * to OpenSSL because we don't want to add any padding, the in_data (signature)
2745  * already contains the data stream to be decrypted and is already
2746  * padded and formatted correctly.
2747  */
2748 CK_RV
2749 token_specific_rsa_verify_recover(
2750     TSS_HCONTEXT hContext,
2751     CK_BYTE *in_data, /* signature */
2752     CK_ULONG in_data_len,
2753     CK_BYTE *out_data, /* decrypted */
2754     CK_ULONG *out_data_len,
2755     OBJECT *key_obj)
2756 {
2757     TSS_HKEY hKey;
2758     TSS_RESULT result;
2759     CK_RV rc;
2760     BYTE *modulus;
2761     UINT32 modLen;
2762     RSA *rsa = NULL;
2763     exp[] = { 0x01, 0x00, 0x01 };
2764     int sslrv, num;
2765     temp[MAX_RSA_KEYLENGTH];
2766     BYTE outdata[MAX_RSA_KEYLENGTH];
2767     int i;

```

```

2769     if ((rc = token_rsa_load_key(hContext, key_obj, &hKey))) {
2770         return (rc);
2771     }
2772
2773     if ((result = Tspi_GetAttribData(hKey, TSS_TSPATTRIB_RSAKEY_INFO,
2774         TSS_TSPATTRIB_KEYINFO_RSA_MODULUS, &modLen, &modulus))) {
2775         stlogit("Tspi_GetAttribData: 0x%0x - %s",
2776             result, Trspi_Error_String(result));
2777         return (CKR_FUNCTION_FAILED);
2778     }
2779
2780     if (in_data_len != modLen) {
2781         rc = CKR_SIGNATURE_LEN_RANGE;
2782         goto end;
2783     }
2784
2785     rsa = RSA_new();
2786     if (rsa == NULL) {
2787         rc = CKR_HOST_MEMORY;
2788         goto end;
2789     }
2790
2791     rsa->n = BN_bin2bn(modulus, modLen, rsa->n);
2792     rsa->e = BN_bin2bn(exp, sizeof (exp), rsa->e);
2793     if (rsa->n == NULL || rsa->e == NULL) {
2794         rc = CKR_HOST_MEMORY;
2795         goto end;
2796     }
2797
2798     rsa->flags |= RSA_FLAG_SIGN_VER;
2799
2800     /* use RSA_NO_PADDING because the data is already padded (PKCS1) */
2801     sslrv = RSA_public_encrypt(in_data_len, in_data, outdata,
2802         rsa, RSA_NO_PADDING);
2803     if (sslrv == -1) {
2804         rc = CKR_FUNCTION_FAILED;
2805         goto end;
2806     }
2807
2808     /* Strip leading 0's before stripping the padding */
2809     for (i = 0; i < sslrv; i++)
2810         if (outdata[i] != 0)
2811             break;
2812
2813     num = BN_num_bytes(rsa->n);
2814
2815     /* Use OpenSSL function for stripping PKCS#1 padding */
2816     sslrv = RSA_padding_check_PKCS1_type_1(temp, sizeof (temp),
2817         &outdata[i], sslrv - i, num);
2818
2819     if (sslrv < 0) {
2820         rc = CKR_FUNCTION_FAILED;
2821         goto end;
2822     }
2823
2824     if (*out_data_len < sslrv) {
2825         rc = CKR_BUFFER_TOO_SMALL;
2826         *out_data_len = 0;
2827         goto end;
2828     }
2829
2830     /* The return code indicates the number of bytes remaining */
2831     (void) memcpy(out_data, temp, sslrv);
2832     *out_data_len = sslrv;
2833 end:

```

```

2834     Tspi_Context_FreeMemory(hContext, modulus);
2835     if (rsa)
2836         RSA_free(rsa);
2837
2838     return (rc);
2839 }

```

```
*****
60465 Fri May 30 18:32:24 2014
new/usr/src/pkg/manifests/system-library.mf
4853 illumos-gate is not lint-clean when built with openssl 1.0
*****
```

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
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17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 #
22 #
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24 # Copyright (c) 2010, Oracle and/or its affiliates. All rights reserved.
25 # Copyright 2012 OmniTI Computer Consulting, Inc. All rights reserved.
26 # Copyright (c) 2013 Gary Mills
27 #
28 #
29 <include system-library.man3.inc>
30 <include system-library.man3bsm.inc>
31 <include system-library.man3c.inc>
32 <include system-library.man3c_db.inc>
33 <include system-library.man3cfgadm.inc>
34 <include system-library.man3commputil.inc>
35 <include system-library.man3contract.inc>
36 <include system-library.man3curses.inc>
37 <include system-library.man3devid.inc>
38 <include system-library.man3devinfo.inc>
39 <include system-library.man3dlpi.inc>
40 <include system-library.man3elf.inc>
41 <include system-library.man3exacct.inc>
42 <include system-library.man3ext.inc>
43 <include system-library.man3fstyp.inc>
44 <include system-library.man3gen.inc>
45 <include system-library.man3kstat.inc>
46 <include system-library.man3kvm.inc>
47 <include system-library.man3ldap.inc>
48 <include system-library.man3lgrp.inc>
49 <include system-library.man3lib.inc>
50 <include system-library.man3mail.inc>
51 <include system-library.man3malloc.inc>
52 <include system-library.man3mp.inc>
53 <include system-library.man3nsl.inc>
54 <include system-library.man3nvpair.inc>
55 <include system-library.man3pam.inc>
56 <include system-library.man3scf.inc>
57 <include system-library.man3sec.inc>
58 <include system-library.man3secdb.inc>
59 <include system-library.man3sip.inc>
60 <include system-library.man3socket.inc>
61 <include system-library.man3tsol.inc>
```

```
62 <include system-library.man3uuid.inc>
63 <include system-library.man3volmgt.inc>
64 <include system-library.man3xcurses.inc>
65 <include system-library.man3xnet.inc>
66 <include system-library.man4.inc>
67 <include system-library.man5.inc>
68 <include system-library.man7p.inc>
69 set name=pkg.fmri value=pkg:/system/library@$(PKGVERS)
70 set name=pkg.description \
71     value="core shared libraries for a specific instruction-set architecture"
72 set name=pkg.summary value="Core Solaris, (Shared Libs)"
73 set name=info.classification value=org.opensolaris.category.2008:System/Core
74 set name=variant.arch value=$(ARCH)
75 $(i386_ONLY)dir path=etc group=sys
76 $(i386_ONLY)dir path=etc/flash group=sys
77 $(i386_ONLY)dir path=etc/flash/postcreation group=sys mode=0700
78 $(i386_ONLY)dir path=etc/flash/precreation group=sys mode=0700
79 $(i386_ONLY)dir path=etc/flash/preexit group=sys mode=0700
80 dir path=lib
81 dir path=lib/$(ARCH64)
82 dir path=lib/crypto
83 dir path=lib/crypto/$(ARCH64)
84 dir path=lib/mpxio
85 dir path=lib/secure
86 dir path=lib/secure/$(ARCH64)
87 dir path=usr group=sys
88 dir path=usr/bin
89 dir path=usr/ccs
90 dir path=usr/ccs/lib
91 dir path=usr/ccs/lib/$(ARCH64)
92 dir path=usr/lib
93 dir path=usr/lib/$(ARCH64)
94 dir path=usr/lib/cfgadm
95 dir path=usr/lib/cfgadm/$(ARCH64)
96 dir path=usr/lib/iconv/$(ARCH64)
97 $(i386_ONLY)dir path=usr/lib/libc
98 dir path=usr/lib/lwp
99 dir path=usr/lib/lwp/$(ARCH64)
100 dir path=usr/lib/python2.6
101 dir path=usr/lib/python2.6/vendor-packages
102 dir path=usr/lib/python2.6/vendor-packages/solaris
103 dir path=usr/lib/raidcfg
104 dir path=usr/lib/raidcfg/$(ARCH64)
105 dir path=usr/lib/scsi
106 dir path=usr/lib/scsi/$(ARCH64)
107 dir path=usr/lib/scsi/plugins
108 dir path=usr/lib/scsi/plugins/scsi
109 dir path=usr/lib/scsi/plugins/scsi/engines
110 dir path=usr/lib/scsi/plugins/scsi/engines/$(ARCH64)
111 dir path=usr/lib/scsi/plugins/ses
112 dir path=usr/lib/scsi/plugins/ses/framework
113 dir path=usr/lib/scsi/plugins/ses/framework/$(ARCH64)
114 dir path=usr/lib/scsi/plugins/ses/vendor
115 $(sparc_ONLY)dir path=usr/lib/scsi/plugins/ses/vendor/$(ARCH64)
116 dir path=usr/lib/scsi/plugins/smp
117 dir path=usr/lib/scsi/plugins/smp/engine
118 dir path=usr/lib/scsi/plugins/smp/engine/$(ARCH64)
119 dir path=usr/lib/scsi/plugins/smp/framework
120 dir path=usr/lib/scsi/plugins/smp/framework/$(ARCH64)
121 dir path=usr/lib/security
122 dir path=usr/lib/security/$(ARCH64)
123 dir path=usr/share/man
124 dir path=usr/share/man/man3
125 dir path=usr/share/man/man3bsm
126 dir path=usr/share/man/man3c
127 dir path=usr/share/man/man3c_db
```



```
128 dir path=usr/share/man/man3cfgadm
129 dir path=usr/share/man/man3commputil
130 dir path=usr/share/man/man3contract
131 dir path=usr/share/man/man3curses
132 dir path=usr/share/man/man3devinfo
133 dir path=usr/share/man/man3devinfo
134 dir path=usr/share/man/man3dlpi
135 dir path=usr/share/man/man3elf
136 dir path=usr/share/man/man3exacct
137 dir path=usr/share/man/man3ext
138 dir path=usr/share/man/man3fstyp
139 dir path=usr/share/man/man3gen
140 dir path=usr/share/man/man3kstat
141 dir path=usr/share/man/man3kvm
142 dir path=usr/share/man/man3ldap
143 dir path=usr/share/man/man3lgrp
144 dir path=usr/share/man/man3lib
145 dir path=usr/share/man/man3mail
146 dir path=usr/share/man/man3mallocc
147 dir path=usr/share/man/man3mp
148 dir path=usr/share/man/man3nsl
149 dir path=usr/share/man/man3nvpair
150 dir path=usr/share/man/man3pam
151 dir path=usr/share/man/man3pool
152 dir path=usr/share/man/man3scf
153 dir path=usr/share/man/man3sec
154 dir path=usr/share/man/man3secdb
155 dir path=usr/share/man/man3sip
156 dir path=usr/share/man/man3socket
157 dir path=usr/share/man/man3tsol
158 dir path=usr/share/man/man3uuid
159 dir path=usr/share/man/man3volmgt
160 dir path=usr/share/man/man3xcurses
161 dir path=usr/share/man/man3xnet
162 dir path=usr/share/man/man5
163 dir path=usr/share/man/man7p
164 dir path=usr/xpg4
165 dir path=usr/xpg4/lib
166 dir path=usr/xpg4/lib/$(ARCH64)
167 $(i386_ONLY)file path=etc/flash/precreation/caplib group=sys mode=0500
168 file path=lib/$(ARCH64)/c_synonyms.so.1
169 file path=lib/$(ARCH64)/ld.so.1
170 file path=lib/$(ARCH64)/libadm.so.1
171 file path=lib/$(ARCH64)/libaio.so.1
172 file path=lib/$(ARCH64)/libavl.so.1
173 file path=lib/$(ARCH64)/libbsm.so.1
174 file path=lib/$(ARCH64)/libc.so.1
175 file path=lib/$(ARCH64)/libc_db.so.1
176 file path=lib/$(ARCH64)/libcndutils.so.1
177 file path=lib/$(ARCH64)/libcontract.so.1
178 file path=lib/$(ARCH64)/libcryptoutil.so.1
179 file path=lib/$(ARCH64)/libctf.so.1
180 file path=lib/$(ARCH64)/libcurses.so.1
181 file path=lib/$(ARCH64)/libdevice.so.1
182 file path=lib/$(ARCH64)/libdevinfo.so.1
183 file path=lib/$(ARCH64)/libdevinfo.so.1
184 file path=lib/$(ARCH64)/libdhcputil.so.1
185 file path=lib/$(ARCH64)/libdl.so.1
186 file path=lib/$(ARCH64)/libdladm.so.1
187 file path=lib/$(ARCH64)/libdlpi.so.1
188 file path=lib/$(ARCH64)/libdoor.so.1
189 file path=lib/$(ARCH64)/libefi.so.1
190 file path=lib/$(ARCH64)/libelf.so.1
191 $(i386_ONLY)file path=lib/$(ARCH64)/libfdisk.so.1
192 file path=lib/$(ARCH64)/libgen.so.1
193 file path=lib/$(ARCH64)/libinetutil.so.1
```

```
194 file path=lib/$(ARCH64)/libintl.so.1
195 file path=lib/$(ARCH64)/libkmf.so.1
196 file path=lib/$(ARCH64)/libkmfherder.so.1
197 file path=lib/$(ARCH64)/libkstat.so.1
198 file path=lib/$(ARCH64)/libld.so.4
199 file path=lib/$(ARCH64)/liblddbg.so.4
200 file path=lib/$(ARCH64)/libmd.so.1
201 file path=lib/$(ARCH64)/libmd5.so.1
202 file path=lib/$(ARCH64)/libmp.so.2
203 file path=lib/$(ARCH64)/libnsl.so.1
204 file path=lib/$(ARCH64)/libnvpair.so.1
205 file path=lib/$(ARCH64)/libpam.so.1
206 file path=lib/$(ARCH64)/libproc.so.1
207 file path=lib/$(ARCH64)/libpthread.so.1
208 file path=lib/$(ARCH64)/librcm.so.1
209 file path=lib/$(ARCH64)/libresolv.so.2
210 file path=lib/$(ARCH64)/librestart.so.1
211 file path=lib/$(ARCH64)/librpcsvc.so.1
212 file path=lib/$(ARCH64)/librt.so.1
213 file path=lib/$(ARCH64)/librtld.so.1
214 file path=lib/$(ARCH64)/librtld_db.so.1
215 file path=lib/$(ARCH64)/libscf.so.1
216 file path=lib/$(ARCH64)/libsec.so.1
217 file path=lib/$(ARCH64)/libsecdb.so.1
218 file path=lib/$(ARCH64)/libsendfile.so.1
219 file path=lib/$(ARCH64)/libsocket.so.1
220 file path=lib/$(ARCH64)/libsysevent.so.1
221 file path=lib/$(ARCH64)/libtermcap.so.1
222 file path=lib/$(ARCH64)/libthread.so.1
223 file path=lib/$(ARCH64)/libtsnet.so.1
224 file path=lib/$(ARCH64)/libtsol.so.2
225 file path=lib/$(ARCH64)/libumem.so.1
226 file path=lib/$(ARCH64)/libuuid.so.1
227 file path=lib/$(ARCH64)/libutil.so.1
228 file path=lib/$(ARCH64)/libw.so.1
229 file path=lib/$(ARCH64)/libxnet.so.1
230 file path=lib/$(ARCH64)/nss_compat.so.1
231 file path=lib/$(ARCH64)/nss_dns.so.1
232 file path=lib/$(ARCH64)/nss_files.so.1
233 file path=lib/$(ARCH64)/nss_nis.so.1
234 file path=lib/$(ARCH64)/nss_user.so.1
235 file path=lib/c_synonyms.so.1
236 file path=lib/crypto/$(ARCH64)/kmf_mapper_cn.so.1
237 file path=lib/crypto/$(ARCH64)/kmf_nss.so.1
238 file path=lib/crypto/$(ARCH64)/kmf_openssl.so.1
239 file path=lib/crypto/$(ARCH64)/kmf_pkcs11.so.1
240 file path=lib/crypto/kmf_mapper_cn.so.1
241 file path=lib/crypto/kmf_nss.so.1
242 file path=lib/crypto/kmf_openssl.so.1
243 file path=lib/crypto/kmf_pkcs11.so.1
244 file path=lib/ld.so.1
245 file path=lib/libadm.so.1
246 file path=lib/libaio.so.1
247 file path=lib/libavl.so.1
248 file path=lib/libbsm.so.1
249 file path=lib/libc.so.1 reboot-needed=true
250 file path=lib/libc_db.so.1
251 file path=lib/libcndutils.so.1
252 file path=lib/libcontract.so.1
253 file path=lib/libcryptoutil.so.1
254 file path=lib/libctf.so.1
255 file path=lib/libcurses.so.1
256 file path=lib/libdevice.so.1
257 file path=lib/libdevinfo.so.1
258 file path=lib/libdevinfo.so.1
259 file path=lib/libdhcagent.so.1
```

```
260 file path=lib/libdhcputil.so.1
261 file path=lib/libdl.so.1
262 file path=lib/libldadm.so.1
263 file path=lib/libdldpi.so.1
264 file path=lib/libdoor.so.1
265 file path=lib/libefi.so.1
266 file path=lib/libelf.so.1
267 file path=lib/libelfsign.so.1
268 $(i386_ONLY)file path=lib/libfdisk.so.1
269 file path=lib/libgen.so.1
270 file path=lib/libinetutil.so.1
271 file path=lib/libintl.so.1
272 file path=lib/libipadm.so.1
273 file path=lib/libipmp.so.1
274 file path=lib/libkcfld.so.1
275 file path=lib/libkmf.so.1
276 file path=lib/libkmfberder.so.1
277 file path=lib/libkstat.so.1
278 file path=lib/libld.so.4
279 file path=lib/liblddbg.so.4
280 file path=lib/libmd.so.1
281 file path=lib/libmd5.so.1
282 file path=lib/libmp.so.1
283 file path=lib/libmp.so.2
284 file path=lib/libnsl.so.1
285 file path=lib/libnvpair.so.1
286 file path=lib/libnwam.so.1
287 file path=lib/libpam.so.1
288 file path=lib/libproc.so.1
289 file path=lib/libpthread.so.1
290 file path=lib/librcm.so.1
291 file path=lib/libresolv.so.1
292 file path=lib/libresolv.so.2
293 file path=lib/librestart.so.1
294 file path=lib/librpcsvc.so.1
295 file path=lib/librt.so.1
296 file path=lib/librtld.so.1
297 file path=lib/librtld_db.so.1
298 file path=lib/libscf.so.1
299 file path=lib/libsec.so.1
300 file path=lib/libsecdb.so.1
301 file path=lib/libsendfile.so.1
302 file path=lib/libsocket.so.1
303 file path=lib/libsysevent.so.1
304 file path=lib/libtermcap.so.1
305 file path=lib/libthread.so.1
306 file path=lib/libtsnet.so.1
307 file path=lib/libtsol.so.2
308 file path=lib/libumem.so.1
309 file path=lib/libuuid.so.1
310 file path=lib/libuutil.so.1
311 file path=lib/libw.so.1
312 file path=lib/libxnet.so.1
313 file path=lib/mpxio/stmsboot_util mode=0555
314 file path=lib/nss_compat.so.1
315 file path=lib/nss_dns.so.1
316 file path=lib/nss_files.so.1
317 file path=lib/nss_nis.so.1
318 file path=lib/nss_user.so.1
319 file path=usr/lib/$(ARCH64)/0@0.so.1
320 file path=usr/lib/$(ARCH64)/getloginx.so.1
321 file path=usr/lib/$(ARCH64)/libadutils.so.1
322 file path=usr/lib/$(ARCH64)/libast.so.1
323 file path=usr/lib/$(ARCH64)/libbsdmalloc.so.1
324 file path=usr/lib/$(ARCH64)/libcfgadm.so.1
325 file path=usr/lib/$(ARCH64)/libcmd.so.1
```

```
326 file path=usr/lib/$(ARCH64)/libcommutil.so.1
327 file path=usr/lib/$(ARCH64)/libcrle.so.1
328 file path=usr/lib/$(ARCH64)/libcrypt.so.1
329 file path=usr/lib/$(ARCH64)/libdisasm.so.1
330 file path=usr/lib/$(ARCH64)/libdll.so.1
331 file path=usr/lib/$(ARCH64)/libexacct.so.1
332 file path=usr/lib/$(ARCH64)/libform.so.1
333 file path=usr/lib/$(ARCH64)/libfstyp.so.1
334 file path=usr/lib/$(ARCH64)/libhotplug.so.1
335 file path=usr/lib/$(ARCH64)/libidmap.so.1
336 file path=usr/lib/$(ARCH64)/libike.so.1
337 file path=usr/lib/$(ARCH64)/libipmi.so.1
338 file path=usr/lib/$(ARCH64)/libipp.so.1
339 file path=usr/lib/$(ARCH64)/libipsecutil.so.1
340 file path=usr/lib/$(ARCH64)/libkvm.so.1
341 file path=usr/lib/$(ARCH64)/libl.so.1
342 file path=usr/lib/$(ARCH64)/libldap.so.5
343 file path=usr/lib/$(ARCH64)/liblgrp.so.1
344 file path=usr/lib/$(ARCH64)/liblm.so.1
345 file path=usr/lib/$(ARCH64)/libmail.so.1
346 file path=usr/lib/$(ARCH64)/libmalloc.so.1
347 file path=usr/lib/$(ARCH64)/libmapmalloc.so.1
348 file path=usr/lib/$(ARCH64)/libmenu.so.1
349 file path=usr/lib/$(ARCH64)/libmtmalloc.so.1
350 file path=usr/lib/$(ARCH64)/libnls.so.1
351 file path=usr/lib/$(ARCH64)/libpanel.so.1
352 file path=usr/lib/$(ARCH64)/libpcidb.so.1
353 file path=usr/lib/$(ARCH64)/libpkcs11.so.1
354 file path=usr/lib/$(ARCH64)/libproject.so.1
355 file path=usr/lib/$(ARCH64)/libraidcfg.so.1
356 file path=usr/lib/$(ARCH64)/libreparse.so.1
357 $(i386_ONLY)file path=usr/lib/$(ARCH64)/libsavargs.so.1
358 file path=usr/lib/$(ARCH64)/libsched.so.1
359 file path=usr/lib/$(ARCH64)/libsctp.so.1
360 file path=usr/lib/$(ARCH64)/libshell.so.1
361 file path=usr/lib/$(ARCH64)/libsip.so.1
362 file path=usr/lib/$(ARCH64)/libslldap.so.1
363 file path=usr/lib/$(ARCH64)/libsmbios.so.1
364 file path=usr/lib/$(ARCH64)/libsoftcrypto.so.1
365 file path=usr/lib/$(ARCH64)/libsum.so.1
366 file path=usr/lib/$(ARCH64)/libsunw_crypto.so.1
367 file path=usr/lib/$(ARCH64)/libsunw_ssl.so.1
368 $(sparc_ONLY)file path=usr/lib/$(ARCH64)/libv12n.so.1
369 file path=usr/lib/$(ARCH64)/libvolmgt.so.1
370 file path=usr/lib/$(ARCH64)/libwrap.so.1.0
371 file path=usr/lib/$(ARCH64)/liby.so.1
372 file path=usr/lib/$(ARCH64)/libzoneinfo.so.1
373 file path=usr/lib/$(ARCH64)/nss_ad.so.1
374 file path=usr/lib/$(ARCH64)/nss_ldap.so.1
375 file path=usr/lib/$(ARCH64)/passwdutil.so.1
376 file path=usr/lib/$(ARCH64)/straddr.so.2
377 file path=usr/lib/$(ARCH64)/watchmalloc.so.1
378 file path=usr/lib/0@0.so.1
379 file path=usr/lib/cfgadm/$(ARCH64)/ib.so.1
380 file path=usr/lib/cfgadm/$(ARCH64)/pci.so.1
381 $(i386_ONLY)file path=usr/lib/cfgadm/$(ARCH64)/sata.so.1
382 file path=usr/lib/cfgadm/$(ARCH64)/scsi.so.1
383 file path=usr/lib/cfgadm/$(ARCH64)/shp.so.1
384 file path=usr/lib/cfgadm/$(ARCH64)/usb.so.1
385 file path=usr/lib/cfgadm/ib.so.1
386 file path=usr/lib/cfgadm/pci.so.1
387 $(i386_ONLY)file path=usr/lib/cfgadm/sata.so.1
388 file path=usr/lib/cfgadm/scsi.so.1
389 file path=usr/lib/cfgadm/shp.so.1
390 file path=usr/lib/cfgadm/usb.so.1
391 file path=usr/lib/extendedFILE.so.1
```

```

392 file path=usr/lib/getlogin.so.1
393 file path=usr/lib/lib.b mode=0444
394 file path=usr/lib/libadutils.so.1
395 file path=usr/lib/libast.so.1
396 file path=usr/lib/libbsdmalloca.so.1
397 $(i386_ONLY)file path=usr/lib/libc/libc_hwcapi.so.1 reboot-needed=true
398 $(i386_ONLY)file path=usr/lib/libc/libc_hwcapi2.so.1 reboot-needed=true
399 $(i386_ONLY)file path=usr/lib/libc/libc_hwcapi3.so.1 reboot-needed=true
400 file path=usr/lib/libcfdm.so.1
401 file path=usr/lib/libcmd.so.1
402 file path=usr/lib/libcommutil.so.1
403 file path=usr/lib/libcrl.so.1
404 file path=usr/lib/libcrypt.so.1
405 file path=usr/lib/libdisasm.so.1
406 file path=usr/lib/libdll.so.1
407 file path=usr/lib/libexacct.so.1
408 file path=usr/lib/libform.so.1
409 file path=usr/lib/libfstyp.so.1
410 file path=usr/lib/libhotplug.so.1
411 file path=usr/lib/libidmap.so.1
412 file path=usr/lib/libike.so.1
413 file path=usr/lib/libinetsvc.so.1
414 file path=usr/lib/libipmi.so.1
415 file path=usr/lib/libipp.so.1
416 file path=usr/lib/libipsecutil.so.1
417 file path=usr/lib/libkvm.so.1
418 file path=usr/lib/libl.so.1
419 file path=usr/lib/libldap.so.5
420 file path=usr/lib/liblgrp.so.1
421 file path=usr/lib/liblm.so.1
422 file path=usr/lib/libmail.so.1
423 file path=usr/lib/libmalloca.so.1
424 file path=usr/lib/libmapmalloca.so.1
425 file path=usr/lib/libmenu.so.1
426 file path=usr/lib/libmtmalloca.so.1
427 file path=usr/lib/libnls.so.1
428 file path=usr/lib/libpanel.so.1
429 file path=usr/lib/libpcidb.so.1
430 file path=usr/lib/libpkcs11.so.1
431 file path=usr/lib/libproject.so.1
432 file path=usr/lib/libraidcfg.so.1
433 file path=usr/lib/librepase.so.1
434 file path=usr/lib/libsched.so.1
435 file path=usr/lib/libscpt.so.1
436 file path=usr/lib/libshell.so.1
437 file path=usr/lib/libsip.so.1
438 file path=usr/lib/libslldap.so.1
439 file path=usr/lib/libsmbios.so.1
440 file path=usr/lib/libsoftcrypto.so.1
441 file path=usr/lib/libsum.so.1
442 file path=usr/lib/libsunw_crypto.so.1
443 file path=usr/lib/libsunw_ssl.so.1
444 file path=usr/lib/libsys.so.1
445 $(sparc_ONLY)file path=usr/lib/libv12n.so.1
446 file path=usr/lib/libvolmgt.so.1
447 file path=usr/lib/libwrap.so.1.0
448 file path=usr/lib/liby.so.1
449 file path=usr/lib/libzoneinfo.so.1
450 file path=usr/lib/nss_ad.so.1
451 file path=usr/lib/nss_ldap.so.1
452 file path=usr/lib/passwdutil.so.1
453 file path=usr/lib/python2.6/vendor-packages/solaris/__init__.py
454 file path=usr/lib/python2.6/vendor-packages/solaris/__init__.pyc
455 file path=usr/lib/python2.6/vendor-packages/solaris/misc.so
456 file path=usr/lib/raidcfg/$(ARCH64)/mpt.so.1
457 file path=usr/lib/raidcfg/mpt.so.1

```

```

458 file path=usr/lib/scsi/$(ARCH64)/libscsi.so.1
459 file path=usr/lib/scsi/$(ARCH64)/libses.so.1
460 file path=usr/lib/scsi/$(ARCH64)/libsmp.so.1
461 file path=usr/lib/scsi/libscsi.so.1
462 file path=usr/lib/scsi/libses.so.1
463 file path=usr/lib/scsi/libsmp.so.1
464 file path=usr/lib/scsi/plugins/scsi/engines/$(ARCH64)/uscsi.so
465 file path=usr/lib/scsi/plugins/scsi/engines/uscsi.so
466 file path=usr/lib/scsi/plugins/ses/framework/$(ARCH64)/libses.so
467 file path=usr/lib/scsi/plugins/ses/framework/$(ARCH64)/ses2.so
468 file path=usr/lib/scsi/plugins/ses/framework/libses.so
469 file path=usr/lib/scsi/plugins/ses/framework/ses2.so
470 file path=usr/lib/scsi/plugins/smp/engine/$(ARCH64)/usmp.so
471 file path=usr/lib/scsi/plugins/smp/engine/usmp.so
472 file path=usr/lib/scsi/plugins/smp/framework/$(ARCH64)/sas2.so
473 file path=usr/lib/scsi/plugins/smp/framework/sas2.so
474 file path=usr/lib/security/$(ARCH64)/crypt_bsdh.so.1
475 file path=usr/lib/security/$(ARCH64)/crypt_bsdmd5.so.1
476 file path=usr/lib/security/$(ARCH64)/crypt_sha256.so.1
477 file path=usr/lib/security/$(ARCH64)/crypt_sha512.so.1
478 file path=usr/lib/security/$(ARCH64)/crypt_sunmd5.so.1
479 file path=usr/lib/security/$(ARCH64)/pam_allow.so.1
480 file path=usr/lib/security/$(ARCH64)/pam_authok_check.so.1
481 file path=usr/lib/security/$(ARCH64)/pam_authok_get.so.1
482 file path=usr/lib/security/$(ARCH64)/pam_authok_store.so.1
483 file path=usr/lib/security/$(ARCH64)/pam_deny.so.1
484 file path=usr/lib/security/$(ARCH64)/pam_dhkeys.so.1
485 file path=usr/lib/security/$(ARCH64)/pam_dial_auth.so.1
486 file path=usr/lib/security/$(ARCH64)/pam_ldap.so.1
487 file path=usr/lib/security/$(ARCH64)/pam_list.so.1
488 file path=usr/lib/security/$(ARCH64)/pam_passwd_auth.so.1
489 file path=usr/lib/security/$(ARCH64)/pam_rhosts_auth.so.1
490 file path=usr/lib/security/$(ARCH64)/pam_roles.so.1
491 file path=usr/lib/security/$(ARCH64)/pam_sample.so.1
492 file path=usr/lib/security/$(ARCH64)/pam_tsol_account.so.1
493 file path=usr/lib/security/$(ARCH64)/pam_unix_account.so.1
494 file path=usr/lib/security/$(ARCH64)/pam_unix_auth.so.1
495 file path=usr/lib/security/$(ARCH64)/pam_unix_cred.so.1
496 file path=usr/lib/security/$(ARCH64)/pam_unix_session.so.1
497 file path=usr/lib/security/$(ARCH64)/pkcs11_kernel.so.1
498 file path=usr/lib/security/$(ARCH64)/pkcs11_softtoken.so.1
499 file path=usr/lib/security/$(ARCH64)/pkcs11_tpm.so.1
500 file path=usr/lib/security/audit_binfile.so.1
501 file path=usr/lib/security/audit_remote.so.1
502 file path=usr/lib/security/audit_syslog.so.1
503 file path=usr/lib/security/crypt_bsdh.so.1
504 file path=usr/lib/security/crypt_bsdmd5.so.1
505 file path=usr/lib/security/crypt_sha256.so.1
506 file path=usr/lib/security/crypt_sha512.so.1
507 file path=usr/lib/security/crypt_sunmd5.so.1
508 file path=usr/lib/security/pam_allow.so.1
509 file path=usr/lib/security/pam_authok_check.so.1
510 file path=usr/lib/security/pam_authok_get.so.1
511 file path=usr/lib/security/pam_authok_store.so.1
512 file path=usr/lib/security/pam_deny.so.1
513 file path=usr/lib/security/pam_dhkeys.so.1
514 file path=usr/lib/security/pam_dial_auth.so.1
515 file path=usr/lib/security/pam_ldap.so.1
516 file path=usr/lib/security/pam_list.so.1
517 file path=usr/lib/security/pam_passwd_auth.so.1
518 file path=usr/lib/security/pam_rhosts_auth.so.1
519 file path=usr/lib/security/pam_roles.so.1
520 file path=usr/lib/security/pam_sample.so.1
521 file path=usr/lib/security/pam_tsol_account.so.1
522 file path=usr/lib/security/pam_unix_account.so.1
523 file path=usr/lib/security/pam_unix_auth.so.1

```

```

524 file path=usr/lib/security/pam_unix_cred.so.1
525 file path=usr/lib/security/pam_unix_session.so.1
526 file path=usr/lib/security/pkcs11_kernel.so.1
527 file path=usr/lib/security/pkcs11_softtoken.so.1
528 file path=usr/lib/security/pkcs11_tpm.so.1
529 file path=usr/lib/straddr.so.2
530 file path=usr/lib/watchmalloc.so.1
531 # XXX: Obsoleted by open i18n?
532 file path=usr/xpg4/lib/$(ARCH64)/libcurses.so.1
533 file path=usr/xpg4/lib/$(ARCH64)/libcurses.so.2
534 file path=usr/xpg4/lib/libcurses.so.1
535 file path=usr/xpg4/lib/libcurses.so.2
536 legacy pkg=SUNwcs1 \
537   desc="core shared libraries for a specific instruction-set architecture" \
538   name="Core Solaris, (Shared Libs)"
539 legacy pkg=SUNwcs1r \
540   desc="core software for a specific instruction-set architecture" \
541   name="Core Solaris Libraries (Root)"
542 license cr_Sun license=cr_Sun
543 license lic_CDDL license=lic_CDDL
544 license lic_OSBL license=lic_OSBL
545 license lic_OSBL_preamble license=lic_OSBL_preamble
546 # libwrap is part of tcp wrappers along with tcpd
547 license usr/src/cmd/tcpd/THIRDPARTYLICENSE \
548   license=usr/src/cmd/tcpd/THIRDPARTYLICENSE
549 license usr/src/common/crypto/THIRDPARTYLICENSE.cryptogams \
550   license=usr/src/common/crypto/THIRDPARTYLICENSE.cryptogams
551 license usr/src/common/crypto/aes/amd64/THIRDPARTYLICENSE.gladman \
552   license=usr/src/common/crypto/aes/amd64/THIRDPARTYLICENSE.gladman
553 license usr/src/common/crypto/aes/amd64/THIRDPARTYLICENSE.openssl \
554   license=usr/src/common/crypto/aes/amd64/THIRDPARTYLICENSE.openssl
555 license usr/src/common/crypto/ecc/THIRDPARTYLICENSE \
556   license=usr/src/common/crypto/ecc/THIRDPARTYLICENSE
557 license usr/src/common/crypto/md5/amd64/THIRDPARTYLICENSE \
558   license=usr/src/common/crypto/md5/amd64/THIRDPARTYLICENSE
559 license usr/src/common/mpi/THIRDPARTYLICENSE \
560   license=usr/src/common/mpi/THIRDPARTYLICENSE
561 license usr/src/lib/libast/THIRDPARTYLICENSE \
562   license=usr/src/lib/libast/THIRDPARTYLICENSE
563 license usr/src/lib/libbsdmalloc/THIRDPARTYLICENSE \
564   license=usr/src/lib/libbsdmalloc/THIRDPARTYLICENSE
565 license usr/src/lib/libc/THIRDPARTYLICENSE \
566   license=usr/src/lib/libc/THIRDPARTYLICENSE
567 license usr/src/lib/libcmd/THIRDPARTYLICENSE \
568   license=usr/src/lib/libcmd/THIRDPARTYLICENSE
569 license usr/src/lib/libdli/THIRDPARTYLICENSE \
570   license=usr/src/lib/libdli/THIRDPARTYLICENSE
571 license usr/src/lib/libinetutil/common/THIRDPARTYLICENSE \
572   license=usr/src/lib/libinetutil/common/THIRDPARTYLICENSE
573 license usr/src/lib/libkrmf/THIRDPARTYLICENSE \
574   license=usr/src/lib/libkrmf/THIRDPARTYLICENSE
575 license usr/src/lib/libldap5/THIRDPARTYLICENSE \
576   license=usr/src/lib/libldap5/THIRDPARTYLICENSE
577 license usr/src/lib/libmp/common/THIRDPARTYLICENSE \
578   license=usr/src/lib/libmp/common/THIRDPARTYLICENSE
579 license usr/src/lib/libresolv/THIRDPARTYLICENSE \
580   license=usr/src/lib/libresolv/THIRDPARTYLICENSE
581 license usr/src/lib/libresolv2/THIRDPARTYLICENSE \
582   license=usr/src/lib/libresolv2/THIRDPARTYLICENSE
583 license usr/src/lib/libshell/THIRDPARTYLICENSE \
584   license=usr/src/lib/libshell/THIRDPARTYLICENSE
585 license usr/src/lib/libsum/THIRDPARTYLICENSE \
586   license=usr/src/lib/libsum/THIRDPARTYLICENSE
587 license usr/src/lib/pam_modules/authok_check/THIRDPARTYLICENSE \
588   license=usr/src/lib/pam_modules/authok_check/THIRDPARTYLICENSE
589 license usr/src/lib/passwdutil/THIRDPARTYLICENSE \

```

```

590   license=usr/src/lib/passwdutil/THIRDPARTYLICENSE
591 license usr/src/lib/pkcs11/pkcs11_tpm/THIRDPARTYLICENSE \
592   license=usr/src/lib/pkcs11/pkcs11_tpm/THIRDPARTYLICENSE
593 license usr/src/uts/common/sys/THIRDPARTYLICENSE.unicode \
594   license=usr/src/uts/common/sys/THIRDPARTYLICENSE.unicode
595 link path=lib/$(ARCH64)/libadm.so target=libadm.so.1
596 link path=lib/$(ARCH64)/libaio.so target=libaio.so.1
597 link path=lib/$(ARCH64)/libbsm.so target=libbsm.so.1
598 link path=lib/$(ARCH64)/libc.so reboot-needed=true target=libc.so.1
599 link path=lib/$(ARCH64)/libc_db.so target=libc_db.so.1
600 link path=lib/$(ARCH64)/libcontract.so target=libcontract.so.1
601 link path=lib/$(ARCH64)/libcryptoutil.so target=libcryptoutil.so.1
602 link path=lib/$(ARCH64)/libctf.so target=libctf.so.1
603 link path=lib/$(ARCH64)/libcurses.so target=libcurses.so.1
604 link path=lib/$(ARCH64)/libdevice.so target=libdevice.so.1
605 link path=lib/$(ARCH64)/libdevinfo.so target=libdevinfo.so.1
606 link path=lib/$(ARCH64)/libdevinfo.so target=libdevinfo.so.1
607 link path=lib/$(ARCH64)/libdl.so target=libdl.so.1
608 link path=lib/$(ARCH64)/libldm.so target=libldm.so.1
609 link path=lib/$(ARCH64)/libldpi.so target=libldpi.so.1
610 link path=lib/$(ARCH64)/libdoor.so target=libdoor.so.1
611 link path=lib/$(ARCH64)/libefi.so target=libefi.so.1
612 link path=lib/$(ARCH64)/libelf.so target=libelf.so.1
613 $(i386_ONLY)link path=lib/$(ARCH64)/libfdisk.so target=libfdisk.so.1
614 link path=lib/$(ARCH64)/libgen.so target=libgen.so.1
615 link path=lib/$(ARCH64)/libintl.so target=libintl.so.1
616 link path=lib/$(ARCH64)/libkrmf.so target=libkrmf.so.1
617 link path=lib/$(ARCH64)/libkrmfberder.so target=libkrmfberder.so.1
618 link path=lib/$(ARCH64)/libkstat.so target=libkstat.so.1
619 link path=lib/$(ARCH64)/libmd.so target=libmd.so.1
620 link path=lib/$(ARCH64)/libmd5.so target=libmd5.so.1
621 link path=lib/$(ARCH64)/libmp.so target=libmp.so.2
622 link path=lib/$(ARCH64)/libnsl.so target=libnsl.so.1
623 link path=lib/$(ARCH64)/libnvpair.so target=libnvpair.so.1
624 link path=lib/$(ARCH64)/libpam.so target=libpam.so.1
625 link path=lib/$(ARCH64)/libposix4.so target=libposix4.so.1
626 link path=lib/$(ARCH64)/libposix4.so.1 target=librt.so.1
627 link path=lib/$(ARCH64)/libproc.so target=libproc.so.1
628 link path=lib/$(ARCH64)/libpthread.so target=libpthread.so.1
629 link path=lib/$(ARCH64)/librcm.so target=librcm.so.1
630 link path=lib/$(ARCH64)/libresolv.so target=libresolv.so.2
631 link path=lib/$(ARCH64)/librestart.so target=librestart.so.1
632 link path=lib/$(ARCH64)/librpcsvc.so target=librpcsvc.so.1
633 link path=lib/$(ARCH64)/librt.so target=librt.so.1
634 link path=lib/$(ARCH64)/librtld_db.so target=librtld_db.so.1
635 link path=lib/$(ARCH64)/libscf.so target=libscf.so.1
636 link path=lib/$(ARCH64)/libsec.so target=libsec.so.1
637 link path=lib/$(ARCH64)/libsecdb.so target=libsecdb.so.1
638 link path=lib/$(ARCH64)/libsendfile.so target=libsendfile.so.1
639 link path=lib/$(ARCH64)/libsocket.so target=libsocket.so.1
640 link path=lib/$(ARCH64)/libsysevent.so target=libsysevent.so.1
641 link path=lib/$(ARCH64)/libtermcap.so target=libtermcap.so.1
642 link path=lib/$(ARCH64)/libtermmlib.so target=libtermmlib.so.1
643 link path=lib/$(ARCH64)/libtermmlib.so.1 target=libcurses.so.1
644 link path=lib/$(ARCH64)/libthread.so target=libthread.so.1
645 link path=lib/$(ARCH64)/libthread_db.so target=libc_db.so.1
646 link path=lib/$(ARCH64)/libthread_db.so.1 target=libc_db.so.1
647 link path=lib/$(ARCH64)/libtsnet.so target=libtsnet.so.1
648 link path=lib/$(ARCH64)/libtsol.so target=libtsol.so.2
649 link path=lib/$(ARCH64)/libumem.so target=libumem.so.1
650 link path=lib/$(ARCH64)/libuuid.so target=libuuid.so.1
651 link path=lib/$(ARCH64)/libuutil.so target=libuutil.so.1
652 link path=lib/$(ARCH64)/libw.so target=libw.so.1
653 link path=lib/$(ARCH64)/libxnet.so target=libxnet.so.1
654 link path=lib/32 target=.
655 link path=lib/64 target=$(ARCH64)

```

```

656 link path=lib/crypto/32 target=.
657 link path=lib/crypto/64 target=$(ARCH64)
658 link path=lib/libadm.so target=libadm.so.1
659 link path=lib/libaio.so target=libaio.so.1
660 link path=lib/libbsm.so target=libbsm.so.1
661 link path=lib/libc.so target=libc.so.1
662 link path=lib/libc_db.so target=libc_db.so.1
663 link path=lib/libcontract.so target=libcontract.so.1
664 link path=lib/libcryptoutil.so target=libcryptoutil.so.1
665 link path=lib/libctf.so target=libctf.so.1
666 link path=lib/libcurses.so target=libcurses.so.1
667 link path=lib/libdevice.so target=libdevice.so.1
668 link path=lib/libdevinfo.so target=libdevinfo.so.1
669 link path=lib/libdevinfo.so target=libdevinfo.so.1
670 link path=lib/libdl.so target=libdl.so.1
671 link path=lib/libldadm.so target=libldadm.so.1
672 link path=lib/libldpi.so target=libldpi.so.1
673 link path=lib/libdoor.so target=libdoor.so.1
674 link path=lib/libefi.so target=libefi.so.1
675 link path=lib/libelf.so target=libelf.so.1
676 link path=lib/libelfsign.so target=libelfsign.so.1
677 $(i386_ONLY)link path=lib/libfdisk.so target=libfdisk.so.1
678 link path=lib/libgen.so target=libgen.so.1
679 link path=lib/libintl.so target=libintl.so.1
680 link path=lib/liblmp.so target=liblmp.so.1
681 link path=lib/libkmf.so target=libkmf.so.1
682 link path=lib/libkmfberder.so target=libkmfberder.so.1
683 link path=lib/libkstat.so target=libkstat.so.1
684 link path=lib/libmd.so target=libmd.so.1
685 link path=lib/libmd5.so target=libmd5.so.1
686 link path=lib/libmp.so target=libmp.so.2
687 link path=lib/libnsl.so target=libnsl.so.1
688 link path=lib/libnvpair.so target=libnvpair.so.1
689 link path=lib/libnwam.so target=libnwam.so.1
690 link path=lib/libpam.so target=libpam.so.1
691 link path=lib/libposix4.so target=libposix4.so.1
692 link path=lib/libposix4.so.1 target=librt.so.1
693 link path=lib/libproc.so target=libproc.so.1
694 link path=lib/libpthread.so target=libpthread.so.1
695 link path=lib/librcm.so target=librcm.so.1
696 link path=lib/libresolv.so target=libresolv.so.2
697 link path=lib/librpcsvc.so target=librpcsvc.so.1
698 link path=lib/librt.so target=librt.so.1
699 link path=lib/librtld_db.so target=librtld_db.so.1
700 link path=lib/libscf.so target=libscf.so.1
701 link path=lib/libsec.so target=libsec.so.1
702 link path=lib/libsecdb.so target=libsecdb.so.1
703 link path=lib/libsendfile.so target=libsendfile.so.1
704 link path=lib/libsocket.so target=libsocket.so.1
705 link path=lib/libsysevent.so target=libsysevent.so.1
706 link path=lib/libtermcap.so target=libtermcap.so.1
707 link path=lib/libtermplib.so target=libtermplib.so.1
708 link path=lib/libtermplib.so.1 target=libcurses.so.1
709 link path=lib/libthread.so target=libthread.so.1
710 link path=lib/libthread_db.so target=libc_db.so.1
711 link path=lib/libthread_db.so.1 target=libc_db.so.1
712 link path=lib/libtsol.so target=libtsol.so.2
713 link path=lib/libumem.so target=libumem.so.1
714 link path=lib/libuuid.so target=libuuid.so.1
715 link path=lib/libw.so target=libw.so.1
716 link path=lib/libxnet.so target=libxnet.so.1
717 link path=lib/libsecure/32 target=.
718 link path=lib/libsecure/64 target=$(ARCH64)
719 link path=usr/ccs/lib/$(ARCH64)/libcurses.so \
720 target=../lib/$(ARCH64)/libcurses.so.1
721 link path=usr/ccs/lib/$(ARCH64)/libform.so \

```

```

722 target=../lib/$(ARCH64)/libform.so.1
723 link path=usr/ccs/lib/$(ARCH64)/libgen.so \
724 target=../lib/$(ARCH64)/libgen.so.1
725 link path=usr/ccs/lib/$(ARCH64)/libl.so \
726 target=../lib/$(ARCH64)/libl.so.1
727 link path=usr/ccs/lib/$(ARCH64)/libmalloc.so \
728 target=../lib/$(ARCH64)/libmalloc.so.1
729 link path=usr/ccs/lib/$(ARCH64)/libmenu.so \
730 target=../lib/$(ARCH64)/libmenu.so.1
731 link path=usr/ccs/lib/$(ARCH64)/libpanel.so \
732 target=../lib/$(ARCH64)/libpanel.so.1
733 link path=usr/ccs/lib/$(ARCH64)/libtermcap.so \
734 target=../lib/$(ARCH64)/libtermcap.so.1
735 link path=usr/ccs/lib/$(ARCH64)/libtermplib.so \
736 target=../lib/$(ARCH64)/libcurses.so.1
737 link path=usr/ccs/lib/$(ARCH64)/liby.so \
738 target=../lib/$(ARCH64)/liby.so.1
739 link path=usr/ccs/lib/libcurses.so target=../lib/libcurses.so.1
740 link path=usr/ccs/lib/libform.so target=../lib/libform.so.1
741 link path=usr/ccs/lib/libgen.so target=../lib/libgen.so.1
742 link path=usr/ccs/lib/libl.so target=../lib/libl.so.1
743 link path=usr/ccs/lib/libmalloc.so target=../lib/libmalloc.so.1
744 link path=usr/ccs/lib/libmenu.so target=../lib/libmenu.so.1
745 link path=usr/ccs/lib/libpanel.so target=../lib/libpanel.so.1
746 link path=usr/ccs/lib/libtermcap.so target=../lib/libtermcap.so.1
747 link path=usr/ccs/lib/libtermplib.so target=../lib/libcurses.so.1
748 link path=usr/ccs/lib/liby.so target=../lib/liby.so.1
749 link path=usr/lib/$(ARCH64)/libadm.so \
750 target=../lib/$(ARCH64)/libadm.so.1
751 link path=usr/lib/$(ARCH64)/libadm.so.1 \
752 target=../lib/$(ARCH64)/libadm.so.1
753 link path=usr/lib/$(ARCH64)/libadutils.so target=libadutils.so.1
754 link path=usr/lib/$(ARCH64)/libaio.so \
755 target=../lib/$(ARCH64)/libaio.so.1
756 link path=usr/lib/$(ARCH64)/libaio.so.1 \
757 target=../lib/$(ARCH64)/libaio.so.1
758 link path=usr/lib/$(ARCH64)/libavl.so.1 \
759 target=../lib/$(ARCH64)/libavl.so.1
760 link path=usr/lib/$(ARCH64)/libbsdmalloc.so target=libbsdmalloc.so.1
761 link path=usr/lib/$(ARCH64)/libbsm.so \
762 target=../lib/$(ARCH64)/libbsm.so.1
763 link path=usr/lib/$(ARCH64)/libbsm.so.1 \
764 target=../lib/$(ARCH64)/libbsm.so.1
765 link path=usr/lib/$(ARCH64)/libc.so target=../lib/$(ARCH64)/libc.so.1
766 link path=usr/lib/$(ARCH64)/libc.so.1 target=../lib/$(ARCH64)/libc.so.1
767 link path=usr/lib/$(ARCH64)/libc_db.so \
768 target=../lib/$(ARCH64)/libc_db.so.1
769 link path=usr/lib/$(ARCH64)/libc_db.so.1 \
770 target=../lib/$(ARCH64)/libc_db.so.1
771 link path=usr/lib/$(ARCH64)/libcfgadm.so target=libcfgadm.so.1
772 link path=usr/lib/$(ARCH64)/libcmd.so target=libcmd.so.1
773 link path=usr/lib/$(ARCH64)/libcmdutils.so.1 \
774 target=../lib/$(ARCH64)/libcmdutils.so.1
775 link path=usr/lib/$(ARCH64)/libcommutil.so target=libcommutil.so.1
776 link path=usr/lib/$(ARCH64)/libcontract.so \
777 target=../lib/$(ARCH64)/libcontract.so.1
778 link path=usr/lib/$(ARCH64)/libcontract.so.1 \
779 target=../lib/$(ARCH64)/libcontract.so.1
780 link path=usr/lib/$(ARCH64)/libcrypt.so target=libcrypt.so.1
781 link path=usr/lib/$(ARCH64)/libcrypt.d.so target=libcrypt.so
782 link path=usr/lib/$(ARCH64)/libcrypt.d.so.1 target=libcrypt.so.1
783 link path=usr/lib/$(ARCH64)/libcrypt_i.so target=libcrypt.so
784 link path=usr/lib/$(ARCH64)/libcrypt_i.so.1 target=libcrypt.so.1
785 link path=usr/lib/$(ARCH64)/libctf.so \
786 target=../lib/$(ARCH64)/libctf.so.1
787 link path=usr/lib/$(ARCH64)/libctf.so.1 \

```

```

788 target=../../../../lib/$(ARCH64)/libctf.so.1
789 link path=usr/lib/$(ARCH64)/libcurses.so \
790 target=../../../../lib/$(ARCH64)/libcurses.so.1
791 link path=usr/lib/$(ARCH64)/libcurses.so.1 \
792 target=../../../../lib/$(ARCH64)/libcurses.so.1
793 link path=usr/lib/$(ARCH64)/libdevice.so \
794 target=../../../../lib/$(ARCH64)/libdevice.so.1
795 link path=usr/lib/$(ARCH64)/libdevice.so.1 \
796 target=../../../../lib/$(ARCH64)/libdevice.so.1
797 link path=usr/lib/$(ARCH64)/libdevinfo.so \
798 target=../../../../lib/$(ARCH64)/libdevinfo.so.1
799 link path=usr/lib/$(ARCH64)/libdevinfo.so.1 \
800 target=../../../../lib/$(ARCH64)/libdevinfo.so.1
801 link path=usr/lib/$(ARCH64)/libdevinfo.so.1 \
802 target=../../../../lib/$(ARCH64)/libdevinfo.so.1
803 link path=usr/lib/$(ARCH64)/libdevinfo.so.1 \
804 target=../../../../lib/$(ARCH64)/libdevinfo.so.1
805 link path=usr/lib/$(ARCH64)/libdhcputil.so.1 \
806 target=../../../../lib/$(ARCH64)/libdhcputil.so.1
807 link path=usr/lib/$(ARCH64)/libdisasm.so target=libdisasm.so.1
808 link path=usr/lib/$(ARCH64)/libdl.so target=../../../../lib/$(ARCH64)/libdl.so.1
809 link path=usr/lib/$(ARCH64)/libdl.so.1 \
810 target=../../../../lib/$(ARCH64)/libdl.so.1
811 link path=usr/lib/$(ARCH64)/libdlpi.so \
812 target=../../../../lib/$(ARCH64)/libdlpi.so.1
813 link path=usr/lib/$(ARCH64)/libdlpi.so.1 \
814 target=../../../../lib/$(ARCH64)/libdlpi.so.1
815 link path=usr/lib/$(ARCH64)/libdoor.so \
816 target=../../../../lib/$(ARCH64)/libdoor.so.1
817 link path=usr/lib/$(ARCH64)/libdoor.so.1 \
818 target=../../../../lib/$(ARCH64)/libdoor.so.1
819 link path=usr/lib/$(ARCH64)/libefi.so \
820 target=../../../../lib/$(ARCH64)/libefi.so.1
821 link path=usr/lib/$(ARCH64)/libefi.so.1 \
822 target=../../../../lib/$(ARCH64)/libefi.so.1
823 link path=usr/lib/$(ARCH64)/libelf.so \
824 target=../../../../lib/$(ARCH64)/libelf.so.1
825 link path=usr/lib/$(ARCH64)/libelf.so.1 \
826 target=../../../../lib/$(ARCH64)/libelf.so.1
827 link path=usr/lib/$(ARCH64)/libexacct.so target=libexacct.so.1
828 $(i386_ONLY)link path=usr/lib/$(ARCH64)/libfdisk.so \
829 target=../../../../lib/$(ARCH64)/libfdisk.so.1
830 $(i386_ONLY)link path=usr/lib/$(ARCH64)/libfdisk.so.1 \
831 target=../../../../lib/$(ARCH64)/libfdisk.so.1
832 link path=usr/lib/$(ARCH64)/libform.so target=libform.so.1
833 link path=usr/lib/$(ARCH64)/libfstyp.so target=libfstyp.so.1
834 link path=usr/lib/$(ARCH64)/libgen.so \
835 target=../../../../lib/$(ARCH64)/libgen.so.1
836 link path=usr/lib/$(ARCH64)/libgen.so.1 \
837 target=../../../../lib/$(ARCH64)/libgen.so.1
838 link path=usr/lib/$(ARCH64)/libhotplug.so target=libhotplug.so.1
839 link path=usr/lib/$(ARCH64)/libidmap.so target=libidmap.so.1
840 link path=usr/lib/$(ARCH64)/libinetutil.so.1 \
841 target=../../../../lib/$(ARCH64)/libinetutil.so.1
842 link path=usr/lib/$(ARCH64)/libintl.so \
843 target=../../../../lib/$(ARCH64)/libintl.so.1
844 link path=usr/lib/$(ARCH64)/libintl.so.1 \
845 target=../../../../lib/$(ARCH64)/libintl.so.1
846 link path=usr/lib/$(ARCH64)/libipmi.so target=libipmi.so.1
847 link path=usr/lib/$(ARCH64)/libipp.so target=libipp.so.1
848 link path=usr/lib/$(ARCH64)/libkstat.so \
849 target=../../../../lib/$(ARCH64)/libkstat.so.1
850 link path=usr/lib/$(ARCH64)/libkstat.so.1 \
851 target=../../../../lib/$(ARCH64)/libkstat.so.1
852 link path=usr/lib/$(ARCH64)/libkvm.so target=libkvm.so.1
853 link path=usr/lib/$(ARCH64)/libl.so target=libl.so.1

```

```

854 link path=usr/lib/$(ARCH64)/libldap.so target=libldap.so.5
855 link path=usr/lib/$(ARCH64)/libltdbg.so.4 \
856 target=../../../../lib/$(ARCH64)/libltdbg.so.4
857 link path=usr/lib/$(ARCH64)/liblgrp.so target=liblgrp.so.1
858 link path=usr/lib/$(ARCH64)/liblm.so target=liblm.so.1
859 link path=usr/lib/$(ARCH64)/libmail.so target=libmail.so.1
860 link path=usr/lib/$(ARCH64)/libmalloc.so target=libmalloc.so.1
861 link path=usr/lib/$(ARCH64)/libmapmalloc.so target=libmapmalloc.so.1
862 link path=usr/lib/$(ARCH64)/libmd.so target=../../../../lib/$(ARCH64)/libmd.so.1
863 link path=usr/lib/$(ARCH64)/libmd.so.1 \
864 target=../../../../lib/$(ARCH64)/libmd.so.1
865 link path=usr/lib/$(ARCH64)/libmd5.so \
866 target=../../../../lib/$(ARCH64)/libmd5.so.1
867 link path=usr/lib/$(ARCH64)/libmd5.so.1 \
868 target=../../../../lib/$(ARCH64)/libmd5.so.1
869 link path=usr/lib/$(ARCH64)/libmenu.so target=libmenu.so.1
870 link path=usr/lib/$(ARCH64)/libmp.so target=../../../../lib/$(ARCH64)/libmp.so.2
871 link path=usr/lib/$(ARCH64)/libmp.so.2 \
872 target=../../../../lib/$(ARCH64)/libmp.so.2
873 link path=usr/lib/$(ARCH64)/libmtmalloc.so target=libmtmalloc.so.1
874 link path=usr/lib/$(ARCH64)/libnls.so target=libnls.so.1
875 link path=usr/lib/$(ARCH64)/libnsl.so \
876 target=../../../../lib/$(ARCH64)/libnsl.so.1
877 link path=usr/lib/$(ARCH64)/libnsl.so.1 \
878 target=../../../../lib/$(ARCH64)/libnsl.so.1
879 link path=usr/lib/$(ARCH64)/libnvpair.so \
880 target=../../../../lib/$(ARCH64)/libnvpair.so.1
881 link path=usr/lib/$(ARCH64)/libnvpair.so.1 \
882 target=../../../../lib/$(ARCH64)/libnvpair.so.1
883 link path=usr/lib/$(ARCH64)/libpam.so \
884 target=../../../../lib/$(ARCH64)/libpam.so.1
885 link path=usr/lib/$(ARCH64)/libpam.so.1 \
886 target=../../../../lib/$(ARCH64)/libpam.so.1
887 link path=usr/lib/$(ARCH64)/libpanel.so target=libpanel.so.1
888 link path=usr/lib/$(ARCH64)/libpkcs11.so target=libpkcs11.so.1
889 link path=usr/lib/$(ARCH64)/libposix4.so \
890 target=../../../../lib/$(ARCH64)/librt.so.1
891 link path=usr/lib/$(ARCH64)/libposix4.so.1 \
892 target=../../../../lib/$(ARCH64)/librt.so.1
893 link path=usr/lib/$(ARCH64)/libproc.so \
894 target=../../../../lib/$(ARCH64)/libproc.so.1
895 link path=usr/lib/$(ARCH64)/libproc.so.1 \
896 target=../../../../lib/$(ARCH64)/libproc.so.1
897 link path=usr/lib/$(ARCH64)/libproject.so target=libproject.so.1
898 link path=usr/lib/$(ARCH64)/libpthread.so \
899 target=../../../../lib/$(ARCH64)/libpthread.so.1
900 link path=usr/lib/$(ARCH64)/libpthread.so.1 \
901 target=../../../../lib/$(ARCH64)/libpthread.so.1
902 link path=usr/lib/$(ARCH64)/librcm.so \
903 target=../../../../lib/$(ARCH64)/librcm.so.1
904 link path=usr/lib/$(ARCH64)/librcm.so.1 \
905 target=../../../../lib/$(ARCH64)/librcm.so.1
906 link path=usr/lib/$(ARCH64)/librepase.so target=librepase.so.1
907 link path=usr/lib/$(ARCH64)/libresolv.so \
908 target=../../../../lib/$(ARCH64)/libresolv.so.2
909 link path=usr/lib/$(ARCH64)/libresolv.so.2 \
910 target=../../../../lib/$(ARCH64)/libresolv.so.2
911 $(i386_ONLY)link path=usr/lib/$(ARCH64)/librestart.so \
912 target=../../../../lib/$(ARCH64)/librestart.so.1
913 link path=usr/lib/$(ARCH64)/librestart.so.1 \
914 target=../../../../lib/$(ARCH64)/librestart.so.1
915 link path=usr/lib/$(ARCH64)/librpcsvc.so \
916 target=../../../../lib/$(ARCH64)/librpcsvc.so.1
917 link path=usr/lib/$(ARCH64)/librpcsvc.so.1 \
918 target=../../../../lib/$(ARCH64)/librpcsvc.so.1
919 link path=usr/lib/$(ARCH64)/librt.so target=../../../../lib/$(ARCH64)/librt.so.1

```

```
920 link path=usr/lib/$(ARCH64)/librt.so.1 \
921     target=../../../../lib/$(ARCH64)/librt.so.1
922 link path=usr/lib/$(ARCH64)/librtld.so.1 \
923     target=../../../../lib/$(ARCH64)/librtld.so.1
924 link path=usr/lib/$(ARCH64)/librtld_db.so \
925     target=../../../../lib/$(ARCH64)/librtld_db.so.1
926 link path=usr/lib/$(ARCH64)/librtld_db.so.1 \
927     target=../../../../lib/$(ARCH64)/librtld_db.so.1
928 link path=usr/lib/$(ARCH64)/libscf.so \
929     target=../../../../lib/$(ARCH64)/libscf.so.1
930 link path=usr/lib/$(ARCH64)/libscf.so.1 \
931     target=../../../../lib/$(ARCH64)/libscf.so.1
932 link path=usr/lib/$(ARCH64)/libsched.so target=libsched.so.1
933 link path=usr/lib/$(ARCH64)/libsctp.so target=libsctp.so.1
934 link path=usr/lib/$(ARCH64)/libsec.so \
935     target=../../../../lib/$(ARCH64)/libsec.so.1
936 link path=usr/lib/$(ARCH64)/libsec.so.1 \
937     target=../../../../lib/$(ARCH64)/libsec.so.1
938 link path=usr/lib/$(ARCH64)/libsecdb.so \
939     target=../../../../lib/$(ARCH64)/libsecdb.so.1
940 link path=usr/lib/$(ARCH64)/libsecdb.so.1 \
941     target=../../../../lib/$(ARCH64)/libsecdb.so.1
942 link path=usr/lib/$(ARCH64)/libsendfile.so \
943     target=../../../../lib/$(ARCH64)/libsendfile.so.1
944 link path=usr/lib/$(ARCH64)/libsendfile.so.1 \
945     target=../../../../lib/$(ARCH64)/libsendfile.so.1
946 link path=usr/lib/$(ARCH64)/libsip.so target=libsip.so.1
947 link path=usr/lib/$(ARCH64)/libslldap.so target=libslldap.so.1
948 link path=usr/lib/$(ARCH64)/libsmbios.so target=libsmbios.so.1
949 link path=usr/lib/$(ARCH64)/libsocket.so \
950     target=../../../../lib/$(ARCH64)/libsocket.so.1
951 link path=usr/lib/$(ARCH64)/libsocket.so.1 \
952     target=../../../../lib/$(ARCH64)/libsocket.so.1
953 link path=usr/lib/$(ARCH64)/libsoftcrypto.so target=libsoftcrypto.so.1
954 link path=usr/lib/$(ARCH64)/libsysevent.so \
955     target=../../../../lib/$(ARCH64)/libsysevent.so.1
956 link path=usr/lib/$(ARCH64)/libsysevent.so.1 \
957     target=../../../../lib/$(ARCH64)/libsysevent.so.1
958 link path=usr/lib/$(ARCH64)/libtermcap.so \
959     target=../../../../lib/$(ARCH64)/libtermcap.so.1
960 link path=usr/lib/$(ARCH64)/libtermcap.so.1 \
961     target=../../../../lib/$(ARCH64)/libtermcap.so.1
962 link path=usr/lib/$(ARCH64)/libtermplib.so \
963     target=../../../../lib/$(ARCH64)/libcurses.so.1
964 link path=usr/lib/$(ARCH64)/libtermplib.so.1 \
965     target=../../../../lib/$(ARCH64)/libcurses.so.1
966 link path=usr/lib/$(ARCH64)/libthread.so \
967     target=../../../../lib/$(ARCH64)/libthread.so.1
968 link path=usr/lib/$(ARCH64)/libthread.so.1 \
969     target=../../../../lib/$(ARCH64)/libthread.so.1
970 link path=usr/lib/$(ARCH64)/libthread_db.so \
971     target=../../../../lib/$(ARCH64)/libc_db.so.1
972 link path=usr/lib/$(ARCH64)/libthread_db.so.1 \
973     target=../../../../lib/$(ARCH64)/libc_db.so.1
974 link path=usr/lib/$(ARCH64)/libtsnet.so \
975     target=../../../../lib/$(ARCH64)/libtsnet.so.1
976 link path=usr/lib/$(ARCH64)/libtsnet.so.1 \
977     target=../../../../lib/$(ARCH64)/libtsnet.so.1
978 link path=usr/lib/$(ARCH64)/libtsol.so \
979     target=../../../../lib/$(ARCH64)/libtsol.so.2
980 link path=usr/lib/$(ARCH64)/libtsol.so.2 \
981     target=../../../../lib/$(ARCH64)/libtsol.so.2
982 link path=usr/lib/$(ARCH64)/libumem.so \
983     target=../../../../lib/$(ARCH64)/libumem.so.1
984 link path=usr/lib/$(ARCH64)/libumem.so.1 \
985     target=../../../../lib/$(ARCH64)/libumem.so.1
```

```
986 link path=usr/lib/$(ARCH64)/libuuid.so \
987     target=../../../../lib/$(ARCH64)/libuuid.so.1
988 link path=usr/lib/$(ARCH64)/libuuid.so.1 \
989     target=../../../../lib/$(ARCH64)/libuuid.so.1
990 $(i386_ONLY)link path=usr/lib/$(ARCH64)/libuutil.so \
991     target=../../../../lib/$(ARCH64)/libuutil.so.1
992 link path=usr/lib/$(ARCH64)/libuutil.so.1 \
993     target=../../../../lib/$(ARCH64)/libuutil.so.1
994 $(sparc_ONLY)link path=usr/lib/$(ARCH64)/libv12n.so target=libv12n.so.1
995 link path=usr/lib/$(ARCH64)/libvolmgt.so target=libvolmgt.so.1
996 link path=usr/lib/$(ARCH64)/libw.so target=../../../../lib/$(ARCH64)/libw.so.1
997 link path=usr/lib/$(ARCH64)/libw.so.1 target=../../../../lib/$(ARCH64)/libw.so.1
998 link path=usr/lib/$(ARCH64)/libwrap.so target=libwrap.so.1.0
999 link path=usr/lib/$(ARCH64)/libwrap.so.1 target=libwrap.so.1.0
1000 link path=usr/lib/$(ARCH64)/libxnet.so \
1001     target=../../../../lib/$(ARCH64)/libxnet.so.1
1002 link path=usr/lib/$(ARCH64)/libxnet.so.1 \
1003     target=../../../../lib/$(ARCH64)/libxnet.so.1
1004 link path=usr/lib/$(ARCH64)/liby.so target=liby.so.1
1005 link path=usr/lib/$(ARCH64)/libzoneinfo.so target=libzoneinfo.so.1
1006 link path=usr/lib/$(ARCH64)/nss_compat.so.1 \
1007     target=../../../../lib/$(ARCH64)/nss_compat.so.1
1008 link path=usr/lib/$(ARCH64)/nss_dns.so.1 \
1009     target=../../../../lib/$(ARCH64)/nss_dns.so.1
1010 link path=usr/lib/$(ARCH64)/nss_files.so.1 \
1011     target=../../../../lib/$(ARCH64)/nss_files.so.1
1012 link path=usr/lib/$(ARCH64)/nss_nis.so.1 \
1013     target=../../../../lib/$(ARCH64)/nss_nis.so.1
1014 link path=usr/lib/$(ARCH64)/nss_user.so.1 \
1015     target=../../../../lib/$(ARCH64)/nss_user.so.1
1016 link path=usr/lib/$(ARCH64)/straddr.so target=straddr.so.2
1017 link path=usr/lib/32 target=
1018 link path=usr/lib/64 target=$(ARCH64)
1019 link path=usr/lib/cfgadm/$(ARCH64)/ib.so target=ib.so.1
1020 link path=usr/lib/cfgadm/$(ARCH64)/pci.so target=pci.so.1
1021 $(i386_ONLY)link path=usr/lib/cfgadm/$(ARCH64)/sata.so target=sata.so.1
1022 link path=usr/lib/cfgadm/$(ARCH64)/scsi.so target=scsi.so.1
1023 link path=usr/lib/cfgadm/$(ARCH64)/shp.so target=shp.so.1
1024 link path=usr/lib/cfgadm/$(ARCH64)/usb.so target=usb.so.1
1025 link path=usr/lib/cfgadm/ib.so target=ib.so.1
1026 link path=usr/lib/cfgadm/pci.so target=pci.so.1
1027 $(i386_ONLY)link path=usr/lib/cfgadm/sata.so target=sata.so.1
1028 link path=usr/lib/cfgadm/scsi.so target=scsi.so.1
1029 link path=usr/lib/cfgadm/shp.so target=shp.so.1
1030 link path=usr/lib/cfgadm/usb.so target=usb.so.1
1031 link path=usr/lib/libadm.so target=../../../../lib/libadm.so.1
1032 link path=usr/lib/libadm.so.1 target=../../../../lib/libadm.so.1
1033 link path=usr/lib/libadutils.so target=libadutils.so.1
1034 link path=usr/lib/libaio.so target=../../../../lib/libaio.so.1
1035 link path=usr/lib/libaio.so.1 target=../../../../lib/libaio.so.1
1036 link path=usr/lib/libavl.so.1 target=../../../../lib/libavl.so.1
1037 link path=usr/lib/libbsdmalloc.so target=libbsdmalloc.so.1
1038 link path=usr/lib/libbsm.so target=../../../../lib/libbsm.so.1
1039 link path=usr/lib/libbsm.so.1 target=../../../../lib/libbsm.so.1
1040 link path=usr/lib/libc.so target=../../../../lib/libc.so.1
1041 link path=usr/lib/libc.so.1 target=../../../../lib/libc.so.1
1042 link path=usr/lib/libc_db.so target=../../../../lib/libc_db.so.1
1043 link path=usr/lib/libc_db.so.1 target=../../../../lib/libc_db.so.1
1044 link path=usr/lib/libcfgadm.so target=libcfgadm.so.1
1045 link path=usr/lib/libcmd.so target=libcmd.so.1
1046 link path=usr/lib/libcmdutils.so.1 target=../../../../lib/libcmdutils.so.1
1047 link path=usr/lib/libcommputil.so target=libcommputil.so.1
1048 link path=usr/lib/libcontract.so target=../../../../lib/libcontract.so.1
1049 link path=usr/lib/libcontract.so.1 target=../../../../lib/libcontract.so.1
1050 link path=usr/lib/libcrypt.so target=libcrypt.so.1
1051 link path=usr/lib/libcrypt_d.so target=libcrypt.so
```

```

1052 link path=usr/lib/libcrypt_d.so.1 target=../libcrypt.so.1
1053 link path=usr/lib/libcrypt_i.so target=../libcrypt.so
1054 link path=usr/lib/libcrypt_i.so.1 target=../libcrypt.so.1
1055 link path=usr/lib/libctf.so target=../lib/libctf.so.1
1056 link path=usr/lib/libctf.so.1 target=../lib/libctf.so.1
1057 link path=usr/lib/libcurses.so target=../lib/libcurses.so.1
1058 link path=usr/lib/libcurses.so.1 target=../lib/libcurses.so.1
1059 link path=usr/lib/libdevice.so target=../lib/libdevice.so.1
1060 link path=usr/lib/libdevice.so.1 target=../lib/libdevice.so.1
1061 link path=usr/lib/libdevvid.so target=../lib/libdevvid.so.1
1062 link path=usr/lib/libdevvid.so.1 target=../lib/libdevvid.so.1
1063 link path=usr/lib/libdevinfo.so target=../lib/libdevinfo.so.1
1064 link path=usr/lib/libdevinfo.so.1 target=../lib/libdevinfo.so.1
1065 link path=usr/lib/libdhcpcagent.so.1 target=../lib/libdhcpcagent.so.1
1066 link path=usr/lib/libdhcputil.so.1 target=../lib/libdhcputil.so.1
1067 link path=usr/lib/libdisasm.so target=../lib/libdisasm.so.1
1068 link path=usr/lib/libdl.so target=../lib/libdl.so.1
1069 link path=usr/lib/libdl.so.1 target=../lib/libdl.so.1
1070 link path=usr/lib/libdmpi.so target=../lib/libdmpi.so.1
1071 link path=usr/lib/libdmpi.so.1 target=../lib/libdmpi.so.1
1072 link path=usr/lib/libdoor.so target=../lib/libdoor.so.1
1073 link path=usr/lib/libdoor.so.1 target=../lib/libdoor.so.1
1074 link path=usr/lib/libefi.so target=../lib/libefi.so.1
1075 link path=usr/lib/libefi.so.1 target=../lib/libefi.so.1
1076 link path=usr/lib/libelf.so target=../lib/libelf.so.1
1077 link path=usr/lib/libelf.so.1 target=../lib/libelf.so.1
1078 link path=usr/lib/libexacct.so target=../libexacct.so.1
1079 $(i386_ONLY)link path=usr/lib/libfdisk.so target=../lib/libfdisk.so.1
1080 $(i386_ONLY)link path=usr/lib/libfdisk.so.1 target=../lib/libfdisk.so.1
1081 link path=usr/lib/libform.so target=../libform.so.1
1082 link path=usr/lib/libfstyp.so target=../libfstyp.so.1
1083 link path=usr/lib/libgen.so target=../lib/libgen.so.1
1084 link path=usr/lib/libgen.so.1 target=../lib/libgen.so.1
1085 link path=usr/lib/libhotplug.so target=../libhotplug.so.1
1086 link path=usr/lib/libidmap.so target=../libidmap.so.1
1087 link path=usr/lib/libinetutil.so.1 target=../lib/libinetutil.so.1
1088 link path=usr/lib/libintl.so target=../lib/libintl.so.1
1089 link path=usr/lib/libintl.so.1 target=../lib/libintl.so.1
1090 link path=usr/lib/libipmi.so target=../libipmi.so.1
1091 link path=usr/lib/libipp.so target=../libipp.so.1
1092 link path=usr/lib/libkstat.so target=../lib/libkstat.so.1
1093 link path=usr/lib/libkstat.so.1 target=../lib/libkstat.so.1
1094 link path=usr/lib/libkvm.so target=../libkvm.so.1
1095 link path=usr/lib/libl.so target=../libl.so.1
1096 link path=usr/lib/libldap.so target=libldap.so.5
1097 link path=usr/lib/liblddbg.so.4 target=../lib/liblddbg.so.4
1098 link path=usr/lib/liblgrp.so target=../liblgrp.so.1
1099 link path=usr/lib/liblm.so target=../liblm.so.1
1100 link path=usr/lib/libmail.so target=../libmail.so.1
1101 link path=usr/lib/libmalloc.so target=../libmalloc.so.1
1102 link path=usr/lib/libmapmalloc.so target=../libmapmalloc.so.1
1103 link path=usr/lib/libmd.so target=../lib/libmd.so.1
1104 link path=usr/lib/libmd.so.1 target=../lib/libmd.so.1
1105 link path=usr/lib/libmd5.so target=../lib/libmd5.so.1
1106 link path=usr/lib/libmd5.so.1 target=../lib/libmd5.so.1
1107 link path=usr/lib/libmenu.so target=../libmenu.so.1
1108 link path=usr/lib/libmp.so target=../lib/libmp.so.2
1109 link path=usr/lib/libmp.so.1 target=../lib/libmp.so.1
1110 link path=usr/lib/libmp.so.2 target=../lib/libmp.so.2
1111 link path=usr/lib/libmtmalloc.so target=../libmtmalloc.so.1
1112 link path=usr/lib/libnls.so target=../libnls.so.1
1113 link path=usr/lib/libnsl.so target=../lib/libnsl.so.1
1114 link path=usr/lib/libnsl.so.1 target=../lib/libnsl.so.1
1115 link path=usr/lib/libnvpair.so target=../lib/libnvpair.so.1
1116 link path=usr/lib/libnvpair.so.1 target=../lib/libnvpair.so.1
1117 link path=usr/lib/libpam.so target=../lib/libpam.so.1

```

```

1118 link path=usr/lib/libpam.so.1 target=../lib/libpam.so.1
1119 link path=usr/lib/libpanel.so target=../libpanel.so.1
1120 link path=usr/lib/libpkcs11.so target=../libpkcs11.so.1
1121 link path=usr/lib/libposix4.so target=../lib/librt.so.1
1122 link path=usr/lib/libposix4.so.1 target=../lib/librt.so.1
1123 link path=usr/lib/libproc.so target=../lib/libproc.so.1
1124 link path=usr/lib/libproc.so.1 target=../lib/libproc.so.1
1125 link path=usr/lib/libproject.so target=../libproject.so.1
1126 link path=usr/lib/libpthread.so target=../lib/libpthread.so.1
1127 link path=usr/lib/libpthread.so.1 target=../lib/libpthread.so.1
1128 link path=usr/lib/librcm.so target=../lib/librcm.so.1
1129 link path=usr/lib/librcm.so.1 target=../lib/librcm.so.1
1130 link path=usr/lib/librepase.so target=../librepase.so.1
1131 link path=usr/lib/libresolv.so target=../lib/libresolv.so.2
1132 link path=usr/lib/libresolv.so.1 target=../lib/libresolv.so.1
1133 link path=usr/lib/libresolv.so.2 target=../lib/libresolv.so.2
1134 link path=usr/lib/librestart.so.1 target=../lib/librestart.so.1
1135 link path=usr/lib/librpcsvc.so target=../lib/librpcsvc.so.1
1136 link path=usr/lib/librpcsvc.so.1 target=../lib/librpcsvc.so.1
1137 link path=usr/lib/librt.so target=../lib/librt.so.1
1138 link path=usr/lib/librt.so.1 target=../lib/librt.so.1
1139 link path=usr/lib/librtdb.so.1 target=../lib/librtdb.so.1
1140 link path=usr/lib/librtdb_db.so target=../lib/librtdb_db.so.1
1141 link path=usr/lib/librtdb_db.so.1 target=../lib/librtdb_db.so.1
1142 link path=usr/lib/libscf.so target=../lib/libscf.so.1
1143 link path=usr/lib/libscf.so.1 target=../lib/libscf.so.1
1144 link path=usr/lib/libsched.so target=../libsched.so.1
1145 link path=usr/lib/libscdp.so target=../libscdp.so.1
1146 link path=usr/lib/libsec.so target=../lib/libsec.so.1
1147 link path=usr/lib/libsec.so.1 target=../lib/libsec.so.1
1148 link path=usr/lib/libsecdb.so target=../lib/libsecdb.so.1
1149 link path=usr/lib/libsecdb.so.1 target=../lib/libsecdb.so.1
1150 link path=usr/lib/libsendfile.so target=../lib/libsendfile.so.1
1151 link path=usr/lib/libsendfile.so.1 target=../lib/libsendfile.so.1
1152 link path=usr/lib/libsip.so target=../lib/libsip.so.1
1153 link path=usr/lib/libslldap.so target=libslldap.so.1
1154 link path=usr/lib/libsmbios.so target=libsmbios.so.1
1155 link path=usr/lib/libsocket.so target=../lib/libsocket.so.1
1156 link path=usr/lib/libsocket.so.1 target=../lib/libsocket.so.1
1157 link path=usr/lib/libsoftcrypto.so target=../libsoftcrypto.so.1
1158 link path=usr/lib/libsys.so target=../libsys.so.1
1159 link path=usr/lib/libsyssevent.so target=../lib/libsyssevent.so.1
1160 link path=usr/lib/libsyssevent.so.1 target=../lib/libsyssevent.so.1
1161 link path=usr/lib/libtermcap.so target=../lib/libtermcap.so.1
1162 link path=usr/lib/libtermcap.so.1 target=../lib/libtermcap.so.1
1163 link path=usr/lib/libtermmlib.so target=../lib/libcurses.so.1
1164 link path=usr/lib/libtermmlib.so.1 target=../lib/libcurses.so.1
1165 link path=usr/lib/libthread.so target=../lib/libthread.so.1
1166 link path=usr/lib/libthread.so.1 target=../lib/libthread.so.1
1167 link path=usr/lib/libthread_db.so target=../lib/libc_db.so.1
1168 link path=usr/lib/libthread_db.so.1 target=../lib/libc_db.so.1
1169 link path=usr/lib/libtsnet.so target=../lib/libtsnet.so.1
1170 link path=usr/lib/libtsnet.so.1 target=../lib/libtsnet.so.1
1171 link path=usr/lib/libtsol.so target=../lib/libtsol.so.2
1172 link path=usr/lib/libtsol.so.2 target=../lib/libtsol.so.2
1173 link path=usr/lib/libumem.so target=../lib/libumem.so.1
1174 link path=usr/lib/libumem.so.1 target=../lib/libumem.so.1
1175 link path=usr/lib/libuuid.so target=../lib/libuuid.so.1
1176 link path=usr/lib/libuuid.so.1 target=../lib/libuuid.so.1
1177 link path=usr/lib/libuutil.so.1 target=../lib/libuutil.so.1
1178 $(sparc_ONLY)link path=usr/lib/libv12n.so target=../libv12n.so.1
1179 link path=usr/lib/libvolmgt.so target=../libvolmgt.so.1
1180 link path=usr/lib/libw.so target=../lib/libw.so.1
1181 link path=usr/lib/libw.so.1 target=../lib/libw.so.1
1182 link path=usr/lib/libwrap.so target=libwrap.so.1.0
1183 link path=usr/lib/libwrap.so.1 target=libwrap.so.1.0

```



```

1184 link path=usr/lib/libxnet.so target=../lib/libxnet.so.1
1185 link path=usr/lib/libxnet.so.1 target=../lib/libxnet.so.1
1186 link path=usr/lib/liby.so target=../liby.so.1
1187 link path=usr/lib/libzoneinfo.so target=../libzoneinfo.so.1
1188 link path=usr/lib/lwp/$(ARCH64)/libthread.so.1 \
1189 target=../lib/$(ARCH64)/libthread.so.1
1190 link path=usr/lib/lwp/$(ARCH64)/libthread_db.so.1 \
1191 target=../lib/$(ARCH64)/libthread_db.so.1
1192 link path=usr/lib/lwp/32 target=
1193 link path=usr/lib/lwp/64 target=$(ARCH64)
1194 link path=usr/lib/lwp/libthread.so.1 target=../libthread.so.1
1195 link path=usr/lib/lwp/libthread_db.so.1 target=../libthread_db.so.1
1196 link path=usr/lib/nss_compat.so.1 target=../lib/nss_compat.so.1
1197 link path=usr/lib/nss_dns.so.1 target=../lib/nss_dns.so.1
1198 link path=usr/lib/nss_files.so.1 target=../lib/nss_files.so.1
1199 link path=usr/lib/nss_nis.so.1 target=../lib/nss_nis.so.1
1200 link path=usr/lib/nss_user.so.1 target=../lib/nss_user.so.1
1201 link path=usr/lib/scsi/$(ARCH64)/libscsi.so target=../libscsi.so.1
1202 link path=usr/lib/scsi/$(ARCH64)/libses.so target=../libses.so.1
1203 link path=usr/lib/scsi/$(ARCH64)/libsmp.so target=../libsmp.so.1
1204 link path=usr/lib/scsi/libscsi.so target=../libscsi.so.1
1205 link path=usr/lib/scsi/libses.so target=../libses.so.1
1206 link path=usr/lib/scsi/libsmp.so target=../libsmp.so.1
1207 link path=usr/lib/security/$(ARCH64)/crypt_bsdbf.so target=../crypt_bsdbf.so.1
1208 link path=usr/lib/security/$(ARCH64)/crypt_bsmd5.so \
1209 target=../crypt_bsmd5.so.1
1210 link path=usr/lib/security/$(ARCH64)/crypt_sha256.so \
1211 target=../crypt_sha256.so.1
1212 link path=usr/lib/security/$(ARCH64)/crypt_sha512.so \
1213 target=../crypt_sha512.so.1
1214 link path=usr/lib/security/$(ARCH64)/crypt_sunmd5.so \
1215 target=../crypt_sunmd5.so.1
1216 link path=usr/lib/security/$(ARCH64)/pam_allow.so target=../pam_allow.so.1
1217 link path=usr/lib/security/$(ARCH64)/pam_authok_check.so \
1218 target=../pam_authok_check.so.1
1219 link path=usr/lib/security/$(ARCH64)/pam_authok_get.so \
1220 target=../pam_authok_get.so.1
1221 link path=usr/lib/security/$(ARCH64)/pam_authok_store.so \
1222 target=../pam_authok_store.so.1
1223 link path=usr/lib/security/$(ARCH64)/pam_deny.so target=../pam_deny.so.1
1224 link path=usr/lib/security/$(ARCH64)/pam_dhkeys.so target=../pam_dhkeys.so.1
1225 link path=usr/lib/security/$(ARCH64)/pam_dial_auth.so \
1226 target=../pam_dial_auth.so.1
1227 link path=usr/lib/security/$(ARCH64)/pam_ldap.so target=../pam_ldap.so.1
1228 link path=usr/lib/security/$(ARCH64)/pam_list.so target=../pam_list.so.1
1229 link path=usr/lib/security/$(ARCH64)/pam_passwd_auth.so \
1230 target=../pam_passwd_auth.so.1
1231 link path=usr/lib/security/$(ARCH64)/pam_rhosts_auth.so \
1232 target=../pam_rhosts_auth.so.1
1233 link path=usr/lib/security/$(ARCH64)/pam_roles.so target=../pam_roles.so.1
1234 link path=usr/lib/security/$(ARCH64)/pam_sample.so target=../pam_sample.so.1
1235 link path=usr/lib/security/$(ARCH64)/pam_tsol_account.so \
1236 target=../pam_tsol_account.so.1
1237 link path=usr/lib/security/$(ARCH64)/pam_unix_account.so \
1238 target=../pam_unix_account.so.1
1239 link path=usr/lib/security/$(ARCH64)/pam_unix_auth.so \
1240 target=../pam_unix_auth.so.1
1241 link path=usr/lib/security/$(ARCH64)/pam_unix_cred.so \
1242 target=../pam_unix_cred.so.1
1243 link path=usr/lib/security/$(ARCH64)/pam_unix_session.so \
1244 target=../pam_unix_session.so.1
1245 link path=usr/lib/security/$(ARCH64)/pkcs11_kernel.so \
1246 target=../pkcs11_kernel.so.1
1247 link path=usr/lib/security/$(ARCH64)/pkcs11_softtoken.so \
1248 target=../pkcs11_softtoken.so.1
1249 link path=usr/lib/security/$(ARCH64)/pkcs11_tpm.so target=../pkcs11_tpm.so.1

```

```

1250 link path=usr/lib/security/64 target=$(ARCH64)
1251 link path=usr/lib/security/audit_binfile.so target=../audit_binfile.so.1
1252 link path=usr/lib/security/audit_remote.so target=../audit_remote.so.1
1253 link path=usr/lib/security/audit_syslog.so target=../audit_syslog.so.1
1254 link path=usr/lib/security/crypt_bsdbf.so target=../crypt_bsdbf.so.1
1255 link path=usr/lib/security/crypt_bsmd5.so target=../crypt_bsmd5.so.1
1256 link path=usr/lib/security/crypt_sha256.so target=../crypt_sha256.so.1
1257 link path=usr/lib/security/crypt_sha512.so target=../crypt_sha512.so.1
1258 link path=usr/lib/security/crypt_sunmd5.so target=../crypt_sunmd5.so.1
1259 link path=usr/lib/security/pam_allow.so target=../pam_allow.so.1
1260 link path=usr/lib/security/pam_authok_check.so \
1261 target=../pam_authok_check.so.1
1262 link path=usr/lib/security/pam_authok_get.so target=../pam_authok_get.so.1
1263 link path=usr/lib/security/pam_authok_store.so \
1264 target=../pam_authok_store.so.1
1265 link path=usr/lib/security/pam_deny.so target=../pam_deny.so.1
1266 link path=usr/lib/security/pam_dhkeys.so target=../pam_dhkeys.so.1
1267 link path=usr/lib/security/pam_dial_auth.so target=../pam_dial_auth.so.1
1268 link path=usr/lib/security/pam_ldap.so target=../pam_ldap.so.1
1269 link path=usr/lib/security/pam_list.so target=../pam_list.so.1
1270 link path=usr/lib/security/pam_passwd_auth.so target=../pam_passwd_auth.so.1
1271 link path=usr/lib/security/pam_rhosts_auth.so target=../pam_rhosts_auth.so.1
1272 link path=usr/lib/security/pam_roles.so target=../pam_roles.so.1
1273 link path=usr/lib/security/pam_sample.so target=../pam_sample.so.1
1274 link path=usr/lib/security/pam_tsol_account.so target=../pam_tsol_account.so.1
1275 link path=usr/lib/security/pam_unix_account.so target=../pam_unix_account.so.1
1276 link path=usr/lib/security/pam_unix_auth.so target=../pam_unix_auth.so.1
1277 link path=usr/lib/security/pam_unix_cred.so target=../pam_unix_cred.so.1
1278 link path=usr/lib/security/pam_unix_session.so target=../pam_unix_session.so.1
1279 link path=usr/lib/security/pkcs11_kernel.so target=../pkcs11_kernel.so.1
1280 link path=usr/lib/security/pkcs11_softtoken.so target=../pkcs11_softtoken.so.1
1281 link path=usr/lib/security/pkcs11_tpm.so target=../pkcs11_tpm.so.1
1282 link path=usr/lib/straddr.so target=../straddr.so.2
1283 link path=usr/xpg4/lib/$(ARCH64)/libcurses.so target=libcurses.so.2
1284 link path=usr/xpg4/lib/64 target=$(ARCH64)
1285 link path=usr/xpg4/lib/libcurses.so target=../libcurses.so.2
1286 #
1287 # libses.so needs to dlopen(3C) plugins from usr/lib/scsi/plugins/ses/vendor/,
1288 # a dependency which cannot be automatically derived
1289 #
1290 depend fmri=system/library/storage/scsi-plugins type=require

```

new/usr/src/stand/lib/wanboot/Makefile

1

1720 Fri May 30 18:32:24 2014
new/usr/src/stand/lib/wanboot/Makefile
4853 illumos-gate is not lint-clean when built with openssl 1.0

```
1 #
2 # CDDL HEADER START
3 #
4 # The contents of this file are subject to the terms of the
5 # Common Development and Distribution License (the "License").
6 # You may not use this file except in compliance with the License.
7 #
8 # You can obtain a copy of the license at usr/src/OPENSOLARIS.LICENSE
9 # or http://www.opensolaris.org/os/licensing.
10 # See the License for the specific language governing permissions
11 # and limitations under the License.
12 #
13 # When distributing Covered Code, include this CDDL HEADER in each
14 # file and include the License file at usr/src/OPENSOLARIS.LICENSE.
15 # If applicable, add the following below this CDDL HEADER, with the
16 # fields enclosed by brackets "[]" replaced with your own identifying
17 # information: Portions Copyright [yyyy] [name of copyright owner]
18 #
19 # CDDL HEADER END
20 #
21 # Copyright 2009 Sun Microsystems, Inc. All rights reserved.
22 # Use is subject to license terms.
23 #

25 LIBRARY = libwanboot.a
26 LOCOBJS = http_aux.o bootinfo_aux.o
27 CMNOBJS = boot_http.o parseURL.o bootlog.o auxutil.o p12access.o \
28          p12auxpars.o p12err.o p12misc.o http_errorstr.o bootconf.o bootinfo.o
29 OBJECTS = $(LOCOBJS) $(CMNOBJS)

31 include ../Makefile.com

33 CMNDIR = $(CMNNETDIR)/wanboot
34 SRCS = $(LOCOBJS:%.o=$(SRCDIR)/%.c) $(CMNOBJS:%.o=$(CMNDIR)/%.c)
35 LDLIBS += -lsunw_crypto -lsock -linet -lsunw_ssl -lnvpair

37 CPPFLAGS += -I$(CMNNETDIR)/dhcp -I$(TOPDIR)/common/net/wanboot/crypt \
38            -I../inet $(DHCPPPPFLAGS) $(SOCKCPPFLAGS)

40 #
41 # several objects need access to openssl headers, now in ../openssl
42 #
43 CPPFLAGS += -I..

45 CERRWARN += -_gcc=-Wno-char-subscripts
46 CERRWARN += -_gcc=-Wno-switch
47 CERRWARN += -_gcc=-Wno-parentheses
48 CERRWARN += -_gcc=-Wno-uninitialized
49 CERRWARN += -_gcc=-Wno-unused-value

51 include ../Makefile.targ
```